



ThinkSystem SR685a V3 User Guide



Machine Type: 7DHC

Note

Before using this information and the product it supports, be sure to read and understand the safety information and the safety instructions, which are available at:

https://pubs.lenovo.com/safety_documentation/

In addition, be sure that you are familiar with the terms and conditions of the Lenovo warranty for your server, which can be found at:

<http://datacentersupport.lenovo.com/warrantylookup>

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 Safety Information（安全信息）。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφαλείας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

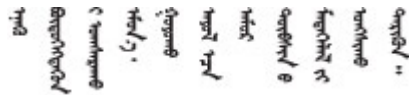
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.



Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

ཐོན་ཇུས་འདི་བདེ་སྤྱད་མ་བྱས་གོང་། གློ་རྒྱ་ཡིད་གཟབ་
བྱ་འདྲ་མིན་ཡོད་པའི་འོད་ཟེར་བལྟ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

مەزكۇر مەھسۇلاتنى ئورنىتىشتىن بۇرۇن بىخەتەرلىك ئۇچۇرلىرىنى ئوقۇپ چىقىڭ.

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canjbinj soengq cungj vahgangj ancien siusik.

Safety inspection checklist

Use the information in this section to identify potentially unsafe conditions with your server. As each machine was designed and built, required safety items were installed to protect users and service technicians from injury.

Note: The product is not suitable for use at visual display workplaces according to §2 of the Workplace Regulations.

Note: The set-up of the server is made in the server room only.

CAUTION:

- **This equipment must be serviced by trained personnel, as defined by the IEC 62368-1, the standard for Safety of Electronic Equipment within the Field of Audio/Video, Information Technology and Communication Technology. Lenovo assumes you are qualified in the servicing of equipment and trained in recognizing hazards energy levels in products. Equipment must be installed in a restricted access location and access to the equipment is controlled by the authority responsible for the location.**
- **Consult with the supply authority, if necessary, that the equipment is connected only to a supply of Zmax 0.105 for IEC 61000-3-11 compliance.**

Important: Electrical grounding of the server is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Use the following checklist to verify that there are no potentially unsafe conditions:

1. Make sure that the power is off and the power cord is disconnected.
2. Check the power cord.
 - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
 - Make sure that the power cord is the correct type.

To view the power cords that are available for the server:

a. Go to:

<http://dcsc.lenovo.com/#/>

b. Click **Preconfigured Model** or **Configure to order**.

c. Enter the machine type and model for your server to display the configurator page.

d. Click **Power → Power Cables** to see all line cords.

- Make sure that the insulation is not frayed or worn.
3. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
 4. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
 5. Check for worn, frayed, or pinched cables.
 6. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.
 7. The design of the electrical distribution system must take into consideration the total grounding leakage current from all power supplies in the server.

CAUTION:



High touch current. Connect to earth before connecting to supply.

8. Use the PDUs (power distribution units) with pluggable equipment type B to distribute electrical power to servers.

Chapter 1. Introduction

The ThinkSystem SR685a V3 server (Type 7DHC) is a powerful 8U server that features two AMD EPYC 9004 processors and eight high-performance GPUs. This air-cooled server is the ultimate Generative AI server, with advanced GPU-to-GPU communications and high-speed PCIe 5.0 connectivity between the GPUs, processors, and networking. AI workloads including modeling, training, simulation, rendering, financial tech, and scientific research.

Figure 1. ThinkSystem SR685a V3



Features

Performance, ease of use, reliability, and expansion capabilities were key considerations in the design of your server. These design features make it possible for you to customize the system hardware to meet your needs today and provide flexible expansion capabilities for the future.

Your server implements the following features and technologies:

- **Features on Demand**

If a Features on Demand feature is integrated in the server or in an optional device that is installed in the server, you can purchase an activation key to activate the feature. For information about Features on Demand, see:

<https://fod.lenovo.com/lkms>

- **Lenovo XClarity Controller (XCC)**

The Lenovo XClarity Controller is the common management controller for Lenovo ThinkSystem server hardware. The Lenovo XClarity Controller consolidates multiple management functions in a single chip on the server system board (system board assembly). Some of the features that are unique to the Lenovo XClarity Controller are enhanced performance, higher-resolution remote video, and expanded security options.

The server supports Lenovo XClarity Controller 2 (XCC2). For additional information about Lenovo XClarity Controller 2 (XCC2), refer to <https://pubs.lenovo.com/lxcc-overview/>.

- **UEFI-compliant server firmware**

Lenovo ThinkSystem firmware is Unified Extensible Firmware Interface (UEFI) compliant. UEFI replaces BIOS and defines a standard interface between the operating system, platform firmware, and external devices.

Lenovo ThinkSystem servers are capable of booting UEFI-compliant operating systems, BIOS-based operating systems, and BIOS-based adapters as well as UEFI-compliant adapters.

Note: The server does not support Disk Operating System (DOS).

- **Large system-memory capacity**

The server supports registered DIMMs (RDIMMs). For more information about the specific types and maximum amount of memory, see [“Technical specifications” on page 3](#).

- **Large data-storage capacity and hot-swap capability**

With the hot-swap feature, you can add, remove, or replace hard disk drives without turning off the server.

Storage capacity is different depending on server model. See [“Technical specifications” on page 3](#) for more information.

- **Lightpath Diagnostics**

Lightpath Diagnostics provides LEDs to help you diagnose problems. For more information about the Lightpath Diagnostics, see [“Troubleshooting by system LEDs and diagnostics display” on page 281](#).

- **Mobile access to Lenovo Service Information website**

The server provides a QR code on the system service label, which is on the cover of the server, that you can scan using a QR code reader and scanner with a mobile device to get quick access to the Lenovo Service Information website. The Lenovo Service Information website provides additional information for parts installation, replacement videos, and error codes for server support.

- **Active Energy Manager**

Lenovo XClarity Energy Manager is a power and temperature management solution for data centers. You can monitor and manage the power consumption and temperature of Converged, NeXtScale, System x, and ThinkServer servers, and improve energy efficiency using Lenovo XClarity Energy Manager.

- **Redundant networking connection**

The Lenovo XClarity Controller provides failover capability to a redundant Ethernet connection with the applicable application installed. If a problem occurs with the primary Ethernet connection, all Ethernet traffic that is associated with the primary connection is automatically switched to the optional redundant Ethernet connection. If the applicable device drivers are installed, this switching occurs without data loss and without user intervention.

- **Redundant cooling**

The redundant cooling by the fans in the server enables continued operation if one of the fans fails.

Tech Tips

Lenovo continually updates the support website with the latest tips and techniques that you can use to solve issues that your server might encounter. These Tech Tips (also called retain tips or service bulletins) provide procedures to work around issues or solve problems related to the operation of your server.

To find the Tech Tips available for your server:

1. Go to <http://datacentersupport.lenovo.com> and navigate to the support page for your server.
2. Click on **How To's** from the navigation pane.
3. Click **Article Type** → **Solution** from the drop-down menu.

Follow the on-screen instructions to choose the category for the problem that you are having.

Security advisories

Lenovo is committed to developing products and services that adhere to the highest security standards in order to protect our customers and their data. When potential vulnerabilities are reported, it is the responsibility of the Lenovo Product Security Incident Response Team (PSIRT) to investigate and provide information to our customers so they may put mitigation plans in place as we work toward providing solutions.

The list of current advisories is available at the following site:

https://datacentersupport.lenovo.com/product_security/home

Specifications

Summary of the features and specifications of the server. Depending on the model, some features might not be available, or some specifications might not apply.

Refer to the below table for specifications categories and the content of each category.

Specification category	Technical specifications	Mechanical specifications	Environmental specifications
Content	<ul style="list-style-type: none">• Processor• Memory• M.2 Drive• Storage expansion• Expansion slots• Graphics processing unit (GPU)• Integrated functions and I/O connectors• Network• Rear button• System fan• Electrical input• Minimal configuration for debugging• Operating systems	<ul style="list-style-type: none">• Dimension• Weight	<ul style="list-style-type: none">• Environmental

Technical specifications

Summary of the technical specifications of server. Depending on the model, some features might not be available, or some specifications might not apply.

Processor

- Two AMD EPYC™ 9004 series processors
- Scalable up to 64 cores per socket, 128 cores in total
- Designed for LGA 6096 (SP5) socket
- Supports 4800 MHz DDR5 frequency
- Supports three x16 xGMI links up to 32 GT/s
- Supports TDP up to 400W

For a list of supported processors, see: <https://serverproven.lenovo.com>.

Memory

See “[Memory module installation rules and order](#)” on page 41 for detailed information about memory configuration and setup.

- Memory module type:
 - TruDDR5 4800MHz RDIMM: 64 GB (2Rx4) and 96 GB (2Rx4)
- Capacity
 - Minimum: 1.5 TB
 - Maximum: 2.3 TB
- Slots: 12 DIMM slots per processor, 24 DIMM slots in total

For a list of supported memory modules, see: <https://serverproven.lenovo.com>.

M.2 Drive

The server supports the following M.2 drive capacity:

- 960 GB

The following form factors are supported:

- 42 mm (2242)
- 60 mm (2260)
- 80 mm (2280)
- 110 mm (22110)

For a list of supported M.2 drives, see: <https://serverproven.lenovo.com>.

Storage expansion

- Up to sixteen 2.5-inch hot-swap NVMe drives
- Up to two M.2 drives (RAID support)

For a list of supported drives, see: <https://serverproven.lenovo.com>.

Expansion slots

- Eight front PCIe slots
- One of the following is supported in the rear:
 - Two rear PCIe slots
 - One rear PCIe slot and one OCP slot

For more information, see “[Front view](#)” on page 13 and “[Rear view](#)” on page 15.

Graphics processing unit (GPU)

The server supports one of the following configurations:

- Eight AMD MI300X 750W OAM GPUs with 192GB HBM3 memory
- Eight NVIDIA H100 700W SXM5 GPUs with 80GB HBM3 memory

Integrated functions and I/O connectors

- Lenovo XClarity Controller (XCC), which provides service processor control and monitoring functions, video controller, and remote keyboard, video, mouse, and remote drive capabilities.
 - The server supports Lenovo XClarity Controller 2 (XCC2). For additional information about Lenovo XClarity Controller 2 (XCC2), refer to <https://pubs.lenovo.com/lxcc-overview/>.
- Front connectors:
 - One USB 3.1 Gen 1 (5 Gbps) connector
 - One USB 2.0 connector with XCC system management function
 - One VGA connector
 - Integrated diagnostics panel
 - Power button and power LED (green)
 - Network Activity LED (green)
 - System ID button/LED (blue)
 - System Error LED (yellow)
- Rear connectors:
 - One XCC system management port (10/100/1000 Mbps RJ-45) on the rear to connect to a systems-management network. This RJ-45 connector is dedicated to the Lenovo XClarity Controller functions and runs at 10/100/1000 Mbps speed.
 - One VGA connector
 - Three USB 3.1 Gen 1 (5 Gbps) connectors
 - A group of two or four Ethernet connectors on the OCP 3.0 module (optional)

Note: The maximum video resolution is 1920 x 1200 at 60 Hz.

Network

One OCP module, which provides two or four Ethernet connectors for network support

Rear button

NMI button

System fan

Fifteen 80 mm x 80 mm x 56 mm dual-rotor fans

Electrical input

Eight power supplies provide N+N redundancy support.

- 2600-watt Titanium, input power 200-240 Vac

Important: Power supplies and redundant power supplies in the server must be with the same power rating, wattage or level.

Minimal configuration for debugging

- Two processors
- Twenty-four memory modules
- Eight power supplies
- One M.2 drive or one 2.5-inch drive (If OS is needed by debugging)
- Fifteen system fans
- One OCP module with required cable (if network is required)

Operating systems

Supported and certified operating system:

- Canonical Ubuntu

References:

- Complete list of available operating systems: <https://lenovopress.lenovo.com/osig>.
- OS deployment instructions, see “Deploy the operating system” on page 276.

Mechanical specifications

Summary of the mechanical specifications of server. Depending on the model, some features might not be available, or some specifications might not apply.

Dimension

- Chassis:
 - Height: 351 mm (13.82 inches)
 - Width (with EIA flange): 483 mm (19.02 inches)
 - Depth (with power supplies): 924.2 mm (36.39 inches)
- 2U compute shuttle (without release levers):
 - Height: 85.7 mm (3.37 inches)
 - Width: 438 mm (17.24 inches)
 - Depth: 585.8 mm (23.06 inches)
- 8U GPU shuttle (without release levers):
 - Height: 344.4 mm (13.56 inches)
 - Width: 440 mm (17.32 inches)
 - Depth: 847 mm (33.35 inches)

Weight

- Chassis (empty): 19.4 kg (43 lbs)
- 2U compute shuttle: approximately 11.8 kg (26 lbs), depending on the configuration
- 8U GPU shuttle:
 - approximately 73.2 kg (162 lbs) with H100 GPU complex, depending on the configuration
 - approximately 78.2 kg (172 lbs) with MI300X GPU complex, depending on the configuration
- Total server:
 - approximately 104.4 kg (230 lbs) with H100 GPU complex, depending on the configuration
 - approximately 109.4 kg (241 lbs) with MI300X GPU complex, depending on the configuration

Environmental specifications

Summary of the environmental specifications of server. Depending on the model, some features might not be available, or some specifications might not apply.

Environment

Depending on hardware configurations, ThinkSystem SR685a V3 complies with ASHRAE Class A2 specifications with certain thermal restrictions. System performance may be impacted when operating temperature is out of permitted conditions.

- Air temperature:
 - Operating
 - ASHRAE Class A2: 10°C to 35°C (50°F to 95°F); the maximum ambient temperature decreases by 1°C for every 300 m (984 ft) increase in altitude above 900 m (2,953 ft).
 - Server off: 5°C to 45°C (41°F to 113°F)
 - Shipment/storage: -20°C to 60°C (-4°F to 140°F)
- Maximum altitude: 3,050 m (10,000 ft)
- Relative Humidity (non-condensing):
 - Operating
 - ASHRAE Class A2: 8% to 80%; maximum dew point: 21°C (70°F)
 - Shipment/storage: 8% to 90%
- Particulate contamination

Attention: Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server. For information about the limits for particulates and gases, see [“Particulate contamination” on page 7](#).

Note: The server is designed for standard data center environment and recommended to be placed in industrial data center.

Particulate contamination

Attention: Airborne particulates (including metal flakes or particles) and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the device that is described in this document.

Risks that are posed by the presence of excessive particulate levels or concentrations of harmful gases include damage that might cause the device to malfunction or cease functioning altogether. This specification sets forth limits for particulates and gases that are intended to avoid such damage. The limits must not be viewed or used as definitive limits, because numerous other factors, such as temperature or moisture content of the air, can influence the impact of particulates or environmental corrosives and gaseous contaminant transfer. In the absence of specific limits that are set forth in this document, you must implement practices that maintain particulate and gas levels that are consistent with the protection of human health and safety. If Lenovo determines that the levels of particulates or gases in your environment have caused damage to the device, Lenovo may condition provision of repair or replacement of devices or parts

on implementation of appropriate remedial measures to mitigate such environmental contamination. Implementation of such remedial measures is a customer responsibility.

Table 1. Limits for particulates and gases

Contaminant	Limits
Reactive gases	Severity level G1 as per ANSI/ISA 71.04-1985 ¹ : <ul style="list-style-type: none"> • The copper reactivity level shall be less than 200 Angstroms per month ($\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour}$ weight gain).² • The silver reactivity level shall be less than 200 Angstroms per month ($\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour}$ weight gain).³ • The reactive monitoring of gaseous corrosivity must be conducted approximately 5 cm (2 in.) in front of the rack on the air inlet side at one-quarter and three-quarter frame height off the floor or where the air velocity is much higher.
Airborne particulates	Data centers must meet the cleanliness level of ISO 14644-1 class 8. For data centers without airside economizer, the ISO 14644-1 class 8 cleanliness might be met by choosing one of the following filtration methods: <ul style="list-style-type: none"> • The room air might be continuously filtered with MERV 8 filters. • Air entering a data center might be filtered with MERV 11 or preferably MERV 13 filters. For data centers with airside economizers, the choice of filters to achieve ISO class 8 cleanliness depends on the specific conditions present at that data center. <ul style="list-style-type: none"> • The deliquescent relative humidity of the particulate contamination should be more than 60% RH.⁴ • Data centers must be free of zinc whiskers.⁵
<p>¹ ANSI/ISA-71.04-1985. <i>Environmental conditions for process measurement and control systems: Airborne contaminants</i>. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.</p> <p>² The derivation of the equivalence between the rate of copper corrosion growth in the thickness of the corrosion product in $\text{\AA}/\text{month}$ and the rate of weight gain assumes that Cu_2S and Cu_2O grow in equal proportions.</p> <p>³ The derivation of the equivalence between the rate of silver corrosion growth in the thickness of the corrosion product in $\text{\AA}/\text{month}$ and the rate of weight gain assumes that Ag_2S is the only corrosion product.</p> <p>⁴ The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.</p> <p>⁵ Surface debris is randomly collected from 10 areas of the data center on a 1.5 cm diameter disk of sticky electrically conductive tape on a metal stub. If examination of the sticky tape in a scanning electron microscope reveals no zinc whiskers, the data center is considered free of zinc whiskers.</p>	

Management options

The XClarity portfolio and other system management options described in this section are available to help you manage the servers more conveniently and efficiently.

Overview

Options	Description
Lenovo XClarity Controller	<p>Baseboard management controller (BMC)</p> <p>Consolidates the service processor functionality, Super I/O, video controller, and remote presence capabilities into a single chip on the server system board (system board assembly).</p> <p>Interface</p> <ul style="list-style-type: none"> • CLI application • Web GUI interface • Mobile application • Redfish API <p>Usage and downloads</p> <p>https://pubs.lenovo.com/lxcc-overview/</p>
Lenovo XCC Logger Utility	<p>Application that reports the XCC events to local OS system log.</p> <p>Interface</p> <ul style="list-style-type: none"> • CLI application <p>Usage and downloads</p> <ul style="list-style-type: none"> • https://pubs.lenovo.com/lxcc-logger-linux/ • https://pubs.lenovo.com/lxcc-logger-windows/
Lenovo XClarity Administrator	<p>Centralized interface for multi-server management.</p> <p>Interface</p> <ul style="list-style-type: none"> • Web GUI interface • Mobile application • REST API <p>Usage and downloads</p> <p>https://pubs.lenovo.com/lxca/</p>
Lenovo XClarity Essentials toolset	<p>Portable and light toolset for server configuration, data collection, and firmware updates. Suitable both for single-server or multi-server management contexts.</p> <p>Interface</p> <ul style="list-style-type: none"> • OneCLI: CLI application • Bootable Media Creator: CLI application, GUI application • UpdateXpress: GUI application <p>Usage and downloads</p> <p>https://pubs.lenovo.com/lxce-overview/</p>

Options	Description
Lenovo XClarity Provisioning Manager	<p>UEFI-based embedded GUI tool on a single server that can simplify management tasks.</p> <p>Interface</p> <ul style="list-style-type: none"> • Web interface (BMC remote access) • GUI application <p>Usage and downloads</p> <p>https://pubs.lenovo.com/lxpm-overview/</p> <p>Important: Lenovo XClarity Provisioning Manager (LXPM) supported version varies by product. All versions of Lenovo XClarity Provisioning Manager are referred to as Lenovo XClarity Provisioning Manager and LXPM in this document, unless specified otherwise. To see the LXPM version supported by your server, go to https://pubs.lenovo.com/lxpm-overview/.</p>
Lenovo XClarity Integrator	<p>Series of applications that integrate the management and monitoring functionalities of the Lenovo physical servers with the software used in a certain deployment infrastructure, such as VMware vCenter, Microsoft Admin Center, or Microsoft System Center while delivering additional workload resiliency.</p> <p>Interface</p> <ul style="list-style-type: none"> • GUI application <p>Usage and downloads</p> <p>https://pubs.lenovo.com/lxci-overview/</p>
Lenovo XClarity Energy Manager	<p>Application that can manage and monitor server power and temperature.</p> <p>Interface</p> <ul style="list-style-type: none"> • Web GUI Interface <p>Usage and downloads</p> <p>https://datacentersupport.lenovo.com/solutions/Invo-lxem</p>
Lenovo Capacity Planner	<p>Application that supports power consumption planning for a server or rack.</p> <p>Interface</p> <ul style="list-style-type: none"> • Web GUI Interface <p>Usage and downloads</p> <p>https://datacentersupport.lenovo.com/solutions/Invo-lcp</p>

Functions

Options		Functions							
		Multi-system mgmt	OS deployment	System configuration	Firmware updates ¹	Event/alert monitoring	Inventory/logs	Power mgmt	Power planning
Lenovo XClarity Controller				√	√ ²	√	√ ⁴		
Lenovo XCC Logger Utility						√			
Lenovo XClarity Administrator		√	√	√	√ ²	√	√ ⁴		
Lenovo XClarity Essentials toolset	OneCLI	√		√	√ ²	√	√		
	Bootable Media Creator			√	√ ²		√ ⁴		
	UpdateXpress			√	√ ²				
Lenovo XClarity Provisioning Manager			√	√	√ ³		√ ⁵		
Lenovo XClarity Integrator		√	√ ⁶	√	√	√	√	√ ⁷	
Lenovo XClarity Energy Manager		√				√		√	
Lenovo Capacity Planner									√ ⁸

Notes:

1. Most options can be updated through the Lenovo tools. Some options, such as GPU firmware or Omni-Path firmware require the use of supplier tools.
2. The server UEFI settings for option ROM must be set to **Auto** or **UEFI** to update firmware using Lenovo XClarity Administrator, Lenovo XClarity Essentials, or Lenovo XClarity Controller.
3. Firmware updates are limited to Lenovo XClarity Provisioning Manager, Lenovo XClarity Controller, and UEFI updates only. Firmware updates for optional devices, such as adapters, are not supported.
4. The server UEFI settings for option ROM must be set to **Auto** or **UEFI** for detailed adapter card information, such as model name and firmware levels, to be displayed in Lenovo XClarity Administrator, Lenovo XClarity Controller, or Lenovo XClarity Essentials.
5. Limited inventory.
6. The Lenovo XClarity Integrator deployment check for System Center Configuration Manager (SCCM) supports Windows operating system deployment.
7. Power management function is supported only by Lenovo XClarity Integrator for VMware vCenter.
8. It is highly recommended that you check the power summary data for your server using Lenovo Capacity Planner before purchasing any new parts.

Chapter 2. Server components

This section contains information about each of the components associated with the server.

Front view

This section contains information on the front view.

Note: The illustration in this section show the location of certain parts. Some parts may not be supported at the same time within certain configuration(s).

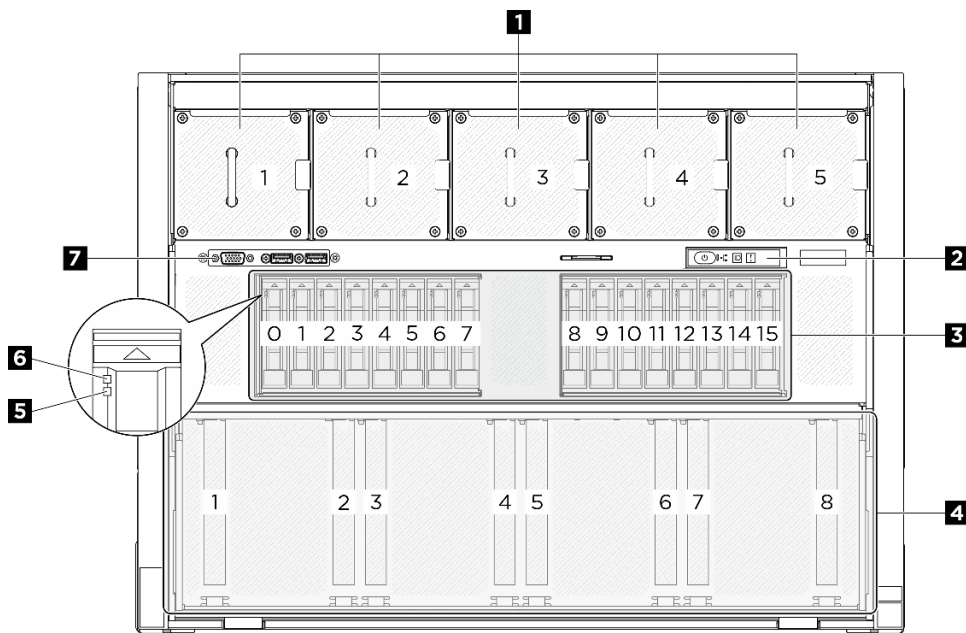


Figure 2. Front view

Table 2. Components on the front view

1 Front fans	2 Integrated diagnostics panel
3 2.5-inch drive bays (bay 0 to 15)	4 PCIe switch shuttle (PCIe slot 1-8)
5 Drive status LED (yellow)	6 Drive activity LED (green)
7 Front I/O module	

1 Front fans

Install front fans in this space. See [“Install a hot-swap fan \(front and rear\)”](#) on page 81 for more information.

2 Integrated diagnostics panel

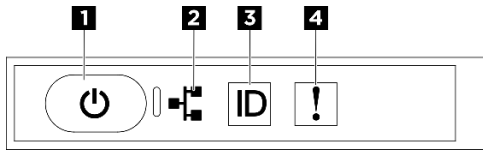


Figure 3. Integrated diagnostics panel LEDs

Table 3. Integrated diagnostics panel LEDs

1 Power button with power status LED (green)	2 Network activity LED (green)
3 System ID button with system ID LED (blue)	4 System Error LED (yellow)

1 Power button with power status LED (green)

You can press the power button to power on the server when you finish setting up the server. You also can hold the power button for several seconds to power off the server if you cannot shut down the server from the operating system. The states of the power LED are as follows:

Status	Color	Description
Off	None	No power supply is properly installed, or the LED itself has failed.
Flashing rapidly (four times per second)	Green	The server is turned off and is not ready to be turned on. The power button is disabled. This will last approximately 5 to 10 seconds.
Flashing slowly (once per second)	Green	The server is turned off and is ready to be turned on. You can press the power button to turn on the server.
Lit	Green	The server is turned on.

2 Network activity LED (green)

The network activity LED helps you identify the network connectivity and activity.

Status	Color	Description
On	Green	The server is connected to a network.
Blinking	Green	The network is connected and active.
Off	None	The server is disconnected from the network.

3 System ID button with system ID LED (blue)

Use this system ID button and the blue system ID LED to visually locate the server. Each time you press the system ID button, the state of the system ID LED changes. The LED can be changed to on, blinking, or off. You can also use the Lenovo XClarity Controller or a remote management program to change the state of the system ID LED to assist in visually locating the server among other servers.

4 System Error LED (yellow)

The system error LED helps you to determine if there are any system errors.

Status	Color	Description	Action
On	Yellow	<p>An error has been detected on the server. Causes might include one or more of the following errors:</p> <ul style="list-style-type: none"> • The temperature of the server reached the non-critical temperature threshold. • The voltage of the server reached the non-critical voltage threshold. • A fan has been detected to be running at low speed. • The power supply has a critical error. • The power supply is not connected to the power. 	Check the LCD display or the event log to determine the exact cause of the error.
Off	None	The server is off or the server is on and is working correctly.	None.

For more information about the integrated diagnostics panel, see [“Integrated diagnostics panel” on page 284](#).

3 2.5-inch drive bays (bay 0 to 15)

Install 2.5-inch NVMe drives to these bays. See [“Install a 2.5-inch hot-swap drive” on page 60](#) for more information.

4 PCIe switch shuttle (PCIe slot 1-8)

Install PCIe adapters to the PCIe switch shuttle. These PCIe slots support the following configuration:

- PCIe Gen5 x16, FH/HL

5 Drive status LED (yellow)

The drive status LED indicates the following status:

- The LED is lit: the drive has failed.
- The LED is flashing slowly (once per second): the drive is being rebuilt.
- The LED is flashing rapidly (three times per second): the drive is being identified.

6 Drive activity LED (green)

Each hot-swap drive comes with an activity LED. When this LED is flashing, it indicates that the drive is in use.

7 Front I/O module

For more information about the front I/O module, see [“Front I/O module” on page 19](#).

Rear view

This section contains information on the rear view.

Note: The illustration in this section show the location of certain parts. Some parts may not be supported at the same time within certain configuration(s).

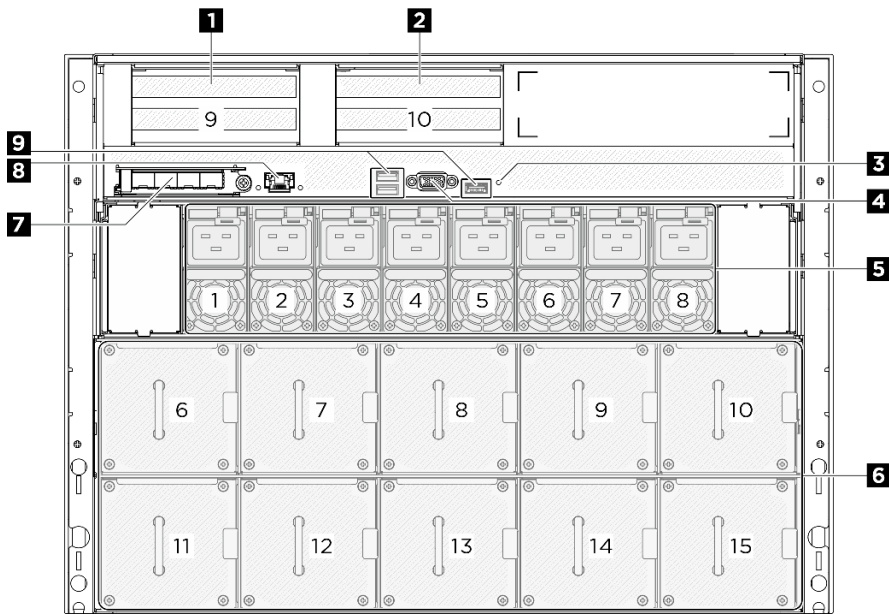


Figure 4. Rear view

Table 4. Components on the rear view

1 PCIe riser 1 (PCIe slot 9)	2 PCIe riser 2 (PCIe slot 10)
3 NMI button	4 VGA connector
5 Power supply units	6 Rear fans
7 OCP module	8 XCC system management port (10/100/1000 Mbps RJ-45) (1 GB RJ-45)
9 USB 3.1 Gen 1 (5 Gbps) connectors (total of three connectors)	

1/2 PCIe riser 1/2

Install PCIe adapters into these risers. See the following table for PCIe slots corresponding to the risers.

Table 5. PCIe riser and corresponding slots

PCIe riser	PCIe slot
1 PCIe riser 1	Slot 9: PCIe Gen5 x16, FH/HL
2 PCIe riser 2	Slot 10: PCIe Gen5 x16, FH/HL

3 NMI button

Press this button to force a nonmaskable interrupt to the processor. You might have to use a pen or the end of a straightened paper clip to press the button. You can also use it to force a blue-screen memory dump. Use this button only when you are directed to do so by Lenovo Support.

4 VGA connector

Connect a monitor to this connector.

Note: The maximum video resolution is 1920 x 1200 at 60 Hz.

5 Power supply units

Install power supply units to these bays, connect them to power cords. Make sure the power cords are connected properly. Following are the power supplies supported by this system:

- 2600-watt Titanium, input power 200-240 Vac

For more information on the power supply LEDs, see [“Power supply LEDs” on page 281](#).

6 Rear fans

Install rear fans in this space. See [“Install a hot-swap fan \(front and rear\)” on page 81](#) for more information.

7 OCP 3.0 module

The system may support a 2-port or a 4-port OCP module for network connections. Port numbering are shown in the illustrations below.

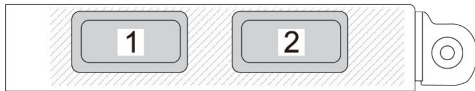


Figure 5. Port numbering — 2-port OCP module

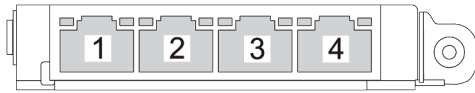


Figure 6. Port numbering — 4-port OCP 3.0 module

8 XCC system management port (10/100/1000 Mbps RJ-45) (10/100/1000 Mbps RJ-45)

The server has a 10/100/1000 Mbps RJ-45 connector dedicated to Lenovo XClarity Controller (XCC) functions. Through the system management port, you can access the Lenovo XClarity Controller directly by connecting your laptop to the management port using an Ethernet cable. Make sure that you modify the IP settings on the laptop so that it is on the same network as the server default settings. A dedicated management network provides additional security by physically separating the management network traffic from the production network.

See the following for more information:

- [“Set the network connection for the Lenovo XClarity Controller” on page 269](#)
- [“XCC system management port LEDs” on page 283](#)

9 USB 3.1 Gen 1 (5 Gbps) connectors

There are three USB 3.1 Gen 1 (5 Gbps) connectors on the rear of the server. Connect a USB device, such as a mouse, keyboard, or other devices, to either of these connectors.

Top view

This section contains information on the top view.

Note: The illustrations in this section show the location of certain parts. Some parts may not be supported at the same time within certain configuration(s).

- “2U compute shuttle top view” on page 18
- “8U GPU shuttle top view” on page 19

2U compute shuttle top view

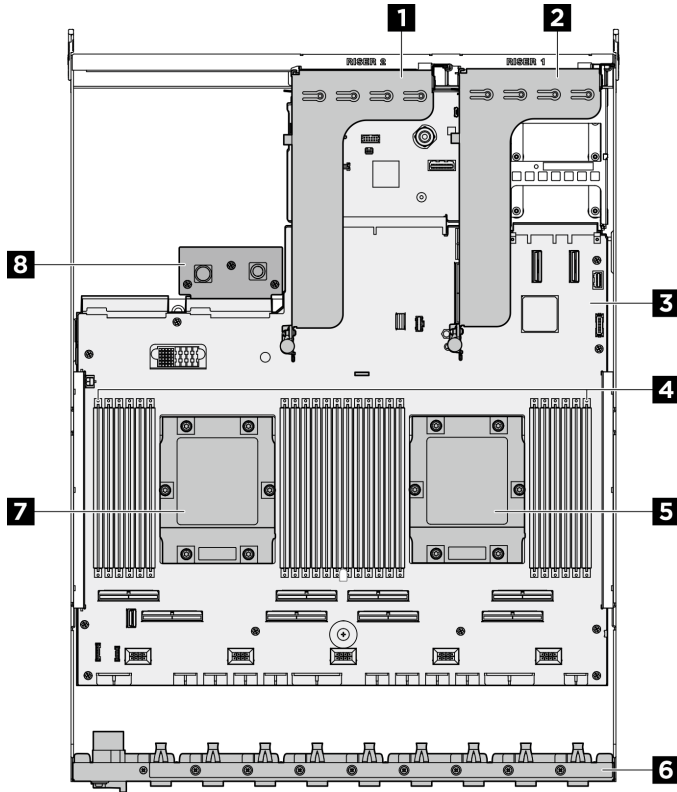


Figure 7. 2U compute shuttle top view

Table 6. Components on the 2U compute shuttle top view

1 PCIe riser 2	2 PCIe riser 1
3 System board assembly	4 Memory modules
5 Processor 1	6 Rear PCIe switch cable harness
7 Processor 2	8 Power interface board

8U GPU shuttle top view

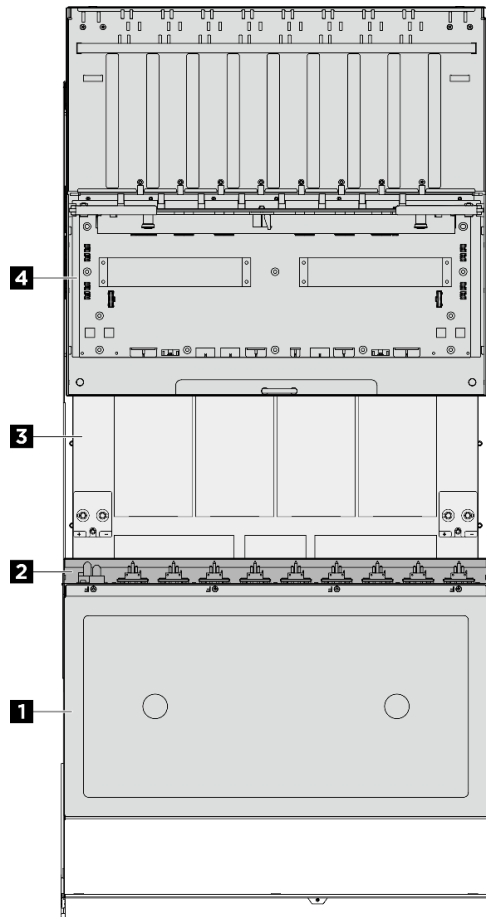


Figure 8. 8U GPU shuttle top view

Table 7. Components on the 8U GPU shuttle top view

1 Cable cover	2 Front PCIe switch cable harness
3 GPU complex	4 Power complex

Front I/O module

This section contains information on the front I/O module

The following illustrations show the front I/O module. To locate the front I/O module, see [“Front view” on page 13](#).

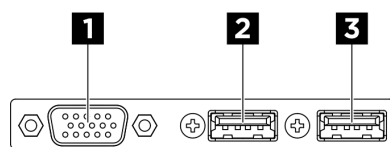


Figure 9. Front I/O module

Table 8. Components on the front I/O module

1 VGA connector	2 USB 2.0 connector with Lenovo XClarity Controller management
3 USB 3.1 Gen 1 (5 Gbps) connector	

1 VGA connector

Connect a monitor to this connector.

Note: The maximum video resolution is 1920 x 1200 at 60 Hz.

2 USB 2.0 connector with Lenovo XClarity Controller management

Connect a USB 2.0 device, such as a mouse, keyboard, or other devices, to this connector.

Note: This is the only USB port that supports USB automation update of the firmware and RoT security module.

Connection to Lenovo XClarity Controller is primarily intended for users with a mobile device running the Lenovo XClarity Controller mobile application. When a mobile device is connected to this USB port, an Ethernet over USB connection is established between the mobile application running on the device and the Lenovo XClarity Controller.

Select **Network** in **BMC Configuration** to view or modify settings.

Four types of settings are available:

- **Host only mode**

In this mode, the USB port is always solely connected to the server.

- **BMC only mode**

In this mode, the USB port is always solely connected to Lenovo XClarity Controller.

- **Shared mode: owned by BMC**

In this mode, connection to the USB port is shared by the server and Lenovo XClarity Controller, while the port is switched to Lenovo XClarity Controller.

- **Shared mode: owned by host**

In this mode, connection to the USB port is shared by the server and Lenovo XClarity Controller, while the port is switched to the server.

3 USB 3.1 Gen 1 (5 Gbps) connector

The USB 3.1 Gen 1 (5 Gbps) connector can be used to attach a USB-compatible device, such as a USB keyboard, USB mouse, or USB storage device.

System-board-assembly layout

The illustrations in this section provide information about the connectors, switches, and jumpers that are available on the system board assembly.

The following illustration shows the layout of the system board assembly which contains the firmware and RoT security module, system I/O board, and processor board.

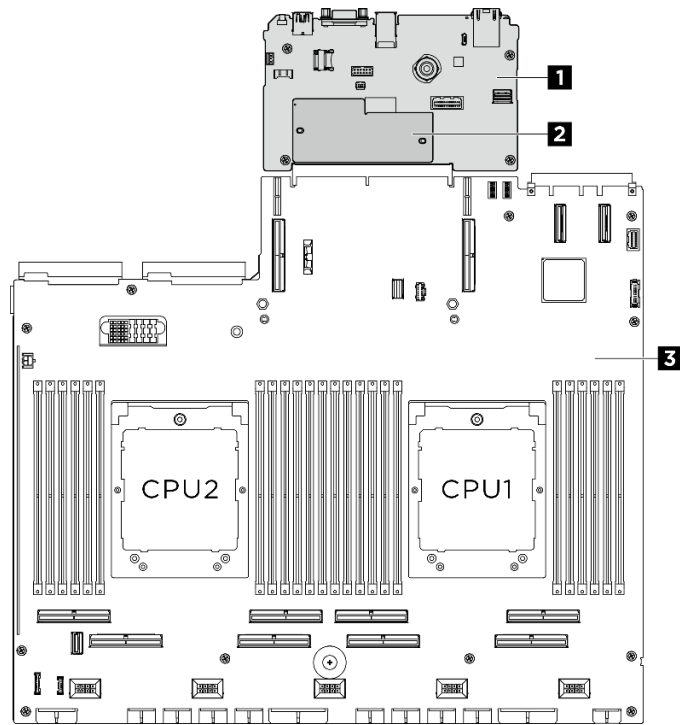


Figure 10. System-board-assembly layout

1 System I/O board	2 Firmware and RoT security module	3 Processor board
--------------------	------------------------------------	-------------------

System-board-assembly connectors

The following illustration shows the internal connectors on the system board assembly.

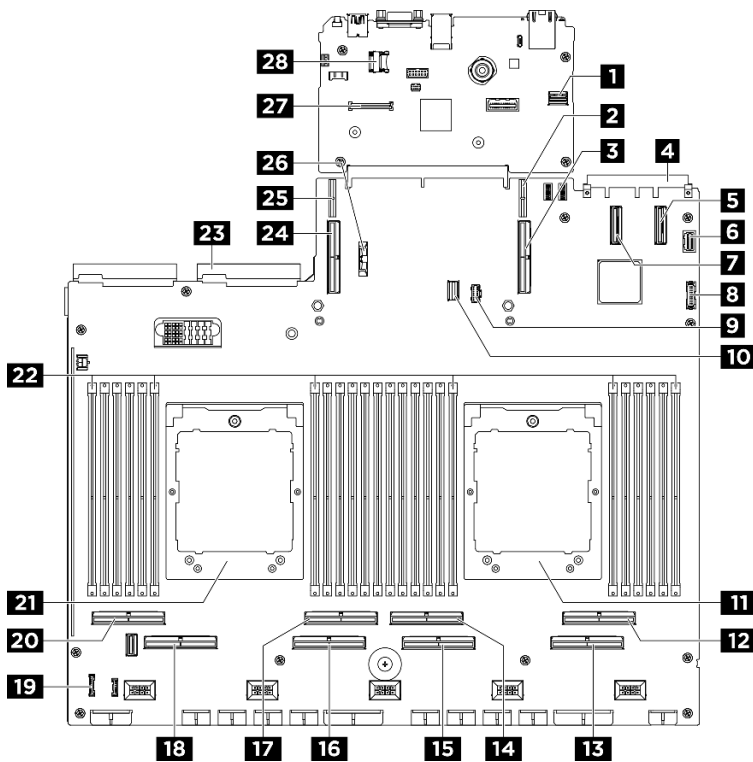


Figure 11. System-board-assembly connectors

Table 9. System-board-assembly connectors

1 PCIe SW MGMT connector	2 PCIe riser 1 power connector
3 PCIe connector 9 / PCIe riser 1 connector	4 OCP connector
5 PCIe connector 11	6 Front VGA connector
7 PCIe connector 12	8 Front USB connector
9 M.2 power connector	10 M.2 signal connector
11 Processor 1	12 PCIe connector 2
13 PCIe connector 1	14 PCIe connector 4
15 PCIe connector 3	16 PCIe connector 5
17 PCIe connector 6	18 PCIe connector 7
19 Integrated diagnostics panel connector	20 PCIe connector 8
21 Processor 2	22 Memory module slot 1-24 (right to left)
23 Power interface board connector	24 PCIe connector 10 / PCIe riser 2 connector
25 PCIe riser 2 power connector	26 3V battery (CR2032)
27 Firmware and RoT security module connector	28 MicroSD socket

System-board-assembly switches

The following illustration shows the location of the switches, jumpers, and buttons on the system board assembly.

Note: If there is a clear protective sticker on the top of the switch blocks, you must remove and discard it to access the switches.

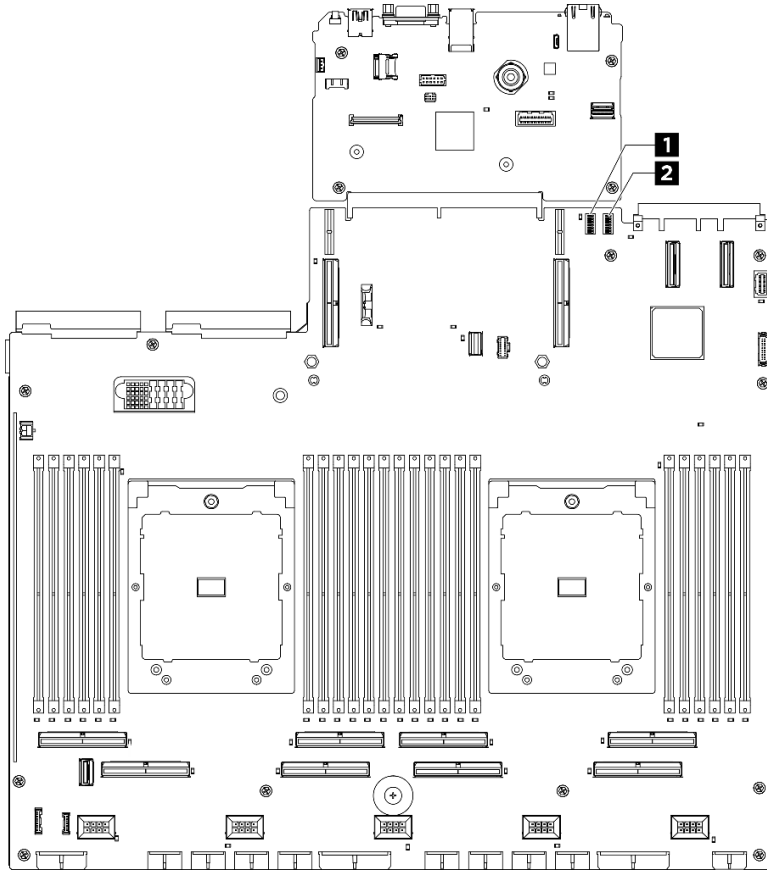


Figure 12. System-board-assembly switches

Table 10. System-board-assembly switches

1 Switch block 6 (SW6)	2 Switch block 5 (SW5)
-------------------------------	-------------------------------

Important:

1. Before you change any switch settings or move any jumpers, turn off the server; then, disconnect all power cords and external cables. Review the following information:
 - https://pubs.lenovo.com/safety_documentation/
 - “Installation Guidelines” on page 37
 - “Handling static-sensitive devices” on page 40
 - “Power off the server” on page 43
2. Any system-board-assembly switch or jumper block that is not shown in the illustrations in this document are reserved.

Switch block 6 (SW6)

The following table describes the functions of the switch block 6 (SW6) on the system board assembly.

Table 11. Switch block 6 (SW6) description

Switch number	Default position	Description
1	Off	Reserved
2	Off	Reserved
3	Off	Reserved
4	Off	Reserved
5	Off	Reserved
6	Off	Reserved
7	Off	Reserved
8	Off	Reserved

Switch block 5 (SW5)

The following table describes the functions of the switch block 5 (SW5) on the system board assembly.

Table 12. Switch block 5 (SW5) description

Switch number	Default position	Description
1	Off	Changing this switch to the On position forces the XCC processor into reset.
2	Off	Changing this switch to the On position forces the real time clock to reset.
3	Off	Changing this switch to the On position provides one time Power-On password bypass.
4	Off	Changing this switch to the On position forces FPGA into reset.
5	Off	Reserved
6	Off	Reserved
7	Off	Reserved
8	Off	Reserved

System LEDs and diagnostics display

See the following section for information on available system LEDs and diagnostics display.

For more information, refer to [“Troubleshooting by system LEDs and diagnostics display”](#) on page 281.

Chapter 3. Parts list

Identify each of the components that is available for your server with the parts list.

For more information about ordering parts:

1. Go to <http://datacentersupport.lenovo.com> and navigate to the support page for your server.
2. Click **Parts**.
3. Enter the serial number to view a listing of parts for your server.

It is highly recommended that you check the power summary data for your server using Lenovo Capacity Planner before purchasing any new parts.

Note: Depending on the model, your server might look slightly different from the illustration.

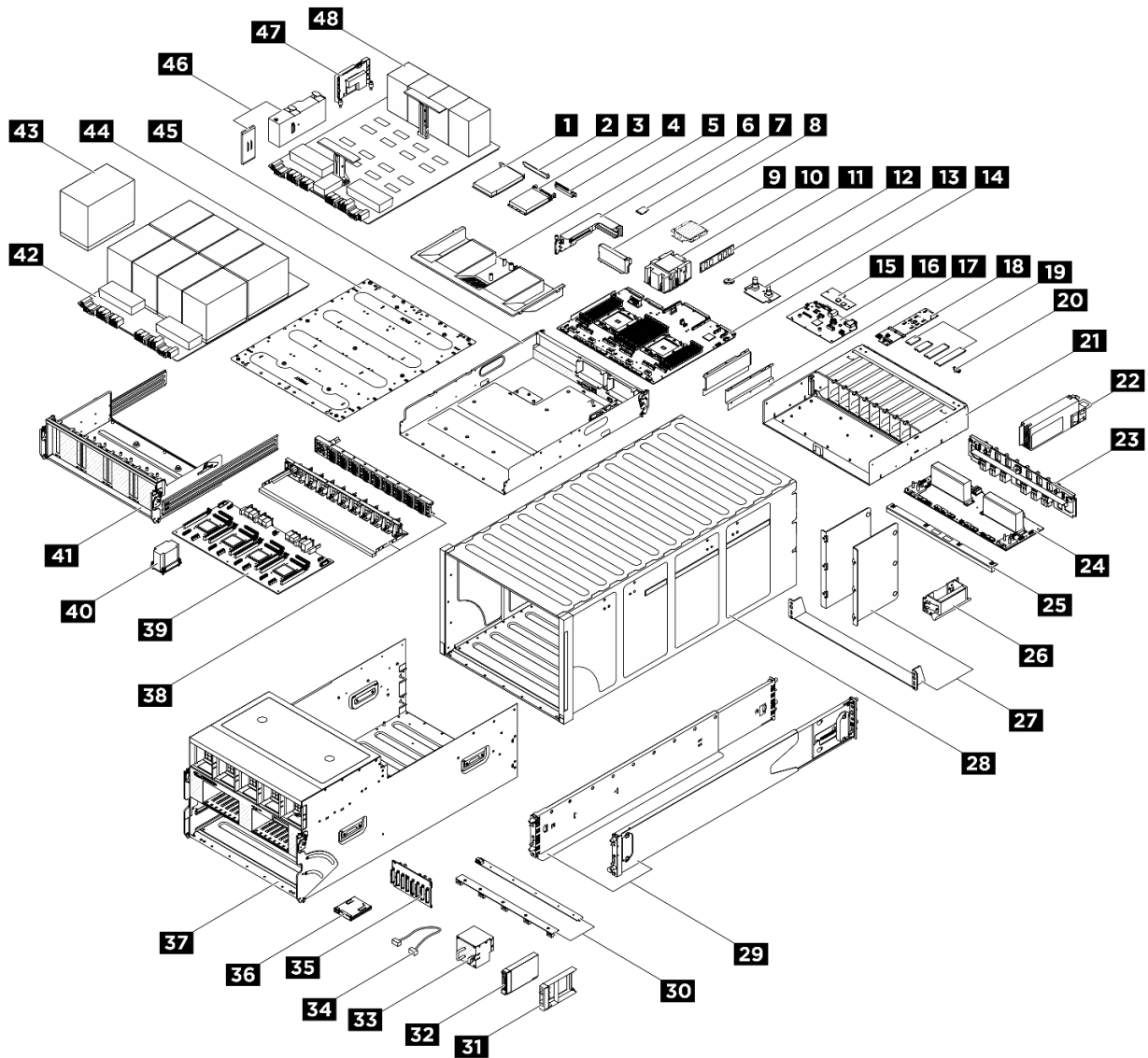


Figure 13. Server components

The parts listed in the following table are identified as one of the following:

- **T1:** Tier 1 customer replaceable unit (CRU). Replacement of Tier 1 CRUs is your responsibility. If Lenovo installs a Tier 1 CRU at your request with no service agreement, you will be charged for the installation.
- **T2:** Tier 2 customer replaceable unit (CRU). You may install a Tier 2 CRU yourself or request Lenovo to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **F:** Field replaceable unit (FRU). FRUs must be installed only by trained service technicians.
- **C:** Consumable and Structural parts. Purchase and replacement of consumable and structural parts (components, such as a filler or bezel) is your responsibility. If Lenovo acquires or installs a structural component at your request, you will be charged for the service.

Table 13. Parts list

Index	Description	Type
<p>For more information about ordering parts:</p> <ol style="list-style-type: none"> 1. Go to http://datacentersupport.lenovo.com and navigate to the support page for your server. 2. Click Parts. 3. Enter the serial number to view a listing of parts for your server. 		
1	PCIe adapter	F
2	PCIe filler (single-slot)	C
3	OCP module	T1
4	OCP module filler	C
5	Processor air baffle	F
6	PCIe riser	F
7	MicroSD card	F
8	PCIe riser filler	C
9	Processor	F
10	Processor heat sink	F
11	Memory module	F
12	CMOS battery (CR2032)	C
13	Power interface board	F
14	Processor board	F
15	Firmware and RoT security module	F
16	System I/O board	F
17	Cable guide	F
18	M.2 drive backplane	F
19	M.2 drive	F
20	M.2 drive retainer	F
21	PSU cage	F
22	Power supply unit	T1
23	PSU interposer	F
24	Power distribution board	F
25	GPU air baffle	F
26	Chassis lift handle	F
27	Chassis support brackets	F
28	Chassis	F
29	Slide rail kit	C
30	Fan control boards	F
31	2.5-inch drive filler (1-bay)	C
32	2.5-inch hot-swap drive	T1

Table 13. Parts list (continued)

Index	Description	Type
33	Fan	T1
34	External cable	T1
	Internal cable	F
35	2.5-inch drive backplane	F
36	Integrated diagnostics panel	T1
37	8U GPU shuttle	F
38	PCIe switch cable harnesses	F
39	PCIe switch board	F
40	PCIe switch board heat sink	F
41	PCIe switch shuttle	F
42	GPU complex	F
43	GPU and heat sink module	F
44	GPU complex adaptor plate	F
45	2U compute shuttle	F
46	GPU air duct	F
47	HMC card	F
48	GPU baseboard	F

Power cords

Several power cords are available, depending on the country and region where the server is installed.

