Dell EMC DSS8440

Installation and Service Manual

Regulatory Model: B21S Series
Regulatory Type: B21S001
June 2022
Rev. A08

DELL Technologies

Notes, cautions, and warnings

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

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

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

Contents

1

About this document

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

2

DSS8440 system overview

This chapter briefly describes the main features of the Dell EMC DSS8440 system. The chapter includes figures of the products, a list of the server system features, and diagrams showing the location of the components and connections on the server systems.

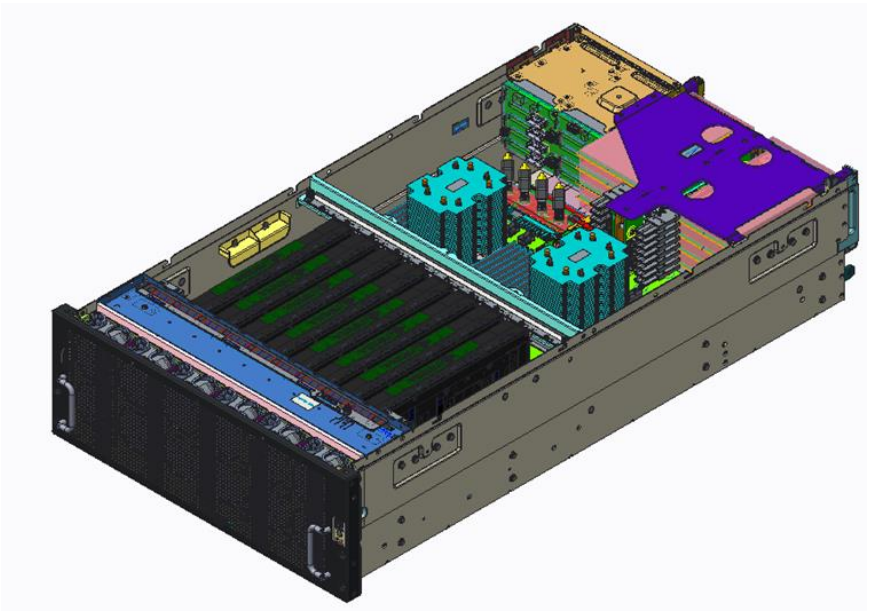


Figure 1. Dell EMC DSS8440 front View

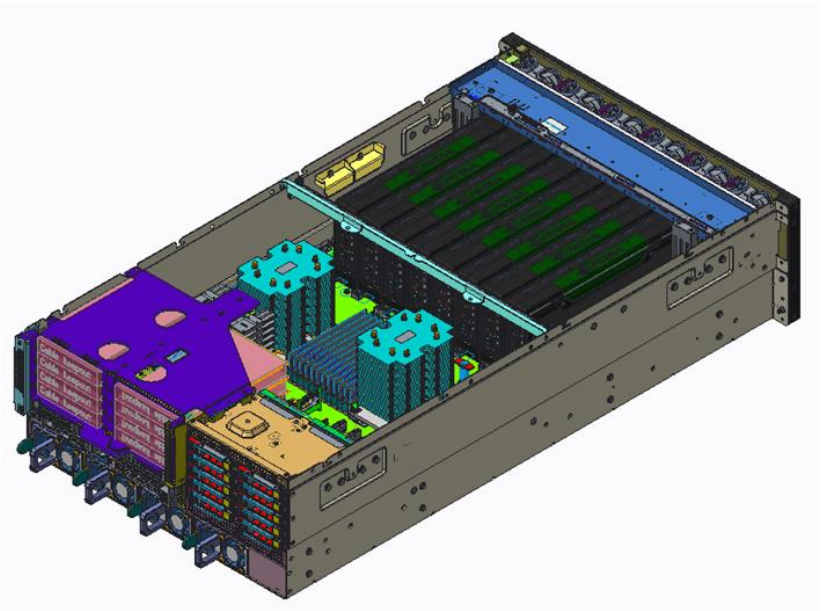


Figure 2. Dell EMC DSS8440 rear view

Topics:

- DSS8440 system feature overview

DSS8440 system feature overview

The DSS8440 is a 4U PCIe Accelerator Server by PCIe Switch Board(PSB) with PCIe downstream up to 10x general-purpose double width graphics processing unit (GPGPU), 8x NVMe, 4x (center) + 4x (right, optional) rear-PCIe slots and upstream the 14G leveraged PowerEdge C4140.

The system contains configuration-A with 8x/10x double width GPGPU, 10x 2.5" hot-swap storage-drives (no expander), single or dual Skylake processors, 845.4mm maximum length, PCIe slots (through PCIe Switch Board(PSB) and C4140 risers), 24x DIMM slots, quad hot-plug power-supply units, rNDC, and the ability to use an HBA for the data drives.

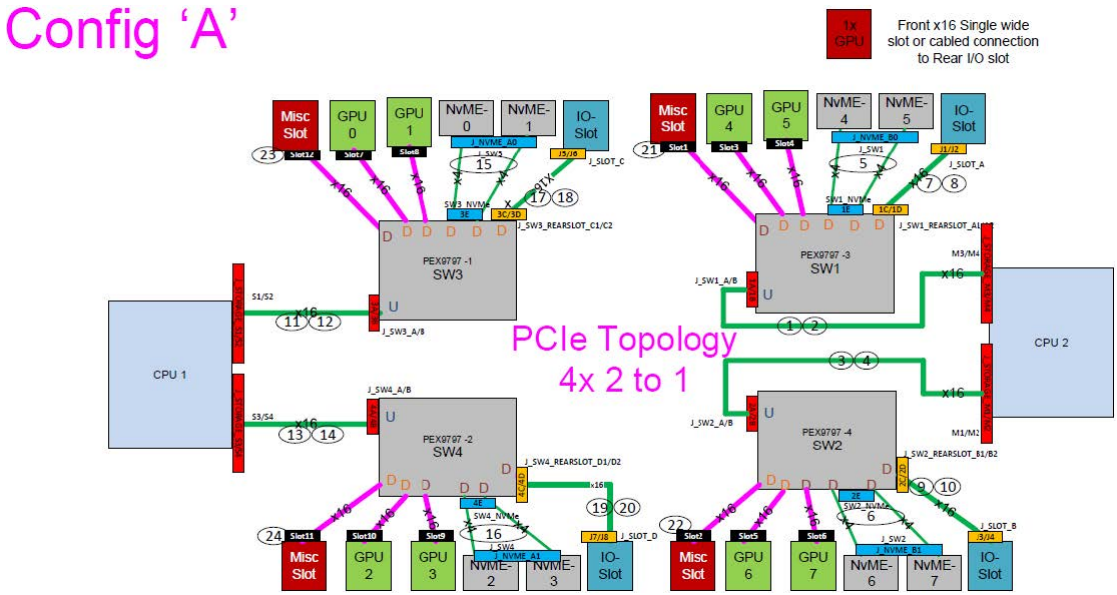
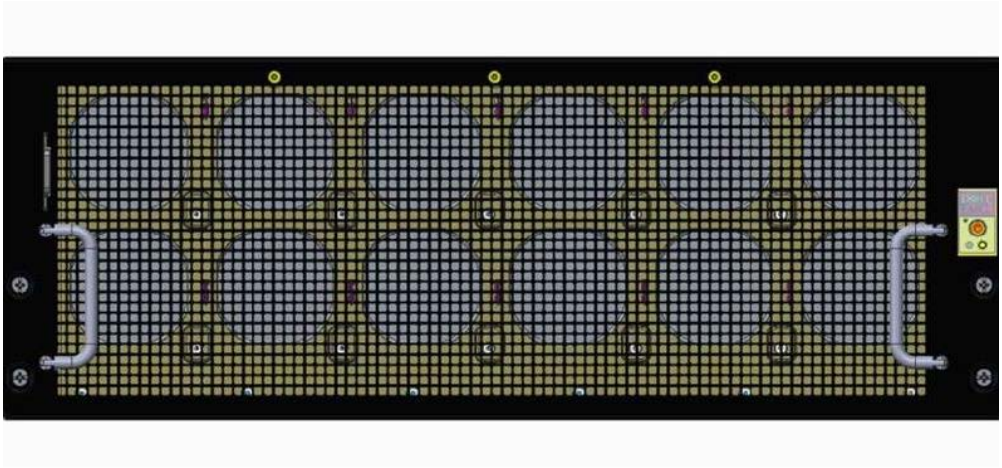


Figure 3. DSS8440 system feature overview

Front view of the system



NOTE:

The handles in front control panel are not intended to lift the system.

Control panel

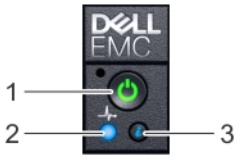


Figure 4. Right control panel view

1. Power-on indicator/power button
2. System-health indicator
3. System identification button

Rear view of the system

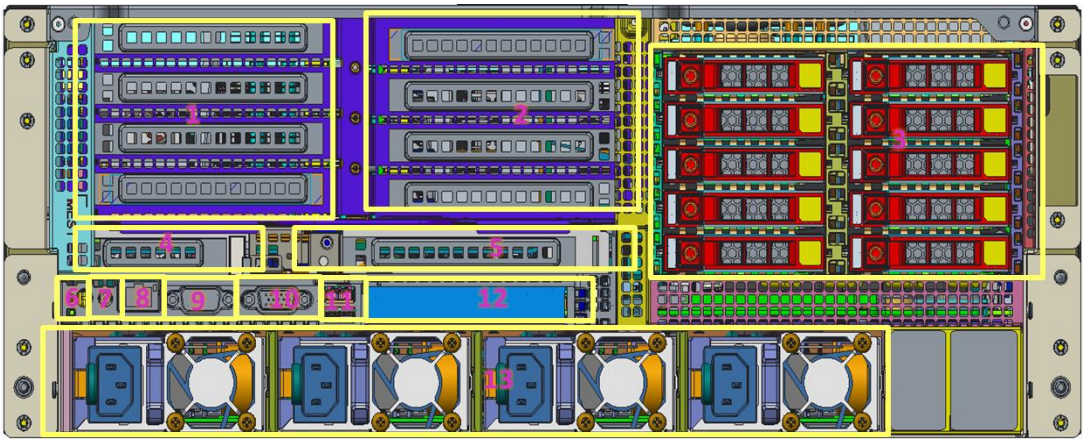


Figure 5. Rear view of the system

1. Slots-4, 5, 14, 15
2. Slots-[19..16]
3. Drive-[0..9]
4. Slot-1
5. Slot-3
6. ID
7. Power-Jack
8. RJ45
9. DB9
10. DB15
11. 2x USB-3.0
12. 2x RJ45 + 2xSFP+
13. Power Supply 1 to 4

3

Technical specifications

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

Topics:

Chassis dimensions

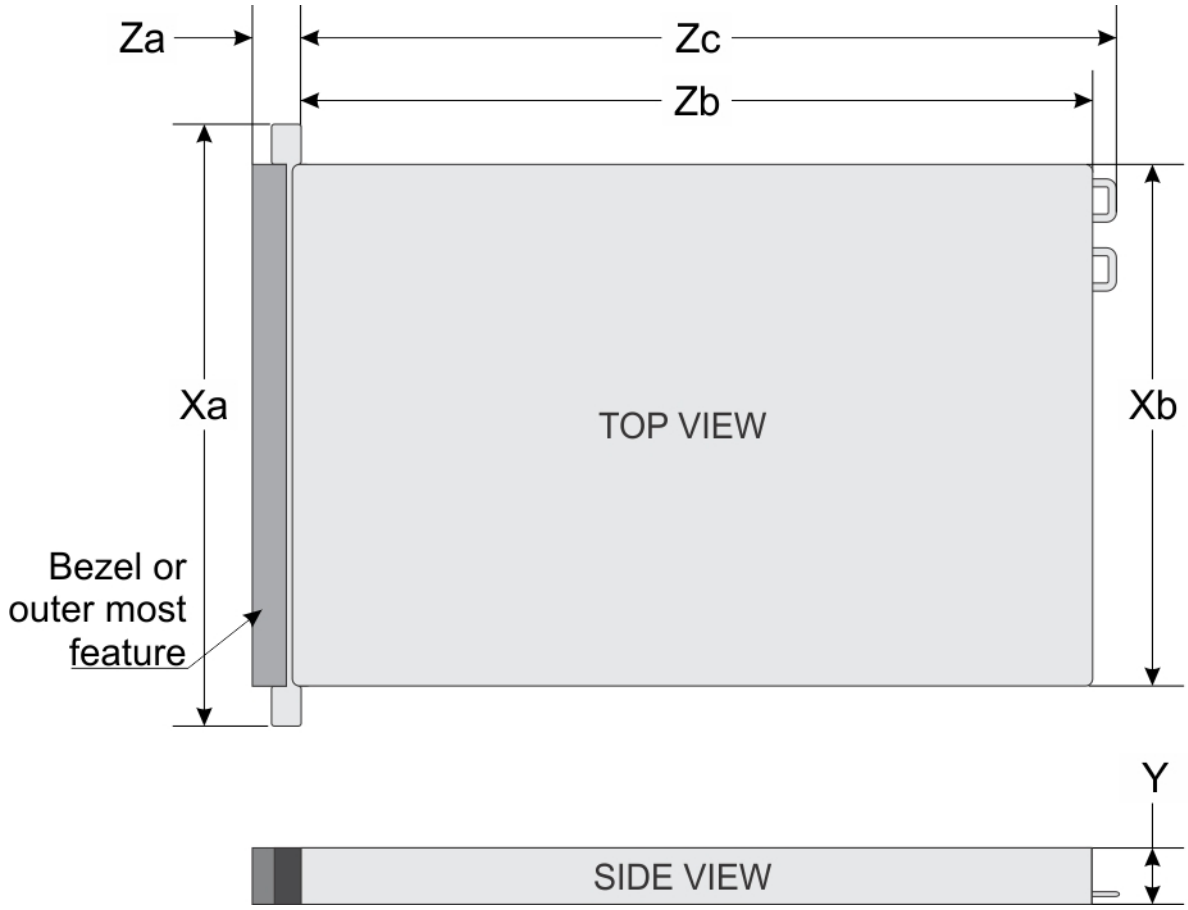


Figure 6. Chassis dimensions

Table 1. Dell EMC DSS 8440 chassis dimensions

Xa	Xb	Y	Za	Zb	Zc
483.2 mm (19.02 inches)	444.6 mm (17.50 inches)	174.8 mm (6.88 inches)	With bezel: 872.0 mm (34.33 inches)	836.5 mm (32.93 inches)	850.2 mm (34.47 inches)

Chassis weight

Table 2. Chassis weight

System	Maximum weight (with all drives)
DSS 8440 (2 CPU/ 10 GPU/ 10 HDD/ 1 H730P+/ 1 CX5)	46.3 Kg (102.07 lb)

Processor specifications

TheDell EMC DSS 8440 system supports two Intel Xeon Scalable processors with up to 24 cores per processor.

NOTE: Ensure that both the processors are populated and both are of the same type or model.

Supported operating systems

The DSS 8440 supports the following operating systems:

- Cent OS
- Canonical Ubuntu LTS
- Microsoft Windows Server
- Red Hat Enterprise Linux
- VMware ESXi/vSAN

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

PSU specifications

The system supports up to four redundant AC power supply units (PSUs).

Table 3. PSU specifications

Functions	2400W Power supply
Input	
Input voltage range	AC input : 200Vac~240Vac @ High line : 2400W
Frequency	50/60 Hz
Efficiency	VIN=230Vac • 89% @ 10% load • 93% @ 20%load • 94% @ 50% load • 100% load @ 91.5% load
Power Factor	PF at 230Vac/50,60 Hz • > 0.88 @ 10% load • > 0.94 @ 20% load • > 0.98 @ 50% load • > 0.99 @ 100% load
iTHD	230Vac/60 Hz • 25% @ 0% load • 25% @10% load • 10% @ 20% load • 5% @50% load • 4% @100% load
Hold-up Time	13.5ms @ 100% load
Conducted EMI	Class A
Radiated EMI	Class A
Output	
Main DC Output	
Voltage Regulation	12.2V +/-5%
Output current	196.72A @ high line
Standby Output	
Voltage Regulation	12V +/-5%
Output current	3.5A

Cooling fans specifications

The Dell EMC DSS 8440 system supports up to twelve 60 mm x 60 mm (square) cooling fans.

System battery specifications

The Dell EMC DSS 8440 system supports CR 2032 3.0-V lithium coin cell system battery.

Expansion card riser specifications

The Dell EMC DSS 8440 system supports up to 10 x Dual width full height PCIe slots and rear I/O x8 full height full length x16 PCIe slots.

GPU specifications

The Dell EMC DSS 8440 system supports up to 16 GPU:

- Double wide
- Nvidia V100 16 GB/32 GB GPU card
- Graph core C2 IPU card
- Nvidia T4 GPU card
- Nvidia A100 GPU card
- Nvidia A40 GPU card

Table 4. Nvidia Tesla T4 GPU configurations

Nvidia Tesla T4 number				
PCIe Dummy bracket	8 GPUs	8 GPUs + optional riser	12 GPUs	16 GPUs
Quantity	12	8	8	5
Position(slot)	4, 5, 6L, 7L, 8L, 9L, 10L, 11L, 12L,13L, 14, 15	6L, 7L, 8L, 9L, 10L, 11L, 12L , 13L	6L, 7 L, 8L, 9L, 10L, 11L, 12L, 13L	6L, 7L, 8L, 9L, 10L

Table 5. Nvidia A100/A40 GPU configurations

Nvidia A100/A40			
Configurations	4 GPUs	8 GPUs	10 GPUs
Slot	8, 9, 10, 11	6, 7, 8, 9, 10, 11, 12, 13	5, 6, 7, 8, 9, 10, 11, 12, 13, 15
NVLink Bridge	[8,9][10,11]	[6,7][8,9][10,11][12,13]	N/A

.

Memory specifications

Table 6. Memory specifications

DIMM type	**DIMM rank**	**DIMM capacity**	**Dual processors**	
			Minimum RAM	**Maximum RAM**
RDIMM	Dual rank	32 GB	64 GB	768 GB
RDIMM	Dual rank	16 GB	32 GB	384 GB
RDIMM	Single rank	8 GB	16 GB	192 GB

NOTE: Ensure that all the memory slots are populated either with DIMMs or DIMM blanks.

NOTE: It is recommended to have all DIMMs of the same type.

Drive specifications

The Dell EMC DSS 8440 system supports 10 x 2.5 inch hard drives with following configurations:

- Drive 0–1: Support SATA/SAS only
- Drive 2–7: Support SATA/SAS/NVMe only
- Drive 8–9: Support NVMe only

Ports and connectors specifications

USB ports specifications

Dell EMC DSS 8440 system supports two USB 3.0 ports available through back panel and one internal USB 3.0 port on system board.

COM port specifications

Dell EMC DSS 8440 system supports one 9 pin 16550 compliant com ports available through the back panel.

VGA port specifications

Dell EMC DSS 8440 system supports one 15 pin VGA ports available through the back panel.

LOM port specifications

Dell EMC DSS 8440 system supports two 10GbE SFP+ ports and two 1GbE RJ-45 ports available through the back panel.

Environmental specifications

The following details define the system level operating and non-operating environmental limits.

Table 7. Maximum Temperature:

Maximum Temperature:	
Operation:	
Fan normal	10°C–35°C. (Maximum temperature is reduced by 1°C/300m (1°F/547ft) above 950 m (3117 ft)).
One rotor fan failure	10°C -35°C. (Maximum temperature is reduced by 1°C/300m (1°F/547ft) above 950 m (3117 ft)).
Non-Operation	-40°C to 65°C

Table 8. Humidity

Humidity	
Operation	10% to 80% RH, non-condensing
Non-Operation	5% to 95% RH, non-condensing

Table 9. Maximum Altitude

Maximum Altitude	
Operation	10,000 ft
Non-Operation	30,000 ft

System diagnostics and indicator codes

Table 10. System diagnostics and indicator codes

Icon	Indicator, button, or connector	Description
	Power-on indicator, power button	The power-on indicator lights when the system powered on. The power button controls the power supply output to the system. **NOTE:** On APCI-compliant operating system, turning off the system using power button causes the system to perform a graceful shutdown before power to the system is turned off.
	Health indicator	Indicates the health of the system. ● If the system is powered on and in good health, the indicator lights solid blue. No corrective action is required. ● The indicator blinks amber if the system is on or in standby, and if any error exists (For example, a failed fan). See the System Event Log or system messages for the specific issue. 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**.Invalid memory configurations can cause a blank screen or no video output. See the Getting help section.
	System identification button	The identification button on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pressed, the corresponding system identification button on the back flashes until one of the buttons is pressed again. Press the system identification button to turn the system ID on or off. If the system stops responding during POST, press and hold the system ID button for more than five seconds to enter BIOS progress mode. To reset iDRAC (if not disabled in F2 iDRAC setup), press and hold the button for more than 15 seconds.

NIC indicator codes

Each NIC on the back panel has an indicator that provides information about the network activity and link status. The activity LED indicates whether the NIC is connected or not. The link LED indicates the speed of the connected network.

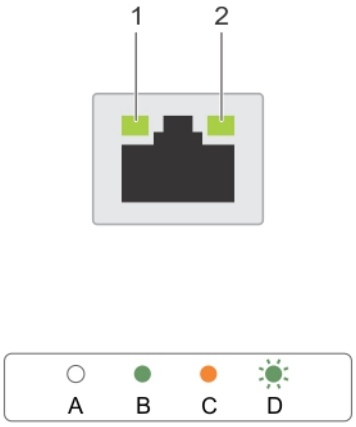


Figure 7. NIC indicators

1. link indicator
2. activity indicator

Table 11. NIC indicators

Convention	Status	Condition
A	Link and activity indicators are off.	The NIC is not connected to the network.
B	Link indicator is green.	The NIC is connected to a valid network at its maximum port speed (1 Gbps or 10 Gbps).
C	Link indicator is amber.	The NIC is connected to a valid network at less than its maximum port speed.
D	Activity indicator is flashing green.	Network data is being sent or received.

Power supply unit indicator codes

AC power supply units (PSUs) have an illuminated translucent handle that serves as an indicator. The indicator shows whether power is present or a power fault has occurred.

Figure 8. AC PSU status indicator

1. AC PSU status indicator/handle

Table 12. AC PSU status indicators

Convention	Power indicator pattern	Condition
A	Green	A valid power source is connected to the PSU and the PSU is operational.
B	Flashing green	When the firmware of the PSU is being updated, the PSU handle flashes green. **CAUTION: Do not disconnect the power cable or unplug the PSU when updating firmware. if firmware update is interrupted, the PSUs do not function.**
C	Flashing green and turns off.	When hot-adding a PSU, the PSU handle flashes green five times at 4 Hz rate and turns off. This indicates a PSU mismatch with respect to efficiency, feature set, health status, and supported voltage. **CAUTION: If four PSU are installed, the four PSUs must have the same type of label; for example, Extended Power Performance (EPP) label. Mixing PSU from previous generations of PowerEdge servers is not supported, even if the PSU has same power rating. This results in a PSU mismatch condition or failure to turn the system on.** **CAUTION: When correcting a PSU mismatch, replace only PSU with the blinking indicator. Swapping the PSU to make matched pair can result in an error condition and unexpected system shutdown. To change from a high output configuration to a low output configuration or vice versa, you must turn off the system** **CAUTION: The 120 V AC PSU is not recommended for this system. Operating at 120 V AC results in the 2400W PSU de-rating to only 1400W, which can affect power redundancy policy and possibly system throttling.** **CAUTION: If four PSUs are used, they must be of the same type and have the same maximum output power.**
D	Flashing amber	Indicates a problem with the PSU.
E	Not illuminated	Power is not connected to the PSU.

4

Initial system setup and configuration

Topics:

Setting up your system

Complete the following steps to set up your system:

Steps

1. Unpack the system.
2. Install the system into the rack.
3. Connect the peripherals to the system.
4. Connect the system to its electrical outlet.
5. Turn the system on by pressing the power button or by using iDRAC.
6. Turn on the attached peripherals.

Results

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

iDRAC configuration

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

Options to set up iDRAC IP address

You must configure the initial network settings based on your network infrastructure to enable the communication to and from iDRAC. You must use the default iDRAC IP address 192.168.0.120 to configure the initial network settings, including setting up DHCP or a static IP for iDRAC. You can set up the IP address by using one of the following interfaces:

NOTE: To access iDRAC, ensure that you connect the Ethernet cable to the iDRAC direct port. You can also access iDRAC through the shared LOM mode, if you have opted for a system that has the shared LOM mode enabled.

Log in to iDRAC

You can log in to iDRAC as:

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

The default user name and password are `root` and `calvin`. You can also log in by using Single Sign-On or Smart Card.

NOTE: You must have iDRAC credentials to log in to iDRAC

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

5

Pre-operating system management applications

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

Topics:

Options to manage the pre-operating system applications

Your system has the following options to manage the pre-operating system applications:

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

System Setup

By using the **System Setup** screen, you can configure the BIOS settings, iDRAC settings and device settings of your system.

NOTE: Help text for the selected field is displayed in the graphical browser by default. To view the help text in the text browser, press F1.

You can access system setup by using two methods:

- Standard graphical browser — The browser is enabled by default.
- Text browser — The browser is enabled by using Console Redirection.

Viewing System Setup

To view the **System Setup** screen, perform the following steps:

Steps

1. Turn on, or restart your system
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

System Setup details

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

Option	Description
System BIOS	Enables you to configure BIOS settings.
iDRAC Settings	Enables you to configure 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.
Device Settings	Enables you to configure device settings.
Sevice Tag Settings	Enables you to configure service tag settings.

System BIOS

You can use the **System BIOS** screen to edit specific functions such as boot order, system password, and setup password, set the SATA and PCIe NVMe RAID mode, and enable or disable USB ports.

Viewing System BIOS

To view the **System BIOS** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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.

3. On the **System Setup Main Menu** screen, click **System BIOS**.

System BIOS Settings details

About this task

The **System BIOS Settings** screen details are explained as follows:

Option	Description
System Information	Provides information about the system such as the system model name, BIOS version, and Service Tag.
Memory Settings	Provides information and options related to the installed memory.
Processor Settings	Provides information and options related to the processor such as speed and cache size.
SATA Settings	Provides options to enable or disable the integrated SATA controller and ports.
NVMe Settings	Provides 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.

Option	Description
Boot Settings	Specifies options to specify the Boot mode (BIOS or UEFI). Enables you to modify UEFI and BIOS boot settings.
Network Settings	Provides options to manage the UEFI network settings and boot protocols. Legacy network settings are managed from the **Device Settings** menu.
Integrated Devices	Provides options to manage integrated device controllers and ports, specifies related features and options.
Serial Communication	Provides options to manage the serial ports, their related features and options.
System Profile Settings	Provides options to change the processor power management settings, and memory frequency.
System Security	Provides 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 Settings	Provides the options to configure the Redundant OS settings.
Miscellaneous Settings	Provides options to change the system date and time.

System Information

You can use the **System Information** screen to view system properties such as Service Tag, system model name, and BIOS version.

Viewing System Information

To view the **System Information** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **System Information**.

System Information details

About this task

The **System Information** screen details are explained as follows:

Option	Description
System Model Name	Specifies the system model name.
System BIOS Version	Specifies the BIOS version installed on the system.

Option	Description
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

You can use the **Memory Settings** screen to view all the memory settings and enable or disable specific memory functions, such as system memory testing and node interleaving.

Viewing Memory Settings

To view the **Memory Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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.

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Memory Settings**.

Memory Settings details

About this task

The **Memory Settings** screen details are explained as follows:

Option	Description
Installed Memory Size	Specifies the amount of DDR4 memory installed in the system.
System Memory Size	Specifies the memory size in the system.
System Memory Type	Specifies the type of memory installed in the system.
System Memory Speed	Specifies the system memory speed.

Option	Description
System Memory Voltage	Specifies the system memory voltage.
Video Memory	Specifies the amount of video memory.
System Memory Testing	Specifies whether the system memory tests are run during system boot. Options are **Enabled** and **Disabled**. This option is set to **Disabled** by default.
Memory Operating Mode	Specifies the memory operating mode. The available option is **Optimizer Mode**, **Single Rank Spare Mode**, Multi Rank Spare Mode, and Mirror Mode. This option is set to Optimizer Mode by default. **NOTE:** The Memory Operating Mode option can have different default and available options based on the memory configuration of your system.
Current State of Memory Operating Mode	Specifies the current state of the memory operating mode.
Node Interleaving	Specifies if Non-Uniform Memory Architecture (NUMA) is supported. If this field is set to **Enabled**, memory interleaving is supported if a symmetric memory configuration is installed. If this field is set to **Disabled**, the system supports NUMA (asymmetric) memory configurations. This option is set to **Disabled** by default.
Snoop Mode	Specifies the **Snoop Mode** options. The **Snoop Mode** options available are **Home Snoop**, **Early Snoop**, and **Cluster on Die**. This option is set to **Early Snoop** by default. This field is available only when the **Node Interleaving** is set to **Disabled**.
Correctable Error logging	Enables or disables logging of correctable memory threshold error. This option is set to **Disabled** by default.
Opportunistic Self-Refresh	Enables or disables opportunistic self-refresh feature. This option is set to **Enabled** by default.
DIMM Self Healing (Post Package Repair) on Uncorrectable Memory Error	Enable/Disable Post Package Repair (PPR) on Uncorrectable Memory Error. This option is set to **Enabled** by default.

Processor Settings

You can use the **Processor Settings** screen to view the processor settings and perform specific functions such as enabling virtualization technology, hardware prefetcher, and logical processor idling.

Viewing Processor Settings

To view the **Processor Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Processor Settings**.

Processor Settings details

About this task

The **Processor Settings** screen details are explained as follows:

Option	Description
Logical Processor	Enables or disables the logical processors and displays the number of logical processors. If this option is set to **Enabled**, the BIOS displays all the logical processors. If this option is set to **Disabled**, the BIOS displays only one logical processor per core. This option is set to **Enabled** by default.
Virtualization Technology	Enables or disables the virtualization technology for the processor. This option is set to **Enabled** by default.
Adjacent Cache Line Prefetch	Optimizes the system for applications that need high utilization of sequential memory access. This option is set to **Enabled** by default. You can disable this option for applications that need high utilization of random memory access.
Hardware Prefetcher	Enables or disables the hardware prefetcher. This option is set to **Enabled** by default.
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	Sub NUMA Clustering (SNC) is a feature for breaking up the LLC into disjoint clusters based on address range, with each cluster bound to a subset of the memory controllers in the system. It improves average latency to the LLC. Enables or disables the Sub NUMA Cluster. This option is set to **Disabled** by default.
UPI Prefetch	Enables you to get the memory that is read started early on DDR bus. The Ultra Path Interconnect (UPI) Rx path will spawn the speculative memory that is read to Integrated Memory Controller (iMC) directly. This option is set to **Enabled** by default.
LLC Prefetch	Enables or disables the LLC Prefetch on all threads. This option is set to **Disabled** 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.
Logical Processor Idling	Enables you to improve the energy efficiency of a system. It uses the operating system core parking algorithm and parks some of the logical processors in the system which in turn allows the corresponding processor cores to transition into a lower power idle state. This option can only be enabled if the operating system supports it. It is set to **Disabled** by default.
Configurable TDP	Enables you to configure the TDP level. The available options are **Nominal**, **Level 1**, and **Level 2**. This option is set to **Nominal** by default. **NOTE:** This option is only available on certain stock keeping units (SKUs) of the processors.
Number of Cores per Processor	Controls the number of enabled cores in each processor. This option is set to **All** by default.
Processor Core Speed	Specifies the maximum core frequency of the processor.
Processor n	**NOTE:** Depending on the number of processors, there might be up to processors listed. The following settings are displayed for each processor that is installed in the system:

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.

Option	Description

Option	Description
Level 3 Cache	Specifies the total L3 cache.
Number of Cores	Specifies the number of cores per processor.
Maximum Memory Capacity	Specifies the maximum memory capacity per processor.
Microcode	Specifies the microcode.

SATA Settings

You can use the **SATA Settings** screen to view the settings of SATA devices and enable SATA and PCIe NVMe RAID mode on your system.

Viewing SATA Settings

To view the **SATA Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **SATA Settings**.

SATA Settings details

About this task

The **SATA Settings** screen details are explained as follows:

NOTE:

- Port A is for the internal SATA SSD.
- Ports B—G are for the six front panel hard drives.

Option	Description
Embedded SATA	Enables the embedded SATA option to be set to **Off**,**AHCI Mode**, or **RAID Mode** modes. This option is set to **AHCI Mode** by default.
Security Freeze Lock	Enables you to send **Security Freeze Lock** command to the embedded SATA drives during POST. This option is applicable only for AHCI mode. This option is set to **Enabled** by default
Write Cache	Enables or disables the command for the embedded SATA drives during POST. This option is set to **Disabled** by default.
Port n	Enables you to set the drive type of the selected device. For **AHCI Mode** or **RAID Mode**, BIOS support is always enabled.

Option	Description
Model	Specifies the drive model of the selected device.

Option	Description

Option	Description
Drive Type	Specifies the type of drive attached to the SATA port.
Capacity	Specifies the total capacity of the drive. This field is undefined for removable media devices such as optical drives.

Boot Settings

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

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

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

Viewing Boot Settings

To view the **Boot Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

   ```
   F2 = System Setup
   ```

   NOTE: If your operating system begins to load before you press F2, wait for the system to finish booting, and then restart your system and try again.
3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Boot Settings**.

Choosing system boot mode

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

- BIOS boot mode (the default) is the standard BIOS-level boot interface.
- 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.

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**.

Steps

1. On the **System Setup Main Menu** screen, click **System BIOS** > **Boot Settings** > **UEFI/BIOS Boot Settings** > **UEFI/BIOS Boot Sequence**.
2. Click **Boot Option Settings** > **BIOS/UEFI Boot Settings** > **Boot Sequence**.
3. 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.
4. Click **Exit**, and then click **Yes** to save the settings on exit.

Network Settings

You can use the **Network Settings** screen to modify UEFI PXE, iSCSI, and HTTP boot settings. The network settings option is available only in the UEFI mode.

NOTE: BIOS does not control network settings in the BIOS mode. For the BIOS boot mode, the optional Boot ROM of the network controllers handles the network settings.

Viewing Network Settings

To view the **Network Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Network Settings**.

Network Settings screen details

The **Network Settings** screen details are explained as follows:

About this task

Option	Description
UEFI PXE Settings	Enables or disables the device. When enabled, a UEFI PXE boot option is created for the device.
UEFI HTTP Settings	Enables or disables the device. When enabled, a UEFI HTTP boot option is created for the device.
UEFI iSCSI Settings	Enables you to control the configuration of the iSCSI device.

Option	Description

Table 13. 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.

UEFI iSCSI Settings

You can use the iSCSI Settings screen to modify iSCSI device settings. The iSCSI Settings option is available only in the UEFI boot mode. BIOS does not control network settings in the BIOS boot mode. For the BIOS boot mode, the option ROM of the network controller handles the network settings.

Viewing UEFI iSCSI Settings

To view the **UEFI iSCSI Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **UEFI iSCSI Settings**.

UEFI iSCSI Settings details

The **UEFI iSCSI Settings** screen details are explained as follows:

Option	Description
iSCSI Initiator Name	Specifies the name of the iSCSI initiator (iqn format).
iSCSI Device1	Enables or disables the iSCSI device. When enabled, a UEFI boot option is created for the iSCSI device automatically.
iSCSI Device1 Settings	Enables you to control the configuration of the iSCSI device.

Integrated Devices

You can use the **Integrated Devices** screen to view and configure the settings of all integrated devices including the video controller, integrated RAID controller, and the USB ports.

Viewing Integrated Devices

To view the **Integrated Devices** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Integrated Devices**.

Integrated Devices details

About this task

The **Integrated Devices** screen details are explained as follows:

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. The USB keyboard and mouse still function in certain USB ports during the boot process, depending on the selection. After the boot process is complete, the USB ports will be enabled or disabled as per the setting.
Internal USB Port	Enables or disables the internal USB port. This option is set to **On** or **Off**. This option is set to **On** by default.
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 RAID Controller	Enables or disables the integrated RAID controller. This option is set to **Enabled** by default.
Embedded NIC1 and NIC2	**NOTE:** The Embedded NIC1 and NIC2 options are only available on systems that do not have **Integrated Network Card 1**. Enables or disables the Embedded NIC1 and NIC2 options. If set to **Disabled**, the NIC may still be available for shared network access by the embedded management controller. The embedded NIC1 and NIC2 options are only available on systems that do not have Network Daughter Cards (NDCs). The Embedded NIC1 and NIC2 option is mutually exclusive with the Integrated Network Card 1 option. Configure the Embedded NIC1 and NIC2 option by using the NIC management utilities of the system.
I/OAT DMA Engine	Enables or disables the I/O Acceleration Technology (I/OAT) option. I/OAT is a set of DMA features designed to accelerate network traffic and lower CPU utilization. Enable only if the hardware and software support the feature.
Embedded Video Controller	Enables or disables the use of Embedded Video Controller as the primary display. When set to **Enabled**, the Embedded Video Controller is used as 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

Option	Description
	to both the primary add-in video and the embedded video during POST and pre-boot environment. The embedded video is disabled before the operating system boots. This option is set to **Enabled** by default. **NOTE:** When there are multiple add-in graphic cards installed in the system, the first card discovered during PCI enumeration is selected as the primary video. You might have to re-arrange the cards in the slots in order to control which card is the primary video.
Current State of Embedded Video Controller	Displays the current state of the embedded video controller. The **Current State of Embedded Video Controller** option is a read-only field. If the Embedded Video Controller is the only display capability in the system (that is, no add-in graphics card is installed), then the Embedded Video Controller is automatically used as the primary display even if the **Embedded Video Controller** setting is set to **Disabled**.
SR-IOV Global Enable	Enables or disables the BIOS configuration of Single Root I/O Virtualization (SR-IOV) devices. This option is set to **Disabled** by default.
Internal SD Card Port	Enables or disables the internal SD card port of the Internal Dual SD Module (IDSDM). This option is set to **On** by default.
Internal SD Card Redundancy	Configures the redundancy mode of the Internal Dual SD Module (IDSDM). When set to **Mirror** Mode, data is written on both SD cards. After failure of either card and replacement of the failed card, the data of the active card is copied to the offline card during the system boot. When Internal SD Card Redundancy is set to **Disabled**, only the primary SD card is visible to the OS. This option is set to **Disabled** by default.
Internal SD Primary Card	When Redundancy is set to Disabled, either one of the SD card can be selected to present itself as mass storage device by setting it to be primary card. By default, the primary SD card is selected to be SD Card 1. If SD Card 1 is not present, then the controller selects SD Card 2 to be the primary SD card.
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.
Memory Mapped I/O above 4 GB	Enables or disables the support for the PCIe devices that need large amounts of memory. Enable this option only for 64-bit operating systems. This option is set to **Enabled** by default.
Memory Mapped I/O above Base	When set to **12 TB**, the system maps the MMIO base to 12 TB. Enable this option for an OS that requires 44 bit PCIe addressing. When set to **512 GB**, the system maps the MMIO base to 512 GB, and reduces the maximum support for memory to less than 512 GB. Enable this option only for the 4 GPU DGMA issue. This option is set to **56 TB** by default.
Slot Disablement	Enables or disables the available PCIe slots on your system. The slot disablement feature controls the configuration of the PCIe cards installed in the specified slot. Slots must be disabled only when the installed peripheral card prevents booting into the operating system or causes delays in system startup. If the slot is disabled, both the Option ROM and UEFI drivers are disabled. Only slots that are present on the system are available for control.

Table 14. Slot Disablement

Option	Description
Slot 1	Enables or disables or only the boot driver is disabled for the PCIe slot 1. This option is set to **Enabled** by default.
Slot 2	Enables or disables or only the boot driver is disabled for the PCIe slot 2. This option is set to **Enabled** by default.
Slot 3	Enables or disables or only the boot driver is disabled for the PCIe slot 3. This option is set to **Enabled** by default.

Slot Bifurcation	Allows **Platform Default Bifurcation**, **Auto discovery of Bifurcation** and **Manual bifurcation Control**. The default is set to **Platform Default Bifurcation**. The slot bifurcation field is accessible

Option	Description
	when set to **Manual bifurcation Control** and is disabled when set to **Platform Default Bifurcation** or **Auto discovery of Bifurcation**.

Table 15. Slot Bifurcation

Option	Description
Auto Discovery Bifurcation Settings	Platform Default Bifurcation , Auto Bifurcation, and Manual bifurcation
Slot 1 Bifurcation	x4 or x8 Bifurcation
Slot 2 Bifurcation	x16 or x4 or x8 or x4x4x8 or x8x4x4 Bifurcation
Slot 3 Bifurcation	x16 or x4 or x8 or x4x4x8 or x8x4x4 Bifurcation

Serial Communication

You can use the **Serial Communication** screen to view the properties of the serial communication port.

Viewing Serial Communication

To view the **Serial Communication** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Serial Communication**.

Serial Communication details

About this task

The **Serial Communication** screen details are explained as follows:

Option	Description
Serial Communication	Enables you to select serial communication devices (Serial Device 1 and Serial Device 2) in BIOS. BIOS console redirection can also be enabled, and the port address can be specified. This option is set to **Auto** by default. Enables the **COM** port or **Console Redirection** options. This option is set to **Off** by default.
Serial Port Address	Enables you to set the port address for serial devices. This field sets the serial port address to either COM1 or COM2 . This option is set to **Serial Device1=COM2** 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 saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from

Option	Description
	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	Enables you to set the remote console terminal type. This option is set to **ANSIVT100/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

You can use the **System Profile Settings** screen to view the properties of the serial communication port.

Viewing System Profile Settings

To view the **System Profile Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **System Profile Settings**.

System Profile Settings details

About this task

The **System Profile Settings** screen details are explained as follows:

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

Option	Description
	and **Workstation Performance**Other options include **Performance Per Watt (OS)**, **Performance**, and **Workstation Performance**. **NOTE:** All the parameters on the system profile setting screen are available only when the **System Profile** option is set to **Custom**.
CPU Power Management	Sets the CPU power management. This option is set to **System DBPM (DAPC)** by default. DBPM is Demand-Based Power Management . Other options include **OS DBPM**, and **Maximum Performance.**
Memory Frequency	Sets the speed of the system memory. You can select **Maximum Performance**, **Maximum Reliability**, or a specific speed. This option is set to **Maximum Performance** by default.
Turbo Boost	Enables or disables the processor to operate in the turbo boost mode. This option is set to **Enabled** by default.
C1E	Enables or disables the processor to switch to a minimum performance state when it is idle. This option is set to **Enabled** by default.
C States	Enables or disables the processor to operate in all available power states. This option is set to **Enabled** by default.
Write Data CRC	Enables or disables the Write Data CRC. This option is set to **Disabled**by default.
Collaborative CPU Performance Control	Enables or disables the CPU power management option. When set to **Enabled**, the CPU power management is controlled by the OS DBPM and the System DBPM (DAPC). This option is set to **Disabled** by default.
Memory Patrol Scrub	Sets the memory patrol scrub frequency. This option is set to **Standard** by default.
Memory Refresh Rate	Sets the memory refresh rate to either 1x or 2x. This option is set to **1x** by default.
Uncore Frequency	Enables you to select the **Processor Uncore Frequency** option.**Dynamic mode** enables the processor to optimize power resources across cores and uncores during runtime. The optimization of the uncore frequency to either save power or optimize performance is influenced by the setting of the **Energy Efficiency Policy** option.
Energy Efficient Policy	Enables you to select the **Energy Efficient Policy** option. The CPU uses the setting to manipulate the internal behavior of the processor and determines whether to target higher performance or better power savings. This option is set to **Balanced Performance** by default.
Number of Turbo Boost Enabled Cores for Processor 1	**NOTE:** If there are two processors installed in the system, you will see an entry for **Number of Turbo Boost Enabled Cores for Processor 2**. Controls the number of turbo boost enabled cores for Processor 1. The maximum number of cores is enabled by default.
Monitor/Mwait	Enables the Monitor/Mwait instructions in the processor. This option is set to **Enabled** for all system profiles, except **Custom** by default. **NOTE:** This option can be disabled only if the **C States** option in the **Custom** mode is set to **disabled**. **NOTE:** When **C States** is set to **Enabled** in the **Custom** mode, changing the Monitor/Mwait setting does not impact the system power or performance.
CPU Interconnect Bus Link Power Management	Enables or disables the CPU Interconnect Bus Link Power Management. This option is set to **Enabled** by default.
PCI ASPM L1 Link Power Management	Enables or disables the PCI ASPM L1 Link Power Management. This option is set to **Enabled** by default.

System Security

You can use the **System Security** screen to perform specific functions such as setting the system password, setup password and disabling the power button.

Viewing System Security

To view the **System Security** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **System Security**.

System Security Settings details

About this task

The **System Security Settings** screen details are explained as follows:

Option	Description
Intel(R) 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	Enables you to set 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	Enables you to set the system setup password. This option is read-only if the password jumper is not installed in the system.
Password Status	Enables you to lock the system password. This option is set to **Unlocked** by default.
TPM Security	**NOTE:** The TPM menu is available only when the TPM module is installed. Enables you to control the reporting mode of the TPM. The **TPM Security** option is set to **Off** by default. You can only modify the TPM Status, TPM Activation and the Intel TXT fields if the **TPM Status** field is set to either **On with Pre-boot Measurements** or **On without Pre-boot Measurements** .
TPM Information	Enables you to change the operational state of the TPM. This option is set to **No Change** by default.
TPM Status	Specifies the TPM status.
TPM Command	Controls the Trusted Platform Module (TPM). When set to **None**, no command is sent to the TPM. When set to **Activate**, the TPM is enabled and activated. When set to **Deactivate**, the TPM is disabled and deactivated. When set to **Clear**, all the contents of the TPM are cleared. This option is set to **None** by default. **CAUTION: Clearing the TPM results in the loss of all keys in the TPM. The loss of TPM keys may affect booting to the operating system.** This field is read-only when TPM Security is set to Off. The action requires an additional reboot before it can take effect.
Intel(R) TXT	Enables you to set the Intel Trusted Execution Technology (TXT) option. To enable the **Intel TXT** option, virtualization technology and TPM Security must be enabled with Pre-boot measurements. This option is set to **Off** by default.

Option	Description
Power Button	Enables you to set the power button on the front of the system. This option is set to **Enabled** by default.
AC Power Recovery	Sets how the system behaves after AC power is restored to the system. This option is set to **Last** by default.
AC Power Recovery Delay	Enables you to set the time that the system should take to power up after AC power is restored to the system. This option is set to **Immediate** by default.
User Defined Delay (60 s to 240 s)	Enables you to set the **User Defined Delay** option when the **User Defined** option for **AC Power Recovery Delay** is selected.
UEFI Variable Access	Provides varying degrees of securing UEFI variables. When set to **Standard** (the default), UEFI variables are accessible in the operating system per the UEFI specification. When set to **Controlled**, selected UEFI variables are protected in the environment, and new UEFI boot entries are forced to be at the end of the current boot order.
In-Band Manageability Interface	When set to **Disabled**, this setting will hide the Management Engine's (ME), HECI devices, and the system's IPMI devices from the operating system. This prevents the operating system from changing the ME power capping settings, and blocks access to all in-band management tools. All management should be managed through out-of-band. This option is set to **Enabled** by default. **NOTE:** BIOS update requires HECI devices to be operational and DUP updates require IPMI interface to be operational. This setting needs to be set to **Enabled** to avoid updating errors.
Secure Boot	Enables Secure Boot, where the BIOS authenticates each pre-boot image by using the certificates in the Secure Boot Policy. Secure Boot is set to **Disabled** by default.
Secure Boot Policy	When Secure Boot policy is set to **Standard**, the BIOS uses the system manufacturer key and certificates to authenticate pre-boot images. When Secure Boot policy is set to **Custom**, the BIOS uses the user-defined key and certificates. Secure Boot policy is set to **Standard** by default.
Secure Boot Mode	Enables you to configure 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**.

Options	Description
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 updates to the policy objects, and transitions between modes. **Audit Mode** is useful for programmatically determining a working set of policy objects. BIOS performs signature verification on pre-boot images and logs the results in the image Execution Information Table, but approves the images whether they pass or fail verification.
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**.

Creating a system and setup password

Prerequisites

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

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

Steps

1. To enter System Setup, press F2 immediately after turning on or rebooting your system.
2. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security**.
3. On the **System Security** screen, verify that **Password Status** is set to **Unlocked**.
4. In the **System Password** field, type your system password, and press Enter or Tab.
   Use the following guidelines to assign the system password:
   - A password can have up to 32 characters.
   - The password can contain the numbers 0 through 9.
   - Only the following special characters are allowed: space, (”), (+), (,), (-), (.), (/), (;), ([), (\), (]), (`).

   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 the system

About this task

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

Steps

1. Power 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, change 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.

   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.

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

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

Operating with setup password enabled

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

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

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

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

Even after you 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 details section.
- You cannot disable or change an existing system password.

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

Redundant OS Control

In the **Redundant OS Control** screen you can set the redundant OS information. This enables you to set up a physical recovery disk on the system.

Viewing Redundant OS Control

To view the **Redundant OS Control** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

   ```
   F2 = System Setup
   ```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Redundant OS Control**.

Redundant OS Control screen details

The **Redundant OS Control** screen details are explained as follows:

About this task

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

Miscellaneous Settings

You can use the **Miscellaneous Settings** screen to perform specific functions such as updating the asset tag and changing the system date and time.

Viewing Miscellaneous Settings

To view the **Miscellaneous Settings** screen, perform the following steps:

Steps

1. Power on, or restart your system.
2. Press F2 immediately after you see the following message:

```
F2 = System Setup
```

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

3. On the **System Setup Main Menu** screen, click **System BIOS**.
4. On the **System BIOS** screen, click **Miscellaneous Settings**.

