Dell PowerEdge XE9640

Installation and Service Manual

DELLTechnologies

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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Dell PowerEdge XE9640 system configurations and features

The Dell PowerEdge XE9640 is 2-socket, 2U server that supports:

● Two 4th Generation Intel Xeon Scalable Processors with up to 56 cores per processor
● Four Intel Data Center Max GPU series 1550 600 W OAM GPUs, fully interconnected with XeLink with Only 16 DIMM slots are supported out of 32 DIMMs (with 8 DIMMs per processor),
● Four NVIDIA H100 700 W SXM GPUs fully interconnected with NVlink with 8 DIMMs, 16 DIMMs and 32 DIMMs for XE9640 NVIDIA GPU supported systems
● Up to 4 PCIe slots (4 x16 Gen5)
● 100% Liquid cooling system
● Up to 4 x 2.5-inch NVMe SSD drives, 61.44 TB max for XE9640 Intel GPU and NVIDIA GPU supported systems

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

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

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

Topics:

System configurations - front view for PowerEdge XE9640

Figure 1. 4 x 2.5-inch NVMe SSD drives for XE9640 Intel and NVIDIA GPU configuration

Table 1. Features available on the front of the 4 x 2.5-inch NVMe SSD drives for XE9640 Intel and NVIDIA GPU configuration

Item	Ports, panels, and slots	Icon	Description
1	Left control panel	N/A	Contains the system health, system ID, and the status LED indicator.
2	Drives	N/A	Enables you to install drives that are supported on your system.
3	BOSS-N1	N/A	There are two M.2 connectors populated on the board and support two NVMe drives for boot.
4	Right control panel	N/A	Contains the power button, USB port, iDRAC Direct (Micro-AB USB) port.
5	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.

System configurations - rear view for PowerEdge XE9640
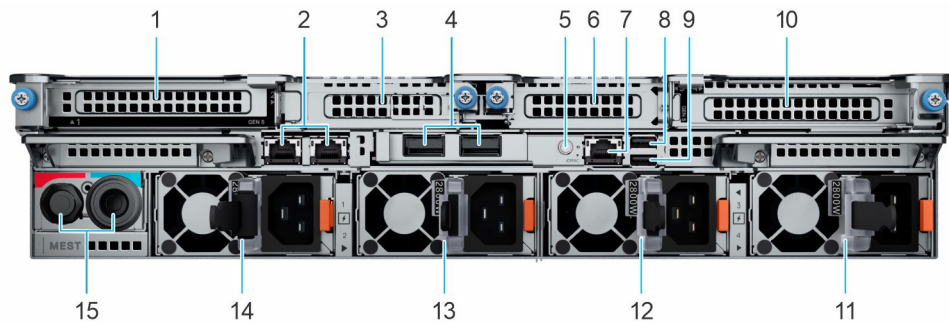
Figure 2. XE9640 chassis rear view

Table 2. Rear view of the system

Item	Ports, panels, or slots	Icon	Description
1	PCIe expansion card riser 1 (slot 1)	NA	The expansion card riser enables you to connect PCI Express expansion cards.
2	NIC Ports	🖧	The NIC ports are embedded on the LOM card that is connected to the system board.
3	PCIe expansion card riser 1 (slot 2)	NA	The expansion card riser enables you to connect PCI Express expansion cards.
4	OCP NIC card	N/A	The OCP NIC card supports OCP 3.0. The NIC ports are integrated on the OCP card which is connected to the system board.
5	System Identification (ID) button	ⓘ	The System Identification (ID) button is available on the front and back of the system. Press the button to identify a system in a rack by turning on the system ID button. You can also use the system ID button to reset iDRAC and to access BIOS using the step through mode. When pressed, the system ID LED in the back panel blinks until either the front or rear button is pressed again. Press the button to toggle between on or off mode. ⓘ **NOTE:** If the server stops responding during POST, press and hold the **System ID** button for more than five seconds to enter the BIOS progress mode

Table 2. Rear view of the system (continued)

Item	Ports, panels, or slots	Icon	Description
			ⓘ **NOTE:** To reset the iDRAC (if not disabled on the iDRAC setup page by pressing F2 during system boot), press and hold the **System ID** button for more than 15 seconds.
6	PCIe expansion card riser 4 (slot 3)	NA	The expansion card riser enables you to connect PCI Express expansion cards.
7	Dedicated iDRAC9 Ethernet port	🔧	Enables you to remotely access iDRAC. For more information, see the Integrated *Dell Remote Access Controller User's Guide* at www.dell.com/poweredgemanuals.
8	USB 2.0 port	⛏	The USB port is 4-pin, 2.0-compliant. This port enables you to connect USB devices to the system.
9	USB 3.0 port	ss⛏	The USB port is 9-pin and 3.0-compliant. This port enables you to connect USB devices to the system.
10	PCIe expansion card riser 4 (slot 4)	NA	The expansion card riser enables you to connect PCI Express expansion cards.
11	Power supply unit (PSU) 4	N/A	PSU4 is the fourth PSU of the system.
12	Power supply unit (PSU) 3	N/A	PSU3 is the third PSU of the system.
13	Power supply unit (PSU) 2	⚡2	PSU2 is the secondary PSU of the system.
14	Power supply unit (PSU) 1	⚡1	PSU1 is the primary PSU of the system.
15	Manifold	NA	The Manifold liquid cooling allows cooling for the GPUs and processors.

System configurations - inside view for PowerEdge XE9640
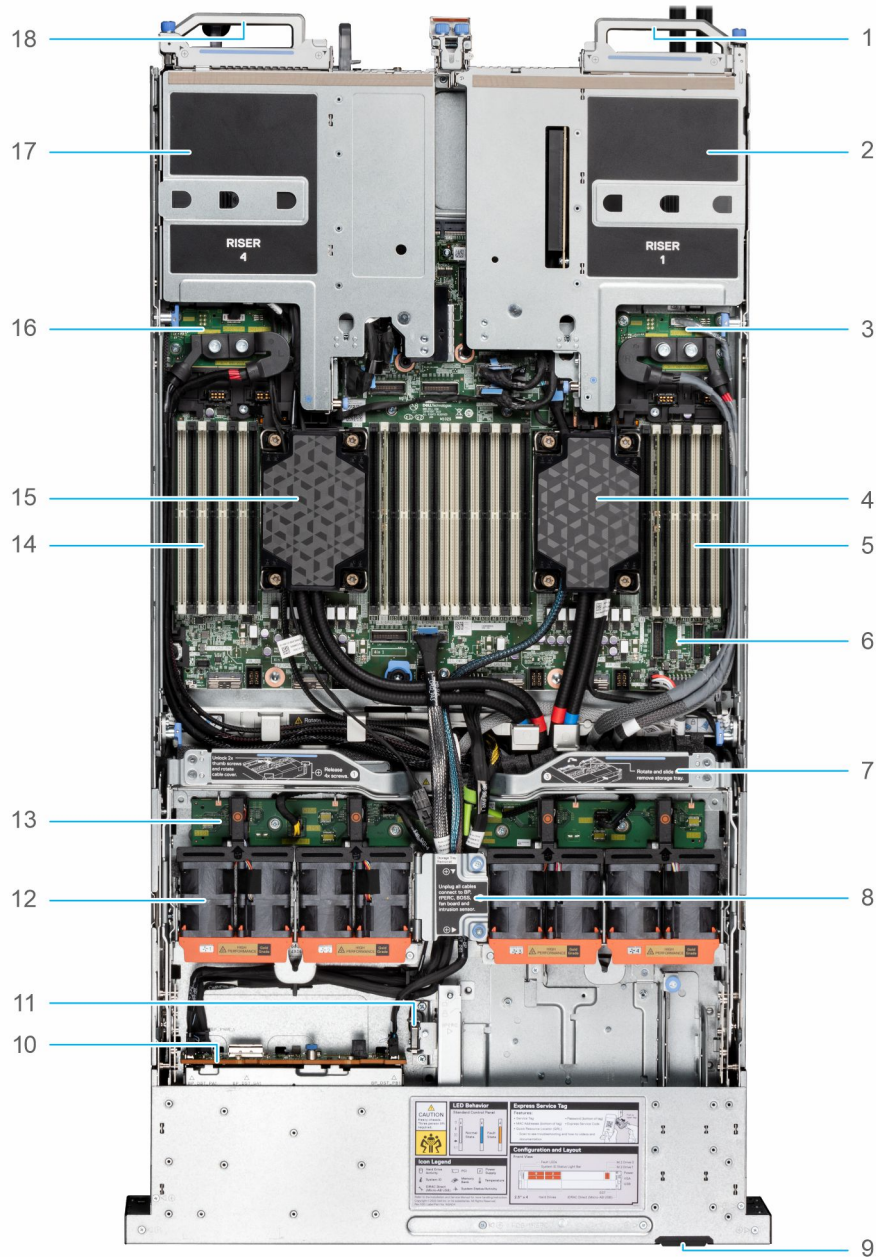
Figure 3. Top layer of the XE9640 system with Intel GPUs - inside the system

1. System handle
2. Riser 1
3. VSB L (left)
4. Processor 1 with cold plate
5. Memory modules for processor 1
6. System board
7. Storage tray with handle
8. Cable cover
9. Express Service Tag
10. Backplane
11. Intrusion switch
12. Fan modules
13. Fan board
14. Memory modules for processor 2
15. Processor 2 with cold plate
16. VSB R (Right)
17. Riser 4
18. System handle
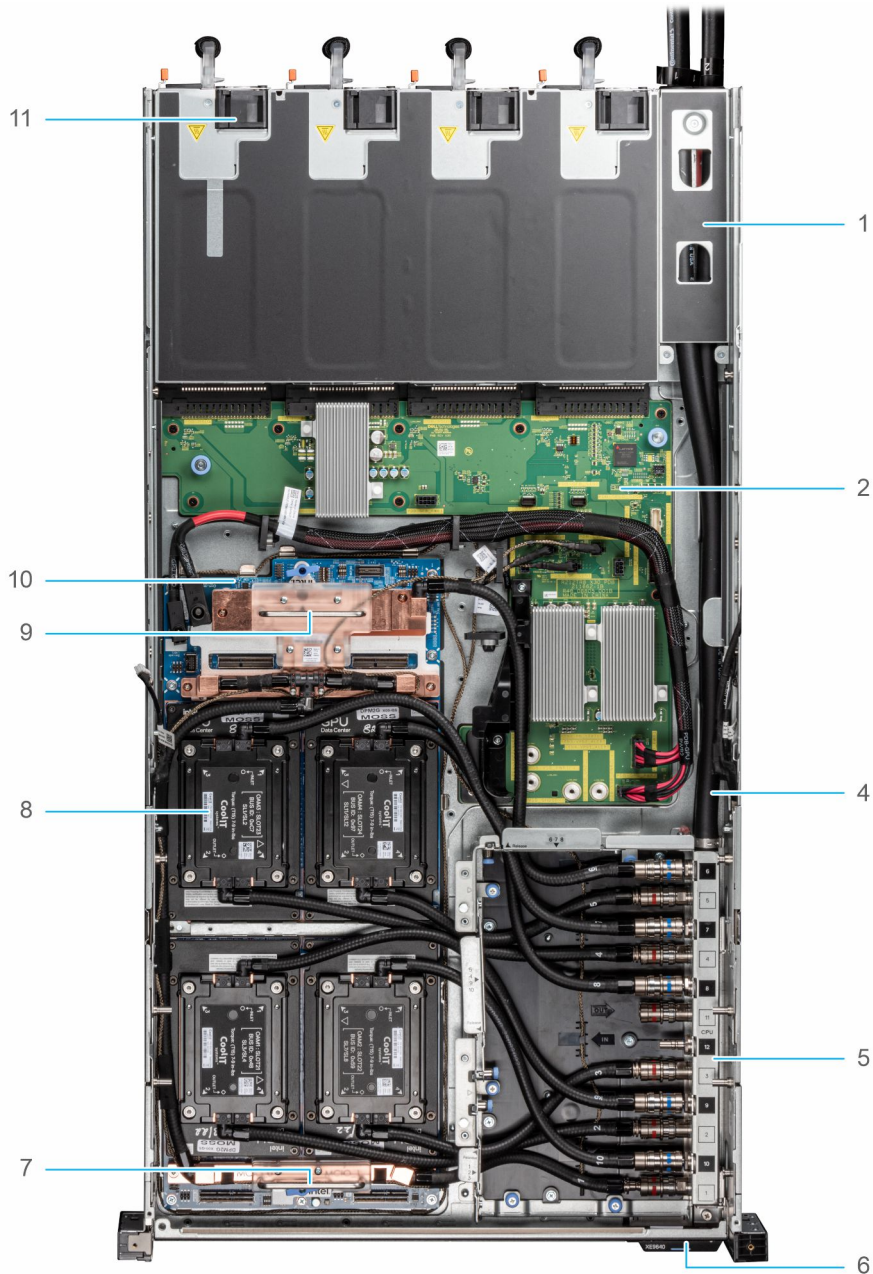
Figure 4. Bottom layer of the XE9640 system with Intel GPUs - inside the system

1. Manifold Liquid cooling cover
2. Power distribution board (PDB)
3. NA
4. Manifold Liquid cooling tubes
5. Manifold Liquid cooling tray
6. Express service tag
7. Carrier Base Board (CBB) B
8. Intel GPU and cold plate

   (i) **NOTE:** Handle must be removed after the CBB is installed.

9. Carrier Base Board (CBB) A

   (i) **NOTE:** Handle must be removed after the CBB is installed.

10. GPU board
11. PSU
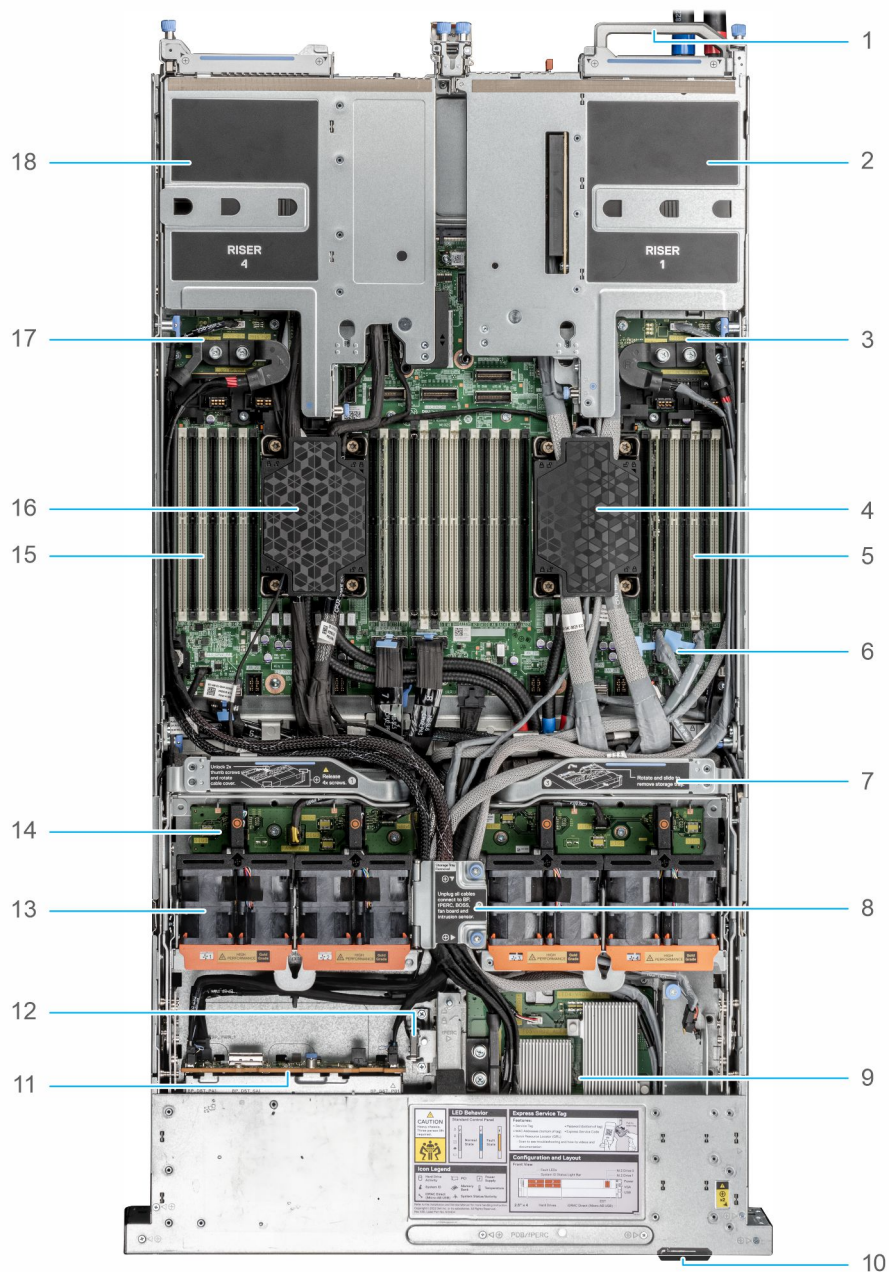
Figure 5. Top layer of XE9640 with NVIDIA GPUs - inside the system

1. System handle
2. Riser 1
3. VSB L (left)
4. Processor 1 with cold plate
5. Memory modules for processor 1
6. System board
7. Storage tray with handle
8. Cable cover
9. PDB2
10. Express Service Tag
11. Backplane
12. Intrusion switch
13. Fan modules
14. Fan board
15. Memory modules for processor 2
16. Processor 2 with cold plate
17. VSB R (Right)
18. Riser 4
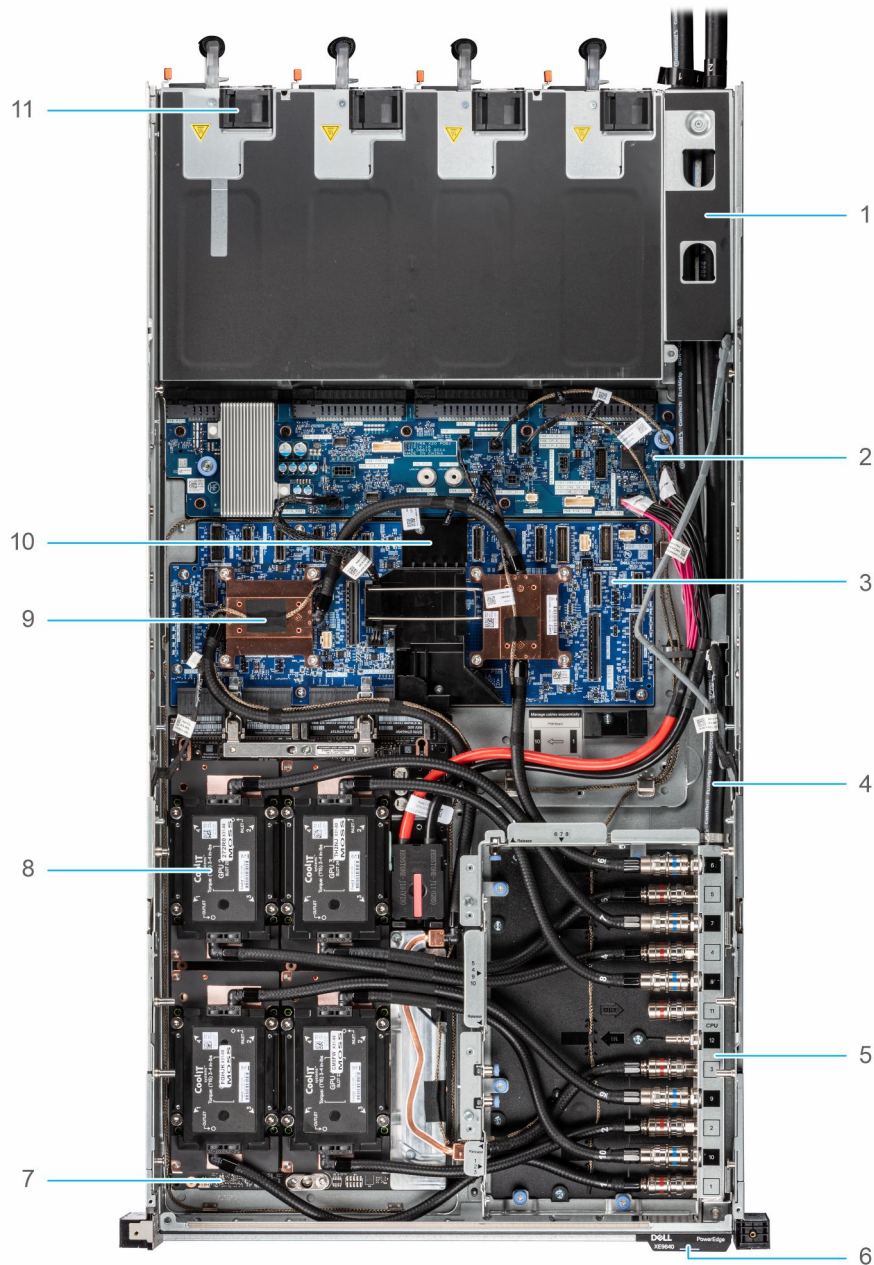
Figure 6. Bottom layer of the XE9640 system with NVIDIA GPUs - inside the system

1. Manifold Liquid cooling cover
2. Power distribution board (PDB)
3. PCIe switch board (PSB)
4. Manifold Liquid cooling tubes
5. Manifold Liquid cooling tray
6. Express service tag
7. GPU board
8. NVIDIA GPU and cold plate
9. PSB cold plate
10. Cables holder
11. PSU
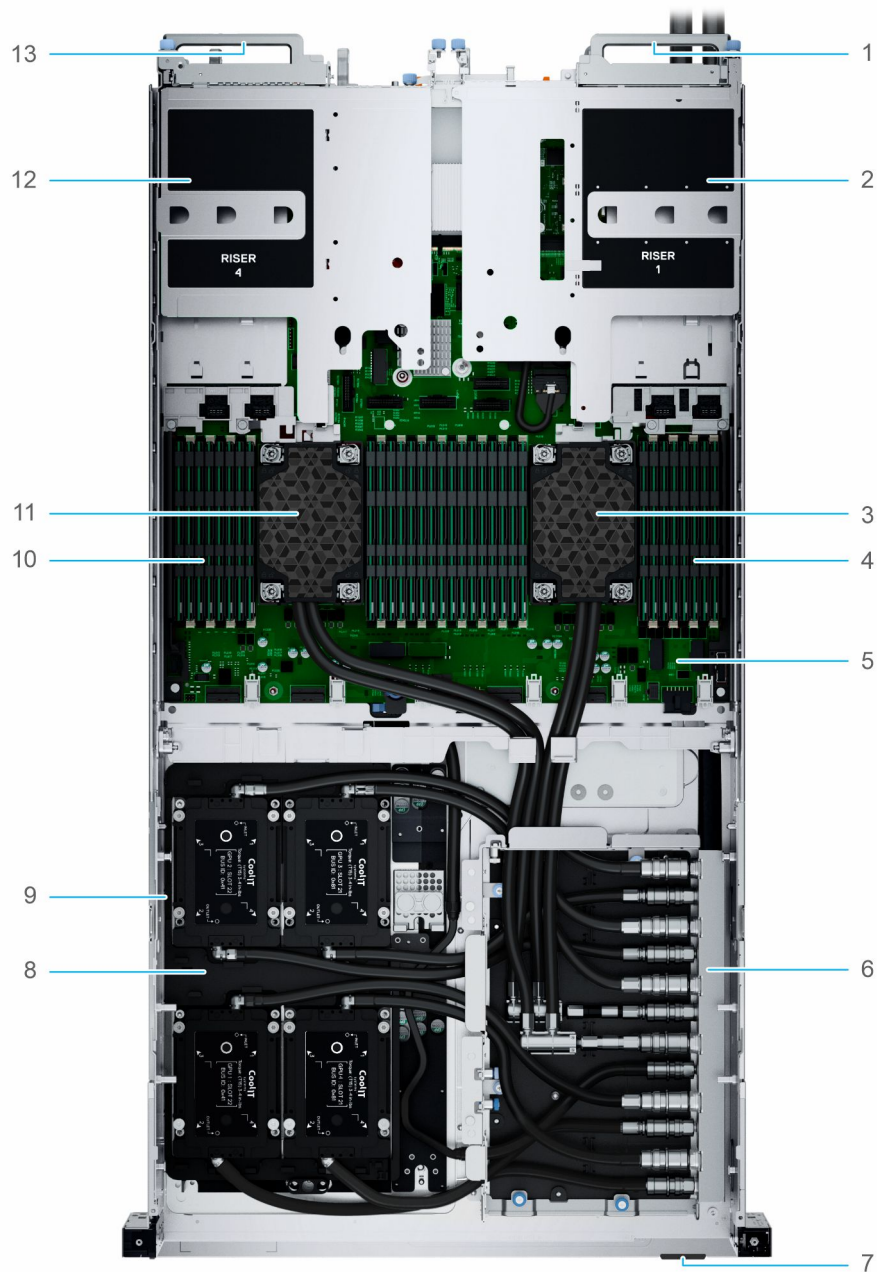
Figure 7. XE9640 with processors and NVIDIA GPUs - inside the system

1. System handle
2. Riser 1
3. Processor 1 with cold plate
4. Memory modules for processor 1
5. System board
6. Manifold Liquid cooling tray
7. Express service tag
8. Intel GPU cold plate
9. GPU board
10. Memory modules for processor 2
11. Processor 2 with cold plate
12. Riser 4
13. System handle

Air and Liquid Cooling Infrastructure Requirements

The PowerEdge XE9640 system has processors and GPUs and a few other minor components with direct liquid cooled 100% of the time while other components like DDR5 DIMMs, PCIe cards, PSUs and storage are air cooled with a max inlet air temperature of 35C.

Water inlet temperature requirement may vary based on several factors on a given deployment. Guidance is that we require 32C primary water temperature but it may be possible to go higher under certain circumstances.

Liquid cooling components in a datacenter include facility water, cooling distribution units (CDU) and rack manifolds (looks like a PDU but for water). The XE9640 has a higher flow-rate requirement. The rack manifold is not shared with the other platforms.

The rack manifold model numbers that are supported with the 42U XE9640 rack manifold and 48U XE9640 rack manifold. Each can handle a full rack of each size.

The CDU's (Cooling distribution units) available that are supported with the XE9640 are the in-rack CHx80 and CHx200 models, as well as the end-of-row CHx750 which is generally chosen for multi-rack liquid cooling XE9640 environments. Each model number is indicative of the total number of kilowatts of cooling capacity, however there are many variables (T-case of CPUs in your server configuration, flow rate of chilled facility water, temperature of water inlet from facility, etc).

Rack requirements will vary per customer depending on density, number of power supplies per server, PDU choices, and brand preference - however the minimum supportable rack is 750mm wide by 1200mm deep. Standard 600m wide by 1070mm racks are not supported.

Pictured below is a rack full of XE9640 demonstrating an in-rack CDU and the liquid manifold, which always goes on the right side of the rack when facing from the back.

XE9640 Direct Liquid Cooled Rack Example
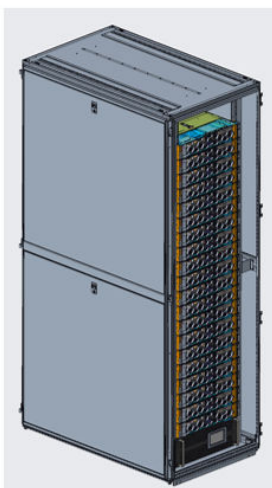
Example Cool IT CHx200 in-rack Cooling Distribution Unit (CDU) shown.
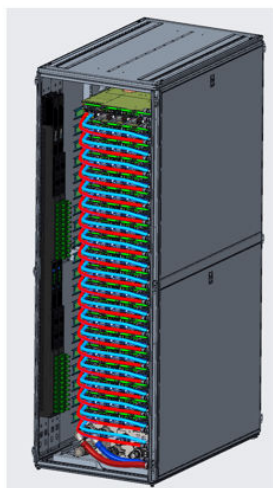
Rack is at least 750mm wide by 1200mm deep, with additional depth potentially dictated by PDU choice and quantity.
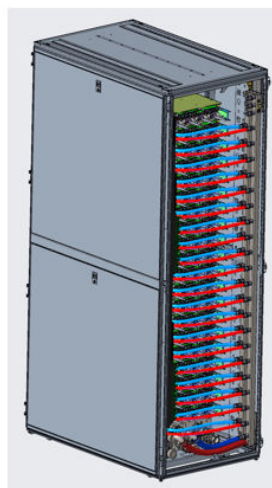
Liquid Manifold goes on the right, always. This manifold is unique for XE9640 due to higher flow rate.
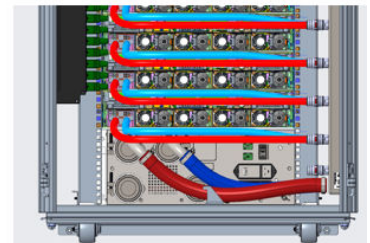
Detail of manifold and in-rack CDU. End of row CDU (CHx750) likely to be used for large deployments.

Figure 8. Direct Liquid Cooled Racks

Locating the Express Service Code and Service Tag

The unique Express Service Code and Service Tag is used to identify the system. The information tag is located on the front of the system that includes system information such as Service Tag, Express Service Code, Manufacture date, NIC, MAC address, QRL label, and so on. If you have opted for the secure default access to iDRAC, the Information tag also contains the iDRAC secure default password. If you have opted for iDRAC Quick Sync 2, the Information tag also contains the OpenManage Mobile (OMM) label, where administrators can configure, monitor, and troubleshoot the PowerEdge servers.
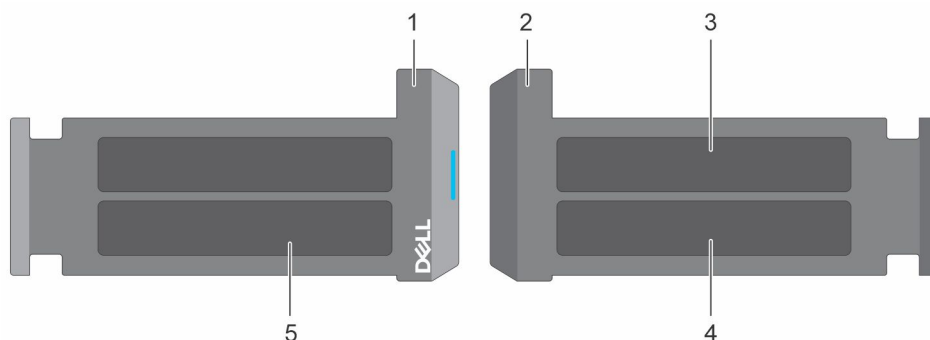
Figure 9. Locating the Express Service Code and Service tag

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

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

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

System information label

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

Figure 10. Service information

Memory Information

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

B8 B2 B6 B4   B1 B7 B3 B5 A8 A2 A6 A4   A1 A7 A3 A5
B16 B10 B14 B12   B9 B15 B11 B13 A16 A10 A14 A12   A9 A15 A11 A13

Memory Population   **Configuration**   **Sequence**

Memory-Optimized   1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

* Latest population rules are documented in the *Installation and Service Manual.*

Figure 11. Memory information

Service Information

Electrical Overview

System Board Information

Scan to see hardware servicing and software setup videos, how-to's, and documentation.

Quick Resource Locator
Dell.com/QRL/Server/PEXE9640

7 BOSS Card Power
8 Riser 1
9 PCIe Connector 16 (SL16_PCH_PA9)
10 Front VGA Connector
11 PCIe Connector 15 (SL15_CPU1_PB8)
12 PCIe Connector 14 (SL14_CPU1_PA7)
13 PCIe Connector 13 (SL13_CPU1_PB7)
14 DIMMs for CPU 1
15 CPU 1
16 DIMMs for CPU 1
17 PCIe Connector 8 (SL8_CPU1_PA4)
18 Right Control Panel Connector
19 PWR Connector 0B (SIG_PWR_0B)
20 PCIe Connector 7 (SL7_CPU1_PB4)
21 PCIe Connector 4 (SL4_CPU1_PB2)
22 PCIe Connector 3 (SL3_CPU1_PA2)
23 PWR Connector 1 (SIG_PWR_1)
24 PCIe Connector 6 (SL6_CPU2_PA3)
25 PCIe Connector 5 (SL5_CPU2_PB3)

26 PCIe Connector 2 (SL2_CPU2_PB1)
27 PCIe Connector 1 (SL1_CPU2_PA1)
28 Jumper
29 GPU Sideband Signal
30 Left Control Panel Connector
31 DIMMs for CPU 2
32 CPU 2
33 DIMMs for CPU 2
34 PCIe Connector 12 (SL12_CPU2_PA6)
35 PCIe Connector 11 (SL11_CPU2_PB6)
36 PCIe Connector 9 (SL9_CPU2_PA5)
37 Riser 4
38 PCIe Connector 10 (SL10_CPU2_PB5)
39 PCIe Connector 27 (SL27_CPU2_PA10)
40 PSU 3 and PSU 4 Expansion Interface
41 Rear I/O Connector

1 Intrusion Switch Connector
2 Liquid Leakage Detect Connector
3 TPM Connector
4 OCP NIC 3.0 Connector
5 LOM Connector
6 Coin Cell Battery

28 Jumper Settings

PWRD_EN

Pin 1

NVRAM_CLR

BIOS password is **enabled**. (default)
BIOS password is **disabled**.

BIOS configuration settings **retained** at system boot. (default)
BIOS configuration settings **cleared** at system boot.

Figure 12. Electrical overview

⚠ **CAUTION**
Heavy chassis. Three person lift required.

LED Behavior
Standard Control Panel

Normal State   Fault State

Express Service Tag
Features:
• Service Tag
• MAC Addresses (bottom of tag)
• Quick Resource Locator (QRL)
  - Scan to see troubleshooting and how-to videos and documentation
• Password (bottom of tag)
• Express Service Code

Pull to open tag

Icon Legend
Hard Drive Activity
System ID
iDRAC Direct (Micro-AB USB)
PCI
Memory Bank
System Status/Activity
Power Supply
Temperature

Configuration and Layout
Front View
Fault LEDs
System ID Status Light Bar
0 2
1 3
M.2 Drive 0
M.2 Drive 1
Power
VGA
USB
EST
2.5" x 4   Hard Drives   iDRAC Direct (Micro-AB USB)

Figure 13. LED behavior, Express Service Tag, Configuration and Layout, Icon Legend

Figure 14. Intel GPU configuration with Liquid cooling setup

Figure 15. NVIDIA GPU configuration with Liquid cooling setup

Rail sizing and rack compatibility matrix

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

The document provides the information that is listed below:

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

Technical specifications

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

Topics:

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

Chassis dimensions
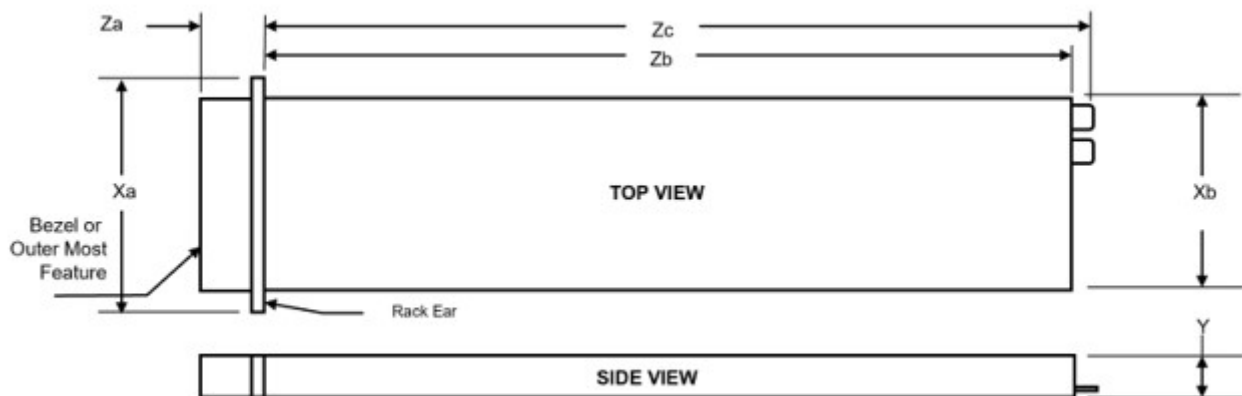
Figure 16. Chassis dimensions

Table 3. Chassis dimension for the PowerEdge XE9640 system

Drives	Xa	Xb	Y	Za	Zb	Zc
4 x 2.5-inch NVMe drives configuration	482 mm (18.97 inches)	444 mm (17.48 inches)	86.8 mm (3.41 inches)	35.77 mm (1.4 inches)With bezel 22.0 mm (0.87 inches Without bezel	850 mm (33.46 inches) Ear to rear wall	890.8 mm (35.07 inches) Ear to PSU handle

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

System weight

Table 4. Weight for the PowerEdge XE9640 system

System configuration	Maximum weight (with all drives/SSDs)
XE9640 system with Intel GPUs	43.2 kg (95.23 pounds)
XE9640 system with NVIDIA GPUs	46.3 kg (102.07 pounds)

Table 5. PowerEdge system weight handling recommendations

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

ⓘ **NOTE:** The system is heavy therefore can slide over and cause damage during installation and removal from a higher position on the rack.

Processor specifications

Table 6. PowerEdge XE9640 processor specifications

Supported processor	Number of processors supported
4th Generation Intel Xeon Scalable processors	Two

PSU specifications

The PowerEdge XE9640 system supports up to 4 AC or DC power supply units (PSUs) with 2+0 Non redundant, full power with 2x PSUs, 2+1 - N+1 redundancy, 2+2 - N+N redundancy.

ⓘ **NOTE:**
1. The wattage capacities of any two PSUs that are present during POST are compared. The larger of the two PSUs is activated if the PSU wattages don't match. A PSU mismatch alert is also visible in the BIOS, iDRAC, or on the system LCD.
2. If a second PSU is installed during runtime, its wattage capacity must match that of the first PSU in order for it to be enabled. If not, the second PSU won't be activated and the PSU will be marked as mismatched in iDRAC.

Table 7. PSU specifications

PSU	Class	Heat dissipation (maximum) (BTU/hr)	Frequency (Hz)	Voltage	High line 240 VDC	Low line 100–120 V	DC Current (A)	AC Current (A)
2800 W AC	Titanium	10165 BTU/hr	50/60	200-240 V AC	2800 W	NA	NA	15.6 - 12.7 A
2800 W HVDC	NA	10220 BTU/hr	NA	240 V DC	2800 W	NA	13.6 A	NA

ⓘ **NOTE:** This system is also designed to connect to the IT power systems with a phase-to-phase voltage not exceeding 240 V.

(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 Dell Energy Smart Solution Advisor available at **Dell.com/ESSA**.

Table 8. PSU Efficiency Levels

Efficiency Targets by Load PSU Efficiency Levels						
Form Factor	Output	Class	10%	20%	50%	100%
Redundant 86 mm	2800 W (Input 230 AC)	Titanium	90.00%	94.00%	96.00%	94.00%

Cooling fan specifications

The PowerEdge XE9640 system supports up to four sets of high-performance gold (HPR) hot-swappable cooling fans.

(i) **NOTE:** XE9640 includes dual fan module form factor. One set of fan module includes two fan body with one fan connector.

Table 9. Cooling fan specifications

Fan type	Abbreviation	Also known as	Label color	Label image
High Performance Gold fan	HPR	Very High Performance	High Performance Gold Grade	Figure 17. HPR fan

(i) **NOTE:** For more information about the supported fan configuration or matrix, see Thermal Restriction Matrix.

Supported operating systems

The PowerEdge XE9640 supports the following operating systems:
- Canonical Ubuntu Server LTS
- Red Hat Enterprise Linux

System battery specifications

The PowerEdge XE9640 system uses one CR 2032 3.0-V lithium coin cell battery.

Expansion card riser specifications

The PowerEdge XE9640 system supports up to four PCI express (PCIe) slots (Gen5 full-height, half-length cards) on the system board.

Table 10. Expansion card slots supported on the system board

Expansion card riser	PCIe slot	Processor Connection	PCIe slot height	PCIe slot length	PCIe slot width
Riser 1A (R1A) for Intel GPU configurations	1	Processor 1	Full height	Half length	x16
	2	Processor 1	Low Profile	Half length	x16
Riser 4A (R4A) for Intel GPU configurations	3	Processor 2	Low Profile	Half length	x16
	4	Processor 2	Full height	Half length	x16
Riser 1B (R1B) for NVIDIA GPU configurations	1	Processor 1	Full height	Half length	x16
	2	Processor 1	Low Profile	Half length	x16
Riser 4B (R4B) for NVIDIA GPU configurations	3	Processor 2	Low Profile	Half length	x16
	4	Processor 2	Full height	Half length	x16

Memory specifications

The PowerEdge XE9640 system supports the following memory specifications for optimized operation.

Table 11. Total System Memory Capacity Requirement for Intel GPUs

DIMM capacity	64 GB
16 x DIMM sockets population	Total memory: 1 TB

Table 12. Total System Memory Capacity Requirement for NVIDIA GPUs

DIMM capacity	16 GB			32 GB			64 GB		
	Total memory	80 GB GPU	94 GB GPU	Total memory	80 GB GPU	94 GB GPU	Total memory	80 GB GPU	94 GB GPU
8 x DIMM sockets population	64 GB	Not supported	Not supported	256 GB	Not supported	Not supported	512 TB	Support	Support
16 x DIMM sockets population	256 GB	Not supported	Not supported	512GB	Support	Support	1 TB	Support	Support
32 x DIMM sockets population	512 GB	Support	Support	1 TB	Support	Support	2 TB	Support	Support

Table 13. Memory module sockets

Memory module sockets	Speed
● Only 16 DIMM slots (288-pin) are supported out of 32 DIMMs (with 8 DIMMs per processor) for XE9640 Intel GPU supported systems ● 8 DIMMS, 16 DIMMs and 32 DIMMs (288-pin) for XE9640 NVIDIA GPU supported systems	4800 MT/s (1 DIMM Per Channel), 4400 MT/s (2 DIMMs Per Channel)

> (i) **NOTE:** XE9640 supports RDIMM only.

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

Storage controller specifications

The PowerEdge XE9640 system supports the following controller cards:

Table 14. Storage controller cards

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

Drives

The PowerEdge XE9640 system supports:
● Up to 4 x 2.5-inch NVMe SSDs for XE9640 Intel GPU and NVIDIA GPU supported systems.

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

GPU Specifications

The PowerEdge XE9640 system supports:
1. NVIDIA H100 SXM 700W NVLINK GPUs
2. Intel Data Center Max GPU Series 1550 OAM 600W Xelink GPUs

Leakage behavior specifications

There are built in leak sensors for the liquid cooling elements in the XE9640. At launch, the platform will provide the appropriate action upon any leak detection in the system

Dell recommended action when leak:
● Processor leakage behavior spec - system report leakage event. Recommend customers to power off the system, unplug that system's cooling hose from the rack manifold immediately. Then call Tech support
● GPU leakage behavior spec – system reports leakage event and server shuts down automatically. Recommend customers to power off the system, unplug that system's cooling hose from the rack manifold immediately. Then call Tech support.

Ports and connectors specifications

USB ports specifications

Table 15. PowerEdge XE9640 USB specifications

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

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

Optional LOM and OCP NIC 3.0 specifications

The PowerEdge XE9640 system supports the shared LOM feature (iDRAC port redirect) on optional 2x1GbE LOM and on optional OCP NIC 3.0 adapters.

ⓘ **NOTE:** LOM and OCP are optional and one has to be selected for any configuration.

VGA ports specifications

The PowerEdge XE9640 system supports One DB-15 VGA port on the front panel.

iDRAC9 port specifications

The PowerEdge XE9640 system supports One RJ45 iDRAC9 ethernet port on the rear of the system.

Video specifications

The PowerEdge XE9640 system supports integrated Matrox G200 graphics controller with 16 MB of video frame buffer.

Table 16. Supported video resolution options

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

ⓘ **NOTE:** *(RB) - Reduced Blanking for Digital Displays requiring less blank time. This was introduced for Signal Integrity improvements by reducing Pixel Clock rates for VGA- Analog input devices.

Environmental specifications

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

Table 17. Operational climatic range category A2

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

ⓘ **NOTE:** Certain system hardware configurations may require operating temperatures to be less than 28°C. For more information, see the Thermal air restrictions section.

Table 18. Shared requirements across all categories

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

Table 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 consecutiveky executed shock pulses in the positive and negative x, y, and z axis (one pulse on each side o f the system) of 71 G for up to 2 ms.

Particulate and gaseous contamination specifications

The following table defines the limitations that help avoid any equipment damage or failure from particulates and gaseous contamination. If the levels of particulates or gaseous pollution exceed the specified limitations and result in equipment damage or failure, you may need to rectify the environmental conditions. Remediation of environmental conditions is the responsibility of the customer.

Table 21. Particulate contamination specifications

Particulate contamination	Specifications
Conductive dust	Air must be free of conductive dust, zinc whiskers, or other conductive particles ⓘ **NOTE:** This condition applies to data center and non-data center environments.
Corrosive dust	● Air must be free of corrosive dust ● Residual dust present in the air must have a deliquescent point less than 60% relative humidity ⓘ **NOTE:** This condition applies to data center and non-data center environments.

Table 22. Gaseous contamination specifications

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

Thermal restriction matrix

Table 23. Commodities thermal restrictions

Commodities	Configuration		2 x NVMe	4 x NVMe
	GPUs		Intel Max 1550 GPU	Nvidia H100 GPU chassis
Processors	8468	350 W	35° C	35° C
	8480+	350 W	N/A	35° C
	8470Q	350 W	N/A	35° C
	8470	350 W	N/A	35° C
	8460+	300 W	N/A	35° C
	8452Y	300 W	N/A	35° C
Memory	64 GB RDIMM 4800 MT/s	1 DPC/ 2 DPC	35° C	35° C
BOSS			35° C	35° C
PCIe			35° C	35° C
OCP			35° C	35° C

Initial system setup and configuration

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

Topics:

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

Setting up the system

Perform the following steps to set up the system:

Steps

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

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

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

iDRAC configuration

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

Options to set up iDRAC IP address

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

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

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

Table 24. Interfaces to set up iDRAC IP address

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

Table 24. Interfaces to set up iDRAC IP address (continued)

Interface	Documentation links
	ⓘ **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article https://www.dell.com/support/article/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**. ⓘ **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**. ⓘ **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.
Server LCD panel	LCD panel section.
iDRAC Direct and Quick Sync 2 (optional)	*Integrated Dell Remote Access Controller User's Guide* at https://www.dell.com/idracmanuals or for system specific *Integrated Dell Remote Access Controller User's Guide*, go to https://www.dell.com/poweredgemanuals > **Product Support** page of your system > **Documentation**. ⓘ **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article https://www.dell.com/support/article/sln000178115.

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

Options to log in to iDRAC

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

You can log in to iDRAC as:

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

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

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

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

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

ⓘ **NOTE:** To determine the most recent iDRAC release for your platform and for latest documentation version, see KB article
  https://www.dell.com/support/article/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 25. 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.

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 26. Options to download firmware

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

Table 26. Options to download firmware (continued)

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

Options to download and install OS drivers

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

Table 27. 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.

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.

Pre-operating system management applications

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

Options to manage the pre-operating system applications

You can use any one of the following options to manage the pre-operating system applications:
- System Setup
- Dell Lifecycle Controller
- Boot Manager
- Preboot Execution Environment (PXE)

Topics:

System Setup

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

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

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

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

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

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

Table 28. 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 28. 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 29. System BIOS details

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

System Information

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

Table 30. System Information details

Option	Description
System Model Name	Specifies the system model name.

Table 30. System Information details (continued)

Option	Description
System BIOS Version	Specifies the BIOS version installed on the system.
System Management Engine Version	Specifies the current version of the Management Engine firmware.
System Service Tag	Specifies the system Service Tag.
System Manufacturer	Specifies the name of the system manufacturer.
System Manufacturer Contact Information	Specifies the contact information of the system manufacturer.
System CPLD Version	Specifies the current version of the system Complex Programmable Logic Device (CPLD) firmware.
UEFI Compliance Version	Specifies the UEFI compliance level of the system firmware.

Memory Settings

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

Table 31. Memory Settings details

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

Table 31. Memory Settings details (continued)

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

Processor Settings

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

Table 32. Processor Settings details

Option	Description
Logical Processor	Each processor core supports up to two logical processors. If this option is set to **Enabled**, the BIOS displays all the logical processors. If this option is set to **Disabled**, the BIOS displays only one logical processor per core. This option is set to **Enabled** by default.
CPU Interconnect Speed	Enables you to govern the frequency of the communication links among the processors in the system.
	ⓘ **NOTE:** The standard and basic bin processors support lower link frequencies.
	The options available are **Maximum data rate**, **16 GT/s**, **14.4 GT/s**, and **12.8 GT/s**. This option is set to **Maximum data rate** by default.
	Maximum data rate indicates that the BIOS runs the communication links at the maximum frequency supported by the processors. You can also select specific frequencies that the processors support, which can vary.
	For best performance, you should select **Maximum data rate**. Any reduction in the communication link frequency affects the performance of non-local memory access and cache coherency traffic. In addition, it can slow access to non-local I/O devices from a particular processor.
	However, if power saving considerations outweigh performance, reduce the frequency of the processor communication links. Before reducing the frequency, you must localize the memory and I/O access to the nearest NUMA node to minimize the impact to system performance.
Virtualization Technology	Enables or disables the virtualization technology for the processor. This option is set to **Enabled** by default.

Table 32. Processor Settings details (continued)

Option	Description
Kernel DMA Protection	This option is set to **Disabled** by default. When option is set to **Enabled**, BIOS and Operating System will enable direct memory access protection for DMA capable peripheral devices using virtualization technology.
Directory Mode	Enables or disables the directory mode. This option is set to **Enabled** by default.
Adjacent Cache Line Prefetch	Optimizes the system for applications that need high utilization of sequential memory access. This option is set to **Enabled** by default. You can disable this option for applications that need high utilization of random memory access.
Hardware Prefetcher	Enables or disables the hardware prefetcher. This option is set to **Enabled** by default.
DCU Streamer Prefetcher	Enables or disables the Data Cache Unit (DCU) streamer prefetcher. This option is set to **Enabled** by default.
DCU IP Prefetcher	Enables or disables the Data Cache Unit (DCU) IP prefetcher. This option is set to **Enabled** by default.
Sub NUMA Cluster	Enables or disables the Sub NUMA Cluster. This option is set to **Disabled** by default.
MADT Core Enumeration	Specifies the MADT Core Enumeration. This option is set to default in **Round Robin**. Linear option supports industry core enumeration whereas, Round Robin option supports Dell optimized core enumeration.
UMA Based Clustering	It is a read-only field and displays as **Quadrant** , when Sub NUMA Cluster is disabled or displays as **Disabled**, when Sub NUMA Cluster is either 2-way or 4-way.
UPI Prefetch	Enables you to get the memory read started early on DDR bus. The Ultra Path Interconnect (UPI) Rx path spawns the speculative memory that is read to Integrated Memory Controller (iMC) directly. This option is set to **Enabled** by default.
XPT Prefetch	This option is set to **Enabled** by default.
LLC Prefetch	Enables or disables the LLC Prefetch on all threads. This option is set to **Enabled** by default.
Dead Line LLC Alloc	Enables or disables the Dead Line LLC Alloc. This option is set to **Enabled** by default. You can enable this option to enter the dead lines in LLC or disable the option to not enter the dead lines in LLC.
Directory AtoS	Enables or disables the Directory AtoS. AtoS optimization reduces remote read latencies for repeat read accesses without intervening writes. This option is set to **Disabled** by default.
AVX P1	Enables you to reconfigure the processor Thermal Design Power (TDP) levels during POST based on the power and thermal delivery capabilities of the system. TDP verifies the maximum heat the cooling system is must dissipate. This option is set to **Normal** by default. ⓘ **NOTE:** This option is only available on certain stock keeping units (SKUs) of the processors.
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. Operating Point n | P1:1.8 Ghz, TDP:185w, Core Count:32

Table 32. Processor Settings details (continued)

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

Table 32. Processor Settings details (continued)

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

Table 33. 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 34. 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 set to **Disabled** by default.

NVMe Settings

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

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

Table 35. 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

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.

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

Table 36. Boot Settings details

Option	Description
Boot Mode	Specifies the boot mode of the system. This option is set to **UEFI** by default.
Boot Sequence Retry	Enables or disables the Boot sequence retry feature or resets the system. When this option is set to **Enabled** and the system fails to boot, the system re-attempts the boot sequence after 30 seconds. When this option is set to **Reset** and the system fails to boot, the system reboots immediately. This option is set to **Enabled** by default.
Hard-disk Failover	Enables or disables the Hard-disk failover. This option is set to **Disabled** by default.
Generic USB Boot	Enables or disables the generic USB boot placeholder. This option is set to **Disabled** by default.
Hard-disk Drive Placeholder	Enables or disables the Hard-disk drive placeholder. This option is set to **Disabled** by default.
Clean all Sysprep variables and order	When this option is set to **None**, BIOS will do nothing. When set to **Yes**, BIOS will delete variables of SysPrep #### and SysPrepOrder this option is a onetime option, will reset to none when deleting variables. This setting is only available in **UEFI Boot Mode**. This option is set to **None** by default.
UEFI Boot Settings	Specifies the UEFI boot sequence. Enables or disables UEFI Boot options. ⓘ **NOTE:** This option controls the UEFI boot order. The first option in the list will be attempted first.

Table 37. 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 38. Network Settings details

Option	Description
UEFI PXE Settings	Enables you to control the configuration of the UEFI PXE device.
Number of PXE Devices	This field specifies the number of PXE devices. This option is set to **4** by default.
PXE Device n (n = 1 to 4)	Enables or disables the device. When enabled, a UEFI PXE boot option is created for the device.
PXE Device n Settings (n = 1 to 4)	Enables you to control the configuration of the PXE device.
UEFI HTTP Settings	Enables you to control the configuration of the UEFI HTTP device.
HTTP Device n (n = 1 to 4)	Enables or disables the device. When enabled, a UEFI HTTP boot option is created for the device.
HTTP Device n Settings (n = 1 to 4)	Enables you to control the configuration of the HTTP device.
UEFI iSCSI Settings	Enables you to control the configuration of the iSCSI device.

Table 38. Network Settings details (continued)

Option	Description
iSCSI Initiator Name	Specifies the name of the iSCSI initiator in IQN format.
iSCSI Device1	Enables or disables the iSCSI device. When disabled, a UEFI boot option is created for the iSCSI device automatically. This is set to **Disabled** by default.
iSCSI Device1 Settings	Enables you to control the configuration of the iSCSI device.
UEFI NVMe-oF Settings	Enables you to control the configuration of the NVMe-oF devices.
NVMe-oF	Enables or disables the NVMe-oF feature. When enabled, it allows to configure the host and target parameters needed for fabric connection. This is set to **Disabled** by default.
NVMe-oF Host NQN	This field specifies the name of the NVMe-oF host NQN. Allowed input is in the following format: nqn.yyyy-mm.<Reserved Domain Name>:<Unique String>. Leave it empty to use system generated value with following format: nqn.1988-11.com.dell:<Model name>.<Model number>.<Service Tag>.
NVMe-oF Host Id	This field specifies a 16 bytes value of the NVMe-oF host identifier that uniquely identifies this host with the controller in the NVM subsystem. Allowed input is a hexadecimal-encoded string in this format: 00112233-4455-6677-8899-aabbccddeeff. Leave it empty to use system generated value. A value of all FF is not allowed.
Host Security Key Path	This field specifies the Host security key path.
NVMe-oF SubSystem Settings	This field controls the parameters for the NVMe-oF subsystem n connections.

Table 39. PXE Device n Settings details

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

Table 40. HTTP Device n Settings details

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

Table 40. HTTP Device n Settings details (continued)

Option	Description
Gateway	Specifies gateway for the HTTP device.
DNS info via DHCP	Enables or disables DNS Information from DHCP. This option is set to **Enabled** by default.
Primary DNS	Specifies the primary DNS server IP address for the HTTP Device.
Secondary DNS	Specifies the secondary DNS server IP address for the HTTP Device.
URI	Obtain URI from the DHCP server if not specified
TLS Authentication Configuration	Specifies the option for TLS authentication configuration.

Table 41. ISCSI Device1 Settings screen details

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

Table 42. HTTP Device and Settings details

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

Table 43. 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.

Table 43. TLS Authentication Configuration screen details (continued)

Option	Description
Root Certificate Configuration	Import, delete, or export the root certificate.

Table 44. UEFI iSCSI Settings screen details

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

Table 45. NVMe-oF SubSystem Settings screen details

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

Table 46. NVMe-oF SubSystem n Settings

Option	Description
Interface	NIC interface used for NVMe-oF connections. This option is set to **Embedded NIC 1 Port 1 Partition 1** by default.
Transport Type	This field sets the value of transport type for NVMe-oF connection. This option is set to **TCP** by default.
Protocol	This field sets the value of protocol type for NVMe-oF connection. This option is set to **IPv4** by default.
VLAN	Enables or disables VLAN for this NVMe-oF connections. This option is set to **Disabled** by default.
VLAN Id	Specifies the VLAN Id for this NVMe-oF connection. This option is set to **1** by default.
VLAN Priority	Specifies the VLAN priority for this NVMe-oF connection. This option is set to **0** by default.
Retry Count	Specifies the retry count for this NVMe-oF connection. This option is set to **3** by default.
Timeout	Specifies the time out for this NVMe-oF connection. This option is set to **10000** by default.
DHCP	Enables and disables the DHCP for this NVMe-oF connection. This option is set to **Disabled** by default.
Host IP Address	Specifies the Host IP Address for this NVMe-oF connection.
Host Subnet Mask	Specifies the Host Subnet Mask for this NVMe-oF connection.
Host Gateway	Specifies the Host Gateway for this NVMe-oF connection.
NVMe-oF subsystem info via DHCP	Enables and disables the NVMe-oF subsystem's DHCP for this connection. This option is set to **Disabled** by default.
NVMe-oF subsystem NQN	Specifies the NVMe-oF subsystem's NQN for this connection.
NVMe-oF subsystem Address	Specifies the NVMe-oF subsystem's IP address for this connection.
NVMe-oF subsystem Port	Specifies the NVMe-oF subsystem's port for this connection. This option is set to **4420** by default.

Table 46. NVMe-oF SubSystem n Settings (continued)

Option	Description
NVMe-oF subsystem NID	Specifies the NamespaceID (NID) for this NVMe-oF connection.
NVMe-oF subsystem Controller ID	Specifies the NVMe-oF subsystem's Controller ID for this connection. This option is set to **0** by default.
Security	Enables or disables the security option for this NVMe-oF connection. This option is set to **Disabled** by default.
Authentication Type	Specifies the authentication type for this NVMe-oF connection. This option is set to **None** by default.
Securitykeypath	Specifies the Securitykeypath for this NVMe-oF connection.

Integrated Devices

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

Table 47. Integrated Devices details

Option	Description
User Accessible USB Ports	Configures the user accessible USB ports. Selecting **Only Back Ports On** disables the front USB ports; selecting **All Ports Off** disables all front and back USB ports.; selecting **All Ports Off (Dynamic)** disables all front and back USB ports during POST. and front ports can be enabled or disabled dynamically by authorized user without resetting the system. This option is set to **All Ports On** by default.
	The USB keyboard and mouse still function in certain USB ports during the boot process, depending on the selection. After the boot process is complete, the USB ports will be enabled or disabled as per the setting.
iDRAC Direct USB Port	The iDRAC Direct USB port is managed by iDRAC exclusively with no host visibility. This option is set to **ON** or **OFF**. When set to **OFF**, iDRAC does not detect any USB devices installed in this managed port. This option is set to **On** by default.
Integrated Network Card1	This option is seen only if OCP is installed. 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 and NIC2	Enables or disables the OS interface of the Embedded NIC1 and NIC2 controller. If set to **Disabled (OS)** , the NIC may still be available for shared network access by the embedded management controller. Configure the **Embedded NIC1 and NIC2** option by using the NIC management utilities of the system. 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

Table 47. Integrated Devices details (continued)

Option	Description
	disabled right before the operating system boots. This option is set to **Enabled** by default. ⓘ **NOTE:** When there are multiple add-in graphic cards installed in the system, the first card discovered during PCI enumeration is selected as the primary video. You might have to rearrange the cards in the slots in order to control which card is the primary video.
I/O Snoop HoldOff Response	Selects the number of cycles PCI I/O can withhold snoop requests, from the CPU, to allow time to complete its own write to LLC. This setting can help improve performance on workloads where throughput and latency are critical. The options available are **256 Cycles**, **512 Cycles**, **1K Cycles**, **2K Cycles**, **4K Cycles**, **8K Cycles**, **16K Cycles**, **32K Cycles**, **64K Cycles** and **128K Cycles**.This option is set to **2K Cycles** by default.
Current State of Embedded Video Controller	Displays the current state of the embedded video controller. The **Current State of Embedded Video Controller** option is a read-only field. If the Embedded Video Controller is the only display capability in the system (that is, no add-in graphics card is installed), then the Embedded Video Controller is automatically used as the primary display even if the **Embedded Video Controller** setting is set to **Disabled**.
SR-IOV Global Enable	Enables or disables the BIOS configuration of Single Root I/O Virtualization (SR-IOV) devices. This option is set to **Disabled** by default.
OS Watchdog Timer	If your system stops responding, this watchdog timer aids in the recovery of your operating system. When this option is set to **Enabled**, the operating system initializes the timer. When this option is set to **Disabled** (the default), the timer does not have any effect on the system.
Empty Slot Unhide	Enables or disables the root ports of all the empty slots that are accessible to the BIOS and operating system. This option is set to **Disabled** by default.
Slot Disablement	Enables or boot driver disables the available PCIe slots on your system. The slot disablement feature controls the configuration of the PCIe cards installed in the specified slot. Slots must be disabled only when the installed peripheral card prevents booting into the operating system or causes delays in system startup. When this option is set to boot driver disabled, both the Option ROM and UEFI driver from the slot will not run during POST. The system will not boot from the card and its pre-boot services will not be available. However, the card is available to the operating system.
	Slot n: Enables or only the boot driver is disabled for the PCIe slot n. This option is set to **Enabled** by default.
Slot Bifurcation	**Auto Discovery Bifurcation Settings** allows **Platform Default Bifurcation** 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 XE9640 system. The Serial Communication option is applicable only if the serial COM port is installed in the system.

Table 48. Serial Communication details

Option	Description
Serial Communication	Enables the serial communication options. Selects serial communication devices (Serial Device 1 and Serial Device 2) in BIOS. BIOS console redirection can also be enabled, and the port address can be specified. The options available for System without serial COM port (DB9) are **On without Console Redirection**, **On with Console Redirection**, **Off**. This option is set to **On without Console Redirection** by default.
Serial Port Address	Enables you to set the port address for serial devices. This option is set to either **COM1** or **COM2** for the serial device **(COM1=0x3F8,COM2=0x2F8)**and set to **COM1** by default. ⓘ **NOTE:** You can use only Serial Device 2 for the Serial Over LAN (SOL) feature. To use console redirection by SOL, configure the same port address for console redirection and the serial device. ⓘ **NOTE:** Every time the system boots, the BIOS syncs the serial MUX setting that is saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from within the BIOS setup utility may not always revert the serial MUX setting to the default setting of Serial Device 1.
External Serial Connector	Enables you to associate the External Serial Connector to **Serial Device 1**, **Serial Device 2**, or the **Remote Access Device** by using this option. This option is set to **Serial Device 1** by default. ⓘ **NOTE:** Only Serial Device 2 can be used for Serial Over LAN (SOL). To use console redirection by SOL, configure the same port address for console redirection and the serial device. ⓘ **NOTE:** Every time the system boots, the BIOS syncs the serial MUX setting saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from within the BIOS setup utility may not always revert this setting to the default setting of Serial Device 1.
Failsafe Baud Rate	Specifies the failsafe baud rate for console redirection. The BIOS attempts to determine the baud rate automatically. This failsafe baud rate is used only if the attempt fails, and the value must not be changed. This option is set to **115200** by default.
Remote Terminal Type	Sets the remote console terminal type. This option is set to **VT100/VT220** by default.
Redirection After Boot	Enables or disables the BIOS console redirection when the operating system is loaded. This option is set to **Enabled** by default.

System Profile Settings

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

Table 49. System Profile Settings details

Option	Description
System Profile	Sets the system profile. If you set the System Profile option to a mode other than **Performance Per Watt (DAPC)**, the BIOS automatically sets the rest of the options. You can only change the rest of the options if the mode is set to **Custom**. This option is set to **Performance Per Watt (DAPC)** by default. Other options include **Custom**, **Performance**, **Performance Per Watt (OS)** and **Workstation Performnce**.

Table 49. System Profile Settings details (continued)

Option	Description
	(i) **NOTE:** All the parameters on the system profile setting screen are available only when the **System Profile** option is set to **Custom**.
Optimized Power Mode	When this option is set to **Enabled**, processor is tuned for lower power consumption. Also sets C1E to **Enabled**, sets processor power management to **System DBPM mode**, sets **Energy Efficient Policy** to **Performance**, sets **Uncore frequency** to **Dynamic**, and sets **Dynamic Load Line Switch** to **Enabled**.
CPU Power Management	Sets the CPU power management. This option is set to **System DBPM (DAPC)** by default. Other option includes **Maximum Performance**, **OS DBPM**.
Memory Frequency	Sets the speed of the system memory. You can select **Maximum Performance**, **Maximum Reliability** or a specific speed. This option is set to **Maximum Performance** by default.
Turbo Boost	Enables or disables the processor to operate in the turbo boost mode. This option is set to **Enabled** by default.
Enery Efficient Turbo	Energy Efficient Turbo (EET) is a mode of operation where a processor's core frequency is adjusted within the turbo range based on workload. This option is set to **Enabled** by default.
C1E	Enables or disables the processor to switch to a minimum performance state when it is idle. This option is set to **Enabled** by default.
C States	Enables or disables the processor to operate in all available power states. C States allow the processor to enter lower power states when idle. When set to **Enabled** (OS controlled) or when set to **Autonomous** (if hardware controlled is supported), the processor can operate in all available Power States to save power, but may increase memory latency and frequency jitter. This option is set to **Enabled** by default.
Memory Patrol Scrub	Sets the memory patrol scrub mode. This option is set to **Standard** by default.
Memory Refresh Rate	Sets the memory refresh rate to either 1x or 2x. This option is set to **1x** by default.
Uncore Frequency	Enables you to select the **Uncore Frequency** option. **Dynamic mode** enables the processor to optimize power resources across cores and uncores during runtime. The optimization of the uncore frequency to either save power or optimize performance is influenced by the setting of the **Energy Efficiency Policy** option.
Dynamic Load Line Switch	The Dynamic Load Line Switch is a Power Management feature, which dynamically switches to the performance mode during periods of high CPU utilization. This setting is read-only and set to **Enabled** when Optimized Power mode is Enabled. (i) **NOTE:** This option can be disabled when System Profile is set to **Custom**.
Energy Efficient Policy	Enables you to select the **Energy Efficient Policy** option. The CPU uses the setting to manipulate the internal behavior of the processor and determines whether to target higher performance or better power savings. This option is set to **Balanced Performance** by default.
Monitor/Mwait	Enables the Monitor/Mwait instructions in the processor. This option is set to **Enabled** for all system profiles, except **Custom** by default. (i) **NOTE:** This option can be disabled when System Profile is set to **Custom**. (i) **NOTE:** When C States is set to Enabled in the Custom mode, changing the Monitor/Mwait setting does not impact the system power or performance.
Workload Profile	This option allows the user to specify the targeted workload of a server. It allows optimization of performance based on the workload type. This option is set to **Not Configured** by default.
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.

Table 49. System Profile Settings details (continued)

Option	Description
Workload Configuration	This field controls the Energy Performance BIAS settings to allow BIOS to choose a configuration that improve performance on the certain workloads. This option is set to **Balanace** by default. ⓘ **NOTE:** This option can be disabled when System Profile is set to **Custom**.

System Security

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

Table 50. System Security details

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

Table 51. TPM 2.0 security information

Option	Description
TPM Information	
TPM Security	ⓘ **NOTE:** The TPM menu is available only when the TPM module is installed.
	Enables you to control the reporting mode of the TPM. When set to Off, the presence of the TPM is not reported to the OS. When set to On, the presence of the TPM is reported to the OS. The **TPM Security** option is set to **Off** by default.
	When TPM 2.0 is installed, the **TPM Security** option is set to **On** or **Off**. This option is set to **Off** by default.
TPM Information	Indicates the type of Trusted Platform Module, if present.
TPM Firmware	Indicates the firmware version of the TPM.
TPM Hierarcy	Enables, disables, or clears the storage and endorsement hierarchies. When set to **Enabled**, the storage and endorsement hierarchies can be used.
	When set to **Disabled**, the storage and endorsement hierarchies cannot be used.
	When set to **Clear**, the storage and endorsement hierarchies are cleared of any values, and then reset to **Enabled**.
TPM Advanced Settings	Specifies TPM Advanced Settings details.

Table 52. System Security details

Option	Description
Intel(R) TXT	Enables you to set the Intel Trusted Execution Technology (TXT) option. To enable the **Intel TXT** option, virtualization technology and TPM Security must be enabled with

Table 52. System Security details (continued)

Option	Description
	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.
Global Memory Integrity	Enables or disables the Global Memory Integrity.
TME Encryption Bypass	Allows the option to bypass the Intel Total Memory Encryption. This option is set to **Disabled** by default.
Intel(R) SGX	Enables you to set the Intel Software Guard Extension (SGX) option. To enable the **Intel SGX** option, processor must be SGX capable, memory population must be compatible (minimum x8 identical DIMM1 to DIMM8 per CPU socket, not support on persistent memory configuration), memory operating mode must be set at optimizer mode, memory encryption must be enabled and node interleaving must be disabled. This option is set to **Off** by default. When this option is to **Off**, BIOS disables the SGX technology. When this option is to **On**, BIOS enables the SGX technology.
Power Button	Enables or disables the power button on the front of the system. This option is set to **Enabled** by default.
AC Power Recovery	Sets how the system behaves after AC power is restored to the system. This option is set to **Last** by default. (i) **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. (i) **NOTE:** BIOS update requires HECI devices to be operational and DUP updates require IPMI interface to be operational. This setting needs to be set to Enabled to avoid updating errors.
SMM Security Migration	Enables or disables the UEFI SMM security migration protections. It is set to **Disabled** by default.
Secure Boot	Enables Secure Boot, where the BIOS authenticates each pre-boot image by using the certificates in the Secure Boot Policy. Secure Boot is set to **Disabled** by default.
Secure Boot Policy	When Secure Boot policy is set to **Standard**, the BIOS uses the system manufacturer's key and certificates to authenticate pre-boot images. When Secure Boot policy is set to

Table 52. System Security details (continued)

Option	Description
	Custom, the BIOS uses the user-defined key and certificates. When Secure Boot policy is set to **Linux(R) Boot**, **VMware(R) Boot** or **Microsoft(R) Boot** the Secure Boot Policy includes only certificates necessary for the corresponding operating systems. Secure Boot policy is set to **Standard** by default.
Secure Boot Mode	Configures how the BIOS uses the Secure Boot Policy Objects (PK, KEK, db, dbx).
	If the current mode is set to **Deployed Mode**, the available options are **User Mode** and **Deployed Mode**. If the current mode is set to **User Mode**, the available options are **User Mode**, **Audit Mode**, and **Deployed Mode**.
	Below are the details of different boot modes available in the **Secure Boot Mode** option.
	User Mode — In **User Mode**, PK must be installed, and BIOS performs signature verification on programmatic attempts to update policy objects. The BIOS allows unauthenticated programmatic transitions between modes.
	Audit mode — In **Audit Mode**, PK is not present. BIOS does not authenticate programmatic update to the policy objects and transitions between modes. The BIOS performs a signature verification on pre-boot images and logs the results in the image Execution Information Table, but executes the images whether they pass or fail verification. **Audit Mode** is useful for programmatic determination of a working set of policy objects.
	Deployed Mode — **Deployed Mode** is the most secure mode. In **Deployed Mode**, PK must be installed and the BIOS performs signature verification on programmatic attempts to update policy objects. **Deployed Mode** restricts the programmatic mode transitions.
Secure Boot Policy Summary	Specifies the list of certificates and hashes that secure boot uses to authenticate images.
Secure Boot Custom Policy Settings	Configures the Secure Boot Custom Policy. To enable this option, set the Secure Boot Policy to **Custom** option.

Creating a system and setup password

Prerequisites

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

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

Steps

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

   A message prompts you to reenter the system password.
5. Reenter the system password, and click **OK**.
6. In the **Setup Password** field, type your setup password and press Enter or Tab.
   A message prompts you to reenter the setup password.

7. Reenter the setup password, and click **OK**.
8. Press Esc to return to the System BIOS screen. Press Esc again.

   A message prompts you to save the changes.

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

Using your system password to secure your system

About this task

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

Steps

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

Next steps

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

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

Deleting or changing system and setup password

Prerequisites

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

Steps

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

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

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

Operating with setup password enabled

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

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

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

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 53. Redundant OS Control details

Option	Description
Redundant OS Location	Enables you to select a backup disk from the following devices: • **None** • **SATA Ports in AHCI mode** • **SATA ports** (i) **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)** • SATA Port A
Redundant OS State	(i) **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. (i) **NOTE:** BIOS disables the device in hardware, so it is not accessed by the OS.
Redundant OS Boot	(i) **NOTE:** This option is disabled if **Redundant OS Location** is set to **None** or if **Redundant OS State** is set to **Hidden**. When set to **Enabled**, BIOS boots to the device specified in **Redundant OS Location**. When set to **Disabled**, BIOS preserves the current boot list settings. This option is set to **Disabled** by default.

Miscellaneous Settings

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

Table 54. Miscellaneous Settings details

Option	Description
System Time	Enables you to set the time on the system.
System Date	Enables you to set the date on the system.
Time Zone	Enables you to select required Time Zone.
Daylight Savings Time	Enables or disables Daylight Savings Time. This option is set to **Disabled** by default.
Asset Tag	Specifies the asset tag and enables you to modify it for security and tracking purposes.
Keyboard NumLock	Enables you to set whether the system boots with the NumLock enabled or disabled. This option is set to **On** by default. (i) **NOTE:** This option does not apply to 84-key keyboards.

Table 54. Miscellaneous Settings details (continued)

Option	Description
F1/F2 Prompt on Error	Enables or disables the F1/F2 prompt on error. This option is set to **Enabled** by default. The F1/F2 prompt also includes keyboard errors.
Load Legacy Video Option ROM	This option determines whether th system BIOS will load legacy video (INT 10h) option ROM from the video controller. This option is set to **Disabled** by default. ⓘ **NOTE:** This option cannot be set to Enabled, when the Boot mode is UEFI and Secure Boot is enabled.
Dell Wyse P25/P45 BIOS Access	Enables or disables the Dell Wyse P25/P45 BIOS Access. This option is set to **Enabled** by default.
Power Cycle Request	Enables or disables the Power Cycle Request. This option is set to **None** by default.

iDRAC Settings

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

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

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

Device Settings

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

Dell Lifecycle Controller

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

Embedded system management

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

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

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

Boot Manager

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

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

Table 55. Boot Manager details

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

PXE boot

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

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

Minimum to POST and system management configuration validation

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

Topics:

- Minimum configuration to POST
- Configuration validation

Minimum configuration to POST

The components mentioned below are the minimum configuration to POST for Intel GPU configurations:

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

The components mentioned below are the minimum configuration to POST for NVIDIA GPU configurations:

- Power button control panel and cables
- Power Distribution Board (PDB) and cables, PCIe Switch Board (PSB) with cables, Power Distribution Board 2 (PDB2) and cables
- Two processors in processor socket 1 and 2
- Two memory modules (DIMMs) in slot A1 and B1
- System board + RIO card
- One 2800 W PSU (54 V) and 54 V PSU power cord

Configuration validation

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

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

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

Table 56. Configuration validation error

Error	Description	Possible cause and recommendations	Example
Config Error	A configuration element within the closest match contains something that is unexpected and does not match any Dell qualified configuration.	Wrong configuration	Config Error: Backplane cable CTRS_SRC_SA1 and BP-DST_SA1
		The element reported in HWC8010 errors are	Config Error : SL Cable PLANAR_SL7 and CTRL_DST_PA1

Table 56. Configuration validation error (continued)

Error	Description	Possible cause and recommendations	Example
		assembled incorrectly. Verify element (cable, risers, etc) placement in the system.	
Config Missing	iDRAC found a configuration element missing within the closest match detected.	Missing or damaged cable, device, or part	Config Missing: adapter HBA
		Missing element or cable is reported in HWC8010 error logs. Install the missing element (cable, risers, etc).	Config Missing : SL cable PLANAR_SL8 and CTRL_DST_PA1
Comm Error	A configuration element is not responding to iDRAC using the management interface while running an inventory check.	System management sideband communication	Comm Error: Backplane 2
		Unplug AC Power, reseat the element and replace the element if the problem persists.	

