Dell PowerEdge C6620

Installation and Service Manual

D&LL Technologies

Notes, cautions, and warnings

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

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

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

Contents

About this document

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

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PowerEdge C6620 system configurations and features

The PowerEdge C6620 system is a half-width sled that supports:
- Up to two 4ᵗʰ Generation Intel Xeon Scalable processors with up to 56 cores
- 16 DDR5 DIMM slots
- Two redundant AC or DC power supply units
- Up to 16 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) drives
- Up to 8 x E3.s NVMe SSD drives

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

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

Topics:

- System configurations - inside view for PowerEdge C6620
- System configurations - rear view for PowerEdge C6620
- Network ports indicator codes
- Sled to hard drive mapping
- C6600 chassis options and drive enumerations
- Locating the Express Service Code and Service Tag
- System information label

System configurations - inside view for PowerEdge C6620
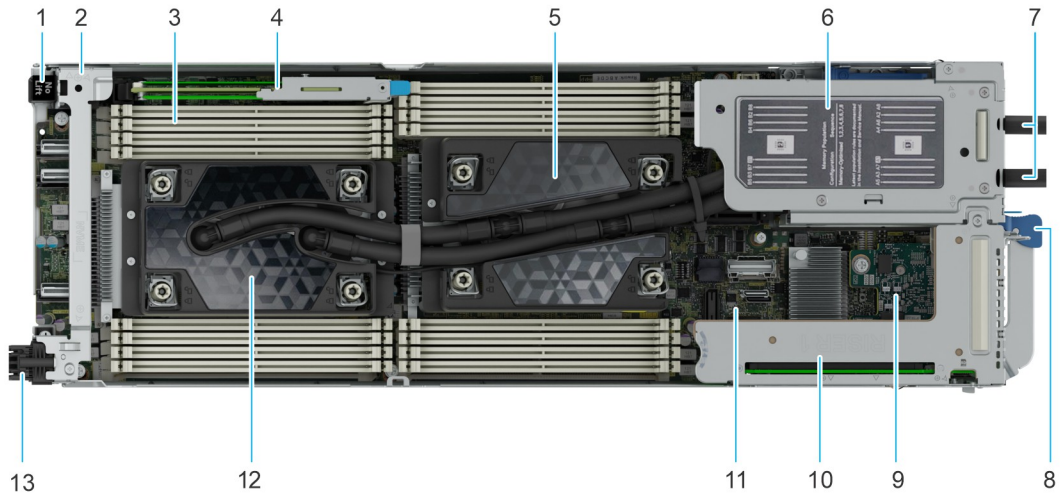
Figure 1. Inside view of the PowerEdge C6620 sled (liquid cooling configuration)

1. Power connector
2. Support bracket
3. Memory module sockets
4. BOSS-N1: HWRAID 1, 2 x M.2 SSDs
5. Processor 1 and liquid cooling cold plate with leak sensor
6. Liquid cooling rubber tube cover
7. Rubber tubes
8. Lock release for sled handle
9. LOM
10. Expansion card riser (R1A/R1B)
11. System board
12. Processor 2 and liquid cooling cold plate with leak sensor
13. EXAMAX connector
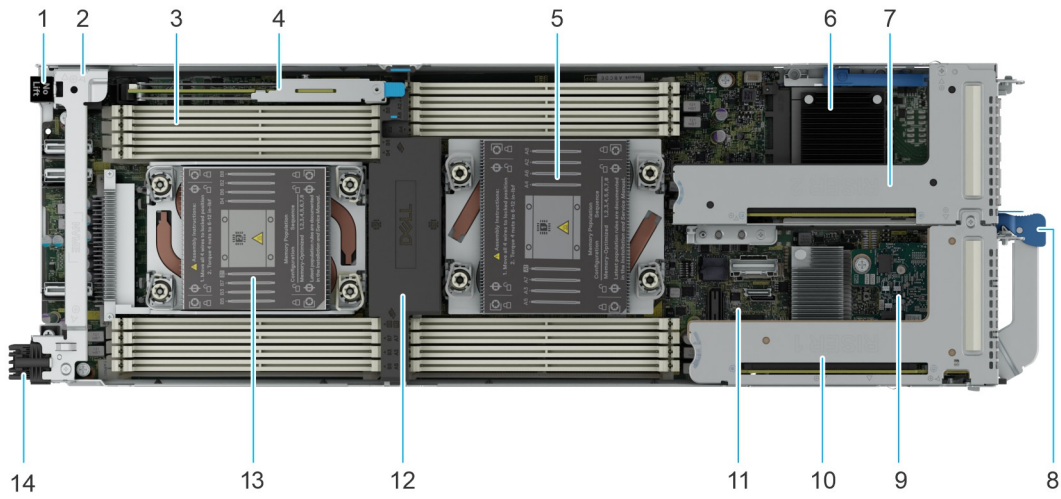
Figure 2. Inside view of the PowerEdge C6620 sled (air cooling configuration)

1. Power connector
2. Support bracket
3. Memory module sockets
4. BOSS-N1: HWRAID 1, 2 x M.2 SSDs
5. Processor 1 and heat sink module
6. OCP 3.0 card
7. Expansion card riser (R2A/R2B)
8. Lock release for sled handle
9. LOM
10. Expansion card riser (R1A/R1B)
11. System board
12. Air shroud
13. Processor 2 and heat sink module
14. EXAMAX connector

System configurations - rear view for PowerEdge C6620
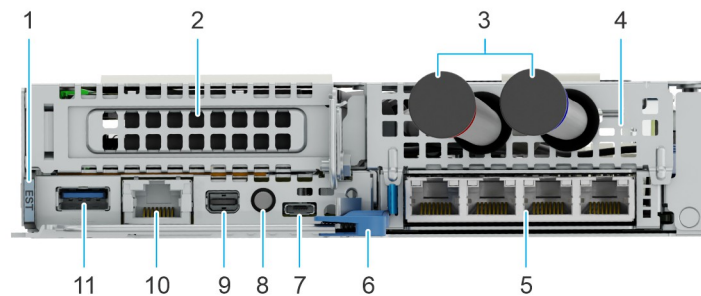
Figure 3. Rear view or the system (liquid cooling configuration)

Table 1. Rear view of the system (liquid cooling configuration)

Item	Ports, panels, or slots	Icon	Description
1	Express Service Tag	N/A	The Express Service Tag is a slide-out label panel that contains system information such as Service Tag, NIC, MAC address, and so on. If you have opted for the secure default access to iDRAC, the Information tag will also contain the iDRAC secure default password.
2	PCIe expansion card riser 1 (R1A/ R2A)	N/A	The expansion card riser enables you to connect PCI Express expansion cards.
3	Coolant tubes	N/A	Cold coolant flows into the system from one tube and hot coolant leaves the system from another tube.
4	Liquid cooling bracket	N/A	Enables you to secure the coolant tubes at the back of the system.
5	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 system board.
6	Lock release for sled handle	N/A	Enables you to release and then pivot the handle to remove the sled from the enclosure.
7	iDRAC Direct port (Micro AB-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.
8	Sled power button	N/A	Enables you to power on the sled while accessing it from the rear.
9	Mini-DisplayPort	▯	Enables you to connect a display device to the system.
10	iDRAC or NIC or RJ45 port	品	The NIC ports that are integrated on the LOM card provide network connectivity which is connected to the system board. or Enables you to remotely access iDRAC. For more information, see the Integrated *Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals.
11	USB 3.0 port	SS⟵	The USB ports are 9-pin, 3.0-compliant. These ports enable you to connect USB devices to the system.

Figure 4. Rear view of the system (air cooling configuration)

Table 2. Rear view of the system (air cooling configuration)

Item	Ports, panels, or slots	Icon	Description
1	Express Service Tag	N/A	The Express Service Tag is a slide-out label panel that contains system information such as Service Tag, NIC, MAC address, and so on. If you have opted for the secure default access to iDRAC, the Information tag will also contain the iDRAC secure default password.
2	PCIe expansion card riser 1 (R1A/R1B)	N/A	The expansion card riser enables you to connect PCI Express expansion cards.
3	PCIe expansion card riser 2 (R2A/R2B)	N/A	The expansion card riser enables you to connect PCI Express expansion cards.
4	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 system board.
5	Lock release for sled handle	N/A	Enables you to release and then pivot the handle to remove the sled from the enclosure.
6	UID LED	N/A	When pressed, the system ID LED in the back panel blinks until either the front or rear button is pressed again. Press the button to toggle between on or off mode.
7	iDRAC Direct port (Micro AB-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.
8	Sled power button	N/A	Enables you to power on the sled while accessing it from the rear.
9	Mini-DisplayPort	▭	Enables you to connect a display device to the system.

Table 2. Rear view of the system (air cooling configuration) (continued)

Item	Ports, panels, or slots	Icon	Description
10	iDRAC or NIC or RJ45 port	🖧	The NIC ports that are integrated on the LOM card provide network connectivity which is connected to the system board. or Enables you to remotely access iDRAC. For more information, see the Integrated *Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals.
11	USB 3.0 port	⮑	The USB ports are 9-pin, 3.0-compliant. These ports enable you to connect USB devices to the system.

Network ports indicator codes
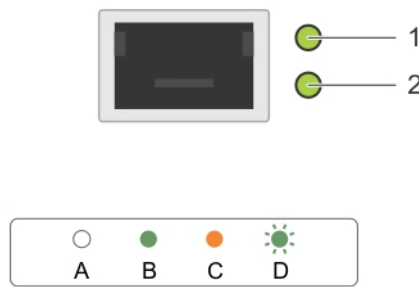
Figure 5. LAN indicators on the QSFP OCP card

1. Link indicator
2. Activity indicator

Table 3. QSFP port on OCP card indicator codes

Connection State	QSFP Upper green LED	QSFP Lower green LED
No link/Not Connected	Off	Off
InfiniBand Physical Link - No Logical Link	Green	Off
InfiniBand Logical Link - No Traffic	Green	Green
InfiniBand Logical Link - Traffic	Green	Blink
InfiniBand Physical Link Issue	Blink	Green
Ethernet Link - No Traffic	Green	Green
Ethernet - Traffic	Green	Blink

ⓘ **NOTE:** The LED blink speed varies according to the traffic bandwidth.
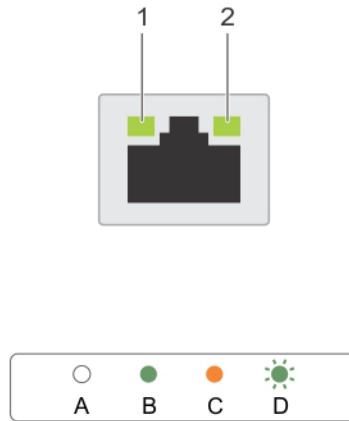
Figure 6. Ethernet port indicator codes

1. Speed indicator
2. Link and activity indicator

Table 4. Ethernet port indicator codes

Convention	Status	Condition
A	Link and activity indicators are off	The NIC is not connected to the network.
B	Link indicator is green	The NIC is connected to a valid network at its maximum port speed.
C	Link indicator is amber	The NIC is connected to a valid network at less than its maximum port speed.
D	Activity indicator is flashing green	Network data is being sent or received.

Sled to hard drive mapping
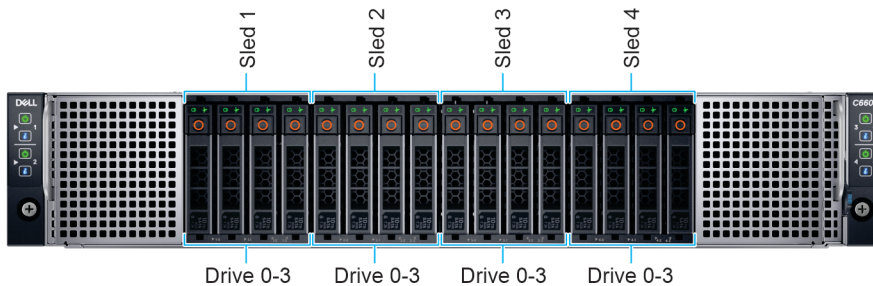
Figure 7. Sled to drive mapping for 16 x 2.5-inch drive configuration

1. Drives 0–3 mapped to sled 1
2. Drives 0-3 mapped to sled 2
3. Drives 0-3 mapped to sled 3
4. Drives 0-3 mapped to sled 4
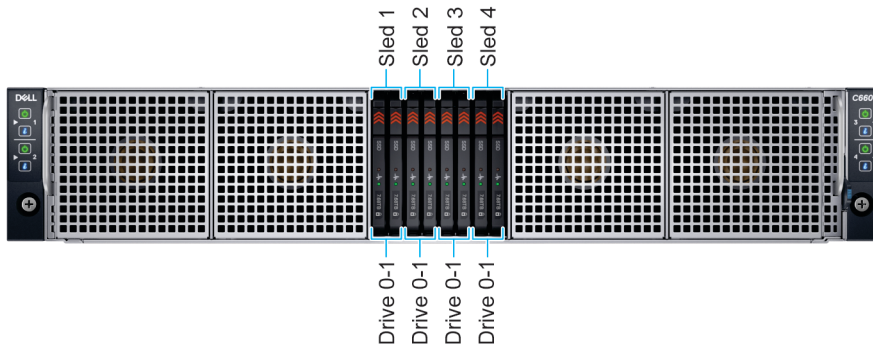
Figure 8. Sled to drive mapping for 8 x E3.s drive configuration

1. Drives 0–1 mapped to sled 1
2. Drives 0–1 mapped to sled 2
3. Drives 0–1 mapped to sled 3
4. Drives 0–1 mapped to sled 4

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

C6600 chassis options and drive enumerations

C6600 chassis - 16 x 2.5-inch NVMe drive configuration

The C6600 chassis with 16 x 2.5-inch NVMe drive configuration supports a NVMe backplane and up to four NVMe drives per sled and a total of 16 NVMe drives per chassis.

ⓘ **NOTE:**
- The NVMe backplane supports only NVMe drives, It does not support SAS/SATA drives.
- The NVMe backplane is PCIe Gen4 capable and can support both Gen4 and Gen3 NVMe drives.
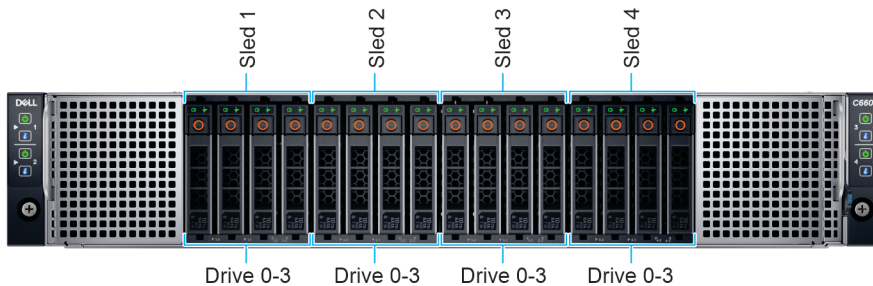
Figure 9. C6600 chassis - 16 x 2.5-inch NVMe backplane with four C6620 sleds

C6600 chassis - 16 x 2.5-inch SAS/SATA drive configuration

The C6600 chassis with 16 x 2.5-inch SAS/SATA drive configuration supports a SAS/SATA backplane and up to four SAS/SATA drives per C6620 sled and a total of 16 SAS/SATA drives per chassis.

ⓘ **NOTE:**
- The chassis is optimized for High-Performance Computing (HPC), High Performance Data Analytics (HPDA), Saas/IaaS, Financial Modeling, vSAN.
- Using an M.2 boot drive in each C6620 sled enables use of front 2.5-inch drives entirely for application data.
- An NVMe PCI card can be used in the LP slot in each C6620 to provide high-performance storage for say writes/cache.
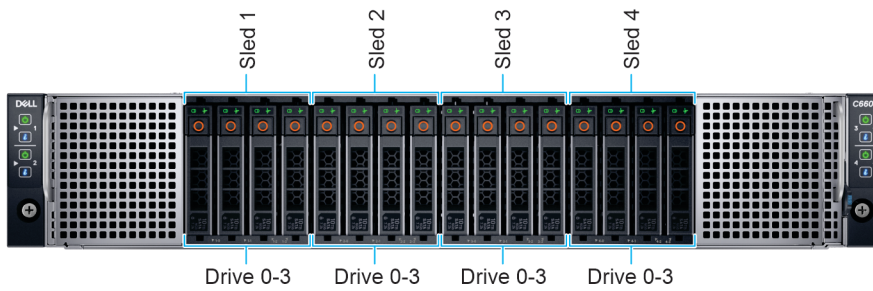
Figure 10. C6600 chassis - 16 x 2.5-inch SAS/SATA backplane with four C6620 sleds

C6600 chassis - 8 x E3.s drive configuration

The C6600 chassis with 8 x E3.s NVMe backplane drive configuration enables a total of 8 x E3.s drives and up to two drives per C6620 sled. Each sled has two drive slots which can use NVMe drives.

ⓘ **NOTE:**
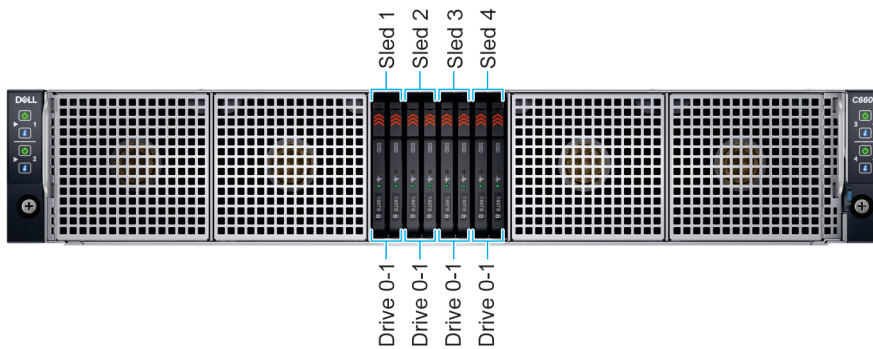
Figure 11. C6600 chassis - 8 x E3.s configuration with four C6620 sleds

C6600 chassis - 16 x 2.5-inch SAS/SATA/NVMe drive configuration - Drive enumeration

The image below shows the C6600 chassis with four C6620 sleds with all drive slots that are populated with either NVMe drives and/or SAS/SATA drives. With the universal backplane, the chassis can support both SAS/SATA and NVMe drives in the order of 2 x SAS/SATA and 2 x universal slot (SAS/SATA/NVMe) sequence until it amounts to 16 drives.
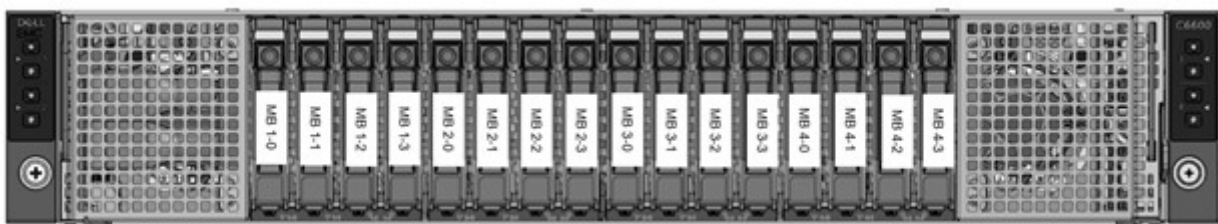
Figure 12. 2.5-inch SAS/SATA/NVMe backplane chassis with four C6620 sleds

C6600 chassis - 8 x E3.s drive configuration - Drive enumeration

The image below shows the C6600 chassis with four C6620 sleds with all drive slots that are populated with NVMe drives.
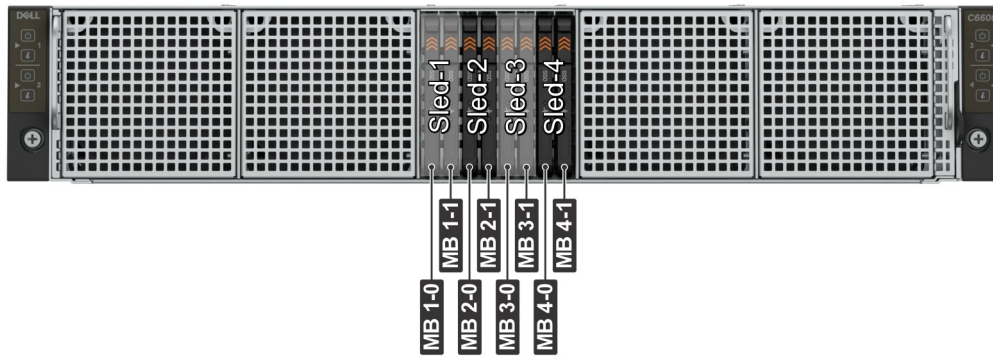
Figure 13. 8 x E3.s configuration chassis with four C6620 sleds

C6600 chassis - No backplane

The C6600 chassis with no-backplane configuration is optimized for use cases that require little to no local storage and primarily use external storage. Each C6620 sled in this chassis can still be optionally configured with a local M.2 boot drive. This chassis does not come with a drive backplane and no front drives are supported for any C6620 sled. Not having a drive backplane maximizes air flow to the C6620 sleds, hence this configuration is the most thermally flexible among all chassis options.

The C6600 chassis with no-backplane a good fit for use cases such as HPC, High Frequency Trading, SaaS/IaaS with external storage, Hadoop data node with external HDFS storage (such as Isilon).
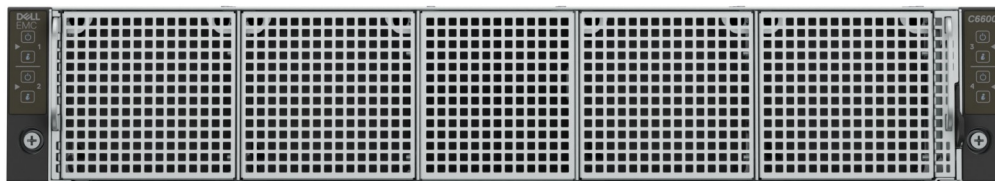
Figure 14. C6600 chassis - No backplane

Locating the Express Service Code and Service Tag

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

The information tag is located on the rear of the system that includes system information such as the Service Tag, Express Service Code, Manufacture date, NIC, MAC address, QRL label, and so on.
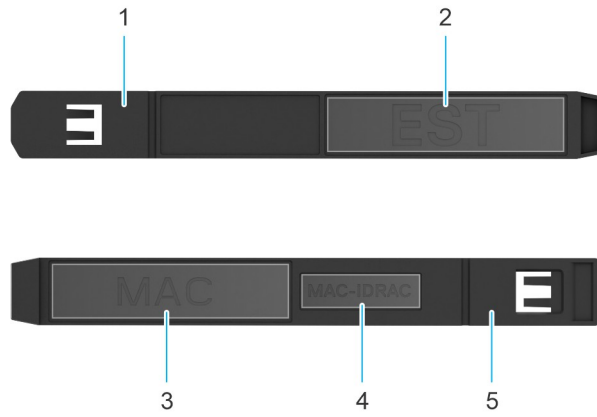
Figure 15. Locating the Service Tag of your system

1. Information tag (top view)
2. Express Service Tag label
3. MAC address information label
4. iDRAC MAC address information label
5. Information tag (bottom view)

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

System information label
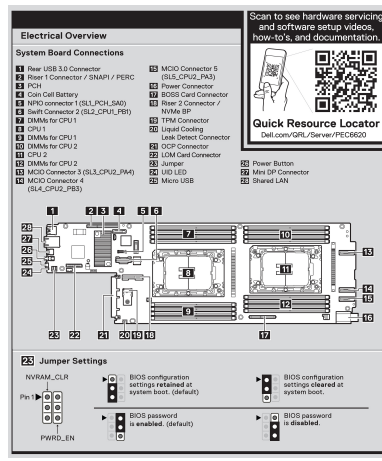
Figure 16. System board connections and Jumper settings

Sled Service Information

Mechanical Overview

Rear View

PCIe GEN 5

USB 3.0

RJ45 Mini DP iDRAC Direct
(Micro-AB USB)

Power Button

OCP NIC

UID LED

Memory Information

⚠**Caution:** Memory (DIMMs) and CPUs may be hot during servicing.

A5 → B5
A3 → B3
A7 → B7
A1 → B1

A4 → B4
A6 → B6
A2 → B2
A8 → B8

Memory Population

Configuration	Sequence
Memory-Optimized	1,2,3,4,5,6,7,8

Latest population guidance and Memory Sparing details are documented in the *Installation and Service Manual.*

To learn more about this Dell product or to order additional or replacement parts, go to **Dell.com/support**

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⚠ **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 coveredby your warranty. Read and follow the safety instructions that came with the product.

Figure 17. Mechanical Overview and Memory information

Figure 18. System tasks: Riser cable and OCP
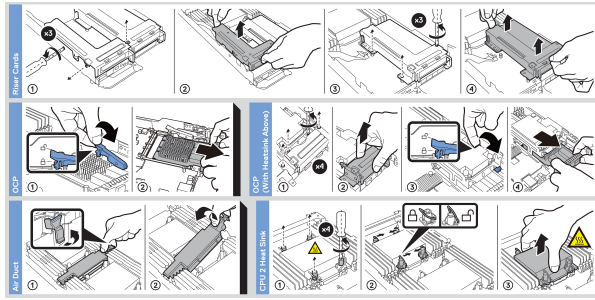
Figure 19. System tasks: Liquid cooling cold plate with leak sensor

Technical specifications

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

Topics:

- Sled dimensions
- System weight
- Processor specifications
- PSU specifications
- Supported operating systems
- System battery specifications
- Expansion card riser specifications
- Memory specifications
- Storage controller specifications
- Drives
- Ports and connectors specifications
- Video specifications
- Environmental specifications

Sled dimensions
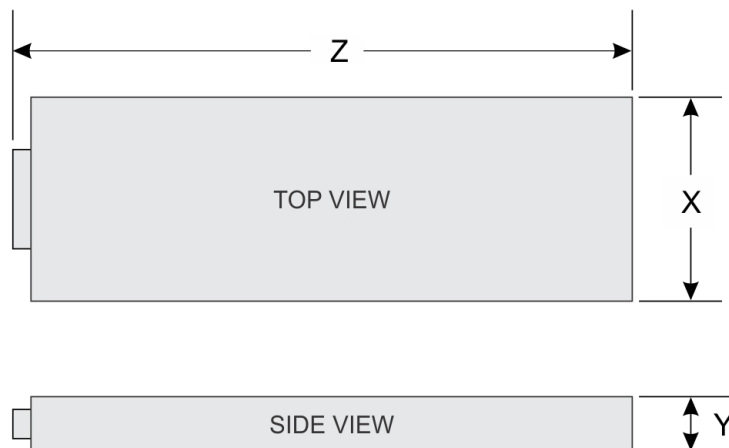
Figure 20. Sled dimensions

Table 5. PowerEdge C6620 sled dimensions

X	Y	Z
174.4 mm (6.86 inches)	40.0 mm (1.57 inches)	549.7 mm (21.64 inches) - diskless configuration
		561.3 mm (22.10 inches) - 2.5-inch E3.s configuration

System weight

Table 6. PowerEdge C6620 system weight

System configuration	Maximum weight
Air cooling	5.1 kg (11.2 pounds)
Liquid cooling	5.1 kg (11.2 pounds)

Processor specifications

Table 7. PowerEdge C6620 processor specifications

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

Minimum firmware version requirements

Table 8. Minimum firmware requirements form CPUs

Processors	iDRAC	BIOS	CPLD
8462Y+	6.10.39.00	1.2.1	1.0.5
6458Q			
6448Y			
6444Y			
6442Y			
6438Y+			
6438M			
6434			
6426Y			
5420+			
5418Y			
5416S			
5415+			
5412U			
4416+			
4410Y			
3408U			
9480	6.10.80.00	1.3.2	1.0.5
9470			
9460			
9462			

PSU specifications

The PowerEdge C6620 system supports up to two AC or DC power supply units (PSUs).

Table 9. PSU specifications

PSU	Class	Heat dissipation (maximum) (BTU/hr)	Frequency (Hz)	Voltage	AC		DC	Current (A)
					High line wattage	**Low line wattage**		
3200 W	N/A	12000 BTU/hr	N/A	336 V DC	N/A	N/A	3200 W	11.5 A
3200 W	N/A	12000 BTU/hr	50/60 Hz	277 V AC	3200 W	N/A	N/A	13.0 A
2800 W	N/A	10500 BTU/hr	N/A	240 V DC	N/A	N/A	2800 W	13.6 A
2800 W	Titanium	10500 BTU/hr	50/60 Hz	200-240 V AC	2800 W	N/A	N/A	15.6 A
2400 W	N/A	9000 BTU/hr	N/A	240 V DC	N/A	N/A	2400 W	11.2 A
2400 W	Platinum	9000 BTU/hr	50/60 Hz	100-240 V AC	2400 W	1400 W	N/A	16-13.5 A
1800 W	N/A	6750 BTU/hr	N/A	240 VDC	N/A	N/A	1800 W	8.2 A
1800 W	Titanium	6750 BTU/hr	50/60 Hz	200-240 V AC	1800 W	N/A	N/A	10 A

(i) **NOTE:** 3200 W AC and DC power supplies are only available in North America.

(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.

Supported operating systems

The PowerEdge C6620 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 vSAN/ESXi

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

System battery specifications

The PowerEdge C6620 system supports CR 2032 3.0-V lithium coin cell system battery.

Expansion card riser specifications

The PowerEdgeC6620 system supports up to four PCI express (PCIe) slots on the system board.

Table 10. Expansion card slots supported on the system board

PCIe slot	Expansion card riser	Processor connection	Height	Length	Slot width
Slot 1	Riser 1A	Processor 1	Low Profile	Half length	x16
Slot 1	Riser 1B	Processor 1, 2	Low Profile	Half length	x8 + x8

Table 10. Expansion card slots supported on the system board (continued)

PCIe slot	Expansion card riser	Processor connection	Height	Length	Slot width
Slot 2	Riser 2B	Processor 2	Low Profile	Half length	x16
Slot 2	Riser 2A	Processor 1	Low Profile	Half length	x8 + x8

Memory specifications

The PowerEdge C6620 system supports the following memory specifications for optimized operation.

Table 11. Memory specifications

DIMM type	DIMM rank	DIMM capacity	Single processor		Dual processors	
			Minimum system capacity	Maximum system capacity	Minimum system capacity	Maximum system capacity
DDR5 RDIMM	Single rank	16 GB	16 GB	128 GB	32 GB	256 GB
	Dual rank	32 GB	32 GB	256 GB	64 GB	512 GB
		64 GB	64 GB	512 GB	128 GB	1 TB
		128 GB	128 GB	1 TB	256 GB	2 TB
		256 GB	256 GB	2 TB	512 GB	4 TB

ⓘ **NOTE:** DDR4 DIMMs are not supported in the C6620 sled.

Table 12. Memory module sockets

Memory module sockets	Speed
16, 288-pin	4800 MT/s

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

Storage controller specifications

The PowerEdge C6620 system supports the following controller cards:

Table 13. Storage controller cards

Supported storage controller cards
Internal controllers ● PERC H965i ● PERC H755 ● PERC H355
Internal Boot ● Boot Optimized Storage Subsystem (BOSS-N1): HWRAID 2 x M.2 SSDs or uSD card
Software RAID ● S160
SAS Hot Bus Adapters (HBA) ● HBA355i

Drives

The PowerEdge C6620 system supports:
- 16 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) drives
- 8 x E3.s 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** > **Data Center Infrastructure** > **Storage Adapters & Controllers** > **Dell PowerEdge Express Flash NVMe PCIe SSD** > **Documentation** > **Manuals and Documents**.

Ports and connectors specifications

USB ports specifications

The PowerEdge C6620 system supports one USB 3.0 on the rear of each sled.

Display port specifications

The PowerEdge C6620 system supports one Mini-DisplayPort on the rear of each sled.

NIC port specifications

The PowerEdge C6620 system supports up to two 10/100/1000 Mbps Network Interface Controller (NIC) ports embedded on the LAN on Motherboard (LOM) and integrated on the optional Open Compute Project (OCP) cards.

Table 14. NIC port specification for the system

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

iDRAC9 port specifications

The PowerEdge C6620 system supports one iDRAC Direct port (Micro-AB USB 2.0-compliant port) on the rear of the system.

GPU specifications

The PowerEdge C6620 system supports up to two 75 W (Low-Profile) GPUs.

Video specifications

The PowerEdge C6620 system supports integrated Matrox G200 graphics controller from mini-DP display port.

Table 15. Supported video resolution options

Resolution	Refresh rate (Hz)	Color depth (bits)
640 x 480	60	8, 16, 32
800 x 600	60	8, 16, 32

Table 15. Supported video resolution options (continued)

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

Environmental specifications

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

Table 16. Continuous Operation Specifications for ASHRAE A3

	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 17. Continuous Operation Specifications for ASHRAE A4

	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 18. Common Environmental Specifications for ASHRAE A3 and A4

	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)

Table 19. Maximum vibration specifications

Maximum vibration	Specifications
Operating	0.26 G_{rms} at 5 Hz to 350 Hz (all operation orientations)
Storage	1.88 G_{rms} at 10 Hz to 500 Hz for 15 minutes (all six sides tested)

Table 20. Maximum shock pulse specifications

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

Thermal air restrictions for C6620

ASHRAE A3/A4 configuration restrictions

- NVMe SSD and E3.s are not supported
- A2 GPU is not supported.
- 128 GB and 256 GB DIMM is not supported
- CPU TDP restrictions:
  - Air cooled 2.5-inch chassis:
    - Maximum supported CPU TDP is 150 W for one processor configuration
    - Two processor configuration is not supported
  - Air cooled with no backplane chassis
    - Maximum supported CPU TDP is 250 W for one processor configuration
    - Maximum supported CPU TDP is 205 W for two processor configuration

DIMM/HDD/M.2 Blanks Restriction

- **Table 21. DIMM blank requirements**

Requirements	1 socket configuration		2 socket configuration	
	CPU 1 slot	CPU 2 slot	CPU 1 slot	CPU 2 slot
DIMM blank requirement	Yes	No	Yes	Yes

- All sled slots must be fully populated or blanked.
- All HDD slots must be fully populated or blanked
- BOSS card slot must be populated or blanked
- All PSU slots must be fully populated or blanked
- All E3.s slots must be fully populated or blanked

Mixed Sled Restriction

Mix of 1P sled and 2P sled on the same chassis is restricted. Only homogeneous 1P sleds or homogeneous 2P sleds can be supported.