Miscellaneous Settings details

About this task

The **Miscellaneous Settings** screen details are explained as follows:

Option	Description
System Time	Enables you to set the time on the system.
System Date	Enables you to set the date on the system.
Asset Tag	Specifies the asset tag and enables you to modify it for security and tracking purposes.
Keyboard NumLock	Enables you to set whether the system should boot with the NumLock enabled or disabled. This option is set to **On** by default. **NOTE:** This option does not apply to 84-key keyboards.
F1/F2 Prompt on Error	Enables or disables the F1/F2 prompt on error. This option is set to **Enabled** by default. The F1/F2 prompt also includes keyboard errors.
Load Legacy Video Option ROM	Enables you to determine whether the system BIOS loads the legacy video (INT 10H) option ROM from the video controller. Selecting **Enabled** in the operating system does not support UEFI video output standards. This field is available only for UEFI boot mode. You cannot set the option to **Enabled** if **UEFI Secure Boot** mode is enabled. This option is set to **Disabled** by default.
Dell Wyse P25/P45 BIOS Access	Enables or disables the Dell Wyse P25/P45 BIOS Access. This option is set to **Enabled** by default.

iDRAC Settings utility

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

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

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

Device Settings

Device Settings enables you to configure the below device parameters:

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

Dell Lifecycle Controller

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

Embedded system management

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

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

Boot Manager

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

Viewing Boot Manager

To enter **Boot Manager**:

Steps

1. Turn on, or restart your system.
2. Press F11 when you see the following message:

```
F11 = Boot Manager
```

If your operating system begins to load before you press F11, allow the system to complete the booting, and then restart your system and try again.

Boot Manager main menu

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

One-shot UEFI boot menu

One-shot UEFI boot menu enables you to select a boot device to boot from.

System Utilities

System Utilities contains the following utilities that can be launched:

- 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.

NOTE: 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.

6

Installing and removing system components

Topics:

Safety instructions

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

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

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

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

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 bays in the system and system fans must be always populated with a component or a blank.

Before working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Power off the system and all attached peripherals.
2. Disconnect the system from the electrical outlet, and disconnect the peripherals.

After working inside your system

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Reconnect the peripherals and connect the system to the electrical outlet.
2. Power on the attached peripherals and then power on the system.

Recommended tools

You need the following tools to perform the removal and installation procedures:

- Cross head srewdriver (#2 bit)
- Needle nosed pliers
- Anti-static wrist strap and conductive foam pad (recommended)
- Torx #T30 screwdriver
- Torx #T15 screwdriver
- Plastic scribe

System cover

Removing the system cover

Prerequisites

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

Steps

1. Loosen and remove the captive screw on the system cover
2. Slid the system cover backwards and lift the cover from the system.

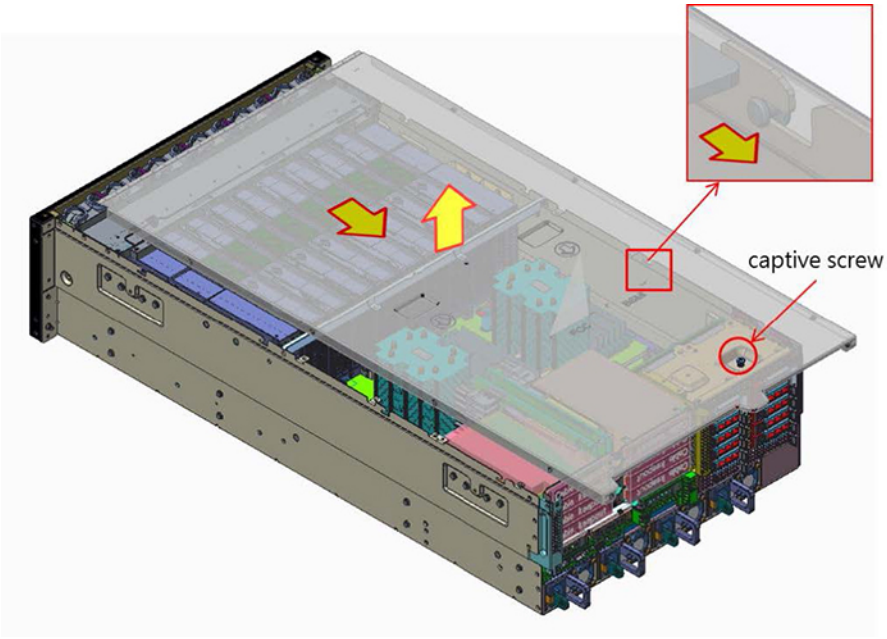


Figure 9. Removing the system cover

Next steps

Install the system cover.

Installing the system cover

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

NOTE: Ensure that all internal cables are connected and placed out of the way 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 chassis.
2. Tighten the captive screw.

NOTE: The captive screw must be tightened with a screwdriver after the top chassis is closed.

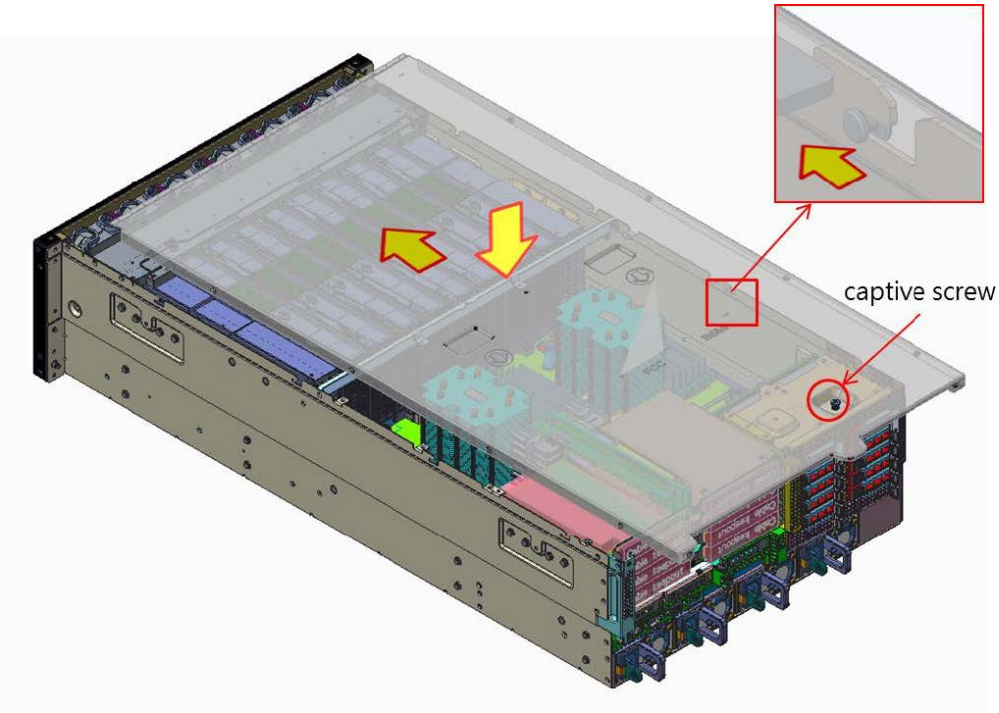


Figure 10. Installing the system cover

Next steps

1. Reconnect the peripherals, and connect the system to the electrical outlet.
2. Power on the system and all attached peripherals.

Front bezel

Removing the front bezel

Prerequisites

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

Steps

1. Remove the screws that secures the front bezel to the fan cage.

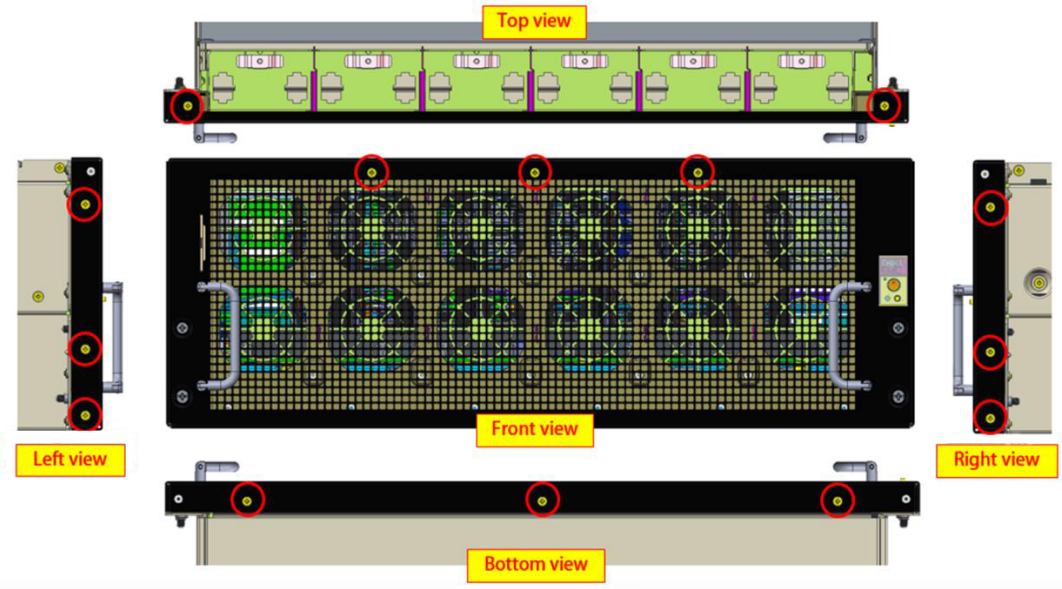


Figure 11. Removing the screws

2. Remove the front bezel from the fan cage.

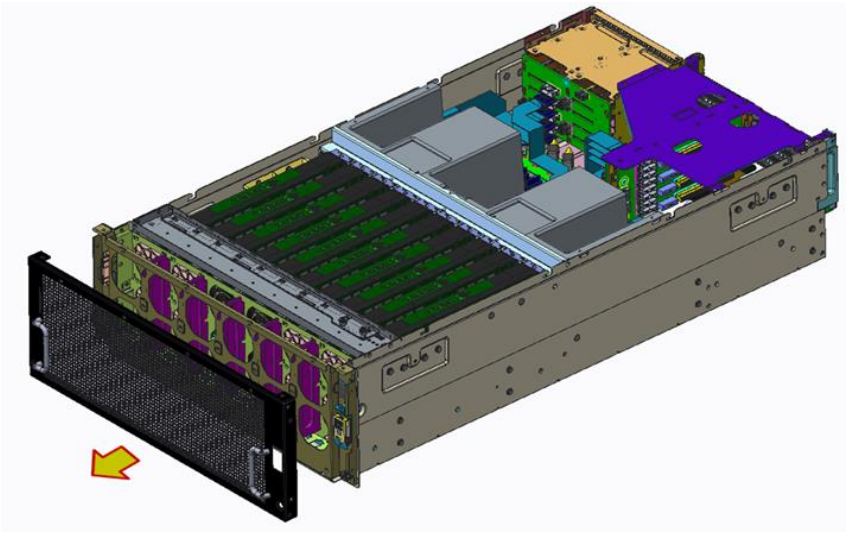


Figure 12. Removing the front bezel

Installing the front bezel

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Place the front bezel onto the chassis and slide the front bezel into place.

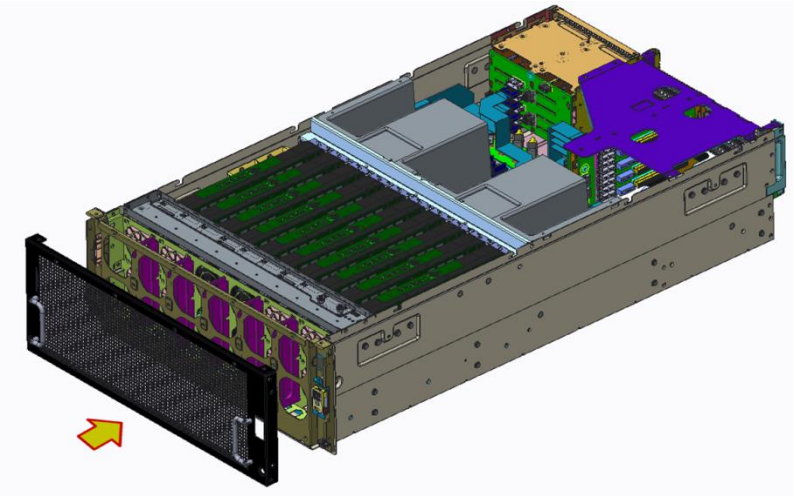
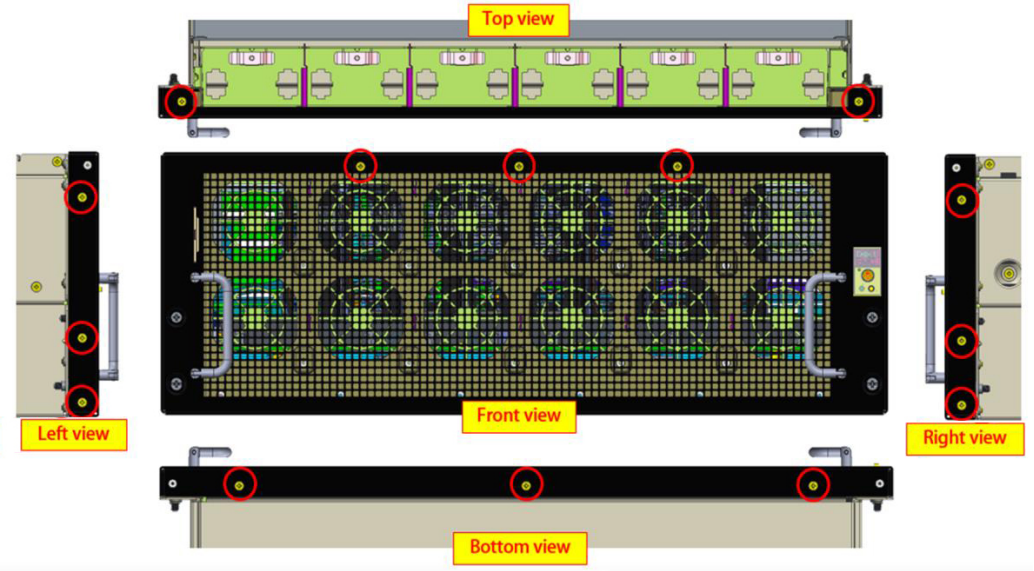


Figure 13. Installing the front bezel

2. Tighten the screws to secure the front bezel to the fan cage.



Next steps

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

Air shroud

Removing the air shroud

Prerequisites

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

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

Steps

NOTE: The screws on top of the air shroud are meant to secured the T_standoff. Do not remove the crews when removing the air shroud.

Slide the air shroud backward to unlock it from the T_standoff and lift the air shroud out of the system.

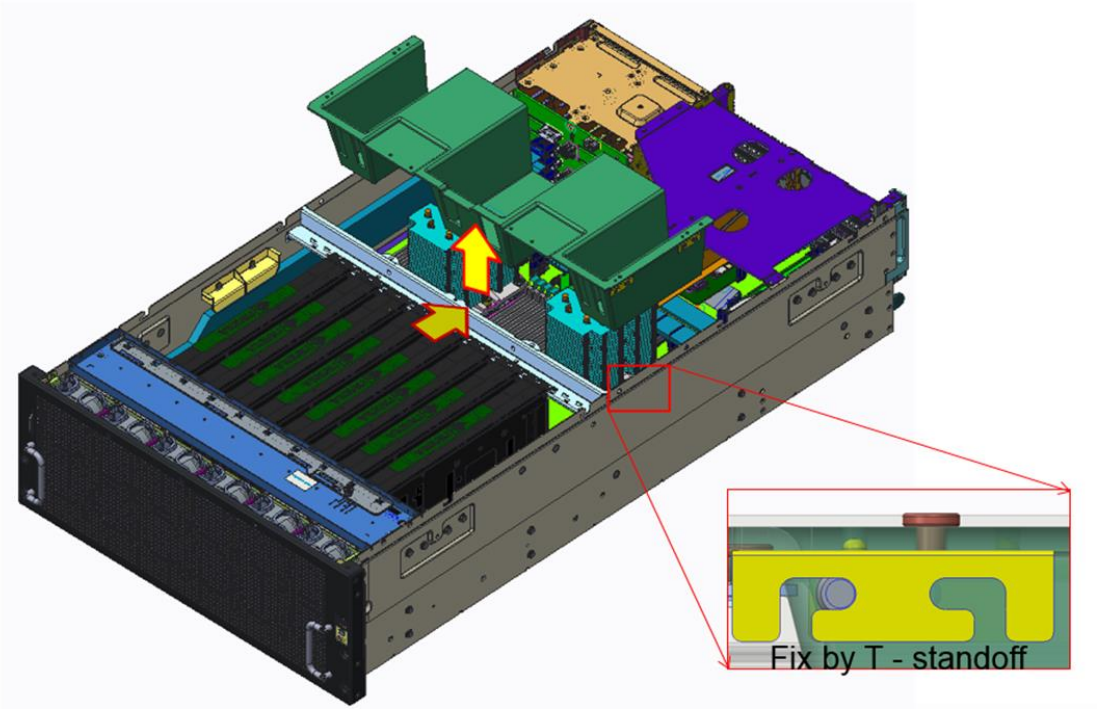


Figure 14. Removing the air shroud

Next steps

1. Installing the air shroud.

Installing the air shroud

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. If applicable, route the cables inside the system along the system wall and secure the cables by using the cable-securing bracket.

Steps

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

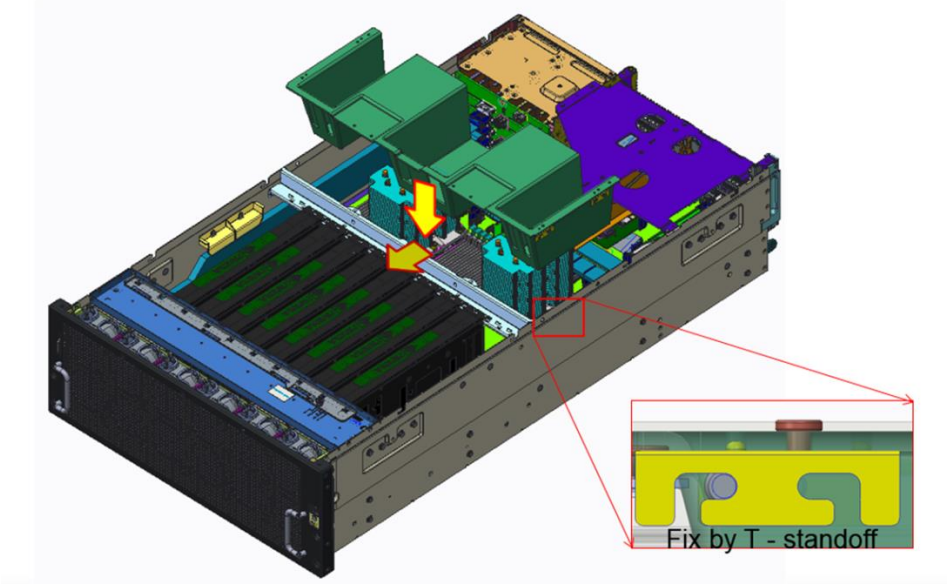


Figure 15. Installing the air shroud

Next steps

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

Drives

Removing a drive carrier and drive

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Remove the drive carrier by pressing the latch to unlock and pull the drive carrier out of the system.

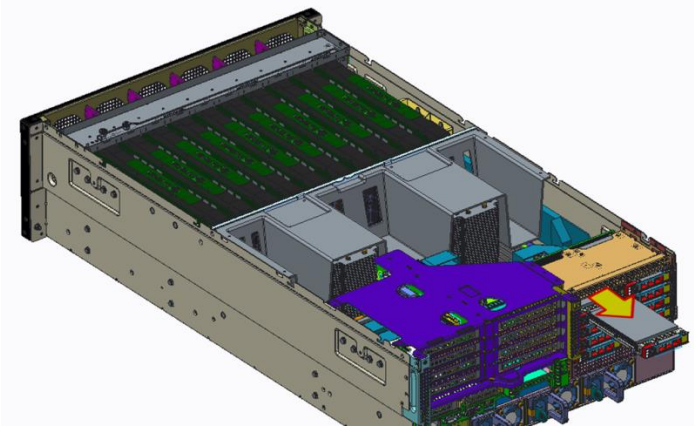


Figure 16. Removing the drive carrier

2. Remove the four screws securing the drive to the carrier.
3. Remove the drive from the carrier.

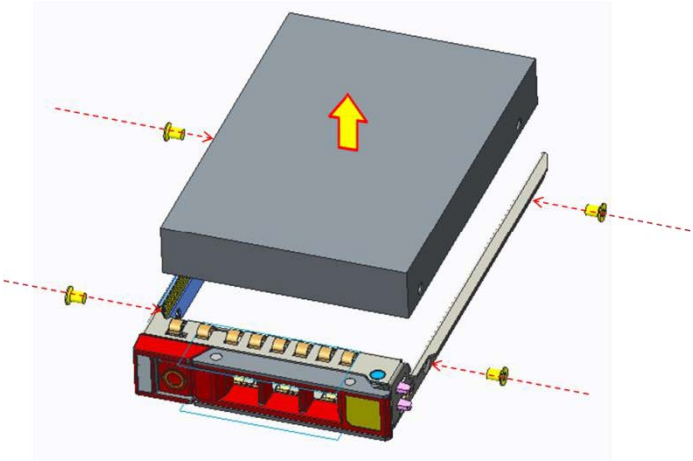


Figure 17. Removing the drive from the drive carrier

Next steps

Install the drive and drive carrier.

Installing the drive and drive carrier

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Install the drive to the carrier.
2. Tighten the four screws to secure the drive to the carrier.

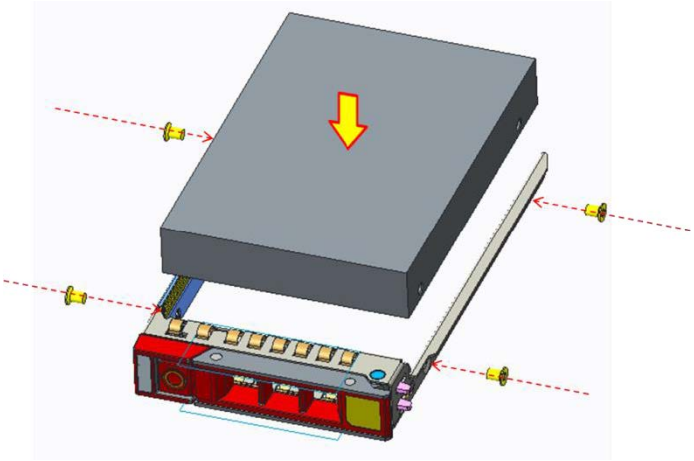


Figure 18. Install the drive

3. Insert the drive carrier into the chassis, and then push the drive carrier into the place.

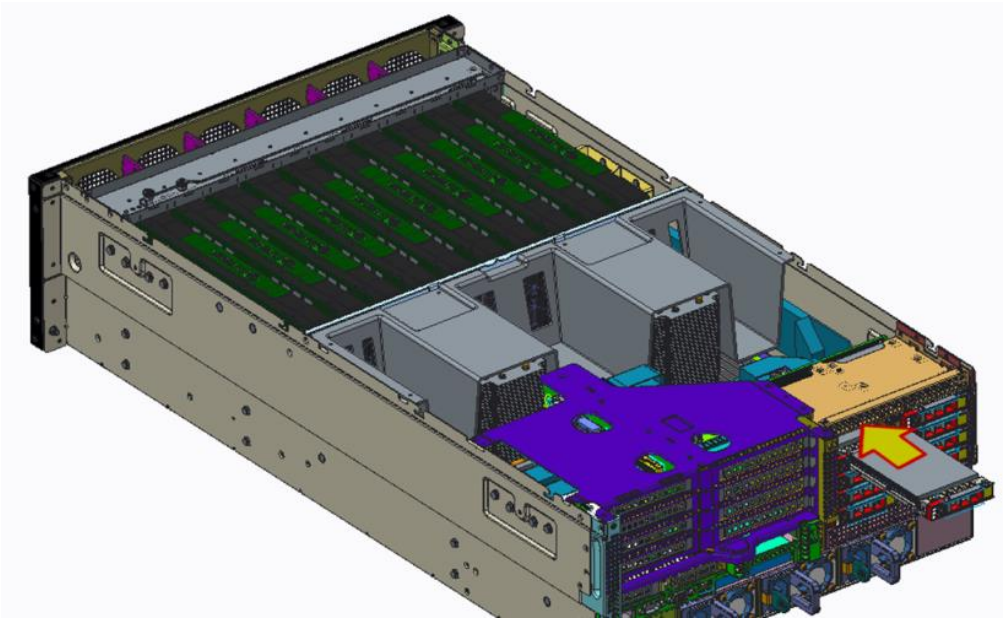


Figure 19. Installing the drive carrier

Next steps

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

Drive backplane

Removing the drive backplane

Prerequisites

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

Steps

1. Remove the one screw securing the drive backplane to the system.
2. Lift the backplane from the hooks and then pull away from the system.

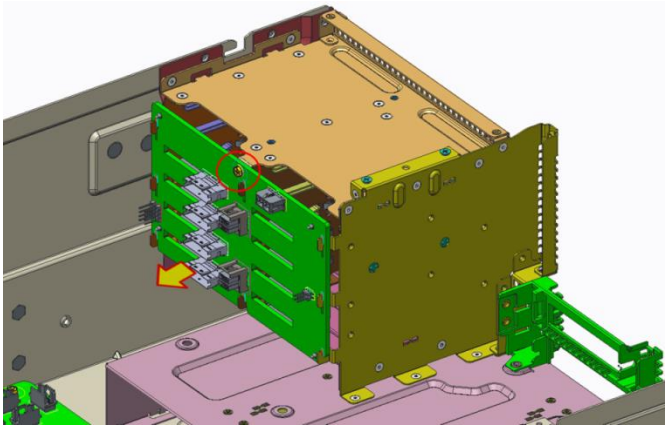


Figure 20. Removing the drive backplane

Next steps

Install the drive backplane

Installing the drive backplane

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Install the drive backplane to storage cage's hook.
2. Tighten the one screw to secure the drive backplane to the system.

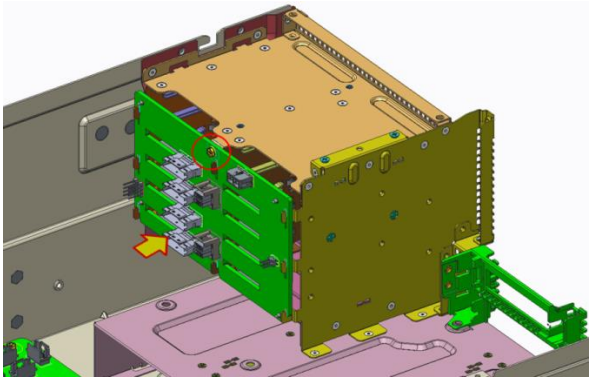


Figure 21. Installing the drive backplane

Next steps

1. Connect all the cables.
2. Install the all drives.
3. Install the top cover.
4. Follow the procedure listed in After working inside your system

Power supply unit

Removing a power supply unit

Prerequisites

CAUTION: The power supply is only hot-swappable if you have a redundant system with all power supplies installed. If you only have one power supply installed, before removing or replacing the power supply, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the AC power cord from the system or wall outlet.

1. Follow the safety guidelines listed in Safety instructions.
2. Disconnect the power cable from the power source and from the PSU you intend to remove.

Steps

Push the latch in the direction shown while pulling out of power supply module by the handle.

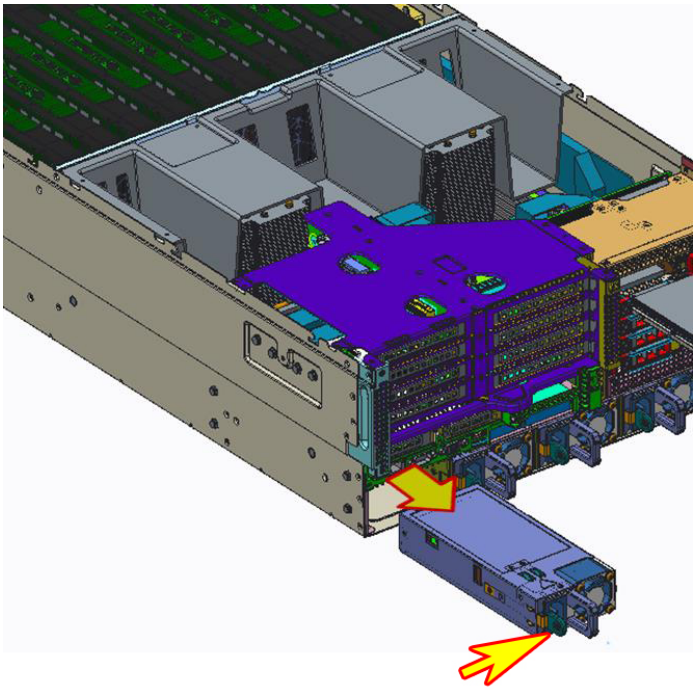


Figure 22. Removing a power supply unit

Next steps

Install the Power supply unit.

Installing a power supply unit

Prerequisites

1. Follow the safety guidelines listed in 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

Insert the power supply module into the power supply cage and push all the way until it clicks into place.

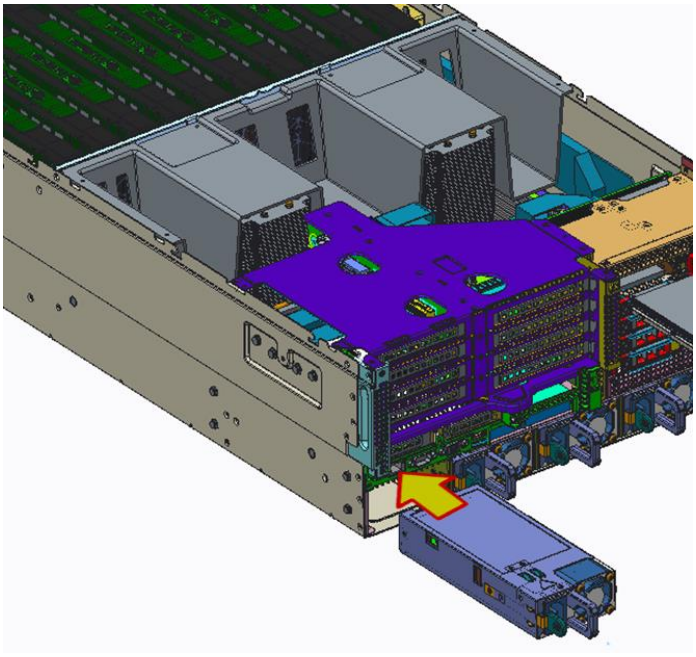


Figure 23. Installing a power supply unit

Next steps

1. Connect the power cable to the PSU, and plug the cable into a power outlet.
2. Follow the procedure listed in After working inside your system.

Expansion cards and expansion card risers

Removing a GPU

Prerequisites

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

NOTE: Do not operate the system with any GPU or GPU slot filler removed, as proper air flow and cooling may be impaired, impacting system performance.

Steps

1. Remove the screws securing the GPU clamp.
2. Lift the GPU clamp from the system.

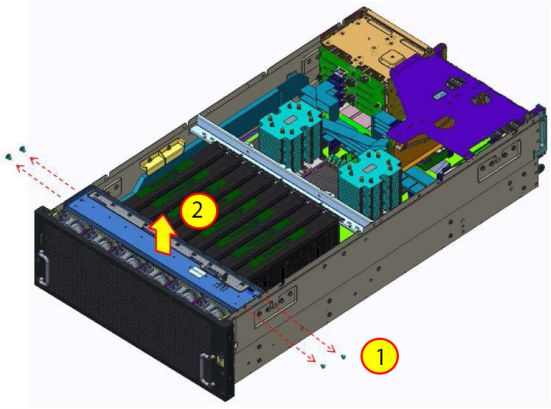


Figure 24. Removing the GPU clamp

3. Release two captive plungers on the GPU holding bracket and slide sideway to lift it from the system
4. Disconnect power cable from GPU card
5. Lift the GPU card from the system.

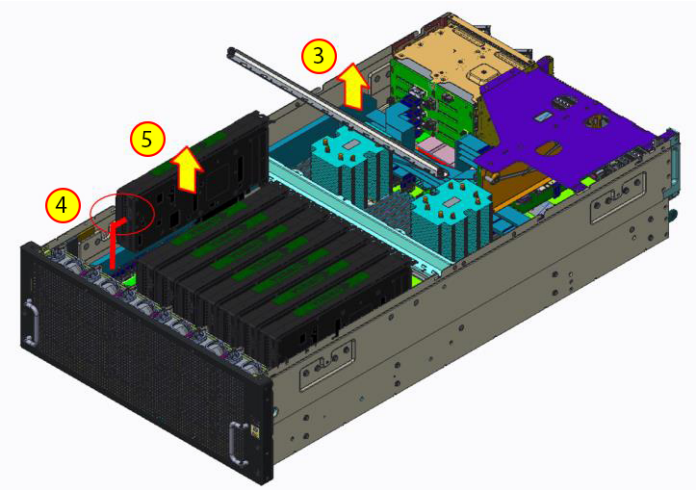


Figure 25. Removing GPU card

Installing a GPU

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Insert the GPU card into chassis.
2. Connect the GPU card power cable.
3. Slide the GPU holding bracket and until the captive plunger secure the GPU support bracket.

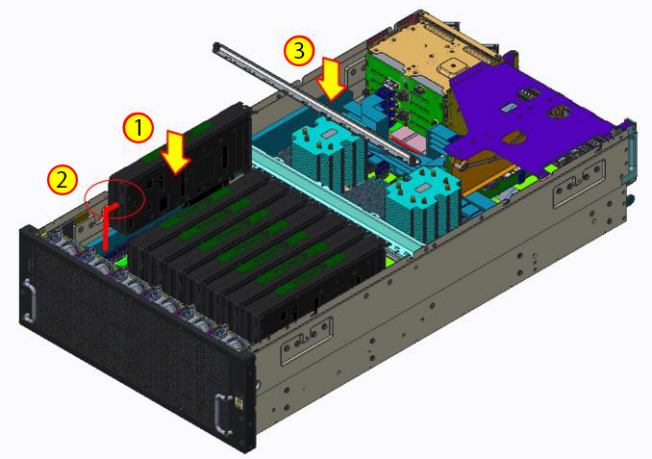


Figure 26. Installing the GPU card

4. Insert the GPU clamp into chassis.
5. Secure fixing the GPU clamp by four screws.

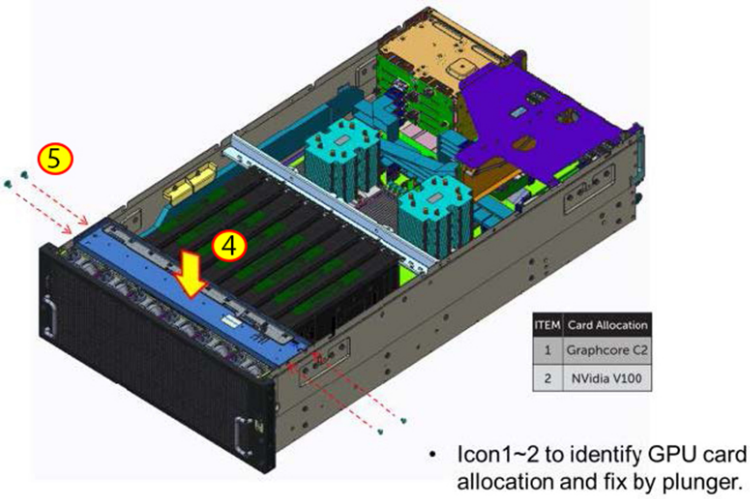


Figure 27. Installing the GPU clamp

Next steps

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

Removing a GPU support bracket

Prerequisites

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

Steps

1. Loosen the two screws securing the GPU support bracket.
2. Remove the GPU support bracket.

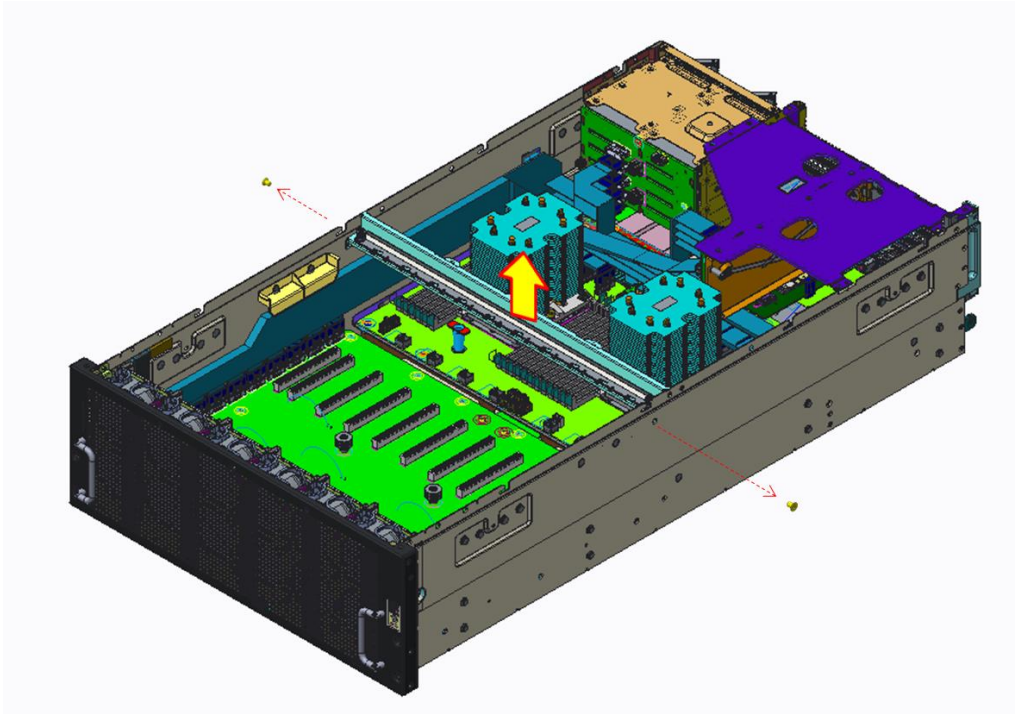


Figure 28. Removing the GPU support bracket

Next steps

1. Remove the GPU card.

Installing a GPU support bracket

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Install the GPU card.

Steps

1. Install the GPU support bracket into place.
2. Secure the GPU support bracket using two screws.

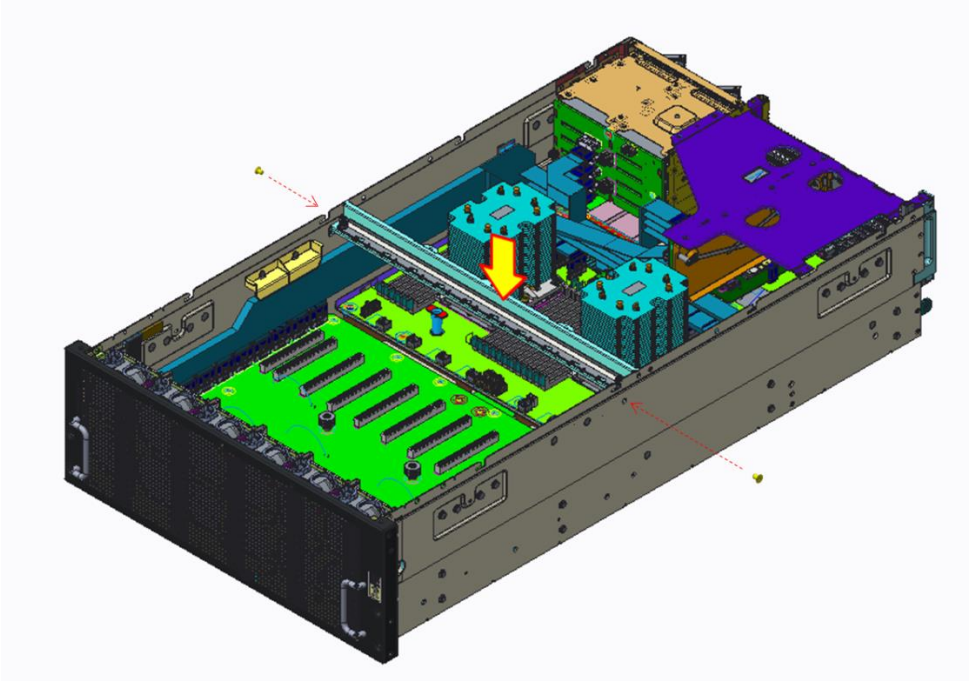


Figure 29. Installing the GPU support bracket

Next steps

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

Removing the PCIe switch board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the system cover.
4. Remove the GPU support bracket.
5. Remove the GPU card.
6. Disconnect all the cables. For more information, see
   a. 3M cable Installation-Config A left
   b. 3M cable Installation-Config A right
   c. GPU power cable assembly GPU card to PSB
7. Remove the fan louver.

Steps

1. Remove the six screws securing the PCIe switch board module.
2. Lift up the two levers at the front and rear side of the PSB module.

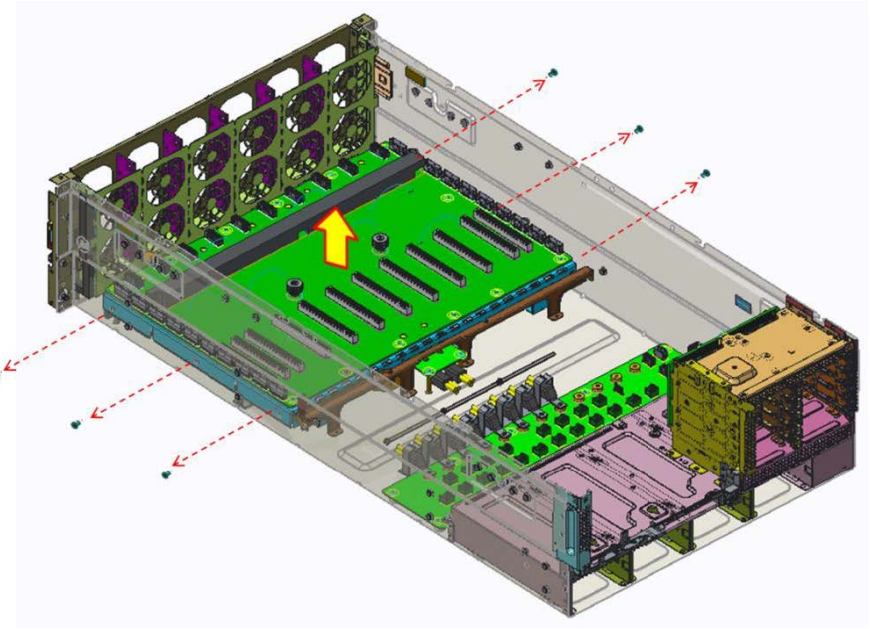


Figure 30. Lift up the two levers

3. Lift the PCIe switch board module from the system.

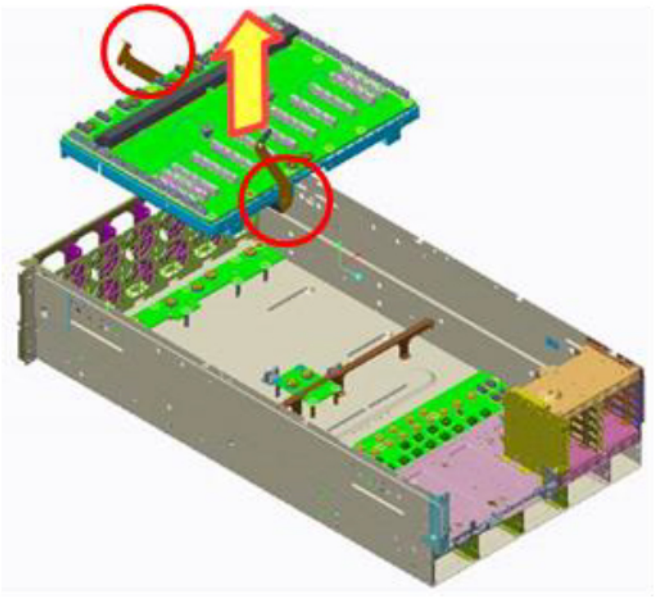


Figure 31. Removing the PCIe switch board

4. Remove the fourteen screws securing the PCIe switch board. and loosen the two captive screws.

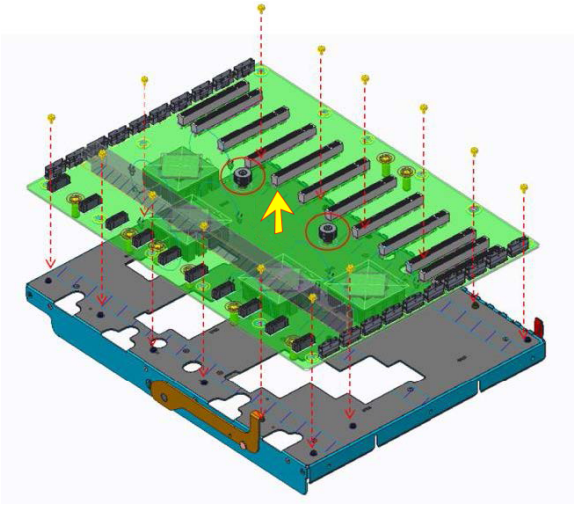


Figure 32. Remove the screws securing the PCIe switch board

5. Lift the PCIe switch board from the GPU base.

Installing the PCIe switch board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Insert the PCIe switch board into GPU base.
2. Secure fixing the PCIe switch board by fourteen screws and tighten the two captive screws.

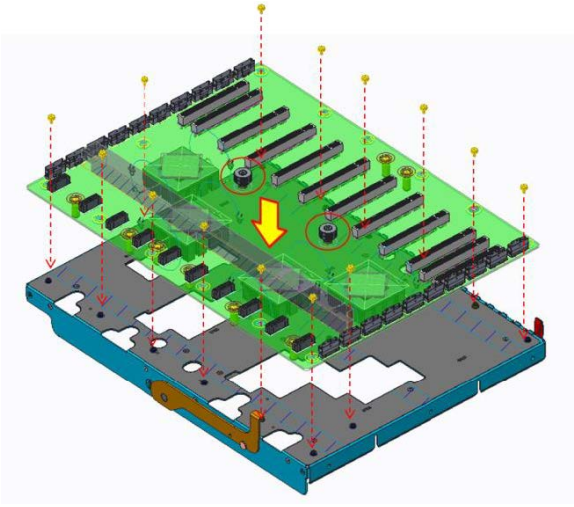


Figure 33. Installing the PCIe switch board

3. Insert the PCIe switch board module into chassis.
4. Insert the two levers at the front and rear side of the PSB module.

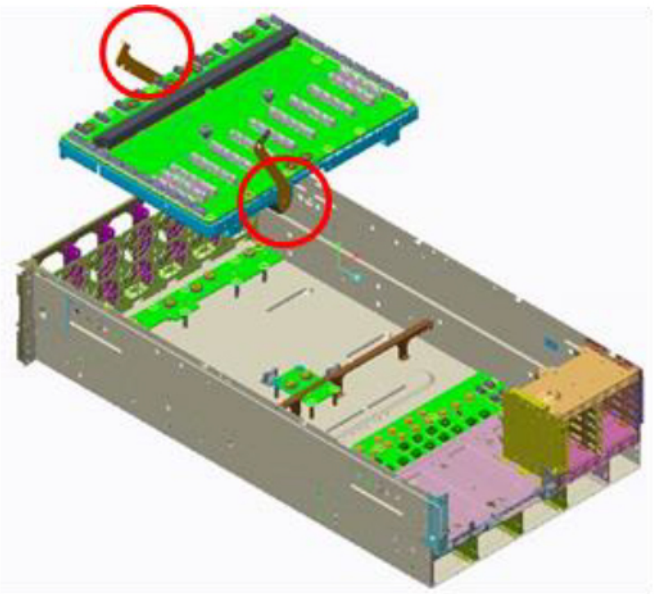
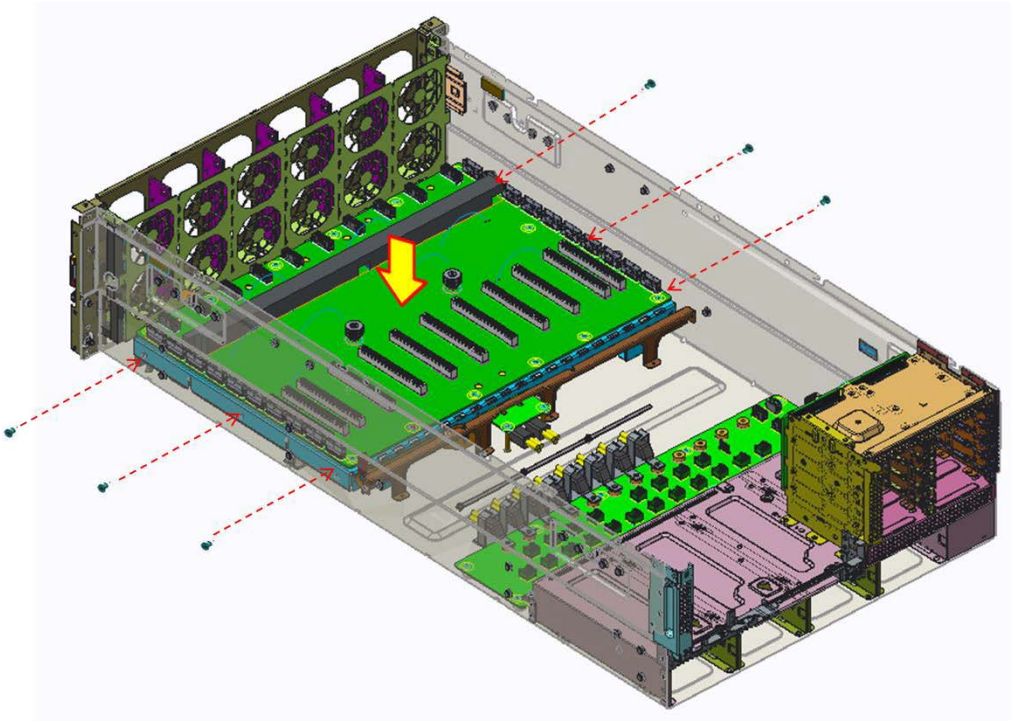


Figure 34. Insert the two levers

5. Secure fixing the PCIe switch board module by six screws.

Figure 35. Installing the PCIe switch board module



Next steps

1. Connect all the cables.
2. Install the GPU card.
3. Install the GPU support bracket.
4. Install the system cover.
5. Follow the procedure listed in After working inside your system.