Error messages

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

Table 57. Error message HWC8010

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

Table 58. Error message HWC8011

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

Table 58. Error message HWC8011 (continued)

Error code	HWC8011
Category	System Health (HWC = Hardware Config)
Severity	Critical

Installing and removing system components

Topics:

Safety instructions

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

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

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

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

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

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

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

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

ⓘ **NOTE:** While replacing faulty storage controller, FC, or NIC card with the same type of card, after you power on the system, the new card automatically updates to the same firmware and configuration of the faulty one. For updating to the latest firmware and changing the configuration, see the *Lifecycle Controller User's Guide* at https://www.dell.com/idracmanuals.

Before working inside your system

Prerequisites

Follow the safety guidelines listed in the Safety instructions.

Steps

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

After working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

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

Recommended tools

You may need some or all of the following tools to perform the removal and installation procedures:
● Key to the bezel lock. The key is required only if your system includes a bezel.
● Phillips 1 screwdriver
● Phillips 2 screwdriver
● Torx T30 screwdriver
● Torx T15 screwdriver

- 5 mm hex nut screwdriver
- Plastic scribe
- 1/4-inch flat blade screwdriver
- Wrist grounding strap connected to the ground
- ESD mat
- Needle-nose pliers
- UV flashlight to check leakage

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

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

Optional front bezel

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

Removing the front bezel

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

Prerequisites

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

Steps

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

Figure 18. Removing the front bezel with the LCD panel

Next steps

Replace front bezel.

Installing the front bezel

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

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Locate and remove the bezel key.
   ⓘ **NOTE:** The bezel key is part of the LCD bezel package.

Steps

1. Align and insert the tabs on the bezel into the slots on the system.
2. Press the bezel until the release button clicks in place.
3. Lock the bezel.

Figure 19. Installing the front bezel with the LCD panel

System cover

Removing the system cover

Prerequisites

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

Steps

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

Figure 20. Removing the system cover

Next steps

1. Replace the system cover.

Installing the system cover

Prerequisites

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

Steps

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

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

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

Figure 21. Installing the system cover

Next steps

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

Cooling fans

Removing a cooling fan module

Prerequisites

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

Steps

Holding the orange (near the lable) and black (near the orange touch point) edges on the fan module, lift the cooling fan module to disconnect from the connector on the fan board.
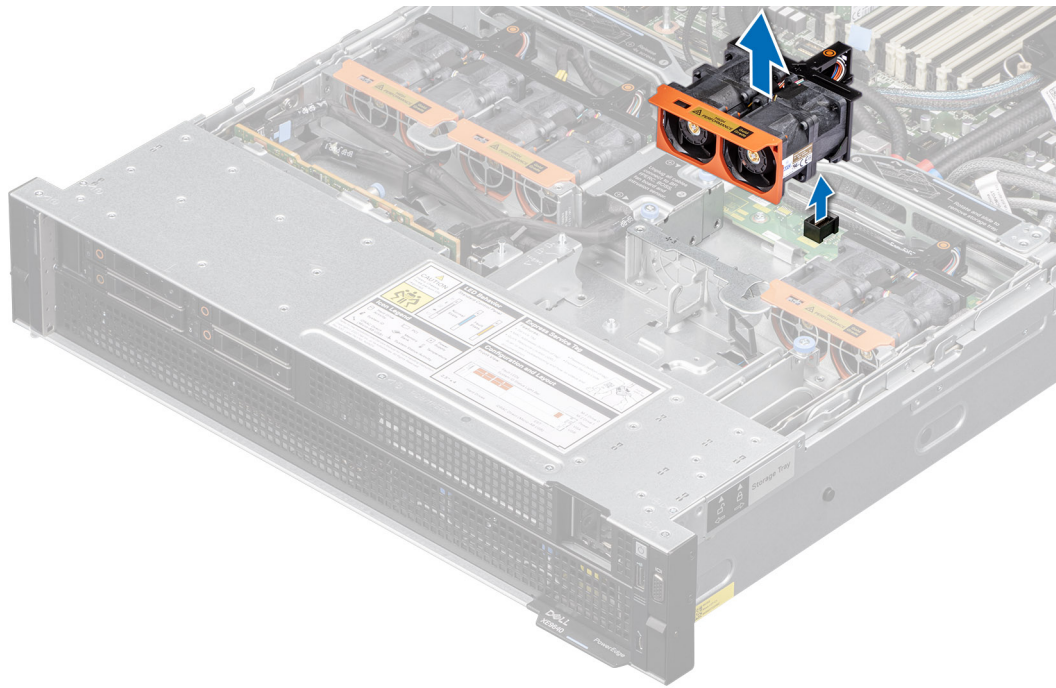
Figure 22. Removing a cooling fan module

Next steps

1. Replace a cooling fan.

Installing a cooling fan 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. Align and place the fan module connector horizontally with the connector on the system board.
2. Press the orange touch point on the cooling fan module until firmly connected.
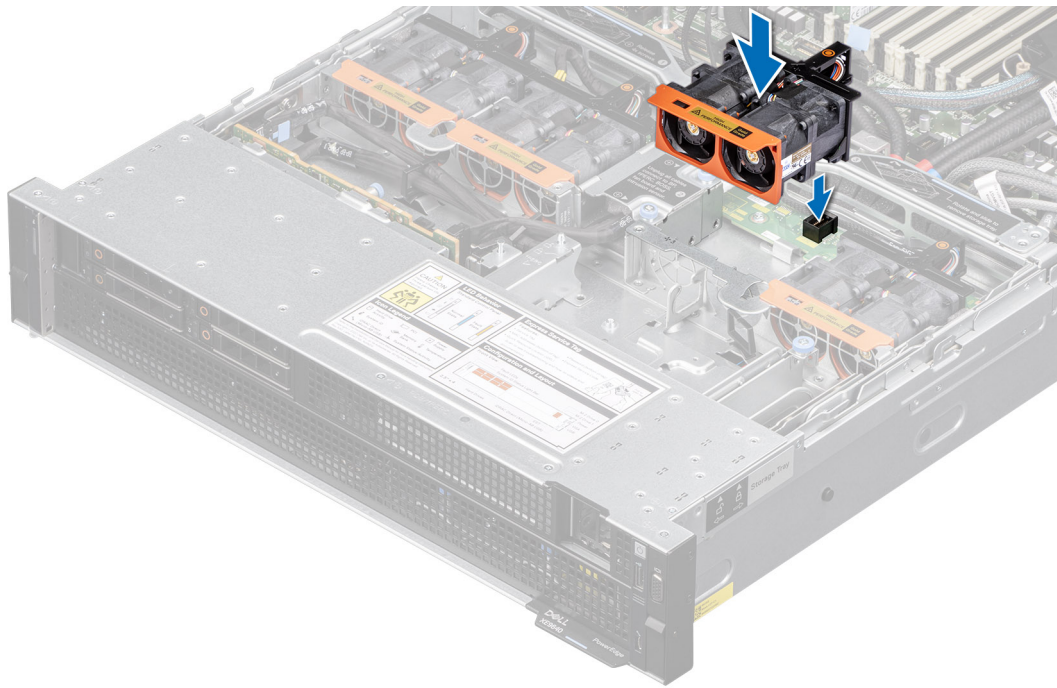
Figure 23. Installing a cooling fan module

Next steps

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

Cable cover

Removing the cable cover

Prerequisites

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

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

Steps

1. Using the Phillips 2 screwdriver, loosen the blue thumb screws.
2. Pull up the metallic cover to disconnect the cables.
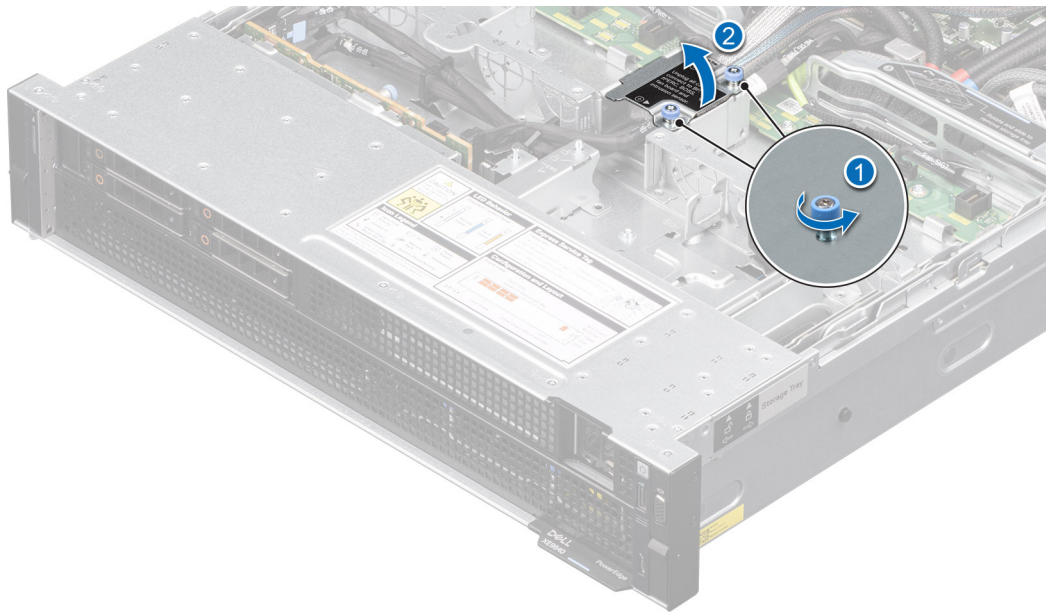
Figure 24. Removing the cable cover

Next steps

Replace the cable cover.

Installing the cable cover

Prerequisites

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

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

Steps

1. Push down the metallic cable cover on the storage tray.

   ⓘ **NOTE:** Route the cables through the cable holder.

2. Using the Phillips 2 screwdriver, tighten the blue thumb screws.
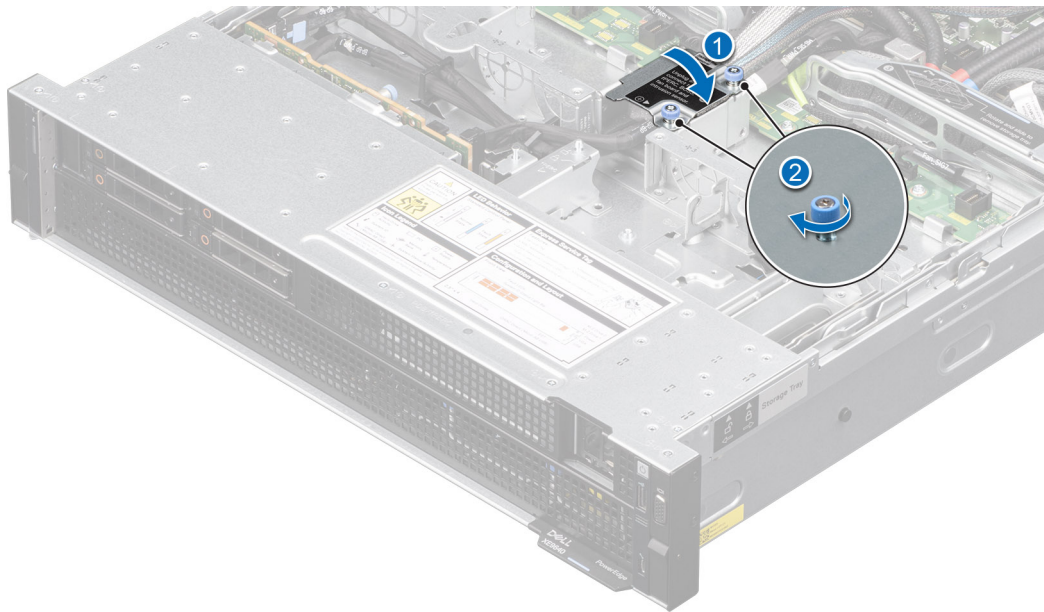
Figure 25. Installing the cable cover

Next steps

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

Fan board

This is a service technician replaceable part only.

Removing the cooling fan board for Intel GPU configurations

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 cooling fan modules.
4. Remove the cable cover.
5. Observe and disconnect the intrusion switch cable from the storage tray that is connected from the system board. Disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connectors of the storage tray and keep the cables away from the storage tray.

Steps

1. Using the Phillips 2 screwdriver, remove the screws securing fan board to the storage tray. Holding the fan board, lift it away from the system.

Figure 26. Removing the cooling fan board

2. To remove the cables from the PDB of the bottom layer, first Remove the storage tray, and then Remove the system board tray. Disconnect the fan cables connected on the PDB of the bottom layer.

   ⓘ **NOTE:** This step is optional. Disconnect the fan board cables from the PDB of the bottom layer unless it is required to replace the cables.
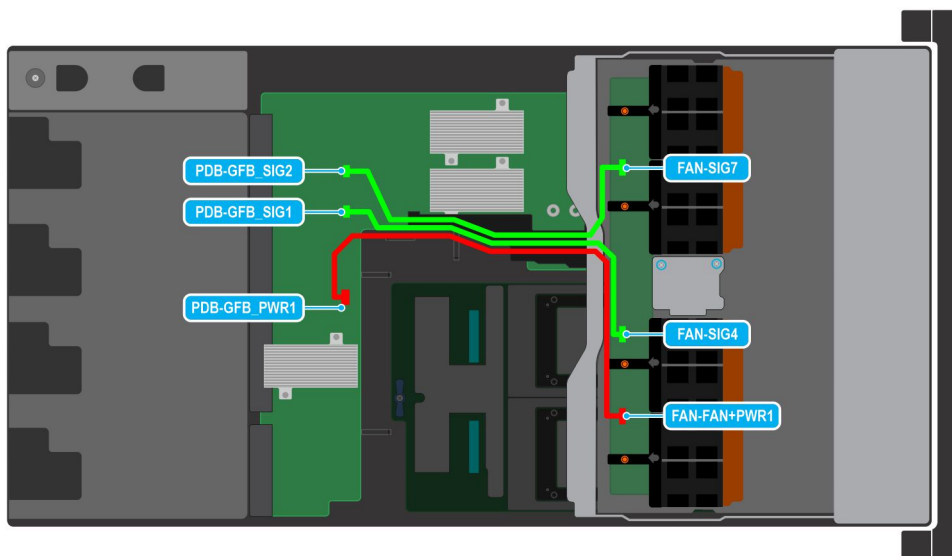
Figure 27. Fan cables connection on the Storage tray connecting on the PDB of the bottom layer

Table 59. Fan cable connections

Order	From	To
1	PDB-GFB_PWR1 (Power Distribution Board (PDB) power connector)	FAN-FAN+PWR1 (System fan power connector)

Table 59. Fan cable connections (continued)

Order	From	To
2	PDB-GFB_SIG1 (PDB signal cable)	FAN-SIG4 (System fan signal cable)
3	PDB-GFB_SIG2 (PDB signal cable)	FAN-SIG7 (System fan signal cable)

Next steps

Replace the cooling fan board.

Installing the cooling fan board for Intel GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the cooling fan modules.
4. Remove the cable cover.
5. Observe and disconnect the intrusion switch cable from the storage tray that is connected from the system board. Disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connectors of the storage tray and keep the cables away from the storage tray.

Steps

1. Reconnect the fan cables on the PDB of the bottom layer. Install the system board tray. Install the storage tray. Reconnect the fan board cables on the fan board into the storage tray.

   (i) **NOTE:** This step is optional. Reconnect the fan board cables from the PDB of the bottom layer unless it is required to replace the cables.

Figure 28. Fan cables connection on the Storage tray connecting on the PDB of the bottom layer

Table 60. Fan cable connections

Order	From	To
1	PDB-GFB_PWR1 (Power Distribution Board (PDB) power connector)	FAN-FAN+PWR1 (System fan power connector)
2	PDB-GFB_SIG1 (PDB signal cable)	FAN-SIG4 (System fan signal cable)

Table 60. Fan cable connections (continued)

Order	From	To
3	PDB-GFB_SIG2 (PDB signal cable)	FAN-SIG7 (System fan signal cable)

2. Align and insert the fan board into the slots until it is seated firmly. Using a Phillips 2 screwdriver, tighten the screws to secure the fan board into the storage tray.
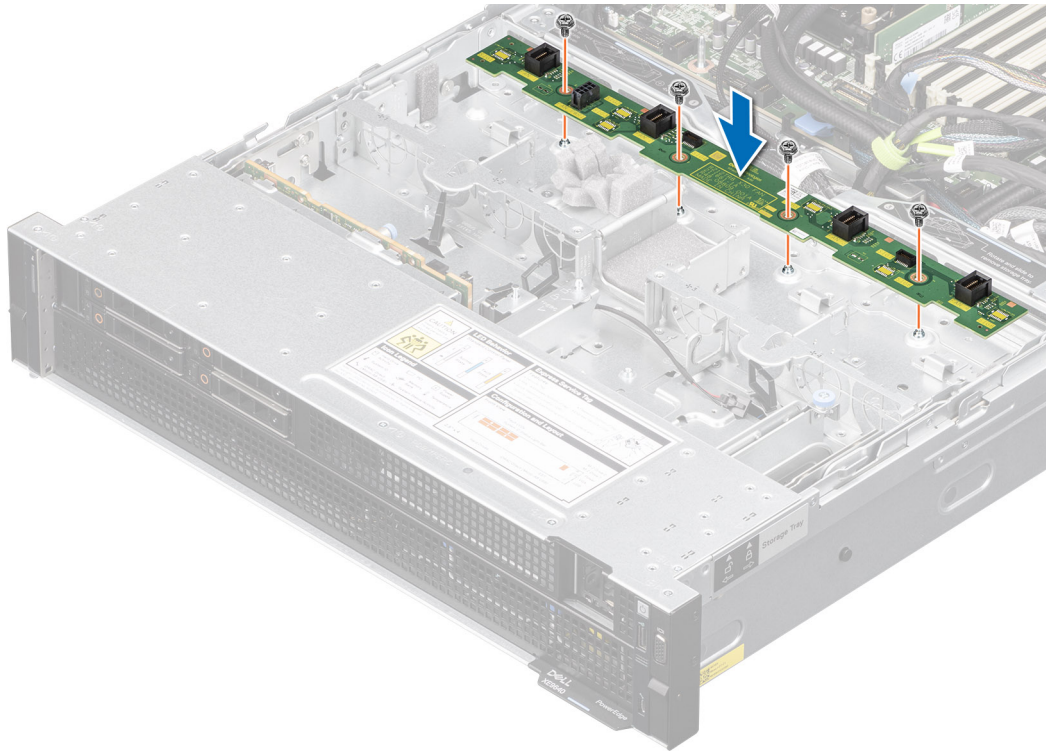
Figure 29. Installing the cooling fan board

Next steps

1. Reconnect the intrusion switch bridge cable from the storage tray that is connected from the system board. Reconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connector of the storage tray.
2. Install the cooling fan modules.
3. Install the cable cover.
4. Follow the procedure listed in After working inside your system.

Removing the cooling fan board for NVIDIA GPU configurations

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 cooling fan modules.
4. Remove the cable cover.
5. Observe and disconnect the intrusion switch bridge cable from the connectors on the storage tray that is connected from the system board. Observe and disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connector on the storage tray, signal cable from the connectors on the PDB2 and then keep the cables away from the storage tray. Disconnect the VSB power cables (left and Right) from the connector on the system board and keep them on the storage tray.

Steps

1. Using the Phillips 2 screwdriver, remove the screws securing fan board to the storage tray. Holding the fan board, lift it away from the system.

Figure 30. Removing the cooling fan board

2. To remove the cables from the PDB of the bottom layer, first Remove the storage tray, and thenRemove the system board tray. Disconnect the fan cables connected on the PDB of the bottom layer. Disconnect the VSB cable from the PDB2 connected on the PDB of the bottom layer.

   (i) **NOTE:** This step is optional. Disconnect the fan board cables from the PDB of the bottom layer unless it is required to replace the cables.
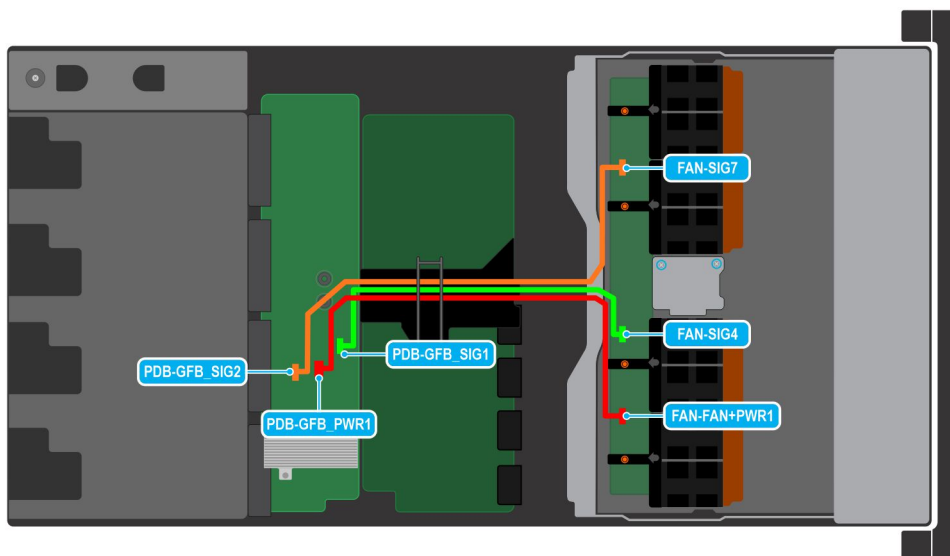
Figure 31. Fan cables connection of the Storage tray on the bottom layer of the PDB

Table 61. Fan cable connections

Order	From	To
1	PDB-GFB_PWR1 (Power Distribution Board (PDB) power connector)	FAN-FAN+PWR1 (System fan power connector)
2	PDB-GFB_SIG1 (PDB signal cable)	FAN-SIG4 (System fan signal cable)
3	PDB-GFB_SIG2 (PDB signal cable)	FAN-SIG7 (System fan signal cable)

Next steps

Replace the cooling fan board.

Installing the cooling fan board for NVIDIA GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the cooling fan modules.
4. Remove the cable cover.
5. Observe and disconnect the intrusion switch bridge cable from the connectors on the storage tray that is connected from the system board. Observe and disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connector on the storage tray, signal cable from the connectors on the PDB2 and then keep the cables away from the storage tray. Disconnect the VSB power cables (left and Right) from the connector on the system board and keep them on the storage tray.

Steps

1. Reconnect the fan cables on the PDB of the bottom layer. Install the system board tray. Install the storage tray. Reconnect the fan board cables on the fan board into the storage tray.

   (i) **NOTE:** This step is optional. Reconnect the fan board cables from the PDB of the bottom layer unless it is required to replace the cables.

Figure 32. Fan cables connection of the Storage tray on the bottom layer of the PDB

Table 62. Fan cable connections

Order	From	To
1	PDB-GFB_PWR1 (Power Distribution Board (PDB) power connector)	FAN-FAN+PWR1 (System fan power connector)
2	PDB-GFB_SIG1 (PDB signal cable)	FAN-SIG4 (System fan signal cable)
3	PDB-GFB_SIG2 (PDB signal cable)	FAN-SIG7 (System fan signal cable)

2. Align and insert the fan board into the slots until it is seated firmly. Using a Phillips 2 screwdriver, tighten the screws to secure the fan board into the storage tray.

Figure 33. Installing the cooling fan board

Next steps

1. Reconnect the intrusion switch bridge cable from the storage tray that is connected from the system board. Reconnect the drive backplane cables, BOSS power and signal cables, signal cable on the PDB2, fan board cables on the connector of the storage tray. Reconnect the VSB power cables on the system board.
2. Install the cooling fan modules.
3. Install the cable cover.
4. Follow the procedure listed in After working inside your system.

Drives

Removing a drive blank

Prerequisites

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

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

Steps

Press the release button, and slide the drive blank out of the drive slot.
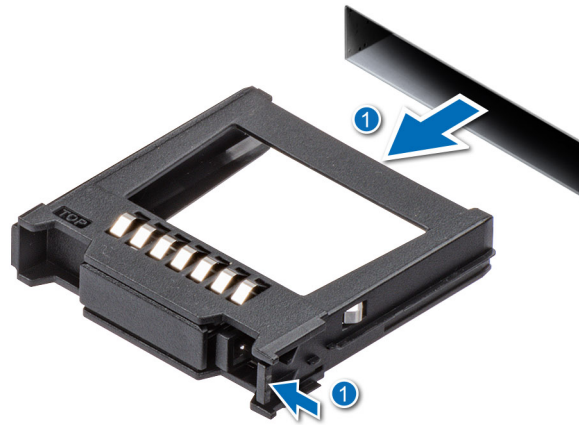
Figure 34. Removing a drive blank

Next steps

1. Replace the drive blank.

Installing a drive blank

Prerequisites

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

Steps

Slide the drive blank into the drive slot until the release button clicks into place.
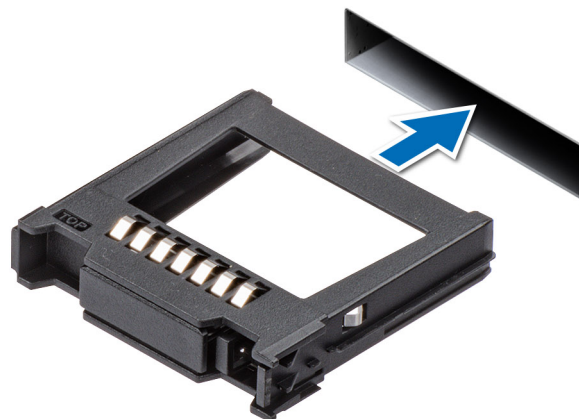
Figure 35. Installing a drive blank

Next steps

1. If removed, install the front bezel.

Removing a drive carrier

Prerequisites

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

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

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

Steps

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

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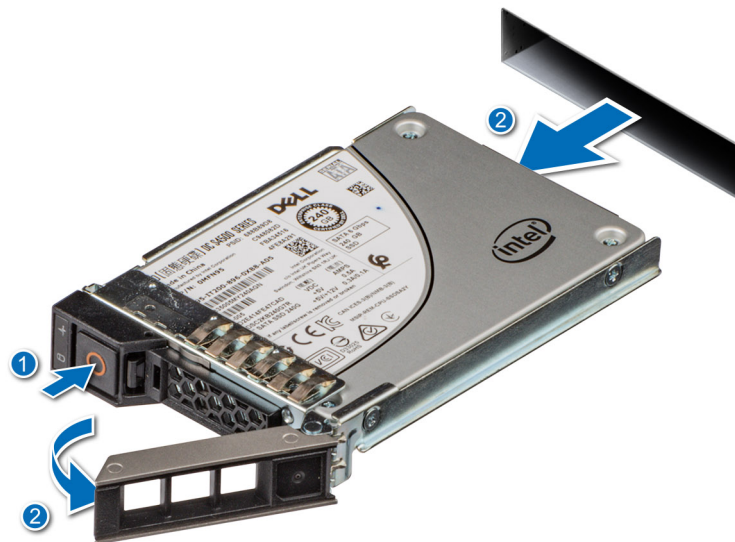
Figure 36. Removing a drive carrier

Next steps

Replace the drive or a drive blank.

Installing the drive carrier

Prerequisites

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

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

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

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

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

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

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

Steps

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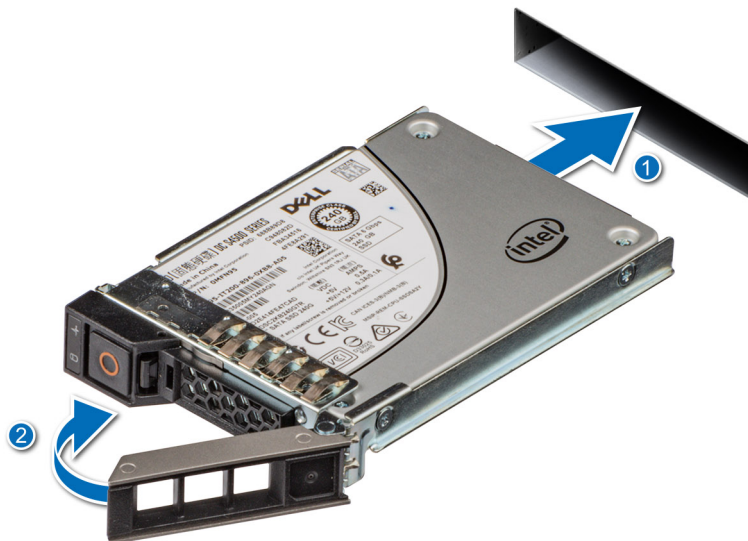
Figure 37. Installing a drive carrier

Next steps

install the front bezel.

Removing the drive from the drive carrier

Prerequisites

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

Steps

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

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

2. Lift the drive out of the drive carrier.
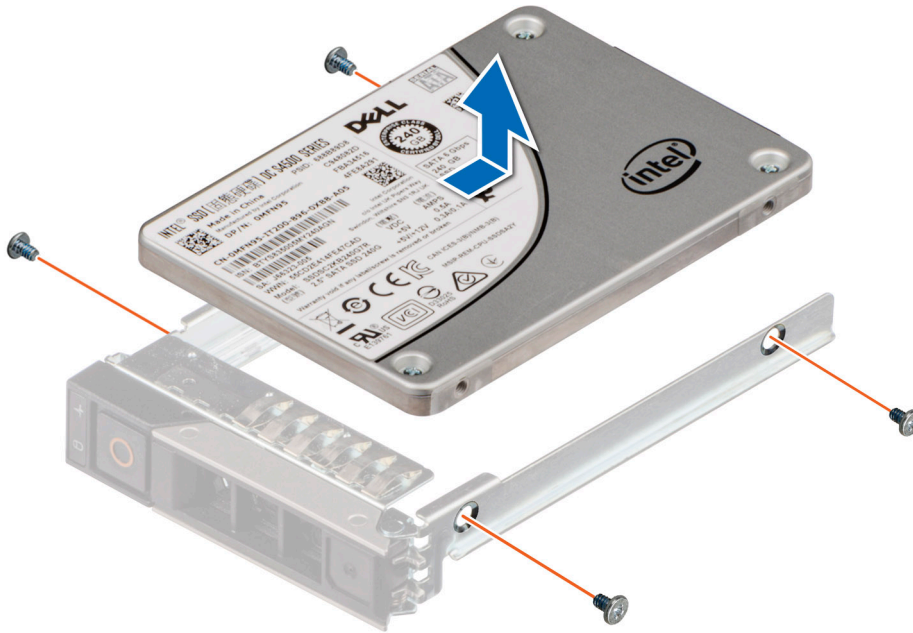
Figure 38. Removing the drive from the drive carrier

Next steps

Install the drive into the drive carrier.

Installing the drive into the drive carrier

Prerequisites

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

Steps

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

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

   (i) **NOTE:** If the drive carrier has Torx screw, use Torx 6 (for 2.5-inch drive) screwdriver to install the drive.
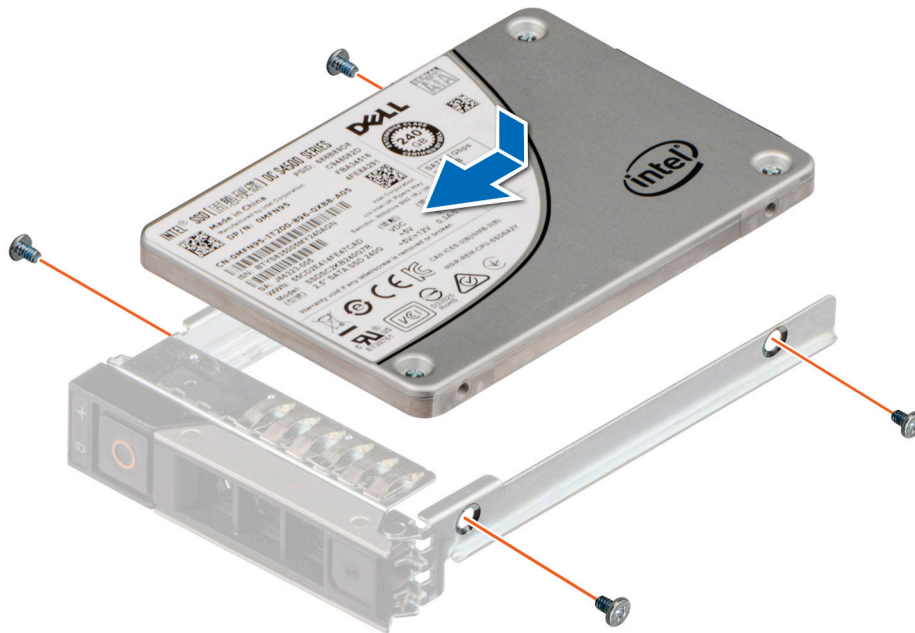
Figure 39. Installing a drive into the drive carrier

Next steps

Install the drive carrier.

Drive backplane

This is a service technician replaceable part only.

Drive backplane

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

Table 63. Supported backplane options

System	Supported hard drives options
PowerEdge XE9640	2.5-inch (x4) NVMe backplane
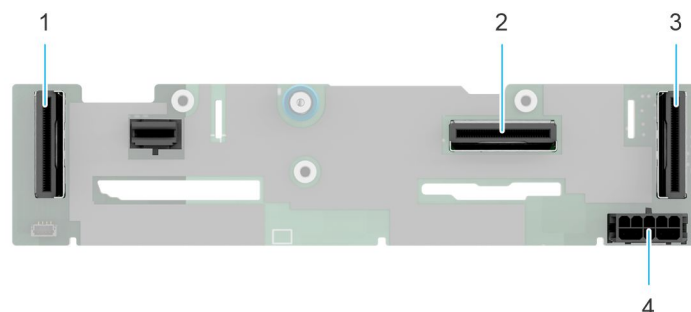
Figure 40. 4 x 2.5-inch NVMe drive backplane

1. PCIE connector (BP_DST_PB1)
2. SATA connector (BP_DST_SA1)
3. PCIE connector (BP_DST_PA1)
4. Power connector (BP_PWR_1)

Removing the drive backplane for Intel GPU configurations

Prerequisites

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

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

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

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the drives.
4. Remove the cable cover.
5. Remove the turtle shell.
6. Observe and disconnect the drive backplane cables from the backplane and signal and power cables from the system board.

Figure 41. Cabling diagram

Order	From	To
1	MB-SL6_CPU2_PA3 (signal connector on system board)	BP-BP_DST_PA1 (backplane signal connector)
2	MB-SIG_PWR_1 (system board power connector)	BP-BP_PWR_1 (backplane power connector)
3	MB-SL15_CPU1_PB8 (signal connector on system board)	BP-BP_DST_PB1(backplane signal connector)

Steps

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

   ⓘ **NOTE:** To avoid damaging the backplane, remove the disconnected backplane cables from the cable routing clips before removing the backplane.
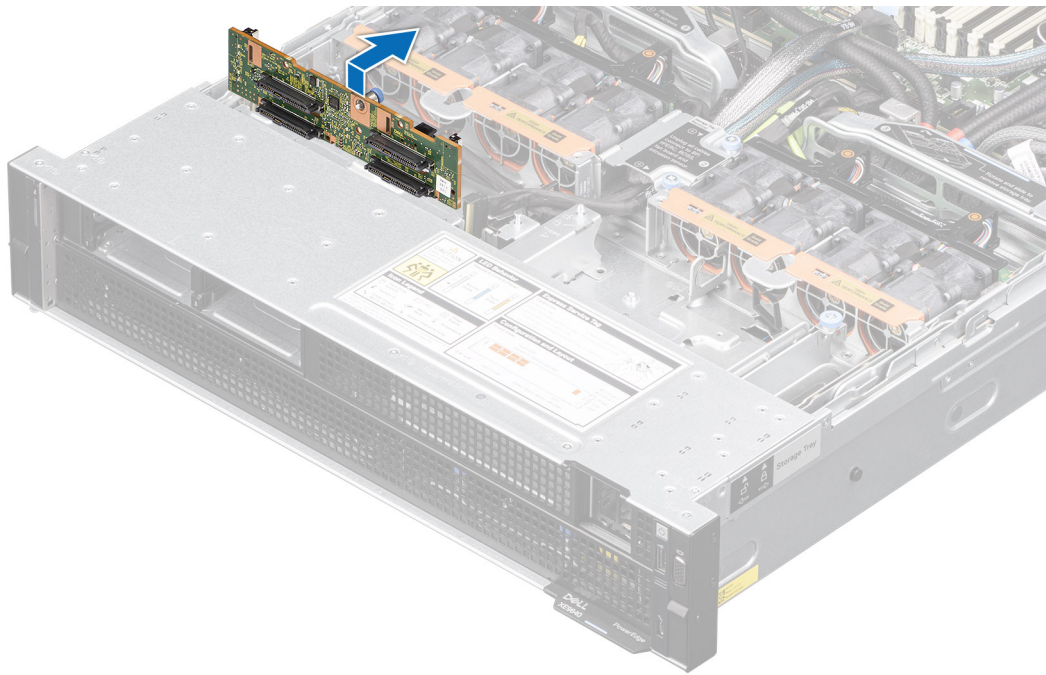
Figure 42. Removing the drive backplane

Next steps

Replace the drive backplane.

Installing the drive backplane for Intel GPU configurations

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 drives.
4. Remove the cable cover.
5. Remove the turtle shell.
6. Observe and disconnect the drive backplane cables from the backplane and signal and power cables from the system board.

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

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

Steps

1. Align the slots on the drive backplane with the guides on the system.
2. Slide the drive backplane into the guides and lower the backplane until the blue release tab clicks into place.
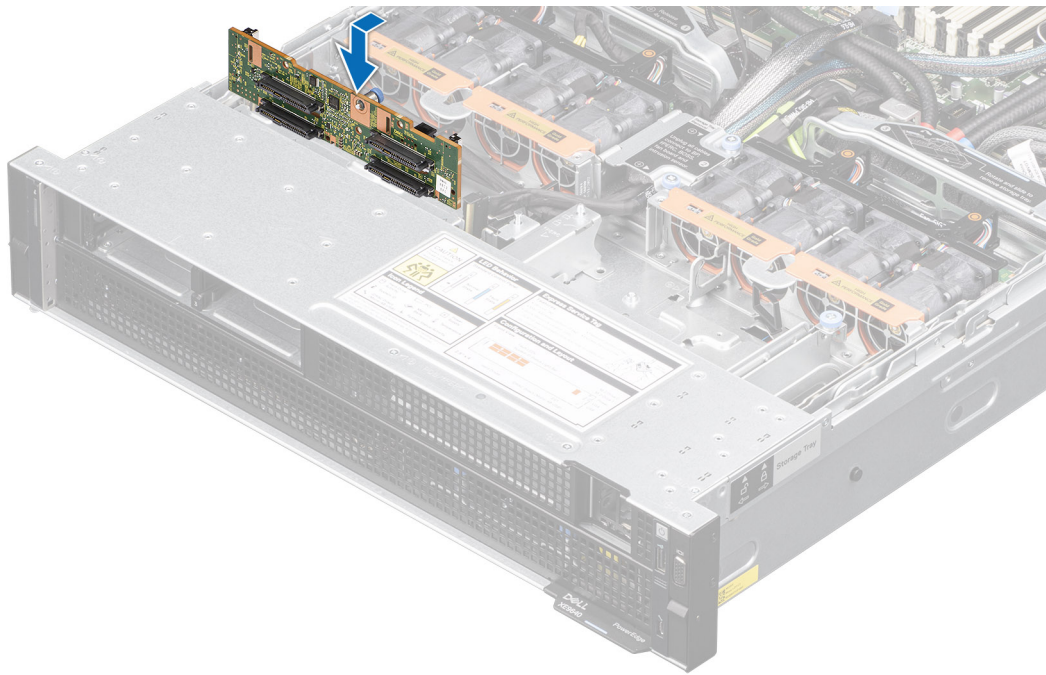
Figure 43. Installing the drive backplane

Next steps

1. Connect the drive backplane cables to the backplane, signal and power cables on the system board.
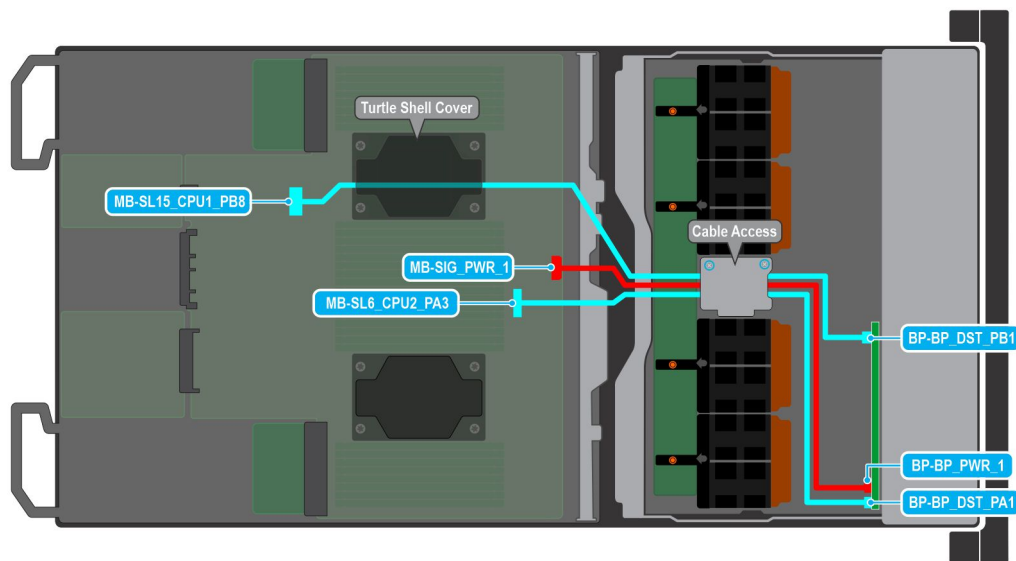
Figure 44. Cabling diagram

Table 64. 4 x 2.5-inch backplane cable connections

Order	From	To
1	MB-SL6_CPU2_PA3 (signal connector on system board)	BP-BP_DST_PA1 (backplane signal connector)
2	MB-SIG_PWR_1 (system board power connector)	BP-BP_PWR_1 (backplane power connector)

Table 64. 4 x 2.5-inch backplane cable connections (continued)

Order	From	To
3	MB-SL15_CPU1_PB8 (signal connector on system board)	BP-BP_DST_PB1(backplane signal connector)

2. Install the turtle shell.
3. Install the drives.
4. Install the cable cover.
5. Follow the procedure listed in After working inside your system.

Removing the drive backplane for NVIDIA GPU configurations

Prerequisites

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

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

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

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the drives.
4. Remove the cable cover.
5. Observe and disconnect the intrusion switch bridge cable from the connectors on the storage tray that is connected from the system board. Observe and disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connector on the storage tray, signal cable from the connectors on the PDB2 and then keep the cables away from the storage tray. Disconnect the VSB power cables (left and Right) from the connector on the system board and keep them on the storage tray.
6. Observe and disconnect the drive backplane cables from the backplane and power cables from the system board.

Steps

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

   ⓘ **NOTE:** To avoid damaging the backplane, remove the disconnected backplane cables from the cable routing clips before removing the backplane.
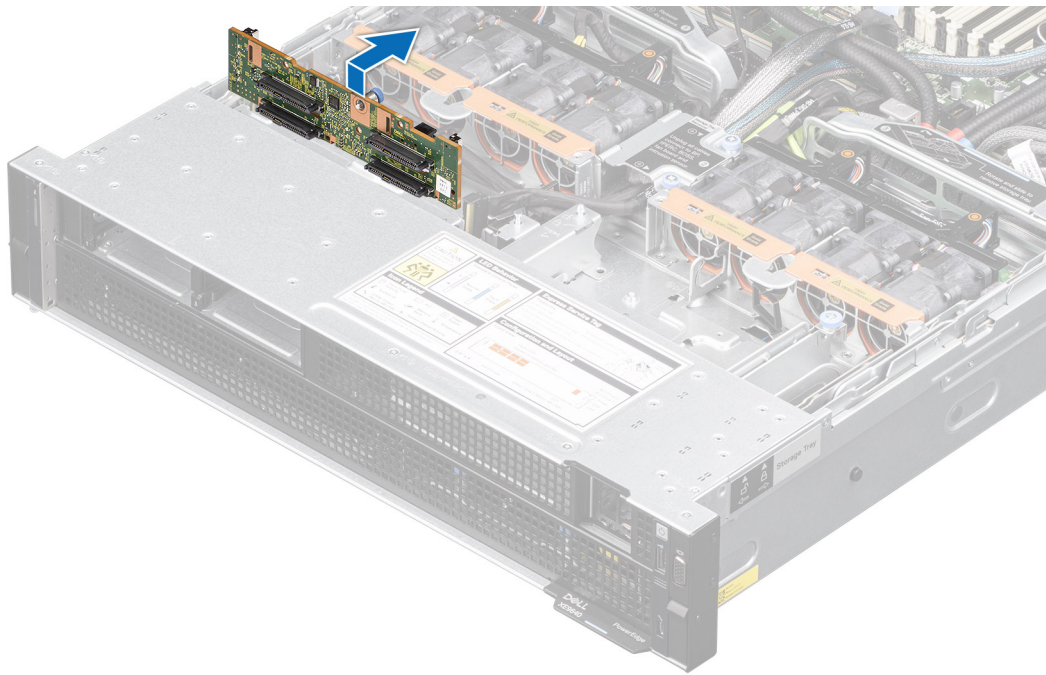
Figure 45. Removing the drive backplane

3. To remove the cables from the PDB of the bottom layer, first Remove the storage tray, and then Remove the system board tray. Disconnect the backplane cables connected on the PSB of the bottom layer.
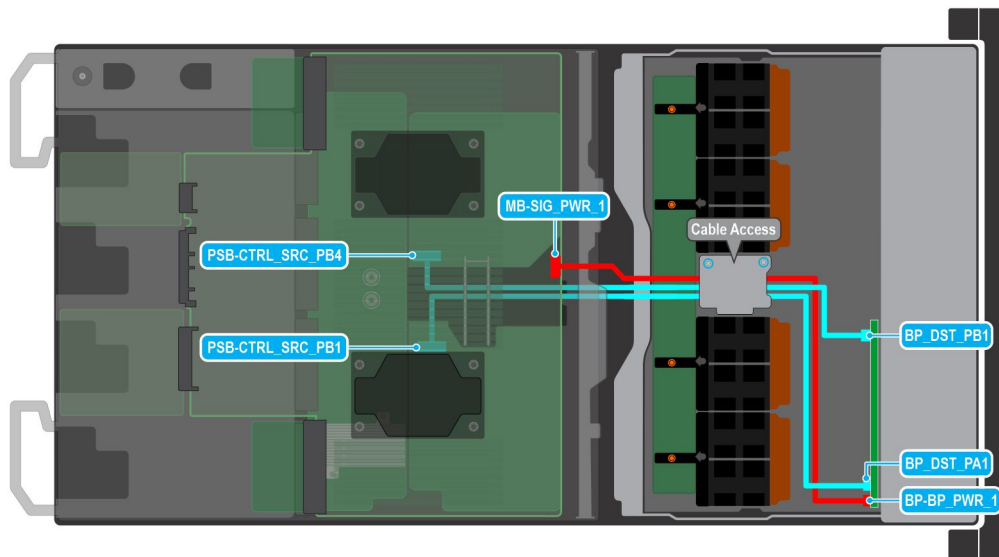
Figure 46. Cabling diagram

Table 65. 4 x 2.5-inch backplane cable connections

Order	From	To
1	MB-SIG_PWR_1 (system board power connector)	BP-BP_PWR_1 (backplane signal connector)
2	PSB-CTRL_SRC_PB4 (signal connector on system board)	BP_DST_PB1 (backplane signal connector)
3	PSB-CTRL_SRC_PB1 (signal connector on system board)	BP_DST_PA1 (backplane signal connector)

Next steps

Replace the drive backplane.

Installing the drive backplane for NVIDIA GPU configurations

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 drives.
4. Remove the cable cover.
5. Observe and disconnect the intrusion switch bridge cable from the connectors on the storage tray that is connected from the system board. Observe and disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connector on the storage tray, signal cable from the connectors on the PDB2 and then keep the cables away from the storage tray. Disconnect the VSB power cables (left and Right) from the connector on the system board and keep them on the storage tray.
6. Observe and disconnect the drive backplane cables from the backplane and power cables from the system board.

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

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

Steps

1. Reconnect the backplane cables on the PSB of the bottom layer.
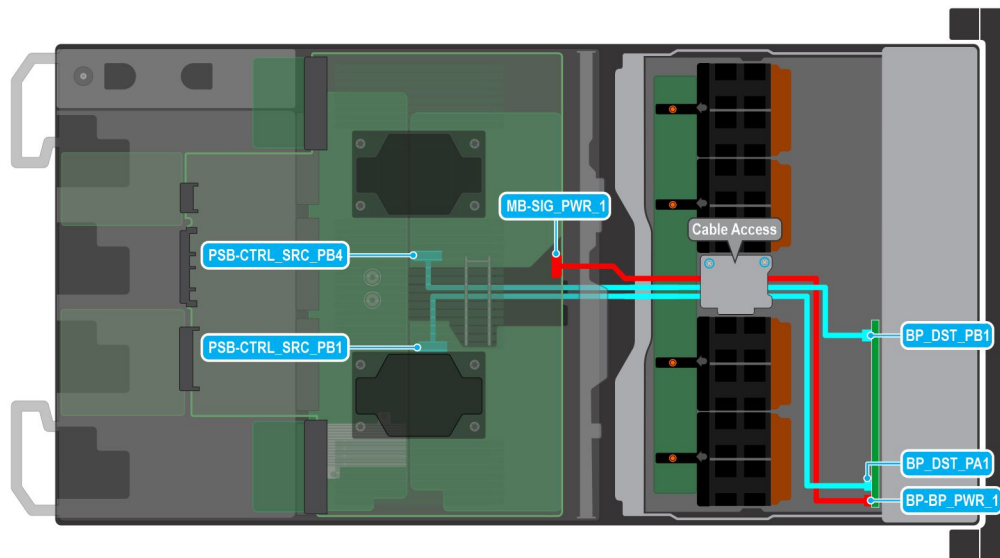
Figure 47. Cabling diagram

Order	From	To
1	MB-SIG_PWR_1 (system board power connector)	BP-BP_PWR_1 (backplane signal connector)
2	PSB-CTRL_SRC_PB4 (signal connector on system board)	BP_DST_PB1 (backplane signal connector)
3	PSB-CTRL_SRC_PB1 (signal connector on system board)	BP_DST_PA1 (backplane signal connector)

2. Install the system board tray.
3. Install the storage tray.

4. Align the slots on the drive backplane with the guides on the system.
5. Slide the drive backplane into the guides and lower the backplane until the blue release tab clicks into place.
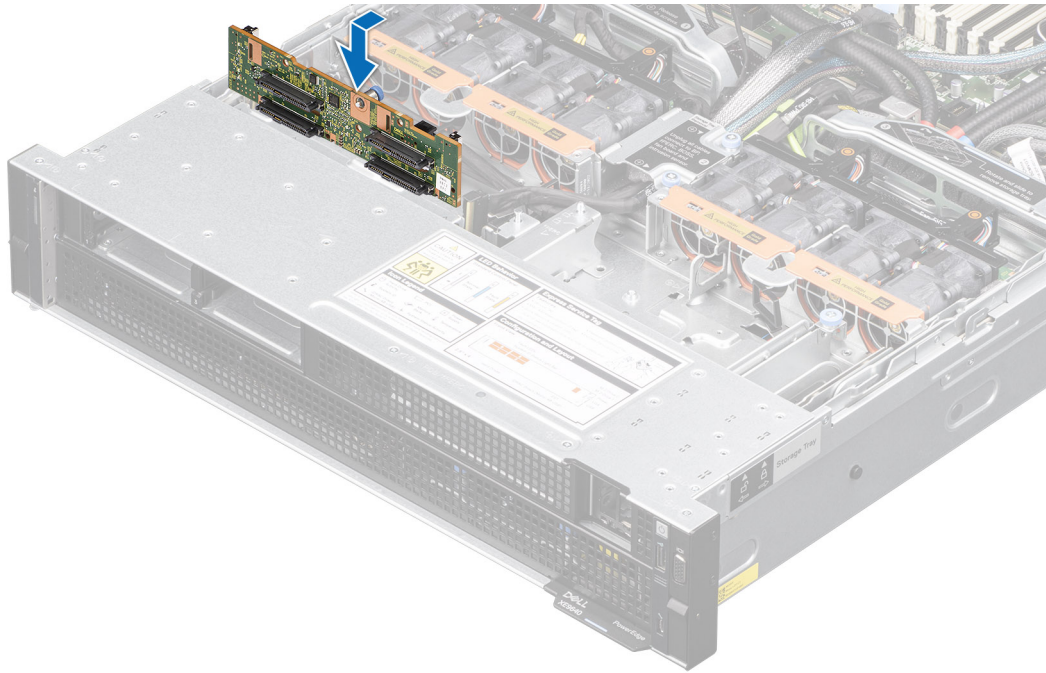
Figure 48. Installing the drive backplane

6. Reconnect the backplane cables from the PSB into the backplane of the storage tray. Reconnect the power cable from the system board into the backplane of the storage tray.

Next steps

1. Install the drives.
2. Reconnect the intrusion switch bridge cable from the storage tray that is connected from the system board. Reconnect the drive backplane cables, BOSS power and signal cables, signal cable on the PDB2, fan board cables on the connector of the storage tray. Reconnect the VSB power cables on the system board.
3. Install the cable cover.
4. Follow the procedure listed in After working inside your system.

Optional BOSS-N1 module

Removing the BOSS-N1 card carrier blank

Prerequisites

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

Steps

Press and pull the BOSS-N1 card carrier blank out from the BOSS-N1 module.
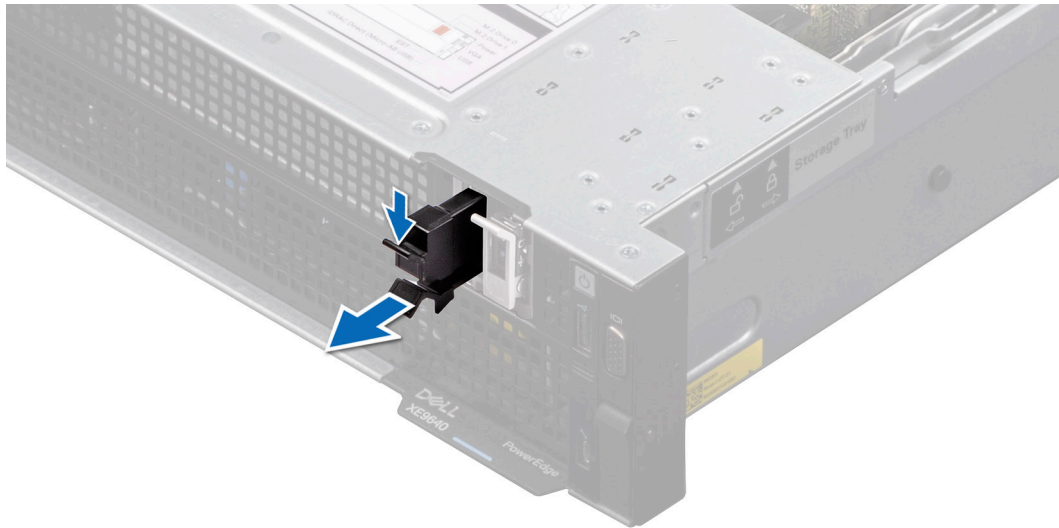
Figure 49. Removing the BOSS-N1 card carrier blank

Next steps

1. Replace the BOSS-N1 card carrier blank or install BOSS-N1 card carrier.

Installing the BOSS-N1 card carrier blank

Prerequisites

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

Steps

Align the blank with the BOSS-N1 module bay and push it into the bay until it clicks into place.
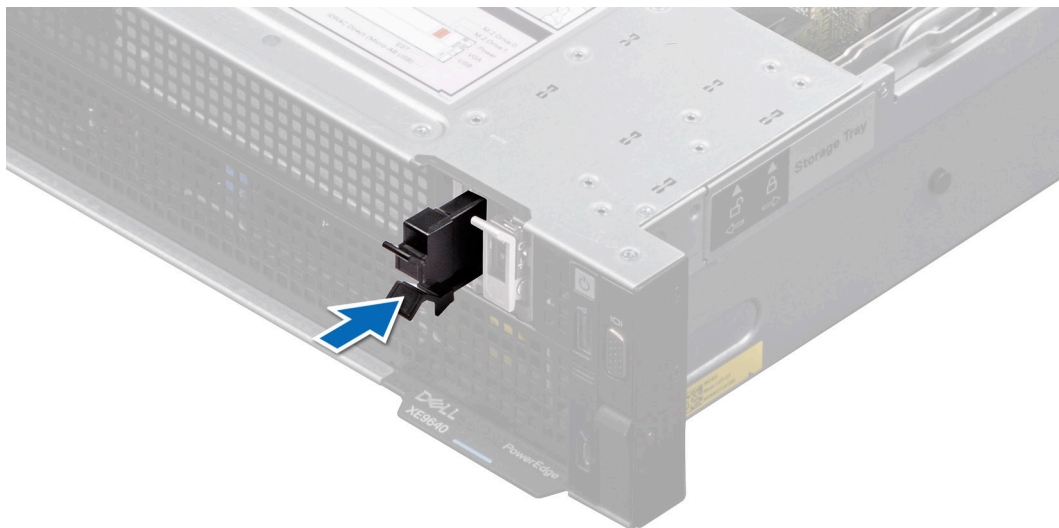
Figure 50. Installing the BOSS-N1 card carrier blank

Removing the BOSS-N1 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 riser 1A for Intel GPU configurations or Remove the riser 1B for NVIDIA GPU configurations.

Steps

1. Pull and lift the BOSS-N1 card carrier retention latch lock to open.
2. Slide the BOSS-N1 card carrier out.
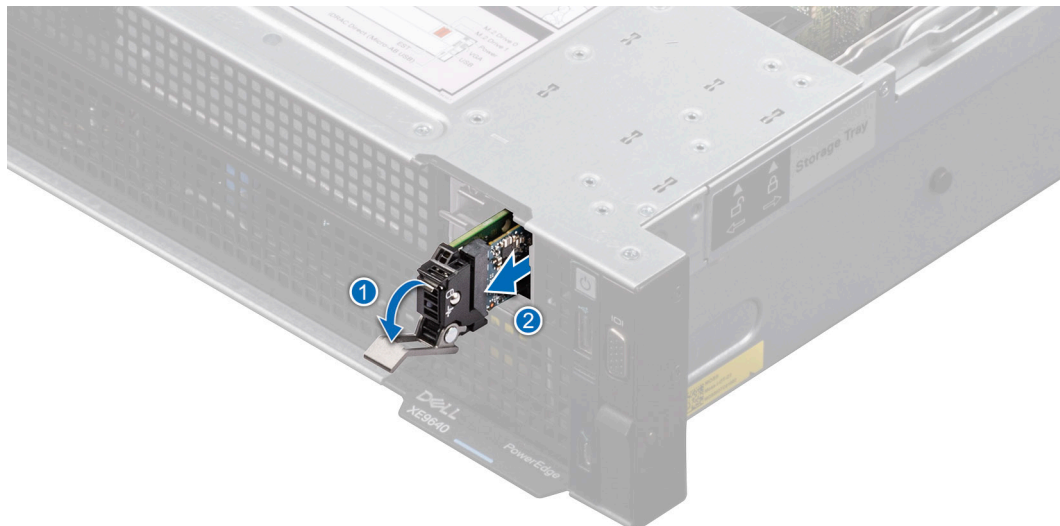
Figure 51. Removing the BOSS-N1 card carrier

3. Using the Phillips 1 screwdriver remove the M3 x 0.5 x 4.5 mm screw that secures the M.2 SSD to the BOSS-N1 card carrier.
4. Slide the M.2 SSD out from the BOSS-N1 card carrier.
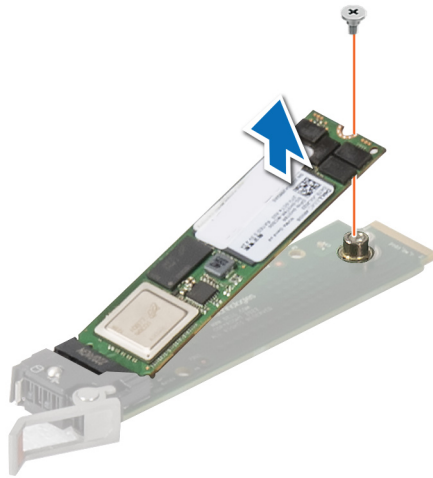
Figure 52. Removing the M.2 SSD

5. Remove the cable cover. Using two fingers, lift the turtle shell from the DLC module. Disconnect the BOSS-N1 power and signal cable from the system board.
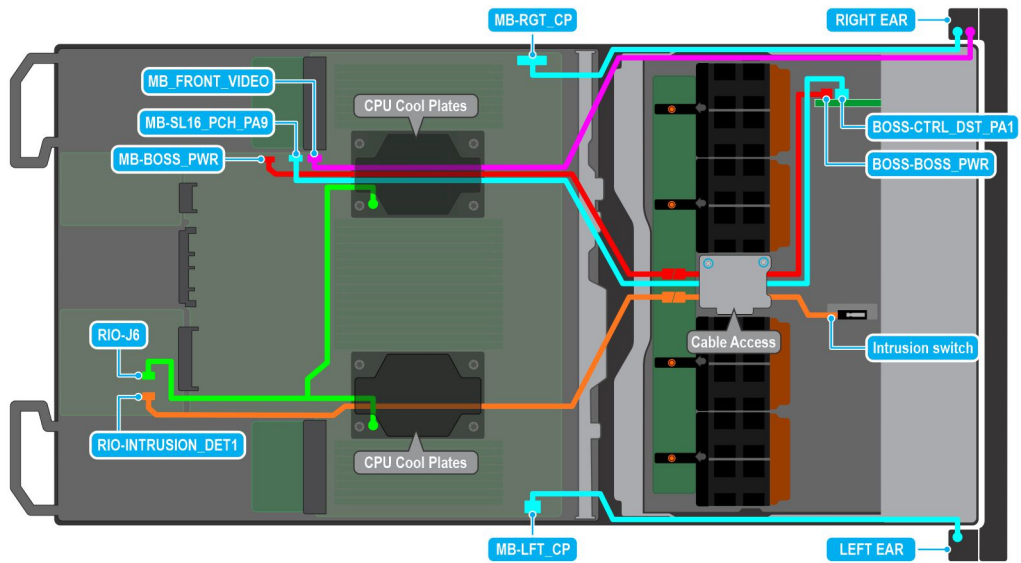
Figure 53. BOSS-N1 cable diagram

6. Remove the BOSS-N1 power and signal cable from the BOSS-N1 module.
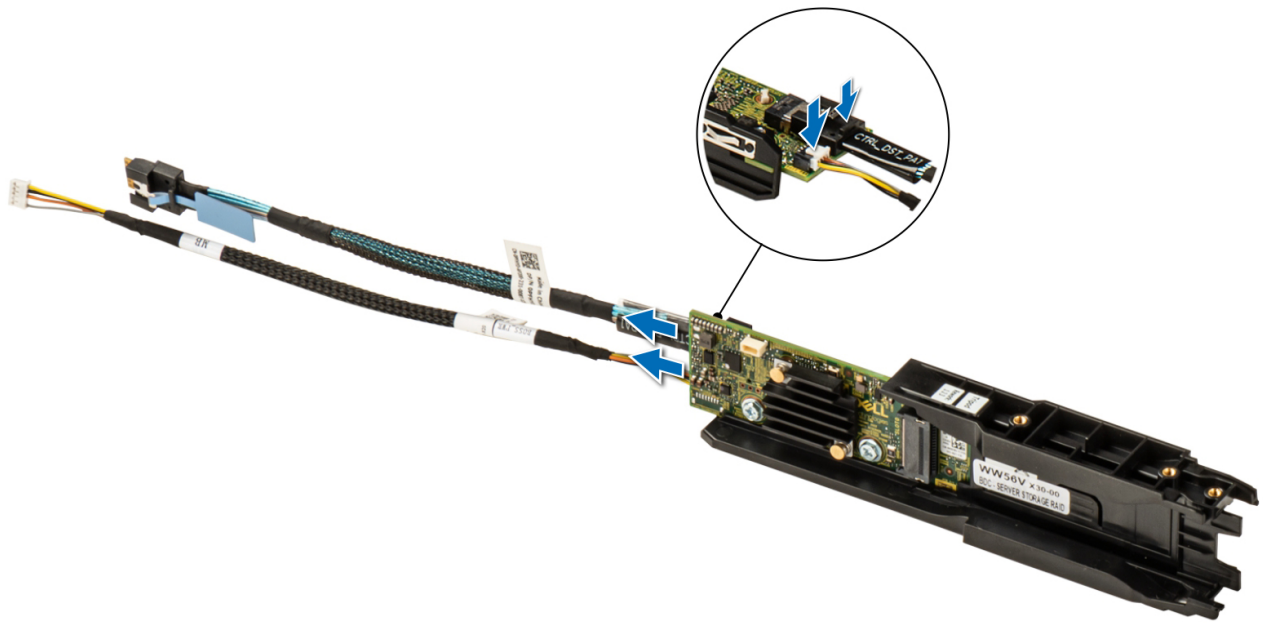
Figure 54. Removing the BOSS-N1 power and signal cable from the BOSS-N1 module

7. Using the Phillips 1 screwdriver remove the M3 x 0.5 x 4.5 mm screw that secures the BOSS-N1 module.
8. Slide the BOSS-N1 module toward the front of the chassis and lift the module.
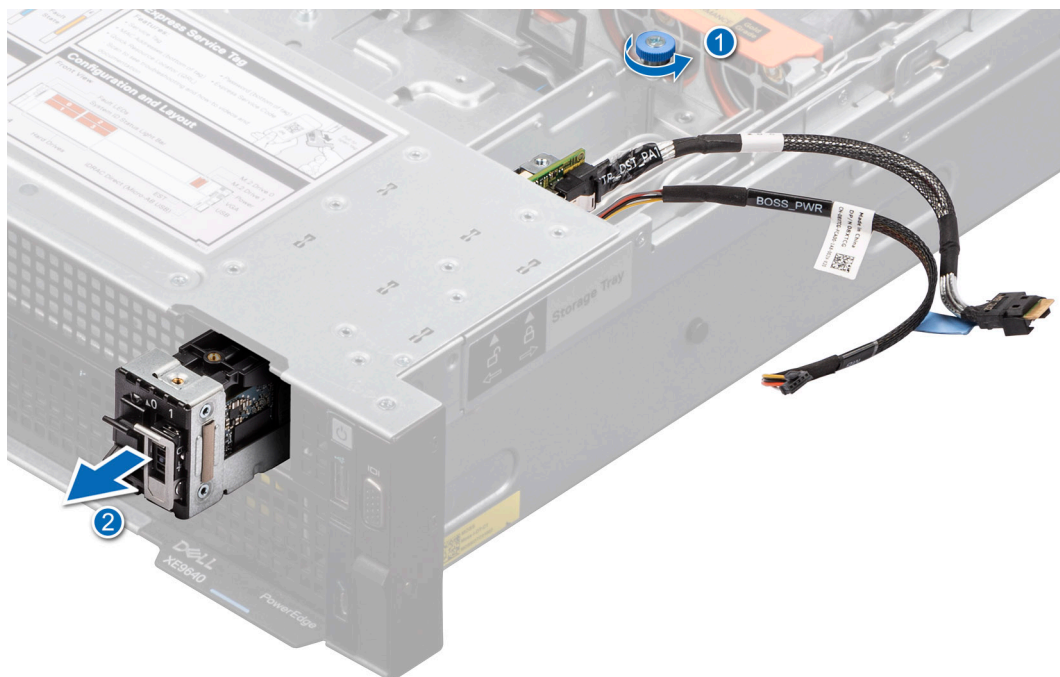
Figure 55. Removing the BOSS-N1 module

Next steps

Replace the BOSS-N1 module.

Installing the BOSS-N1 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 riser 1A for Intel GPU configurations or Remove the riser 1B for NVIDIA GPU configurations.

Steps

1. Align the BOSS-N1 module at an angle with the controller card module slot.
2. Insert the BOSS-N1 module and push the module horizontally toward the rear of the system until firmly seated.
3. Using the Phillips 1 screwdriver, secure the BOSS-N1 module with the M3 x 0.5 x 4.5 mm screw.
4. Connect the BOSS-N1 power and signal cables to the connectors on the BOSS-N1 module.
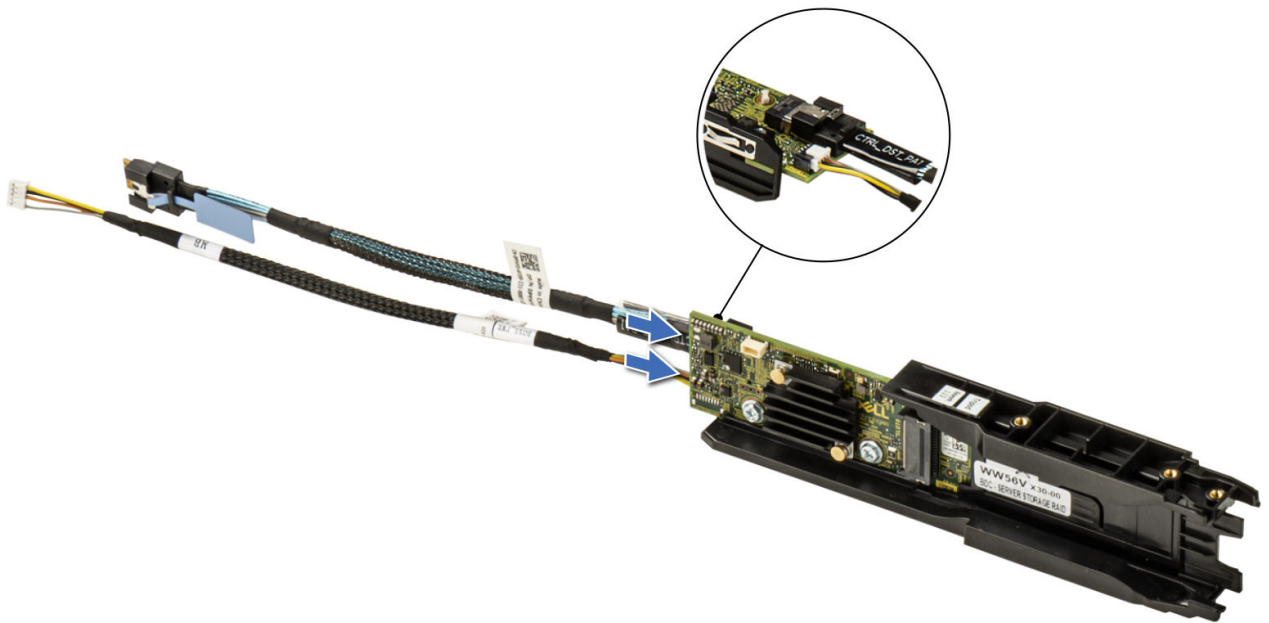
Figure 56. Connecting the BOSS-N1 power and signal cables to the BOSS-N1 module

5. Connect the BOSS-N1 power and signal cable to the connectors on the system board by routing through the DLC module, install the turtle shell and then install the cable cover.
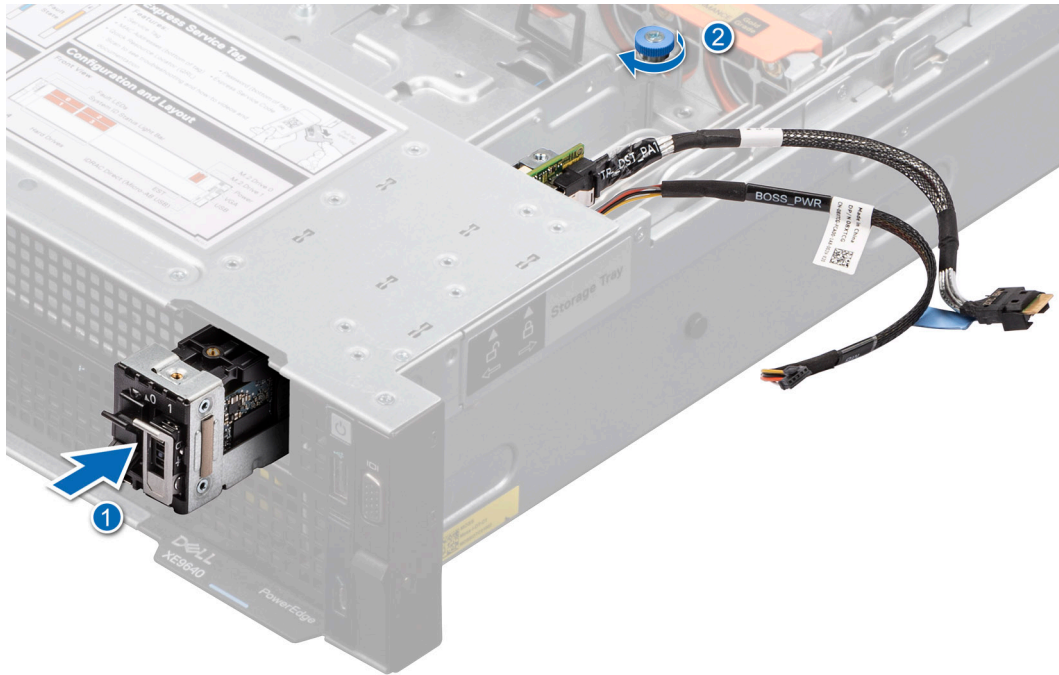
Figure 57. Installing the BOSS-N1 module
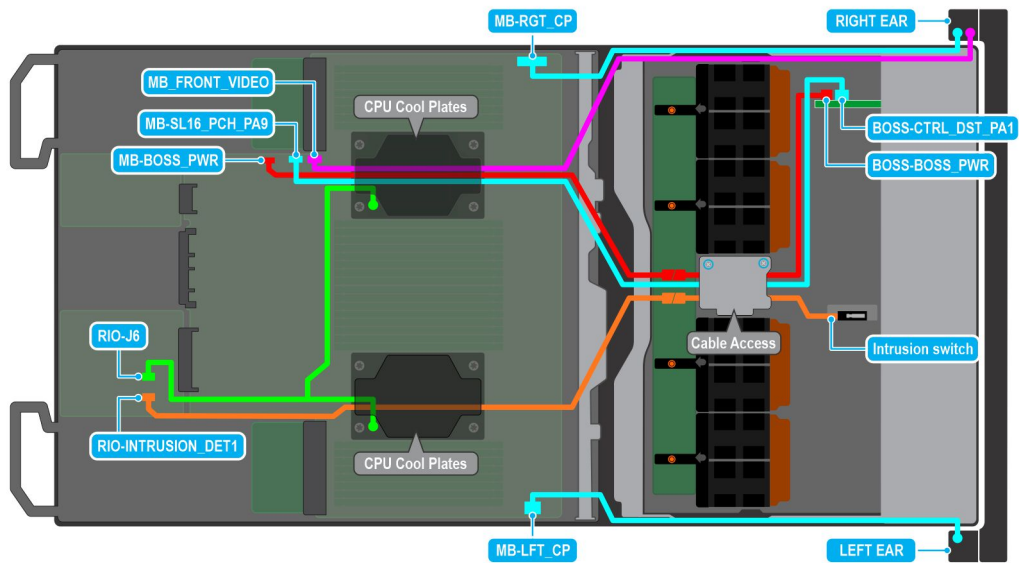
Figure 58. BOSS-N1 cable diagram

6. Align the M.2 SSD at an angle with the BOSS-N1 card carrier.
7. Insert the M.2 SSD until it is firmly seated in the BOSS-N1 card carrier.
8. Using the Phillips 1 screwdriver, secure the M.2 SSD on the BOSS-N1 card carrier with the M3 x 0.5 x 4.5 mm screw.
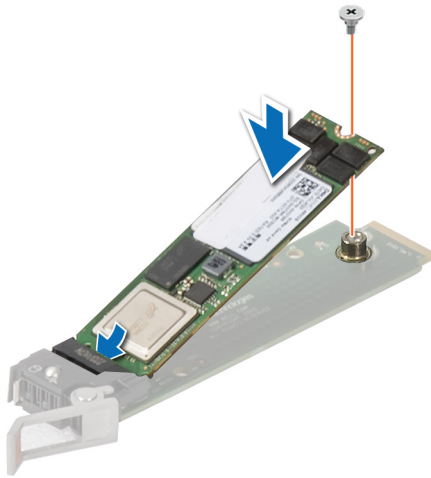
Figure 59. Installing the M.2 SSD

9. Slide the BOSS-N1 card carrier into the BOSS-N1 module slot.
10. Close the BOSS-N1 card carrier release latch to lock the carrier in place.
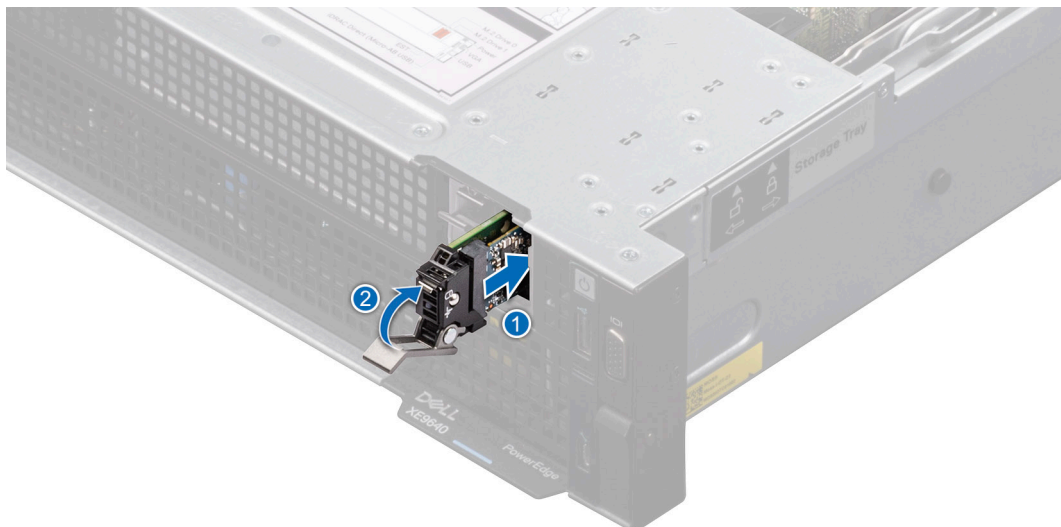
Figure 60. Installing the BOSS-N1 card carrier

Next steps

1. Install the riser 1A for Intel GPU configurations or install the riser 1B for NVIDIA GPU configurations.
2. Follow the procedure listed in After working inside your system.