Thermal restriction matrix for C6620

Temperature restriction for 2.5-inch/2.5-inch PN chassis

Table 22. 2.5-inch chassis, air cooled, 2P (2 processors)

Processor	TDP	Core count	CPU1 heat sink	CPU2 heat sink	All storage configuration
8470Q	350 W	52	N/A	N/A	N/A
8480+	350 W	56	N/A	N/A	N/A
8470	350 W	52	N/A	N/A	N/A
8468	350 W	48	N/A	N/A	N/A
8458P	350 W	44	N/A	N/A	N/A
8468V	330 W	48	N/A	N/A	N/A
8468H	330 W	48	N/A	N/A	N/A
8460H	330 W	40	N/A	N/A	N/A
8470N	300 W	52	N/A	N/A	N/A
8460Y+	300 W	40	N/A	N/A	N/A
8452Y	300 W	36	N/A	N/A	N/A
6454S	270 W	32	N/A	N/A	N/A
8454H	270 W	32	N/A	N/A	N/A
6430	270 W	32	N/A	N/A	N/A
8444H	270 W	16	N/A	N/A	N/A
8450H	250 W	28	N/A	N/A	N/A

Table 23. 2.5-inch chassis, air cooled, P (1 processors)

Processor	TDP	Core count	CPU1 heat sink	CPU2 heat sink	All storage configuration
8470Q	350 W	52	N/A	N/A	N/A
8480+	350 W	56	N/A	N/A	N/A
8470	350 W	52	N/A	N/A	N/A
8468	350 W	48	N/A	N/A	N/A
8458P	350 W	44	N/A	N/A	N/A
8468V	330 W	48	N/A	N/A	N/A
8468H	330 W	48	N/A	N/A	N/A
8460H	330 W	40	N/A	N/A	N/A
8471N	300 W	52	N/A	N/A	N/A
8470N	300 W	52	N/A	N/A	N/A
8461V	300 W	48	N/A	N/A	N/A
8460Y+	300 W	40	N/A	N/A	N/A
8452Y	300 W	36	N/A	N/A	N/A

Table 23. 2.5-inch chassis, air cooled, P (1 processors) (continued)

Processor	TDP	Core count	CPU1 heat sink	CPU2 heat sink	All storage configuration
6454S	270 W	32	T0FVH (Extended)	N/A	25
8454H	270 W	32	T0FVH (Extended)	N/A	25
6430	270 W	32	T0FVH (Extended)	N/A	25
8444H	270 W	16	T0FVH (Extended)	N/A	25
6414U	250 W	32	T0FVH (Extended)	N/A	25
8450H	250 W	28	T0FVH (Extended)	N/A	25

Table 24. NVME chassis, air cooled, 2P

Processor	TDP	Core count	CPU1 heat sink	CPU2 heat sink	All storage configuration
8470Q	350 W	52	N/A	N/A	N/A
8480+	350 W	56	N/A	N/A	N/A
8470	350 W	52	N/A	N/A	N/A
8468	350 W	48	N/A	N/A	N/A
8458P	350 W	44	N/A	N/A	N/A
8468V	330 W	48	N/A	N/A	N/A
8468H	330 W	48	N/A	N/A	N/A
8460H	330 W	40	N/A	N/A	N/A
8470N	300 W	52	N/A	N/A	N/A
8460Y+	300 W	40	N/A	N/A	N/A
8452Y	300 W	36	N/A	N/A	N/A
6454S	270 W	32	N/A	N/A	N/A
8454H	270 W	32	N/A	N/A	N/A
6430	270 W	32	N/A	N/A	N/A
8444H	270 W	16	N/A	N/A	N/A
8450H	250 W	28	N/A	N/A	N/A

Table 25. NVME chassis, air cooled, 1P

Processor	TDP	Core count	CPU1 heat sink	CPU2 heat sink	All storage configuration
8470Q	350 W	52	N/A	N/A	N/A
8480+	350 W	56	N/A	N/A	N/A
8470	350 W	52	N/A	N/A	N/A
8468	350 W	48	N/A	N/A	N/A

Table 25. NVME chassis, air cooled, 1P (continued)

Processor	TDP	Core count	CPU1 heat sink	CPU2 heat sink	All storage configuration
8458P	350 W	44	N/A	N/A	N/A
8468V	330 W	48	N/A	N/A	N/A
8468H	330 W	48	N/A	N/A	N/A
8460H	330 W	40	N/A	N/A	N/A
8471N	300 W	52	N/A	N/A	N/A
8470N	300 W	52	N/A	N/A	N/A
8461V	300 W	48	N/A	N/A	N/A
8460Y+	300 W	40	N/A	N/A	N/A
8452Y	300 W	36	N/A	N/A	N/A
6454S	270 W	32	T0FVH (Extended)	N/A	20
8454H	270 W	32	T0FVH (Extended)	N/A	20
6430	270 W	32	T0FVH (Extended)	N/A	20
8444H	270 W	16	T0FVH (Extended)	N/A	20
6414U	250 W	32	T0FVH (Extended)	N/A	25
8450H	250 W	28	T0FVH (Extended)	N/A	25

Temperature restrictions for no backplane board and E3.s chassis

Table 26. No backplane chassis and E3.s chassis, air cooled, 2P

Processor	TDP	Core count	CPU1 heat sink	CPU2 heat sink	All storage configuration
8470Q	350 W	52	N/A	N/A	N/A
8480+	350 W	56	N/A	N/A	N/A
8470	350 W	52	N/A	N/A	N/A
8468	350 W	48	N/A	N/A	N/A
8458P	350 W	44	N/A	N/A	N/A
8468V	330 W	48	N/A	N/A	N/A
8468H	330 W	48	N/A	N/A	N/A
8460H	330 W	40	N/A	N/A	N/A
8470N	300 W	52	N/A	N/A	N/A
8460Y+	300 W	40	N/A	N/A	N/A
8452Y	300 W	36	N/A	N/A	N/A
6454S	270 W	32	T0FVH (Extended)	V25GT	25

Table 26. No backplane chassis and E3.s chassis, air cooled, 2P (continued)

Processor	TDP	Core count	CPU1 heat sink	CPU2 heat sink	All storage configuration
8454H	270 W	32	T0FVH (Extended)	V25GT	25
6430	270 W	32	T0FVH (Extended)	V25GT	25
8444H	270 W	16	T0FVH (Extended)	V25GT	25
8450H	250 W	28	V3P2V (General)	V25GT	25*

Table 27. No backplane chassis and E3.s chassis, air cooled, 1P

Processor	TDP	Core count	CPU1 heat sink	CPU2 heat sink	All storage configuration
8470Q	350 W	52	T0FVH (Extended)	N/A	30
8480+	350 W	56	T0FVH (Extended)	N/A	30
8470	350 W	52	T0FVH (Extended)	N/A	30
8468	350 W	48	T0FVH (Extended)	N/A	30
8458P	350 W	44	V3P2V (General)	N/A	25
8468V	330 W	48	V3P2V (General)	N/A	25
8468H	330 W	48	V3P2V (General)	N/A	25
8460H	330 W	40	V3P2V (General)	N/A	35
8471N	300 W	52	V3P2V (General)	N/A	35
8470N	300 W	52	V3P2V (General)	N/A	35
8461V	300 W	48	V3P2V (General)	N/A	35
8460Y+	300 W	40	V3P2V (General)	N/A	35
8452Y	300 W	36	V3P2V (General)	N/A	35
6454S	270 W	32	V3P2V (General)	N/A	35
8454H	270 W	32	V3P2V (General)	N/A	35
6430	270 W	32	V3P2V (General)	N/A	35

Table 27. No backplane chassis and E3.s chassis, air cooled, 1P (continued)

Processor	TDP	Core count	CPU1 heat sink	CPU2 heat sink	All storage configuration
8444H	270 W	16	V3P2V (General)	N/A	35
6414U	250 W	32	V3P2V (General)	N/A	35
8450H	250 W	28	V3P2V (General)	N/A	35

Temperature restrictions for liquid cooled chassis

Table 28. All chassis, liquid cooled (no A2 GPU card)

Processor	TDP	Core count	CPU1 heat sink	CPU2 heat sink	All storage configuration
8470Q	350 W	52	Cold plate	Cold plate	35
8480+	350 W	56	Cold plate	Cold plate	35
8470	350 W	52	Cold plate	Cold plate	35
8468	350 W	48	Cold plate	Cold plate	35
8458P	350 W	44	Cold plate	Cold plate	35
8468V	330 W	48	Cold plate	Cold plate	35
8468H	330 W	48	Cold plate	Cold plate	35
8460H	330 W	40	Cold plate	Cold plate	35
8470N	300 W	52	Cold plate	Cold plate	35
8460Y+	300 W	40	Cold plate	Cold plate	35
8452Y	300 W	36	Cold plate	Cold plate	35
6454S	270 W	32	Cold plate	Cold plate	35
8454H	270 W	32	Cold plate	Cold plate	35
6430	270 W	32	Cold plate	Cold plate	35
8444H	270 W	16	Cold plate	Cold plate	35
8450H	250 W	28	Cold plate	Cold plate	35

4

Initial system setup and configuration

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

Topics:

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

Setting up the system

Perform the following steps to set up the system:

Steps

1. Unpack the system.
2. Install the system into the rack. For more information, see the rail installation and cable management accessory guides relevant to your rail and cable management solution at www.dell.com/poweredgemanuals.
3. Connect the peripherals to the system and the system to the electrical outlet.
4. Power on the system.
   For more information about setting up the system, see the *Getting Started Guide* that is shipped with your system.
   (i) **NOTE:** For information about managing the basic settings and features of the system, see the Pre-operating system management applications chapter.

5. Power on the sled.
   Alternatively, you can also power on the system by using iDRAC by any of the below :
   - For more information about powering on the system using iDRAC, see the Options to log in to iDRAC.

   For more information about setting up the system, see the *Getting Started Guide* that is shipped with your system.
   (i) **NOTE:** For information about managing the basic settings and features of the system, see the Pre-operating system management applications chapter.

iDRAC configuration

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

Options to set up iDRAC IP address

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

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

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

Table 29. Interfaces to set up iDRAC IP address

Interface	Documentation links
iDRAC Settings utility	*Integrated Dell Remote Access Controller User's Guide* at https://www.dell.com/idracmanuals or for system specific *Integrated Dell Remote Access Controller User's Guide*, go to https://www.dell.com/poweredgemanuals > **Product Support** page of your system > **Documentation**. (i) **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article https://www.dell.com/support/article/sln000178115.
OpenManage Deployment Toolkit	*Dell OpenManage Deployment Toolkit User's Guide* available at https://www.dell.com/openmanagemanuals > Open Manage Deployment Toolkit.
iDRAC Direct	*Integrated Dell Remote Access Controller User's Guide* at https://www.dell.com/idracmanuals or for system specific *Integrated Dell Remote Access Controller User's Guide*, go to https://www.dell.com/poweredgemanuals > **Product Support** page of your system > **Documentation**. (i) **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article https://www.dell.com/support/article/sln000178115.
Lifecycle Controller	*Dell Lifecycle Controller User's Guide* at https://www.dell.com/idracmanuals or for system specific *Dell Lifecycle Controller User's Guide*, go to https://www.dell.com/poweredgemanuals > **Product Support** page of your system > **Documentation**. (i) **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article https://www.dell.com/support/article/sln000178115.

(i) **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 mode, if the system is set it to share iDRAC port with OS as an OS NIC or shared LOM mode enabled.

Options to log in to iDRAC

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

You can log in to iDRAC as:

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

In the login screen displayed, if you have opted for secure default access to iDRAC, the default username is `root` and enter the iDRAC secure default password available on back of the Information Tag. If you opted for legacy password, use the iDRAC legacy username and password - `root` and `calvin`, the iDRAC default password will be blank on the information tag. Then you will be prompted and required to create a password of your choice before proceeding. You can also log in by using your Single Sign-On or Smart Card.

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

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

NOTE: To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article https://www.dell.com/support/article/sln000178115.

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

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

Resources to install operating system

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

Table 30. Resources to install the operating system

Resource	Documentation links
iDRAC	*Integrated Dell Remote Access Controller User's Guide* at https://www.dell.com/idracmanuals or for system specific *Integrated Dell Remote Access Controller User's Guide*, go to https://www.dell.com/poweredgemanuals > **Product Support** page of your system > **Documentation**. **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article at https://www.dell.com/support/article/sln000178115.
Lifecycle Controller	*Dell Lifecycle Controller User's Guide* at https://www.dell.com/idracmanuals or for system specific *Dell Lifecycle Controller User's Guide*, go to https://www.dell.com/poweredgemanuals > **Product Support** page of your system > **Documentation**. Dell recommends using Lifecycle Controller to install the OS, since all required drivers are installed on the system. **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article at https://www.dell.com/support/article/sln000178115.
OpenManage Deployment Toolkit	www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit
Dell certified VMware ESXi	www.dell.com/virtualizationsolutions

NOTE: For more information about installation and how-to videos for operating systems supported on PowerEdge systems, see Supported Operating Systems for Dell PowerEdge systems.

Downloading drivers and firmware

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

Prerequisites

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

Steps

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

   NOTE: If you do not have the Service Tag, click **Browse all products**, and navigate to your product.

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

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 31. 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** . ⓘ **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see www.dell.com/support/article/sln000178115.

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 32. 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

Pre-operating system management applications

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

Options to manage the pre-operating system applications

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

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

Topics:

System Setup

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

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

● Graphical User interface — To access go to iDRAC Dashboard, click **Configurations** > **BIOS Settings**.
● Text browser — To enable the text browser, use the Console Redirection.

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

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

The options on the
System Setup Main Menu screen are described in the following table:

Table 33. 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 33. 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 34. 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.
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 35. System Information details

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

Table 35. System Information details (continued)

Option	Description
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 36. Memory Settings details

Option	Description
System Memory Size	Specifies the size of the system memory.
System Memory Type	Specifies the type of memory installed in the system.
System Memory Speed	Specifies the speed of the system memory.
Video Memory	Specifies the size video memory.
System Memory Testing	Specifies whether the system memory tests are run during system boot. The two options available are **Enabled** and **Disabled**. This option is set to **Disabled** by default.
Memory Operating Mode	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 grayed out 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 **Enabled** by default.
ADDDC Settings	Enables or disables ADDDC Setting 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 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. 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.

Table 36. Memory Settings details (continued)

Option	Description
	When option is set to **Enabled**, the system performs the force full memory training steps on every power on and boot time is slowed on every boot.
Memory Map Out	This option controls DIMMs slots on the system. This option is set to **Enabled** by default. It allows to disable system installed DIMMs.
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 Packing 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 37. Processor Settings details

Option	Description
Logical Processor	Each processor core supports up to two logical processors. If this option is set to **Enabled**, the BIOS displays all the logical processors. If this option is set to **Disabled**, the BIOS displays only one logical processor per core. This option is set to **Enabled** by default.
CPU Interconnect Speed	Enables you to govern the frequency of the communication links among the processors in the system. ⓘ **NOTE:** The standard and basic bin processors support lower link frequencies. The options available are **Maximum data rate**, **16.0 GT/s**, **14.4 GT/s**, and **12.8 GT/s**. This option is set to **Maximum data rate** by default. Maximum data rate indicates that the BIOS runs the communication links at the maximum frequency supported by the processors. You can also select specific frequencies that the processors support, which can vary. For best performance, you should select **Maximum data rate**. Any reduction in the communication link frequency affects the performance of non-local memory access and cache coherency traffic. In addition, it can slow access to non-local I/O devices from a particular processor. However, if power saving considerations outweigh performance, reduce the frequency of the processor communication links. Before reducing the frequency, you must localize the memory and I/O access to the nearest NUMA node to minimize the impact to system performance.
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.
Virtualization Technology	When set to **Enabled**, the BIOS will enable processor Virtualization features and provide the virtualization support to the Operating System (OS) through

Table 37. Processor Settings details (continued)

Option	Description
	the DMAR table. In general, only virtualized environments such as VMware®, ESX™, Microsoft Hyper-V®, Red Hat® KVM, and other virtualized operating systems will take advantage of these features. Disabling this feature is not known to significantly alter the performance or power characteristics of the system, so leaving this option **Enabled** is advised for most cases.
Directory Mode	Enables or disables the directory mode. This option is set to **Enabled** by default.
Kernel DMA Protection	When set to **Enabled**, using IOMMU, BIOS and Operating System will enable direct memory access protection for DMA capable peripheral devices. **Enable** IOMMU Support to use this option. When set to Enabled, using Virtualization Technology, BIOS and Operating System will enable direct memory access protection for DMA capable peripheral devices. **Enable** Virtualization Technology to use this option. This option is set to **Disabled** by default. It is enabled for **Secure Launch (Firmware Protection)** support on Windows 2022.
Address Translation Services(ATS)	This option is set to **Enabled** by default. ATS provides an interface between Chipset's address translation and protection table to translate DMA addresses to host addresses.
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.
System Isochronous Mode	This feature reduces latency of memory transactions at the expense of bandwidth. Enabling it may be best for real-time audio and video streaming applications. Disabling it may be best for applications needing highest memory bandwidth especially with large number of cores under heavy utilization. This option is set to **Disabled** by default.
Sub NUMA Cluster	Enables or disables the Sub NUMA Cluster. This option is set to **Disabled** by default.
MADT Core Enumeration	Specifies the MADT Core Enumeration. This option is set to default in **Round Robin**. Linear option supports industry core enumeration whereas, Round Robin option supports Dell optimized core enumeration.
UPI Prefetch	Enables you to get the memory read started early on DDR bus. The Ultra Path Interconnect (UPI) Rx path spawns the speculative memory that is read to Integrated Memory

Table 37. Processor Settings details (continued)

Option	Description
	Controller (iMC) directly. This option is set to **Enabled** by default.
XPT Prefetch	This option is set to **Enabled** by default.
LLC Prefetch	Enables or disables the LLC Prefetch on all threads. This option is set to **Enabled** by default.
Dead Line LLC Alloc	Enables or disables the Dead Line LLC Alloc. This option is set to **Enabled** by default. You can enable this option to enter the dead lines in LLC or disable the option to not enter the dead lines in LLC.
Directory AtoS	Enables or disables the Directory AtoS. AtoS optimization reduces remote read latencies for repeat read accesses without intervening writes. This option is set to **Disabled** by default.
AVX P1	Enables you to reconfigure the processor Thermal Design Power (TDP) levels during POST based on the power and thermal delivery capabilities of the system. TDP verifies the maximum heat the cooling system is must dissipate. This option is set to **Normal** by default. ⓘ **NOTE:** This option is only available on certain stock keeping units (SKUs) of the processors.
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. ⓘ **NOTE:** This option will be hidden if the processor installed does not support SST capabilities.
SST-Performance Profile	Enables you to reconfigure the processor using Speed Select Technology. ⓘ **NOTE:** This option will be hidden if the processor installed does not support SST capabilities.
Intel SST-BF	Enables Intel SST-BF. This option is displayed if Performance Per Watt (operating system) 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 if Performance Per Watt (operating system) or Custom (when OSPM is enabled) system profiles are selected. This option is displayed and selectable for each system profile mode. This option is set to **Disabled** by default. ⓘ **NOTE:** This option will be hidden if the processor installed does not support SST capabilities.
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	

Table 37. Processor Settings details (continued)

Option	Description
Dell Controlled Turbo Settings	Controls the turbo engagement. Enable this option only when System Profile is set to **Performance** or **Custom**, and CPU Power Management is set to **Performance**. This item can be selected for each system profile mode. This option is set to **Disabled** by default. (i) **NOTE:** Depending on the number of installed processors, there might be up to two processor listings.
Dell AVX Scaling Technology	Enables you to configure the Dell AVX scaling technology. This option is set to **0** by default. Enter the value from 0 to 12 bins. The value that is entered decreases the Dell AVX Scaling Technology frequency when the Dell-controlled Turbo feature is enabled.
Optimizer Mode	Enables or disables the CPU performance. When this option is set to **Auto**, set the CPU Power Management to Max Performance. When set to **Enabled**, enables the CPU Power Management settings. When set to **Disabled**, the CPU Power Management option is disabled. This option is set to **Auto** by default.
Number of Cores per Processor	Controls the number of enabled cores in each processor. This option is set to **All** by default.
Processor Core Speed	Specifies the maximum core frequency of the processor.
Processor Bus Speed	Specifies the bus speed of the processor. (i) **NOTE:** The processor bus speed option displays only when both processors are installed.
Local Machine Check Exception	Enables or disables the local machine check exception. This is an extension of the MCA Recovery mechanism providing the capability to deliver Uncorrected Recoverable (UCR) Software Recoverable Action Required (SRAR) errors to one or more specific logical processors threads receiving previously 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 **Disabled** by default.
Processor n	(i) **NOTE:** Depending on the number of processors, there might be up to n processors listed. The following settings are displayed for each processor:

Table 38. Processor 1 details

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

Table 38. Processor 1 details (continued)

Option	Description
Microcode	Specifies the processor microcode version.

Table 39. Processor n details

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

SATA Settings

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

Table 40. SATA Settings details

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

Table 41. Port n

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

NVMe Settings

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

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

Table 42. NVMe Settings details

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

Boot Settings

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

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

  (i) **NOTE:** You must use only the UEFI boot mode in order to boot from NVMe drives.

- **BIOS**: The **BIOS Boot Mode** is the legacy boot mode. It is maintained for backward compatibility.

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

Table 43. Boot Settings details

Option	Description
Boot Mode	Enables you to set the boot mode of the system. If the operating system supports UEFI, you can set this option to UEFI. Setting this field to BIOS allows compatibility with non-UEFI operating systems. This option is set to **UEFI** by default. ⚠ **CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.** (i) **NOTE:** Setting this field to UEFI disables the **BIOS Boot Settings** menu.
Boot Sequence Retry	Enables or disables the Boot sequence retry feature or resets the system. When this option is set to **Enabled** and the system fails to boot, the system re-attempts the boot sequence after 30 seconds. When this option is set to **Reset** and the system fails to boot, the system reboots immediately. This option is set to **Enabled** by default.
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. (i) **NOTE:** This option controls the UEFI boot order. The first option in the list will be attempted first.

Table 44. UEFI Boot Settings

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

Choosing system boot mode

System Setup enables you to specify one of the following boot modes for installing your operating system:
- UEFI boot mode (the default), is an enhanced 64-bit boot interface. If you have configured your system to boot to UEFI mode, it replaces the system BIOS.
1. From the **System Setup Main Menu**, click **Boot Settings**, and select **Boot Mode**.
2. Select the UEFI boot mode you want the system to boot into.

   ⚠ **CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.**

3. After the system boots in the specified boot mode, proceed to install your operating system from that mode.

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

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

Changing boot order

About this task

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

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

Steps

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

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

Network Settings

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

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

Table 45. 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 16)	Enables or disables the device. When enabled, a UEFI PXE boot option is created for the device.
PXE Device n Settings(n = 1 to 16)	Enables you to control the configuration of the PXE device.

Table 45. Network Settings details (continued)

Option	Description
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 **Enabled** 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 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 (n = 1 to 4)	This field controls the parameters for the NVMe-oF subsystem n connections.

Table 46. 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 47. 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 48. NVMe-oF SubSystem n Settings

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

Integrated Devices

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

Table 49. Integrated Devices details

Option	Description
User Accessible USB Ports	Configures the user accessible USB ports. Selecting **All Ports Off** disables all front and back USB ports.This option is set to **All Ports On** by default.

Table 49. Integrated Devices details (continued)

Option	Description
	The USB keyboard and mouse still function in certain USB ports during the boot process, depending on the selection. After the boot process is complete, the USB ports will be enabled or disabled as per the setting.
Internal SD Card Port	Enables or disables the internal SD card port. This option is set to **On** or **Off**. This option is set to **On** by default. ⓘ **NOTE:** The Internal SD Card Port on the PCIe riser is controlled by Internal USB Port.
iDRAC Direct USB Port	The iDRAC Direct USB port is managed by iDRAC exclusively with no host visibility. This option is set to **ON** or **OFF**. When set to **OFF**, iDRAC does not detect any USB devices installed in this managed port. This option is set to **On** by default.
Integrated Network Card1	Enables or disables the integrated network card. When this option is set to **Enabled**, the card is not available to the operating system. This option is set to **On** by default. ⓘ **NOTE:** If set to Disabled (operating system), the Integrated NICs might still be available for shared network access by iDRAC.
Embedded NIC1	Enables or disables the Embedded NIC1. If set to **Disabled (OS)**, the NIC may still be available for shared network access by the embedded management controller. Configure the **Embedded NIC1** option by using the NIC management utilities of the system. 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 during POST and preboot environment. The embedded video will then be disabled right before the operating system boots. This option is set to **Enabled** by default. ⓘ **NOTE:** When there are multiple add-in graphic cards installed in the system, the first card discovered during PCI enumeration is selected as the primary video. You might have to rearrange the cards in the slots in order to control which card is the primary video.
I/O Snoop HoldOff Response	Selects the number of cycles PCI I/O can withhold snoop requests, from the CPU, to allow time to complete its own write to LLC. This setting can help improve performance on workloads where throughput and latency are critical. The options available are **256 Cycles**, **512 Cycles**, **1K Cycles**, **2K Cycles**, **4K Cycles**, **8K Cycles**, **16K Cycles**, **32K Cycles**, **64K Cycles** and **128K Cycles**.This option is set to **2K Cycles** by default.
Current State of Embedded Video Controller	Displays the current state of the embedded video controller. The **Current State of Embedded Video Controller** option is a read-only field. If the Embedded Video Controller is the only display capability in the system (that is, no add-in graphics card is installed), then the Embedded Video Controller is automatically used as the primary display even if the **Embedded Video Controller** setting is set to **Enabled**.
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.

Table 49. Integrated Devices details (continued)

Option	Description
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.
Slot Disablement	Enables or disables the available PCIe slots on your system. The slot disablement feature controls the configuration of the PCIe cards installed in the specified slot. Slots must be disabled only when the installed peripheral card prevents booting into the operating system or causes delays in system startup. If the slot is disabled, both the Option ROM and UEFI drivers are disabled. Only slots that are present on the system will be available for control.
	Slot n: Enables or disables or only the boot driver is disabled for the PCIe slot n. This option is set to **Enabled** by default.
Slot Bifurcation	**Auto Discovery Bifurcation Settings** allows **Platform Default 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 port is optional for the PowerEdge C6620 system. The Serial Communication option is applicable only if the serial COM port is installed in the system.

Table 50. Serial Communication details

Option	Description
Serial Communication	Enables the serial communication options. Selects serial communication devices (Serial Device 1 and Serial Device 2) in BIOS. BIOS console redirection can also be enabled, and the port address can be specified.
	The options available for System without serial COM port (DB9) are **On without Console Redirection**, **On with Console Redirection**, **Off**. This option is set to **Off** by default.
Serial Port Address	Enables you to set the port address for serial devices. This option is set to **COM1, COM2 (COM1=0x3F8, COM2=0x2F8)** 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** by using this option.

Table 50. Serial Communication details (continued)

Option	Description
	ⓘ **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 51. System Profile Settings details

Option	Description
System Profile	Sets the system profile. If you set the System Profile option to a mode other than **Custom**, the BIOS automatically sets the rest of the options. You can only change the rest of the options if the mode is set to **Custom**. This option is set to **Performance Per Watt (DAPC)** by default. Other options include **Performance**, **Performance Per Watt (OS)** and **Custom**. ⓘ **NOTE:** All the parameters on the system profile setting screen are available only when the **System Profile** option is set to **Custom**.
CPU Power Management	Sets the CPU power management. This option is set to **System DBPM (DAPC)** by default. Other option includes **Maximum Performance**, **OS DBPM**.
Memory Frequency	Sets the speed of the system memory. You can select **Maximum Performance**, **Maximum Reliability** or a specific speed. This option is set to **Maximum Performance** by default.
Turbo Boost	Enables or disables the processor to operate in the turbo boost mode. This option is set to **Enabled** by default.
C1E	Enables or disables the processor to switch to a minimum performance state when it is idle. This option is set to **Enabled** by default.
C States	Enables or disables the processor to operate in all available power states. C States allow the processor to enter lower power states when idle. When set to **Enabled** (OS controlled) or when set to **Autonomous** (if hardware controlled is supported), the processor can operate in all available Power States to save power, but may increase memory latency and frequency jitter. This option is set to **Enabled** by default.
Memory Patrol Scrub	Sets the memory patrol scrub mode. This option is set to **Standard** by default.
Memory Refresh Rate	Sets the memory refresh rate to either 1x or 2x. This option is set to **1x** by default.
Uncore Frequency	Enables you to select the **Uncore Frequency** option. **Dynamic mode** enables the processor to optimize power resources across cores and uncores during runtime. The optimization of the uncore frequency to either save power or optimize performance is influenced by the setting of the **Energy Efficiency Policy** option.
Energy Efficient Policy	Enables you to select the **Energy Efficient Policy** option. The CPU uses the setting to manipulate the internal behavior of the processor and determines whether to target higher

Table 51. System Profile Settings details (continued)

Option	Description
	performance or better power savings. This option is set to **Balanced Performance** by default.
Monitor/Mwait	Enables the Monitor/Mwait instructions in the processor. This option is set to **Enabled** for all system profiles, except **Custom** by default. ⓘ **NOTE:** This option can be disabled when System Profile is set to **Custom**. ⓘ **NOTE:** When C States is set to Enabled in the Custom mode, changing the Monitor/Mwait setting does not impact the system power or performance.
Workload Profile	This option allows the user to specify the targeted workload of a server. It allows optimization of performance based on the workload type. This option is set to **Not Configured** by default.
CPU Interconnect Bus Link Power Management	Enables or disables the CPU Interconnect Bus Link Power Management. This option is set to **Enabled** by default.
PCI ASPM L1 Link Power Management	Enables or disables the PCI **ASPM L1 Link Power Management**. This option is set to **Enabled** by default.
OS ACPI Cx	Enables you to set the OS SCPI Cx to C2 or C3 state.
GPSS Timer	Enables you to set the GPSS timer from 0 to 500us. This option is set to **500us** by default.
CPU C1 Auto Demotion	Enables or disables the CPU core to automatically demote to lower core idle states.
CPU C1 Auto UnDemotion	Enables or disables the CPU core to automatically to undemote from demoted C1 state.
Workload Configuration	Enables you to control the energy performance of bias settings to allow BIOS to choose a configuration that improve performance on certain workload. This option is set to **Balance** by default.
Dynamic L1	Enables or disables the package level settings to allow dynamic entering lower power link state L1.
Package C States	Enables or disables the package to transition to deeper C-stats or limit to operational state.
Package C State Latency Negotiation	Enables or disables the Package C State Latency Negotiation option when Package C States is enabled.
Power and System Criteria for Package C State	Enables you to set the power and system criteria for Package C States.

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 52. System Security details

Option	Description
CPU AES-NI	Improves the speed of applications by performing encryption and decryption by using the Advanced Encryption Standard Instruction Set (AES-NI). This option is set to **Enabled** by default.
System Password	Sets the system password. This option is 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 53. 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.
TPM Hierarcy	Enables, disables, or clears the storage and endorsement hierarchies. When set to **Enabled**, the storage and endorsement hierarchies can be used.
	When set to **Disabled**, the storage and endorsement hierarchies cannot be used.
	When set to **Clear**, the storage and endorsement hierarchies are cleared of any values, and then reset to **Enabled**.
TPM Advanced Settings	Specifies TPM Advanced Settings details.

Table 54. System Security details

Option	Description
Intel(R) TXT	Enables you to set the Intel Trusted Execution Technology (TXT) option. To enable the **Intel TXT** option, virtualization technology and TPM Security must be enabled with Pre-boot measurements. This option is set to **Off** by default. It is set **On** for Secure Launch (Firmware Protection) support on Windows 2022.
Memory Encryption	Enables or disables the Intel Total Memory Encryption (TME) and Multi-Tenant (Intel® TME-MT). When option is set to **Disabled**, BIOS disables both TME and MK-TME technology. When option is set to **Single Key** BIOS enables the TME technology. When option is set to **Multiple Keys**, BIOS enables the TME-MT technology. This option is set to **Disabled** by default. This setting can be enabled only if the CPU Physical Address Limit is disabled.
TME Encryption Bypass	Allows the option to bypass the Intel Total Memory Encryption. This option is set to **Disabled** by default.
Intel(R) SGX	Enables you to set the Intel Software Guard Extension (SGX) option. To enable the **Intel SGX** option, processor must be SGX capable, memory population must be compatible (minimum x8 identical DIMM1 to DIMM8 per CPU socket, not support on persistent memory configuration), memory operating mode must be set at optimizer mode, memory encryption must be enabled and node interleaving must be disabled. This option is set to **Off** by default. When this option is to **Off**, BIOS disables the SGX technology. When this option is to **On**, BIOS enables the SGX technology.
SGX Package Info In-Band Access	Enables you to access the Intel Software Guard Extension (SGX) package info in-band option. This option is set to **Off** by default.
PPMRR Size	Sets the PPMRR size.
SGX QoS	Enables or disables the SGX quality of service.
Select Owner EPOCH input type	Enables you to select **Change to New random Owner EPOCHs** or **Manual User Defined Owner EPOCHs**. Each EPOCH is 64-bit. After generating new EPOCH by selecting **Change to New random Owner EPOCHs**, the selection reverts back to **Manual User Defined Owner EPOCHs**.
	Software Guard Extensions Epoch n: Sets the Software Guard Extensions Epoch values.