Removing a GPU power interposer board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the system cover.
4. Remove the GPU support bracket.
5. Remove the GPU card.
6. Remove the PCIe switch board module.

Steps

1. Remove the eleven screws securing the GPU power interposer board.
2. Lift the GPU power interposer board from the system.

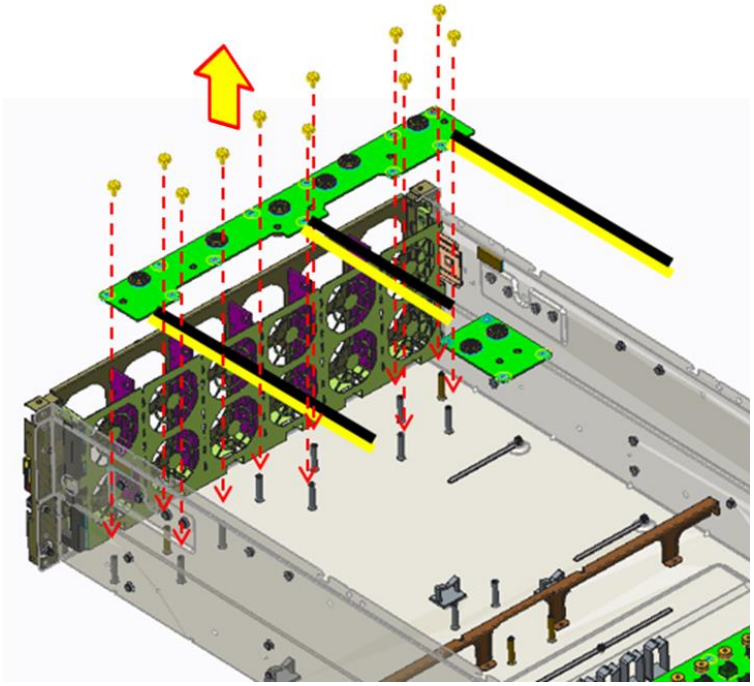


Figure 36. Removing the GPU power interposer board

Next steps

1. Disconnect all the cables from the GPU power interposer board. For more information, see Power cable assembly to PDB.
2. Installing a GPU power interposer board.

Installing a GPU power interposer board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Connect all the cables to the GPU power interposer board.

Steps

1. Insert the GPU power interposer board into GPU base.
2. Secure fixing the GPU power interposer board by eleven screws.

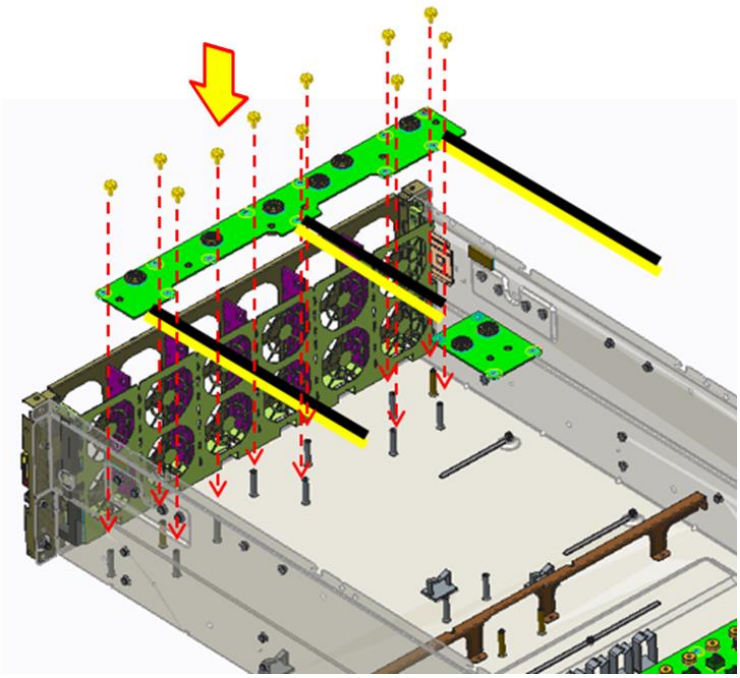


Figure 37. Installing the GPU power interposer board

Next steps

1. Install the PCIe switch board module.
2. Install the GPU card.
3. Install the GPU support bracket.
4. Install the system cover.
5. Follow the procedure listed in After working inside your system.

Removing a butterfly module and riser 3 board

Prerequisites

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

Steps

1. Remove the four screws securing the butterfly module.
2. Disconnect all the cables and release the cable ties.
   Remove 3M cable start from the bottom as the cable release latch facing the bottom of the butterfly module.
3. Lift the butterfly module from the system.

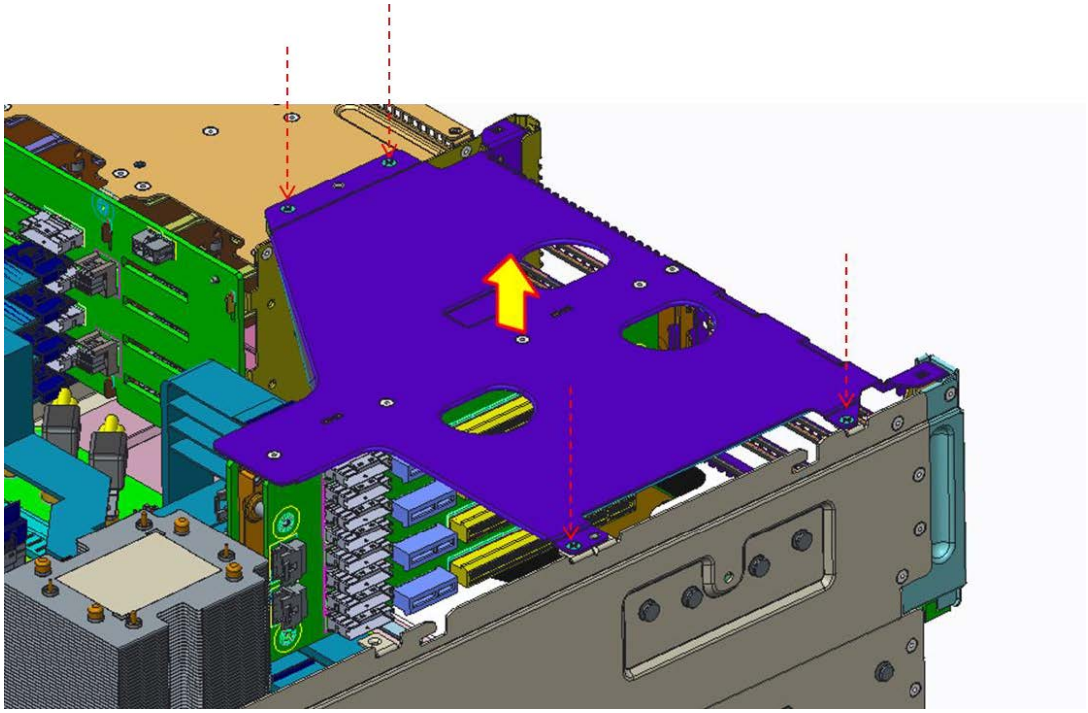


Figure 38. Removing the butterfly module

4. Remove the eight screws securing both the riser 3 board
5. Lift the riser 3 board from the riser bracket.

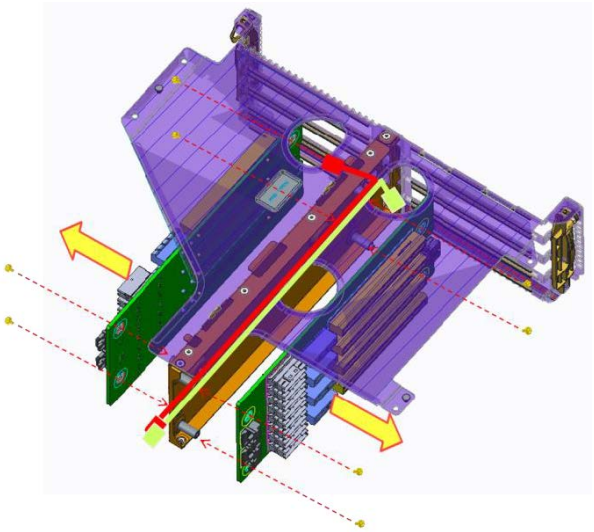


Figure 39. Removing the riser 3 board

Next steps

Install the riser 3 board.

Installing the riser 3 board and butterfly module

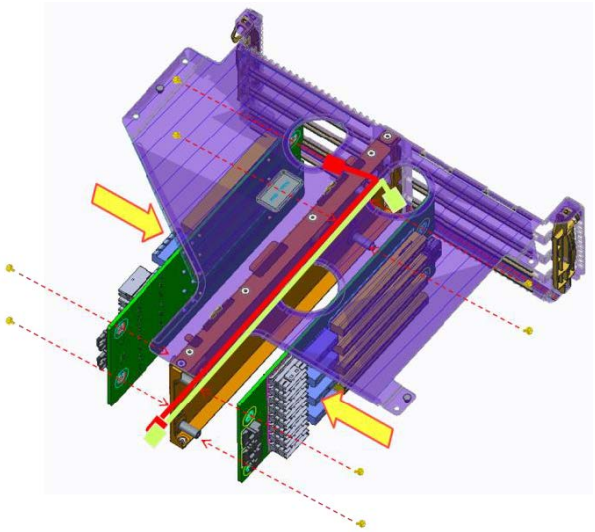
Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Insert the riser 3 board into riser bracket.
2. Secure fixing the both the riser 3 board by eight screws.

Figure 40. Installing the riser 3 board



3. Connect all the cables.
4. Insert the butterfly module into chassis.
5. Secure fixing the butterfly module by four screws.

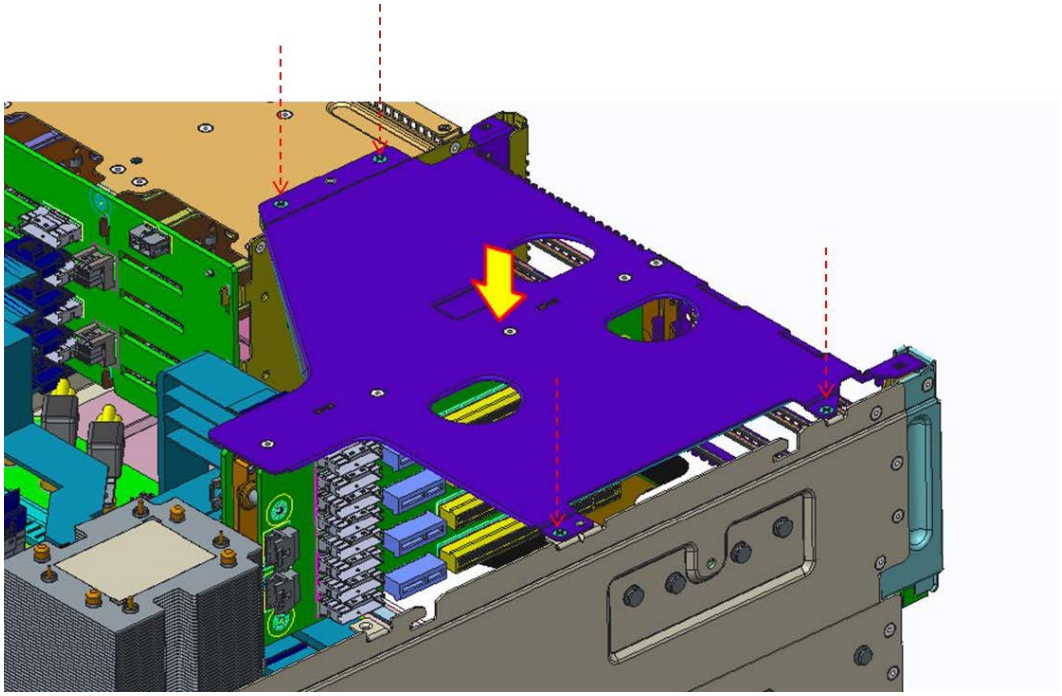


Figure 41. Installing the butterfly module

Next steps

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

Nvidia Tesla T4 GPU

Removing a T4 GPU

Prerequisites

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

Steps

1. Remove the screws securing the GPU clamp.
2. Lift the GPU clamp from the system.

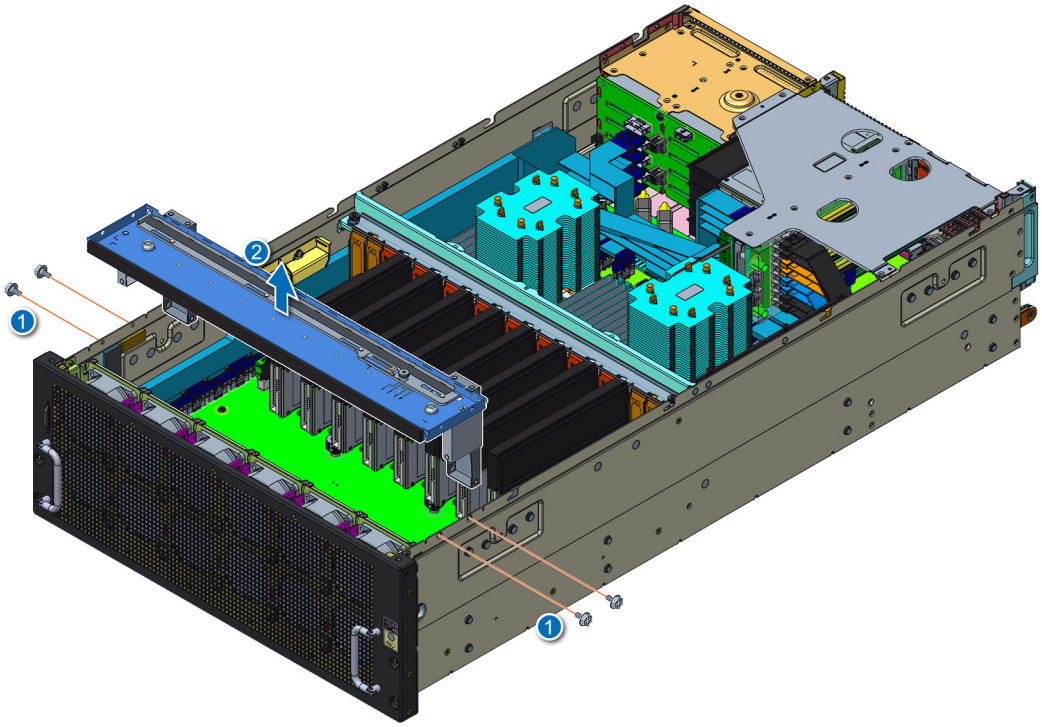


Figure 42. Removing the GPU clamp

3. Release two captive plungers on the GPU holding bracket and slide sideway to lift it from the system
4. Lift the GPU card from the system.

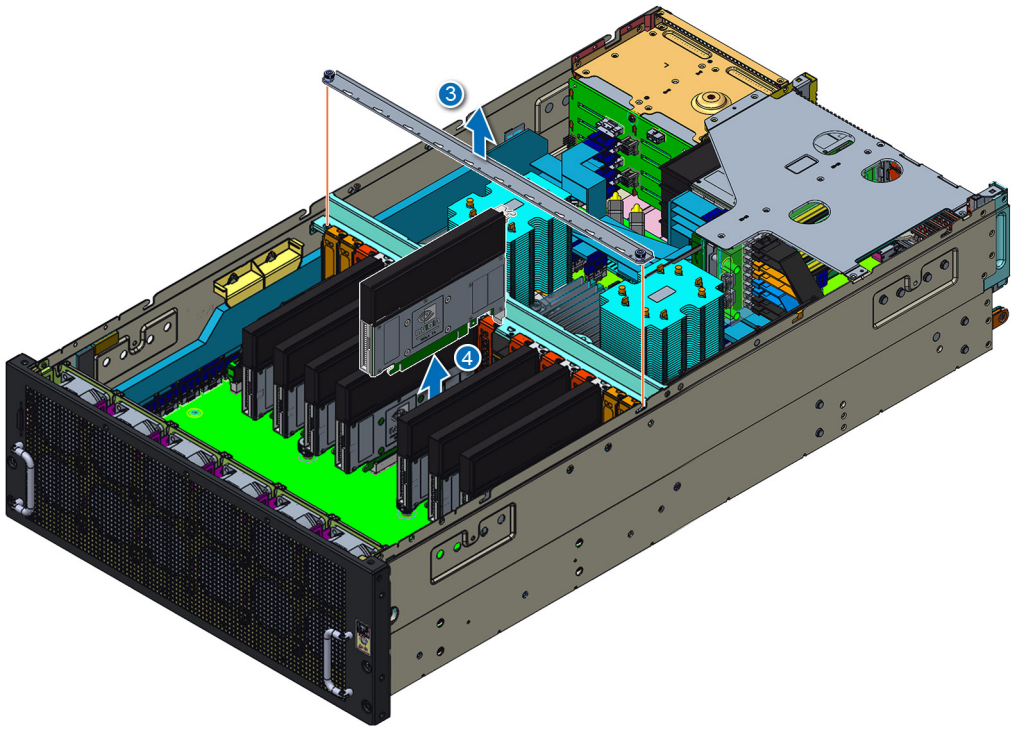


Figure 43. Removing GPU card

NOTE: Do not operate the system with any GPU or GPU slot filler removed, as proper air flow and cooling may be impaired, impacting system performance.

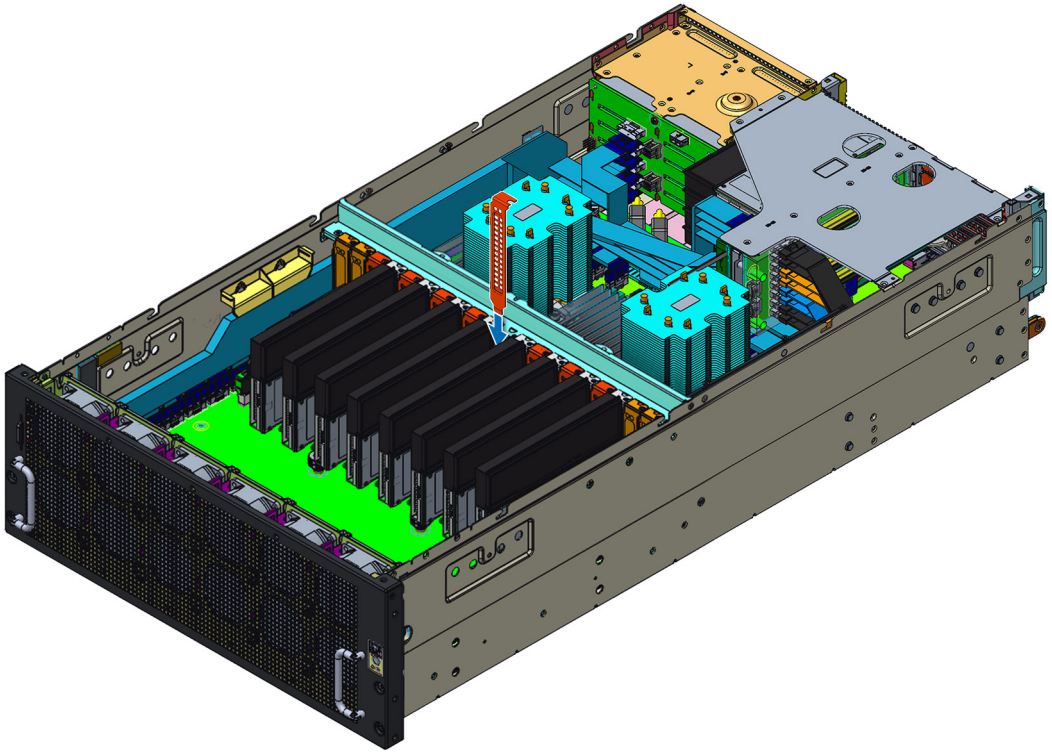


Figure 44. Installing GPU slot filler

Installing a T4 GPU

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Insert the GPU card into chassis. To know more about GPU specifications, go to GPU specifications.
2. Slide the GPU holding bracket and until the captive plunger secure the GPU support bracket.

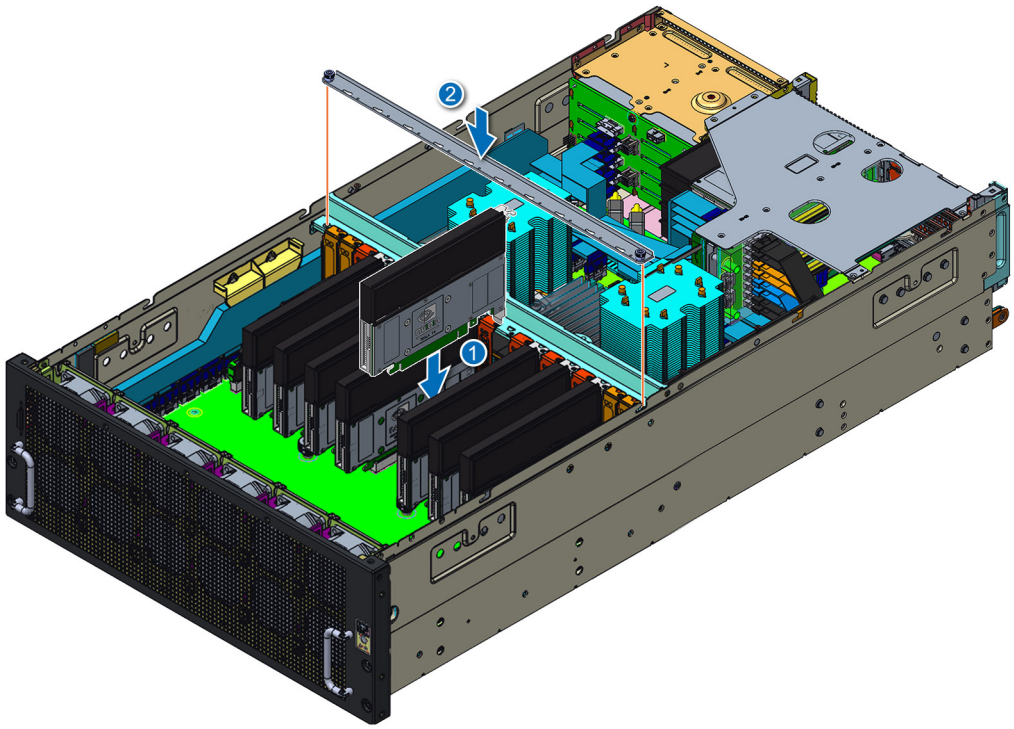


Figure 45. Installing the GPU card

3. Insert the GPU clamp into chassis.
4. Secure fixing the GPU clamp by four screws.

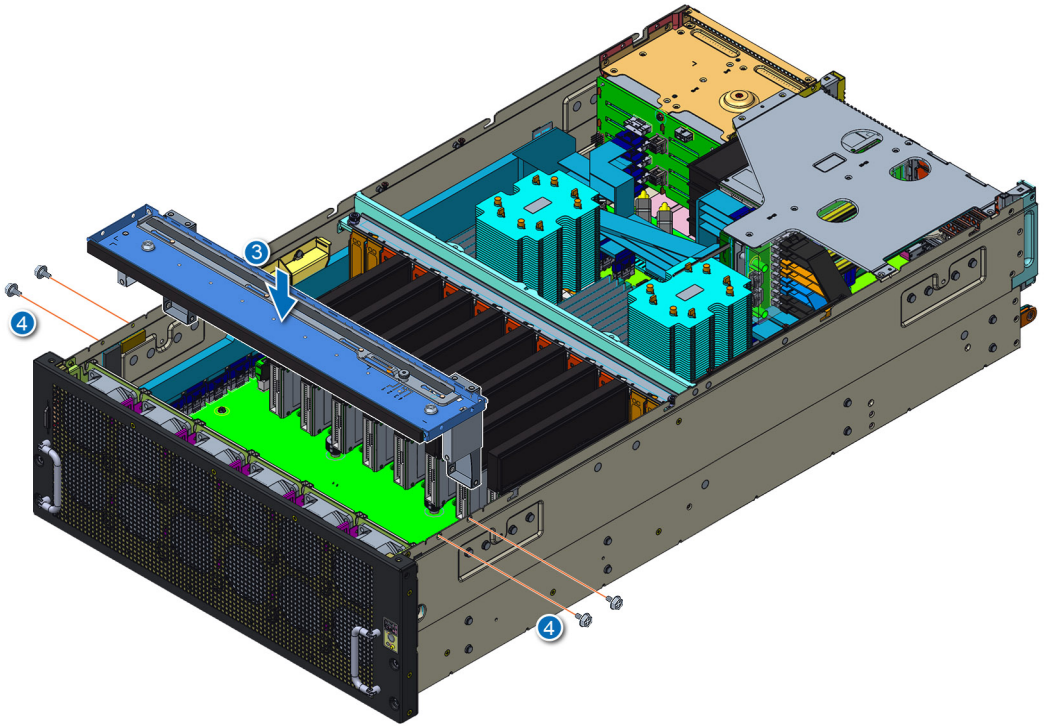


Figure 46. Installing the GPU clamp

NOTE: Do not operate the system with any GPU or GPU slot filler removed, as proper air flow and cooling may be impaired, impacting system performance.

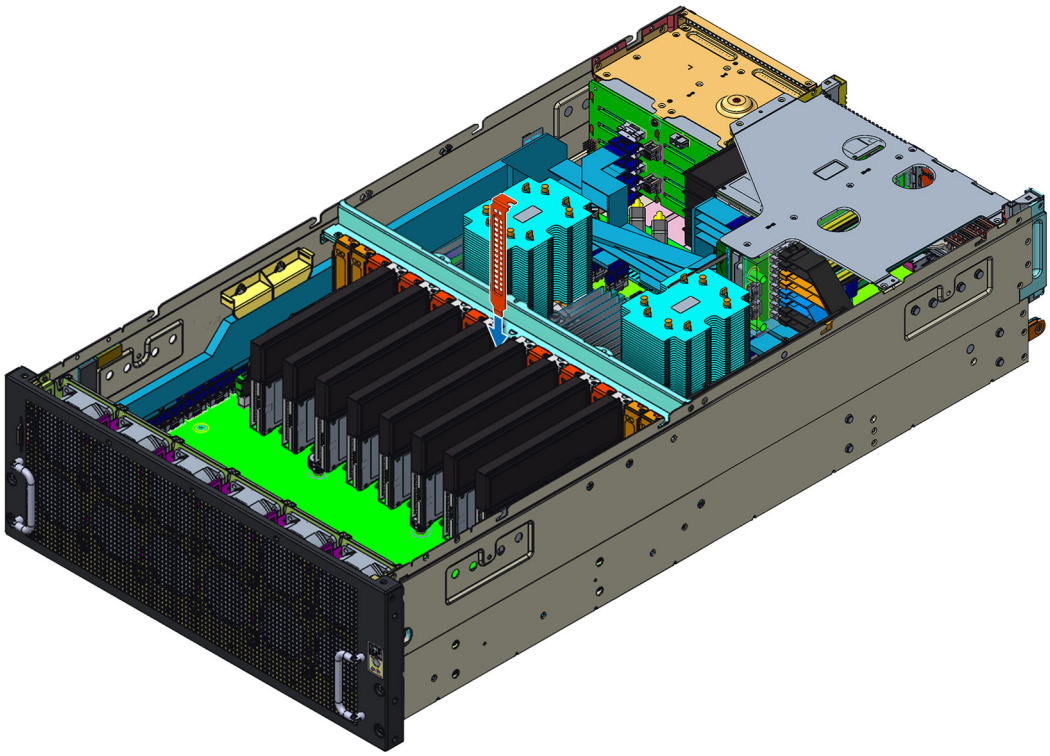


Figure 47. GPU slot filler installation

Next steps

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

Removing the Nvidia Tesla T4 GPU from butterfly module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the system cover..
4. Remove the butterfly module.
5. Disconnect the SATA cable.

Steps

1. Remove the screws securing the Nvidia Tesla T4 GPU.
2. Pull the GPU card out from the C-riser.

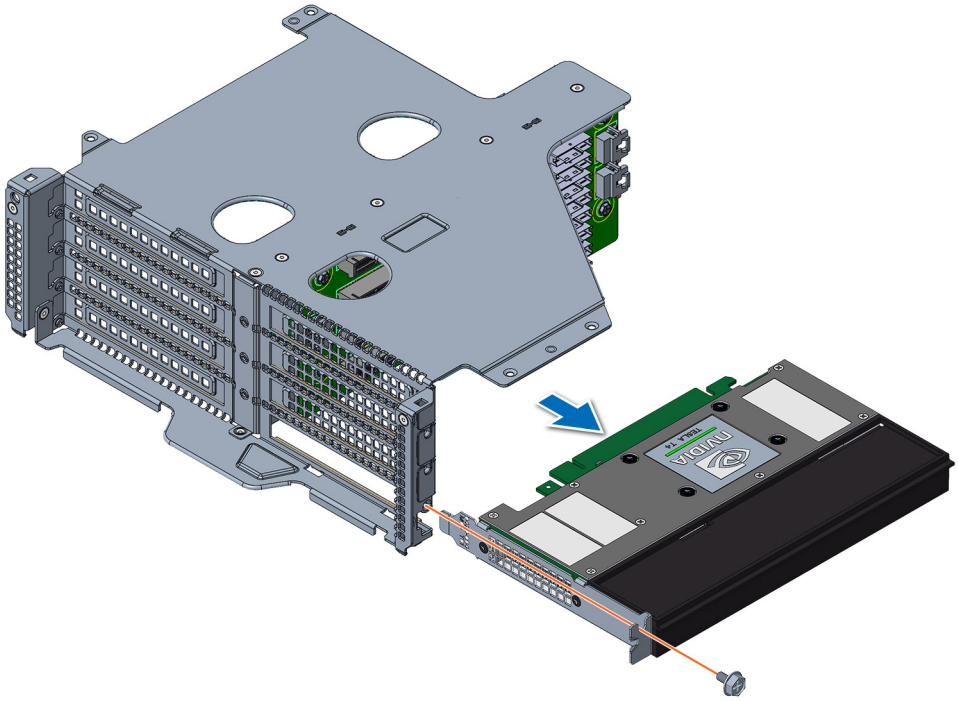


Figure 48. Removing Nvidia Tesla T4 GPU

Next steps

Install Nvidia Tesla T4 GPU from Butterfly module.

Installing the Nvidia Tesla T4 GPU in butterfly riser module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Install the Nvidia Tesla T4 GPU card in the butterfly riser module. To know more about specifications, go to GPU specification.

2. Secure the GPU card using screws.

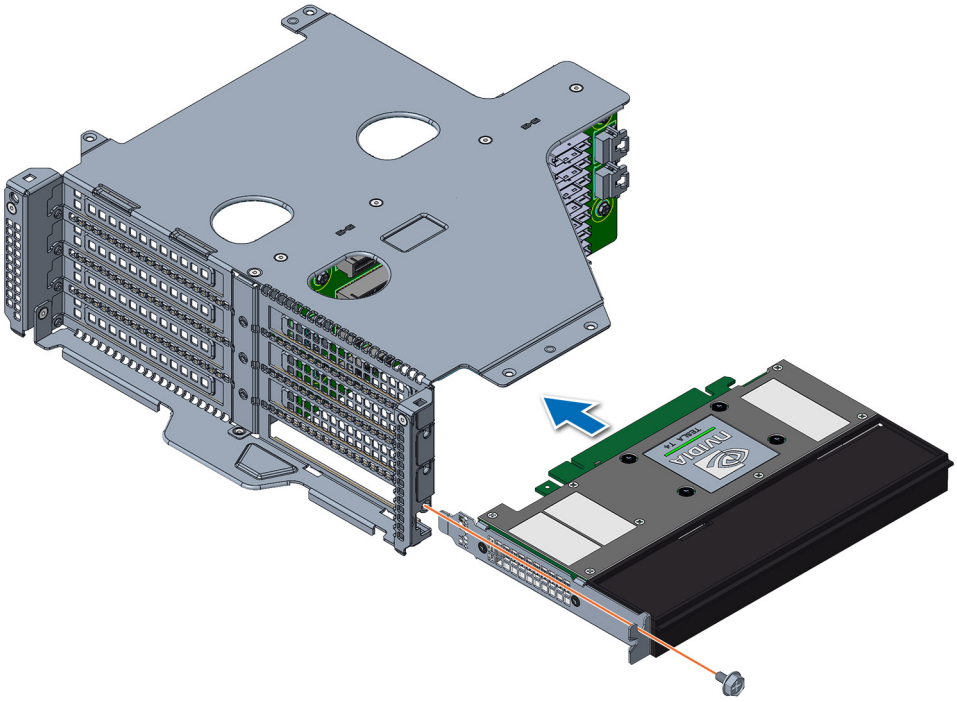


Figure 49. Installing the Nvidia Tesla T4 GPU in butterfly riser module

Next steps

1. Install the butterfly module.
2. Install the top cover.
3. Follow the procedure listed in After working inside your system

Nvidia A100 GPU and NVLink bridge

Removing a A100 GPU and NVLink bridge

Prerequisites

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

NOTE: Do not operate the system with any GPU or GPU slot filler that is removed, as proper air flow and cooling may be impaired, impacting system performance.

Steps

1. Remove the screws securing the GPU clamp.
2. Lift the GPU clamp from the system.

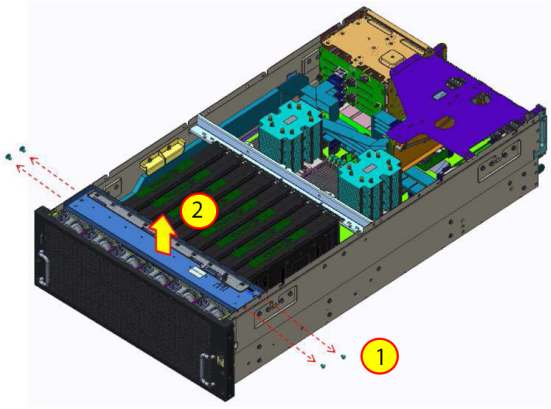


Figure 50. Removing GPU clamp

3. Release two captive plungers on the GPU holding bracket and slide sideway to lift it from the system. For more information, see Removing GPU support bracket.
4. Remove the screws securing the NVlink cross bars to the system.
5. Remove the NVLink cross bar.

NOTE: Nvidia A100 system has three NVLink cross bars, regardless the number of GPGPU.

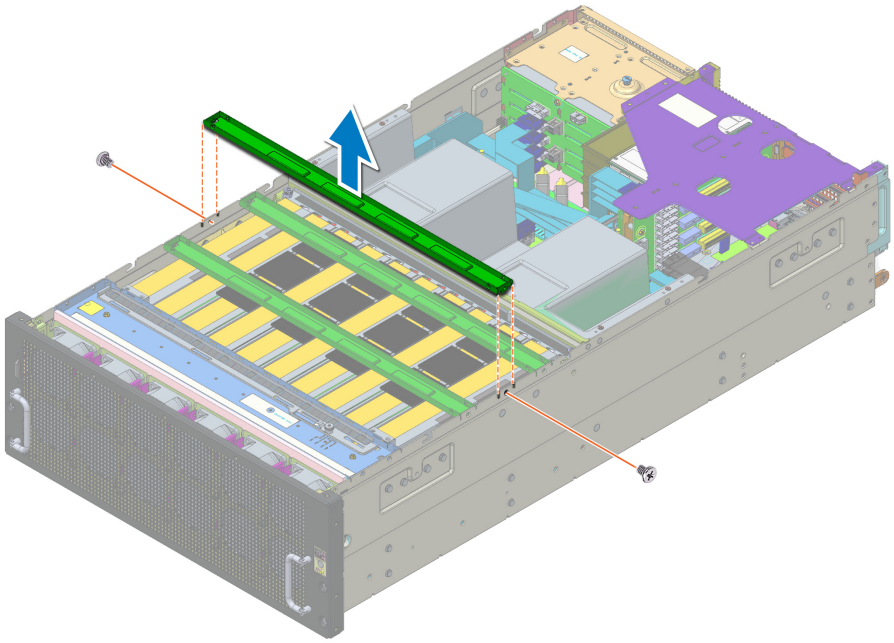


Figure 51. Removing NVLink cross bar from A100 GPU

6. Locate the NVLink bridge on the GPU cards. A100 GPU has three pieces of NVLink.

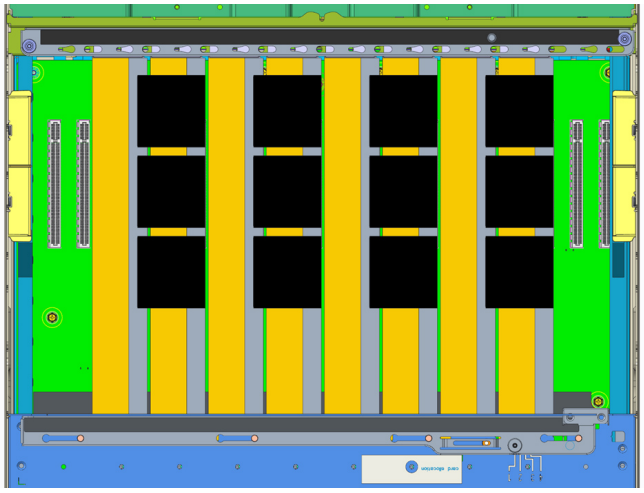


Figure 52. Top view of NVLink bridge for A100 GPU

7. By using a plastic scribe, lift the NVLink bridge.

   NOTE: Ensure to use a plastic scribe for NVLink bridge removal, to avoid any damage.

8. Hold the NVLink bridge by the edges to remove it from the GPU cards.
9. Disconnect power cable from the GPU card.
10. Lift the GPU card from the system.
11. If you are removing the GPU permanently, install a filler bracket.

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

12. Install a metal filler bracket over the empty expansion slot opening.

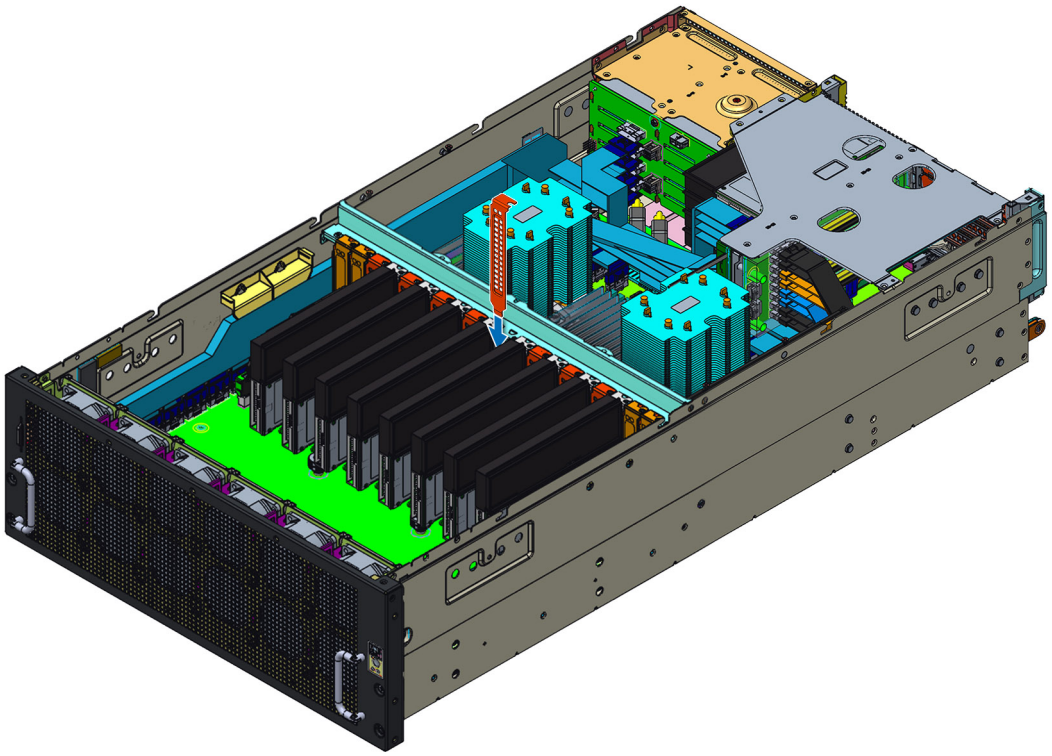


Figure 53. Installing GPU slot filler

Next steps

1. Replace the GPU and NVLink bridge .

Installing a A100 GPU and NVLink bridge

Prerequisites

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

   For instructions, see the documentation accompanying the card.
5. If installed, remove the air shroud.

Steps

1. Remove the metal filler bracket.
2. Insert the A100 GPU card into the chassis.
3. Connect the GPU card power cable.
4. Slide the GPU holding bracket until the captive plunger secures the GPU support bracket. For more information about support bracket, see Installing a GPU support bracket.
5. Install the GPU clamp into the chassis.

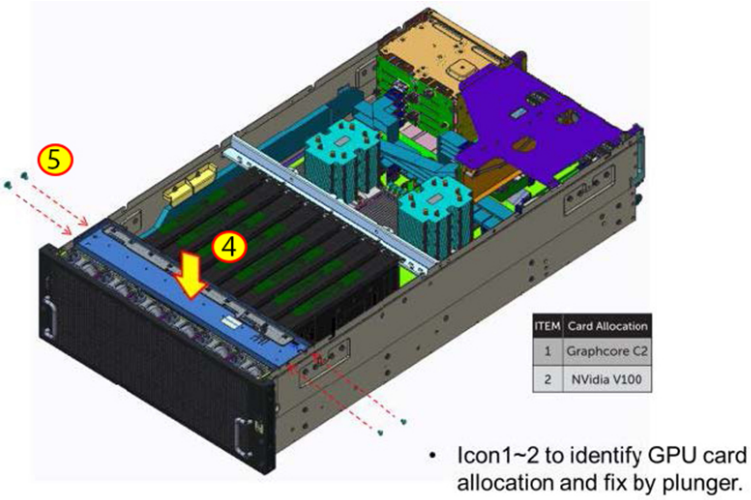


Figure 54. Installing GPU clamp

6. Fix the GPU clamp securely using four screws.

   NOTE: Do not operate the system with any GPU or GPU slot filler that is removed, as proper air flow and cooling may be impaired, impacting system performance.

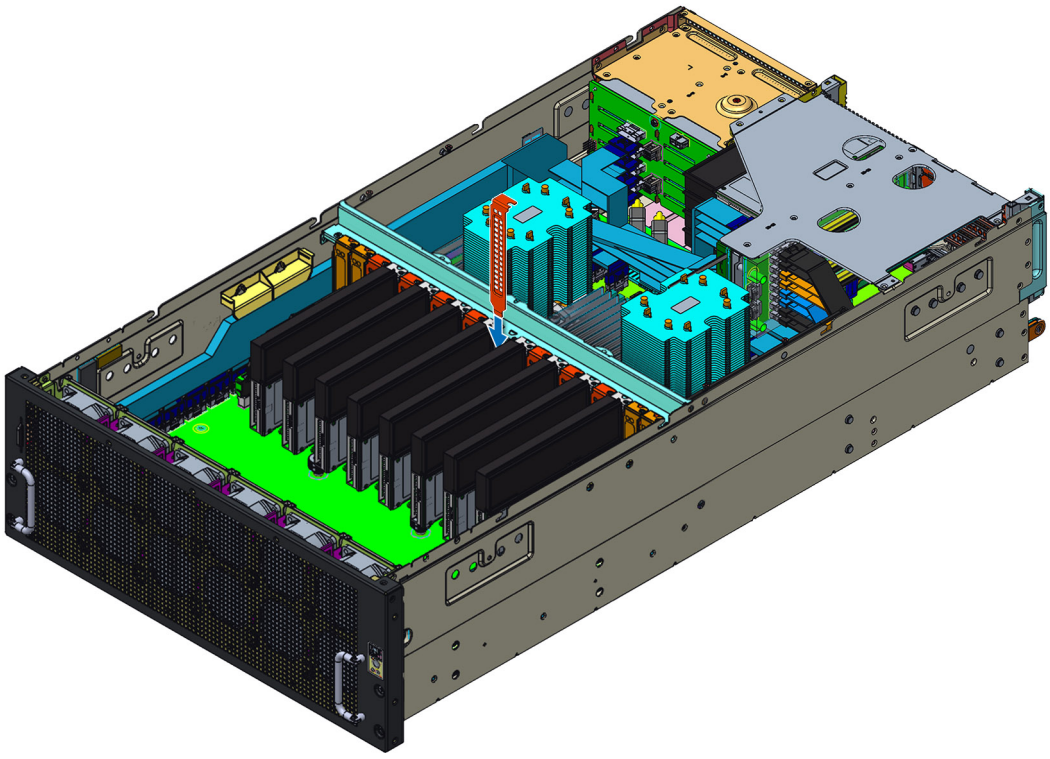


Figure 55. Installing GPU slot filler

7. Locate and remove the NVLink bridge cover on the GPU cards by using a plastic scribe.

   NOTE: Ensure to use a plastic scribe for NVLink bridge cover removal, to avoid any damage.

8. Install the NVLink bridges by placing the bridge between the cards and gently pressing downwards until firmly seated with no gap.

   NOTE: The A100 GPU has three NVLink bridges. NVLink bridges can only be installed in one orientation. If it does not fit easily, turn the NVLink bridge around to install it on the GPU cards.

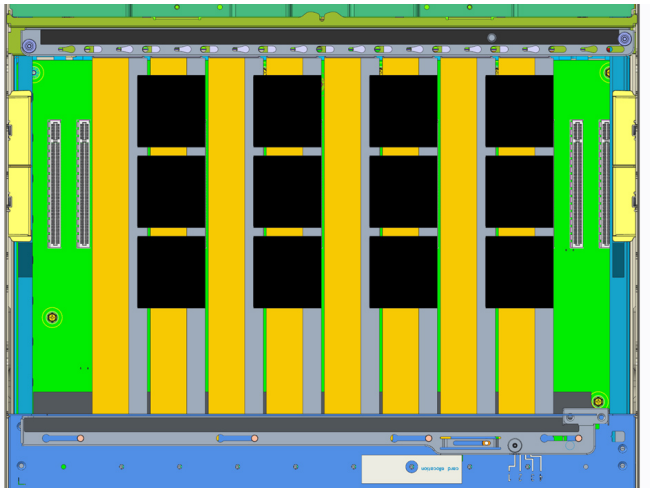


Figure 56. Top view of NVLink bridge for A100 GPU

9. Replace the screws, to secure the NVLink cross bars on the NVlink bridge.

NOTE: Nvidia A100 system has only three NVLink cross bars, regardless the number of GPGPU.

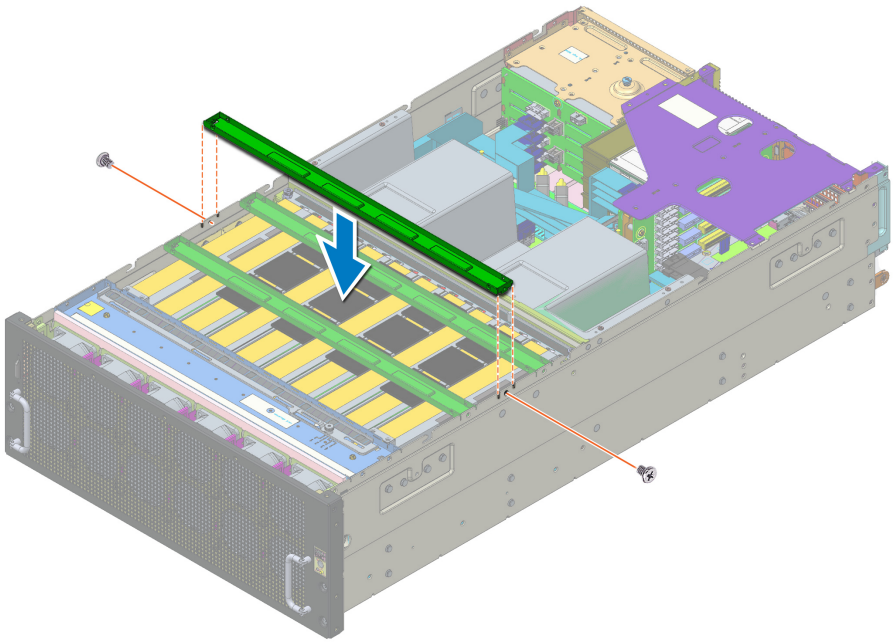


Figure 57. Installing NVLink cross bar to A100 GPU

Next steps

1. Installing the system cover.
2. Installing the air shroud.
3. Follow the procedure listed in After working inside your system.

Nvidia A40 GPU and NVLink bridge

Removing a A40 GPU and NVLink bridge

Prerequisites

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

NOTE: Do not operate the system with any GPU or GPU slot filler removed, as proper air flow and cooling may be impaired, impacting system performance.

Steps

1. Remove the screws securing the GPU clamp.
2. Lift the GPU clamp from the system.

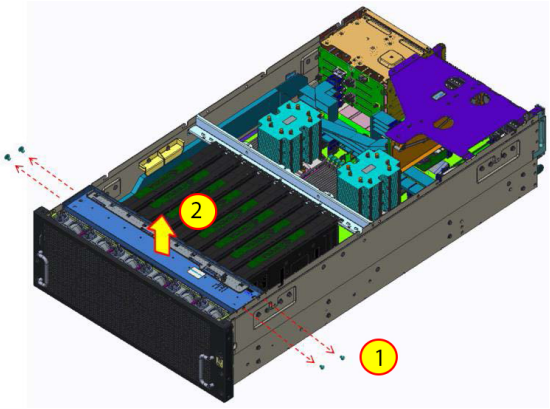


Figure 58. Removing GPU clamp

3. Release two captive plungers on the GPU holding bracket and slide sideway to lift it from the system. For more information, see Removing GPU support bracket.
4. Remove the screws securing the NVlink cross bars to the system.
5. Remove the NVLink cross bar.