Versabay board (VSB)

This is a service technician replaceable part only.

Removing the VSB assembly and VSB

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the riser 1A and 4A for Intel GPU configurations or Remove the riser 1B and 4B for NVIDIA GPU configurations.

Steps

1. Using the Phillips 2 screwdriver, remove the screws to disengage the VSB cable from the VSB board connected to the system board.
2. Disconnect the signal cable from the VSB.
3. Lift the plunger and slide the VSB tray to rear of the system.
4. Disengage the VSB tray from the system board and lift it out of the system.

   (i) **NOTE:** The procedure to remove the left and right VSB is similar.
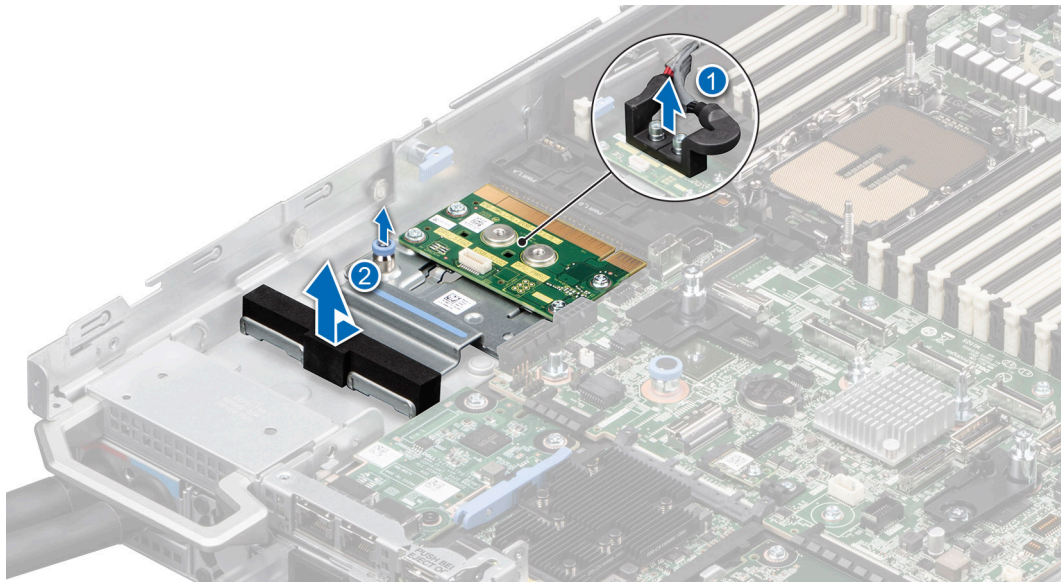
Figure 61. Removing the VSB assembly

5. For Intel GPU configurations, remove the storage tray, and then disconnect the VSB cables from the PDB of the bottom layer and disconnect the VSB cables from the system board.
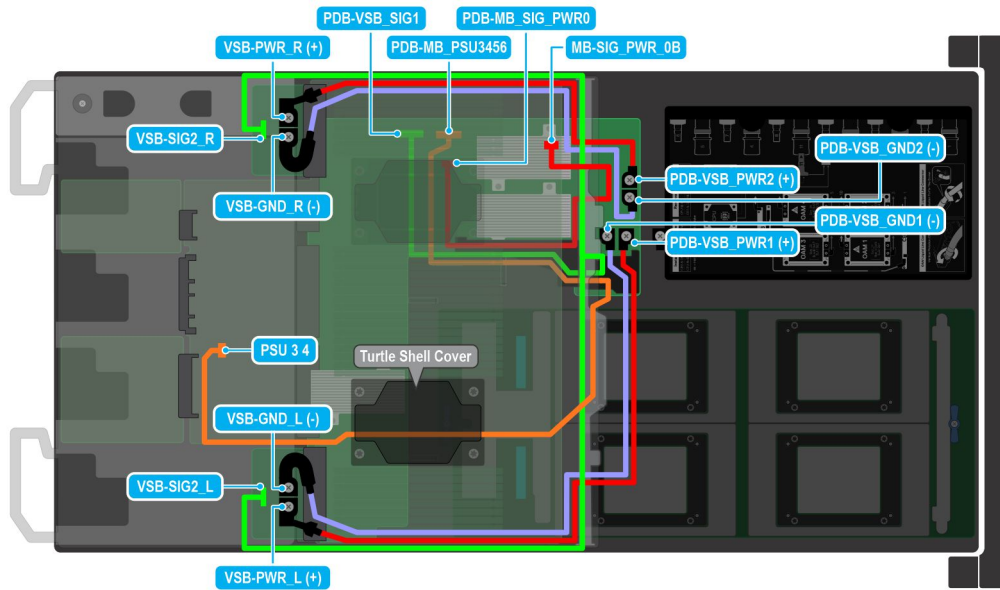
Figure 62. Cabling diagram

6. For NVIDIA GPU configurations, disconnect the VSB cables from the system board. Disconnect the VSB cables from the PDB2 of the storage tray. Remove the storage tray. Disconnect the power cable from the PBD of the bottom layer connected on to the PDB2 on the storage tray. Remove the system board tray. Disconnect the VSB cables from the PDB on the bottom layer.

7. Remove all the screws and lift the VSB from the VSB tray.
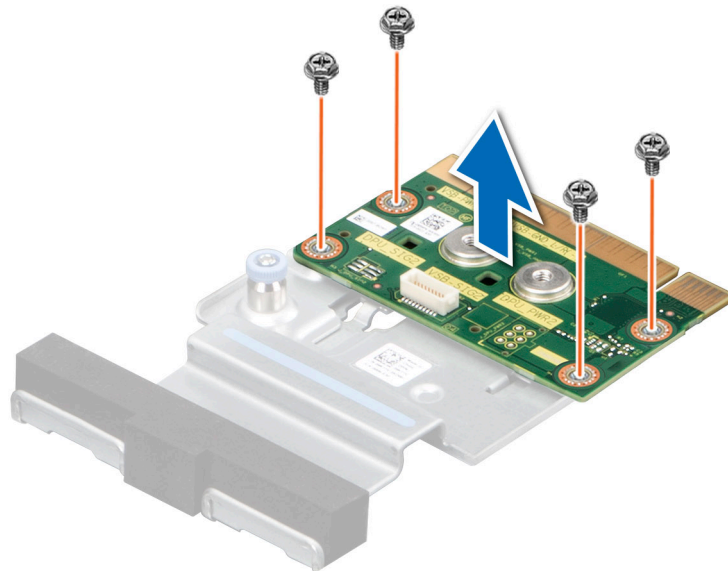
Figure 63. Remove the VSB from the VSB tray

Next steps

Replace the Versabay assembly.

Installing the VSB and VSB assembly

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the riser 1A and 4A for Intel GPU configurations or Remove the riser 1B and 4B for NVIDIA GPU configurations.

Steps

1. Align the VSB on the tray and using the Phillips 2 screwdriver, tighten the screws to secure the VSB on to the VSB tray.
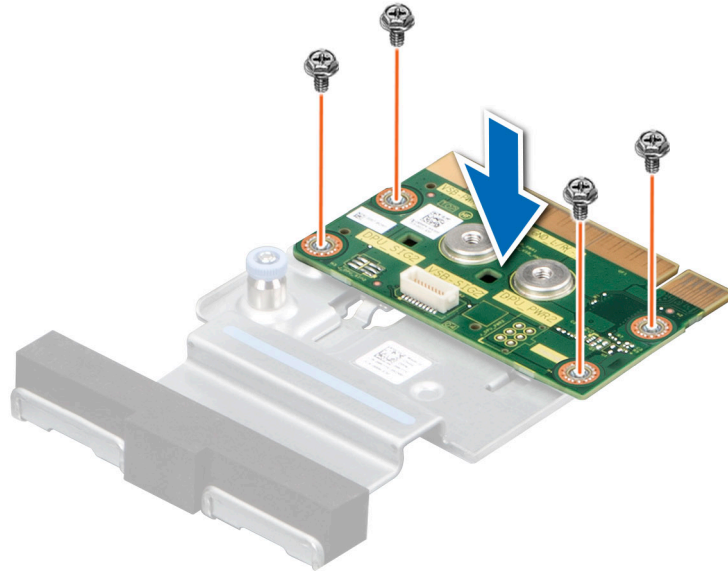
Figure 64. Installing the VSB on to VSB tray

2. Align the VSB on the system board tray. Lift the plunger, align the VSB tray to the system board and slide it toward the front of the system.
3. Align the power cable to the VSB and secure the cables with the screws. Using the Phillips 2 screwdriver, tighten the screws with torque force 10 in-lbf to secure the VSB on to the VSB tray.

   (i) **NOTE:** The procedure to install the left and right VSBs are same.
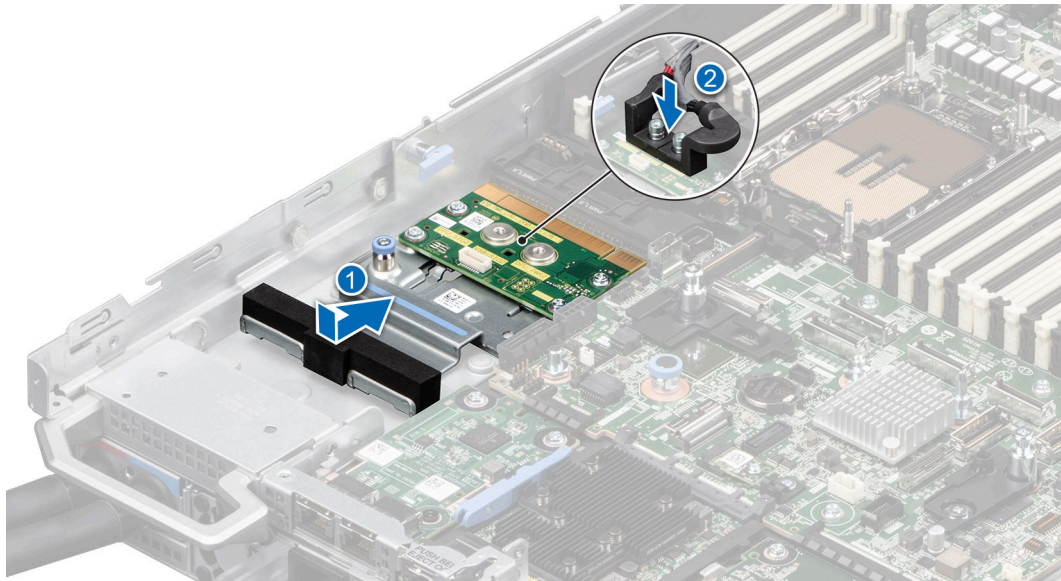
Figure 65. Installing the VSB assembly

4. For Intel GPU configurations, reconnect the VSB cables on the PDB of the bottom layer. Install the system board tray, and then install the storage tray into the chassis. Reconnect the VSB cables on the system board.
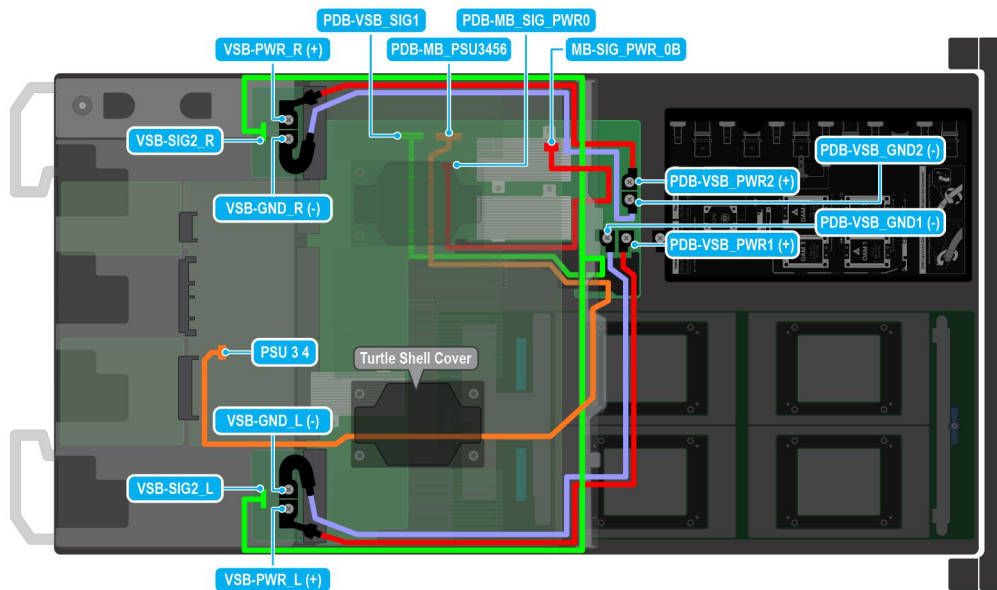
Figure 66. Cabling diagram

5. For NVIDIA GPU configurations, reconnect the VSB cables on the PDB of the bottom layer. Install the system board tray, and then install the storage tray into the chassis. Reconnect the VSB cables on the PBD2 of the storage tray and on the system board.

6. Reconnect the signal cable on to the VSB.

Next steps

1. Install the riser 1A and 4A for Intel GPU configurations or install the riser 1B and 4B for NVIDIA GPU configurations.
2. Follow the procedure listed in After working inside your system.

Storage tray

This is a service technician replaceable part only.

Removing the storage tray for Intel GPU configurations

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 cable cover.
4. Observe and disconnect the intrusion switch cable from the storage tray that is connected from the system board. Disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connectors of the storage tray and keep the cables away from the storage tray.

Steps

1. Using a Phillips 1 screwdriver, remove the screws on the drive cage.
2. Rotate the handle at an angle and slide the storage tray toward the front of the chassis.
3. Lift the storage tray out of the system.

   (i) **NOTE:** There is label to show the Storage tray lock and unlock on the left side of the chassis.

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

Figure 67. Removing the storage tray

Next steps

Replace the storage tray for Intel GPU configurations.

Installing the storage tray for Intel GPU configurations

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 cable cover.
4. Observe and disconnect the intrusion switch cable from the storage tray that is connected from the system board. Disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connectors of the storage tray and keep the cables away from the storage tray.

Steps

1. Align and insert the storage tray on the guiding slots of the chassis.
2. For tray installation, press down the handle and slide the tray into the chassis toward the rear of the system until it is firmly seated.
3. Using a Phillips 1 screwdriver, tighten the screws to secure on the drive cage.

   (i) **NOTE:** There is label to show the Storage tray lock and unlock on the left side of the chassis.

   (i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
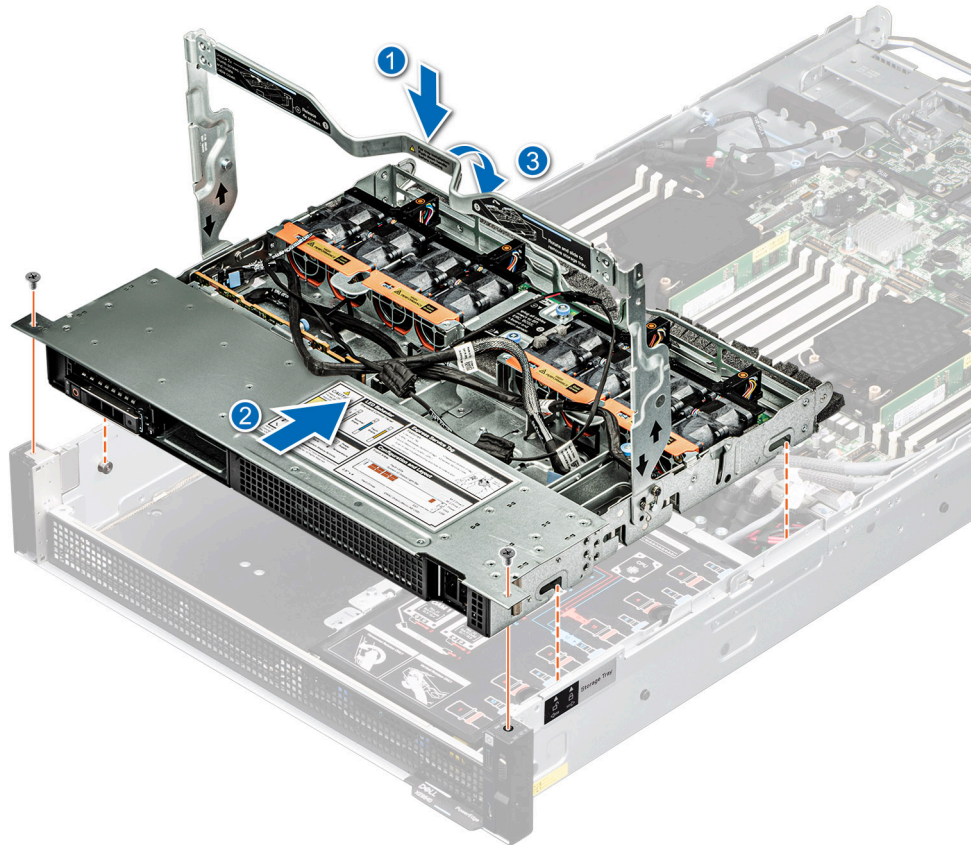
Figure 68. Installing the storage tray

Next steps

1. Reconnect the intrusion switch bridge cable from the storage tray that is connected from the system board. Reconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connector of the storage tray.
2. Install the cable cover.
3. Follow the procedure listed in After working inside your system.

Removing the storage tray for NVIDIA GPU configurations

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 cable cover.
4. Observe and disconnect the intrusion switch bridge cable from the connectors on the storage tray that is connected from the system board. Observe and disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connector on the storage tray, signal cable from the connectors on the PDB2 and then keep the cables away from the storage tray. Disconnect the VSB power cables (left and Right) from the connector on the system board and keep them on the storage tray.

Steps

1. Using a Phillips 1 screwdriver, remove the screws on the drive cage.
2. Rotate the handle at an angle and slide the storage tray toward the front of the chassis.
3. Lift the storage tray out of the system.

   (i) **NOTE:** There is label to show the Storage tray lock and unlock on the left side of the chassis.

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

Figure 69. Removing the storage tray

Next steps

Replace the storage tray for NVIDIA GPU configurations.

Installing the storage tray for NVIDIA GPU configurations

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 cable cover.
4. Observe and disconnect the intrusion switch bridge cable from the connectors on the storage tray that is connected from the system board. Observe and disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connector on the storage tray, signal cable from the connectors on the PDB2 and then keep the cables away from the storage tray. Disconnect the VSB power cables (left and Right) from the connector on the system board and keep them on the storage tray.

Steps

1. Align and insert the storage tray on the guiding slots of the chassis.
2. For tray installation, press down the handle and slide the tray into the chassis toward the rear of the system until it is firmly seated.
3. Using a Phillips 1 screwdriver, tighten the screws on the drive cage.

   (i) **NOTE:** There is label to show the Storage tray lock and unlock on the left side of the chassis.

   (i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
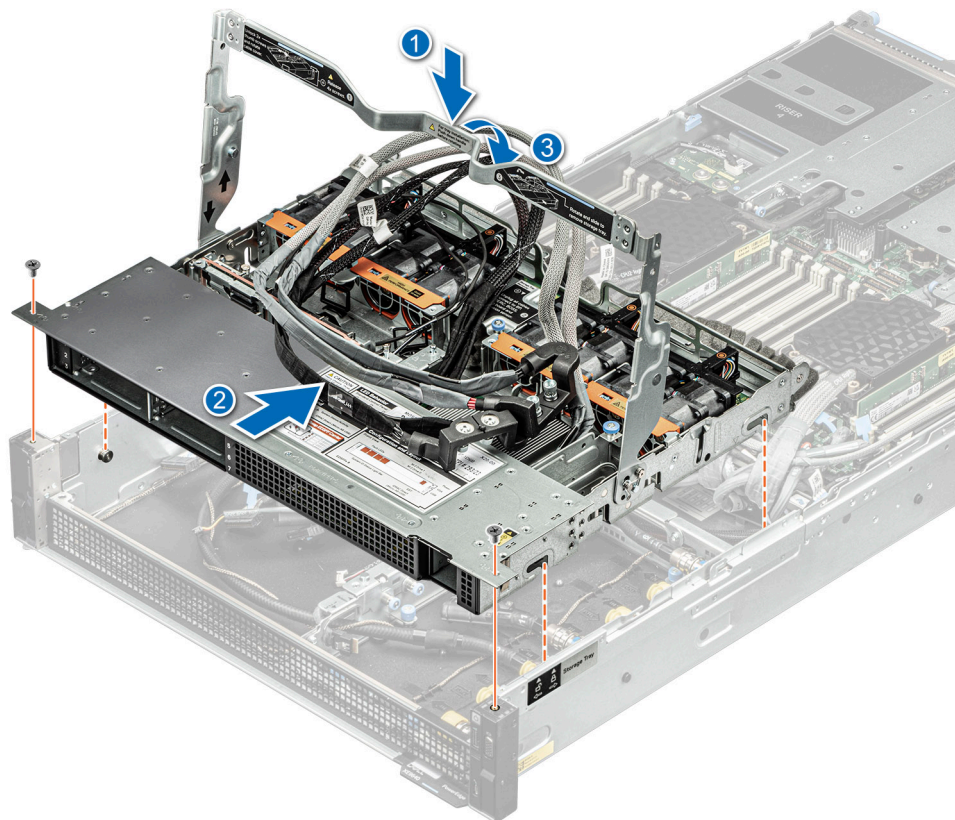
Figure 70. Installing the storage tray

Next steps

1. Reconnect the intrusion switch bridge cable from the storage tray that is connected from the system board. Reconnect the drive backplane cables, BOSS power and signal cables, signal cable on the PDB2, fan board cables on the connector of the storage tray. Reconnect the VSB power cables on the system board.
2. Install the cable cover.

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

Cable routing for Intel GPU Configurations
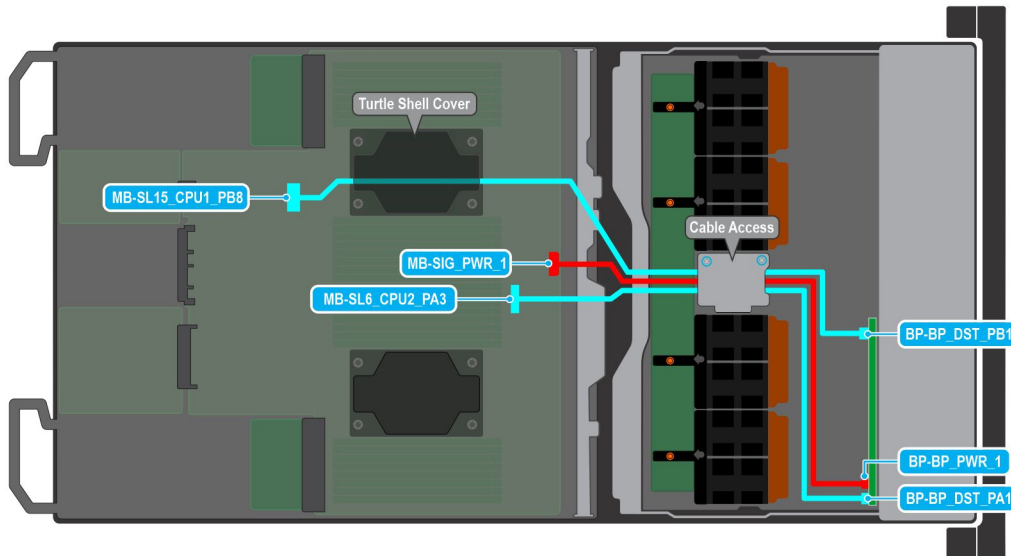
Figure 71. 4 x 2.5-inch Backplane cable connections on the system board for Intel GPU Configurations

ⓘ **NOTE:** Make sure you route the SL15_CPU1_PB8 cable via processor 1 turtle shell.

Order	From	To
1	MB-SL6_CPU2_PA3 (signal connector on system board)	BP-BP_DST_PA1 (backplane signal connector)
2	MB-SIG_PWR_1 (system board power connector)	BP-BP_PWR_1 (backplane power connector)
3	MB-SL15_CPU1_PB8 (signal connector on system board)	BP-BP_DST_PB1(backplane signal connector)
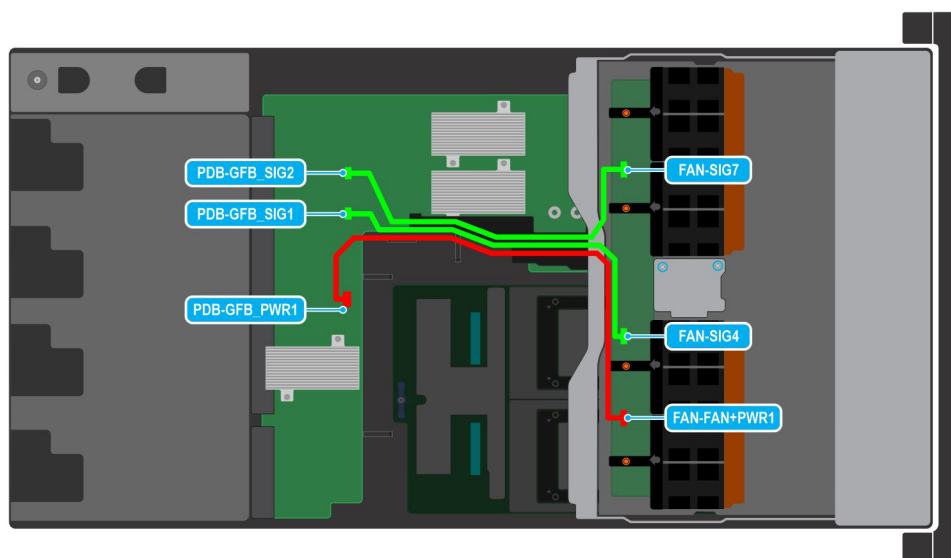
Figure 72. Fan cables connection from the fan board of the Storage tray to the PDB of the bottom layer for the Intel GPU configurations

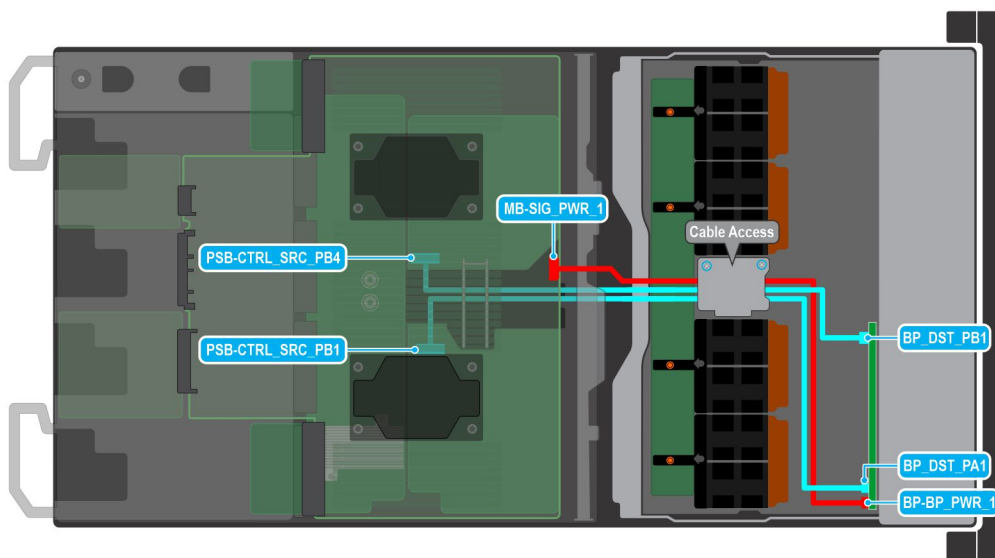| Order	From	To
1	PDB-GFB_PWR1 (Power Distribution Board (PDB) power connector)	FAN-FAN+PWR1 (System fan power connector)
2	PDB-GFB_SIG1 (PDB signal cable)	FAN-SIG4 (System fan signal cable)
3	PDB-GFB_SIG2 (PDB signal cable)	FAN-SIG7 (System fan signal cable)
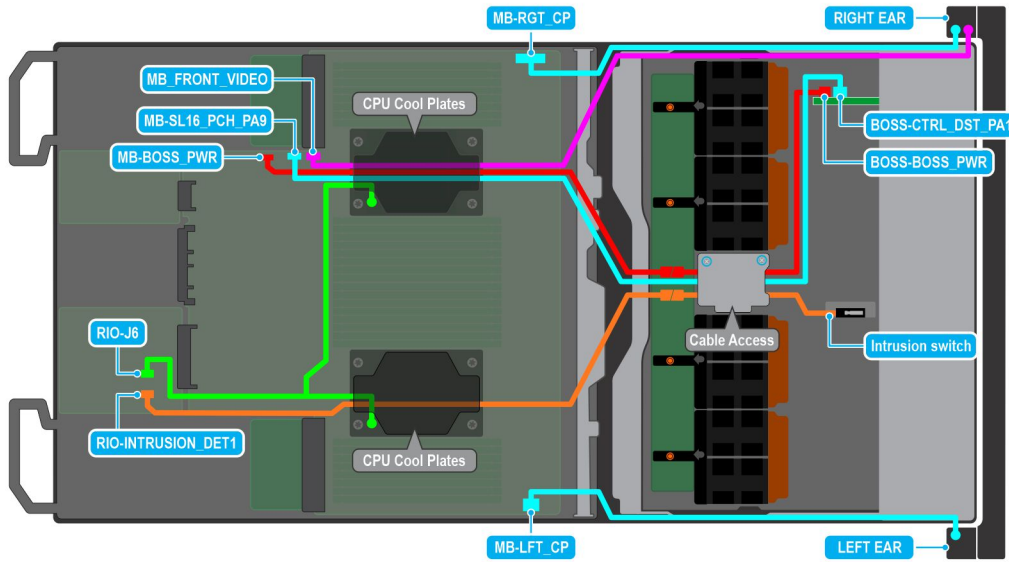
Figure 73. BOSS-N1, Right and Left Control panels, Intrusion switch cable connections from the Storage tray connecting on the System board for Intel GPU Configurations

ⓘ **NOTE:** Make sure you route the VGA connector, BOSS module signal cable, BOSS module power connector on system board via Processor 1 turtle shell.

ⓘ **NOTE:** Make sure you route the Intrusion switch connector on system board via processor 2 turtle shell.

Order	From	To
1	MB-BOSS_PWR (BOSS module power connector on system board)	BOSS-BOSS_PWR (BOSS module power connector)
2	MB-SL16_PCH_PA9 (BOSS module signal cable on system board)	BOSS-CTRL_DST_PA1 (BOSS module signal connector)
3	RIO-INTRUSION_DET1 (Intrusion switch connector on system board)	Intrusion Switch
4	MB-LFT_CP (Left control panel connector on system board)	Left EAR (Left Control Panel)
5	MB-RGT_CP (Right control panel connector on system board)	Right EAR (Right Control Panel)
6	MB_FRONT_VIDEO (VGA connector on system board)	VGA port
7	RIO-J6 (CPU cool plates connector on system board)	CPU Cool Plates
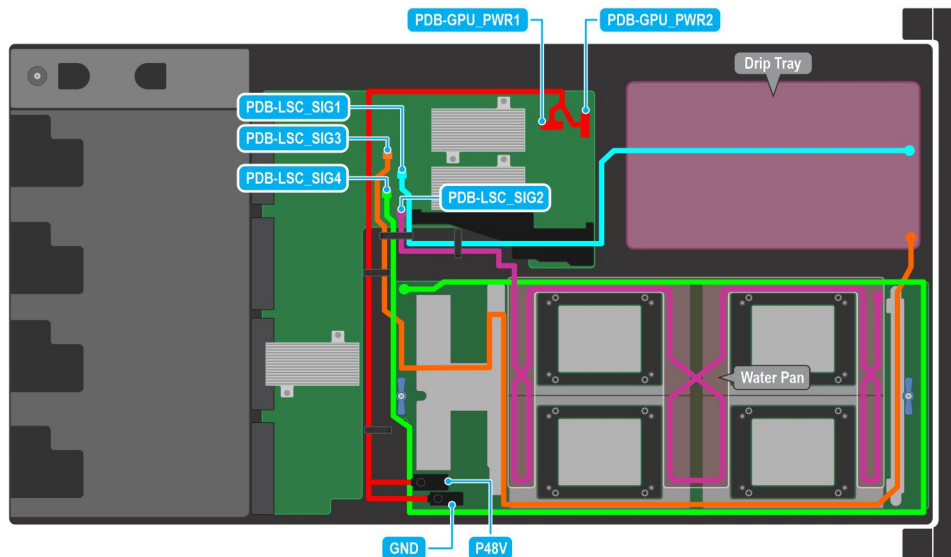
Figure 74. Leakage sensor cable connections for Intel GPU configuration

Order	Cable names
1	P48V and GND (Intel PVC power cable connectors on GPU board) connecting to PDB-GPU_PWR1 and PDB-GPU_PWR2 (GPU power connectors on PDB)
2	PDB-LSC_SIG3 (PDB signal connector) - CBB Cold Plate LS cable
3	PDB-LSC_SIG1 (PDB signal connector) - Internal Manifold Drip Tray LS Cable
4	PDB-LSC_SIG2 (PDB signal connector) - Sensor Tray LS cable
5	PDB-LSC_SIG4 (PDB signal connector) - Base Board LS cable
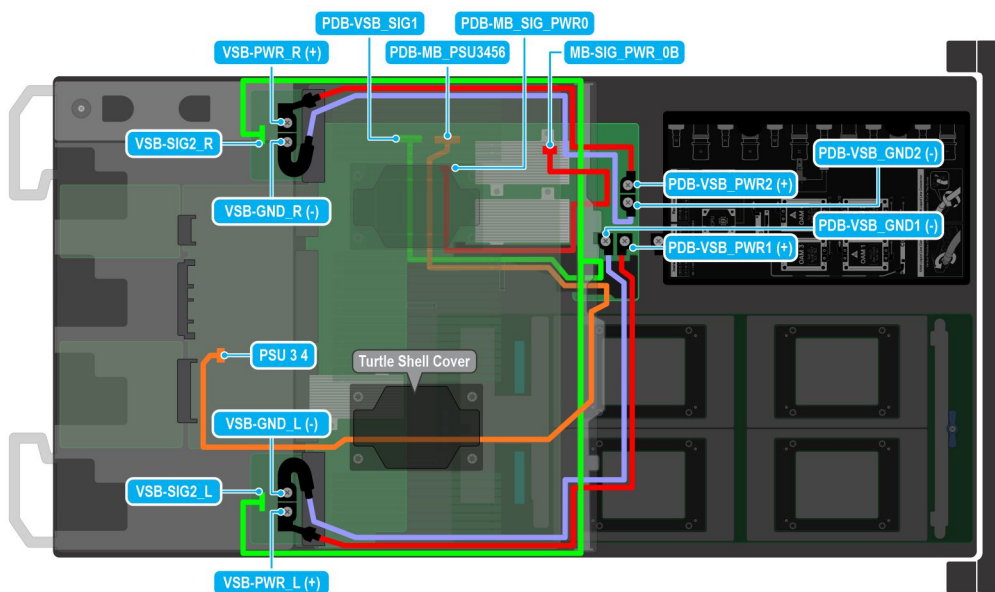
Figure 75. VSB cables connections for Intel GPU configurations

> **NOTE:** Make sure you route the PSU 3 4 (Power Supply Unit connector cable) on system board via processor 2 turtle shell from the PDB of the bottom layer.

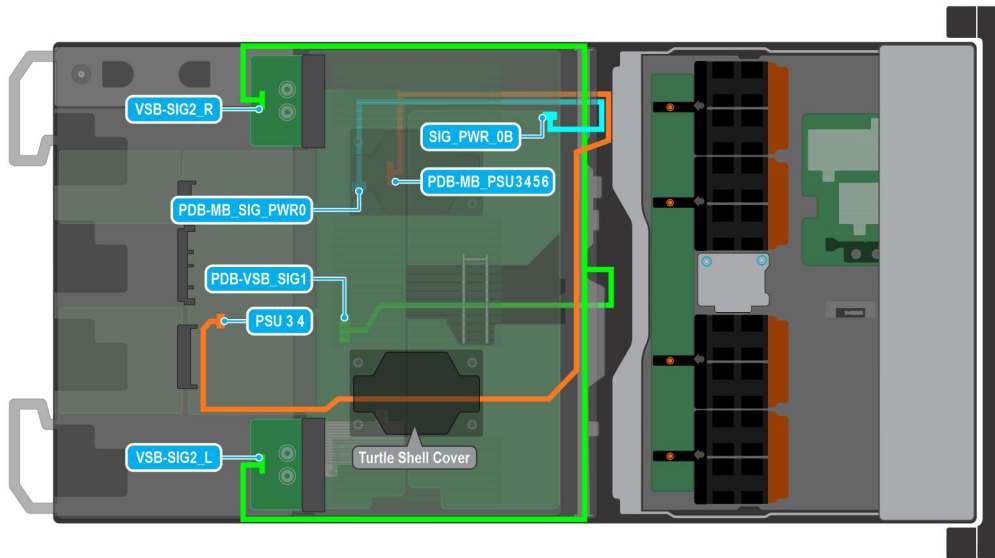| Order	From	To
1	VSB-PWR_L (+) (VSB left power connector)	PDB-VSB_PWR1 (+) (PDB power connector)
2	VSB-GND_L (-) (VSB left ground connector)	PDB-VSB_GND1 (-) (PDB ground connector)
3	VSB-PWR_R (+)(VSB right power connector)	PDB-VSB_PWR2 (+) (PDB power connector)
4	VSB-GND_R (-) (VSB right ground connector)	PDB-VSB_GND2 (-) (PDB ground connector)
5	VSB-SIG2_R (VSB right signal connector)	VSB-SIG2_R and PDB-VSB_SIG1 (VSB right signal connector and PDB signal connector)
6	MB-SIG_PWR_0B (System board power connector)	PDB-MB_SIG_PWR0 (PDB signal connector)
7	PSU 3 4 (Power Supply Unit connector cable)	PDB-MB_PSU3456 (System board power connector)
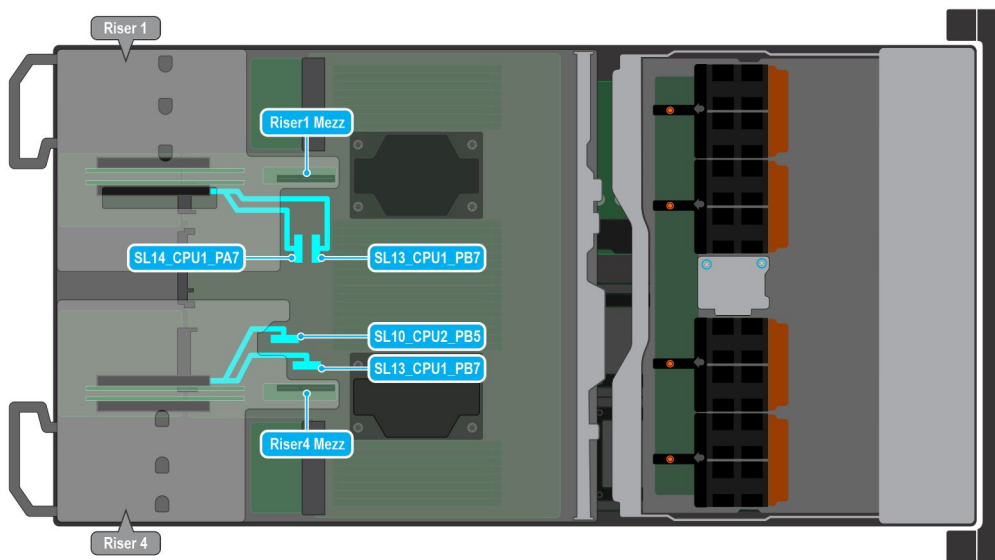
Figure 76. Risers 1A and 4A cable connectors on the system board for Intel GPU configurations

Order	From	To
1	SL14_CPU1_PA7 and SL13_CPU1_PB7 (Riser 1 signal cable connectors on system board)	Riser 1 (Mezz)
2	SL10_CPU2_PB5 and SL13_CPU1_PB7 (Riser 4 signal cable connectors on system board)	Riser 4 (Mezz)
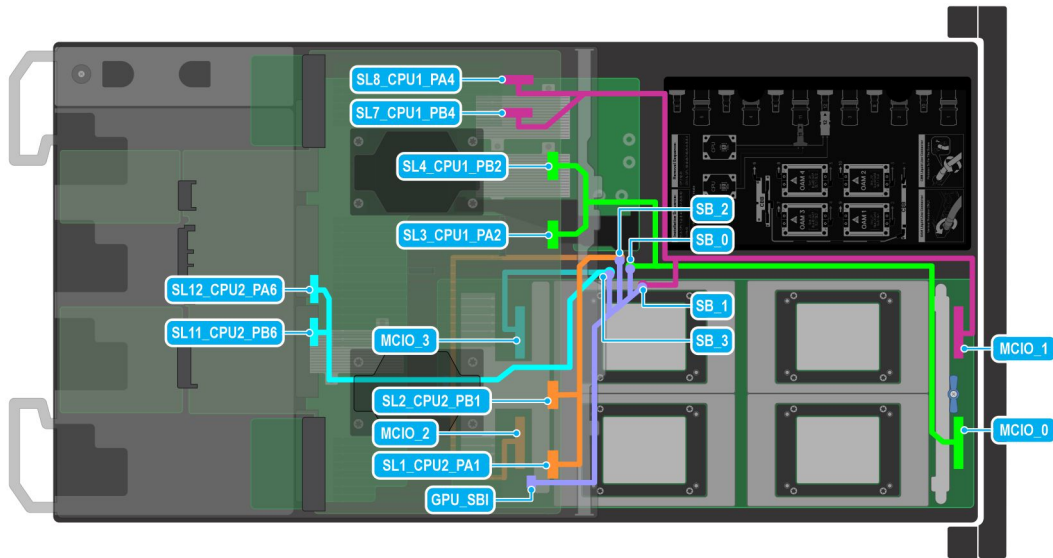
Figure 77. GPU cable connectors for Intel GPU configurations

ⓘ **NOTE:** Make sure you route theSL12_CPU2_PA6 and SL11_CPU2_PB6 (Signal connectors on system board) via processor 2 turtle shell from the PDB of the bottom layer.

Order	From	To
1	GPU_SBI (GPU cable connector on system board)	SB_0, SB_1, SB_2 and SB_3 (GPU floating cables)
2	SL1_CPU2_PA1 and SL2_CPU2_PB2 (Signal connectors on system board)	MCIO_2 (Intel PVC Tuscany)
3	SL8_CPU1_PB4 and SL7_CPU1_PB4 (Signal connectors on system board)	MCIO_1 (Intel PVC Tuscany)
4	SL4_CPU_PB2 and SL3_CPU1_PA2 (Signal connectors on system board)	MCIO_0 (Intel PVC Tuscany)
5	SL12_CPU2_PA6 and SL11_CPU2_PB6 (Signal connectors on system board)	MCIO_3 (Intel PVC Tuscany)

Cable routing for NVIDIA GPU Configurations

ⓘ **NOTE:** Make sure

Figure 78. BOSS-N1, Right and Left Control panels, Intrusion switch cable connections from the Storage tray connecting on the System board for NVIDIA GPU Configurations

(i) **NOTE:** Make sure you route the VGA connector, BOSS module signal cable, BOSS module power connector on system board via Processor 1 turtle shell.

(i) **NOTE:** Make sure you route the Intrusion switch connector on system board via processor 2 turtle shell.

Order	From	To
1	MB-BOSS_PWR (BOSS module power connector on system board)	BOSS-BOSS_PWR (BOSS module power connector)
2	MB-SL16_PCH_PA9 (BOSS module signal cable on system board)	BOSS-CTRL_DST_PA1 (BOSS module signal connector)
3	RIO-INTRUSION_DET1 (Intrusion switch connector on system board)	Intrusion Switch
4	MB-LFT_CP (Left control panel connector on system board)	Left EAR (Left Control Panel)
5	MB-RGT_CP (Right control panel connector on system board)	Right EAR (Right Control Panel)
6	MB_FRONT_VIDEO (VGA connector on system board)	VGA port
7	MB_DSL1 (System board signal connector)	MB_SL15 (System board signal connector)
8	RIO-J6 (CPU cool plates connector on system board)	CPU Cool Plates
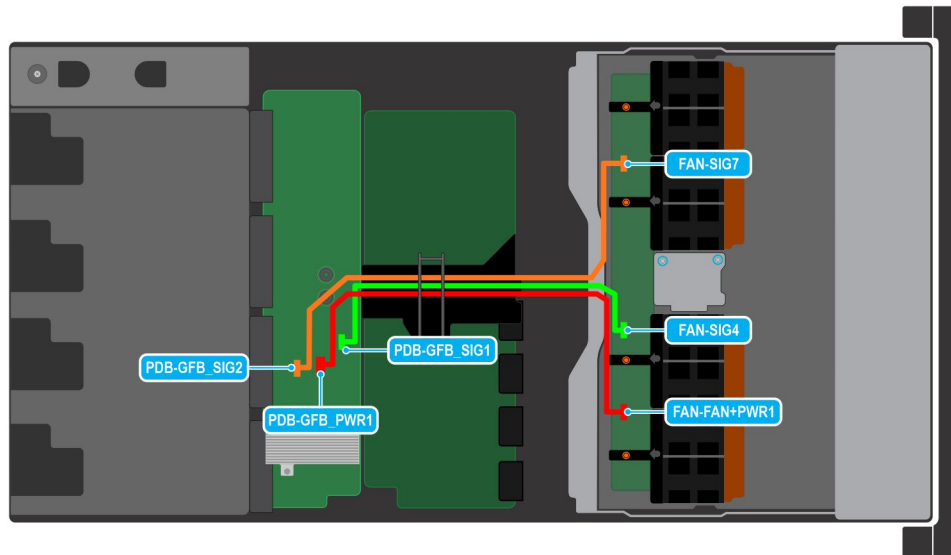
Figure 79. Fan cables connection of the Storage tray on the bottom layer of the PDB for NVIDIA GPU Configurations

Order	From	To
1	PDB-GFB_PWR1 (Power Distribution Board (PDB) power connector)	FAN-FAN+PWR1 (System fan power connector)
2	PDB-GFB_SIG1 (PDB signal cable)	FAN-SIG4 (System fan signal cable)
3	PDB-GFB_SIG2 (PDB signal cable)	FAN-SIG7 (System fan signal cable)

Figure 80. 4 x 2.5-inch Backplane cable connections on the system board for NVIDIA GPU Configurations

Order	From	To
1	MB-SIG_PWR_1 (system board power connector)	BP-BP_PWR_1 (backplane signal connector)
2	PSB-CTRL_SRC_PB4 (signal connector on system board)	BP_DST_PB1 (backplane signal connector)
3	PSB-CTRL_SRC_PB1 (signal connector on system board)	BP_DST_PA1 (backplane signal connector)
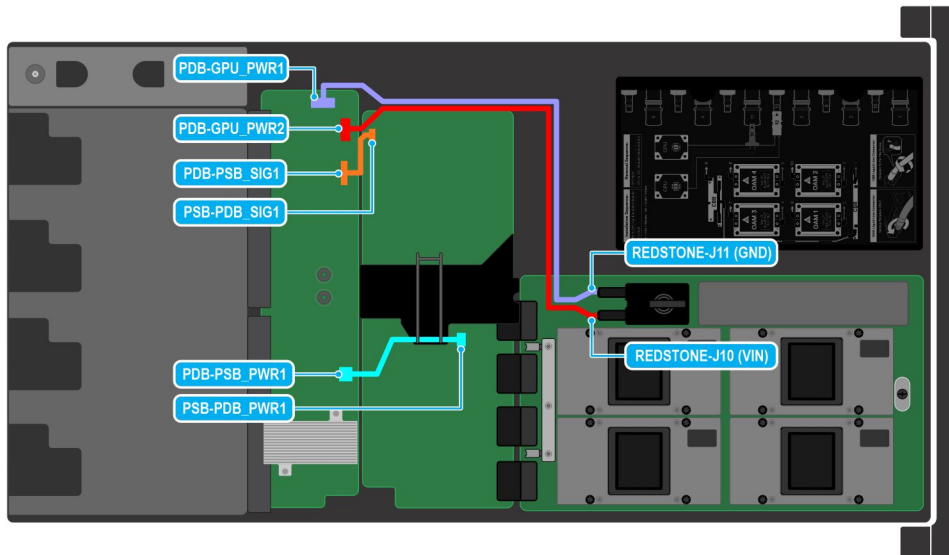
Figure 81. NVIDIA GPU cable connections on the Power Supply Board (PSB) and Power Distribution Board (PDB)

Order	From	To
1	PDB-PSB_SIG1 (PDB signal cable)	PSB-PDB_SIG1 (PSB signal cable)
2	PDB-PSB_PWR1 (PDB power cable)	PSB-PDB_PWR1 (PSB power connector)
3	REDSTONE-J11 (GND) (GPU Ground cable connector)	PDB-GPU_PWR1 (PDB GPU power connector 1)
4	REDSTONE-J10 (VIN) (GPU input signal cable)	PDB-GPU_PWR2 (PDB GPU power connector 2)
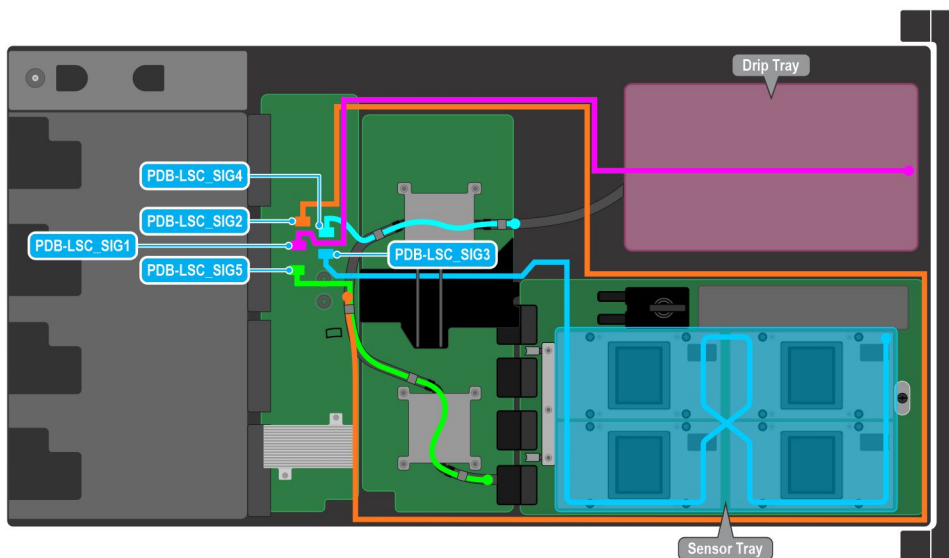
Figure 82. Leakage sensor cable connections for NVIDIA GPU configuration

Order	Cable names
1	PDB-LSC_SIG3 - GPU Plate LS signal cable
2	PDB-LSC_SIG5 (MISC LS signal cable) - NVLINK cold plate LS signal cable

Order	Cable names
3	PDB-LSC_SIG4 (PDB signal connector) - NVLINK cold plate LS signal cable
4	PDB-LSC_SIG2 (PDB signal connector) - Base Tray/ BaseBoard LS signal connector
5	PDB-LSC_SIG1 (PDB signal connector) - Manifold Drip Tray LS Connector
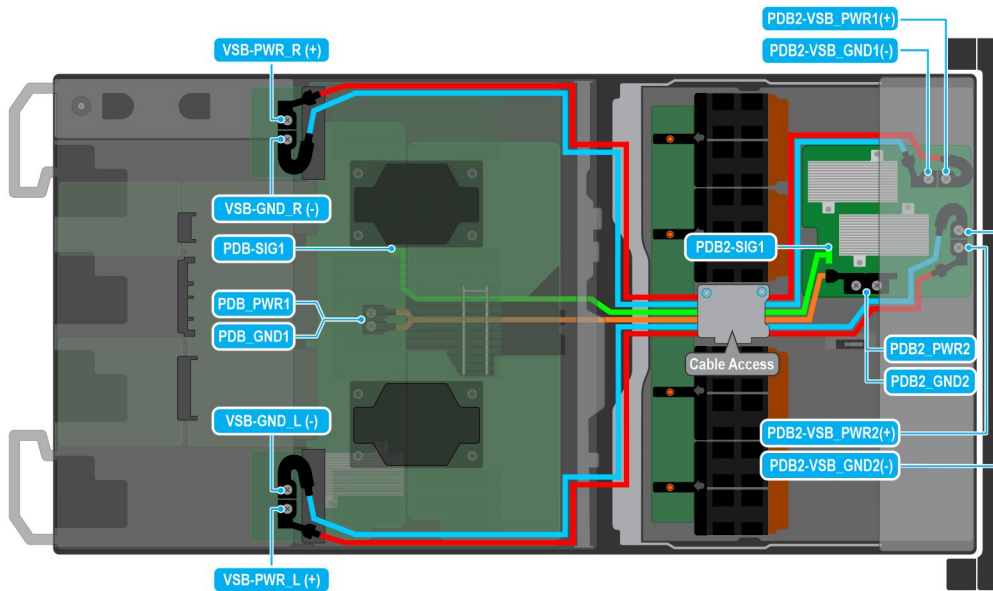
Figure 83. VSB cables connections for NVIDIA GPU configurations

Order	From	To
1	PDB_PWR1 and PDB_GND1 (PDB 1 power and ground connectors)	PDB2_PWR2 and PDB2_GND2 (PDB 2 power and ground connectors)
2	PDB-SIG1 (PDB 1 signal cable)	PDB2-SIG1 (PDB 2 signal cable)
3	VSB-PWR_L (+) and VSB-GND_L (-) (VSB left power and ground connectors)	PDB2-VSB_PWR2 (+) and PDB2-VSB_GND2 (-) (PDB 2 power and ground connectors)
4	VSB-PWR_R (+) and VSB-GND_R (-) (VSB left power and ground connectors)	PDB2-VSB_PWR1 (+) and PDB2-VSB_GND1 (-) (PDB 2 power and ground connectors)
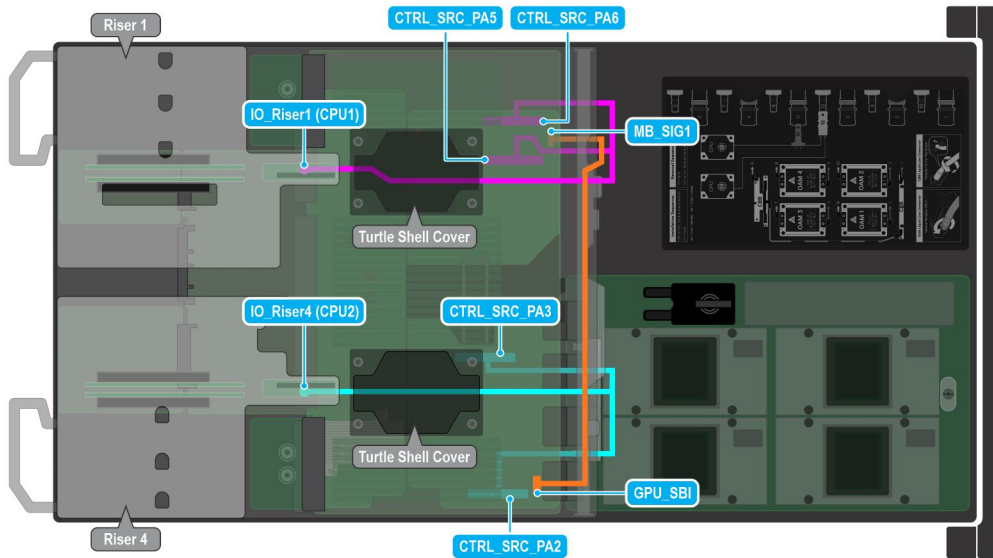
Figure 84. Risers 1A and 4A cable connectors on the system board for NVIDIA GPU configurations

ⓘ **NOTE:** Make sure you route the Riser 1B cable connector on system board via Processor 1 turtle shell from the PSB of the bottom layer.

ⓘ **NOTE:** Make sure you route the Riser 4B cable connector on system board via Processor 1 turtle shell from the PSB of the bottom layer.

Order	From	To
1	CTRL_SRC_PA5 and CTRL_SRC_PA6 (Riser 1 signal cable connectors on PSB)	IO_Riser1 (CPU1) (Riser 1 I/O cable connector)
2	CTRL_SRC_PA2 and CTRL_SRC_PA3 (Riser 4 signal cable connectors on PSB)	IO_Riser4 (CPU2) (Riser 4 I/O cable connector)
3	MB_SIG1 (Signal cable on system board)	GPU_SBI (GPU sideband connector)
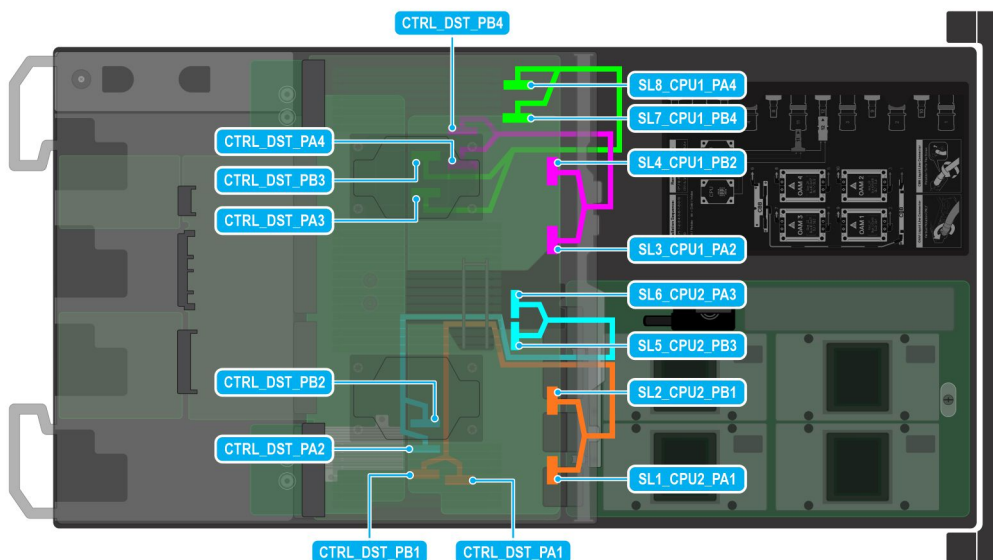
Figure 85. GPU cable connectors for NVIDIA GPU configurations

Order	From	To
1	CTRL_DST_PB3 and CTRL_DST_PA3 (Signal connectors on system board)	SL8_CPU1__PA4 and SL7_CPU1_PB4 (Signal cable connectors on PSB)
2	CTRL_DST_PA4 and CTRL_DST_PB4 (Signal connectors on system board)	SL4_CPU1_PB2 and SL3_CPU1_PA2 (Signal cable connectors on PSB)
3	CTRL_DST_PB2 and CTRL_DST_PA2 (Signal connectors on system board)	SL6_CPU2_PA3 and SL5_CPU2_PB3 (Signal cable connectors on PSB)
4	CTRL_DST_PB1 and CTRL_DST_PA1 (Signal connectors on system board)	SL2_CPU2_PB1 and SL1_CPU2_PA1 (Signal cable connectors on PSB)

Figure 86. VSB cables connections for NVIDIA GPU configurations

(i) **NOTE:** Make sure you route the PSU 3 4 (Power Supply Unit connector cable) on system board via processor 2 turtle shell from the PDB of the bottom layer.

Order	From	To
1	PDB-MB_SIG_PWR0 (PDB power connector on system board)	SIG_PWR_0B (Power connector on PDB)
2	PDB-MB_PSU 3 4 5 6 (PSU connector on system board)	PSU 3 4 (Power Supply Unit)
3	PDB-VSB_SIG1 (VSB signal cable connector on PDB)	VSB-SIG2_R and VSB-SIG2_L (Signal cable right and left on VSB)

Power supply unit

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

Removing a power supply unit

Prerequisites

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

1. Follow the safety guidelines listed in the Safety instructions.
2. Disconnect the power cable from the power outlet and from the PSU that you intend to remove.
3. Remove the cable from the strap on the PSU handle.
4. Unlatch and lift or remove the optional cable management accessory if it interferes with the PSU removal.

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

Steps

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

Figure 87. Removing a power supply unit

Next steps

Replace the PSU.

Installing a power supply unit

Prerequisites

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

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

Steps

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

Figure 88. Installing a power supply unit

Next steps

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

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

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

System memory

System memory guidelines

The PowerEdge XE9640 system supports DDR5 registered DIMMs (RDIMMs). System memory holds the instructions that are started by the processor.
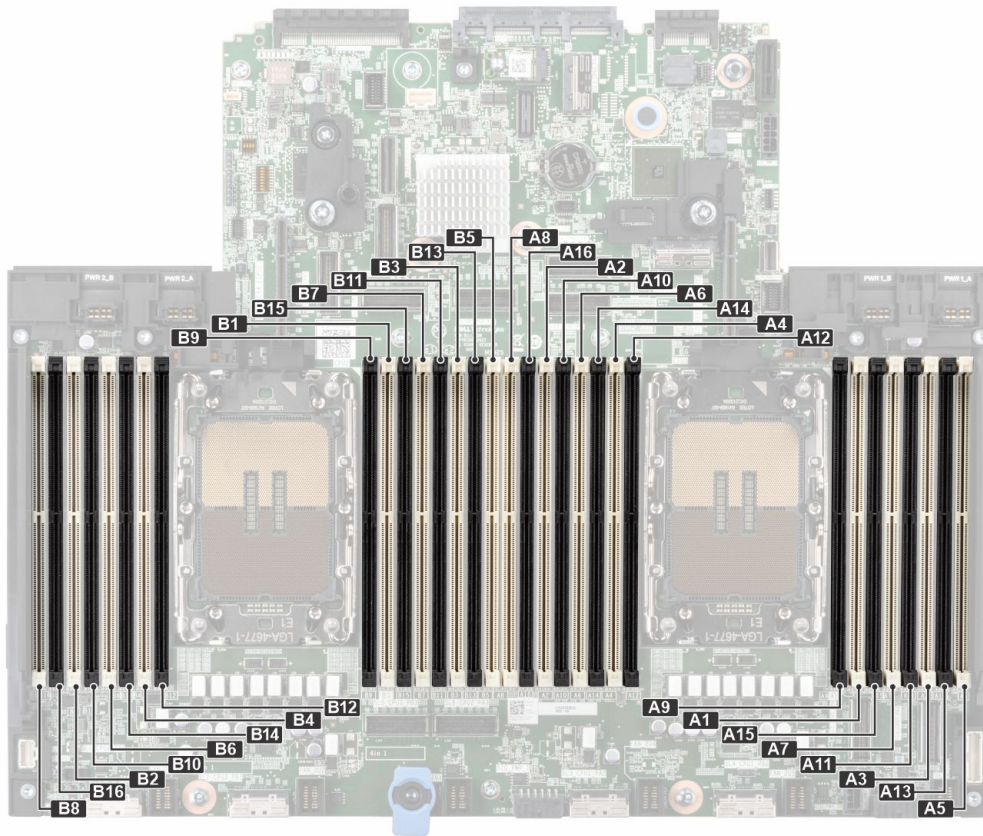
Figure 89. Memory channels

Memory channels are organized as follows:

Table 66. Memory channels

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

Table 67. Supported memory matrix for Intel GPUs

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

Table 68. Supported memory matrix for NVIDIA GPUs

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

Table 68. Supported memory matrix for NVIDIA GPUs (continued)

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

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

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

General memory module installation guidelines

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

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

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

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

The following are the recommended guidelines for installing memory modules:

- All DIMMs must be DDR5.
- If memory modules with different speeds are installed, they operate at the speed of the slowest installed memory module(s).
- Populate memory module sockets only if a processor is installed.
  - For Intel GPU configured with dual-processor systems, sockets A1 to A8 and sockets B1 to B8 are available.
  - For NVIDIA GPU configured with dual-processor systems, sockets A1 to A16 and sockets B1 to B16 are available.
- In **Optimizer Mode**, the DRAM controllers operate independently in the 64-bit mode and provide optimized memory performance.

Table 69. Memory population rules for Intel GPUs

Processor	Memory population	Memory population information
Dual processor (Start with processor1. Processor 1 and processor 2 population should match)	A{1}, B{1}, A{2}, B{2}, A{3},B{3}, A{4}, B{4}, A{5}, B{5},A{6}, B{6}, A{7}, B{7} A{8},B{8}	16 DIMMs are supported per system.

Table 70. Memory population rules for NVIDIA GPUs

Processor	Memory population	Memory population information
Dual processor (Start with processor1. Processor 1 and processor 2 population should match)	A{1}, B{1}, A{2}, B{2}, A{3},B{3}, A{4}, B{4}, A{5}, B{5},A{6}, B{6}, A{7}, B{7} A{8},B{8}, A{9}, B{9}, A{10},B{10}, A{11}, B{11}, A{12}, B{12}, A{13}, B{13}, A{14},B{14}, A{15}, B{15}, A{16},B{16}	8 or 16 or 32 DIMMs are supported per system.

- Populate all the sockets with white release tabs first, followed by the sockets with black release tabs.
- Mixing of any different memory module capacities is not supported.

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.**

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.
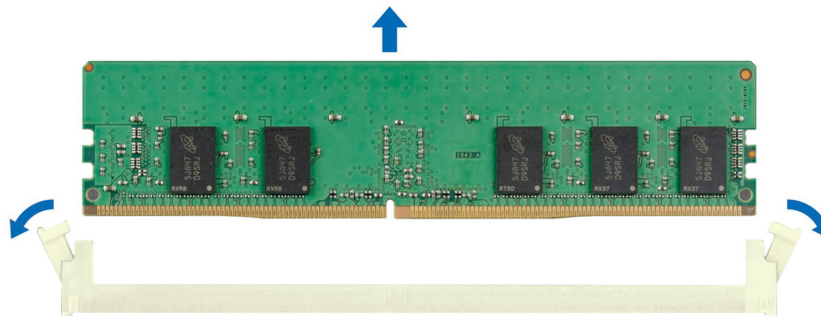
Figure 90. Removing a memory module

Next steps

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

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

ⓘ **NOTE:** To ensure proper system cooling, memory module blanks must be installed in any memory socket that is not occupied. The memory module blanks compatible with the XE9640 are DDR5 gray color blanks. Remove the memory module blanks only if you intend to install memory modules in those sockets.

Installing a memory module

Prerequisites

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

Steps

1. Locate the appropriate memory module socket.

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

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

   (i) **NOTE:** Ensure that the socket ejector latches are fully open, before installing the memory module.

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

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

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

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

4. Press the memory module with your thumbs until the ejectors firmly click into place. When the memory module is properly seated in the socket, the levers on the memory module socket align with the levers on the other sockets that have memory modules that are installed.
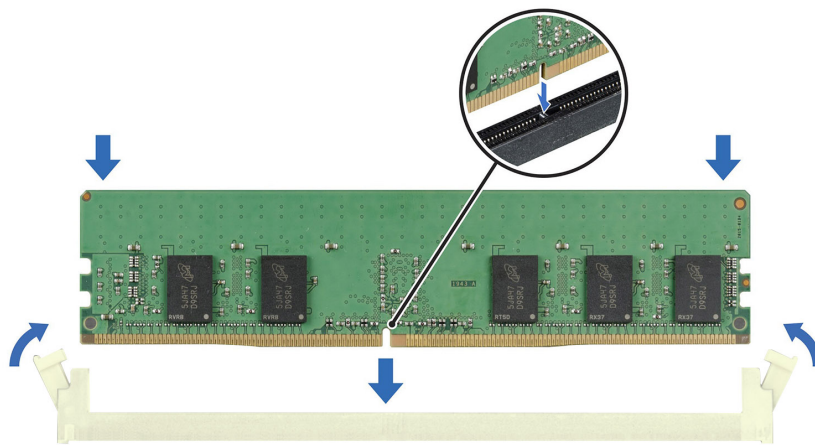
Figure 91. Installing a memory module

Next steps

1. Follow the procedure listed in After working inside your system.
2. To verify if the memory module has been installed properly, press F2 and navigate to **System Setup Main Menu > System BIOS > Memory Settings**. In the **Memory Settings** screen, the System Memory Size must reflect the updated capacity of the installed memory.
3. If the System Memory Size is incorrect, one or more of the memory modules may not be installed properly. Ensure that the memory modules are firmly seated in their sockets.
4. Run the system memory test in system diagnostics.

Turtle shell

This is a service technician replaceable part only.

Removing the turtle shell

Prerequisites

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

Steps

Using the two fingers, lift the turtle shell from the DLC module.
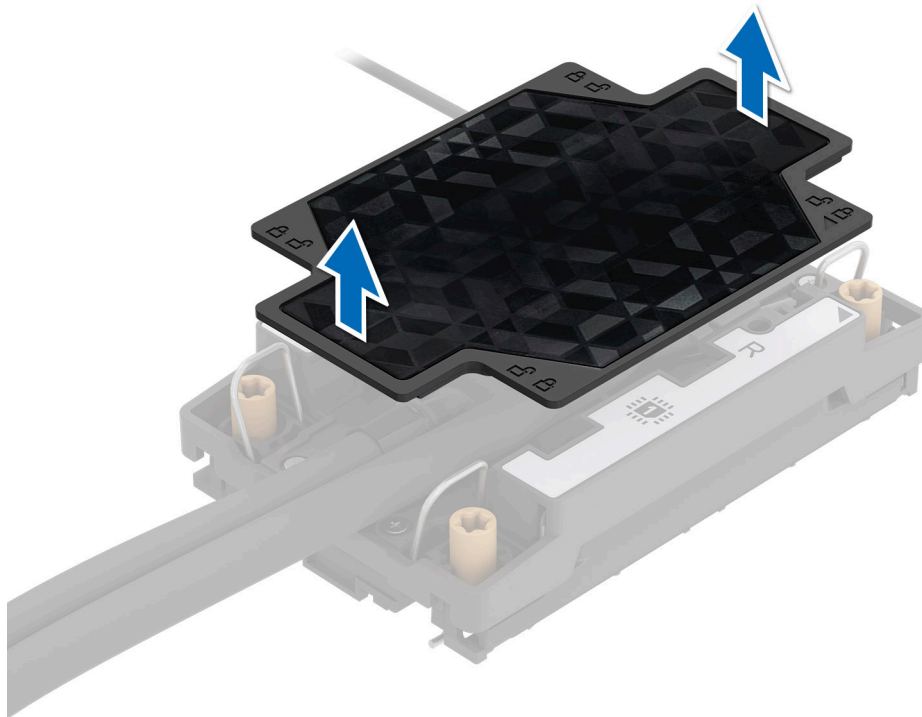
Figure 92. Lift the turtle shell

Next steps

Replace the turtle shell.

Installing the turtle shell

Prerequisites

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

Steps

Using the two finger, align and install the turtle shell on the DLC module. Ensure to align the triangle mark on the turtle shell with the triangle mark on the DLC module.
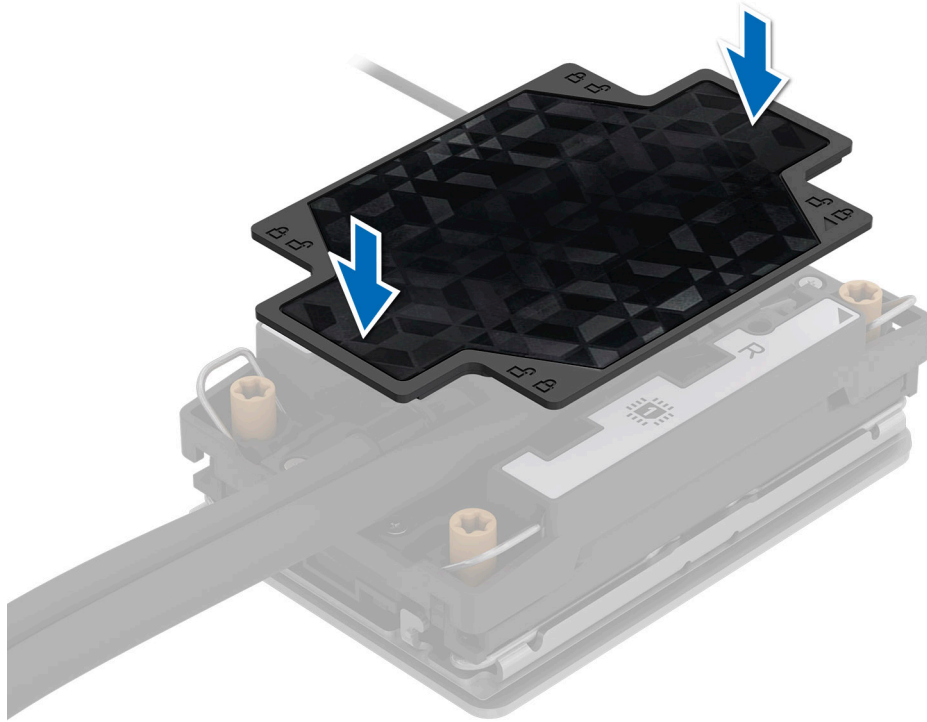
Figure 93. Install the turtle shell

Next steps

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

Expansion cards and expansion card risers

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

Expansion card installation guidelines
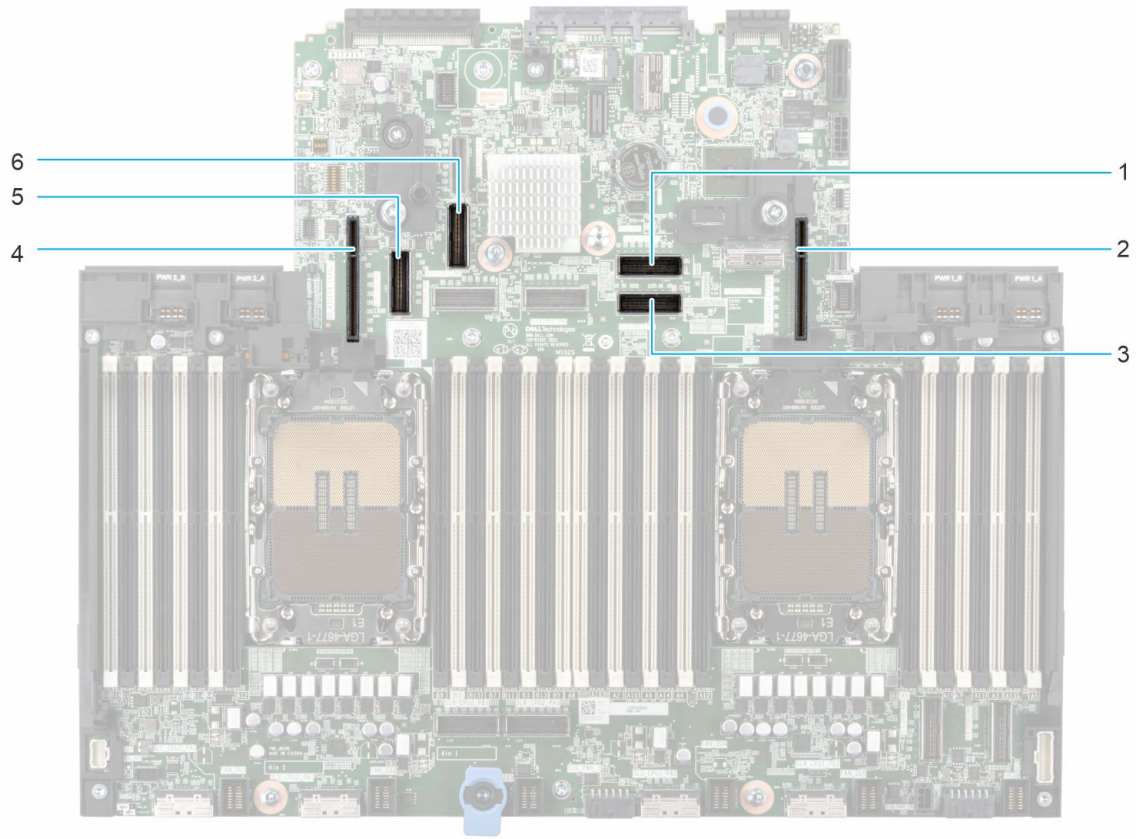
Figure 94. Expansion card riser slot connectors

ⓘ **NOTE:** The Intel GPU configurations support Risers 1A and 4A. The NVIDIA GPU configurations support Risers 1B and 4B.