Table 54. System Security details (continued)

Option	Description
Enable writes to SGXLEPUBKEYHASH[3:0] from OS/SW	Enables or disables the Enable writes to SGXLEPUBKEYHASH[3:0] from OS/SW.
	SGX LE Public Key Hash0: Sets the bytes from 0-7 for SGX Launch Enclave Public Key Hash.
	SGX LE Public Key Hash1: Sets the bytes from 8-15 for SGX Launch Enclave Public Key Hash.
	SGX LE Public Key Hash2: Sets the bytes from 16-23 for SGX Launch Enclave Public Key Hash.
	SGX LE Public Key Hash3: Sets the bytes from 24-31 for SGX Launch Enclave Public Key Hash.
Enable/Disable SGX Auto MP Registration Agent	Enables are disables the SGX Auto MP Registration. The MP registration agent is responsible to register the platform.
SGX Factory Reset	Enables you to reset the SGX option to factory settings. This option is set to **Off** by default.
Power Button	Enables or disables the power button on the front of the system. This option is set to **Enabled** by default.
AC Power Recovery	Sets how the system behaves after AC power is restored to the system. This option is set to **Last** by default. ⓘ **NOTE:** The host system will not power on up until iDRAC Root of Trust (RoT) is completed, host power on will be delayed by minimum 90 seconds after the AC applied.
AC Power Recovery Delay	Sets the time delay for the system to power up after AC power is restored to the system. This option is set to **Immediate** by default. When this option is set to **Immediate**, there is no delay for power up. When this option is set to **Random**, the system creates a random delay for power up. When this option is set to **User Defined**, the system delay time is manually to power up.
User Defined Delay (120 s to 600 s)	Sets the **User Defined Delay** option when the **User Defined** option for **AC Power Recovery Delay** is selected. The actual AC recovery time needs to add iDRAC root of trust time (around 50 seconds).
UEFI Variable Access	Provides varying degrees of securing UEFI variables. When set to **Standard** (the default), UEFI variables are accessible in the operating system per the UEFI specification. When set to **Controlled**, selected UEFI variables are protected in the environment and new UEFI boot entries are forced to be at the end of the current boot order.
In-Band Manageability Interface	When set to **Disabled** , this setting hides the Management Engine's (ME), HECI devices, and the system's IPMI devices from the operating system. This prevents the operating system from changing the ME power capping settings, and blocks access to all in-band management tools. All management should be managed through out-of-band. This option is set to **Enabled** by default. ⓘ **NOTE:** BIOS update requires HECI devices to be operational and DUP updates require IPMI interface to be operational. This setting needs to be set to Enabled to avoid updating errors.
SMM Security 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.

Table 54. System Security details (continued)

Option	Description
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.
	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.
   ⓘ **NOTE:** Password protection does not take effect until the system reboots.

Using your system password to secure your system

About this task

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

Steps

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

Next steps

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

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

Deleting or changing system and setup password

Prerequisites

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

Steps

1. To enter System Setup, press F2 immediately after turning on or restarting your system.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security**.
3. On the **System Security** screen, ensure that **Password Status** is set to **Unlocked**.
4. In the **System Password** field, alter or delete the existing system password, and then press Enter or Tab.
5. In the **Setup Password** field, alter or delete the existing setup password, and then press Enter or Tab.

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

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

   (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.

(i) **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 55. Redundant OS Control details

Option	Description
Redundant OS Location	Enables you to select a backup disk from the following devices: ● **None** ● **SATA ports** ⓘ **NOTE:** RAID configurations and NVMe cards are not included, as BIOS does not have the ability to distinguish between individual drives in those configurations. ● **BOSS PCIe Cards (Internal M.2 Drives)** ● **Internal SD card**
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 56. Miscellaneous Settings details

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

iDRAC Settings

The iDRAC settings is an interface to set up and configure the iDRAC parameters by using UEFI. You can enable or disable various iDRAC parameters by using the iDRAC settings.
ⓘ **NOTE:** Accessing some of the features on the iDRAC settings needs the iDRAC Enterprise License upgrade.

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

Device Settings

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

Dell Lifecycle Controller

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

Embedded system management

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

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

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

Boot Manager

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

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

Table 57. 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.

Installing and removing system components

Topics:

- Safety instructions
- Before working inside your system
- After working inside your system
- Recommended tools
- C6620 sled
- Air shroud
- Support bracket
- Expansion cards and expansion card risers
- LOM riser card
- M.2 SSD module
- System memory
- Processor and heat sink module
- Liquid cooling cold plate with leak sensor
- Optional OCP card
- System battery
- System board
- Trusted Platform Module

Safety instructions

⚠️ **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.

ⓘ **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.

⚠️ **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.**

Before working inside your system

Prerequisites

Follow the safety guidelines listed in the Safety instructions.

Steps

1. Power off the sled.
2. Remove the sled from the enclosure.

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

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

C6620 sled

Sled installation guidelines

⚠ **CAUTION: Ensure that the chassis does not have a mixed architecture of PowerEdge C6420, PowerEdge C6525 and PowerEdge C6620 sled configurations.**

Mixing of sleds are not supported. When chassis or sled mismatch is detected, follow the procedures below:

Table 58. Actions taken when chassis or sled mismatch is detected

Indicators and solution	Description
Common indications of chassis or sled mismatch	Status LED Blinking Amber (Status ID LEDs on chassis ears & SLED rear I/O).
	System generate SEL log in the mismatched Sled in iDRAC.
	Chassis fan runs full speed to maintain sleds operation.
Common indications of chassis or sled mismatch in BIOS	BIOS blocks booting and shows warning message - "Unable to boot because a mismatch is detected in node <Node Number> installed in the chassis. The installed node is <Installed Sled>, but this <Chassis Model> chassis is configured to support 1-4 Nodes of type <Supported Sled>."
Solution	1. Install same type sleds to the chassis. 2. Set up the correct Sticky Bit in Chassis Manager.

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

(i) **NOTE:** For optimized thermal operation, do not mix single processor and dual processor sleds within the same chassis.

(i) **NOTE:** For optimized thermal operation, ensure to follow the sled population sequence shown in the image below:
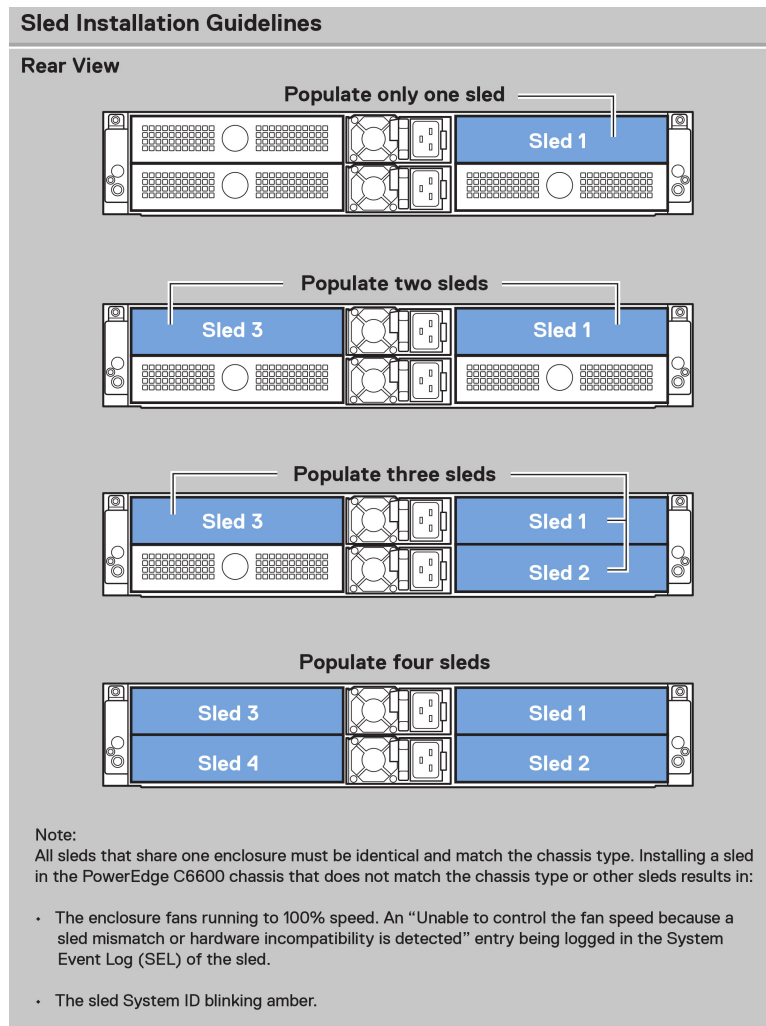
Figure 21. Sled Installation Guidelines

Removing a sled

Prerequisites

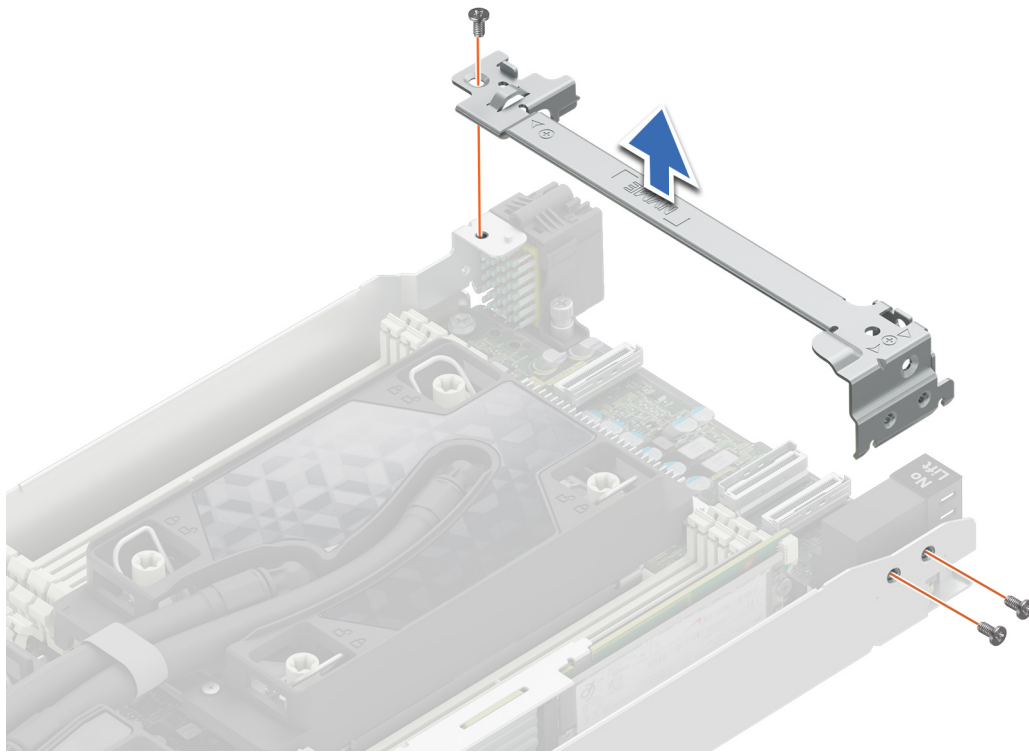1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.

Steps

1. Release the sled handle by pressing the blue latch to disengage from it from the metal hook.
2. Pull outward on the handle until it rotates to the end of its travel and fully disengages the internal sled electrical connectors.
3. Holding the sled handle with one hand, pull the sled out of the enclosure while supporting the sled underside with the other hand.

   ⚠ **CAUTION: Support the sled with both hands while sliding it out of the enclosure.**

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

Figure 22. Removing a sled

4. To release the sled blank, press the retention latch on the sled to release the sled.
5. Slide the sled blank out of the enclosure.
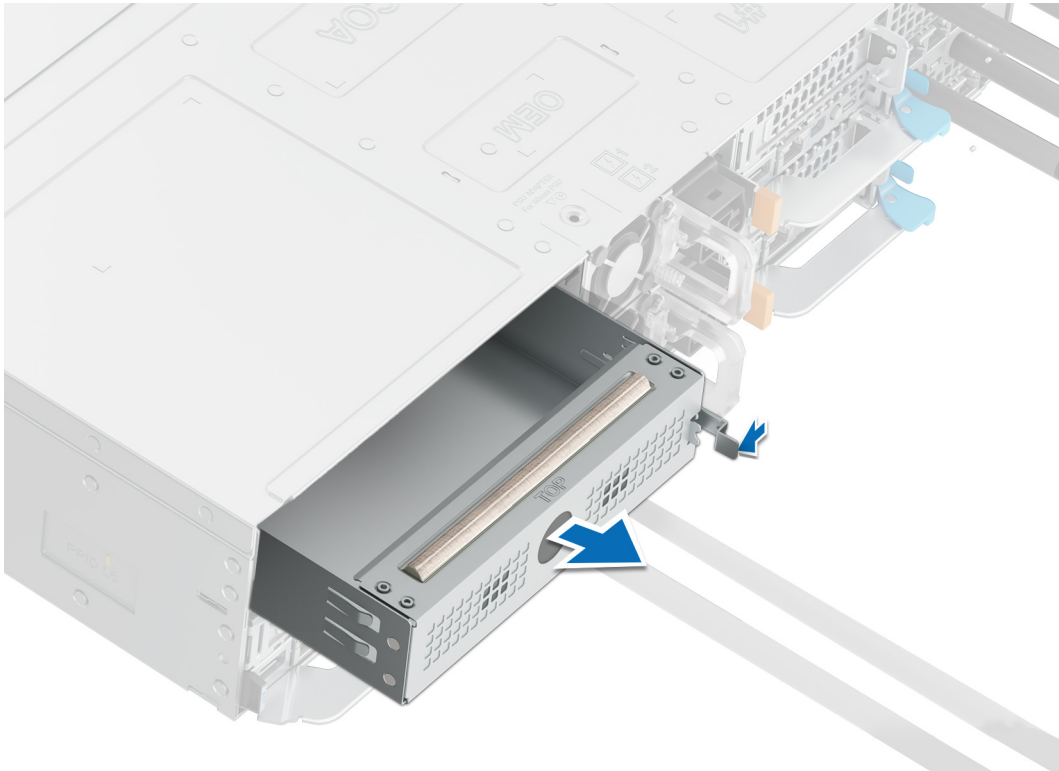
Figure 23. Removing a sled blank

Next steps

Replace the sled.

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

Installing a sled

Prerequisites

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

Steps

1. Release the sled handle by pressing the blue latch to disengage it from the metal hook.
2. Pull the handle until it rotates to the end of its travel.
3. Holding the sled with both hands, align the sled with the sled-bay in the enclosure.

   ⓘ **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
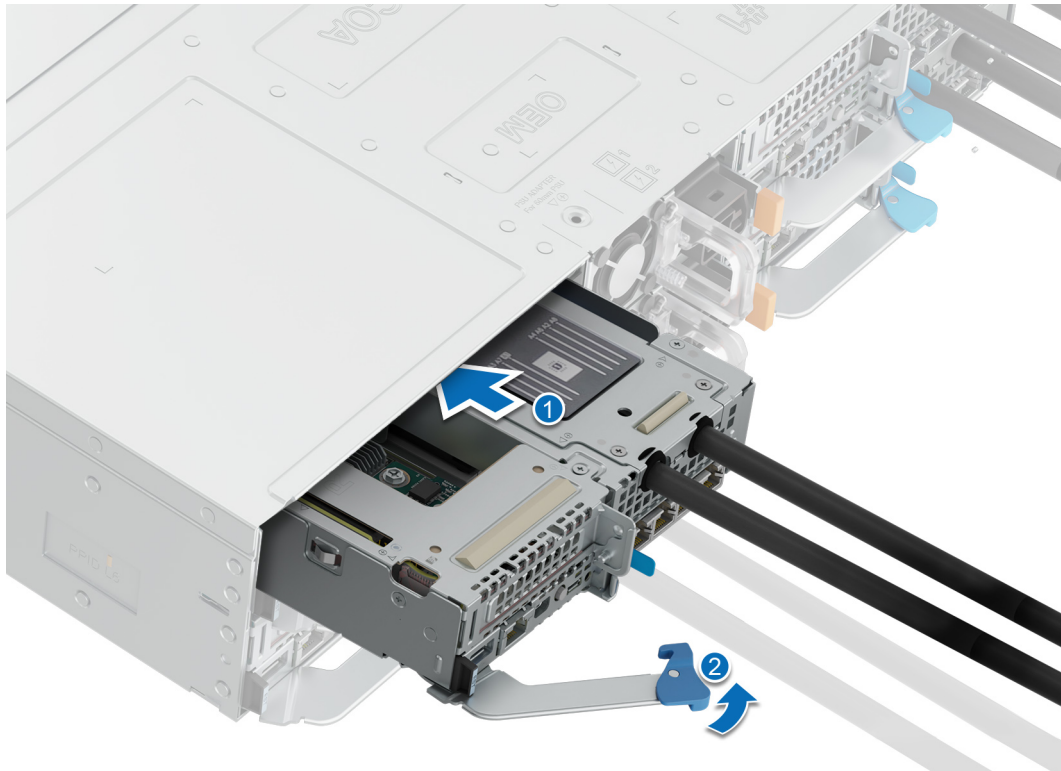
Figure 24. Installing a sled

4. Insert the sled into the enclosure until the edge of the sled handle touches the edge of the enclosure chassis.

   ⚠ **CAUTION: To avoid any damage to the pins on the sled, do not force the sled into the enclosure. Follow the two-position insertion and gently slide the sled into the enclosure.**
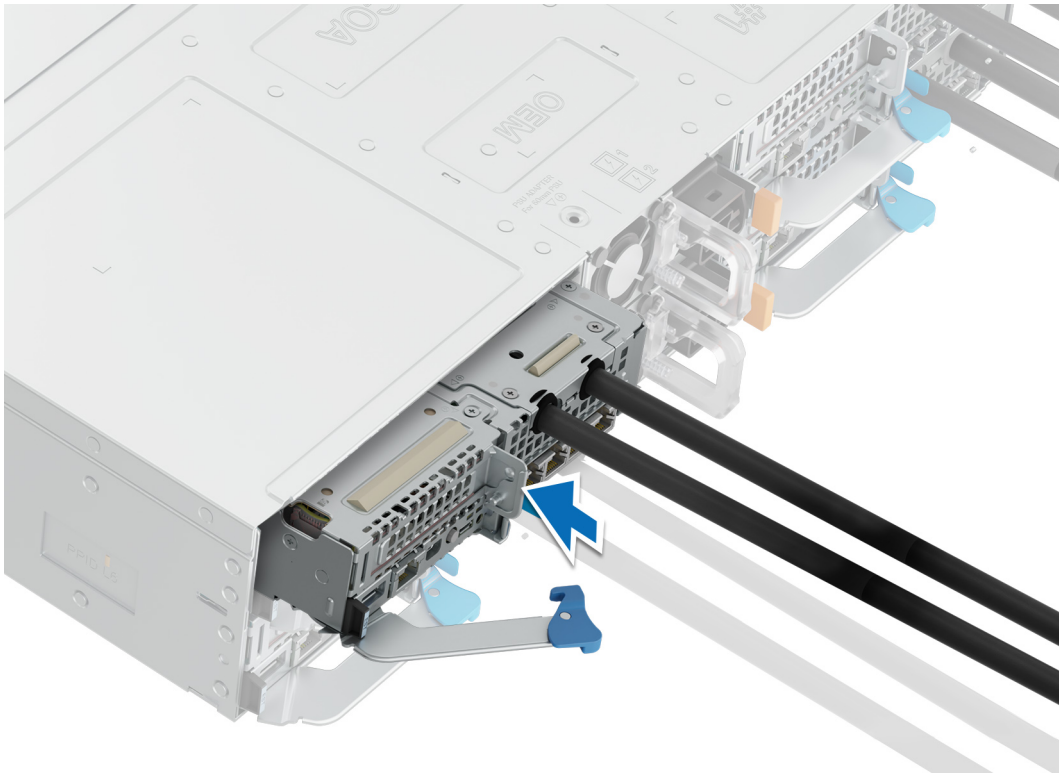
Figure 25. Insert the sled until the edge of the sled handle touches the edge of the enclosure chassis

5. Push inward on the handle until it rotates and locks the sled into place.
6. To install a sled blank, slide it into the enclosure until the retention latch locks it into place.
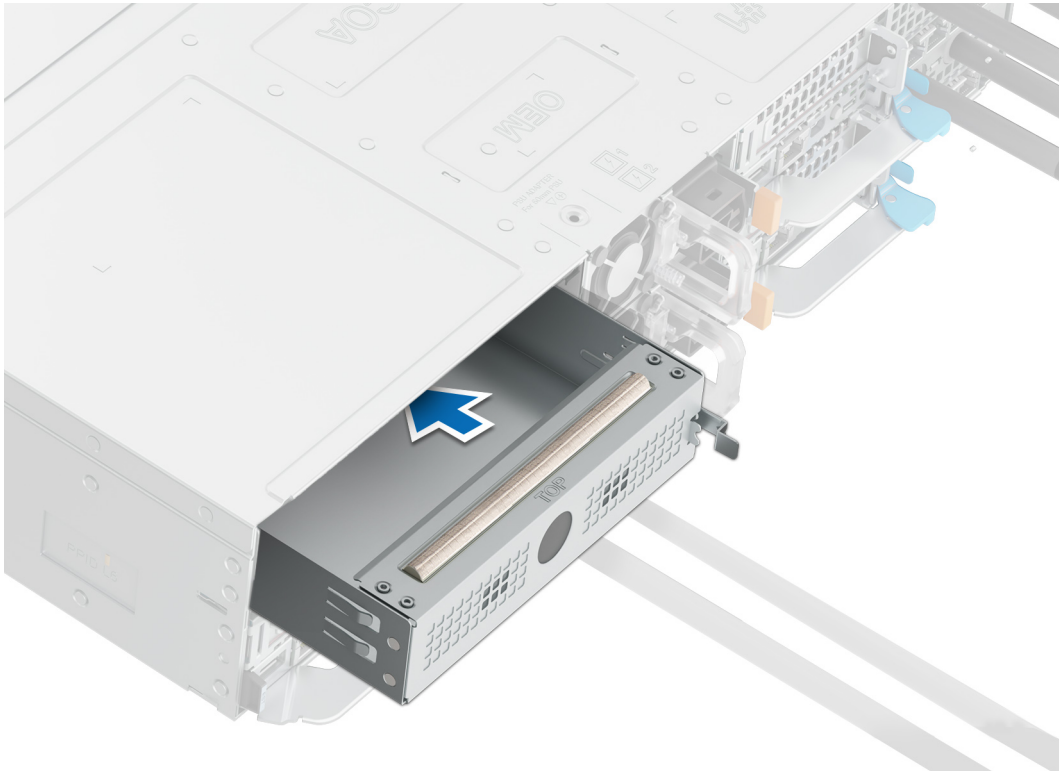
Figure 26. Installing a sled blank

Air shroud

Removing the air shroud

Prerequisites

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

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

Steps

1. Press the blue clip and lift the air shroud.
2. Disengage the air shroud hook from the slot on the chassis and remove the air shroud.
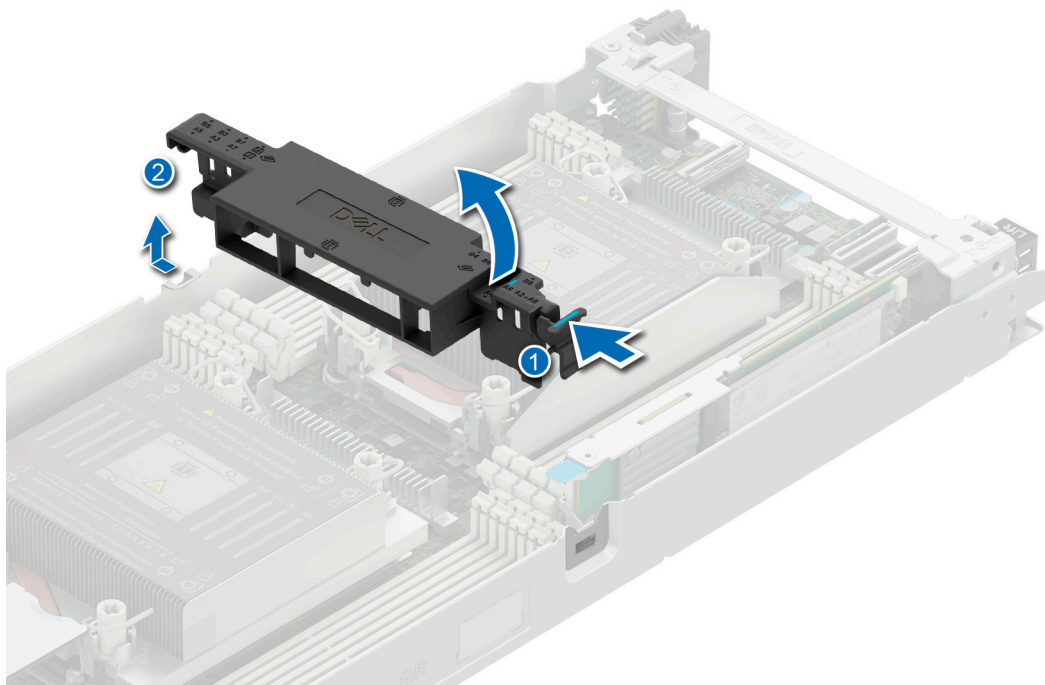
Figure 27. Removing the air shroud

Next steps

Install the air shroud.

Installing the air shroud

Prerequisites

Follow the safety guidelines listed in Safety Instructions.

Steps

1. Insert the hook on the air shroud into the slot on the chassis.

(i) **NOTE:** Ensure that the SATA cables are routed behind the air shroud clip.

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

2. Lower the air shroud until the blue clip locks in place.
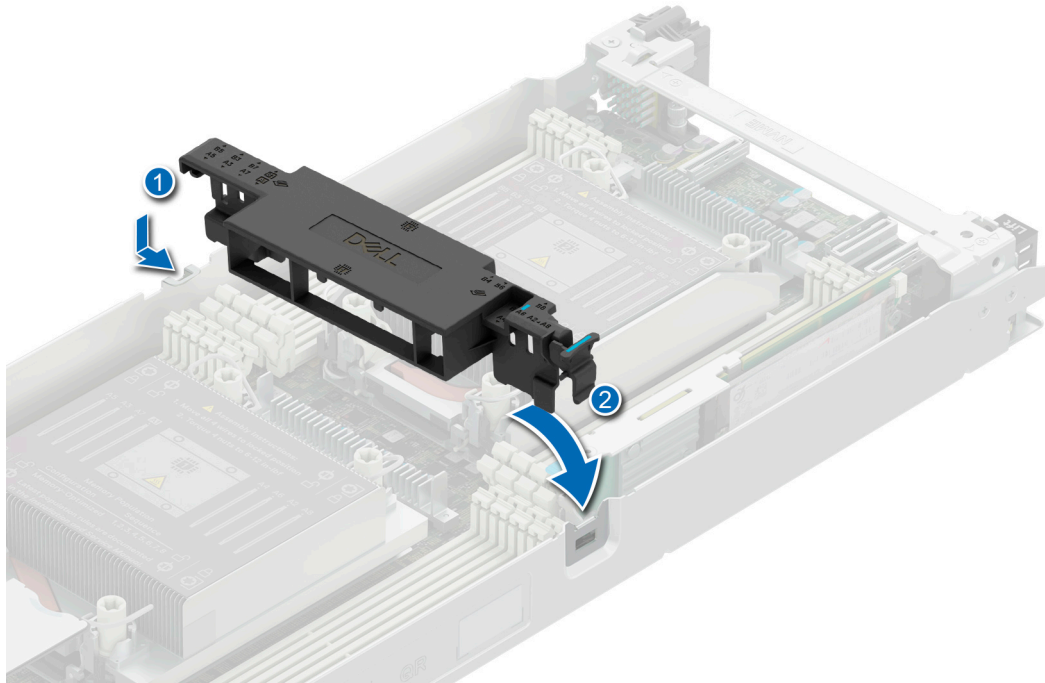
Figure 28. Installing the air shroud

Next steps

Follow the procedure listed in After working inside your system.

Support bracket

Removing the support bracket

Prerequisites

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

Steps

1. Using the Phillips 1 screwdriver, remove the screws that secure the support bracket to the chassis.

Figure 29. Removing the support bracket

2. Remove the support bracket from the chassis.

Next steps

Replace the support bracket.

Installing the support bracket

Prerequisites

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

Steps

1. Align the support bracket with the stand off on the chassis.
2. Using a Phillips 1 screwdriver, tighten the screws that secure the support bracket to the chassis.
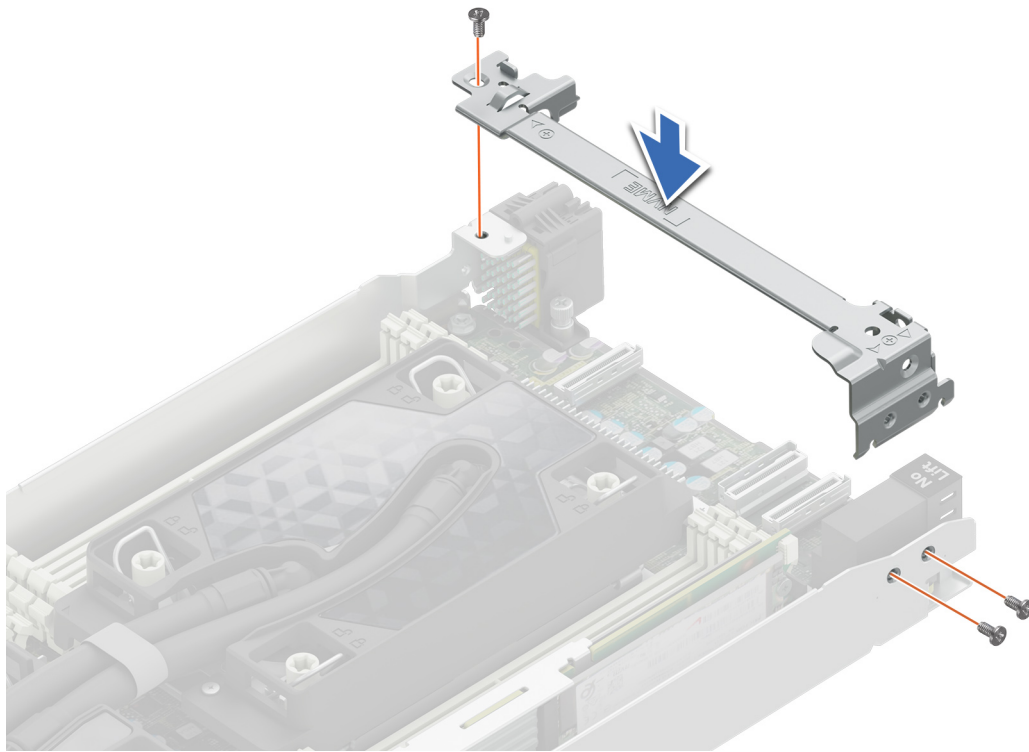
Figure 30. Installing the support bracket

Next steps

Follow the procedure listed in After working inside your system.

Expansion cards and expansion card risers

�घ **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.
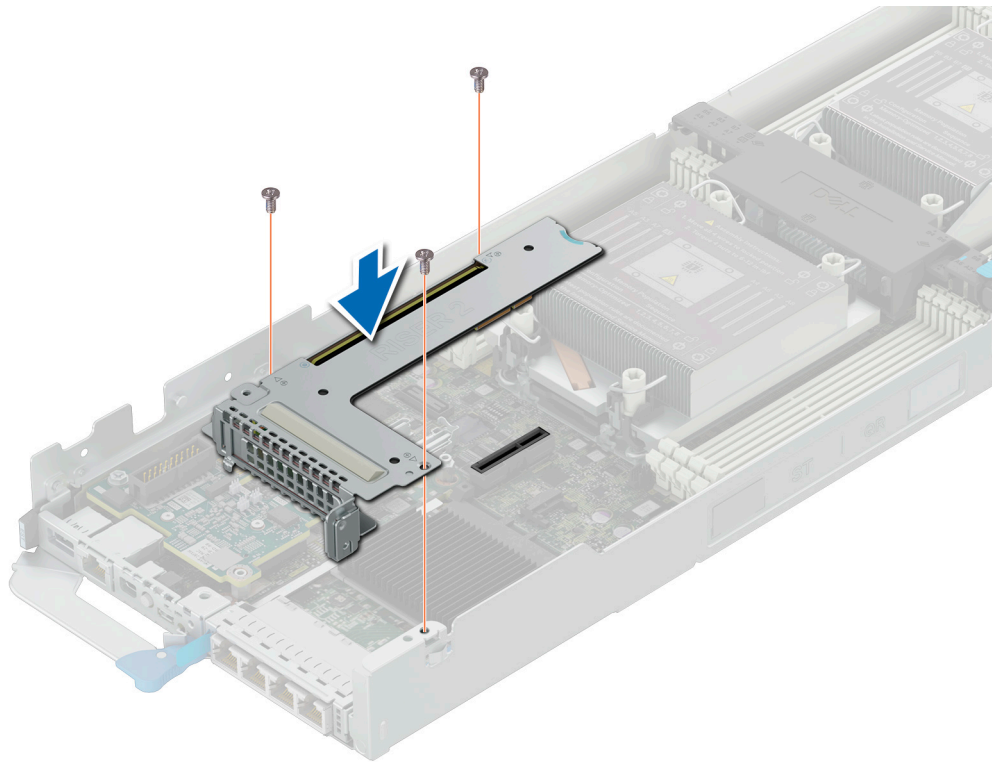
Removing the expansion card riser 1

Prerequisites

ⓘ **NOTE:** Install an expansion card filler bracket over an empty expansion 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.

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the air shroud if applicable.
4. If applicable disconnect the cables.

ⓘ **NOTE:** The procedure to remove a riser 1a or 1b is similar.