NOTE: Nvidia A40 system has only one NVLink cross bar, regardless the number of GPGPU.

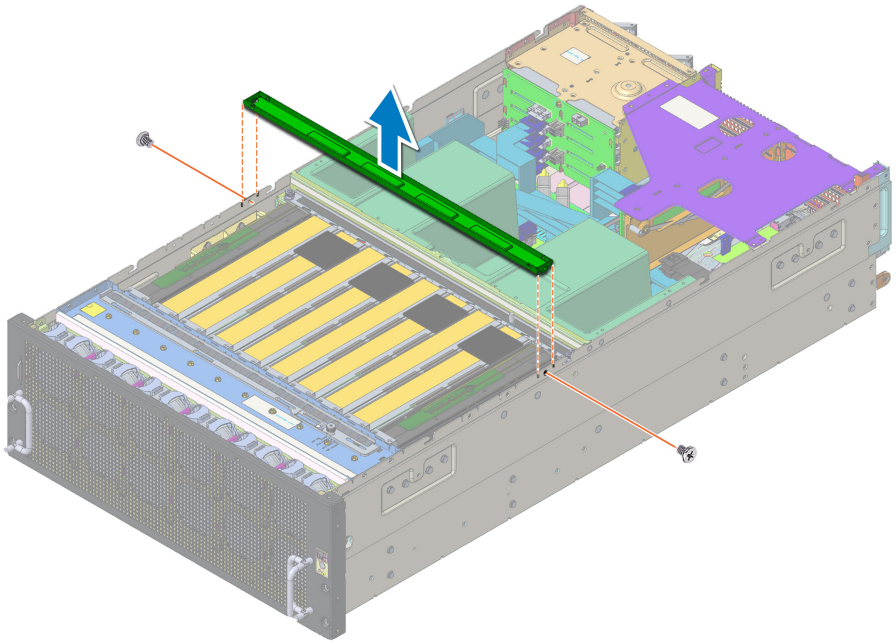


Figure 59. Removing NVLink cross bar from A40 GPU

6. Locate the NVLink bridge on the GPU cards. A40 GPU has one piece of NVLink bridge.

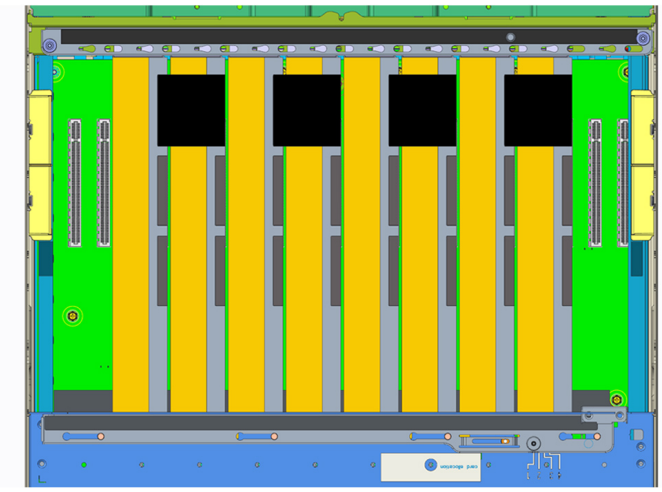


Figure 60. Top view of NVLink bridge for A40 GPU

7. By using a plastic scribe, lift the NVLink bridge.

   NOTE: Ensure to use a plastic scribe for NVLink bridge removal, to avoid any damage.

8. Hold the NVLink bridge by the edges to remove it from the GPU cards.
9. Disconnect power cable from the GPU card.
10. Lift the GPU card from the system.
11. If you are removing the GPU permanently, install a filler bracket.

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

12. Install a metal filler bracket over the empty expansion slot opening.

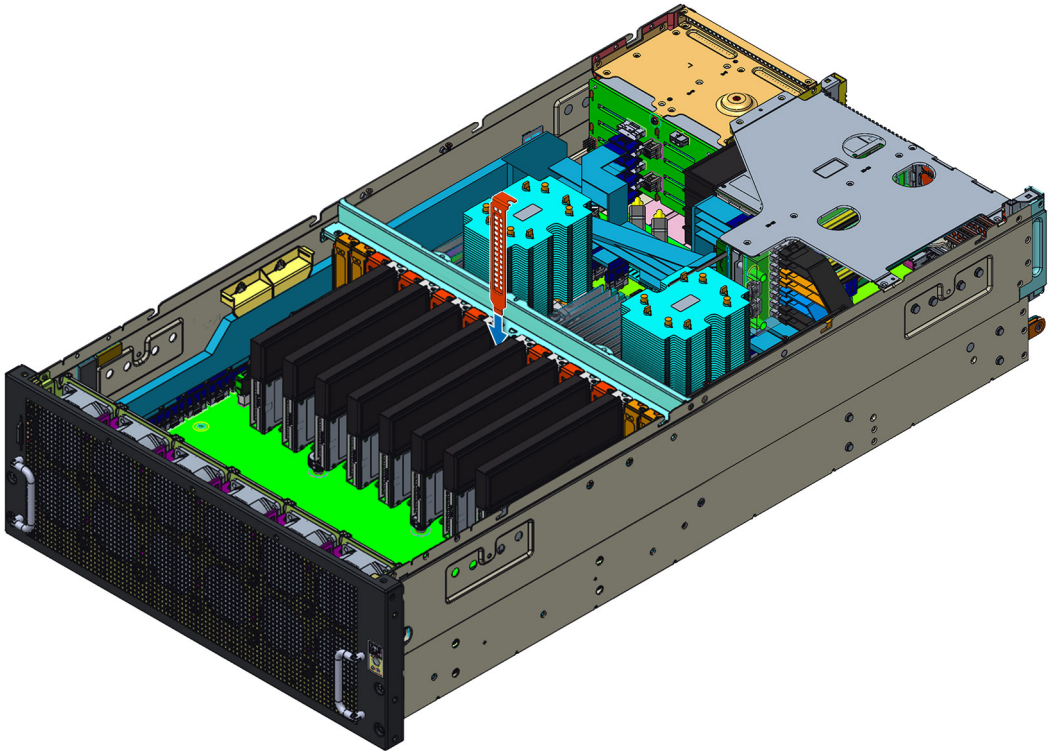


Figure 61. Installing GPU slot filler

Next steps

1. Replace the GPU and NVLink bridge .

Installing a A40 GPU and NVLink bridge

Prerequisites

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

   For instructions, see the documentation accompanying the card.
5. If installed, remove the air shroud.

Steps

1. Remove the metal filler bracket.
2. Insert the A40 GPU card into the chassis.
3. Connect the GPU card power cable.
4. Slide the GPU holding bracket until the captive plunger secures the GPU support bracket. For more information about support bracket, see Installing a GPU support bracket.
5. Insert the GPU clamp into the chassis.

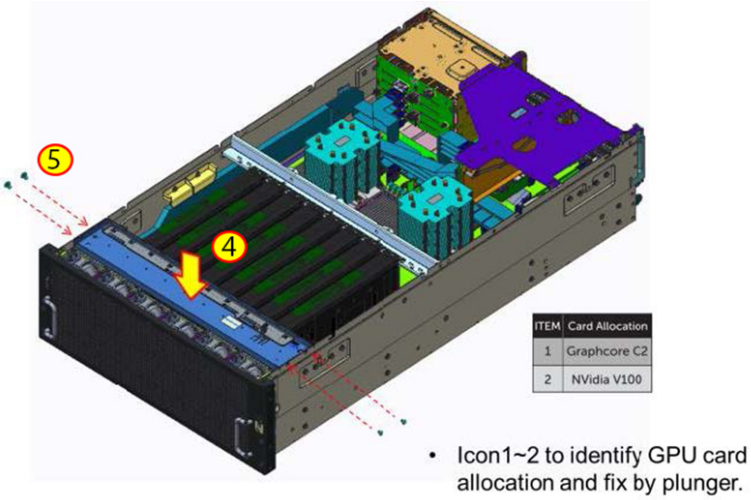


Figure 62. Installing GPU clamp

6. Fix the GPU clamp securely using four screws.

NOTE: Do not operate the system with any GPU or GPU slot filler that is removed, as proper air flow and cooling may be impaired, impacting system performance.

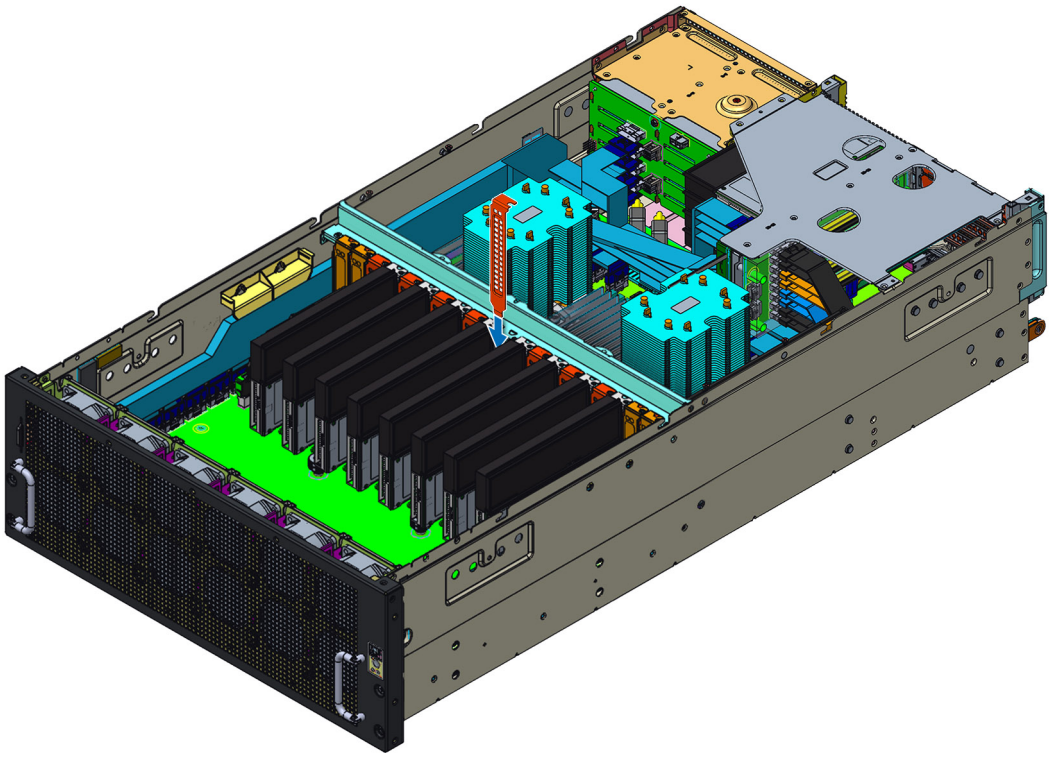


Figure 63. Installing GPU slot filler

7. Locate and remove the NVLink bridge cover on the GPU cards by using a plastic scribe.

NOTE: Ensure to use a plastic scribe for NVLink bridge cover removal, to avoid any damage.

8. Install the NVLink bridge by placing the bridge between the cards and gently pressing downwards until firmly seated with no gap.

NOTE: The A40 GPU has one NVLink bridge. NVLink bridge can only be installed in one orientation. If it does not fit easily, turn the NVLink bridge around to install it on the GPU cards.

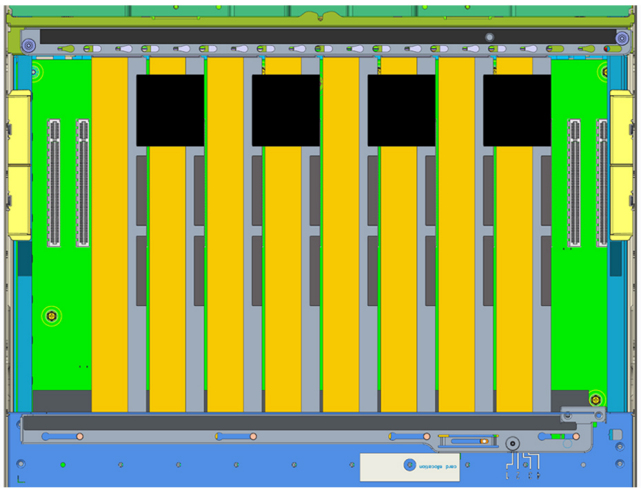


Figure 64. Top view of NVLink Bridge for A40 GPU

9. Replace the screws, to secure the NVLink cross bars on the NVlink bridge.

   NOTE: Nvidia A40 system has one NVLink cross bar, regardless the number of GPGPU.

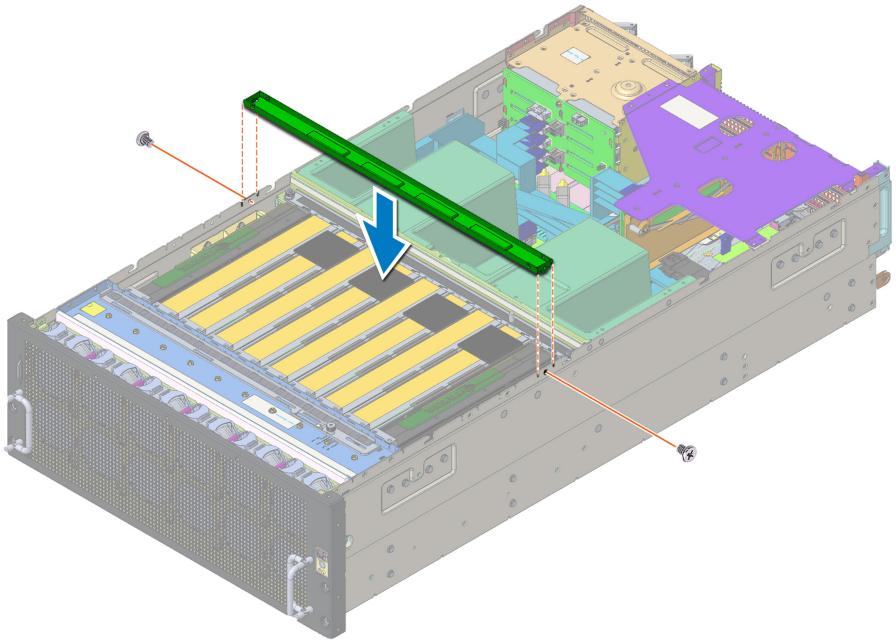


Figure 65. Installing NVLink cross bar to A40 GPU

Next steps

1. Installing the system cover.
2. Installing the air shroud.
3. Follow the procedure listed in After working inside your system.

Processor and heat sink

Removing the processor and heat sink

Prerequisites

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

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the following:
   a. Remove the system cover.
   b. Removing the air shroud.

Steps

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

   NOTE: It is normal for the heat sink to slip off the blue retention clips when the screws are partially loosened, continue to loosen the screw(s).
2. Pushing both blue retention clips simultaneously, lift the processor and heat sink module (PHM) out of the system.
3. Set the PHM aside with the processor side facing up.

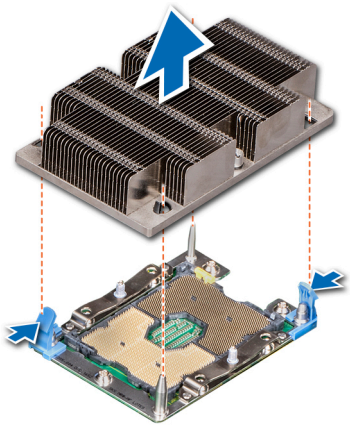


Figure 66. Removing a processor and heat sink module

Next steps

1. Install the processor and heat sink

Installing the processor

Prerequisites

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

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

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

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

Steps

1. Align the pin 1 indicator of the heat sink to the system board and then place the processor and heat sink module (PHM) on the processor socket.

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

   NOTE: Ensure that the PHM is held parallel to the system board to prevent damaging the components.

2. Push the blue retention clips inward to allow the heat sink to drop into place.
3. Supporting the heat sink with one hand.
4. Using the Torx #T30 screwdriver, tighten the screws on the heat sink in the order below:
   a. Partially tighten the first screw (approximately 3 turns).
   b. Tighten the second screw completely.
   c. Return to the first screw and tighten it completely.

   If the PHM slips off the blue retention clips when the screws are partially tightened, follow these steps to secure the PHM:
   a. Loosen both the heat sink screws completely.
   b. Lower the PHM on to the blue retention clips, follow the procedure described in step 2.
   c. Secure the PHM to the system board, follow the procedure described in step 4.

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

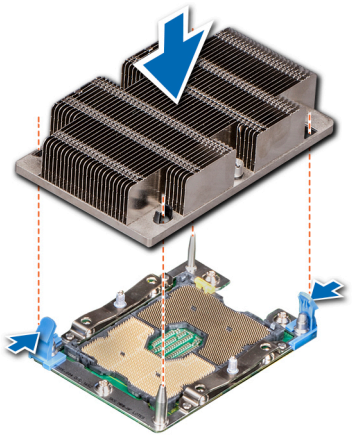


Figure 67. Installing a processor and heat sink module (1U)

Next steps

Follow the procedure listed in After working inside your system.

System memory

Removing a memory module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the following:
   a. Remove the system cover.
   b. Removing the air shroud.

Steps

1. Locate the DIMM sockets. Push the ejectors outward on both ends of the memory module socket to release the memory module from the socket.
2. Holding the DIMM by the edges, lift it from the socket, and store it in an anti-static package.

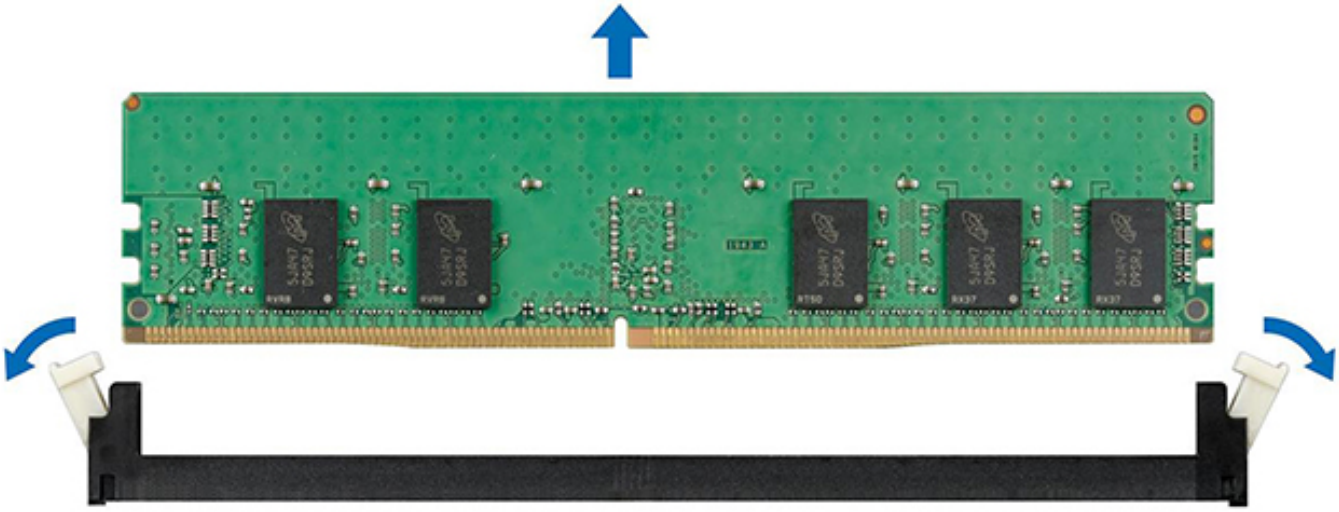


Figure 68. removing a memory module

Next steps

Install a memory module.

Installing a memory module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Locate the appropriate memory module socket.
2. Push the ejectors outward on both ends of the memory module socket.
3. Holding the DIMM by edges insert it into socket tightly.

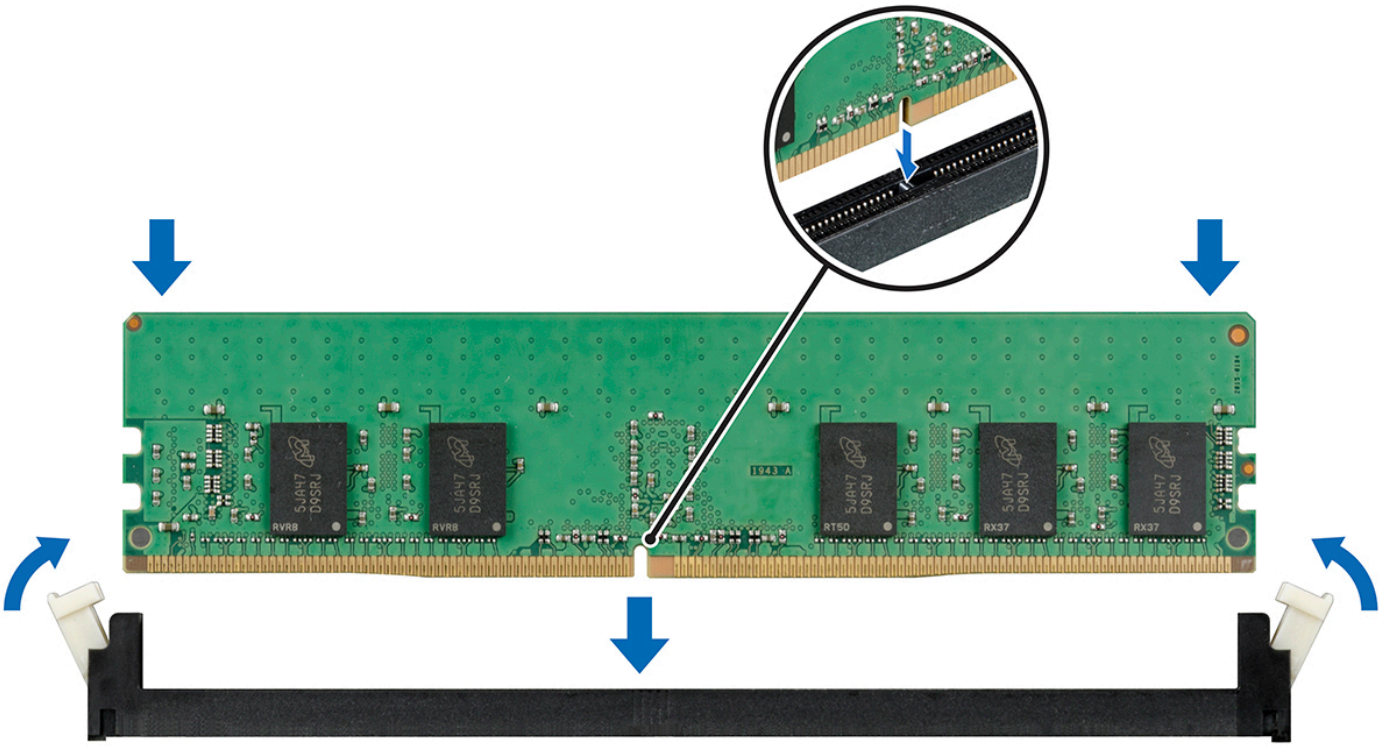


Figure 69. Installing a memory module

Next steps

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

Riser 2 module

Removing the riser 2 module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the system cover..
4. Remove the butterfly module.
5. Disconnect the SATA cable.

Steps

1. Hold the touch points and lift the riser 2 module from the system board.

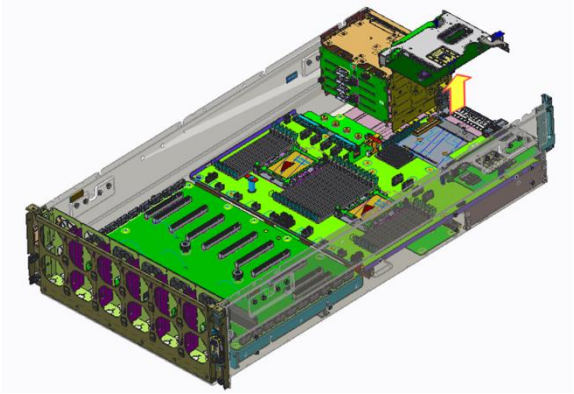


Figure 70. Removing the riser 2 module

2. Open the PCIe bracket latch, removing the H730P+ card from the riser 2 module.

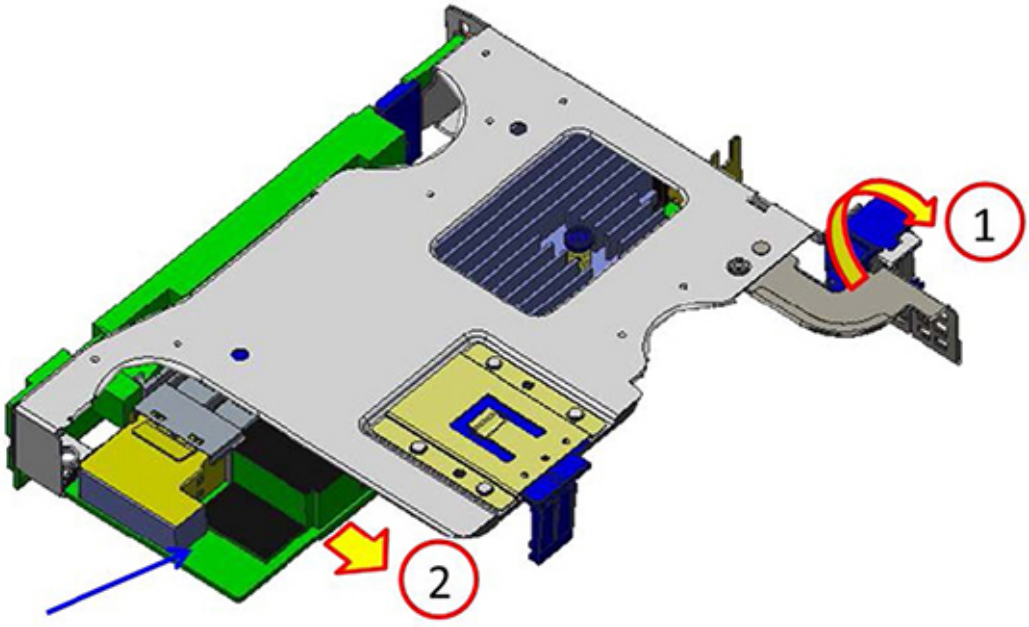


Figure 71. Removing the H730P+ card

Next steps

Install the riser 2 card.

Installing the riser 2 module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Open the PCIe bracket latch.

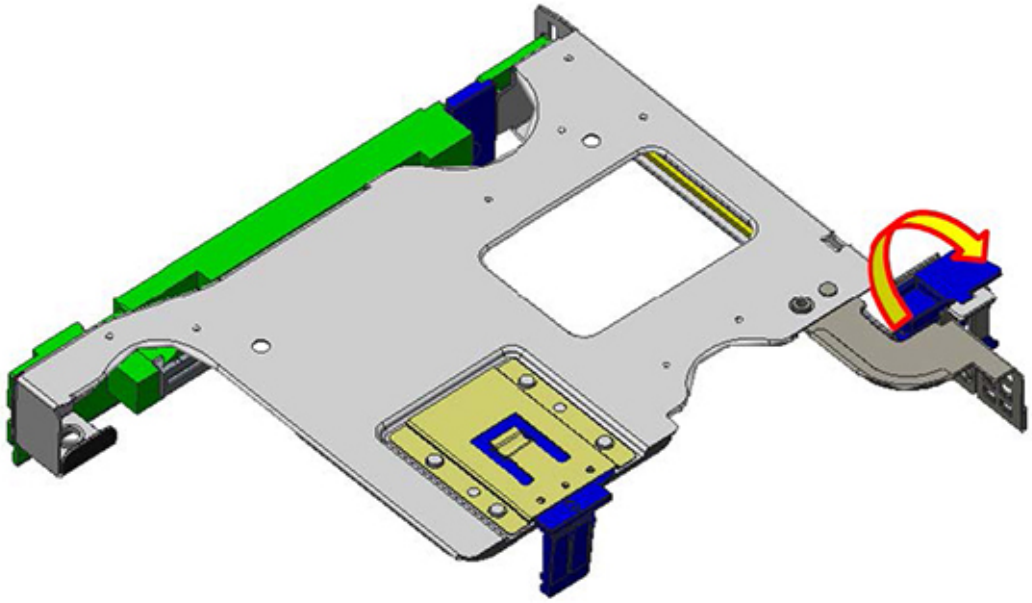


Figure 72. Open the PCIe bracket latch

2. Install the H730P+ card to the riser2 module.

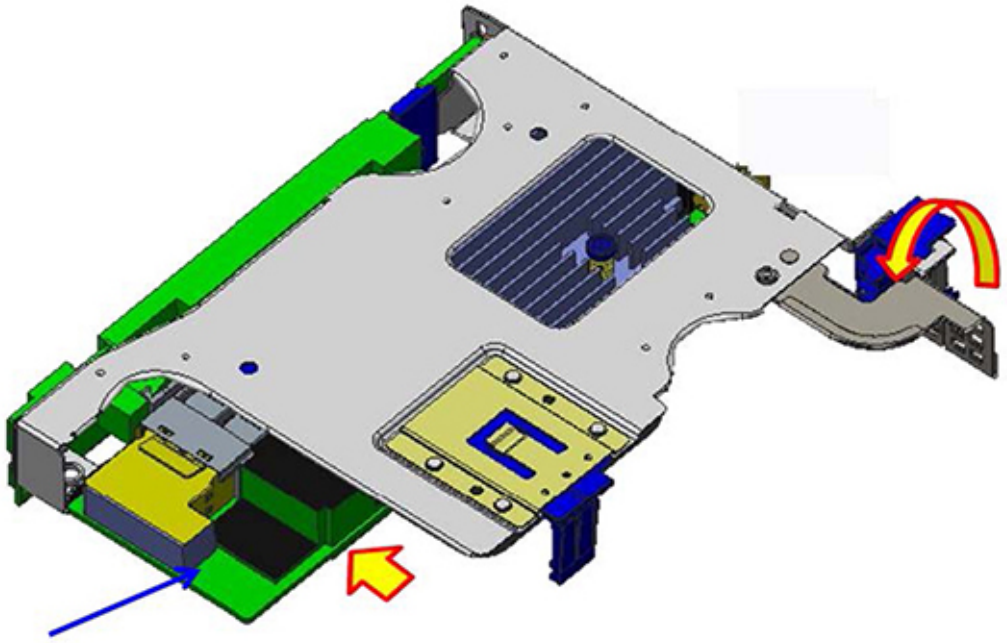


Figure 73. Installing the H730P+ card

3. Close PCIe bracket latch.
4. Press the riser2 module -edge down until the card is fully seated. Align the riser2 module connector with the card connector on the system board and push the riser2 module wards the connector to seat it firmly.

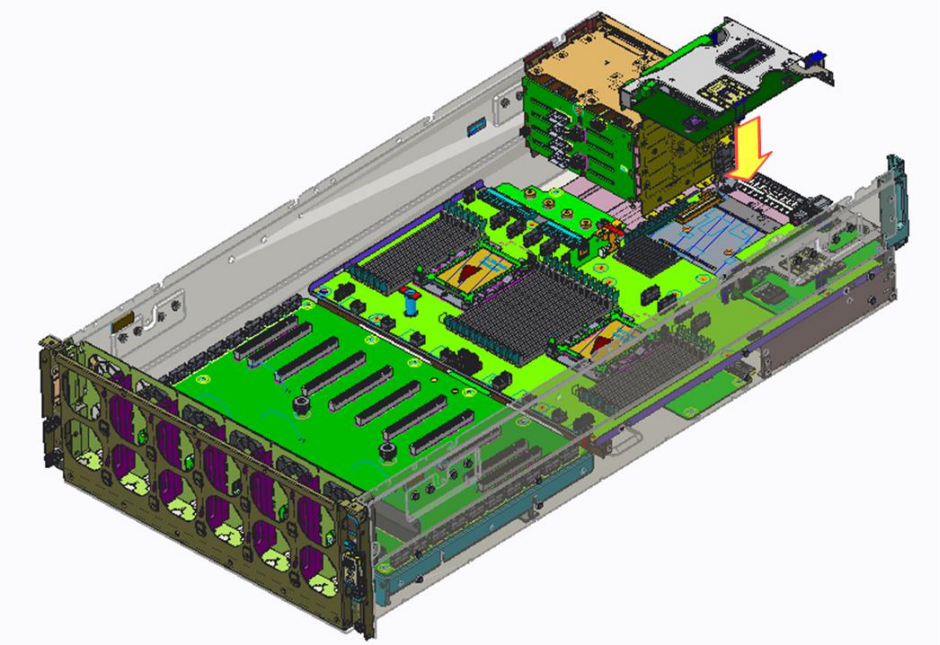


Figure 74. Installing the riser 2 module

Next steps

1. Install the butterfly module.
2. Install the top cover.
3. Follow the procedure listed in After working inside your system

Riser 1 module

Removing the riser 1 module

Prerequisites

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

Steps

Hold the touch points and lift the riser 1 module from the connector on the system board.

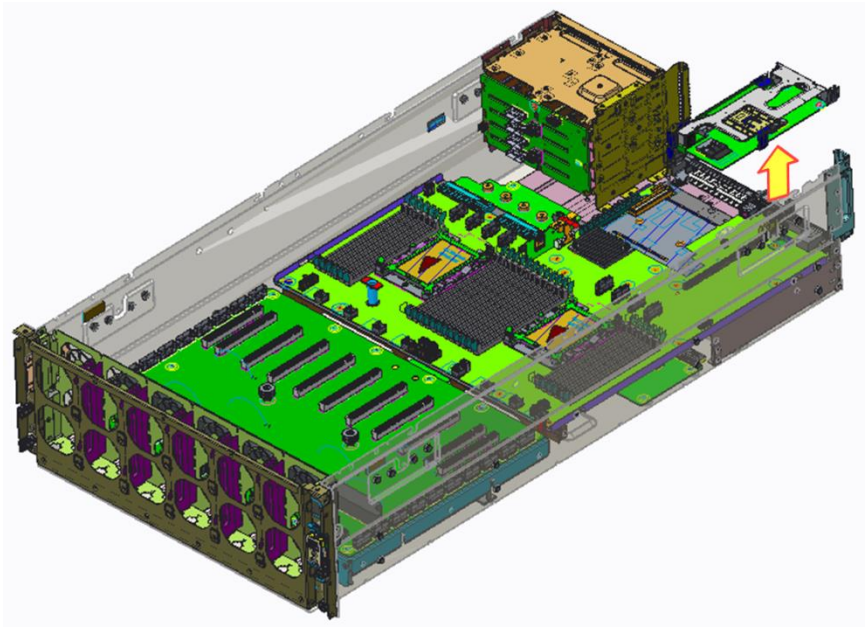


Figure 75. Removing the riser 1 module

Next steps

Install the riser 1 card

Installing the riser 1 module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Align the riser1 module connector with the card connector on the system board and push the riser1 module wards the connector to seat it firmly.
2. Press the riser 1 module-edge down until the card is fully seated.

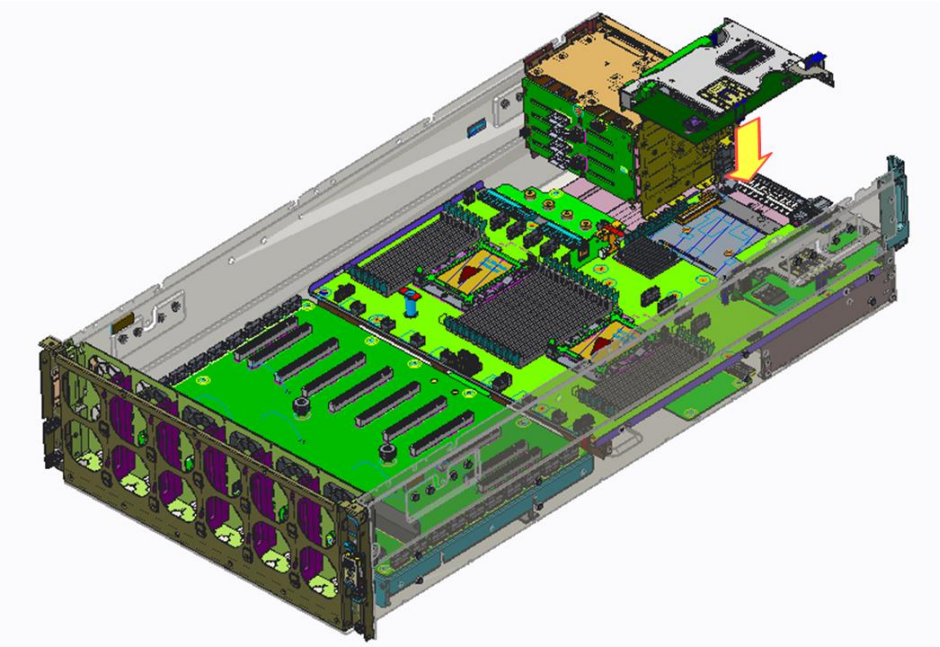


Figure 76. Installing the riser 1 module

Next steps

1. Install the butterfly module.
2. Install the top cover.
3. Follow the procedure listed in After working inside your system

Network daughter card

Removing the network daughter card

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the system cover..
4. Remove the air shroud.
5. Butterfly module
6. Riser 2 Module
7. Riser 1 module

Steps

1. Using a Phillips #2 screwdriver, loosen the captive screws that secure the network daughter card (NDC) to the system board.
2. Hold the NDC by the edges on either side of the touch points, and lift to remove it from the connector on the system board.
3. Slide the NDC towards the front of the system until the Ethernet connectors are clear of the slot in the back panel.

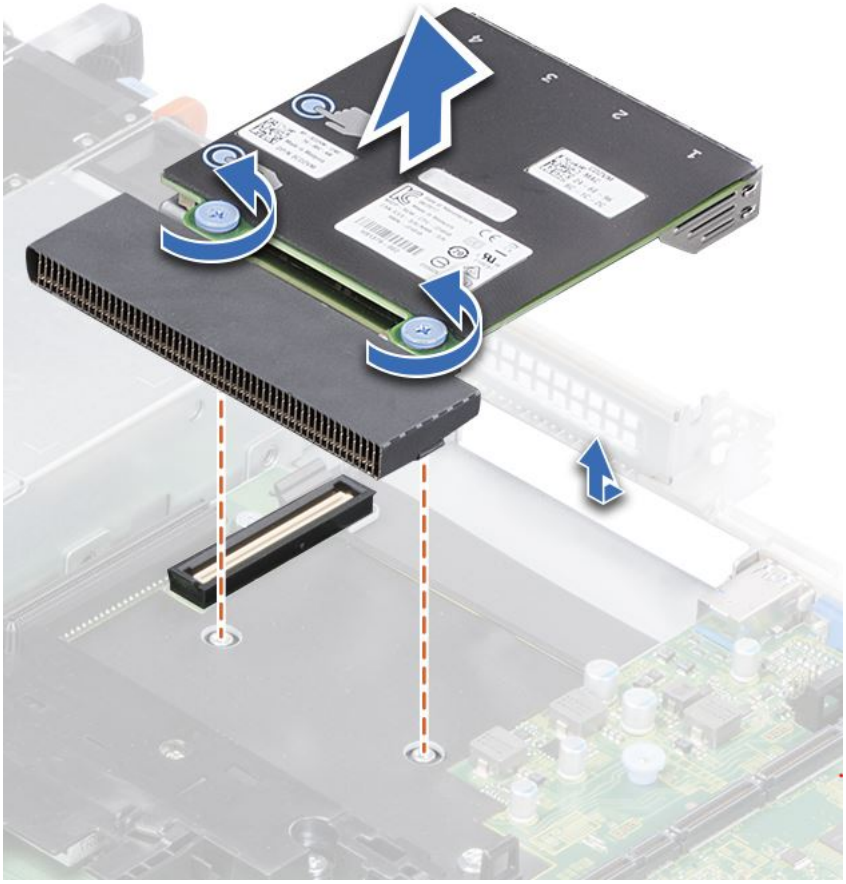


Figure 77. Removing the network daughter card

Installing the network daughter card

Prerequisites

Follow the procedure listed in Before working inside your system

Steps

1. Orient the NDC so that the Ethernet connectors fit through the slot in the chassis.
2. Align the captive screws at the back-end of the card with the screw holes on the system board.
3. Press the touch points on the card until the card connector is firmly seated on the system board connector.
4. Using a Phillips #2 screwdriver, tighten the captive screws to secure the NDC to the system board.

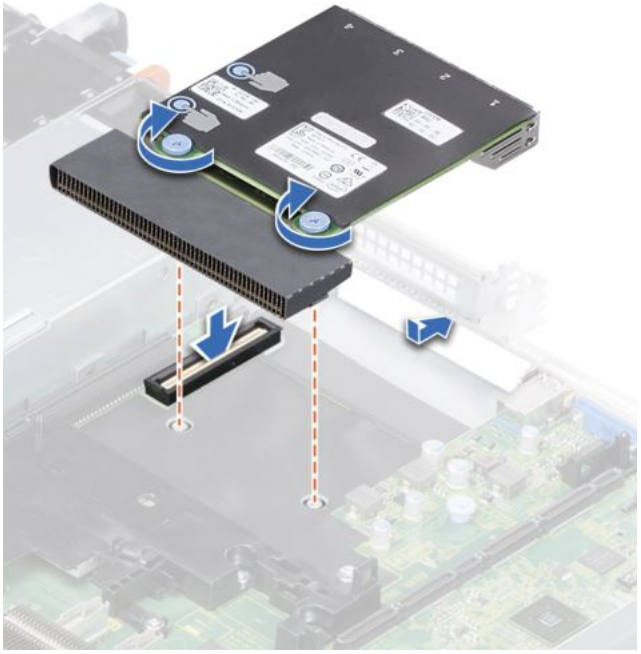


Figure 78. Installing the network daughter card

System board tray module

Removing the system board tray module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the following:
   a. Remove the system cover.
   b. Remove the air shroud.
   c. Remove the GPU card.
   d. Remove the GPU support bracket.
   e. Remove the PCIe switch board module.
   f. Butterfly module
   g. Riser 2 Module
   h. Riser 1 module
   i. Memory
   j. Processor and heat sink
   k. Network daughter card

Steps

1. Disconnect all cables from the system board.
2. Before the removing the system board tray module, it should loosen the screw at the red mark position.

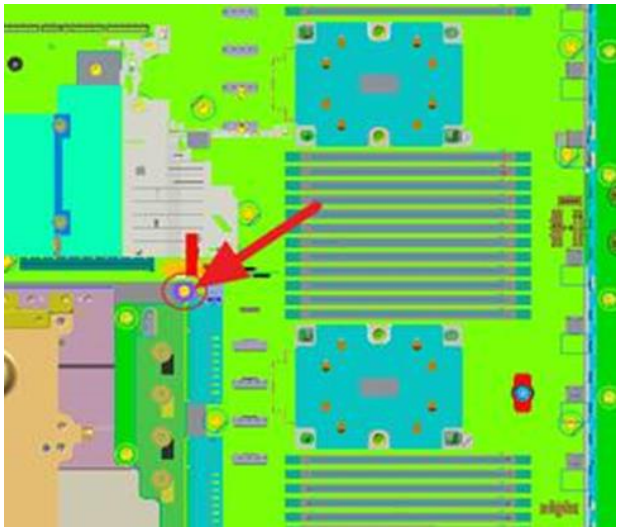


Figure 79. Loosen one screw

3. Slide the system board tray to make sure the it's not secured by the T standoff.
4. Lift the system board tray module out of the chassis.

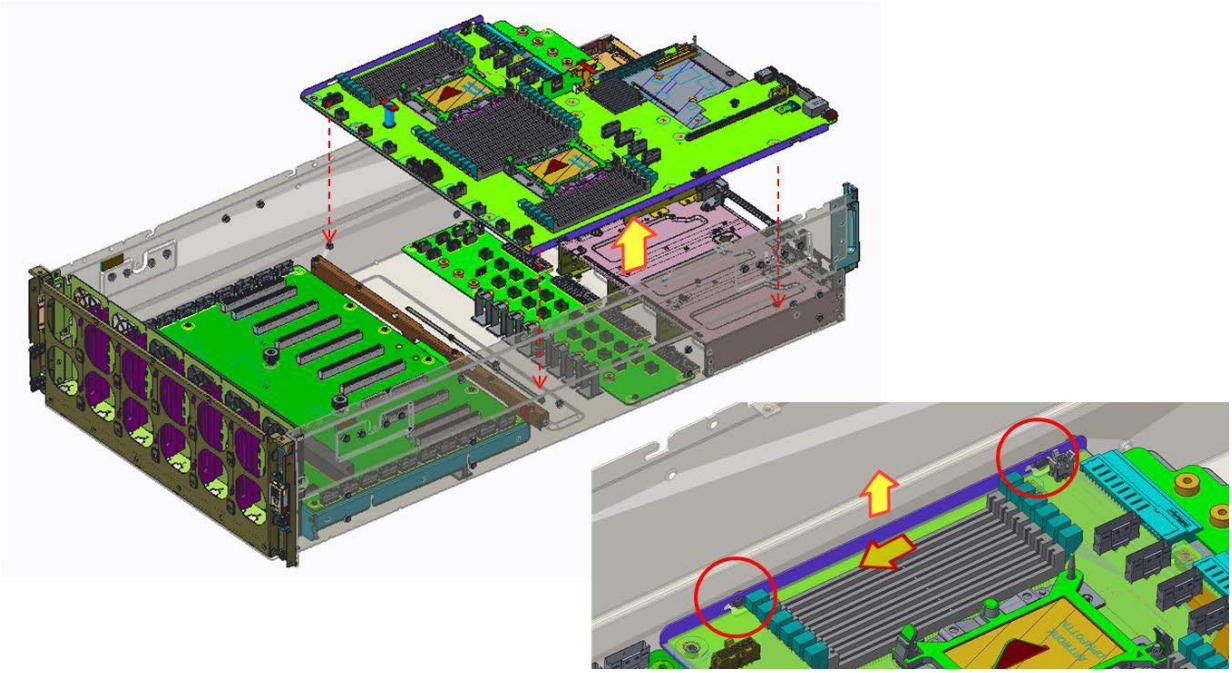


Figure 80. Removing the system board tray module

Next steps

Install the system board tray module

Installing the system board tray module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Align the location pin to install system board tray module.
2. Slide the system board tray to T standoff and make sure the T standoff can fix system board tray exactly.

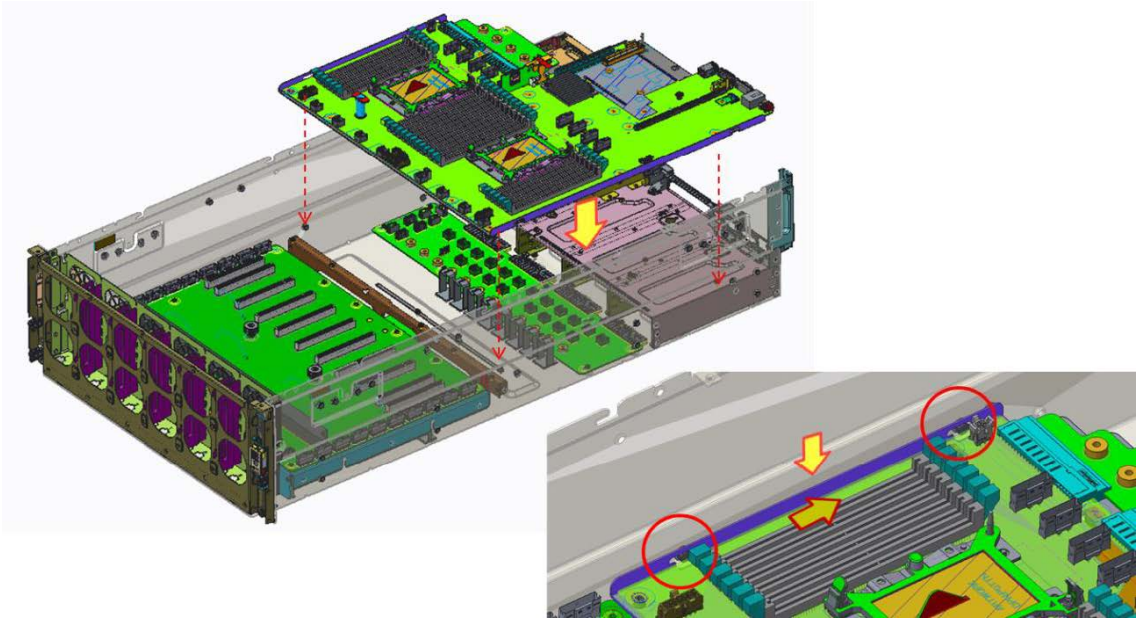


Figure 81. Installing the drive backplane

3. To tighten the screw at the red mark position.

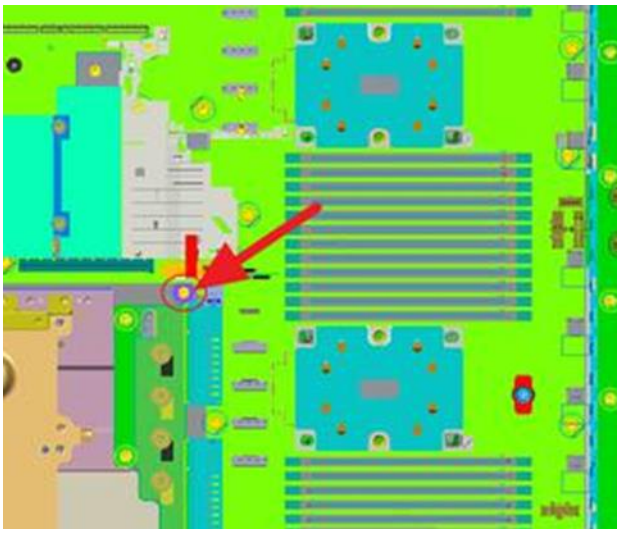


Figure 82. Tighten one screw

Next steps

1. Reconnect all cables to the system board tray module.
2. Install the following:
   a. Processor and heat sink
   b. Memory
   c. Riser 1 module
   d. Riser 2 module
   e. Butterfly module
   f. GPU support bracket
   g. GPU card
   h. Air shroud
   i. System cover
3. Follow the procedure listed in After working inside your system

System board and power interposer board

Removing the system board and power interposer board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the system cover.
4. Remove the air shroud.
5. Remove the system board tray module.Remove the system board tray module.