1. Riser 1A cable connector
2. Riser 1A/1B
3. Riser 1A cable connector
4. Riser 4A/4B
5. Riser 4A cable connector
6. Riser 4A cable connector
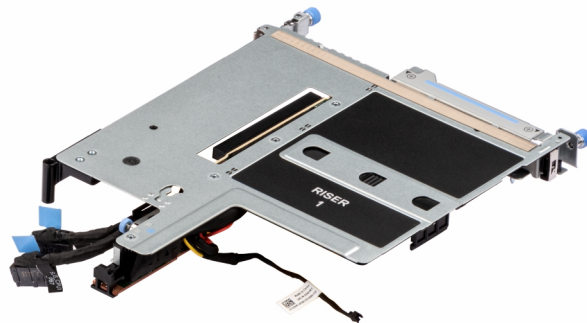
Figure 95. Riser 1A top view for Intel GPU configuration
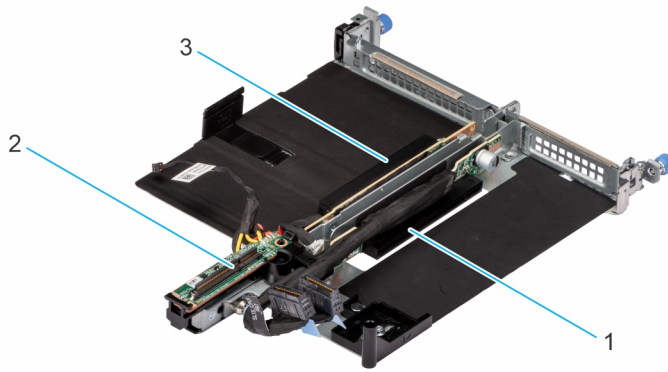
Figure 96. Riser 1A for Intel GPU configuration

1. Slot 2
2. cable connector
3. Slot 1
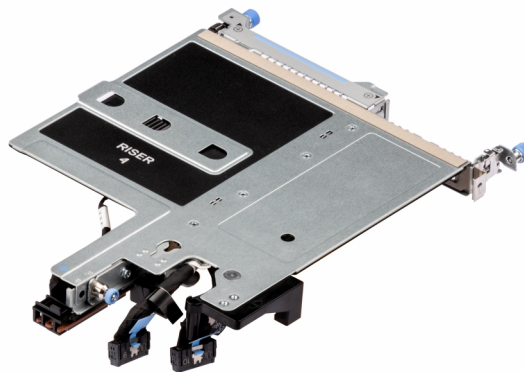
Figure 97. Riser 4A top view or Intel GPU configuration
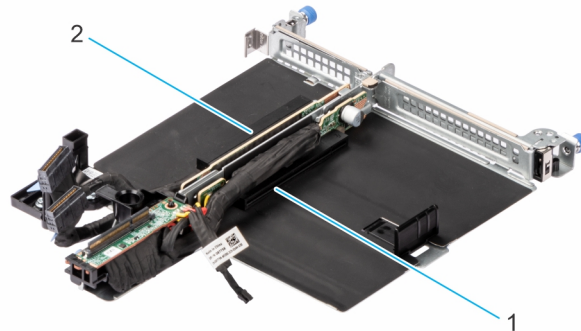
Figure 98. Riser 4A for Intel GPU configuration

1. Slot 4
2. Slot 3
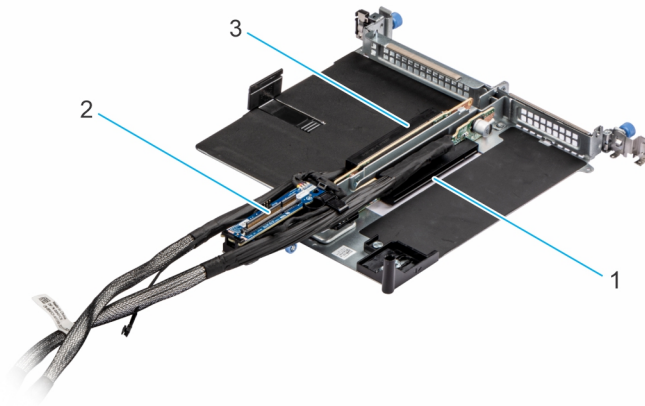
Figure 99. Riser 1B for NVIDIA GPU configuration

1. Slot 2
2. cable connector
3. Slot 1
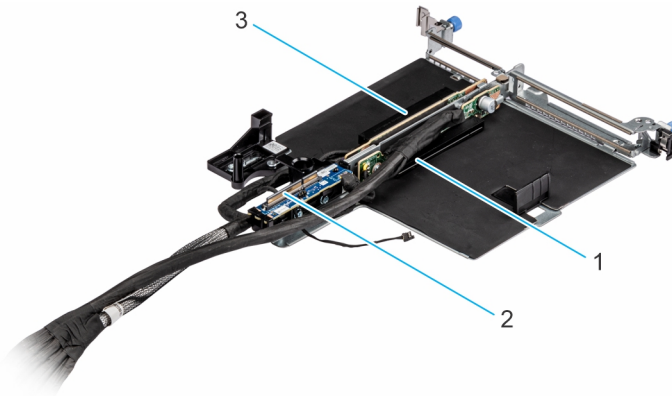
Figure 100. Riser 4B for NVIDIA GPU configuration

1. Slot 4
2. cable connector
3. Slot 3

(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.

Removing the expansion card risers for Intel GPU configuration

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. For Riser 1A and Riser 4A, using a Phillips 2 screwdriver, loosen the blue thumb screw on the riser.
2. Disconnect any cables that are connected to the expansion card or the riser.
3. Pull the plunger toward the front of the chassis to unlock the riser.
4. Lift the expansion card riser from the riser connector on the system board.
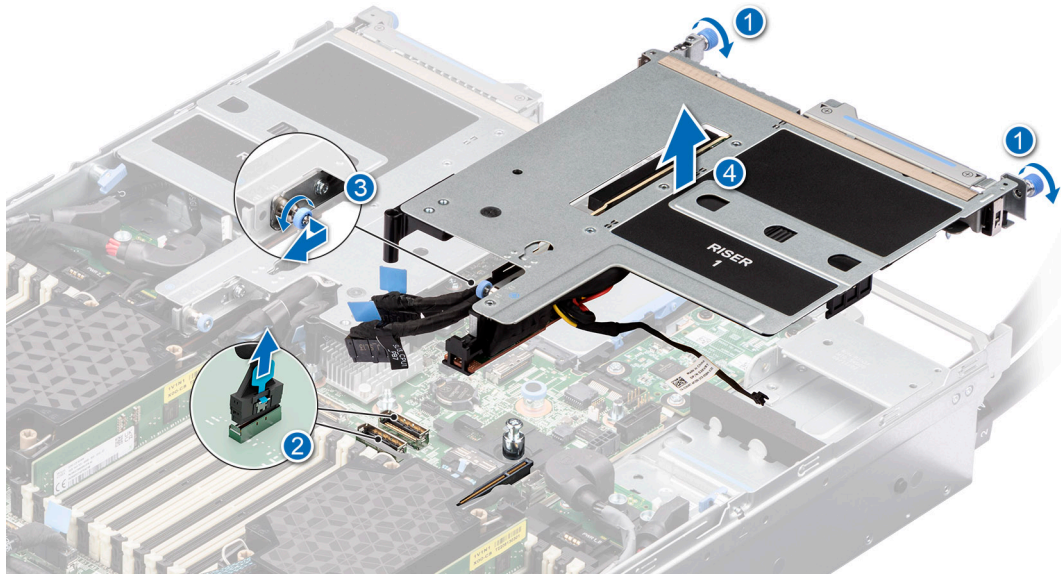
Figure 101. Removing the expansion card riser (Riser 1A)
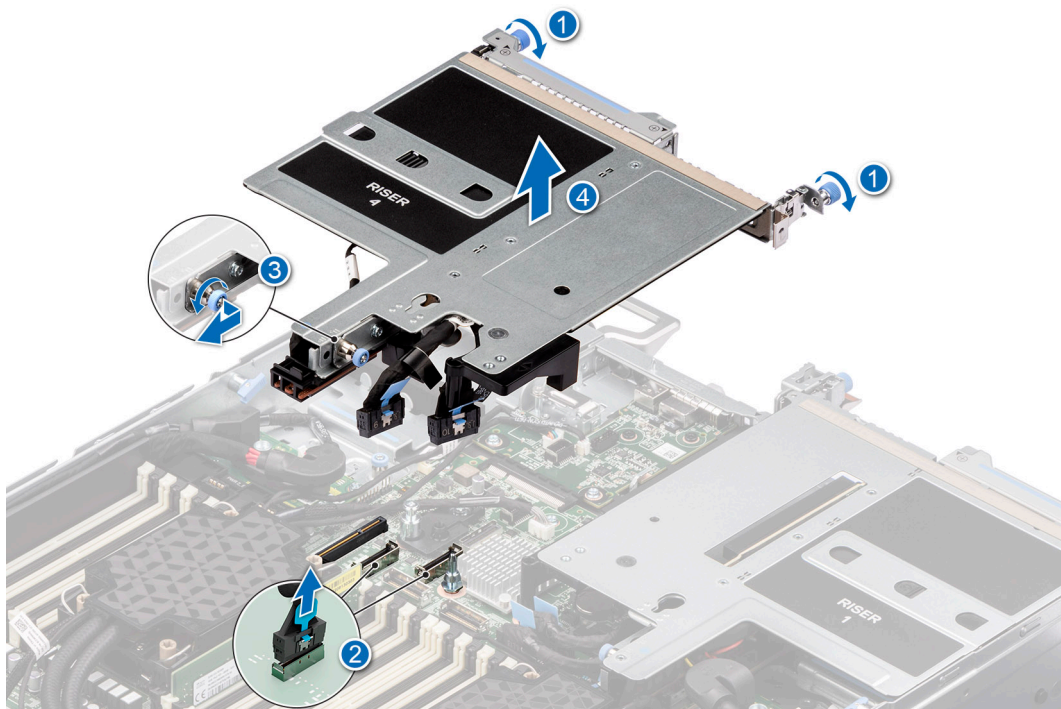
Figure 102. Removing the expansion card riser (Riser 4A)

Next steps

Replace the expansion card riser for Intel GPU configuration.

Installing the expansion card risers for Intel GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. If removed, install the expansion cards into the expansion card risers.

Steps

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

   ⓘ **NOTE:** Minimizing angular mating is critical to avoid any damage caused during mating, which can occur at angles larger than 5° and needs to be assembled vertically and cannot be tilted back and forth.

3. Pull the release tab toward the rear of the chassis to lock the riser.
4. Using a Phillips 2 screwdriver, tighten the blue thumb screw to secure the riser on the chassis.
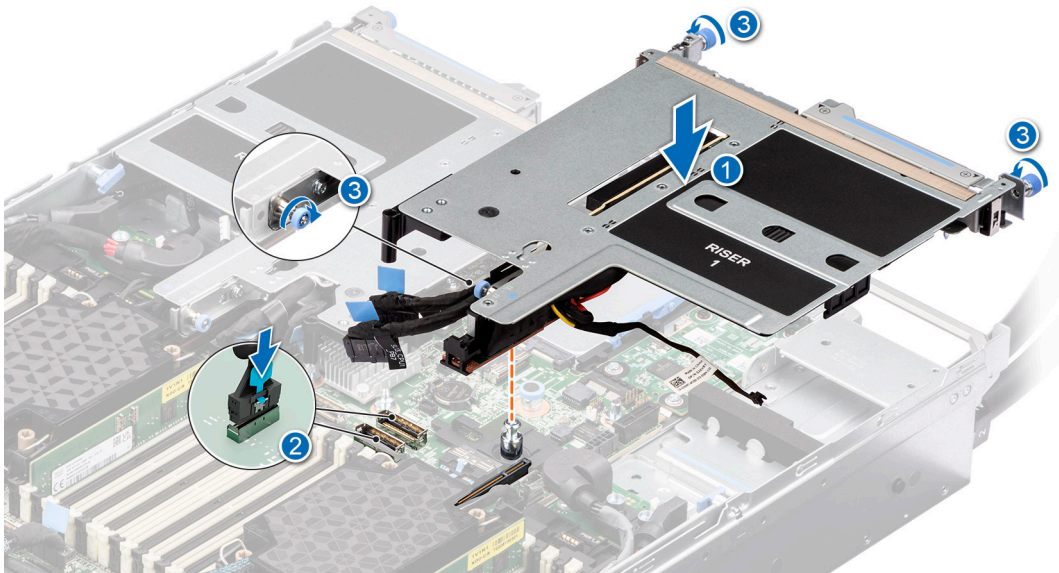
Figure 103. Installing the expansion card riser (Riser 1A)
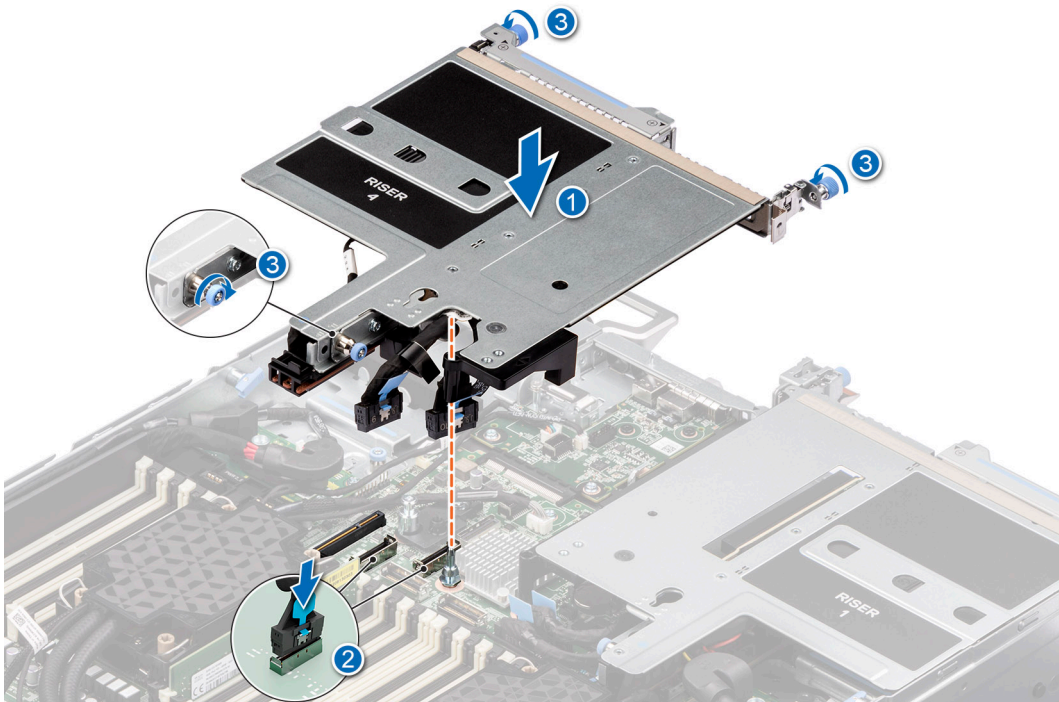
Figure 104. Installing the expansion card riser (Riser 4A)

Next steps

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

Removing the expansion card risers for NVIDIA GPU configuration

Prerequisites

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

Steps

1. For Riser 1B and Riser 4B, using a Phillips 2 screwdriver, loosen the blue thumb screw on the riser.
2. Remove the turtle shell.
3. Pull the plunger toward the front of the chassis to unlock the riser.
4. Disconnect any cables that are connected to the expansion card or the risers from the system board.
5. Lift the expansion card riser from the riser connector on the system board and keep it away from the system board.
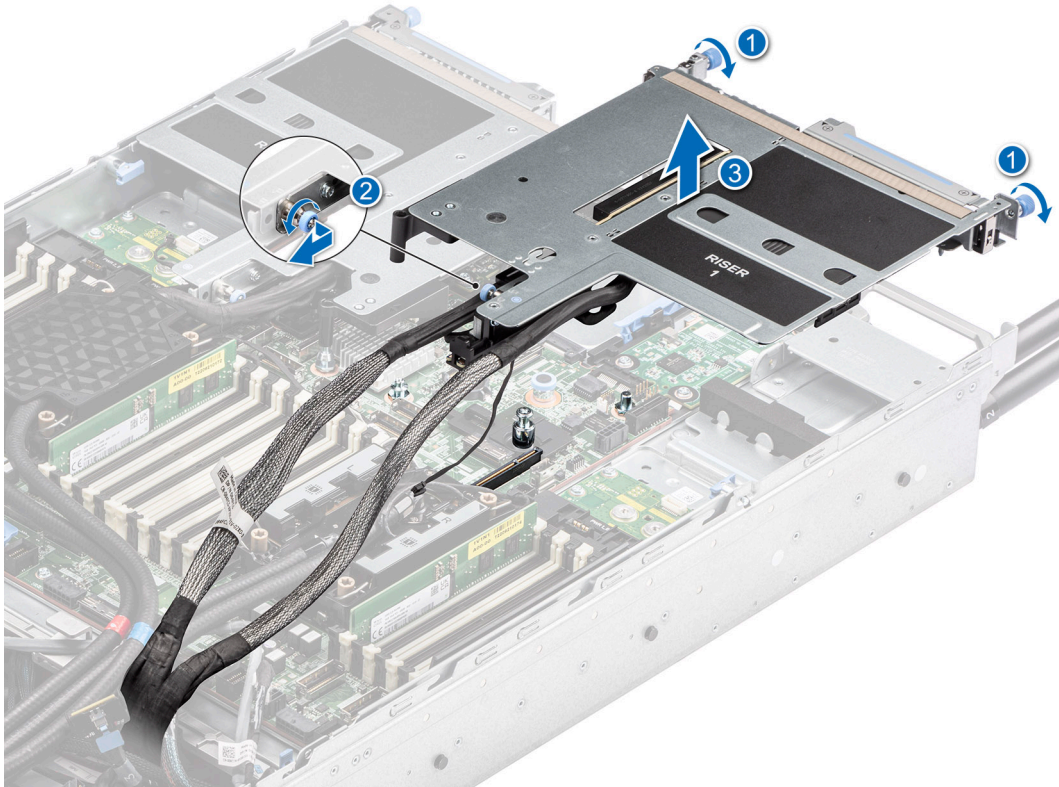
Figure 105. Removing the expansion card riser (Riser 1B)
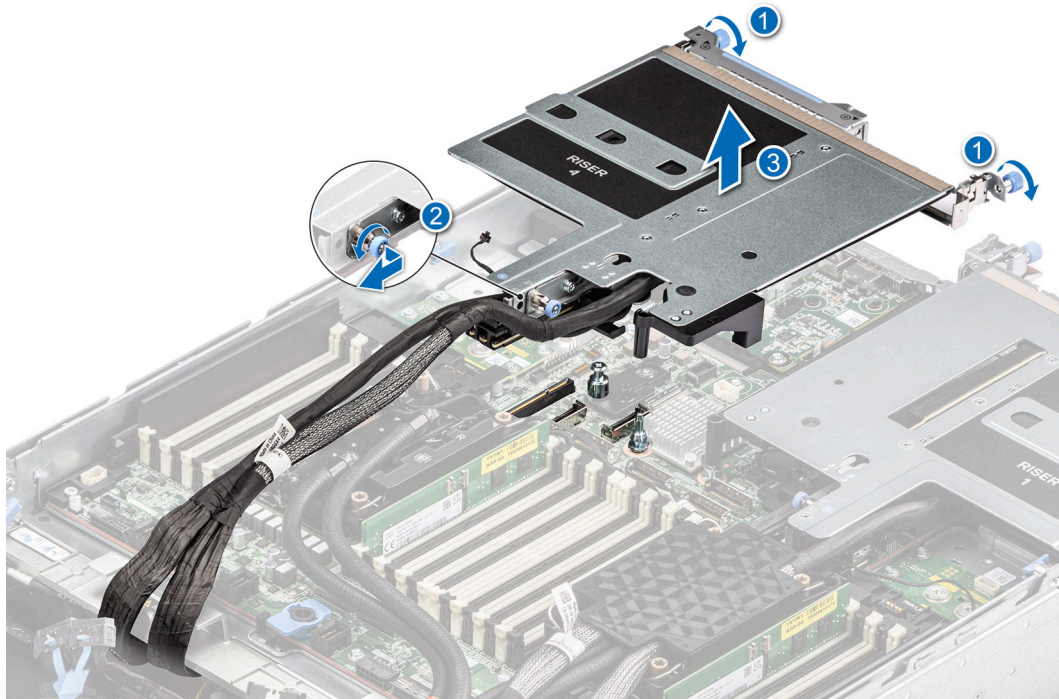
Figure 106. Removing the expansion card riser (Riser 4B)

6. Slide out the system board tray. Disconnect the riser cables connected on the PSB of the bottom layer.

Next steps

Replace the expansion card risers for NVIDIA GPU configurations.

Installing the expansion card risers for NVIDIA GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. If removed, install the expansion cards into the expansion card risers.
4. Remove the storage tray.
5. Slide out the system board tray.

Steps

1. Reconnect the Riser 1B and Riser 4B cable connectors on the PSB of the bottom layer.
2. Slide in the system board tray.
3. For Riser 1B and Riser 4B, holding the blue touch points, align the holes on the expansion card riser with the guides on the system board.
4. Lower the expansion card riser into place and press the touch points until the expansion card riser connector is fully seated on the system board connector.
5. Pull the release tab toward the rear of the chassis to lock the riser.
6. Using a Phillips 2 screwdriver, tighten the blue thumb screw to secure the riser on the chassis.

   (i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
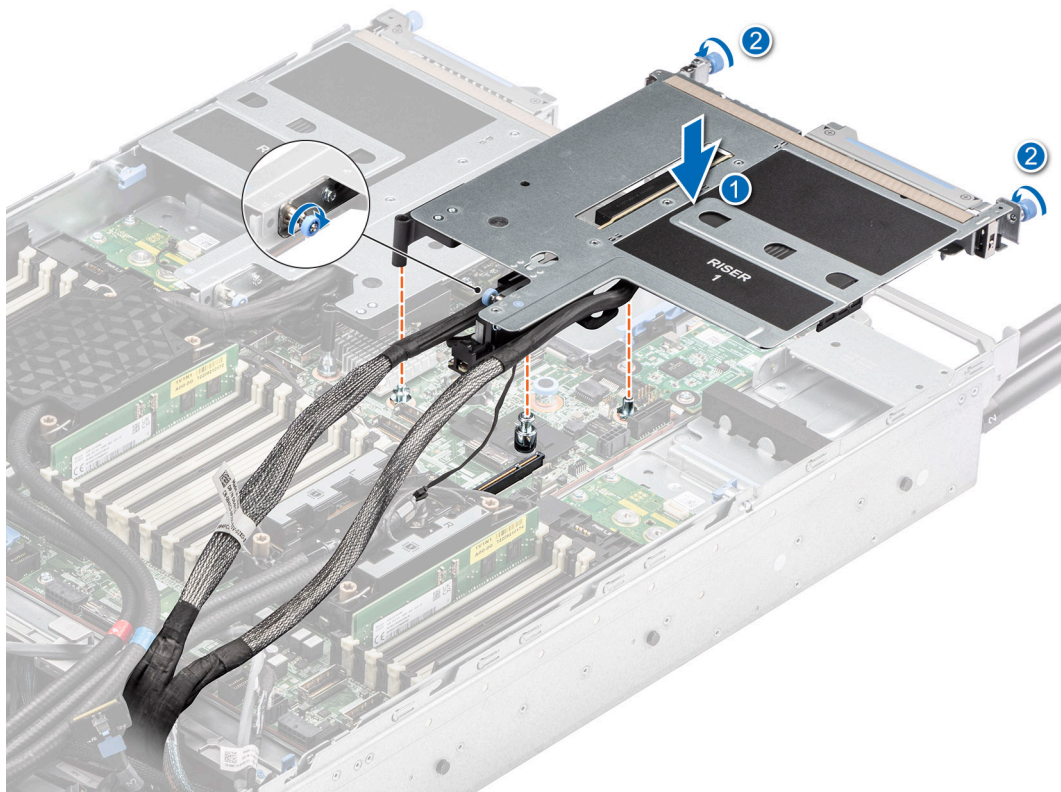
Figure 107. Installing the expansion card riser (Riser 1B)
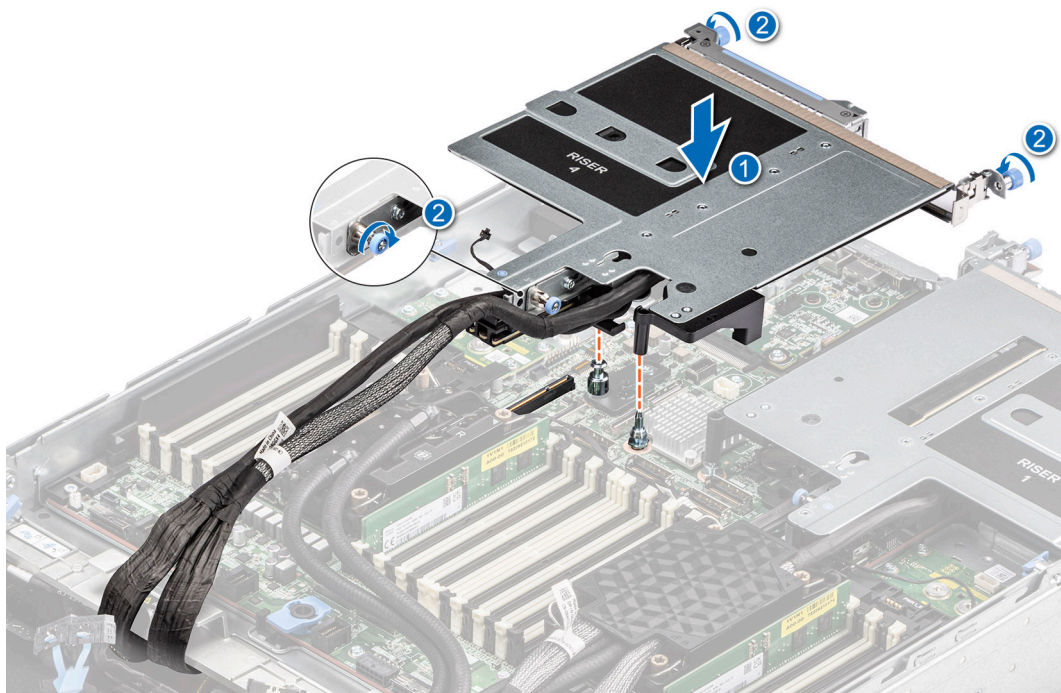
Figure 108. Installing the expansion card riser (Riser 4B)

7. Install the turtle shell.

Next steps

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

2. Install any device drivers required for the card as described in the documentation for the card.

Removing expansion card from the expansion card riser

The procedure to remove the expansion card from the risers 1A (slot 1), 1B (slot 1), 4A (slot 4), 4B (slot 4) is same. The procedure to remove the expansion card from the risers 1A (slot 2), 1B (slot 2), 4A (slot 3), 4B (slot 3) is same.

Prerequisites

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

Steps

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

   (i) **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
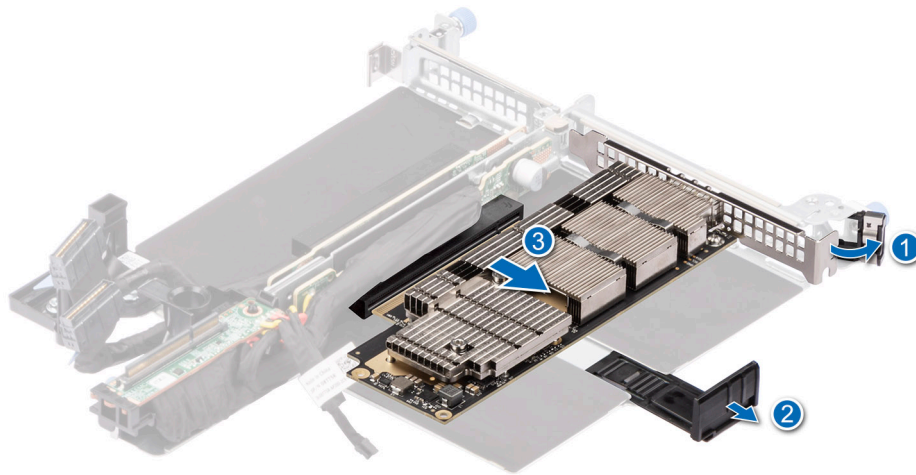
Figure 109. Removing expansion card from riser

2. If the expansion card is not going to be replaced, install a filler bracket and close the card retention latch.
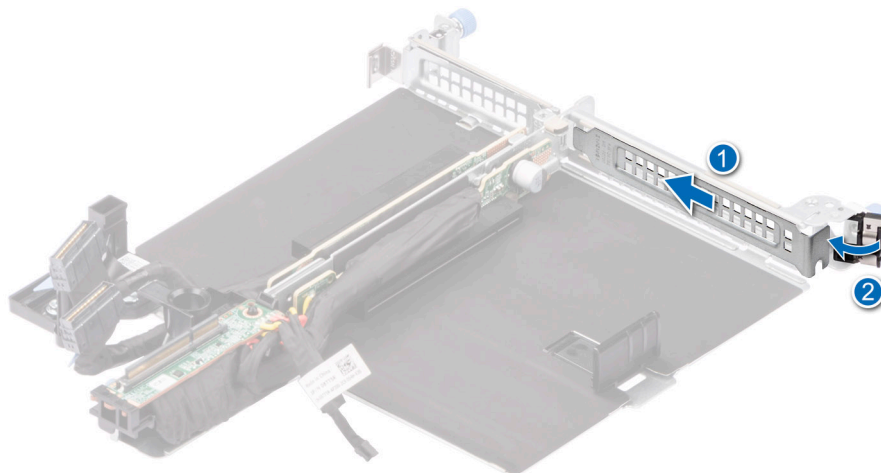
Figure 110. Installing the filler bracket for the riser

Next steps

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

Installing an expansion card into the expansion card riser

The procedure to install the expansion card in to the risers 1A (slot 1), 1B (slot 1), 4A (slot 4), 4B (slot 4) is same. The procedure to install the expansion card in to the risers 1A (slot 2), 1B (slot 2), 4A (slot 3), 4B (slot 3) is same.

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. If installing a new expansion card, unpack it and prepare the card for installation.
   ⓘ **NOTE:** For instructions, see the documentation accompanying the card.
4. If applicable, disconnect the cables from the expansion card.
5. Remove the expansion card riser.

Steps

1. Pull and lift the expansion card retention latch lock to open.
2. If installed, remove the filler bracket.
   ⓘ **NOTE:** Store the filler bracket for future use. Filler brackets must be installed in empty expansion card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.
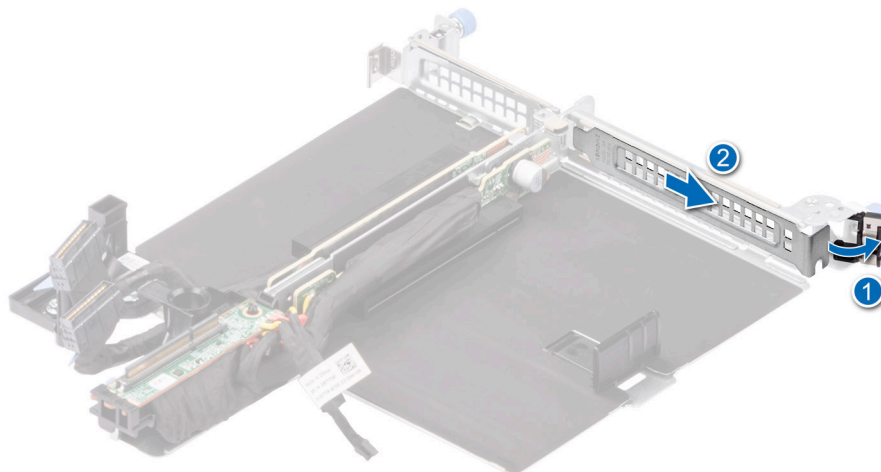
Figure 111. Removing the filler bracket for riser

3. Pull the black card holder, hold the card by its edges, and align the card edge connector with the expansion card connector on the riser. Insert the card edge connector firmly into the expansion card connector until the card is fully seated. Close the metal retention latch. Push the black card holder to hold the card in the riser.
   ⓘ **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
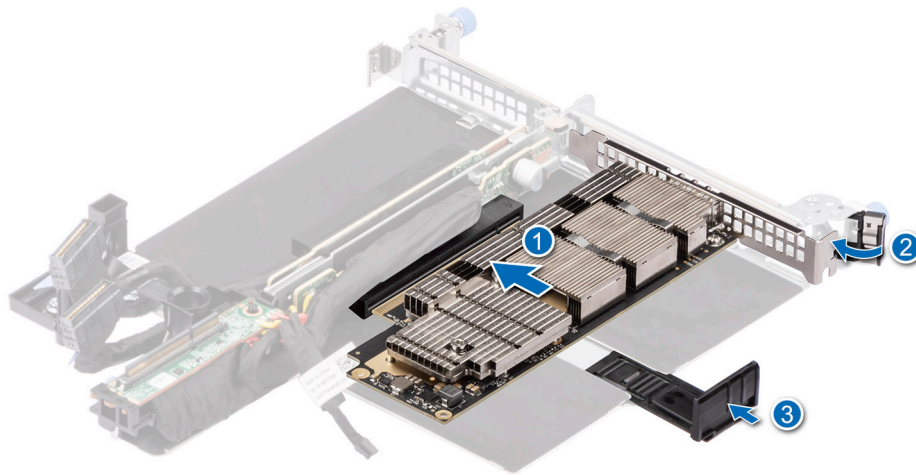
Figure 112. Installing the expansion card in to the riser

Next steps

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

Lower brace cover

This is a service technician replaceable part only.

Removing the lower brace cover for Intel GPU configurations

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 cable cover.
4. Observe and disconnect the intrusion switch cable from the storage tray that is connected from the system board. Disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connectors of the storage tray and keep the cables away from the storage tray.
5. Remove the storage tray.

Steps

Using two fingers press the touch point on the lower brace cover to release it from the lower brace.

Figure 113. Removing the lower brace cover

Next steps

Replace the lower brace for Intel GPU configurations.

Installing the lower brace cover for Intel GPU configurations

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 cable cover.
4. Observe and disconnect the intrusion switch cable from the storage tray that is connected from the system board. Disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connectors of the storage tray and keep the cables away from the storage tray.
5. Remove the storage tray.

Steps

Align the lower brace cover on the lower brace along the arrow, using two fingers press the touch point on the lower brace cover until it firmly seated on the lower brace.

Figure 114. Installing the lower brace cover

Next steps

1. Install the Storage tray.
2. Reconnect the intrusion switch bridge cable from the storage tray that is connected from the system board. Reconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connector of the storage tray.
3. Install the cable cover.
4. Follow the procedure listed in After working inside your system.
.

Removing the lower brace cover for NVIDIA GPU configurations

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 cable cover.
4. Observe and disconnect the intrusion switch bridge cable from the connectors on the storage tray that is connected from the system board. Observe and disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connector on the storage tray, signal cable from the connectors on the PDB2 and then keep the cables away from the storage tray. Disconnect the VSB power cables (left and Right) from the connector on the system board and keep them on the storage tray.
5. Remove the storage tray.

Steps

Using two fingers press the touch point on the lower brace cover to release it from the lower brace.

Figure 115. Removing the lower brace bracket

Next steps

Replace the lower brace for NVIDIA GPU configurations.

Installing the lower brace cover for NVIDIA GPU configurations

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 cable cover.
4. Observe and disconnect the intrusion switch bridge cable from the connectors on the storage tray that is connected from the system board. Observe and disconnect the drive backplane cables, BOSS power and signal cables, fan board cables from the connector on the storage tray, signal cable from the connectors on the PDB2 and then keep the cables away from the storage tray. Disconnect the VSB power cables (left and Right) from the connector on the system board and keep them on the storage tray.
5. Remove the storage tray.

Steps

Align the lower brace cover on the lower brace along the arrow, using two fingers press the touch point on the lower brace cover until it firmly seated on the lower brace.

Figure 116. Installing the lower brace cover

Next steps

1. Install the Storage tray.
2. Reconnect the intrusion switch bridge cable from the storage tray that is connected from the system board. Reconnect the drive backplane cables, BOSS power and signal cables, signal cable on the PDB2, fan board cables on the connector of the storage tray. Reconnect the VSB power cables on the system board.
3. Install the cable cover.
4. Follow the procedure listed in After working inside your system.
.

Processor and Direct Liquid Cooling module

This is a service technician replaceable part only.

Removing the Direct Liquid Cooling 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. ⚠ **WARNING: The Direct liquid cooling (DLC) module and processor are too hot to touch for some time after the system has been powered off. Allow the liquid cooling module and processor to cool down before handling them.**

   Remove the storage tray for Intel GPU configurations or Remove the storage tray for NVIDIA GPU configurations .
4. Remove the lower brace cover for Intel GPU configurations or Remove the lower brace cover for NVIDIA GPU configurations .

Steps

1. Using the two fingers, lift the turtle shell from the DLC module.
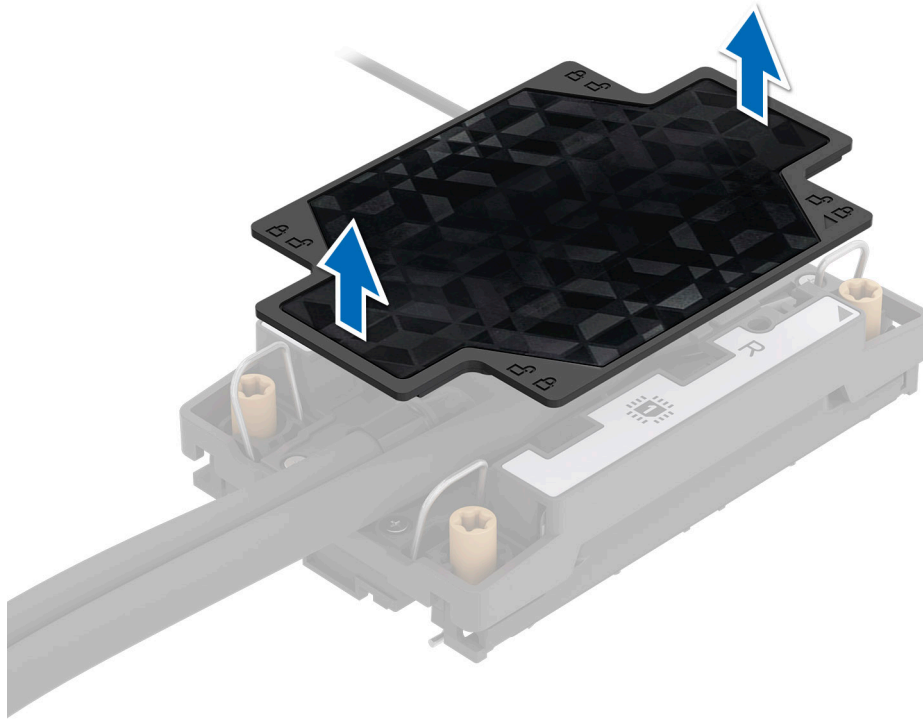
Figure 117. Lift the turtle shell

2. Remove the liquid cooling tubes with numbers naming 11 an 12.
3. Release the blue thumb holder and rotate the metallic gate away from the liquid cooling tray.
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 processor heat sink module (PHM) in the order that is mentioned below:
   a. Loosen the first nut three turns.
   b. Loosen the nut diagonally opposite to the nut you loosened first.
   c. Repeat the procedure for the remaining two nuts.
   d. Return to the first nut and loosen it completely.

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

5. Set the anti-tilt wires on the DLC module to the unlock position and lift the DLC module from the system.
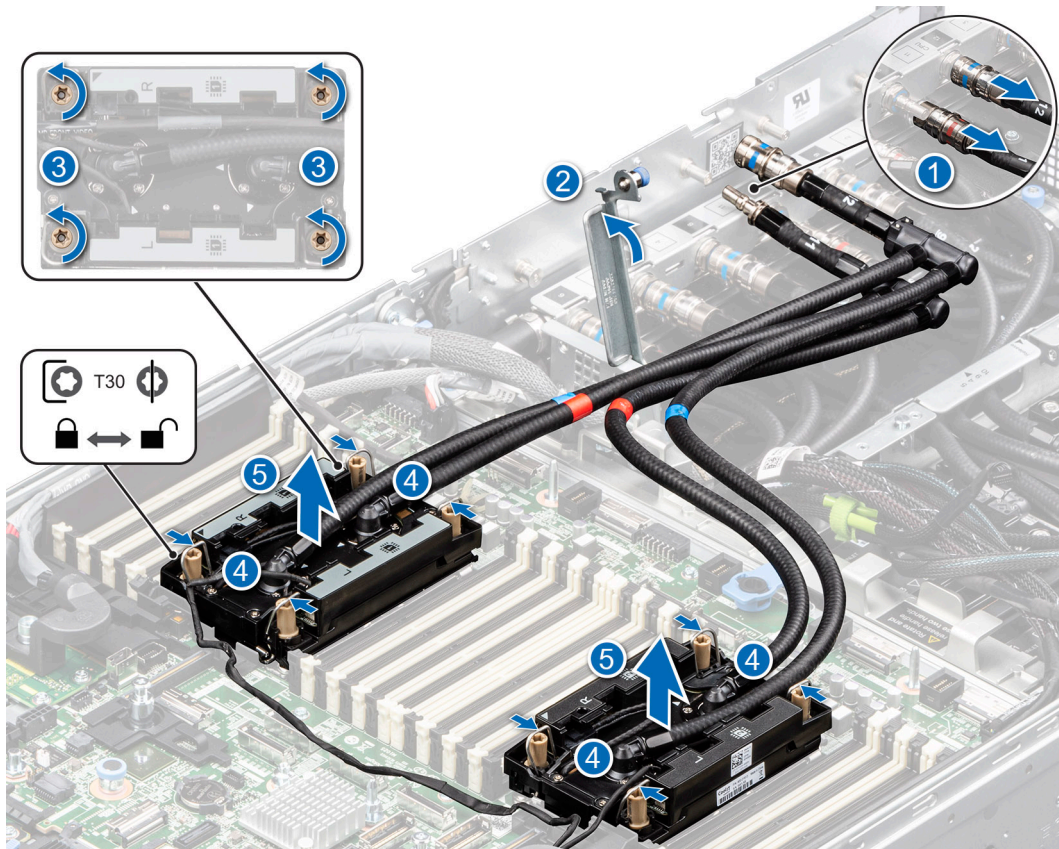
Figure 118. Removing the DLC module

Next steps

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

Removing the processor

Prerequisites

⚠ **WARNING: Remove the processor from processor and DLC module only if you are replacing the processor or DLC module.**

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 storage tray for Intel GPU configurations or Remove the storage tray for NVIDIA GPU configurations .
4. Remove the lower brace cover for Intel GPU configurations or Remove the lower brace cover for NVIDIA GPU configurations .
5. Remove the DLC module.

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

Steps

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

(i) **NOTE:** Ensure to hold the retaining clip to the DLC module as you lift the TIM break lever.
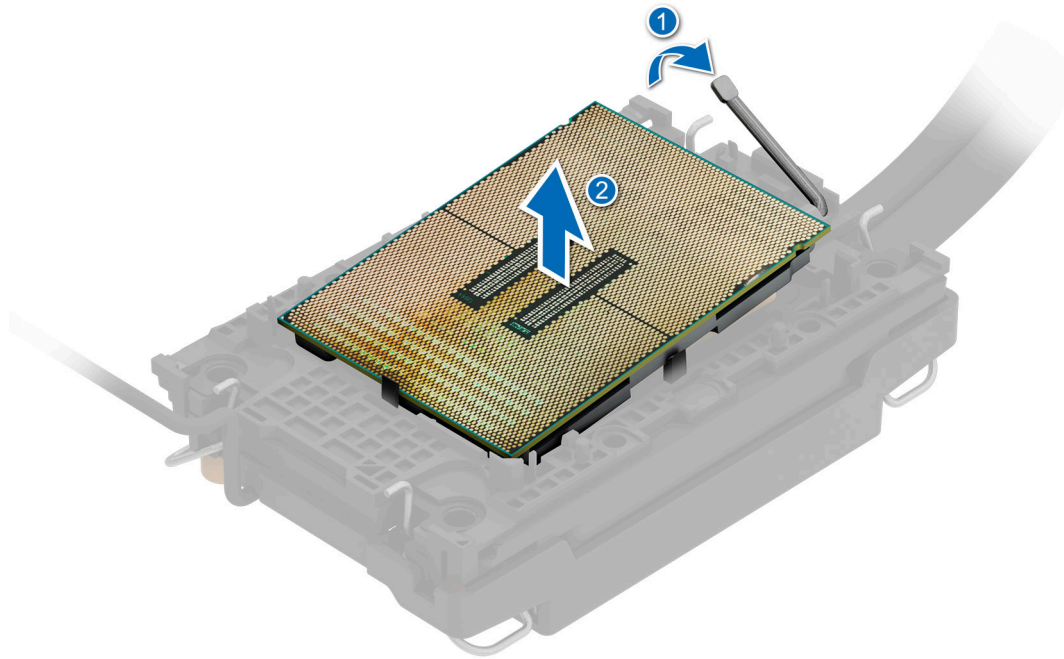
Figure 119. Removing the processor

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

4. Using your thumb and index finger, first hold the retaining clip release tab at the pin 1 connector, pull out the tip of the retaining clip release tab, and then lift the retaining clip partially from the DLC module.
5. Repeat the procedure at the remaining three corners of the retaining clip.
6. After all the corners are released from the DLC module, lift the retaining clip from the pin 1 corner of the DLC module.
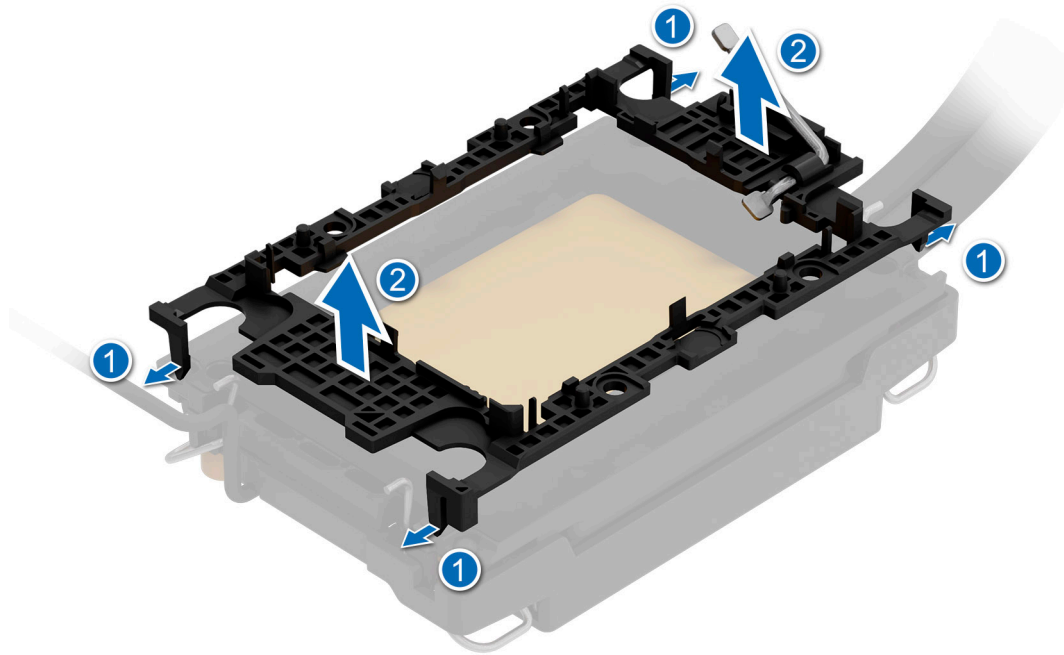
Figure 120. Removing the retaining clip

Next steps

Replace the processor.

Installing the processor

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the storage tray for Intel GPU configurations or Remove the storage tray for NVIDIA GPU configurations .
4. Remove the lower brace cover for Intel GPU configurations or Remove the lower brace cover for NVIDIA GPU configurations .
5. Remove the DLC module.

Steps

1. Place the processor in the processor tray.

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

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

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

   ⓘ **NOTE:** Before you install the DLC module, ensure to place the processor and retaining clip in the tray.
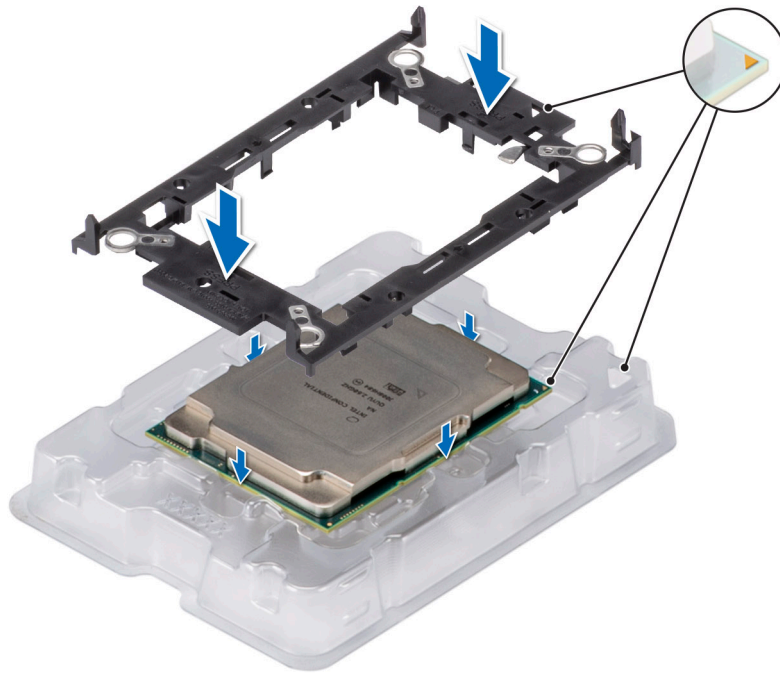
Figure 121. Installing the retaining clip

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

   ⓘ **NOTE:** Ensure that the processor is securely latched to the retaining clip.
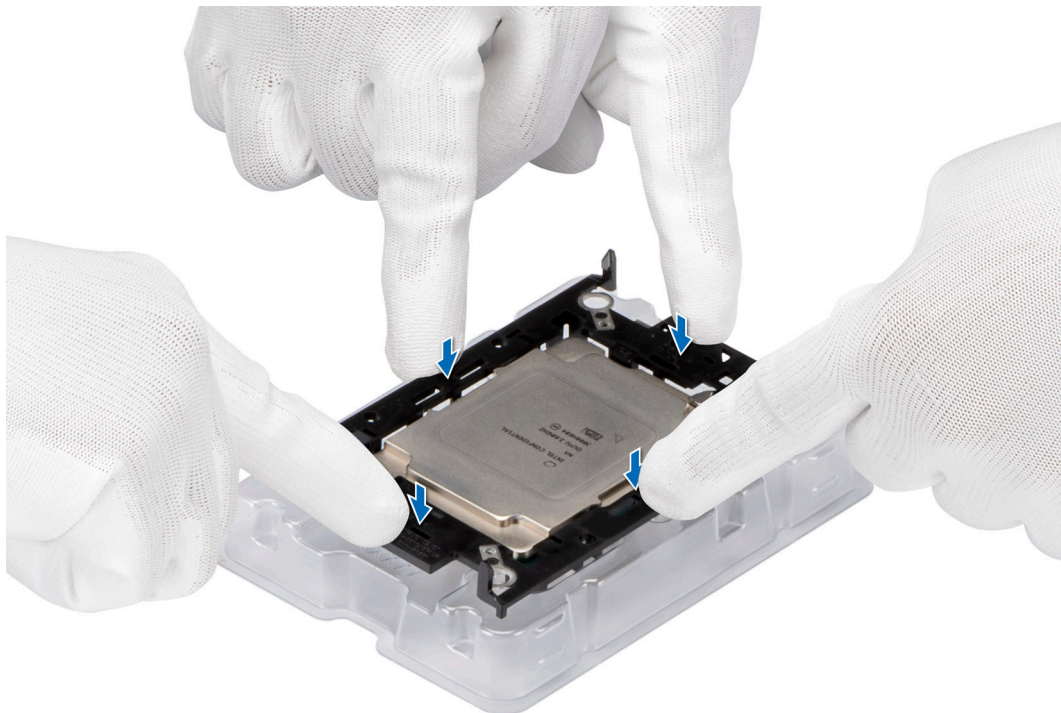
Figure 122. Press the retaining clip on the four sides

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

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

ⓘ **NOTE:** The thermal grease syringe is intended for single use only. Dispose the syringe after you use it.
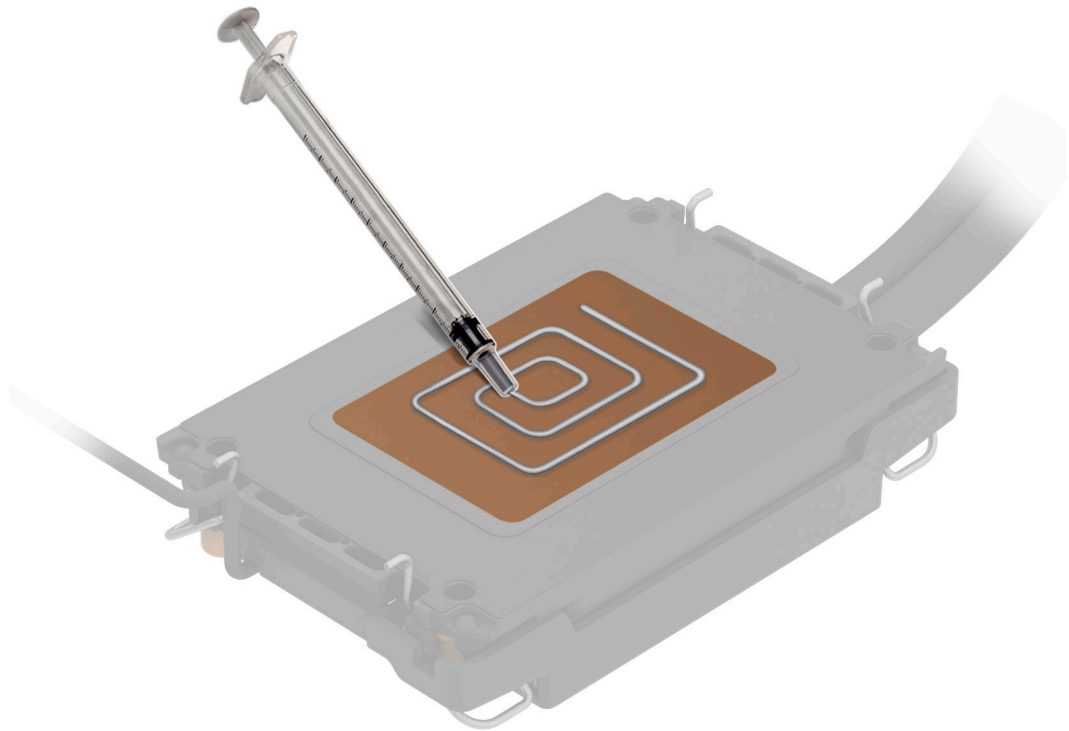
Figure 123. Applying thermal grease

6. Place the DLC module on the processor and press the base of the DLC module until the retaining clip locks onto the DLC module at all the four corners.

ⓘ **NOTE:**
   ● Ensure latching features on retaining clip, and DLC module are aligned during assembly.
   ● Ensure that the pin 1 indicator on the DLC module is aligned with the pin 1 indicator on the retaining clip before placing the DLC module onto the retaining clip.
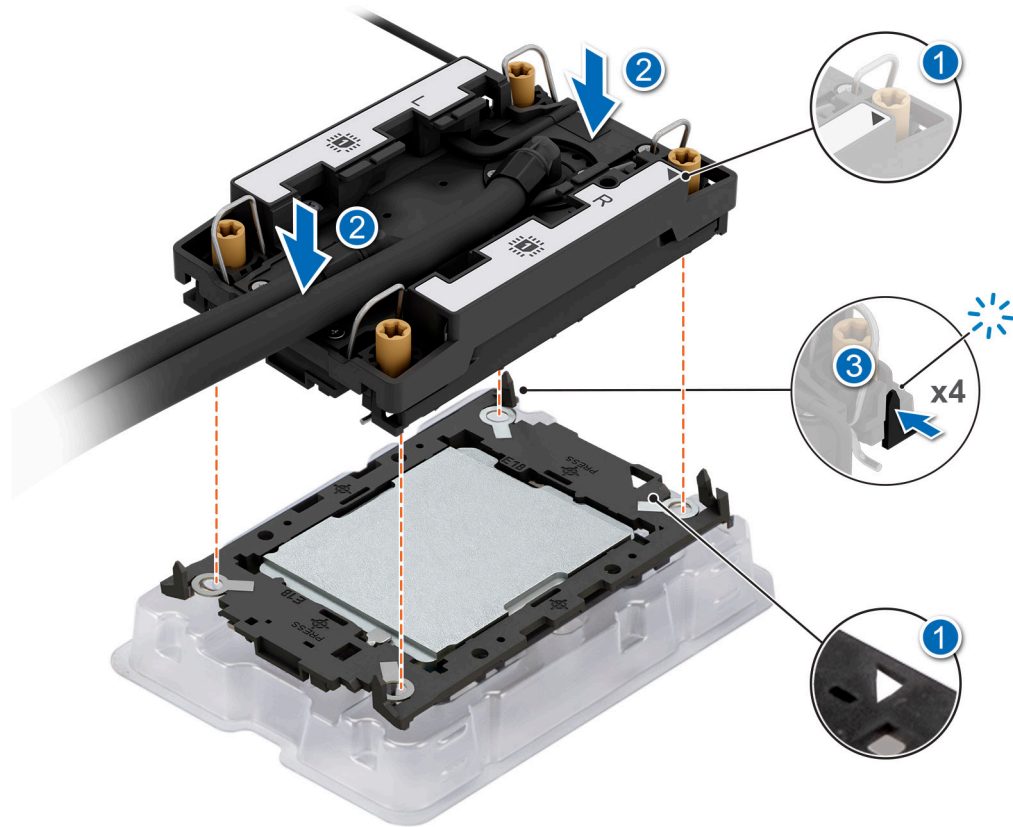
Figure 124. Installing the DLC module onto the processor

Next steps

1. Install the DLC module.
2. Install the lower brace cover for Intel GPU configurations or Install the lower brace cover for NVIDIA GPU configurations .
3. Install the storage tray for Intel GPU configurations or Install the storage tray for NVIDIA GPU configurations .
4. Follow the procedure listed in the After working inside your system.

Installing the Direct Liquid Cooling module

Prerequisites

Never uninstall the Direct Liquid Cooling (DLC) module from a processor unless you intend to replace the processor or system board. The DLC module is necessary to maintain proper thermal conditions.

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the storage tray for Intel GPU configurations or Remove the storage tray for NVIDIA GPU configurations .
4. Remove the lower brace cover for Intel GPU configurations or Remove the lower brace cover for NVIDIA GPU configurations .

Steps

1. Align the DLC module with the standoff screws on the system board.
2. Place the module on the processor slot and set all the anti-tilt wires to locked position (outward position).
3. Using the Torx T30 screwdriver, tighten the captive nuts (8 in-lbf) on the DLC module in the order below:
   a. In a random order, tighten the first nut three turns.
   b. Tighten the nut diagonally opposite to the nut that you tighten first.
   c. Repeat the procedure for the remaining two nuts.
   d. Return to the first nut to tighten it completely.

e. Check all the nuts to ensure they are firmly secured.

4. Reconnect the liquid cooling tubes 11 an 12 to Manifold from DLC module.

5. Rotate themetallic gate near to the liquid cooling tray and lock the blue thumb holder.
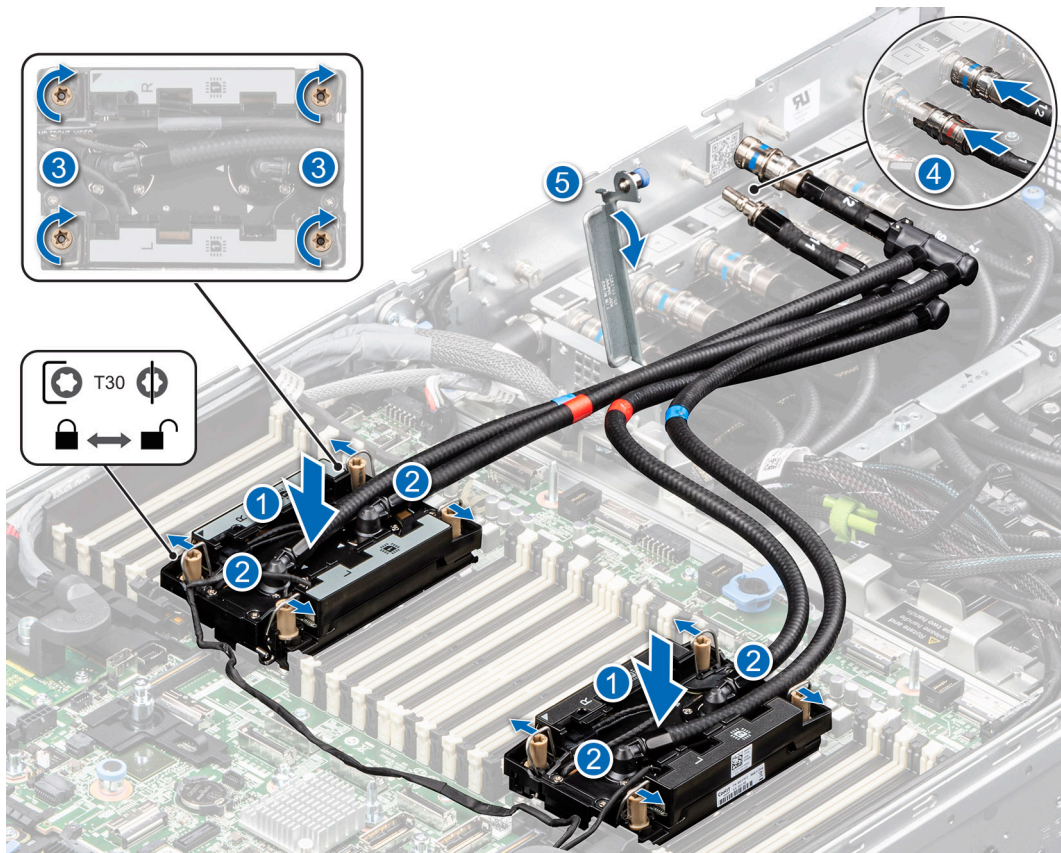
Figure 125. Installing the DLC liquid cooling module

6. Using the two finger, align and install the turtle shell on the DLC module. Ensure to align the triangle mark on the turtle shell with the triangle mark on the DLC module.
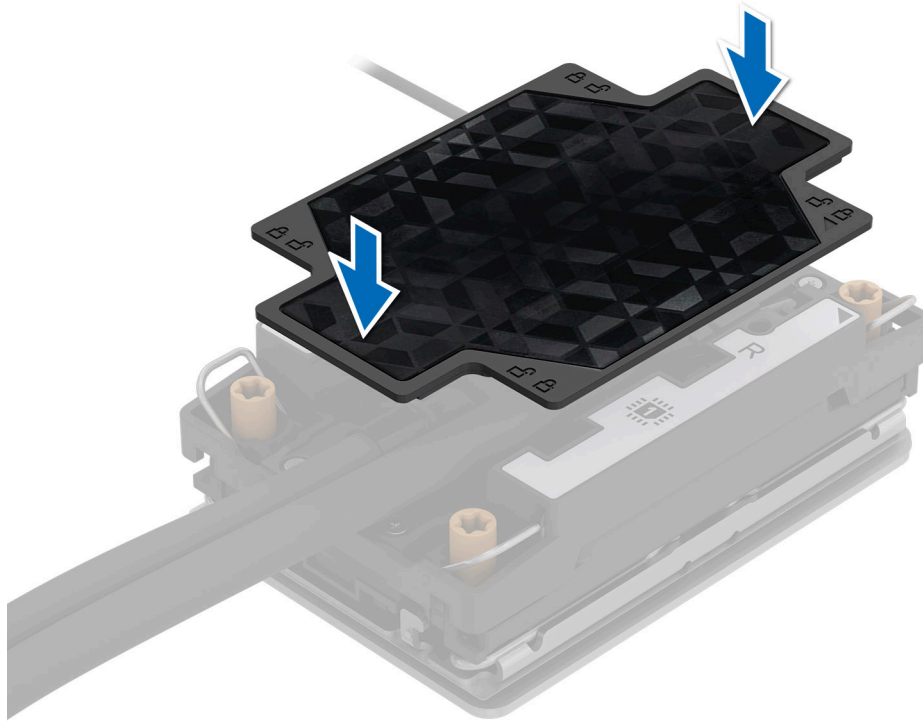
Figure 126. Install the turtle shell

Next steps

1. Install the lower brace cover for Intel GPU configurations or Install the lower brace cover for NVIDIA GPU configurations .
2. Install the storage tray for Intel GPU configurations or Install the storage tray for NVIDIA GPU configurations .
3. Follow the procedure listed in the After working inside your system.

Intrusion switch

This is a service technician replaceable part only.

Removing the intrusion switch module

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the cable cover.
4. Remove the riser 4A for Intel GPU configurations or Remove the riser 4B for NVIDIA GPU configurations.
5. Remove the turtle shell from the DLC module 2.

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

Steps

1. Disconnect the intrusion switch cable from the connector on the system board.
2. Using a Phillips 2 screwdriver, remove the screws on the intrusion switch module.
3. Slide the intrusion switch module out of the slot on the system.
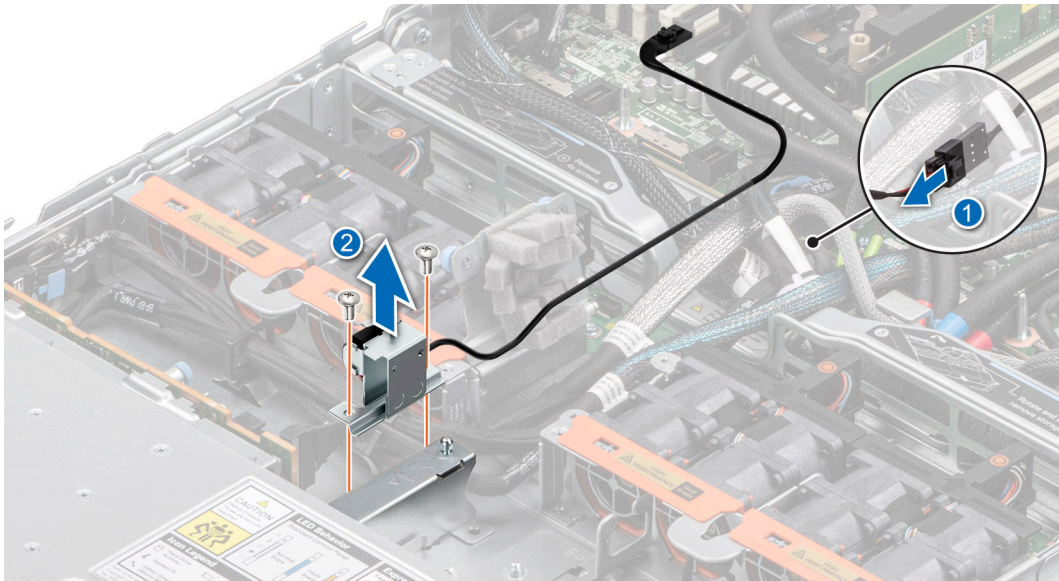
Figure 127. Removing the intrusion switch module
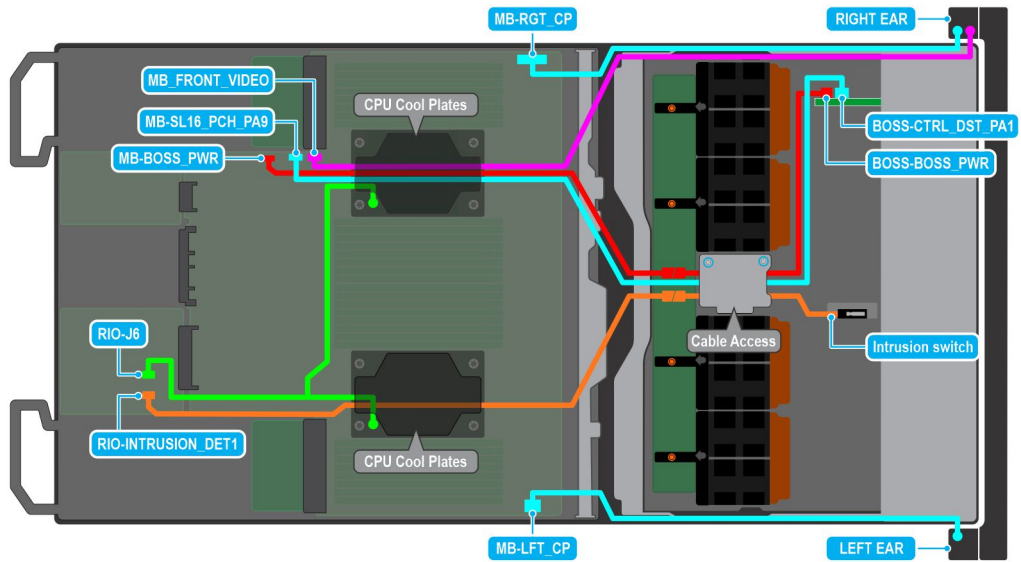
Figure 128. Intrusion switch cabling diagram for Intel GPU configurations

From	To
RIO-INTRUSION_DET1 (Intrusion switch connector on system board)	Intrusion Switch on the Storage tray
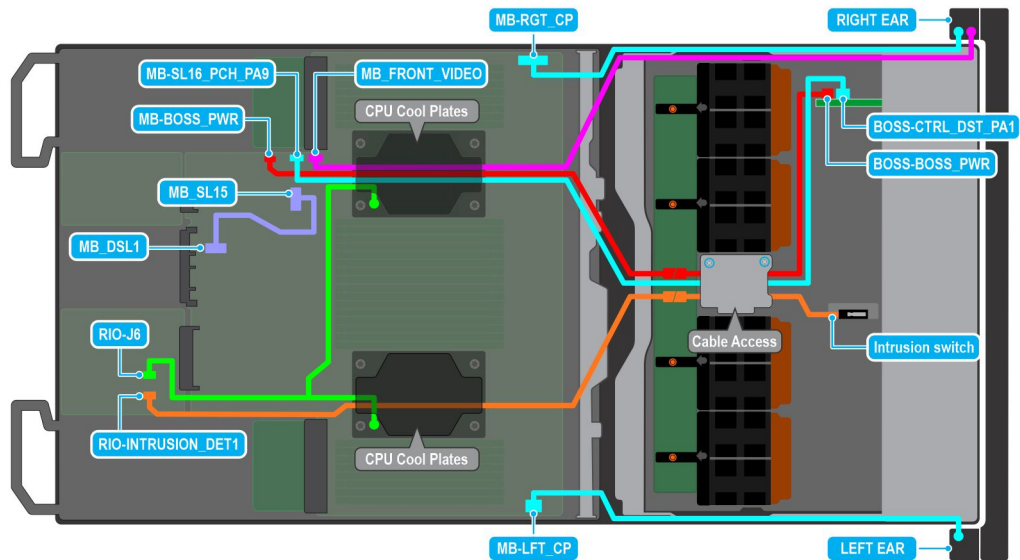
Figure 129. Intrusion switch cabling diagram for NVIDIA GPU configurations

Table 71. Intrusion switch cable connections

From	To
RIO-INTRUSION_DET1 (Intrusion switch connector on system board)	Intrusion Switch on the Storage tray

Next steps

Replace the intrusion switch module.

Installing the intrusion switch module

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the cable cover.
4. Remove the riser 4A for Intel GPU configurations or Remove the riser 4B for NVIDIA GPU configurations.
5. Remove the turtle shell from the DLC module 2.

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

Steps

1. Align and slide the intrusion switch module into the slot in the system until firmly seated.
2. Using a Phillips 2 screwdriver, tighten the screw on the intrusion switch module.
3. Connect the intrusion switch cable to the connector on the system board. Ensure to route the cable through the DLC module 2 below the turtle shell.
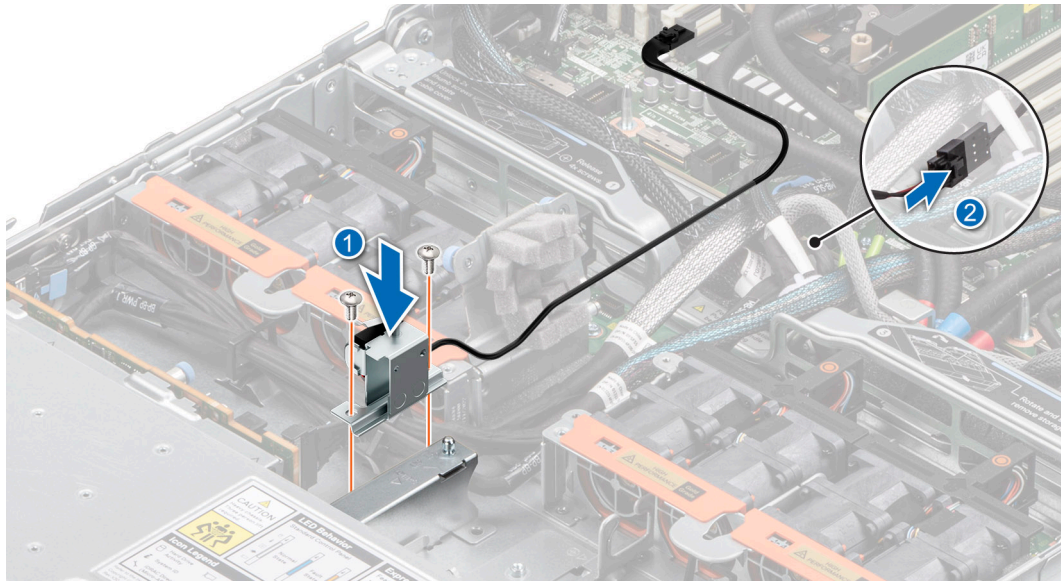
Figure 130. Installing the intrusion switch module

Figure 131. Intrusion switch cabling diagram for Intel GPU configurations

From	To
RIO-INTRUSION_DET1 (Intrusion switch connector on system board)	Intrusion Switch on the Storage tray
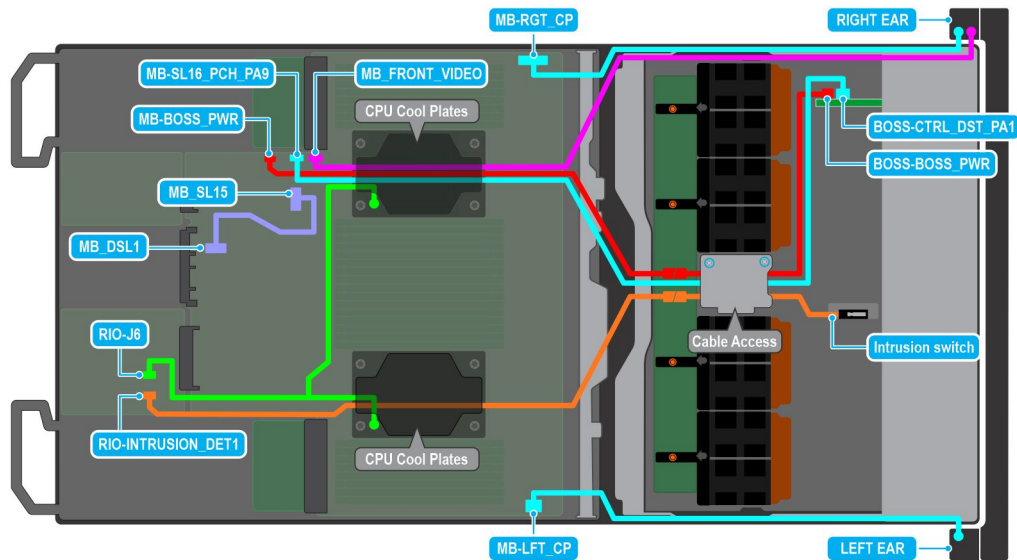
Figure 132. Intrusion switch cabling diagram for NVIDIA GPU configurations

Table 72. Intrusion switch cable connections

From	To
RIO-INTRUSION_DET1 (Intrusion switch connector on system board)	Intrusion Switch on the Storage tray

Next steps

1. Install the riser 4A for Intel GPU configurations or install the riser 4B for NVIDIA GPU configurations.
2. Install the turtle shell on the DLC module 2.
3. Install the cable cover.
4. Follow the procedure listed in After working inside your system.