To view the power cords that are available for the server:

1. Go to:
<http://dcsc.lenovo.com/#/>
2. Click **Preconfigured Model** or **Configure to order**.
3. Enter the machine type and model for your server to display the configurator page.
4. Click **Power** → **Power Cables** to see all line cords.

Notes:

- For your safety, a power cord with a grounded attachment plug is provided to use with this product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.
- Power cords for this product that are used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).
- For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.
- For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

- For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.
- Power cords for a specific country or region are usually available only in that country or region.

Chapter 4. Unboxing and setup

Information in this section assists you on unboxing and setting up the server. When unboxing the server, check if the items in the package are correct, and learn where to find information of server serial number and Lenovo XClarity Controller access. Make sure to follow the instructions in “[Server setup checklist](#)” on [page 34](#) when setting up the server.

Attention: Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform the replacement procedure of certain parts. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Server package contents

When you receive your server, verify that the shipment contains everything that you expected to receive.

The server package includes the following items:

- Server
- Rail installation kit*. Installation guide is provided in the package.
- Material box, including items such as power cords*, accessory kit, and printed documents.

Notes:

- Some of the items listed are available on select models only.
- Items marked with asterisk(*) are optional.

If any item is missing or damaged, contact your place of purchase. Ensure that you retain your proof of purchase and packing material. They might be required to receive warranty service.

Identify the server and access the Lenovo XClarity Controller

This section contains instruction on how to identify your server and where to find the Lenovo XClarity Controller access information.

Identifying your server

When you contact Lenovo for help, the machine type, model, and serial number information help support technicians to identify your server and provide faster service.

The illustration below shows the location of the ID label which contains the model number, machine type, and serial number of the server. You can also add other system information labels to the front of the server in the customer label spaces.

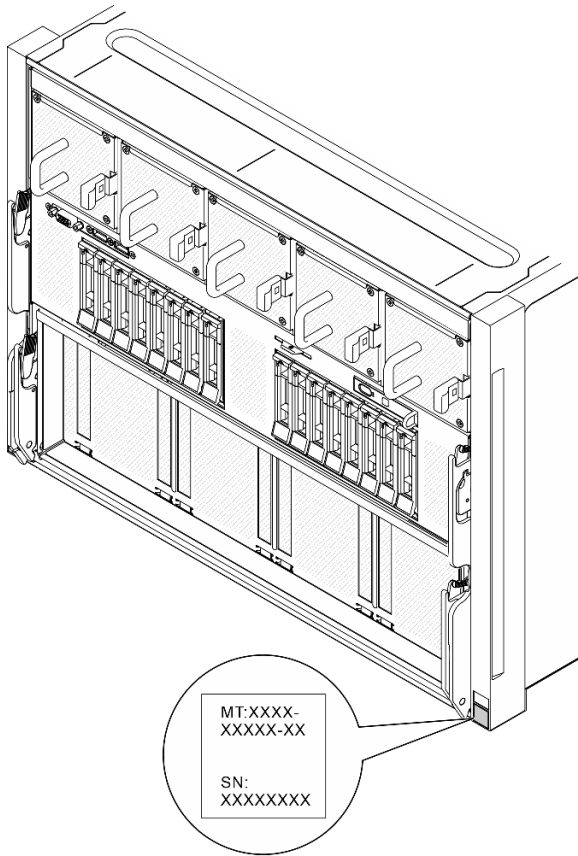


Figure 14. Location of the ID label

Lenovo XClarity Controller network access label

In addition, the Lenovo XClarity Controller network access label is attached to the pull-out information tab located near the integrated diagnostics panel in the front of the 8U GPU shuttle, with MAC address accessible with a pull.

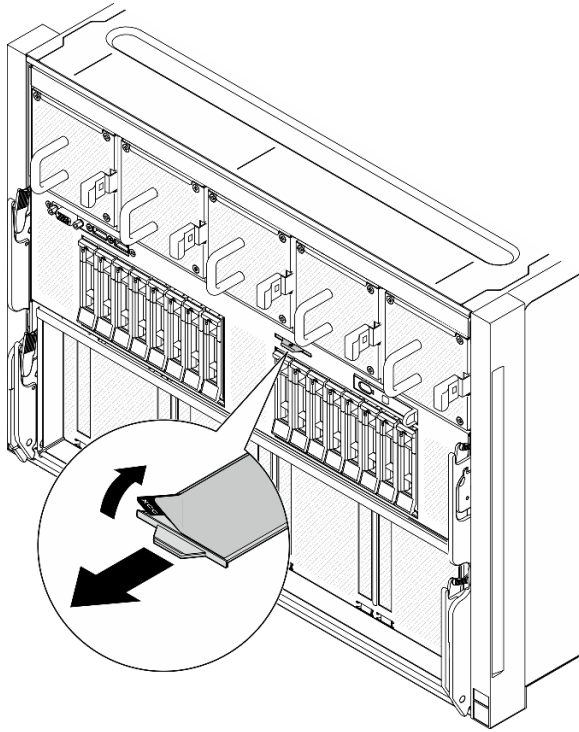


Figure 15. Lenovo XClarity Controller network access label on the pull-out information tab

Service Label and QR code

In addition, the system Service Label is located on the surface of the processor air baffle, provides a quick reference (QR) code for mobile access to service information. You can scan the QR code with a mobile device using a QR code reader application and get quick access to the Service Information web page. The Service Information web page provides additional information for parts installation and replacement videos, and error codes for solution support.

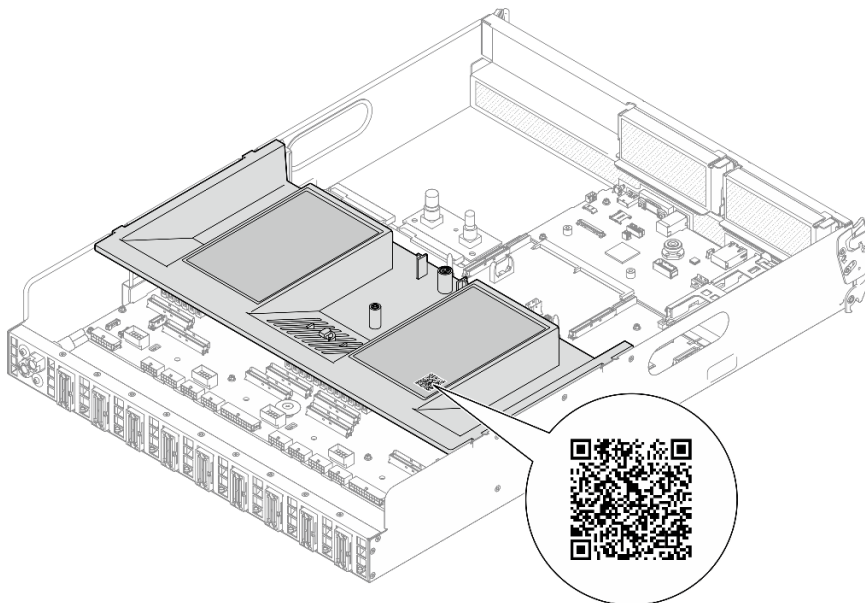


Figure 16. Service Label and QR code

Server setup checklist

Use the server setup checklist to ensure that you have performed all tasks that are required to set up your server.

The server setup procedure varies depending on the configuration of the server when it was delivered. In some cases, the server is fully configured and you just need to connect the server to the network and an AC power source, and then you can power on the server. In other cases, the server needs to have hardware options installed, requires hardware and firmware configuration, and requires an operating system to be installed.

The following steps describe the general procedure for setting up a server.

Setup the server hardware

Complete the following procedures to setup the server hardware.

Attention: Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform the replacement procedure of certain parts. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

1. Unpack the server package. See “[Server package contents](#)” on page 31.
2. Install any required hardware or server options. See the related topics in [Chapter 5 “Hardware replacement procedures](#)” on page 37.
3. If necessary, install the rail to a standard rack cabinet. Follow the instruction in *Rail Installation Guide* that comes with the rail installation kit.
4. If necessary, install the chassis into a standard rack cabinet. See “[Install the chassis to rack](#)” on page 50.
5. Connect all external cables to the server. See [Chapter 2 “Server components”](#) on page 13 for connectors locations.

Typically, you will need to connect the following cables:

- Connect server to the power source
 - Connect server to the data network
 - Connect the server to the storage device
 - Connect the server to the management network
6. Power on the server.

Power button location and power LED are specified in:

- [Chapter 2 “Server components”](#) on page 13
- “[Troubleshooting by system LEDs and diagnostics display](#)” on page 281

The server can be turned on (power LED on) in any of the following ways:

- You can press the power button.
- The server can restart automatically after a power interruption.
- The server can respond to remote power-on requests sent to the Lenovo XClarity Controller.

Note: You can access the management processor interface to configure the system without powering on the server. Whenever the server is connected to power, the management processor interface is available. For details about accessing the management server processor, see “Opening and Using the

XClarity Controller Web Interface” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.

7. Validate the server. Make sure that the power LED, Ethernet connector LED, and network LED are lit with green light, which means the server hardware was set up successfully.

See “[System LEDs and diagnostics display](#)” on page 24 for more information on the LED indications.

Configure the system

Complete the following procedures to configure the system. For detailed instructions, refer to [Chapter 7 “System configuration”](#) on page 269.

1. Set the network connection for the Lenovo XClarity Controller to the management network.
2. Update the firmware for the server, if necessary.
3. Configure the firmware for the server.

The following information is available for RAID configuration:

- <https://lenovopress.lenovo.com/lp0578-lenovo-raid-introduction>
- <https://lenovopress.lenovo.com/lp0579-lenovo-raid-management-tools-and-resources>

4. Install the operating system.
5. Back up the server configuration.
6. Install the applications and programs for which the server is intended to be used.

Chapter 5. Hardware replacement procedures

This section provides installation and removal procedures for all serviceable system components. Each component replacement procedure references any tasks that need to be performed to gain access to the component being replaced.

Attention: Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform the replacement procedure of certain parts. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Installation Guidelines

Before installing components in your server, read the installation guidelines.

Before installing optional devices, read the following notices carefully:

Attention: Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.

- Read the safety information and guidelines to ensure your safety at work:
 - A complete list of safety information for all products is available at:
https://pubs.lenovo.com/safety_documentation/
 - The following guideline is available as well: “[Handling static-sensitive devices](#)” on page 40.
- Make sure the components you are installing are supported by your server.
 - For a list of supported optional components for the server, see <https://serverproven.lenovo.com>.
 - For the option package contents, see <https://serveroption.lenovo.com/>.
- For more information about ordering parts:
 1. Go to <http://datacentersupport.lenovo.com> and navigate to the support page for your server.
 2. Click **Parts**.
 3. Enter the serial number to view a listing of parts for your server.
- When you install a new server, download and apply the latest firmware. This will help ensure that any known issues are addressed, and that your server is ready to work with optimal performance. Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to download firmware updates for your server.

Important: Some cluster solutions require specific code levels or coordinated code updates. If the component is part of a cluster solution, verify the latest Best Recipe code level menu for cluster supported firmware and driver before you update the code.

- If you replace a part, such as an adapter, that contains firmware, you might also need to update the firmware for that part. For more information about updating firmware, see “[Update the firmware](#)” on page 271.
- It is good practice to make sure that the server is working correctly before you install an optional component.
- Keep the working area clean, and place removed components on a flat and smooth surface that does not shake or tilt.

- Do not attempt to lift an object that might be too heavy for you. If you have to lift a heavy object, read the following precautions carefully:
 - Make sure that you can stand steadily without slipping.
 - Distribute the weight of the object equally between your feet.
 - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
 - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.
 - Back up all important data before you make changes related to the disk drives.
 - Have a Phillips #1 screwdriver, a Phillips #2 screwdriver, a torque screwdriver, a 5 mm hex socket screw bit, a 7 mm hex socket screw bit, and a Torx T15 extended bit (6-inch long) available.
 - To view the error LEDs on the system board (system board assembly) and internal components, leave the power on.
 - You do not have to turn off the server to remove or install hot-swap power supplies, hot swap fans, or hot-plug USB devices. However, you must turn off the server before you perform any steps that involve removing or installing adapter cables, and you must disconnect the power source from the server before you perform any steps that involve removing or installing a riser card.
 - When replacing power supply units or fans, make sure to refer to redundancy rules for these components.
 - Blue on a component indicates touch points, where you can grip to remove a component from or install it in the server, open or close a latch, and so on.
 - Orange on a component or an orange on or near a component indicates that the component can be hot-swapped if the server and operating system support hot-swap capability, which means that you can remove or install the component while the server is still running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
 - The Red strip on the drives, adjacent to the release latch, indicates that the drive can be hot-swapped if the server and operating system support hot-swap capability. This means that you can remove or install the drive while the server is still running.
- Note:** See the system specific instructions for removing or installing a hot-swap drive for any additional procedures that you might need to perform before you remove or install the drive.
- After finishing working on the server, make sure you reinstall all safety shields, guards, labels, and ground wires.

Safety inspection checklist

Use the information in this section to identify potentially unsafe conditions with your server. As each machine was designed and built, required safety items were installed to protect users and service technicians from injury.

Note: The product is not suitable for use at visual display workplaces according to §2 of the Workplace Regulations.

Note: The set-up of the server is made in the server room only.

CAUTION:

- **This equipment must be serviced by trained personnel, as defined by the IEC 62368-1, the standard for Safety of Electronic Equipment within the Field of Audio/Video, Information Technology and Communication Technology. Lenovo assumes you are qualified in the servicing of equipment and trained in recognizing hazards energy levels in products. Equipment must be installed in a restricted access location and access to the equipment is controlled by the authority responsible for the location.**

- **Consult with the supply authority, if necessary, that the equipment is connected only to a supply of Zmax 0.105 for IEC 61000-3-11 compliance.**

Important: Electrical grounding of the server is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Use the following checklist to verify that there are no potentially unsafe conditions:

1. Make sure that the power is off and the power cord is disconnected.
 2. Check the power cord.
 - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
 - Make sure that the power cord is the correct type.
- To view the power cords that are available for the server:
- a. Go to:
<http://dcsc.lenovo.com/#/>
 - b. Click **Preconfigured Model** or **Configure to order**.
 - c. Enter the machine type and model for your server to display the configurator page.
 - d. Click **Power → Power Cables** to see all line cords.
- Make sure that the insulation is not frayed or worn.
3. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
 4. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
 5. Check for worn, frayed, or pinched cables.
 6. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.
 7. The design of the electrical distribution system must take into consideration the total grounding leakage current from all power supplies in the server.

CAUTION:



High touch current. Connect to earth before connecting to supply.

8. Use the PDUs (power distribution units) with pluggable equipment type B to distribute electrical power to servers.

System reliability guidelines

Review the system reliability guidelines to ensure proper system cooling and reliability.

Make sure the following requirements are met:

- When the server comes with redundant power, a power supply must be installed in each power-supply bay.

- Adequate space around the server must be spared to allow server cooling system to work properly. Leave approximately 50 mm (2.0 in.) of open space around the front and rear of the server. Do not place any object in front of the fans.
- For proper cooling and airflow, refit the server cover before you turn the power on. Do not operate the server for more than 30 minutes with the server cover removed, for it might damage server components.
- Cabling instructions that come with optional components must be followed.
- A failed fan must be replaced within 48 hours after malfunction.
- A removed hot-swap fan must be replaced within 30 seconds after removal.
- A removed hot-swap drive must be replaced within two minutes after removal.
- A removed hot-swap power supply must be replaced within two minutes after removal.
- Every air baffle that comes with the server must be installed when the server starts (some servers might come with more than one air baffle). Operating the server with a missing air baffle might damage the processor.
- All processor sockets must contain either a socket cover or a processor with heat sink.
- When more than one processor is installed, fan population rules for each server must be strictly followed.

Handling static-sensitive devices

Review these guidelines before you handle static-sensitive devices to reduce the possibility of damage from electrostatic discharge.

Attention: Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.

- Limit your movement to prevent building up static electricity around you.
- Take additional care when handling devices during cold weather, for heating would reduce indoor humidity and increase static electricity.
- Always use an electrostatic-discharge wrist strap or other grounding system, particularly when working inside the server with the power on.
- While the device is still in its static-protective package, touch it to an unpainted metal surface on the outside of the server for at least two seconds. This drains static electricity from the package and from your body.
- Remove the device from the package and install it directly into the server without putting it down. If it is necessary to put the device down, put it back into the static-protective package. Never place the device on the server or on any metal surface.
- When handling a device, carefully hold it by the edges or the frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Keep the device from others' reach to prevent possible damages.

Memory module installation rules and order

Memory modules must be installed in a specific order based on the memory configuration that you implement and the number of processors and memory modules installed in the server.

Supported memory types

For information on the types of memory module supported by this server, see “Memory” section in [“Technical specifications” on page 3](#).

Information about optimizing memory performance and configuring memory is available at the Lenovo Press website:

<https://lenovopress.lenovo.com/servers/options/memory>

In addition, you can take advantage of a memory configurator, which is available at the following site:

https://dcsc.lenovo.com/#/memory_configuration

Specific information about the required installation order of memory modules in your server based on the system configuration and memory mode that you are implementing is shown below.

Memory modules and processors layout

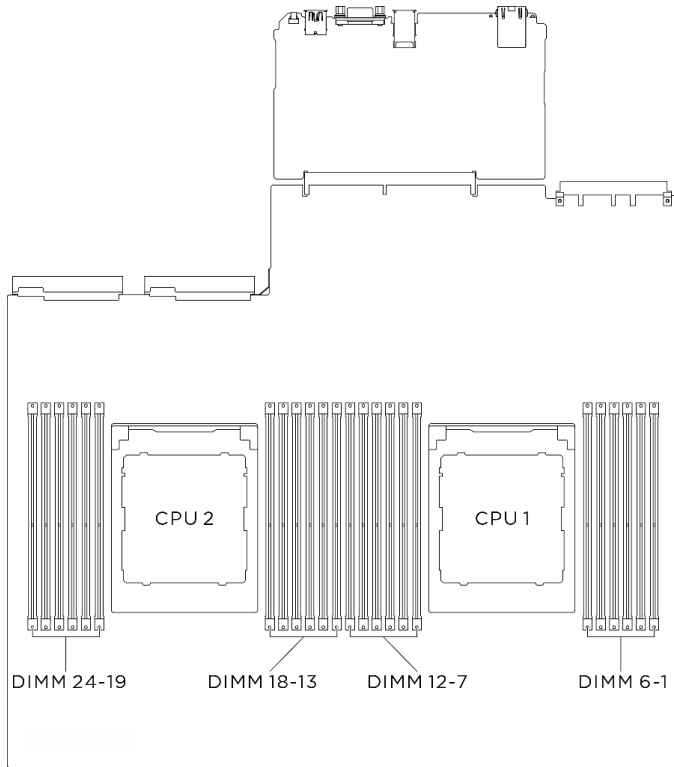


Figure 17. Memory modules and processors layout

The memory-channel configuration table below shows the relationship between the processors, memory controllers, memory channels, and memory module slot numbers.

Table 14. Memory slot and channel identification

Process- or	Processor 2											Processor 1												
Channel number	L	K	J	I	H	G	A	B	C	D	E	F	L	K	J	I	H	G	A	B	C	D	E	F
DIMM slot number	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

Independent memory mode installation order

Independent memory mode guidelines:

- Populate identical memory capacity and rank per memory channel and processor.
- Dual Socket (2P) socket interleaving (NPS0, dual socket system as one NUMA node) can be supported only if:
 1. There is an equal number of populated memory channels per socket and equal number of channels populated in each side of both sockets.
 2. All populated memory channels across both sockets are populated with symmetric memory capacity.

Note: SR685a V3 supports fully populated processors only.

Power on and power off the server

Follow the instructions in this section to power on and power off the server.

Power on the server

After the server performs a short self-test (power status LED flashes quickly) when connected to input power, it enters a standby state (power status LED flashes once per second).

Power button location and power LED are specified in:

- [Chapter 2 “Server components” on page 13](#)
- [“Troubleshooting by system LEDs and diagnostics display” on page 281](#)

The server can be turned on (power LED on) in any of the following ways:

- You can press the power button.
- The server can restart automatically after a power interruption.
- The server can respond to remote power-on requests sent to the Lenovo XClarity Controller.

For information about powering off the server, see [“Power off the server” on page 43](#).

Power off the server

The server remains in a standby state when it is connected to a power source, allowing the Lenovo XClarity Controller to respond to remote power-on requests. To remove all power from the server (power status LED off), you must disconnect all power cables.

Power button location and power LED are specified in:

- [Chapter 2 “Server components” on page 13](#)
- [“Troubleshooting by system LEDs and diagnostics display” on page 281](#)

To place the server in a standby state (power status LED flashes once per second):

Note: The Lenovo XClarity Controller can place the server in a standby state as an automatic response to a critical system failure.

- Start an orderly shutdown using the operating system (if supported by your operating system).
- Press the power button to start an orderly shutdown (if supported by your operating system).
- Press and hold the power button for more than 4 seconds to force a shutdown.

When in a standby state, the server can respond to remote power-on requests sent to the Lenovo XClarity Controller. For information about powering on the server, see [“Power on the server” on page 43](#).

Chassis replacement

Follow instructions in this section to remove and install the chassis.

Remove the chassis from rack

Follow instructions in this section to remove the chassis from the rack.

S036



18 - 32 kg (39 - 70 lb)



32 - 55 kg (70 - 121 lb)

CAUTION:
Use safe practices when lifting.

S037



CAUTION:
The weight of this part or unit is more than 55 kg (121.2 lb). It takes specially trained persons, a lifting device, or both to safely lift this part or unit.

R006



CAUTION:
Do not place any object on top of a rack-mounted device unless that rack-mounted device is intended for use as a shelf.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Make preparation for this task.

- a. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “[Remove the 8U GPU shuttle](#)” on page 69.
- b. Remove the 2U compute shuttle. See “[Remove the 2U compute shuttle](#)” on page 67.
- c. (Optional) Remove all the rear fans. See “[Remove a hot-swap fan \(front and rear\)](#)” on page 79.

Step 2. (Optional) Remove six screws to remove the two upper support brackets on the rear side.

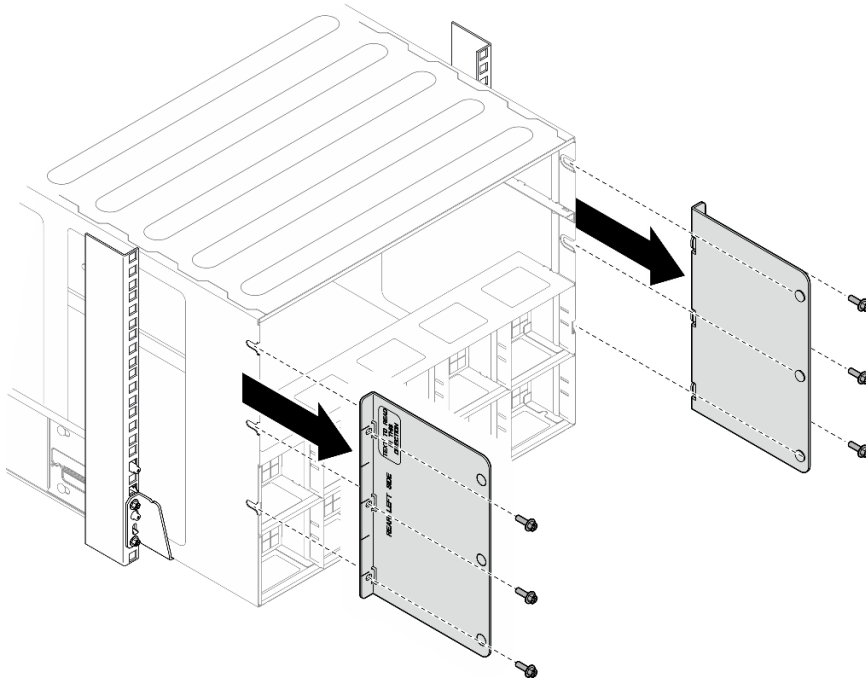


Figure 18. Upper support bracket removal

Step 3. (Optional) Remove four screws to remove the lower support bracket on the rear side.

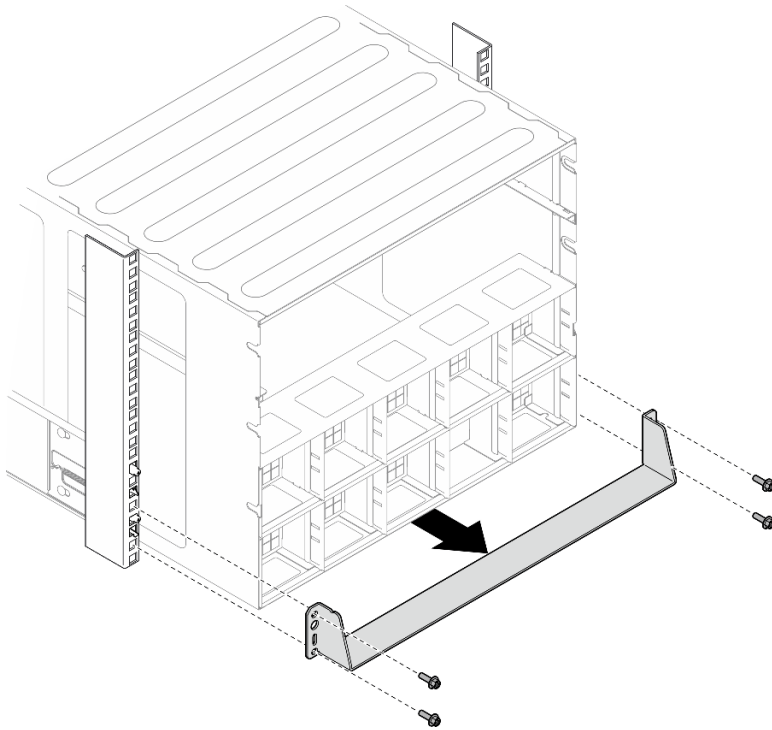


Figure 19. Lower support bracket removal

Step 4. Remove the two EIA covers from the front of the chassis, then, remove the four screws that secure the chassis to the rack.

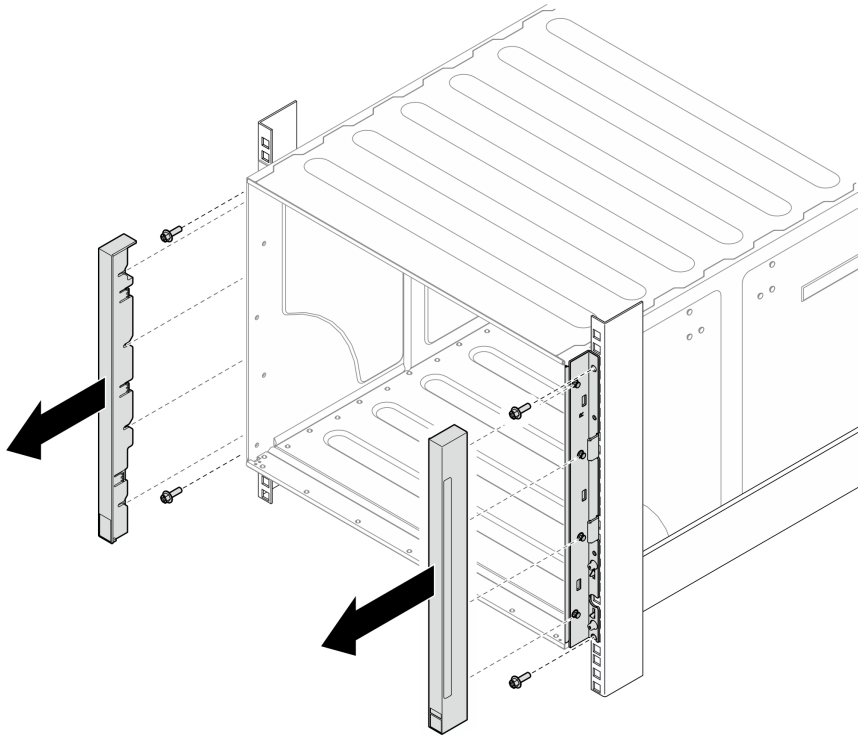


Figure 20. EIA cover removal

Step 5. Slide the chassis out until it allows you to attach front handles at both sides. Align slots on the handles with posts on the chassis and slide handles up until they are locked into place.

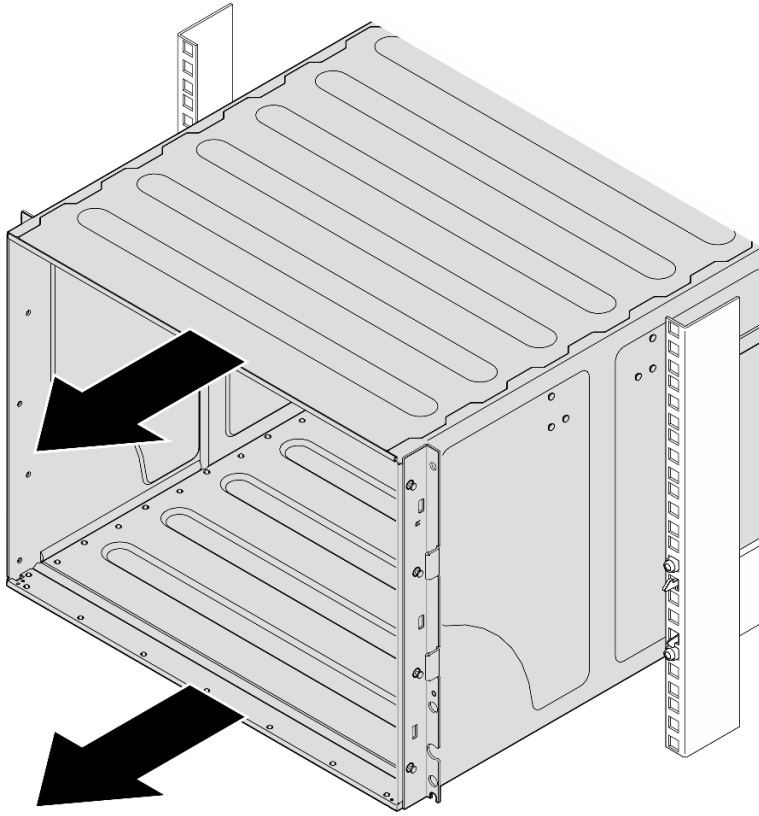


Figure 21. Sliding the chassis

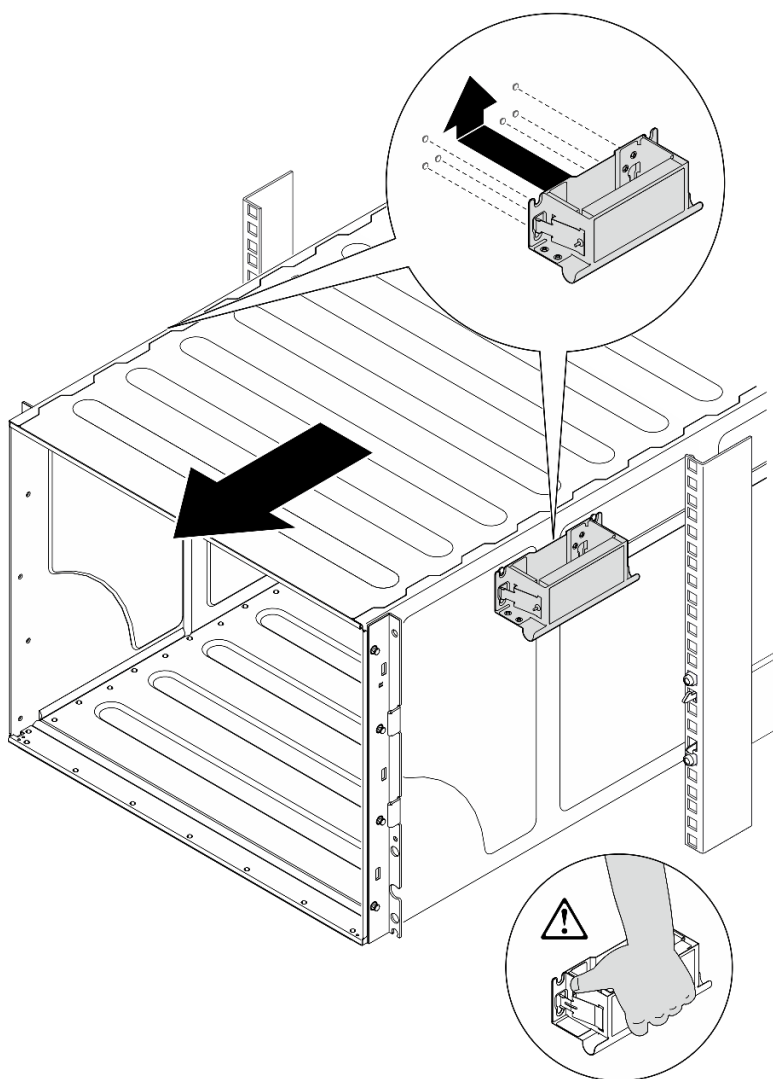


Figure 22. Front handle installation

- Step 6. Hold front handles at both sides and slide the chassis out until you have enough space to install rear handles. Remove the chassis completely from the rack.

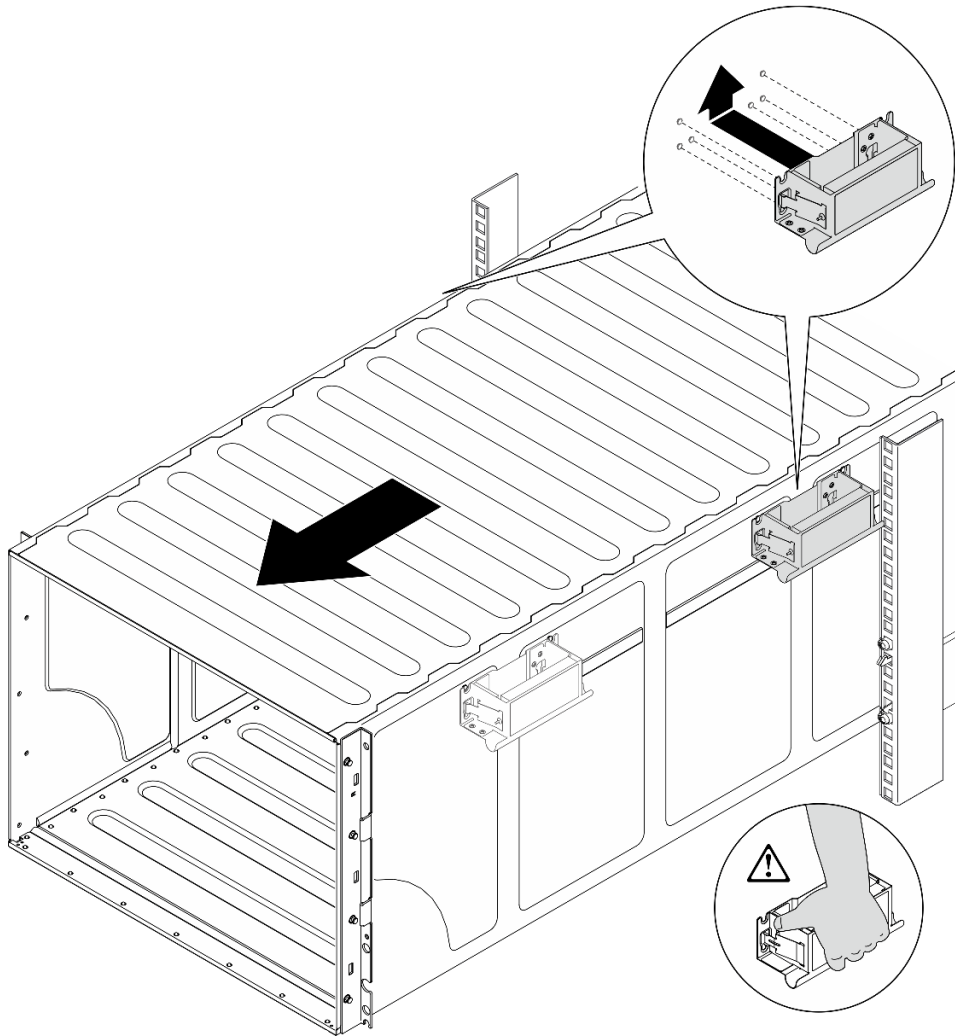


Figure 23. Rear handle installation

Step 7. Remove the handles.

1. Pinch both flaps on the side of the handles.
2. Slide the handles down to remove them.

Note: Make sure to remove all 4 handles.

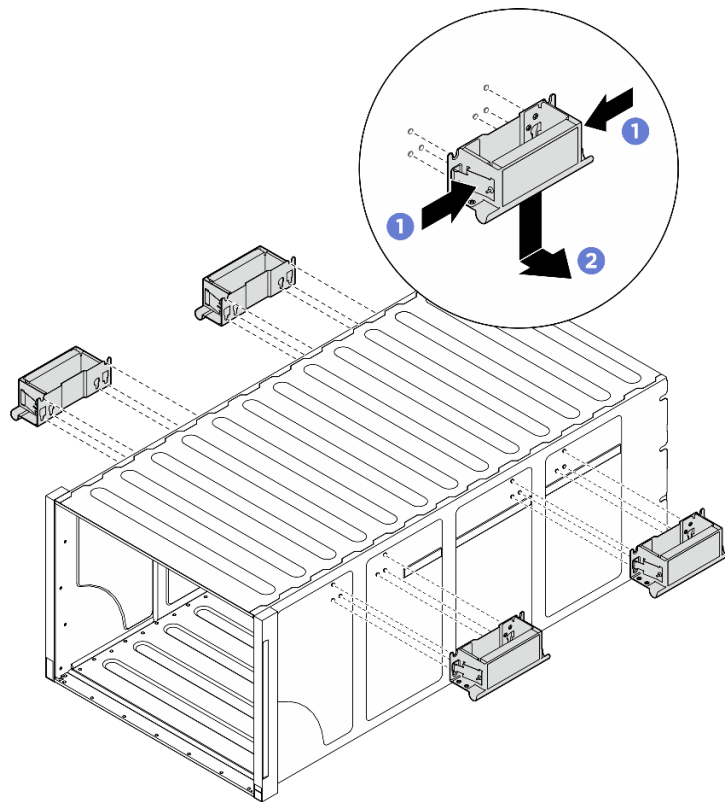


Figure 24. Remove handles

After you finish

Carefully lay the chassis on a flat, static-protective surface.

1. To remove the rails from a rack, follow the instructions that are provided in the *Rail installation Guide*.
2. (Optional) Reinstall the 2U compute shuttle. See “[Install the 2U compute shuttle](#)” on page 68.
3. (Optional) Reinstall the 8U GPU shuttle. See “[Install the 8U GPU shuttle](#)” on page 71.
4. (Optional) Reinstall all the rear fans. See “[Install a hot-swap fan \(front and rear\)](#)” on page 81.

Install the chassis to rack

Follow instructions in this section to install the chassis to the rack.

S036



18 - 32 kg (39 - 70 lb)



32 - 55 kg (70 - 121 lb)

CAUTION:
Use safe practices when lifting.

S037



CAUTION:

The weight of this part or unit is more than 55 kg (121.2 lb). It takes specially trained persons, a lifting device, or both to safely lift this part or unit.

R006



CAUTION:

Do not place any object on top of a rack-mounted device unless that rack-mounted device is intended for use as a shelf.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- **Firmware and driver download:** You might need to update the firmware or driver after replacing a component.
 - Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
 - Go to “[Update the firmware](#)” on page 271 for more information on firmware updating tools.
- To install the rails into a rack, follow the instructions that are provided in the *Rail installation Guide*.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.
- The maximum lift height for installation is 156 cm (61.5 inches). The maximum units to be installed on the rack is up to 4 units from the bottom to the top of the rack as illustrated.

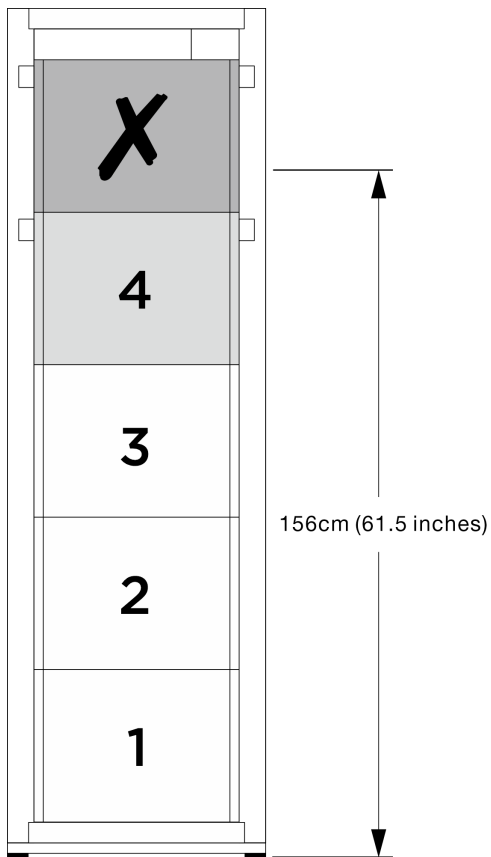


Figure 25. Maximum installation height

After rails are installed successfully, complete the following steps to install the chassis in a rack.

Procedure

Step 1. Make preparation for this task.

- a. Remove the 2U compute shuttle before installing the chassis to the rail (see [“Remove the 2U compute shuttle” on page 67](#)).
- b. Remove the 8U GPU shuttle before installing the chassis to the rail (see [“Remove the 8U GPU shuttle” on page 69](#)).
- c. (Optional) Remove the rear fans before installing the chassis to the rail if necessary (see [“Remove a hot-swap fan \(front and rear\)” on page 79](#)).

Step 2. Attach four handles to the chassis.

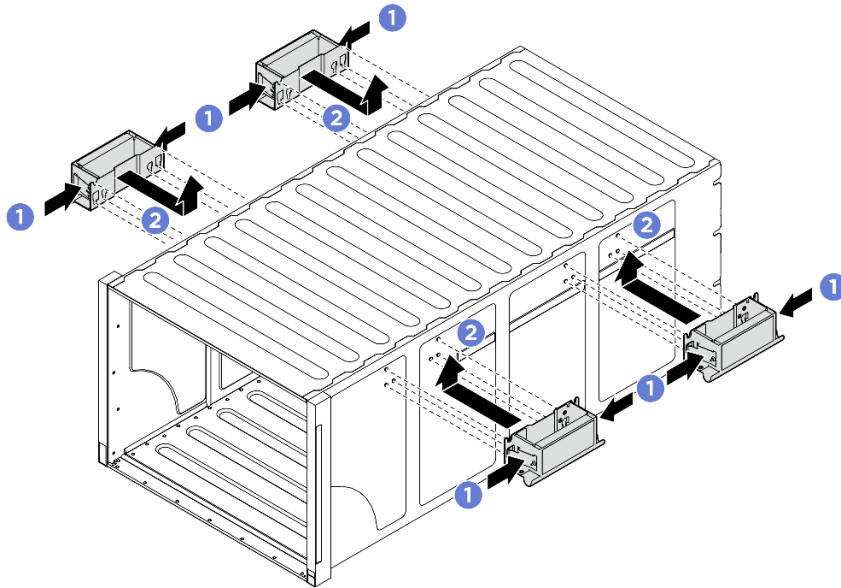


Figure 26. Attaching four handles

Step 3. Carefully put the chassis into the rack with the rear of chassis resting on the rails. Continue to slide the chassis until rear handles are near front rack rails; then, remove rear handles at both sides.

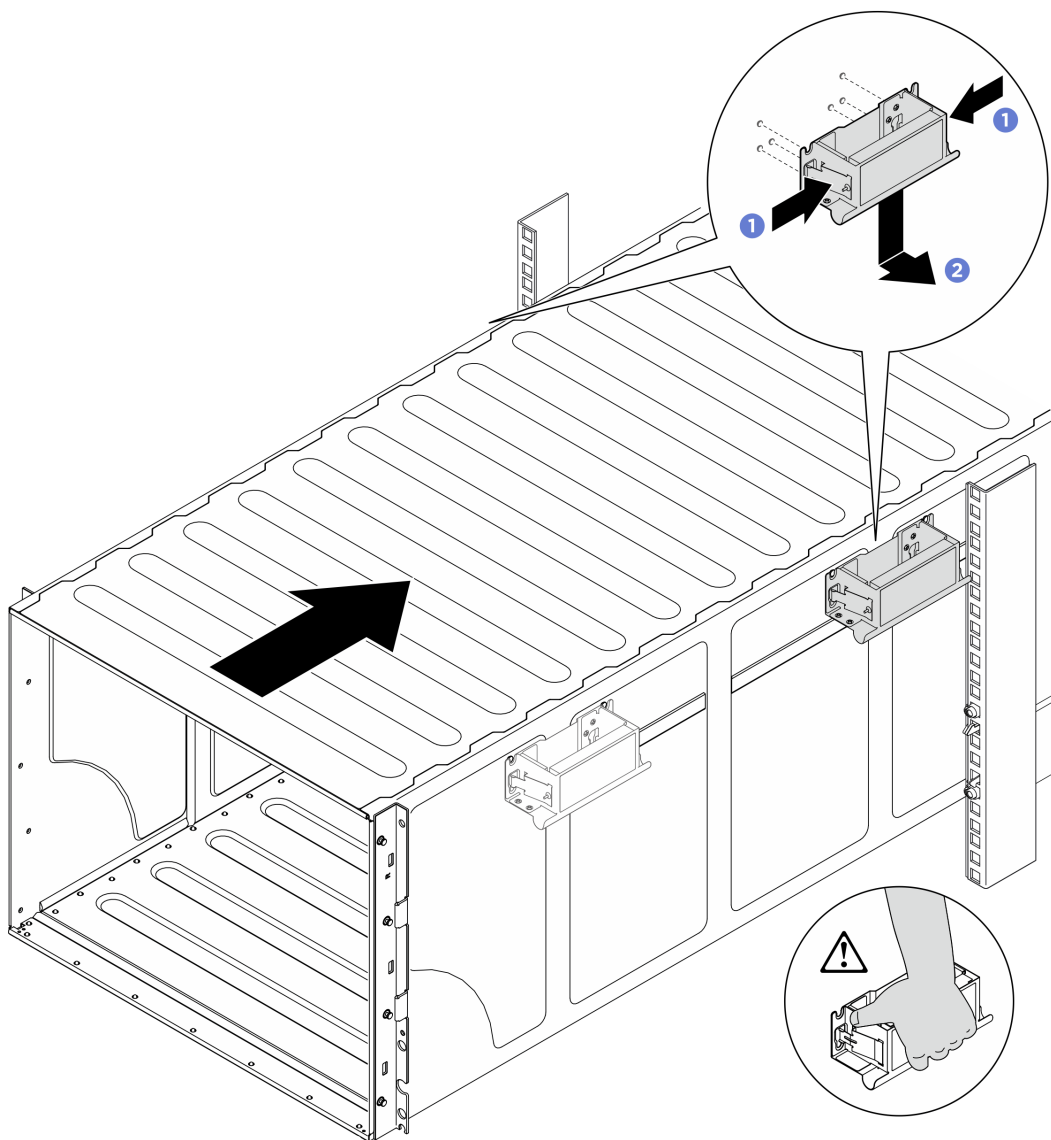


Figure 27. Rear handle removal

- Step 4. Slide the chassis farther into the rack until front handles are near front rack rails; then, remove front handles at both sides.

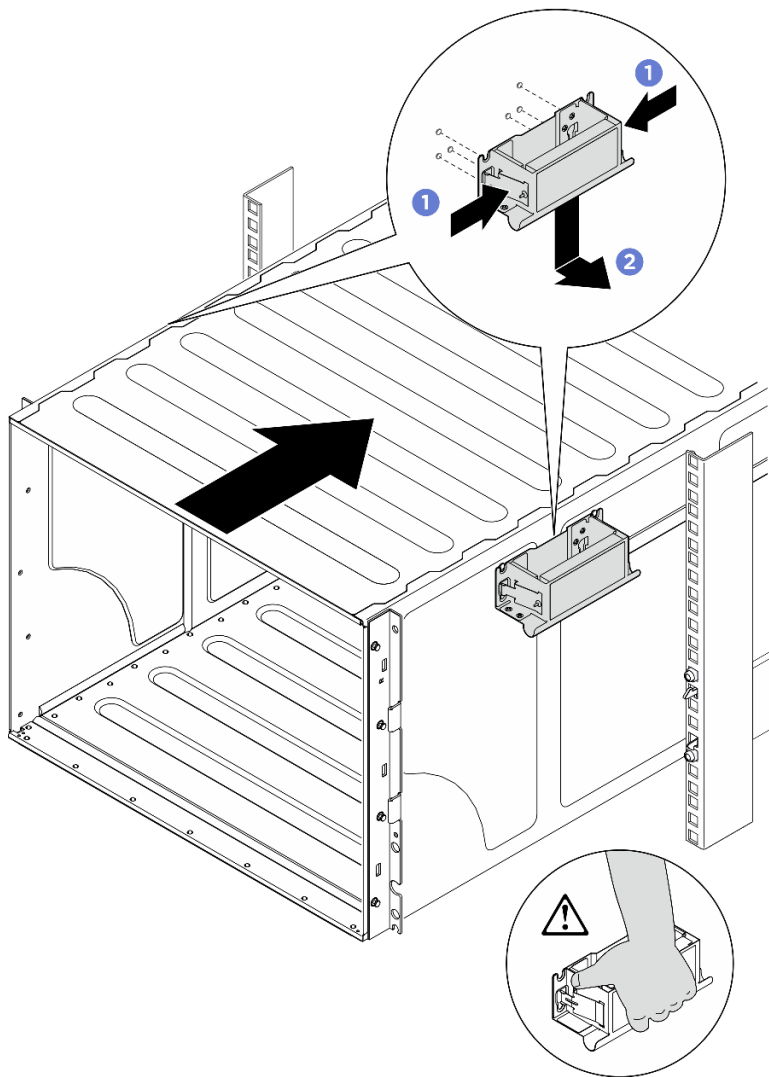


Figure 28. Front handle removal

Step 5. Slide the chassis all the way back to the rack.

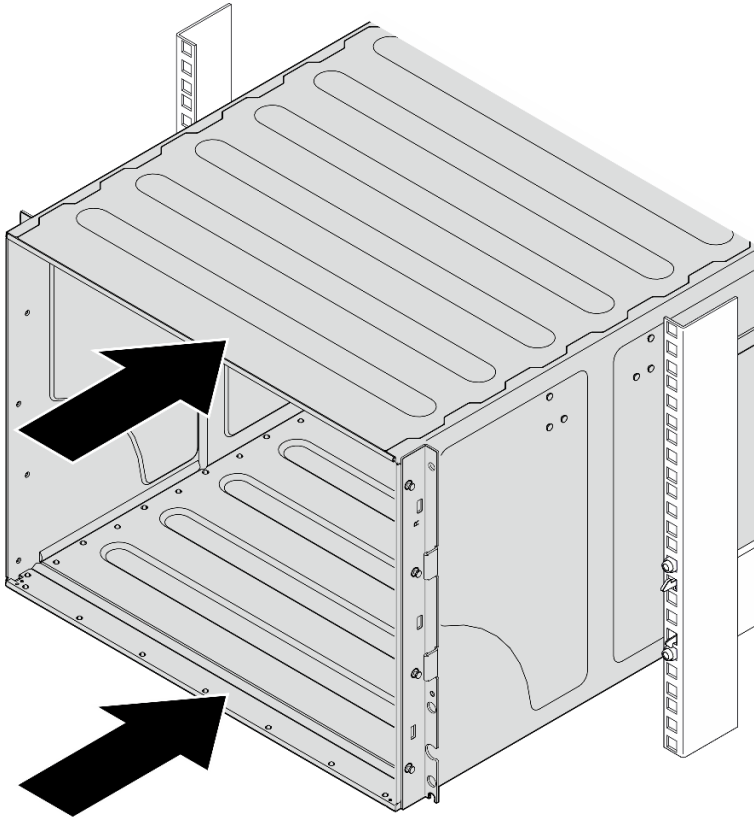


Figure 29. Sliding the chassis

Step 6. Secure the chassis to the rack with four screws; then, reinstall the EIA covers.

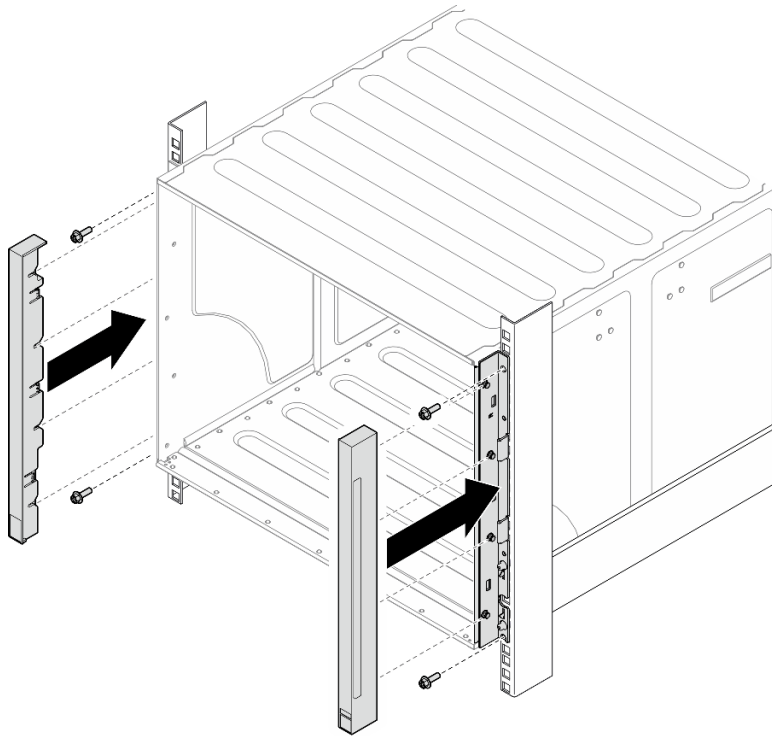


Figure 30. EIA cover installation

Step 7. Secure the lower support bracket on the rear side of the chassis with four screws.