Steps

1. Remove the eighteen screws securing the system board and power interposer board to the system board tray.
2. Remove the one screw securing the system board handle to the system board.
3. Lift the system board and power interposer board from the system board tray module.

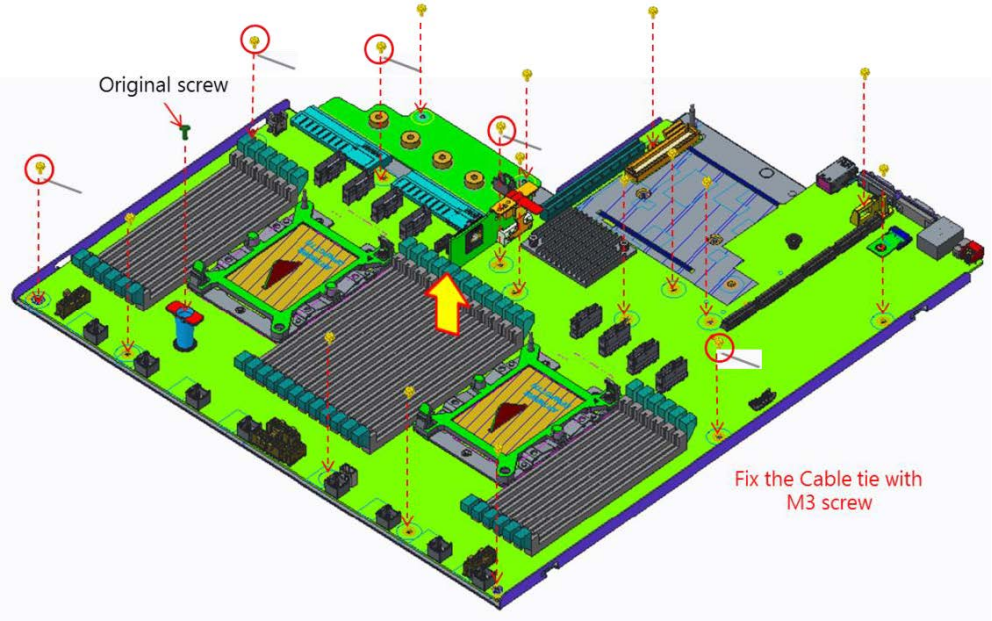


Figure 83. Removing the system board and power interposer board

4. Lift the power interposer board from the system board.

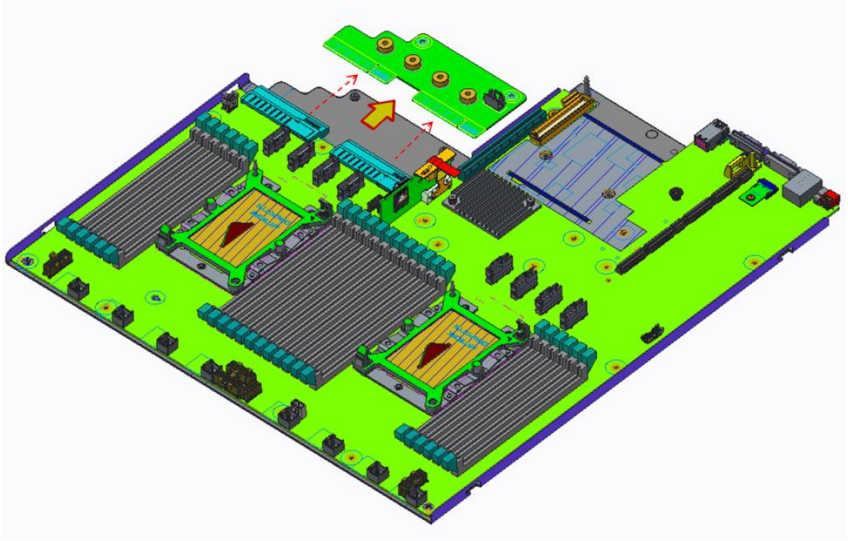


Figure 84. Removing the power interposer board

Next steps

Install the system board and power interposer board.

Installing the system board and power interposer board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Install the power interposer board to the system board.

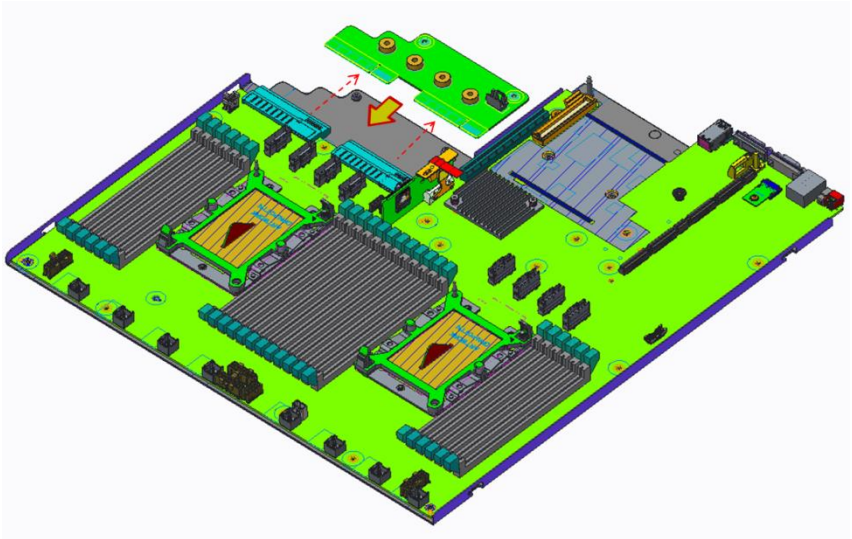


Figure 85. Installing the power interposer board

2. Install system board and power interposer board to system board tray.
3. Tighten the one original screw to secure the system board handle to the system board.
4. Tighten the eighteen screws to secure the system board and power interposer board to the system board tray.

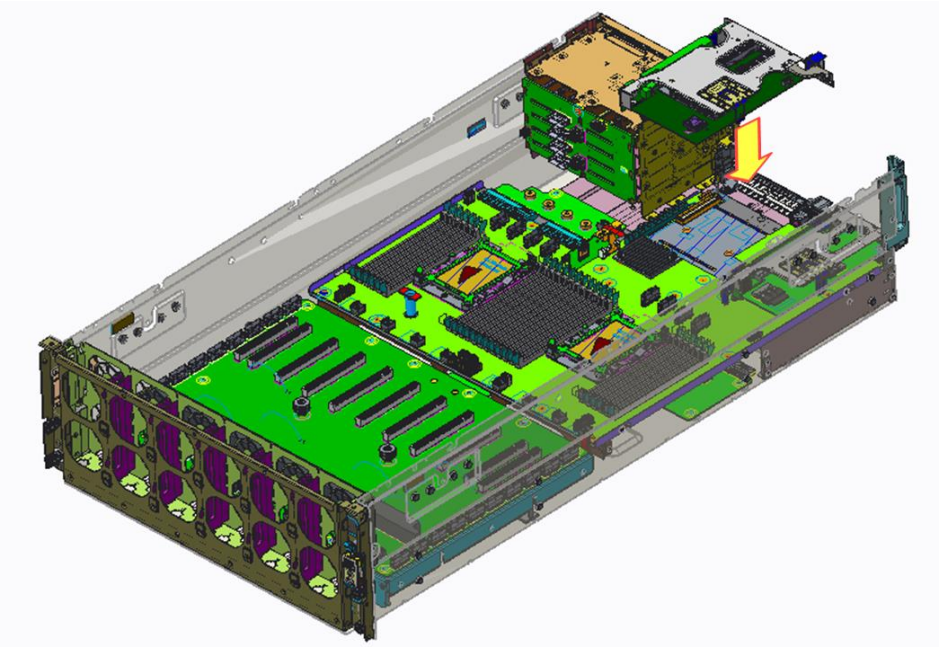


Figure 86. Installing the system board and power interposer board

Next steps

1. Install the system board tray module.
2. Install the air shroud.
3. Install the top cover.
4. Follow the procedure listed in After working inside your system

Backup battery

Replacing the backup battery

Prerequisites

CAUTION: Dispose the battery according to local ordinance.

NOTE: You will need to run the BIOS Setup to restore the configuration settings to the RTC.

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

Steps

1. Locate the battery on the server board.

Figure 87. Locate the battery on the server board

2. Gently press the metal clip as shown to release the battery.
3. Remove the battery from the plastic socket.

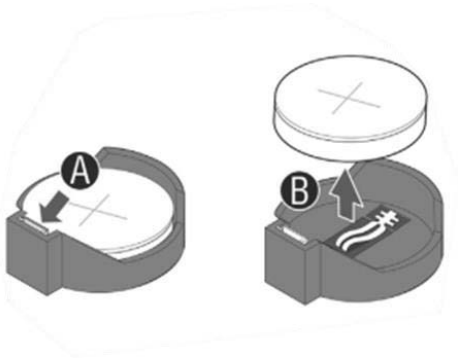


Figure 88. Replacing the backup battery

4. Dispose of the battery according to local ordinance.
5. Remove the new lithium battery from its package, and, being careful to observe the correct polarity, insert it in the battery socket.

Next steps

1. Install the butterfly module.
2. Install the top cover.

3. Follow the procedure listed in After working inside your system.
4. While booting, press F2 to enter the **System Setup** and ensure that the battery is operating properly.
5. Enter the correct time and date in the **System Setup Time** and **Date fields**.
6. Exit the **System Setup**.

Power distribution board

Removing the power distribution board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the following:
   a. Remove the system cover.
   b. Remove the power supplies..
   c. Remove the air shroud.
   d. Remove the system board tray module
   e. Disconnect all the cables from the power distribution board.

Steps

1. Remove the eighteen screws securing the power interposer board to the system board chassis.
2. Lift the power distribution board from the system chassis.

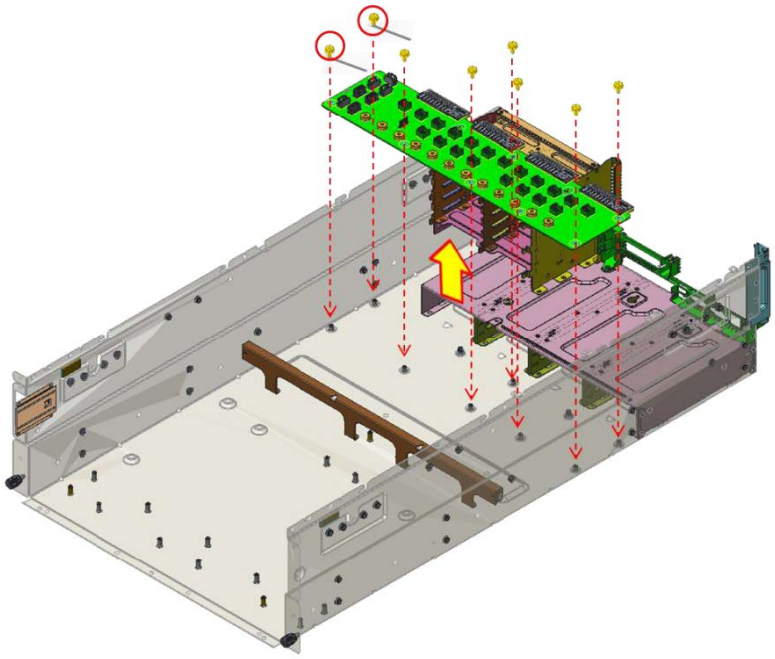


Figure 89. Removing power distribution board

Next steps

1. Install the power distribution board.

Installing the power distribution board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Install the power distribution board to the system chassis.
2. Tighten the eight screws to secure the power distribution board to the system chassis.

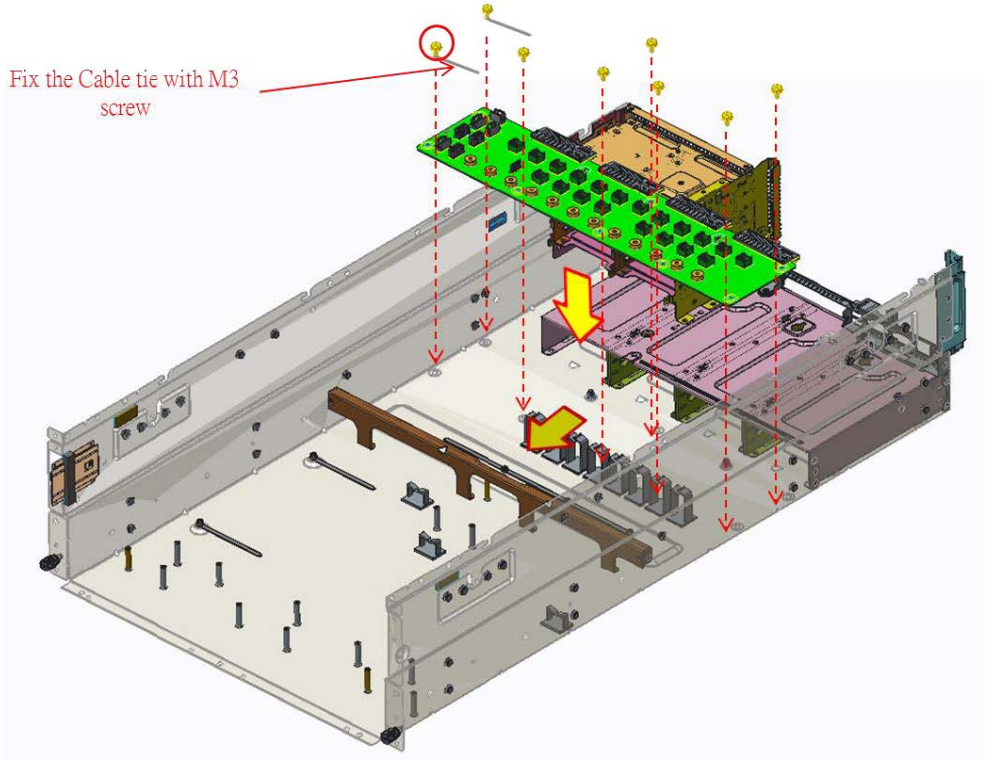


Figure 90. Installing the power distribution board

Next steps

1. Connect all cables from the power distribution board.
2. Install the system board tray module.
3. Install the Air shroud
4. Install all the PSUs.
5. Install the system cover
6. Follow the procedure that is listed in After working inside your system.

PSB power interposer board

Removing the PSB power interposer board

Prerequisites

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

b. Remove the air shroud.
c. Remove the GPU card.
d. Remove the GPU support bracket.
e. Remove the PCIe switch board module.
f. Remove the system board tray module.

Steps

1. Remove the four screws securing the PSB power interposer board to the system.
2. Lift the PSB power interposer board from the system.

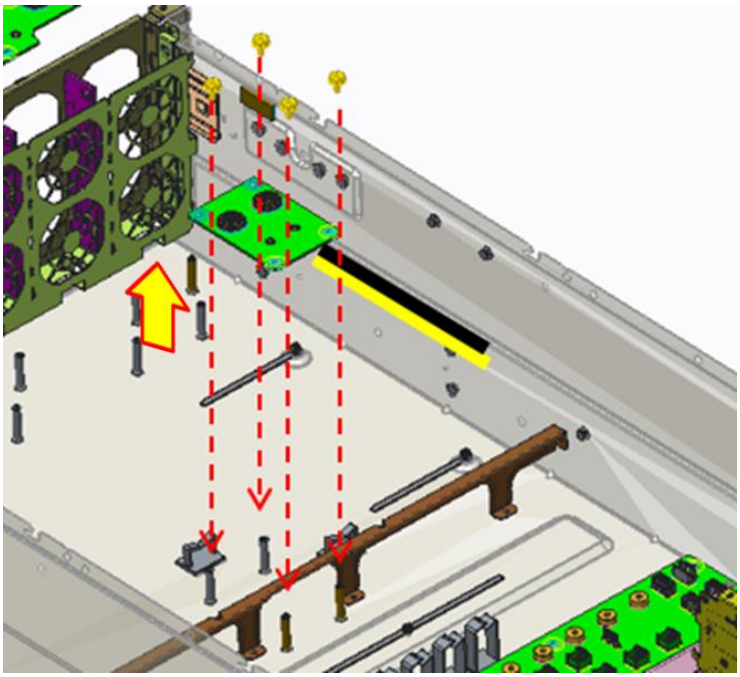


Figure 91. Removing the PSB power interposer board

Next steps

1. Disconnect all cables from the PSB power interposer board.
2. Install the PSB power interposer board.

Installing the PSB power interposer board

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Connect all cables to the PSB power interposer board

Steps

1. Install the PSB power interposer board to the system.
2. Tighten the four screws to secure the PSB power interposer board to the system.

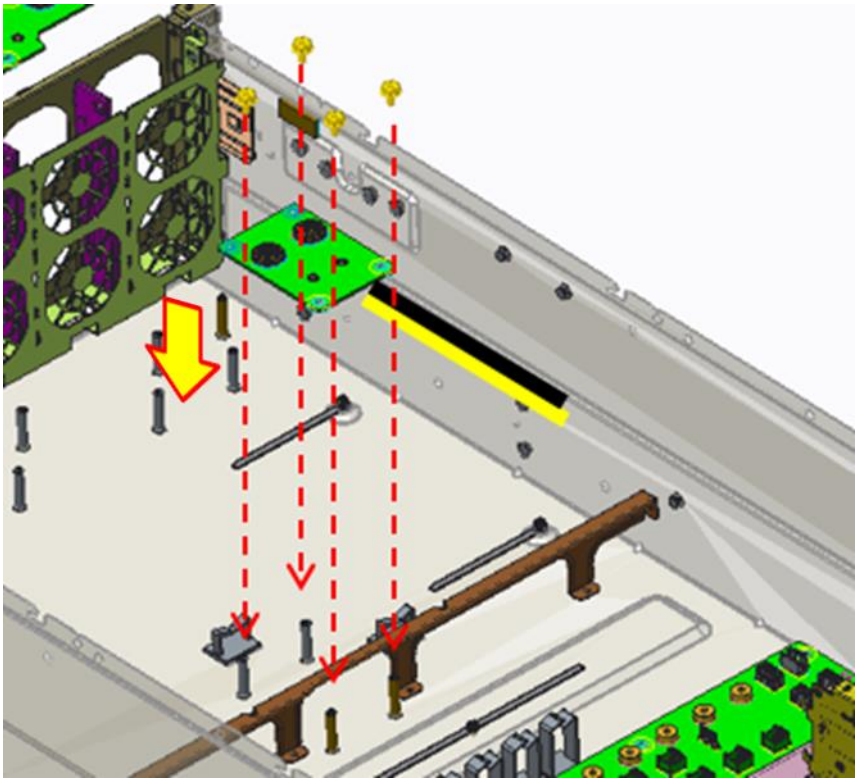


Figure 92. Installing the PSB power interposer board

Next steps

1. Install the system board tray module.
2. Install the Air shroud
3. Installing a PCIe switch board
4. System cover
5. Follow the procedure that is listed in After working inside your system.

Front control module

Removing the front control module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the following:
   a. System cover.
   b. Front bezel
   c. Butterfly module

Steps

1. Disconnect front control module cable from system board.
2. Loosen the two screws.
3. Lift the front control module from the fan cage.

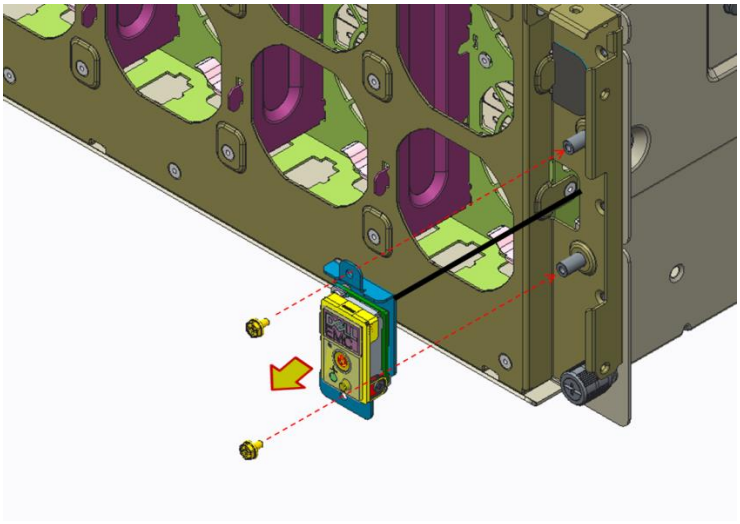


Figure 93. Removing the front control module

Next steps

1. Install the front control module.

Installing the right control panel

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Install the front control module into the chassis.
2. Secure the front control module using two screws.
3. Connect the front control module cable to the system board and ensure that the cable routing is correct.

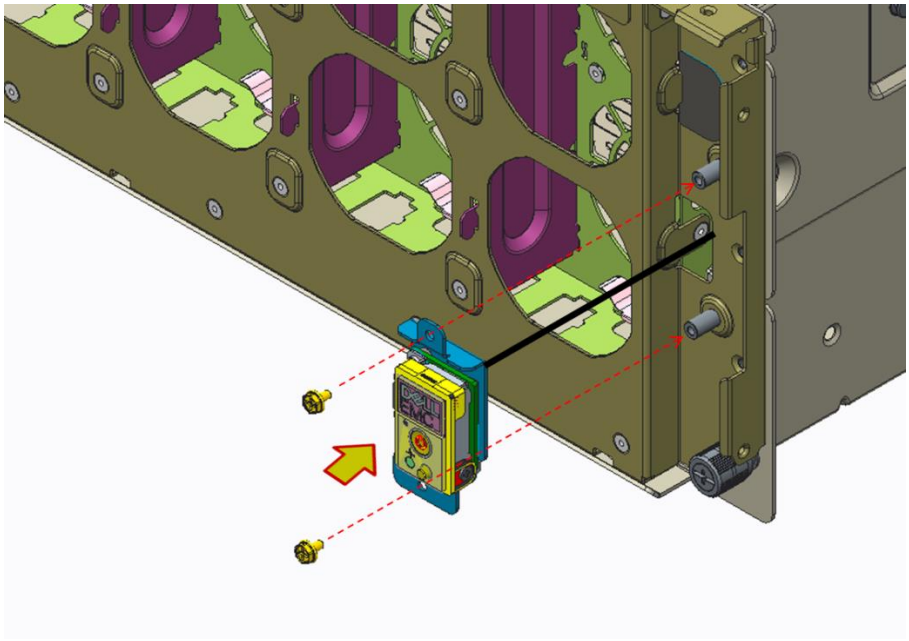


Figure 94. Installing the front control module

Next steps

1. Install the Butterfly module,front bezel,System cover.
2. Follow the procedure listed in After working inside your system.

Fan louvers

Removing the fan louvers

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the system cover.
4. Remove the PCIe switch board module.
5. Remove the air shroud.
6. Remove the GPU support bracket.

Steps

1. Lift the fan louver from the hooks
2. Pull the fan louver away from the system.

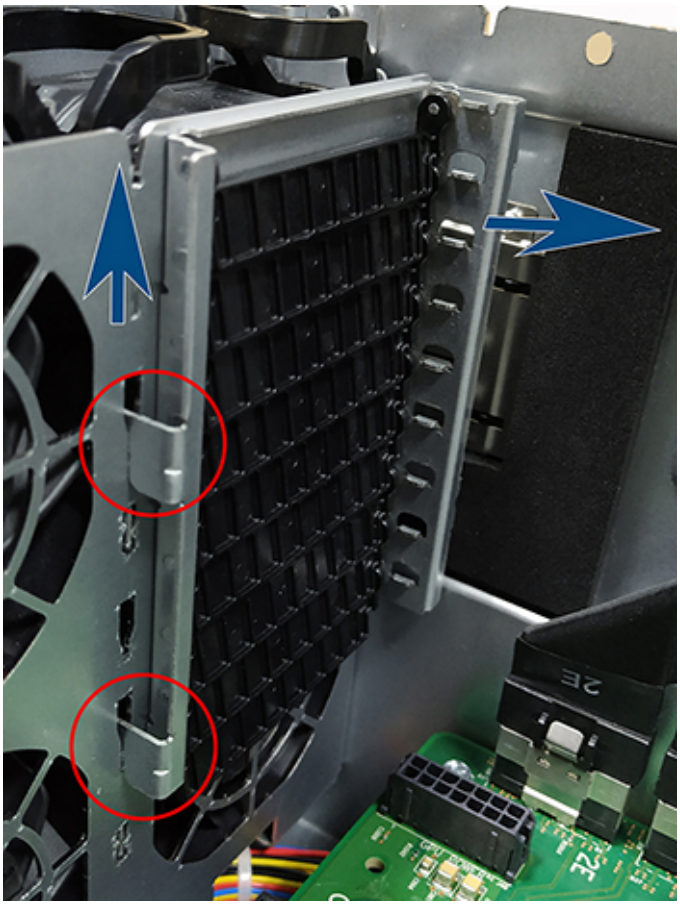


Figure 95. Removing the fan louvers

Installing the fan louvers

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Locate the corresponding hole on the fan cage.

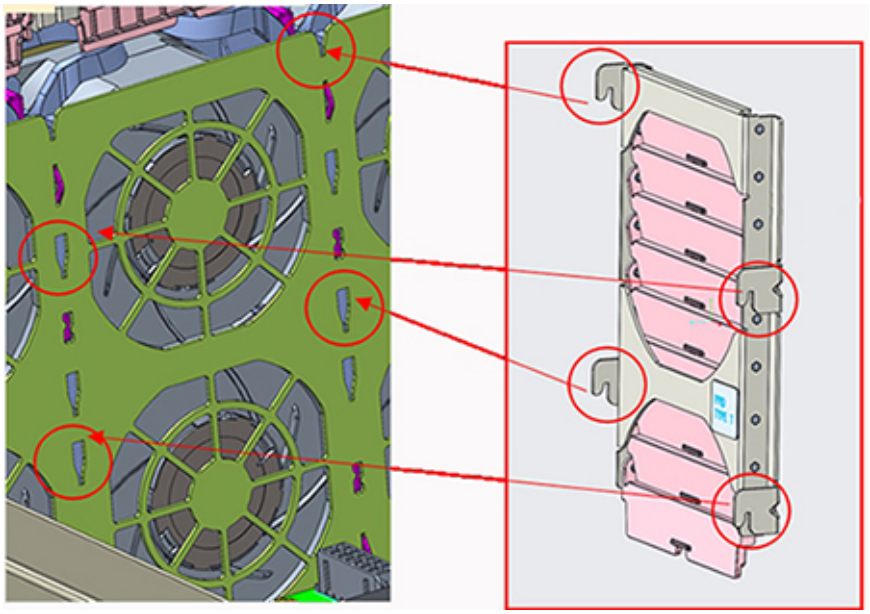
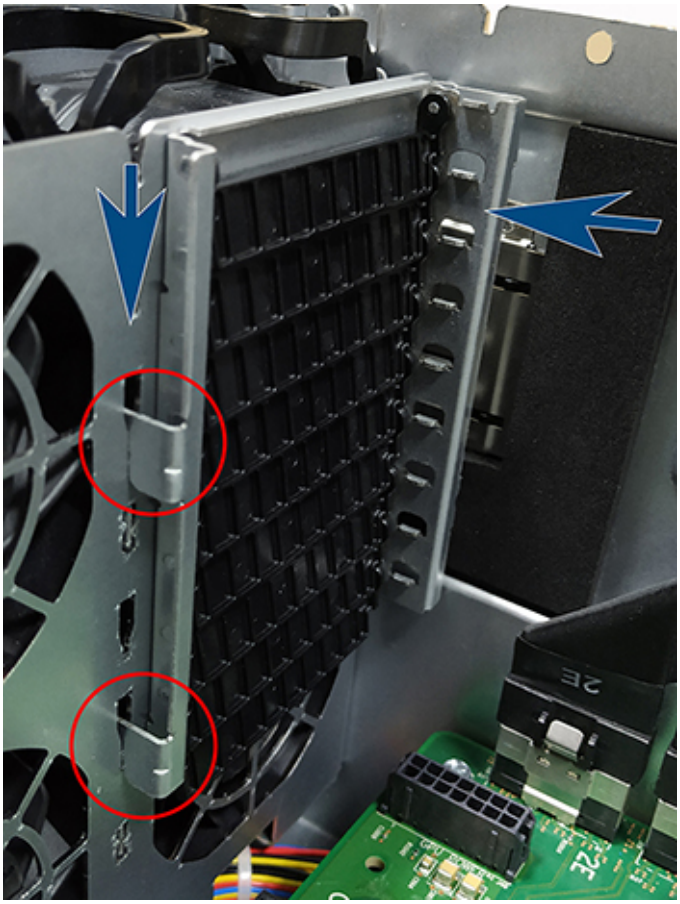


Figure 96. Fan louver hook position

2. Hook the fan louver to the fan cage assembly.



Next steps

1. Install the following:
   a. GPU clamp and GPU card
   b. Air shroud
   c. System cover
2. Follow the procedure listed in After working inside your system

Cooling fans

Replacing a cooling fan

Prerequisites

CAUTION: Cooling fans are not hot swappable.

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

Steps

1. Hold the fan and pull it straight up to remove it from the fan cage.

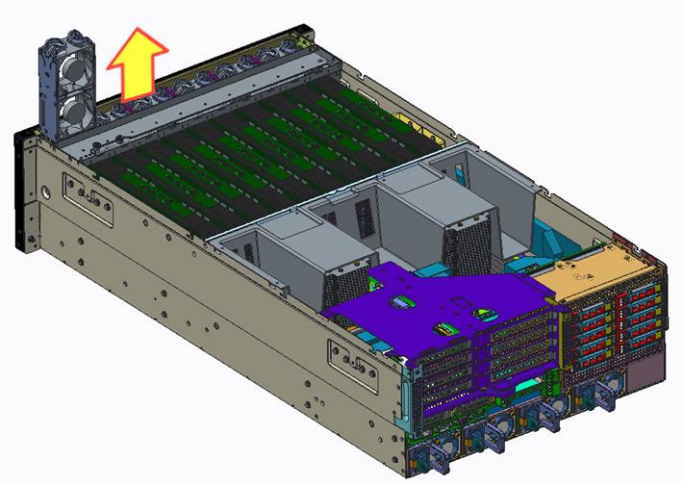


Figure 97. Removing the cooling fan

2. Replace the system fan.

   CAUTION: To avoid injury, do not remove or install the fan by holding the fan blades.

Next steps

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

Fan cage

Removing the fan cage

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Follow the procedure listed in Before working inside your system.
3. Remove the system cover.
4. Remove the PCIe switch board module.
5. Remove the air shroud.
6. Remove the GPU support bracket.
7. Remove the system board tray module.
8. Remove the front control module.
9. Disconnect fan cables from the power distribution board.

Steps

1. Remove the sixteen screws securing the fan cage to the system chassis.
2. Lift the fan cage out of the system chassis.
3. Disconnect the fan cables from the fan cage. For more information, see fan cable assembly to fan bracket cable routing.

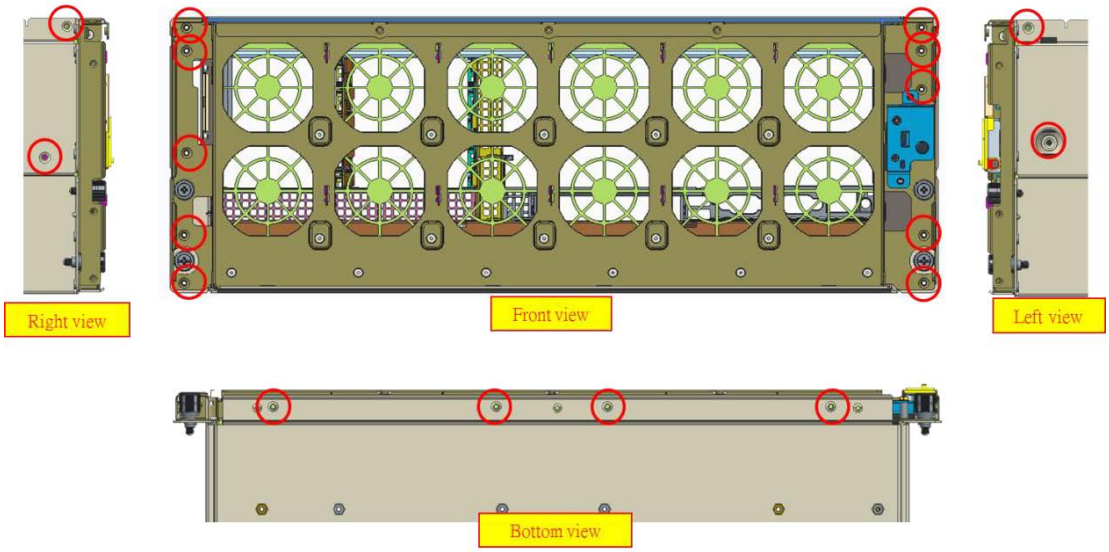


Figure 98. Removing the fan cage

Next steps

1. Install the fan cage

Installing the fan cage

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Install the fan cable to the fan cage.
2. Install the fan cage to the power distribution board.
3. Tighten the sixteen screws to secure the fan cage to the system chassis.

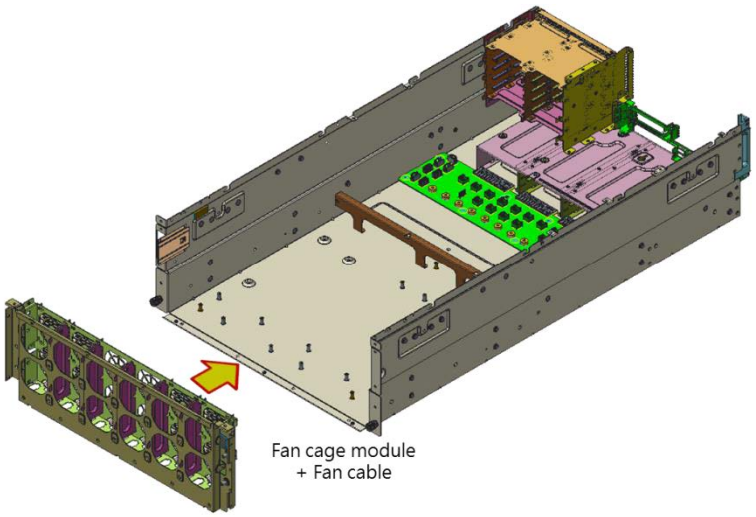


Figure 99. Installing the fan cage

Next steps

1. Connect the fan cable to the PSB power interposer board.
2. Install the following:
   a. Install the front control module.
   b. System board tray module.
   c. Air shroud
   d. PCIe switch board module.
   e. System cover
3. Follow the procedure listed in After working inside your system

Handle

Removing the handle

Prerequisites

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

Steps

1. Unlock the handle by plunger.
2. Remove the handle from the chassis.

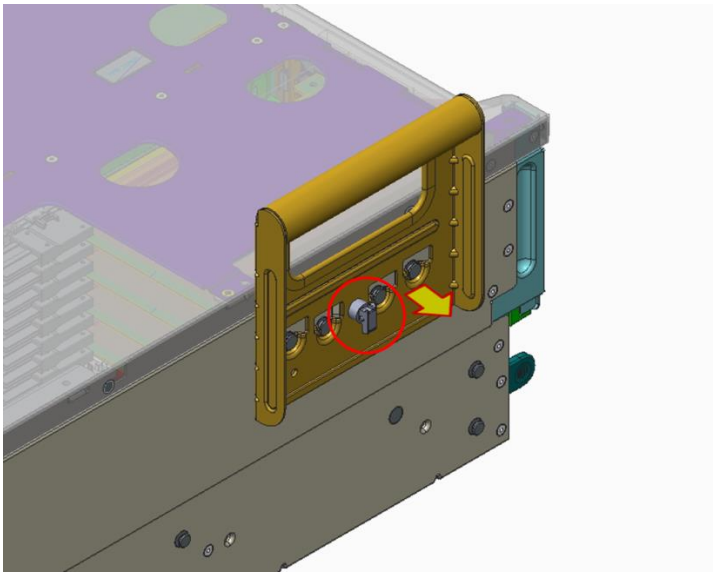


Figure 100. Removing the handle

Next steps

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

Installing the handle

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Install the handle into the chassis.
2. Lock the handle by plunger.

NOTE: Please install the four handles in chassis simultaneously for lifting the system.

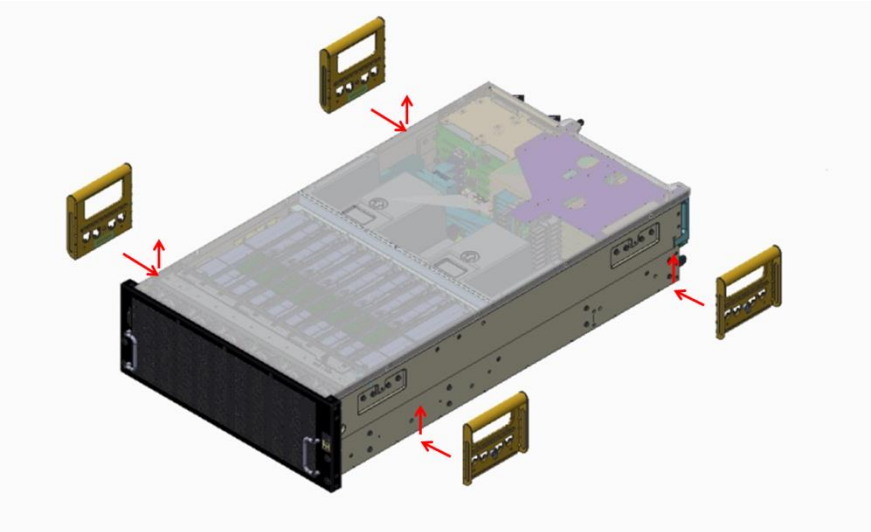


Figure 101. Installing the handle

Next steps

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

Slide rail installation

Prerequisites

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

Steps

1. Take out the inner member and slide the intermediate member back.

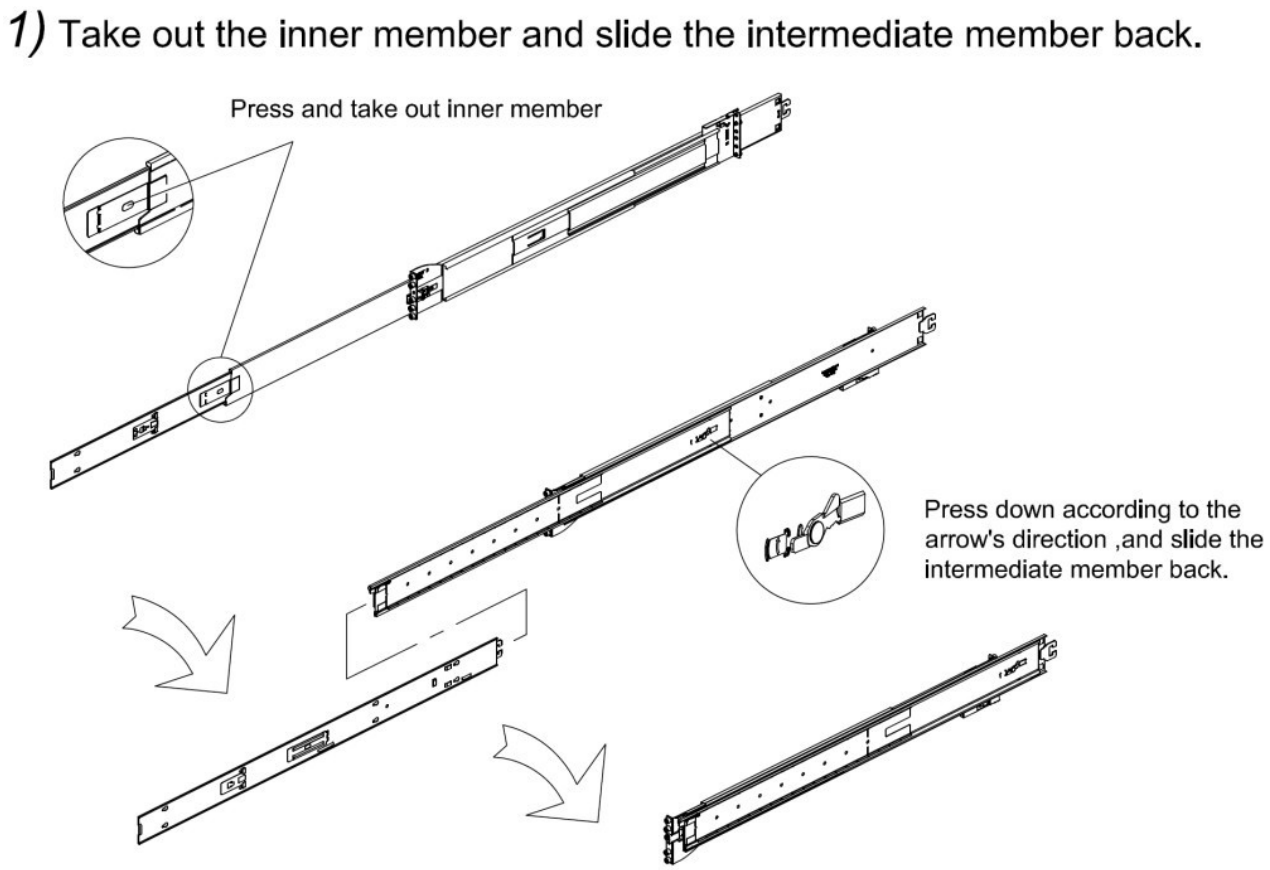


Figure 102. Removal of the inner member

2. Install the inner member into the chassis.

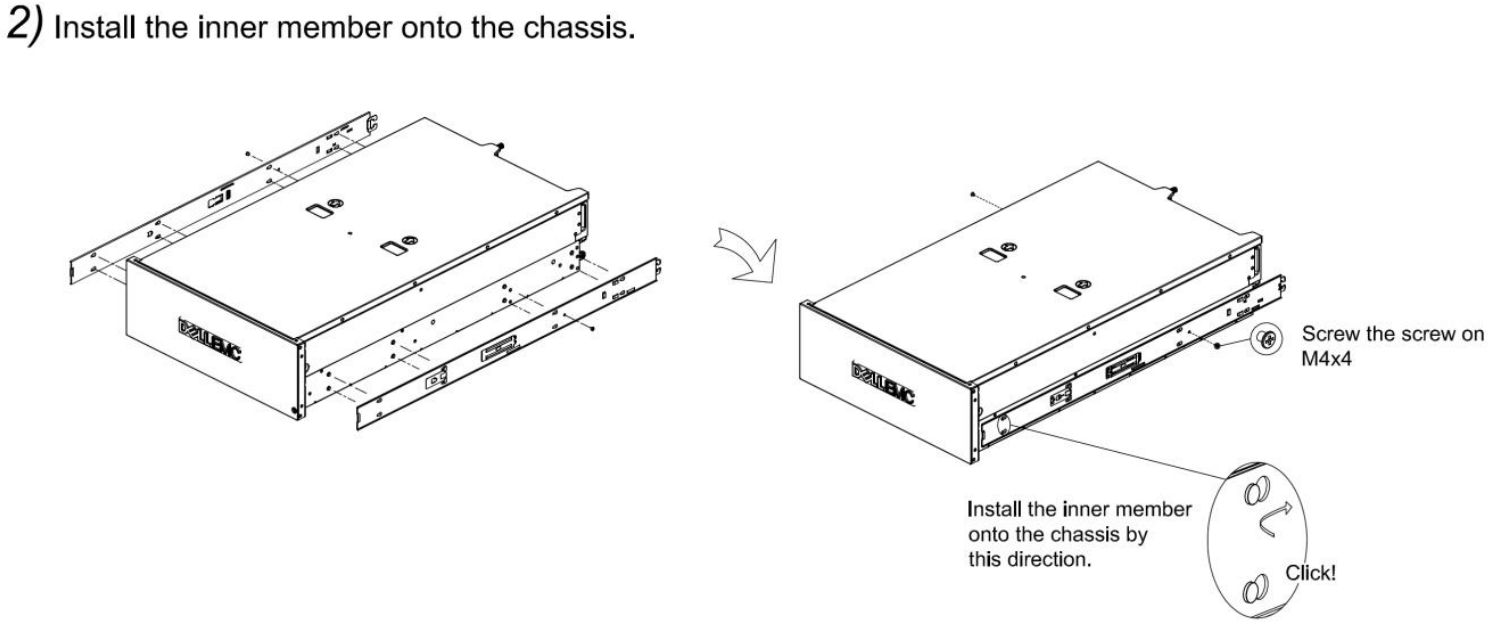


Figure 103. Installation of inner member into the chassis

3. Screw the outer member and bracket into the racket.

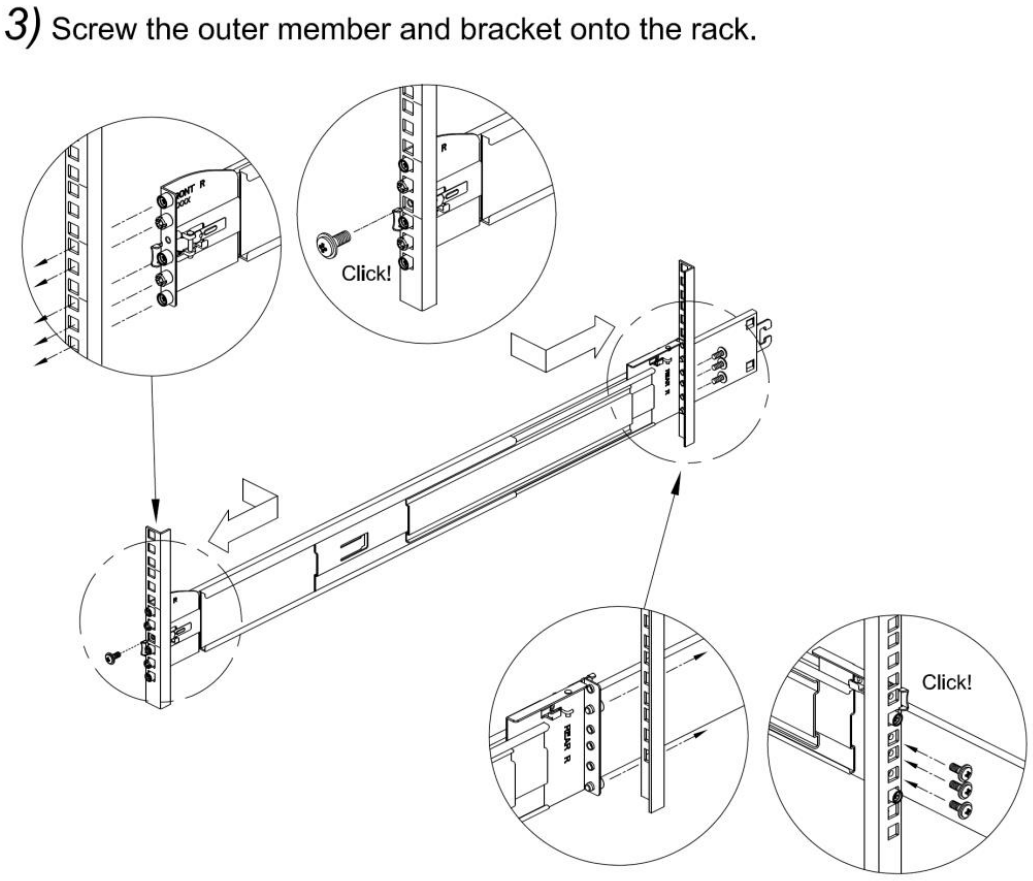


Figure 104. Installation of outer member into the rack

4. Insert the chassis to complete the installation.
   a. Pull the middle rail fully extended in lock position, ensure ball bearing retainer is located at the front of the middle rail.
   b. Insert the chassis into middle-outer rails.
   c. When hit a stop, please push the release tab on middle rail.
   d. Tighten chassis with shipping screws.