System battery

This is a service technician replaceable part only.

Replacing the system battery

Prerequisites

⚠ **WARNING: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type that is recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions. See the Safety instructions that came with your system for more information.**

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the riser 1A for Intel GPU configurations or Remove the riser 1B for NVIDIA GPU configurations.

Steps

1. To remove the battery:
   a. Use a plastic scribe to pry out the system battery.
   ⚠ **CAUTION: To avoid damage to the battery connector, you must firmly support the connector while installing or removing a battery.**
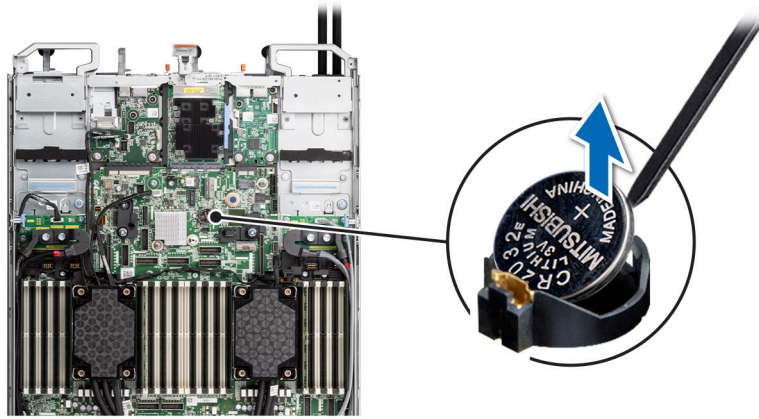
Figure 133. Removing the system battery

2. To install a new system battery:
   a. Hold the battery with the positive side facing up and slide it under the securing tabs.
   b. Press the battery into the connector until it snaps into place.
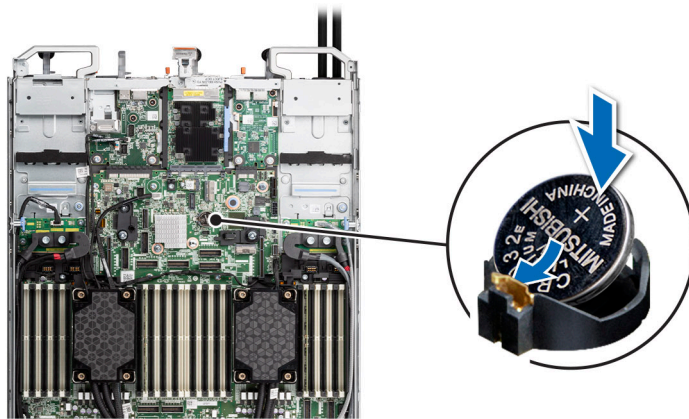
Figure 134. Installing the system battery

Next steps

1. Install the riser 1A for Intel GPU configurations or install the riser 1B for NVIDIA GPU configurations.
2. Follow the procedure listed in 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, check the time and date at least an hour after installing the battery.
   e. Enter the System Setup and if the time and date are still incorrect, see Getting help section.

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 system board connectors.
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.
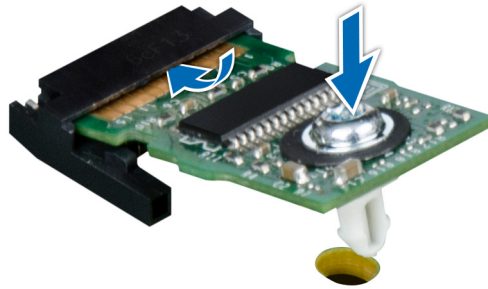
Figure 135. Installing the TPM

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.

Optional OCP card

Removing the OCP card

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the risers 1A and 4A for Intel GPU configurations or Remove the riser 1B and 4B for NVIDIA GPU configurations.

Steps

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

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

Figure 136. Removing the OCP card

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

Next steps

Replace the OCP card

Installing the OCP card

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the risers 1A and 4A for Intel GPU configurations or Remove the riser 1B and 4B for NVIDIA GPU configurations.

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

Steps

1. If installed, remove the filler bracket.

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

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

   ⓘ **NOTE:** The numbers on the image do not depict the exact steps. The numbers are for representation of sequence.
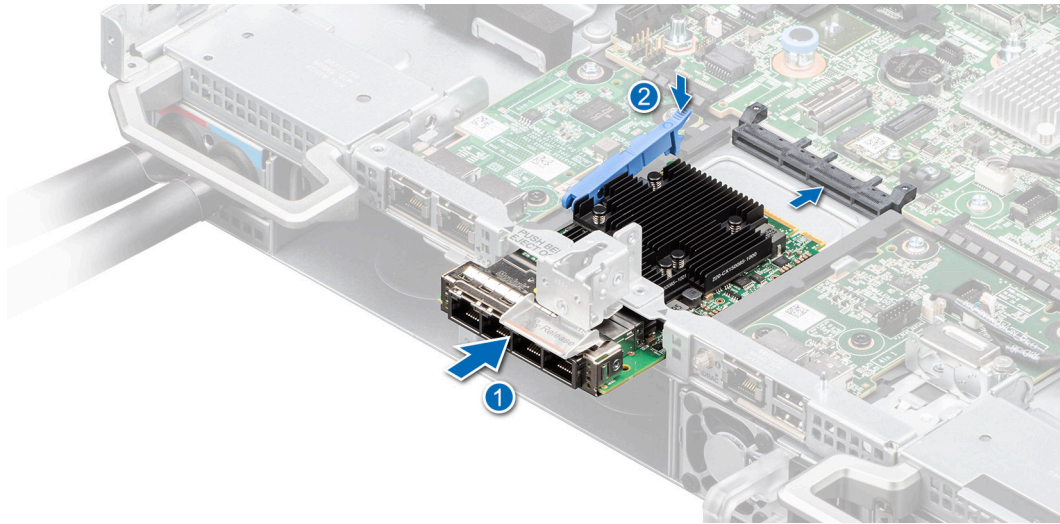
Figure 137. Installing the OCP card

Next steps

1. Install the risers 1A and 4A for Intel GPU configurations or Install the risers 1B and 4B for NVIDIA GPU configurations.
2. Follow the procedure listed in After working inside your system.

System board

This is a service technician replaceable part only.

Removing the system board

Prerequisites

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

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the following components:
   a. Storage tray for Intel GPU configurations or Storage tray for NVIDIA GPU configurations,
   b. Risers 1A and 4A for Intel GPU configurations or Risers 1B and 4B for NVIDIA GPU configurations.
   c. VSBs connected on the system board .
   d. DLC modules with the processors
   e. Disconnect all the cables from the system board and make note of all the cable connections.
      ⚠ **CAUTION: Take care not to damage the system identification button while removing the system board from the system.**

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

Steps

1. Using the system board holder and plunger, slide the system board toward the front of the system.
2. At a tilted angle, lift the system board out of the chassis.
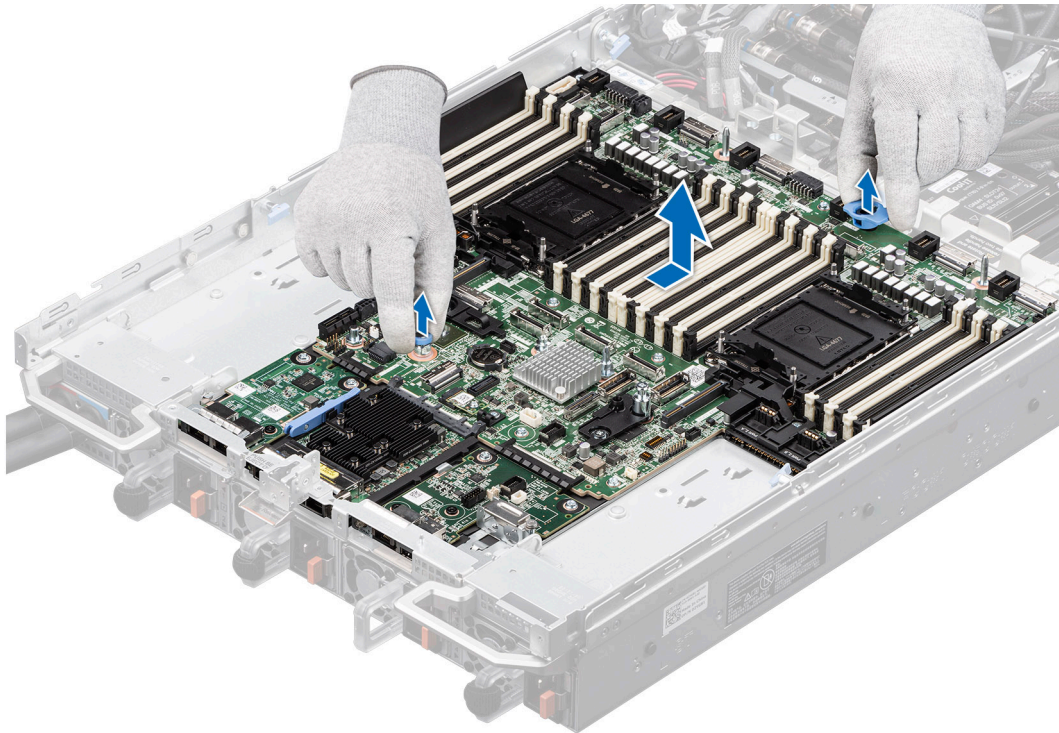
Figure 138. Removing the system board

Next steps

Install the system board.

Installing the system board

Prerequisites

ⓘ **NOTE:** Before replacing the system board, replace the old iDRAC MAC address label on the Express Service Tag with the iDRAC MAC address label of the replacement system board.

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

Steps

1. Unpack the new system board assembly.

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

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

2. Hold onto the blue plastic handle with one hand and use the other hand to push the plunger, sliding the system board towards the rear of the chassis

   ⓘ **NOTE:** Ensure the plunger is locked.
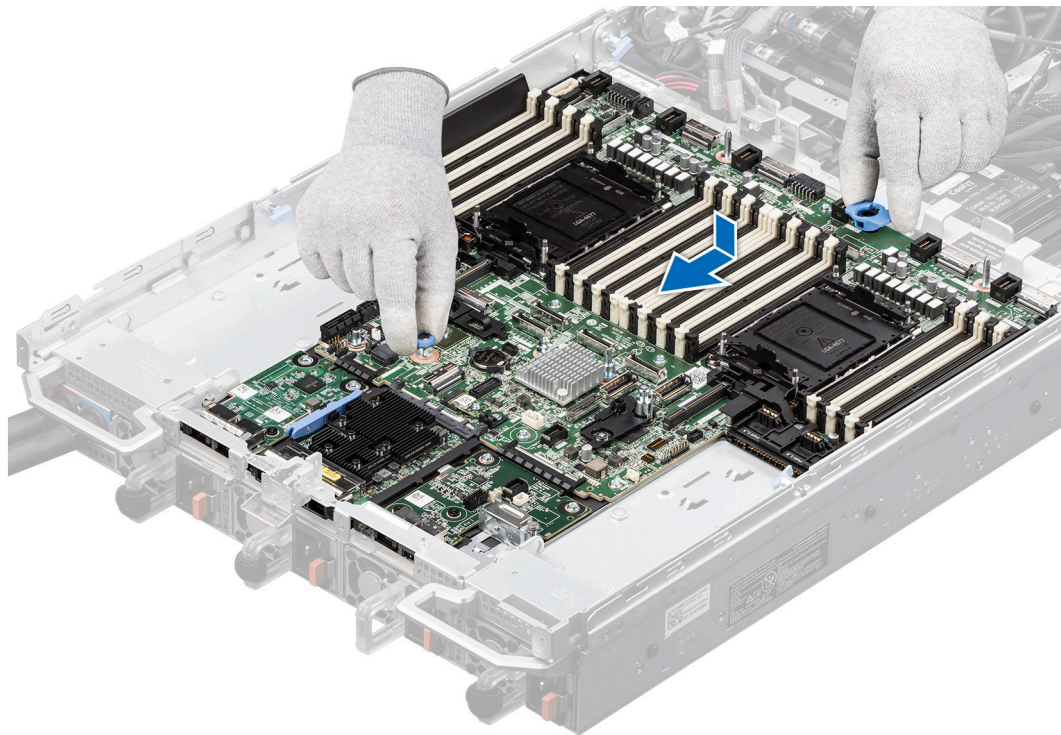
Figure 139. Installing the system board

Next steps

1. Replace the following components:
   a. Trusted Platform Module (TPM)
      ⓘ **NOTE:** The TPM Module must be replaced only while installing new system board.
   b. OCP card (if removed)
   c. DLC Liquid cooling module with processor
   d. Memory modules
   e. VSBs connected to the system board
   f. Reconnect all cables to the system board.
   g. Risers 1A and 4A for Intel GPU configurations or Risers 1B and 4B for NVIDIA GPU configurations
   h. Storage tray for Intel GPU configurations or Storage tray for NVIDIA GPU configurations,
2. Ensure that you perform the following steps:
   a. Use the Easy Restore feature to restore the Service Tag. See the Restoring the system by using the Easy Restore feature section.
   b. If the service tag is not backed up in the backup flash device, enter the system service tag manually. See the Manually update the Service Tag by using System Setup section.
   c. Update the BIOS and iDRAC versions.
   d. Re-enable the Trusted Platform Module (TPM). See the Upgrading the Trusted Platform Module section.
3. If you are not using Easy Restore, import your new or existing iDRAC Enterprise license. For more information, see the *Integrated Dell Remote Access Controller User's Guide* available at https://www.dell.com/idracmanuals.
4. Follow the procedure listed in After working inside your system.

Restoring the system using Easy Restore

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

About this task

Below is a list of options/steps available:

Steps

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

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

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

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

Manually update the Service Tag

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

About this task

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

Steps

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

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

5. Click **OK**.

Sliding out the system board tray for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Remove lower brace cover.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.

Steps

1. Unlock all the four blue plungers on the system board tray. Rotate the handle upward, and then lock the two blue plungers near to the handle.
2. Slide the system board tray toward the rear of the chassis until it locks at its position.

Figure 140. Sliding out the system board tray

Next steps

Sliding in the system board tray for Intel GPU configurations.

Sliding in the system board tray for Intel GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Remove lower brace cover.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.

Steps

1. Hold the system board tray handles, slide it toward front of the chassis until the tray firmly locks in its place.
2. Unlock the two blue plungers near to the handle to release the handle. Rotate the handle and slide the system board tray again to lock in its position. Release the handle until it firmly locks into the chassis. Lock the four blue plungers.
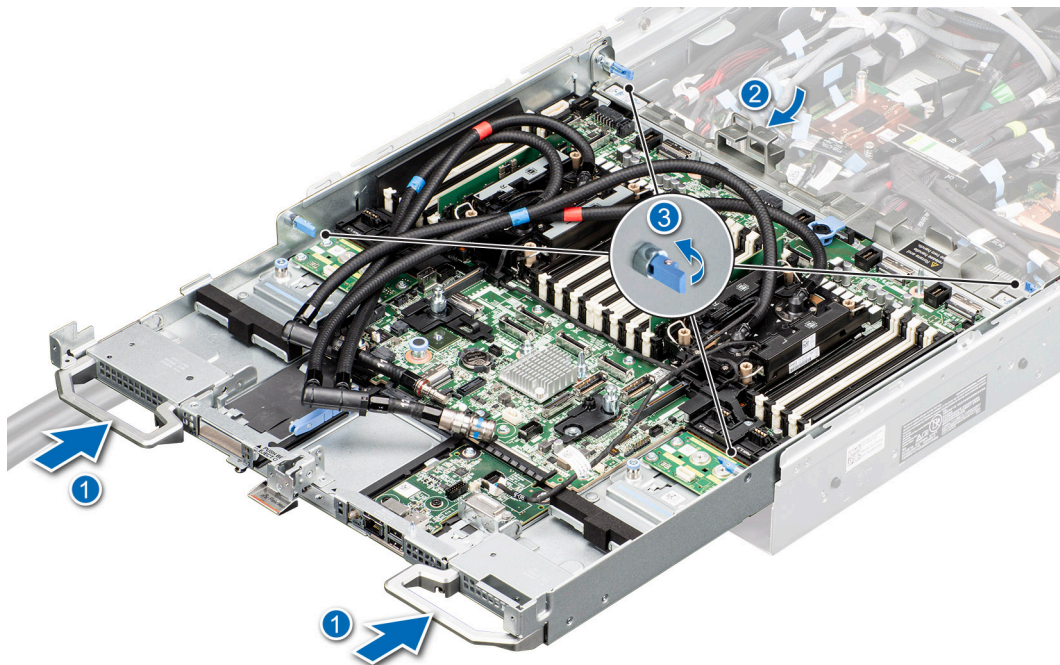
Figure 141. Sliding in the system board tray

Next steps

1. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
2. Install the lower brace cover.
3. Reconnect all the cables onto the system board. For more information, see Cabling diagram
4. Install the risers.
5. Install the storage tray.
6. Install the VSB cables on the system board.
7. Follow the procedure listed in the After working inside your system.
.

Removing the system board tray for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Remove lower brace cover.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.

Steps

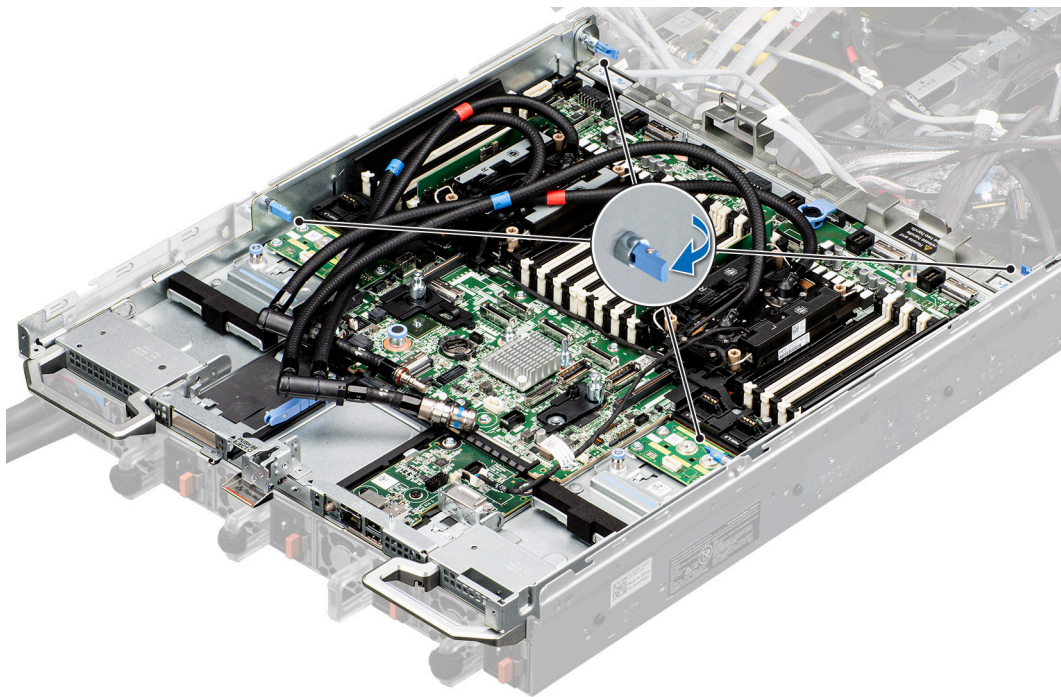1. Unlock all the four blue plungers on the system board tray.

Figure 142. Unlock the blue plungers

2. Rotate the handle upward, and then lock the two blue plungers near to the handle. Slightly (around 2 cm) slide out the system board tray until system board tray triangle mark is fully aligned with chassis triangle mark. Using both the hands, one hand holding the handle and another one holding the system handle, lift the tray out of the chassis.

Figure 143. Alignment of the triangle mark inside and outside the chassis
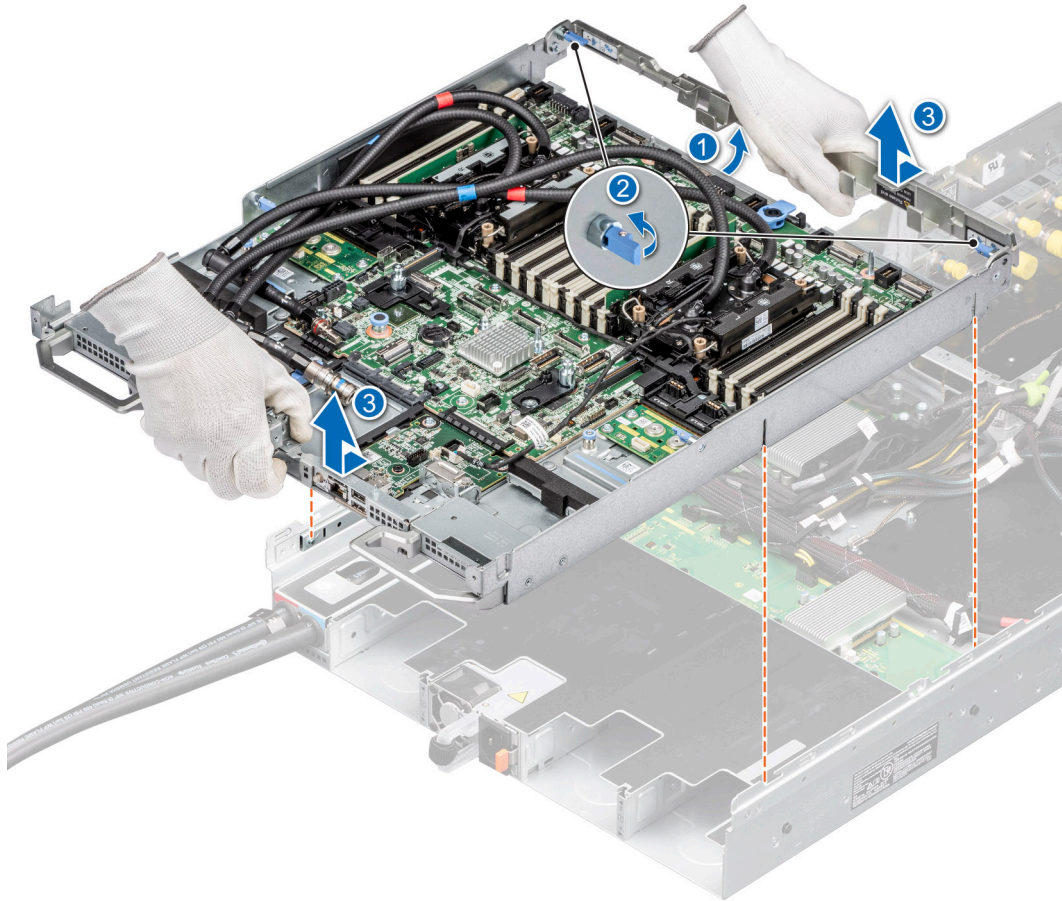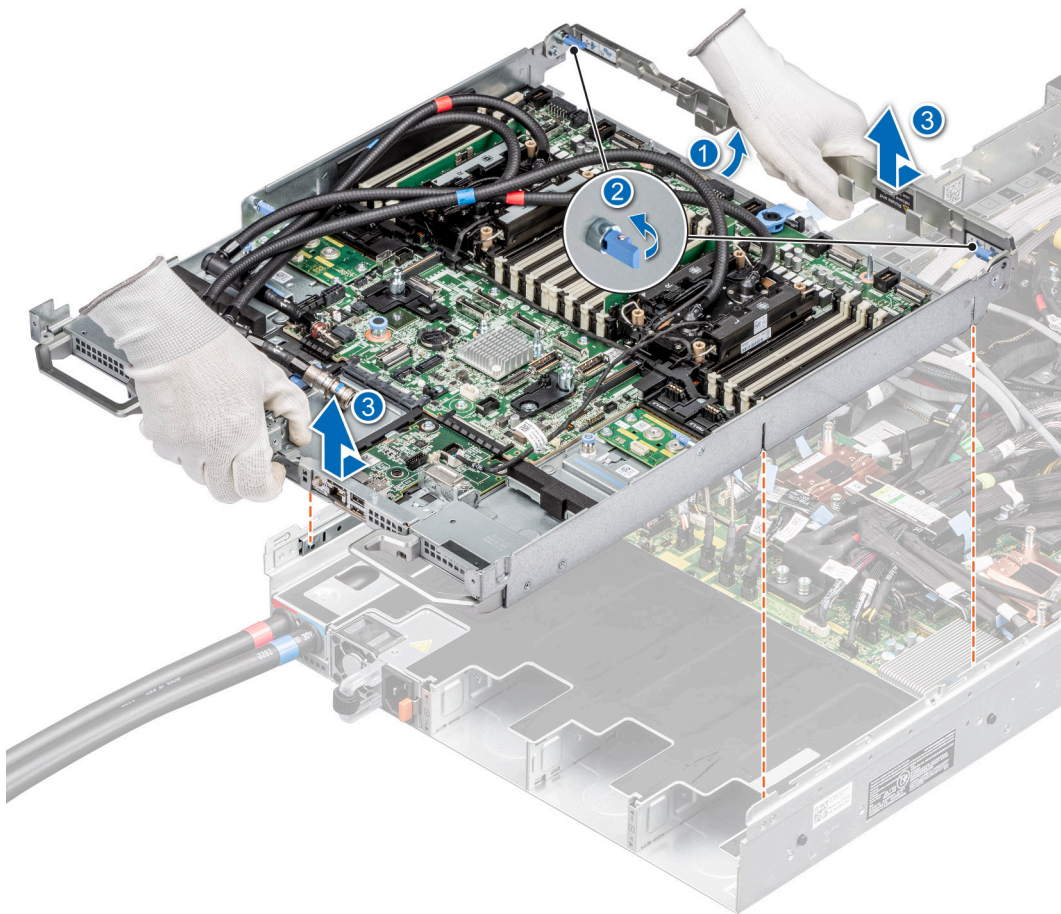
Figure 144. Removing the system board tray

Next steps

Install the system board tray for Intel GPU configurations.

Installing the system board tray for Intel GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Remove lower brace cover.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.

Steps

1. (i) **NOTE:** Make sure the two blue plungers at the rear of the chassis are unlocked and two blue plungers near to the system board handle are in locked position with handle upward.

   (i) **NOTE:** Make sure chassis inner slide up_down triangle mark is fully aligned with chassis triangle mark.

Using both the hands, one hand holding the handle and another one holding the system handle, align system board tray alignment slot into T-standoffs on chassis.
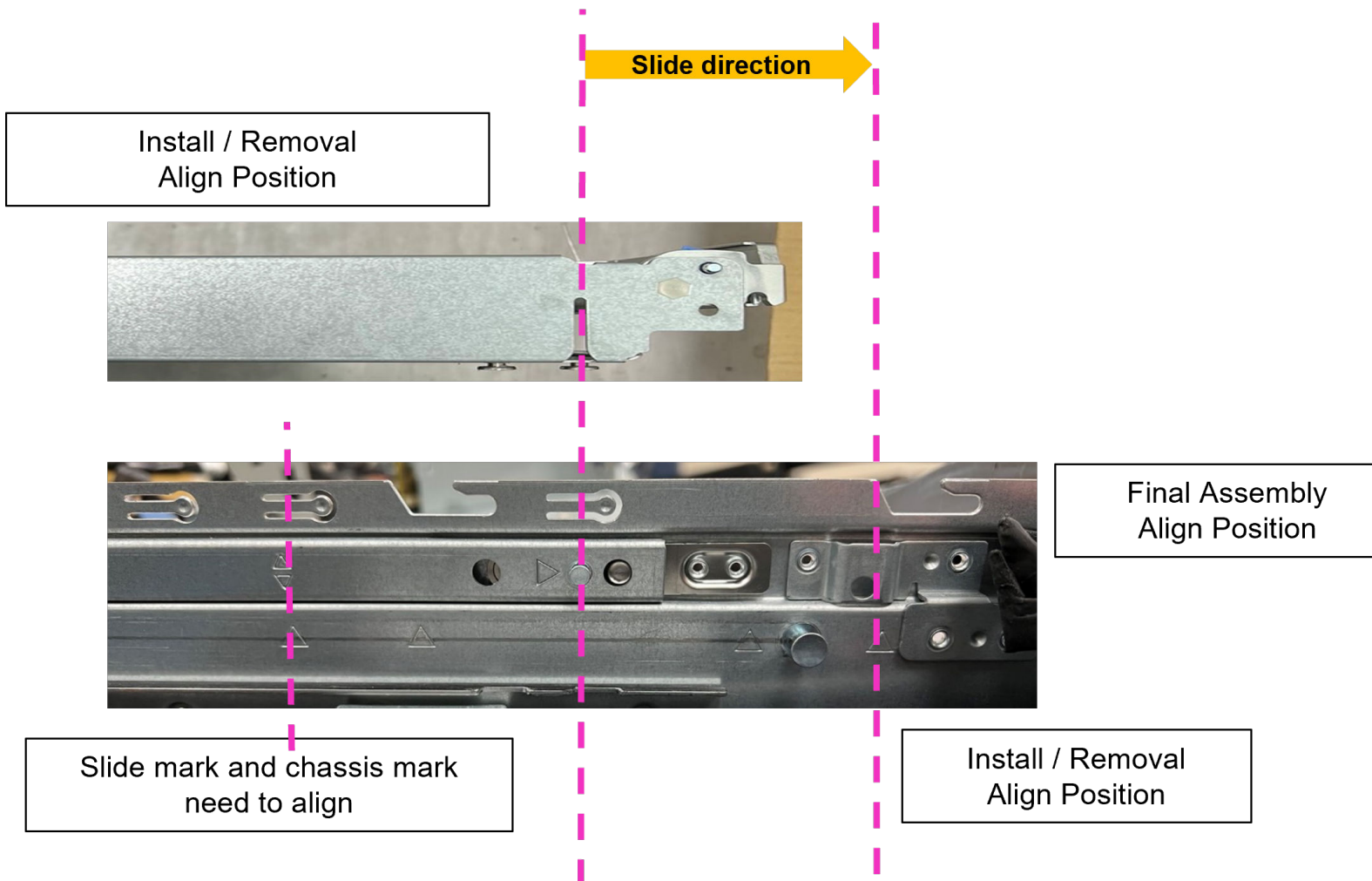
Slide direction

Install / Removal
Align Position

Final Assembly
Align Position

Slide mark and chassis mark
need to align

Install / Removal
Align Position

Figure 145. Alignment position

2. Hold the system board tray, slide it toward front of the chassis until the tray firmly locks in its place.
3. Unlock the two blue plungers near to the handle and the handle firmly locks into the chassis.
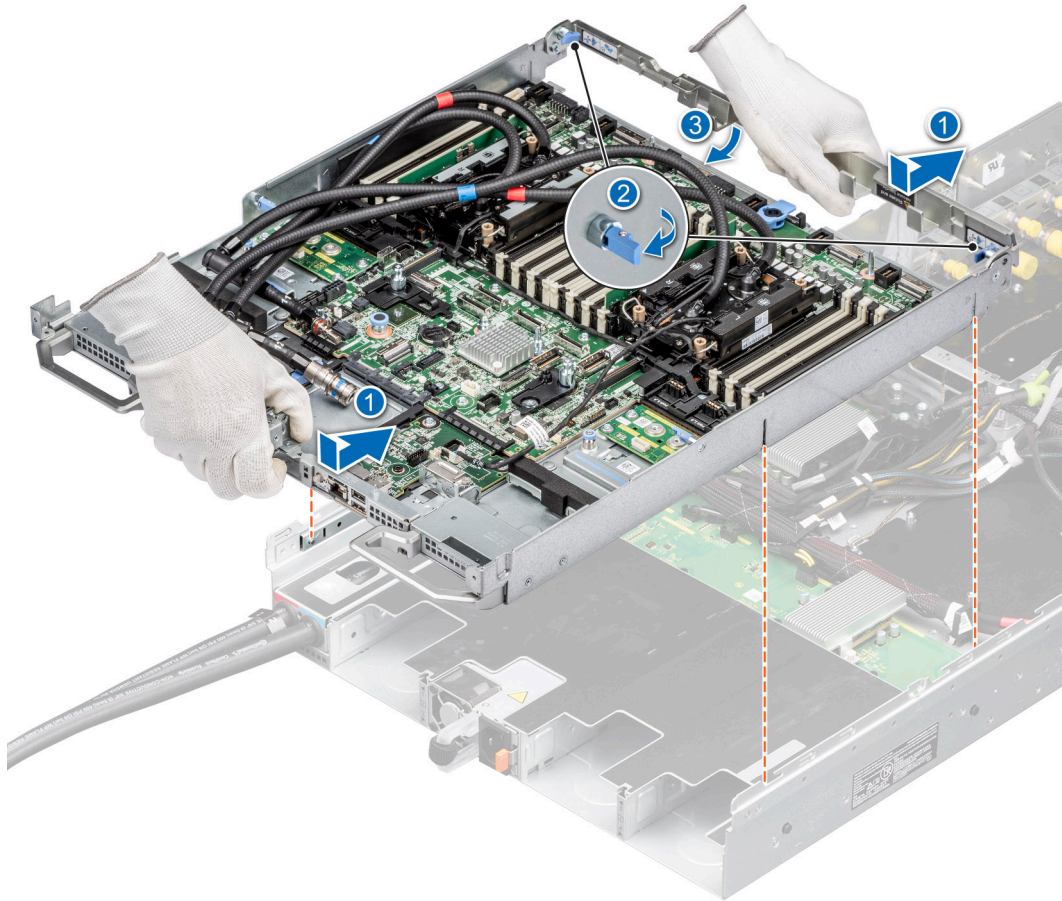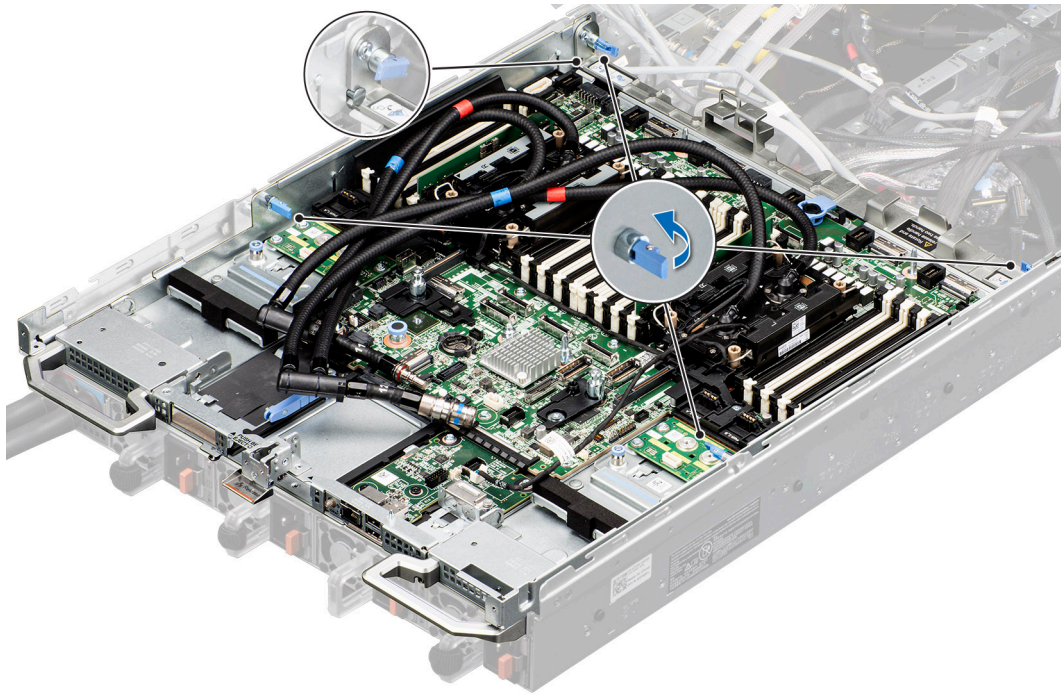
Figure 146.

4. Lock the four blue plungers.
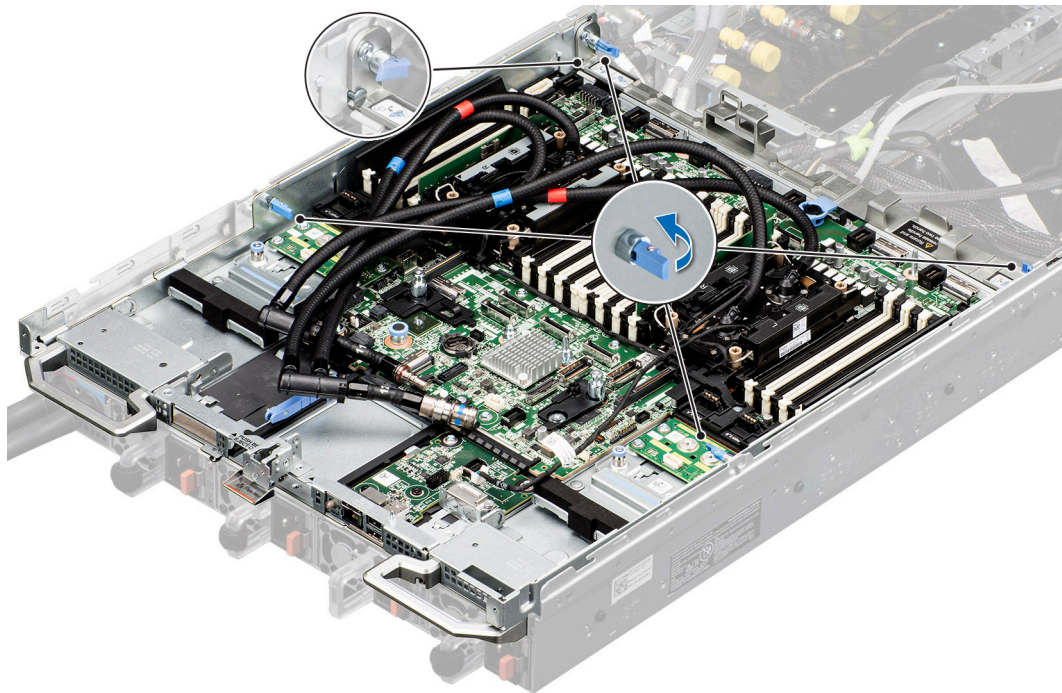
Figure 147. Lock the four blue plungers.

Next steps

1. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
2. Install the lower brace cover.
3. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
4. Install the Risers.
5. Install the Storage tray.
6. Install the VSB cables on the system board.
7. Follow the procedure listed in the After working inside your system.

.

Sliding out the system board tray for NVIDIA GPU configurations

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 storage tray.
4. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
5. Remove the VSB cables from the system board.
6. Remove lower brace cover.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.

Steps

1. Unlock all the four blue plungers on the system board tray. Rotate the handle upward, and then lock the two blue plungers near to the handle.
2. Slide the system board tray toward the rear of the chassis until it locks at its position.

Figure 148. Sliding out the system board tray

Next steps

Sliding in the system board tray for NVIDIA GPU configurations.

Sliding in the system board tray for NVIDIA GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the storage tray.
4. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
5. Remove the VSB cables from the system board.
6. Remove lower brace cover.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.

Steps

1. Hold the system board tray handles, slide it toward front of the chassis until the tray firmly locks in its place.
2. Unlock the two blue plungers near to the handle to release the handle. Rotate the handle and slide the system board tray again to lock in its position. Release the handle until it firmly locks into the chassis. Lock the four blue plungers.

Figure 149. Sliding in the system board tray

Next steps

1. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
2. Install the lower brace cover.
3. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
4. Install the Risers.
5. Install the Storage tray .
6. Install the VSB cables on the system board.
7. Follow the procedure listed in the After working inside your system.
.

Removing the system board tray for NVIDIA GPU configurations

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 storage tray.
4. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
5. Remove the VSB cables from the system board.
6. Remove lower brace cover.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.

Steps

1. Unlock all the four blue plungers on the system board tray.

Figure 150. Unlock the blue plungers

2. Rotate the handle upward, and then lock the two blue plungers near to the handle. Slightly (around 2 cm) slide out the system board tray until system board tray triangle mark is fully aligned with chassis triangle mark. Using both the hands, one hand holding the handle and another one holding the system handle, lift the tray out of the chassis.

Figure 151. Alignment of the triangle mark inside and outside the chassis

Figure 152. Removing the system board tray

Next steps

Install the system board tray.

Installing the system board tray for NVIDIA GPU configurations

Prerequisites

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

2. Follow the procedure listed in Before working inside your system.
3. Remove the storage tray.
4. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
5. Remove the VSB cables from the system board.
6. Remove lower brace cover.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.

Steps

1.   (i) **NOTE:** Make sure the two blue plungers at the rear of the chassis are unlocked and two blue plungers near to the system board handle are in locked position with handle upward.

   (i) **NOTE:** Make sure chassis inner slide up_down triangle mark is fully aligned with chassis triangle mark.

   Using both the hands, one hand holding the handle and another one holding the system handle, align system board tray alignment slot into T-standoffs on chassis.

Slide direction

Install / Removal
Align Position

Final Assembly
Align Position

Slide mark and chassis mark
need to align

Install / Removal
Align Position

Figure 153. Alignment position

2. Hold the system board tray, slide it toward front of the chassis until the tray firmly locks in its place.
3. Unlock the two blue plungers near to the handle and the handle firmly locks into the chassis.
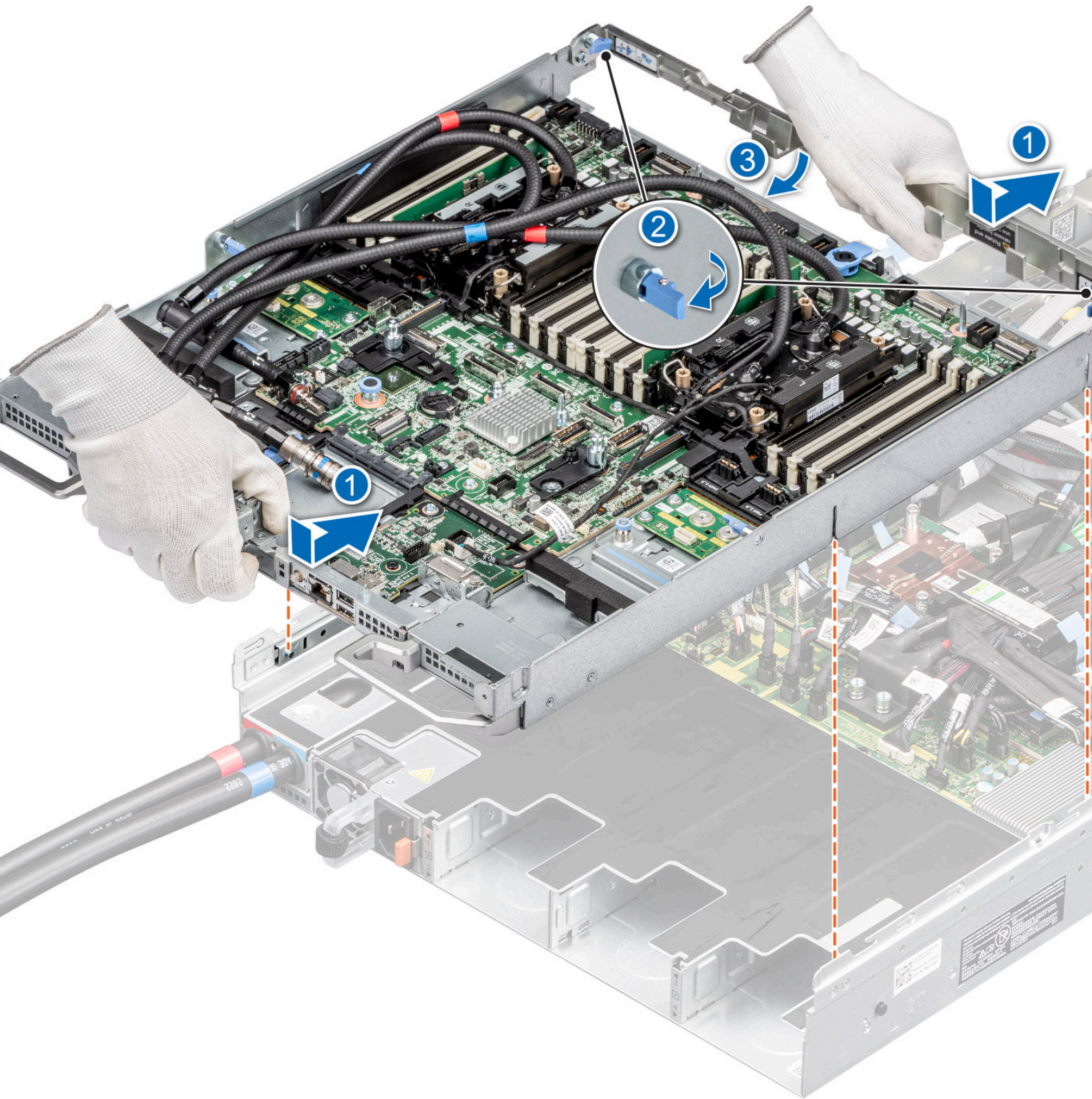
Figure 154. Installing the system board tray

4. Lock the four blue plungers.

Figure 155. Lock the four blue plungers

Next steps

1. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
2. Install the lower brace cover.
3. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
4. Install the Risers.
5. Install the Storage tray .
6. Install the VSB cables on the system board.
7. Follow the procedure listed in the After working inside your system.
.

LOM card and rear I/O board

Removing the LOM card and rear I/O board

Prerequisites

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

Steps

1. Using a Phillips 2 screwdriver, remove the screws that secure the LAN on Motherboard (LOM) card and rear I/O board to the system board.
2. Holding the edges, pull the LOM card or rear I/O board to disconnect from the connector on the system board.
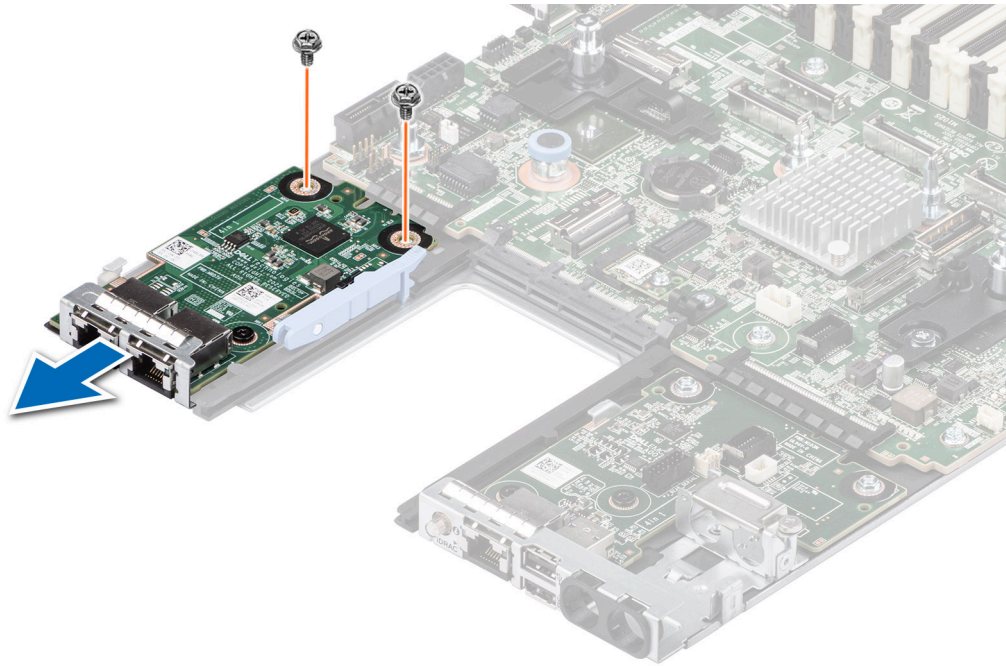
Figure 156. Removing the LOM card
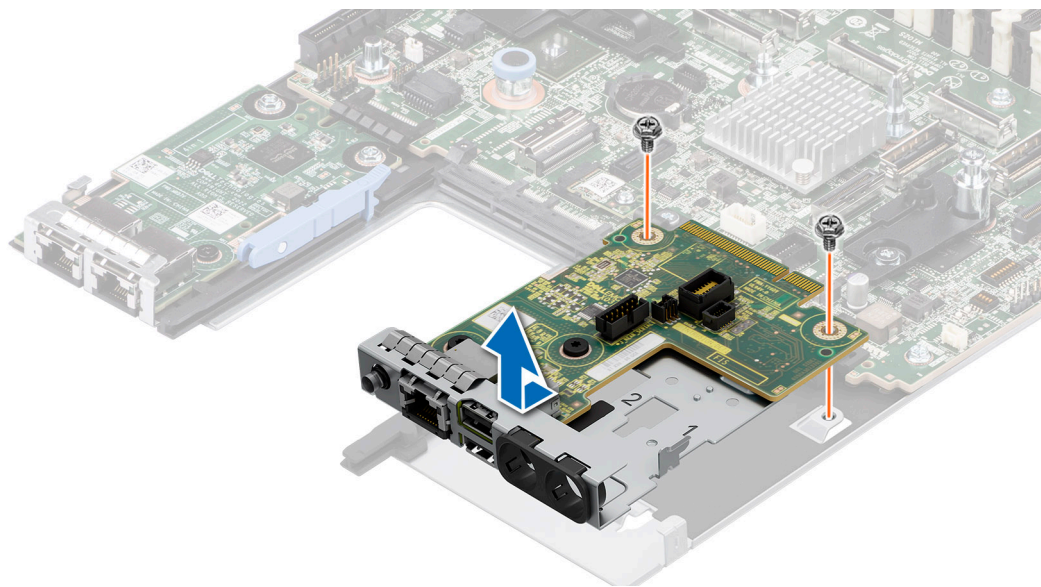
Figure 157. Removing the rear I/O board

Next steps

Replace the LOM card and rear I/O board.

Installing the LOM card and rear I/O board

Prerequisites

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

Steps

1. Align the connectors and slots on the LOM card or rear I/O board with the connector and standoffs on the system board.
2. Press the LOM card or rear I/O board until firmly seated on the system board connector.
3. Using a Phillips 2 screwdriver, secure the LOM card or rear I/O board to the system board with screws.
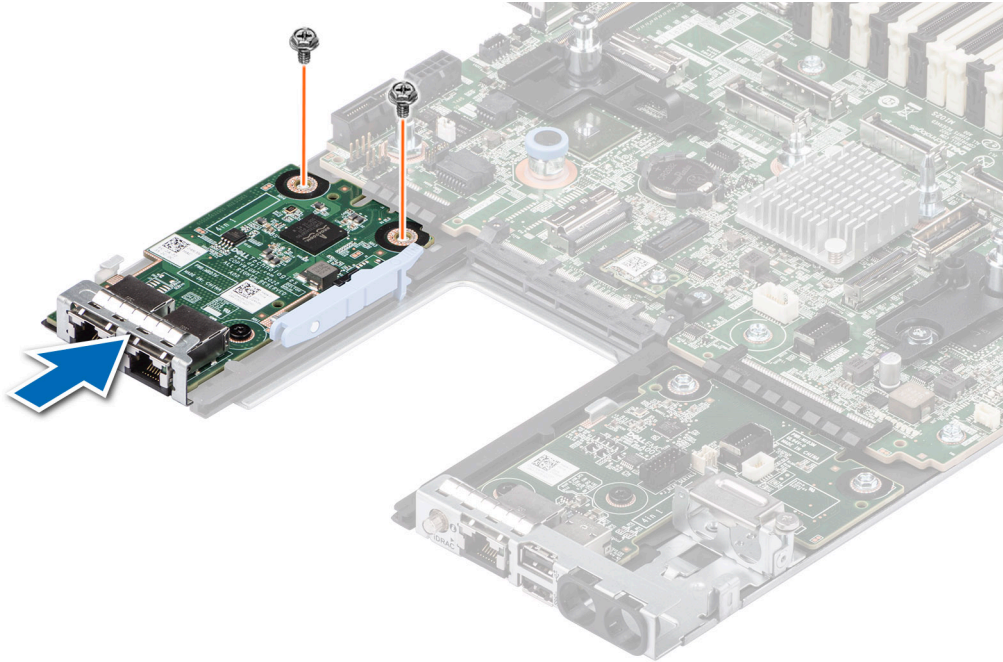
Figure 158. Installing the LOM card
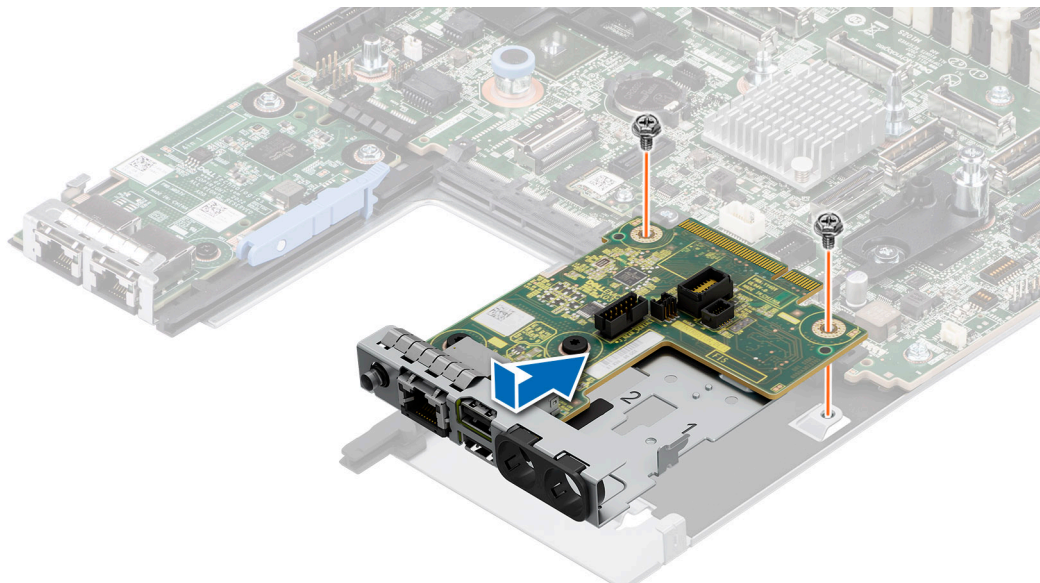
Figure 159. Installing the rear I/O board

Next steps

1. Install the system board.
2. Observe and connect the cables to the connectors on the power distribution board.
3. Follow the procedure listed in After working inside your system.

Control panel

This is a service technician replaceable part only.

Removing the right control panel

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the riser 1A for Intel GPU configurations or Remove the riser 1B for NVIDIA GPU configurations.

Steps

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

   (i) **NOTE:** Observe the routing of the cable assembly as you remove the right control panel from the system.
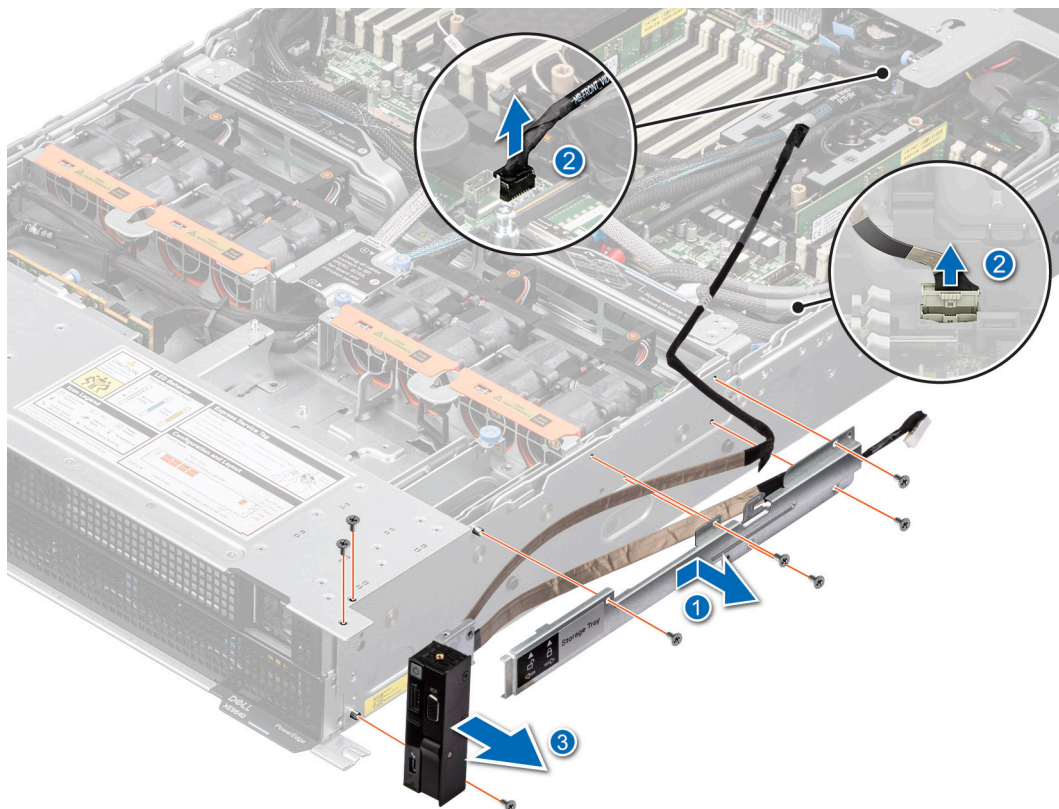
Figure 160. Removing the right control panel

Next steps

Replace the right control panel.

Installing the right control panel

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system.
3. Remove the riser 1A for Intel GPU configurations or Remove the riser 1B for NVIDIA GPU configurations.

Steps

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

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

4. Connect the right control panel cable and VGA cable to the connectors on the system board.
5. Using the Phillips 1 screwdriver, tighten the screws that secure the right control panel and the cable cover to the system.
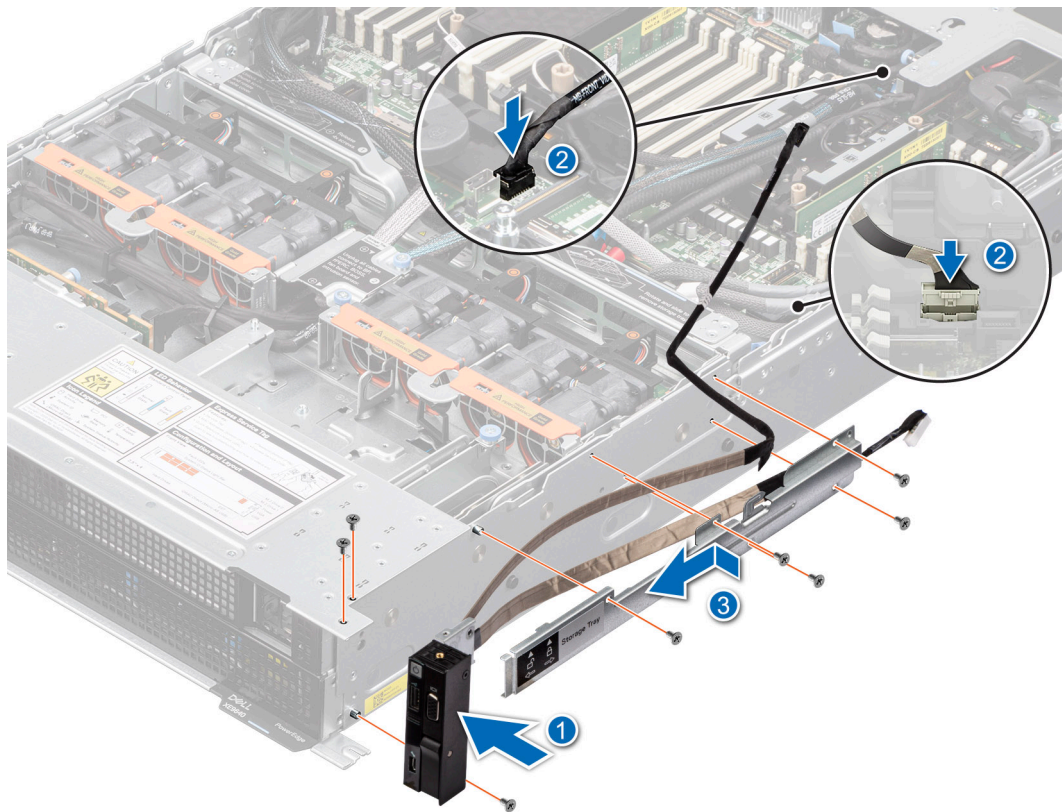
Figure 161. Installing the right control panel

Next steps

1. Install the riser 1A for Intel GPU configurations or Install the riser 1B for NVIDIA GPU configurations.
2. Follow the procedure listed in After working inside your system .

Removing the left control panel

Prerequisites

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

Steps

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

   ⓘ **NOTE:** Observe the routing of the cable as you remove the left control panel from the system.
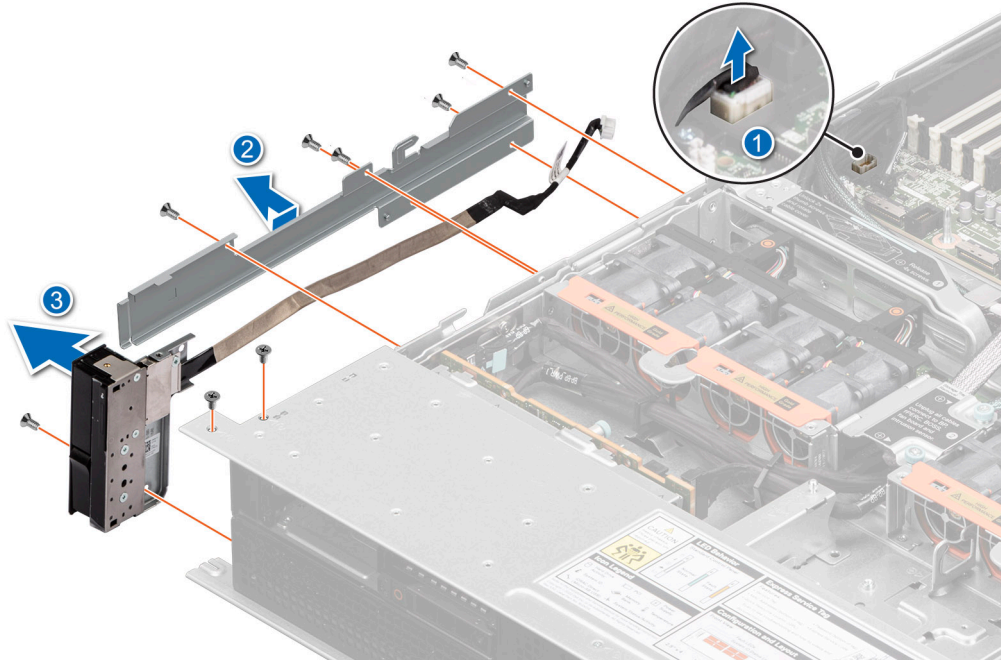
Figure 162. Removing the left control panel

Next steps

Replace the left control panel.

Installing the left control panel

Prerequisites

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

Steps

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

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

4. Using the Phillips 1 screwdriver, tighten the screws to secure the left control panel and the cable cover to the system.
5. Connect the left control panel cable to the connector on the system board .
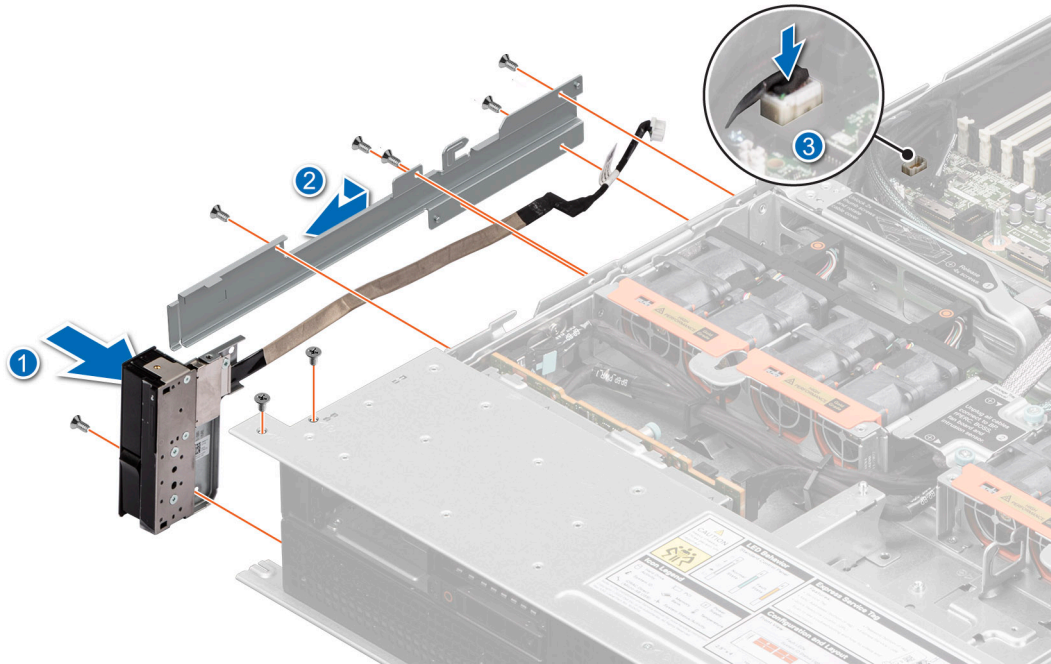
Figure 163. Installing the left control panel

Next steps

Follow the procedure listed in After working inside your system.

Intel GPU module, CBB (Carrier Base board) cold plate, GPU board, GPU cold plates, Power Distribution Board (PDB)

This is a service technician replaceable part only.

Removing the PDB for Intel GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the storage tray.
5. Remove the risers.
6. Remove the VSB cables from the system board.
7. Remove lower brace cover.
8. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Remove the system board tray.
11. Disconnect the liquid cooling tubes from the Manifold for the connectors 6, 7, 8.
12. Remove the VSB cables from the PDB.
13. Disconnect the cables from the connector on the PDB.
14. Remove the power supply units.

Steps

1. Using the Phillips 2 screwdriver, remove the screws securing the plastic cable holder from the PDB.
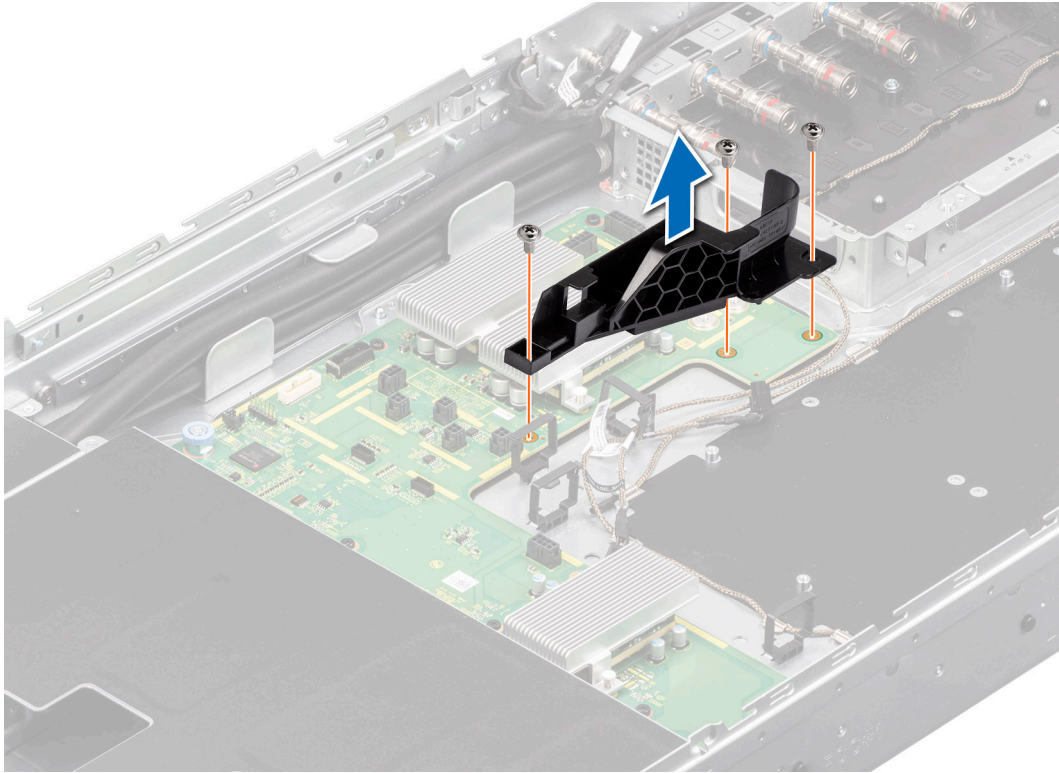
Figure 164. Removing the cable holder

2. Using the Phillips 2 screwdriver, remove the screws on the PDB. Holding the blue holders, lift the PDB away from the chassis.
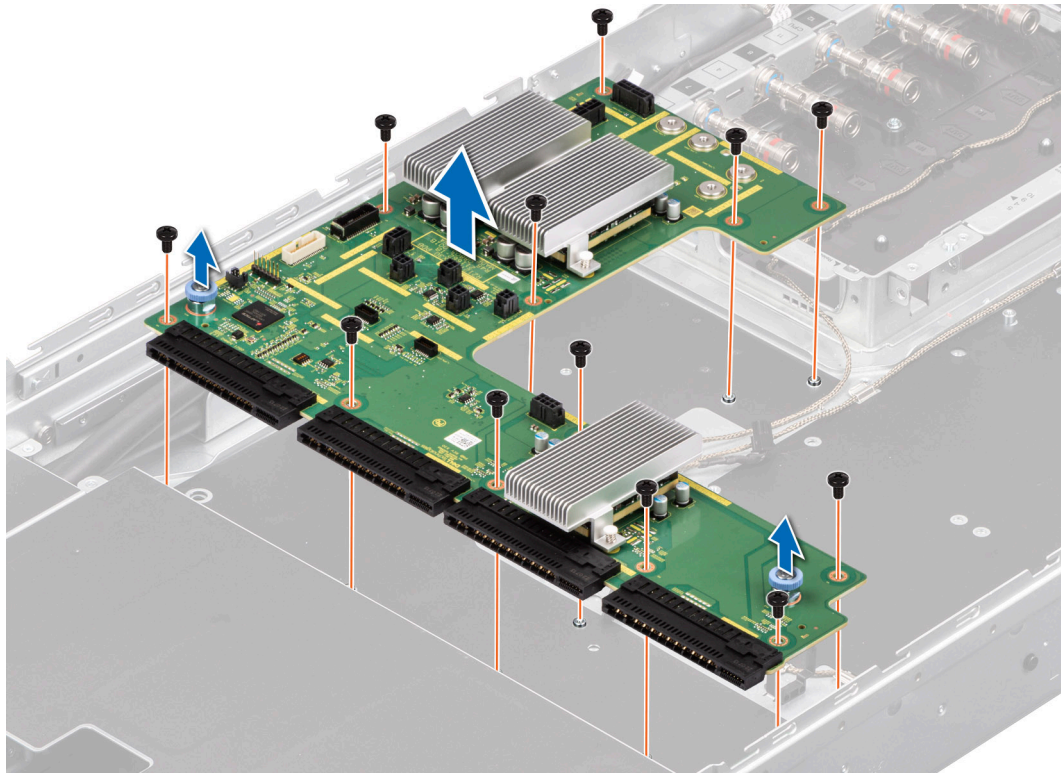
Figure 165. Removing the PDB

Next steps

Replace the PDB for Intel GPU configurations.

Installing the PDB for Intel GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the storage tray.
5. Remove the risers.
6. Remove the VSB cables from the system board.
7. Remove lower brace cover.
8. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
9. Disconnect the liquid cooling tubes from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Remove the system board tray.
11. Disconnect the liquid cooling tubes from the Manifold for the connectors 6, 7, 8.
12. Remove the VSB cables from the PDB.
13. Disconnect the cables from the connector on the PDB.
14. Remove the power supply units.

Steps

1. Holding the blue holders, align and insert the PDB into the chassis. Using the Phillips 2 screwdriver, tighten the screws to secure the PDB in to the chassis.
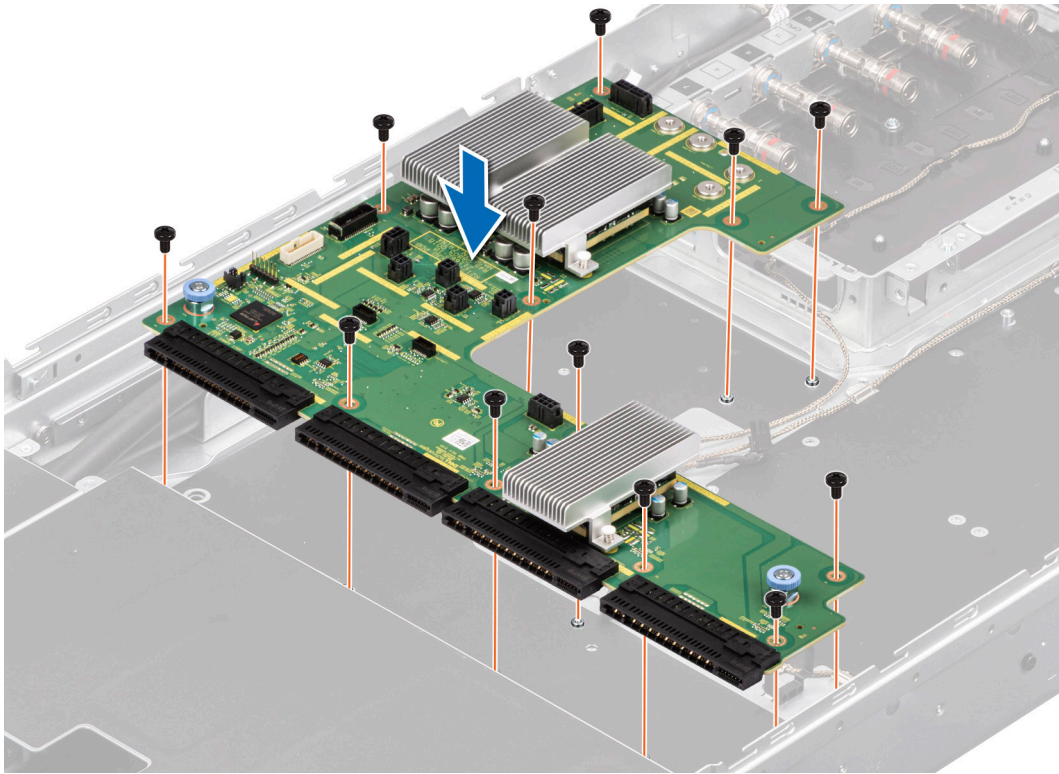
Figure 166. Installing the PDB

2. Align and insert the plastic cable holder on the PDB. Using the Phillips 2 screwdriver, tighten the screws securing the plastic cable holder on the PDB.
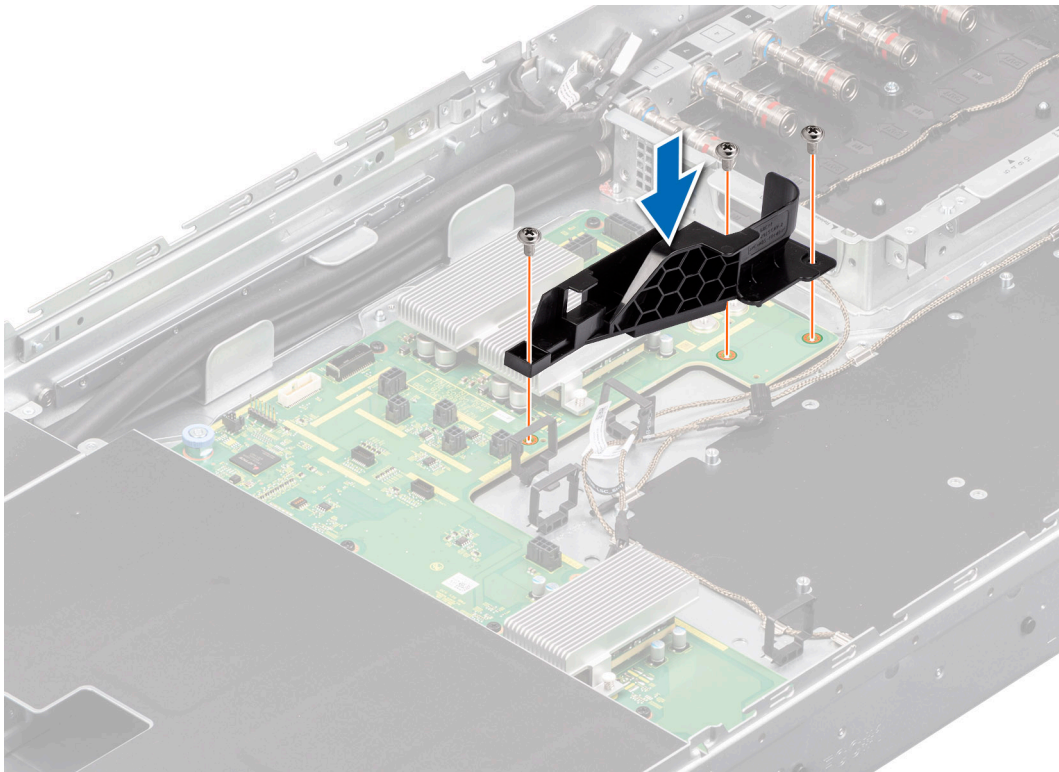
Figure 167. Installing the cable holder

Next steps

.