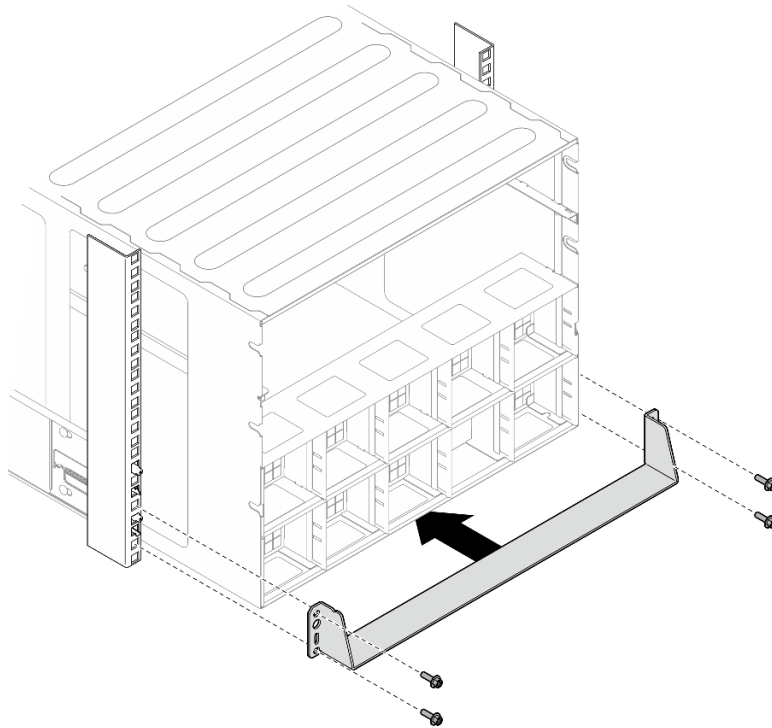


Figure 31. Lower support bracket installation

Step 8. Secure the two upper support brackets on the rear side of the chassis with six screws.

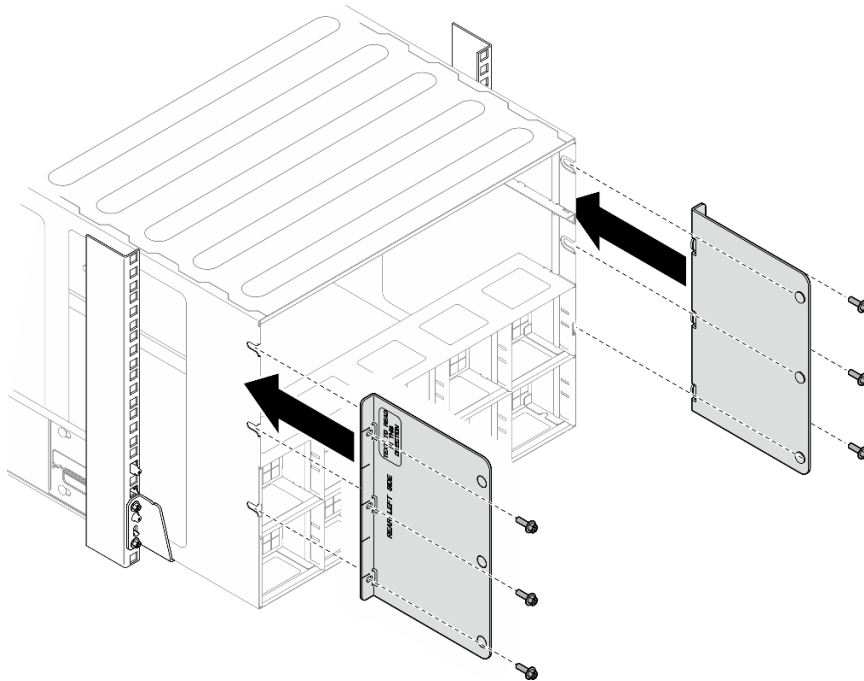


Figure 32. Upper support bracket installation

After you finish

1. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle” on page 68](#).
2. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle” on page 71](#).
3. Reinstall all the rear fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
4. Install any other required components.
5. Reconnect the power cords and any cables that you removed.
6. Power on the server and any peripheral devices. See [“Power on the server” on page 43](#).
7. Update the server configuration. See [“Complete the parts replacement” on page 242](#).

2.5-inch hot-swap drive replacement

Follow instructions in this section to remove and install a 2.5-inch hot-swap drive.

Remove a 2.5-inch hot-swap drive

Follow instructions in this section to remove a 2.5-inch hot-swap drive.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- To make sure that there is adequate system cooling, do not operate the server for more than two minutes without either a drive or a filler installed in each bay.
- If one or more NVMe solid-state drives are to be removed, it is recommended to disable them beforehand via the operating system.

- Before you remove or make changes to drives, drive controllers (including controllers that are integrated on the system board assembly), drive backplanes or drive cables, back up all important data that is stored on drives.
- The server supports up to sixteen 2.5-inch hot-swap NVMe drives with the following corresponding drive bay numbers.

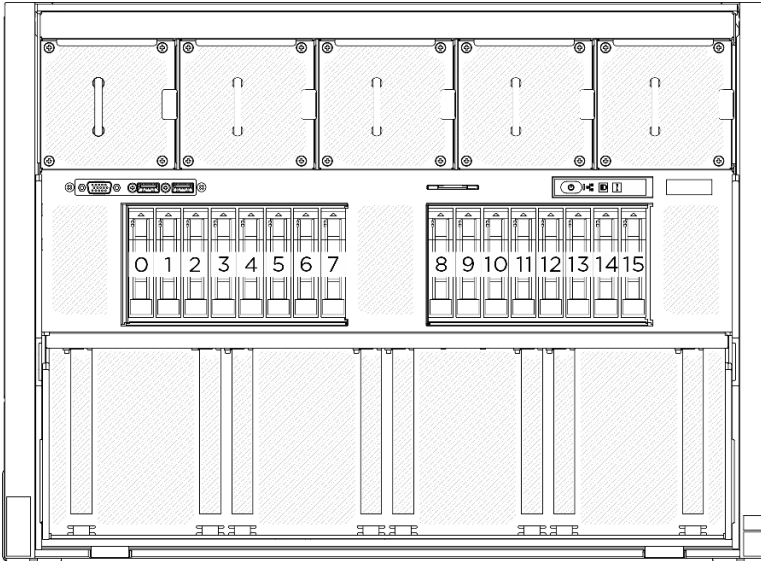


Figure 33. 2.5-inch drive bay numbering

Note: Make sure you have the drive bay fillers available if some drive bays will be left empty after the removal.

Procedure

- Step 1. 1 Slide the release latch to unlock the drive handle.
- Step 2. 2 Rotate the drive handle to the open position.
- Step 3. 3 Grasp the handle and slide the drive out of the drive bay.

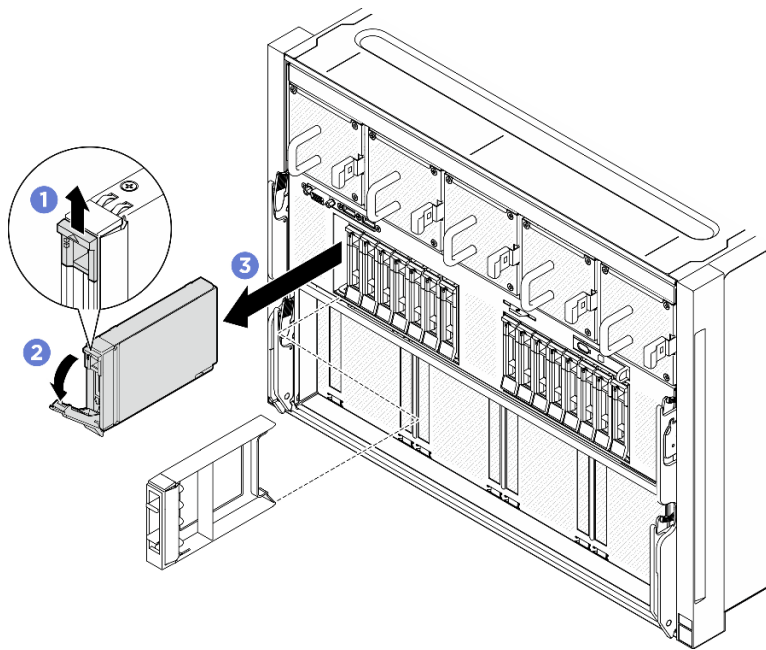


Figure 34. 2.5-inch hot-swap drive removal

After you finish

Note: Install a drive bay filler or replacement drive as soon as possible. See [“Install a 2.5-inch hot-swap drive” on page 60](#).

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a 2.5-inch hot-swap drive

Follow instructions in this section to install a 2.5-inch hot-swap drive.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Make sure you save the data on your drive, especially if it is part of a RAID array, before you remove it from the server.
- To make sure that there is adequate system cooling, do not operate the server for more than two minutes without either a drive or a drive bay filler installed in each bay.
- Before you make changes to drives, drive controllers (including controllers that are integrated on the system board assembly), drive backplanes, or drive cables, back up all important data that is stored on drives.
- The server supports up to sixteen 2.5-inch hot-swap NVMe drives with the following corresponding drive bay numbers.

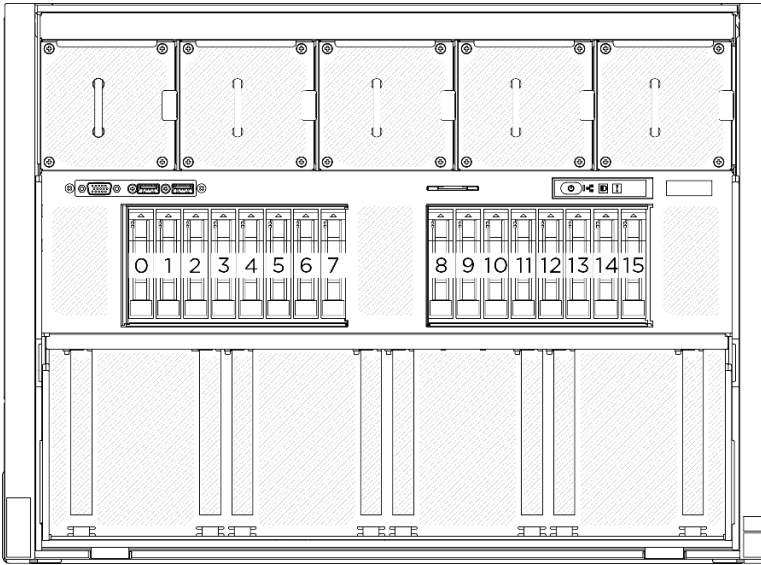


Figure 35. 2.5-inch drive bay numbering

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 271 for more information on firmware updating tools.

Procedure

Step 1. If the drive bay contains a filler, pull the release lever on the filler and slide it out of the bay.

Step 2. Install the 2.5-inch hot-swap drive.

- 1 Make sure that the drive handle is in the open position. Then, align the drive with the guide rails in the bay, and gently slide the drive into the bay until it stops.
- 2 Rotate the drive handle to the fully closed position until the handle latch clicks.

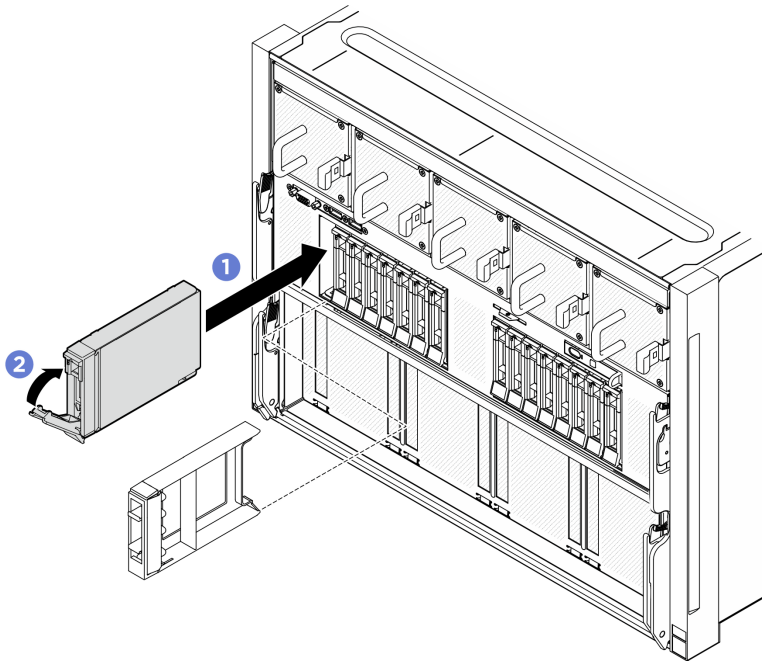


Figure 36. 2.5-inch hot-swap drive installation

After you finish

1. Check the drive status LED to verify that the drive is operating correctly.
 - If the yellow drive status LED of a drive is lit continuously, that drive is faulty and must be replaced.
 - If the green drive activity LED is flashing, the drive is being accessed.
2. If you have installed 2.5-inch drive backplane with U.3 NVMe drives for Trimode. Enable U.3 x1 mode for the selected drive slots on the backplane through the XCC web GUI. See [“U.3 NVMe drive can be detected in NVMe connection, but cannot be detected in Tri-mode” on page 306.](#)

2.5-inch drive backplane replacement (trained technician only)

Follow instructions in this section to remove and install a 2.5-inch drive backplane.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove a 2.5-inch drive backplane

Follow instructions in this section to remove a 2.5-inch drive backplane. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43.](#)

- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.
- The server supports up to two 2.5-inch drive backplanes with the following corresponding drive backplane numbering.

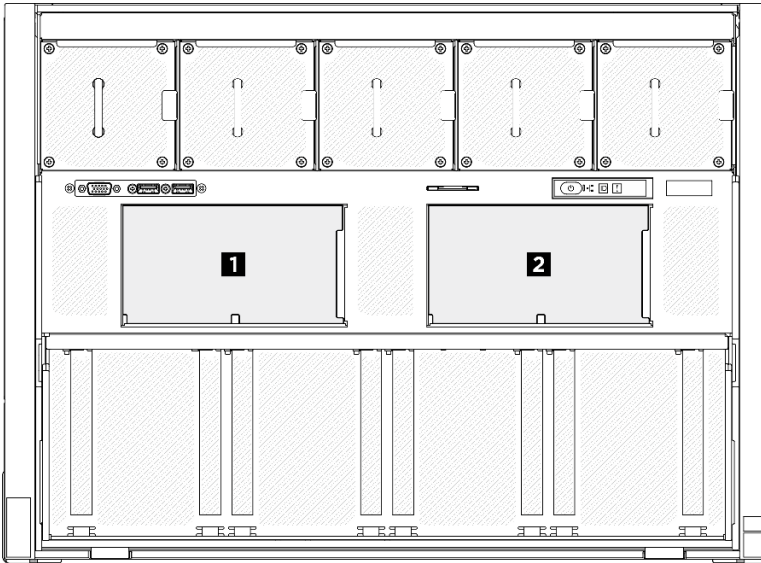


Figure 37. 2.5-inch drive backplane numbering

Procedure

Step 1. Make preparation for this task.

- Remove all the power supply units. See “Remove a hot-swap power supply unit” on page 201.
- Remove all the front fans. See “Remove a hot-swap fan (front and rear)” on page 79.
- Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “Remove a 2.5-inch hot-swap drive” on page 58.
- Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “Remove the 8U GPU shuttle” on page 69.
- Remove the cable cover. See “Remove the cable cover” on page 73.
- Remove the I/O cover. See “Remove the I/O cover” on page 143.

Step 2. Disconnect all the cables from the 2.5-inch drive backplane.

Step 3. Remove the 2.5-inch drive backplane.

- ① Lift and hold the two retention latches on the top of the backplane.
- ② Rotate the backplane from the top to disengage it from the retention latches; then, carefully lift the backplane out of the 8U GPU shuttle.

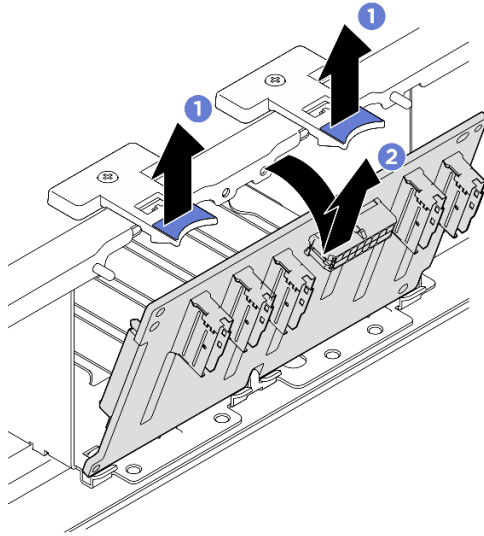


Figure 38. 2.5-inch drive backplane removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a 2.5-inch drive backplane

Follow instructions in this section to install a 2.5-inch drive backplane. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.
- The server supports up to two 2.5-inch drive backplanes with the following corresponding drive backplane numbering.

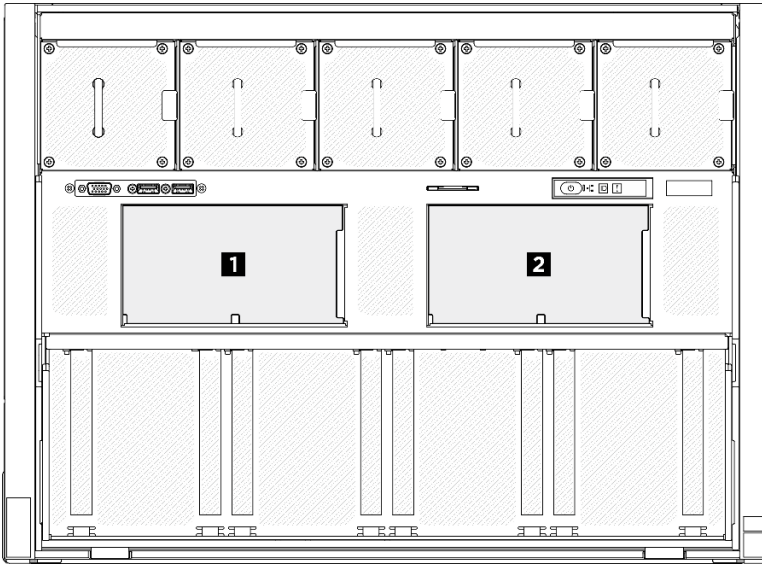


Figure 39. 2.5-inch drive backplane numbering

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 271 for more information on firmware updating tools.

Procedure

- Step 1. ① Align the tabs on the bottom of the 2.5-inch drive backplane with the slots on the 8U GPU shuttle, and insert them into the slots.
- Step 2. ② Push the top of the backplane forward until it clicks into place.

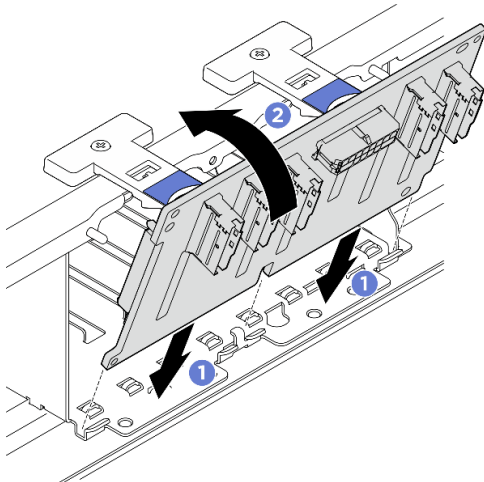


Figure 40. 2.5-inch drive backplane installation

- Step 3. If necessary, attach the labels to both ends of the signal cable(s).
- ① Attach the white space portion of the label to one end of the cable.
 - ② Wrap the label around the cable and attach it to the white space portion.

- c. Repeat to attach the other label to the opposite end of the cable.

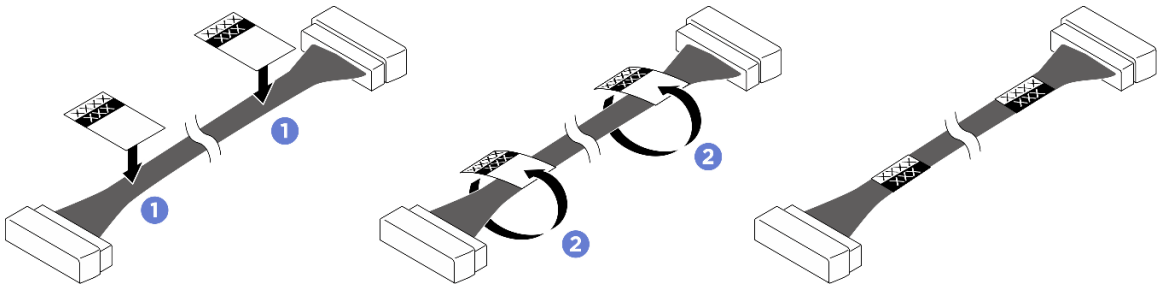


Figure 41. Label application

Note: See the table below to identify the corresponding labels for the cables.

From	To	Label
Backplane 1: NVMe connector 0-1	PCIe switch board: NVMe connector 1 (NVME1)	NVME 0-1 NVME 1
Backplane 1: NVMe connector 2-3	PCIe switch board: NVMe connector 2 (NVME2)	NVME 2-3 NVME 2
Backplane 1: NVMe connector 4-5	PCIe switch board: NVMe connector 3 (NVME3)	NVME 4-5 NVME 3
Backplane 1: NVMe connector 6-7	PCIe switch board: NVMe connector 4 (NVME4)	NVME 6-7 NVME 4
Backplane 2: NVMe connector 0-1	PCIe switch board: NVMe connector 5 (NVME5)	NVME 0-1 NVME 5
Backplane 2: NVMe connector 2-3	PCIe switch board: NVMe connector 6 (NVME6)	NVME 2-3 NVME 6
Backplane 2: NVMe connector 4-5	PCIe switch board: NVMe connector 7 (NVME7)	NVME 4-5 NVME 7
Backplane 2: NVMe connector 6-7	PCIe switch board: NVMe connector 8 (NVME8)	NVME 6-7 NVME 8

Step 4. Connect all the cables to the 2.5-inch drive backplane. See [“2.5-inch drive backplane cable routing” on page 250](#) for more information.

After you finish

1. Reinstall the I/O cover. See [“Install the I/O cover” on page 144](#).
2. Reinstall the cable cover. See [“Install the cable cover” on page 74](#).
3. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle” on page 71](#).

4. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive” on page 60](#)
5. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
6. Reinstall all the power supply units. See [“Install a hot-swap power supply unit” on page 203](#).
7. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

2U compute shuttle replacement (trained technician only)

Follow instructions in this section to remove and install the 2U compute shuttle.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the 2U compute shuttle

Follow instructions in this section to remove the 2U compute shuttle. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).

Procedure

- Step 1. ① Press the two blue release latches.
- Step 2. ② Rotate the two release levers until they are perpendicular to the 2U compute shuttle.
- Step 3. ③ Pull the 2U compute shuttle out of the chassis.

Note: Push the two release levers back until they lock into place after pulling out the 2U compute shuttle to avoid damages.

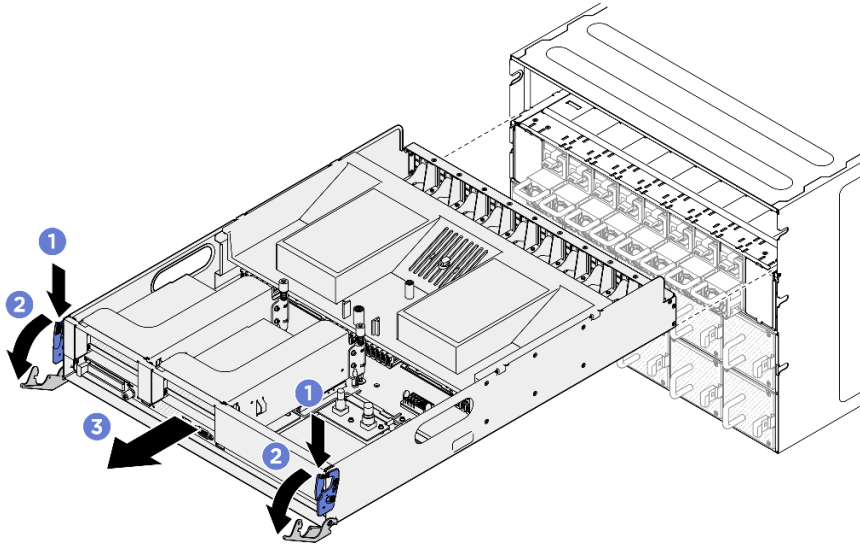


Figure 42. 2U compute shuttle removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the 2U compute shuttle

Follow instructions in this section to install the 2U compute shuttle. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Make sure that all cables, adapters, and other components are installed and seated correctly and that you have not left loose tools or parts inside the server.
- Make sure that all internal cables are correctly routed. See [Chapter 6 “Internal cable routing” on page 245](#).

Procedure

- Step 1. ① Fully open the two release levers; then, align the 2U compute shuttle with its opening in the rear of the chassis, and push it into the chassis until it stops.
- Step 2. ② Rotate the two release levers until they lock into place.

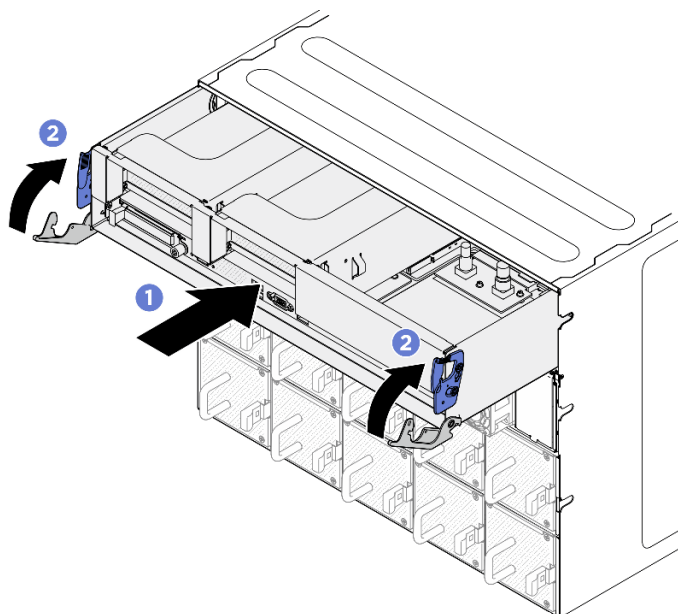


Figure 43. 2U compute shuttle installation

After you finish

Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

8U GPU shuttle replacement (trained technician only)

Follow instructions in this section to remove and install the 8U GPU shuttle.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the 8U GPU shuttle

Follow instructions in this section to remove the 8U compute shuttle. The procedure must be executed by a trained technician.

About this task

S037



CAUTION:

The weight of this part or unit is more than 55 kg (121.2 lb). It takes specially trained persons, a lifting device, or both to safely lift this part or unit.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.

- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

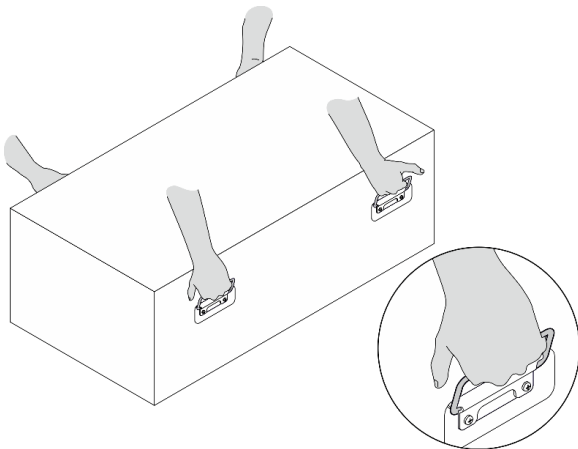
Step 1. Make preparation for this task.

- a. Remove all the power supply units. See “Remove a hot-swap power supply unit” on page 201.
- b. Remove all the front fans. See “Remove a hot-swap fan (front and rear)” on page 79.
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “Remove a 2.5-inch hot-swap drive” on page 58.

Step 2. Remove the 8U GPU shuttle.

- a. ① Press the two blue release latches.
- b. ② Rotate the two release levers until they are perpendicular to the 8U GPU shuttle.
- c. ③ Pull the 8U GPU shuttle out of the chassis.

Attention: Make sure two people lift the 8U GPU shuttle by holding the four handles on both sides of the 8U GPU shuttle. Then, slide the 8U GPU shuttle on a lifting device to move the 8U GPU shuttle.



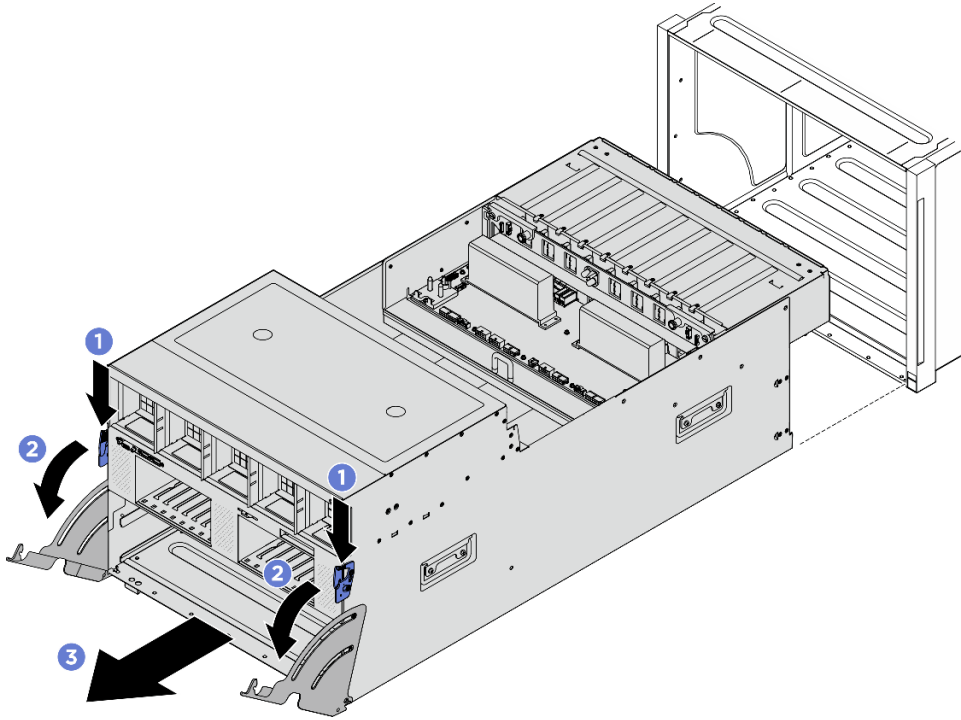


Figure 44. 8U GPU shuttle removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the 8U GPU shuttle

Follow instructions in this section to install the 8U GPU shuttle. The procedure must be executed by a trained technician.

About this task

S037



CAUTION:

The weight of this part or unit is more than 55 kg (121.2 lb). It takes specially trained persons, a lifting device, or both to safely lift this part or unit.

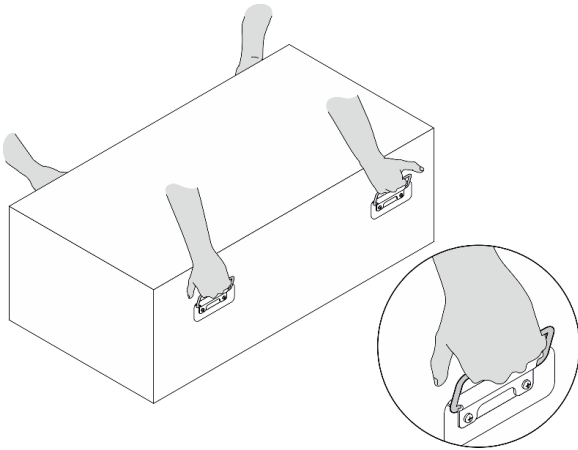
Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Make sure that all cables, adapters, and other components are installed and seated correctly and that you have not left loose tools or parts inside the server.
- Make sure that all internal cables are correctly routed. See [Chapter 6 “Internal cable routing” on page 245](#).

- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Attention: Make sure two people lift the 8U GPU shuttle by holding the four handles on both sides of the 8U GPU shuttle. Then, slide the 8U GPU shuttle on a lifting device to move the 8U GPU shuttle.



- Step 1. ① Fully open the two release levers; then, align the 8U GPU shuttle with its opening in the front of the chassis, and push it into the chassis until it stops.
- Step 2. ② Rotate the two release levers until they lock into place.

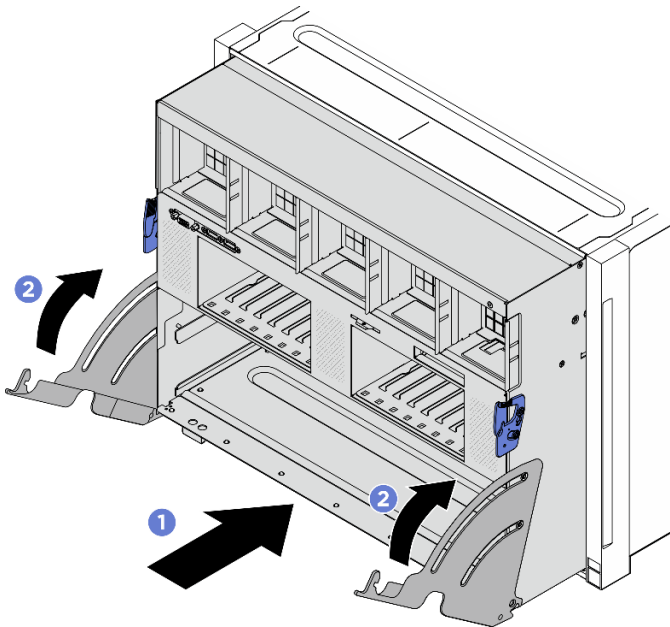


Figure 45. 8U GPU shuttle installation

After you finish

1. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive” on page 60](#)
2. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
3. Reinstall all the power supply units. See [“Install a hot-swap power supply unit” on page 203](#).
4. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

Cable cover replacement (trained technician only)

Follow instructions in this section to remove and install the cable cover.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the cable cover

Follow instructions in this section to remove the cable cover. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See [“Remove a hot-swap power supply unit” on page 201](#).
- b. Remove all the front fans. See [“Remove a hot-swap fan \(front and rear\)” on page 79](#).
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See [“Remove a 2.5-inch hot-swap drive” on page 58](#).
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See [“Remove the 8U GPU shuttle” on page 69](#).

Step 2. Remove the cable cover.

- a. ① Unfasten the fourteen screws marked with **F** on the front PCIe switch cable harness and both sides of the 8U GPU shuttle.
- b. ② Lift the cable cover out of the 8U GPU shuttle.

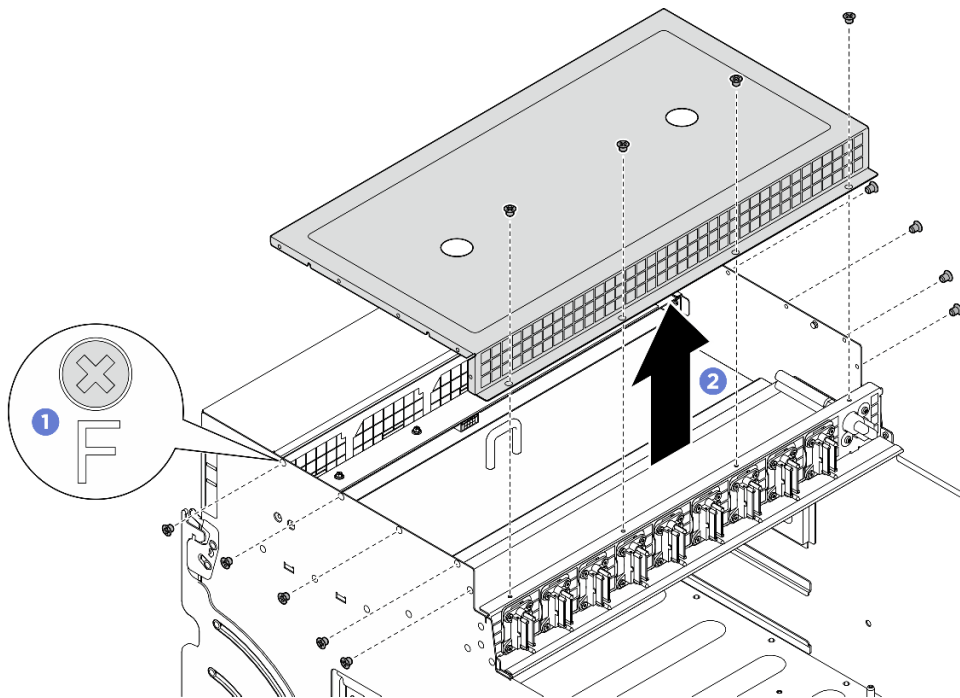


Figure 46. Cable cover removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the cable cover

Follow instructions in this section to install the cable cover. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

- Step 1. ① Align the cable cover with the four guide pins on the 8U GPU shuttle; then, place the cable cover onto the top of the 8U GPU shuttle until it is securely engaged.
- Step 2. ② Locate the fourteen screw holes marked with **F** on the front PCIe switch cable harness and both sides of the 8U GPU shuttle; then, fasten the fourteen screws to secure the cable cover.

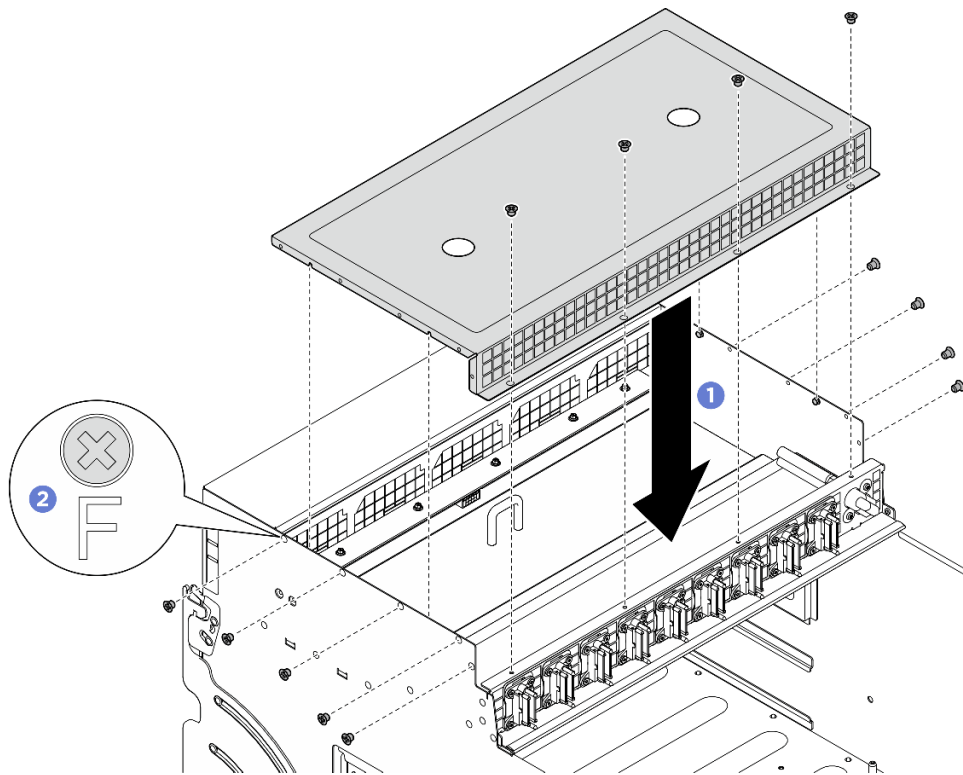


Figure 47. Cable cover installation

After you finish

1. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle” on page 71](#).
2. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive” on page 60](#)
3. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
4. Reinstall all the power supply units. See [“Install a hot-swap power supply unit” on page 203](#).
5. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

CMOS battery (CR2032) replacement

Follow instructions in this section to remove and install the CMOS battery (CR2032).

Remove the CMOS battery (CR2032)

Follow instructions in this section to remove the CMOS battery (CR2032).

About this task

S004



CAUTION:

When replacing the lithium battery, use only Lenovo specified part number or an equivalent type of battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

S005**CAUTION:**

The battery is a lithium ion battery. To avoid possible explosion, do not burn the battery. Exchange it only with the approved part. Recycle or discard the battery as instructed by local regulations.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- The following notes describe information that you must consider when replacing the battery.
 - Lenovo has designed this product with your safety in mind. The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.
 - If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.
 - After you replace the battery, you must reconfigure the server and reset the system date and time.

Procedure

Step 1. Make preparation for this task.

- a. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67](#).
- b. If applicable, remove the PCIe riser assembly 2. See [“Remove a PCIe riser assembly” on page 167](#).

Step 2. Locate the battery socket on the system board assembly.

Step 3. Pivot the CMOS battery away from the seat, and lift the CMOS battery out of the battery socket.

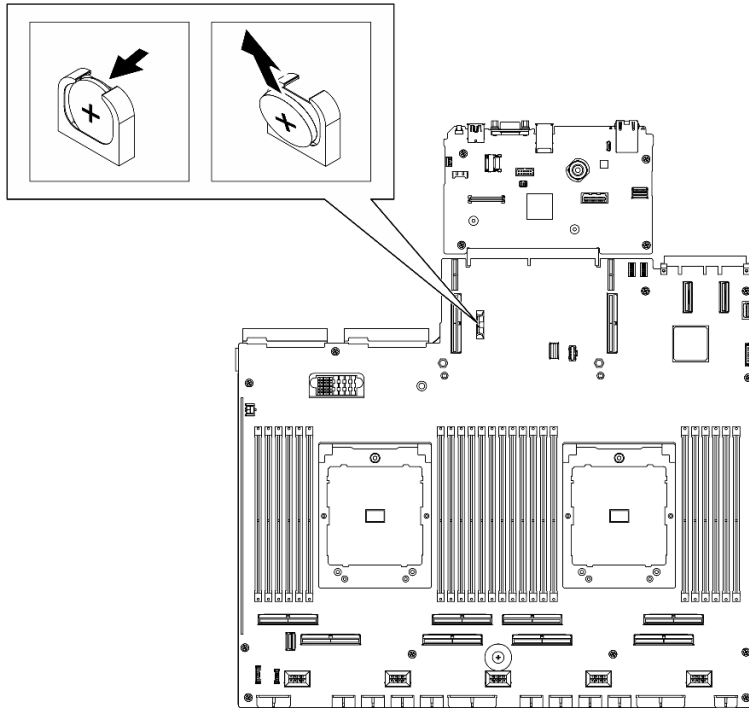


Figure 48. CMOS battery removal

After you finish

Dispose the component with compliance to local regulations.

Install the CMOS battery (CR2032)

Follow instructions in this section to install the CMOS battery (CR2032).

About this task

S004



CAUTION:

When replacing the lithium battery, use only Lenovo specified part number or an equivalent type of battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

S005



CAUTION:

The battery is a lithium ion battery. To avoid possible explosion, do not burn the battery. Exchange it only with the approved part. Recycle or discard the battery as instructed by local regulations.

Attention: Read “Installation Guidelines” on page 37 and “Safety inspection checklist” on page 38 to ensure that you work safely.

Important: The following notes describe information that you must consider when you are replacing the CMOS battery in the server:

- You must replace the CMOS battery with a lithium CMOS battery of the same type from the same manufacturer.
- After you replace the CMOS battery, you must reconfigure the server and reset the system date and time.

Procedure

- Step 1. Follow any special handling and installation instructions that come with the CMOS battery.
- Step 2. Locate the battery socket on the system board assembly.
- Step 3. Orient the CMOS battery so that the positive (+) side faces toward the center of the 2U compute shuttle.
- Step 4. Tilt the CMOS battery at an angle and insert it into the battery socket.

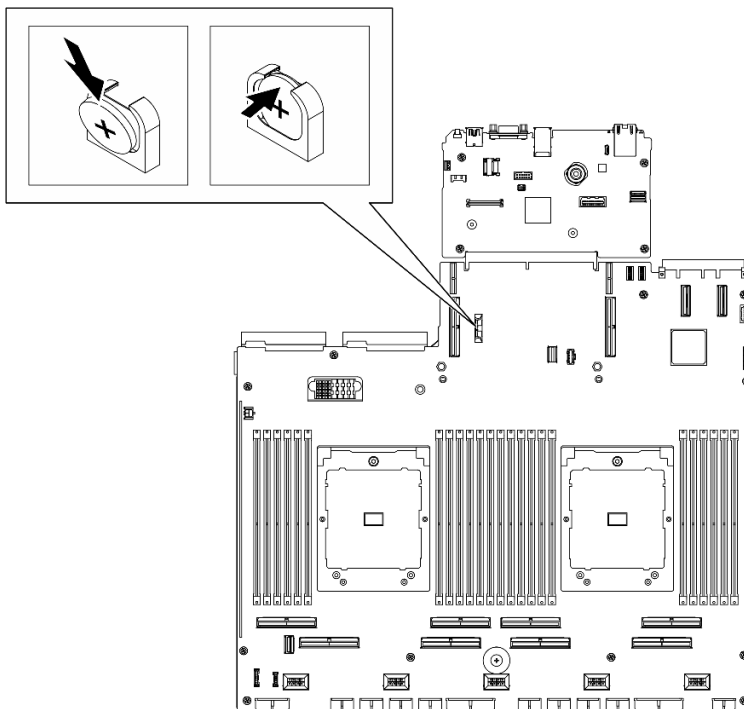


Figure 49. CMOS battery installation

After you finish

1. If applicable, reinstall the PCIe riser assembly 2. See [“Install a PCIe riser assembly”](#) on page 170.
2. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle”](#) on page 68.
3. Complete the parts replacement. See [“Complete the parts replacement”](#) on page 242.
4. Reconfigure the server and reset the system date and time.

Fan replacement

Follow instructions in this section to remove or install a fan.

Remove a hot-swap fan (front and rear)

Follow instructions in this section to remove a front or rear hot-swap fan.

About this task

Attention:

- Read [“Installation Guidelines”](#) on page 37 and [“Safety inspection checklist”](#) on page 38 to ensure that you work safely.
- The following illustrations show the front and rear fan numbering:

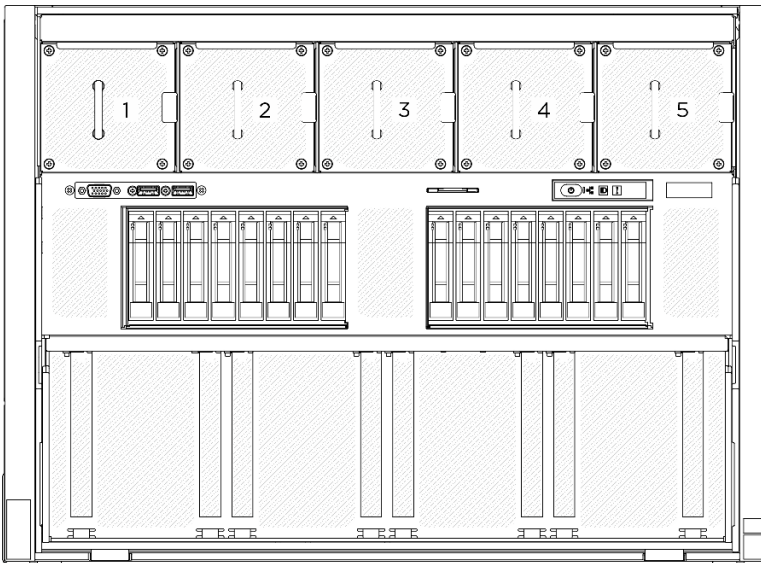


Figure 50. Front fan numbering

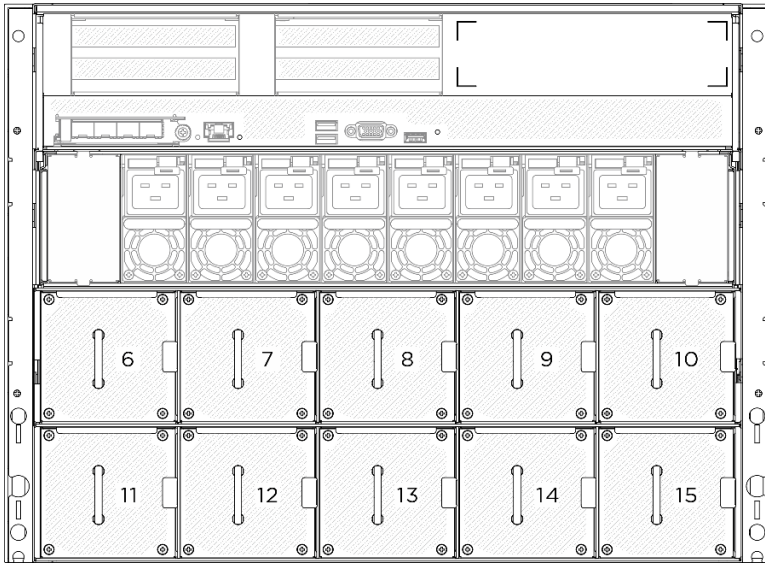


Figure 51. Rear fan numbering

Procedure

- Step 1. ① Press and hold the orange latch to release the fan.
- Step 2. ② Grasp the fan and carefully pull it out of the server.

Note: A front fan is used as an example in the illustration, but the removal method is the same for rear fans.

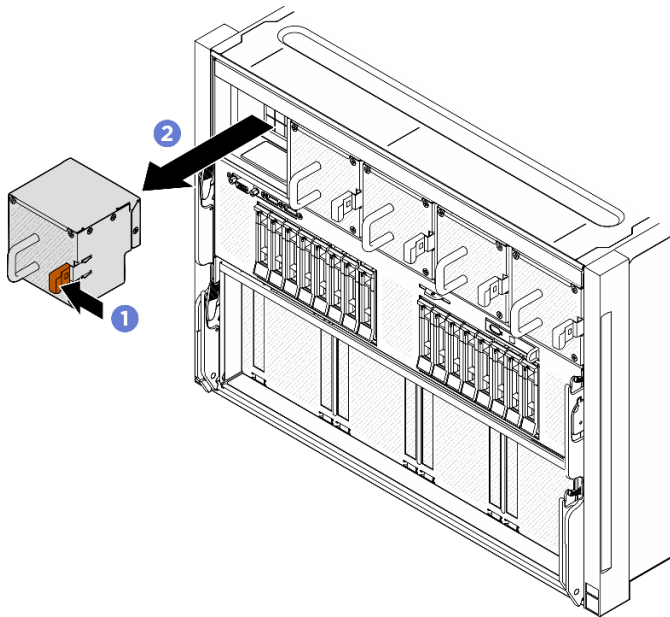


Figure 52. Hot-swap fan removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a hot-swap fan (front and rear)

Follow instructions in this section to install a front or rear hot-swap fan.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Make sure to replace a defective fan with another unit of the exact same type.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- The following illustrations show the front and rear fan numbering:

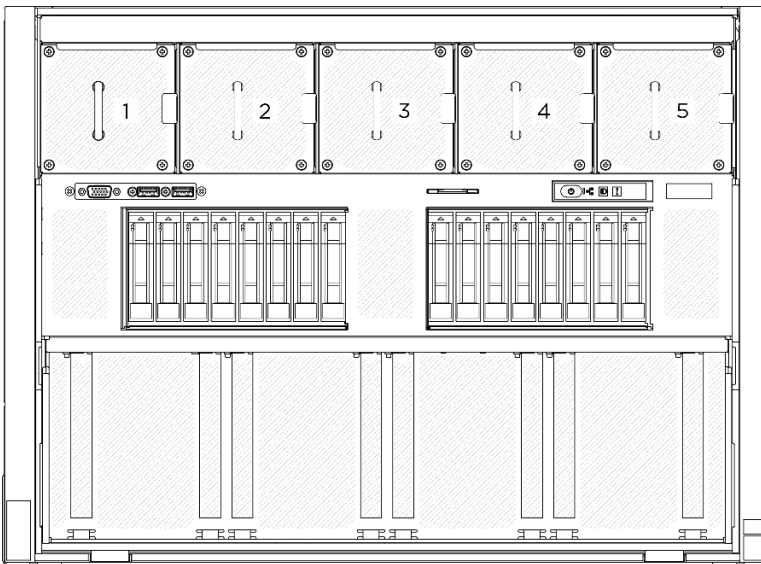


Figure 53. Front fan numbering

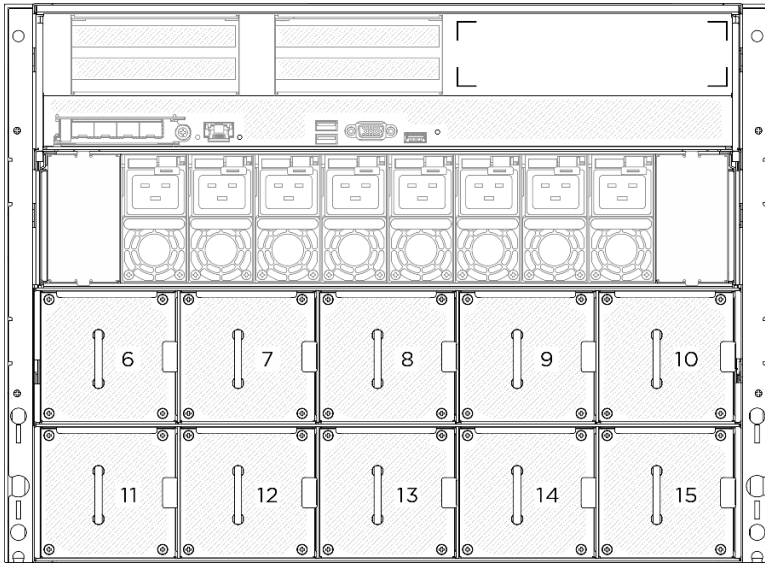


Figure 54. Rear fan numbering

Procedure

- Step 1. Make sure the airflow direction label on the fan is facing up; then, align the fan with the fan socket.
- Step 2. Press and hold the orange latch; then, slide the fan into the socket until it clicks into place.

Note: A front fan is used as an example in the illustration, but the installation method is the same for rear fans.