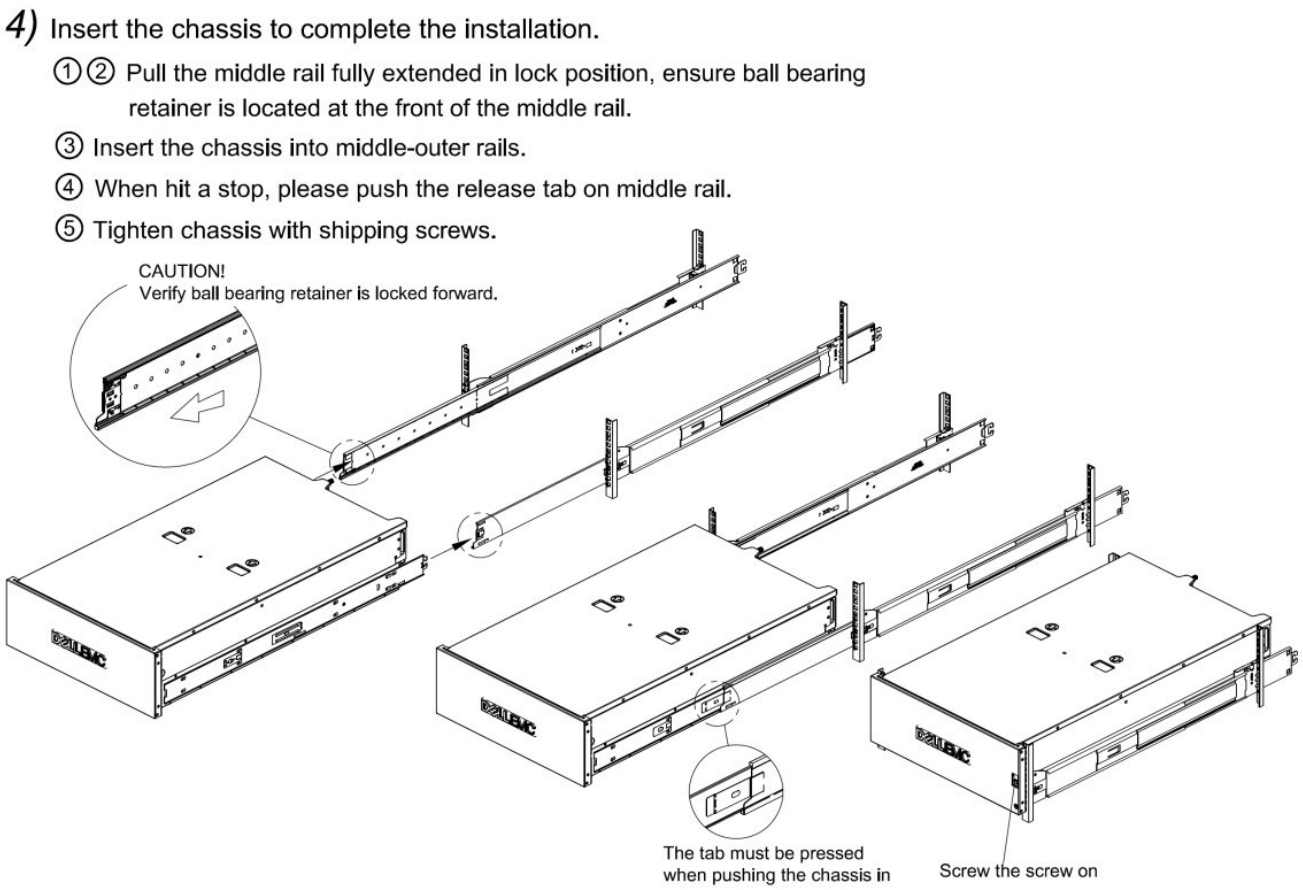


Figure 105. Completion of installation

CAUTION: Verify ball bearing retainer is locked forward.

Next steps

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

7

Cable Routing

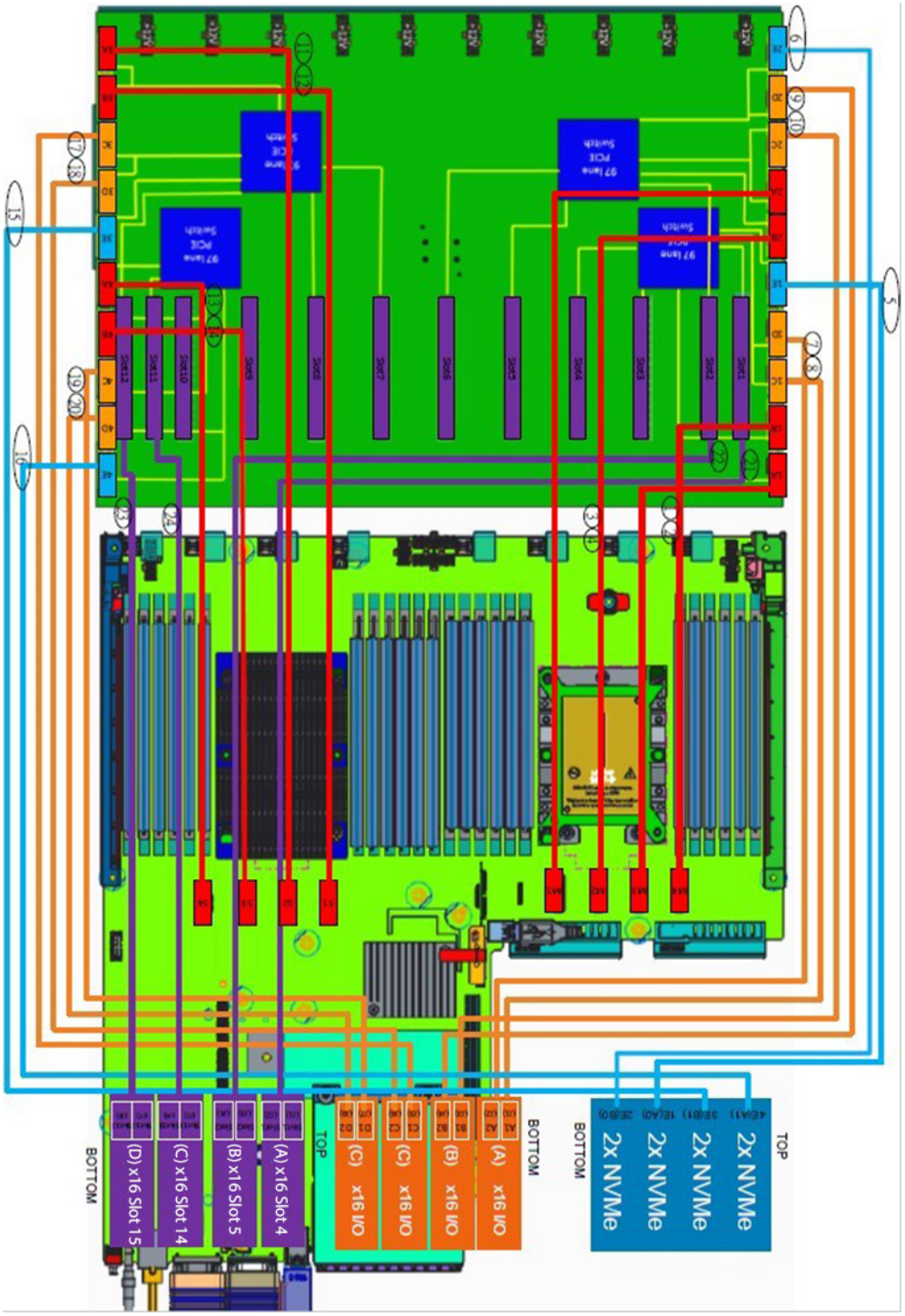


Figure 106. Cable Routing

Topics:

- Dell EMC DSS8440 cable instruction

- 3M cable Installation-Config A left
- 3M cable Installation-Config A right
- Fan cable assembly to fan bracket
- Fan cable MB-PDB assembly to MB
- Fan cable MB-PDB assembly to PDB
- Front control cable assembly control board to MB
- GPU power cable assembly GPU card to PSB
- IDC cable MB-PDB assembly to PDB
- IDC cable MB-PDB assembly to MB
- IDC cable PDB-PIB assembly to PIB
- IDC cable PIB-PDB assembly to PDB
- IDC cable Riser1-PDB assembly to PDB
- IDC cable Riser1-PDB assembly to riser board1
- IDC cable PIB-PDB assembly to PDB
- IDC cable Riser 2- PDB assembly to riser board 2
- Mini SAS HD cable assembly PERC-HDBP
- Mini SAS HD cable assembly HDBP-MB
- Power cable BP-PDB assembly to BP
- Power cable BP-PDB assembly to PDB
- Power cable assembly to PDB
- Power cable assembly to PIB
- Power cable1 assembly to Riser1
- Power cable2 Riser-PDB assembly to PDB
- Power cable2 Riser-PDB assembly to Riser

Dell EMC DSS8440 cable instruction

Table 16. Cable list

Category	Item	Cable name	Connecting Topology	Usage
Power	1	Power-Cable	PDB <-> storage-drive BP	1
	2	Power-Cable 710mm yellow	PDB <-> PIB-GPGPU - 12V	2
	3	Power-Cable 710mm black	PDB <-> PIB-GPGPU - GND	2
	4	Power-Cable 350mm yellow	PDB <-> PIB-PSB - 12V	1
	5	Power-Cable 350mm black	PDB <-> PIB-PSB - GND	1
	6	Power-Cable 550mm yellow	PDB <-> PIB-GPGPU - 12V	1
	7	Power-Cable 550mm black	PDB <-> PIB-GPGPU - GND	1
	8	Power-Cable 390mm yellow	PDB <-> PIB-MB - 12V	1
	9	Power-Cable 390mm black	PDB <-> PIB-MB - GND	1
	10	Power-Cable	PDB <-> riser-3A	2
	11	Power-Cable	PSB <-> GPGPU	10
	12	Power-Cable	PDB <-> riser-3A	2

Table 16. Cable list (continued)

Category	Item	Cable name	Connecting Topology	Usage
Fan	13	Fan-cable	PDB <-> Fan-Module	1
	14	Fan-cable	PDB <->DSS8440	1
Sideband	15	IDC-Cable	PDB <-> PIB-MB	1
	16	IDC-Cable	PDB <-> riser-3A	1
	17	Front-I/O-Cable	Front-Module <-> DSS8440	1
	18	IDC-Cable	PDB <-> riser-3A	1
	19	IDC-Cable	PDB <-> riser-3A	1
SATA/SAS	20	mini SAS-HD-cable	H730P+ <-> storage-drive backplane	1
	21	OCu-Link-to-mini SAS-HD-Cable	C4140 <-> storage-drive backplane	1
SlimLine cable configuration	22	SlimLine left	PSB <-> DSS8440, riser-3A, storage-drive BP	1
	23	SlimLine right	PSB <-> DSS8440, riser-3A, storage-drive BP	1
	24	SlimLine Slot-4	PSB <-> riser-3A	1
	25	SlimLine Slot-5	PSB <-> riser-3A	1
	26	SlimLine Slot-14	PSB <-> riser-3A	1
	27	SlimLine Slot-15	PSB <-> riser-3A	1