1. Install the power supply units
2. Reconnect the cables connector on the PDB.
3. Install the VSB cables on the PDB.
4. Reconnect the liquid cooling tubes to the Manifold for the connectors 6, 7, 8.
5. Install the system board tray.
6. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
7. Install the lower brace cover.
8. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
9. Install the Risers.
10. Install the Storage tray .
11. Install the VSB cables on the system board.
12. Follow the procedure listed in the After working inside your system.

Removing the CBB cold plate module for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
7. Remove lower brace cover.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
9. Slide out the system board tray.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates.

Figure 168. Removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates

2. Unplug the cold plate tubes numbering with 1 and 6 from the Manifold Liquid cooling.

3. Install the handles on the CBB to remove the CBB away from the chassis. Using the Phillips 2 screwdriver, tighten the screws to secure the handles on the CBB.

(i) **NOTE:** The CBB handles are not preinstalled into the system. The handles are part of the CBB kit.
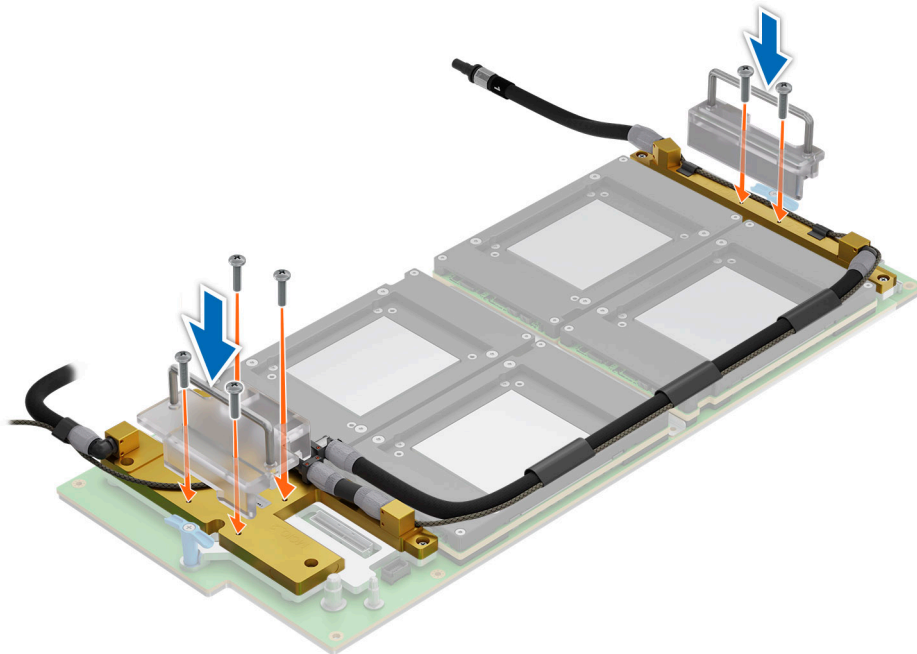
Figure 169. Installing the handles on the CBB

4. Using the Phillips 2 screwdriver, remove the screws securing on the CBB cold plate module. Using both the hands, lift the CBB away from the GPU board.
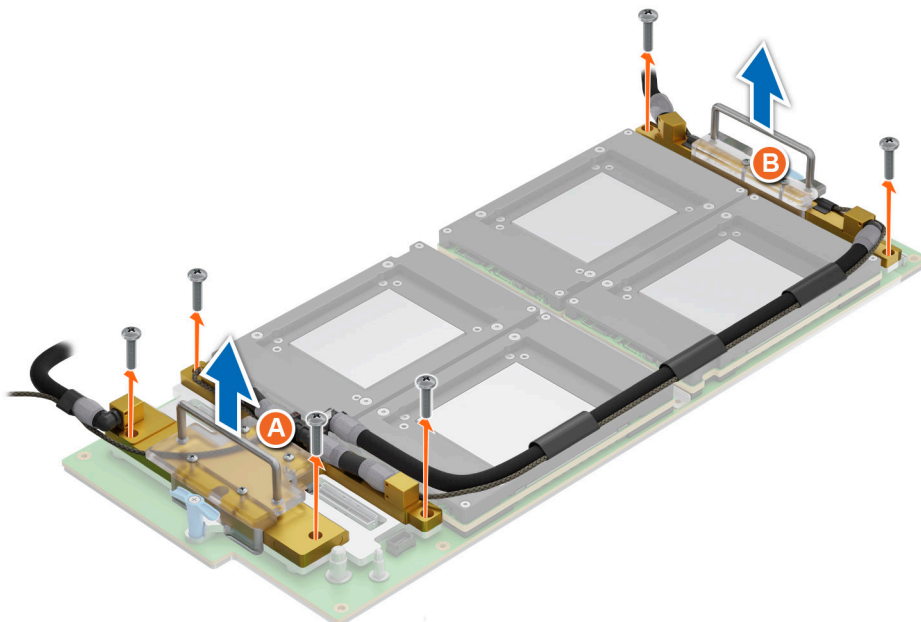
Figure 170. Removing the CBB cold plate module

Next steps

Replace the CBB cold plate module for Intel GPU configurations.

Installing the CBB cold plate module for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
7. Remove lower brace cover.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
9. Slide out the system board tray.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates.

Figure 171. Removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates

2. If you are using an existing GPU cold plate, follow the below process to install the thermal paste on the GPU cold plate.
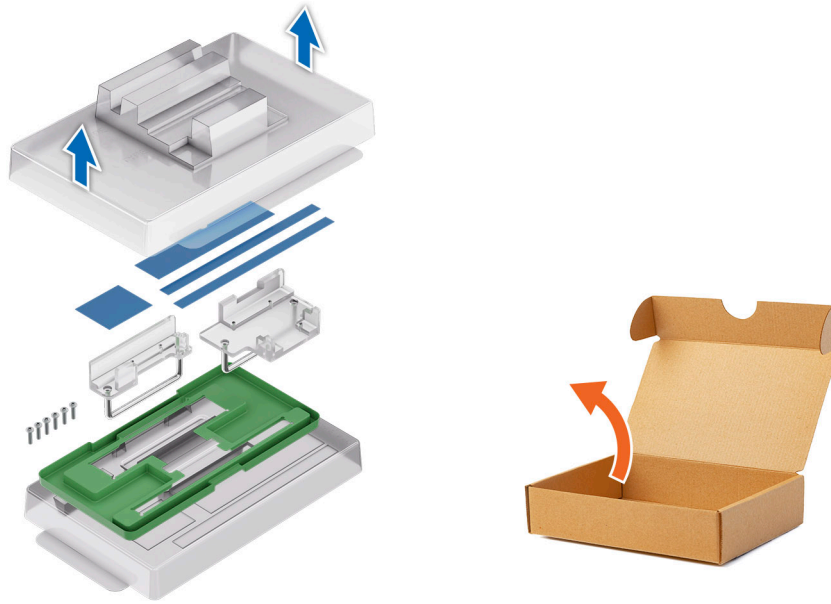
Figure 172.
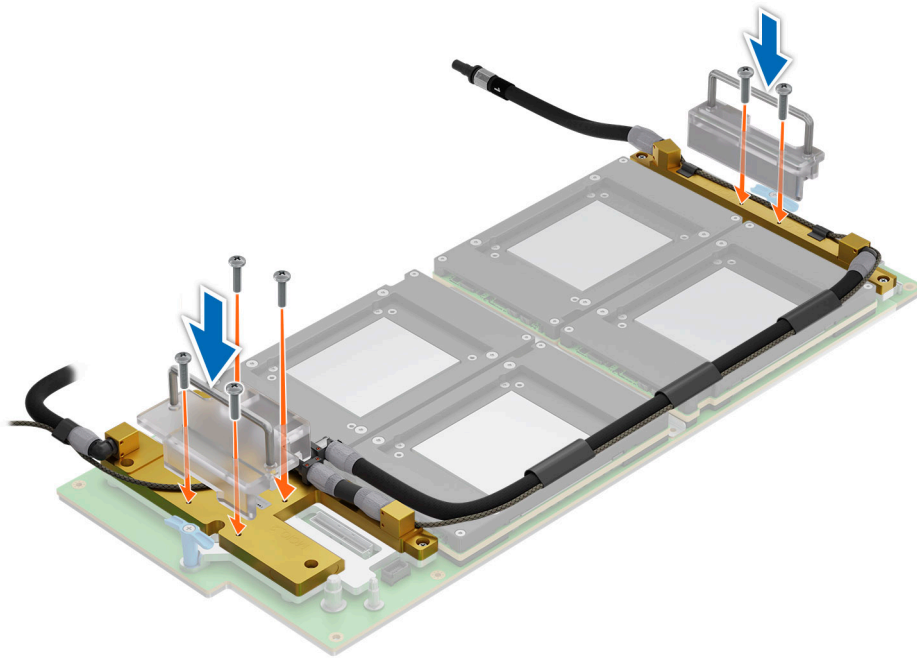
Figure 173.
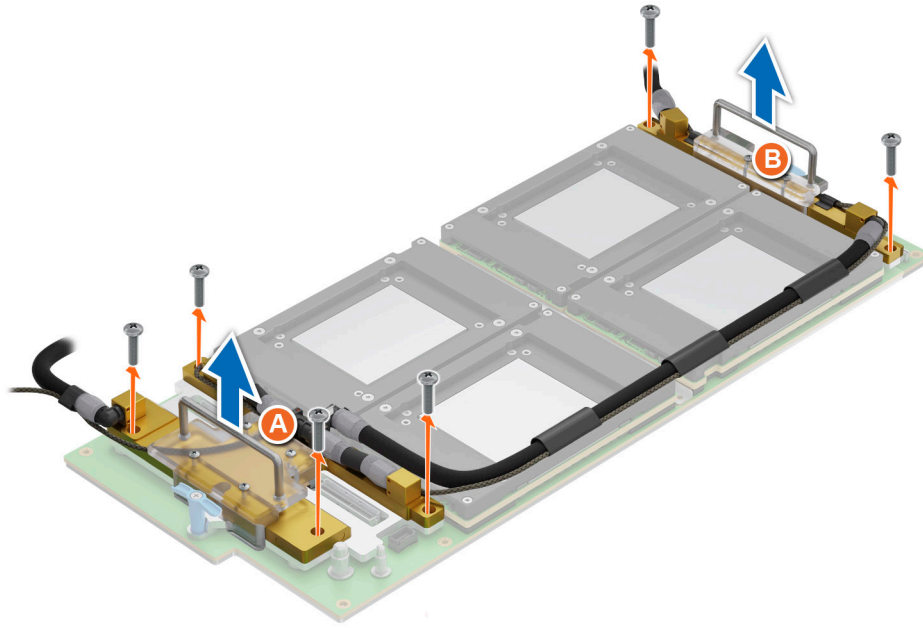
Figure 174.
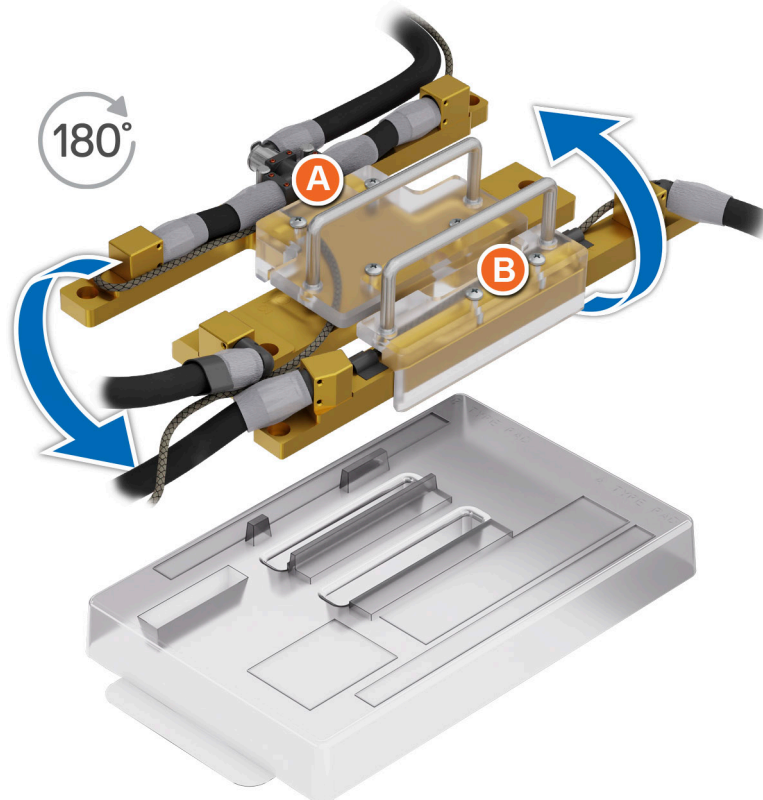
Figure 175.
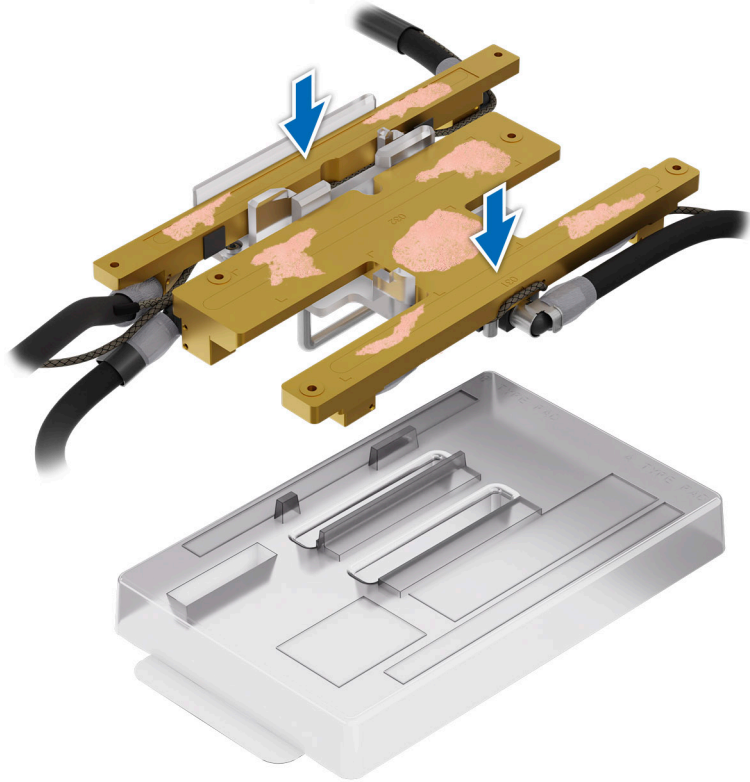
Figure 176.
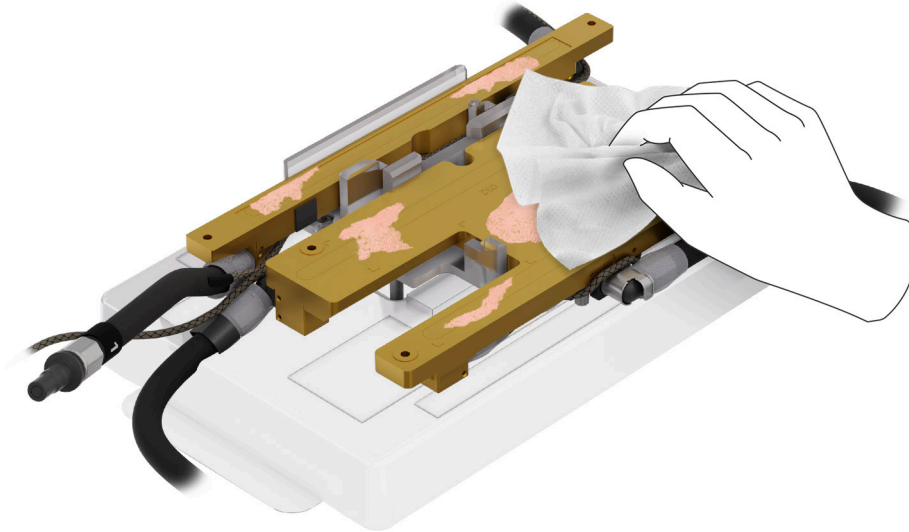
Figure 177.
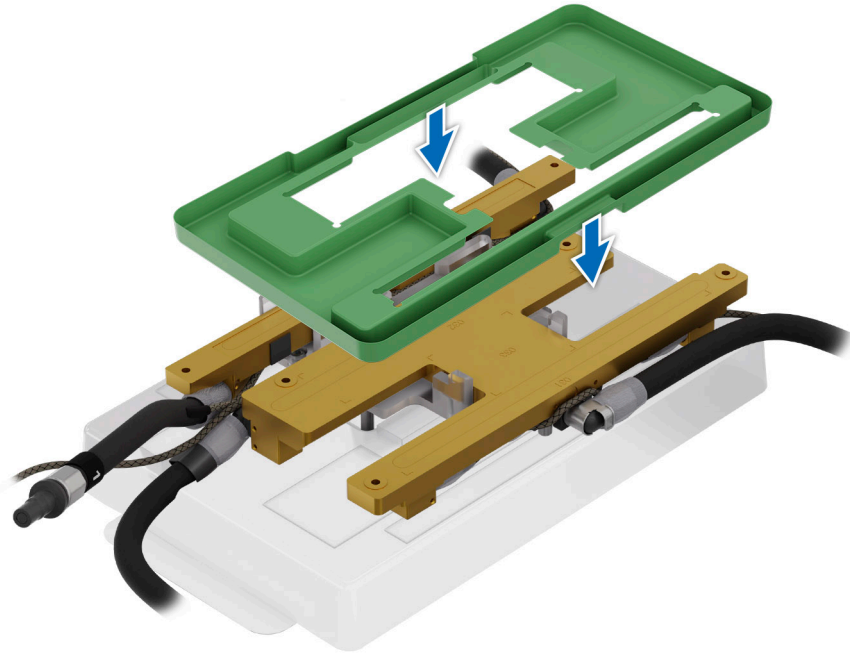
Figure 178.
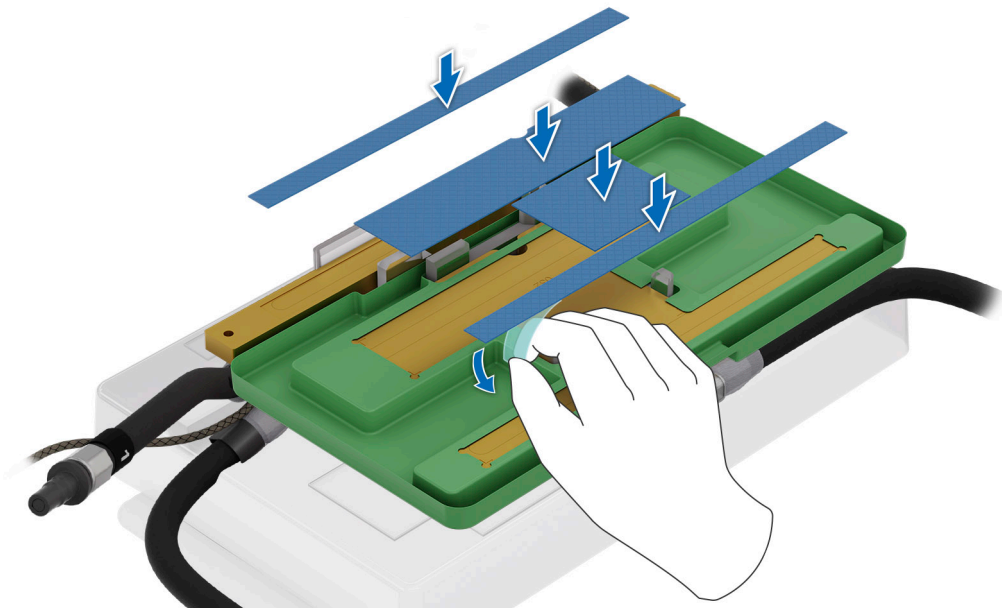
Figure 179.
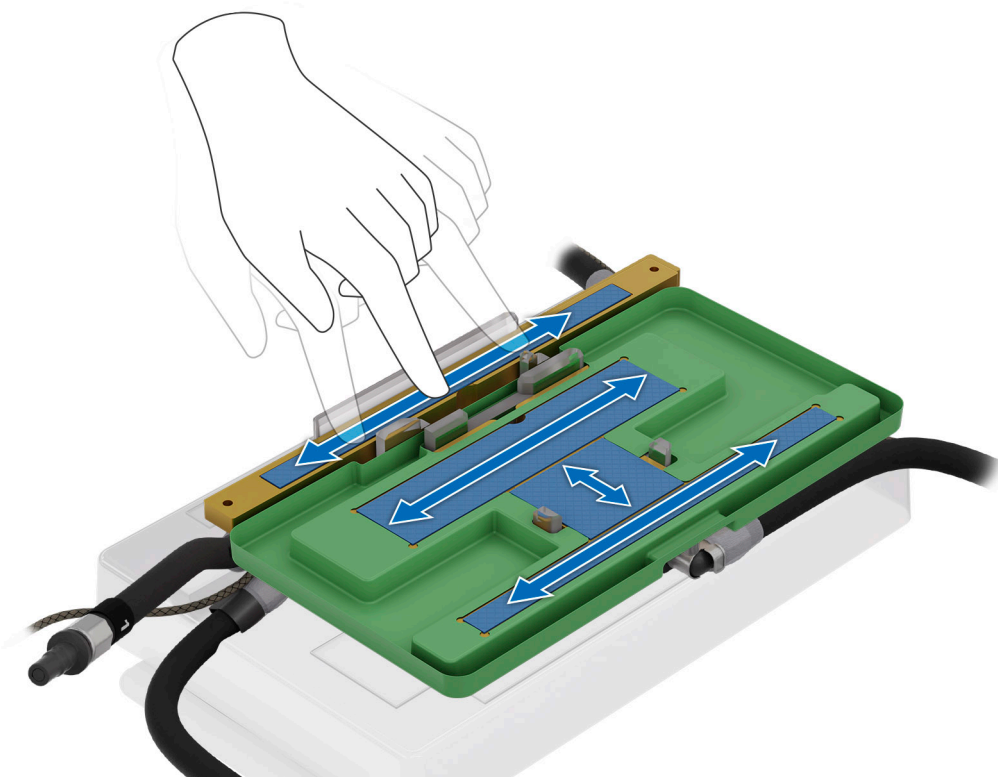
Figure 180.
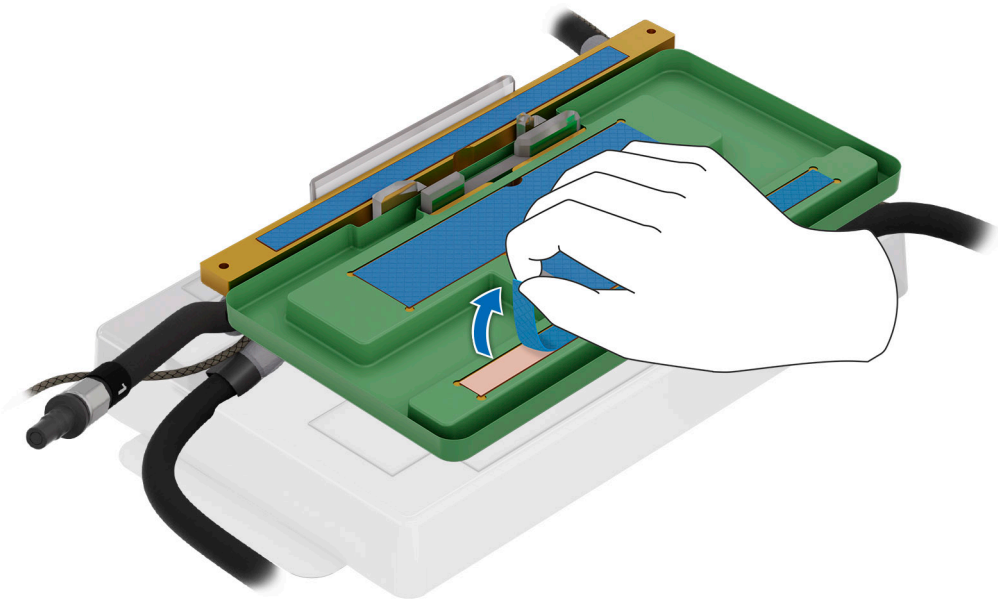
Figure 181.
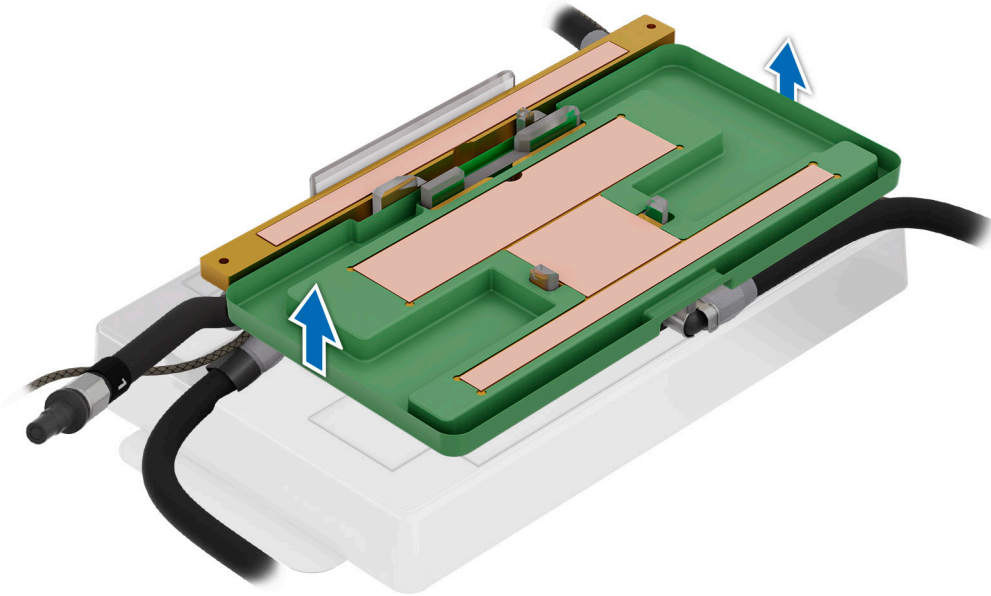
Figure 182.
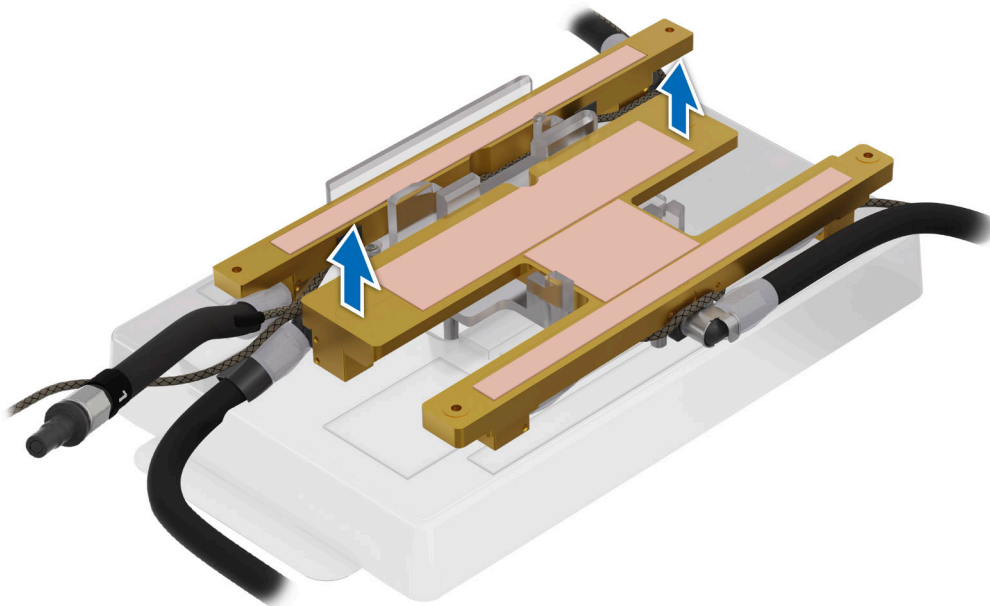
Figure 183.

3. Using both the hands, align and insert the CBB cold plate module on the GPU board. Using the Phillips 2 screwdriver, install and tighten the screws to secure the CBB on the GPU board.
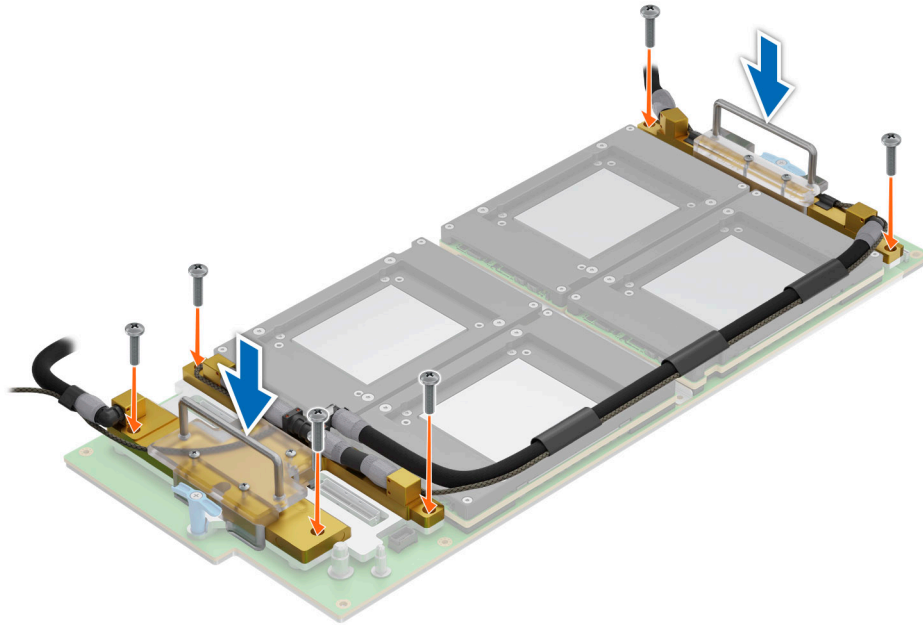
Figure 184. Installing the CBB cold plate module

4. Using the Phillips 2 screwdriver, remove the screws from the CBB handles. Lift the handles away from the CBB cold plate module.
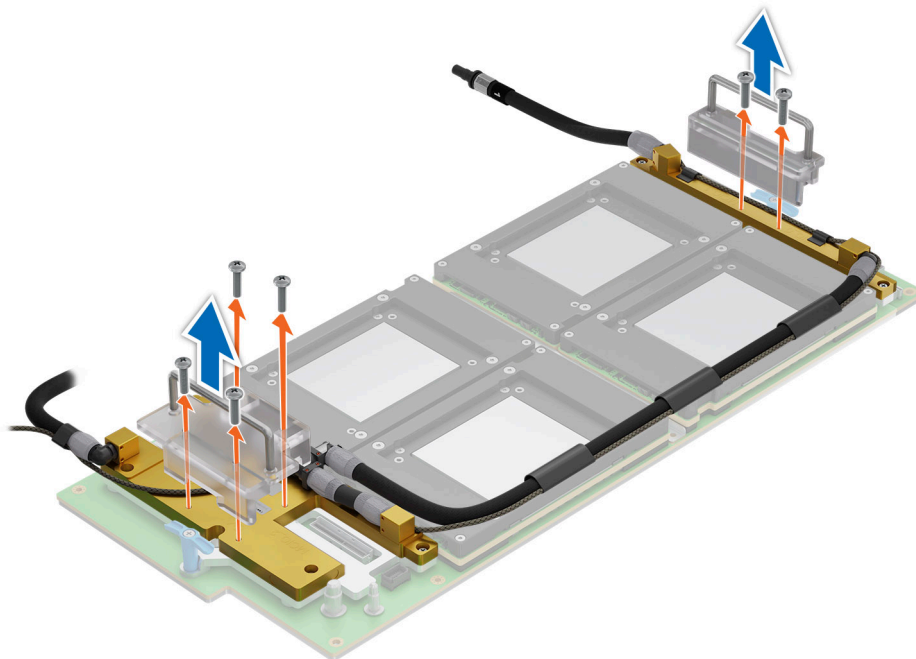
Figure 185. Removing the CBB handles

5. Pull the plunger and rotate the metallic gate . Plug the cold plate tubes numbering with 1 and 6 to the Manifold Liquid cooling.

Next steps

1. Slide in the system board tray.
2. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.

3. Install the lower brace cover.
4. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
5. Install the risers.
6. Install the storage tray.
7. Install the VSB cables on the system board.
8. Follow the procedure listed in the After working inside your system.
.

Removing the sensor tray for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Remove lower brace cover.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
9. Slide out the system board tray.
10. Make sure to wear gloves for remove sensor tray to prevent hands touch sensor cables directly.

Figure 186.

11. Do not touch the sensor tray cable directly.
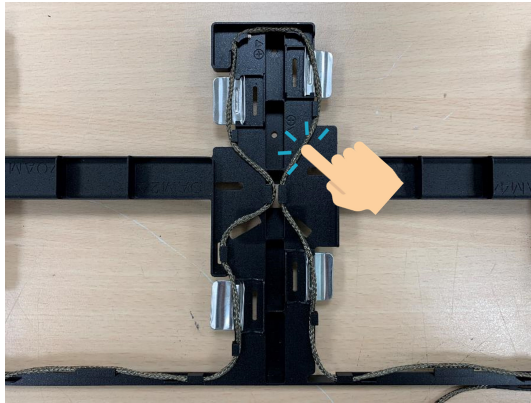
Figure 187.

Steps

1. Release the plunger and rotate the metallic gate to open.

Figure 188.

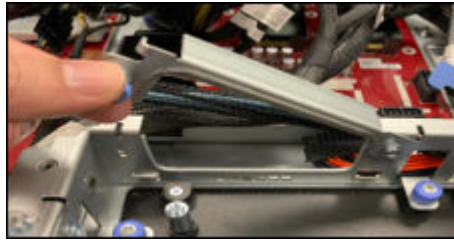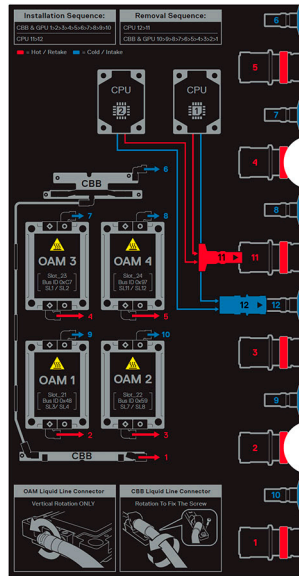2. Release all the GPU cold plate tubes from the Manifold Liquid cooling module.
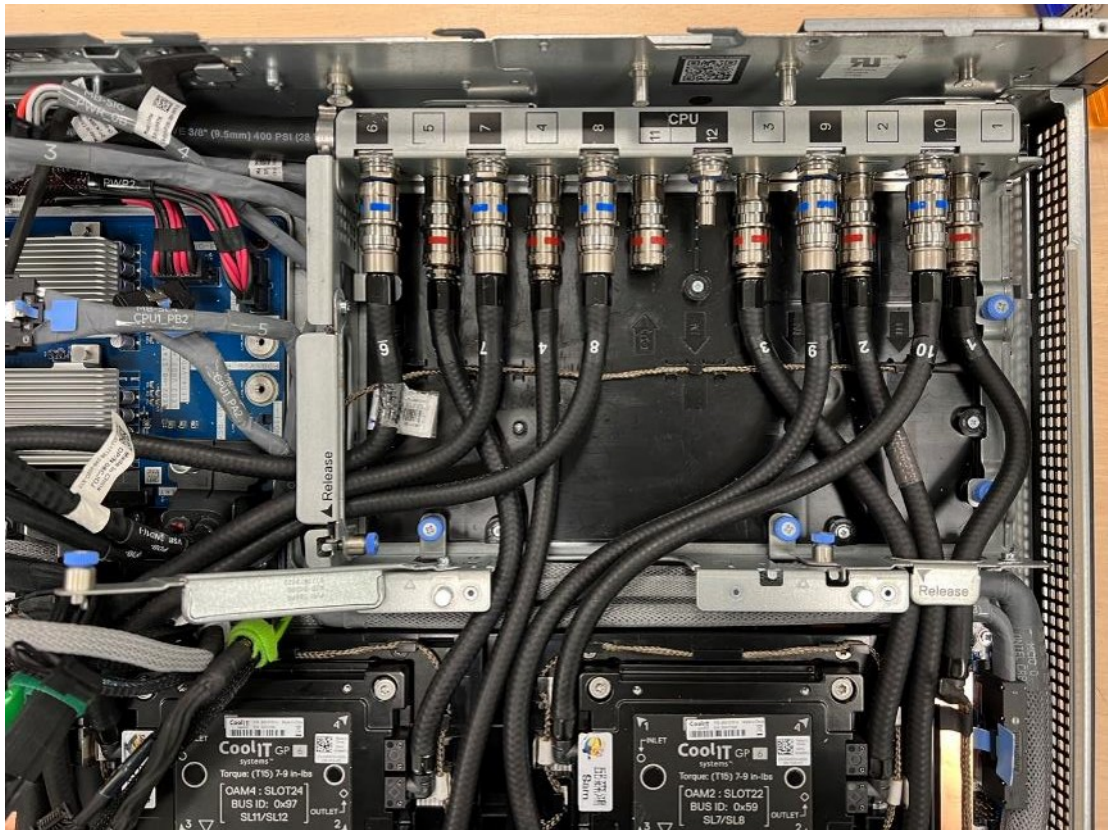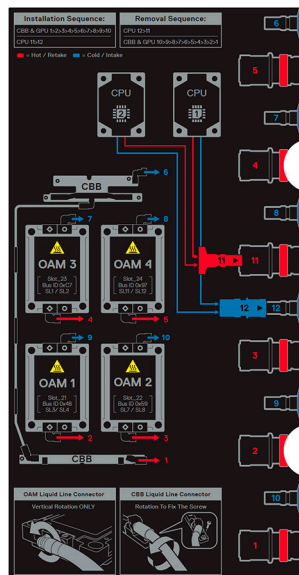

Figure 189.
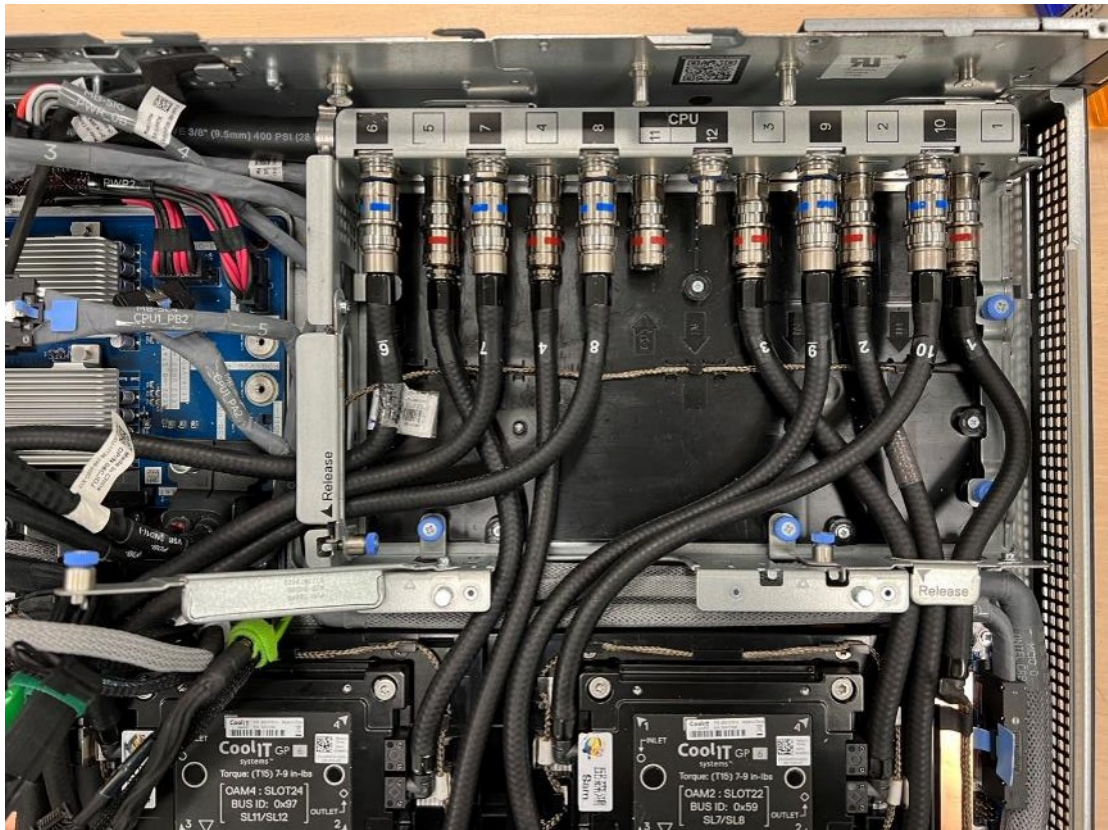
Figure 190. Liquid cooling tubes connectivity positions

3. Remove the sensor tray cable connector on the PDB.
4. Using Phillips 2 screwdriver, remove the screws from the sensor tray.

Figure 191.

5. Move away the metallic bracket from the GPU cold plates. Repeat the same for all 8 brackets

Figure 192.

6. Rotate GPU cold plate tubes. Ensure that each GPU cold plates block has 2 tubes, the tubes must go through the original block, not cross or pass through other blocks.

Figure 193.

7. Remove and lift the sensor tray from the GPU cold plate.

Figure 194.

Next steps

Replace the sensor tray for Intel GPU configurations.

Installing the sensor tray for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Remove lower brace cover.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
9. Slide out the system board tray.
10. Make sure to wear gloves for remove sensor tray to prevent hands touch sensor cables directly.

Figure 195.

11. Do not touch the sensor tray cable directly.
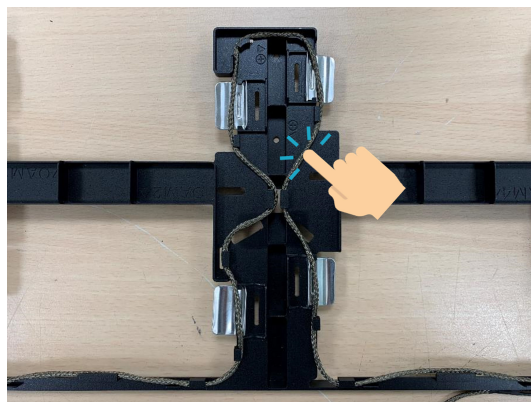
Figure 196.

Steps

1. Using both the hands, rotate GPU cold plate tubes at the position shown in the below image. Hold all the cold plate tubes in one hand.
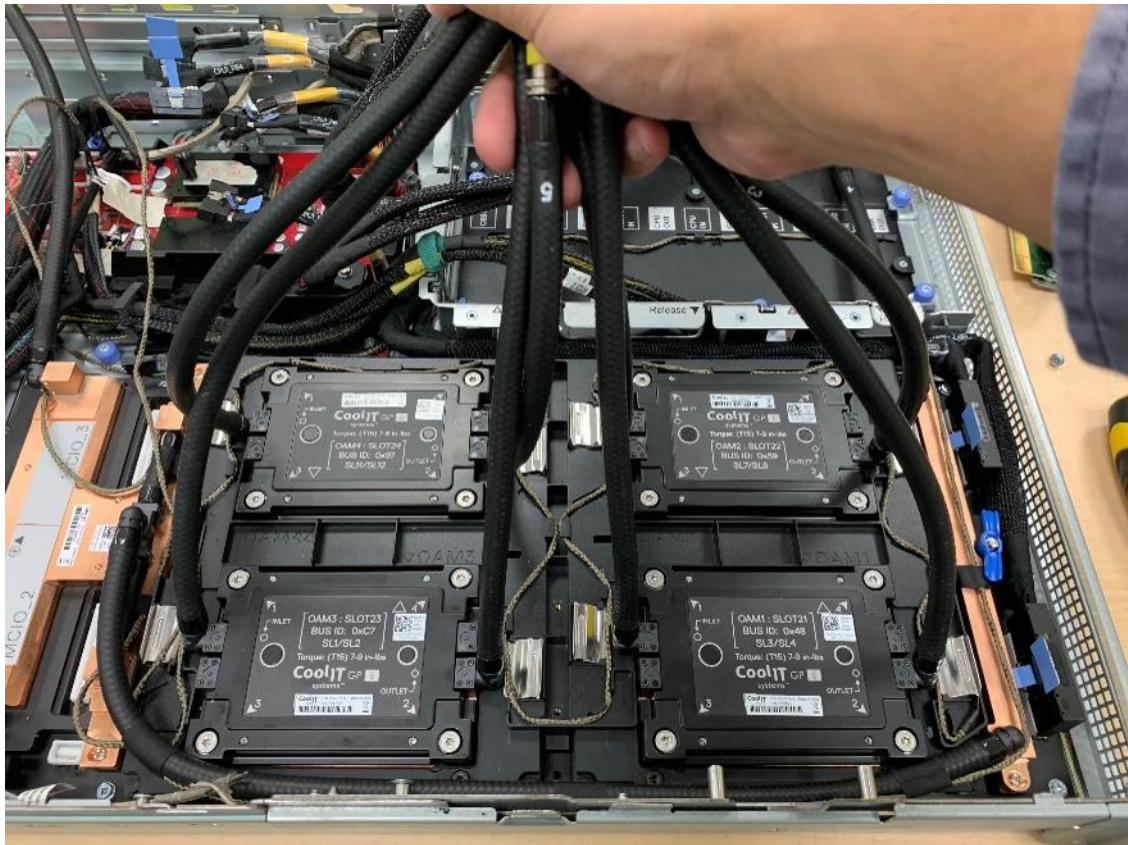
Figure 197.

2. Using another hand, align and install the sensor tray on to the GPU cold plates.

Figure 198.

3. Release the plunger and rotate the metallic gate to open.

Figure 199.

4. Reconnect all the GPU cold plate tubes to the Manifold Liquid cooling module.

Figure 200.

Figure 201. Liquid cooling tubes connectivity positions

5. Reconnect the sensor tray cable connector on the PDB.
6. Using Phillips 2 screwdriver, tighten the screws to secure on to the sensor tray.

Figure 202.

7. Push in the bracket under the cold plate/hose joint. Repeat the same for all 8 brackets.
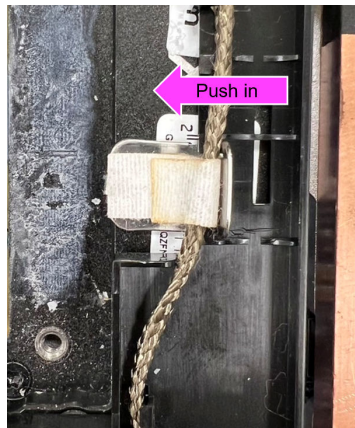
Figure 203.

8. Rotate the metallic gate to lock position and release the plunger.

Next steps

1. Reconnect the liquid cooling tubes from all the GPU cold plates to the Manifold.
2. Slide in the system board tray.
3. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
4. Install the lower brace cover.
5. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
6. Install the risers.
7. Install the storage tray.

8. Install the VSB cables on the system board.
9. Follow the procedure listed in the After working inside your system.
.

Removing the GPU with GPU cold plate for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
7. Remove lower brace cover.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
9. Slide out the system board tray.
10. Unplug the cold plate tubes from the Manifold Liquid cooling module.
11. Remove the sensor tray.

Steps

1. Unplug the cold plate tubes from the Manifold Liquid cooling module. Pull the plunger and rotate the metallic gate . Using Torx 15 screwdriver, release four screws securing GPU with GPU cold plates on GPU socket.
2. Lift and remove the GPU with GPU cold plates from the GPU socket.

   (i) **NOTE:** The procedure to remove the all the GPU with GPU cold plates is same.
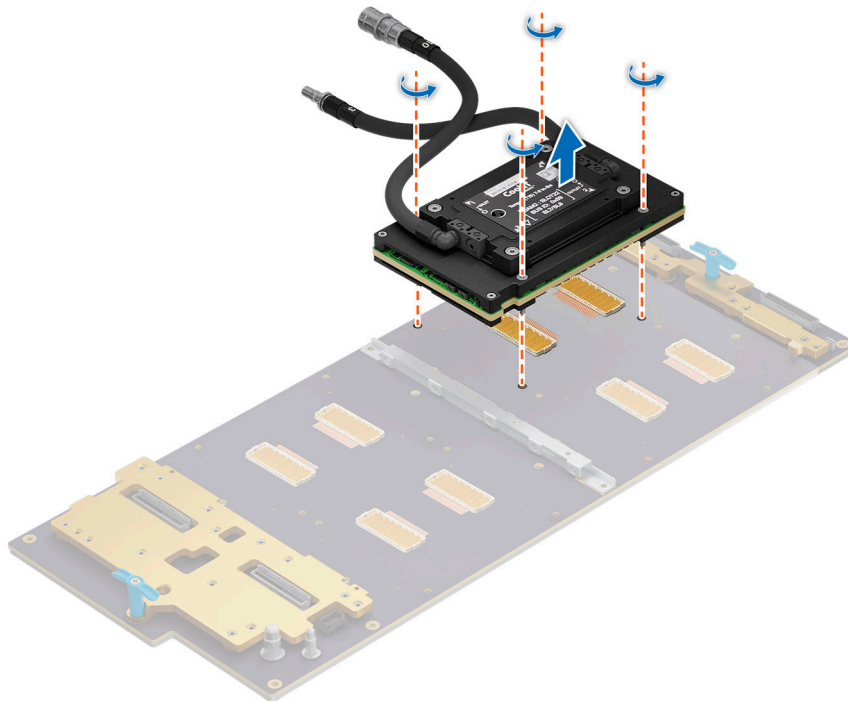
Figure 204. Removing the GPU with GPU cold plates

Next steps

Replace the GPU with GPU cold plate for Intel GPU configurations.

Installing the GPU with GPU cold plate for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
7. Remove lower brace cover.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
9. Slide out the system board tray.
10. Unplug the cold plate tubes from the Manifold Liquid cooling module.
11. Remove the sensor tray.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates.
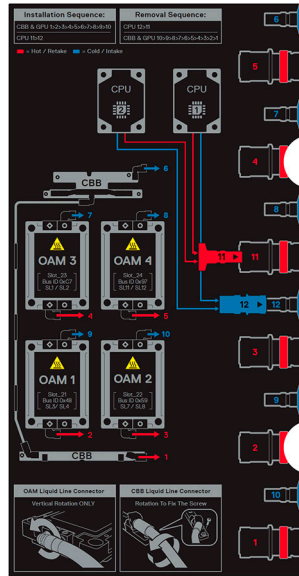

Figure 205. Removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates

2. Align and insert the GPU with GPU cold plates on the GPU socket. Using Torx 15 screwdriver, tighten the four screws securing GPU module on GPU socket. Plug the cold plate tubes to the Manifold Liquid cooling module.

   ⓘ **NOTE:** The procedure to install the all the GPUs is same.
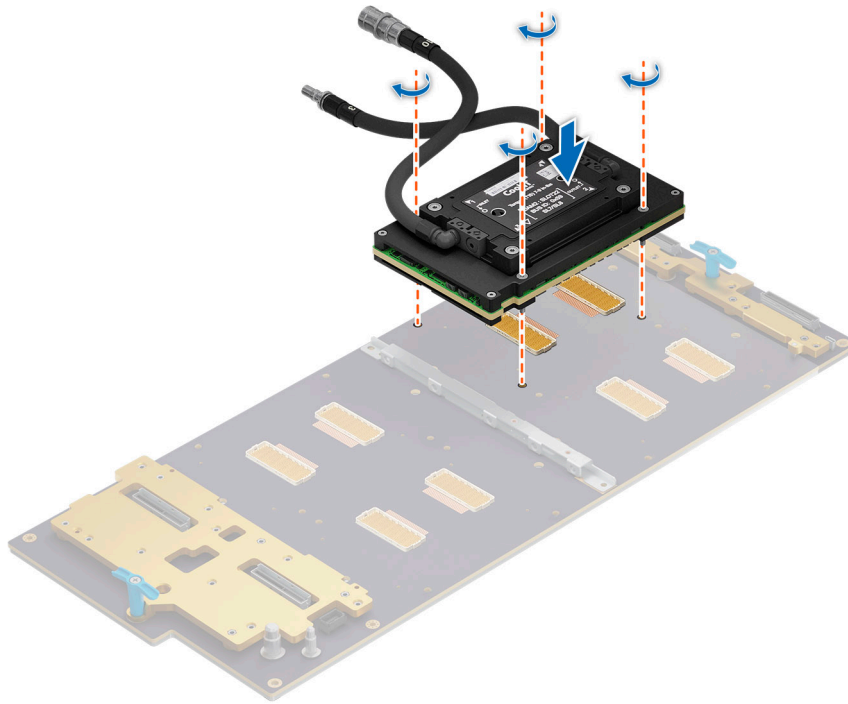
Figure 206. Installing the GPU with GPU module

Next steps

1. Install the sensor tray.
2. Plug the cold plate tubes to the Manifold Liquid cooling module.
3. Slide in the system board tray.
4. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
5. Install the lower brace cover.
6. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
7. Install the risers.
8. Install the storage tray.
9. Install the VSB cables on the system board.
10. Follow the procedure listed in the After working inside your system.

Removing the GPU board for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
7. Remove lower brace cover.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
9. Slide out the system board tray.
10. Remove the CBB cold plate module.
11. Unplug the cold plate tubes from the Manifold Liquid cooling module.
12. Remove the sensor tray.
13. If you want to replace the whole GPU board, remove the GPU and GPU cold plate.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates.
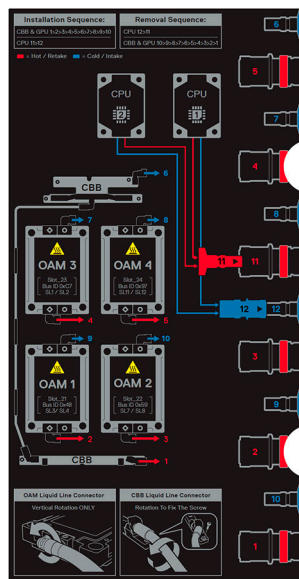

Figure 207. Removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates

2. Disconnect the power cables from the GPU board. Using the Phillips 2 screwdriver, remove the screws securing the GPU board from the chassis. Lift the GPU board away from the tray.
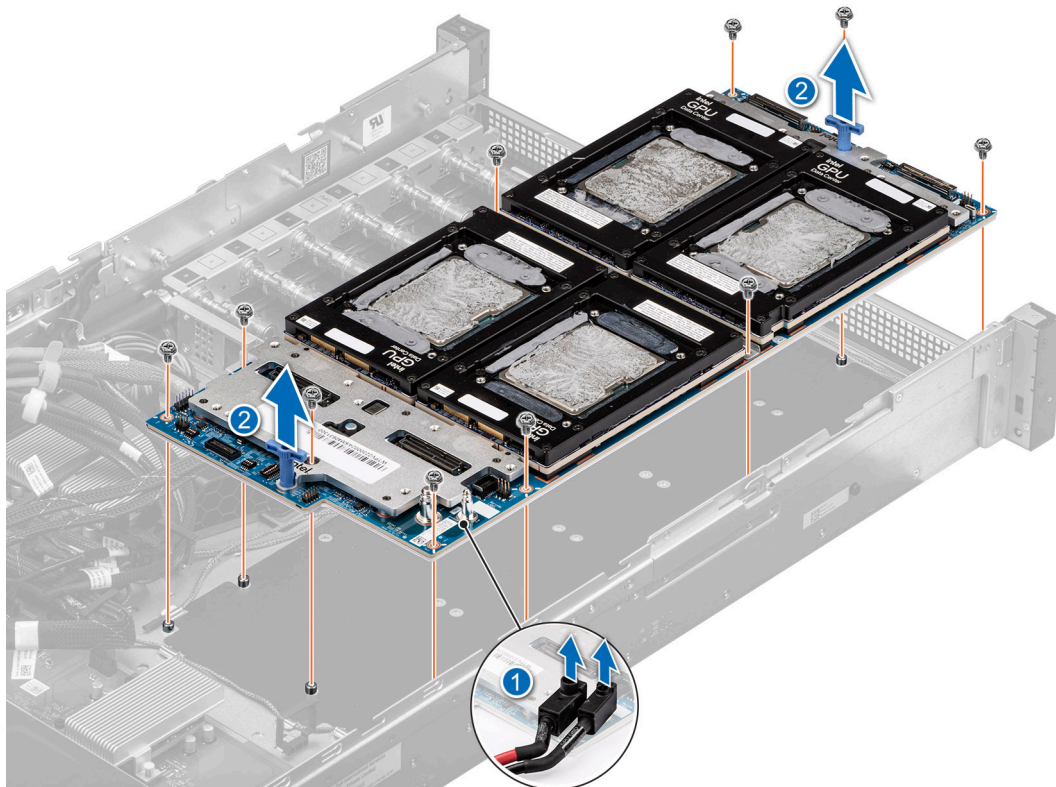
Figure 208. Removing the GPU board

Next steps

Replace the GPU board for Intel GPU configurations.

Installing the GPU board for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
7. Remove lower brace cover.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
9. Slide out the system board tray.
10. Remove the CBB cold plate module.
11. Unplug the cold plate tubes from the Manifold Liquid cooling module.
12. Remove the sensor tray.
13. If you want to replace the whole GPU board, remove the GPU and GPU cold plate.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates.

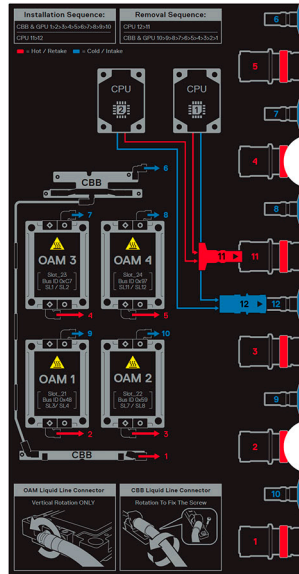**Figure 209. Removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates**

2. Align and insert the GPU board in to the chassis. Using the Phillips 2 screwdriver, tighten the screws securing the GPU board into the chassis. Reconnect the power cables on to the GPU board.
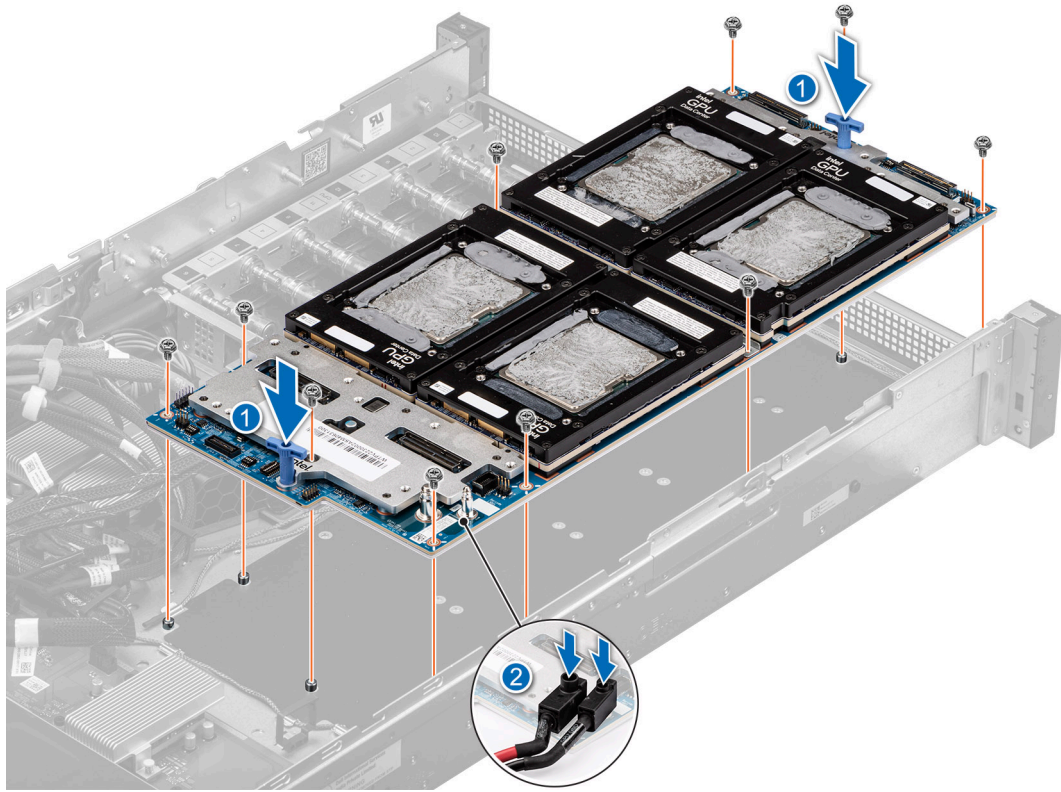
Figure 210. Installing the GPU board

Next steps

1. Install the GPU and GPU cold plates.
2. Install the sensor tray.
3. Plug the cold plate tubes to the Manifold Liquid cooling module.
4. Install the CBB cold plate module.
5. Slide in the system board tray.
6. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
7. Install the lower brace cover.
8. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
9. Install the risers.
10. Install the storage tray .
11. Install the VSB cables on the system board.
12. Follow the procedure listed in the After working inside your system.

Removing the GPU cold plate for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
7. Remove lower brace cover.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.

9. Slide out the system board tray.
10. Unplug the cold plate tubes from the Manifold Liquid cooling module.
11. Remove the sensor tray.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates.
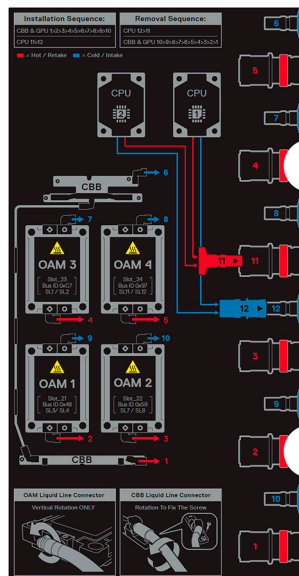

Figure 211. Removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates

2. Unplug the cold plate tubes from the Manifold Liquid cooling module. Pull the plunger and rotate the metallic gate . Using a T15 screwdriver, loosen the screws 3 turns as per the sequence mentioned on the GPU cold plate: 1 > 2 > 3 > 4. Use the same sequence to fully loosen the 4 screws on the cold plate. Lift the GPU cold plate away from the chassis.

   (i) **NOTE:** Make sure to avoid using the hoses to pull up on the cold plate.
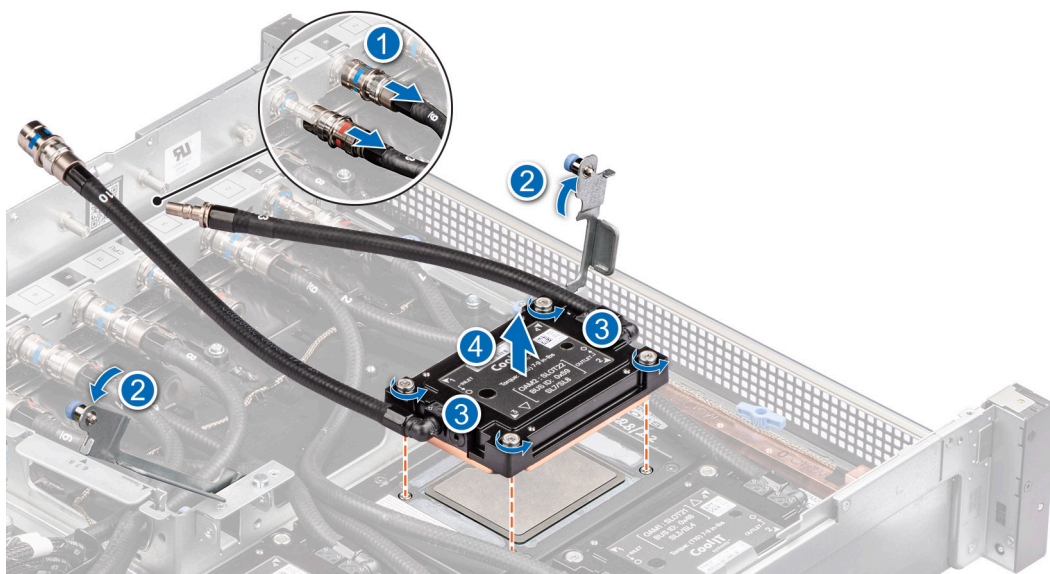
Figure 212. Removing the GPU cold plate

Next steps

Replace the GPU cold plate for Intel GPU configurations.

Installing the GPU cold plate for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
7. Remove lower brace cover.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
9. Slide out the system board tray.
10. Unplug the cold plate tubes from the Manifold Liquid cooling module.
11. Remove the sensor tray.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates.

Figure 213. Removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates

2. If you are using an existing GPU cold plate, follow the below process to install the thermal paste on the GPU cold plate.
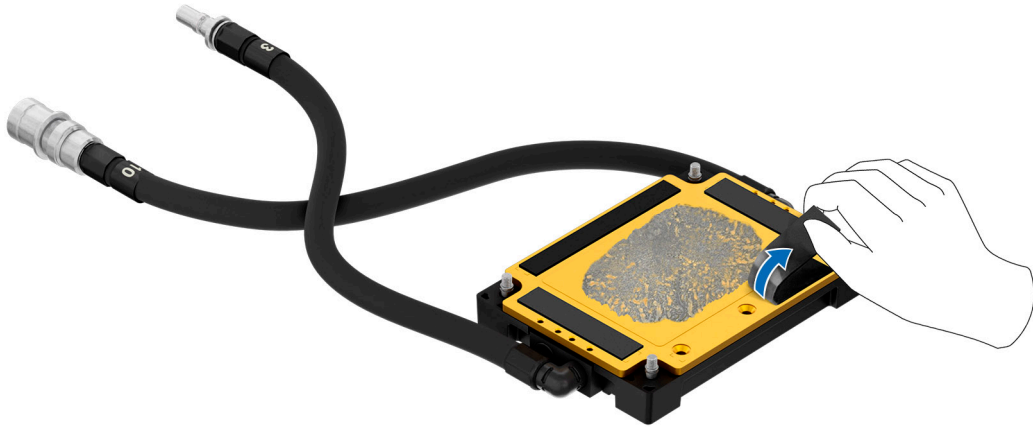
Figure 214.
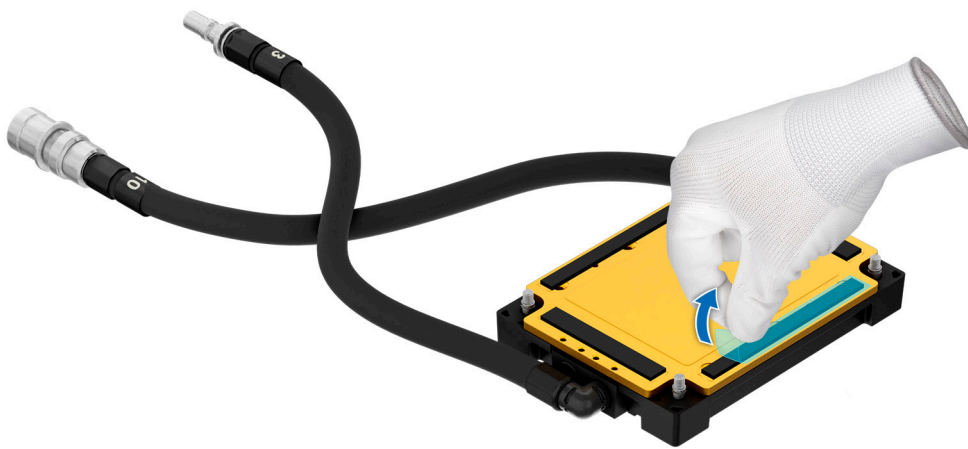
Figure 215.
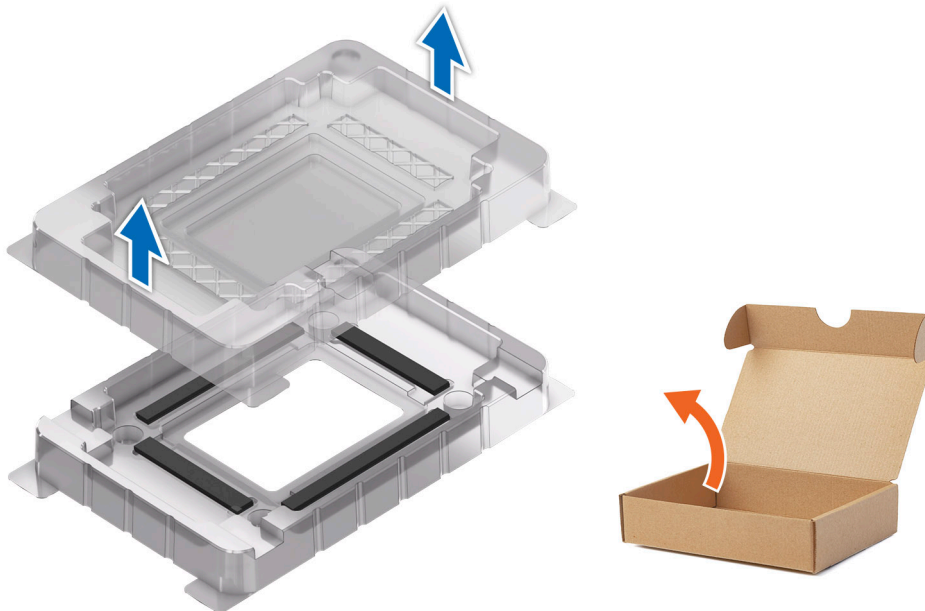
Figure 216.
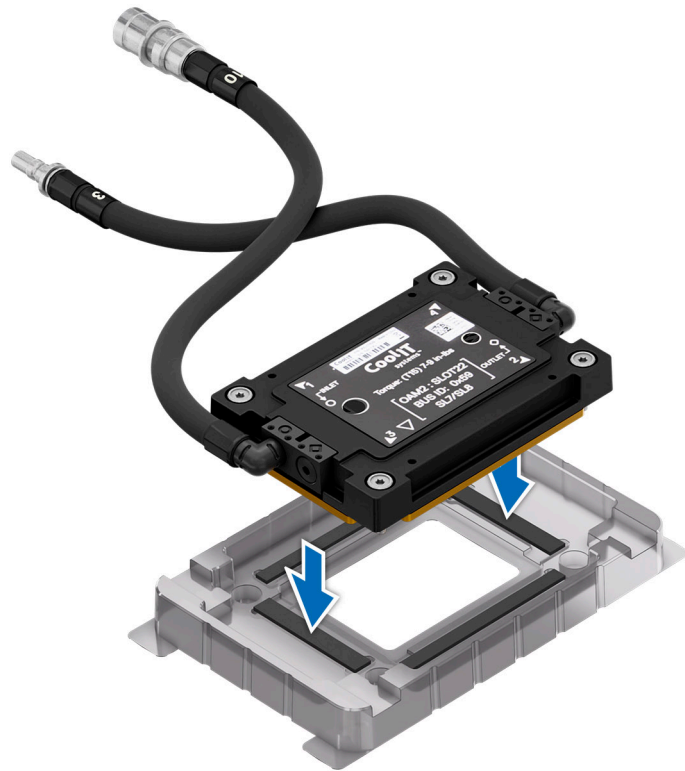
Figure 217.

Figure 218.
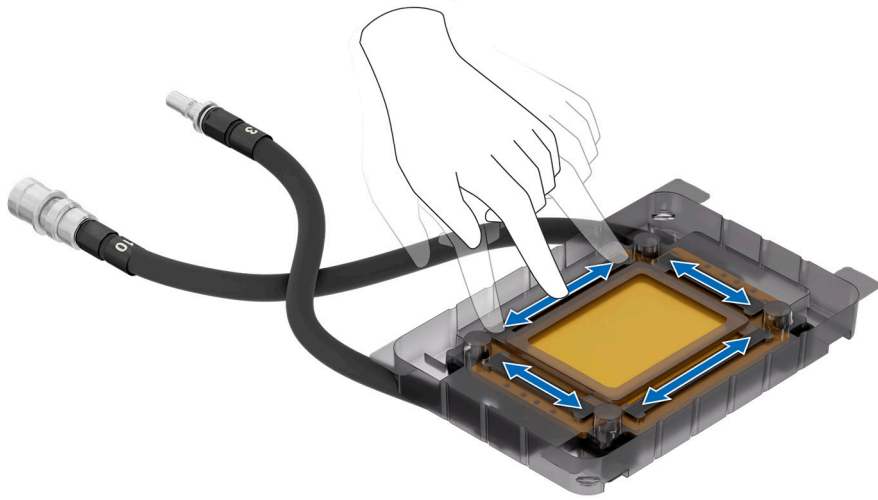
Figure 219.

Figure 220.

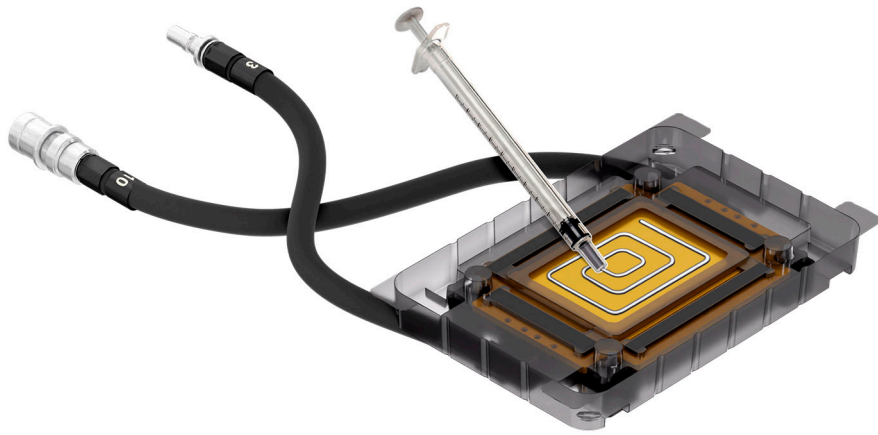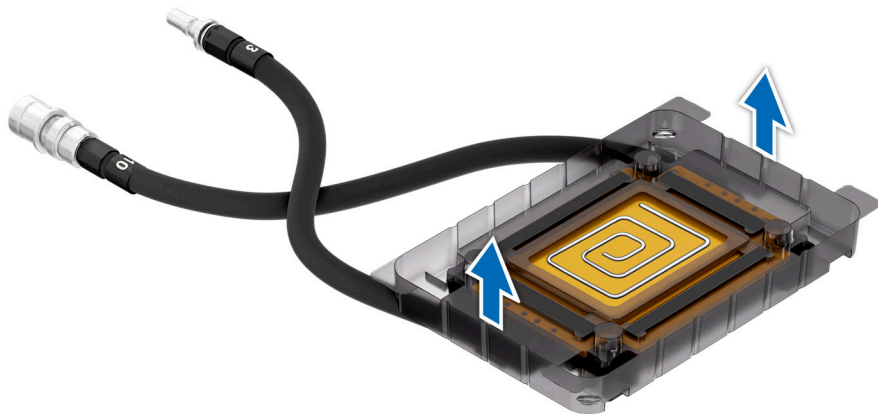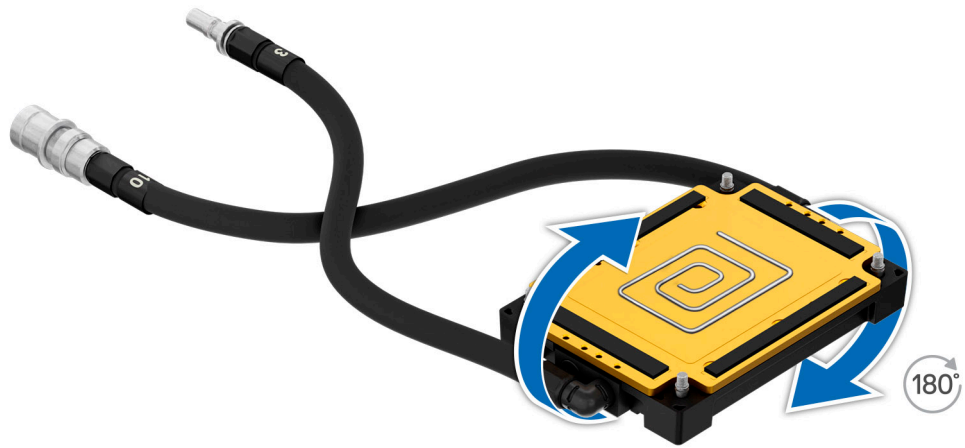**Figure 221.**

Figure 222.