Steps

1. Using a Phillips 1 screwdriver, remove the screws that secure the expansion card riser 1.
2. Holding the handle, lift the expansion card riser from the riser connector on the system board.
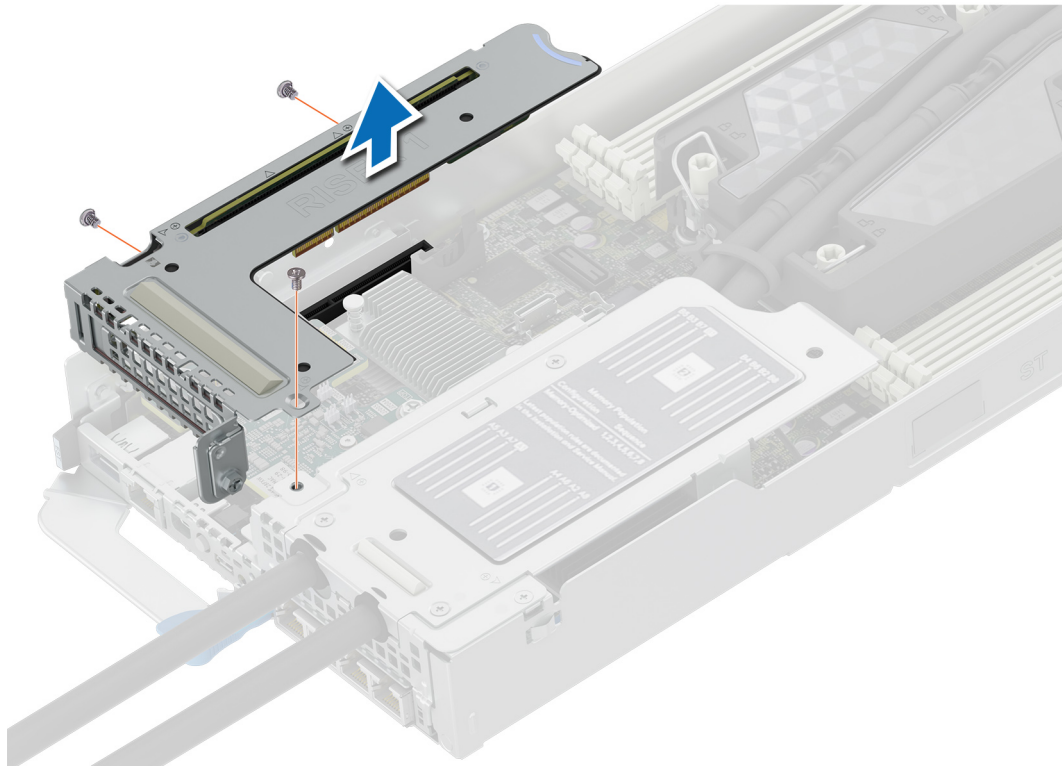
Figure 31. Removing the expansion card riser 1

Next steps

Replace the expansion card riser 1.

Installing the expansion card riser 1

Prerequisites

ⓘ **NOTE:** You must install an expansion card filler bracket over an empty expansion 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.

ⓘ **NOTE:** The expansion card filler bracket for Riser 2 must be installed before installing the expansion card filler bracket for Riser 1.

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the air shroud if applicable.
4. If applicable, reconnect the cables.

ⓘ **NOTE:** The procedure to install a riser 1a or 1b is similar.

Steps

1. Align the screw holes and the T-pin slot on the riser with the screw holes and T-pin on the sled.
2. Lower the riser firmly until the riser card is fully seated in the slot.
3. Using a Phillips 1 screwdriver, tighten the screws that secure the expansion card riser 1 on to the system board.
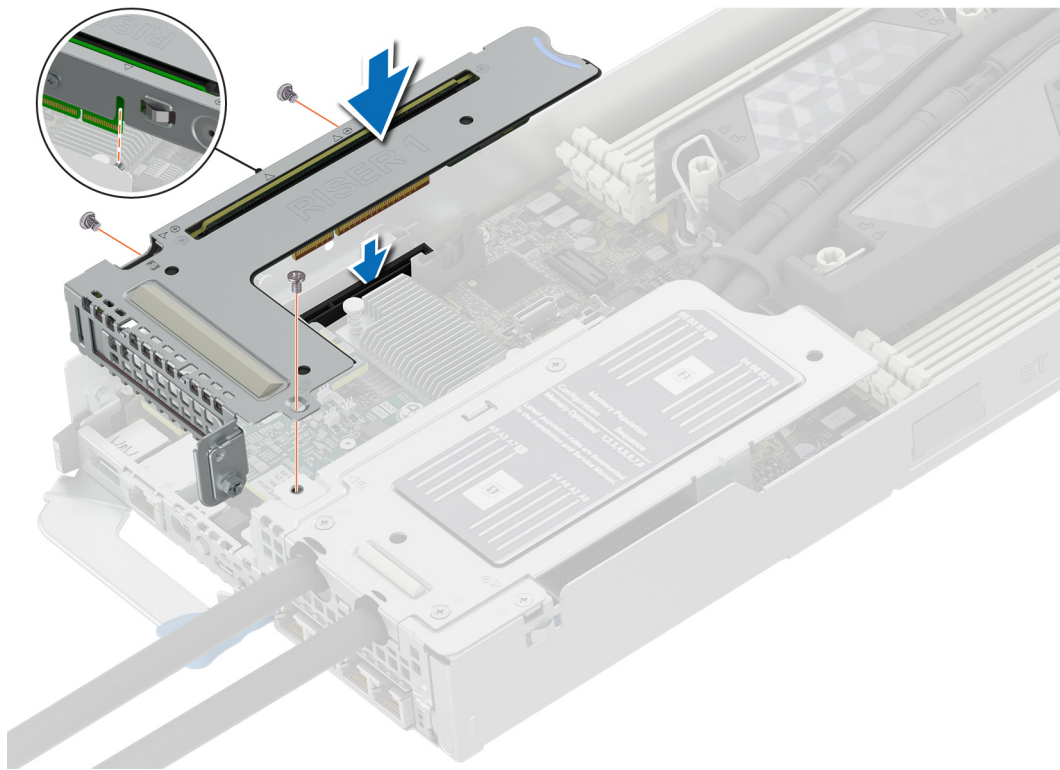
Figure 32. Installing the expansion card riser 1

Next steps

Follow the procedure listed in After working inside your system.

Removing the expansion card riser 2

Prerequisites

ⓘ **NOTE:** Install an expansion card filler bracket over an empty expansion 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.
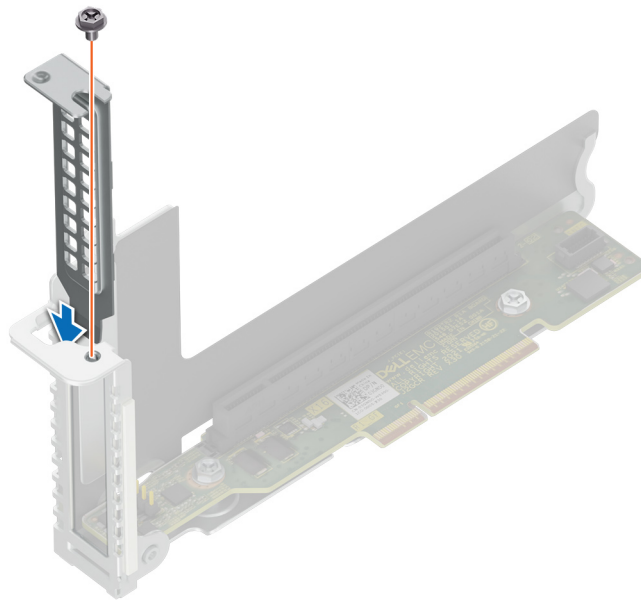
ⓘ **NOTE:** The expansion card riser 2 cannot be removed without first removing the expansion card riser 1.

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

Steps

1. Using Phillips 1 screwdriver, remove the screws that secure the expansion card riser 2.
2. Holding the blue touch point and handle, lift the expansion card riser from the riser connector on the system board.
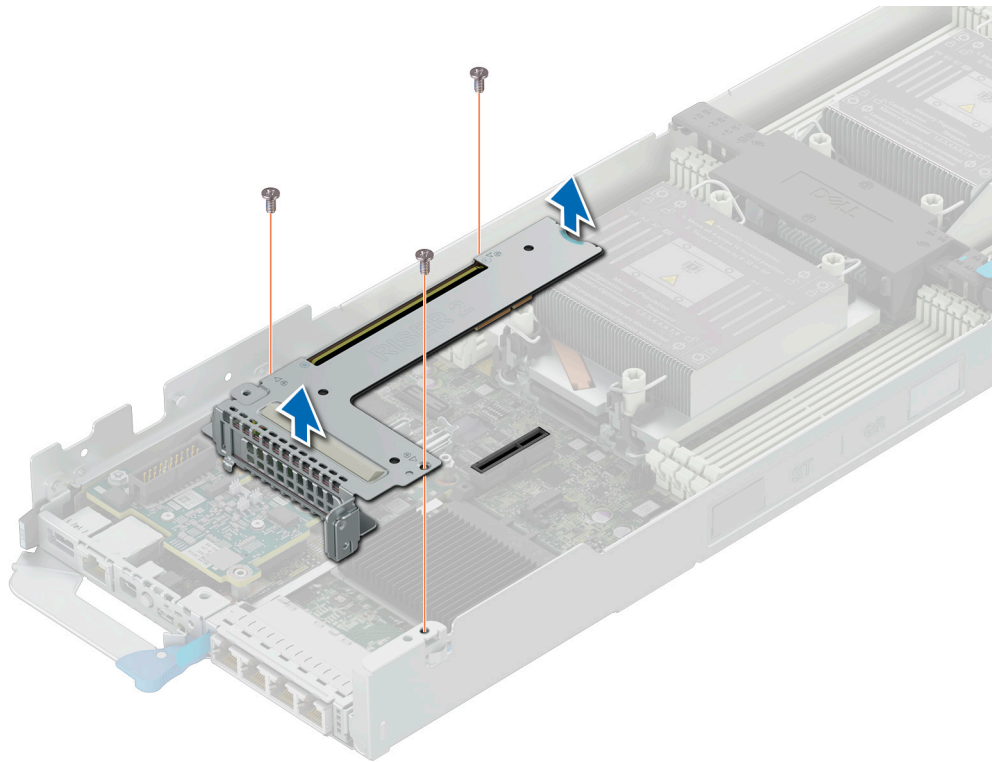
Figure 33. Removing the expansion card riser 2

Next steps

Replace the expansion card riser 2.

Installing the expansion card riser 2

Prerequisites

(i) **NOTE:** You must install an expansion card filler bracket over an empty expansion 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.

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

Steps

1. Align the screw holes on the riser with the screw holes on the chassis.
2. Lower the riser card firmly until the riser card is fully seated in the slot.
3. Using a Phillips 1 screwdriver, tighten the screws that secure the expansion card riser 2 on to the system board.

Figure 34. Installing the expansion card riser 2

Next steps

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

Removing an expansion cards

Prerequisites

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

Steps

1. Using a Phillips 2 screwdriver, remove the screw that secures the expansion card to the riser.
2. Holding the expansion card by its edges, remove it from the riser slots.

   ⓘ **NOTE:** Install an expansion card filler bracket over an empty expansion 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.
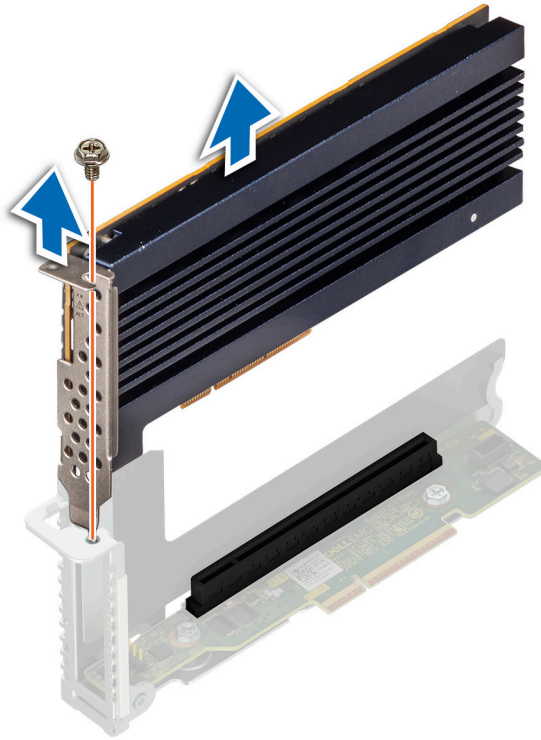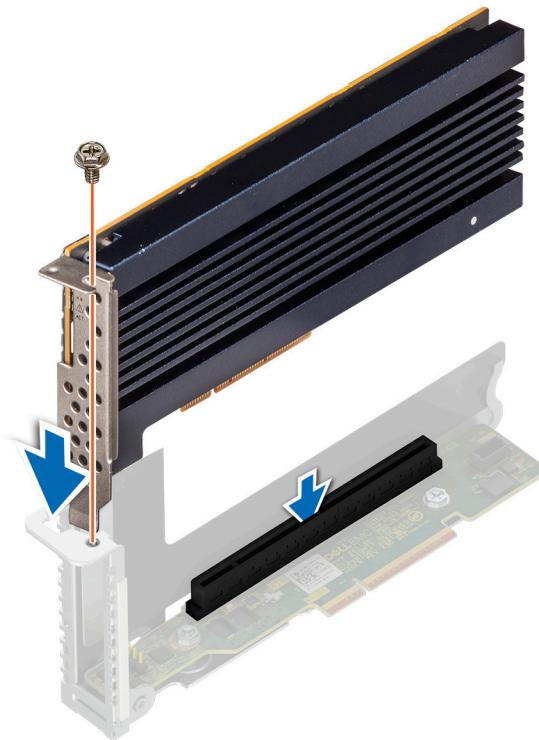
Figure 35. Removing an expansion card from riser 1
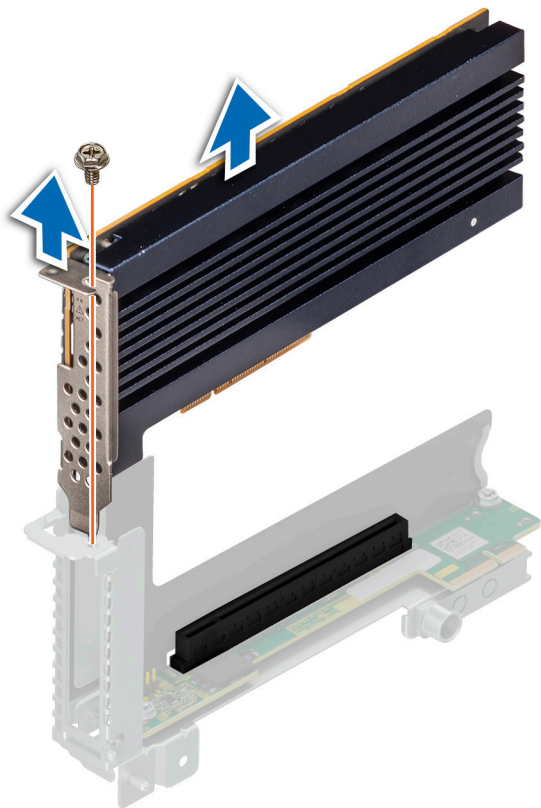
Figure 36. Removing an expansion card from riser 2

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 37. Installing the expansion card filler bracket in riser 1
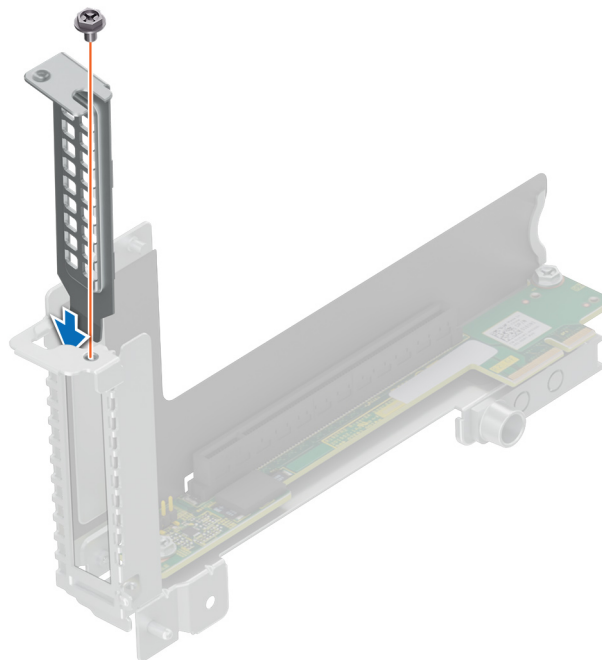
Figure 38. Installing the expansion card filler bracket in riser 2

Next steps

Replace the expansion card.

Installing an expansion card

Prerequisites

⚠️ **CAUTION: Expansion cards can only be installed in the slots on the expansion card riser. Do not attempt to install expansion cards directly into the riser connector on the system board.**

1. Follow the safety guidelines listed in Safety Instructions.
2. Unpack the expansion card and prepare it for installation. For instructions, see the documentation accompanying the card.

Steps

1. If installed, remove the filler bracket by performing the following steps:
   a. Remove the screw that secures the filler bracket.
   b. Hold the filler bracket by its edges, and remove it from the riser.

   ⓘ **NOTE:** You must install an expansion card filler bracket over an empty expansion 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.
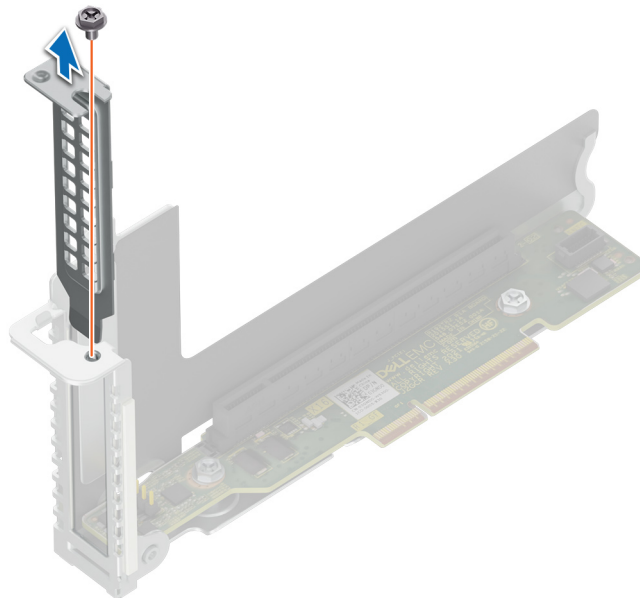
Figure 39. Removing the expansion card filler bracket for riser 1
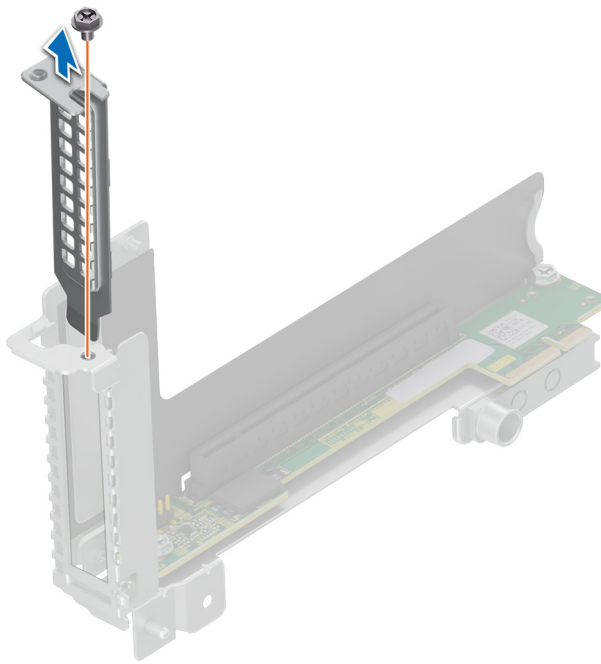
Figure 40. Removing the expansion card filler bracket for riser 2

2. Holding the card by its edges, align the card with the slot on the riser.
3. Insert the card firmly until it is fully seated in the slot.
4. Tighten the screw that secures the expansion card.

Figure 41. Installing an expansion card in riser 1
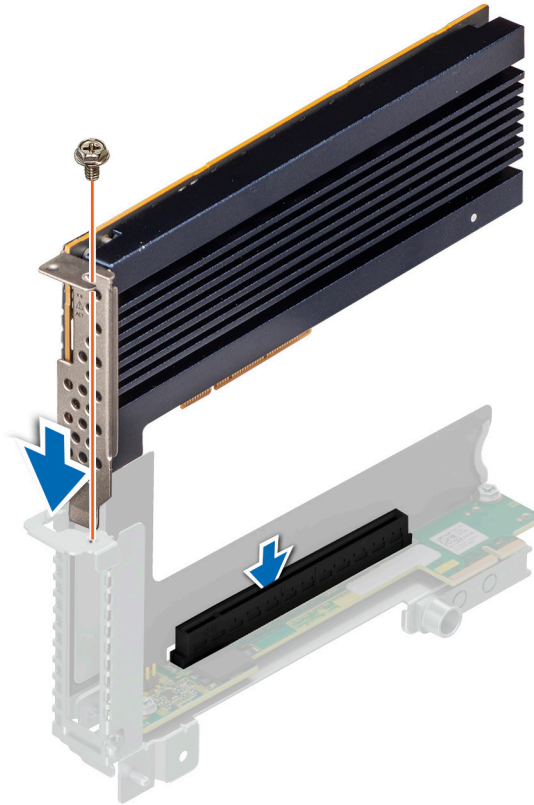
Figure 42. Installing an expansion card in riser 2

Next steps

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

Removing the riser card

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
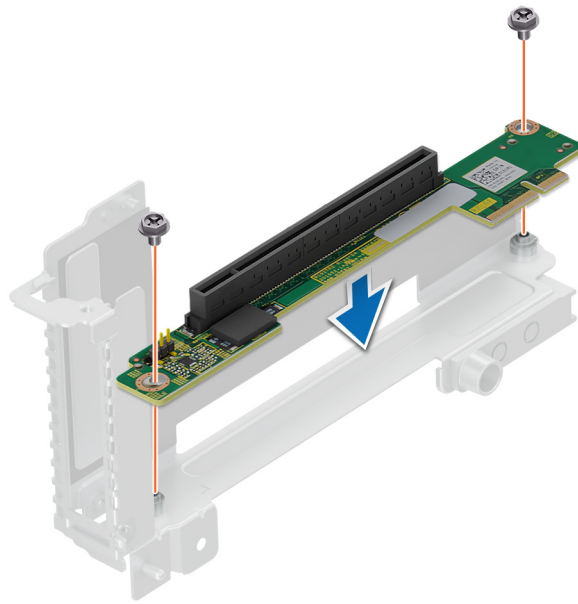2. Follow the procedure listed in Before working inside your system.
3. Remove the expansion card riser 1 and remove the expansion card riser 2.
4. If installed, remove the expansion card.
5. If applicable, disconnect the cable from the riser card.

Steps

1. Using a Phillips 2 screwdriver, remove the screws that secure the riser card to the expansion card riser.
2. Remove the riser card from the expansion card riser.

   ⓘ **NOTE:** The procedure to remove the riser 1B card is similar to removing the riser 1A card.
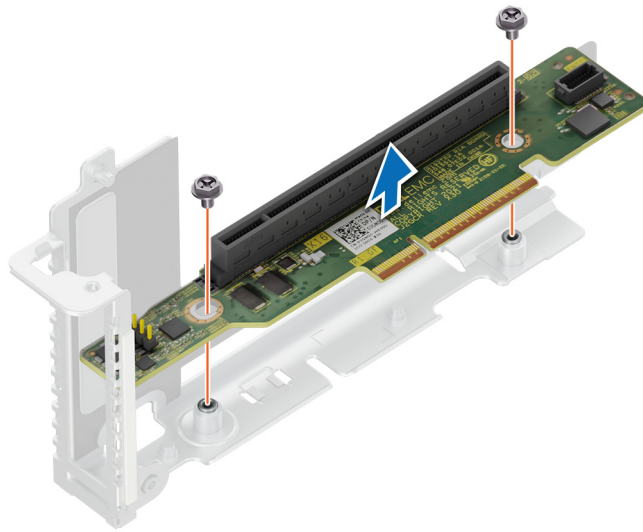
Figure 43. Removing the riser card from riser 1
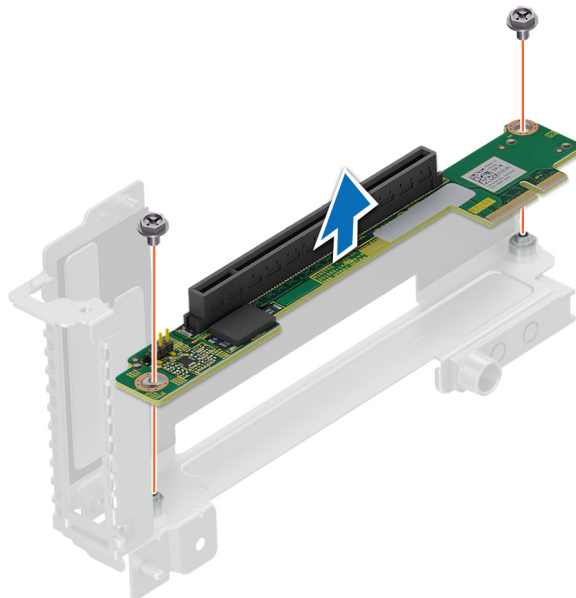
Figure 44. Removing the riser card from riser 2

Next steps

Replace the riser card.

Installing the riser card

Prerequisites

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

Steps

1. Align and insert the riser card with the screw holes on the riser.
2. Using a Phillips 2 screwdriver, tighten the screws that secure the riser card to the expansion card riser.

   (i) **NOTE:** The procedure to install the riser 1B card is similar to installing the riser 1A card.
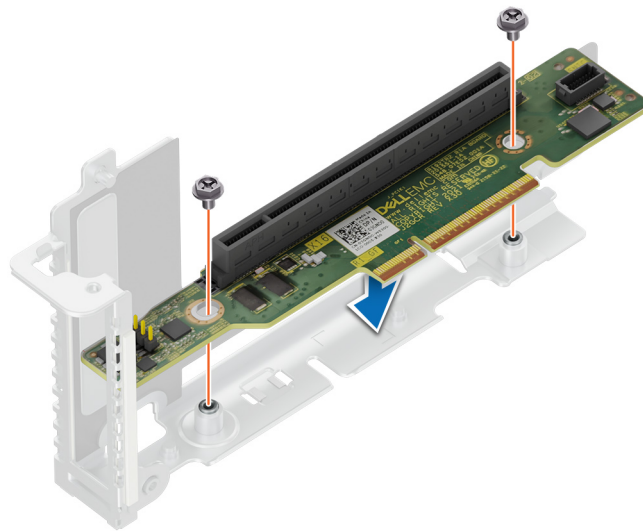
Figure 45. Installing the riser card in riser 1

Figure 46. Installing the riser card in riser 2

Next steps

1. If applicable, connect the cable to the riser card.
2. If removed, install the expansion card.
3. Install the expansion card riser 1 and install the expansion card riser 2.
4. Follow the procedure listed in After working inside your system.

Expansion card installation guidelines
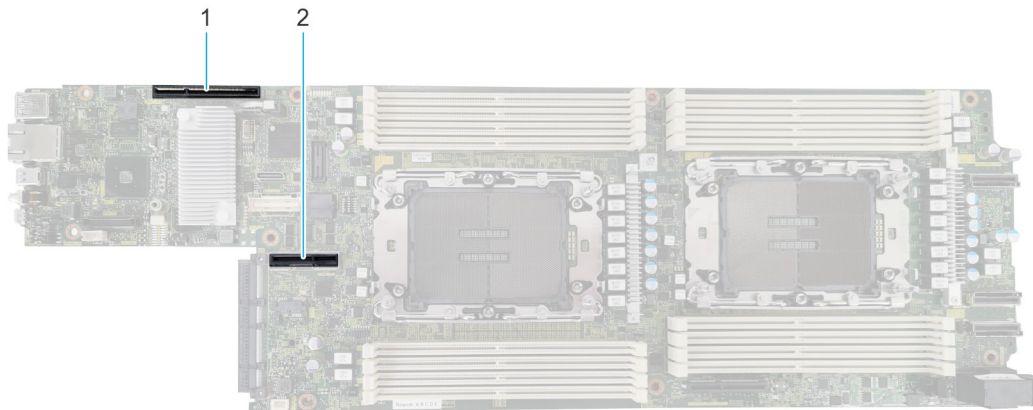
Figure 47. Expansion card slot connectors

1. Riser 1a or Riser 1a with support for SNAP I/O modules (Slot 1)
2. Riser 2b (Slot 2)

The following table describes the expansion card riser configurations:

Table 59. Expansion card riser configuration

Configurations	Expansion card risers	PCIe Slots	Controlling processor	Height	Length	Slot width
Config1. with 1x LP	R1a	1	Processor 1	Low Profile	Half length	x16
Config2. with 2x LP	R1a	1	Processor 1	Low Profile	Half length	x16
	R2a	2	Processor 1	Low Profile	Half length	x8
Config3. with 1x LP SNAPI	R1b	1	Processor 1 and 2	Low Profile	Half length	x8 + x8
Config4. with 1x LP + 1LP SNAPI	R1b	1	Processor 1 and 2	Low Profile	Half length	x16
				Low Profile		
	R2b	2	Processor 2	Low Profile	Half length	x16
Config5. with 2x LP	R1a	1	Processor 1	Low Profile	Half length	x16
	R2b	2	Processor 2	Low Profile	Half length	x16
Config6. with 1x LP + 1x LP SNAPI	R1b	1	Processor 1 and 2	Low Profile	Half length	x16
	R2a	2	Processor 1	Low Profile	Half length	x8
Config7. 1x LP	R2b	2	Processor 2	Low Profile	Half length	x16
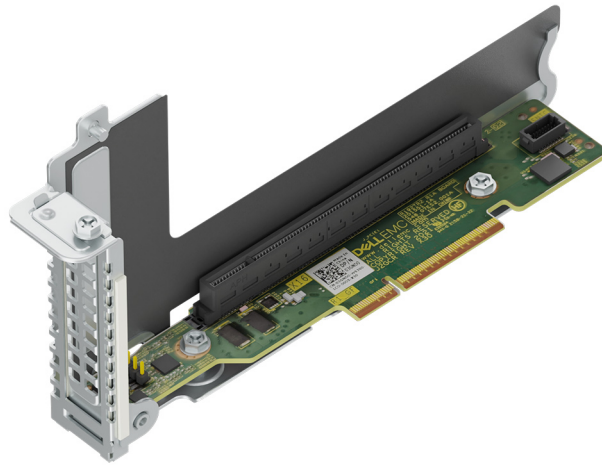
Figure 48. Riser 1a- Slot 1, x16, LP-HL

Figure 49. Riser 1b- Slot 1, x8 + x8, LP-HL

Figure 50. Riser 2a- Slot 2, x16, LP-HL

Figure 51. Riser 2b- Slot 2, x16, LP-HL

(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.