3M cable Installation-Config A left

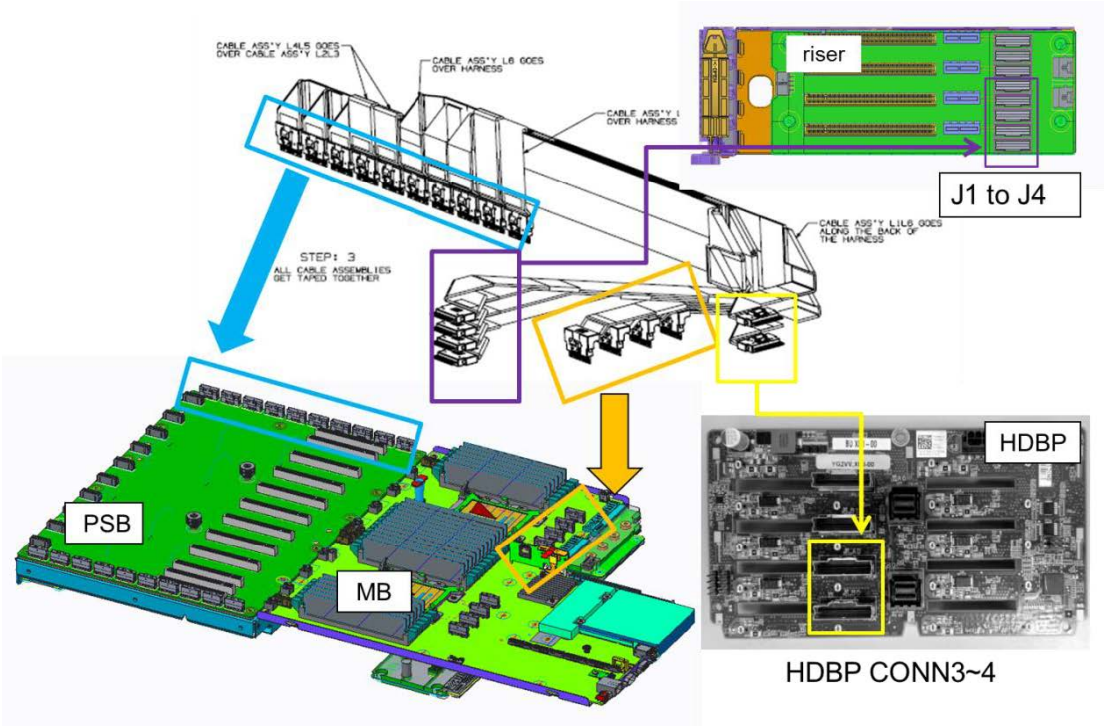


Figure 107. 3M cable Installation-Config A left

3M cable Installation-Config A right

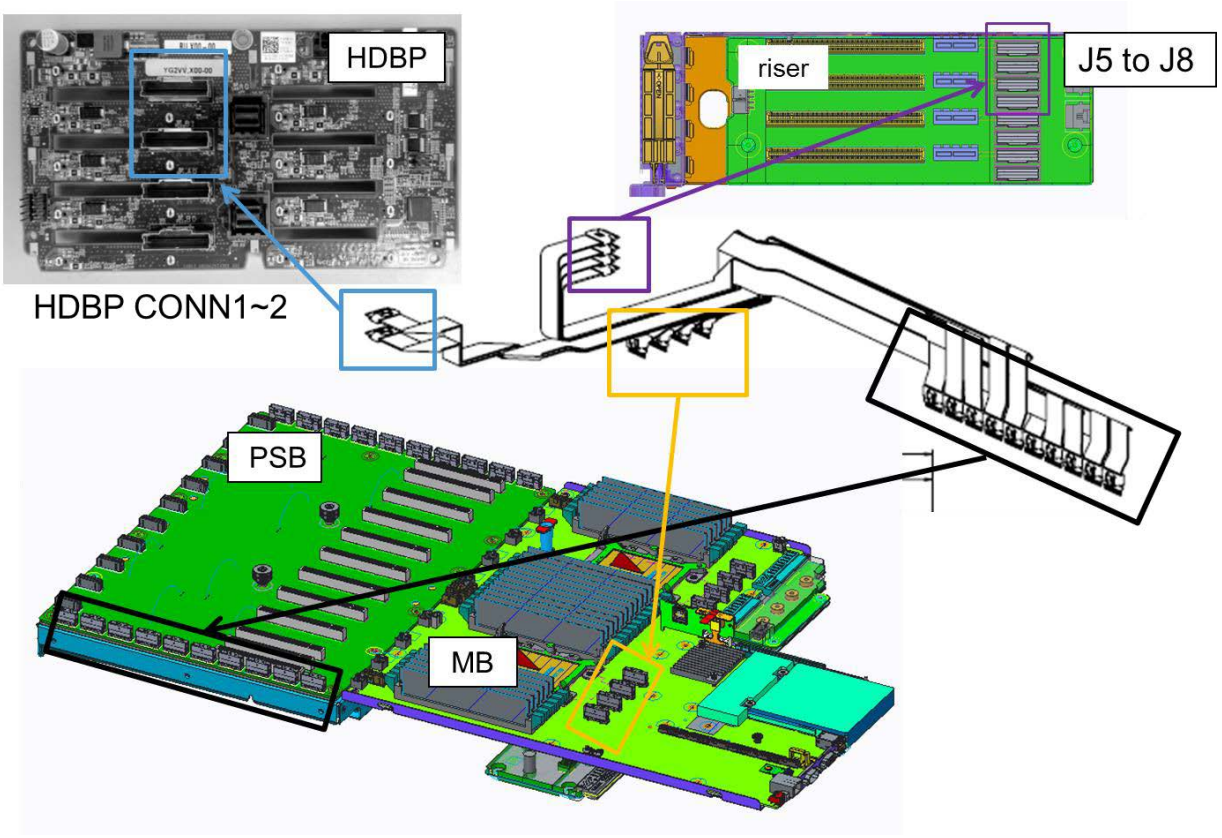


Figure 108. 3M cable Installation-Config A right

Fan cable assembly to fan bracket

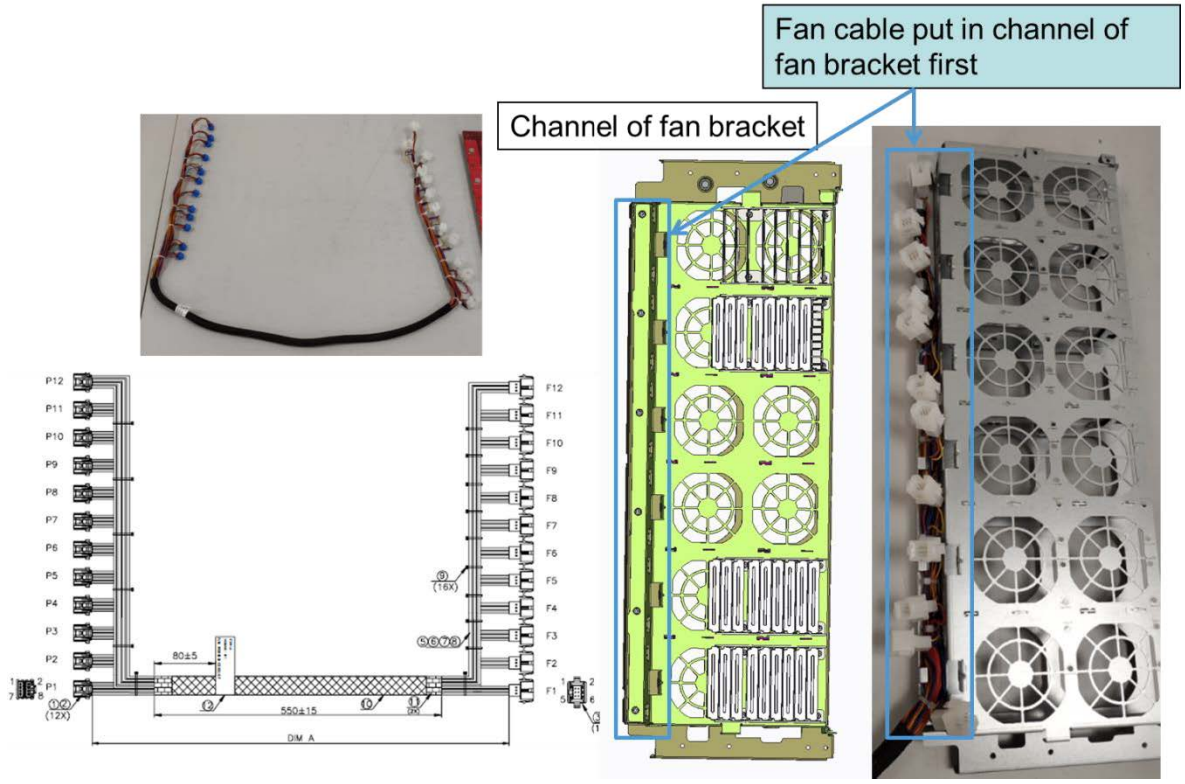


Figure 109. Fan cable assembly to fan bracket

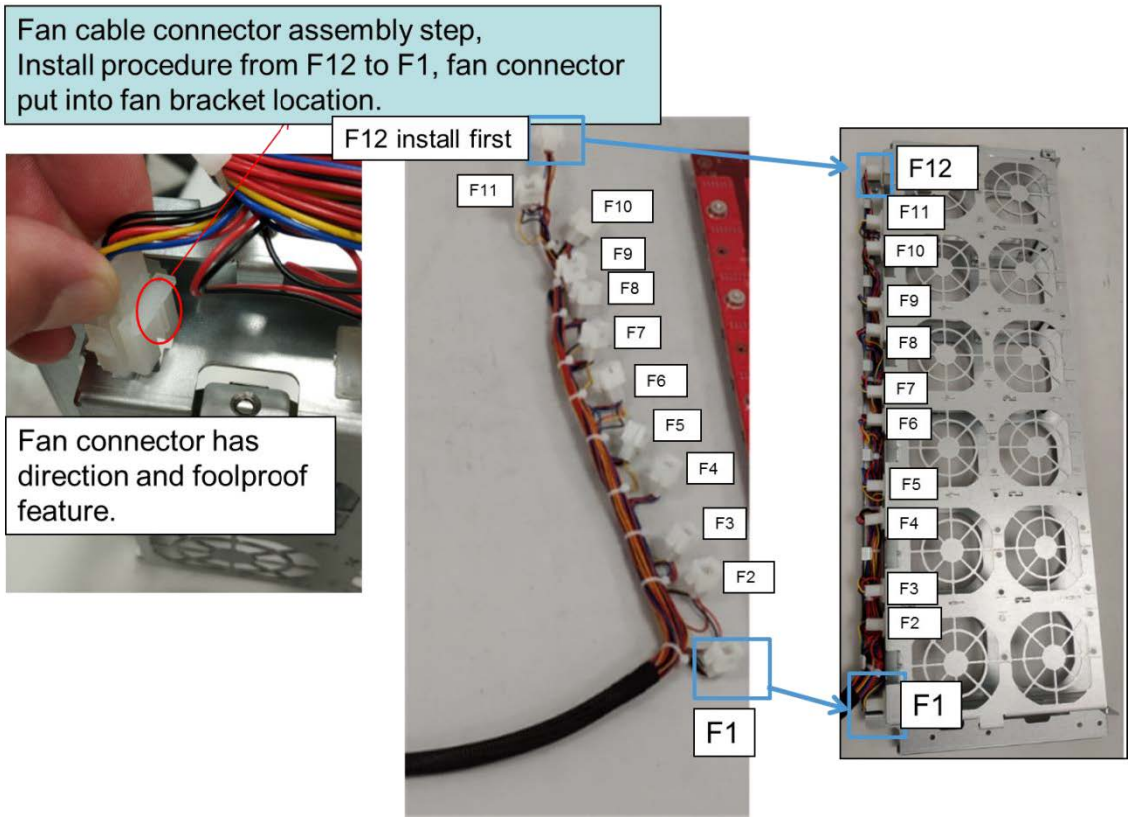


Figure 110. Fan cable assembly to fan bracket

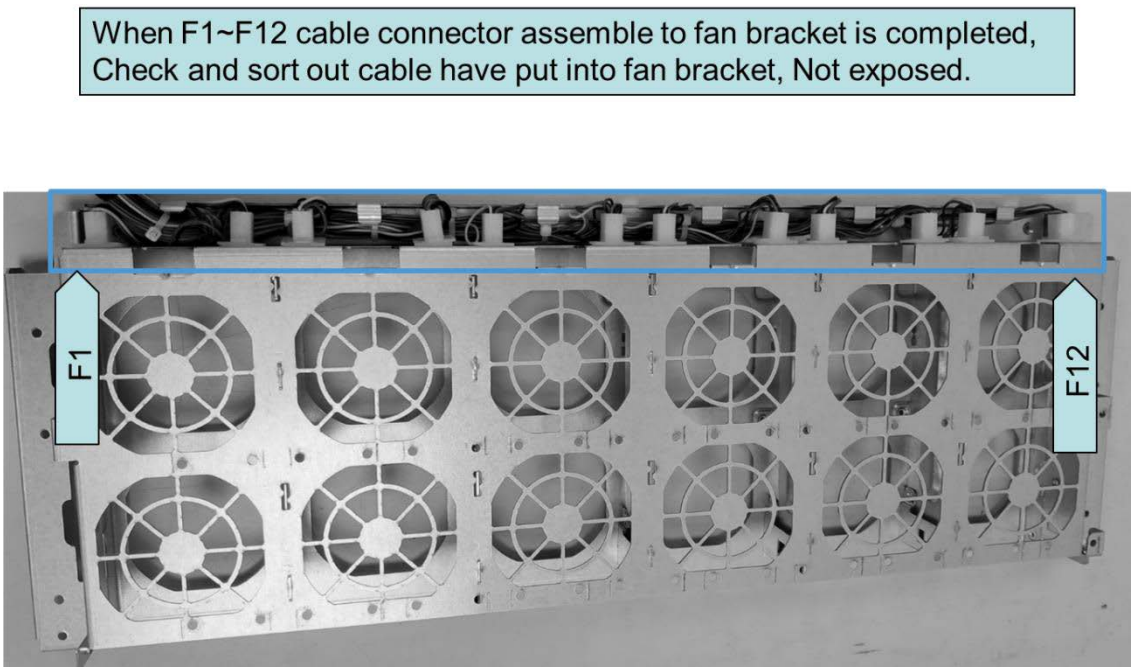


Figure 111. Fan cable assembly to fan bracket

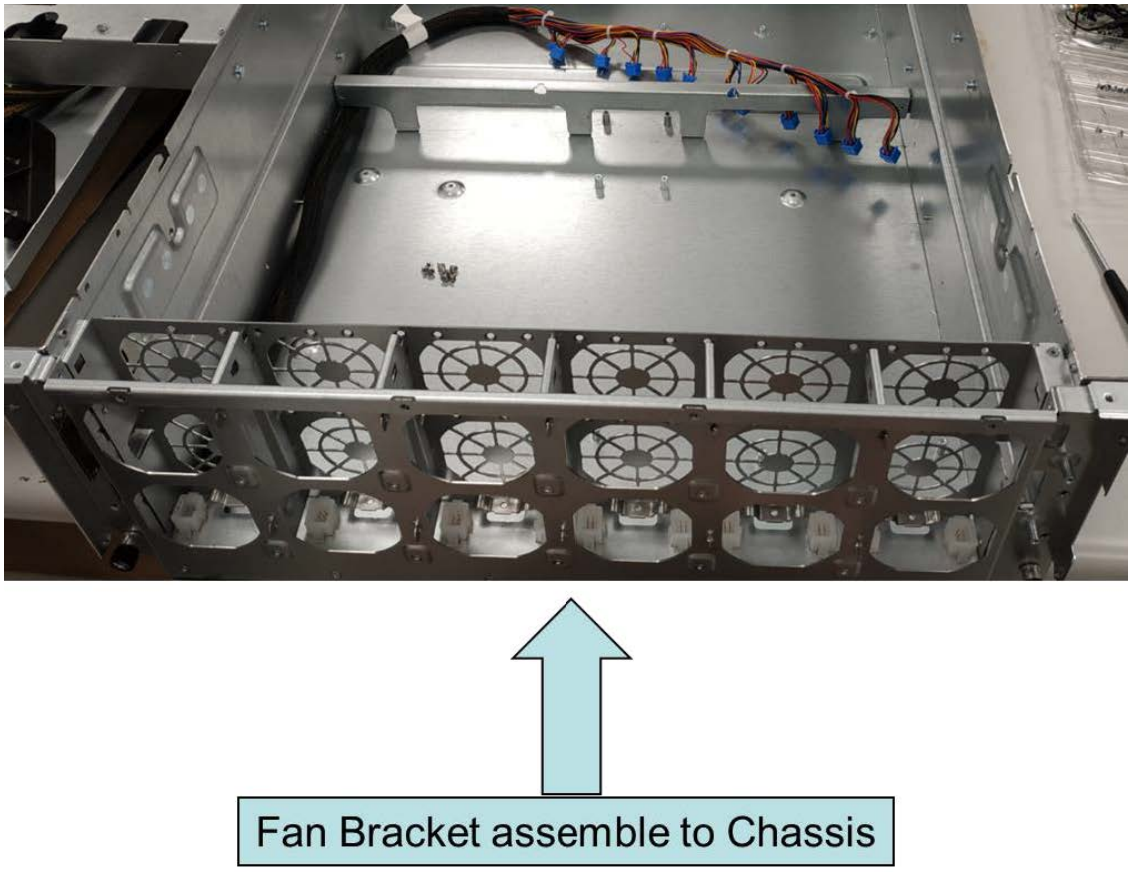


Figure 112. Fan cable assembly to fan bracket

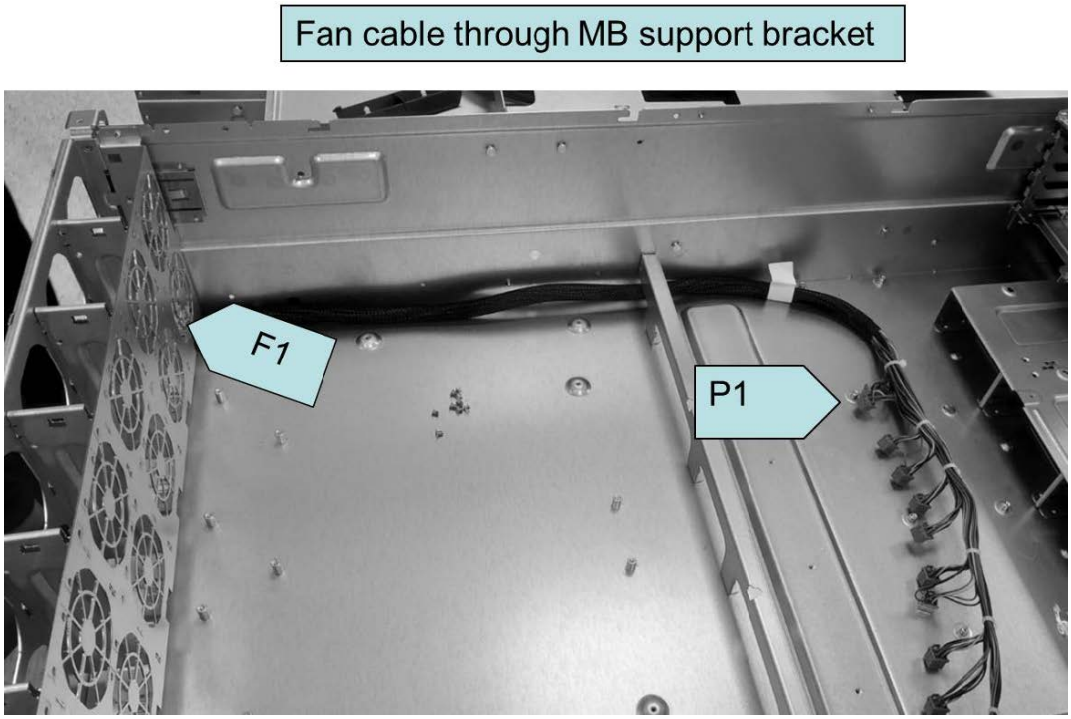


Figure 113. Fan cable assembly to fan bracket

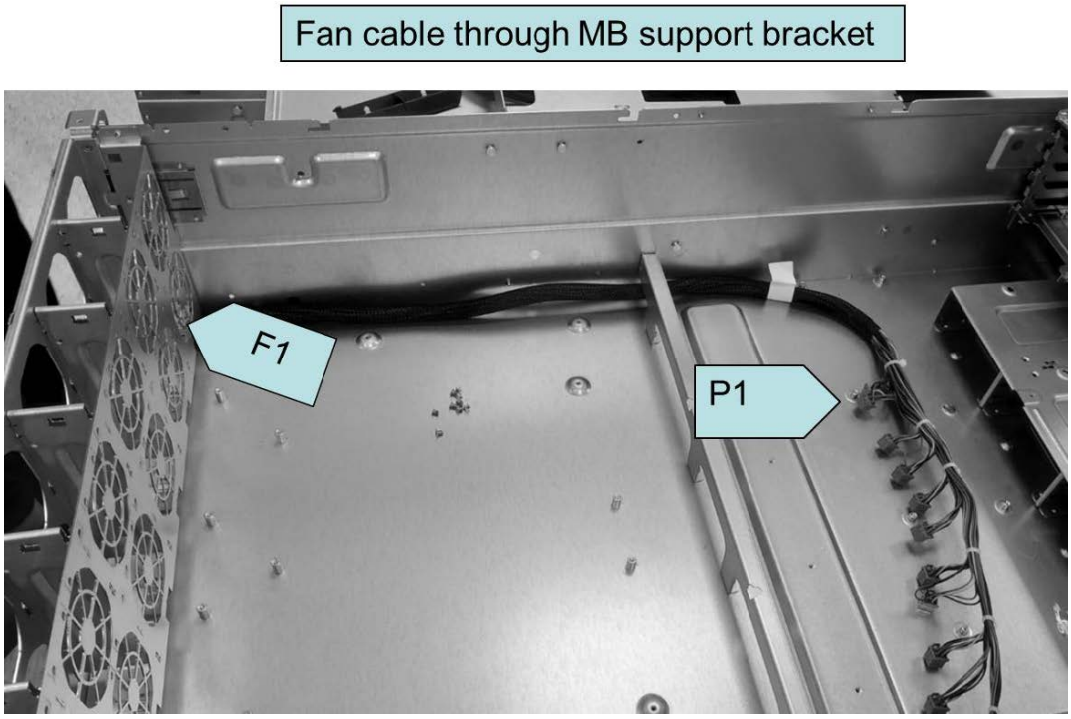


Figure 114. Fan cable assembly to fan bracket

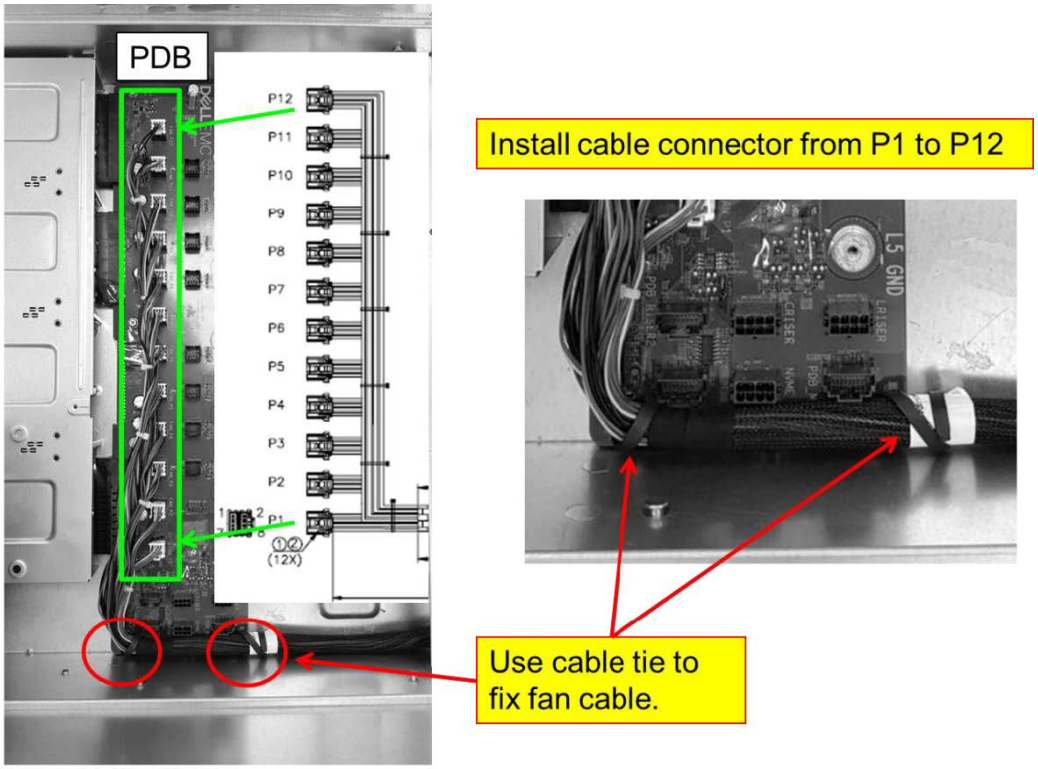


Figure 115. Fan cable assembly to fan bracket

Fan cable MB-PDB assembly to MB

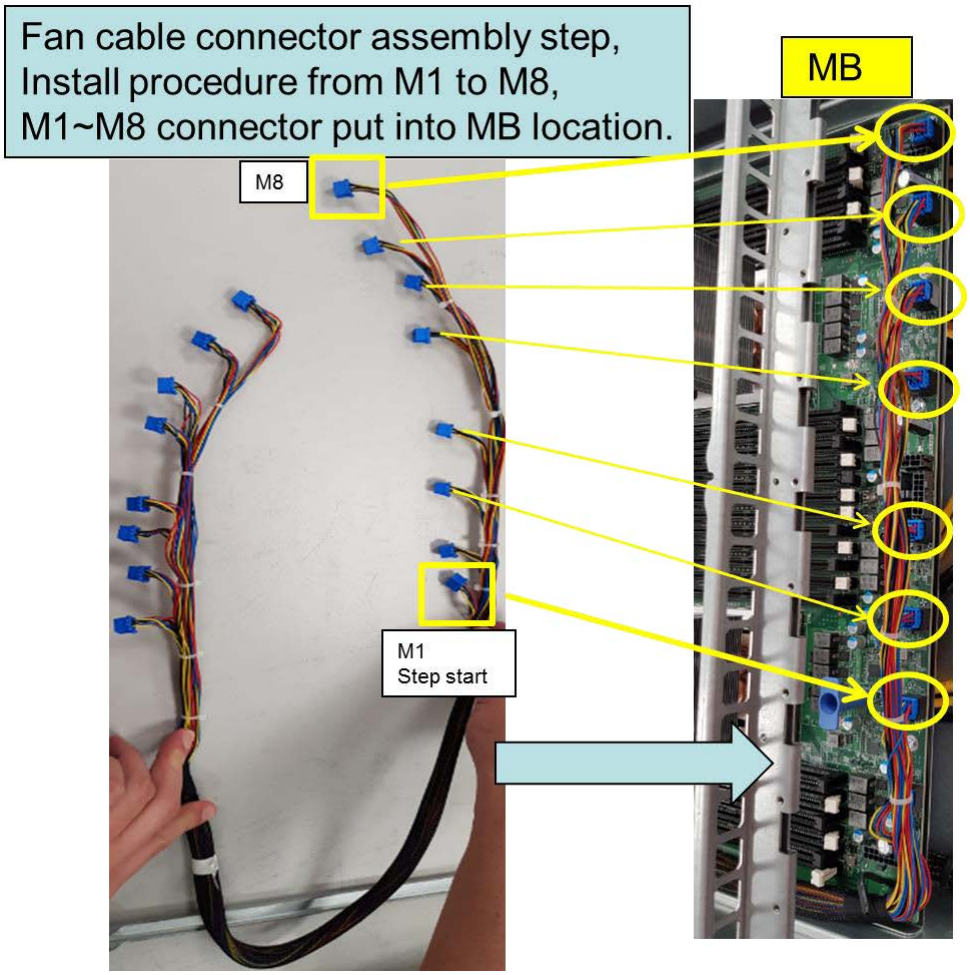


Figure 116. Fan cable MB-PDB assembly to MB

Fan cable MB-PDB assembly to PDB

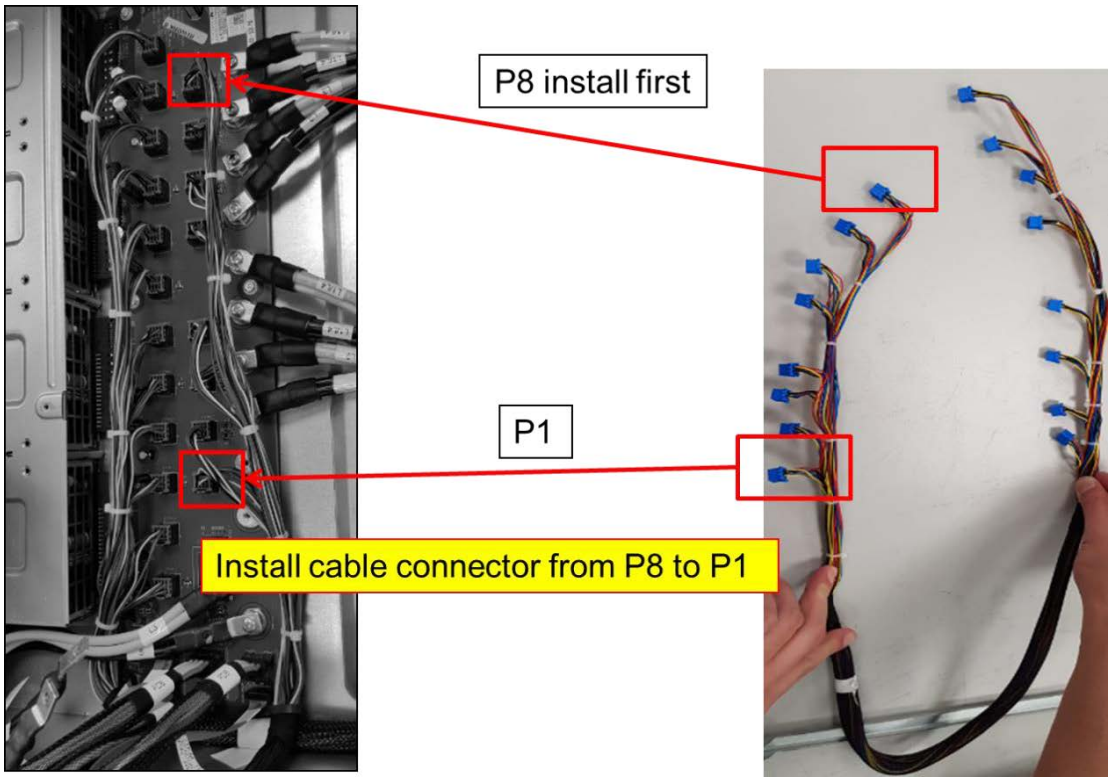


Figure 117. Fan cable MB-PDB assembly to PDB

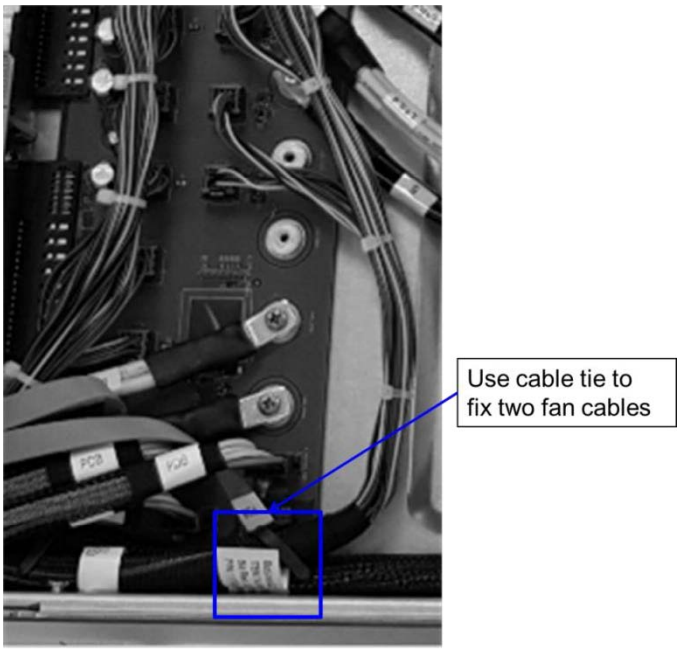


Figure 118. Fan cable MB-PDB assembly to PDB

Front control cable assembly control board to MB

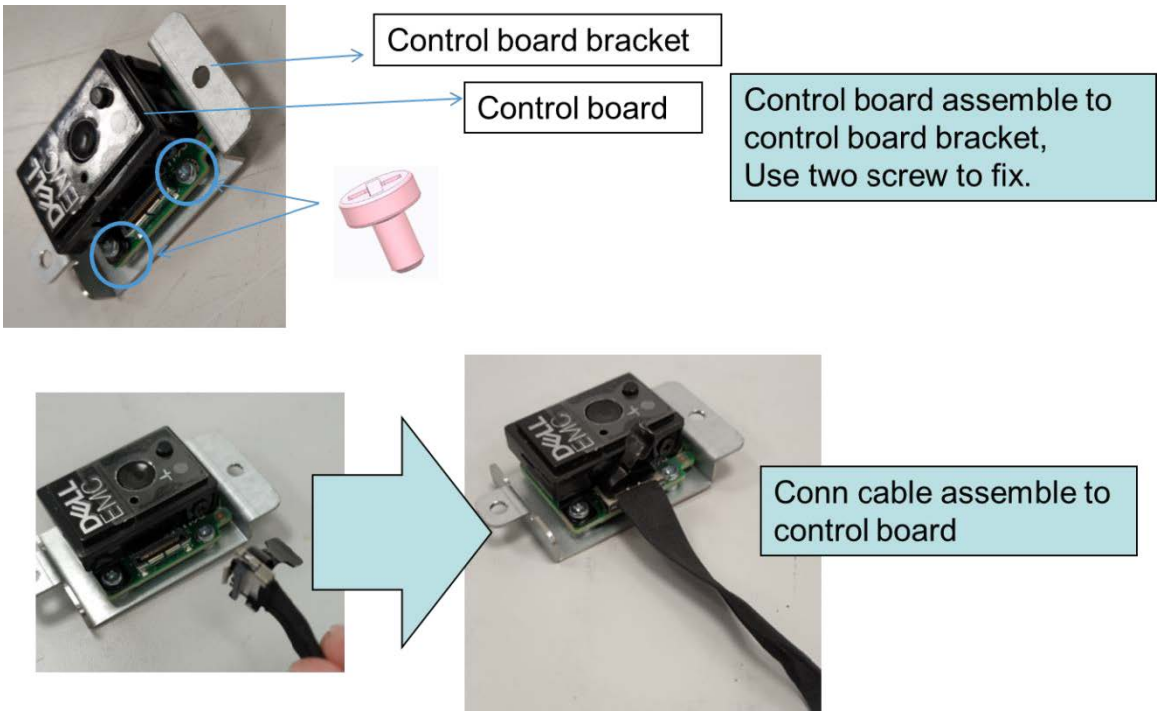


Figure 119. Front control cable assembly control board to MB

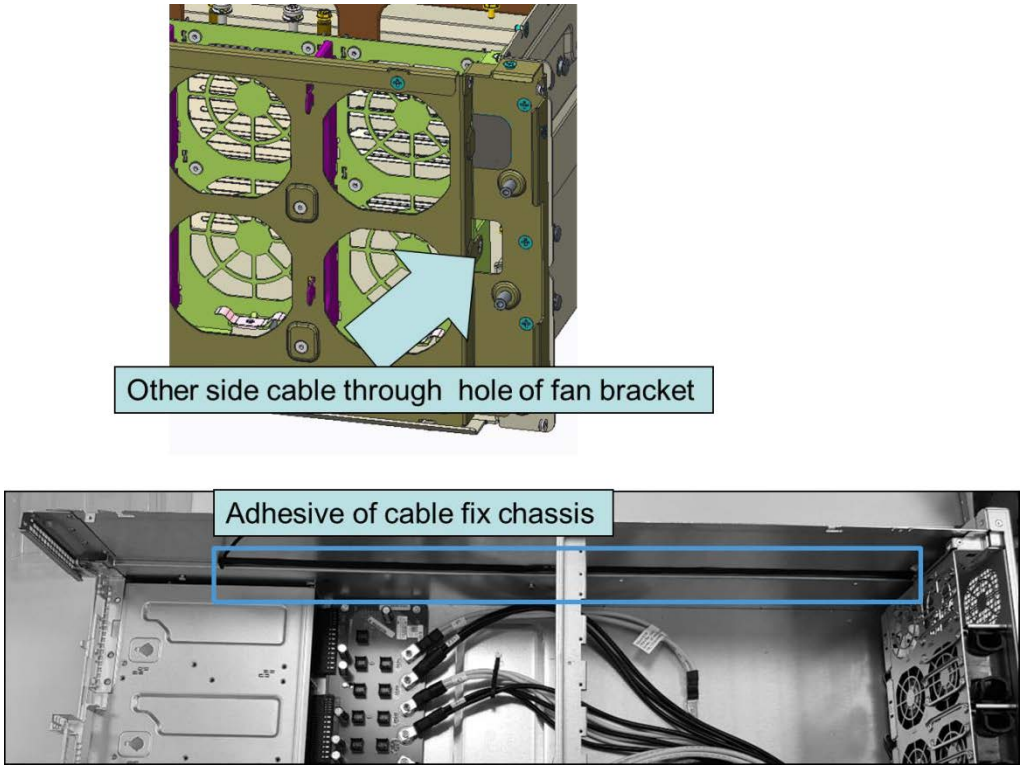


Figure 120. Front control cable assembly control board to MB

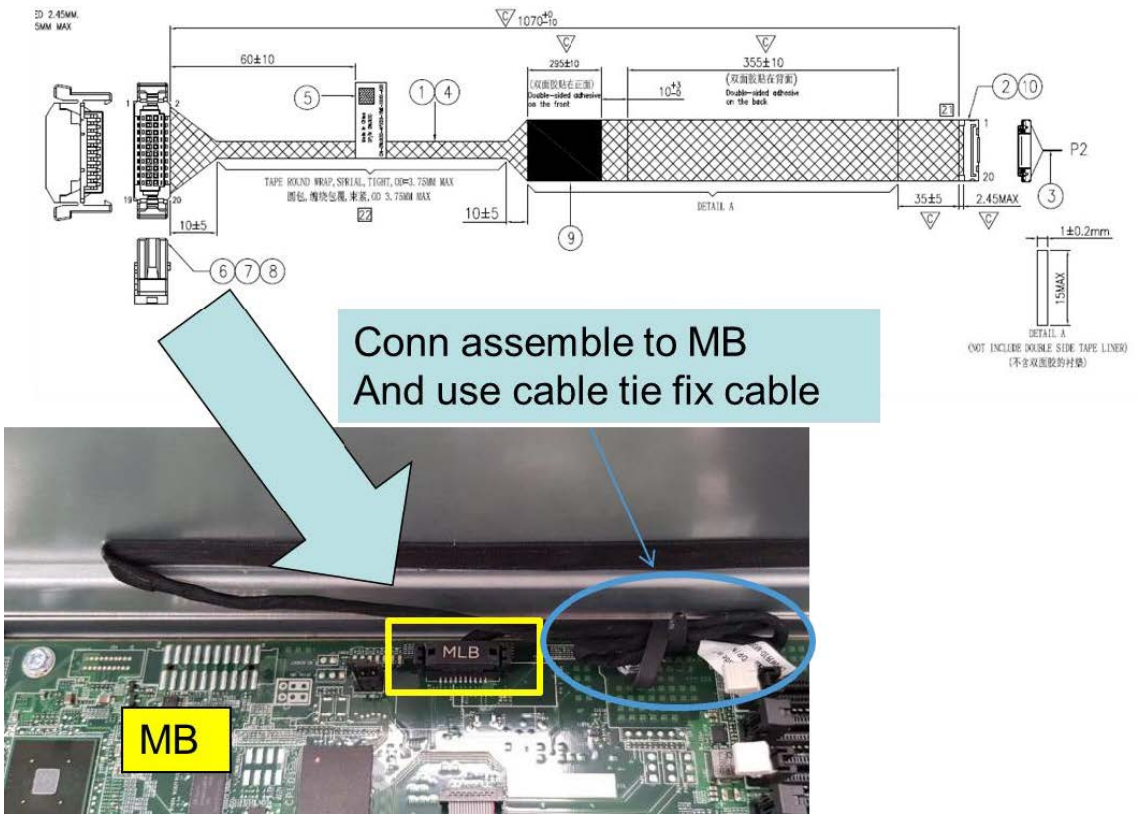


Figure 121. Front control cable assembly control board to MB

GPU power cable assembly GPU card to PSB

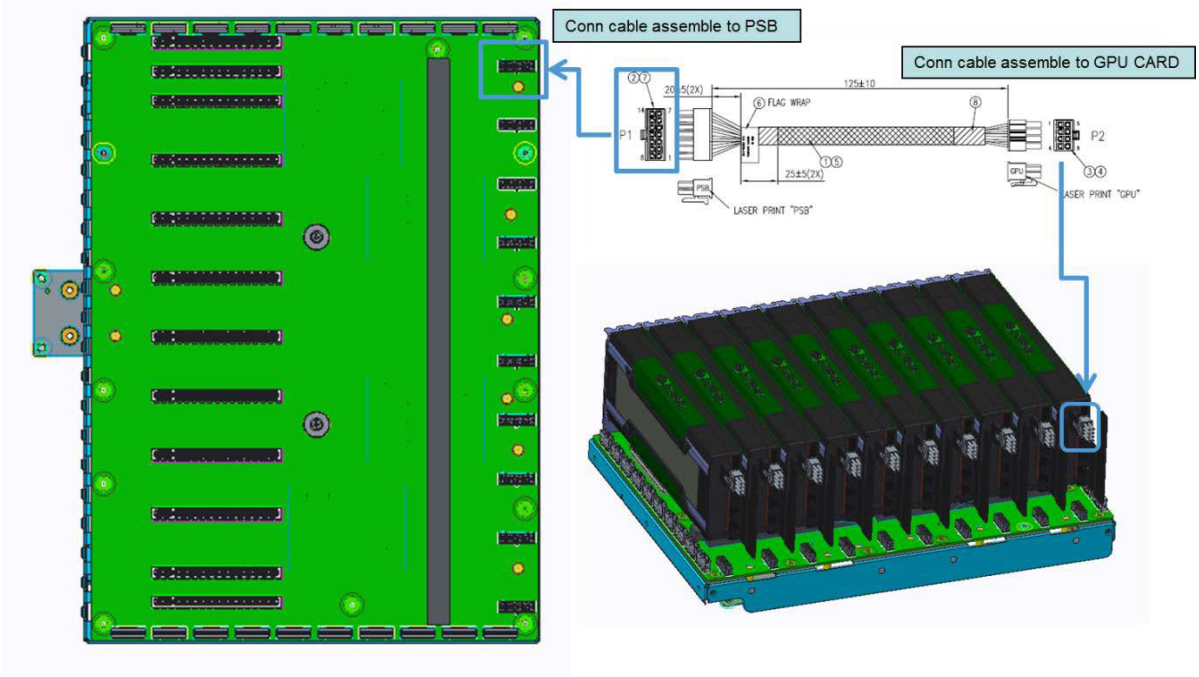


Figure 122. GPU power cable assembly GPU card to PSB

IDC cable MB-PDB assembly to PDB

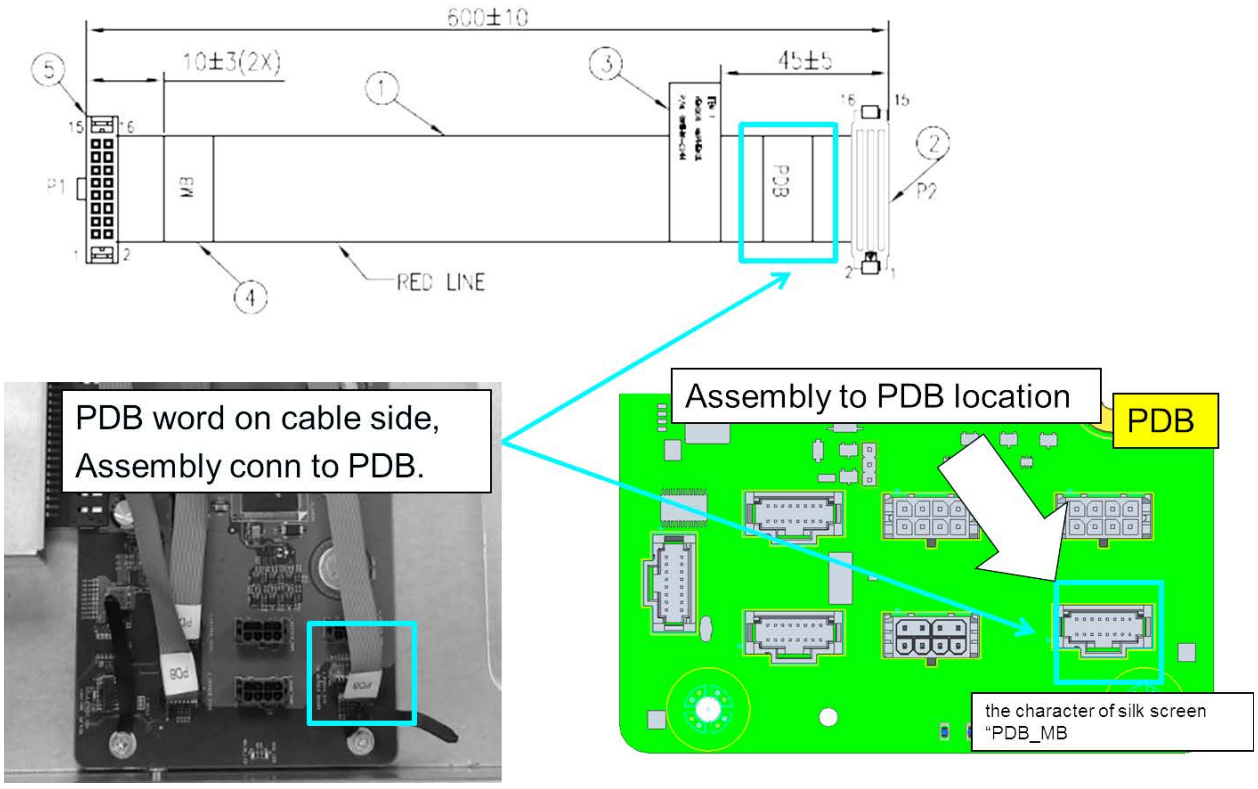


Figure 123. IDC cable MB-PDB assembly to PDB

IDC cable MB-PDB assembly to MB

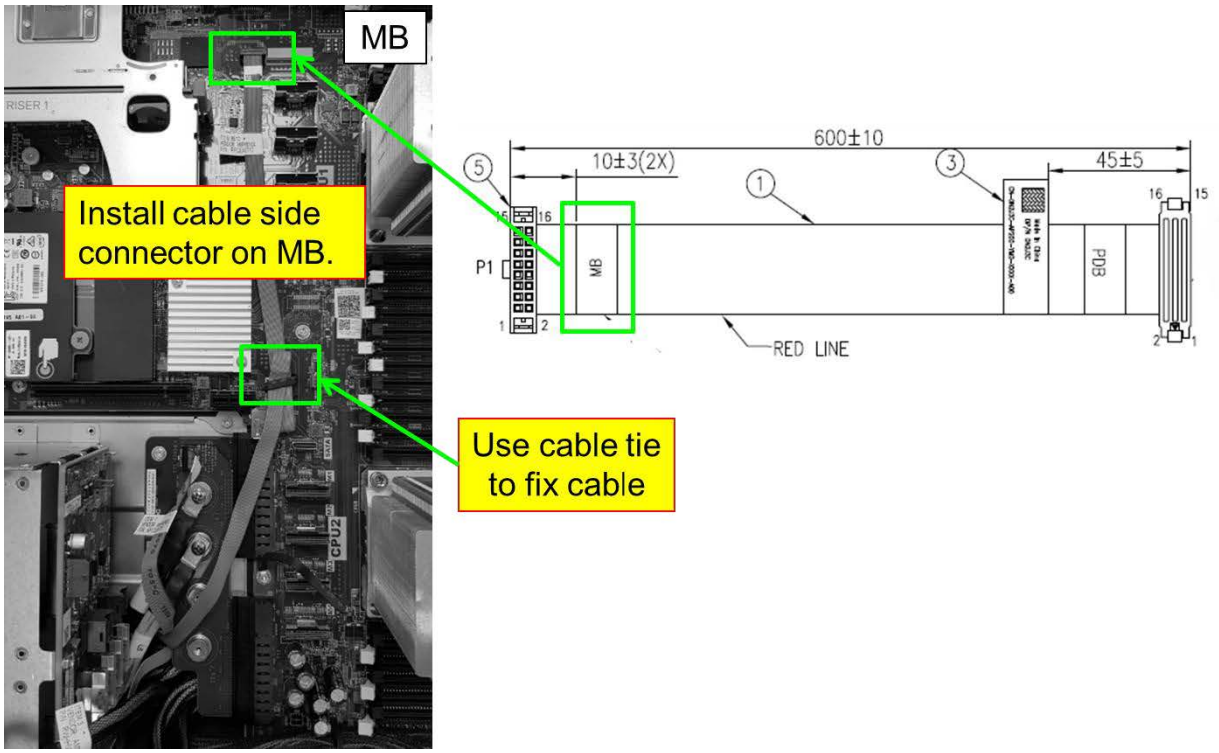


Figure 124. IDC cable (MB-PDB) assembly to MB

IDC cable PDB-PIB assembly to PIB

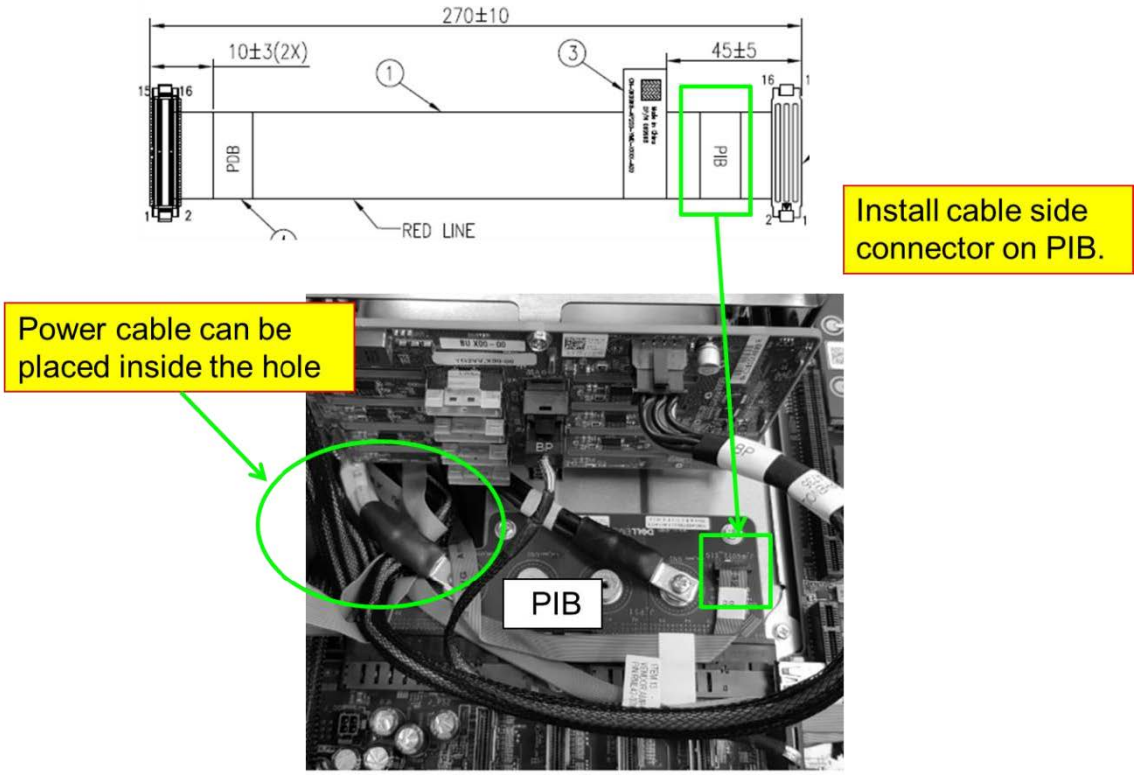


Figure 125. IDC cable PDB-PIB assembly to PIB

IDC cable PIB-PDB assembly to PDB

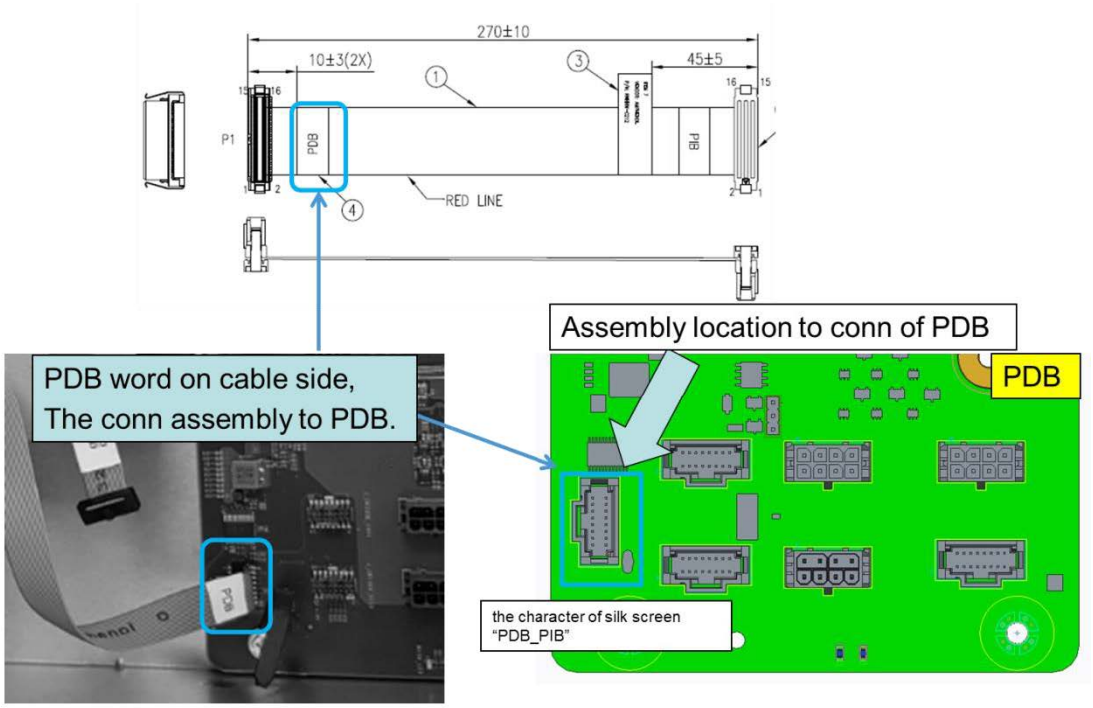


Figure 126. IDC cable PIB-PDB assembly to PDB

IDC cable Riser1-PDB assembly to PDB

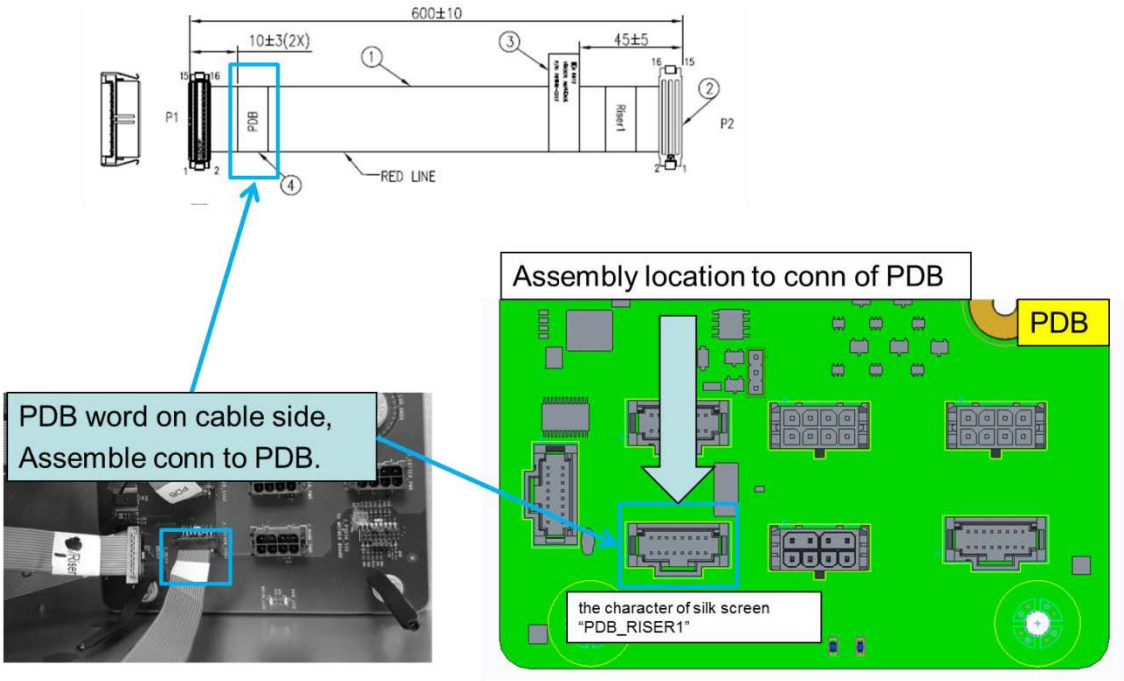


Figure 127. IDC cable Riser1-PDB assembly to PDB

IDC cable Riser1-PDB assembly to riser board1

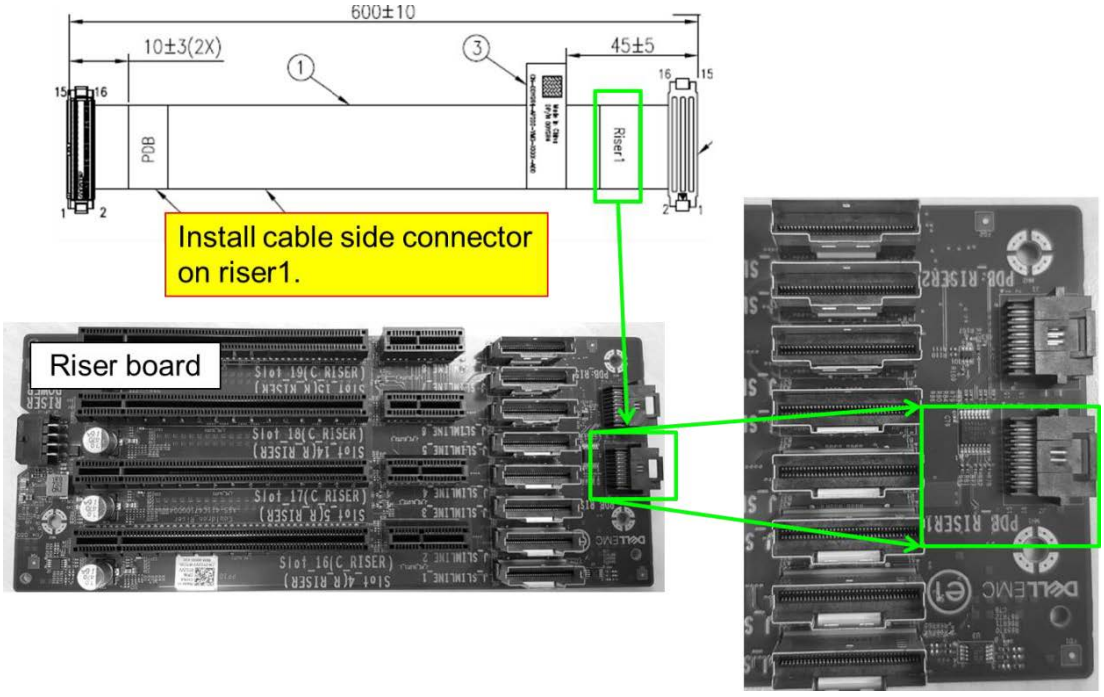


Figure 128. IDC cable Riser1-PDB assembly to riser board1

IDC cable PIB-PDB assembly to PDB

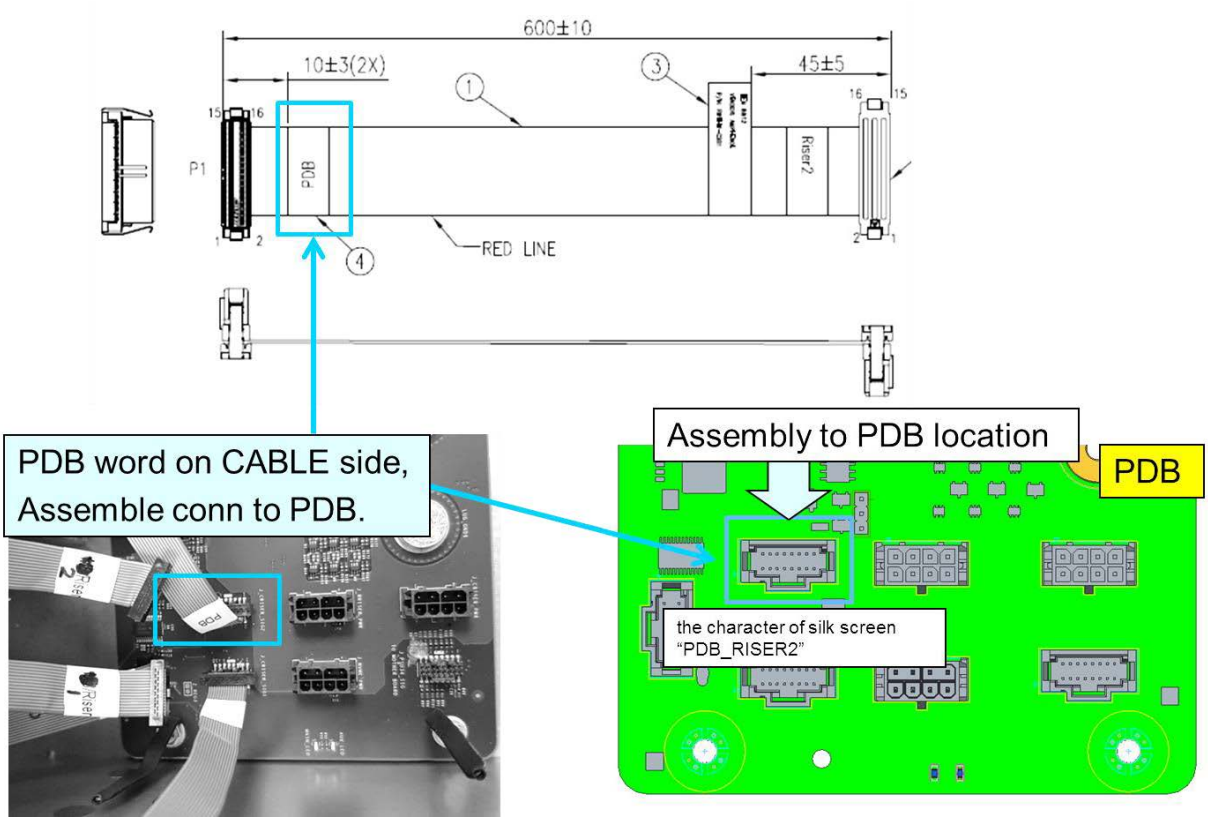


Figure 129. IDC cable Riser2-PDB assembly to PDB

IDC cable Riser 2- PDB assembly to riser board 2

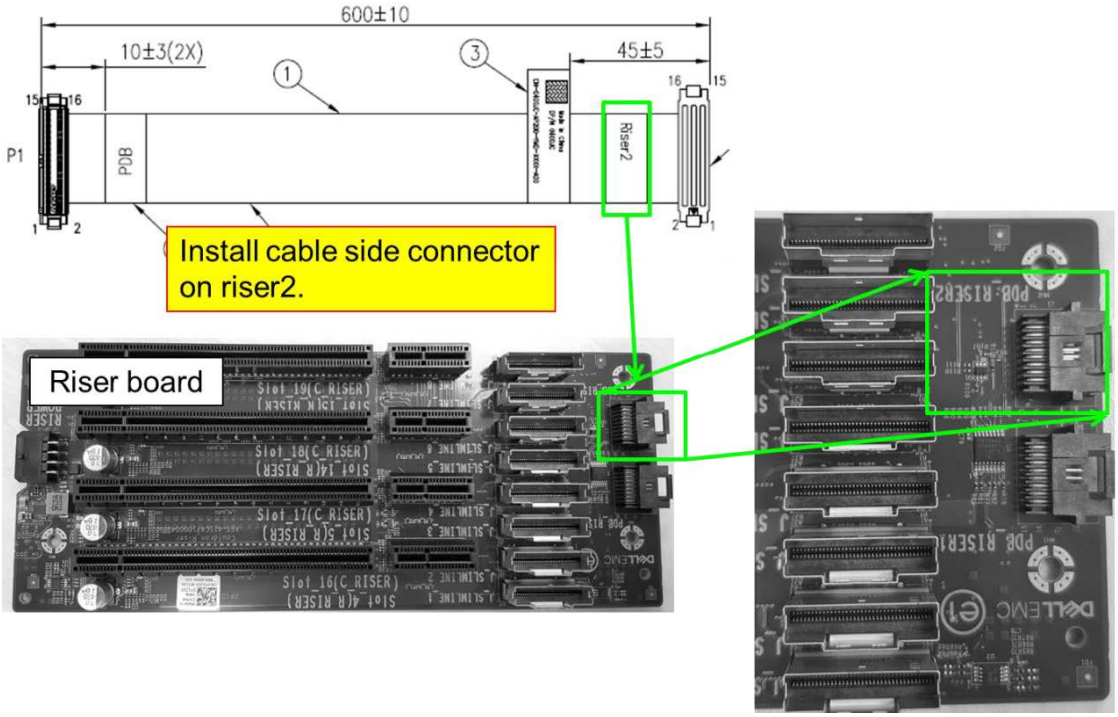


Figure 130. IDC cable (Riser 2- PDB) assembly to riser board 2

Mini SAS HD cable assembly PERC-HDBP

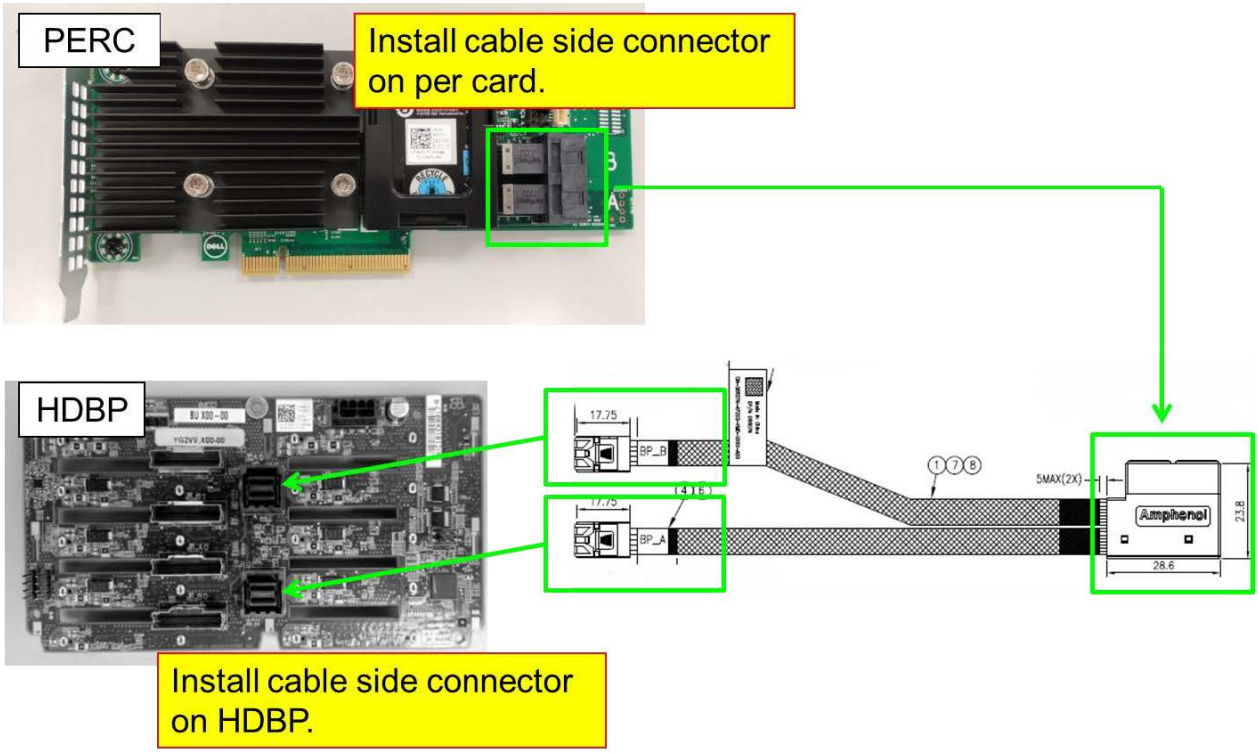


Figure 131. Mini SAS HD cable assembly PERC-HDBP

Mini SAS HD cable assembly HDBP-MB

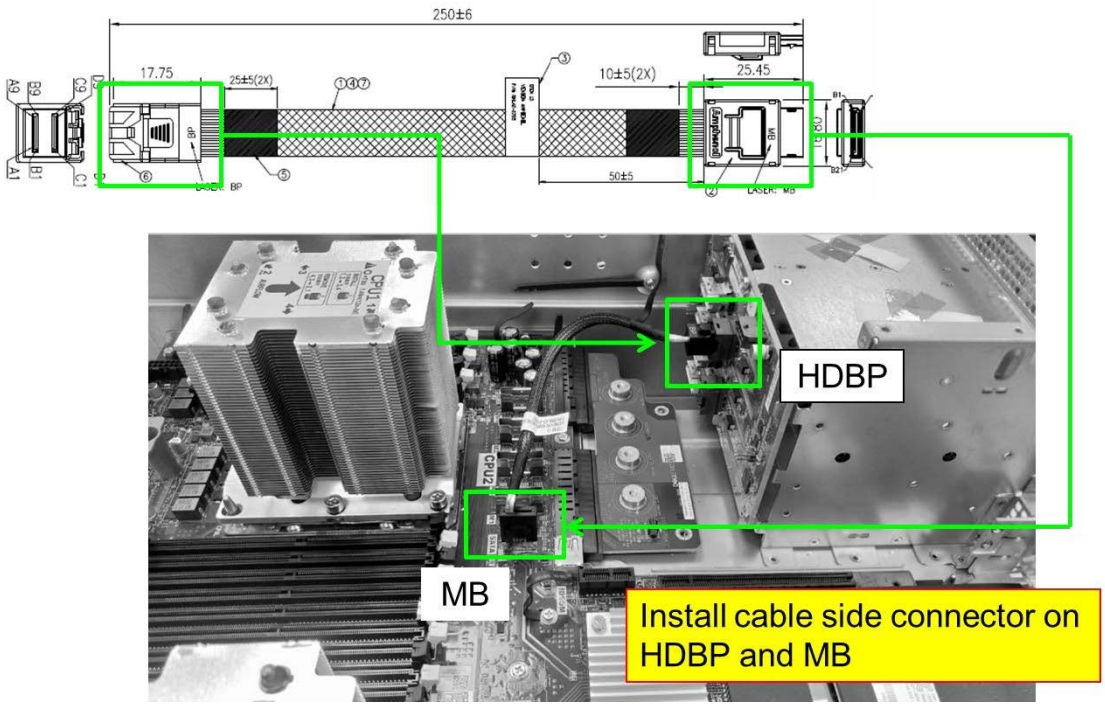


Figure 132. Mini SAS HD cable assembly HDBP-MB

Power cable BP-PDB assembly to BP

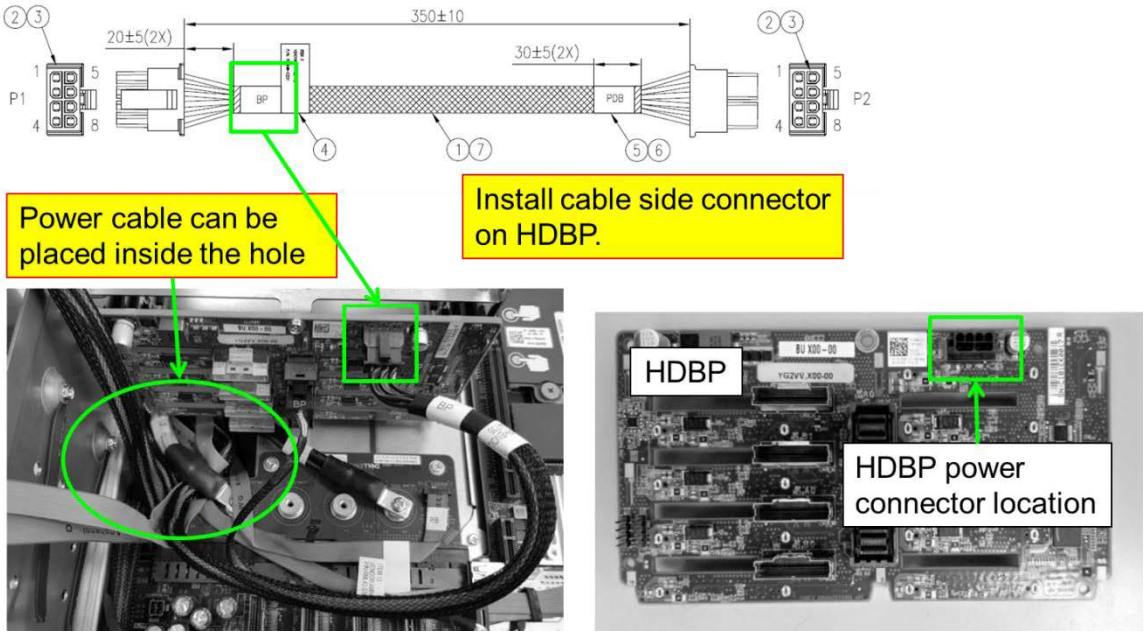


Figure 133. Power cable BP-PDB assembly to BP

Power cable BP-PDB assembly to PDB

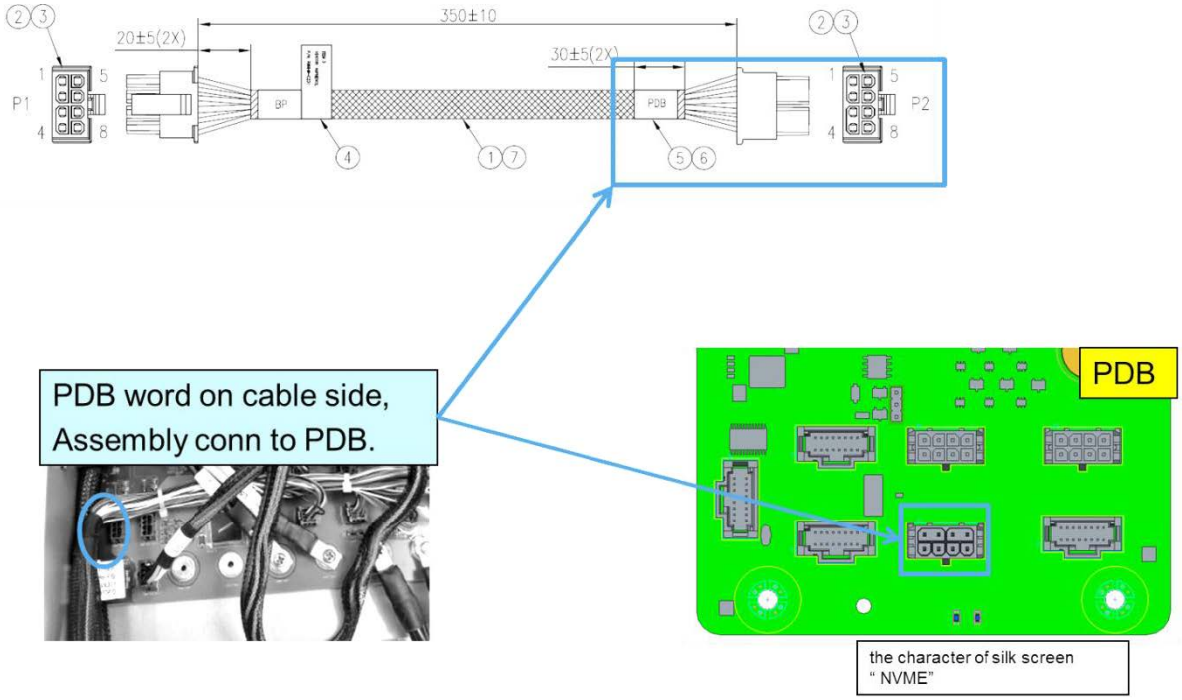


Figure 134. Power cable BP-PDB assembly to PDB

Power cable assembly to PDB

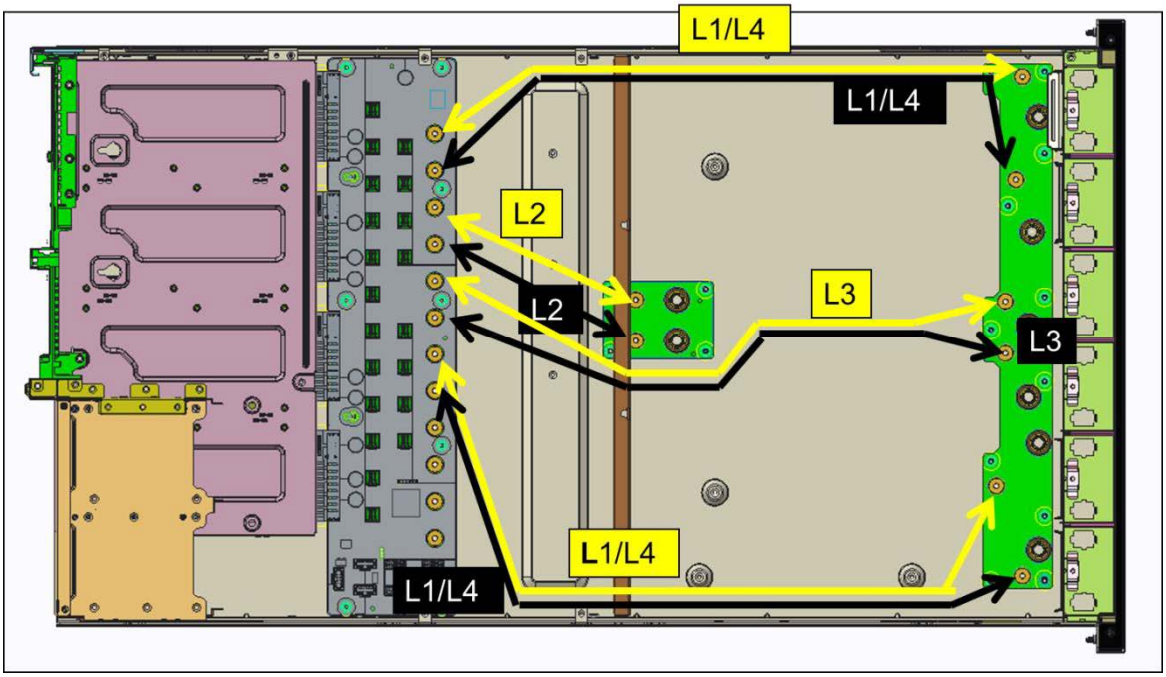


Figure 135. Power cable assembly to PDB

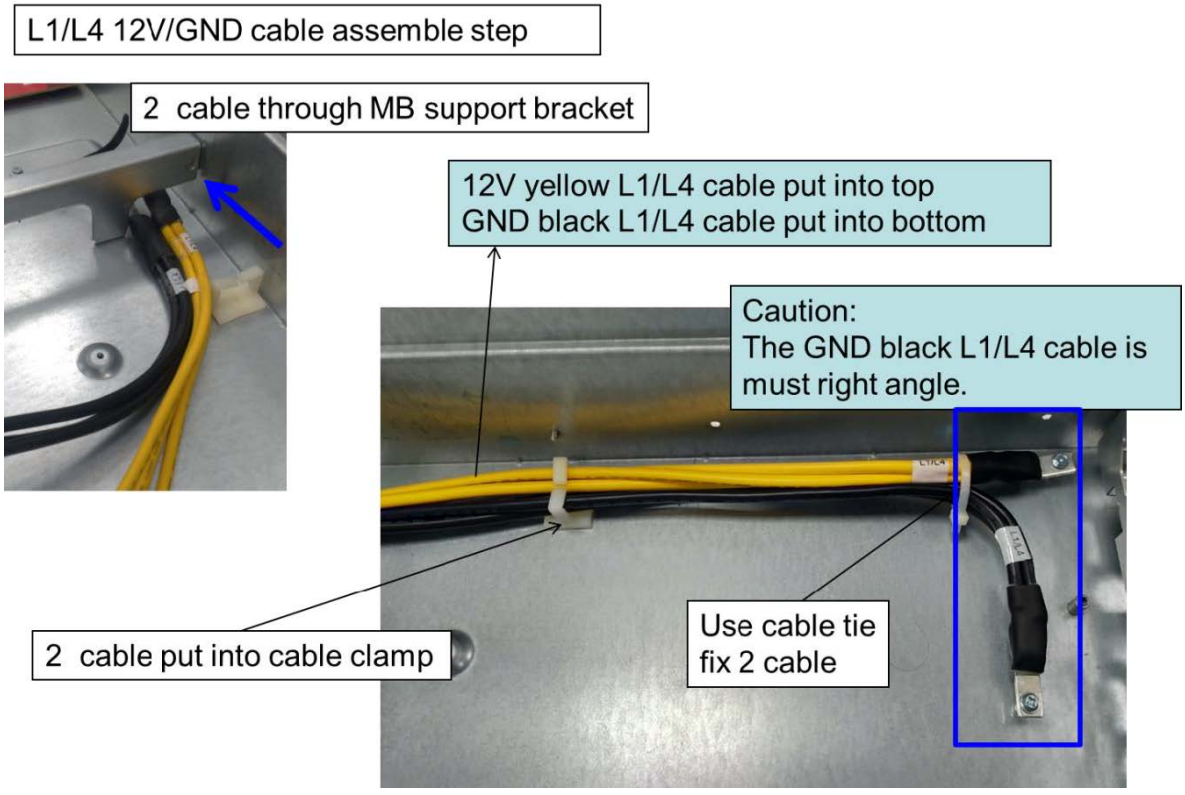


Figure 136. Power cable assembly to PDB

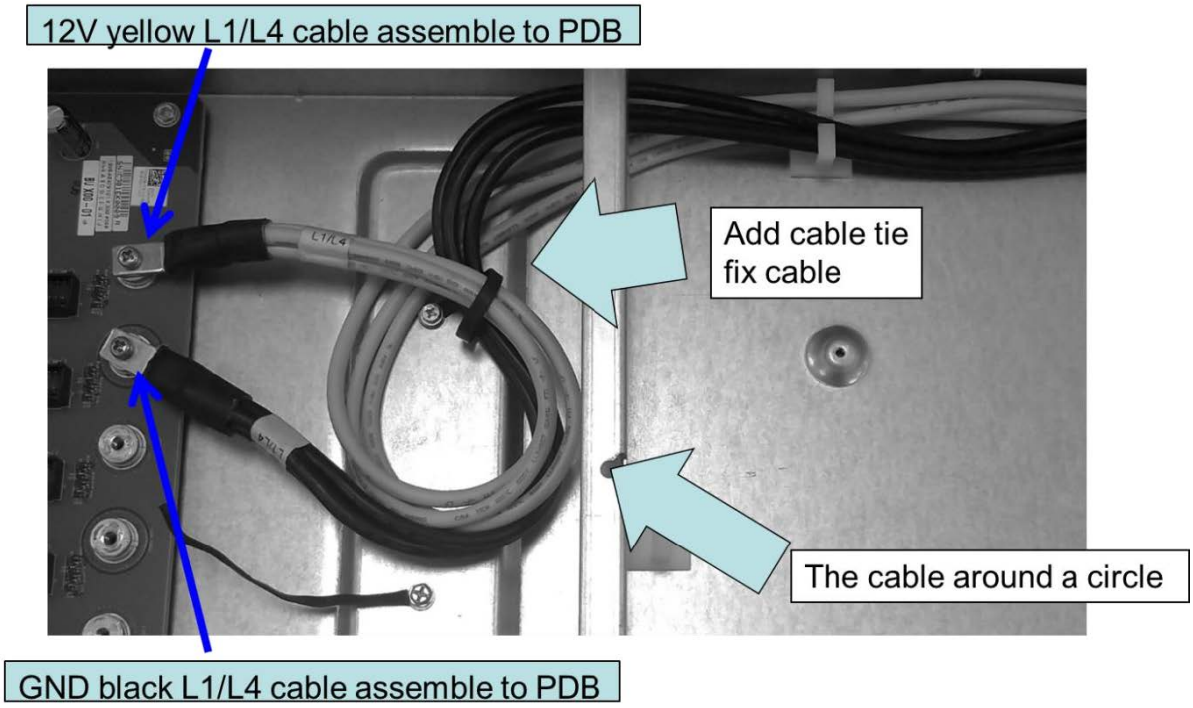


Figure 137. Power cable assembly to PDB

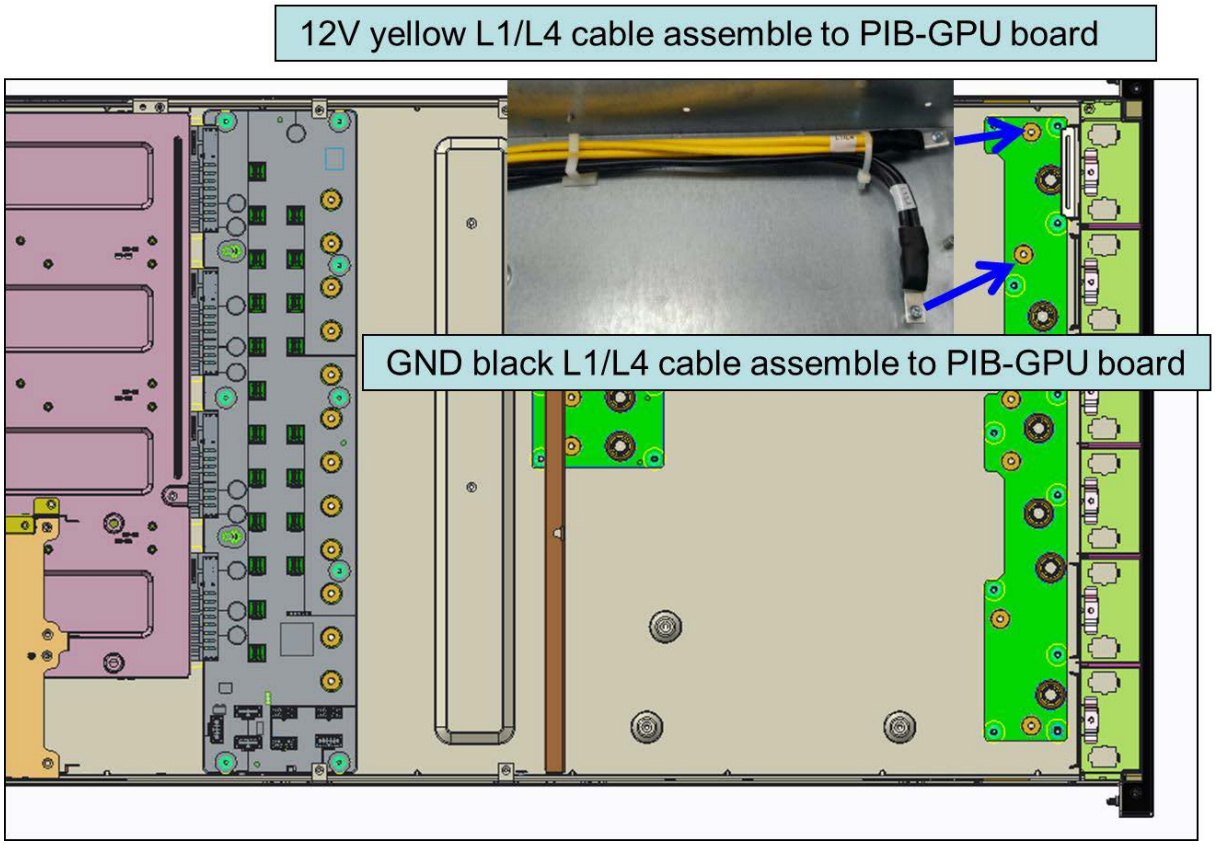


Figure 138. Power cable assembly to PDB

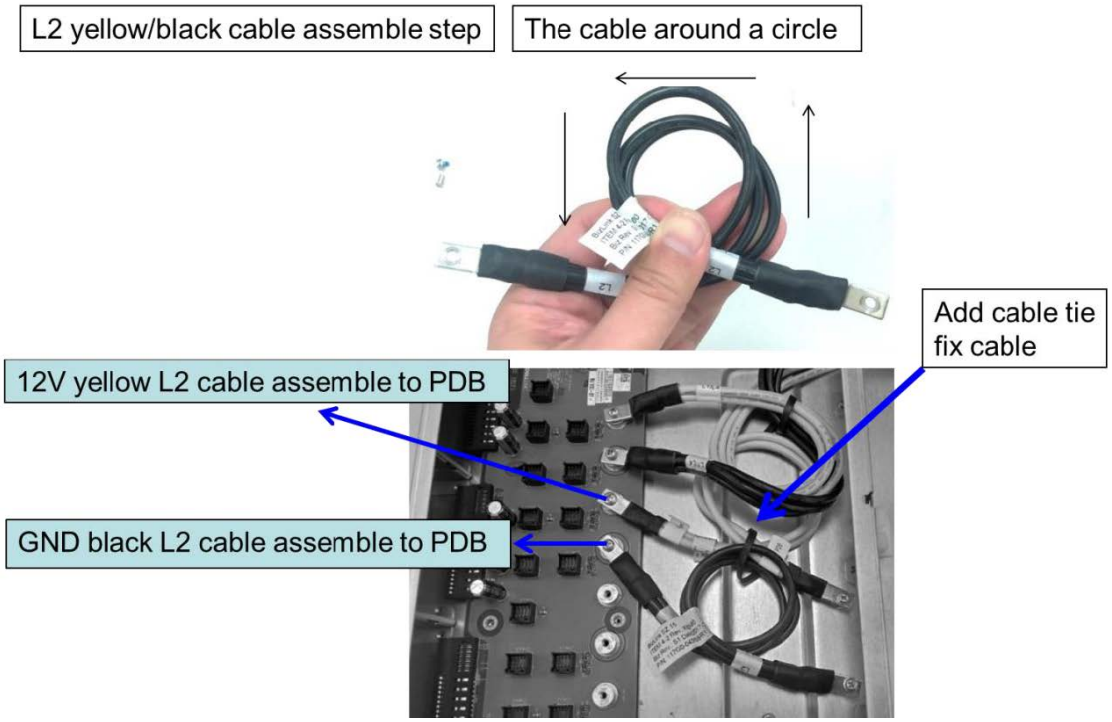


Figure 139. Power cable assembly to PDB

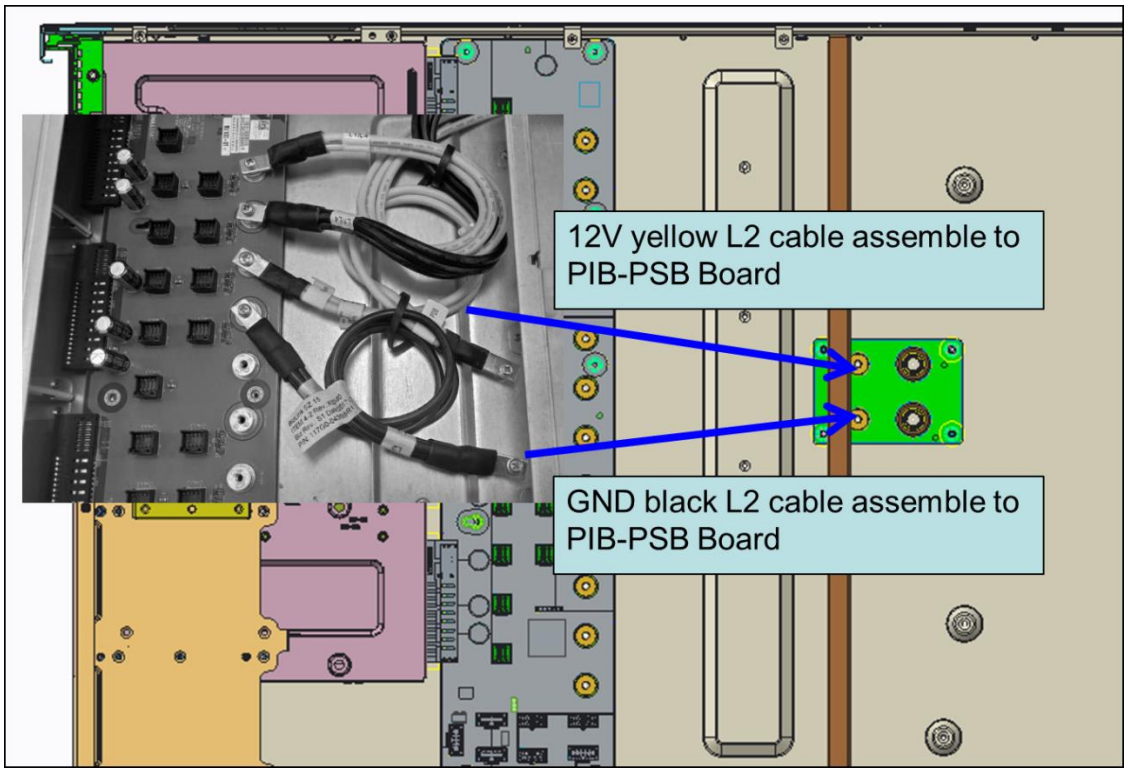


Figure 140. Power cable assembly to PDB

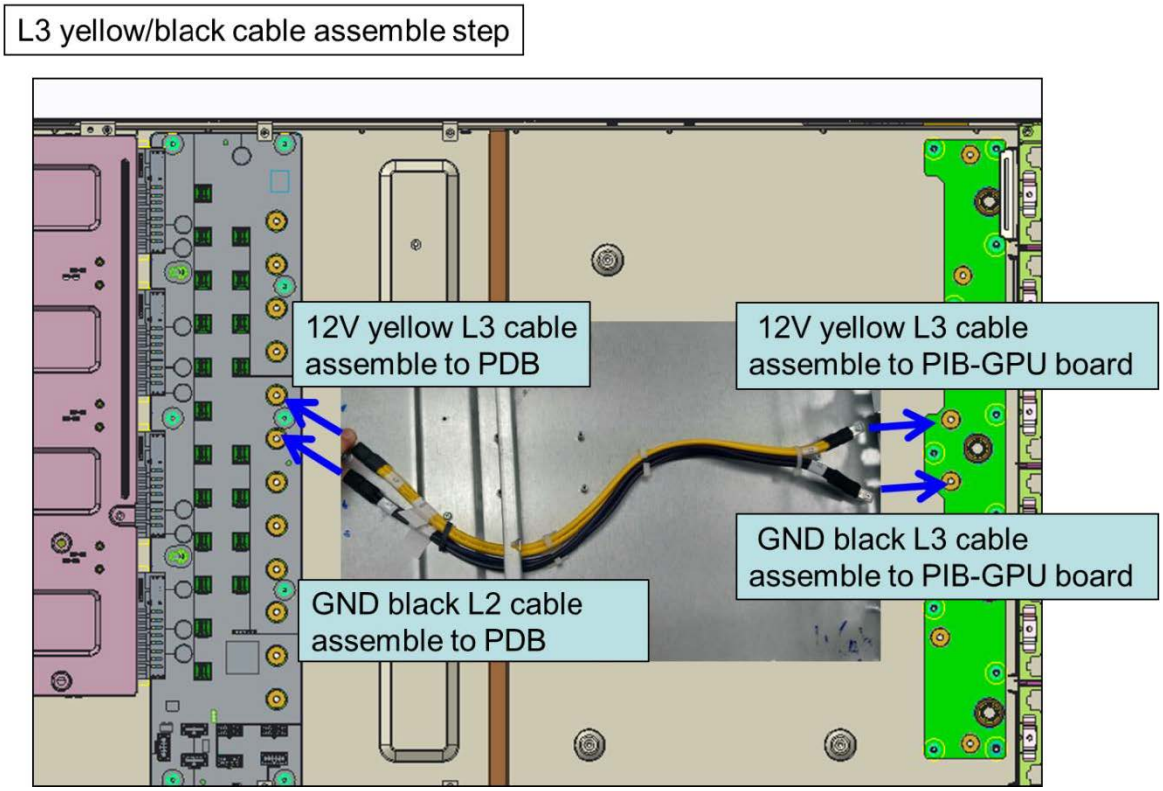


Figure 141. Power cable assembly to PDB

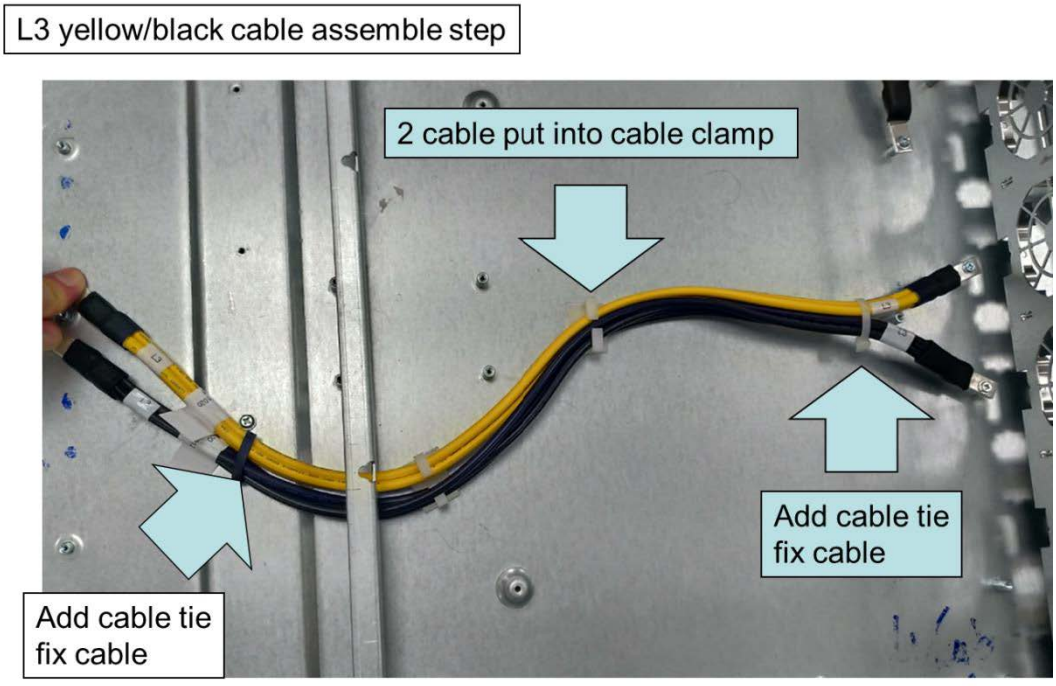


Figure 142. Power cable assembly to PDB

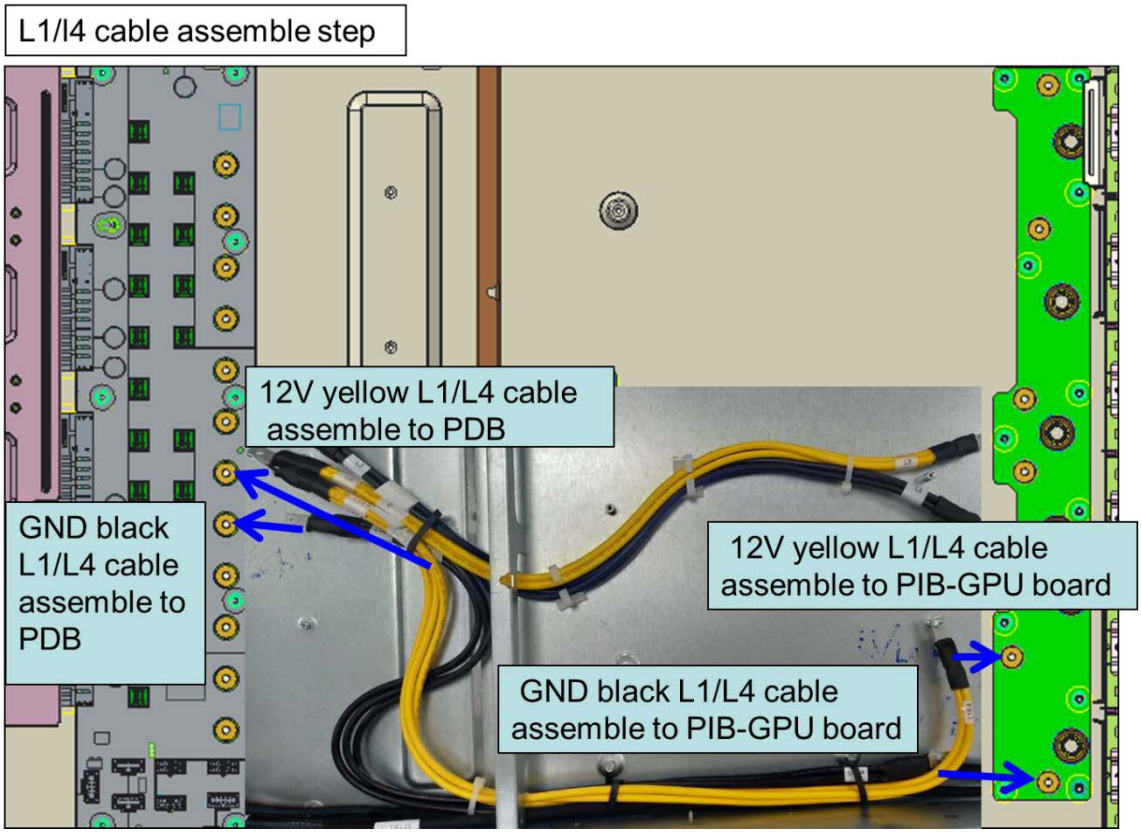


Figure 143. Power cable assembly to PDB

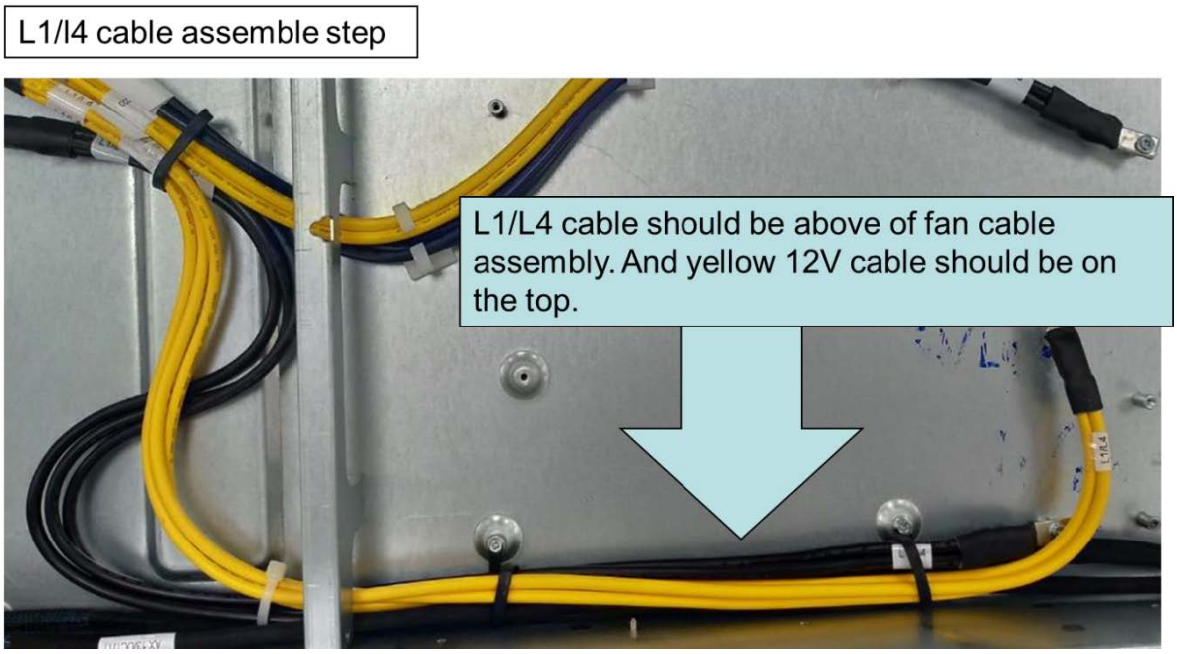


Figure 144. Power cable assembly to PDB

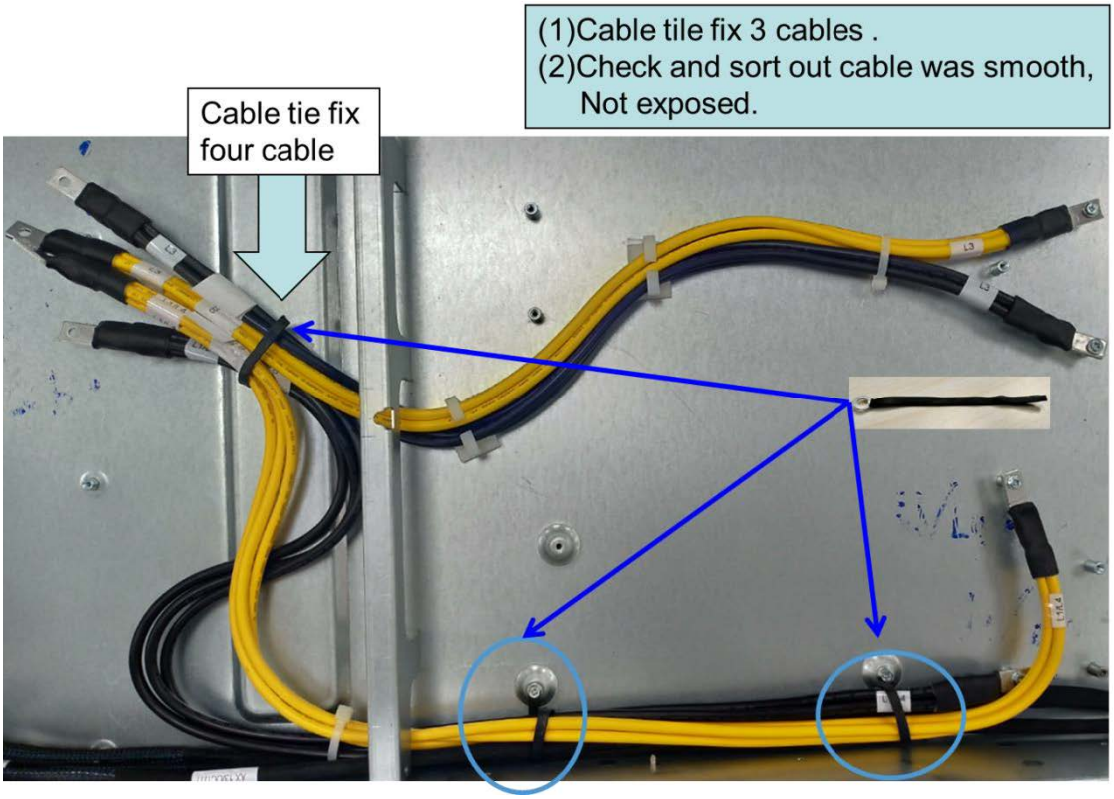


Figure 145. Power cable assembly to PDB

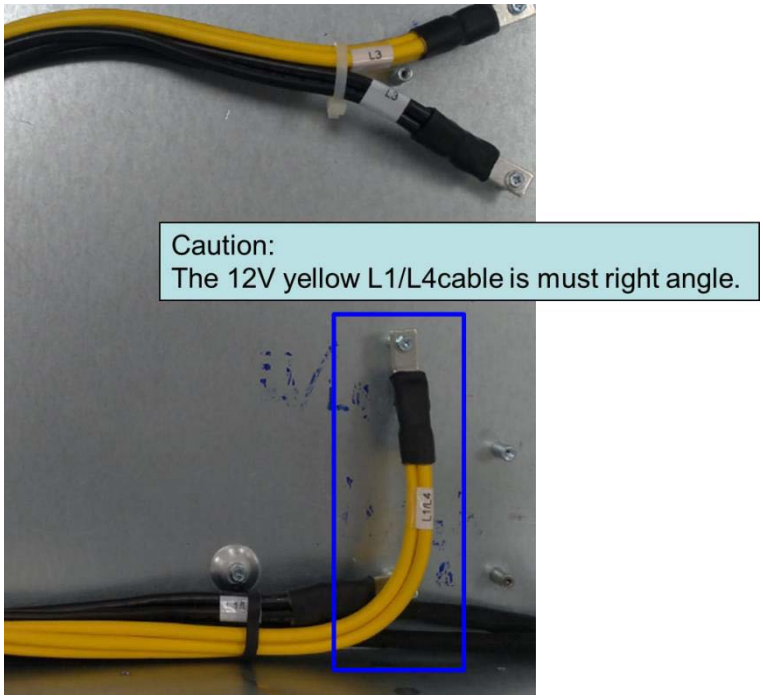


Figure 146. Power cable assembly to PDB

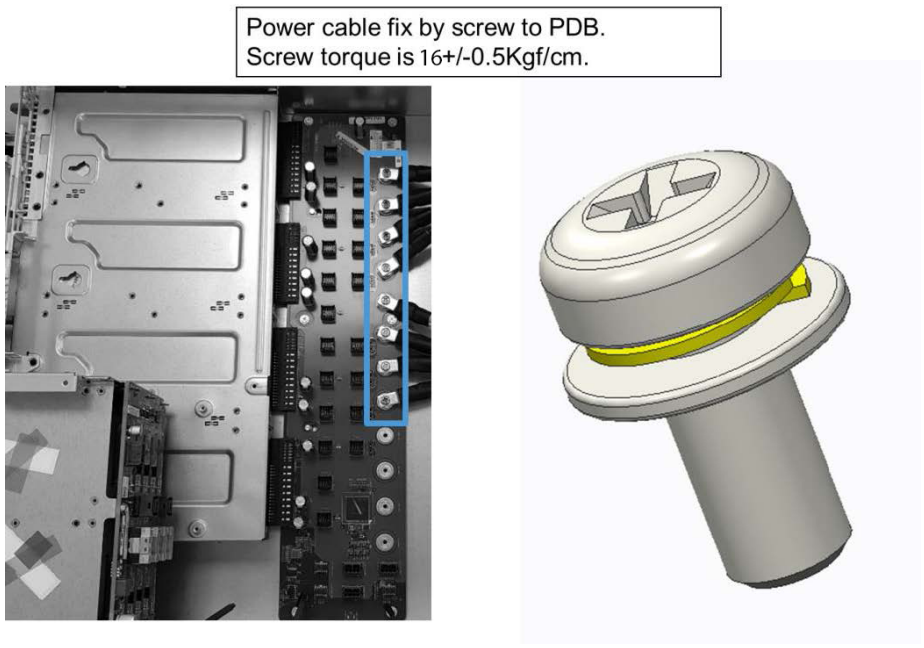


Figure 147. Power cable assembly to PDB

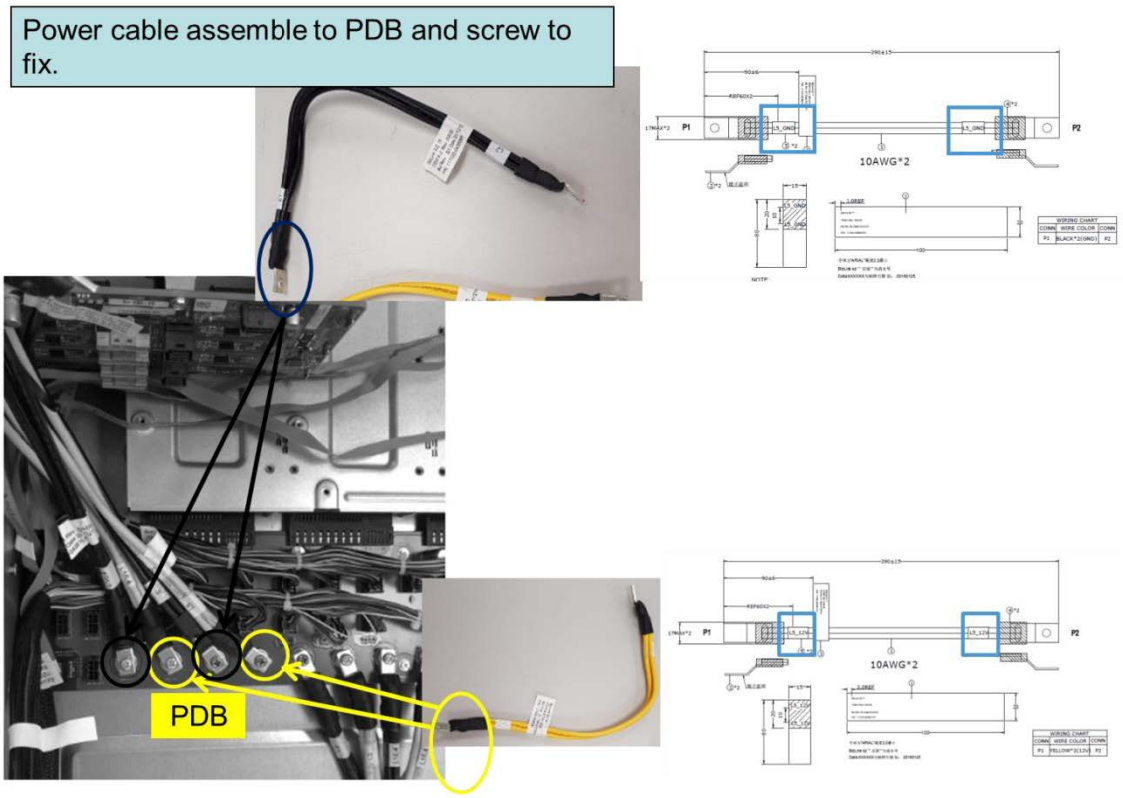


Figure 148. Power cable assembly to PDB

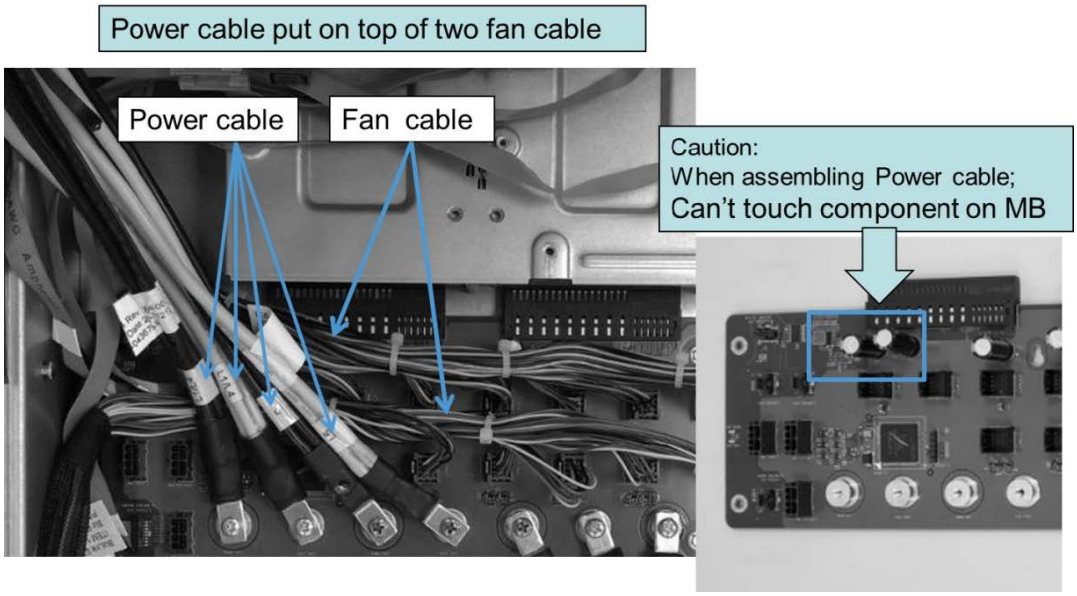


Figure 149. Power cable assembly to PDB

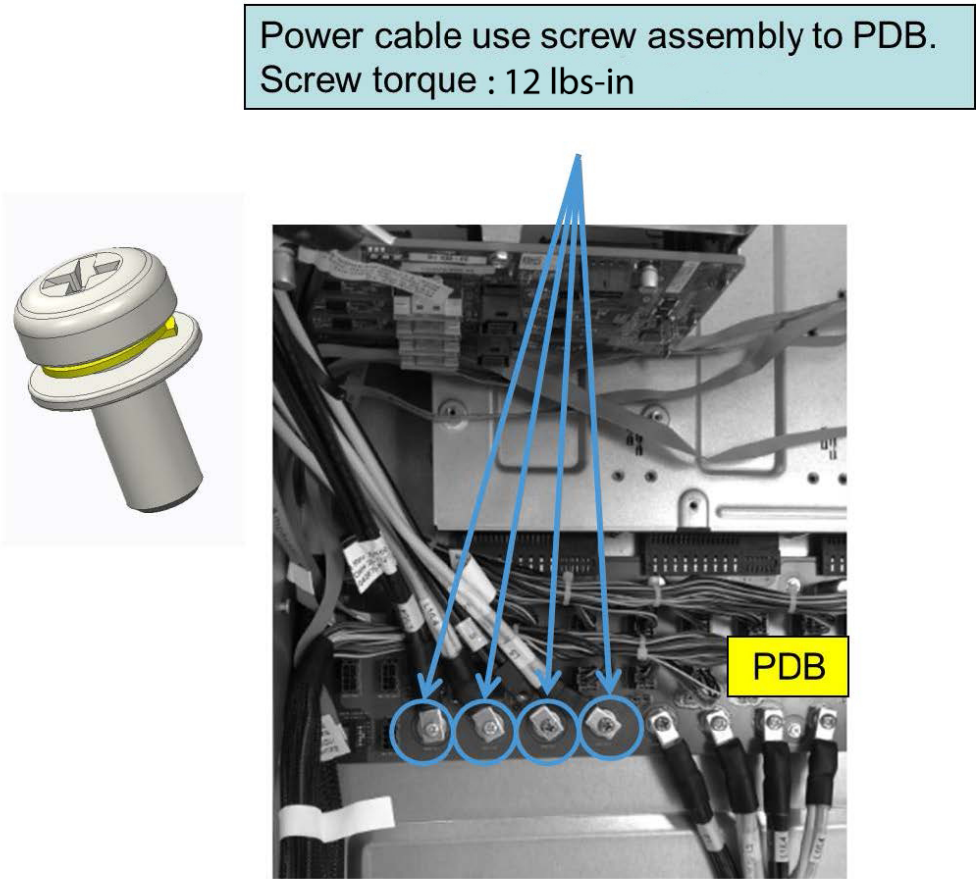


Figure 150. Power cable assembly to PDB

Power cable assembly to PIB

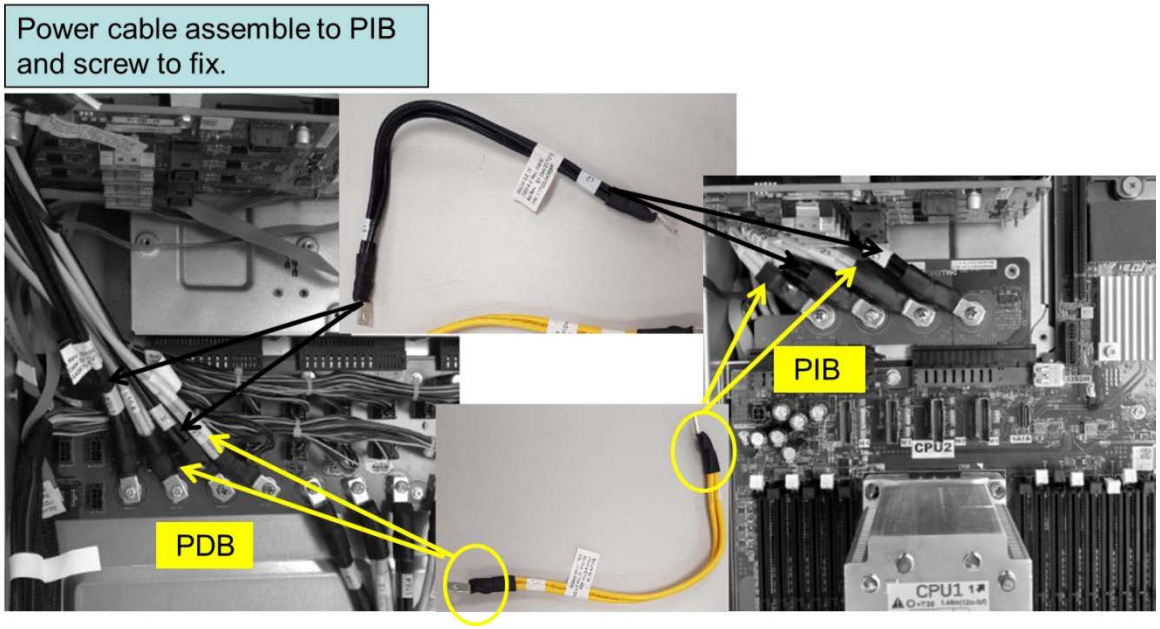


Figure 151. Power cable assembly to PIB