3. Align and insert the GPU cold plate on the GPU module. Using the Torx T15 torque screwdriver, tighten the screws 3 turns as per sequence mentioned on the GPU cold plate. Use the same sequence to tighten the 4 screws on the cold plate to the maximum torque of 8 in-lbf. Pull the plunger and lift the metallic piece. Plug the cold plate tubes in to the Manifold Liquid cooling. Close the metallic piece and release the plunger to click into its place.
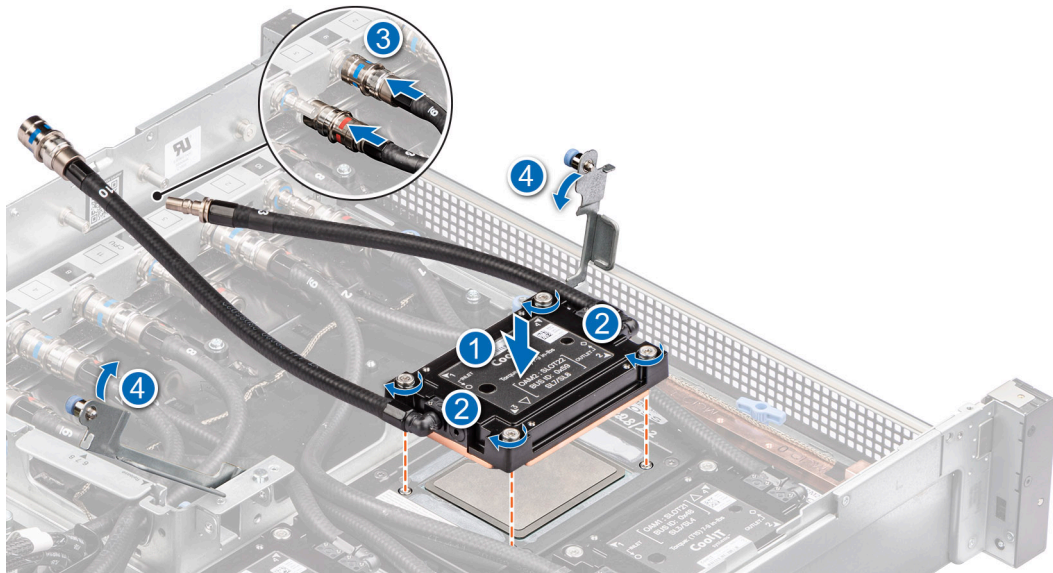
Figure 223. Installing the GPU cold plate

Next steps

1. Install the sensor tray.
2. Plug the cold plate tubes to the Manifold Liquid cooling module.
3. Slide in the system board tray.
4. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
5. Install the lower brace cover.
6. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
7. Install the risers.
8. Install the storage tray .
9. Install the VSB cables on the system board.
10. Follow the procedure listed in the After working inside your system.

.

Removing the GPU for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Remove lower brace cover.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
9. Slide out the system board tray.
10. Unplug the cold plate tubes from the Manifold Liquid cooling module.
11. Remove the sensor tray.
12. Remove the GPU cold plate

Steps

1. If you want replace just the GPU module, using Torx 15, release four screws securing GPU module on GPU socket.

   (i) **NOTE:** All GPU cold plates are not required to be removed for replacing just one GPU.

2. Lift and remove the GPU module from the GPU socket.

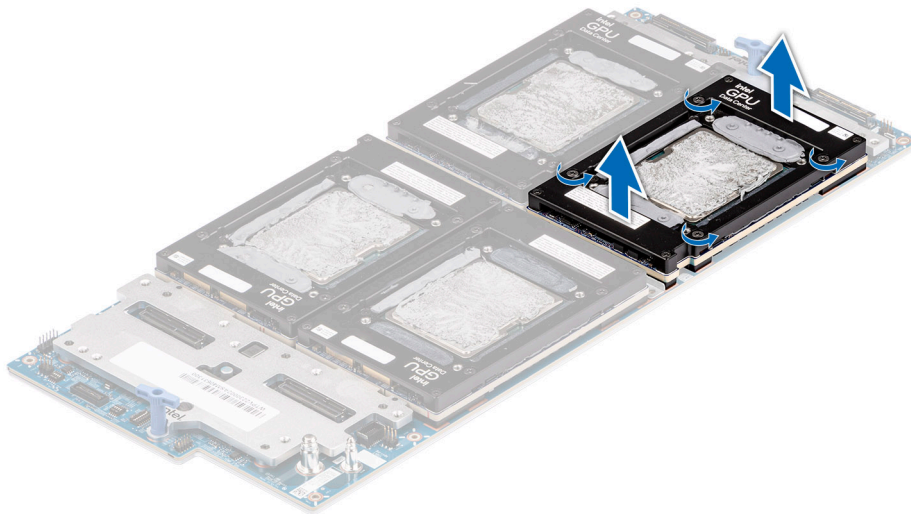   (i) **NOTE:** The procedure to remove the all the GPUs is same.

Figure 224. Removing the GPU module

Next steps

Replace the GPU.

Installing the GPU for Intel GPU configurations

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 storage tray.
4. Remove the risers.
5. Remove the VSB cables from the system board.
6. Remove lower brace cover.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
9. Slide out the system board tray.
10. Unplug the cold plate tubes from the Manifold Liquid cooling module.
11. Remove the sensor tray.
12. Remove the GPU cold plate

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates.

Figure 225. Removal and installation sequence of liquid cooling tubes for processor, CBB, GPU cold plates

2. If you want replace just the GPU module, align and insert the GPU module on the GPU socket. Using Phillips 1 screwdriver, tighten the four screws securing GPU module on GPU socket.

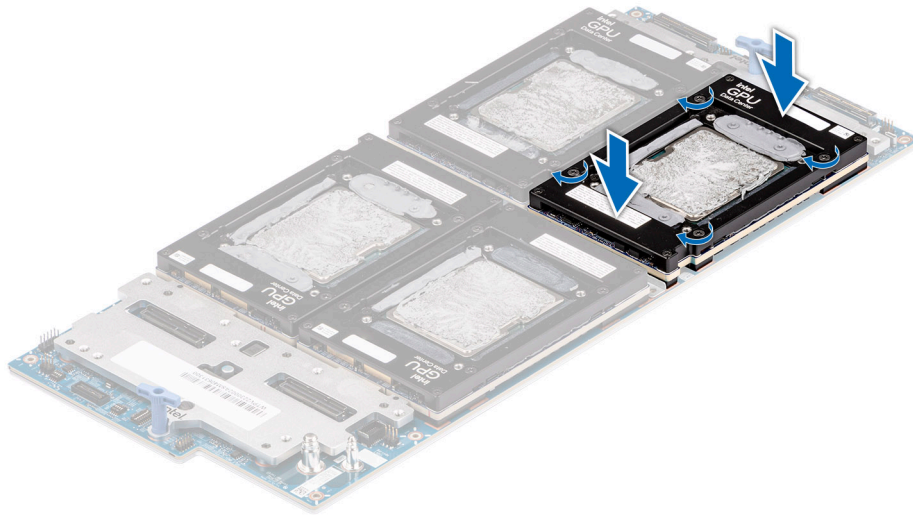   (i) **NOTE:** The procedure to install the all the GPUs is same.

Figure 226. Installing the GPU module

Next steps

1. Install the GPU cold plates.
2. Install the sensor tray.
3. Plug the cold plate tubes to the Manifold Liquid cooling module.
4. Slide in the system board tray.
5. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
6. Install the lower brace cover.
7. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
8. Install the risers.
9. Install the storage tray .
10. Install the VSB cables on the system board.
11. Follow the procedure listed in the After working inside your system.

NVIDIA GPU module, GPU board, GPU cold plates, PCIe Switch Board (PSB), Power Distribution Board (PDB)

This is a service technician replaceable part only.

Removing the PDB2 for NVIDIA GPU configurations

Prerequisites

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

Steps

1. Disconnect the VSB cables connected on the System board and keep them near the storage tray.
2. Using the Phillips 2 screwdriver, remove the screws to disengage on the PDB2 tray and from the storage tray.
3. Disconnect the signal cable from the PDB2.
4. Disconnect the VSB cable from the PDB2 connecting from the PDB of the bottom layer.

5. Slide the PDB2 along with the tray toward front of the chassis and lift the PDB2 with tray away form the chassis along with the VSB cables.
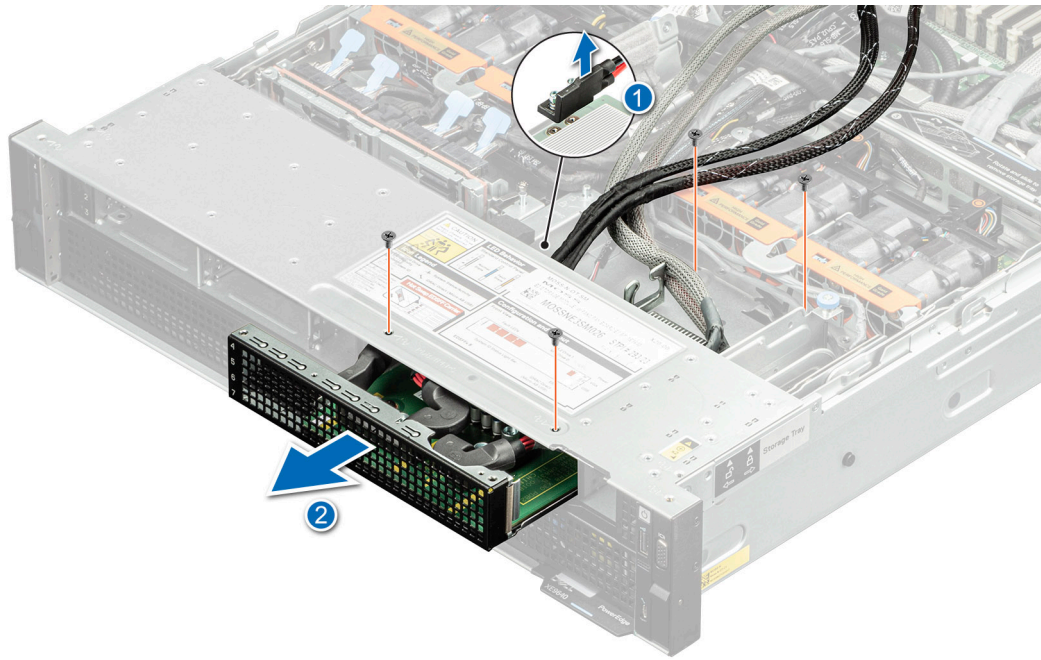

Figure 227. Removing the PDB2

6. Using Phillips screwdriver 2, loosen the screw to disengage VSB cables from the PDB2 connecting from the system board.
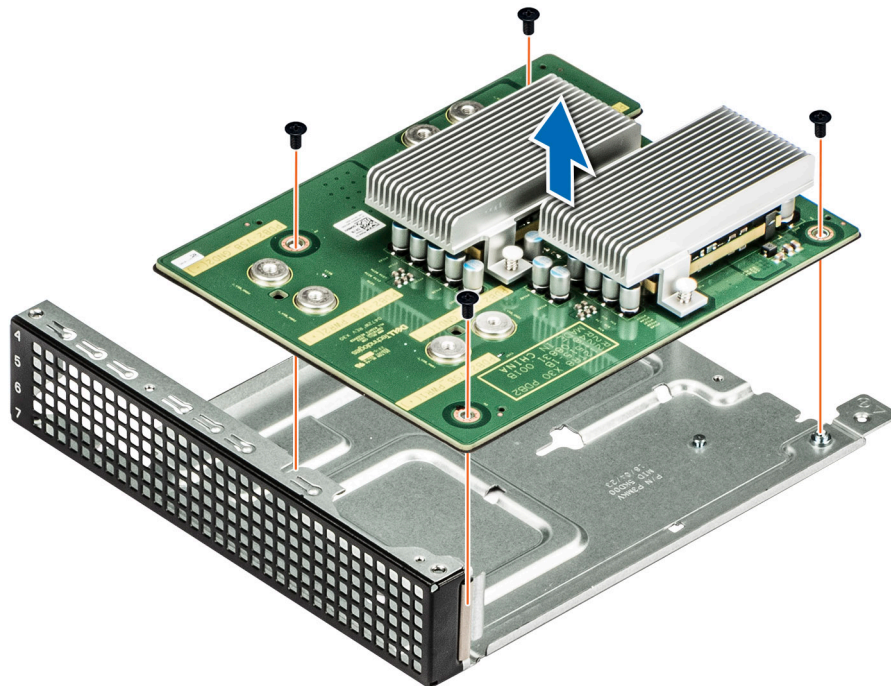7. Remove all the screws and lift the PDB2 from the PDB2 tray.

Figure 228. Remove the PDB2 from the PDB2 tray

Next steps

Replace the PDB2.

Installing the PDB2 for NVIDIA GPU configurations

Prerequisites

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

Steps

1. Align the PDB2 on the tray and using the Phillips 2 screwdriver, tighten the screws to secure the PDB2 into the PDB2 tray.
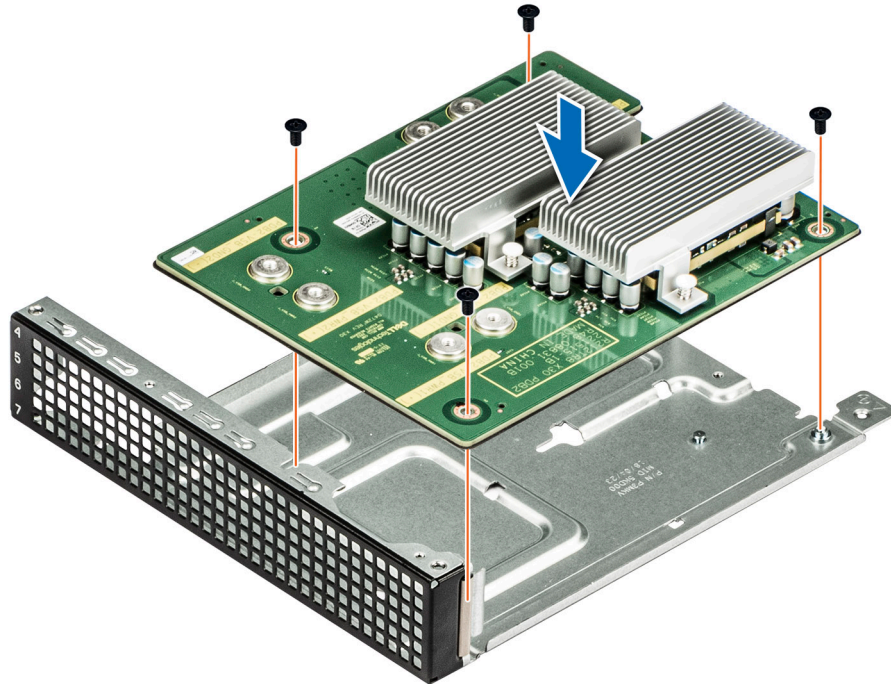

Figure 229. Installing the PDB2 into the PDB2 tray

2. Reconnect the VSB cables on the PDB2 connecting VSB cables (right and Left) from the system board.
3. Align the PDB2 into the storage tray and slide it toward rear of the chassis until it firmly seated. Using Phillips 2 screwdriver, tighten the screws to secure PDB2 tray into the Storage tray.
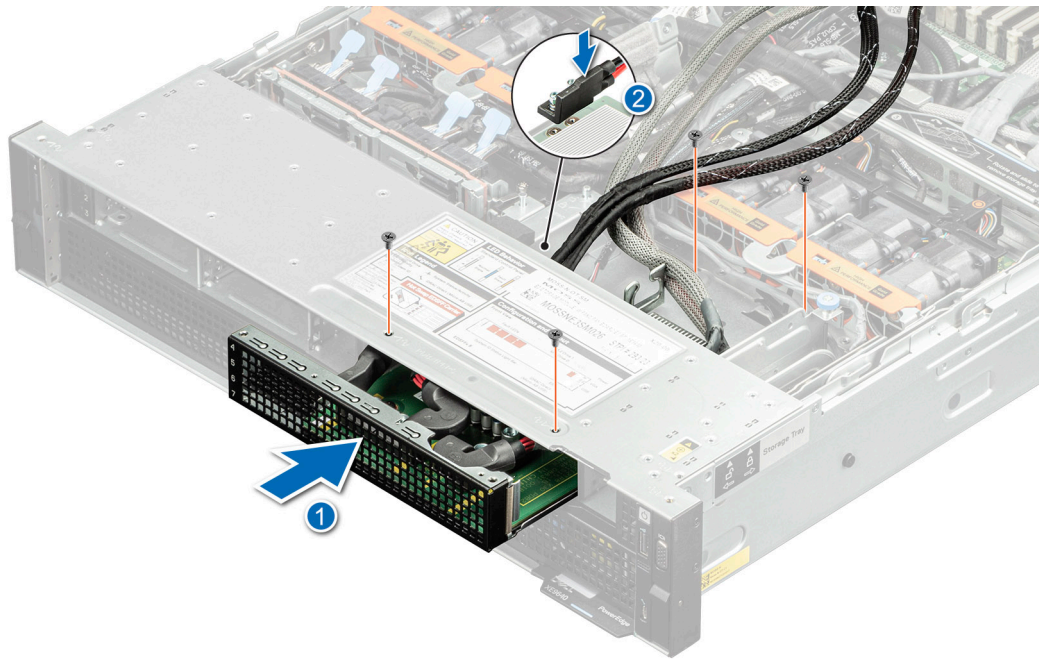4. Reconnect the VSB cables on the PDB2 connecting from the PDB of the bottom layer.

Figure 230. Installing the PDB2

5. Reconnect the signal cable on to the PDB2.

Next steps

Follow the procedure listed in After working inside your system.

Removing the PDB for NVIDIA GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove lower brace cover.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Remove the system board tray.
11. Remove the power supply units.
12. Disconnect the cables connected on the PDB from PSB, system board and PDB2.

Steps

Using the Phillips 2 screwdriver, remove the screws on the PDB. Holding the blue holders, lift the PDB away from the chassis.
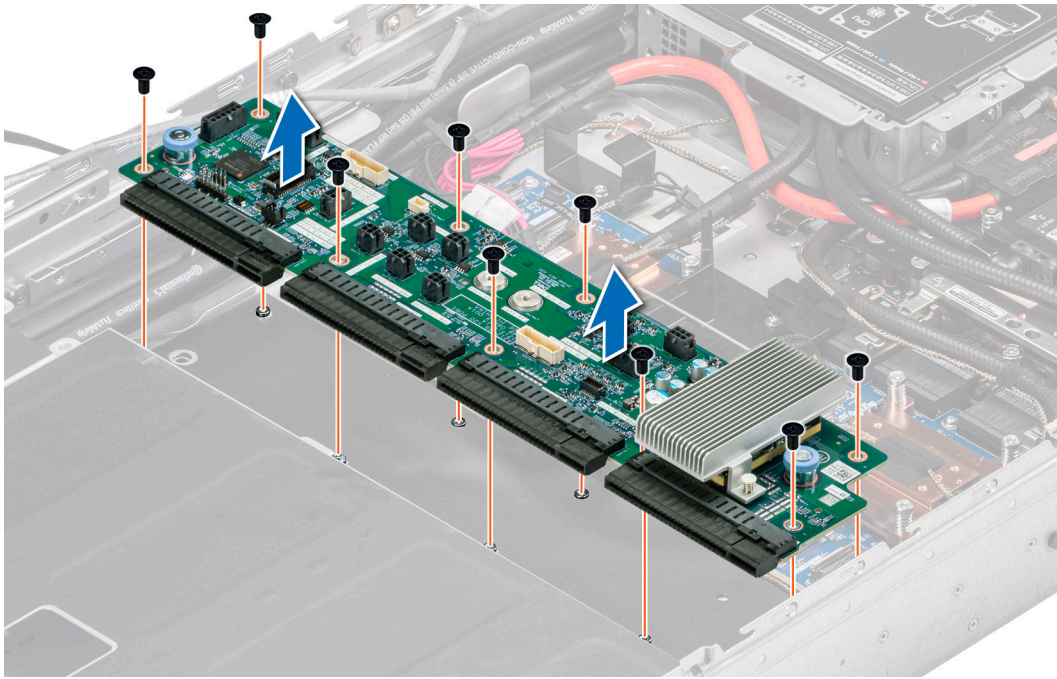
Figure 231. Removing the PDB

Next steps

Replace the PDB for NVIDIA configurations.

Installing the PDB for NVIDIA configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove lower brace cover.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Remove the system board tray.
11. Remove the power supply units.
12. Disconnect the cables connected on the PDB from PSB, system board and PDB2.

Steps

Holding the blue holders, align and insert the PDB into the chassis. Using the Phillips 2 screwdriver, tighten the screws to secure the PDB in to the chassis.
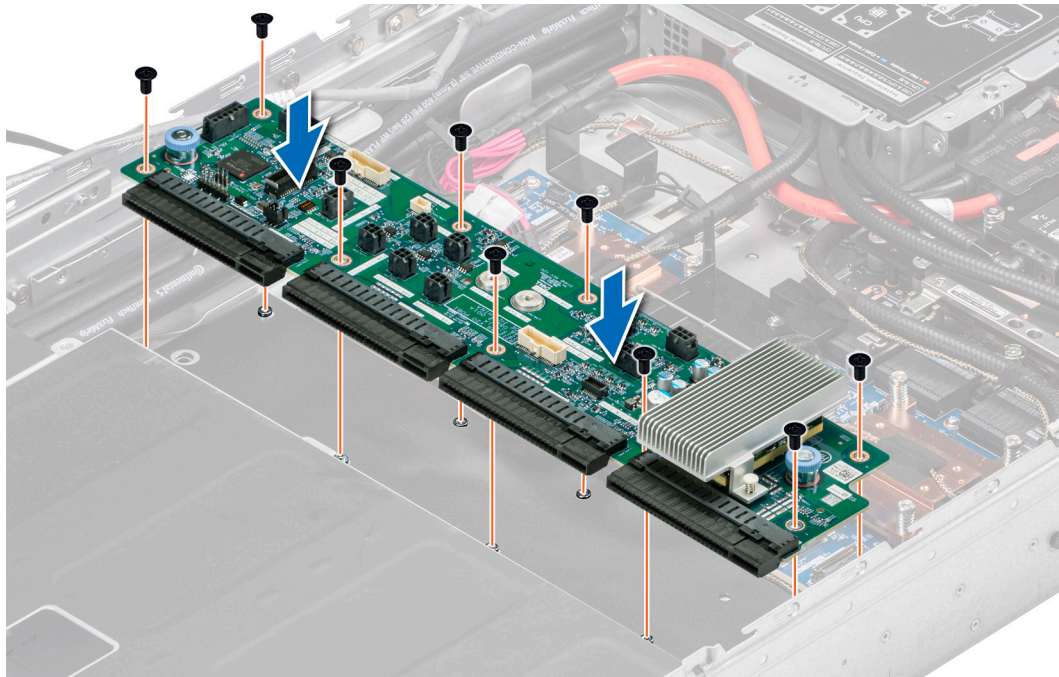
Figure 232. Installing the PDB

Next steps

1. Install the power supply units.
2. Reconnect all the cable connectors on the PDB connected from PSB, system board and PDB2. For more information, see Cabling diagram
3. Install the system board tray.
4. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
5. Install the lower brace cover.
6. Reconnect all the cables onto the system board. For more information, see Cabling diagram
7. Install the risers.
8. Install the storage tray .
9. Install the VSB cables on the system board.
10. Follow the procedure listed in the After working inside your system.
.

Removing the PSB cold plate for NVIDIA configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove lower brace cover.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Remove the system board tray.
11. Disconnect the cables connected on the PSB from PDB, system board and PDB2. For more information, see Cabling diagram.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates.
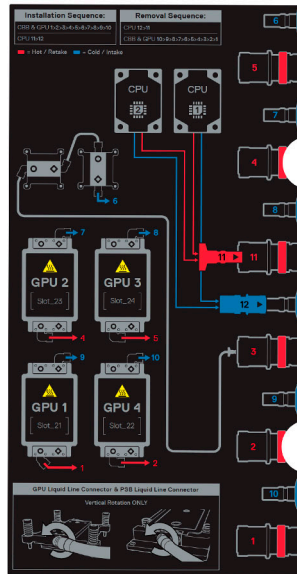

Figure 233. Removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates

2. Unplug the cold plate tubes numbering with 3 and 6 from the Manifold Liquid cooling. Using the Torx 15, remove the screws securing the PCIe switch board (PSB) cold plate from the PSB. Lift the PSB cold plates from the PSB.
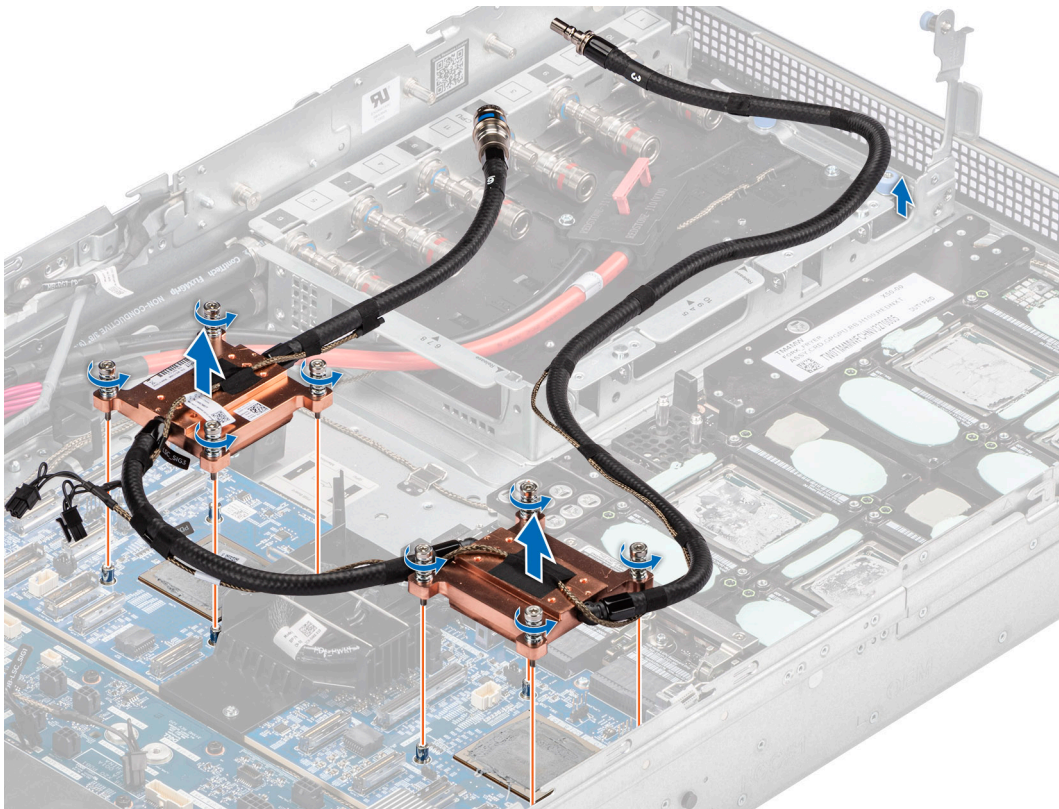

Figure 234. Removing the PCIe switch board cold plate

Next steps

Replace the PSB cold plate for NVIDIA configurations.

Installing the PSB cold plate for NVIDIA configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove lower brace cover.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Remove the system board tray.
11. Disconnect the cables connected on the PSB from PDB, system board and PDB2. For more information, see Cabling diagram.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates.
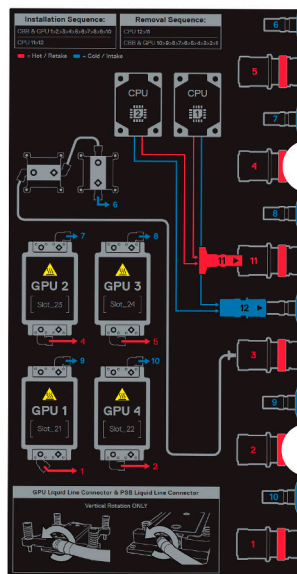

Figure 235. Removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates

2. Unplug the cold plate tubes numbering with 3 and 6 from the Manifold Liquid cooling. Using the Torx 15, remove the screws securing the PCIe switch board (PSB) cold plate from the PSB. Lift the PSB cold plates from the PSB.
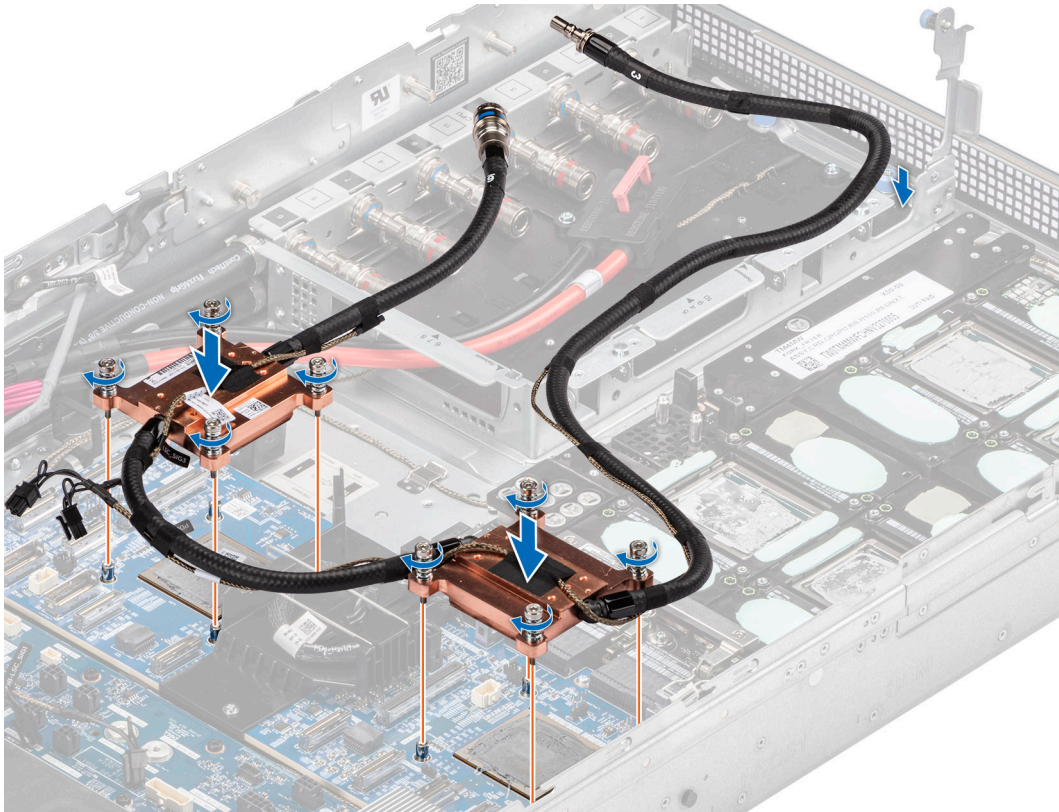
Figure 236. Removing the PCIe switch board cold plate

3. If you are using an existing PSB cold plate, remove the thermal grease on the PSB cold plate by using a clean lint-free cloth.

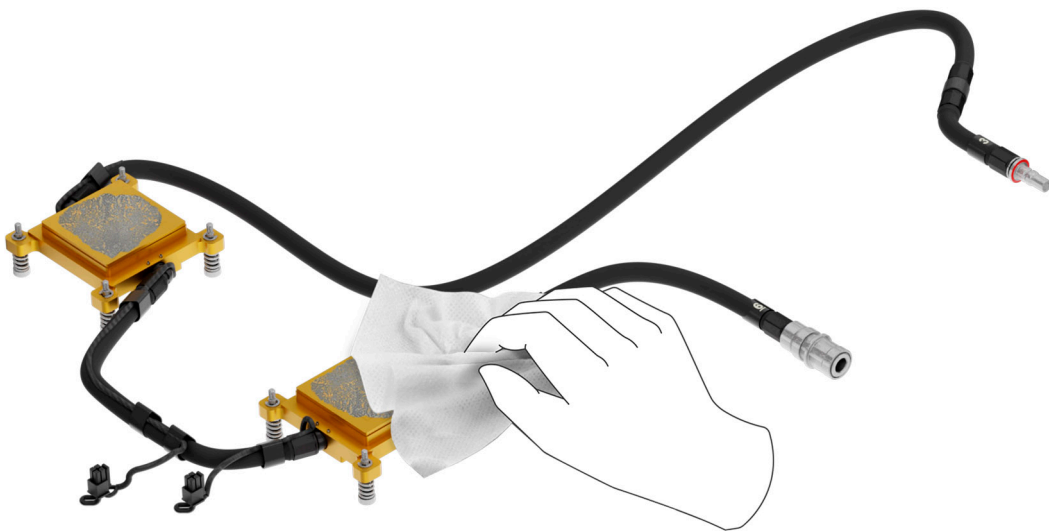   ⓘ **NOTE:** Follow the same procedure for a new heat sink.

Figure 237. Removing the thermal grease

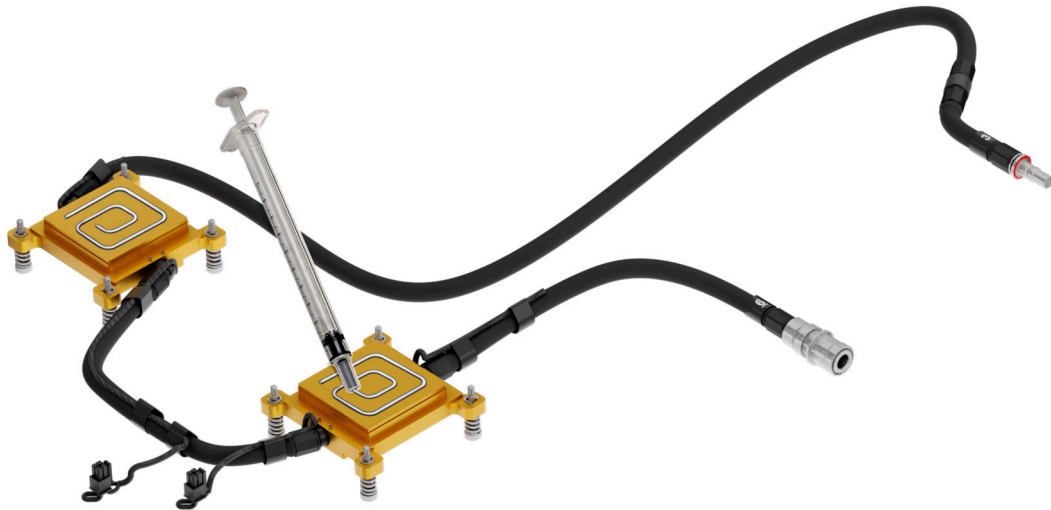4. Use the thermal grease syringe and apply the grease in a thin quadrilateral spiral on the PSB cold plate.

Figure 238. Applying thermal grease

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

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

Next steps

1. Reconnect all the cable connectors on the PSB connected from PDB, system board and PDB2. For more information, see Cabling diagram.
2. Install the system board tray.
3. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
4. Install the lower brace bracket.
5. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
6. Install the risers.
7. Install the storage tray .
8. Install the VSB cables on the system board.
9. Follow the procedure listed in the After working inside your system.

Removing the PSB for NVIDIA configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove lower brace cover.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Remove the system board tray.
11. Disconnect the cables connected on the PSB from PDB, system board and PDB2. For more information, see Cabling diagram.
12. Remove the PSB cold plates.

Steps

1. Using the Phillips 2 screwdriver, remove the screws securing the plastic cable holder from the PSB.
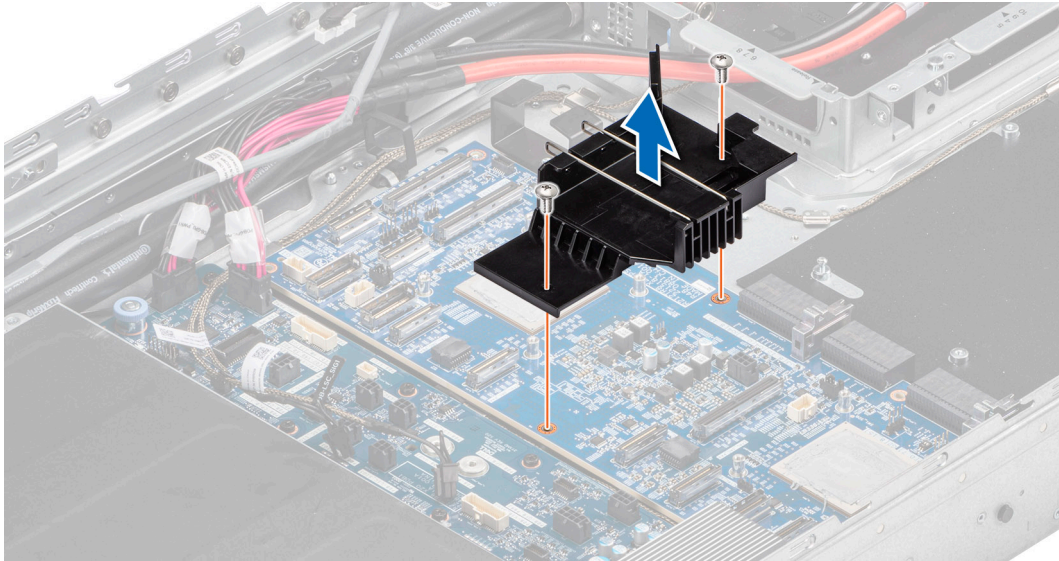

Figure 239. Removing the cable holder

2. To disengage the PSB from the GPU board connectors, follow the steps that are mentioned below:

   a. Lift the GPU assembly handle to disengage the GPU tray clips.
   b. Lift the clips to release them from the clip holders.
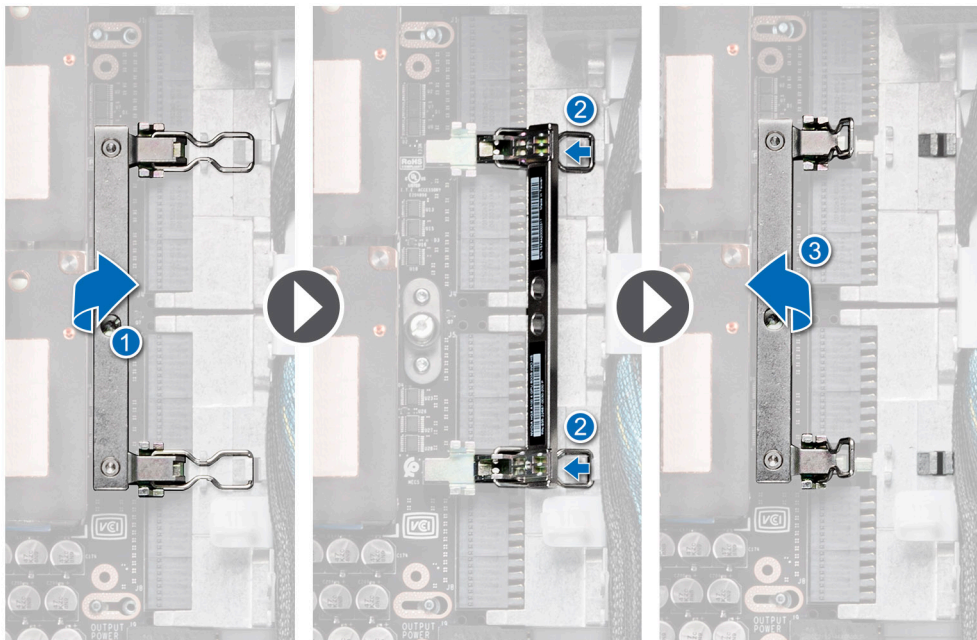   c. Ensure that the clips are free and lower the GPU assembly handle.

Figure 240. Unlocking the GPU assembly handle

3. Using the Phillips 2 screwdriver, remove the screws securing the PSB on the chassis. Lift the PSB away from the chassis.
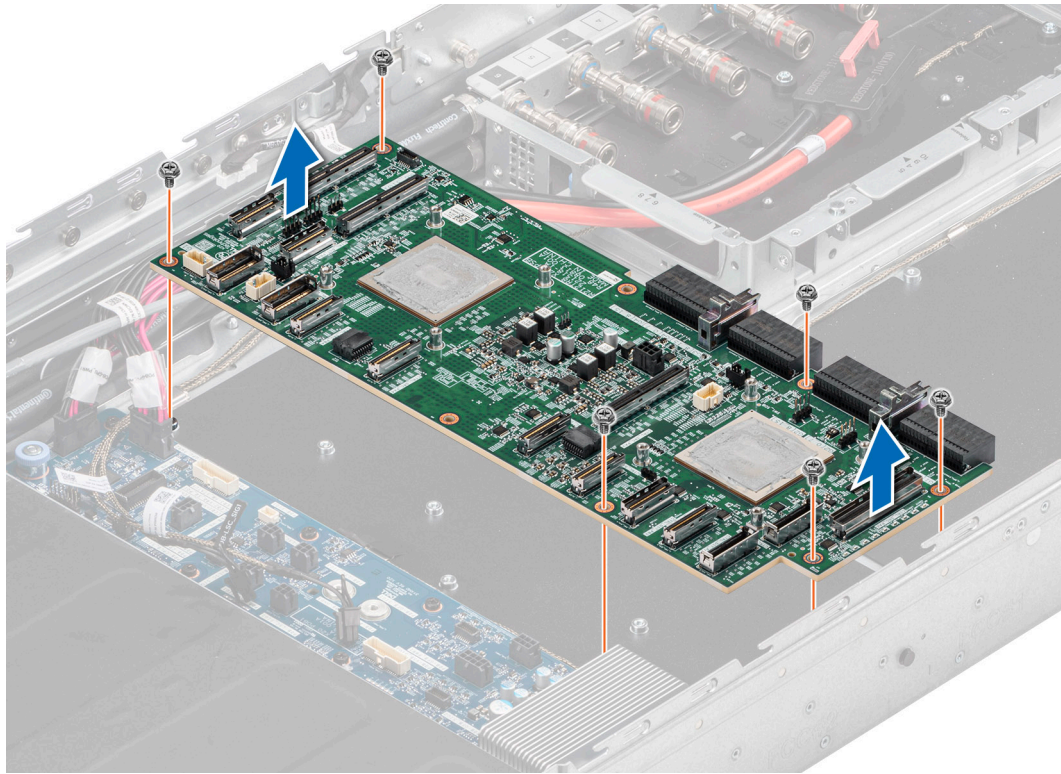
Figure 241. Removing the PSB

Next steps

Replace the PSB for NVIDIA configurations.

Installing the PSB for NVIDIA configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove lower brace cover.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Remove the system board tray.
11. Disconnect the cables connected on the PSB from PDB, system board and PDB2. For more information, see Cabling diagram.
12. Remove the PSB cold plates.

Steps

1. Align and insert the PSB into the chassis. Using the Phillips 2 screwdriver, tighten the screws securing the PSB on the chassis.
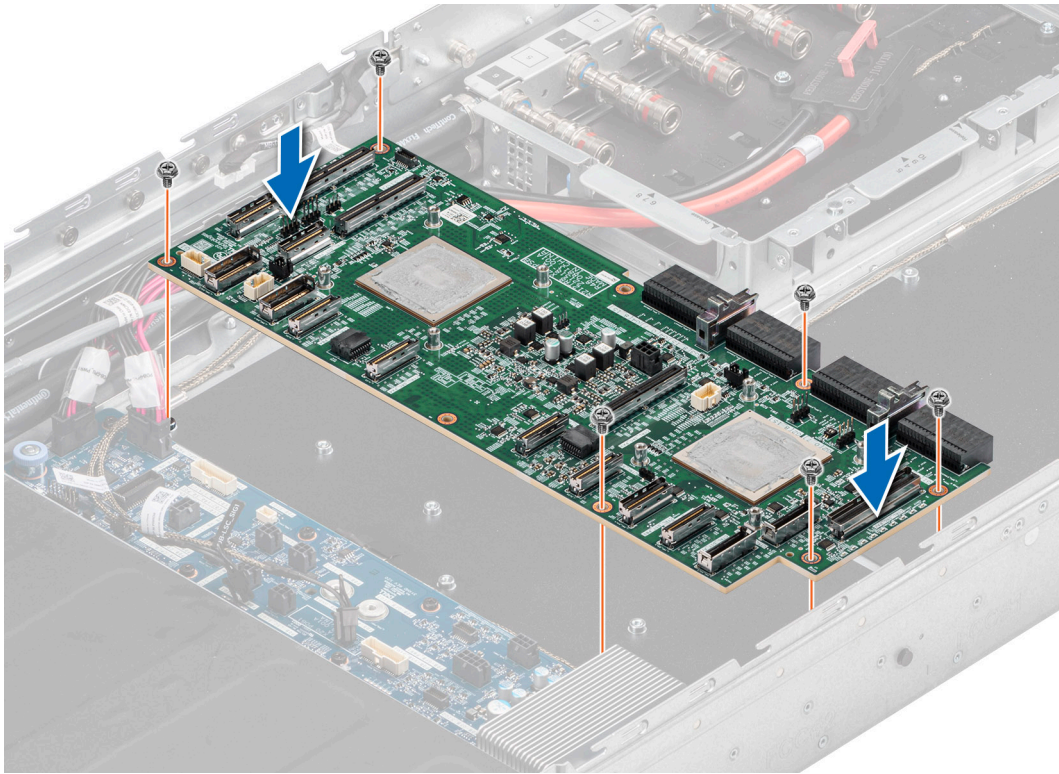
Figure 242. Installing the PSB

2. Align and insert the plastic cable holder on the PSB. Using the Phillips 2 screwdriver, tighten the screws securing the plastic cable holder on the PSB.
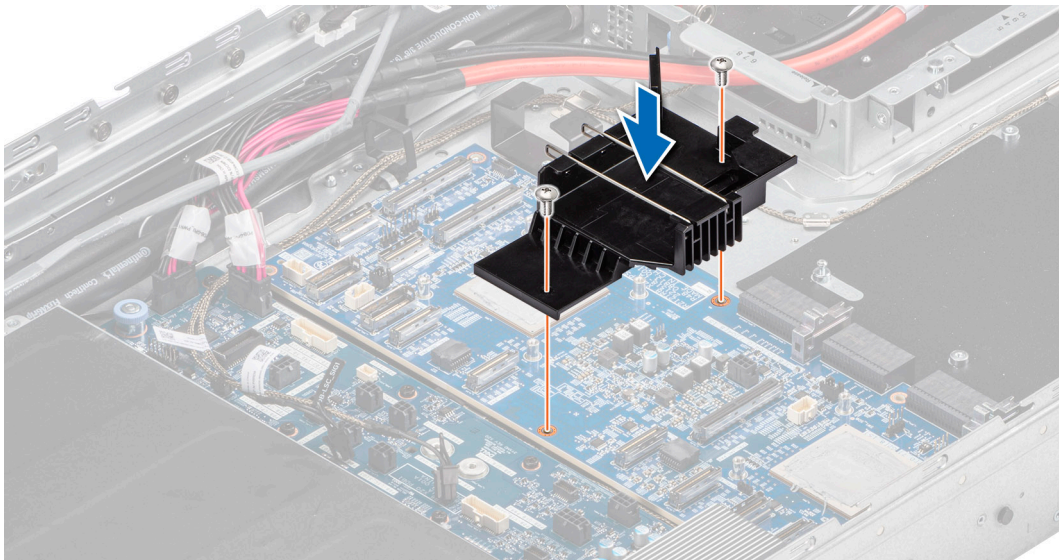

Figure 243. Installing the cable holder

3. To lock the PSB to the GPU assembly on the chassis, follow the steps that are mentioned below:
   a. Lift the GPU assembly handle to extend the clips.
   b. Fit the clips into the holders.
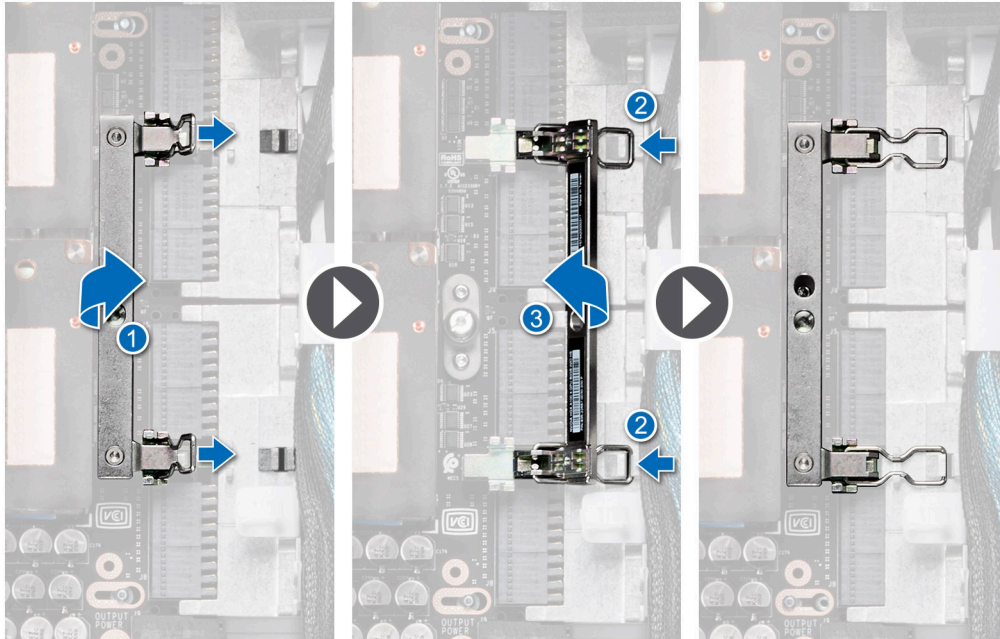   c. Lower the GPU assembly handle to ensure the clips that are connected and the GPU assembly is secured.

Figure 244. Locking the GPU assembly handle

Next steps

1. Install the PSB cold plates.
2. Reconnect all the cable connectors on the PSB connected from PDB, system board and PDB2. For more information, see Cabling diagram.
3. Install the system board tray.
4. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
5. Install the lower brace bracket.
6. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
7. Install the risers.
8. Install the storage tray .
9. Install the VSB cables on the system board.
10. Follow the procedure listed in the After working inside your system.

Removing the sensor tray for NVIDIA GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove lower brace cover.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Slide out the system board tray.
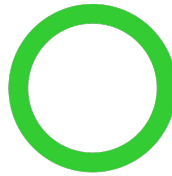11. Make sure to wear gloves for remove sensor tray to prevent hands touch sensor cables directly.

Figure 245. Wear ESD gloves

12. Do not touch the sensor tray cable directly.

Steps

1. Release the plunger and rotate the metallic gate to open.

Figure 246. Release the plunger

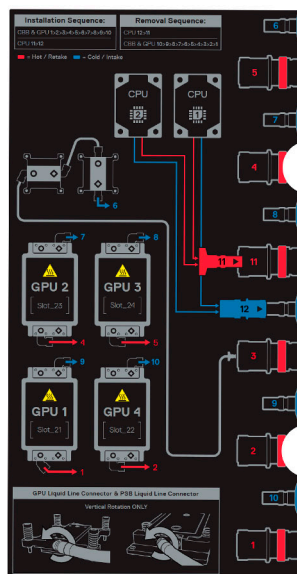2. Release all the GPU cold plate tubes from the Manifold Liquid cooling module.

Figure 247. Manifold Liquid cooling module sequence

3. Tilt the sensor tray along the corner of the GPU 3 and remove the GPU sensor along the GPU 3, GPU 4, GPU 2 and GPU 1 respectively
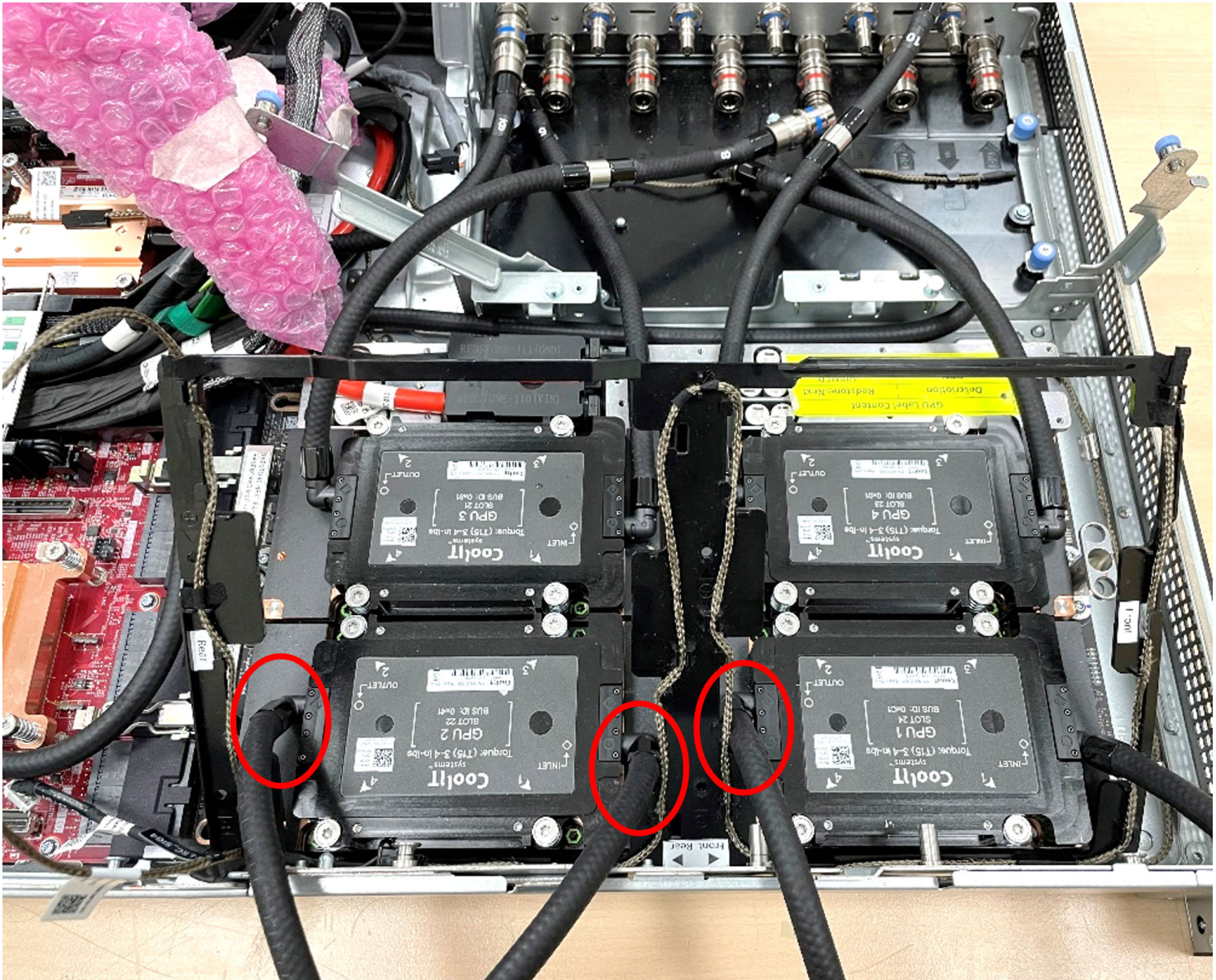

Figure 248. Remove the sensor tray

4. Remove the sensor tray cable connector on the PDB.
5. Remove and lift the sensor tray from the GPU cold plate.

Next steps

Replace the sensor tray for NVIDIA configurations.

Installing the sensor tray for NVIDIA GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.

5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove lower brace cover.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Slide out the system board tray.
11. Make sure to wear gloves for remove sensor tray to prevent hands touch sensor cables directly.

Figure 249.

12. Do not touch the sensor tray cable directly.
13. Release the plunger and rotate the metallic gate to open.
14. Release all the GPU cold plate tubes from the Manifold Liquid cooling module.

Steps

1. Align and insert the sensor tray along the GPU 1 cold plate tubes. Install the sensor tray with tilt angle, make sure the tray is under the chassis roller and T-pin.
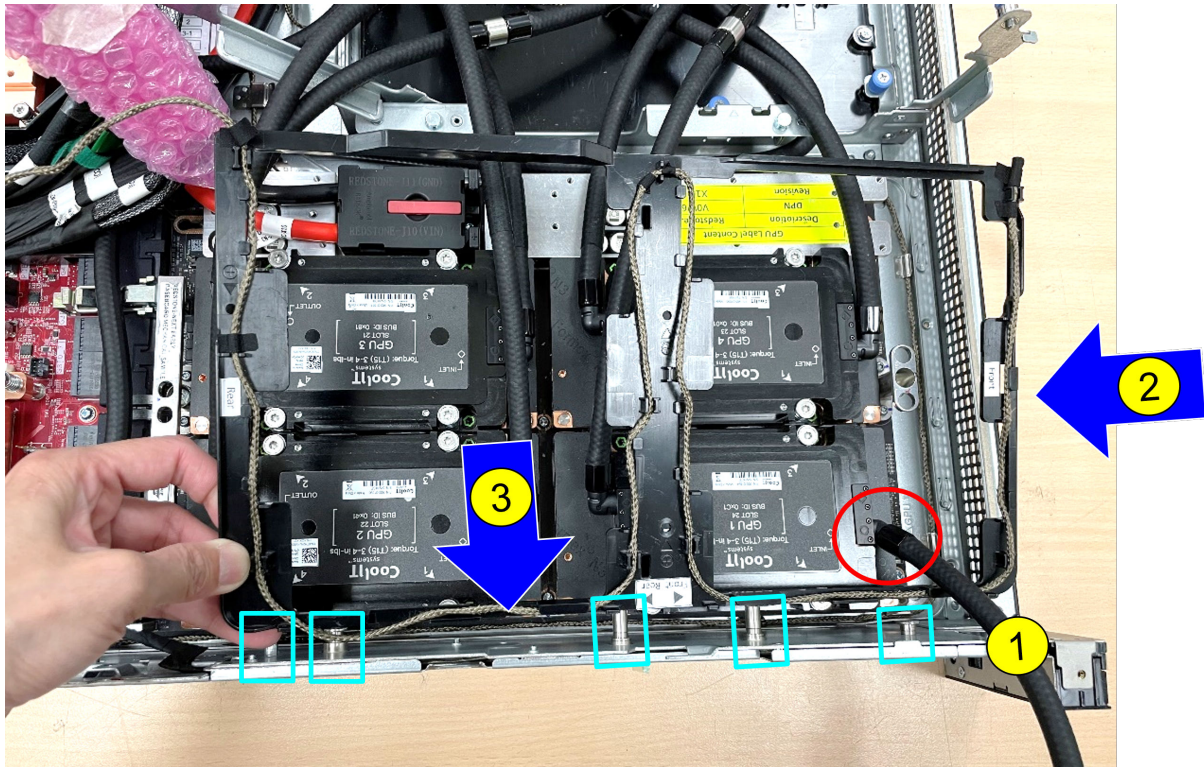
Figure 250.

2. Keep the cold plate tubes away and pass through the sensor tray along the GPU 1, GPU 2, GPU 3 and then the GPU 4.
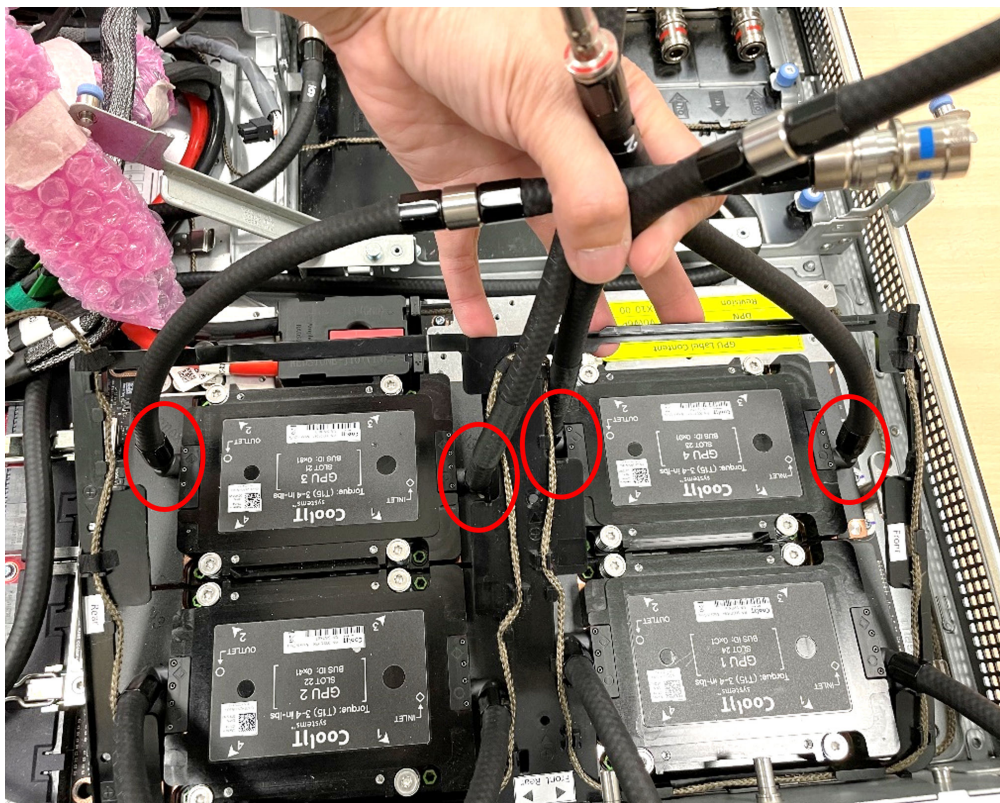

Figure 251.

3. Hold the cold plate tubes and press the middle of the tray to install on to the GPU cold plates.

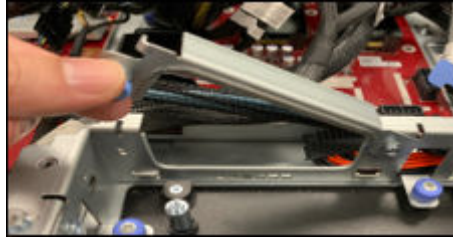4. Release the plunger and rotate the metallic gate to open.

Figure 252.

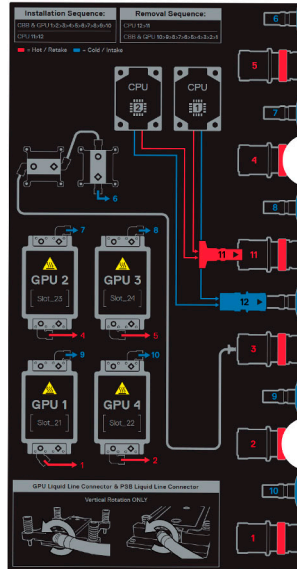5. Reconnect all the GPU cold plate tubes to the Manifold Liquid cooling module.

Figure 253.

6. Reconnect the sensor tray cable connector on the PDB.
7. Rotate the metallic gate to lock position and release the plunger.

Next steps

1. Slide in the system board tray.
2. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
3. Install the lower brace bracket.
4. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
5. Install the risers.
6. Install the storage tray .
7. Install the VSB cables on the system board.
8. Follow the procedure listed in the After working inside your system.
.

Removing the GPU with GPU cold plates for NVIDIA configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.

5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove the lower brace bracket.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Slide out the system board tray.
11. Unplug the GPU cold plate tubes from the Manifold liquid cooling module.
12. Remove the sensor tray.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates.
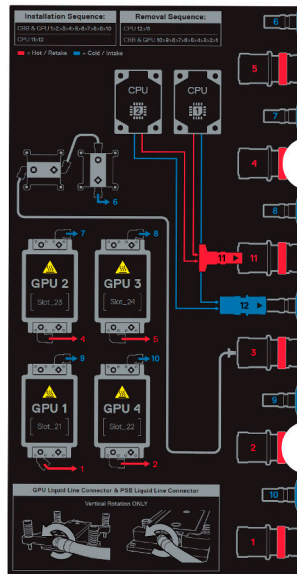

Figure 254. Removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates

2. Using the Torx 15, release four screws securing on the GPU with GPU module from the GPU board. Lift and remove the GPU with GPU module from the GPU socket.

(i) **NOTE:** The procedure to remove the all the GPU with GPU modules is same.
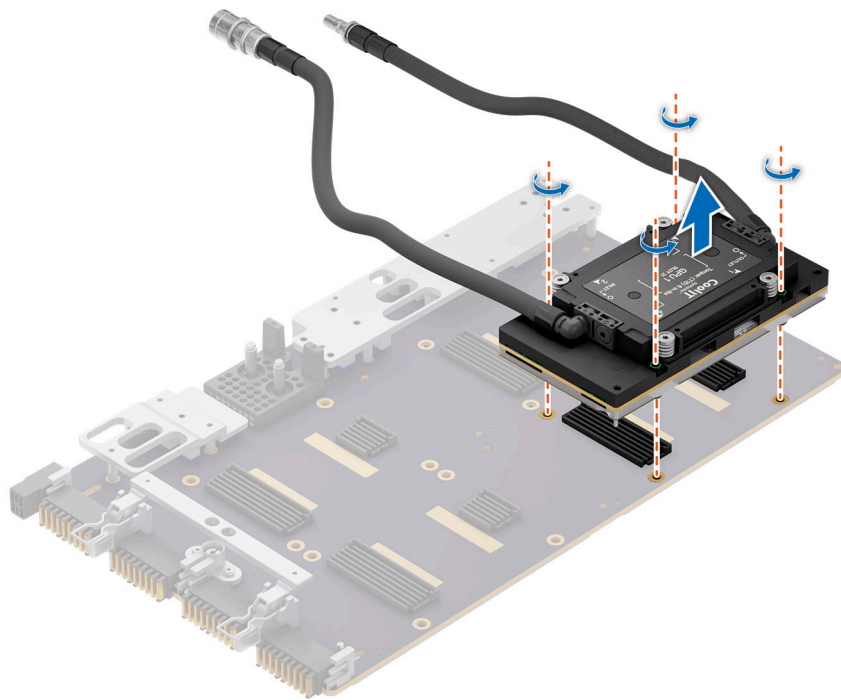
Figure 255. Removing the GPU with GPU cold plate

Next steps

Replace the GPU with GPU cold plate for NVIDIA configurations.

Installing the GPU with GPU cold plates for NVIDIA configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove the lower brace bracket.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Slide out the system board tray.
11. Unplug the GPU cold plate tubes from the Manifold liquid cooling module.
12. Remove the sensor tray.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates.
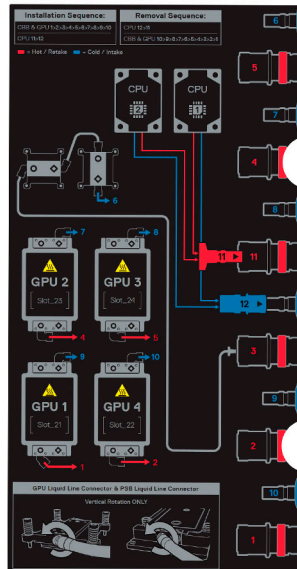
Figure 256. Removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates

2. Align and insert he GPU with GPU module on the GPU socket. Using Torx 15 screwdriver, tighten the four screws securing GPU with GPU module on GPU socket. Plug all the liquid cooling tubes from all the GPU cold plates to the Manifold.

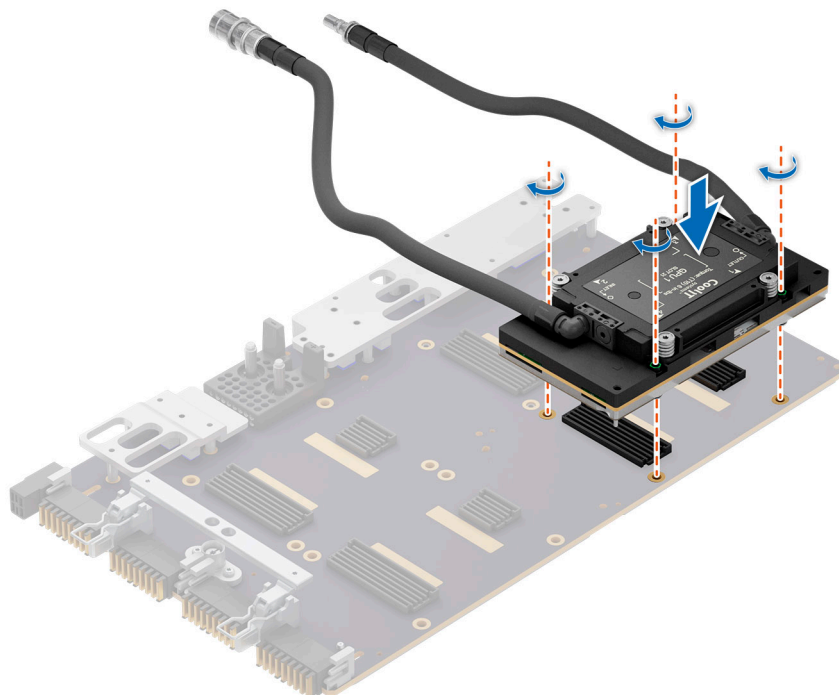ⓘ **NOTE:** The procedure to install all the GPU with GPU modules is same.

Figure 257. Installing the GPU with GPU module

Next steps

1. Install the sensor tray.
2. Plug the cold plate tubes to the Manifold Liquid cooling module.

3. Slide in the system board tray.
4. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
5. Install the lower brace bracket.
6. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
7. Install the risers.
8. Install the storage tray .
9. Install the VSB cables on the system board.
10. Follow the procedure listed in the After working inside your system.

Removing the GPU board for NVIDIA configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove the lower brace bracket.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Slide out the system board tray.
11. Unplug the GPU cold plate tubes from the Manifold liquid cooling module.
12. Remove the sensor tray.
13. Remove the GPU and GPU cold plate.

   ⓘ **NOTE:** If you want to replace the whole GPU board, remove the GPU cold plate module along with the GPUs.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates.
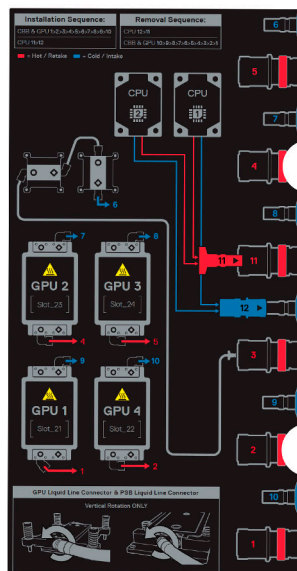

Figure 258. removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates

2. To disengage the GPU assembly from the connectors, follow the steps that are mentioned below:

a. Lift the GPU assembly handle to disengage the GPU tray clips.
b. Lift the clips to release them from the clip holders.
c. Ensure that the clips are free and lower the GPU assembly handle.
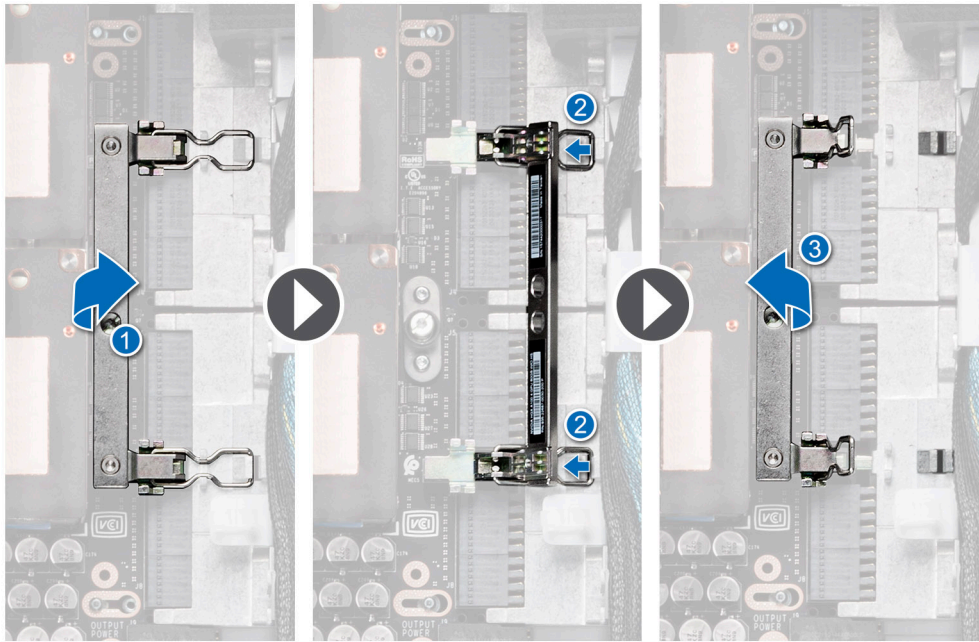

Figure 259. Unlocking the GPU assembly handle

3. Using the Phillips 2 screwdriver, remove the screws securing the GPU board from the chassis. Loosen the captive screws securing the GPU board to the GPU tray and push the GPU board to the left holding the standoffs, to disengage from the tray. Lift the GPU board from the tray.
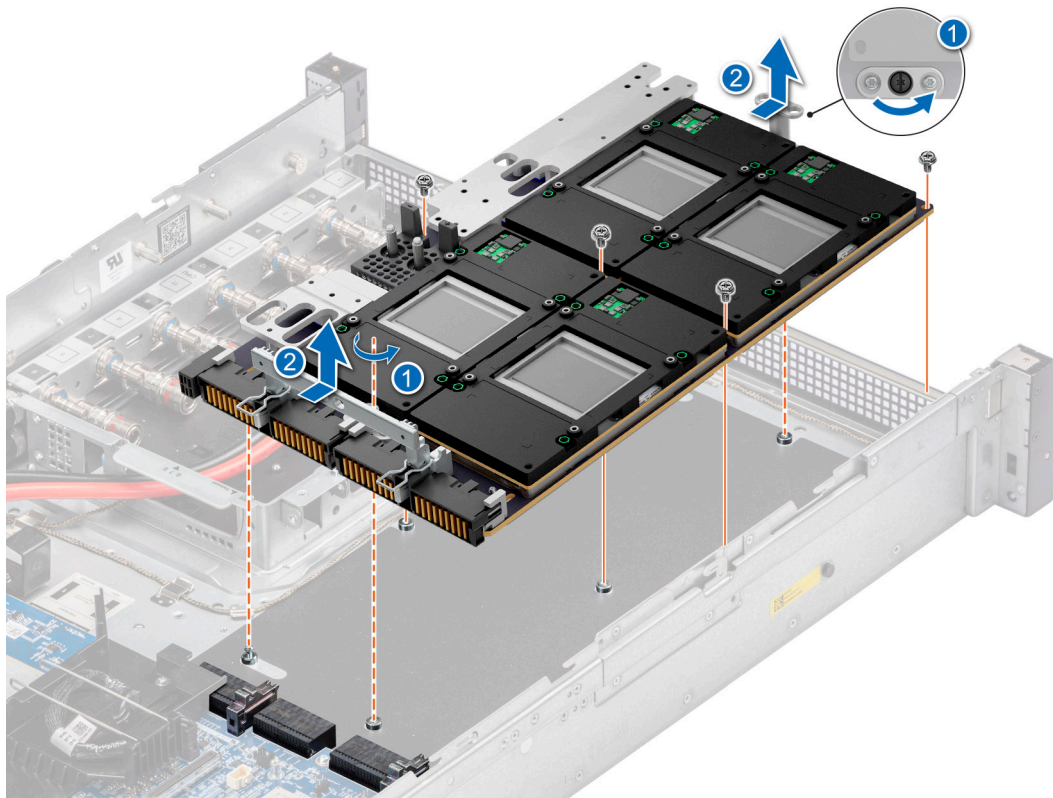

Figure 260. Removing the GPU board

4. If you want to return or replace the NVIDIA GPU board to NVIDIA, remove the Dell provided protective cover from the GPU board connectors and replace with the NVIDIA provided protective cover.

Next steps

Replace the GPU board for NVIDIA configurations.

Installing the GPU board for NVIDIA configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove the lower brace bracket.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Slide out the system board tray.
11. Unplug the GPU cold plate tubes from the Manifold liquid cooling module.
12. Remove the sensor tray.
13. Remove the GPU and GPU cold plate.