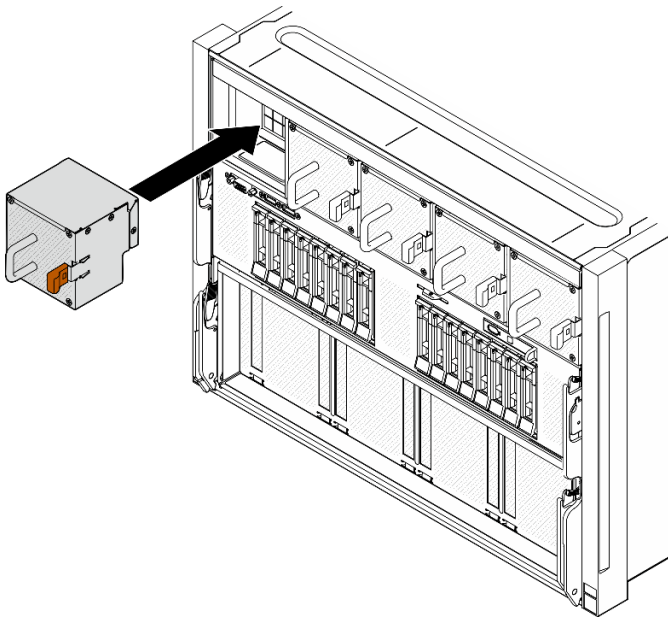


Figure 55. Hot-swap fan installation

After you finish

Complete the parts replacement. See [“Complete the parts replacement” on page 242.](#)

Fan control board assembly replacement (trained technician only)

Follow instructions in this section to remove or install a fan control board assembly.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the front fan control board assembly

Follow instructions in this section to remove the front fan control board assembly. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See “[Remove a hot-swap power supply unit](#)” on page 201.
- b. Remove all the front fans. See “[Remove a hot-swap fan \(front and rear\)](#)” on page 79.
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “[Remove a 2.5-inch hot-swap drive](#)” on page 58.
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “[Remove the 8U GPU shuttle](#)” on page 69.
- e. Remove the cable cover. See “[Remove the cable cover](#)” on page 73.

Step 2. Disconnect the cable from the front fan control board.

Step 3. Remove the front fan control board assembly.

- a. ① Unfasten the four screws marked with **E** on both sides of the 8U GPU shuttle.
- b. ② Slide the front fan control board assembly backward, and lift it out of the 8U GPU shuttle.

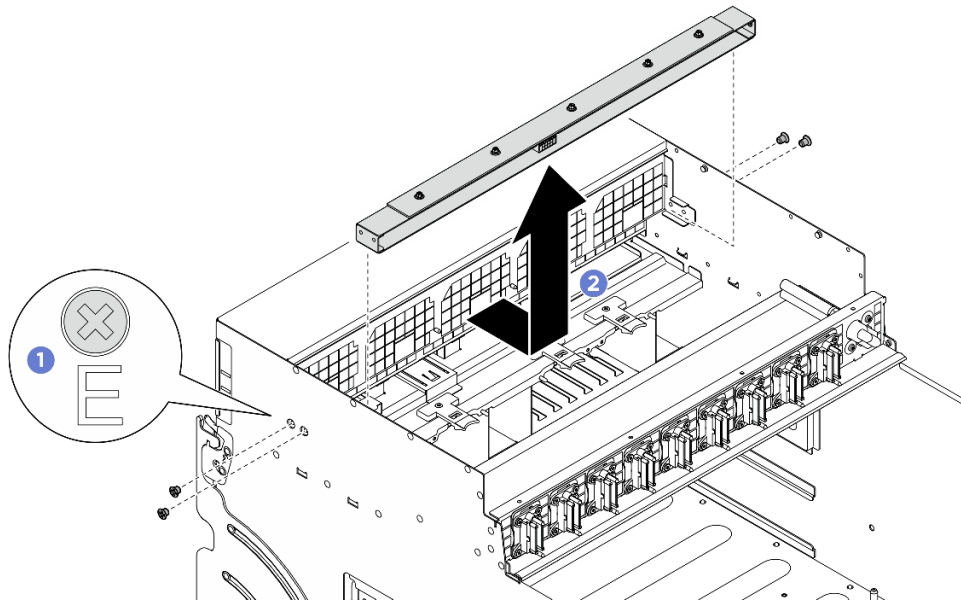


Figure 56. Front fan control board assembly removal

Step 4. If necessary, unfasten the five screws to remove the front fan control board from the bracket.

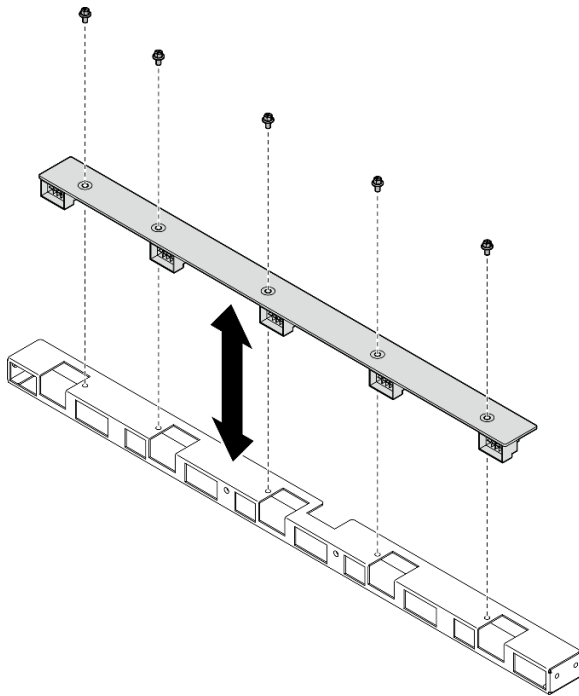


Figure 57. Front fan control board removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the front fan control board assembly

Follow instructions in this section to install the front fan control board assembly. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. If necessary, align the front fan control board with the bracket, and place it onto the bracket; then, fasten the five screws to secure the front fan control board.

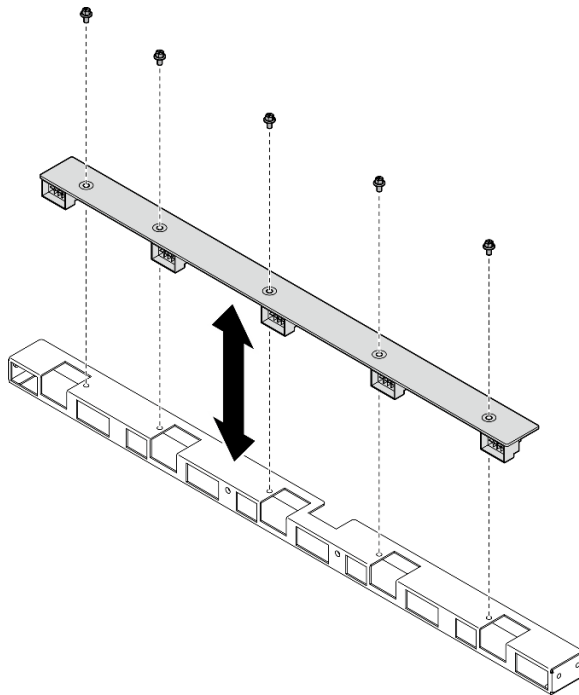


Figure 58. Front fan control board installation

Step 2. Install the front fan control board assembly.

- 1 Lower the front fan control board assembly into the 8U GPU shuttle; then, slide the front fan control board assembly forward to engage it with the two guide pins on the 8U GPU shuttle.
- 2 Locate the four screw holes marked with **E** on both sides of the 8U GPU shuttle; then, fasten the four screws to secure the front fan control board assembly.

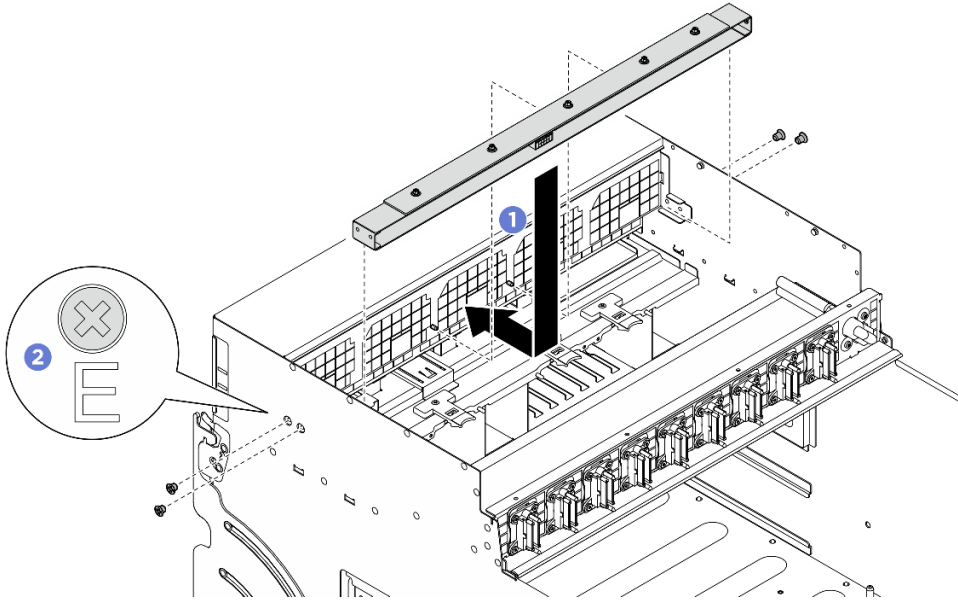


Figure 59. Front fan control board assembly installation

Step 3. If necessary, attach the labels to both ends of the power cable.

- a. ① Attach the white space portion of the label to one end of the cable.
- b. ② Wrap the label around the cable and attach it to the white space portion.
- c. Repeat to attach the other label to the opposite end of the cable.

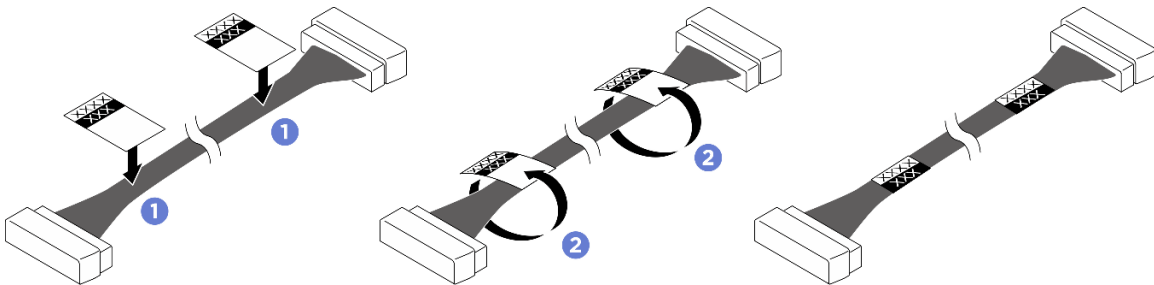


Figure 60. Label application

Note: See the table below to identify the corresponding labels for the cable.

From	To	Label
Front fan control board: Power connector	Power distribution board: Front fan control board power connector (FRONT FAN PWR)	F-Fan PWR FNT PWR

Step 4. Face the cable latch down, and connect the cable to the front fan control board. See [“Fan control board cable routing”](#) on page 254.

After you finish

1. Reinstall the cable cover. See [“Install the cable cover”](#) on page 74.

2. Reinstall the 8U GPU shuttle. See “[Install the 8U GPU shuttle](#)” on page 71.
3. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See “[Install a 2.5-inch hot-swap drive](#)” on page 60
4. Reinstall all the front fans. See “[Install a hot-swap fan \(front and rear\)](#)” on page 81.
5. Reinstall all the power supply units. See “[Install a hot-swap power supply unit](#)” on page 203.
6. Complete the parts replacement. See “[Complete the parts replacement](#)” on page 242.

Remove a rear fan control board assembly

Follow instructions in this section to remove a rear fan control board assembly. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See “[Remove a hot-swap power supply unit](#)” on page 201.
- b. Remove all the front fans. See “[Remove a hot-swap fan \(front and rear\)](#)” on page 79.
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “[Remove a 2.5-inch hot-swap drive](#)” on page 58.
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “[Remove the 8U GPU shuttle](#)” on page 69.

Step 2. Disconnect the cable from the rear fan control board.

Step 3. Remove the rear fan control board assembly.

- a. ① Unfasten the four screws marked with **A** on both sides of the 8U GPU shuttle.
- b. ② Remove the rear fan control board assembly from the 8U GPU shuttle.

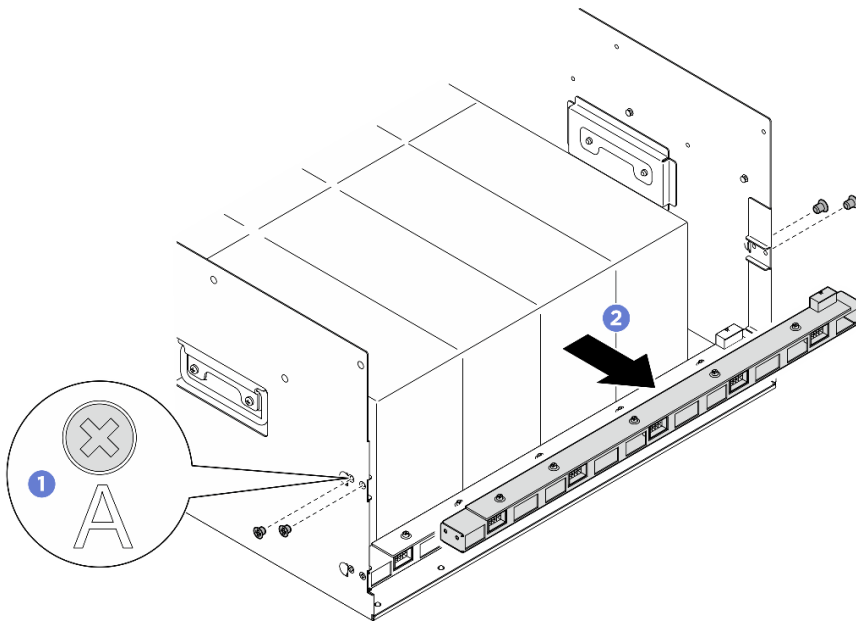


Figure 61. Rear fan control board assembly removal

Step 4. If necessary, unfasten the five screws to remove the rear fan control board from the bracket.

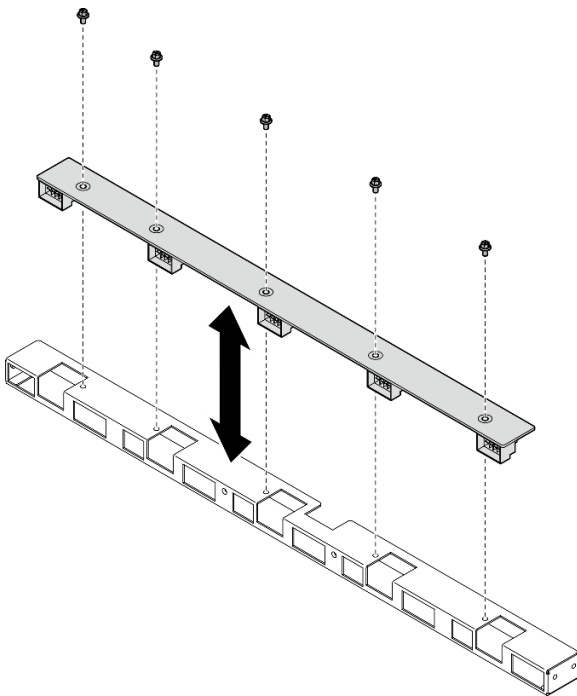


Figure 62. Rear fan control board removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a rear fan control board assembly

Follow instructions in this section to install a rear fan control board assembly. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

- Step 1. If necessary, align the rear fan control board with the bracket, and place it onto the bracket; then, fasten the five screws to secure the rear fan control board.

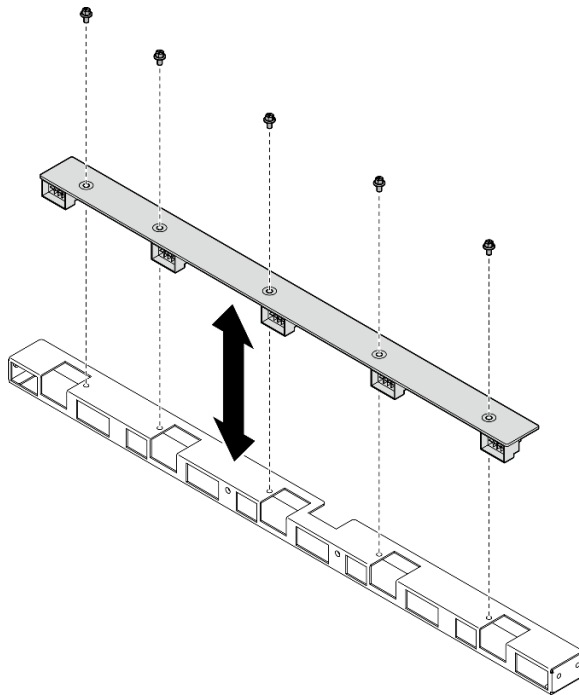


Figure 63. Rear fan control board installation

- Step 2. Install the rear fan control board assembly.
- 1 Hold the rear fan control board assembly in the correct orientation as illustrated, and slide it into the 8U GPU shuttle.
 - 2 Locate the four screw holes marked with **A** on both sides of the 8U GPU shuttle; then, fasten the four screws to secure the rear fan control board assembly.

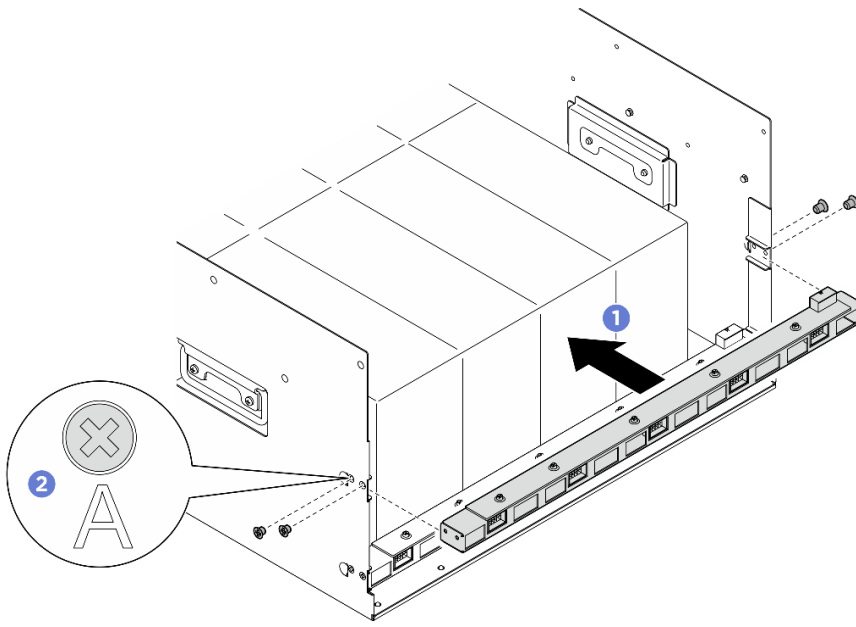


Figure 64. Rear fan control board assembly installation

- Step 3. If necessary, attach the labels to both ends of the power cable.
- a. 1 Attach the white space portion of the label to one end of the cable.
 - b. 2 Wrap the label around the cable and attach it to the white space portion.
 - c. Repeat to attach the other label to the opposite end of the cable.

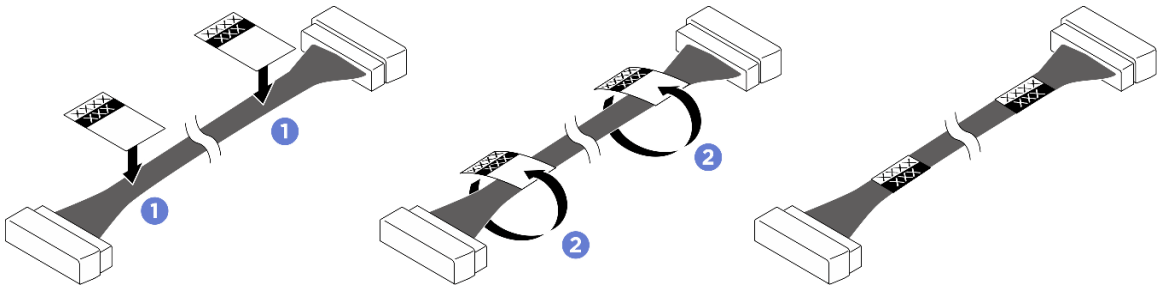


Figure 65. Label application

Note: See the table below to identify the corresponding labels for the cables.

From	To	Label
Rear fan control board (top): Power connector	Power distribution board: Rear fan control board (top) power connector (REAR FAN PWR2)	R-Fan PWR2 TOP PWR
Rear fan control board (bottom): Power connector	Power distribution board: Rear fan control board (bottom) power connector (REAR FAN PWR1)	R-Fan PWR1 LOW PWR

- Step 4. Connect the cable to the rear fan control board. See [“Fan control board cable routing” on page 254.](#)

After you finish

1. Reinstall the 8U GPU shuttle. See “[Install the 8U GPU shuttle](#)” on page 71.
2. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See “[Install a 2.5-inch hot-swap drive](#)” on page 60
3. Reinstall all the front fans. See “[Install a hot-swap fan \(front and rear\)](#)” on page 81.
4. Reinstall all the power supply units. See “[Install a hot-swap power supply unit](#)” on page 203.
5. Complete the parts replacement. See “[Complete the parts replacement](#)” on page 242.

GPU air baffle replacement (trained technician only)

Follow instructions in this section to remove and install the GPU air baffle.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the GPU air baffle

Follow instructions in this section to remove the GPU air baffle. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See “[Remove a hot-swap power supply unit](#)” on page 201.
- b. Remove all the front fans. See “[Remove a hot-swap fan \(front and rear\)](#)” on page 79.
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “[Remove a 2.5-inch hot-swap drive](#)” on page 58.
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “[Remove the 8U GPU shuttle](#)” on page 69.
- e. Remove the power complex. See “[Remove the power complex](#)” on page 192.

Step 2. Hold the power complex and carefully turn it upside down.

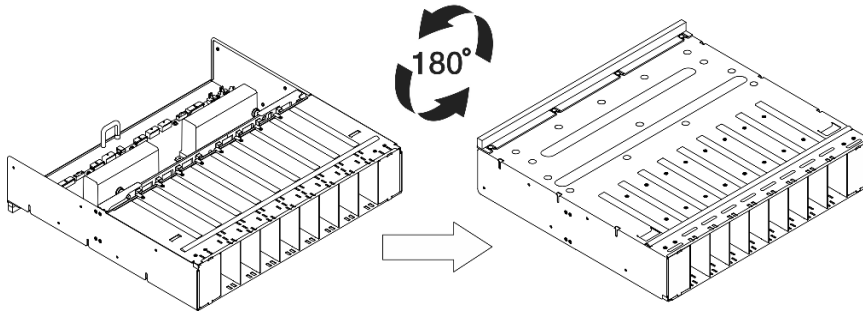


Figure 66. Turning the power complex upside down

Step 3. Remove the GPU air baffle from the bottom of the power complex.

Note: The GPU air baffle might look different from the illustration.

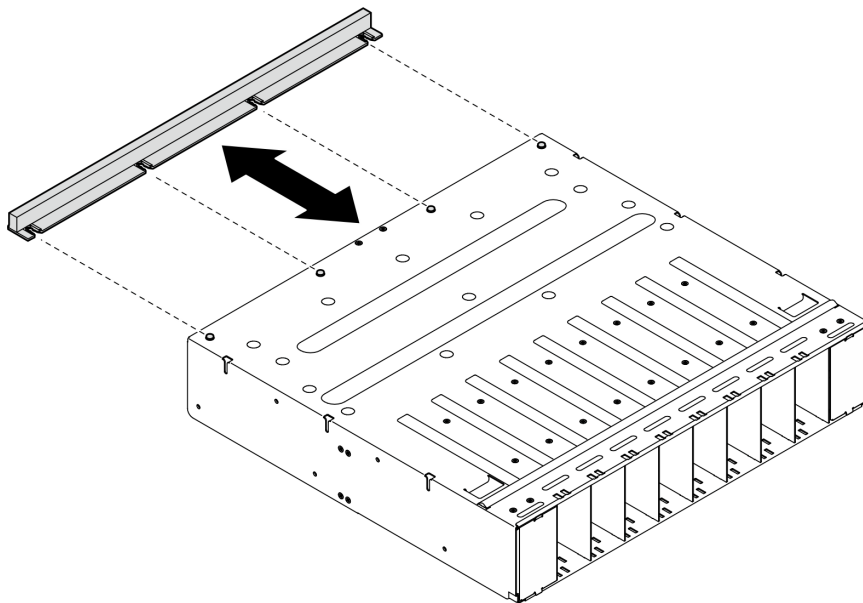


Figure 67. GPU air baffle removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the GPU air baffle

Follow instructions in this section to install the GPU air baffle. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.

- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Align the GPU air baffle with the four guide pins on the bottom of the power complex; then, insert the GPU air baffle into the power complex until it is securely engaged.

Note: The GPU air baffle might look different from the illustration.

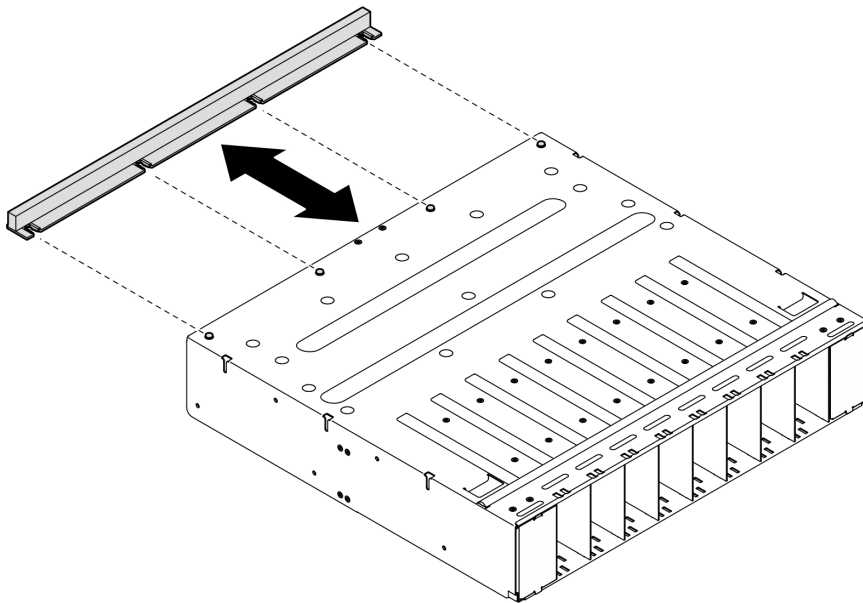


Figure 68. GPU air baffle installation

Step 2. Hold the power complex and carefully turn it right-side up.

After you finish

1. Reinstall the power complex. See “[Install the power complex](#)” on page 194.
2. Reinstall the 8U GPU shuttle. See “[Install the 8U GPU shuttle](#)” on page 71.
3. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See “[Install a 2.5-inch hot-swap drive](#)” on page 60
4. Reinstall all the front fans. See “[Install a hot-swap fan \(front and rear\)](#)” on page 81.
5. Reinstall all the power supply units. See “[Install a hot-swap power supply unit](#)” on page 203.
6. Complete the parts replacement. See “[Complete the parts replacement](#)” on page 242.

GPU air duct replacement (trained technician only)

Follow instructions in this section to remove and install a GPU air duct.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove an H100 GPU air duct

Follow instructions in this section to remove an H100 GPU air duct. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See “[Remove a hot-swap power supply unit](#)” on page 201.
- b. Remove all the front fans. See “[Remove a hot-swap fan \(front and rear\)](#)” on page 79.
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “[Remove a 2.5-inch hot-swap drive](#)” on page 58.
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “[Remove the 8U GPU shuttle](#)” on page 69.
- e. Remove the power complex. See “[Remove the power complex](#)” on page 192.

Step 2. Hold the two handles on the top of the GPU air duct; then, lift the GPU air duct out of the 8U GPU shuttle.

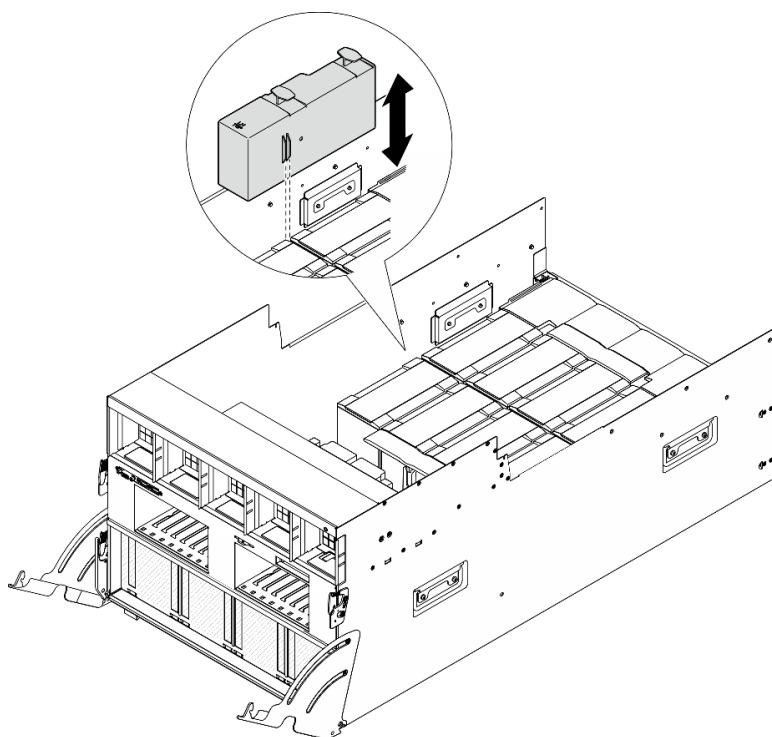


Figure 69. GPU air duct removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install an H100 GPU air duct

Follow instructions in this section to install an H100 GPU air duct. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.
- Do not mix up left and right GPU air ducts.
 - Install the GPU air duct with stamp “LH” on the left side (when looking at the 8U GPU shuttle from the front).
 - Install the GPU air duct with stamp “RH” on the right side (when looking at the 8U GPU shuttle from the front).

Procedure

- Step 1. Make sure the stamp “TOP” on the GPU air duct is facing up.
- Step 2. Hold the two handles on the top of the GPU air duct; then, insert the GPU air duct into the area between the two outermost GPU and heat sink modules until it is seated in place.

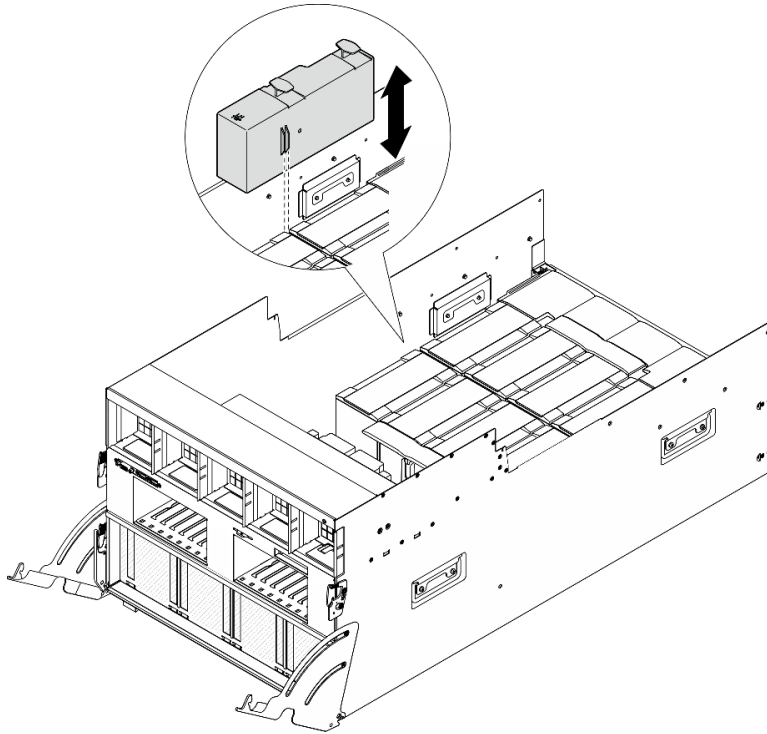


Figure 70. GPU air duct installation

After you finish

1. Reinstall the power complex. See [“Install the power complex” on page 194](#).
2. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle” on page 71](#).
3. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive” on page 60](#)
4. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
5. Reinstall all the power supply units. See [“Install a hot-swap power supply unit” on page 203](#).
6. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

Remove an MI300X GPU air duct

Follow instructions in this section to remove an MI300X GPU air duct. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.

- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Make preparation for this task.

- Remove all the power supply units. See “Remove a hot-swap power supply unit” on page 201.
- Remove all the front fans. See “Remove a hot-swap fan (front and rear)” on page 79.
- Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “Remove a 2.5-inch hot-swap drive” on page 58.
- Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “Remove the 8U GPU shuttle” on page 69.
- Remove the power complex. See “Remove the power complex” on page 192.

Step 2. Hold the edges of the GPU air duct; then, lift the GPU air duct out of the 8U GPU shuttle.

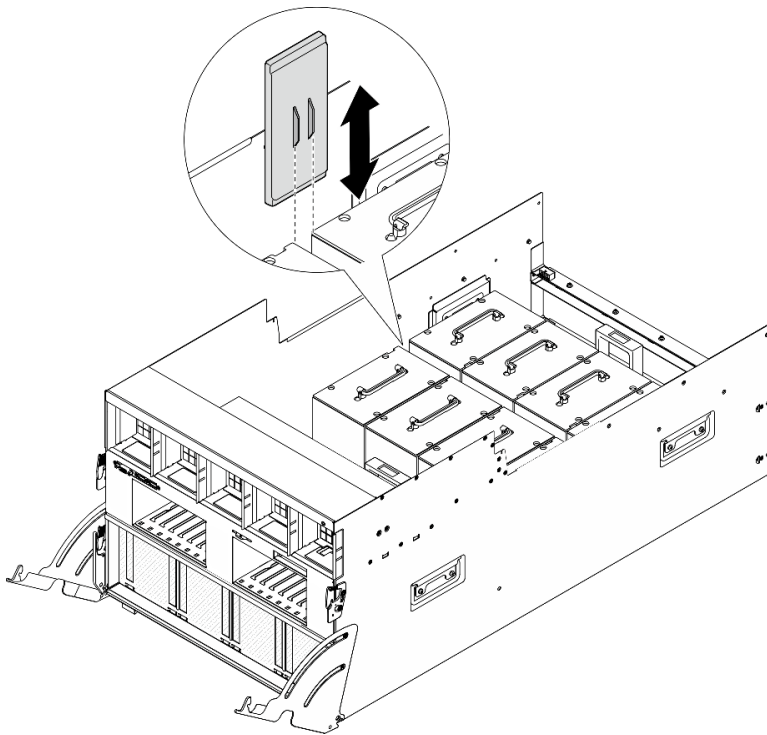


Figure 71. GPU air duct removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install an MI300X GPU air duct

Follow instructions in this section to install an MI300X GPU air duct. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

- Step 1. Hold the GPU air duct in the correct orientation as illustrated; then, insert the GPU air duct into the area between the two outermost GPU and heat sink modules until it is seated in place.

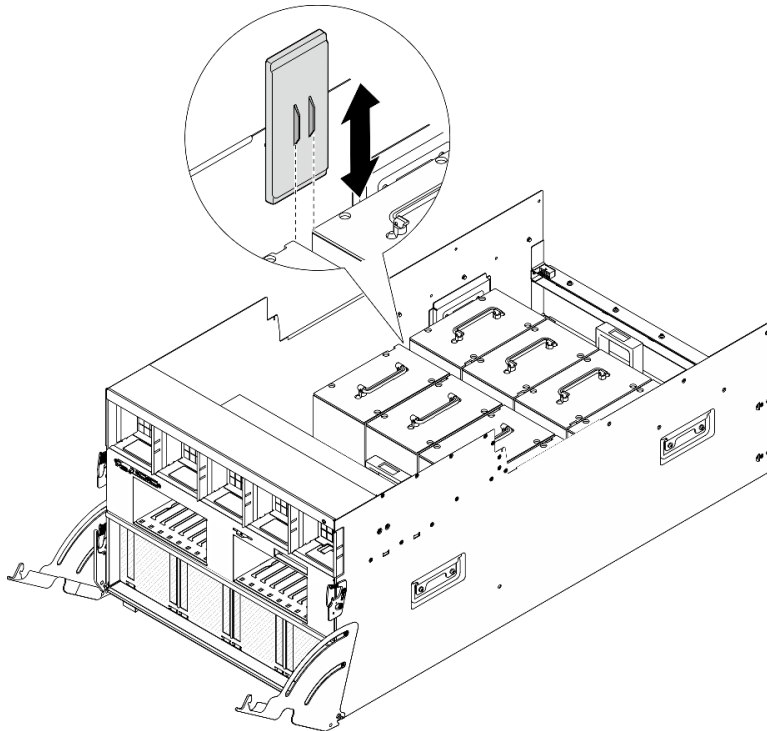


Figure 72. GPU air duct installation

After you finish

1. Reinstall the power complex. See “[Install the power complex](#)” on page 194.
2. Reinstall the 8U GPU shuttle. See “[Install the 8U GPU shuttle](#)” on page 71.

3. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive” on page 60](#)
4. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
5. Reinstall all the power supply units. See [“Install a hot-swap power supply unit” on page 203](#).
6. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

GPU baseboard replacement (trained technician only)

Follow instructions in this section to remove or install the GPU baseboard.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the H100 GPU baseboard

Follow instructions in this section to remove the H100 GPU baseboard. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Torque screwdriver which can be set to 0.6 newton-meters, 5.3 inch-pounds
- Torx T15 extended bit (6-inch long)

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See [“Remove a hot-swap power supply unit” on page 201](#).
- b. Remove all the front fans. See [“Remove a hot-swap fan \(front and rear\)” on page 79](#).
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See [“Remove a 2.5-inch hot-swap drive” on page 58](#).
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See [“Remove the 8U GPU shuttle” on page 69](#).
- e. Remove the cable cover. See [“Remove the cable cover” on page 73](#).
- f. Remove the power complex. See [“Remove the power complex” on page 192](#).
- g. Remove all the rear fan control board assemblies. See [“Remove a rear fan control board assembly” on page 87](#).
- h. Remove all the GPU air ducts. See [“Remove an H100 GPU air duct” on page 94](#).

- i. Disconnect the cables from the GPU baseboard.
- j. Remove all the GPU and heat sink modules. See [“Remove an H100 GPU and heat sink module” on page 127.](#)

Step 2. Disengage the PCIe switch shuttle from the 8U GPU shuttle.

- a. ① Press the two blue release latches.
- b. ② Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.
- c. ③ Pull the PCIe switch shuttle forward until it stops.

Note: Push the two release levers back until they lock into place after pulling out the PCIe switch shuttle to avoid damages.

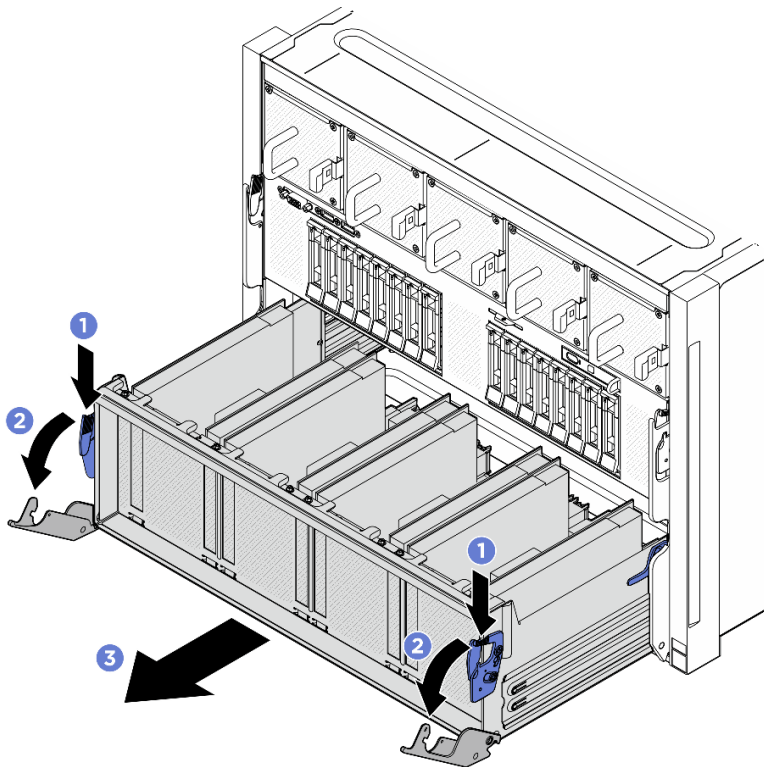


Figure 73. PCIe switch shuttle removal to stop position

Step 3. Flip over the front PCIe switch cable harness.

- a. Unfasten the ten screws marked with **C** on both sides of the 8U GPU shuttle.
- b. Flip over the front PCIe switch cable harness, and gently place it on the I/O cover.

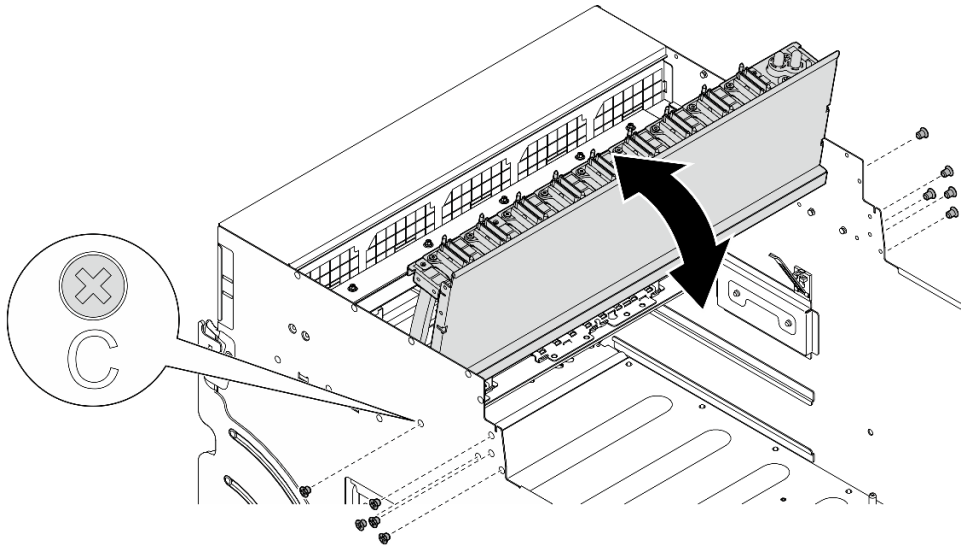


Figure 74. Flipping over the front PCIe switch cable harness

Step 4. Unfasten the seventeen Torx T15 captive screws on the GPU baseboard.

Note: Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 0.6 newton-meters, 5.3 inch-pounds.

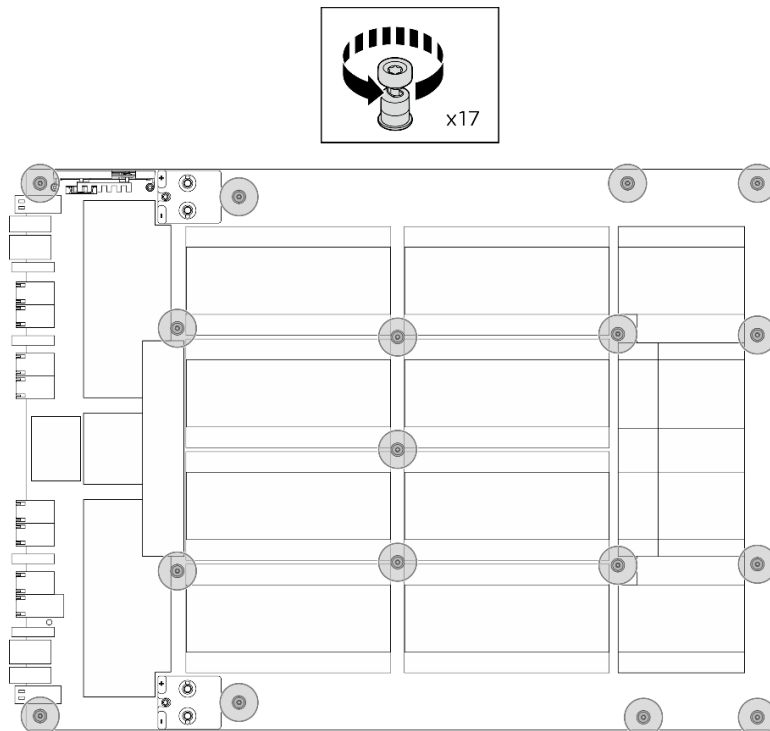


Figure 75. Screw removal

Step 5. Remove the GPU baseboard.

- a. 1 Extend the two handles (E) on both sides of the GPU baseboard.

- b. 2 Hold the two handles (1), and lift the GPU baseboard out of the 8U GPU shuttle.

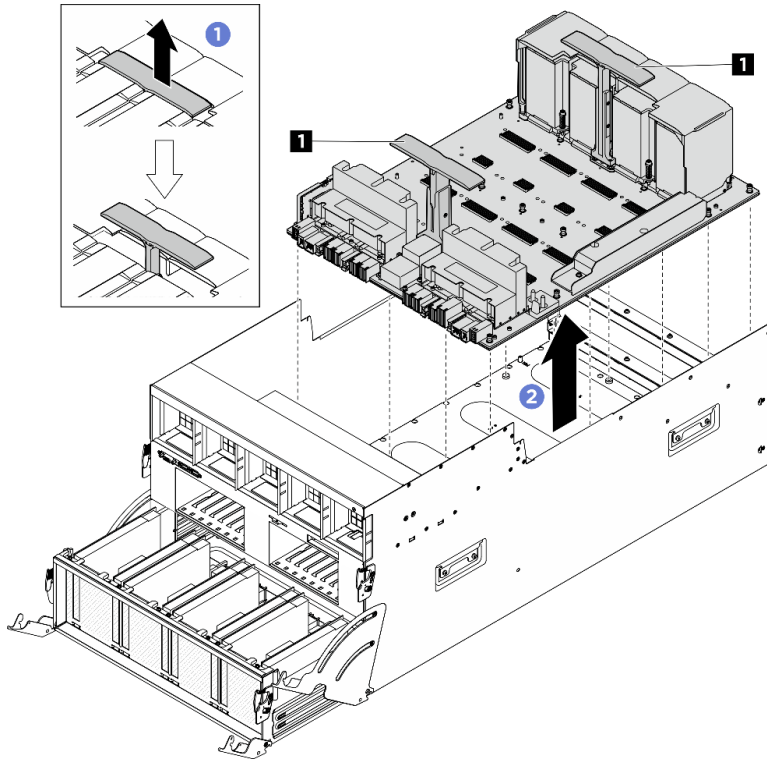


Figure 76. GPU baseboard removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the H100 GPU baseboard

Follow instructions in this section to install the H100 GPU baseboard. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.
- Make sure to inspect the connectors and sockets on the GPU and the GPU baseboard. Do not use the GPU or the GPU baseboard if its connectors are damaged or missing, or if there are debris in the sockets. Replace the GPU or the GPU baseboard with a new one before continuing the installation procedure.

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Torque screwdriver which can be set to 0.6 newton-meters, 5.3 inch-pounds
- Torx T15 extended bit (6-inch long)

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 271 for more information on firmware updating tools.

Procedure

Step 1. (Optional) Remove the new GPU baseboard from the package box.

- 1 Extend the two handles on both sides of the GPU baseboard.
- 2 Hold the two handles, and remove the GPU baseboard out from the package box.

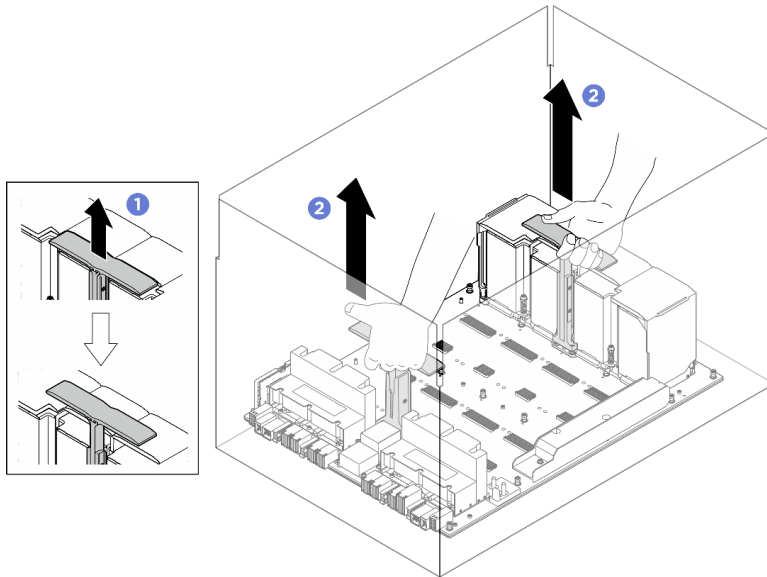


Figure 77. Removing the GPU baseboard from the package box

Step 2. Install the GPU baseboard.

- 1 Hold the handles (1) on both sides of the GPU baseboard in the correct orientation as illustrated; then, align the GPU baseboard with the seventeen standoffs on the GPU complex adaptor plate, and gently place it onto the adaptor plate.
- 2 Push the two handles (1) down.

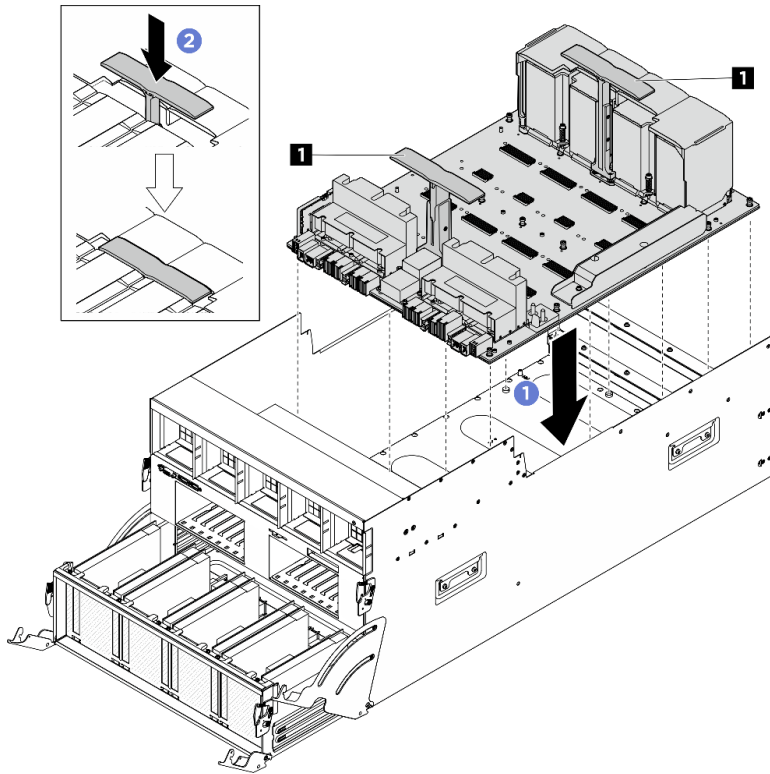


Figure 78. GPU baseboard installation

Step 3. Follow the sequence shown in the illustration below to fasten the seventeen Torx T15 captive screws to secure the GPU baseboard.

Important: Do not overtighten the screws to avoid damage.

Note: Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 0.6 newton-meters, 5.3 inch-pounds.

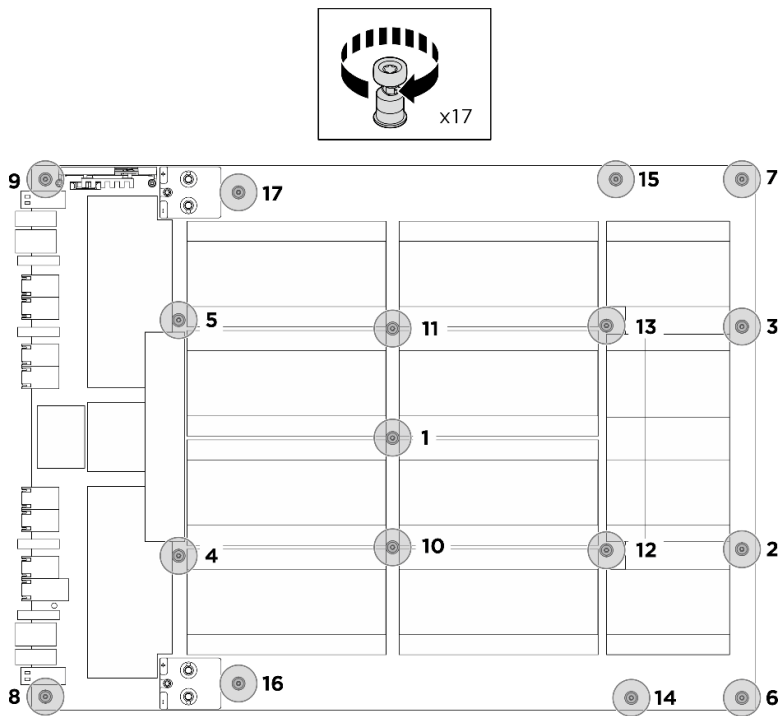


Figure 79. Screw installation

Step 4. Flip over the front PCIe switch cable harness.

- a. Flip over the front PCIe switch cable harness, and make sure that it correctly engages the four guide pins on the 8U GPU shuttle.
- b. Locate the ten screw holes marked with **C** on both sides of the 8U GPU shuttle; then, fasten the ten screws to secure the front PCIe switch cable harness.