Power cable1 assembly to Riser1

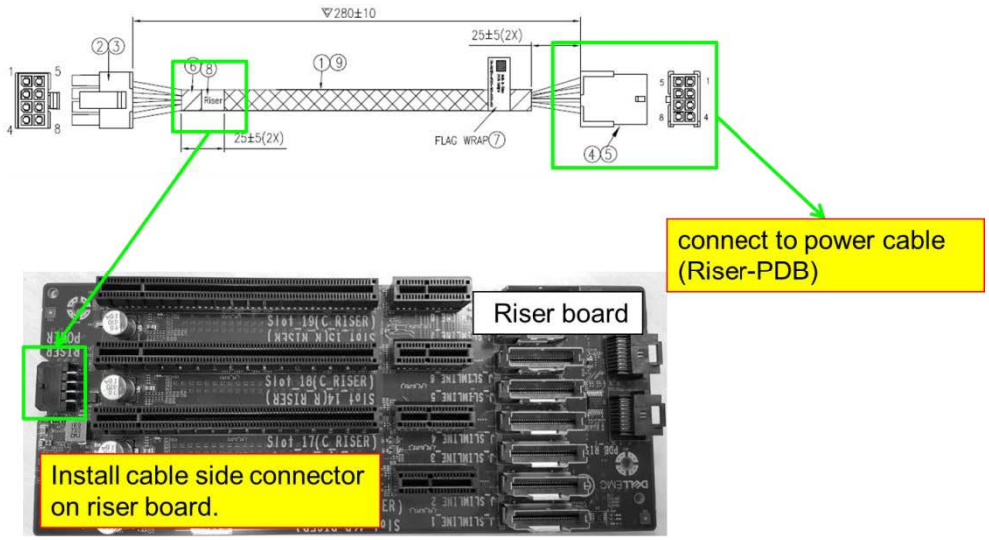


Figure 152. Power cable1 assembly to Riser1

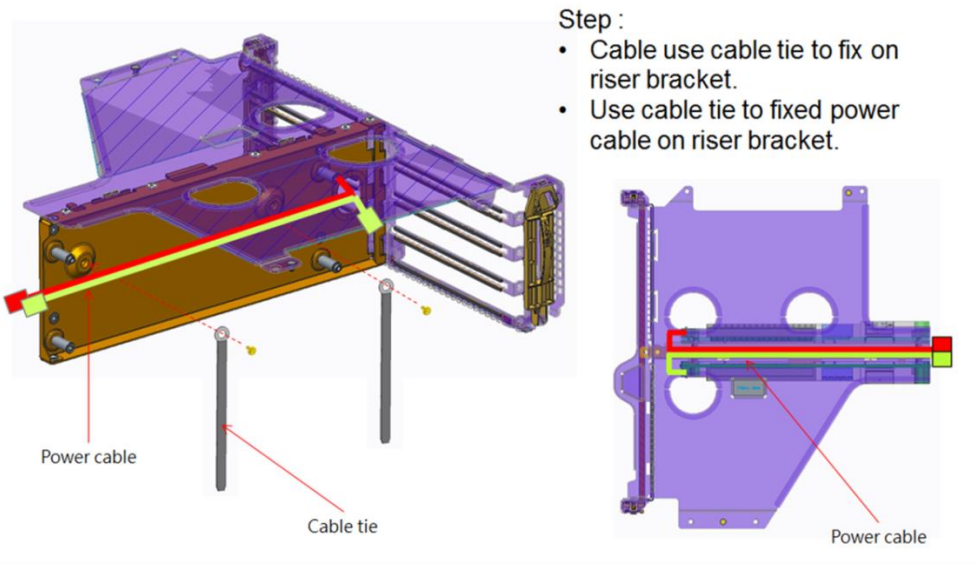


Figure 153. Power cable1 assembly to Riser1

Step :
- Connect the power cable and riser.
- Install Riser to Riser bracket and fix by 8 pcs of M3 screw.
- Torque : 6kgf-cm

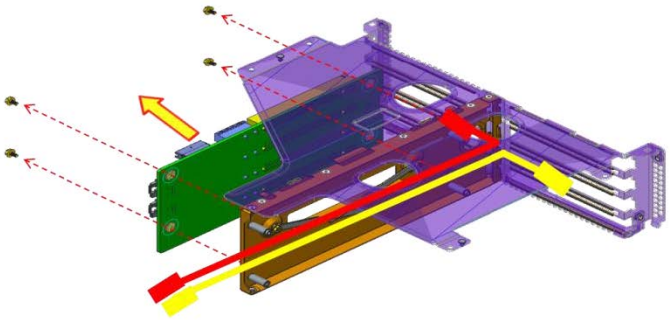


Figure 154. Power cable1 assembly to Riser1

Power cable2 Riser-PDB assembly to PDB

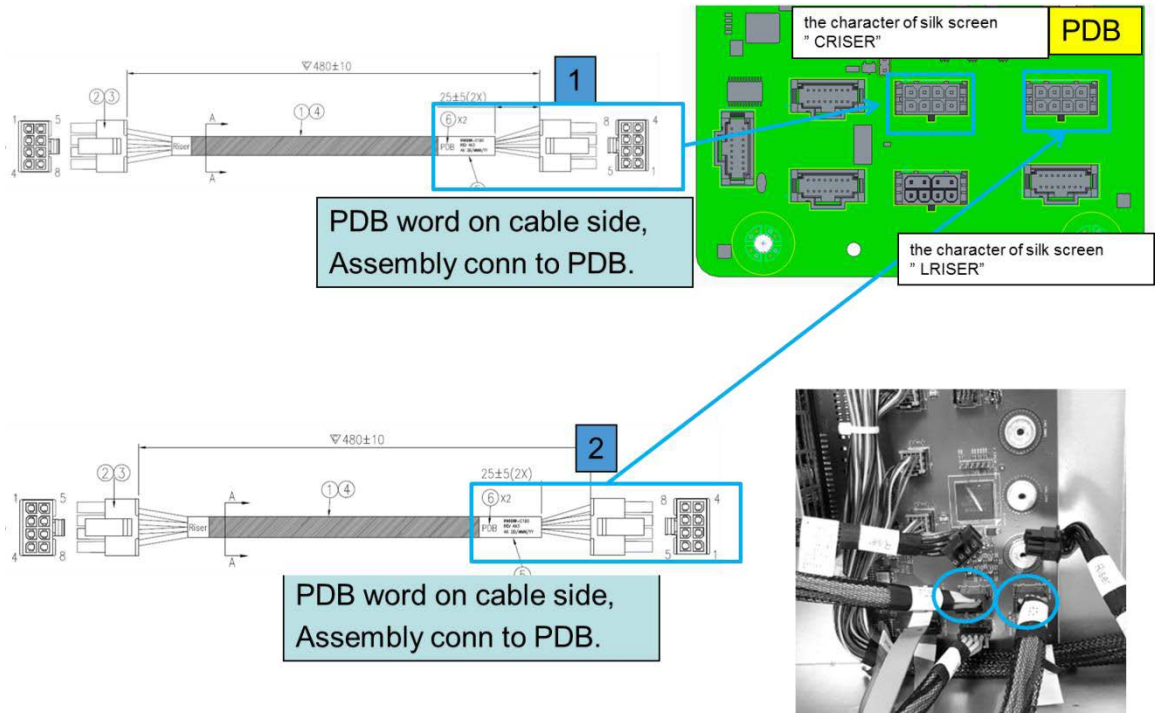


Figure 155. Power cable2 Riser-PDB assembly to PDB

Power cable2 Riser-PDB assembly to Riser

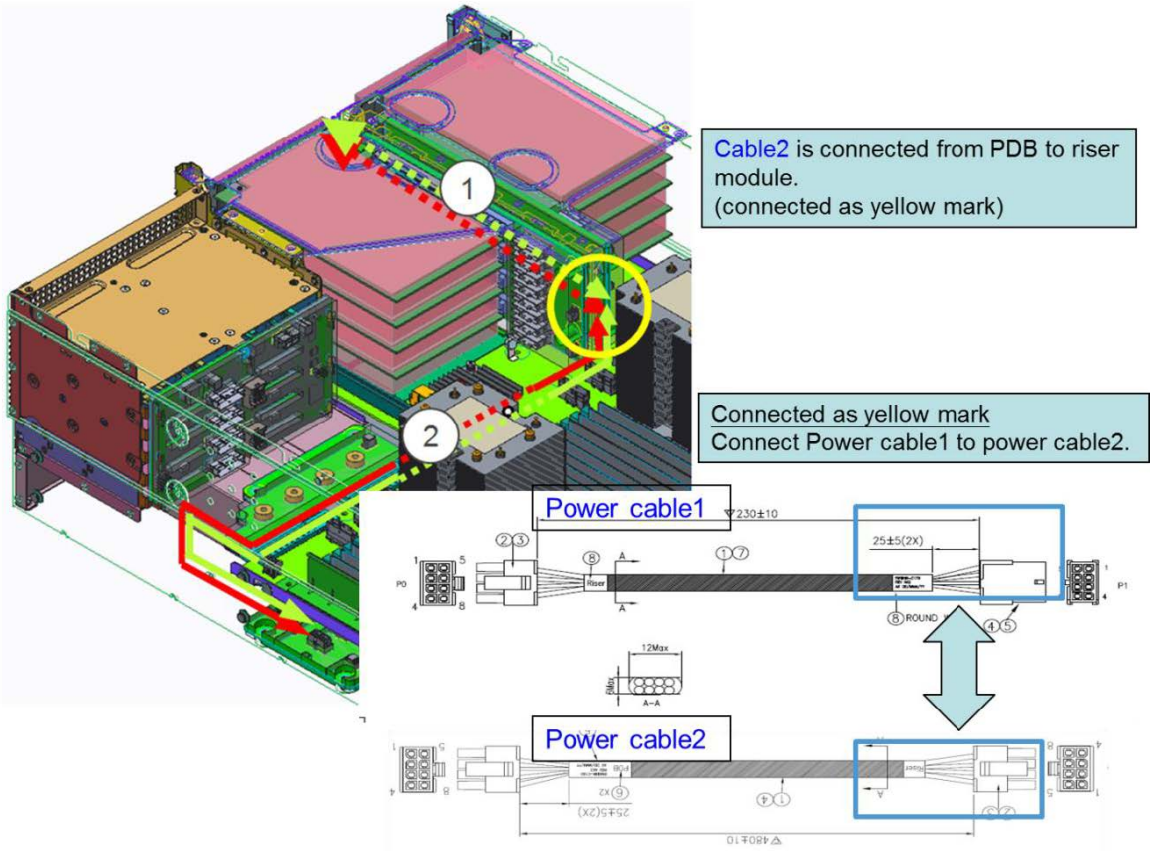


Figure 156. Power cable2 Riser-PDB assembly to Riser

8

Jumpers and connectors

Topics:

System Board Connectors

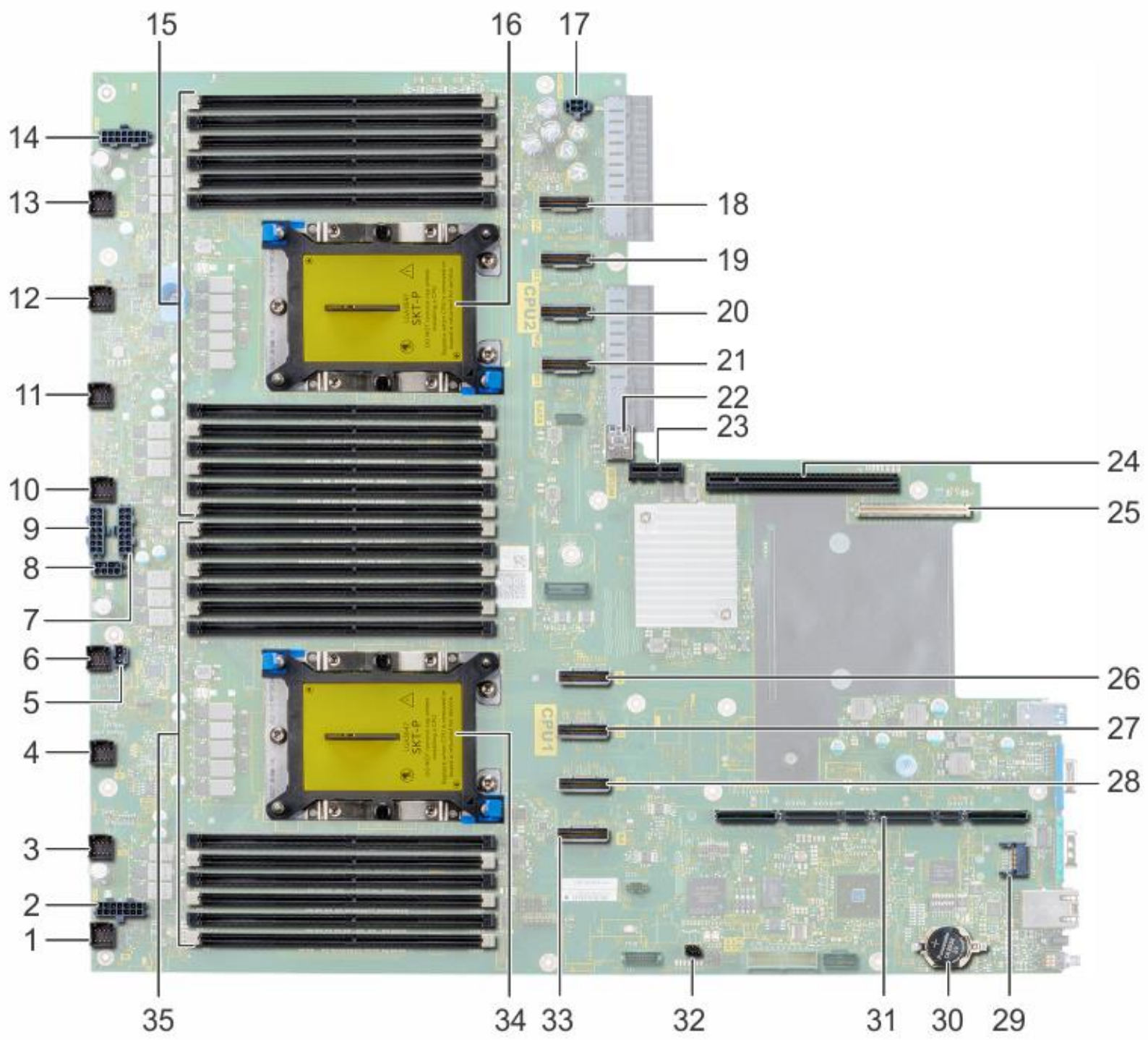


Figure 157. System Board Connectors

Table 17. System board connectors and descriptions

Item	Connector	Description
1	J_FAN1U_8	Cooling fan connector 1
2	GPU_4_PWR	GPU 4 power connector

Table 17. System board connectors and descriptions (continued)

Item	Connector	Description
3	J_FAN1U_7	Cooling fan connector 2
4	J_FAN1U_6	Cooling fan connector 3
5	J_INTRUSION_DET1	Intrusion switch connector
6	J_FAN1U_5	Cooling fan connector 4
7	GPU_5_PWR	GPU 5 power connector
8	PLX_PWR(PCLe_Switch_board)	Switch board power connector
9	GPU_6_PWR	GPU 6 power connector
10	J_FAN1U_4	Cooling fan connector 5
11	J_FAN1U_3	Cooling fan connector 6
12	J_FAN1U_2	Cooling fan connector 7
13	J_FAN1U_1	Cooling fan connector 8
14	GPU_7_PWR	GPU 7 power connector
15	B6,B12,B5,B11,B4,B10,B7,B1,B8,B2,B9,B3	Memory module sockets
16	CPU2	Processor socket 2
17	SATA PWR	SATA power connector
18	M4	Data connector 4
19	M3	Data connector 3
20	M2	Data connector 2
21	M1	Data connector 1
22	J_USB_INT	Internal USB port
23	J_IDSDM_vFLASH	IDSDM/vFlash module connector
24	J_RISER2	Riser 2 connector
25	J_NDC	Network Daughter Card connector
26	S1	SAS connector 1
27	S2	SAS connector 2
28	S3	SAS connector 3
29	J_TPM_MODULE1	TPM module connector
30	BATTERY	Battery connector
31	J_R1_SS82_2	Riser 1 connector
32	CMOS_CLR	CMOS clear/NVRAM clear jumpers
33	S4	SAS connector 4
34	CPU1	Processor socket 1
35	A6,A12,A5,A11,A4,A10,A7,A1,A8,A2,A9,A3	Memory module sockets

System board jumpers settings

Table 18. System board jumper settings

Jumper	Setting	Description
PWRD_EN		The password reset feature is enabled .
		The password reset feature is disabled. iDRAC local access is unlock at next AC power cycle. iDRAC password reset is enabled in F2 iDRAC settings menu.
NVRAM_CLR		The configuration settings are retained at the next system boot.
		The configuration settings are cleared at system boot.

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

   The existing passwords are not disabled (erased) until the system boots with the jumper on pins 4 and 6. However, before you assign a new system and/or setup password, you must move the jumper back to pins 2 and 4.

   NOTE: If you assign a new system and/or setup password with the jumper on pins 4 and 6, the system disables the new password(s) the next time it boots.

5. Reconnect the system to its electrical outlet and power on the system, including any attached peripherals.
6. Power off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
7. Remove the system cover.
8. Move the jumper on the system board jumper from pins 4 and 6 to pins 2 and 4.
9. Install the system cover.
10. Reconnect the system to its electrical outlet and power on the system, including any attached peripherals.
11. Assign a new system and/or setup password.

9

Getting help

Topics:

Contacting Dell EMC

Dell EMC provides several online and telephone based support and service options. If you do not have an active internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell EMC product catalog. Availability varies by country and product, and some services may not be available in your area. To contact Dell EMC for sales, technical assistance, or customer service issues:

Steps

1. Go to www.dell.com/support/home.
2. Select your country from the drop-down menu on the lower right corner of the page.
3. For customized support:
   a. Enter your system Service Tag in the **Enter your Service Tag** field.
   b. Click **Submit**.
   The support page that lists the various support categories is displayed.
4. For general support:
   a. Select your product category.
   b. Select your product segment.
   c. Select your product.
   The support page that lists the various support categories is displayed.
5. For contact details of Dell EMC Global Technical Support:
   a. Click Contact Technical Support.
   b. Enter your system Service Tag in the **Enter your Service Tag** field on the Contact Us webpage.

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