Table 60. Configuration 1: R1a

Card type	Slot priority	Maximum number of cards
Foxconn (PERC HBA355I Adapter)	1	1
Foxconn (PERC H755 Adapter)	1	1
Foxconn (PERC H355 Adapter)	1	1
Foxconn (PERC H965 Adapter)	1	1
Foxconn (BOSS N1)	3	1
Broadcom (NIC: 100G)	1	1
Broadcom (NIC: 25G)	1	1
Broadcom (NIC: 10G)	1	1
Broadcom (HBA: FC32)	1	1
Broadcom (HBA: FC64)	1	1
Broadcom (OCP3: 25Gb)	Integrated slot	1
Broadcom (OCP3: 10Gb)	Integrated slot	1
Broadcom (OCP3: 1Gb)	Integrated slot	1
Cornelis (NIC: OPA)	1	1
Cornelis (OCP3: OPA100)	1	1
Intel (NIC: 100Gb)	1	1
Intel (NIC: 25Gb)	1	1
Intel (NIC: 10G)	1	1
Intel (NIC: 1G)	1	1
Intel (DPU: 25Gb)	1	1
Intel (OCP3: 25Gb)	Integrated slot	1
Intel (OCP3: 10Gb)	Integrated slot	1
Marvell (HBA: FC32)	1	1
Mellanox (NIC: 100Gb)	1	1
Mellanox (NIC: 25Gb)	1	1
Mellanox (OCP3: 25Gb)	Integrated slot	1
Nvidia (GPU: A2 16 GB)	1	1

Table 61. Configuration 2: R1a+R2a

Card type	Slot priority	Maximum number of cards
Foxconn (PERC HBA355I Adapter)	1	1
Foxconn (PERC H755 Adapter)	1	1
Foxconn (PERC H355 Adapter)	1	1
Foxconn (PERC H965 Adapter)	1	1
Foxconn (BOSS N1)	3	1
Broadcom (NIC: 100G)	1	1

Table 61. Configuration 2: R1a+R2a (continued)

Card type	Slot priority	Maximum number of cards
Broadcom (NIC: 25G)	1, 2	2
Broadcom (NIC: 10G)	1, 2	2
Broadcom (NIC: 1G)	1, 2	2
Broadcom (HBA: FC32)	1, 2	2
Broadcom (HBA: FC64)	1, 2	2
Broadcom (OCP3: 25Gb)	Integrated slot	1
Broadcom (OCP3: 10Gb)	Integrated slot	1
Broadcom (OCP3: 1Gb)	Integrated slot	1
Cornelis (NIC: OPA)	1	1
Cornelis (OCP3: OPA100)	Integrated slot	1
Intel (NIC: 100G)	1	1
Intel (NIC: 25Gb)	1, 2	2
Intel (NIC: 10G)	1, 2	2
Intel (NIC: 1G)	1, 2	2
Intel (OCP3: 25Gb)	Integrated slot	1
Intel (OCP3: 10G)	Integrated slot	1
Intel (DPU: 25Gb)	1	1
Marvell (HBA: FC32)	1, 2	1
Mellanox (NIC: 100Gb)	1	2
Mellanox (NIC: 25Gb)	1, 2	2
Mellanox (HBA: FC32)	1, 2	2
Mellanox (OCP3: 25Gb)	Integrated slot	1
Nvidia (GPU: A2 16 GB)	1, 2	2

Table 62. Configuration 3: R1b

Card type	Slot priority	Maximum number of cards
Foxconn (BOSS N1)	3	1
Broadcom (OCP3: 25Gb)	Integrated slot	1
Broadcom (OCP3: 10Gb)	Integrated slot	1
Broadcom (OCP3: 1Gb)	Integrated slot	1
Cornelis (OCP3: OPA100)	Integrated slot	1
Intel (OCP3: 25Gb)	Integrated slot	1
Intel (OCP3: 10Gb)	Integrated slot	1
Mellanox (NIC: NDRV)	1	1
Mellanox (NIC: N200)	1	1
Mellanox (NIC: H100)	1	1
Mellanox (NIC: N400)	1	1
Mellanox (OCP3: 25Gb)	Integrated slot	1

Table 63. Configuration 4: R1b + R2b

Card type	Slot priority	Maximum number of cards
Foxconn (BOSS N1)	3	1
Broadcom (NIC: 100Gb)	2	1
Broadcom (NIC: 25Gb)	2	1
Broadcom (NIC: 10Gb)	2	1
Broadcom (NIC: 1Gb)	2	1
Broadcom (HBA: FC32)	2	1
Broadcom (HBA: FC64)	2	1
Broadcom (OCP3: 25Gb)	Integrated slot	1
Broadcom (OCP3: 10Gb)	Integrated slot	1
Broadcom (OCP3: 1Gb)	Integrated slot	1
Cornelis (OCP3: OPA)	2	1
Cornelis (OCP3: OPA100)	Integrated slot	1
Intel (NIC: 100Gb)	2	1
Intel (NIC: 25Gb)	2	1
Intel (NIC: 10Gb)	2	1
Intel (NIC: 1Gb)	2	1
Intel (OCP3: 25Gb)	Integrated slot	1
Intel (OCP3: 10Gb)	Integrated slot	1
Marvell (HBA: FC32)	2	1
Mellanox (NIC: NDRV)	1	1
Mellanox (NIC: N200)	1	1
Mellanox (NIC: H100)	1	1
Mellanox (NIC: N400)	1	1
Mellanox (NIC: 100Gb)	2	1
Mellanox (NIC: 25Gb)	2	1
Mellanox (OCP3: 25Gb)	Integrated slot	1

Table 64. Configuration 5: R1a + R2b

Card type	Slot priority	Maximum number of cards
Foxconn (PERC HBA355I Adapter)	1	1
Foxconn (PERC H755 Adapter)	1	1
Foxconn (PERC H355 Adapter)	1	1
Foxconn (PERC H965 Adapter)	1	1
Foxconn (BOSS N1)	3	1
Broadcom (NIC: 100Gb)	1, 2	2
Broadcom (NIC: 25Gb)	1, 2	2
Broadcom (NIC: 10Gb)	1, 2	2
Broadcom (NIC: 1Gb)	1, 2	2

Table 64. Configuration 5: R1a + R2b (continued)

Card type	Slot priority	Maximum number of cards
Broadcom (HBA: FC32)	1, 2	2
Broadcom (HBA: FC64)	1, 2	2
Broadcom (OCP3: 25Gb)	Integrated slot	1
Broadcom (OCP3: 10Gb)	Integrated slot	1
Broadcom (OCP3: 1Gb)	Integrated slot	1
Cornelis (OCP3: OPA)	1, 2	2
Cornelis (OCP3: OPA100)	Integrated slot	1
Intel (NIC: 100Gb)	1, 2	2
Intel (NIC: 25Gb)	1, 2	2
Intel (NIC: 10Gb)	1, 2	2
Intel (NIC: 1Gb)	1, 2	2
Intel (OCP3: 25Gb)	Integrated slot	1
Intel (OCP3: 10Gb)	Integrated slot	1
Intel (DPU: 25Gb)	1	1
Marvell (HBA: FC32)	1, 2	2
Mellanox (NIC: 100Gb)	1, 2	2
Mellanox (NIC: 25Gb)	1, 2	2
Mellanox (OCP3: 25Gb)	Integrated slot	1
Nvidia (GPU: A2 16 GB)	1, 2	2

Table 65. Configuration 6: R1b + R2a

Card type	Slot priority	Maximum number of cards
Foxconn (BOSS N1)	3	1
Broadcom (NIC: 25Gb)	2	1
Broadcom (NIC: 10Gb)	2	1
Broadcom (NIC: 1Gb)	2	1
Broadcom (HBA: FC32)	2	1
Broadcom (HBA: FC64)	2	1
Broadcom (OCP3: 25Gb)	Integrated slot	1
Broadcom (OCP3: 10Gb)	Integrated slot	1
Broadcom (OCP3: 1Gb)	Integrated slot	1
Cornelis (OCP3: OPA100)	Integrated slot	1
Intel (NIC: 25Gb)	2	1
Intel (NIC: 10Gb)	2	1
Intel (NIC: 1Gb)	2	1
Intel (OCP3: 25Gb)	Integrated slot	1
Intel (OCP3: 10Gb)	Integrated slot	1
Marvell (HBA: FC32)	2	2

Table 65. Configuration 6: R1b + R2a (continued)

Card type	Slot priority	Maximum number of cards
Mellanox (NIC: NDRV)	1	1
Mellanox (NIC: N200)	1	1
Mellanox (NIC: H100)	1	1
Mellanox (NIC: N400)	1	1
Mellanox (NIC: 25Gb)	2	1
Mellanox (OCP3: 25Gb)	Integrated slot	1
Nvidia (GPU: A2 16 GB)	2	2

Table 66. Configuration 7: R2b

Card type	Slot priority	Maximum number of cards
Foxconn (BOSS N1)	3	1
Broadcom (NIC: 100Gb)	2	1
Broadcom (NIC: 25Gb)	2	1
Broadcom (NIC: 10Gb)	2	1
Broadcom (NIC: 1Gb)	2	1
Broadcom (HBA: FC32)	2	1
Broadcom (HBA: FC64)	2	1
Broadcom (OCP3: 25Gb)	Integrated slot	1
Broadcom (OCP3: 10Gb)	Integrated slot	1
Broadcom (OCP3: 1Gb)	Integrated slot	1
Cornelis (OCP3: OPA)	2	1
Cornelis (OCP3: OPA100)	Integrated slot	1
Intel (NIC: 100Gb)	2	1
Intel (NIC: 25Gb)	2	1
Intel (NIC: 10Gb)	2	1
Intel (NIC: 1Gb)	2	1
Intel (OCP3: 25Gb)	Integrated slot	1
Intel (OCP3: 10Gb)	Integrated slot	1
Marvell (HBA: FC32)	2	2
Mellanox (NIC: 100Gb)	2	1
Mellanox (NIC: 25Gb)	2	1
Mellanox (OCP3: 25Gb)	Integrated slot	1
Nvidia (GPU: A2 16 GB)	2	2

LOM riser card

Removing the LOM

Prerequisites

ⓘ **NOTE:** Install an expansion card filler bracket over an empty expansion 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.

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

Steps

1. Using Phillips 2 screwdriver, remove the screws that secure the LOM.
2. Lift the LOM card from the connector on the system board.
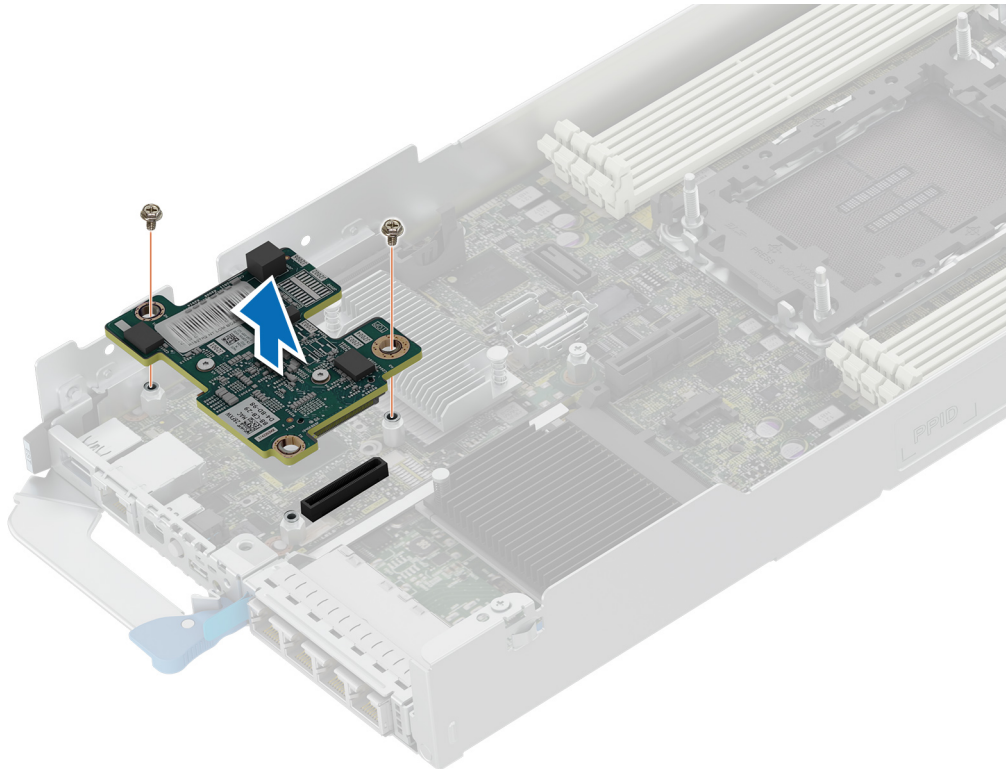
Figure 52. Removing the LOM

Next steps

Install the expansion card riser 1.

Installing the LOM

Prerequisites

ⓘ **NOTE:** You must install an expansion card filler bracket over an empty expansion 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.

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

Steps

1. Align the screw holes on the LOM with the screw holes on the chassis.
2. Lower the LOM firmly until the LOM card is fully seated in the slot.
3. Using a Phillips 2 screwdriver, tighten the screws that secure the LOM card on to the system board.
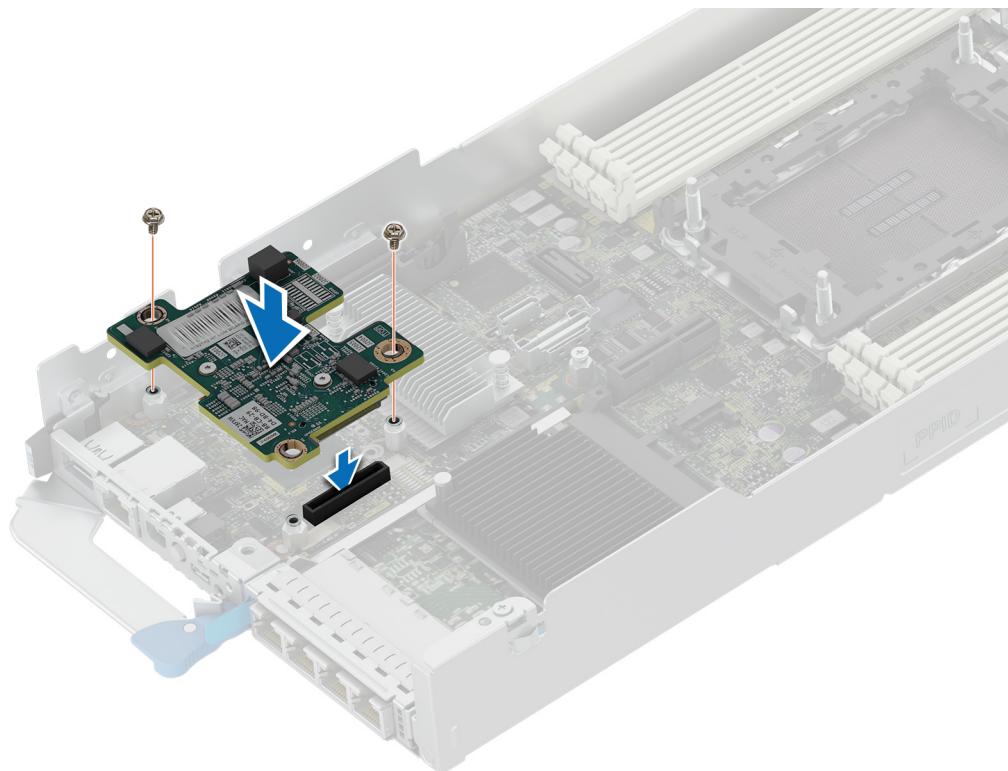
Figure 53. Installing the LOM

Next steps

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

M.2 SSD module

Removing the M.2 riser

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

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

Steps

1. Using a Phillips 2 screwdriver, remove the screw that secures the riser to the chassis.
2. Holding the blue tag, lift the riser to disengage the riser from the connector on the system board.
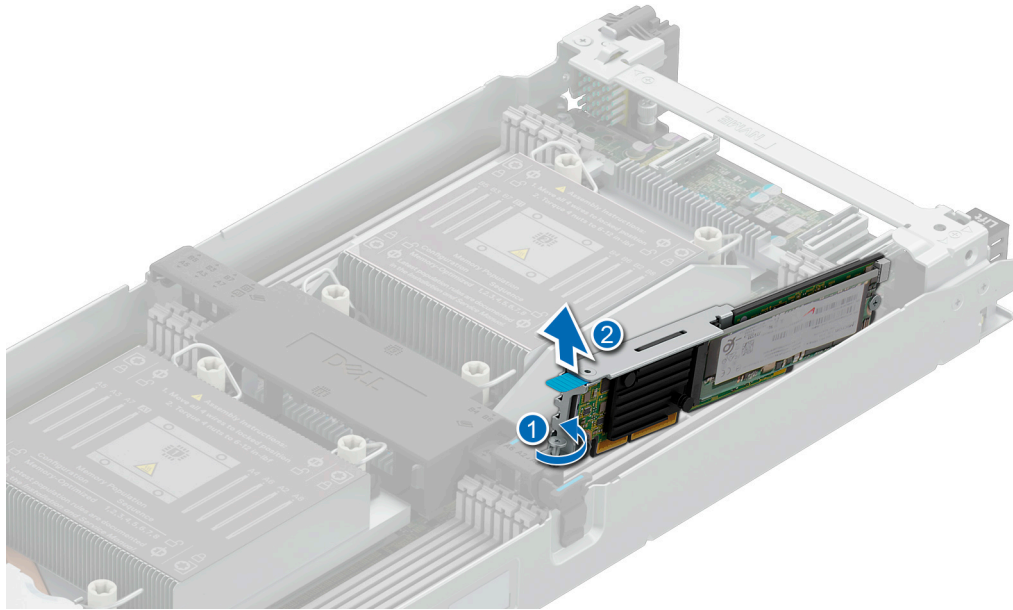
Figure 54. Removing the M.2 riser

Next steps

Replace the M.2 riser.

Installing the M.2 riser

Prerequisites

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

Steps

1. Align the M.2 riser with the stand off on the system board and insert it firmly until the riser is fully seated in the slot.
2. Using a Phillips 2 screwdriver, tighten the screw that secures the riser to the chassis.
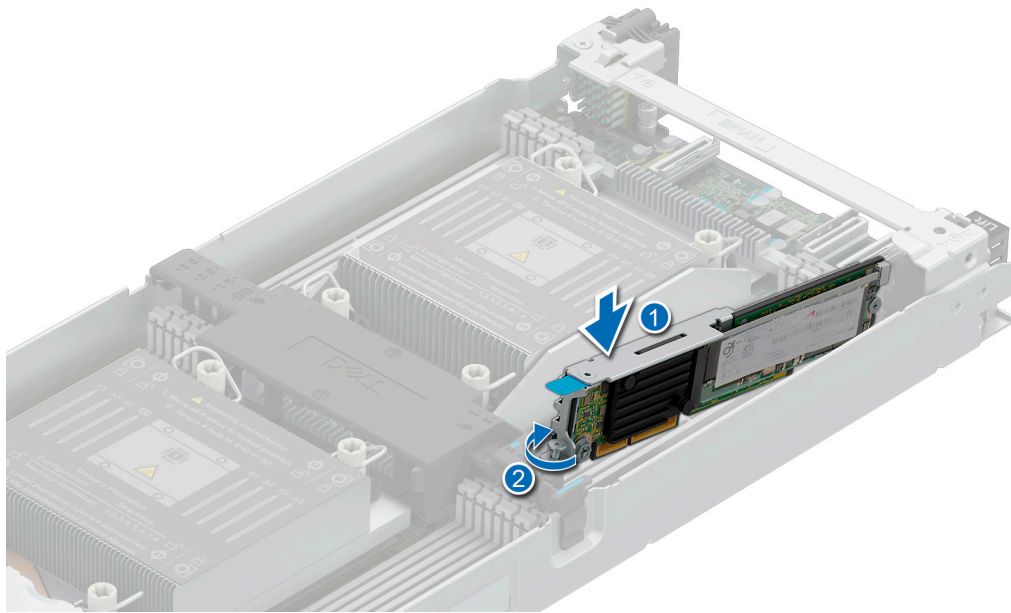
Figure 55. Installing the M.2 riser

Next steps

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

Removing the M.2 SSD module

Prerequisites

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

Steps

1. Using a Phillips 1 screwdriver, remove the screw securing the M.2 SSD module to the M.2 riser.
2. Pull the M.2 SSD module to disconnect from the connector on the M.2 riser.
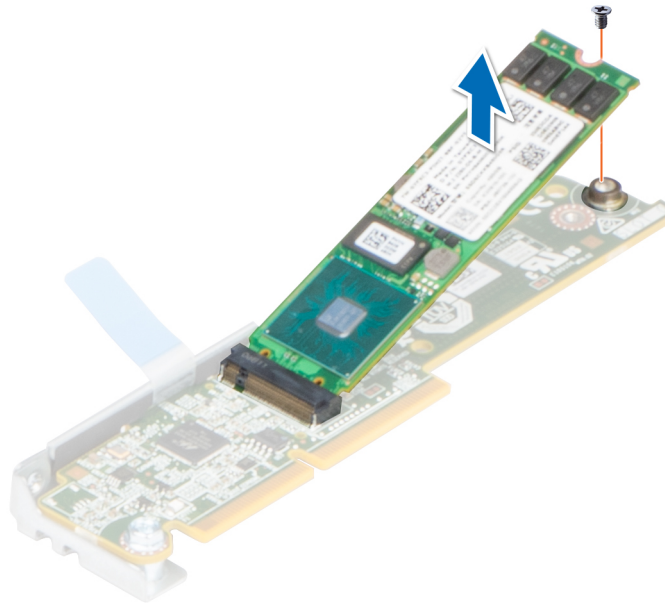
Figure 56. Removing the M.2 SSD module from the M.2 riser

Next steps

Replace the M.2 SSD module.

Installing the M.2 SSD module

Prerequisites

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

Steps

1. Align the M.2 SSD module at an angle with the connector on the M.2 riser.
2. Insert the M.2 SSD module firmly until it is fully seated in the connector on the M.2 riser.
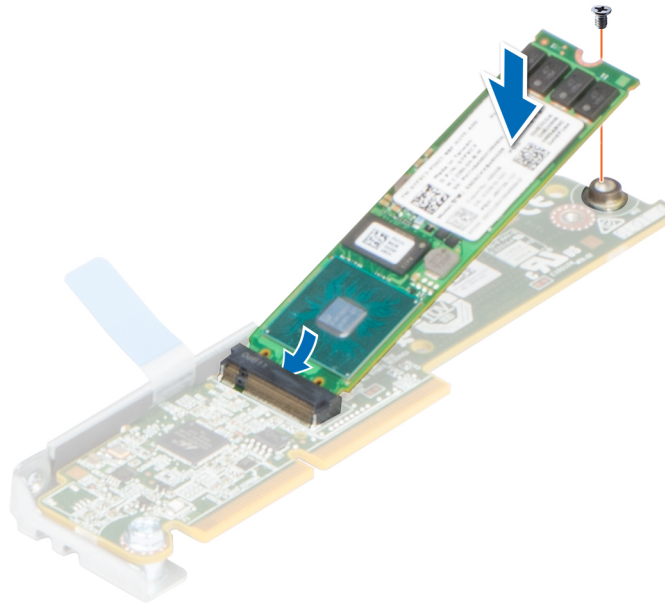
Figure 57. Installing the M.2 SSD module on the M.2 riser

3. Using a Phillips 1 screwdriver, tighten the M.2 SSD module on the M.2 riser with the screw.

Next steps

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

System memory

System memory guidelines

The PowerEdge C6620 system supports DDR5 registered DIMMs (RDIMMs). System memory holds the instructions that are executed by the processor.

Your system contains 16 memory sockets organized into 8 channels per processor.

Memory channels are organized as follows:

Table 67. 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
Processor 2	B1	B7	B3	B5	B4	B6	B2	B8
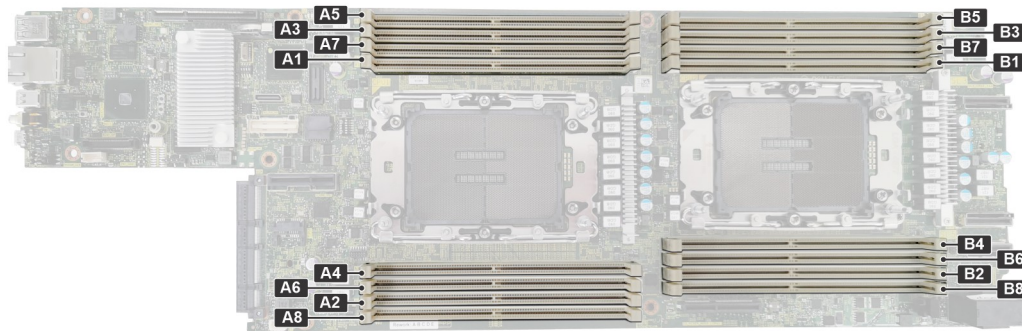
Figure 58. Memory socket location

Table 68. Supported memory matrix

DIMM type	Rank	Capacity	DIMM rated voltage and speed	DIMMs per Channel (DPC)
RDIMM	1Rx8, 1Rx4	16 GB, 32 GB, 64 GB, 128 GB, 256 GB	DDR5 (1.1V), 4800 MT/s	4800 MT/s
	2Rx8, 2Rx4			

ⓘ **NOTE:** Mixing of memory module capacities in a system is not supported.

General memory module installation guidelines

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

The memory bus may operate at speeds of 4800 MT/s, 4400 MT/s, or 4000 MT/s depending on the following factors:

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

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

● All DIMMs must be DDR5.
● Memory mixing is not supported for:
  ○ Different DIMM capacities
  ○ X4 and X8 DRAM memory modules
  ○ 3DS and non-3DS RDIMMs
    ⓘ **NOTE:** 3DS is a DRAM technology that is used to manufacture the highest capacity DIMMs. See your DIMM documentation for additional details.
●
● 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.
  ○ For dual-processor systems, sockets A1 to A8 and sockets B1 to B8 are available.

○ A minimum of one 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 69. 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, 3, 4 DIMMs are allowed.
Dual processor (Start with processor1. Processor 1 and processor 2 population should match)	A{1}, B{1}, A{2}, B{2}, A{3}, B{3}, A{4}, B{4}, A{5}, B{5}, A{6}, B{6}, A{7}, B{7} A{8}, B{8}	1, 2, 3, 4, 5, 6, 7, 8 DIMMs are supported per system.

● Unbalanced or odd memory configurations result in a performance loss, and the system may not identify the memory modules being installed. Always populate memory channels identically with equal DIMMs for the best performance.
● Supported RDIMM configurations are 1, 2, 4, 6, and 8 DIMMs per processor.
● Populate eight equal memory modules per processor (one DIMM per channel) at a time to maximize performance.
  ⓘ **NOTE:** Equal memory modules refer to DIMMs with identical electrical specification and capacity that may be from different vendors.
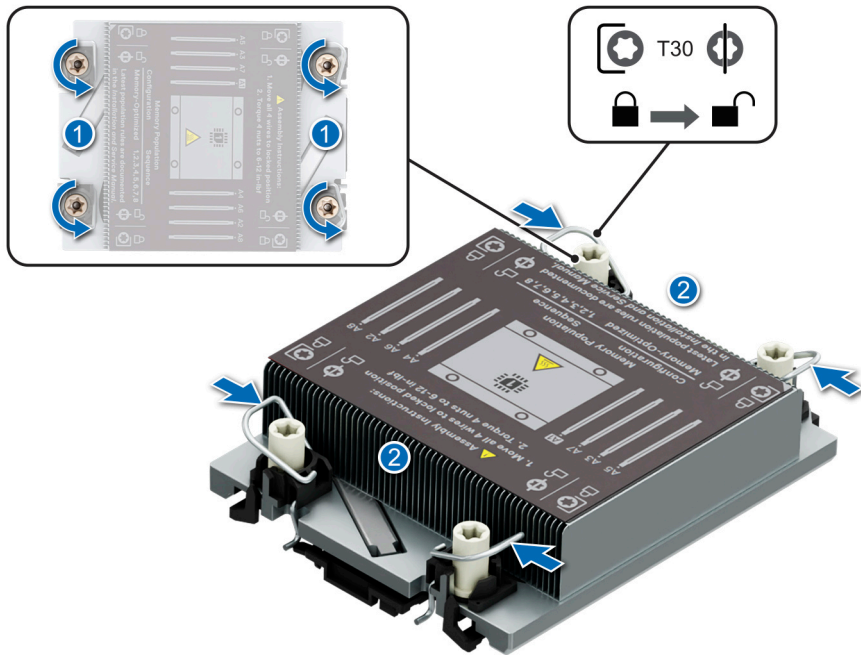
Removing a memory module

Prerequisites

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

⚠ **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.**

ⓘ **NOTE:** To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. The memory module blanks compatible with the C6620 are DDR5 gray color blanks. Remove the 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.
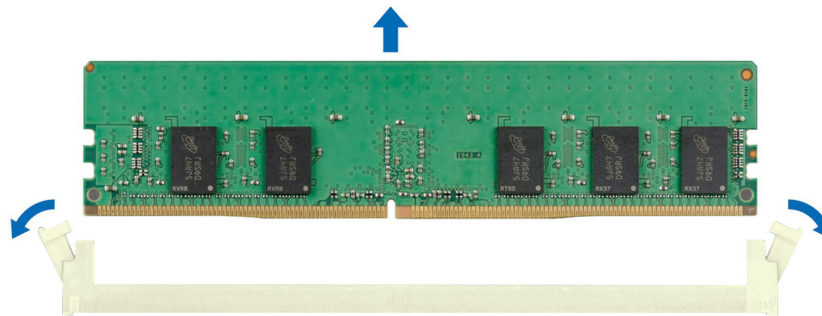
Figure 59. Removing a memory module

Next steps

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

   (i) **NOTE:** When operating your system with single processor, install memory module blanks in processor 2 memory sockets.
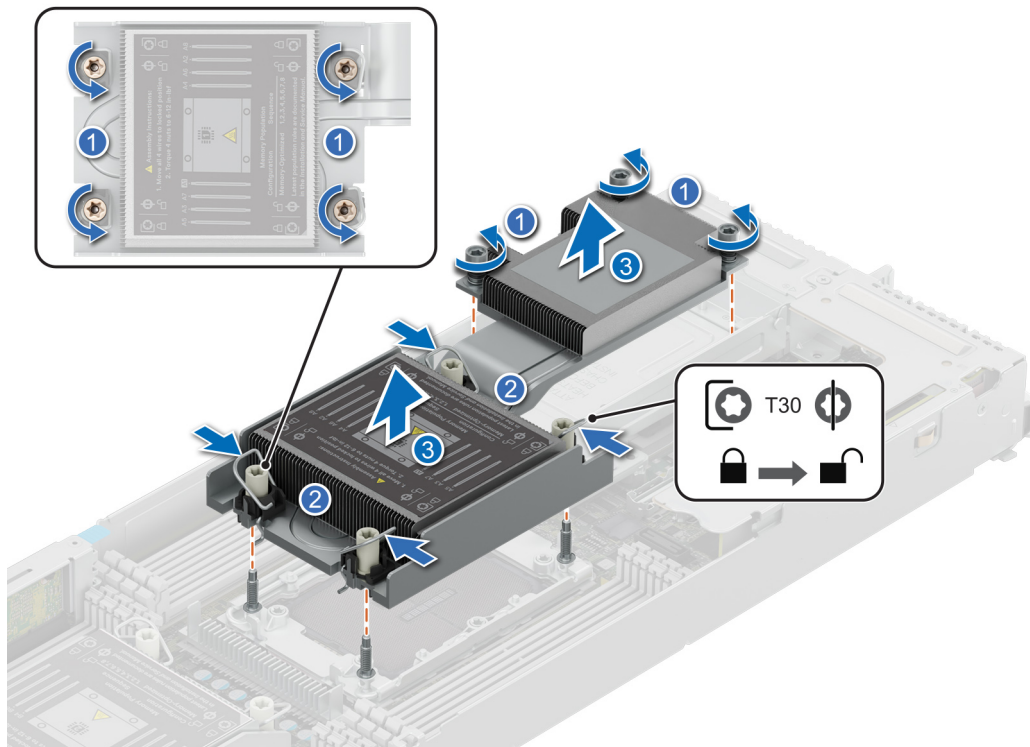
Installing a memory module

Prerequisites

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

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. 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.**

3. Press the memory module with your thumbs until the ejectors firmly click into place. When the memory module is properly seated in the socket, the levers on the memory module socket align with the levers on the other sockets that have memory modules installed.
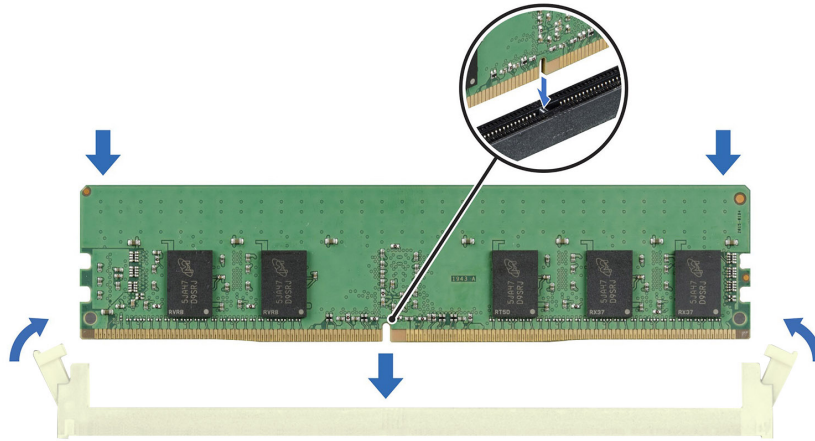
Figure 60. Installing a memory module

Next steps

1. Follow the procedure listed in After working inside your system.
2. To verify that the memory module has been installed properly, press F2 during reboot 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.
3. If the System Memory Size is incorrect, one or more of the memory modules may not be installed properly. Shut down the system and ensure that the memory modules are firmly seated in the correct sockets.
4. Run the system memory test in system diagnostics.

Processor and heat sink module

This is a service technician replaceable part only.

Removing a 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 air shroud.
   (i) **NOTE:** The heat sink and processor are hot to touch for some time after the sled 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 screwdriver, loosen the captive nuts on the heat sink in the order that is mentioned below:
   a. Loosen the first nut three turns.
   b. Loosen the screw diagonally opposite to the nut you loosened first.
   c. Repeat the procedure for the remaining two nuts.
   d. Return to the first nut to loosen it completely.
2. Set the Anti-Tilt wires to the unlocked position (inward position).

Figure 61. Loosening the captive nuts and set the Anti-Tilt wires to the unlocked position

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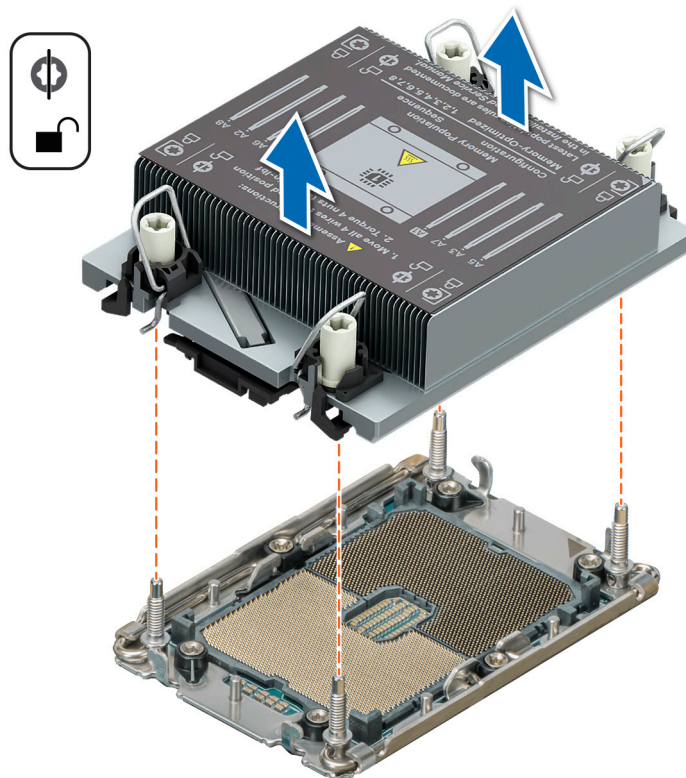
Figure 62. Removing a processor and heat sink module

Next steps

Remove the processor from the processor and heat sink module.

Removing a extended heat sink module and extended heat sink bracket

Prerequisites

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

   (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 screwdriver, loosen the captive nuts on the heat sink in the order that is mentioned below:

   a. Loosen the first nut three turns.
   b. Loosen the screw diagonally opposite to the nut you loosened first.
   c. Repeat the procedure for the remaining two nuts.
   d. Return to the first nut to loosen it completely.
   e. Repeat the same procedure on the extended heat sink.