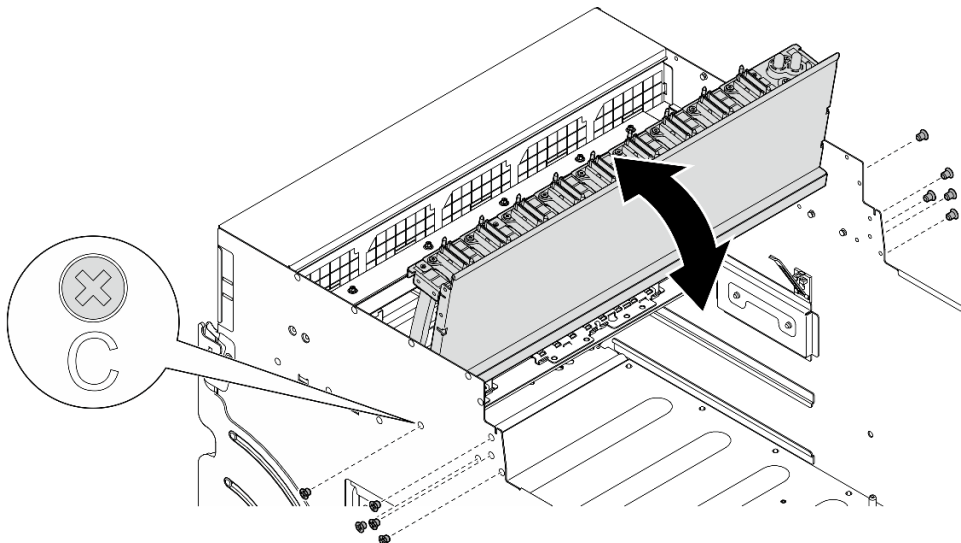


Figure 80. Flipping over the front PCIe switch cable harness

Step 5. Install the PCIe switch shuttle.

- a. ① Press the two lock latches on both sides of the PCIe switch shuttle.

- b. 2 Push the PCIe switch shuttle into the 8U GPU shuttle until it stops.
- c. 3 Rotate the two release levers until they lock into place.

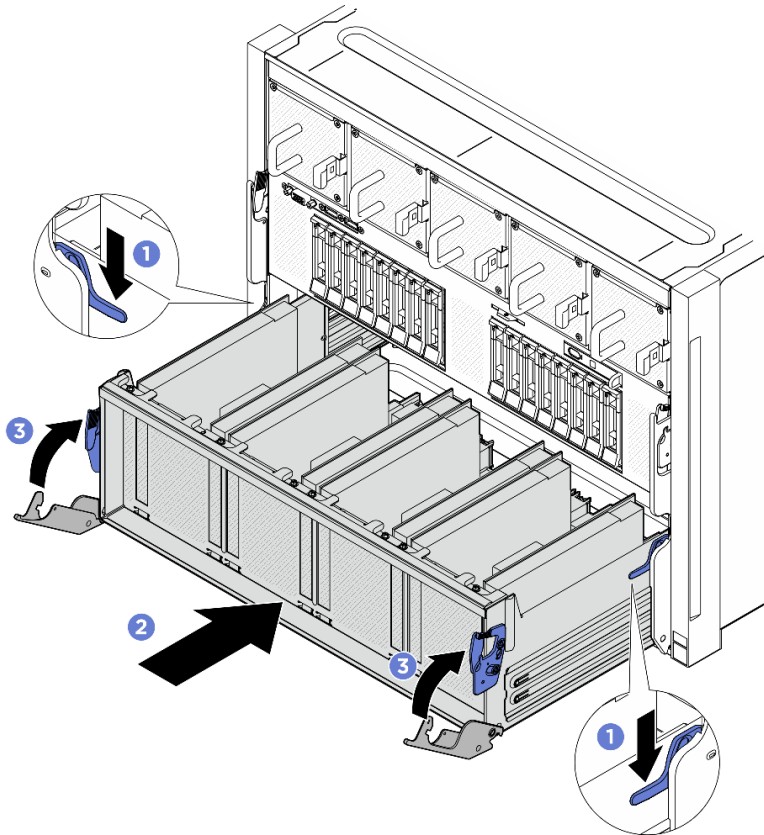


Figure 81. PCIe switch shuttle installation to 8U GPU shuttle

After you finish

1. Reinstall all the GPU and heat sink modules. See [“Install an H100 GPU and heat sink module”](#) on page 130.
2. Reconnect the cables to the GPU baseboard. See [“GPU baseboard cable routing”](#) on page 256 for more information.
3. Reinstall all the GPU air ducts. See [“Install an H100 GPU air duct”](#) on page 95.
4. Reinstall all the rear fan control board assemblies. See [“Install a rear fan control board assembly”](#) on page 89.
5. Reinstall the power complex. See [“Install the power complex”](#) on page 194.
6. Reinstall the cable cover. See [“Install the cable cover”](#) on page 74.
7. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle”](#) on page 71.
8. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive”](#) on page 60
9. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)”](#) on page 81.
10. Reinstall all the power supply units. See [“Install a hot-swap power supply unit”](#) on page 203.
11. Complete the parts replacement. See [“Complete the parts replacement”](#) on page 242.

GPU complex replacement (trained technician only)

Follow instructions in this section to remove or install the GPU complex.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the H100 GPU complex

Follow instructions in this section to remove the H100 GPU complex. The procedure must be executed by a trained technician.

About this task

S036



18 - 32 kg (39 - 70 lb)



32 - 55 kg (70 - 121 lb)

CAUTION:
Use safe practices when lifting.

Attention:

- Read “Installation Guidelines” on page 37 and “Safety inspection checklist” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Torque screwdriver which can be set to 0.6 newton-meters, 5.3 inch-pounds
- Torx T15 extended bit (6-inch long)

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See “Remove a hot-swap power supply unit” on page 201.
- b. Remove all the front fans. See “Remove a hot-swap fan (front and rear)” on page 79.
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “Remove a 2.5-inch hot-swap drive” on page 58.
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “Remove the 8U GPU shuttle” on page 69.

- e. Remove the cable cover. See [“Remove the cable cover” on page 73](#).
- f. Remove the power complex. See [“Remove the power complex” on page 192](#).
- g. Remove all the rear fan control board assemblies. See [“Remove a rear fan control board assembly” on page 87](#).
- h. Remove all the GPU air ducts. See [“Remove an H100 GPU air duct” on page 94](#).
- i. Disconnect the cables from the GPU baseboard.

Step 2. Disengage the PCIe switch shuttle from the 8U GPU shuttle.

- a. ① Press the two blue release latches.
- b. ② Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.
- c. ③ Pull the PCIe switch shuttle forward until it stops.

Note: Push the two release levers back until they lock into place after pulling out the PCIe switch shuttle to avoid damages.

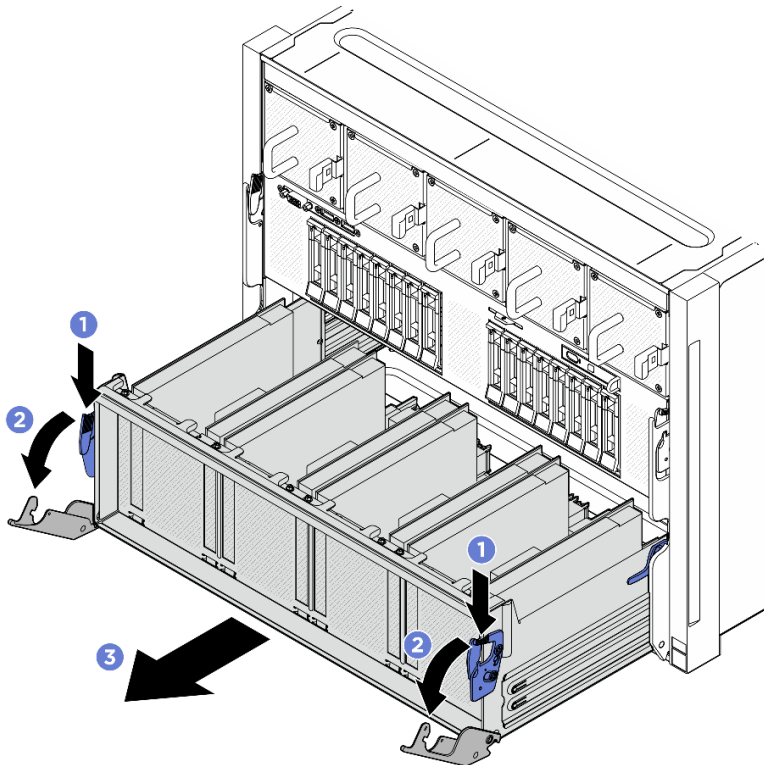


Figure 82. PCIe switch shuttle removal to stop position

Step 3. Flip over the front PCIe switch cable harness.

- a. Unfasten the ten screws marked with **C** on both sides of the 8U GPU shuttle.
- b. Flip over the front PCIe switch cable harness, and gently place it on the I/O cover.

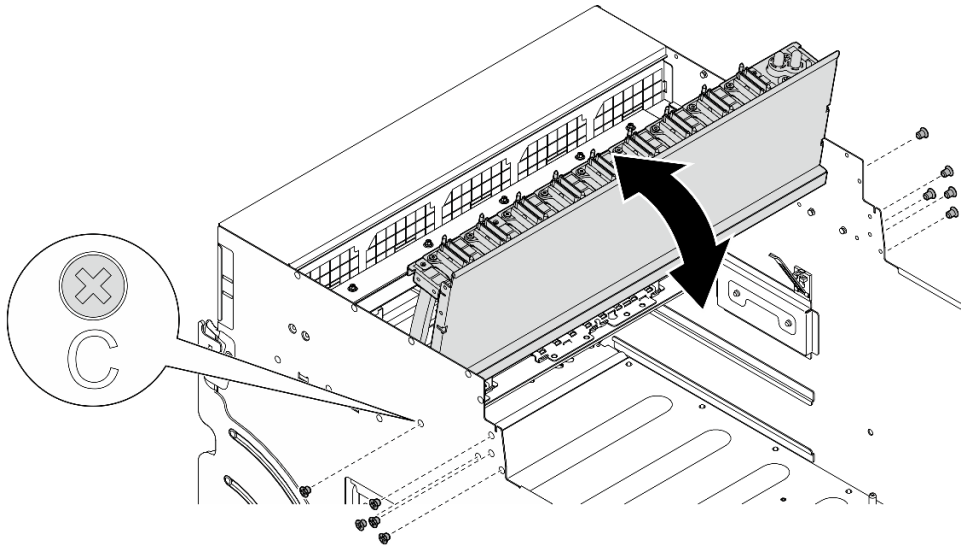


Figure 83. Flipping over the front PCIe switch cable harness

Step 4. Unfasten the seventeen Torx T15 captive screws on the GPU baseboard.

Note: Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 0.6 newton-meters, 5.3 inch-pounds.

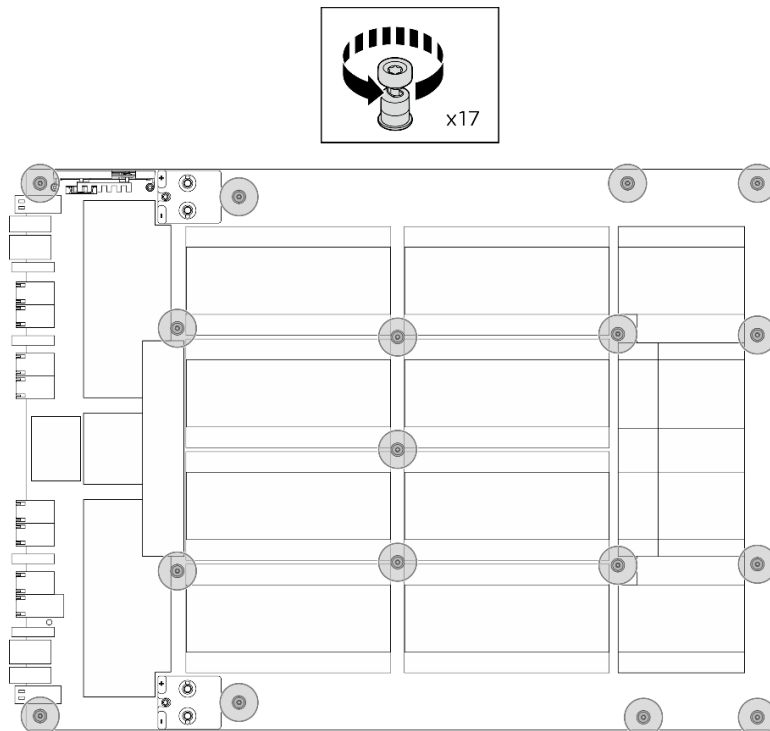


Figure 84. Screw removal

Step 5. Remove the GPU complex.

- a. 1 Extend the two handles (E) on both sides of the GPU baseboard.

- b. ② Hold the two handles (1), and lift the GPU complex out of the 8U GPU shuttle.

Attention: Make sure two people stand on either side of the GPU complex, and lift it by holding the two handles (1).

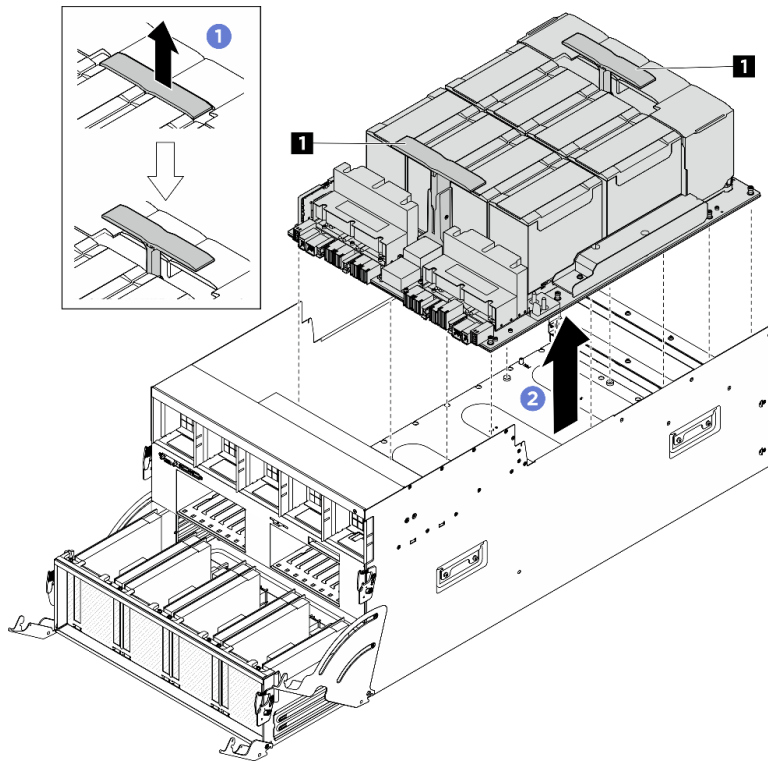


Figure 85. GPU complex removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the H100 GPU complex

Follow instructions in this section to install the H100 GPU complex. The procedure must be executed by a trained technician.

About this task

S036



18 - 32 kg (39 - 70 lb)



32 - 55 kg (70 - 121 lb)

CAUTION:

Use safe practices when lifting.

Attention:

- Read “Installation Guidelines” on page 37 and “Safety inspection checklist” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Torque screwdriver which can be set to 0.6 newton-meters, 5.3 inch-pounds
- Torx T15 extended bit (6-inch long)

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 271 for more information on firmware updating tools.

Procedure

Step 1. (Optional) Remove the new GPU complex from the package box.

- 1 Extend the two handles on both sides of the GPU baseboard.
- 2 Hold the two handles, and remove the GPU complex out from the package box.

Attention: Make sure two people stand on either side of the GPU complex, and lift it by holding the two handles.

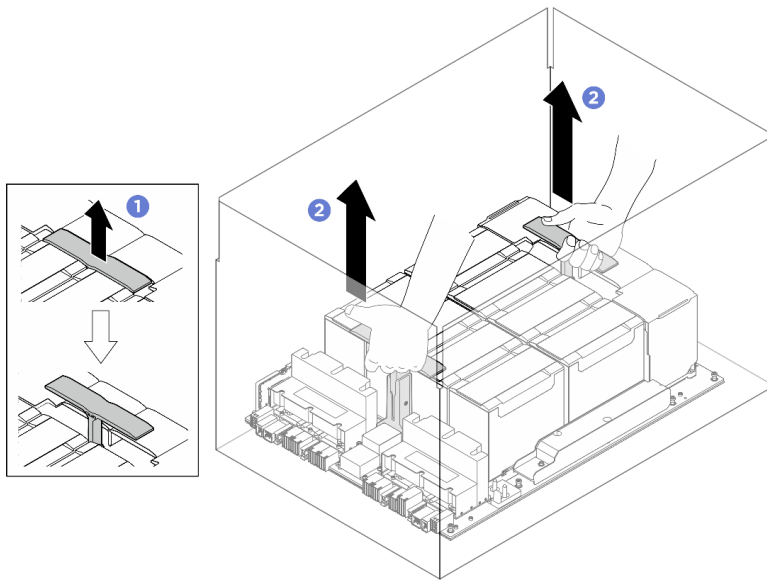


Figure 86. Removing the GPU complex from the package box

Step 2. Install the GPU complex.

- a. ① Hold the handles (1) on both sides of the GPU baseboard in the correct orientation as illustrated; then, align the GPU complex with the seventeen standoffs on the GPU complex adaptor plate, and gently place it onto the adaptor plate.
- b. ② Push the two handles (1) down.

Attention: Make sure two people stand on either side of the GPU complex, and lift it by holding the two handles (1).

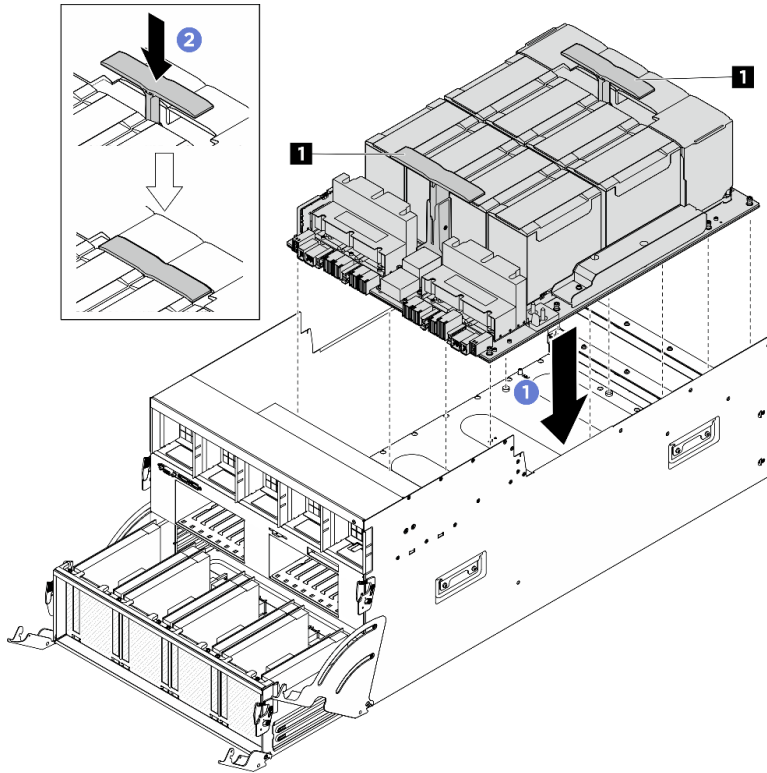


Figure 87. GPU complex installation

Step 3. Follow the sequence shown in the illustration below to fasten the seventeen Torx T15 captive screws to secure the GPU complex.

Important: Do not overtighten the screws to avoid damage.

Note: Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 0.6 newton-meters, 5.3 inch-pounds.

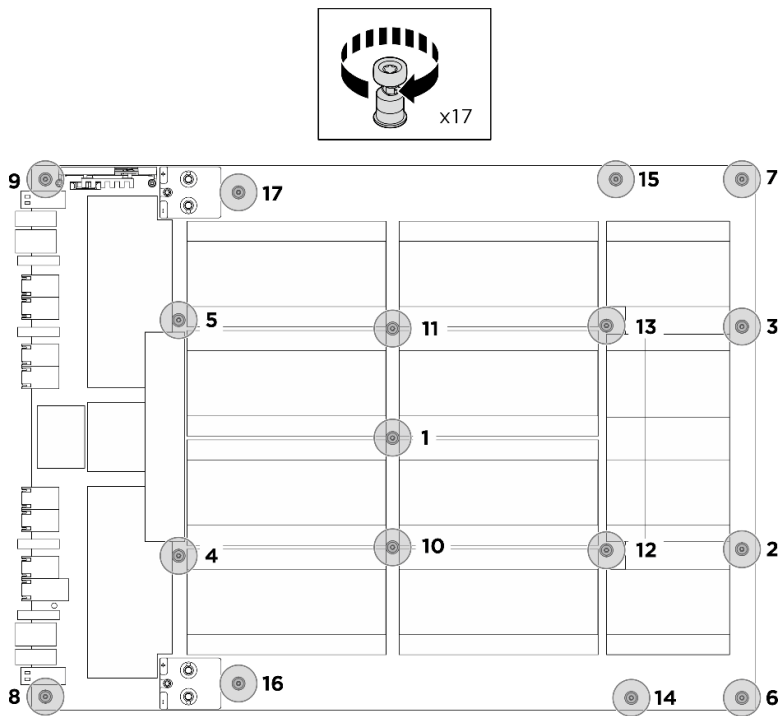


Figure 88. Screw installation

- Step 4. Flip over the front PCIe switch cable harness.
- a. Flip over the front PCIe switch cable harness, and make sure that it correctly engages the four guide pins on the 8U GPU shuttle.
 - b. Locate the ten screw holes marked with **C** on both sides of the 8U GPU shuttle; then, fasten the ten screws to secure the front PCIe switch cable harness.

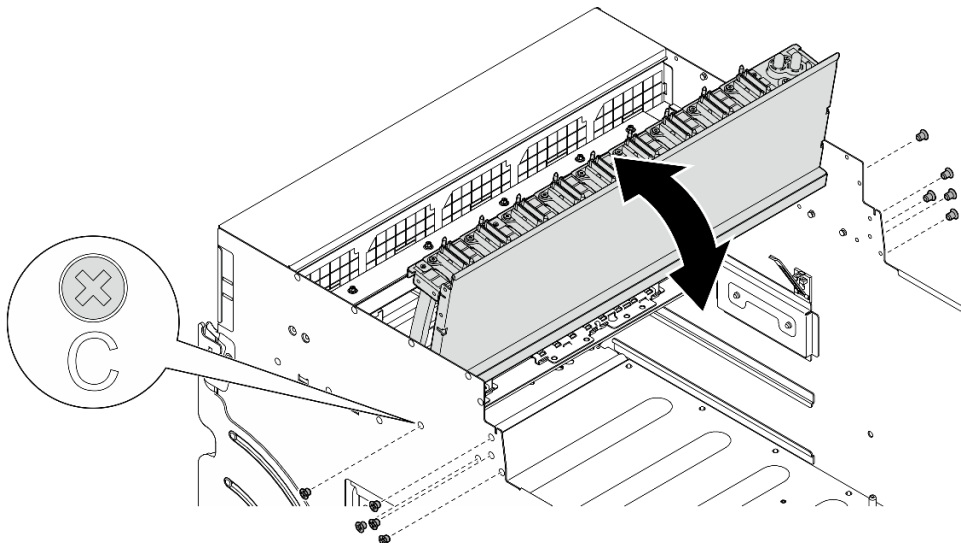


Figure 89. Flipping over the front PCIe switch cable harness

- Step 5. Install the PCIe switch shuttle.
- a. ① Press the two lock latches on both sides of the PCIe switch shuttle.

- b. ② Push the PCIe switch shuttle into the 8U GPU shuttle until it stops.
- c. ③ Rotate the two release levers until they lock into place.

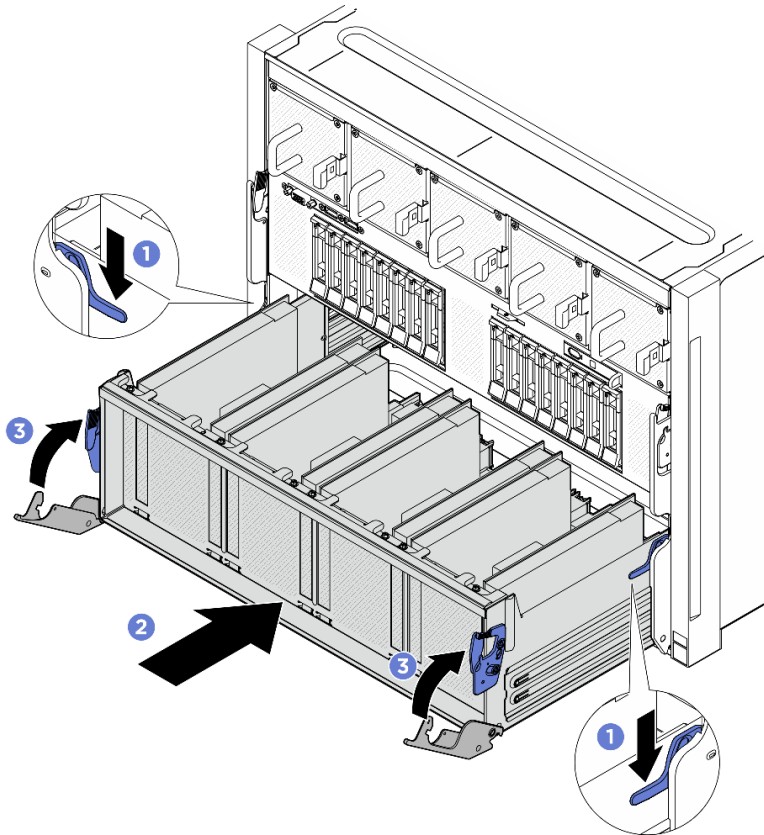


Figure 90. PCIe switch shuttle installation to 8U GPU shuttle

After you finish

1. Reconnect the cables to the GPU baseboard. See [“GPU baseboard cable routing” on page 256](#) for more information.
2. Reinstall all the GPU air ducts. See [“Install an H100 GPU air duct” on page 95](#).
3. Reinstall all the rear fan control board assemblies. See [“Install a rear fan control board assembly” on page 89](#).
4. Reinstall the power complex. See [“Install the power complex” on page 194](#).
5. Reinstall the cable cover. See [“Install the cable cover” on page 74](#).
6. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle” on page 71](#).
7. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive” on page 60](#)
8. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
9. Reinstall all the power supply units. See [“Install a hot-swap power supply unit” on page 203](#).
10. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

Remove the MI300X GPU complex

Follow instructions in this section to remove the MI300X GPU complex. The procedure must be executed by a trained technician.

About this task

S036



18 - 32 kg (39 - 70 lb)



32 - 55 kg (70 - 121 lb)

CAUTION:
Use safe practices when lifting.

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Torque screwdriver which can be set to 1.53 newton-meters, 13.5 inch-pounds
- Torx T15 extended bit (6-inch long)

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See “[Remove a hot-swap power supply unit](#)” on page 201.
- b. Remove all the front fans. See “[Remove a hot-swap fan \(front and rear\)](#)” on page 79.
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “[Remove a 2.5-inch hot-swap drive](#)” on page 58.
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “[Remove the 8U GPU shuttle](#)” on page 69.
- e. Remove the cable cover. See “[Remove the cable cover](#)” on page 73.
- f. Remove the power complex. See “[Remove the power complex](#)” on page 192.
- g. Remove all the rear fan control board assemblies. See “[Remove a rear fan control board assembly](#)” on page 87.
- h. Remove all the GPU air ducts. See “[Remove an MI300X GPU air duct](#)” on page 96.
- i. Disconnect the cables from the GPU baseboard.

Step 2. Disengage the PCIe switch shuttle from the 8U GPU shuttle.

- a. ① Press the two blue release latches.
- b. ② Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.
- c. ③ Pull the PCIe switch shuttle forward until it stops.

Note: Push the two release levers back until they lock into place after pulling out the PCIe switch shuttle to avoid damages.

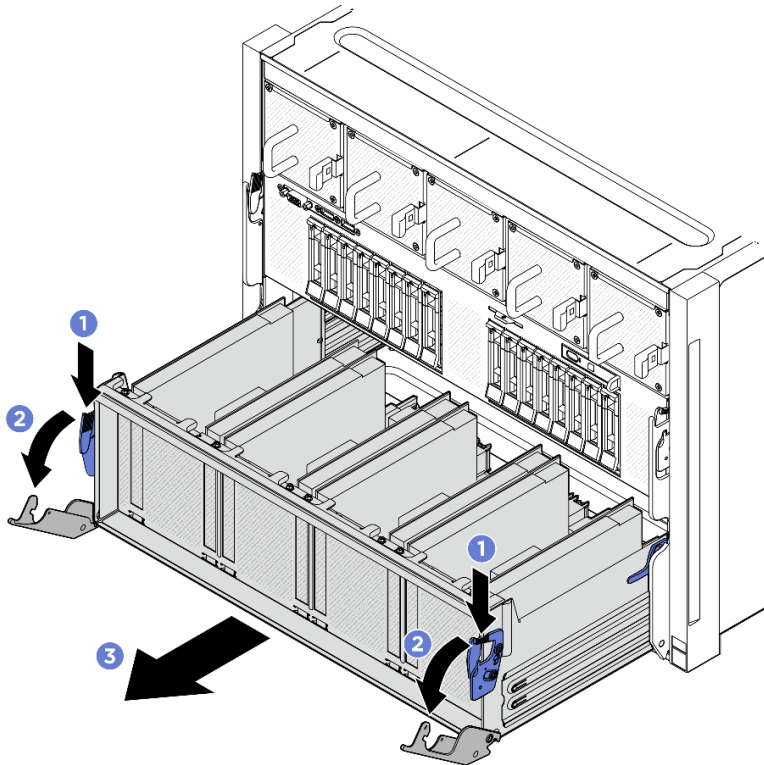


Figure 91. PCIe switch shuttle removal to stop position

- Step 3. Flip over the front PCIe switch cable harness.
- Unfasten the ten screws marked with **C** on both sides of the 8U GPU shuttle.
 - Flip over the front PCIe switch cable harness, and gently place it on the I/O cover.

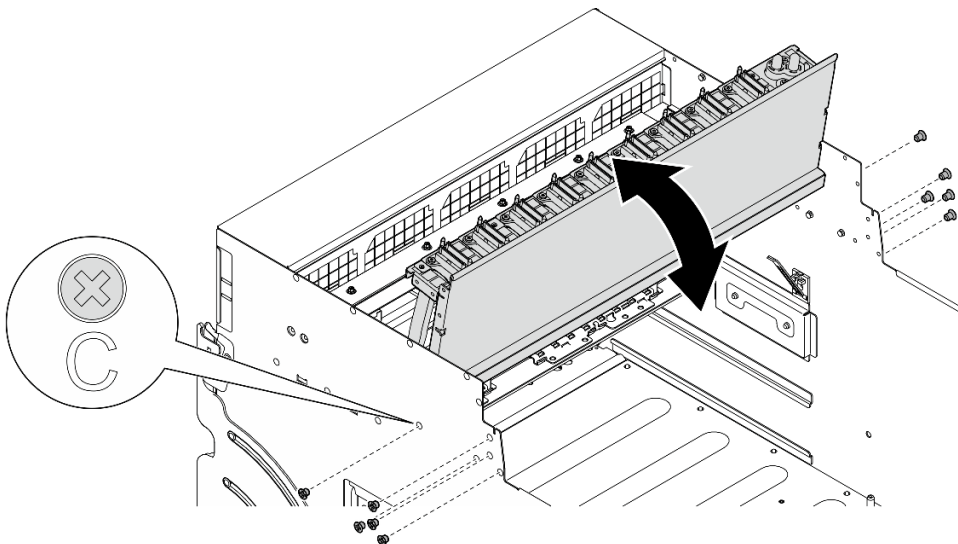


Figure 92. Flipping over the front PCIe switch cable harness

Step 4. Unfasten the thirteen Torx T15 captive screws on the GPU baseboard.

Note: Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 0.6 newton-meters, 5.3 inch-pounds.

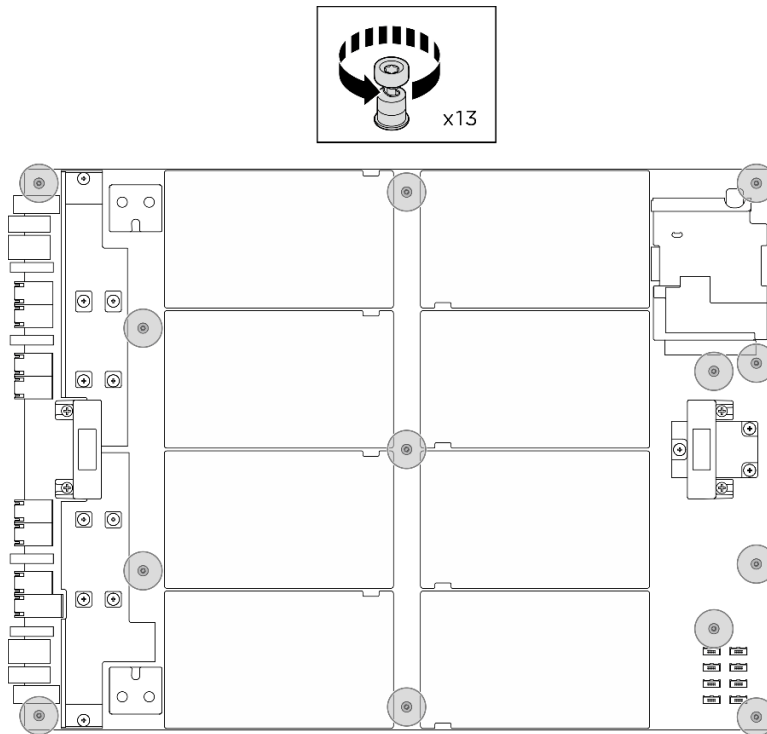


Figure 93. Screw removal

Step 5. Hold the handles (1) on both sides of the GPU baseboard; then, lift the GPU complex out of the 8U GPU shuttle.

Attention: Make sure two people stand on either side of the GPU complex, and lift it by holding the two handles (1).

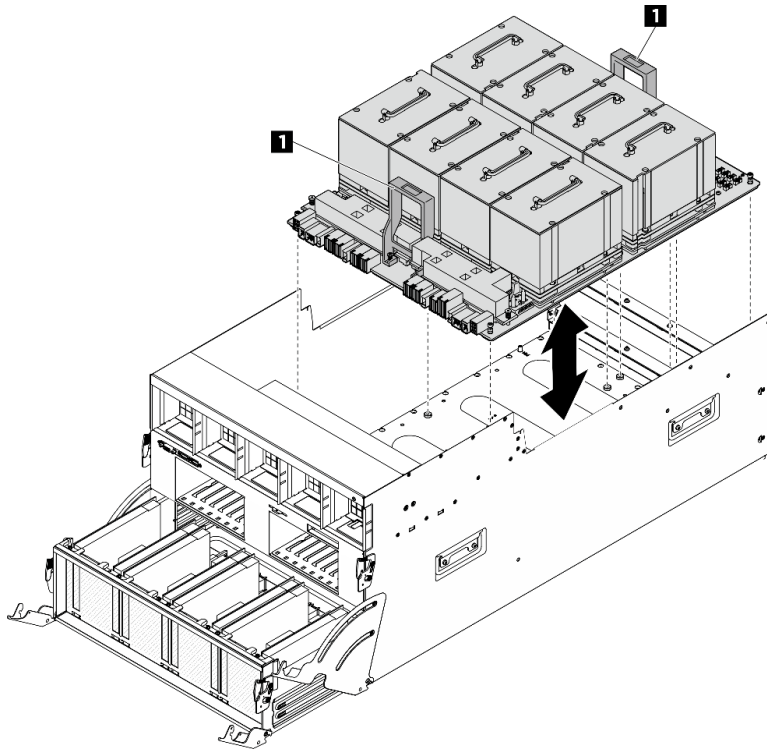


Figure 94. GPU complex removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the MI300X GPU complex

Follow instructions in this section to install the MI300X GPU complex. The procedure must be executed by a trained technician.

About this task

S036



18 - 32 kg (39 - 70 lb)



32 - 55 kg (70 - 121 lb)

CAUTION:
Use safe practices when lifting.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.

- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Torque screwdriver which can be set to 1.53 newton-meters, 13.5 inch-pounds
- Torx T15 extended bit (6-inch long)

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 271 for more information on firmware updating tools.

Procedure

Step 1. Hold the handles (1) on both sides of the GPU baseboard in the correct orientation as illustrated; then, align the GPU complex with the thirteen standoffs on the GPU complex adaptor plate, and gently place it onto the adaptor plate.

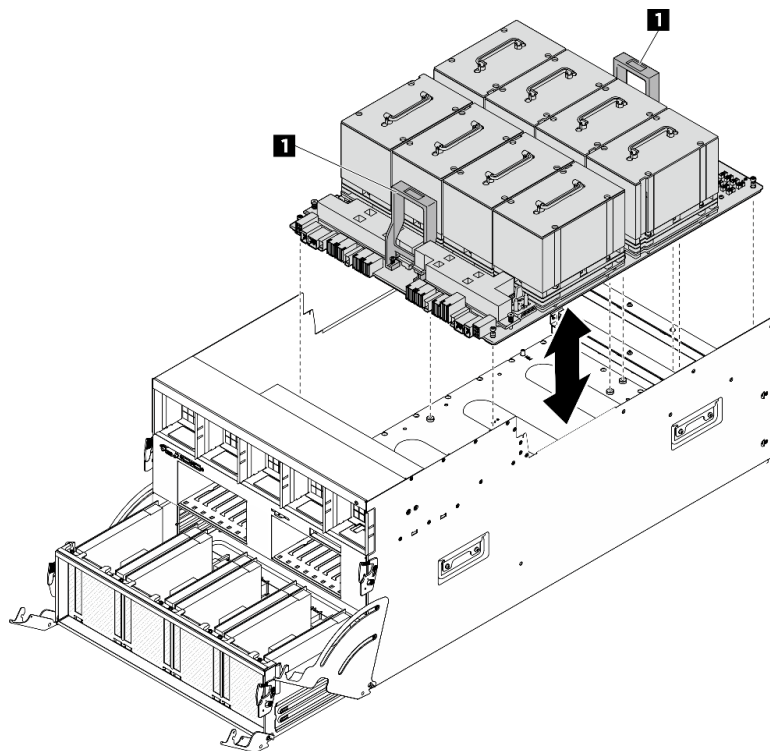


Figure 95. GPU complex installation

Step 2. Follow the sequence shown in the illustration below to fasten the thirteen Torx T15 captive screws to secure the GPU complex.

Important: Do not overtighten the screws to avoid damage.

Note: Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 0.6 newton-meters, 5.3 inch-pounds.

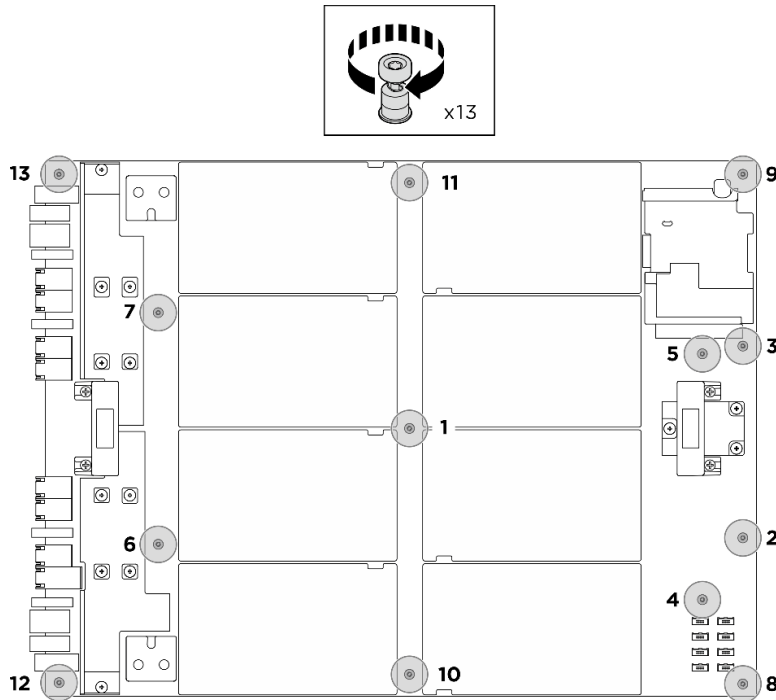


Figure 96. Screw installation

- Step 3. Flip over the front PCIe switch cable harness.
- Flip over the front PCIe switch cable harness, and make sure that it correctly engages the four guide pins on the 8U GPU shuttle.
 - Locate the ten screw holes marked with **C** on both sides of the 8U GPU shuttle; then, fasten the ten screws to secure the front PCIe switch cable harness.

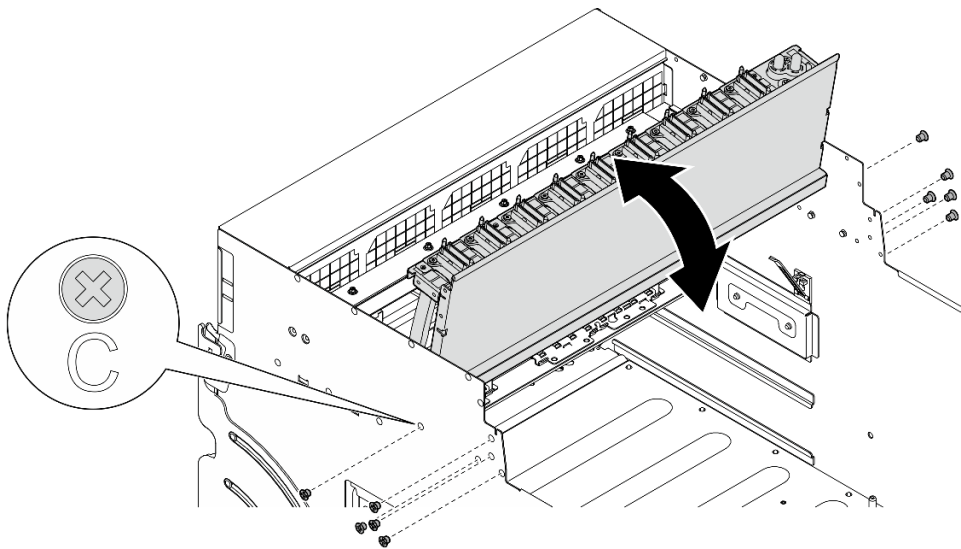


Figure 97. Flipping over the front PCIe switch cable harness

After you finish

1. Reconnect the cables to the GPU baseboard. See [“GPU baseboard cable routing” on page 256](#) for more information.
2. Reinstall all the GPU air ducts. See [“Install an MI300X GPU air duct” on page 98](#).
3. Reinstall all the rear fan control board assemblies. See [“Install a rear fan control board assembly” on page 89](#).
4. Reinstall the power complex. See [“Install the power complex” on page 194](#).
5. Reinstall the cable cover. See [“Install the cable cover” on page 74](#).
6. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle” on page 71](#).
7. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive” on page 60](#)
8. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
9. Reinstall all the power supply units. See [“Install a hot-swap power supply unit” on page 203](#). Reinstall all the rear fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
10. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

GPU complex adaptor plate replacement (trained technician only)

Follow instructions in this section to remove or install the GPU complex adaptor plate.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install it without proper training and qualification.

Remove the GPU complex adaptor plate

Follow instructions in this section to remove the GPU complex adaptor plate. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Torque screwdriver which can be set to 0.6 newton-meters, 5.3 inch-pounds (for H100 GPU complex) or 1.53 newton-meters, 13.5 inch-pounds (for MI300X GPU complex)
- Torx T15 extended bit (6-inch long)

Procedure

Step 1. Make preparation for this task.

- Remove all the power supply units. See “[Remove a hot-swap power supply unit](#)” on page 201.
- Remove all the front fans. See “[Remove a hot-swap fan \(front and rear\)](#)” on page 79.
- Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “[Remove a 2.5-inch hot-swap drive](#)” on page 58.
- Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “[Remove the 8U GPU shuttle](#)” on page 69.
- Remove the cable cover. See “[Remove the cable cover](#)” on page 73.
- Remove the power complex. See “[Remove the power complex](#)” on page 192.
- Remove all the rear fan control board assemblies. See “[Remove a rear fan control board assembly](#)” on page 87.
- Remove all the GPU air ducts. Depending on the configuration, see “[Remove an H100 GPU air duct](#)” on page 94 or “[Remove an MI300X GPU air duct](#)” on page 96.

Step 2. Disengage the PCIe switch shuttle from the 8U GPU shuttle.

- ① Press the two blue release latches.
- ② Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.
- ③ Pull the PCIe switch shuttle forward until it stops.

Note: Push the two release levers back until they lock into place after pulling out the PCIe switch shuttle to avoid damages.

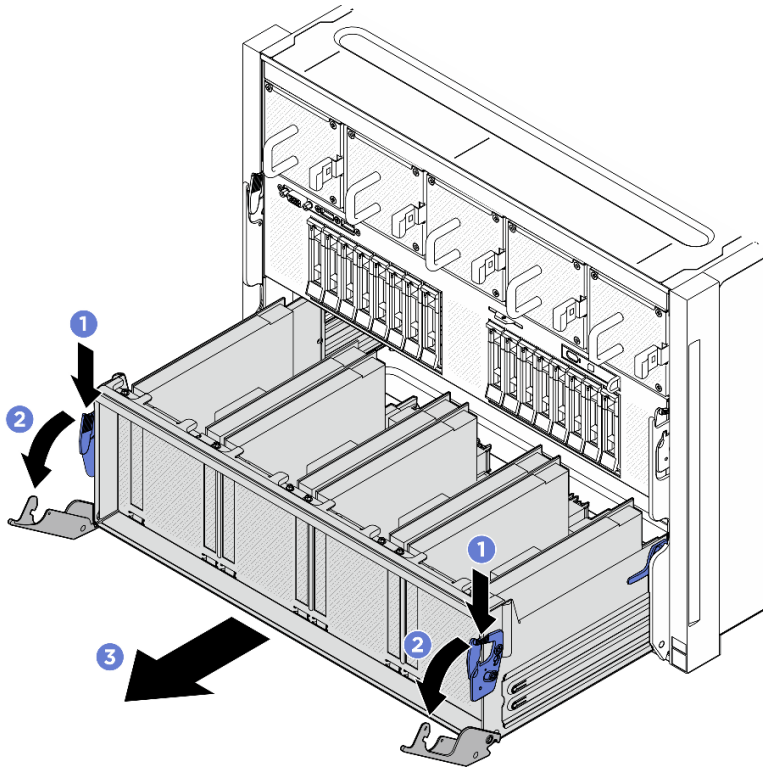


Figure 98. PCIe switch shuttle removal to stop position

- Step 3. Flip over the front PCIe switch cable harness.
- a. Unfasten the ten screws marked with **C** on both sides of the 8U GPU shuttle.
 - b. Flip over the front PCIe switch cable harness, and gently place it on the I/O cover.

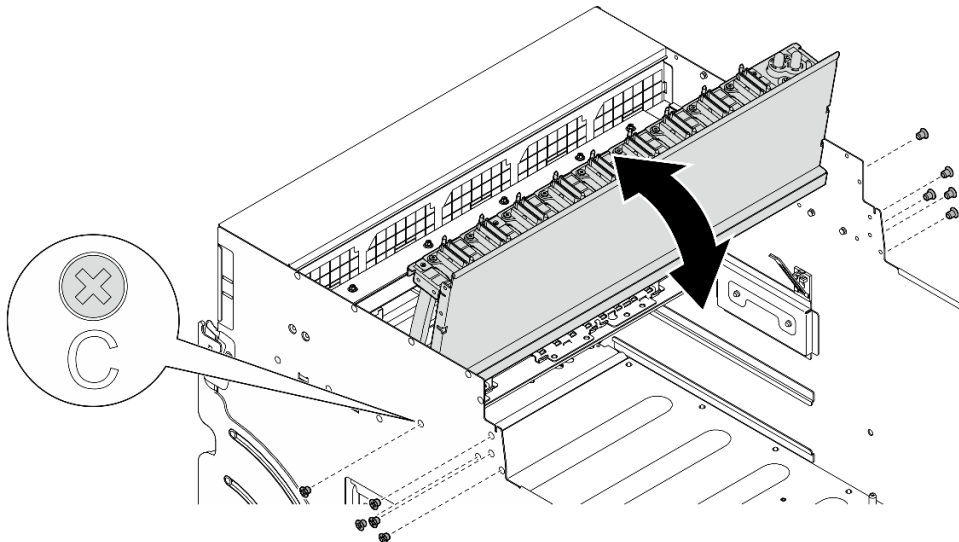


Figure 99. Flipping over the front PCIe switch cable harness

- Step 4. Remove the GPU complex. Depending on the configuration, see [“Remove the H100 GPU complex” on page 107](#) or [“Remove the MI300X GPU complex” on page 114](#).

Step 5. Unfasten the fourteen screws marked with an arrow on the GPU complex adaptor plate; then, lift the GPU complex adaptor plate out of the 8U GPU shuttle.

Note: The GPU complex adaptor plate might look different from the illustration.

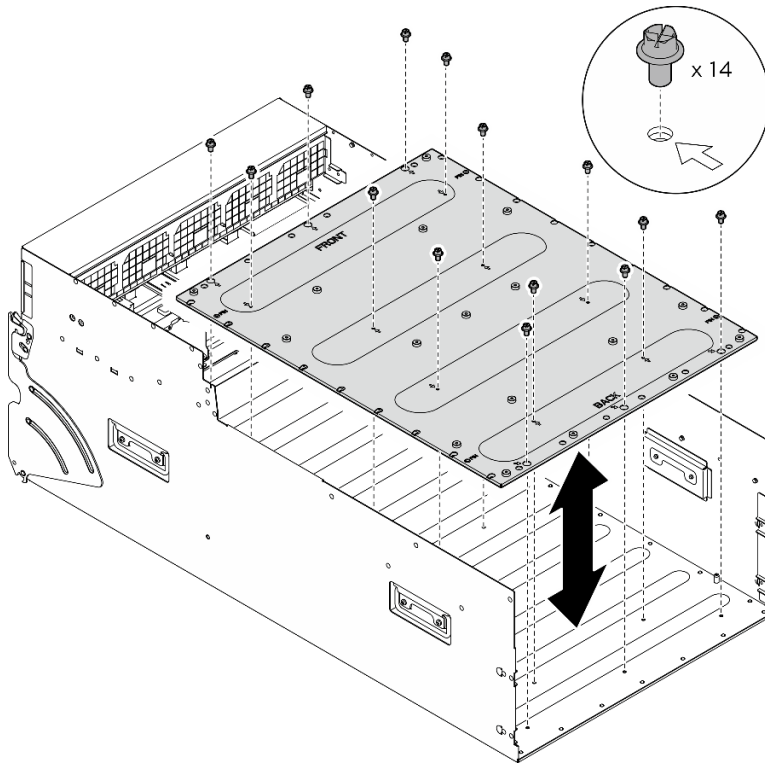


Figure 100. GPU complex adaptor plate removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the GPU complex adaptor plate

Follow instructions in this section to install the GPU complex adaptor plate. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Torque screwdriver which can be set to 0.6 newton-meters, 5.3 inch-pounds (for H100 GPU complex) or 1.53 newton-meters, 13.5 inch-pounds (for MI300X GPU complex)
- Torx T15 extended bit (6-inch long)

Procedure

- Step 1. Align the GPU complex adaptor plate with the four guide pins in the bottom of the 8U GPU shuttle; then, lower the GPU complex adaptor plate into the 8U GPU shuttle.
- Step 2. Locate the fourteen screw holes marked with an arrow; then, fasten the fourteen screws to secure the GPU complex adaptor plate.

Note: The GPU complex adaptor plate might look different from the illustration.

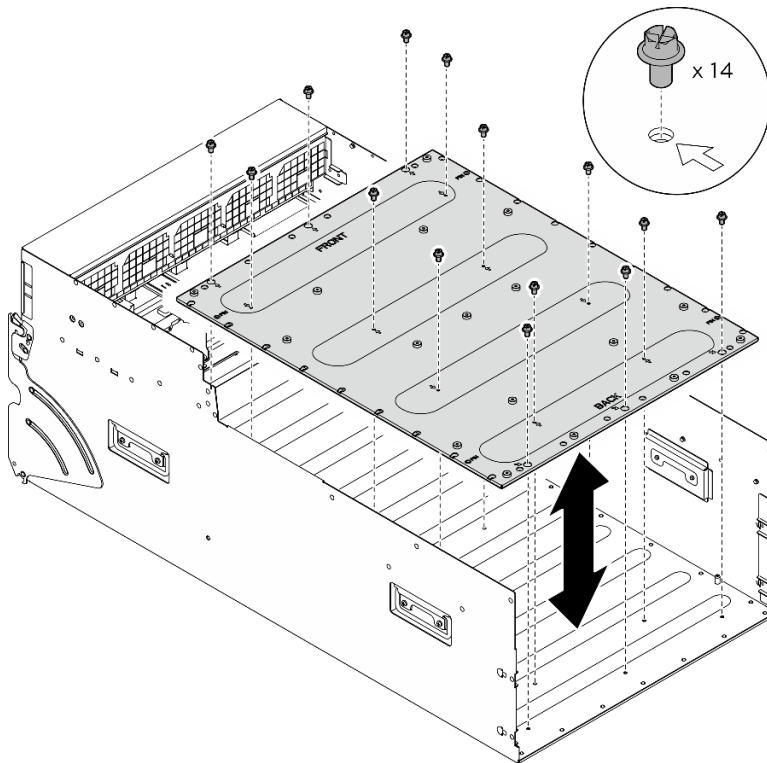


Figure 101. GPU complex adaptor plate installation

- Step 3. Install the GPU complex. Depending on the configuration, see [“Install the H100 GPU complex” on page 110](#) or [“Install the MI300X GPU complex” on page 118](#).
- Step 4. Flip over the front PCIe switch cable harness.
 - a. Flip over the front PCIe switch cable harness, and make sure that it correctly engages the four guide pins on the 8U GPU shuttle.
 - b. Locate the ten screw holes marked with **C** on both sides of the 8U GPU shuttle; then, fasten the ten screws to secure the front PCIe switch cable harness.