   (i) **NOTE:** If you want to replace the whole GPU board, remove the GPU cold plate module along with the GPUs.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates.

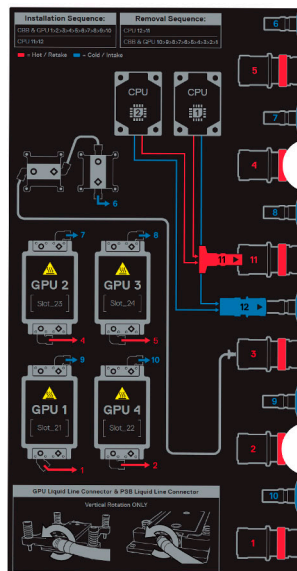**Figure 261. removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates**

2. The NVIDIA GPU boards are shipped with NVIDIA protective covers. These covers should be removed and keep them safe. These covers can be used while shipping the NVIDIA GPU board for replacement if there is any damage to GPU board. Insert the Dell provided protective cover on to the GPU board.
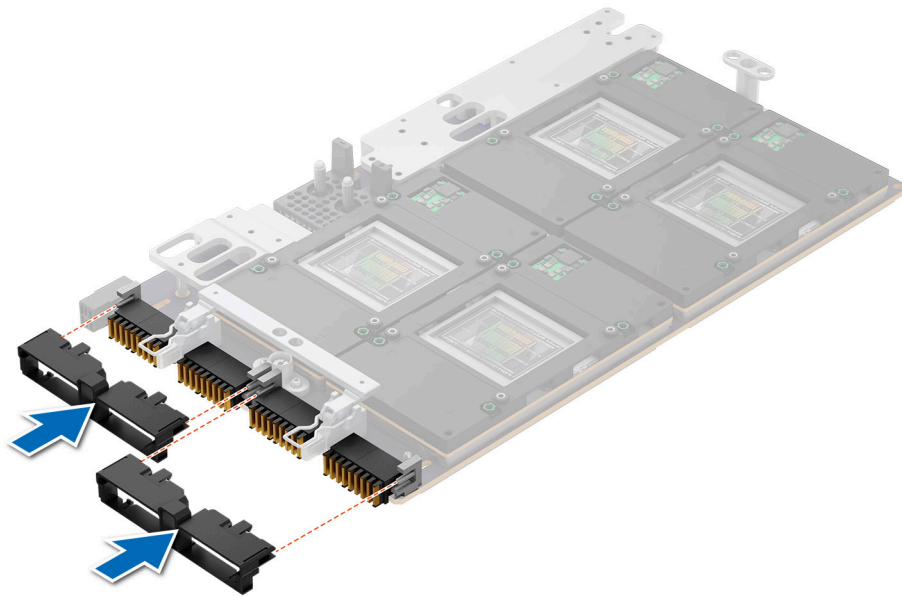
Figure 262. Installing the protective cover

3. To lock the GPU assembly to the chassis, follow the steps that are mentioned below:
   a. Lift the GPU assembly handle to extend the clips.
   b. Fit the clips into the holders.
   c. Lower the GPU assembly handle to ensure the clips that are connected and the GPU assembly is secured.
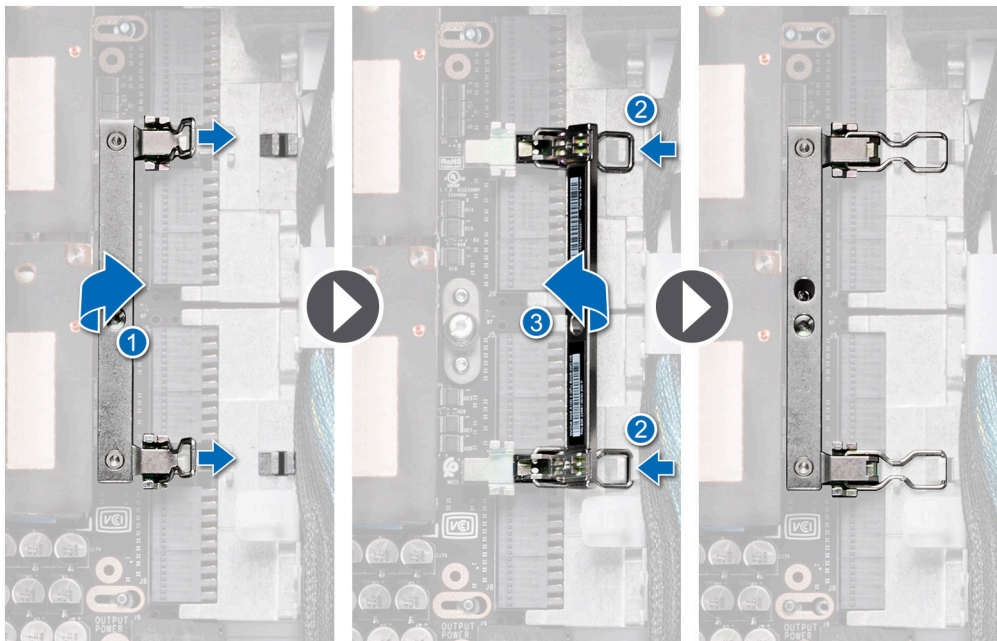

Figure 263. Locking the GPU assembly handle

4. Using the Torx 15 screwdriver, tighten the screws securing the GPU board into the chassis. Tighten the captive screws securing the GPU board to the GPU tray. Reconnect the power cables on to the GPU board.
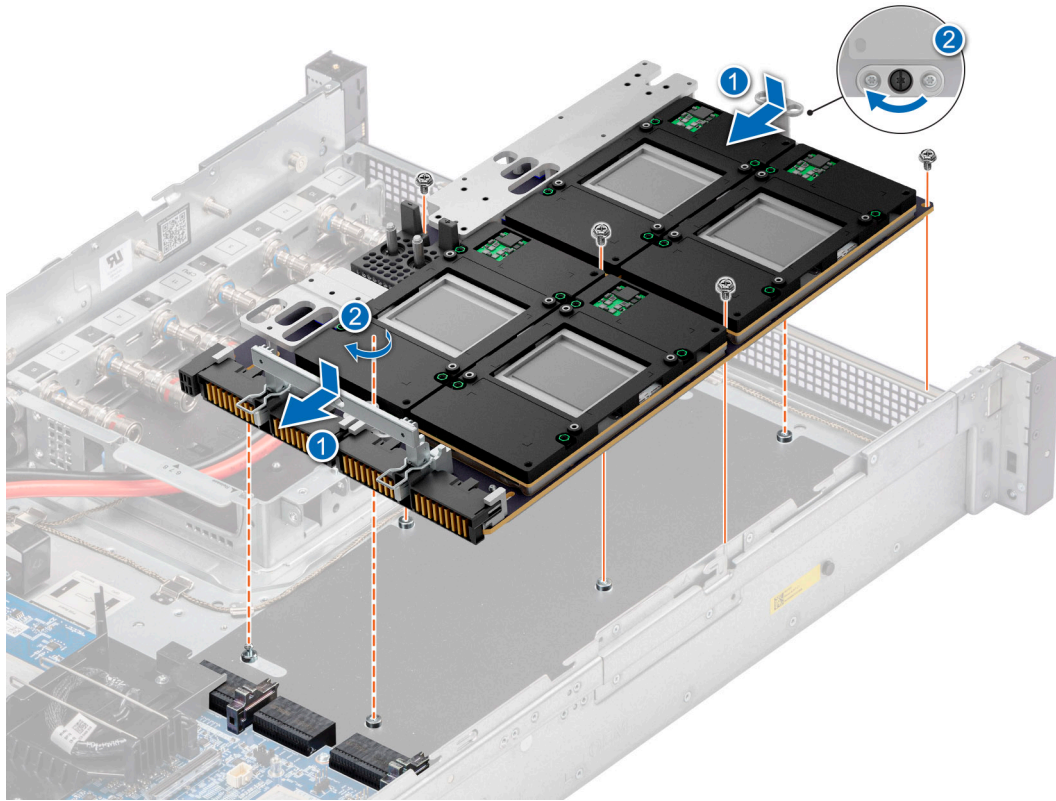
Figure 264. Installing the GPU board

Next steps

1. Install the GPU and GPU cold plates.
2. Install the sensor tray.
3. Plug the cold plate tubes to the Manifold Liquid cooling module.
4. Slide in the system board tray.
5. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
6. Install the lower brace bracket.
7. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
8. Install the risers.
9. Install the storage tray .
10. Install the VSB cables on the system board.
11. Follow the procedure listed in the After working inside your system.

Removing the GPU cold plate for NVIDIA configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove the lower brace bracket.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.

10. Slide out the system board tray.
11. Unplug the GPU cold plate tubes from the Manifold liquid cooling module.
12. Remove the sensor tray.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates.

Figure 265. Removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates

2. To remove the GPU cold plate, first install the handle on the GPU cold plate. Using the Torx 15, tighten the handle screws on to the GPU cold plate. The sequence to tighten the screws is 1, 2, 3 and 4 as mentioned on the handle.
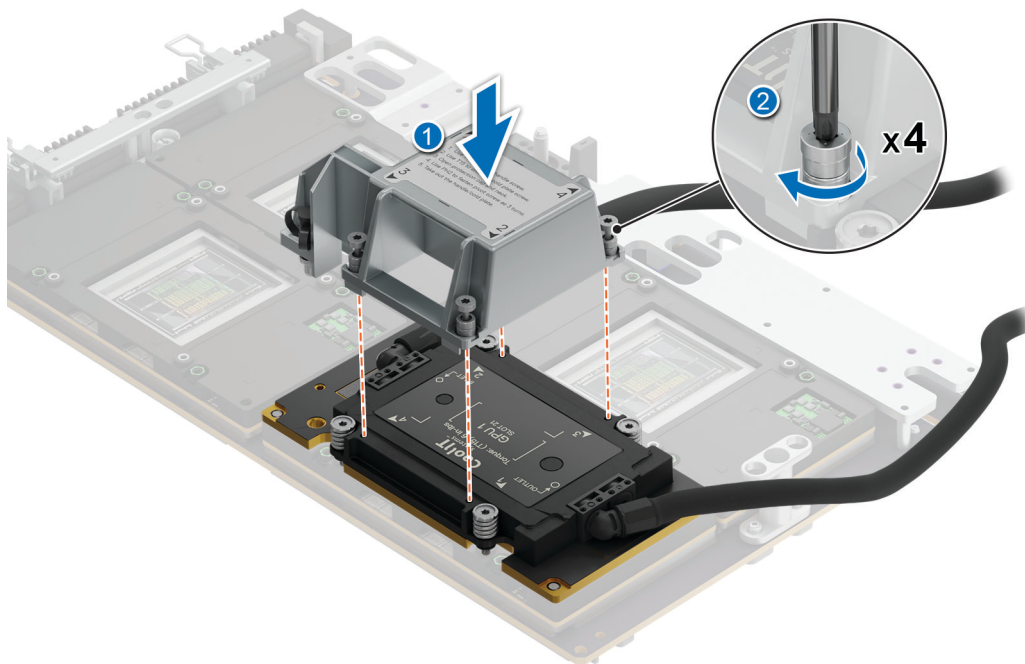
Figure 266. Installing the handle on the GPU cold plate

3. Using the Torx 15, loosen the screws securing the GPU cold plate on the GPU module. Open the protection cap and the neck. Using the Phillips 2 screwdriver, tighten the pivot screw three turns to break the thermal paste bond between GPU cold plate and the GPU module.

   ⓘ **NOTE:** The screws securing the GPU cold plate module to the GPU must be loosened first before tightening the pivot screw

Figure 267. Removing the GPU cold plate module

Next steps

Replace the GPU cold plate for NVIDIA configurations.

Installing the GPU cold plate for NVIDIA GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove the lower brace bracket.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Slide out the system board tray.
11. Unplug the GPU cold plate tubes from the Manifold liquid cooling module.
12. Remove the sensor tray.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates.
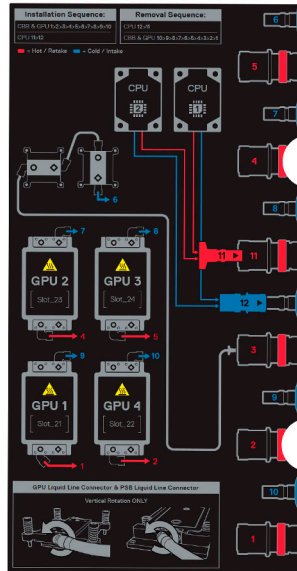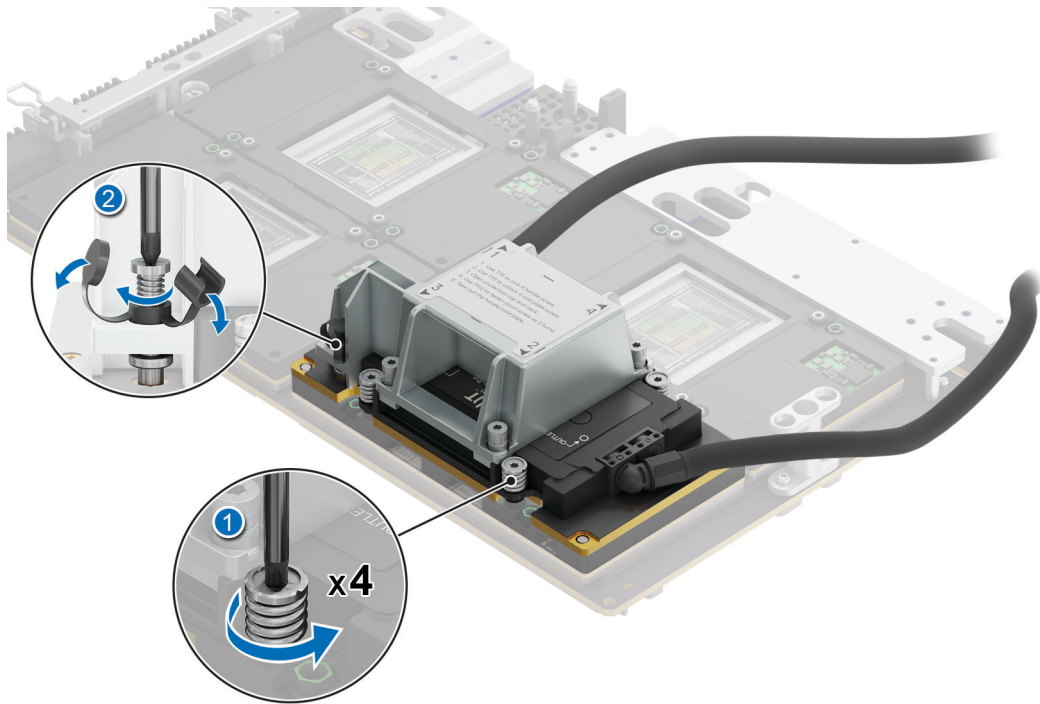

Figure 268. removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates

2. If you are using an existing GPU cold plate, remove the thermal grease on the GPU cold plate by using a clean lint-free cloth.

   (i) **NOTE:** Follow the same procedure for a new heat sink.

Figure 269. Removing the thermal grease

Figure 270.
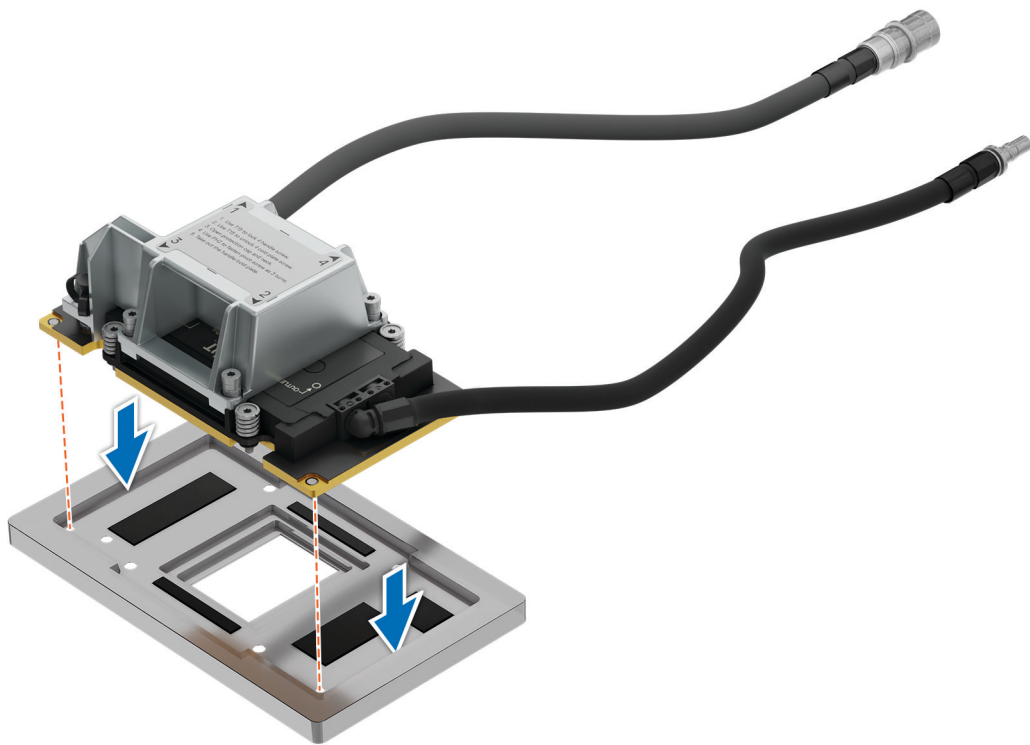
Figure 271.
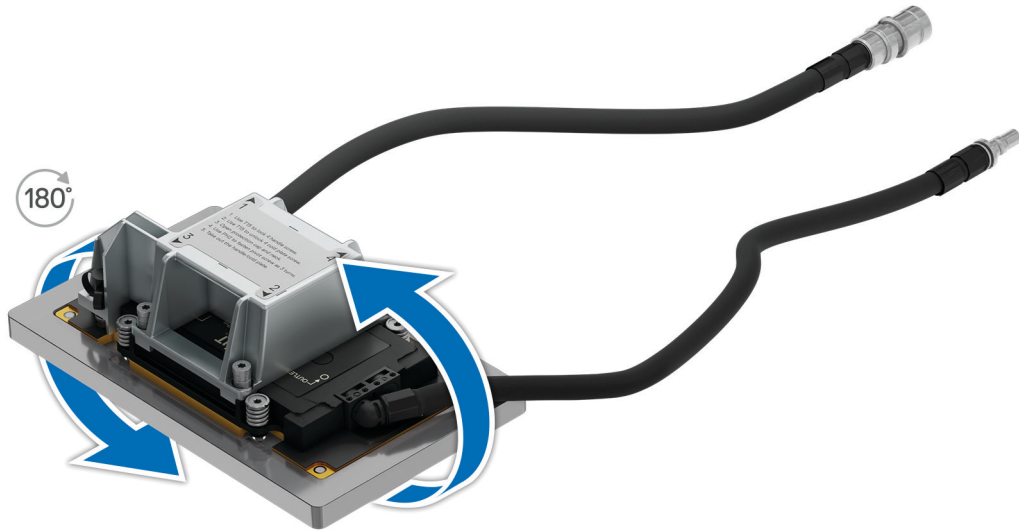
Figure 272.

3. The thermal kit contains the thermal paste and apply the paste on the GPU cold plate.
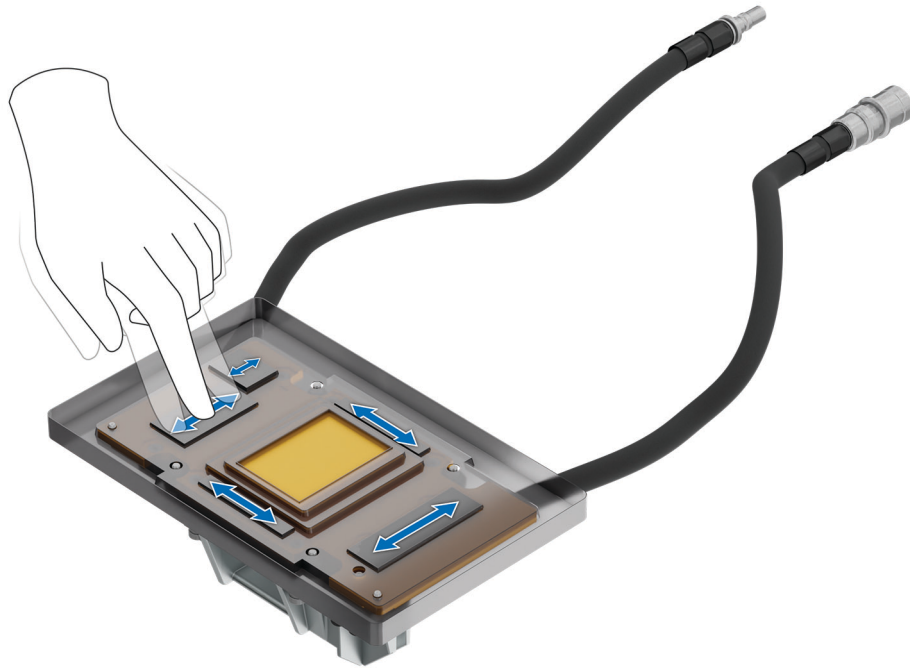
Figure 273. Applying thermal paste
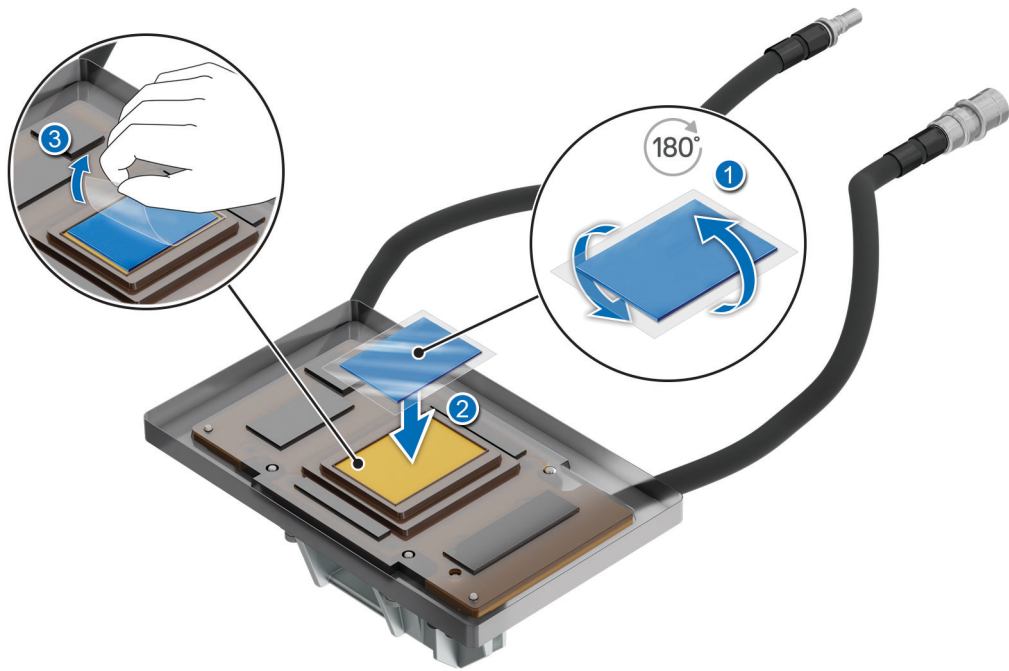
Figure 274. Applying thermal paste
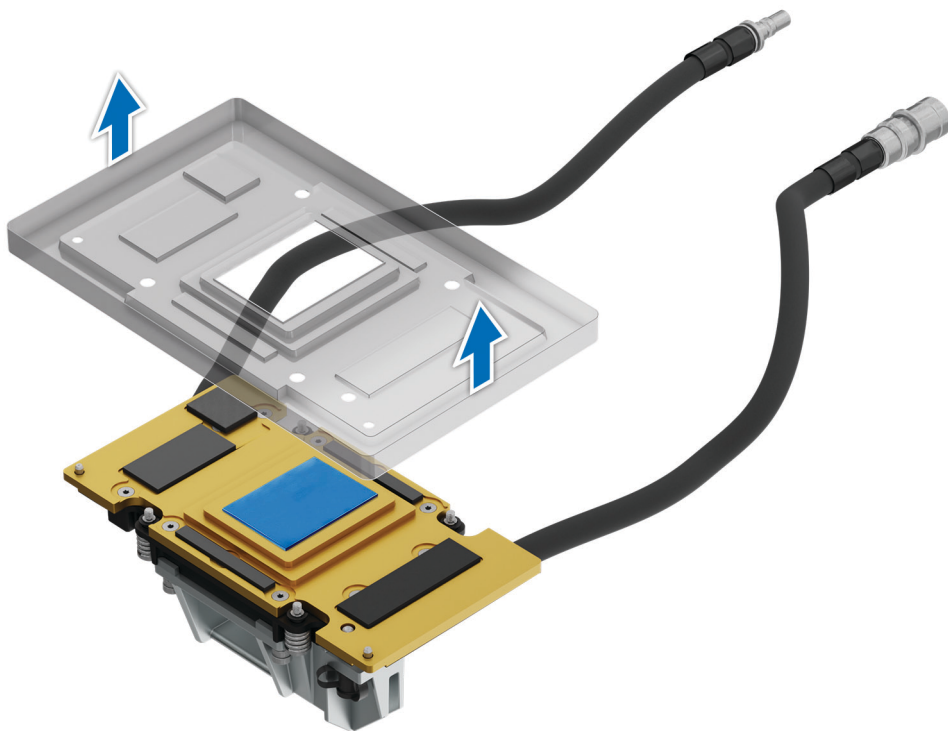
Figure 275.

4. Using the Torx 15, loosen the pivot screw of the handle from the GPU module.
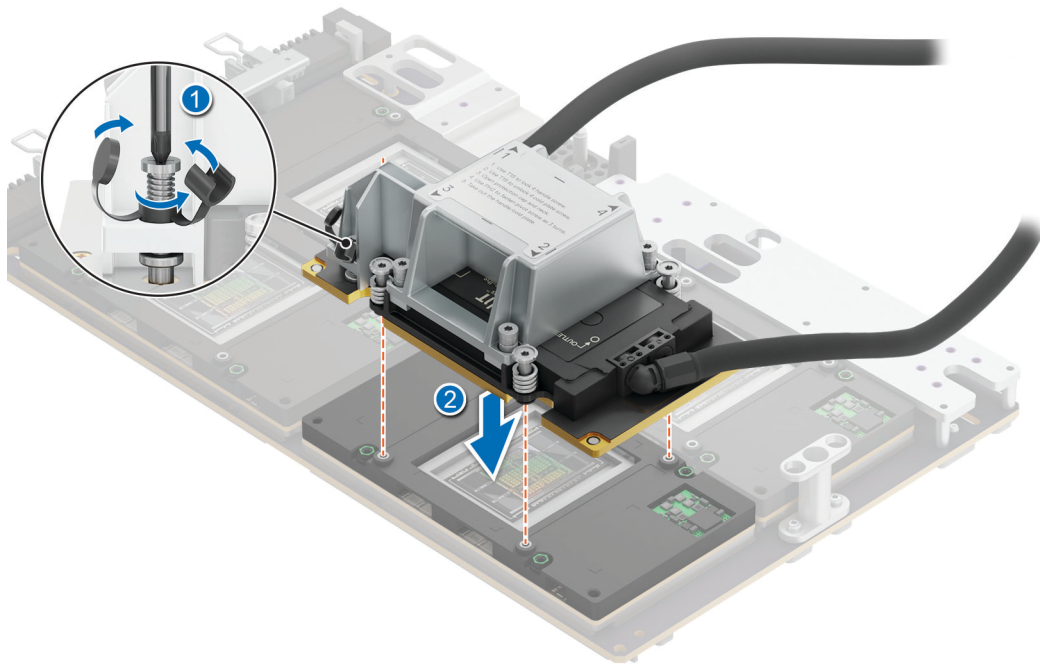
Figure 276. Loosening the pivot screw

5. Align the insert the GPU cold plate along with handle in the GPU socket. Using the Torx 15 screwdriver, tighten the screws with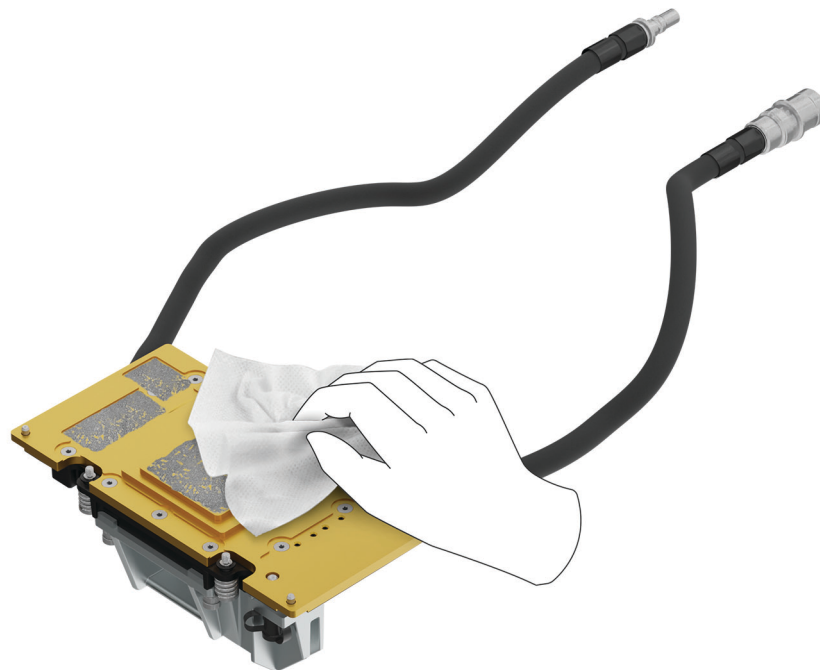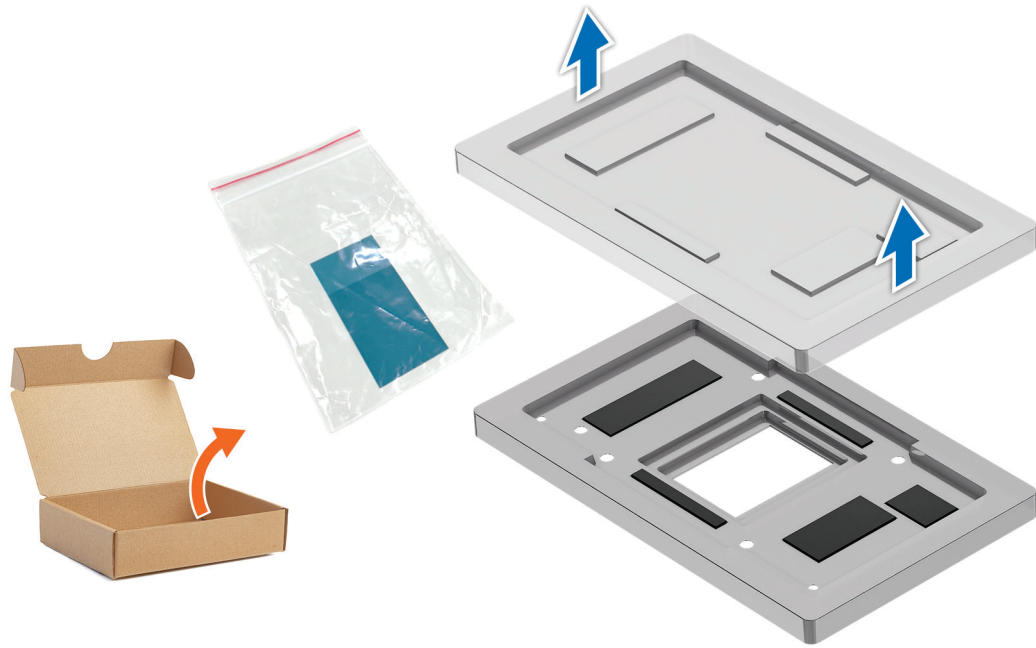 4 in-lbf torque value to secure the screws on the GPU cold plate. The sequence to tighten the screws is 1, 2, 3 and 4 as mentioned on the handle. Use the same sequence to fully tighten the 4 screws with 4 in-lbf torque value on the cold plate. Pull the plunger and lift the metallic piece. Plug the cold plate tubes in to the Manifold Liquid cooling. Close the metallic piece and release the plunger to click into its place.
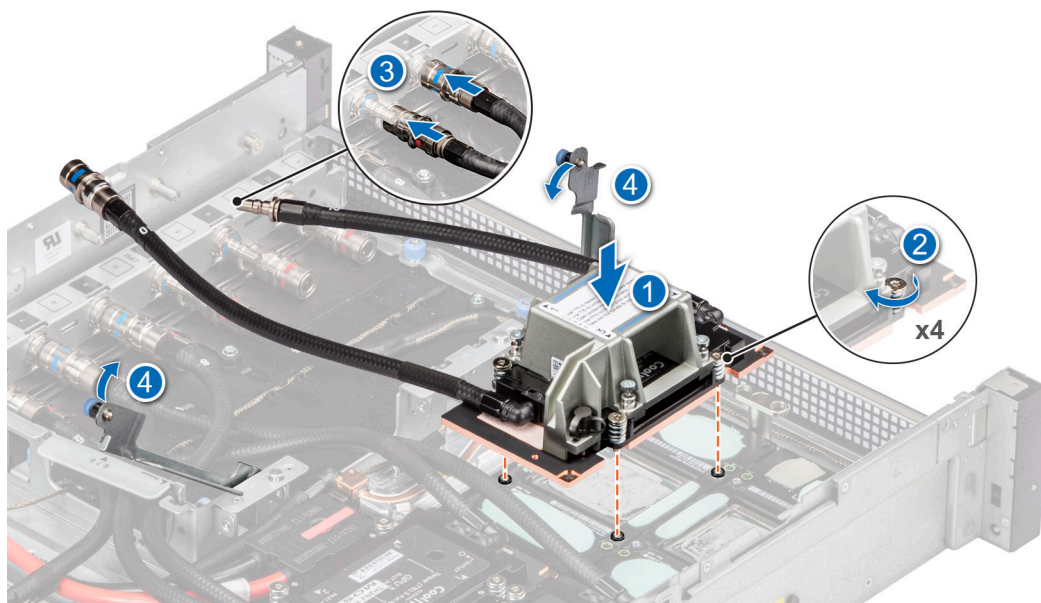
Figure 277. Removing the GPU cold plate with handle

6. Using the Torx 15 screwdriver, loosen the screw of the handle and lift the handle away from the GPU cold plate.
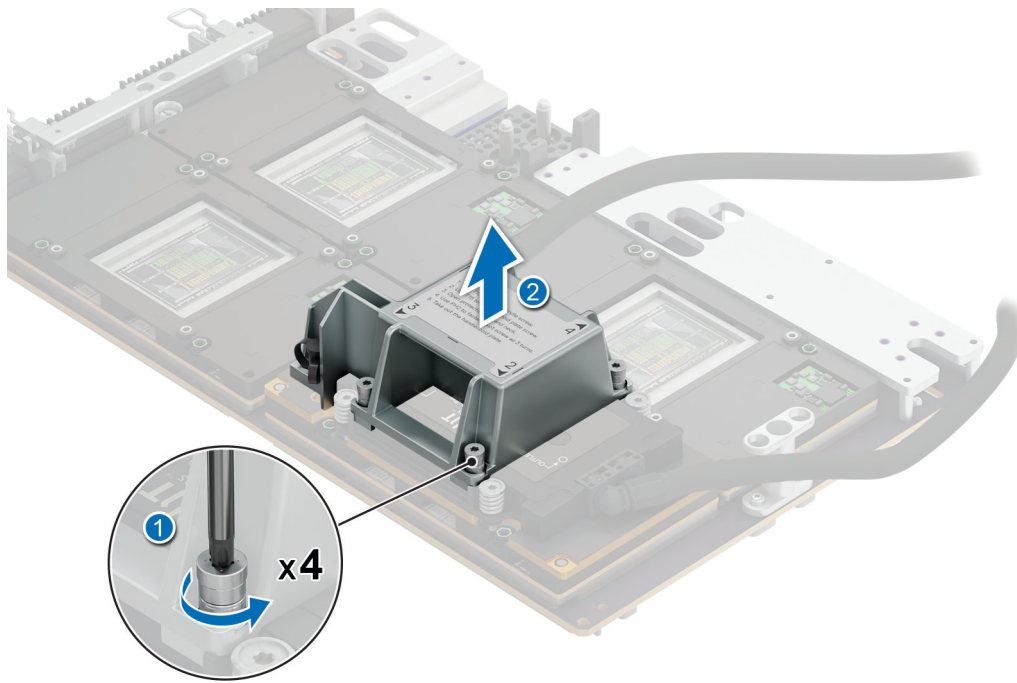
Figure 278. Removing the handle

Next steps

1. Install the sensor tray.
2. Plug the cold plate tubes to the Manifold Liquid cooling module.
3. Slide in the system board tray.
4. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
5. Install the lower brace bracket.
6. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
7. Install the risers.
8. Install the storage tray .
9. Install the VSB cables on the system board.
10. Follow the procedure listed in the After working inside your system.

Removing the GPU for NVIDIA GPU configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove the lower brace bracket.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Slide out the system board tray.
11. Unplug the GPU cold plate tubes from the Manifold liquid cooling module.
12. Remove the sensor tray.

13. Remove the GPU cold plate.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates.

Figure 279. removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates

2. If you want replace just the GPU module, using Torx 15, release four screws securing GPU module on GPU socket.

   (i) **NOTE:** All GPU cold plates are not required to remove for replacing just one GPU.

3. Lift and remove the GPU module from the GPU socket.

   (i) **NOTE:** The procedure to remove the all the GPUs is same.
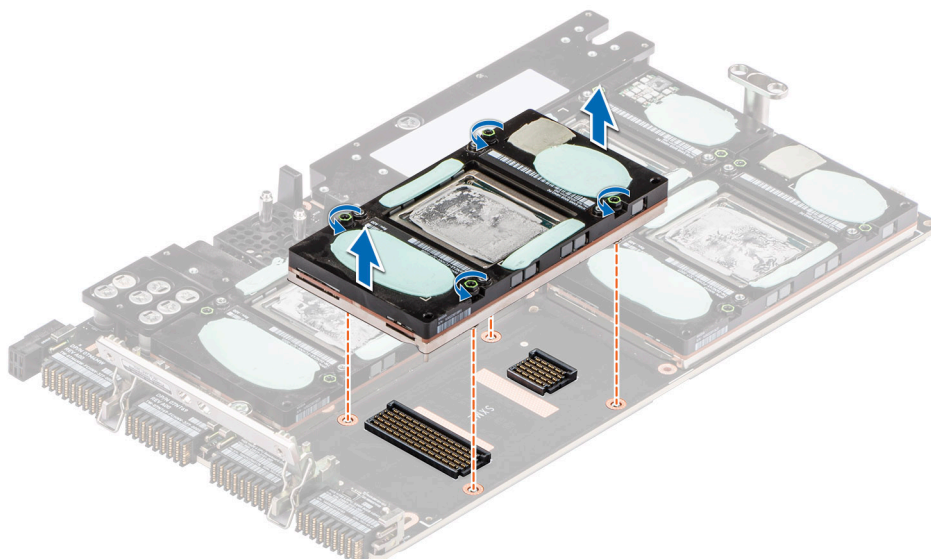
Figure 280. Removing the GPU module

Next steps

Installing the GPU for NVIDIA configurations

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. Disconnect the cables from the connector on the system board and the storage tray.
4. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
5. Remove the storage tray.
6. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
7. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
8. Remove the lower brace bracket.
9. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
10. Slide out the system board tray.
11. Unplug the GPU cold plate tubes from the Manifold liquid cooling module.
12. Remove the sensor tray.
13. Remove the GPU cold plate.

Steps

1. Here is the orientation image for removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates.
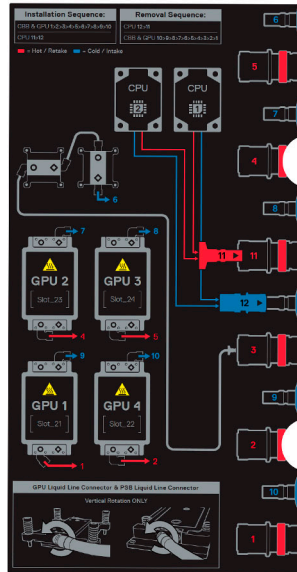

Figure 281. Removal and installation sequence of liquid cooling tubes for processor, PSB cold plate, GPU cold plates

2. If you want replace just the GPU module, align and insert the GPU module on the GPU socket. Using Torx 15 screwdriver, tighten the four screws securing GPU module on GPU socket. Plug all the liquid cooling tubes from all the GPU cold plates to the Manifold.

   (i) **NOTE:** The procedure to install all the GPUs is same.
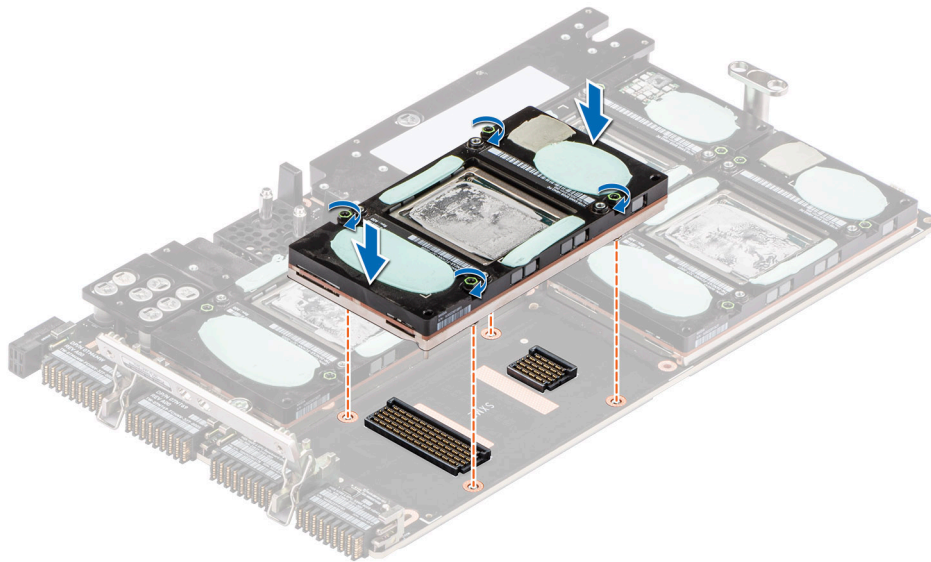
Figure 282. Installing the GPU module

Next steps

1. Install the GPU cold plate.
2. Install the sensor tray.
3. Plug the cold plate tubes to the Manifold Liquid cooling module.
4. Slide in the system board tray.
5. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
6. Install the lower brace bracket.
7. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
8. Install the risers.
9. Install the storage tray .
10. Install the VSB cables on the system board.
11. Follow the procedure listed in the After working inside your system.

Manifold module

This is a service technician replaceable part only.

Removing the Manifold 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. For NVIDIA configurations:.
   - Disconnect the cables from the connector on the system board and the storage tray.
   - Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
   - Remove the storage tray.
   - Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
   - Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
   - Remove the lower brace bracket.
   - Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.

- Slide out the system board tray.
- Unplug the GPU cold plate tubes from the Manifold liquid cooling module.
- Remove the System board tray.
- Disconnect all the liquid cooling tubes from the Manifold.

4. For Intel GPU configurations:
   - Remove the storage tray.
   - Remove the risers.
   - Remove the VSB cables from the system board.
   - Remove lower brace cover.
   - Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
   - Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
   - Slide out the system board tray.
   - Unplug the cold plate tubes from the Manifold Liquid cooling module.

Steps

1. Using the Phillips 2 screwdriver, loosen the thumb screws on the lower brace of the chassis. Lift up the lower brace away from the chassis.
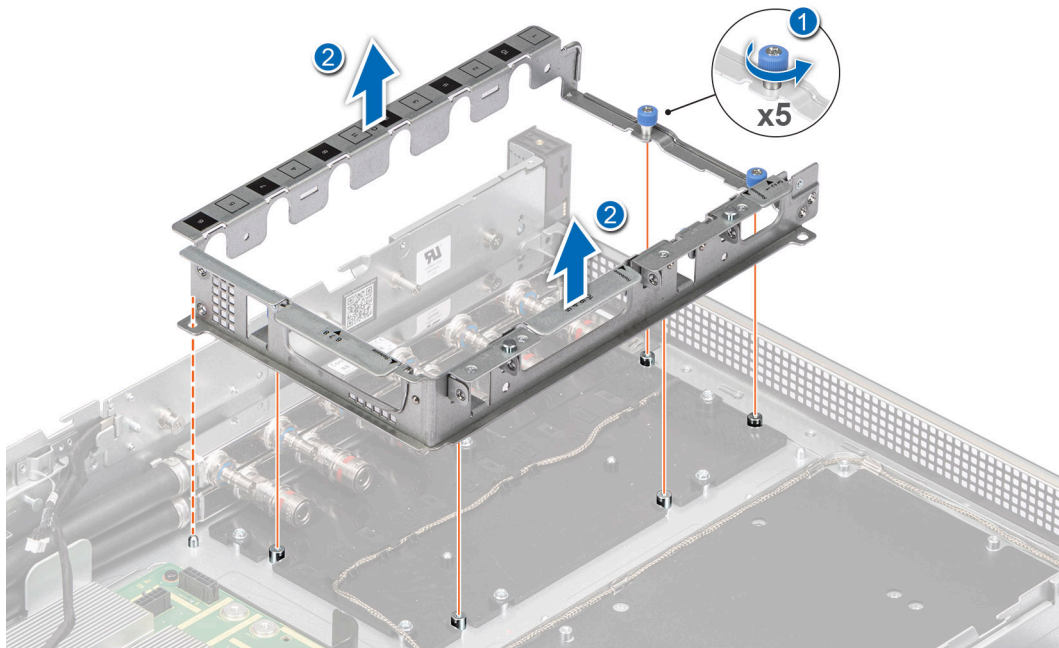
Figure 283. Removing the lower brace

2. Using the Torx 15 screwdriver, remove the screws from the manifold. Lift the tube out of the channel. Slide the manifold toward rear of the chassis along the T-pin and lift up the manifold from the slots on the chassis.
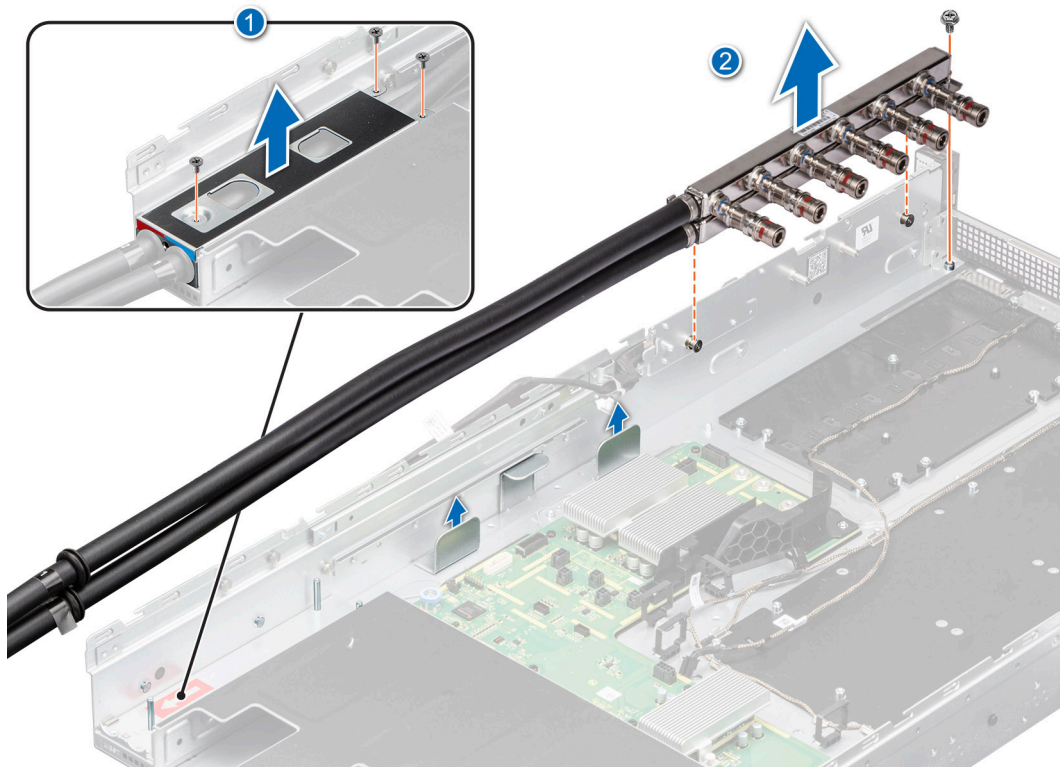
Figure 284. Removing the liquid cooling manifold

Next steps

Replace the liquid cooling manifold.

Installing the Liquid cooling Manifold

Prerequisites

1. Follow the safety guidelines listed in the Safety instructions.
2. Follow the procedure listed in the Before working inside your system .
3. For NVIDIA configurations:.
   a. Disconnect the cables from the connector on the system board and the storage tray.
   b. Remove the VSB from the system board and keep it on the storage tray and no need to disconnect from the PDB2.
   c. Remove the storage tray.
   d. Remove the risers and keep the risers away from the system board tray and no need to disconnect the cables from the PSB.
   e. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.
   f. Remove the lower brace bracket.
   g. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.
   h. Slide out the system board tray.
   i. Unplug the GPU cold plate tubes from the Manifold liquid cooling module.
   j. Remove the System board tray.
   k. Disconnect all the liquid cooling tubes from the Manifold.
4. For Intel GPU configurations:
   a. Remove the storage tray.
   b. Remove the risers.
   c. Remove the VSB cables from the system board.
   d. Remove lower brace cover.

e. Disconnect all the cables from the system board and make note of all the cable connections. For more information, see Cabling diagram.

f. Disconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module and keep in on the system board and make sure do not damage any connectors on the system board.

g. Slide out the system board tray.

h. Unplug the cold plate tubes from the Manifold Liquid cooling module.

Steps

1. First insert the hot tube into the holder and push manifold toward front of the chassis. Using the Torx 15 screwdriver, tighten the screws to secure on the manifold at the front of the chassis. Then insert the cold tube in the holder.

2. Using the Torx 15 screwdriver, tighten the screws to secure on the manifold at the front of the chassis.
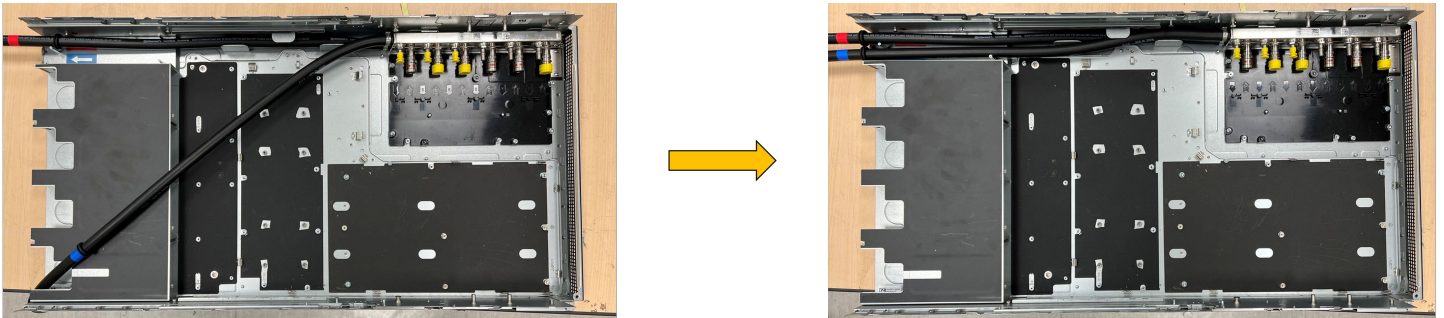
Figure 285. Tighten the screws
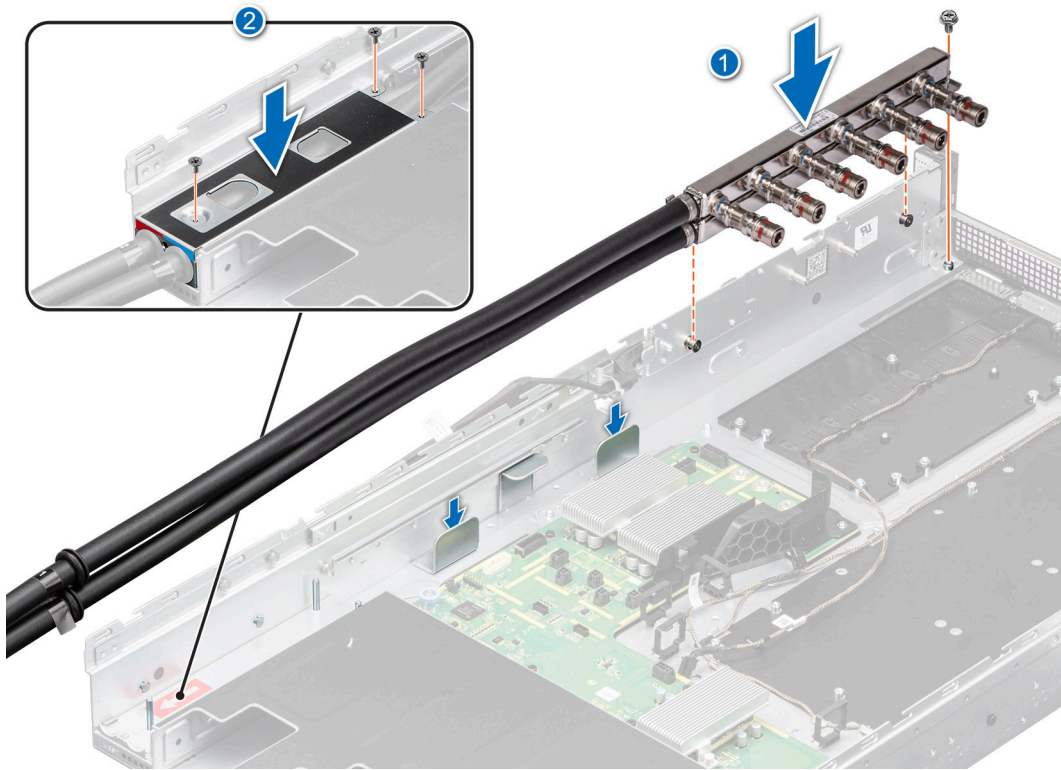
Figure 286. Installing the liquid cooling manifold

3. Align and install the lower brace into the chassis. Using the Phillips 2 screwdriver, tighten the thumbscrews to install the lower brace into the chassis.
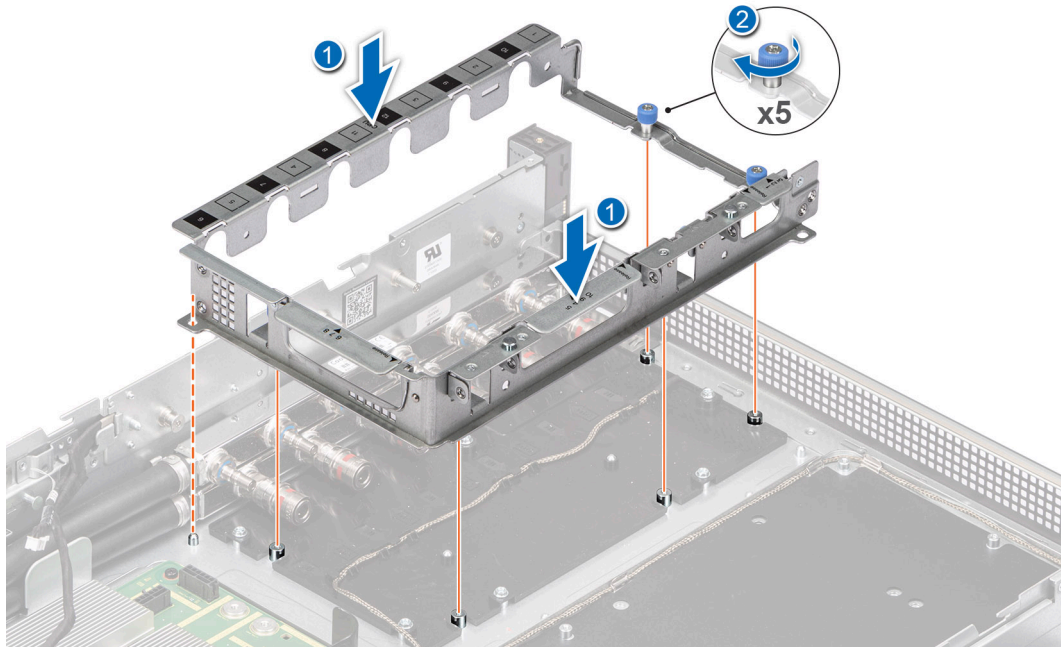
Figure 287. Installing the lower brace
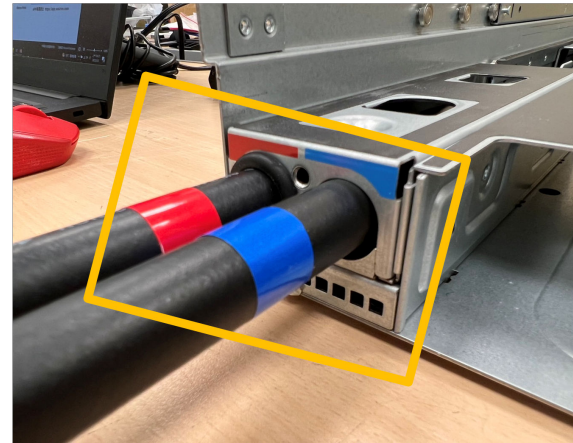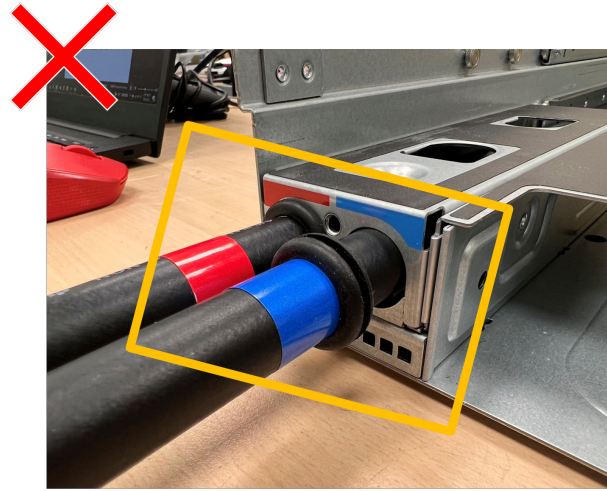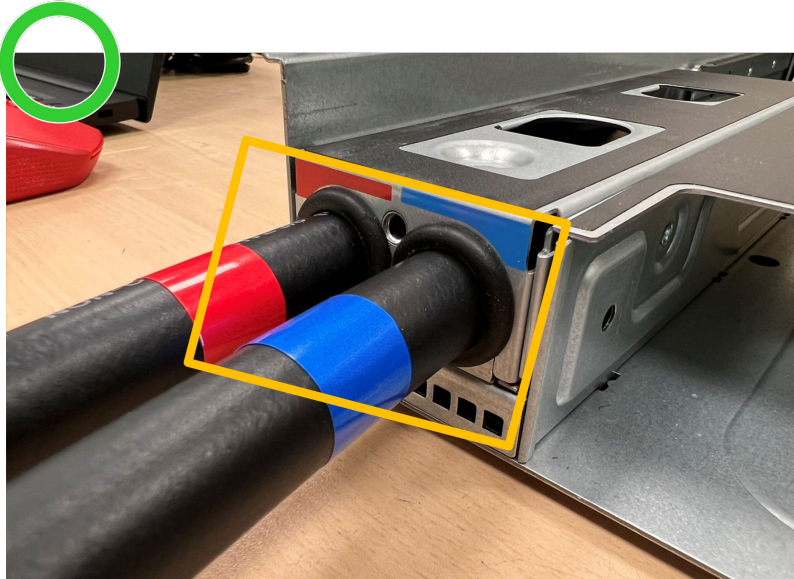
Figure 288. Cold and hot tube correct installation positions

Next steps

1. For NVIDIA GPU configurations:
   a. Plug the GPU cold plate tubes to the Manifold Liquid cooling module.
   b. Slide in the system board tray.
   c. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
   d. Install the lower brace bracket.
   e. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
   f. Install the risers.
   g. Install the storage tray .
   h. Install the VSB cables on the system board.
   i. Follow the procedure listed in the After working inside your system.
2. For Intel GPU configurations:
   a. Plug the cold plate tubes to the Manifold Liquid cooling module.
   b. Slide in the system board tray.
   c. Reconnect the liquid cooling tubes 11 and 12 from the Manifold for DLC module.
   d. Install the lower brace cover.
   e. Reconnect all the cables onto the system board. For more information, see Cabling diagram.
   f. Install the risers.
   g. Install the storage tray .
   h. Install the VSB cables on the system board.
   i. Follow the procedure listed in the After working inside your system.
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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
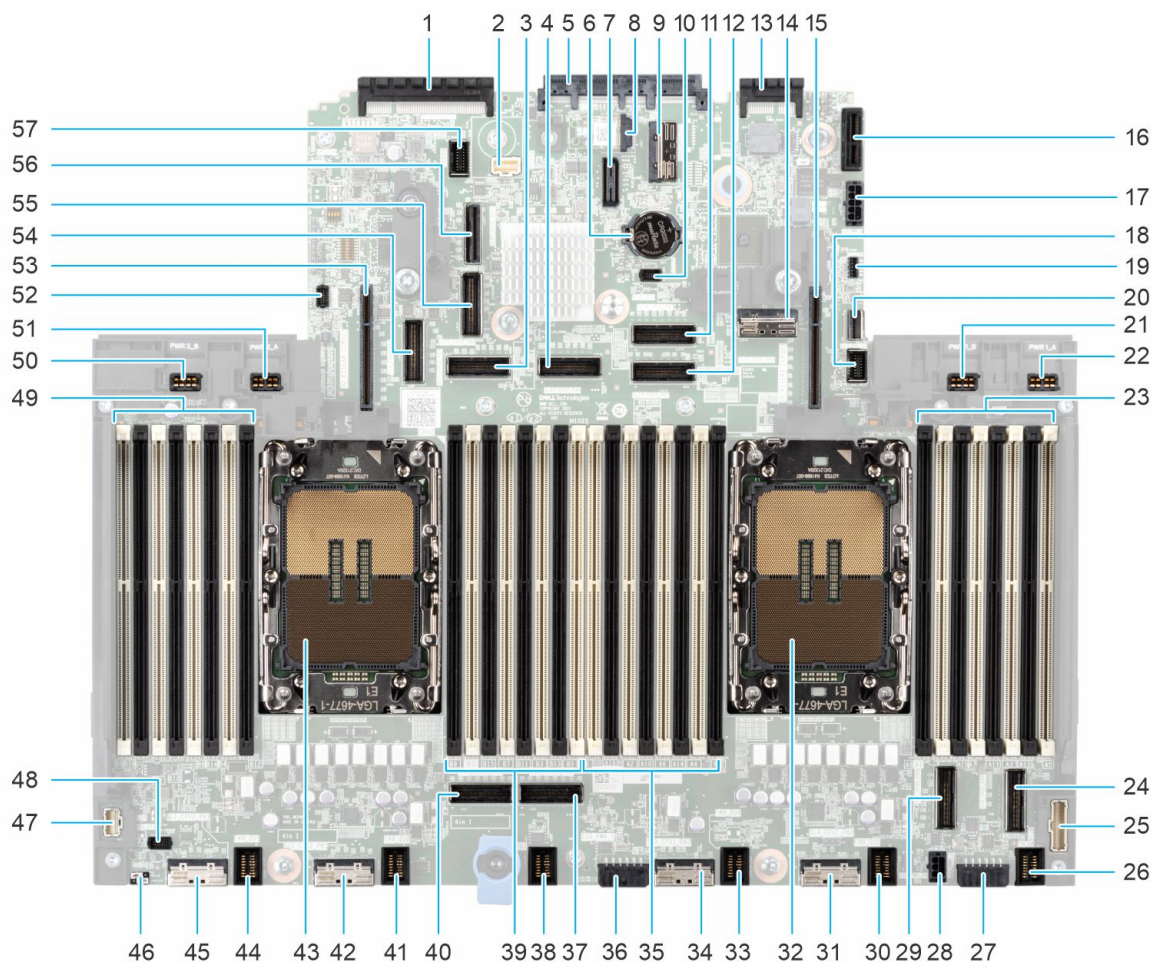
Figure 289. System board jumpers and connectors

Table 73. System board jumpers and connectors

Item	Connector	Description
1.	J_RIO1	Rear I/O connector
2.	P_PSU34	PSU3, 4 signal connector

Table 73. System board jumpers and connectors (continued)

Item	Connector	Description
3.	J_SL11	PCIe connector 11 (applicable only for XE9640 with Intel GPU)
4	J_SL12	PCIe connector 12 (applicable only for XE9640 with Intel GPU)
5.	J_OCP1	OCP NIC 3.0 connector
6.	BAT1	Coin cell battery
7.	J1	XDP connector
8.	P23	TPM connector
9.	J_DSL1	PCIe connector DSL1
10.	J_PSU1_SIG	PSU1 signal connector
11.	J_SL14	PCIe connector 14 (applicable only for XE9640 with Intel GPU)
12.	J_SL13	PCIe connector 13 (applicable only for XE9640 with Intel GPU)
13.	J_LOM1	LOM connector
14.	J_SL15	PCIe connector 15 (applicable only for XE9640 with Intel GPU)
15.	J_R1	Riser 1
16.	J_IDSDM1	IDSDM/Internal USB connector
17.	J_SIG_PWR_0	Power connector 0 - use for BP only
18.	J_FRONT_VIDEO1	Front VGA
19.	BOSS_PWR	BOSS card power
20.	J_SL16	PCIe connector 16
21.	PWR1_B	For Riser 1 GPU power and signal cable
22.	PWR1_A	For right BBU power cable
23.	A9, A1, A15, A7, A11, A3, A13, A5	DIMM for CPU 1 channels A, B, C, D
24.	J_SL8_CPU1_PA4	PCIe connector 8
25.	P_RGT_CP	Right control panel connector
26.	J_FAN_2U6	Fan 6 connector
27.	J_SIG_PWR_2_2U	Power connector 2 - use for BP only
28.	J_SIG_PWR_0B	PCIe connector
29.	J_SL7	PCIe connector 7
30.	J_FAN_2U5	Fan 5 connector
31.	J_SL4	PCIe connector 4
32.	U_CPU1	Processor 1
33.	J_FAN_2U4_1U5_6	Fan 4 connector
34.	J_SL3	PCIe connector 3
35.	A8, A16, A2, A10, A6, A14, A4, A12	DIMMs for CPU 1 channels H, G, F, E
36.	J_SIG_PWR__2U	Power connector 1 - use for BP only
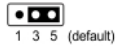
Table 73. System board jumpers and connectors (continued)

Item	Connector	Description
37.	J_SL6	PCIe connector 6
38.	J_FAN_2U3	Fan 3 connector
39.	B9, B1, B15, B7, B11, B3, B13, B5	DIMM for CPU 2 channels A, B, C, D
40.	J_SL5	PCIe connector 5 (applicable only for XE9640 with NVIDIA GPU)
41.	J_FAN_2U2	Fan 2 connector
42.	J_SL2	PCIe connector 2
43.	U_CPU2	Processor 2
44.	J_FAN_2U1_1U1_2	Fan 1 connector
45.	J_SL1	PCIe connector 1
46.	P22	Jumper
47.	P_LFT_CP1	Left control panel connector
48.	J_GPU_SIDEBAND	GPU sideband connector
49.	B8, B16, B2, B10, B6, B14, B4, B12	DIMMs for CPU 2 channels H, G, F, E
50.	PWR2_B	For Riser 4 GPU power and signal cable
51.	PWR2_A	For left BBU power cable
52.	J_PSU2_SIG	PSU2 signal connector
53.	J_R4	Riser 4
54.	J_SL9	PCIe connector 9
55.	J_SL10	PCIe connector 10
56.	J_SL27	PCIe connector 27
57.	P_PSU56	PSU5,6 signal connector

System board jumper settings

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

Table 74. System board jumper settings

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

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

Disabling a forgotten password

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

Prerequisites

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

Steps

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

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

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

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

System diagnostics and indicator codes

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

Topics:

- Status LED indicators
- iDRAC Direct LED indicator codes
- LCD panel
- NIC indicator codes
- Power supply unit indicator codes
- Drive indicator codes
- Using system diagnostics

Status LED indicators

ⓘ **NOTE:** The indicators display solid amber if any error occurs.
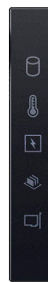
Figure 290. Status LED indicators

Table 75. Status LED indicators and descriptions

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

Table 75. Status LED indicators and descriptions (continued)

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

iDRAC Direct LED indicator codes

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

You can configure iDRAC Direct by using a USB to micro USB (type AB) cable, which you can connect to your laptop or tablet. Cable length should not exceed 3 feet (0.91 meters). Performance could be affected by cable quality. The following table describes iDRAC Direct activity when the iDRAC Direct port is active:

Table 76. iDRAC Direct LED indicator codes

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

LCD panel

The LCD panel provides system information, status, and error messages to indicate if the system is functioning correctly or requires attention. The LCD panel is used to configure or view the iDRAC IP address of the system. For information about the event and error messages generated by the system firmware and agents that monitor system components, go to qrl.dell.com > **Look Up** > **Error Code**, type the error code, and then click **Look it up**..

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

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

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

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

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

  If the problem persists, see Getting help.
● The LCD backlight remains off if LCD messaging is powered off using the iDRAC utility, the LCD panel, or other tools.

Figure 291. LCD panel features

Table 77. LCD panel features

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

Viewing Home screen

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

Steps

1. To view the **Home** screen, press one of the three navigation buttons (Select, Left, or Right).
2. To navigate to the **Home** screen from another menu, complete the following steps:
   a. Press and hold the navigation button till the up arrow ⬆ is displayed.
   b. Navigate to the **Home** icon ⬆ using the up arrow ⬆ .
   c. Select the **Home** icon.
   d. On the **Home** screen, press the **Select** button to enter the main menu.

Setup menu

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

Table 78. Setup menu

Option	Description
iDRAC	Select **DHCP** or **Static IP** to configure the network mode. If **Static IP** is selected, the available fields are **IP**, **Subnet (Sub)**, and **Gateway (Gtw)**. Select **Setup DNS** to enable DNS and to view domain addresses. Two separate DNS entries are available.
Set error	Select **SEL** to view LCD error messages in a format that matches the IPMI description in the SEL. This enables you to match an LCD message with an SEL entry. Select **Simple** to view LCD error messages in a simplified user-friendly description. For information about the event and error messages generated by the system firmware and agents that monitor system components, go to qrl.dell.com > **Look Up** > **Error Code**, type the error code, and then click **Look it up**..
Set home	Select the default information to be displayed on the **Home** screen. See View Home menu section for the options and option items that can be set as the default on the **Home** screen.

View menu

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

Table 79. View menu

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

NIC indicator codes

Each NIC on the back of the system has indicators that provide information about the activity and link status. The activity LED indicator indicates if data is flowing through the NIC, and the link LED indicator indicates the speed of the connected network.
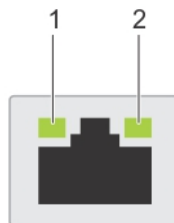

Figure 292. NIC indicator codes

1. Link LED indicator
2. Activity LED indicator

Table 80. NIC indicator codes

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

Table 80. NIC indicator codes (continued)

NIC indicator codes	Condition
Link indicator is green, and activity indicator is blinking green.	Indicates that the NIC is connected to a valid network at its maximum port speed, and data is being sent or received.
Link indicator is amber, and activity indicator is blinking green.	Indicates that the NIC is connected to a valid network at less than its maximum port speed, and data is being sent or received.
Link indicator is green, and activity indicator is off.	Indicates that the NIC is connected to a valid network at its maximum port speed, and data is not being sent or received.
Link indicator is amber, and activity indicator is off.	Indicates that the NIC is connected to a valid network at less than its maximum port speed, and data is not being sent or received.
Link indicator is blinking green, and activity is off.	Indicates that the NIC identity is enabled through the NIC configuration utility.

Power supply unit indicator codes

AC and DC power supply units (PSUs) have an illuminated translucent handle that serves as an indicator. The indicator shows if power is present or if a power fault has occurred.
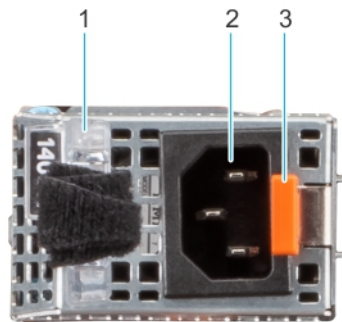
Figure 293. AC PSU status indicator

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

Table 81. AC and DC PSU status indicator codes

Power indicator codes	Condition
Green	Indicates that a valid power source is connected to the PSU and the PSU is operational.
Blinking amber	Indicates an issue with the PSU.
Not powered on	Indicates that the power is not connected to the PSU.
Blinking green	Indicates that the firmware of the PSU is being updated. ⚠ **CAUTION: Do not disconnect the power cord or unplug the PSU when updating firmware. If firmware update is interrupted, the PSUs will not function.**
Blinking green and powers off	When hot-plugging a PSU, it blinks green five times at a rate of 4 Hz and powers off. This indicates a PSU mismatch due to efficiency, feature set, health status, or supported voltage. ⚠ **CAUTION: If two PSUs are installed, both the PSUs must have the same type of label; for example, Extended Power Performance (EPP) label. Mixing PSUs from previous generations of PowerEdge servers is not supported, even if the PSUs have the**

Table 81. AC and DC PSU status indicator codes (continued)

Power indicator codes	Condition
	same power rating. This results in a PSU mismatch condition or failure to power on the system.
	⚠ **CAUTION:** If two PSUs are used, they must be of the same type and have the same maximum output power.
	⚠ **CAUTION:** When correcting a PSU mismatch, replace the PSU with the blinking indicator. Swapping the PSU to make a matched pair can result in an error condition and an unexpected system shutdown. To change from a high output configuration to a low output configuration or vice versa, you must power off the system.
	⚠ **CAUTION:** AC PSUs support both 240 V and 120 V input voltages with the exception of Titanium PSUs, which support only 240 V. When two identical PSUs receive different input voltages, they can output different wattages, and trigger a mismatch.

Drive indicator codes

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

Figure 294. Drive indicators

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

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

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

Table 82. Drive indicator codes

Drive status indicator code	Condition
Blinks green twice per second	Indicates that the drive is being identified or preparing for removal.
Not powered on	Indicates that the drive is ready for removal. ⓘ **NOTE:** The drive status indicator remains off until all drives are initialized after the system is powered on. Drives are not ready for removal during this time.
Blinks green, amber, and then powers off	Indicates that there is an unexpected drive failure.

Table 82. Drive indicator codes (continued)

Drive status indicator code	Condition
Blinks amber four times per second	Indicates that the drive has failed.
Blinks green slowly	Indicates that the drive is rebuilding.
Solid green	Indicates that the drive is online.
Blinks green for three seconds, amber for three seconds, and then powers off after six seconds	Indicates that the rebuild has stopped.

Using system diagnostics

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

Dell Embedded System Diagnostics

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

The Embedded System Diagnostics provide a set of options for particular device groups or devices allowing you to:
- Run tests automatically or in an interactive mode
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of issues encountered during testing

Running the Embedded System Diagnostics from Boot Manager

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

Steps

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

Running the Embedded System Diagnostics from the Dell Lifecycle Controller

Steps

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

System diagnostic controls

Table 83. System diagnostic controls

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

Getting help

Topics:

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

Recycling or End-of-Life service information

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

Contacting Dell Technologies

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

Steps

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

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) located on the Express service tag in the front of the XE9640 system, to access information about PowerEdge XE9640. 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 XE9640 system

Figure 295. Quick Resource Locator for PowerEdge XE9640 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 84. Additional documentation resources for your system

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

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

Task	Document	Location
	For information about installing the operating system, see the operating system documentation.	www.dell.com/operatingsystemmanuals
	For information about updating drivers and firmware, see the Methods to download firmware and drivers section in this document.	www.dell.com/support/drivers
Managing your system	For information about systems management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.	www.dell.com/poweredgemanuals
	For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.	www.dell.com/openmanagemanuals > OpenManage Server Administrator
	For information about installing and using Dell Secure Connect Gateway, see the Dell Secure Connect Gateway Enterprise User's Guide.	https://www.dell.com/serviceabilitytools
	For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.	www.dell.com/openmanagemanuals
Working with the Dell PowerEdge RAID controllers (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