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 63. Loosening the captive nuts and set the Anti-Tilt wires to the unlocked position

4. Using a Phillips 1 screwdriver, remove the screws that secures the extended heat sink bracket and lift it up from the system board.
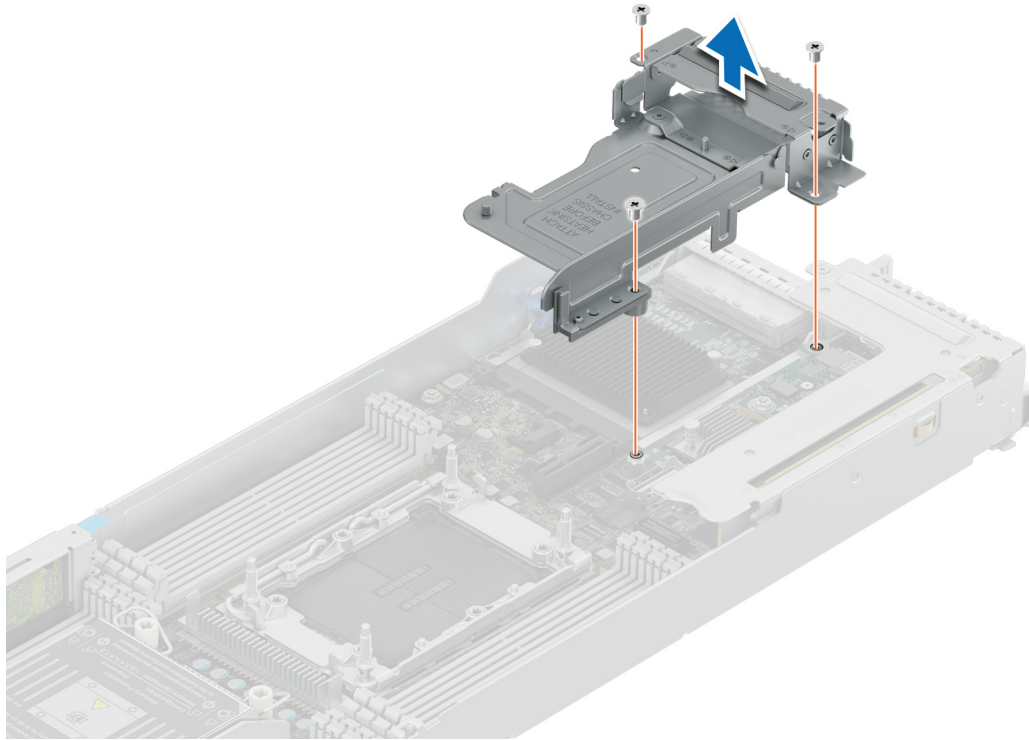
Figure 64. Removing the extended heat sink bracket

Next steps

Remove the processor from the processor and heat sink module.

Removing the processor from the 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 Before working inside your system .
3. Remove the air shroud.
4. Remove the processor and heat sink module (PHM).

⚠ **CAUTION: An expected CMOS battery loss or CMOS checksum error message may be displayed during the first instance of powering on the system after replacing the processor or system board. To resolve this issue, 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 retaining clip.

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

3. Holding the processor by its edges, lift the processor away from the retaining clip, and then place the processor connector side down on the processor tray. Ensure pin 1 marks are aligned.
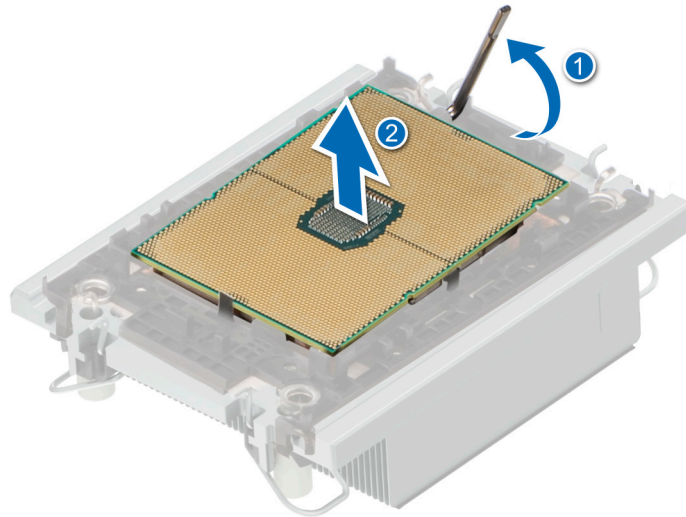
Figure 65. Lift the TIM break lever
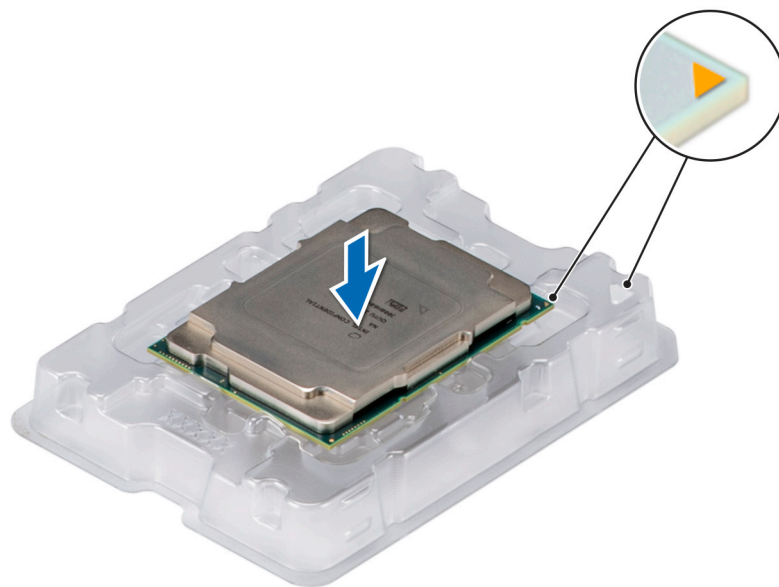
Figure 66. Aligning pin 1 marks of processor with tray

(i) **NOTE:** Ensure that to return the TIM break lever back to its original position.

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

Figure 67. Removing the processor retaining clip

Next steps

Replace the processor into a processor and heat sink module (PHM).

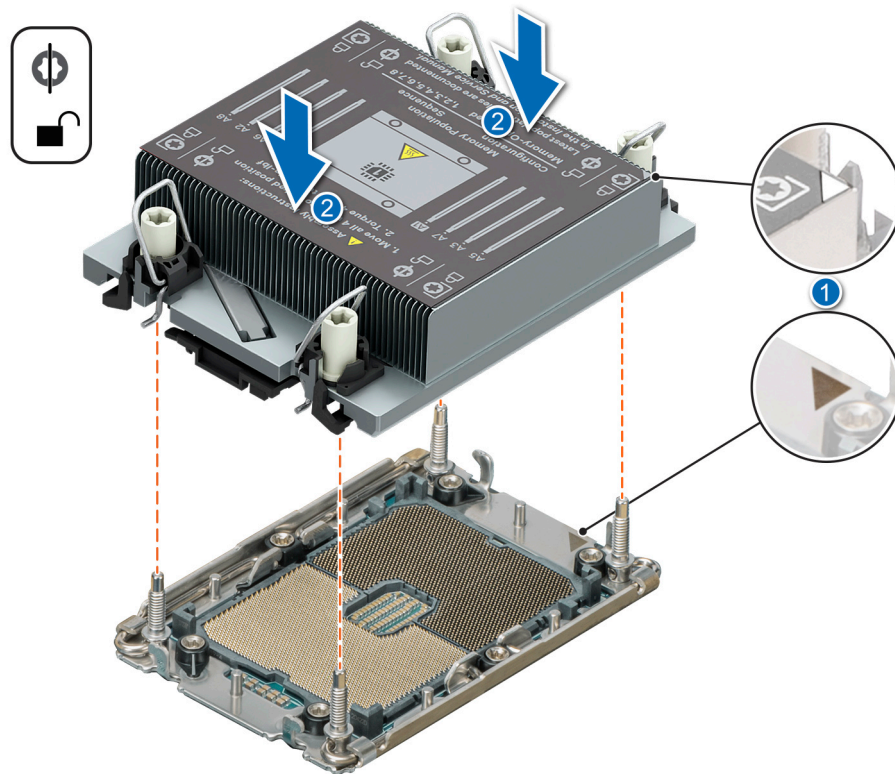# Installing the processor into a heat sink module

Prerequisites

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

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 retaining clip 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 retaining clip is aligned with the pin 1 indicator on the processor before placing the retaining clip on the processor.

   (i) **NOTE:** Ensure that the processor and the retaining clip are placed in the tray before you install the heat sink.
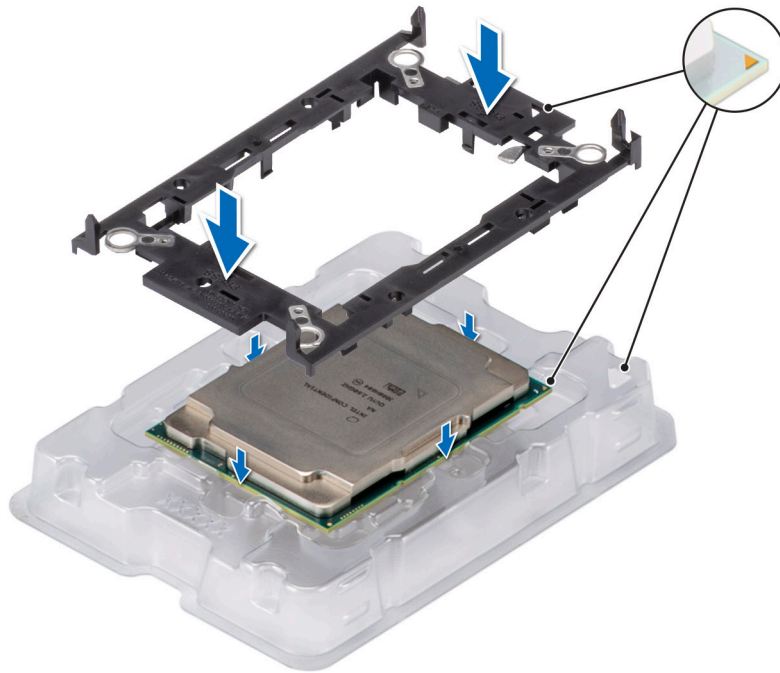
Figure 68. Installing the processor retaining clip

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

   (i) **NOTE:** Ensure that the processor is securely latched to the processor retaining clip.
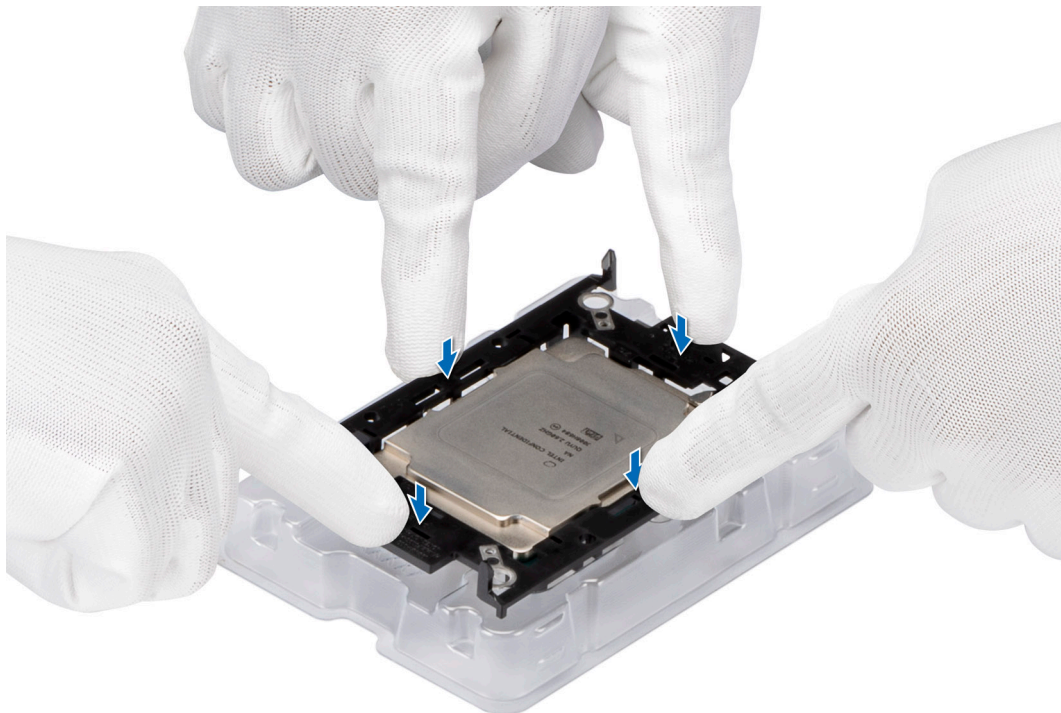
Figure 69. Press the retaining clip on the four sides

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 thin spiral on the bottom of the heat sink.
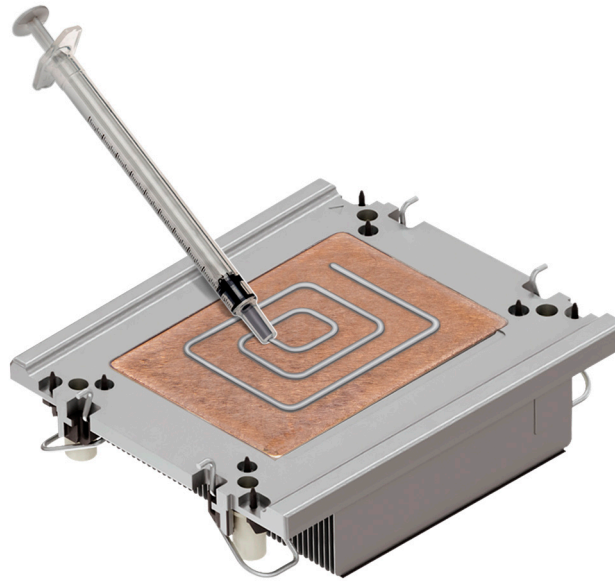
Figure 70. Applying thermal grease

⚠️ **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.
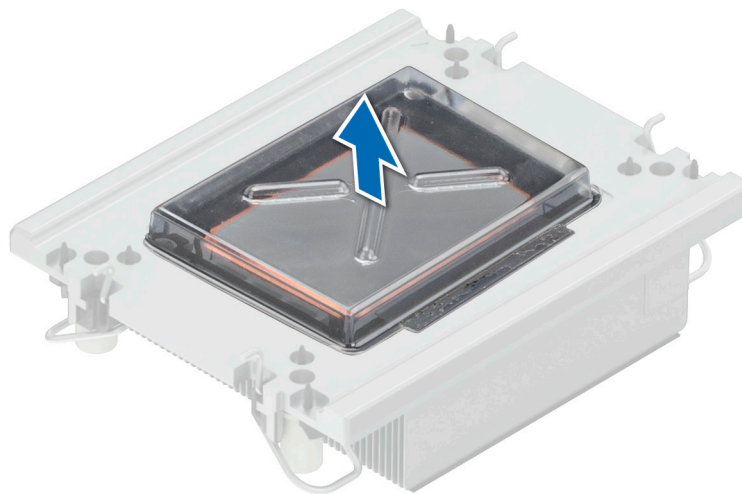
Figure 71. Remove the Thermal Interface Material (TIM) protective film

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

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

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

ⓘ **NOTE:** Ensure latching features on processor retaining clip and heat sink are aligned during assembly.
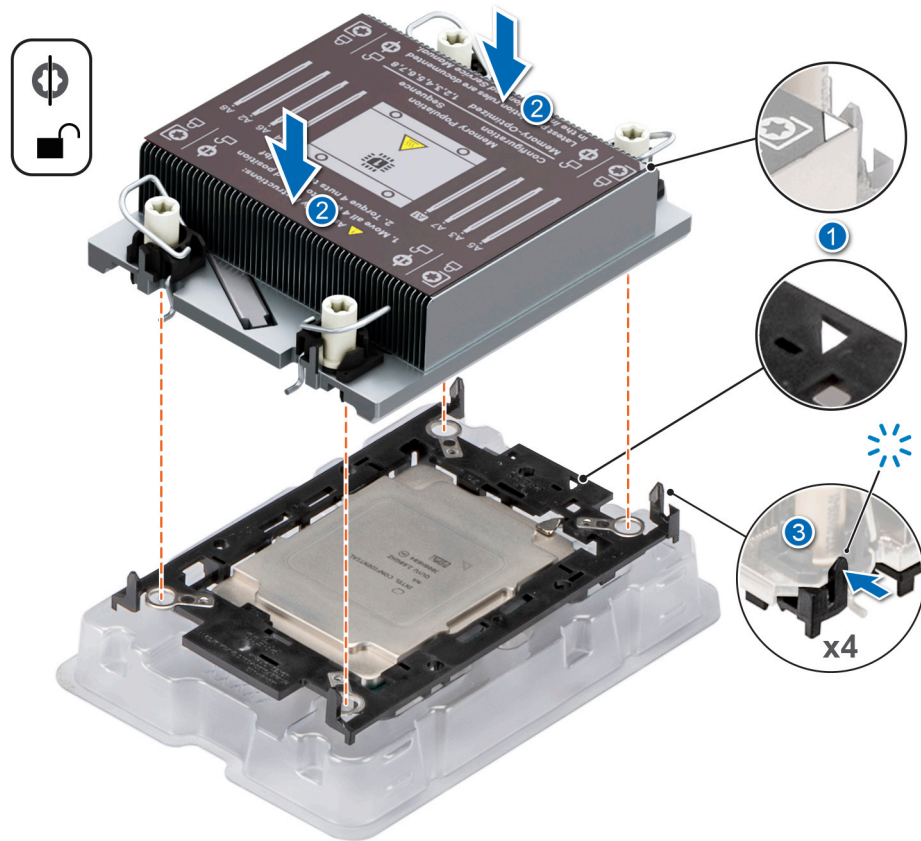
Figure 72. Installing the heat sink onto the processor

Next steps

1. Install the processor and heat sink module.
2. Install the air shroud.
3. Follow the procedure listed in After working inside your system.

Installing the processor and heat sink module

Prerequisites

⚠ **CAUTION: Never remove the heat sink from a processor unless you intend to replace the processor or the 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 Before working inside your system .
3. Remove the air shroud.
4. If installed, remove the processor dust cover.

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 73. 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 screwdriver, tighten the captive nuts (8 in-lbf) on the heat sink in the order below:

   a. Tighten the first nut three turns.
   b. Tighten the screw diagonally opposite to the nut you tighten first.
   c. Repeat the procedure for the remaining two nuts.
   d. Return to the first nut to tighten it completely.
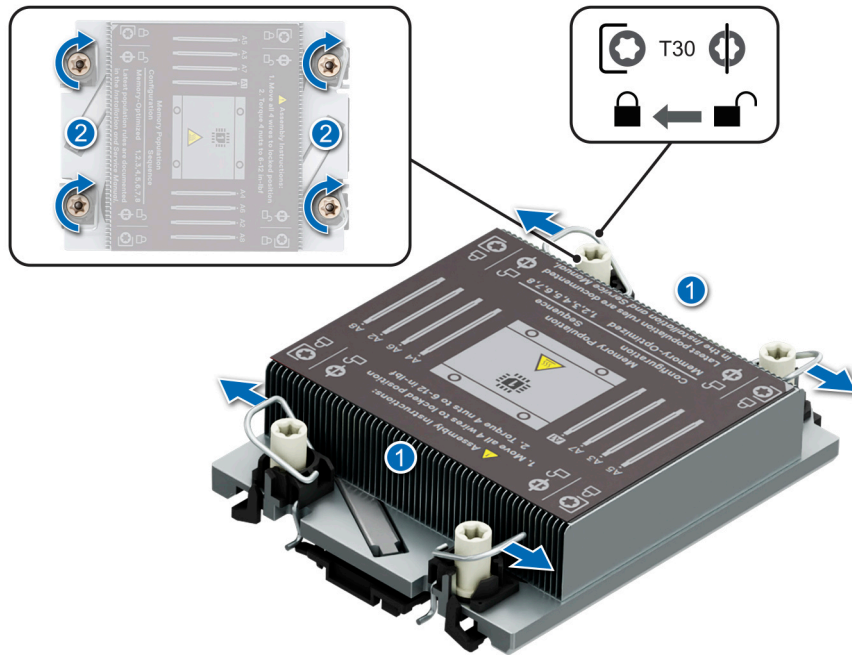
Figure 74. Set the Anti-Tilt wires to the locked position and tightening the captive nuts

Next steps

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

Installing the extended heat sink bracket and extended heat sink module

Prerequisites

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

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in Before working inside your system .
3. Remove the air shroud.
4. If installed, remove the processor dust cover.

Steps

1. Align the extended heat sink bracket with the screw holes on the system board.

   ⓘ **NOTE:** Ensure that riser 1 and riser 2 are not installed in the system.

2. Using the Phillips 1 screwdriver, tighten the screws to secure it on the system board.
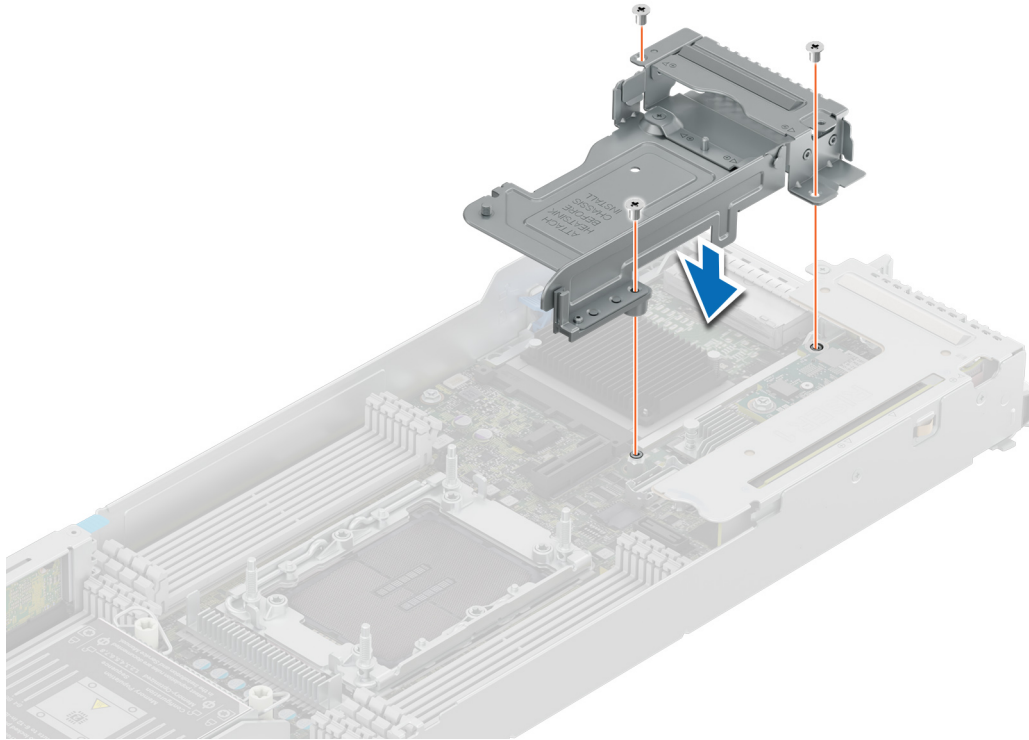
Figure 75. Removing the extended heat sink bracket

3. Set the Anti-Tilt wires to the unlocked position on the heat sink (inward position).
4. 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 heat sink is held parallel to the system board to prevent damaging the components.

5. Set the Anti-Tilt wires to the locked position (outward position), and then using the Torx T30 screwdriver, tighten the captive nuts (8 in-lbf) on the heat sink in the order below:
   a. Tighten the first nut three turns.
   b. Tighten the screw diagonally opposite to the nut you tighten first.
   c. Repeat the procedure for the remaining two nuts.
   d. Return to the first nut to tighten it completely.
   e. Repeat the same procedure on the extended heat sink.
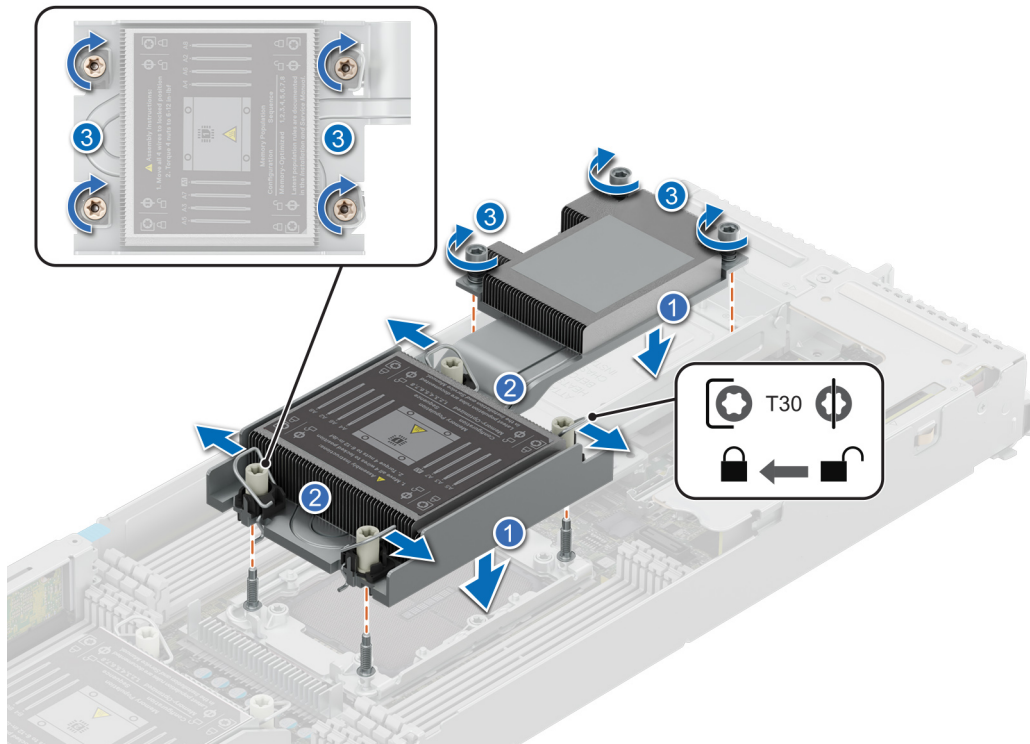
Figure 76. Set the Anti-Tilt wires to the locked position and tightening the captive screws

Next steps

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

Liquid cooling cold plate with leak sensor

This is a service technician replaceable part only.

Removing a liquid cooling cold plate with leak sensor

Prerequisites

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

Steps

1. Using a Phillips 1 screwdriver, remove the screws that secure the rubber tube cover.
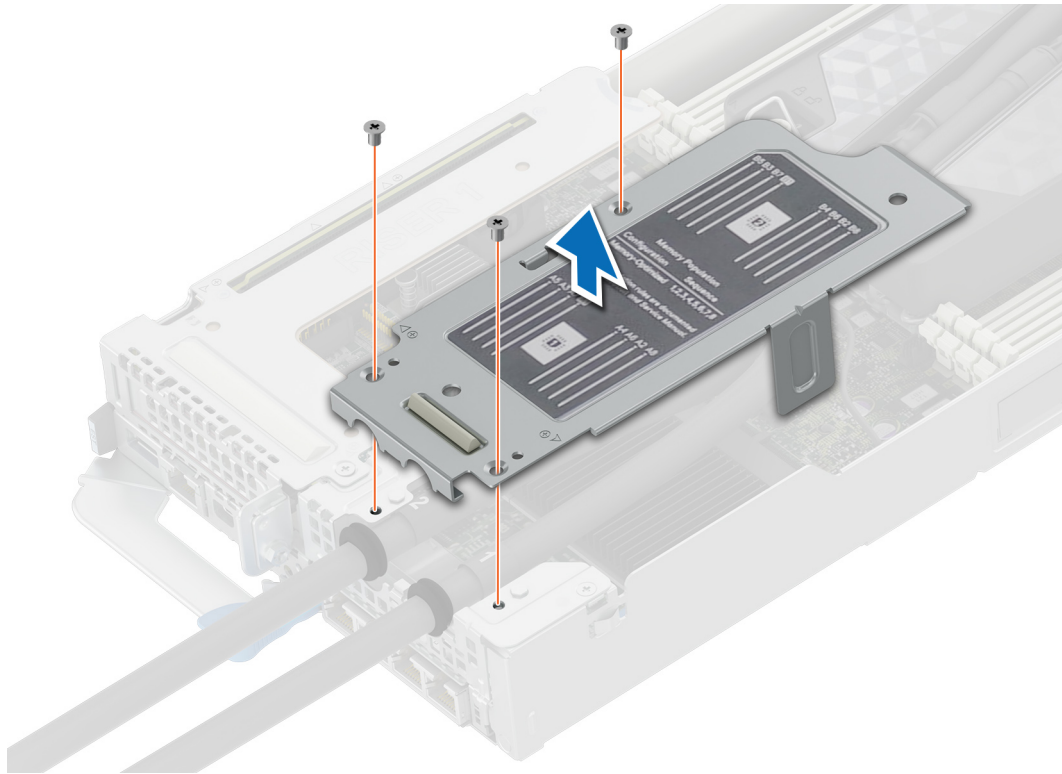
Figure 77. Removing the cold plate with leak sensor

2. Disconnect the leak sensor cable from the system board.
3. Lift the rubber tubes from the groves in the rear bracket.
4. Ensure all four Anti-Tilt wires are in the locked position (outward position), and then using a Torx T30 screwdriver, loosen the captive nuts on the cold plate in the order that is mentioned below:
   a. Loosen the first nut.
   b. Loosen the screw diagonally opposite to the nut you loosened first.
   c. Repeat the procedure for the remaining two nuts.
5. Set the Anti-Tilt wires to the unlocked position (inward position).

   ⓘ **NOTE:** Repeat step 4 and 5 for the other cold plate.

   ⓘ **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
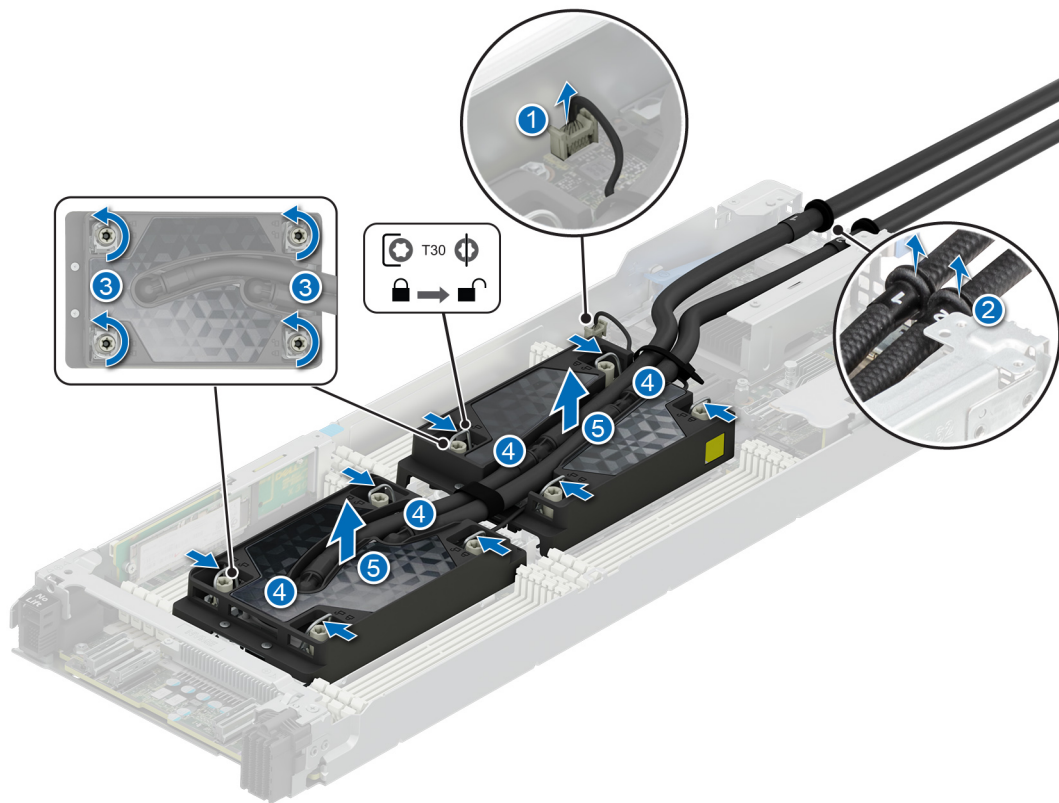
Figure 78. Loosening the captive nuts and set the Anti-Tilt wires to the unlocked position

6. Lift the cold plates and tubing assembly from the system and set aside with the processor side facing up.

Next steps

Replace the liquid cooling cold plate with leak sensor.

Removing the processor from the cold plate

Prerequisites

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

⚠ **WARNING: Remove the processors from the liquid cooling only if you are replacing the processors or need to install a complete new cold plate assembly and transferring both the processors.**

⚠ **CAUTION: An expected CMOS battery loss or CMOS checksum error message may be displayed during the first instance of powering on the system after replacing the processor or system board. To resolve this issue, go to setup option to configure the system settings.**

Steps

1. Start with the cold plate assembly lying on the ESD surface with their processor side facing up.
2. Lift up the Thermal Interface Material (TIM) break lever to release the processor from the TIM and retaining clip.

   ⓘ **NOTE:** Ensure to hold the retaining clip to the cold plate as you lift the TIM break lever.

   ⓘ **NOTE:** Ensure to remove one processor at a time.

3. Holding the processor by its edges, lift the processor away from the retaining clip, and then place the processor connector side down in the processor tray. Ensure pin 1 marks are aligned.