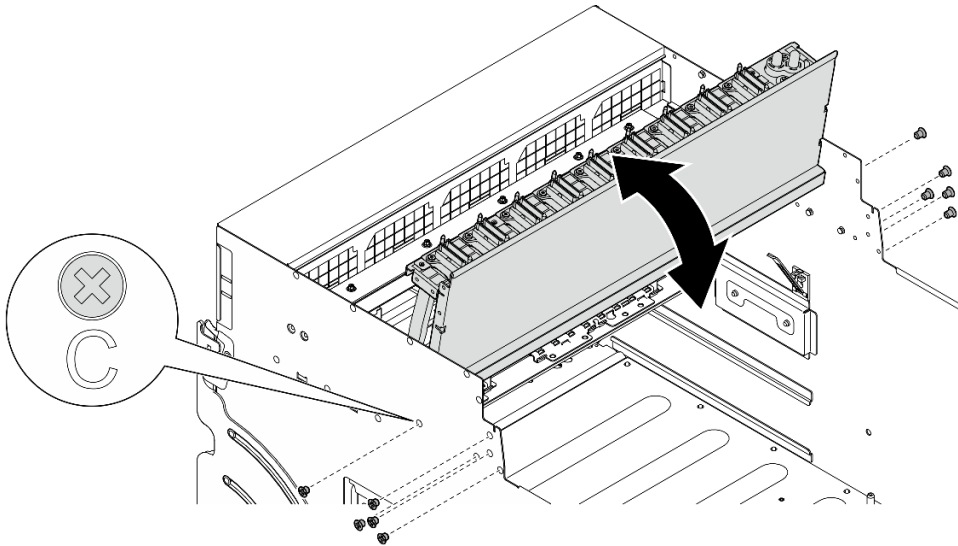


Figure 102. Flipping over the front PCIe switch cable harness

Step 5. Install the PCIe switch shuttle.

- a. 1 Press the two lock latches on both sides of the PCIe switch shuttle.
- b. 2 Push the PCIe switch shuttle into the 8U GPU shuttle until it stops.
- c. 3 Rotate the two release levers until they lock into place.

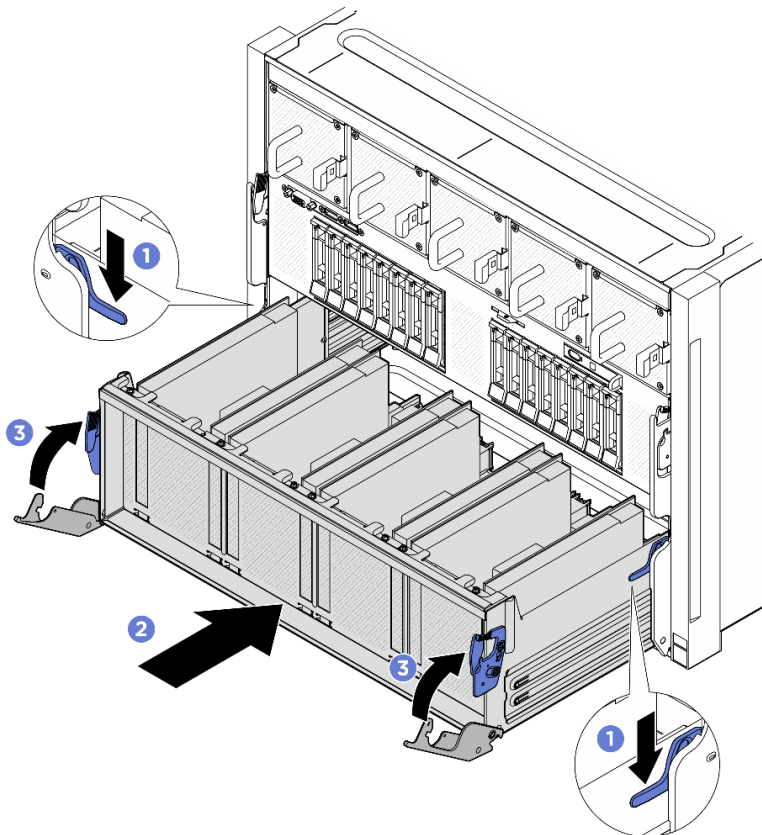


Figure 103. PCIe switch shuttle installation to 8U GPU shuttle

After you finish

1. Reinstall all the GPU air ducts. Depending on the configuration, see “[Install an H100 GPU air duct](#)” on [page 95](#) or “[Install an MI300X GPU air duct](#)” on [page 98](#).
2. Reinstall all the rear fan control board assemblies. See “[Install a rear fan control board assembly](#)” on [page 89](#).
3. Reinstall the power complex. See “[Install the power complex](#)” on [page 194](#).
4. Reinstall the cable cover. See “[Install the cable cover](#)” on [page 74](#).
5. Reinstall the 8U GPU shuttle. See “[Install the 8U GPU shuttle](#)” on [page 71](#).
6. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See “[Install a 2.5-inch hot-swap drive](#)” on [page 60](#).
7. Reinstall all the front fans. See “[Install a hot-swap fan \(front and rear\)](#)” on [page 81](#).
8. Reinstall all the power supply units. See “[Install a hot-swap power supply unit](#)” on [page 203](#).
9. Complete the parts replacement. See “[Complete the parts replacement](#)” on [page 242](#).

GPU and heat sink module replacement (trained technician only)

Follow instructions in this section to remove or install a GPU and heat sink module.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

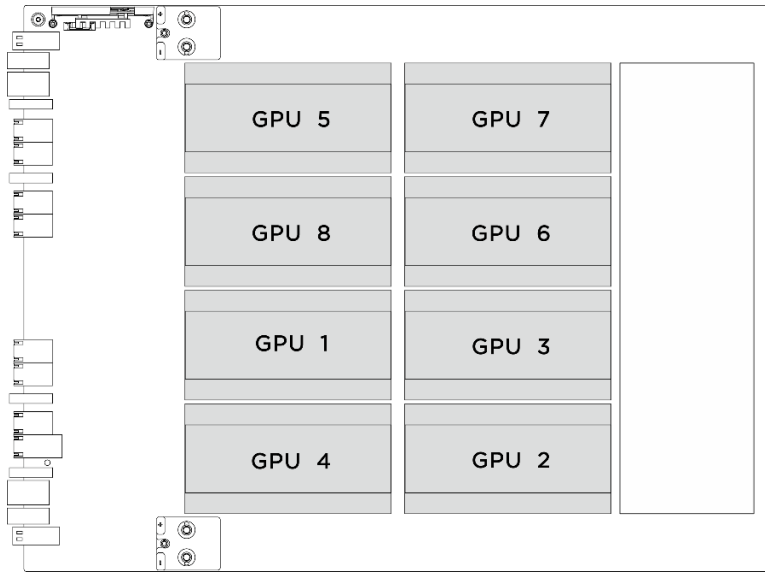
Remove an H100 GPU and heat sink module

Follow instructions in this section to remove an H100 GPU and heat sink module. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on [page 37](#) and “[Safety inspection checklist](#)” on [page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on [page 43](#).
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.
- Make sure to inspect the connectors and sockets on the GPU and the GPU baseboard. Do not use the GPU or the GPU baseboard if its connectors are damaged or missing, or if there are debris in the sockets. Replace the GPU or the GPU baseboard with a new one before continuing the installation procedure.
- GPU and heat sink is one part. Do not remove the heat sink from the GPU.
- The following illustration shows the GPU and heat sink module numbering and corresponding slot numbering in XCC.



GPU and heat sink module numbering	Slot numbering in XCC
GPU 1	Slot 21
GPU 2	Slot 24
GPU 3	Slot 22
GPU 4	Slot 23
GPU 5	Slot 17
GPU 6	Slot 20
GPU 7	Slot 18
GPU 8	Slot 19

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Torque screwdriver which can be set to 0.6 newton-meters, 5.3 inch-pounds
- Torx T15 extended bit (6-inch long)

Procedure

Step 1. Make preparation for this task.

- Remove all the power supply units. See [“Remove a hot-swap power supply unit” on page 201.](#)
- Remove all the front fans. See [“Remove a hot-swap fan \(front and rear\)” on page 79.](#)
- Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See [“Remove a 2.5-inch hot-swap drive” on page 58.](#)

- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See [“Remove the 8U GPU shuttle” on page 69](#).
- e. Remove the power complex. See [“Remove the power complex” on page 192](#).
- f. (GPU and heat sink module 2, 4, 5, and 7 only) Remove the GPU air duct. See [“Remove an H100 GPU air duct” on page 94](#).

Step 2. Remove the plastic cover from the GPU and heat sink module.

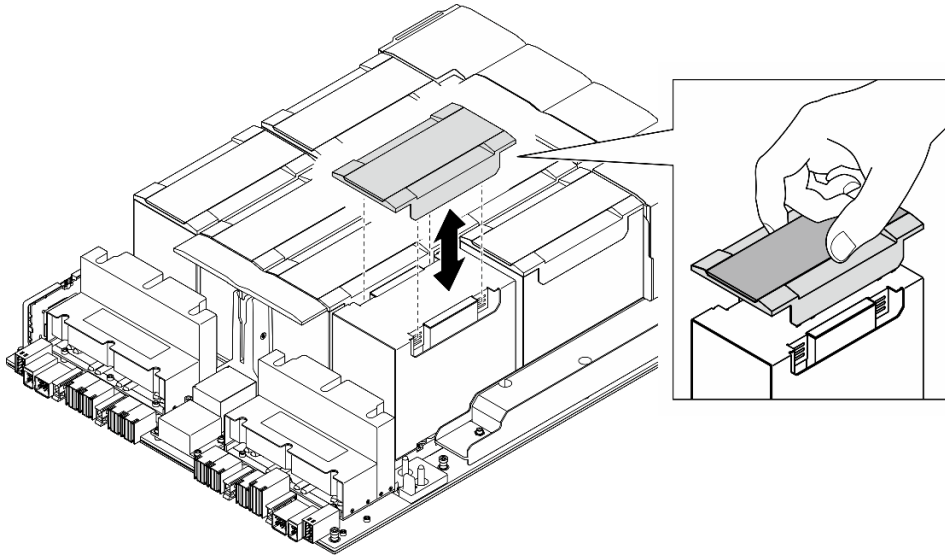


Figure 104. Plastic cover removal

Step 3. Remove the GPU and heat sink module.

- a. ①②③④ Unfasten the four Torx T15 screws in the sequence shown in the illustration below.

Notes:

- Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 0.6 newton-meters, 5.3 inch-pounds.
 - A flashlight helps to locate the screws.
- b. ⑤ Use both hands to lift the GPU and heat sink module out of the GPU baseboard.

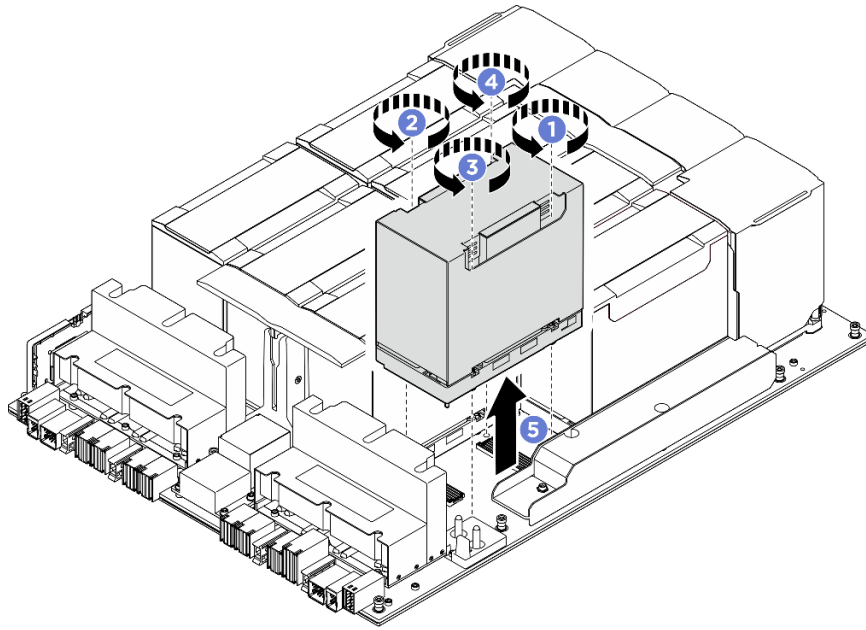


Figure 105. GPU and heat sink module removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

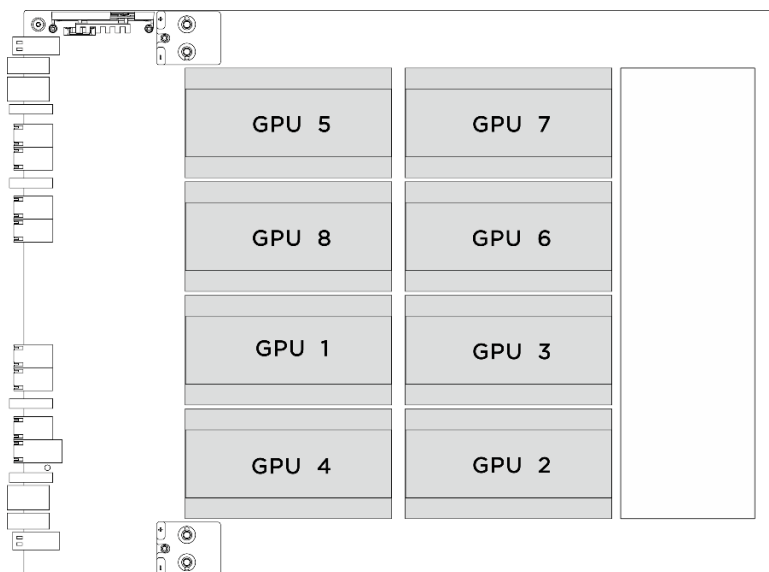
Install an H100 GPU and heat sink module

Follow instructions in this section to install an H100 GPU and heat sink module. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.
- Make sure to inspect the connectors and sockets on the GPU and the GPU baseboard. Do not use the GPU or the GPU baseboard if its connectors are damaged or missing, or if there are debris in the sockets. Replace the GPU or the GPU baseboard with a new one before continuing the installation procedure.
- GPU and heat sink is one part. Do not remove the heat sink from the GPU.
- The following illustration shows the GPU and heat sink module numbering and corresponding slot numbering in XCC.



GPU and heat sink module numbering	Slot numbering in XCC
GPU 1	Slot 21
GPU 2	Slot 24
GPU 3	Slot 22
GPU 4	Slot 23
GPU 5	Slot 17
GPU 6	Slot 20
GPU 7	Slot 18
GPU 8	Slot 19

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Torque screwdriver which can be set to 0.6 newton-meters, 5.3 inch-pounds
- Torx T15 extended bit (6-inch long)

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 271 for more information on firmware updating tools.

Procedure

Step 1. (Optional) Remove the following components from the new GPU and heat sink module.

- Connector covers on the bottom
- Protective film
- Plastic cover

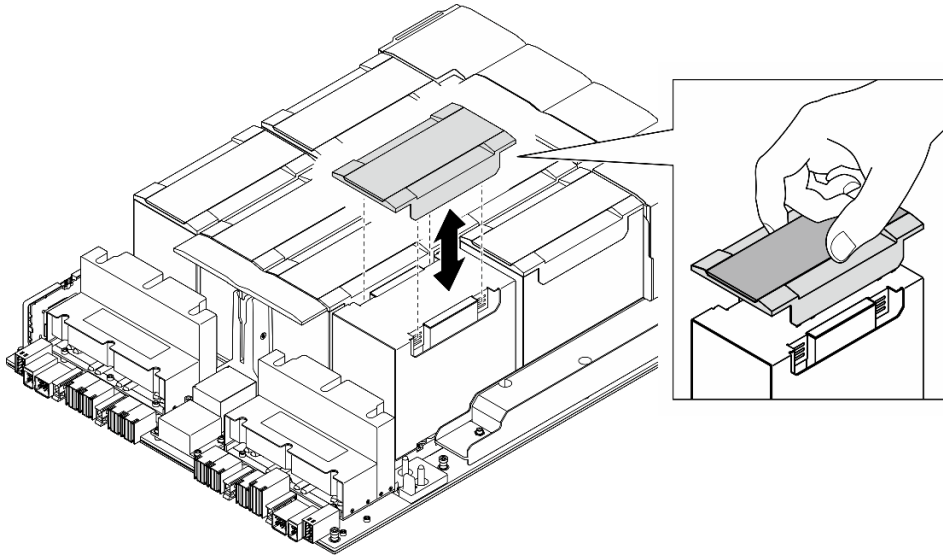


Figure 106. Plastic cover removal

Step 2. Grasp the GPU and heat sink module with both hands; then, align the GPU and heat sink module with the two guide holes on the GPU baseboard and gently place it onto the GPU baseboard.

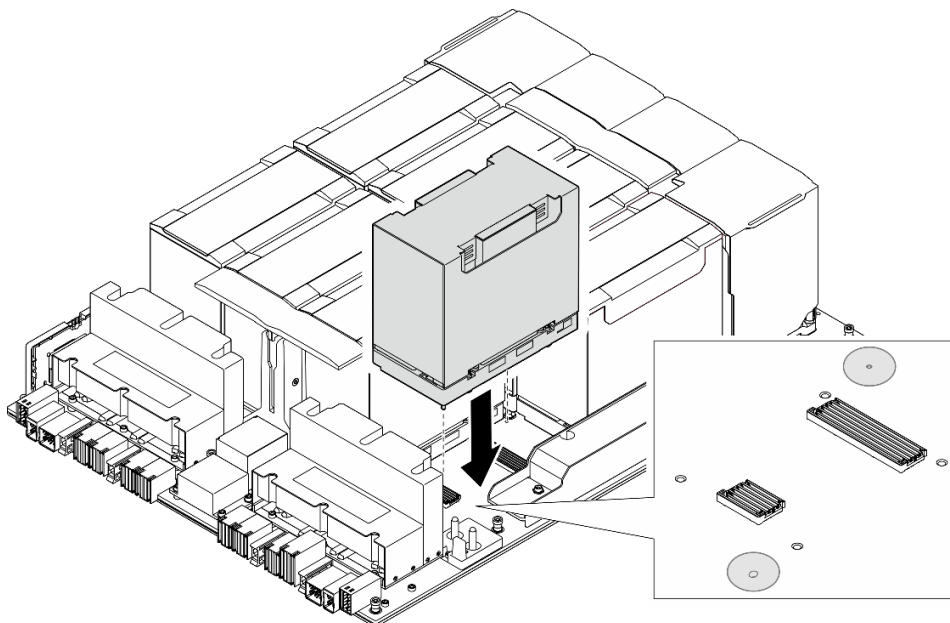


Figure 107. GPU and heat sink module installation

Step 3. ①②③④ Follow the sequence shown in the illustration below to fasten the four Torx T15 screws to secure the GPU and heat sink module.

Notes:

- Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 0.6 newton-meters, 5.3 inch-pounds.
- A flashlight helps to locate the screw holes.

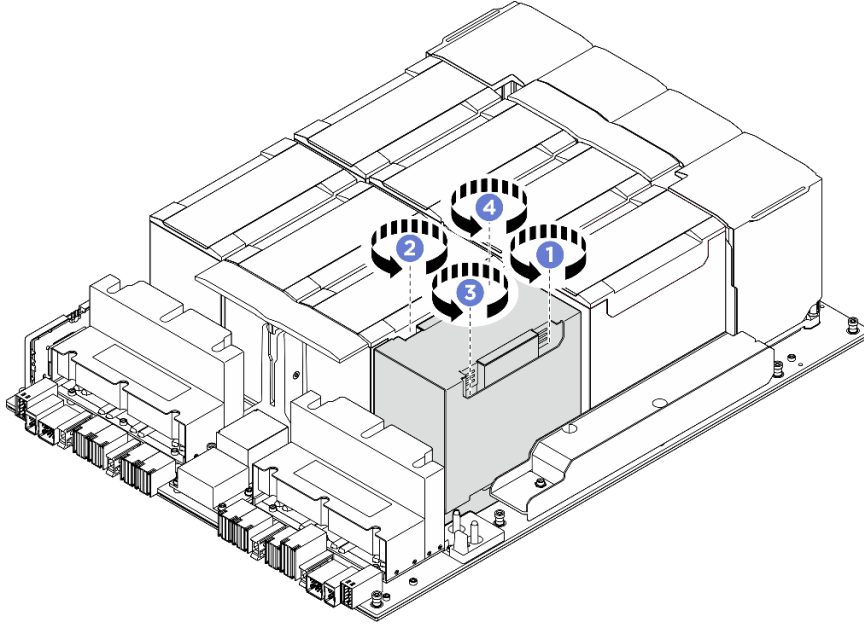


Figure 108. Screw tightening sequence

Step 4. Place the plastic cover onto the GPU and heat sink module until it is securely seated.

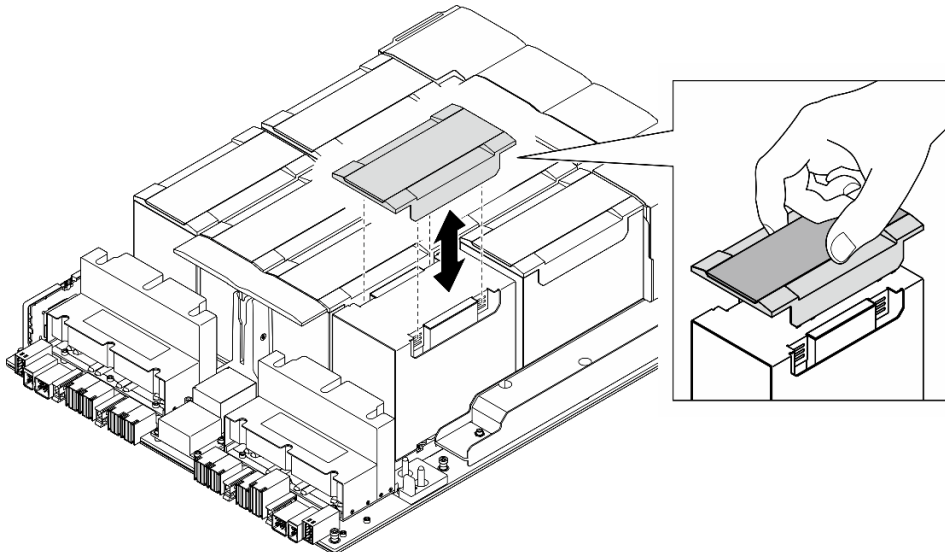


Figure 109. Plastic cover installation

After you finish

1. (GPU and heat sink module 2, 4, 5, and 7 only) Reinstall the GPU air duct. See “[Install an H100 GPU air duct](#)” on page 95.
2. Reinstall the power complex. See “[Install the power complex](#)” on page 194.
3. Reinstall the 8U GPU shuttle. See “[Install the 8U GPU shuttle](#)” on page 71.
4. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See “[Install a 2.5-inch hot-swap drive](#)” on page 60
5. Reinstall all the front fans. See “[Install a hot-swap fan \(front and rear\)](#)” on page 81.
6. Reinstall all the power supply units. See “[Install a hot-swap power supply unit](#)” on page 203.
7. Complete the parts replacement. See “[Complete the parts replacement](#)” on page 242.

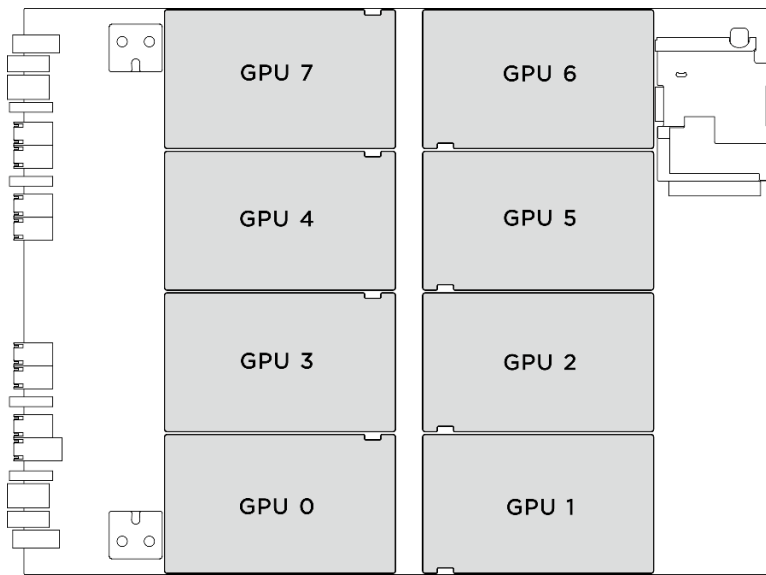
Remove an MI300X GPU and heat sink module

Follow instructions in this section to remove an MI300X GPU and heat sink module. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.
- Make sure to inspect the connectors and sockets on the GPU and the GPU baseboard. Do not use the GPU or the GPU baseboard if its connectors are damaged or missing, or if there are debris in the sockets. Replace the GPU or the GPU baseboard with a new one before continuing the installation procedure.
- GPU and heat sink is one part. Do not remove the heat sink from the GPU.
- The following illustration shows the GPU and heat sink module numbering and corresponding slot numbering in XCC.



GPU and heat sink module numbering	Slot numbering in XCC
GPU 0	Slot 23
GPU 1	Slot 24
GPU 2	Slot 22
GPU 3	Slot 21
GPU 4	Slot 19
GPU 5	Slot 20
GPU 6	Slot 18
GPU 7	Slot 17

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Torque screwdriver which can be set to 1.53 newton-meters, 13.5 inch-pounds
- Torx T15 extended bit (6-inch long)

Procedure

Step 1. Make preparation for this task.

- Remove all the power supply units. See [“Remove a hot-swap power supply unit” on page 201.](#)
- Remove all the front fans. See [“Remove a hot-swap fan \(front and rear\)” on page 79.](#)

- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See [“Remove a 2.5-inch hot-swap drive” on page 58.](#)
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See [“Remove the 8U GPU shuttle” on page 69.](#)
- e. Remove the power complex. See [“Remove the power complex” on page 192.](#)
- f. (GPU and heat sink module 0, 1, 6, and 7 only) Remove the GPU air duct. See [“Remove an MI300X GPU air duct” on page 96.](#)

Step 2. Remove the GPU and heat sink module.

- a. ① Unfasten the four screws **in the removal sequence** shown on the heat-sink label.

Note: Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 1.53 newton-meters, 13.5 inch-pounds.

- b. ② Hold the handle (1) on the GPU and heat sink module; then, lift the GPU and heat sink module out of the GPU baseboard.

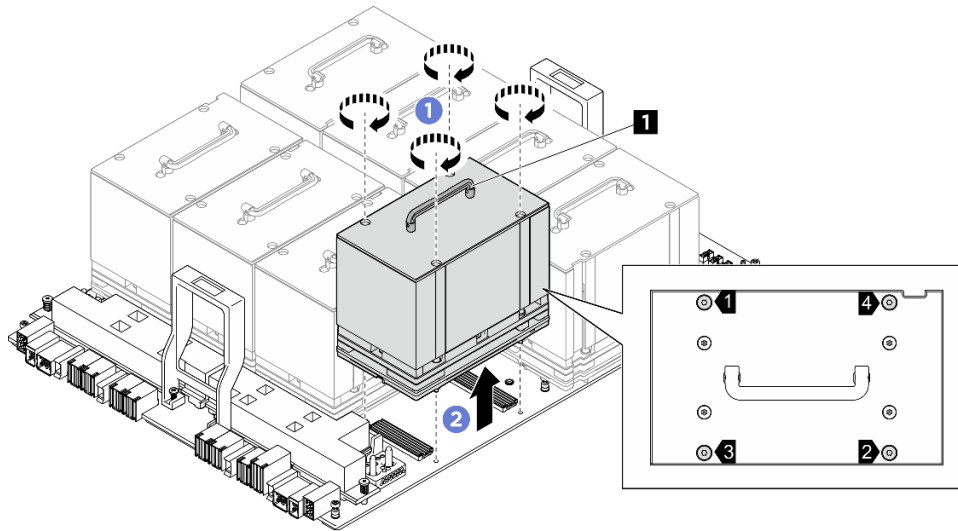


Figure 110. GPU and heat sink module removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install an MI300X GPU and heat sink module

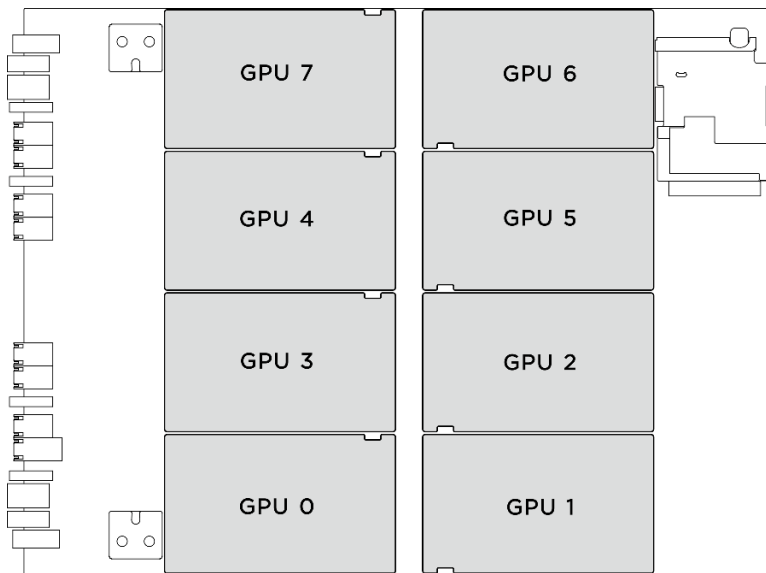
Follow instructions in this section to install an MI300X GPU and heat sink module. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.

- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.
- Make sure to inspect the connectors and sockets on the GPU and the GPU baseboard. Do not use the GPU or the GPU baseboard if its connectors are damaged or missing, or if there are debris in the sockets. Replace the GPU or the GPU baseboard with a new one before continuing the installation procedure.
- GPU and heat sink is one part. Do not remove the heat sink from the GPU.
- The following illustration shows the GPU and heat sink module numbering and corresponding slot numbering in XCC.



GPU and heat sink module numbering	Slot numbering in XCC
GPU 0	Slot 23
GPU 1	Slot 24
GPU 2	Slot 22
GPU 3	Slot 21
GPU 4	Slot 19
GPU 5	Slot 20

GPU and heat sink module numbering	Slot numbering in XCC
GPU 6	Slot 18
GPU 7	Slot 17

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Torque screwdriver which can be set to 1.53 newton-meters, 13.5 inch-pounds
- Torx T15 extended bit (6-inch long)

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “[Update the firmware](#)” on page 271 for more information on firmware updating tools.

Procedure

Step 1. ① Hold the handle (1) on the GPU and heat sink module; then, align the GPU and heat sink module with the two guide holes on the GPU baseboard, and gently place it onto the GPU baseboard.

Step 2. ② Follow the sequence (screw 4 → screw 3 → screw 2 → screw 1) to fasten the four screws to secure the GPU and heat sink module.

Note: Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 1.53 newton-meters, 13.5 inch-pounds.

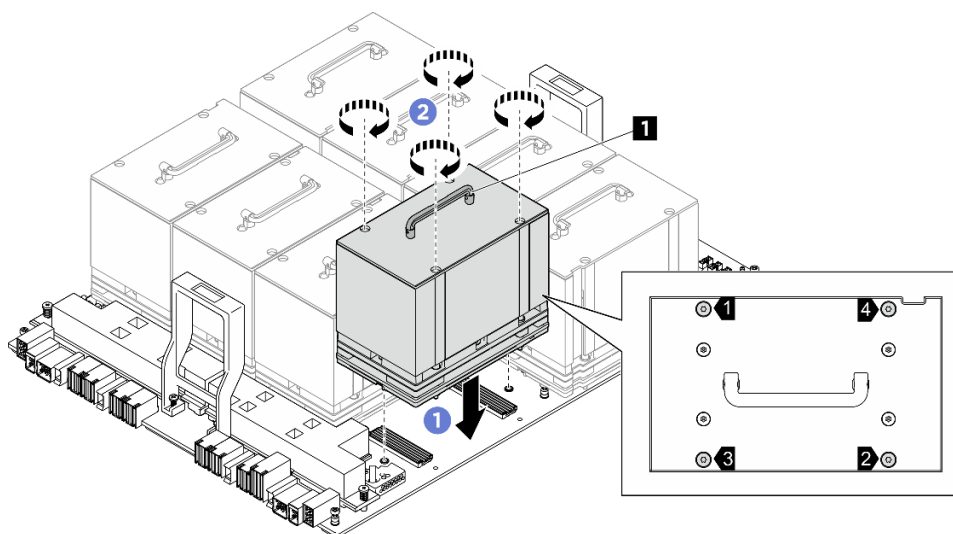


Figure 111. GPU and heat sink module installation

After you finish

1. (GPU and heat sink module 0, 1, 6, and 7 only) Reinstall the GPU air duct. See “[Install an MI300X GPU air duct](#)” on page 98.

2. Reinstall the power complex. See “[Install the power complex](#)” on page 194.
3. Reinstall the 8U GPU shuttle. See “[Install the 8U GPU shuttle](#)” on page 71.
4. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See “[Install a 2.5-inch hot-swap drive](#)” on page 60
5. Reinstall all the front fans. See “[Install a hot-swap fan \(front and rear\)](#)” on page 81.
6. Reinstall all the power supply units. See “[Install a hot-swap power supply unit](#)” on page 203.
7. Complete the parts replacement. See “[Complete the parts replacement](#)” on page 242.

HMC card replacement (trained technician only)

Follow instructions in this section to remove or install the HMC card.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install it without proper training and qualification.

Remove the HMC card

Follow instructions in this section to remove the HMC card. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

- Step 1. Make preparation for this task.
 - a. Remove all the power supply units. See “[Remove a hot-swap power supply unit](#)” on page 201.
 - b. Remove all the front fans. See “[Remove a hot-swap fan \(front and rear\)](#)” on page 79.
 - c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “[Remove a 2.5-inch hot-swap drive](#)” on page 58.
 - d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “[Remove the 8U GPU shuttle](#)” on page 69.
 - e. Remove the power complex. See “[Remove the power complex](#)” on page 192.
- Step 2. Unfasten the two screws to remove the HMC card from the GPU baseboard.

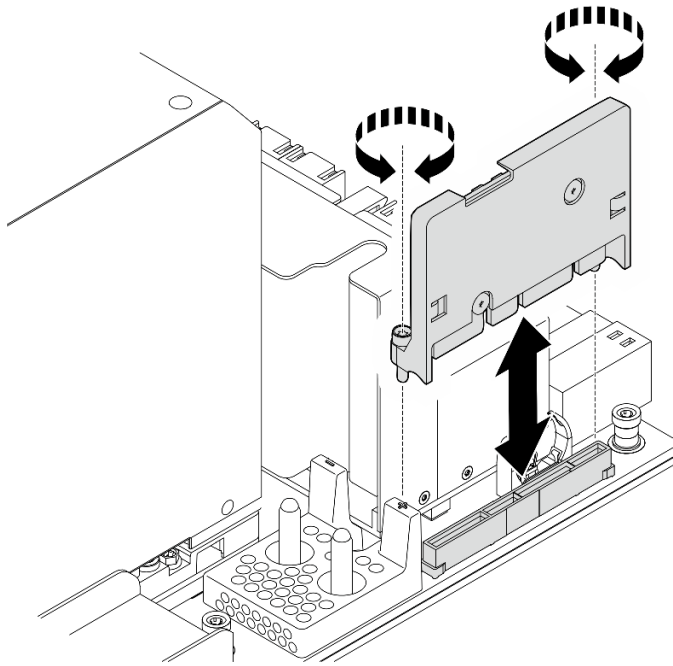


Figure 112. HMC card removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the HMC card

Follow instructions in this section to install the HMC card. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “[Update the firmware](#)” on page 271 for more information on firmware updating tools.

Procedure

- Step 1. Align the HMC card with its connector on the GPU baseboard; then, press the HMC card into the connector until it is fully seated.
- Step 2. Fasten the two screws to secure the HMC card.

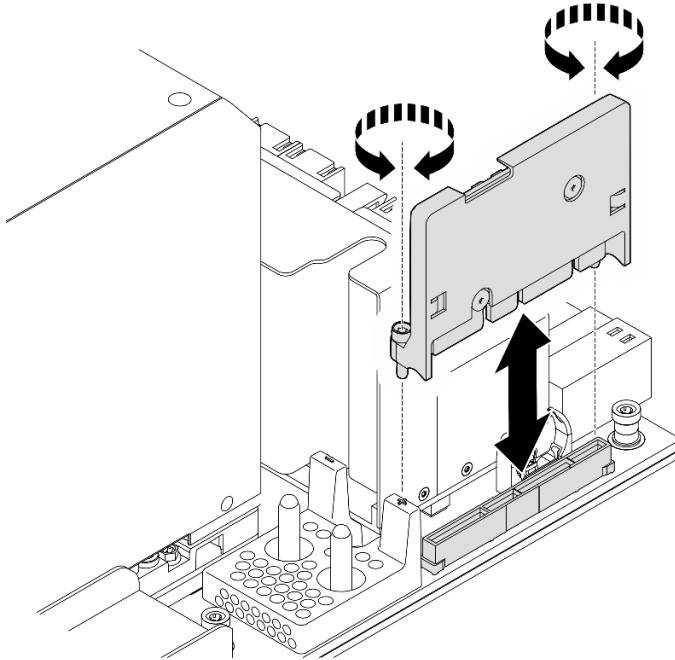


Figure 113. HMC card installation

After you finish

1. Reinstall the power complex. See [“Install the power complex” on page 194](#).
2. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle” on page 71](#).
3. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive” on page 60](#)
4. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
5. Reinstall all the power supply units. See [“Install a hot-swap power supply unit” on page 203](#).
6. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

Integrated diagnostics panel replacement

Follow instructions in this section to remove or install the integrated diagnostics panel.

Remove the integrated diagnostics panel

Follow instructions in this section to remove the integrated diagnostics panel.

About this task

Attention: Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.

Procedure

Step 1. Remove the front fans 4 and 5. See [“Remove a hot-swap fan \(front and rear\)”](#) on page 79.

Step 2. Remove the integrated diagnostics panel.

- a. ① Press and hold on the two release tabs.
- b. ② Slightly disengage the integrated diagnostics panel from the 8U GPU shuttle.
- c. ③ Disconnect the cable from the integrated diagnostics panel.

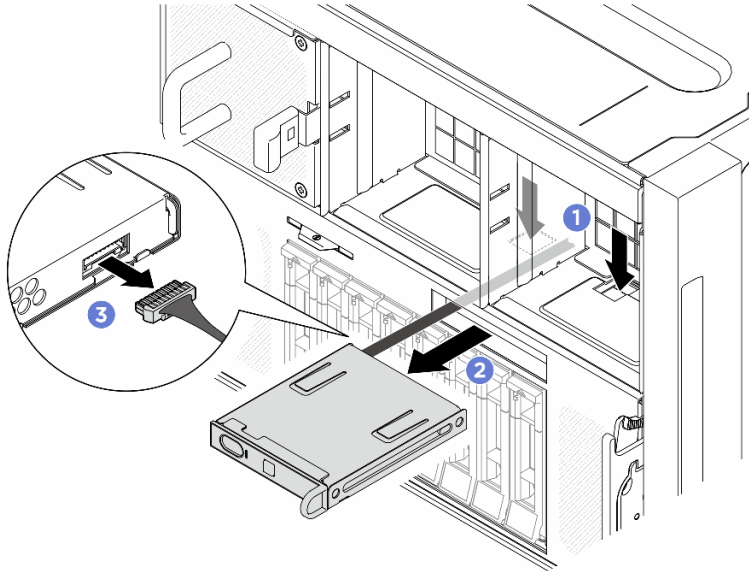


Figure 114. Integrated diagnostics panel removal

Step 3. Remove the integrated diagnostics panel from the 8U GPU shuttle.

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the integrated diagnostics panel

Follow instructions in this section to install the integrated diagnostics panel.

About this task

Attention:

- Read [“Installation Guidelines”](#) on page 37 and [“Safety inspection checklist”](#) on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. ① Connect the cable to the integrated diagnostics panel.

Step 2. ② Align the integrated diagnostics panel with the slot in the front of the 8U GPU shuttle, and slide it in.

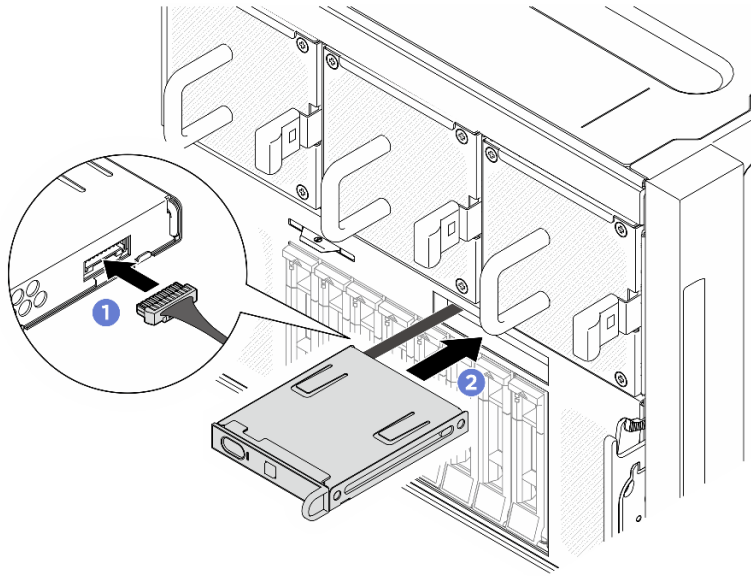


Figure 115. Integrated diagnostics panel installation

After you finish

1. If necessary, reinstall the front fans. See “Install a hot-swap fan (front and rear)” on page 81.
2. Complete the parts replacement. See “Complete the parts replacement” on page 242.

I/O cover replacement (trained technician only)

Follow instructions in this section to remove and install the I/O cover.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the I/O cover

Follow instructions in this section to remove the I/O cover. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “Installation Guidelines” on page 37 and “Safety inspection checklist” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See [“Remove a hot-swap power supply unit” on page 201.](#)
- b. Remove all the front fans. See [“Remove a hot-swap fan \(front and rear\)” on page 79.](#)
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See [“Remove a 2.5-inch hot-swap drive” on page 58.](#)
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See [“Remove the 8U GPU shuttle” on page 69.](#)
- e. Remove the cable cover. See [“Remove the cable cover” on page 73.](#)

Step 2. Remove the I/O cover.

- a. ❶ Unfasten the six screws marked with **D** on both sides of the 8U GPU shuttle.
- b. ❷ Slide the I/O cover backward, and lift it out of the 8U GPU shuttle.

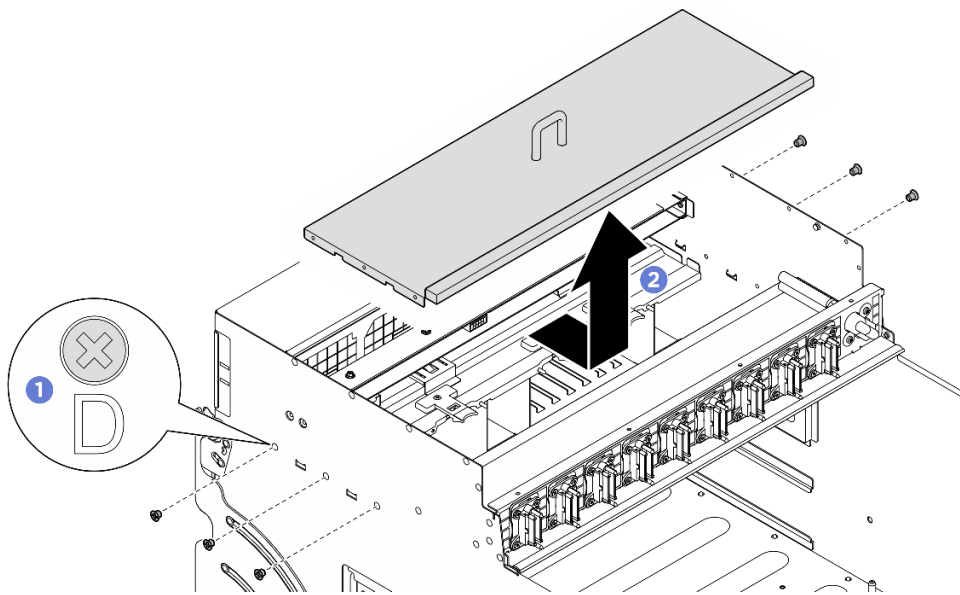


Figure 116. I/O cover removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the I/O cover

Follow instructions in this section to install the I/O cover. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

- Step 1. ① Lower the I/O cover into the 8U GPU shuttle; then, slide the I/O cover forward to align it with the four tabs on the 8U GPU shuttle until it is firmly seated.
- Step 2. ② Locate the six screw holes marked with **D** on both sides of the 8U GPU shuttle; then, fasten the six screws to secure the I/O cover.

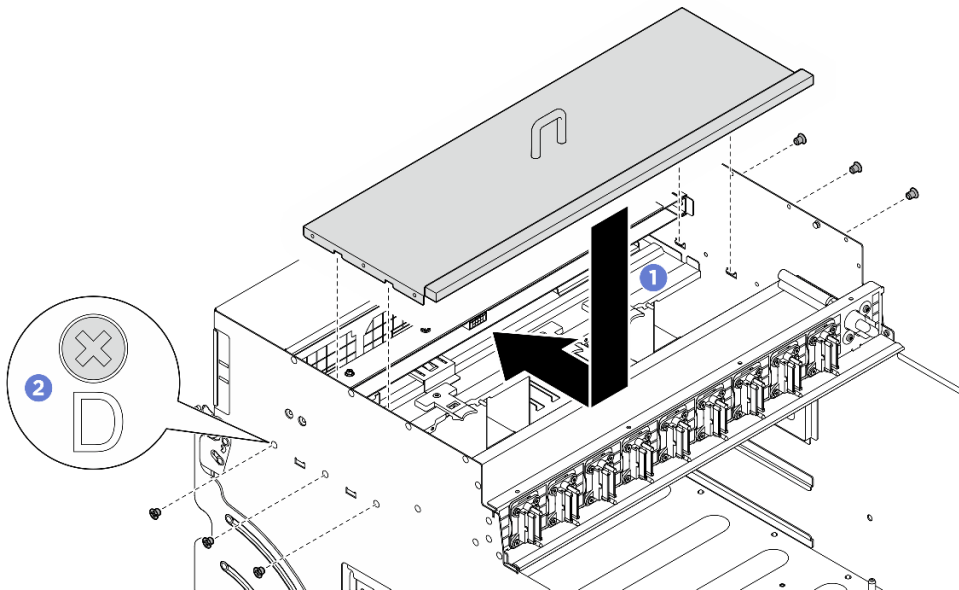


Figure 117. I/O cover installation

After you finish

1. Reinstall the cable cover. See “Install the cable cover” on page 74.
2. Reinstall the 8U GPU shuttle. See “Install the 8U GPU shuttle” on page 71.
3. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See “Install a 2.5-inch hot-swap drive” on page 60
4. Reinstall all the front fans. See “Install a hot-swap fan (front and rear)” on page 81.
5. Reinstall all the power supply units. See “Install a hot-swap power supply unit” on page 203.
6. Complete the parts replacement. See “Complete the parts replacement” on page 242.

M.2 backplane and M.2 drive replacement (trained technician only)

Follow instructions in this section to remove and install the M.2 backplane and an M.2 drive.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove an M.2 drive

Follow instructions in this section to remove an M.2 drive. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- If one or more NVMe solid-state drives are to be removed, it is recommended to disable them beforehand via the operating system.
- Before you remove or make changes to drives, drive controllers (including controllers that are integrated on the system board assembly), drive backplanes or drive cables, back up all important data that is stored on drives.
- Before you remove any component of a RAID array (drive, RAID card, etc.), back up all RAID configuration information.

Procedure

Step 1. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67](#).

Step 2. Remove the M.2 drive.

- a. ① Press the retainer from the both sides.
- b. ② Slide the retainer away from the M.2 drive
- c. ③ Rotate the rear end of the M.2 drive to an angle.
- d. ④ Remove the M.2 drive from the M.2 backplane.

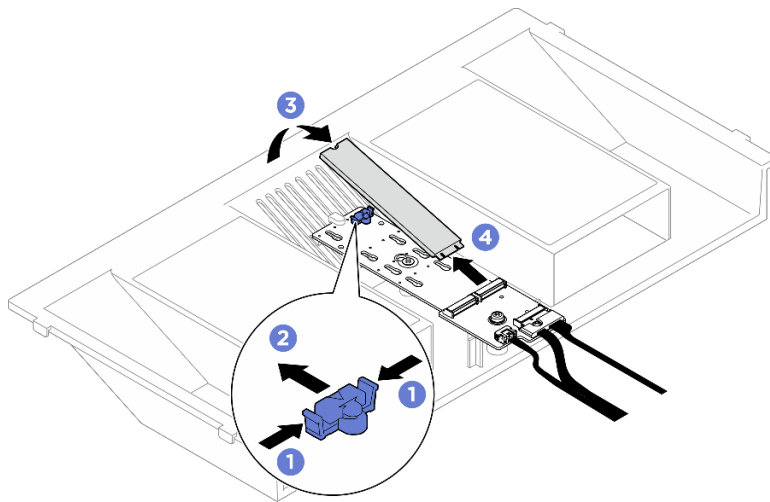


Figure 118. M.2 drive removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Remove the M.2 backplane

Follow instructions in this section to remove the M.2 backplane. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- If one or more NVMe solid-state drives are to be removed, it is recommended to disable them beforehand via the operating system.
- Before you remove or make changes to drives, drive controllers (including controllers that are integrated on the system board assembly), drive backplanes or drive cables, back up all important data that is stored on drives.
- Before you remove any component of a RAID array (drive, RAID card, etc.), back up all RAID configuration information.

Procedure

Step 1. Make preparation for this task.

- a. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67](#).
- b. Remove the M.2 drives. See [“Remove an M.2 drive” on page 146](#).

Step 2. Disconnect the M.2 backplane cables from the system board assembly.

Step 3. Remove the M.2 backplane.

- a. ① Unfasten the screw that secures the end of the M.2 backplane to the processor air baffle.
- b. ② Unfasten the screw that secures the middle of the M.2 backplane to the processor air baffle.
- c. ③ Slide the M.2 backplane backward, and lift it out of the processor air baffle.

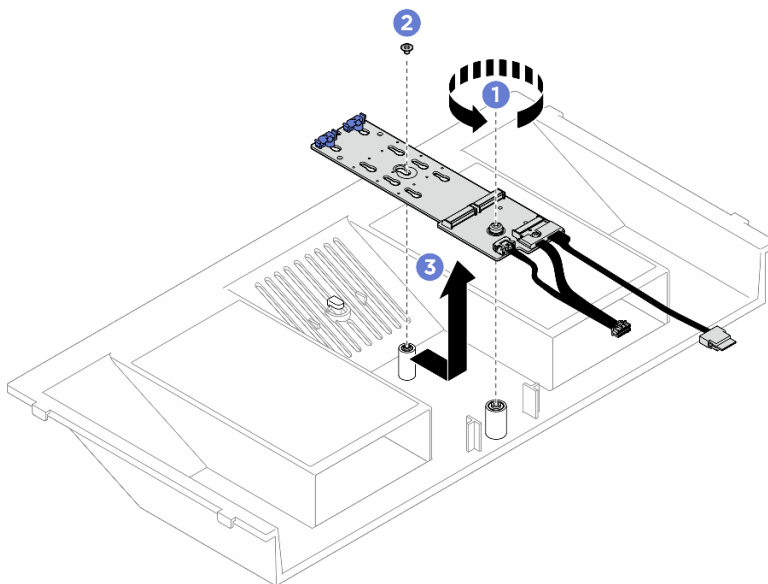


Figure 119. M.2 backplane removal

- Step 4. If needed, disconnect the M.2 backplane cables from the M.2 backplane.
- 1 Loosen the screw on the signal cable.
 - 2 Tilt the connector and remove it as the spring underneath releases.
 - 3 Remove the power cable.

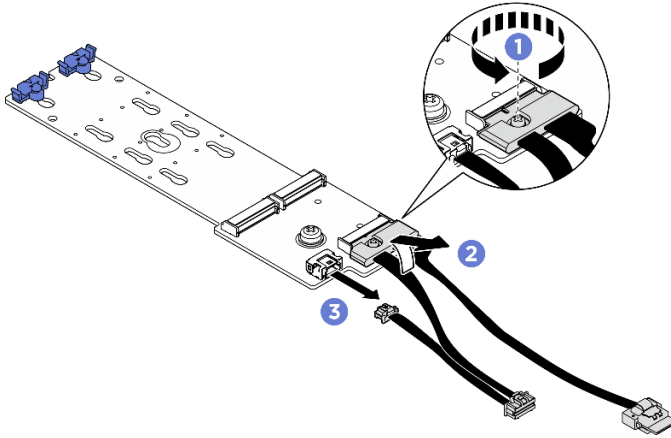


Figure 120. M.2 backplane cable disconnection

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the M.2 backplane

Follow instructions in this section to install the M.2 backplane. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “[Update the firmware](#)” on page 271 for more information on firmware updating tools.

Procedure

- Step 1. If needed, connect the M.2 backplane cables to the M.2 backplane.
- 1 Tilt the connector at an angle of 20 degrees or lower, and insert it until its bottom surface reaches the ramp.
 - 2 Press the connector down flat.

- c. ③ Tighten the screw on the signal cable.
- d. ④ Connect the power cable.

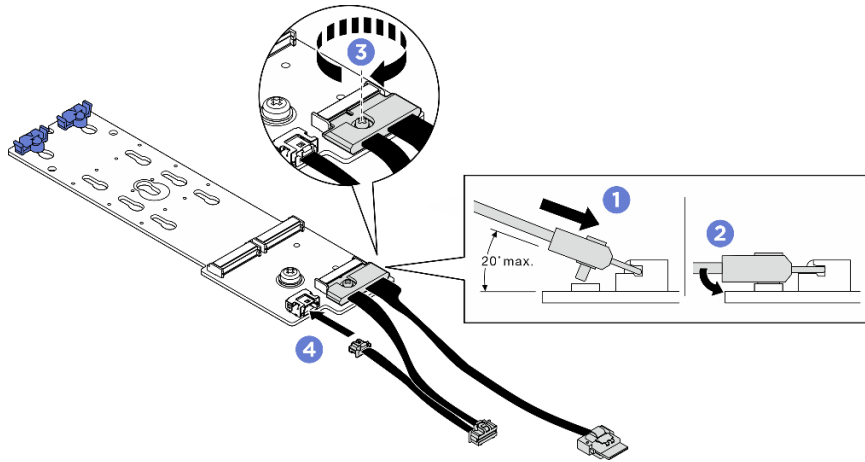


Figure 121. M.2 backplane cable connection

Step 2. Install the M.2 backplane.

- a. ① Lower the M.2 backplane into the processor air baffle; then, slide the M.2 backplane forward until it is seated in place.
- b. ② Fasten the screw that secures the end of the M.2 backplane to the processor air baffle.
- c. ③ Fasten the screw that secures the middle of the M.2 backplane to the processor air baffle.

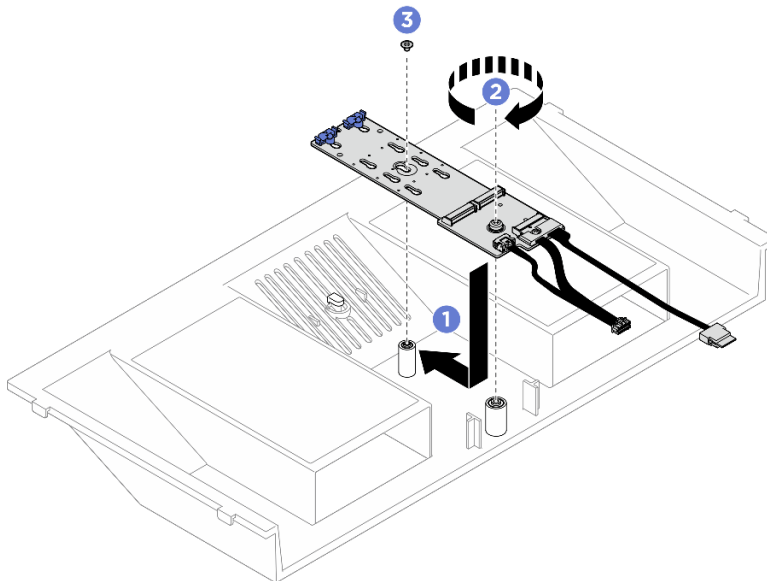


Figure 122. M.2 backplane installation

Step 3. Connect the M.2 backplane cables to the system board assembly.

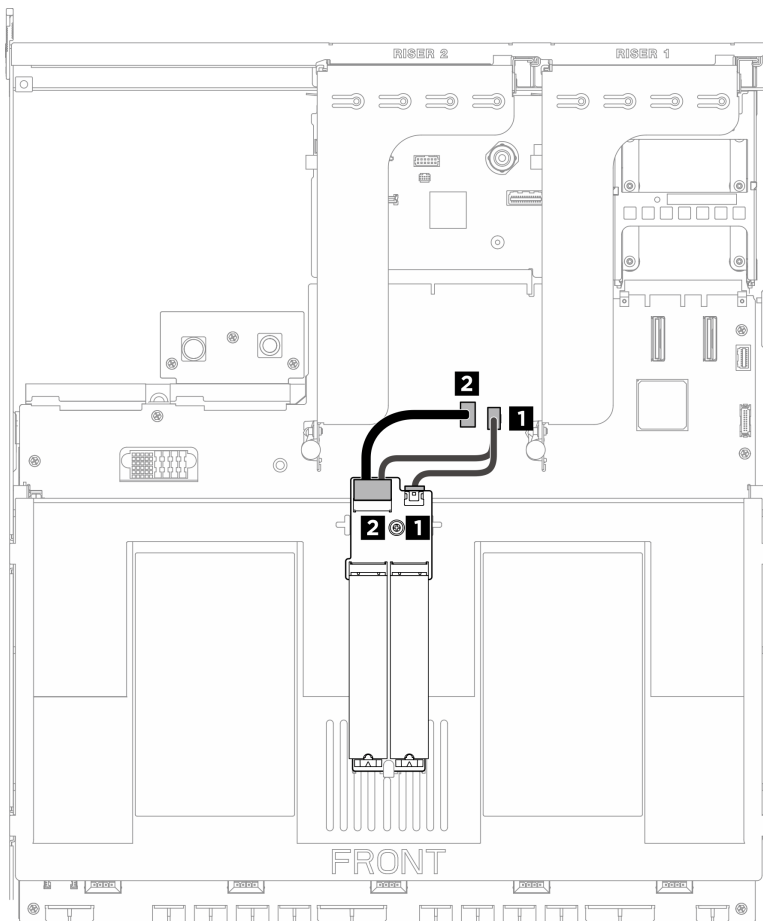


Figure 123. M.2 backplane cable connection

Cable	From	To
1	M.2 backplane: Power connector	System board assembly: M.2 power connector
2	M.2 backplane: Signal connector	System board assembly: M.2 signal connector

After you finish

1. Reinstall the M.2 drives. See [“Install an M.2 drive” on page 151.](#)
2. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle” on page 68.](#)
3. Complete the parts replacement. See [“Complete the parts replacement” on page 242.](#)

Adjust a retainer on the M.2 backplane

Use this information to adjust a retainer on the M.2 backplane. The procedure must be executed by a trained technician.

Procedure

- Step 1. **1** Press both sides of the retainer.
- Step 2. **2** Move the retainer toward the connector until it is in the large opening of the keyhole.

- Step 3. ③ Take the retainer out of the keyhole; then, insert the retainer into the correct keyhole.
- Step 4. ④ Press both sides of the retainer.
- Step 5. ⑤ Slide the retainer back until the retainer locking nubs are in the holes.

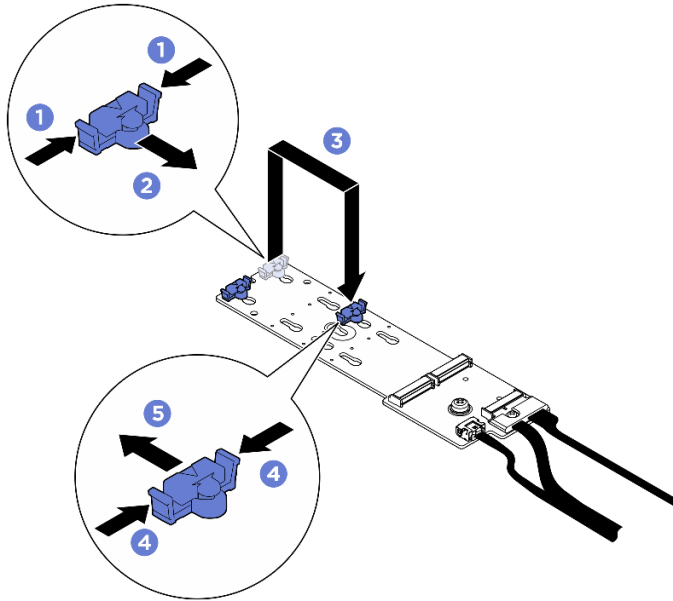


Figure 124. M.2 backplane retainer adjustment

Install an M.2 drive

Follow instructions in this section to install an M.2 drive. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

- Step 1. If necessary, adjust the retainer on the M.2 backplane to accommodate the particular size of the M.2 drive you wish to install. See [“Adjust a retainer on the M.2 backplane” on page 150](#).
- Step 2. Locate the connector on the M.2 backplane.

Notes:

- The M.2 backplane might look different from the illustration.
- Install the M.2 drive in slot 0 first.

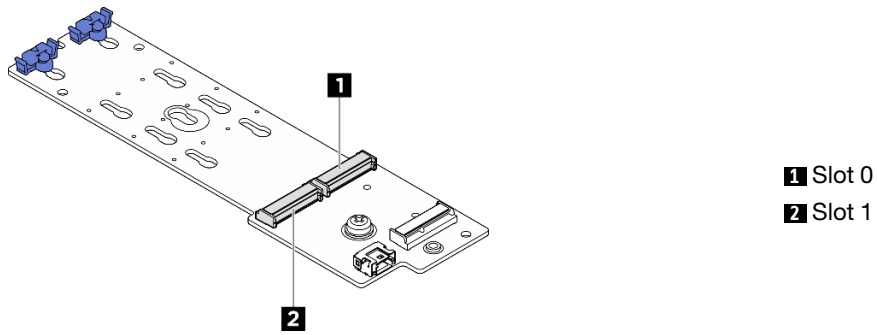


Figure 125. M.2 drive slots

Step 3. Install the M.2 drive.

- a. 1 Hold the M.2 drive at an angle, and insert it into the M.2 slot.
- b. 2 Lower the M.2 drive.
- c. 3 Slide the retainer toward the M.2 drive to secure it in place.

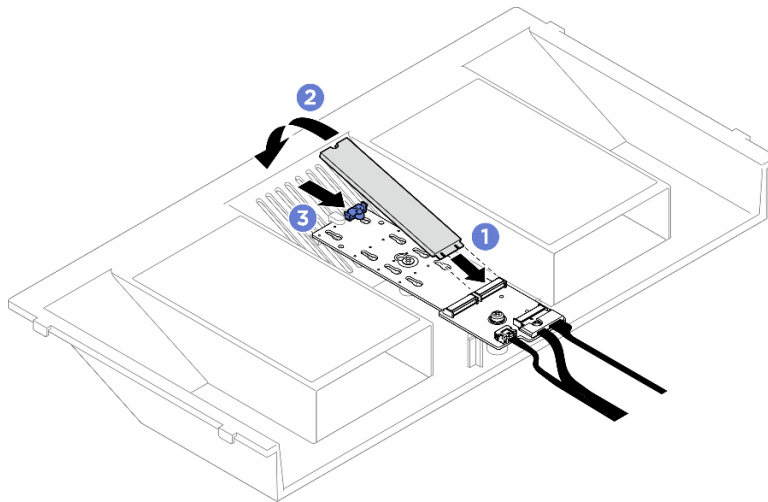


Figure 126. M.2 drive installation

After you finish

1. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle” on page 68.](#)
2. Complete the parts replacement. See [“Complete the parts replacement” on page 242.](#)

Memory module replacement (trained technician only)

Use the following procedures to remove and install a memory module.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove a memory module

Use this information to remove a memory module. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- Make sure to remove or install memory module at least 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.
- If you are not installing a replacement memory module to the same slot, make sure you have memory module filler available.
- Memory modules are sensitive to static discharge and require special handling. Refer to the standard guidelines for [“Handling static-sensitive devices” on page 40](#).
 - Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
 - Never hold two or more memory modules together so that they do not touch each other. Do not stack memory modules directly on top of each other during storage.
 - Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory module connector housing.
 - Handle memory modules with care: never bend, twist, or drop a memory module.
 - Do not use any metal tools (such as jigs or clamps) to handle the memory modules, because the rigid metals may damage the memory modules.
 - Do not insert memory modules while holding packages or passive components, which can cause package cracks or detachment of passive components by the high insertion force.

Important: Remove or install memory modules for one processor at a time.

Procedure

Attention: Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.

Step 1. Make preparation for this task.

- a. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67](#).
- b. Remove the processor air baffle. See [“Remove the processor air baffle” on page 204](#).
- c. Locate the memory module slots and determine which memory module to be removed.

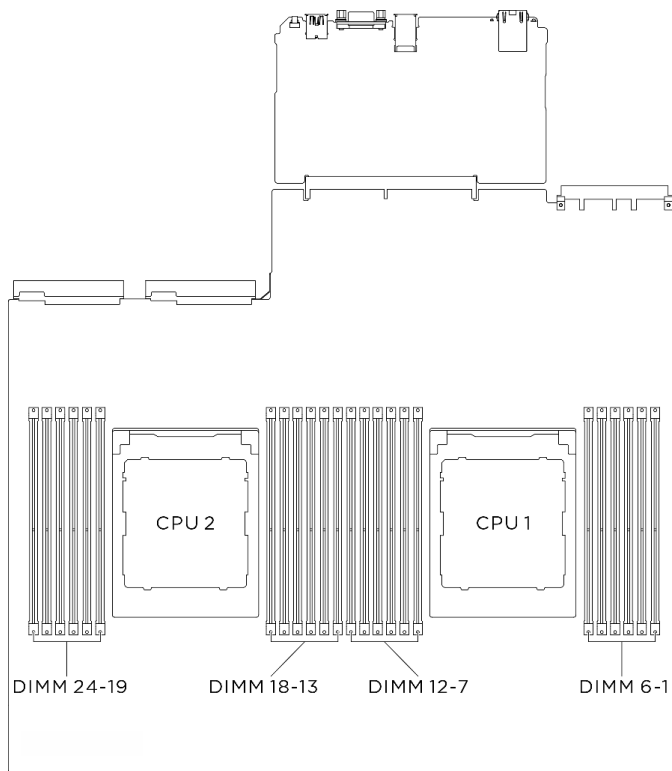


Figure 127. Memory modules and processors layout

Step 2. Remove the memory module from the slot.

Attention: To avoid breaking the retaining clips or damaging the memory module slots, handle the clips gently.

- a. ① Gently open the retaining clip on each end of the memory module slot.
- b. ② Grasp the memory module at both ends and carefully lift it out of the slot.

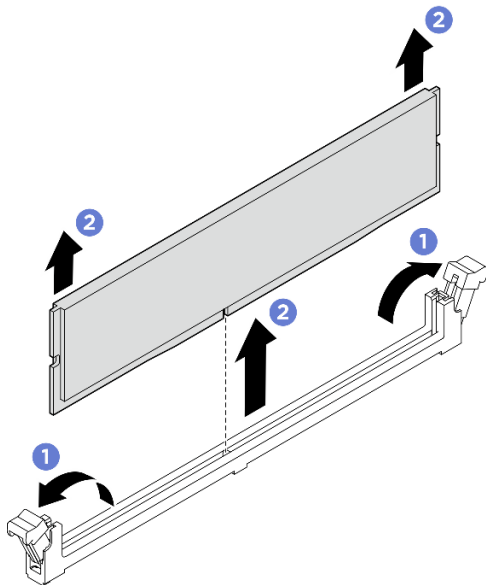


Figure 128. Memory module removal

After you finish

1. A memory module slot must be installed with a memory module or a memory module filler. See [“Install a memory module” on page 155](#).
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a memory module

Follow instructions in this section to install a memory module. The procedure must be executed by a trained technician.

About this task

See [“Memory module installation rules and order” on page 41](#) for detailed information about memory configuration and setup.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Make sure to remove or install memory module at least 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.
- Make sure to adopt one of the supported configurations listed in [“Memory module installation rules and order” on page 41](#).
- Memory modules are sensitive to static discharge and require special handling. Refer to the standard guidelines at [“Handling static-sensitive devices” on page 40](#):
 - Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
 - Never hold two or more memory modules together so that they do not touch each other. Do not stack memory modules directly on top of each other during storage.
 - Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory module connector housing.
 - Handle memory modules with care: never bend, twist, or drop a memory module.
 - Do not use any metal tools (such as jigs or clamps) to handle the memory modules, because the rigid metals may damage the memory modules.
 - Do not insert memory modules while holding packages or passive components, which can cause package cracks or detachment of passive components by the high insertion force.

Important: Remove or install memory modules for one processor at a time.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to [“Update the firmware” on page 271](#) for more information on firmware updating tools.

Procedure

Attention: Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.

Step 1. Locate the required memory module slot on the system board assembly.

Note: Ensure that you observe the installation rules and sequence order in [“Memory module installation rules and order” on page 41.](#)

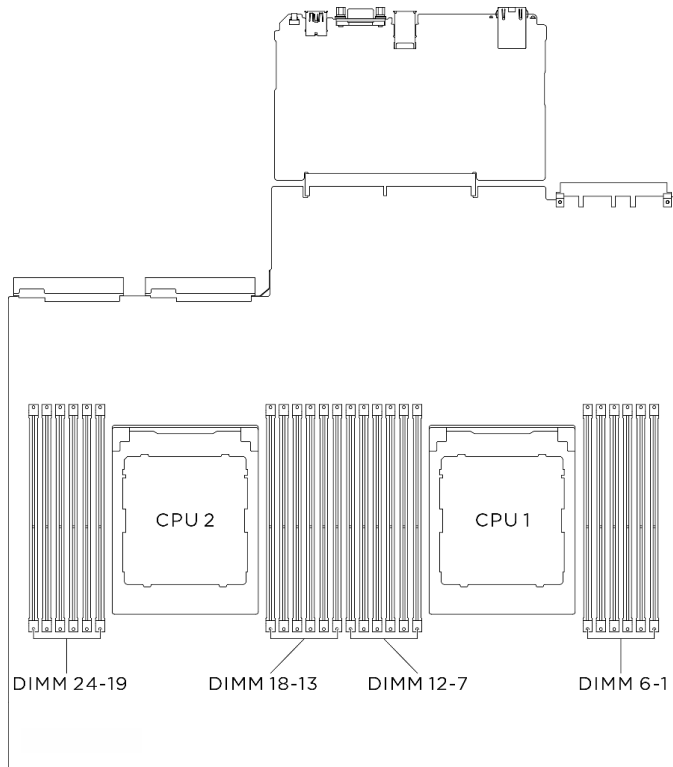


Figure 129. Memory modules and processors layout

Step 2. Install the memory module into the slot.

- a. ① Gently open the retaining clip on each end of the memory module slot.
- b. ② Align the memory module with the slot, and gently place the memory module on the slot with both hands.
- c. ③ Firmly press both ends of the memory module straight down into the slot until the retaining clips snap into the locked position.

Attention:

- To avoid breaking the retaining clips or damaging the memory module slots, open and close the clips gently.
- If there is a gap between the memory module and the retaining clips, the memory module has not been correctly inserted. In this case, open the retaining clips, remove the memory module, and then reinsert it.

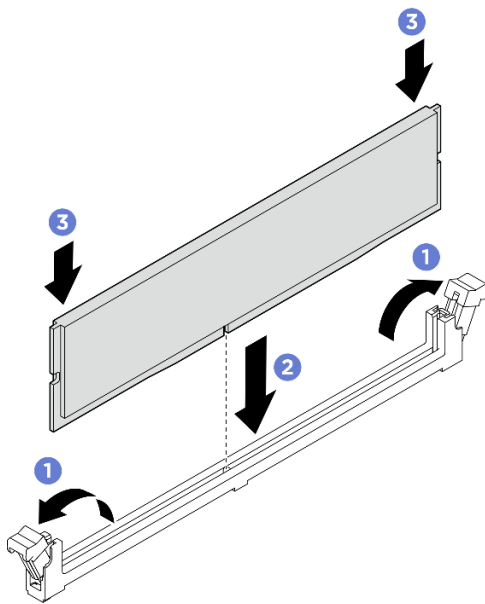


Figure 130. Memory module installation

After you finish

1. Reinstall the processor air baffle. See [“Install the processor air baffle” on page 205](#).
2. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle” on page 68](#).
3. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

MicroSD card replacement (trained technician only)

Follow instructions in this section to remove and install the MicroSD card.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the MicroSD card

Follow instructions in this section to remove the MicroSD card. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).

Procedure

Step 1. Make preparation for this task.

- a. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67](#).
- b. If applicable, remove the PCIe riser assembly 2. See [“Remove a PCIe riser assembly” on page 167](#).

Step 2. Remove the MicroSD card.

- a. ① Slide the socket lid to the open position.
- b. ② Lift open the socket lid.
- c. ③ Remove the MicroSD card from the socket.

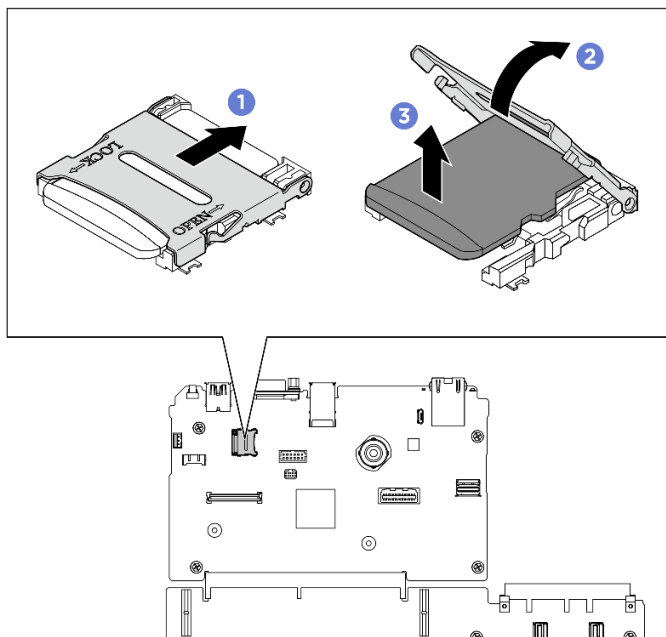


Figure 131. MicroSD card removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the MicroSD card

Follow instructions in this section to install the MicroSD card. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

- Step 1. ① Place the MicroSD card into the socket.
- Step 2. ② Close the socket lid.
- Step 3. ③ Slide the socket lid to the lock position.

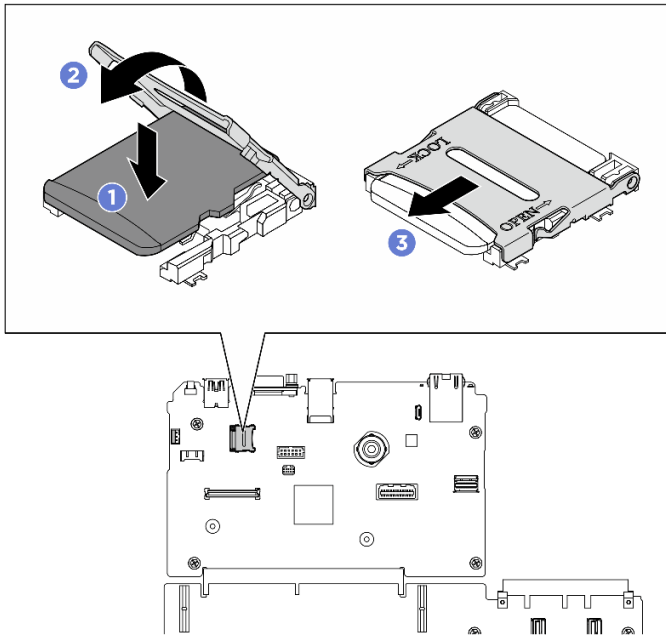


Figure 132. MicroSD card installation

After you finish

1. If applicable, reinstall the PCIe riser assembly 2. See [“Install a PCIe riser assembly” on page 170](#).
2. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle” on page 68](#).
3. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

OCP module replacement

Follow instructions in this section to remove and install the OCP module.

Remove the OCP module

Follow instructions in this section to remove the OCP module.

About this task**Attention:**

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).

Procedure

Step 1. ① Loosen the thumbscrew that secures the OCP module. Use a screwdriver if necessary.

Step 2. ② Grasp the handle and slide the OCP module out.

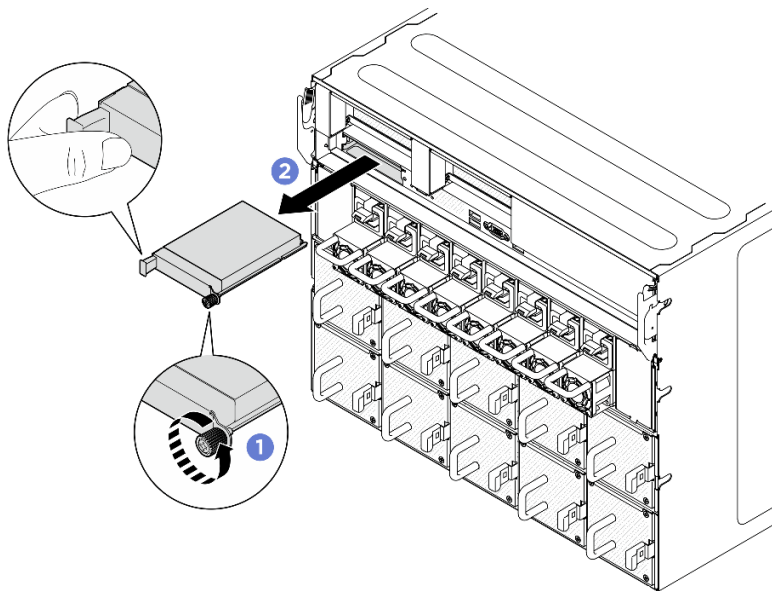


Figure 133. OCP module removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the OCP module

Follow instructions in this section to install the OCP module.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. If the OCP is covered with a OCP filler, remove it.

Step 2. Install the OCP module.

- a. ① Slide the OCP module into the slot until it is fully seated.

- b. ② Tighten the thumbscrew to secure the OCP module. Use a screwdriver if necessary.

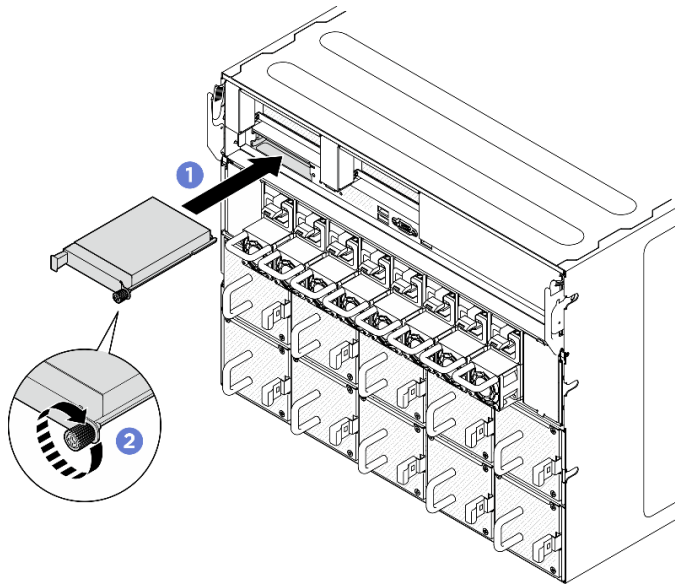


Figure 134. OCP module installation

After you finish

Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

PCIe adapter replacement (trained technician only)

Follow instructions in this section to remove and install a PCIe adapter.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove a front PCIe adapter

Follow instructions in this section to remove a front PCIe adapter. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).

Procedure

Step 1. Disengage the PCIe switch shuttle from the 8U GPU shuttle.

- a. ① Press the two blue release latches.
- b. ② Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.
- c. ③ Pull the PCIe switch shuttle forward until it stops.

Note: Push the two release levers back until they lock into place after pulling out the PCIe switch shuttle to avoid damages.

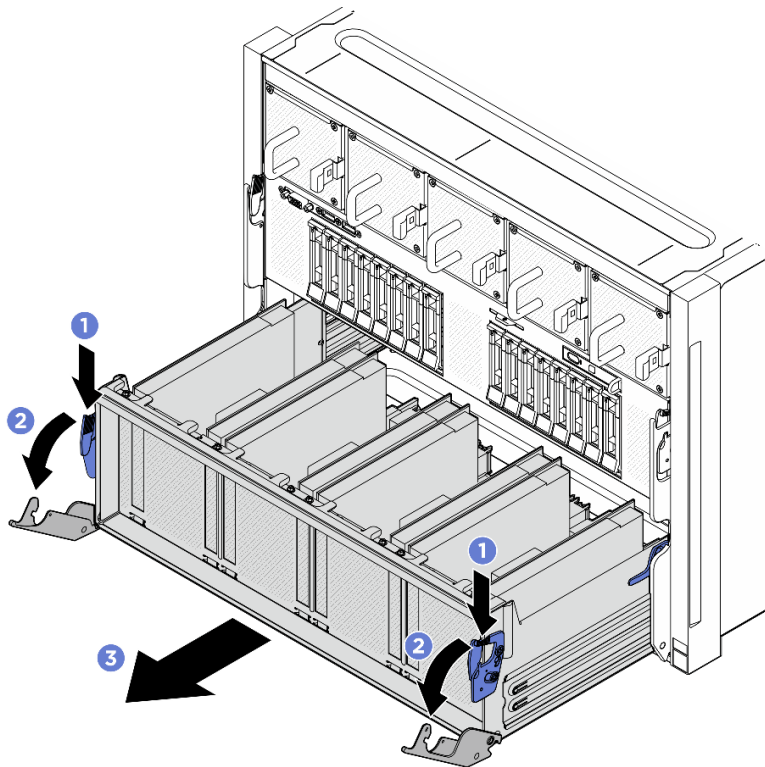


Figure 135. PCIe switch shuttle removal to stop position

Step 2. Unfasten the screw that secures the front PCIe adapter to the PCIe switch shuttle; then, lift the front PCIe adapter out of the PCIe slot.

Note: The PCIe adapter might look different from the illustration.

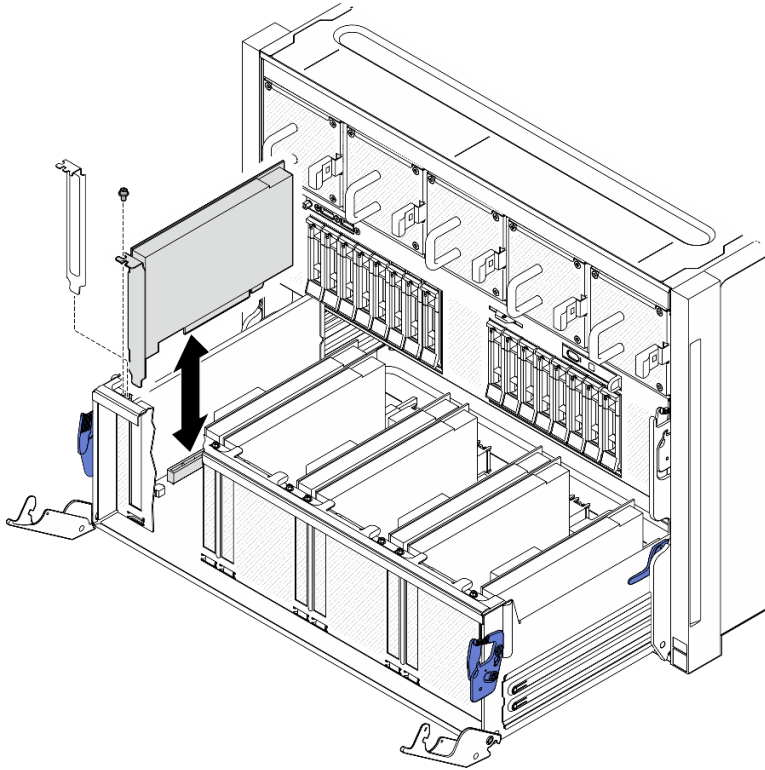


Figure 136. Front PCIe adapter removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a front PCIe adapter

Follow instructions in this section to install a front PCIe adapter. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

- Step 1. Align the front PCIe adapter with the PCIe slot on the PCIe switch board; then, press the front PCIe adapter into the slot until it is fully seated.
- Step 2. Fasten the screw to secure the front PCIe adapter.

Note: The PCIe adapter might look different from the illustration.

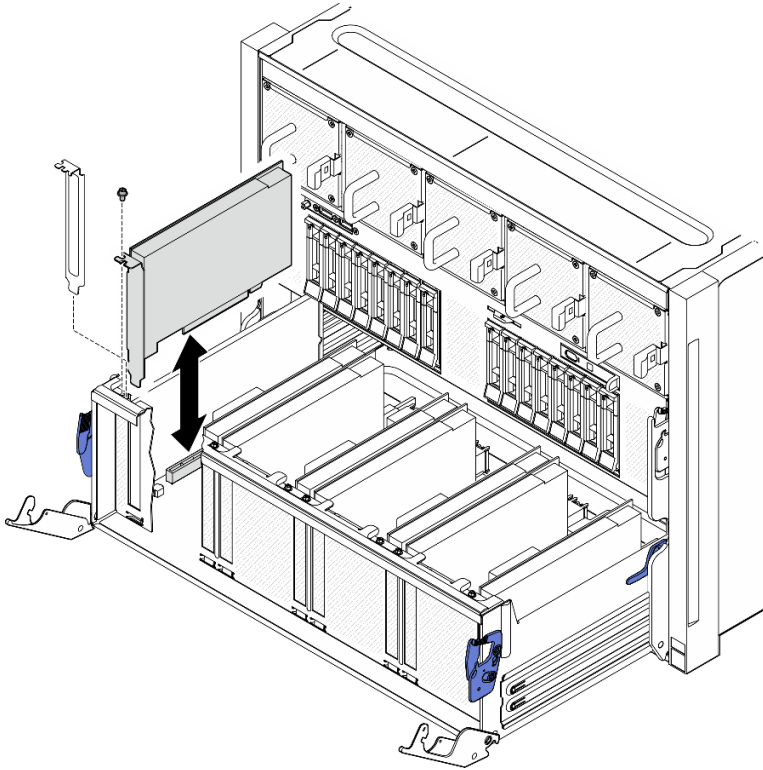


Figure 137. Front PCIe adapter installation

Step 3. Install the PCIe switch shuttle.

- a. ① Press the two lock latches on both sides of the PCIe switch shuttle.
- b. ② Push the PCIe switch shuttle into the 8U GPU shuttle until it stops.
- c. ③ Rotate the two release levers until they lock into place.

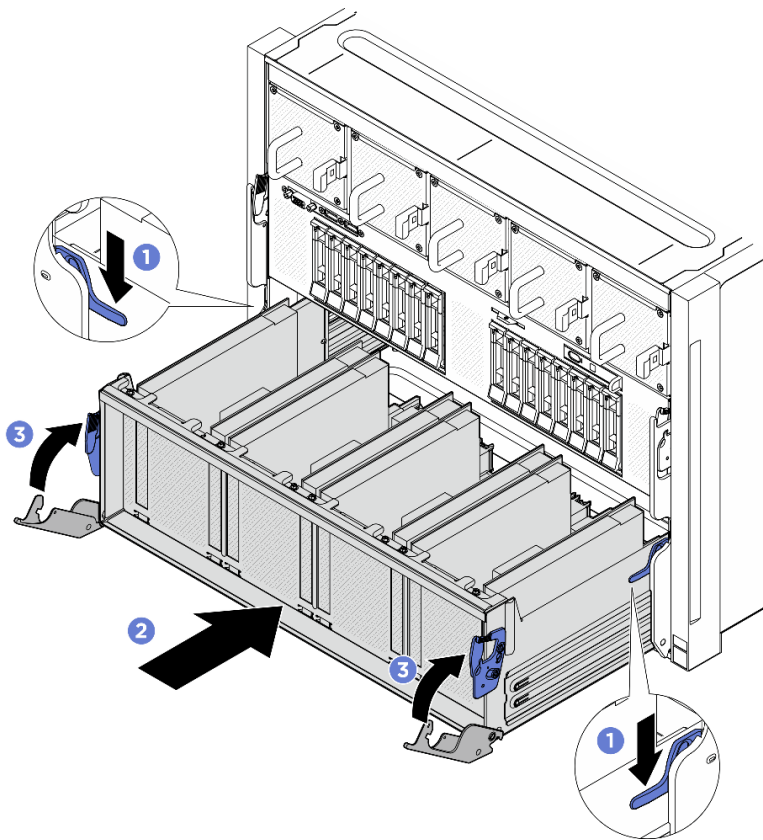


Figure 138. PCIe switch shuttle installation to 8U GPU shuttle

After you finish

Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

Remove a rear PCIe adapter

Follow instructions in this section to remove a rear PCIe adapter. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).

Procedure

- Step 1. Make preparation for this task.
 - a. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67](#).
 - b. Remove the PCIe riser assembly. See [“Remove a PCIe riser assembly” on page 167](#).
- Step 2. Disconnect the cable from the rear PCIe adapter.
- Step 3. Remove the rear PCIe adapter.

- a. ① Unfasten the screw that secures the rear PCIe adapter to the PCIe riser.
- b. ② Grasp the rear PCIe adapter by its edges and carefully pull it out of the PCIe slot.

Note: The PCIe adapter might look different from the illustration.

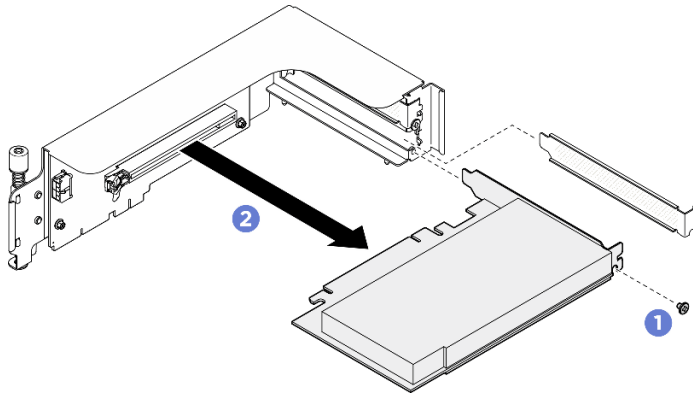


Figure 139. Rear PCIe adapter removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a rear PCIe adapter

Follow instructions in this section to install a rear PCIe adapter. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

- Step 1. ① Insert the rear PCIe adapter into the PCIe riser.
- Step 2. ② Fasten the screw to secure the rear PCIe adapter.

Note: The PCIe adapter might look different from the illustration.

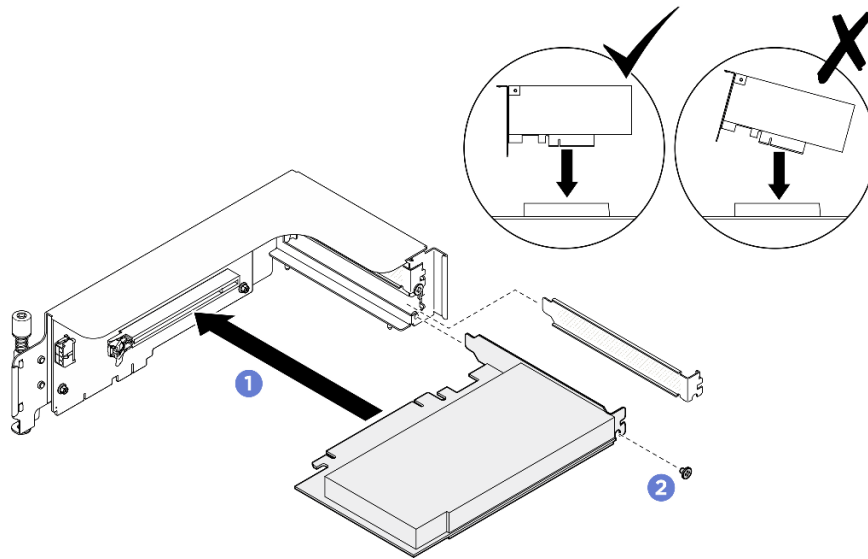


Figure 140. Rear PCIe adapter installation

Step 3. Connect the cable to the rear PCIe adapter.

After you finish

1. Reinstall the PCIe riser assembly. See [“Install a PCIe riser assembly” on page 170](#).
2. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle” on page 68](#).
3. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

PCIe riser assembly replacement (trained technician only)

Follow instructions in this section to remove and install a PCIe riser assembly.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove a PCIe riser assembly

Follow instructions in this section to remove a PCIe riser assembly. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- The server support up to two PCIe risers, see the following illustration for corresponding locations.

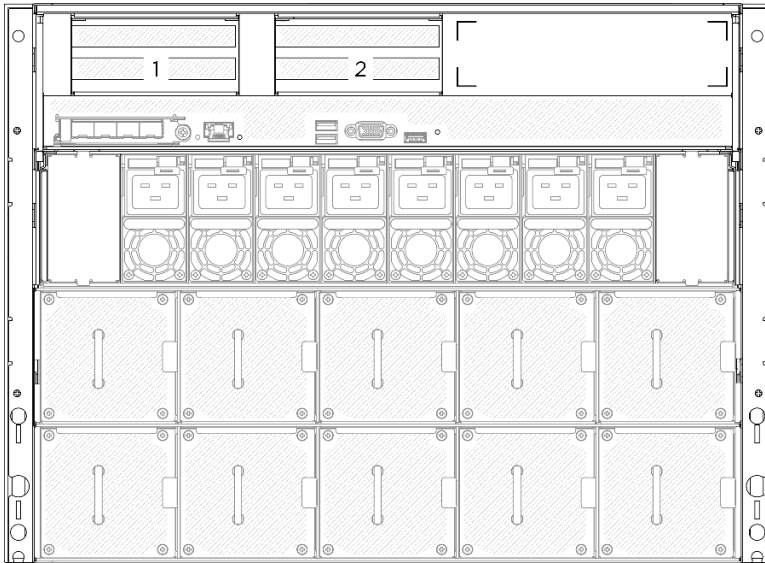


Figure 141. PCIe riser locations

Note: To maintain proper system cooling, do not operate the server without a PCIe riser or a riser filler installed in the 2U compute shuttle.

Procedure

Step 1. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle”](#) on page 67.

Step 2. Remove the PCIe riser assembly.

- a. ① Unfasten the thumbscrew on the PCIe riser.
- b. ② Lift the PCIe riser assembly out of the 2U compute shuttle.

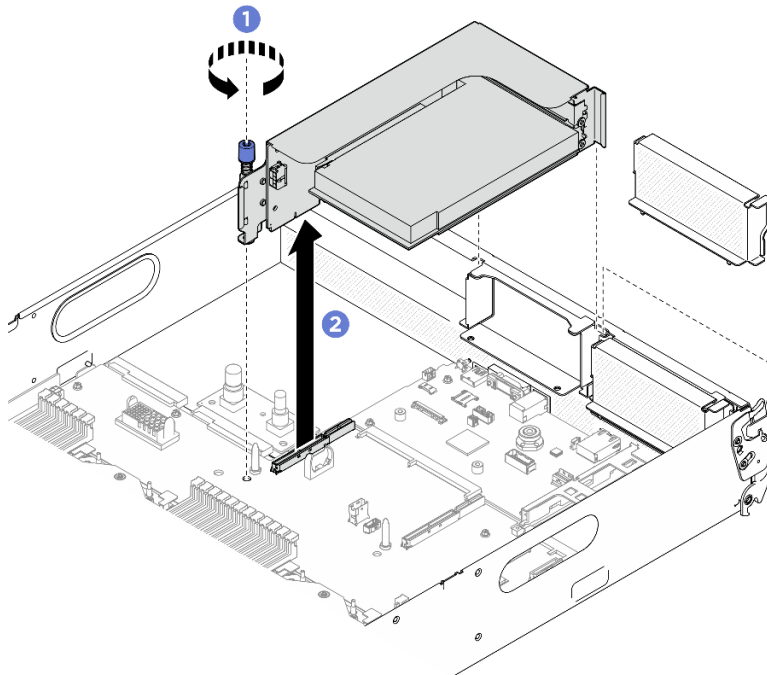


Figure 142. PCIe riser assembly removal

After you finish

1. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.
2. If you plan to recycle the component:
 - a. Remove the rear PCIe adapter from the PCIe riser.
 - 1) ① Unfasten the screw that secures the rear PCIe adapter to the PCIe riser.
 - 2) ② Grasp the rear PCIe adapter by its edges and carefully pull it out of the PCIe slot.

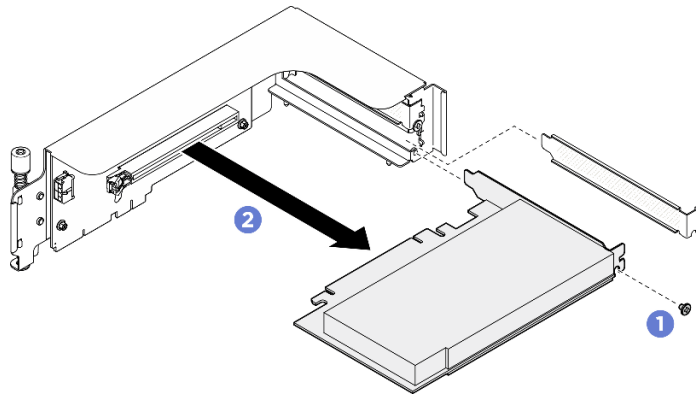


Figure 143. Rear PCIe adapter removal

- b. Unfasten the four screws to remove the PCIe riser card from the PCIe riser cage.

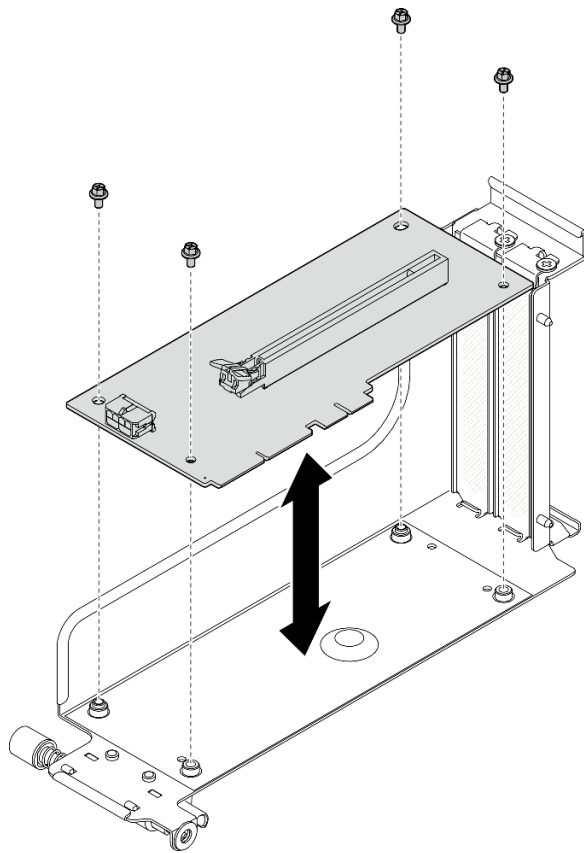


Figure 144. PCIe riser card removal

- c. Recycle the component in compliance with local regulations.

Install a PCIe riser assembly

Follow instructions in this section to install a PCIe riser assembly. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- The server support up to two PCIe risers, see the following illustration for corresponding locations.

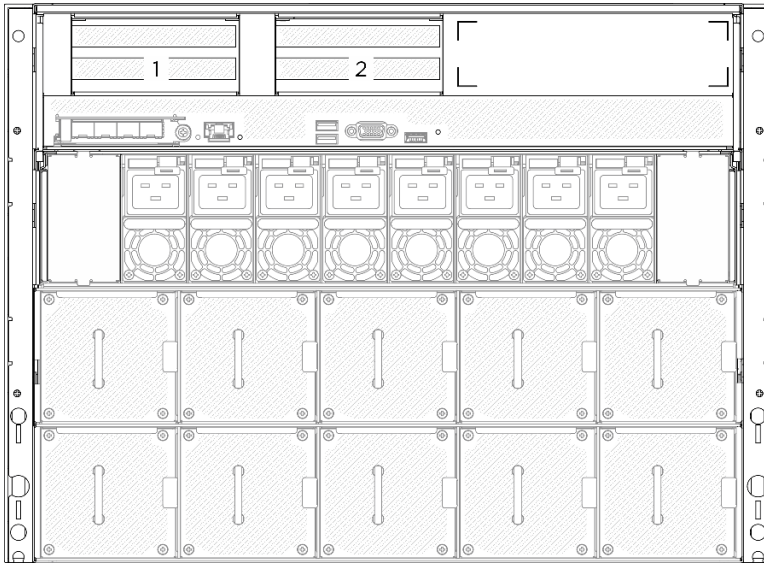


Figure 145. PCIe riser locations

Procedure

- Step 1. ① Align the guide hole on the PCIe riser with the guide post on the system board assembly; then, insert the PCIe riser assembly into the PCIe slot on the system board assembly.
- Step 2. ② Fasten the thumbscrew to secure the PCIe riser assembly.

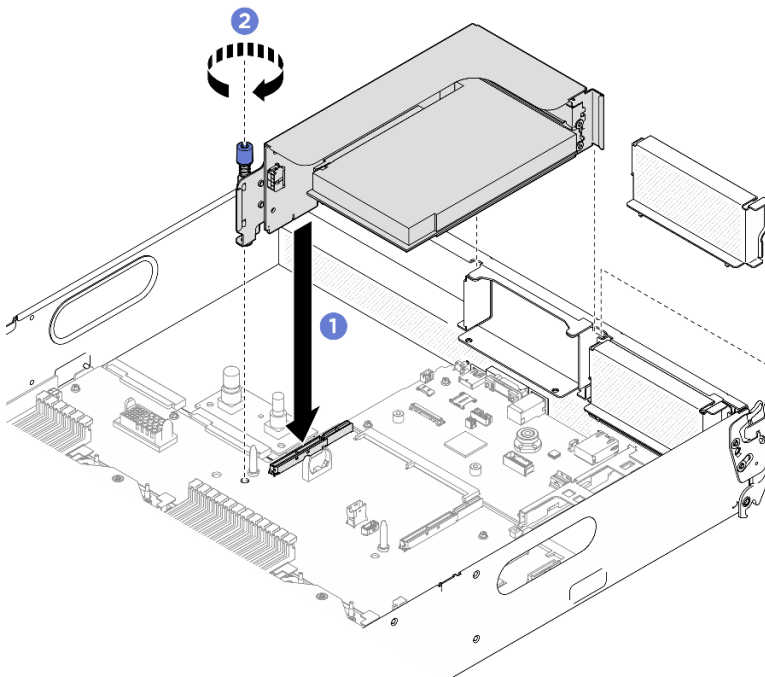


Figure 146. PCIe riser assembly installation

After you finish

1. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle” on page 68](#).
2. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

PCIe switch board and heat sink replacement (trained technician only)

Follow instructions in this section to remove and install the PCIe switch board and a PCIe switch board heat sink.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove a PCIe switch board heat sink

Follow instructions in this section to remove a PCIe switch board heat sink. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).

Procedure

Step 1. Make preparation for this task.

- a. Remove the PCIe switch shuttle. See [“Remove the PCIe switch shuttle” on page 188](#).
- b. Remove all the front PCIe adapters. See [“Remove a front PCIe adapter” on page 161](#).

Step 2. Remove the PCIe switch board heat sink.

- a. ① Fully loosen all the screws on the heat sink *in the removal sequence shown* on the heat-sink label.
- b. ② Carefully lift the heat sink from the PCIe switch board.

Note: Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 0.9 newton-meters, 8 inch-pounds.

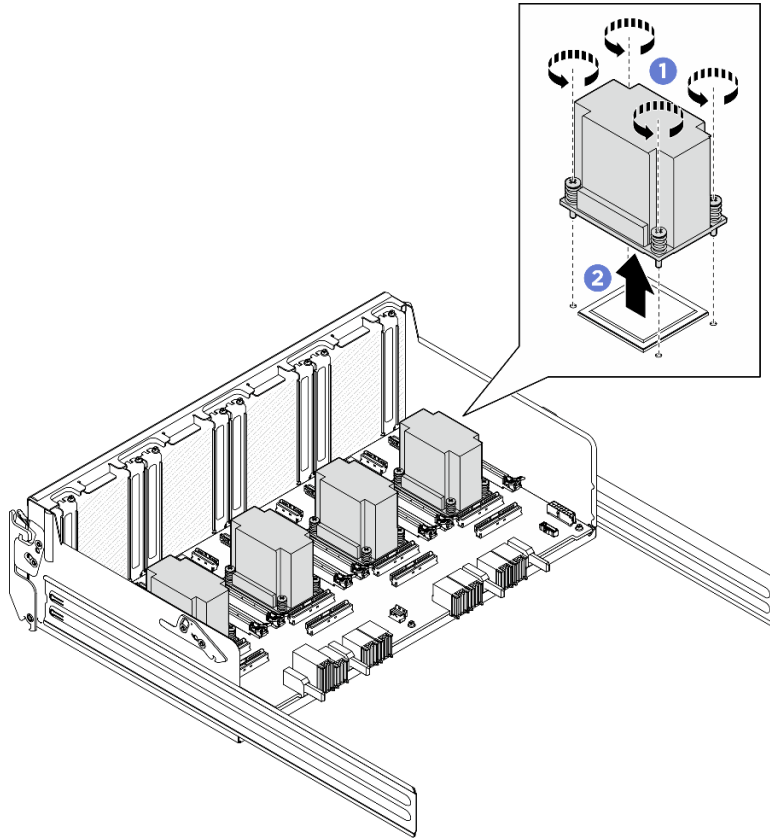


Figure 147. PCIe switch board heat sink removal

Step 3. With an alcohol cleaning pad, wipe off any thermal grease from the following components:

- Heat spreader on the PCIe switch board
- Bottom of the PCIe switch board heat sink

After you finish

1. If you are replacing a PCIe switch board heat sink, install a new one. See [“Install a PCIe switch board heat sink” on page 175](#).
2. If you are replacing the PCIe switch board, remove it. See [“Remove the PCIe switch board” on page 173](#).
3. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Remove the PCIe switch board

Follow instructions in this section to remove the PCIe switch board. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.

- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).

Procedure

Step 1. Make preparation for this task.

- a. Remove the PCIe switch shuttle. See [“Remove the PCIe switch shuttle” on page 188](#).
- b. Remove all the front PCIe adapters. See [“Remove a front PCIe adapter” on page 161](#).
- c. Remove all the PCIe switch board heat sinks. See [“Remove a PCIe switch board heat sink” on page 172](#).

Step 2. Unfasten the six screws on the PCIe switch board; then, lift the PCIe switch board out of the PCIe switch shuttle.