   (i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
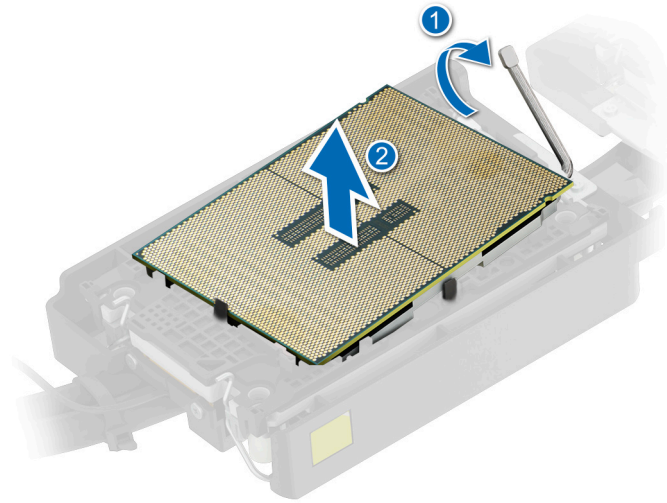
Figure 79. Lift the TIM break lever
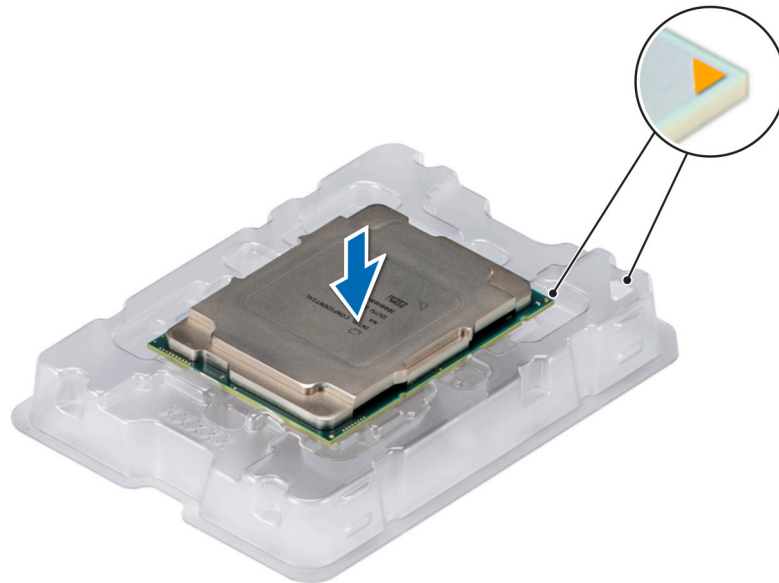
Figure 80. Aligning pin 1 marks of processor with tray

   (i) **NOTE:** Ensure that to return the TIM break lever back to its original position.

4. To remove the plastic retainer from the cold plate, first hold the retaining clip release tab at the pin 1 connector, pull out the tip of the retaining clip release tab, and then lift the retaining clip partially from the cold plate.

5. Repeat the procedure at the remaining three corners of the retaining clip.

6. After all the corners are released from the cold plate, lift the retaining clip from the pin 1 corner of the cold plate.

   (i) **NOTE:** Ensure to follow the same procedure for second processor.

(i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
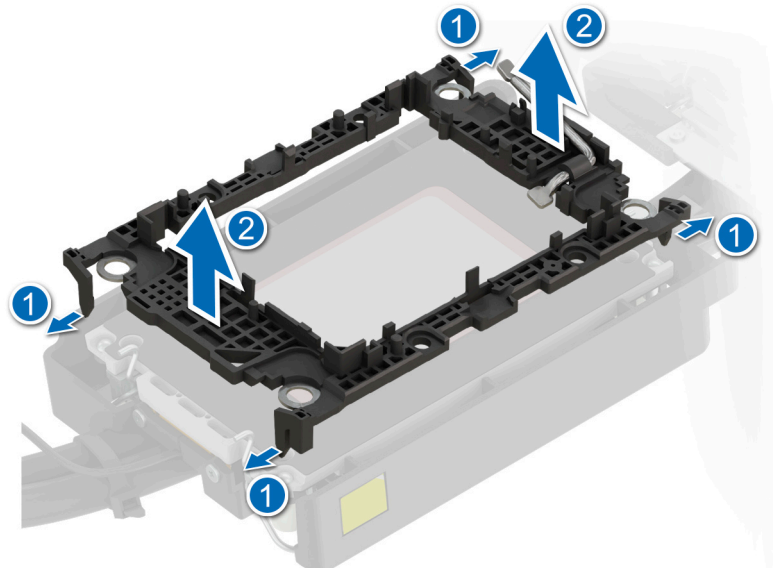
Figure 81. Removing the processor retaining clip

Next steps

Replace the processor into a liquid cooling cold plate.

Removing the Xeon Max processor from the 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 Before working inside your system .
3. Remove the air shroud.
4. Remove the processor and heat sink module (PHM).

⚠ **CAUTION: An expected CMOS battery loss or CMOS checksum error message may be displayed during the first instance of powering on the system after replacing the processor or system board. To resolve this issue, go to setup option to configure the system settings.**

Steps

1. Place the heat sink with the processor side facing up.
2. Using a flathead screwdriver, rotate the screw in an anti clockwise direction to release the processor from the retaining clip.
3. Holding the processor by its edges, lift the processor away from the retaining clip, and then place the processor connector side down on the processor tray. Ensure pin 1 marks are aligned.
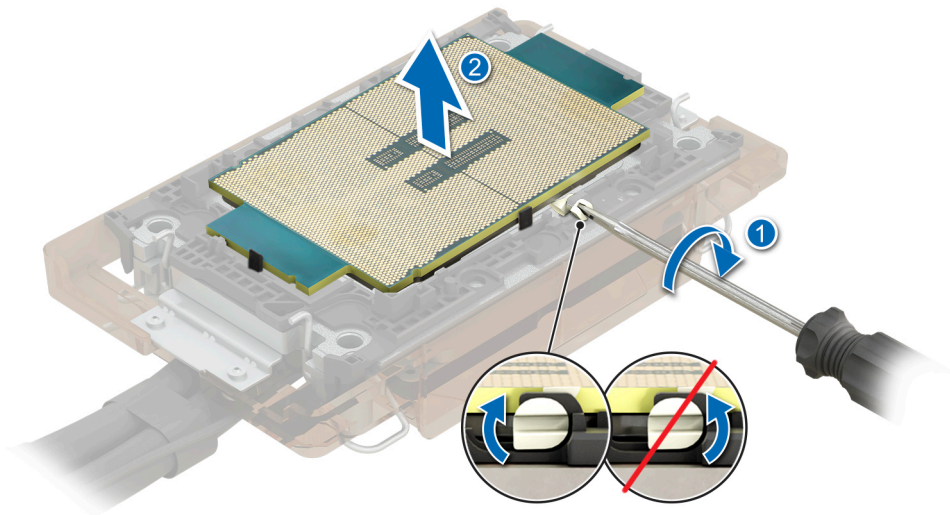
Figure 82. Removing the processor with a flathead screwdriver - liquid cooling configuration
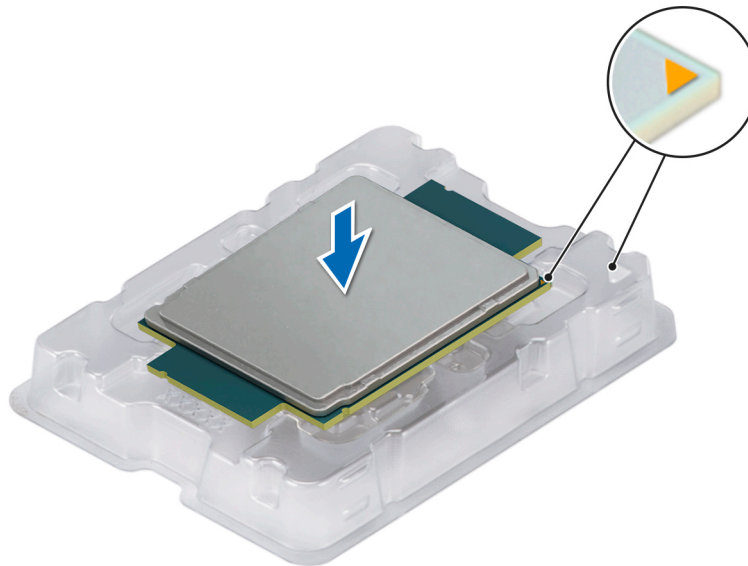
Figure 83. Aligning pin 1 marks of processor with tray

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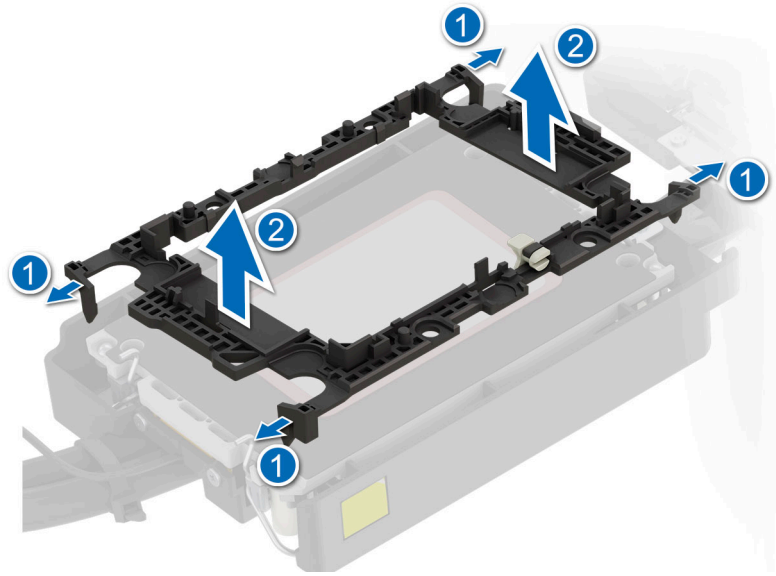
Figure 84. Removing the processor retaining clip

Next steps

Replace the Xeon Max processor into a processor and heat sink module (PHM).

Installing the processor into a liquid cooling cold plate

Prerequisites

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

Steps

1. Place the processor in the processor tray.

   Ensure to install one processor at a time.

   ⓘ **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 retaining clip on top of the processor that is in the processor tray aligning pin 1 indicator on the processor.

   ⓘ **NOTE:** Ensure that the pin 1 indicator on the retaining clip is aligned with the pin 1 indicator on the processor before placing the retaining clip on the processor.
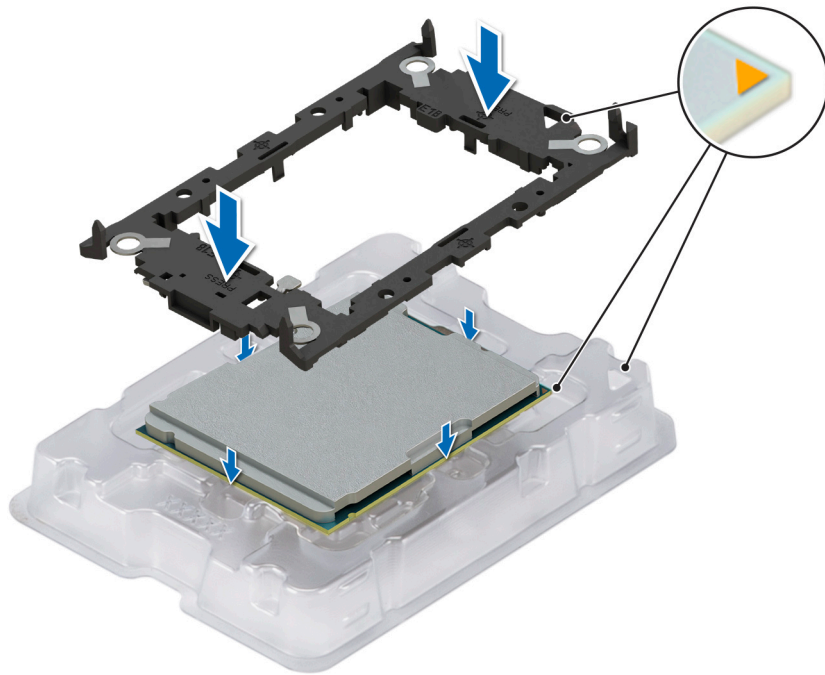
Figure 85. Installing the processor retaining clip

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

ⓘ **NOTE:** Ensure that the processor is securely latched to the processor retaining clip.
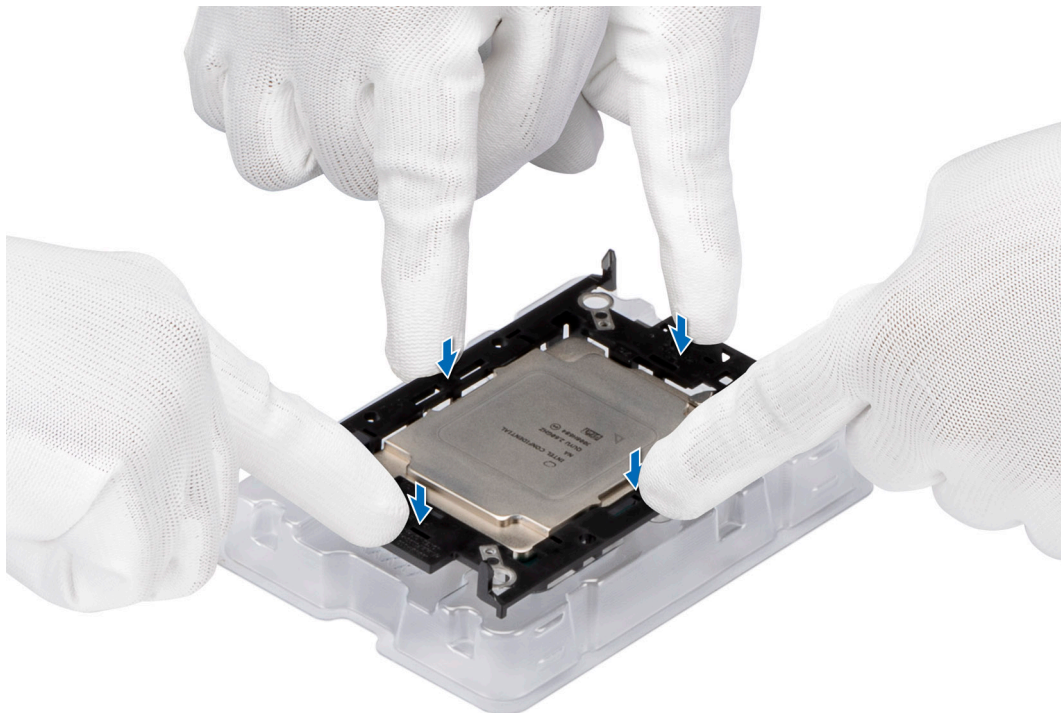
Figure 86. Press the retaining clip on the four sides

4. If you are using an existing cold plate, remove the thermal grease on the cold plate by using a clean lint-free cloth.
5. Use the thermal grease syringe included with your processor kit to apply the grease in a thin spiral on the bottom of the cold plate.
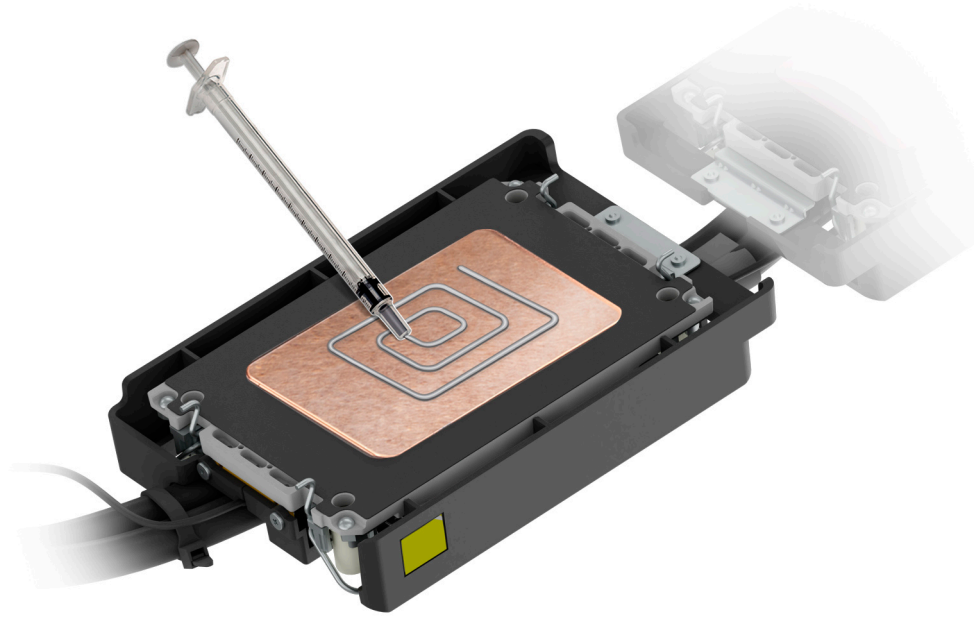
Figure 87. Applying thermal grease

⚠ **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 cold plate, remove the plastic cover from the base of cold plate.
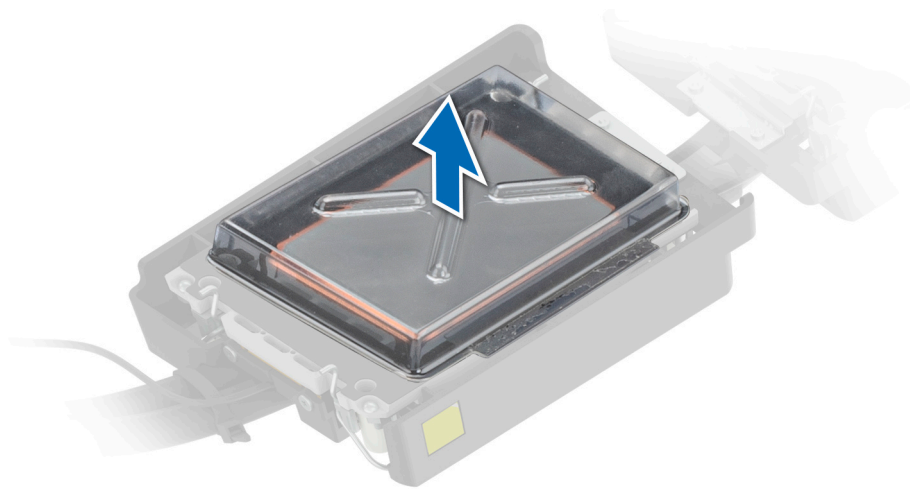
Figure 88. Remove the Thermal Interface Material (TIM) plastic cover

7. Place the cold plate on the processor and press the cold plate until the retaining clip locks onto the cold plate at all the four corners.

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

   ⚠ **CAUTION: To avoid damaging to the tubes, do not press down on the tubes.**

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

(i) **NOTE:** Ensure latching features on processor retaining clip and cold plate are aligned during assembly.

(i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
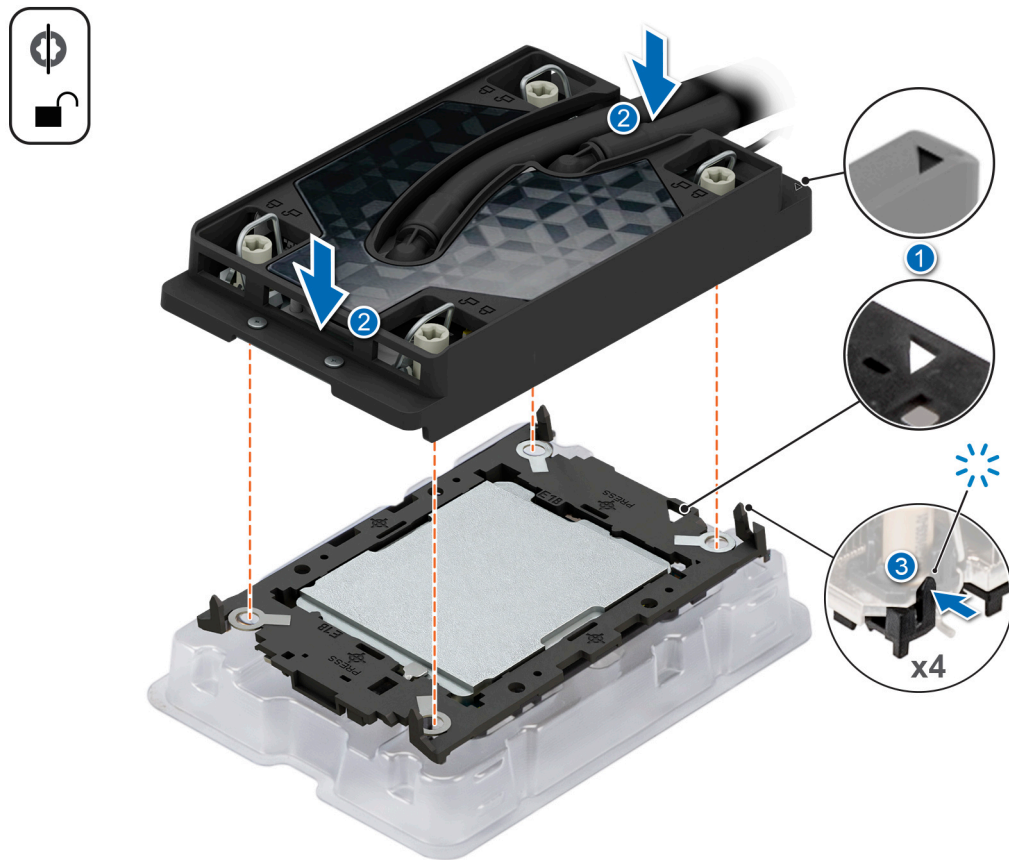
Figure 89. Installing the cold plate onto the processor

Next steps

1. Install a liquid cooling cold plate with leak sensor.
2. Follow the procedure listed in After working inside your system.

Installing the Xeon Max processor into a 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 .

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 retaining clip 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 retaining clip is aligned with the pin 1 indicator on the processor before placing the retaining clip on the processor.

Figure 90. Installing the processor retaining clip

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

   ⓘ **NOTE:** Ensure that the processor is securely latched to the processor retaining clip.

Figure 91. Press the retaining clip 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 thin spiral on the bottom of the heat sink.

Figure 92. Applying thermal grease

⚠️ **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.
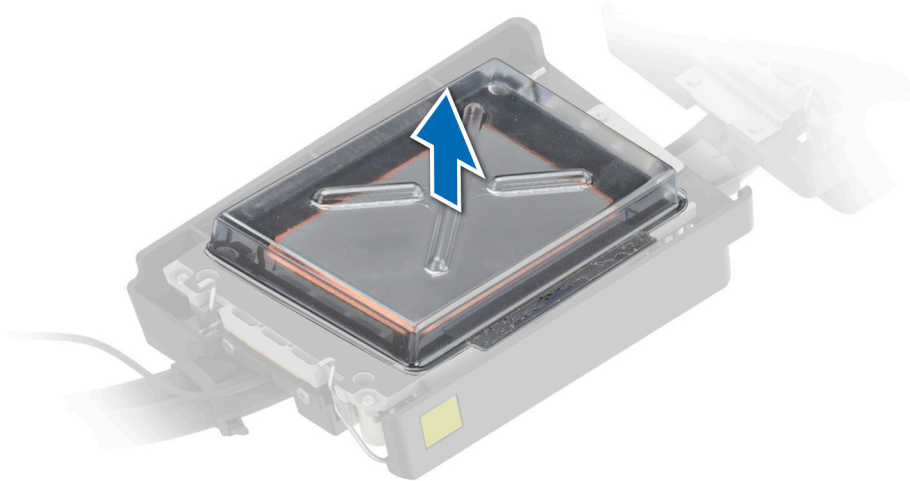
Figure 93. Remove the Thermal Interface Material (TIM) protective film

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

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

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

(i) **NOTE:** Ensure latching features on processor retaining clip and heat sink are aligned during assembly.
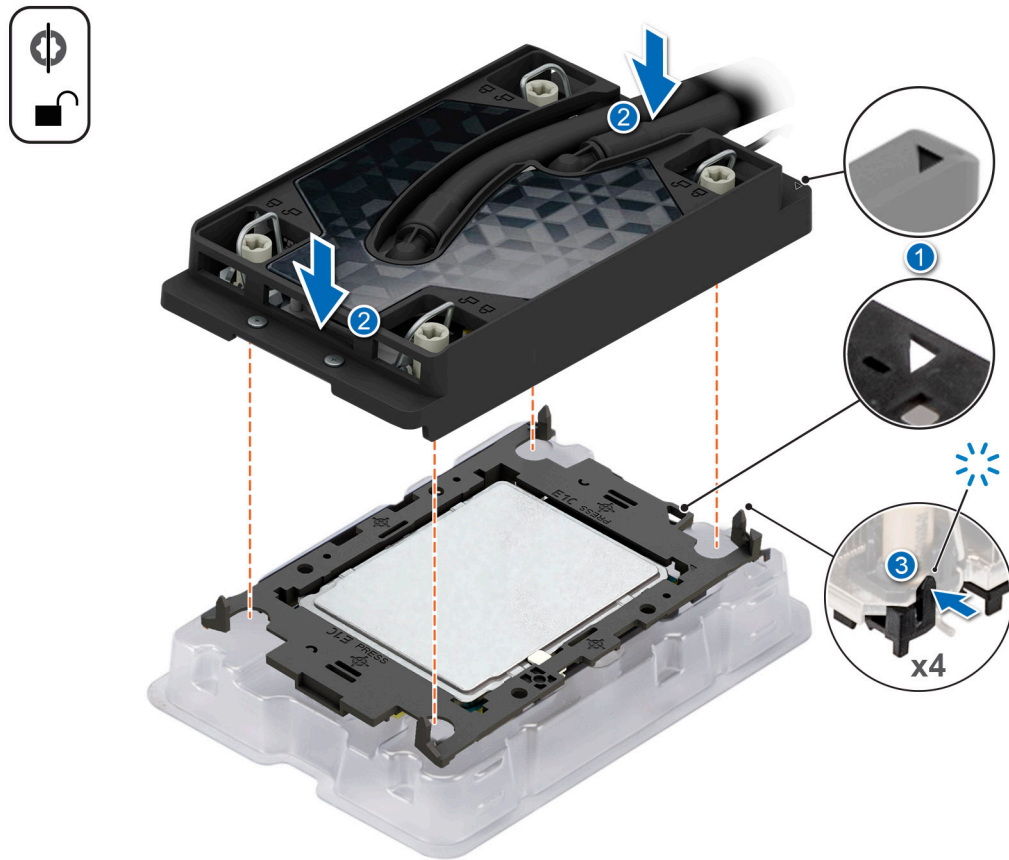
Figure 94. Installing the heat sink onto the processor

Next steps

1. Install the processor and heat sink module.
2. Install the air shroud.
3. Follow the procedure listed in After working inside your system.

Installing a liquid cooling cold plate

Prerequisites

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

Steps

1. Set the Anti-Tilt wires to the unlocked position on the cold plate (inward position).
2. Align the pin 1 indicator of the cold plate to the system board, and then place the cold plate assembly unto the processor sockets.

   ⚠ **CAUTION: To avoid damaging to the tubes, do not press down on the tubes.**

   (i) **NOTE:** Ensure that the processor and cold plate is held parallel to the system board to prevent damaging the components.

   (i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
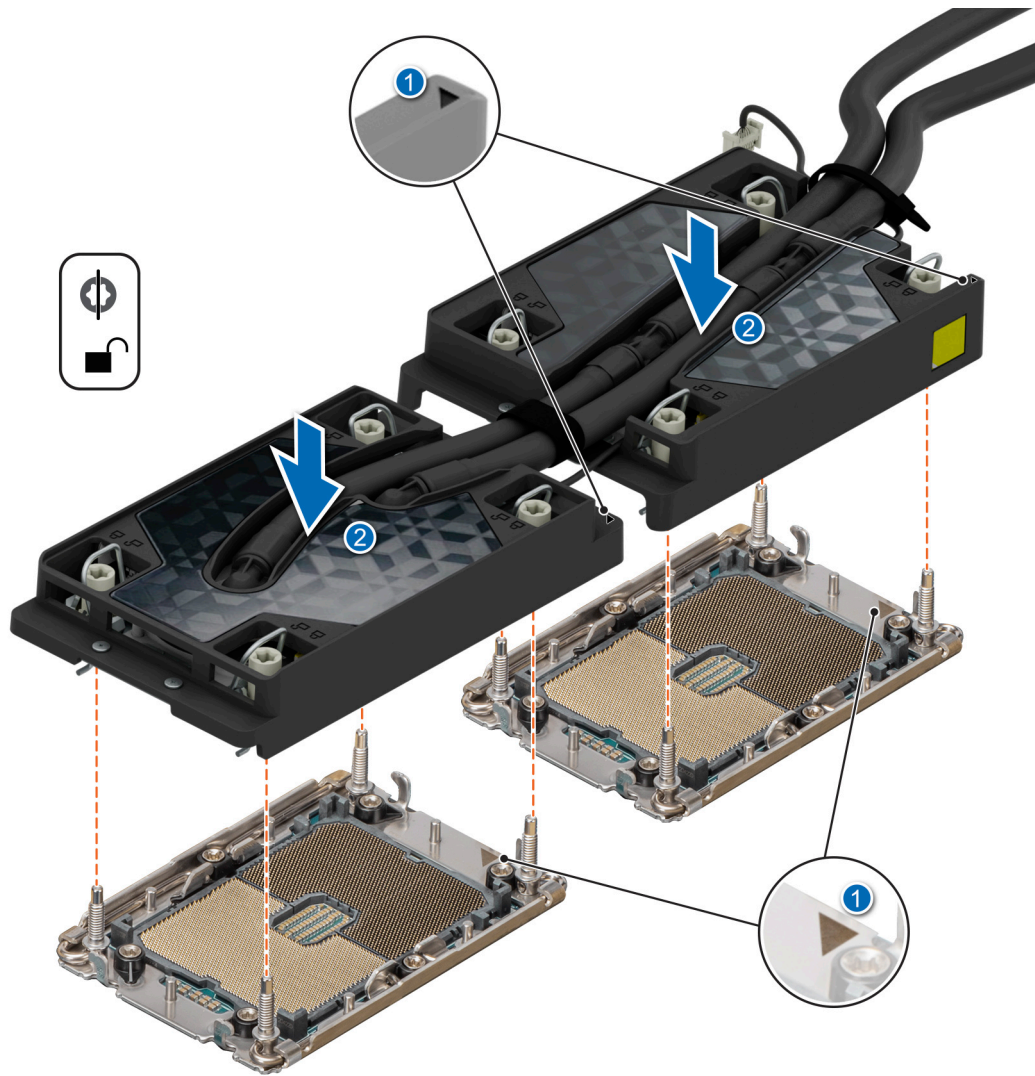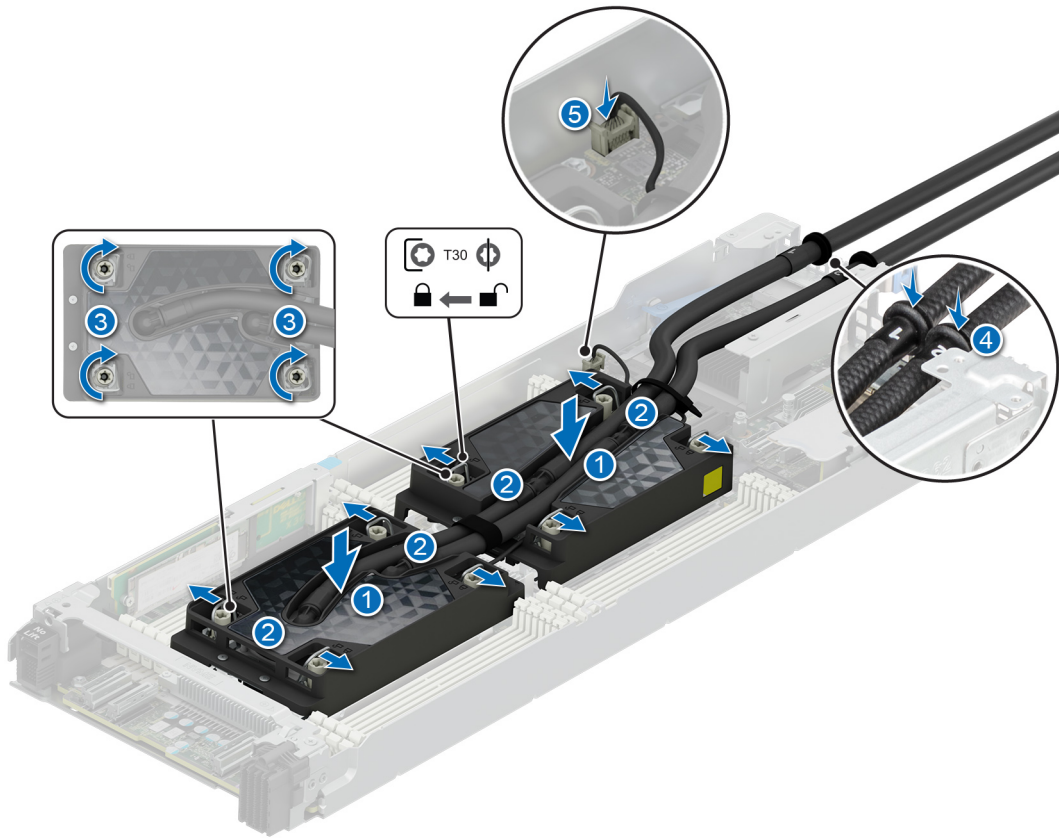
Figure 95. Installing the processor and liquid cooling cold plate

3. Set the Anti-Tilt wires to the locked position (outward position), and then using the Torx T30 screwdriver, tighten the captive nuts on each cold plate, one at a time, in the order below:
   a. Tighten the first nut.
   b. Tighten the screw diagonally opposite to the nut you tighten first.
   c. Repeat the procedure for the remaining two nuts.
4. Place the rubber tubes down into the cutout features on the rear wall.
5. Reconnect the leak sensor connector cable back to the system board.

   (i) **NOTE:** It is critical to ensure the sensor cable is connected.

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

Figure 96. Set the Anti-Tilt wires to the locked position and tightening the captive nuts

6. Using a Phillips 1 screwdriver, tighten the screws that secure the rubber tube cover.
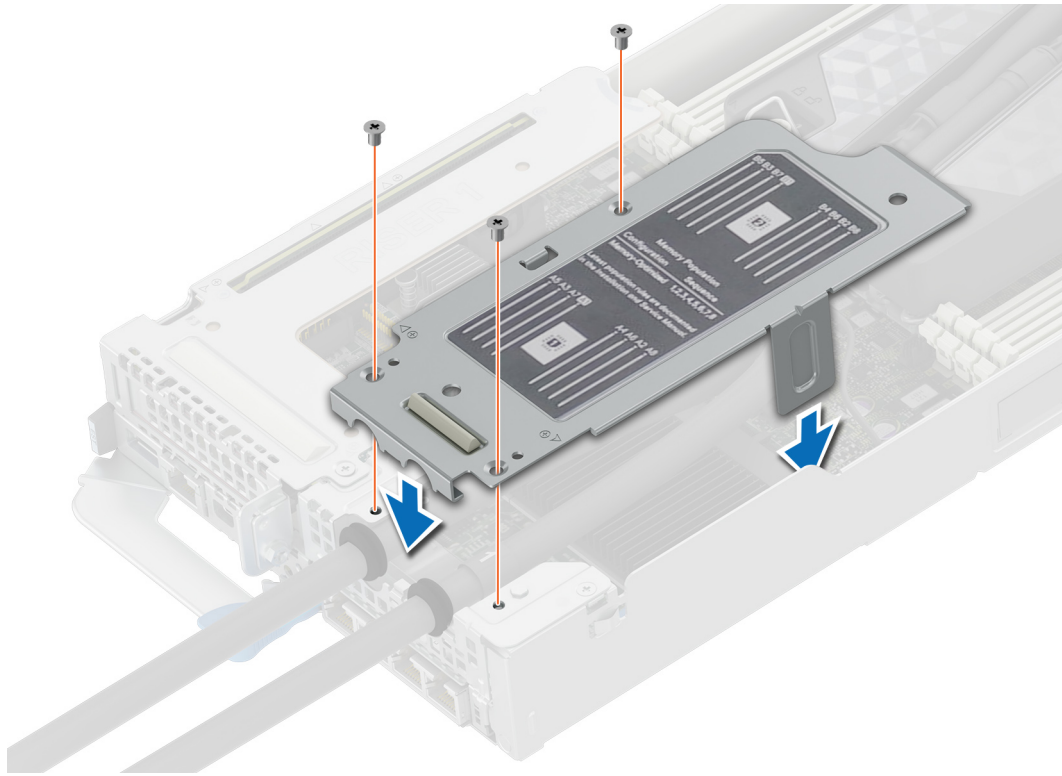
Figure 97. Installing the rubber tube cover

Next steps

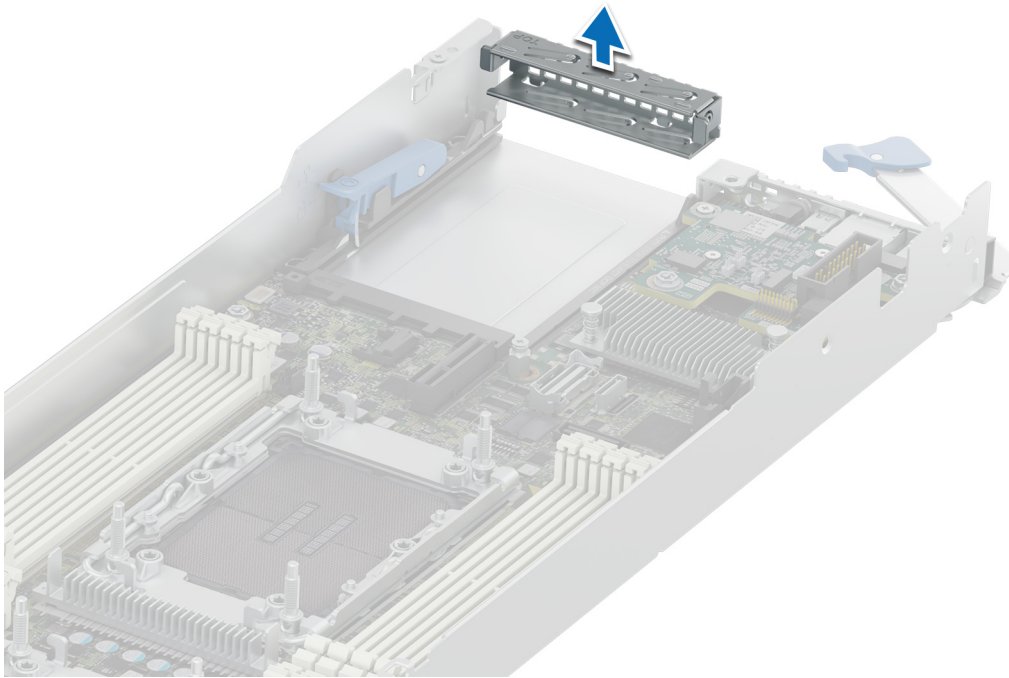Follow the procedures listed in After working inside your system.

Optional OCP card

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.
3. Remove the expansion card riser 1.
4. Remove the rubber tube cover. See remove the liquid cooling cold plate with leak sensor step 1 to remove the rubber tube cover.

Steps

Hold and lift the OCP filler from the OCP slot on the chassis.

Figure 98. Removing the OCP card filler

Next steps

1. Install the OCP card.
2. Install the rubber tube cover. See install the liquid cooling cold plate with leak sensor step 6 to install the rubber tube cover.
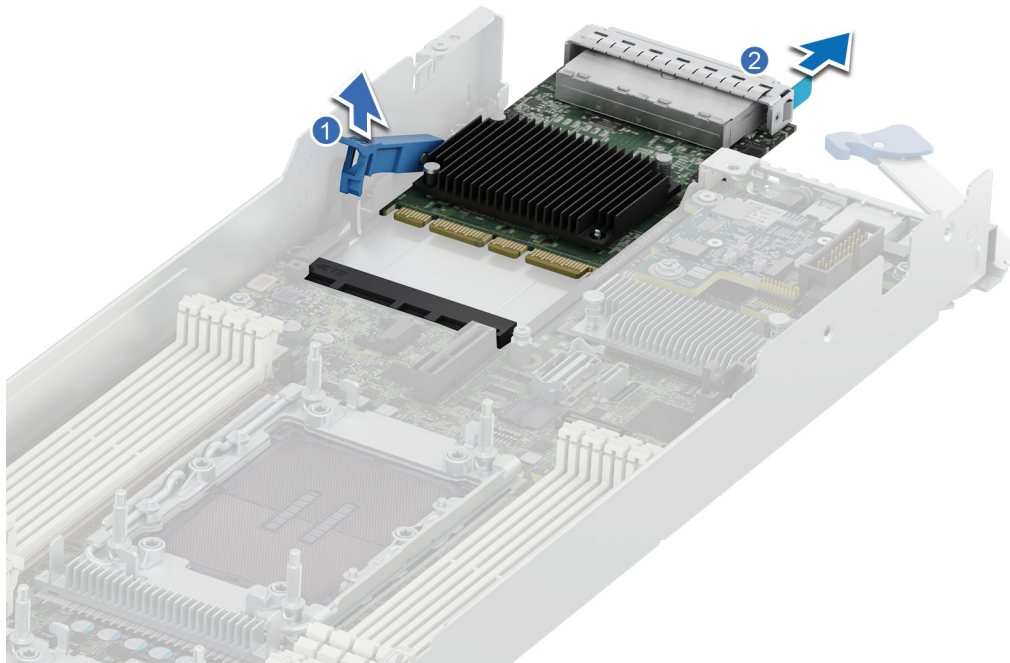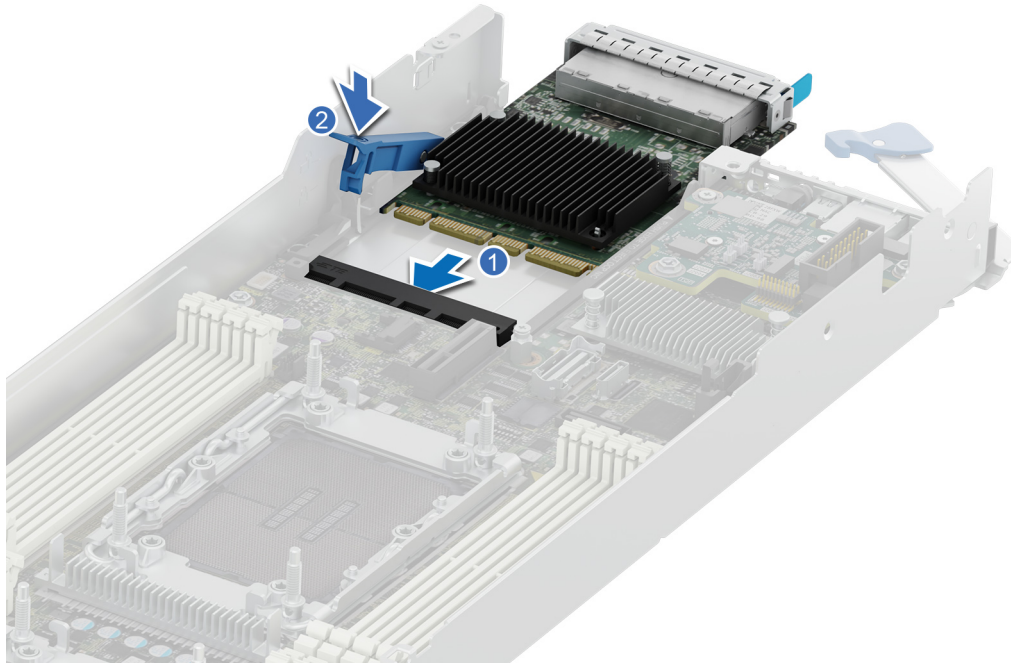3. Install the expansion card riser 1.

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 expansion card riser 1.
4. Remove the rubber tube cover. See remove the liquid cooling cold plate with leak sensor step 1 to remove the rubber tube cover.

Steps

1. Lift the OCP card retention latch.
2. Disengage the OCP card and remove it from the sled.

   ⓘ **NOTE:** Install an expansion card filler bracket over an empty expansion 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 99. Removing an OCP card

3. Press down the OCP card retention latch to lock it.

Next steps

1. Install the OCP filler.
2. Install the rubber tube cover. See install the liquid cooling cold plate with leak sensor step 6 to install the rubber tube cover.
3. Install the expansion card riser 1.

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 expansion card riser 1.
4. Remove the rubber tube cover. See remove the liquid cooling cold plate with leak sensor step 1 to remove the rubber tube cover.
5. Remove the OCP filler.

Steps

1. Align and insert the OCP card into the sled. Slide the OCP card and push firmly until it is fully connected to the system board connector.

   (i) **NOTE:** Ensure to lift the OCP card retention latch if it is in the lock position.

2. Close the OCP card retention latch to secure the card in place.

Figure 100. Installing an OCP card

Next steps

1. Install the rubber tube cover. See install the liquid cooling cold plate with leak sensor step 6 to install the rubber tube cover.
2. Install the expansion card riser 1.
3. Follow the procedure listed in After working inside your system.

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.
3. Remove the expansion card riser 1.
4. Remove the rubber tube cover. See remove the liquid cooling cold plate with leak sensor step 1 to remove the rubber tube cover.

Steps

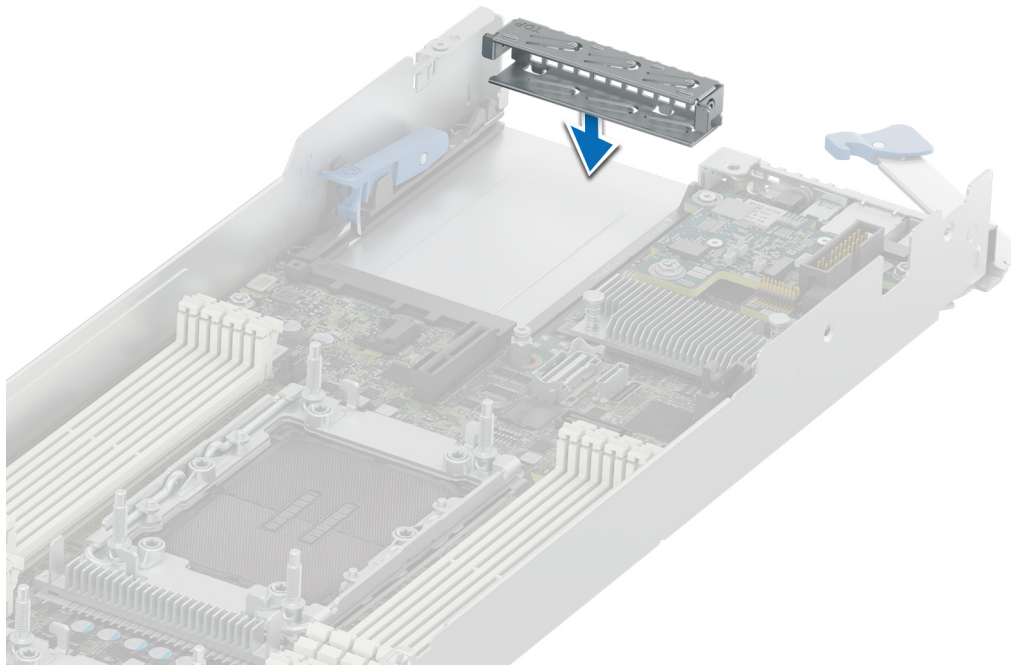Align and insert the OCP filler firmly until it is fully seated.

Figure 101. Installing the OCP card filler

Next steps

1. Install the rubber tube cover. See install the liquid cooling cold plate with leak sensor step 6 to install the rubber tube cover.
2. Install the expansion card riser 1.

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 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 Before working inside your system .
3. Remove the expansion card riser 1.

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.

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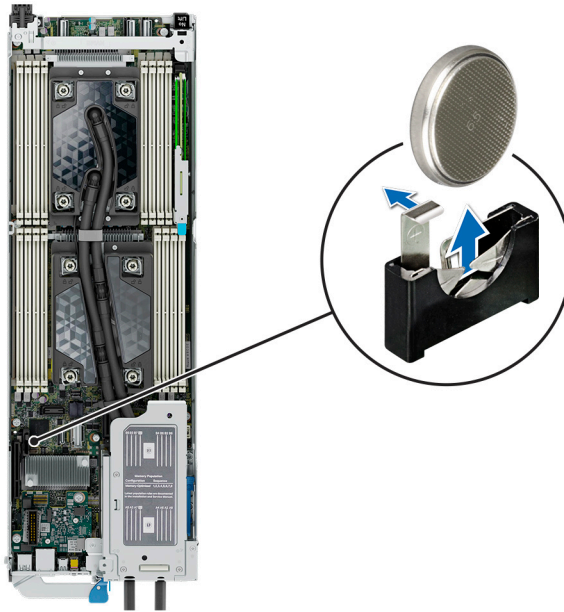

Figure 102. Removing the system battery

⚠️ **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.

   (i) **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.**
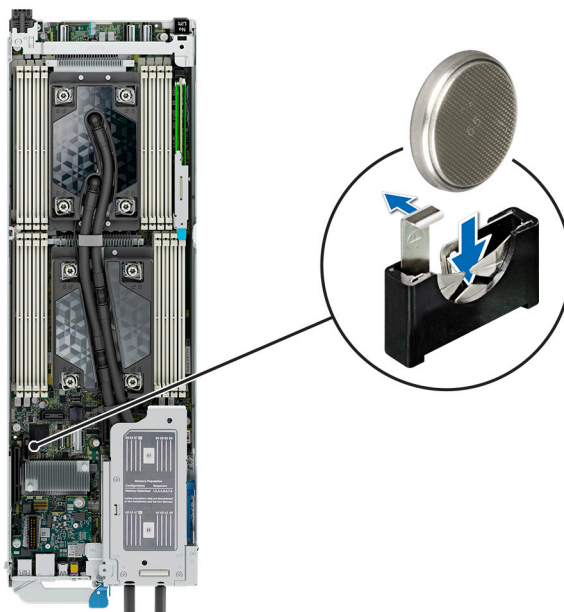

Figure 103. Installing the system battery

Next steps

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

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.**

⚠ **CAUTION: To avoid damage to the system board, ensure that the system board does not touch the side walls of the sled chassis, while sliding the system board into the sled.**

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in Before working inside your system .
3. Remove the following components:
   a. Sled
   b. Expansion card risers
   c. Removing a liquid cooling cold plate with leak sensor
   d. Memory modules
   e. If installed, OCP card
   f. Disconnect all cables from the system board.
      ⚠ **CAUTION: Take care not to damage the system identification button while removing the system board from the sled.**

Steps

1. Using a Phillips 2 screwdriver, remove the screws that secure the system board to the chassis.
2. Using a 5 mm hex nut driver, remove the standoff screws that secure the system board to the chassis.
   ⚠ **CAUTION: Do not lift the system board by holding a memory module slot, any other connector, or component.**
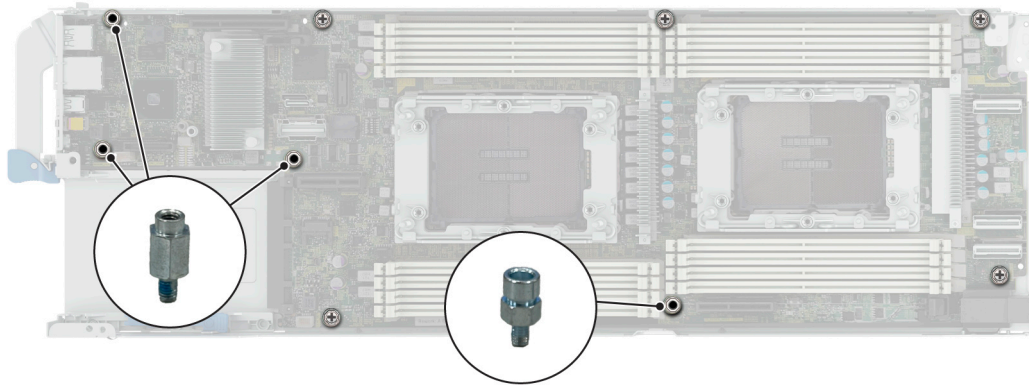
Figure 104. System board screws

3. To disengage the ports from the slots on the chassis, slide the system board toward the front of the chassis.
4. Incline the system board at an angle and lift the system board out of the chassis.

ⓘ **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
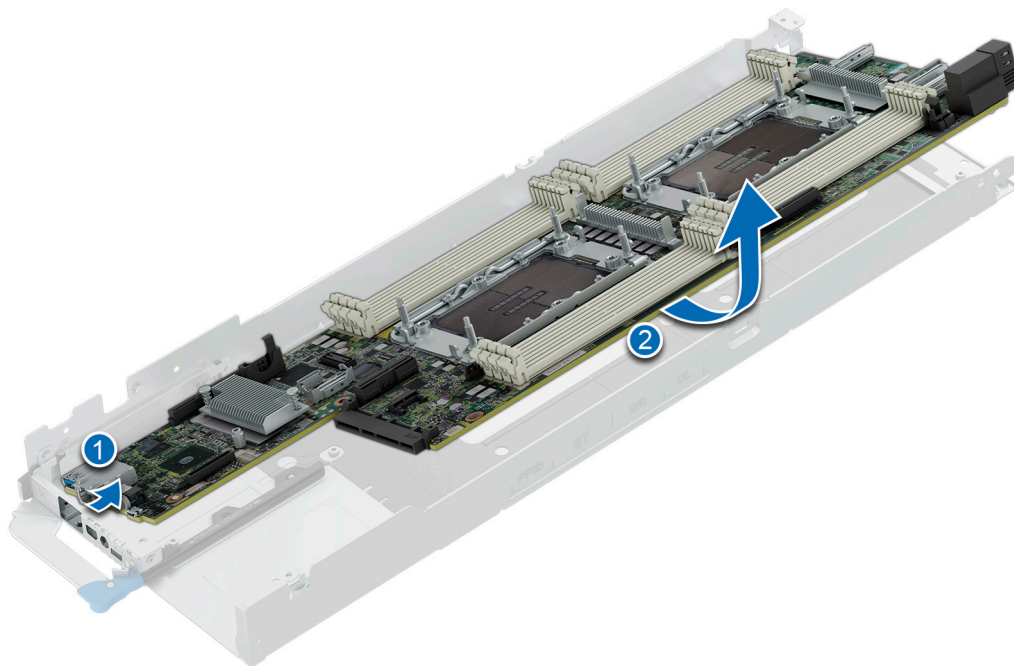
Figure 105. Removing the system board

Next steps

Install the system board

Installing the system board

Prerequisites

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

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

⚠ **CAUTION: To avoid damage to the system board, ensure that the system board does not touch the side walls of the sled chassis, while sliding the system board into the sled.**

Steps

1. Unpack the new system board assembly.

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

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

2. Holding the system board by the edges, lower the system board into the chassis.
3. Incline the system board at an angle and align the connectors on the system board with the slots on the rear of the chassis until the connectors are firmly seated in the slots.

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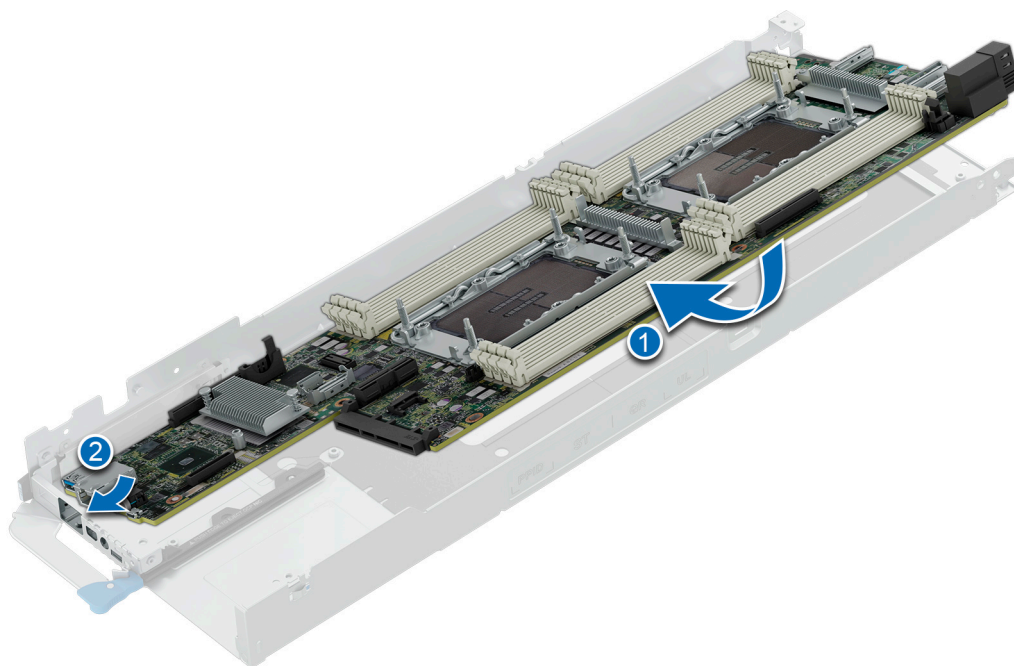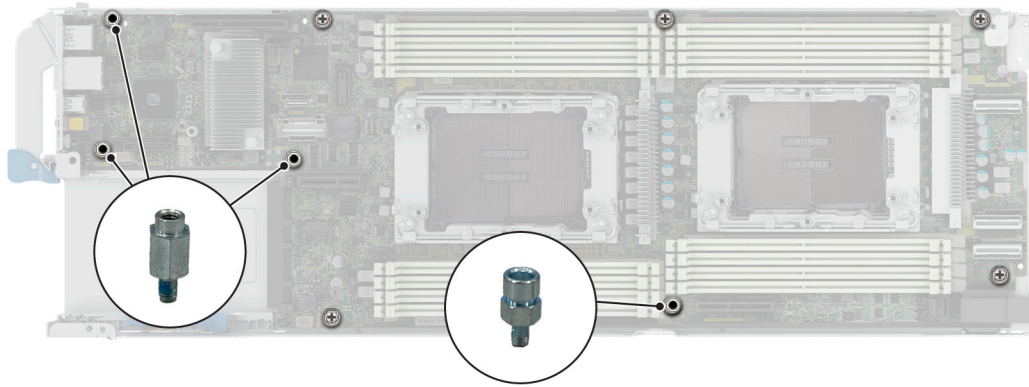

Figure 106. Installing the system board

4. Using a 5 mm hex nut driver, secure the standoff screws that secure the system board to the chassis.
5. Using a Phillips 2 screwdriver, tighten the screws that secure the system board to the chassis.

Figure 107. Tightening the screws on the system board

Next steps

1. Replace the following components:
   a. Trusted Platform Module (TPM)

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

   b. Expansion card risers
   c. OCP card
   d. Installing a liquid cooling cold plate
   e. Memory modules
2. Reconnect all cables to the system board.

   ⓘ **NOTE:** Ensure that the cables inside the system are routed along the chassis wall and secured using the cable securing bracket.
3. Ensure that you perform the following steps:
   a. Use the Easy Restore feature to restore the Service Tag. See the Restoring the system by using the Easy Restore feature section.
   b. If the service tag is not backed up in the backup flash device, enter the system service tag manually. See the Manually update the Service Tag by using System Setup section.
   c. Update the BIOS and iDRAC versions.

      Re-enable the Trusted Platform Module (TPM). See the Upgrading the Trusted Platform 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. The LOM daughter card acts as the rSPI device that supports the EasyRestore feature. 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.
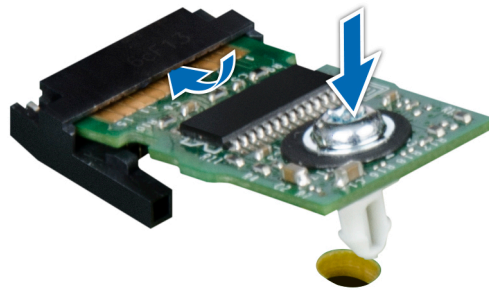4. Replace the screw that secures the TPM to the system board.

Figure 108. Installing the TPM

Initializing TPM for users

Steps

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

Initializing the TPM 2.0 for users

Steps

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

Minimum configuration to POST

The components listed below are the minimum configuration to POST:

- One processor in socket processor 1
- One memory module (DIMM) in socket A1
- One power supply unit
- C6600 chassis (backplane board, link board, CM board, mid board, PIB board, cables)
- System board
- C6620 sled

Upgrade Kits

The table lists the available After Point Of Sale [APOS] kits.

Table 70. Upgrade kits

| Kits	Related links to service instructions
Processors	See Installing the processor
Risers	N/A
Memory modules	See Installing the memory module
Hard drives	N/A
Hard drives SAS/SATA SSD	N/A
Hard drives NVMe SSD	N/A
BOSS N1	See Installing the BOSS N1 card
PCIe SSD card	See Installing the M.2 SSD module
Storage controller cards	See Installing an expansion card
HBA/CNA (3rd party card)	See Installing an expansion card
Network cards	See Installing an expansion card
Cables	N/A
Embedded management firmware (iDRAC)	N/A
Embedded management hardware (IDSDM, vflash)	N/A
Fans	N/A
Heat sink	N/A
Management software (OpenManage,etc)	N/A
Optics, transceivers	N/A
Power cords	N/A
Power supplies	N/A
SD cards	N/A
TPM	See Upgrading the Trusted Platform Module
Rail kit	N/A
Operating system	N/A
Power supply dummy	N/A

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
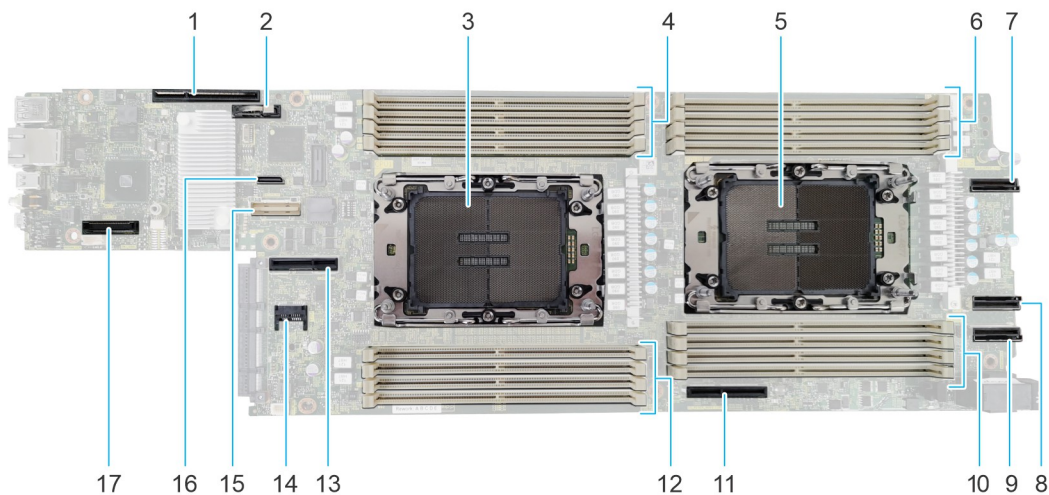
Figure 109. System board jumpers and connectors

1. Riser 1 (R1A/R1B) connector
2. Coin cell battery
3. Processor 1
4. DIMM slots for processor 1
5. Processor 2
6. DIMM slots for processor 2
7. MCIO connector 3 (SL3_CPU2_PA4)
8. MCIO connector 4 (SL4_CPU2_PB3)
9. MCIO connector 5 (SL5_CPU2_PA3)
10. DIMM slots for processor 2
11. BOSS card connector
12. DIMM slots for processor 1
13. Riser 2 (R2A/R2B) connector
14. TPM connector
15. Swift connector 2 (SL2_CPU_PB1)
16. NPIO connector 1 (SL1_PCH_SA0)
17. LOM card connector

System board jumper settings

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

Table 71. System board jumper settings

Jumper	Setting	Description
NVRAM_CLR	1 2 3 (default)	The BIOS configuration settings are retained at system boot.
	1 2 3	The BIOS configuration settings are cleared at system boot.
PWRD_EN	1 2 3 (default)	The BIOS password feature is enabled.
	1 2 3	The BIOS password feature is disabled. iDRAC local access is unlocked at next AC power cycle. iDRAC password reset is enabled in F2 iDRAC settings menu.

⚠ **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 compute sled and remove the compute sled from chassis.
2. Move the jumper on the system board from pins 1 and 2 to pins 2 and 3.

   ⓘ **NOTE:** The existing passwords are not disabled (erased) until the system boots with the jumper on pins 2 and 3. However, before you assign a new system and/or setup password, you must move the jumper back to pins 1 and 2.

   ⓘ **NOTE:** If you assign a new system and/or setup password with the jumper on pins 2 and 3, the system disables the new password(s) the next time it boots.

3. Insert compute sled into chassis and power on the compute sled.
4. Power off the compute sled and remove the compute sled from chassis.
5. Move the jumper on the system board from pins 2 and 3 to pins 1 and 2.
6. Insert compute sled into chassis and power on the compute sled.
7. Assign a new system and/or setup password.

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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.

Topics:

*   Dell Embedded System Diagnostics

Dell Embedded System Diagnostics

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

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

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

Running the Embedded System Diagnostics from 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 72. 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

You can download drivers, firmware and documents from the FTP site: https://mft.dell.com/C6620. For more information about username and password, contact your TAM (Tech Account Manager).

Topics:

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

Recycling or End-of-Life service information

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

Contacting Dell Technologies

Dell provides online and telephone based support and service options. If you do not have an active internet connection, you can find Dell contact information on your purchase invoice, packing slip, bill or Dell product catalog. The availability of services varies depending on the country and product, and some services may not be available in your area. To contact Dell for sales, technical assistance, or customer service issues follow these steps:

Steps

1. Go to www.dell.com/support/home.
2. Select your country from the drop-down menu on the lower right corner of the page.
3. For customized support:
    a. Enter the system Service Tag in the **Enter a Service Tag, Serial Number, Service Request, Model, or Keyword** field.
    b. Click **Search**.
       The support page that lists the various support categories is displayed.
4. For general support:
    a. Select your product category.
    b. Select your product segment.
    c. Select your product.
       The support page that lists the various support categories is displayed.
5. For contact details of Dell Global Technical Support:
    a. Click Contact Technical Support.
    b. The **Contact Technical Support** page is displayed with details to call, chat, or e-mail the Dell Global Technical Support team.

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) located on the Express service tag in the rear of the C6620 system, to access information about PowerEdge C6620. There is also another QRL for accessing product information located on the back of the system cover.

Prerequisites

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

The QRL includes the following information about your system:

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

Steps

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

Quick Resource Locator for PowerEdge C6620 system

Figure 110. Quick Resource Locator for PowerEdge C6620 system

Receiving automated support with Secure Connect Gateway (SCG)

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

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

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

Documentation resources

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

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

- From the Dell support site:
  1. Click the documentation link that is provided in the Location column in the table.
  2. Click the required product or product version.

     ⓘ **NOTE:** To locate the model number, see the front of your system.

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

Table 73. 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.	www.dell.com/support/drivers

Table 73. Additional documentation resources for your system (continued)

Task	Document	Location
Managing your system	For information about systems management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.	www.dell.com/poweredgemanuals
	For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.	www.dell.com/openmanagemanuals > OpenManage Server Administrator
	For information about installing and using Dell Secure Connect Gateway, see the Dell Secure Connect Gateway Enterprise User's Guide.	https://www.dell.com/serviceabilitytools
	For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.	www.dell.com/openmanagemanuals
Working with the Dell PowerEdge RAID controllers (if applicable)	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