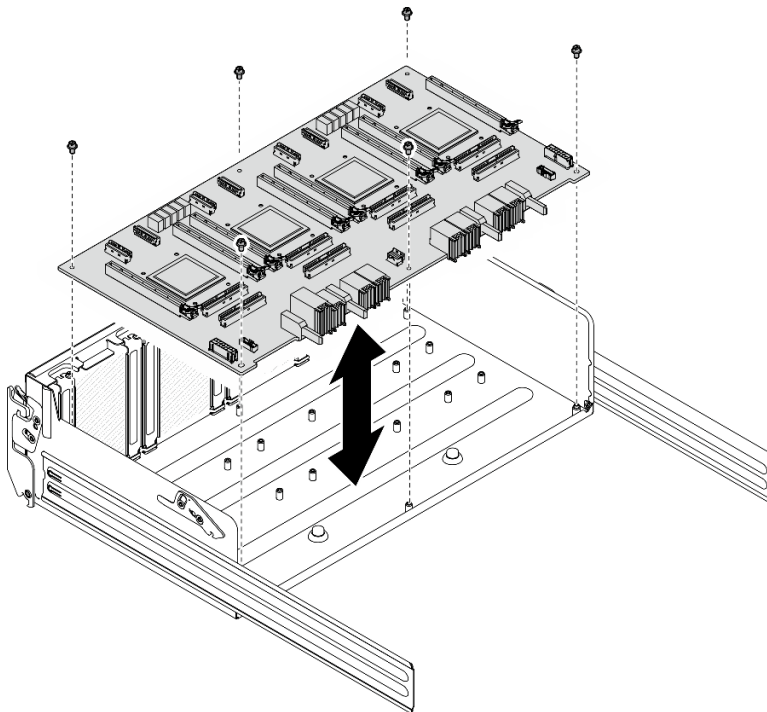


Figure 148. PCIe switch board removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the PCIe switch board

Follow instructions in this section to install the PCIe switch board. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.

- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

- Step 1. Hold the PCIe switch board in the correct orientation as illustrated; then, align the PCIe switch board with the six standoffs on the PCIe switch shuttle, and gently place it onto the PCIe switch shuttle.
- Step 2. Fasten the six screws to secure the PCIe switch board.

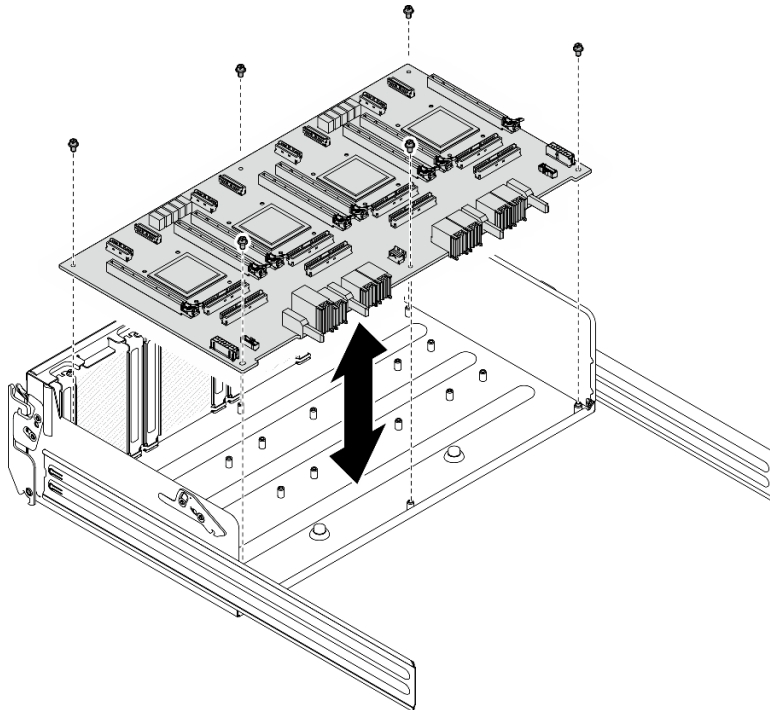


Figure 149. PCIe switch board installation

After you finish

1. Reinstall all the PCIe switch board heat sinks. See [“Install a PCIe switch board heat sink” on page 175](#).
2. Reinstall all the front PCIe adapters. See [“Install a front PCIe adapter” on page 163](#).
3. Reinstall the PCIe switch shuttle. See [“Install the PCIe switch shuttle” on page 190](#).
4. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

Install a PCIe switch board heat sink

Follow instructions in this section to install a PCIe switch board heat sink. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.

- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Apply a blob of new thermal grease (0.3 ml) onto the center of the heat spreader.

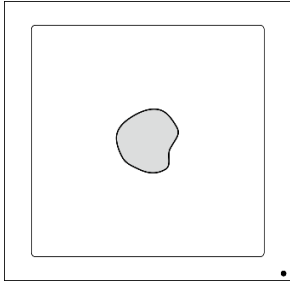


Figure 150. Thermal grease application

Step 2. Install the PCIe switch board heat sink.

- 1 Align the PCIe switch board heat sink with the four screw holes on the PCIe switch board; then, gently place the PCIe switch board heat sink onto the PCIe switch board.
- 2 Fasten the four screws **in the installation sequence shown** on the heat-sink label.

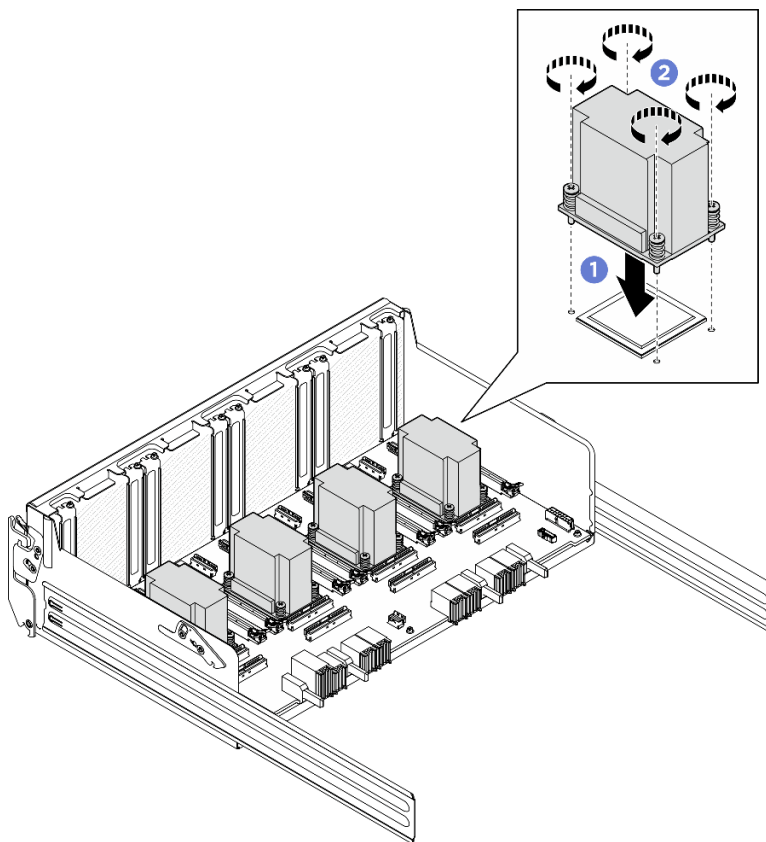


Figure 151. PCIe switch board heat sink installation

After you finish

1. Reinstall all the front PCIe adapters. See “[Install a front PCIe adapter](#)” on page 163.
2. Reinstall the PCIe switch shuttle. See “[Install the PCIe switch shuttle](#)” on page 190.
3. Complete the parts replacement. See “[Complete the parts replacement](#)” on page 242.

PCIe switch cable harness replacement (trained technician only)

Follow instructions in this section to remove and install a PCIe switch cable harness.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the front PCIe switch cable harness

Follow instructions in this section to remove the front PCIe switch cable harness. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Note: Make sure you have a 5 mm hex socket screwdriver available to properly replace the component:

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See “[Remove a hot-swap power supply unit](#)” on page 201.
- b. Remove all the front fans. See “[Remove a hot-swap fan \(front and rear\)](#)” on page 79.
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “[Remove a 2.5-inch hot-swap drive](#)” on page 58.
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “[Remove the 8U GPU shuttle](#)” on page 69.
- e. Remove the cable cover. See “[Remove the cable cover](#)” on page 73.
- f. Remove the I/O cover. See “[Remove the I/O cover](#)” on page 143.
- g. Remove the integrated diagnostics panel. See “[Remove the integrated diagnostics panel](#)” on page 141.

Step 2. Disconnect the cables that connected from the front PCIe switch cable harness to the PCIe switch board and the PSU interposer.

Step 3. Remove the front I/O module.

- a. ① Unfasten the two outer screws on the front I/O module.
- b. ② Unfasten the inner screw on the front I/O module.

- c. ③ Slide the front I/O module rearward.

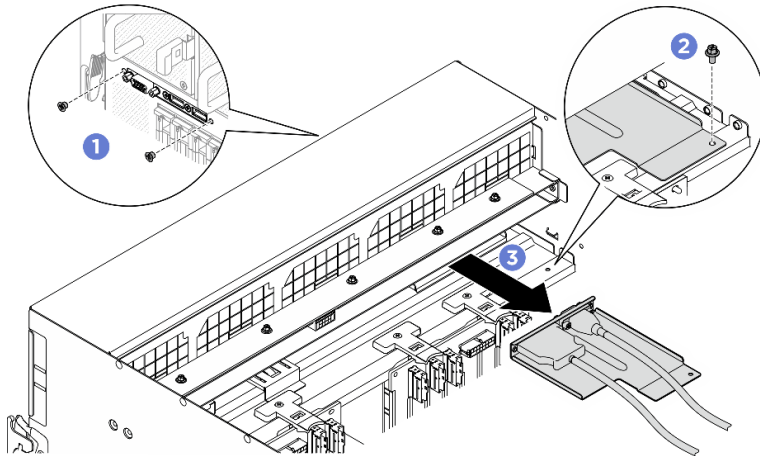


Figure 152. Front I/O module removal

Step 4. Remove the following front I/O module cables.

- Unfasten the two hex nuts (1) to remove the VGA cable from the front I/O bracket.
- Unfasten the two screws (2) to remove the USB cable from the front I/O bracket.

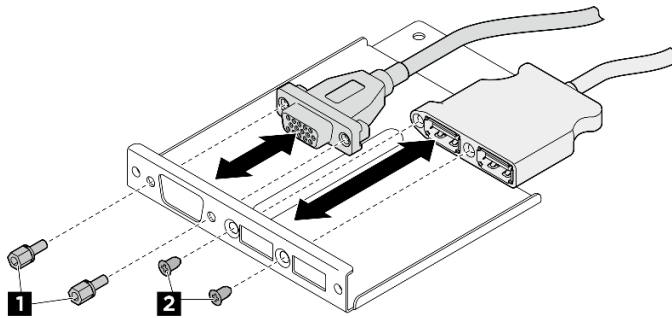


Figure 153. Front I/O module cables removal

Step 5. Remove the front PCIe switch cable harness.

- a. ① Unfasten the ten screws marked with **C** on both sides of the 8U GPU shuttle.
- b. ② Lift the front PCIe switch cable harness out of the 8U GPU shuttle.

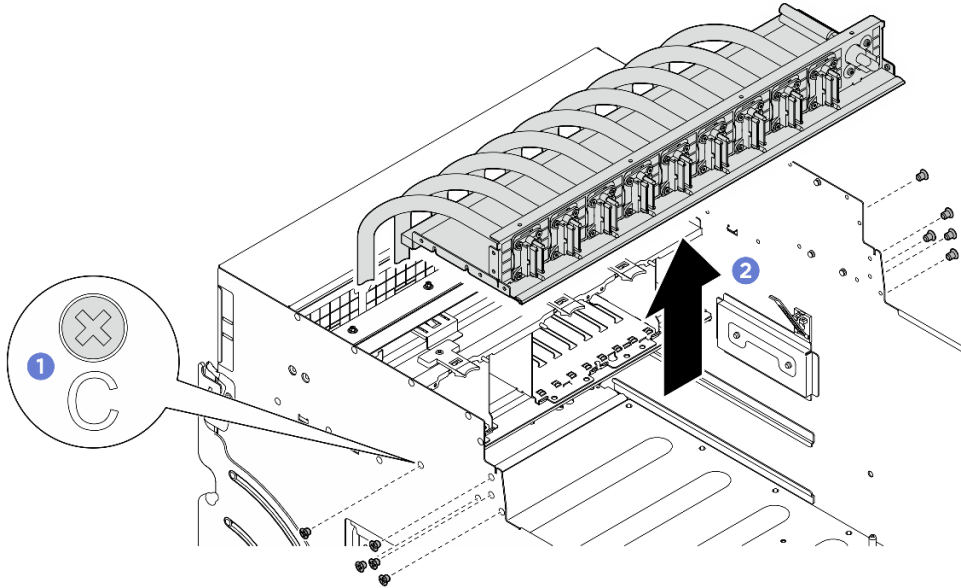


Figure 154. Front PCIe switch cable harness removal

Step 6. If needed, remove the cables from the front PCIe switch cable harness.

- **Front I/O module, integrated diagnostics panel, GPU management, or signal cable**

Unfasten the four screws to remove the cable from the front PCIe switch cable harness.

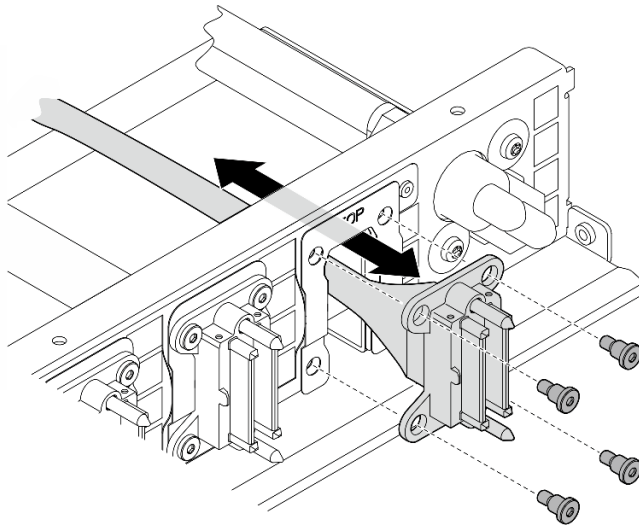


Figure 155. Front I/O module, integrated diagnostics panel, GPU management, or signal cable removal

- **Power cable**

1. Remove the two screws and the two washers on the front PCIe switch cable harness.
2. Remove the cable from the front PCIe switch cable harness.

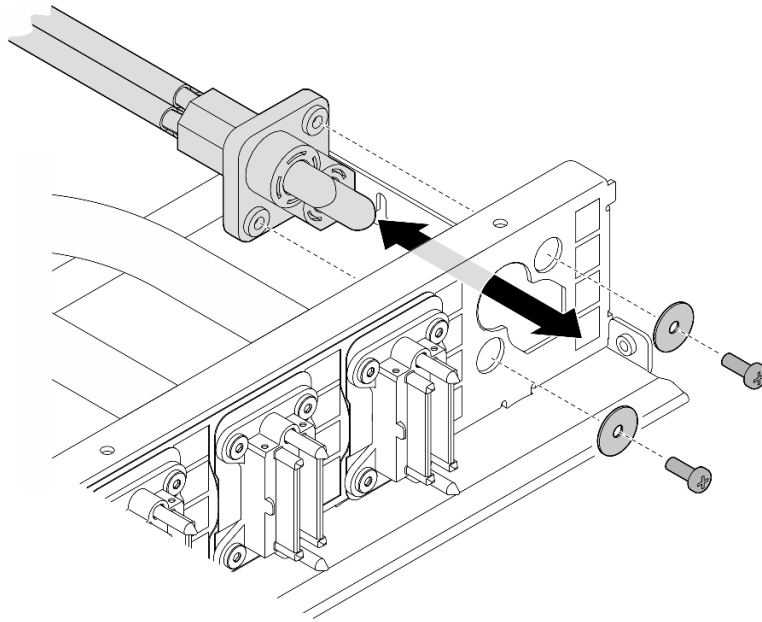


Figure 156. Power cable removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the front PCIe switch cable harness

Follow instructions in this section to install the front PCIe switch cable harness. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Note: Make sure you have a 5 mm hex socket screwdriver available to properly replace the component:

Procedure

Step 1. If necessary, attach the label to the signal cable(s).

- a. ① Attach the white space portion of the label to the end of the cable that connects to the PCIe switch board.
- b. ② Wrap the label around the cable and attach it to the white space portion.

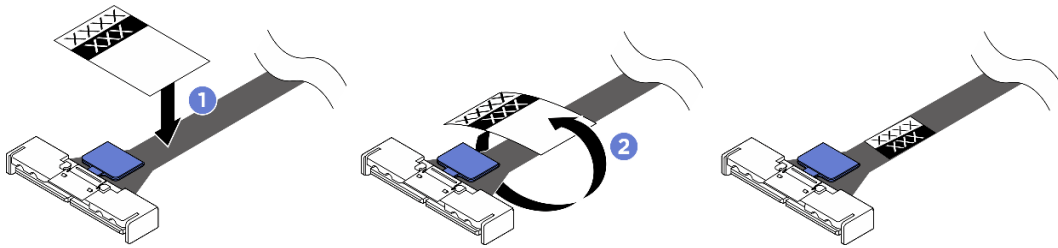


Figure 157. Label application

Note: See the table below to identify the corresponding labels for the cables.

From	To	Label
Front PCIe switch cable harness: MCIO 1 cable	PCIe switch board: MCIO connector 1 (MCIO1)	MCIO 1
Front PCIe switch cable harness: MCIO 1 cable	PCIe switch board: MCIO connector 1 (MCIO1)	MCIO 1
Front PCIe switch cable harness: MCIO 2 cable	PCIe switch board: MCIO connector 2 (MCIO2)	MCIO 2
Front PCIe switch cable harness: MCIO 3 cable	PCIe switch board: MCIO connector 3 (MCIO3)	MCIO 3
Front PCIe switch cable harness: MCIO 4 cable	PCIe switch board: MCIO connector 4 (MCIO4)	MCIO 4
Front PCIe switch cable harness: MCIO 5 cable	PCIe switch board: MCIO connector 5 (MCIO5)	MCIO 5
Front PCIe switch cable harness: MCIO 6 cable	PCIe switch board: MCIO connector 6 (MCIO6)	MCIO 6
Front PCIe switch cable harness: MCIO 7 cable	PCIe switch board: MCIO connector 7 (MCIO7)	MCIO 7
Front PCIe switch cable harness: MCIO 8 cable	PCIe switch board: MCIO connector 8 (MCIO8)	MCIO 8

Step 2. If needed, install the cables to the front PCIe switch cable harness.

- **Front I/O module, integrated diagnostics panel, GPU management, or signal cable**

Align the cable with the hole on the front PCIe switch cable harness and insert it; then, fasten the four screws to secure the cable.

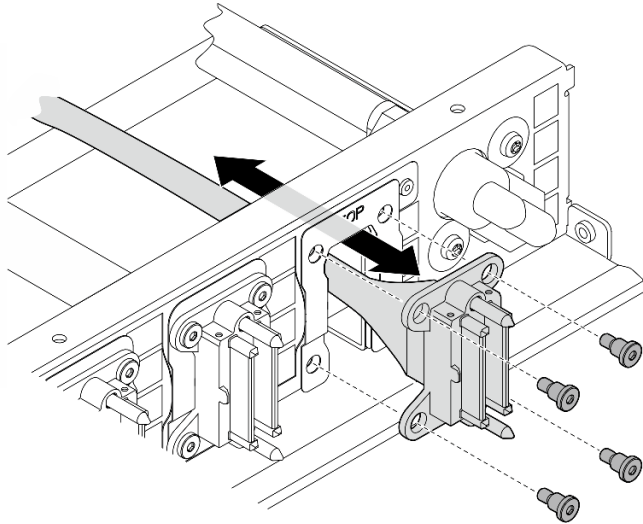


Figure 158. Front I/O module, integrated diagnostics panel, GPU management, or signal cable installation

- **Power cable**

1. Align the cable with the hole on the front PCIe switch cable harness, and insert it.
2. Insert the two washers and the two screws to the holes, and fasten them to secure the cable.

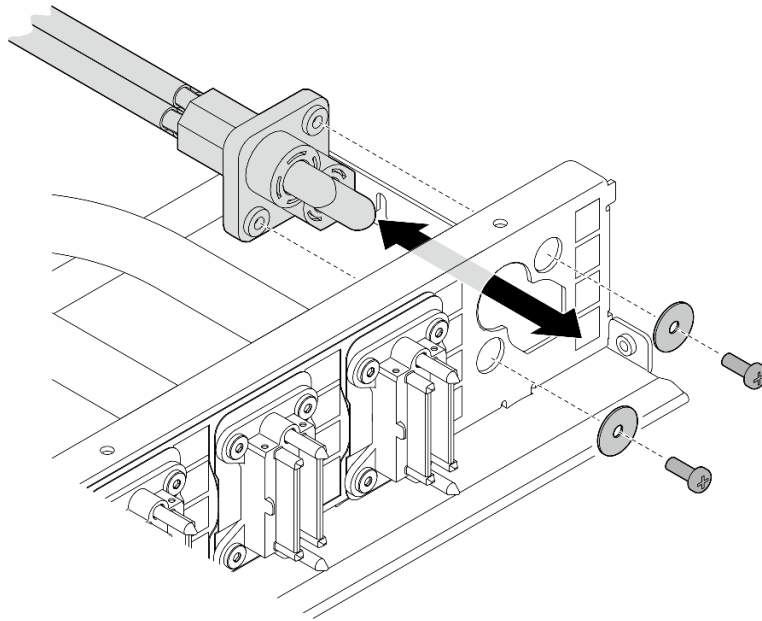


Figure 159. Power cable installation

Step 3. Install the front PCIe switch cable harness.

- a. ① Align the front PCIe switch cable harness with the four guide pins on the 8U GPU shuttle; then, lower the front PCIe switch cable harness into the 8U GPU shuttle until it is securely engaged.
- b. ② Locate the ten screw holes marked with **C** on both sides of the 8U GPU shuttle; then, fasten the ten screws to secure the front PCIe switch cable harness.

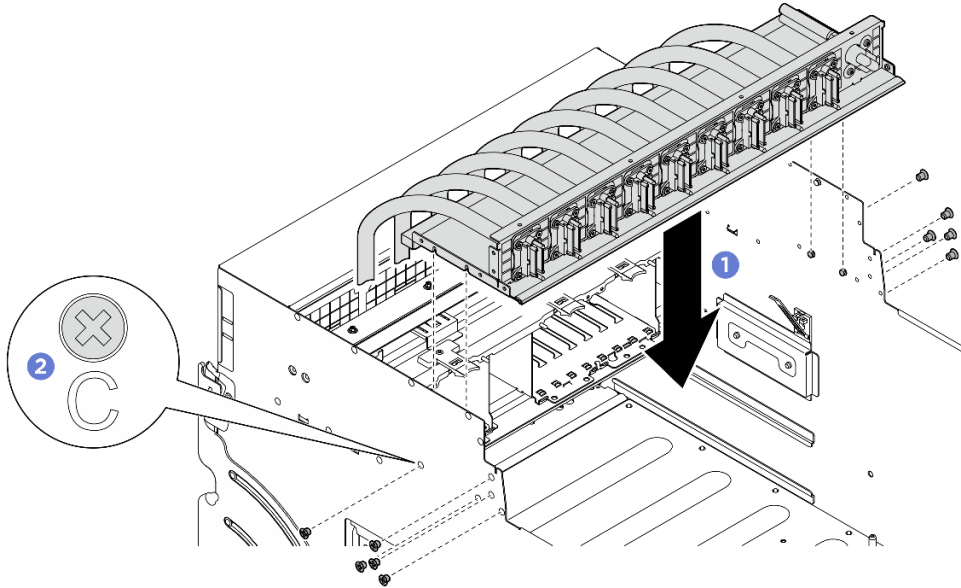


Figure 160. Front PCIe switch cable harness installation

- Step 4. Connect the cables to the PCIe switch board and the PSU interposer. See [“PCIe switch board cable routing”](#) on page 259 and [“Power interface board cable routing”](#) on page 265 for more information.
- Step 5. Install the following front I/O module cables.
- Fasten the two hex nuts (1) to install the VGA cable to the front I/O bracket.
 - Fasten the two screws (2) to install the USB cable to the front I/O bracket.

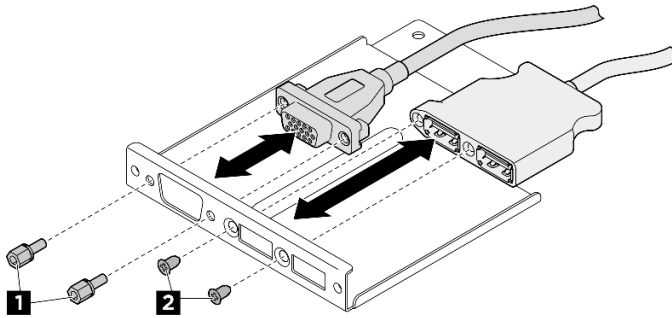


Figure 161. Front I/O module cables installation

- Step 6. Install the front I/O module.
- 1 Insert the front I/O module into the front I/O module slot.
 - 2 Fasten the inner screw to secure the front I/O module.
 - 3 Fasten the two outer screws to secure the front I/O module.

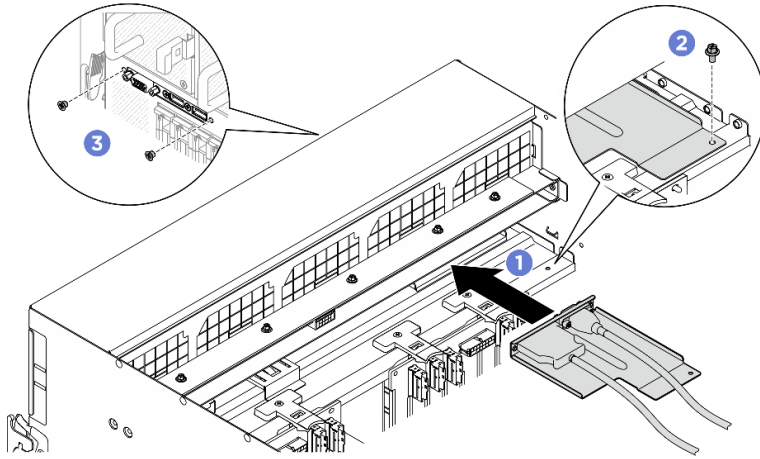


Figure 162. Front I/O module installation

After you finish

1. Reinstall the integrated diagnostics panel. See [“Install the integrated diagnostics panel” on page 142](#).
2. Reinstall the I/O cover. See [“Install the I/O cover” on page 144](#).
3. Reinstall the cable cover. See [“Install the cable cover” on page 74](#).
4. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle” on page 71](#).
5. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive” on page 60](#)
6. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
7. Reinstall all the power supply units. See [“Install a hot-swap power supply unit” on page 203](#).
8. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

Remove the rear PCIe switch cable harness

Follow instructions in this section to remove the rear PCIe switch cable harness. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).

Procedure

- Step 1. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67](#).
- Step 2. Disconnect the cables that connected from the rear PCIe switch cable harness to the system board assembly and the power interface board.
- Step 3. Remove the rear PCIe switch cable harness.
 - a. ① Unfasten the six screws on both sides of the 2U compute shuttle.
 - b. ② Remove the rear PCIe switch cable harness from the 2U compute shuttle.

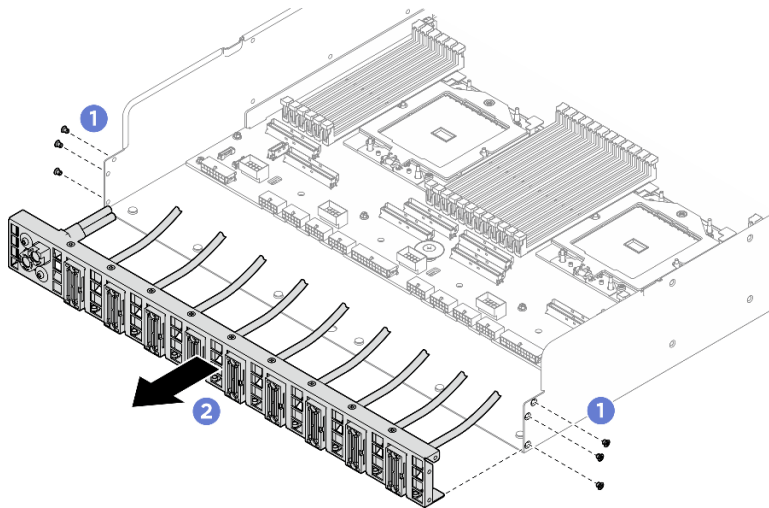


Figure 163. Rear PCIe switch cable harness removal

Step 4. If needed, remove the cables from the rear PCIe switch cable harness.

- **Front I/O module, integrated diagnostics panel, GPU management, or signal cable**

1. ① Unfasten the two screws that secure the bracket to the rear PCIe switch cable harness.
2. ② Slide the bracket away from the rear PCIe switch cable harness.
3. ③ Remove the cable from the rear PCIe switch cable harness.

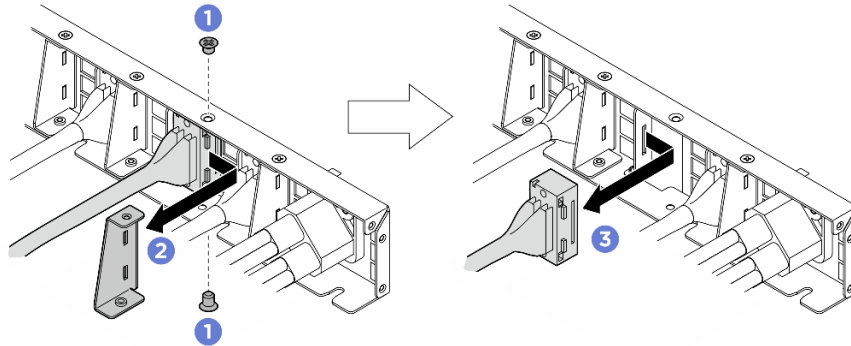


Figure 164. Front I/O module, integrated diagnostics panel, GPU management, or signal cable removal

- **Power cable**

1. Remove the two screws and the two washers on the rear PCIe switch cable harness.
2. Remove the cable from the rear PCIe switch cable harness.

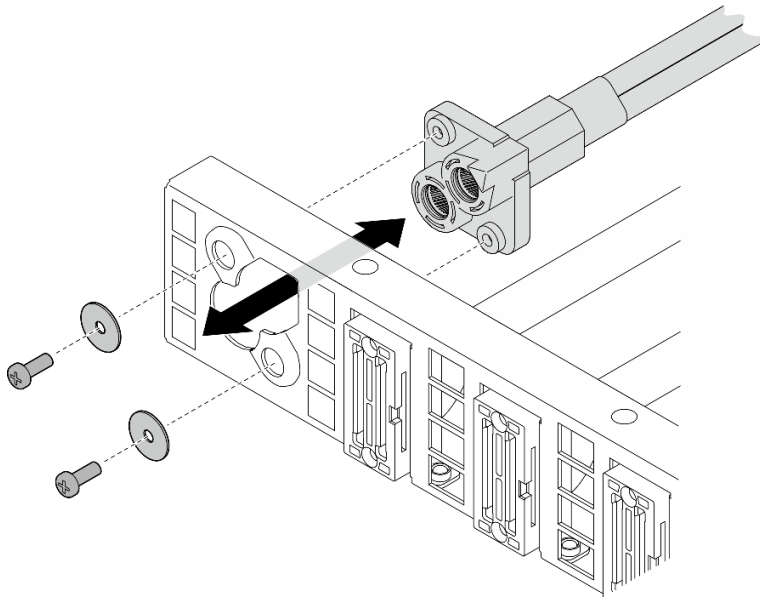


Figure 165. Power cable removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the rear PCIe switch cable harness

Follow instructions in this section to install the rear PCIe switch cable harness. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. If needed, install the cables to the rear PCIe switch cable harness.

- **Front I/O module, integrated diagnostics panel, GPU management, or signal cable**
 1. ① Align the cable with the slot on the bracket that is mounted on the rear PCIe switch cable harness, and insert it.
 2. ② Align the bracket with the two tabs on the cable, and insert it.
 3. ③ Fasten the two screws to secure the bracket and the cable.

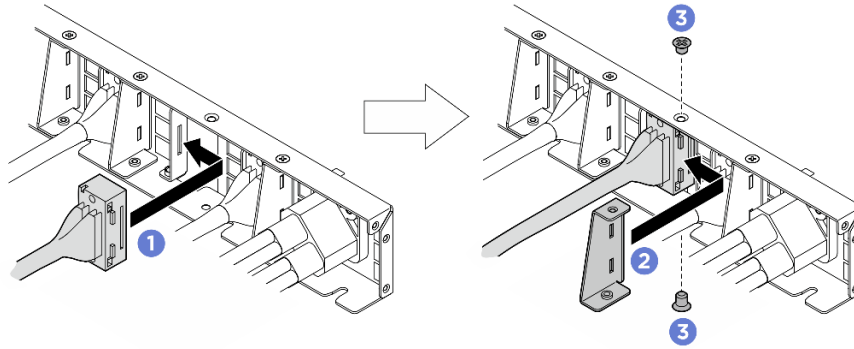


Figure 166. Front I/O module, integrated diagnostics panel, GPU management, or signal cable installation

- **Power cable**

1. Align the cable with the hole on the rear PCIe switch cable harness, and insert it.
2. Insert the two washers and the two screws to the holes, and fasten them to secure the cable.

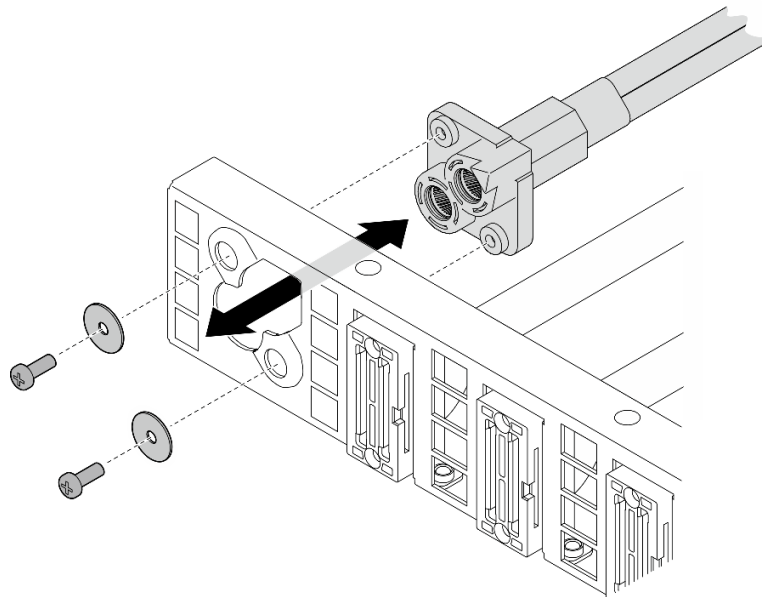


Figure 167. Power cable installation

Step 2. Install the rear PCIe switch cable harness.

- 1 Align the rear PCIe switch cable harness with the six guide pins on the 2U compute shuttle; then, insert the rear PCIe switch cable harness into the 2U compute shuttle until it is securely engaged.
- 2 Fasten the six screws to secure the rear PCIe switch cable harness.

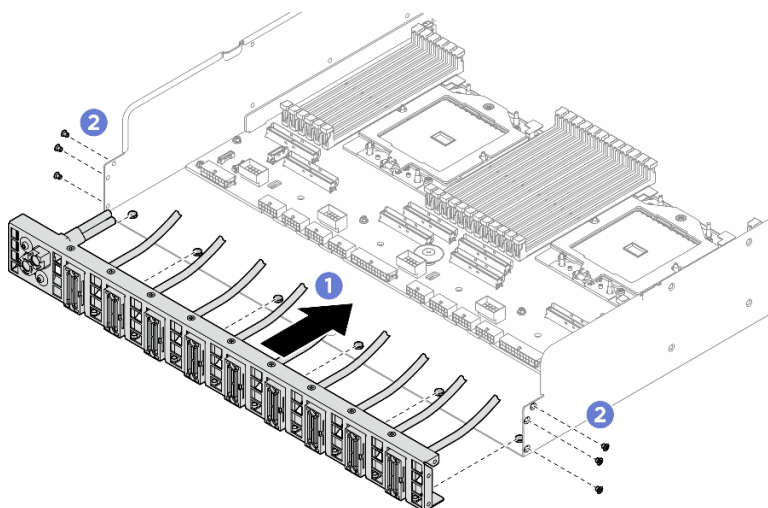


Figure 168. Rear PCIe switch cable harness installation

- Step 3. Connect the cables to the system board assembly and the power interface board. See [“Front I/O module and integrated diagnostics panel cable routing” on page 256](#), [“PCIe switch board cable routing” on page 259](#), and [“Power interface board cable routing” on page 265](#) for more information.

After you finish

1. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle” on page 68](#).
2. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

PCIe switch shuttle replacement (trained technician only)

Follow instructions in this section to remove and install the PCIe switch shuttle.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the PCIe switch shuttle

Follow instructions in this section to remove the PCIe switch shuttle. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- Anti-static gloves are recommended as a precaution while disconnecting cables from the PCIe switch board.

Procedure

- Step 1. Disengage the PCIe switch shuttle from the 8U GPU shuttle.
- a. 1 Press the two blue release latches.

- b. ② Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.
- c. ③ Pull the PCIe switch shuttle forward until it stops.

Note: Push the two release levers back until they lock into place after pulling out the PCIe switch shuttle to avoid damages.

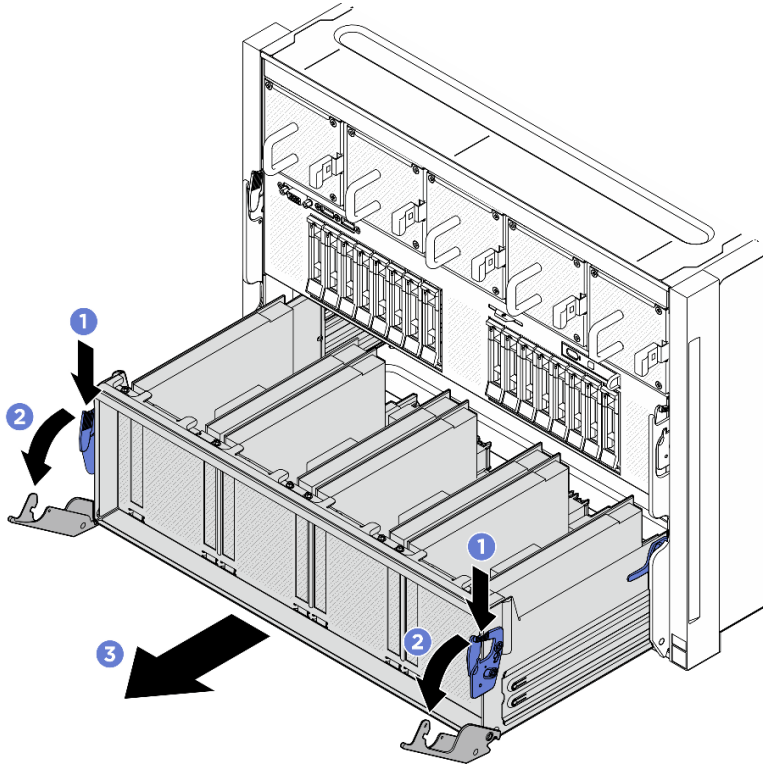


Figure 169. PCIe switch shuttle removal to stop position

Step 2. Disconnect the cables from the PCIe switch board.

Step 3. Remove the PCIe switch shuttle.

- a. ① Press the two lock latches on both sides of the PCIe switch shuttle.
- b. ② Slide the PCIe switch shuttle fully forward and remove it from the 8U GPU shuttle.

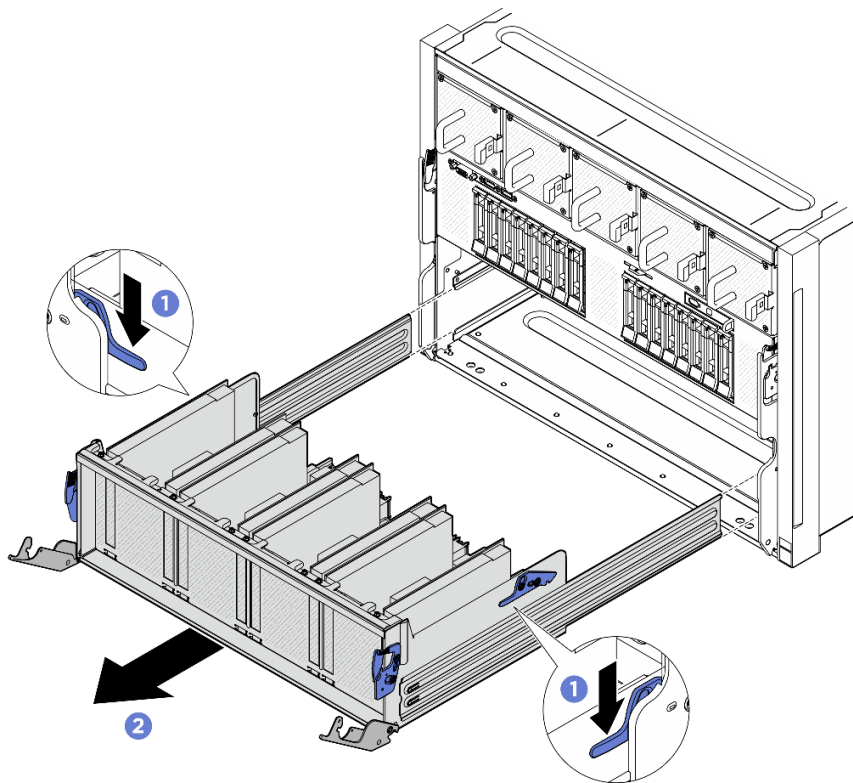


Figure 170. PCIe switch shuttle removal from 8U GPU shuttle

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the PCIe switch shuttle

Follow instructions in this section to install the PCIe switch shuttle. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Anti-static gloves are recommended as a precaution while connecting cables to the PCIe switch board.

Procedure

- Step 1. Fully open the two release levers; then, align the PCIe switch shuttle with the opening in the front of the 8U GPU shuttle, and slide it into the 8U GPU shuttle until it snaps into place.

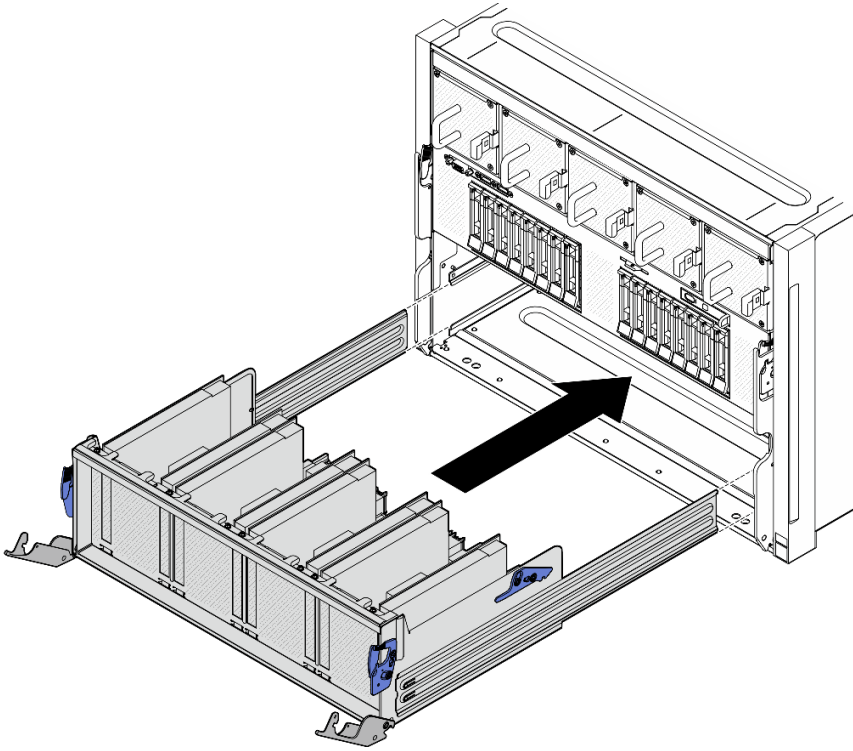


Figure 171. PCIe switch shuttle installation to stop position

- Step 2. Connect the cables to the PCIe switch board. See [“2.5-inch drive backplane cable routing” on page 250](#) and [“PCIe switch board cable routing” on page 259](#) for more information.
- Step 3. Install the PCIe switch shuttle.
- a. ① Press the two lock latches on both sides of the PCIe switch shuttle.
 - b. ② Push the PCIe switch shuttle into the 8U GPU shuttle until it stops.
 - c. ③ Rotate the two release levers until they lock into place.

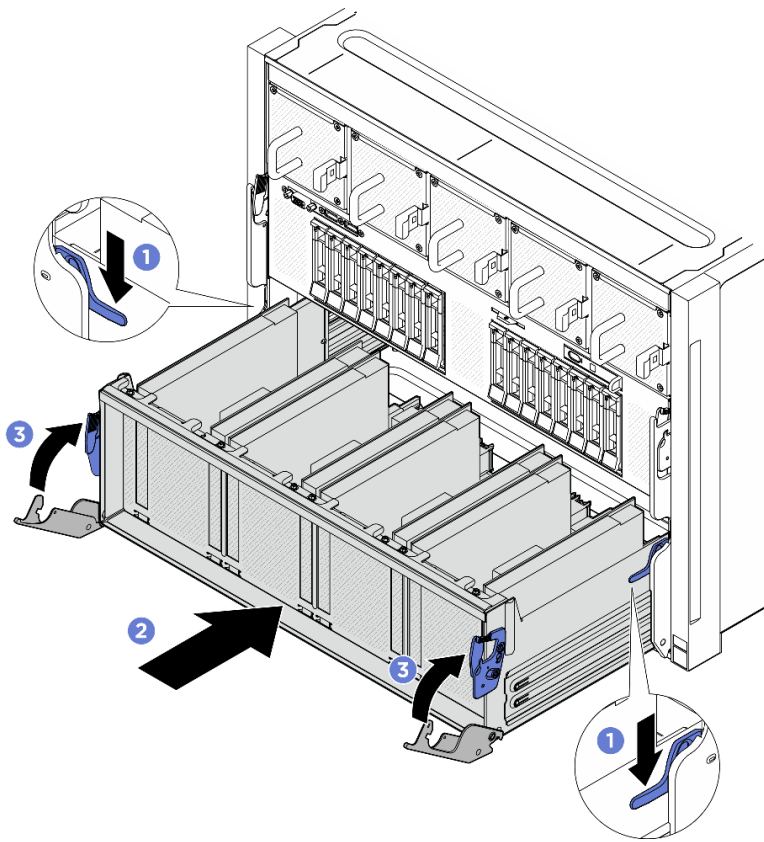


Figure 172. PCIe switch shuttle installation to 8U GPU shuttle

After you finish

Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

Power complex replacement (trained technician only)

Follow instructions in this section to remove and install the power complex.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the power complex

Follow instructions in this section to remove the power complex. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).

- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See “Remove a hot-swap power supply unit” on page 201.
- b. Remove all the front fans. See “Remove a hot-swap fan (front and rear)” on page 79.
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “Remove a 2.5-inch hot-swap drive” on page 58.
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “Remove the 8U GPU shuttle” on page 69.

Step 2. Disconnect all the cables from the PSU interposer and the power distribution board.

Step 3. Remove the power complex.

- a. ① Unfasten the ten screws marked with **B** on both sides of the 8U GPU shuttle.
- b. ② Lift the power complex out of the 8U GPU shuttle.

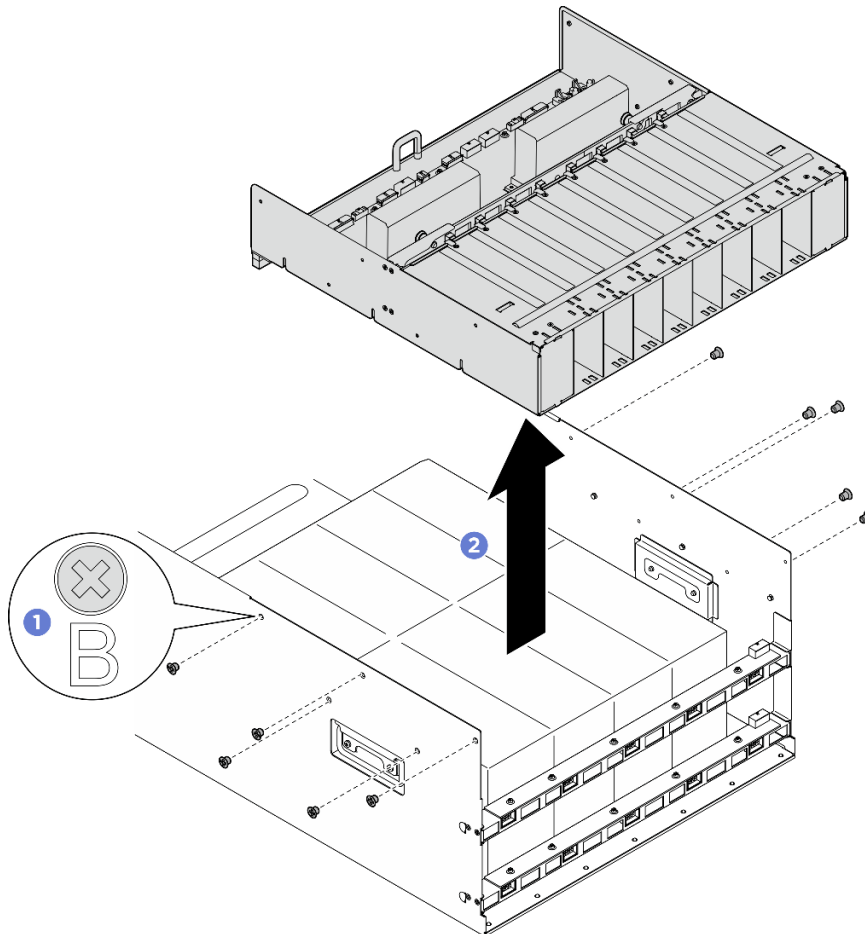


Figure 173. Power complex removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the power complex

Follow instructions in this section to install the power complex. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “Installation Guidelines” on page 37 and “Safety inspection checklist” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

- Step 1. ① Align the power complex with the six guide pins on the 8U GPU shuttle; then, lower the power complex into the 8U GPU shuttle until it is securely engaged.
- Step 2. ② Locate the ten screw holes marked with **B** on both sides of the 8U GPU shuttle; then, fasten the ten screws to secure the power complex.

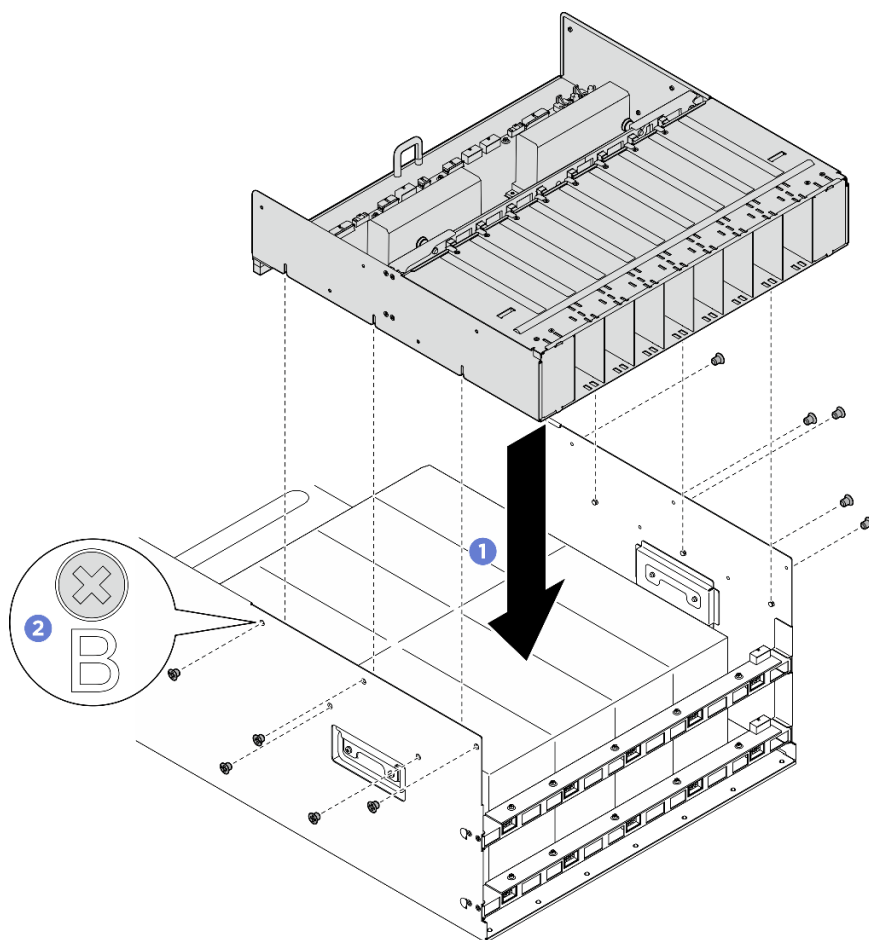


Figure 174. Power complex installation

Step 3. Connect the cables to the PSU interposer and the power distribution board. See [“2.5-inch drive backplane cable routing”](#) on page 250, [“Fan control board cable routing”](#) on page 254, [“GPU baseboard cable routing”](#) on page 256, [“PCIe switch board cable routing”](#) on page 259, [“Power interface board cable routing”](#) on page 265, and [“PSU interposer cable routing”](#) on page 267 for more information.

After you finish

1. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle”](#) on page 71.
2. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive”](#) on page 60
3. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)”](#) on page 81.
4. Reinstall all the power supply units. See [“Install a hot-swap power supply unit”](#) on page 203.
5. Complete the parts replacement. See [“Complete the parts replacement”](#) on page 242.

Power distribution board replacement (trained technician only)

Follow instructions in this section to remove and install the power distribution board.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the power distribution board

Follow instructions in this section to remove the power distribution board. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See “[Remove a hot-swap power supply unit](#)” on page 201.
- b. Remove all the front fans. See “[Remove a hot-swap fan \(front and rear\)](#)” on page 79.
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “[Remove a 2.5-inch hot-swap drive](#)” on page 58.
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “[Remove the 8U GPU shuttle](#)” on page 69.
- e. Remove the PSU interposer. See “[Remove the PSU interposer](#)” on page 220.

Step 2. Disconnect all the cables from the power distribution board.

Step 3. Remove the two cable retainers from the power distribution board.

- a. Unfasten the two screws to lift the cable retainer out of the power distribution board.
- b. Repeat to remove the other cable retainer.

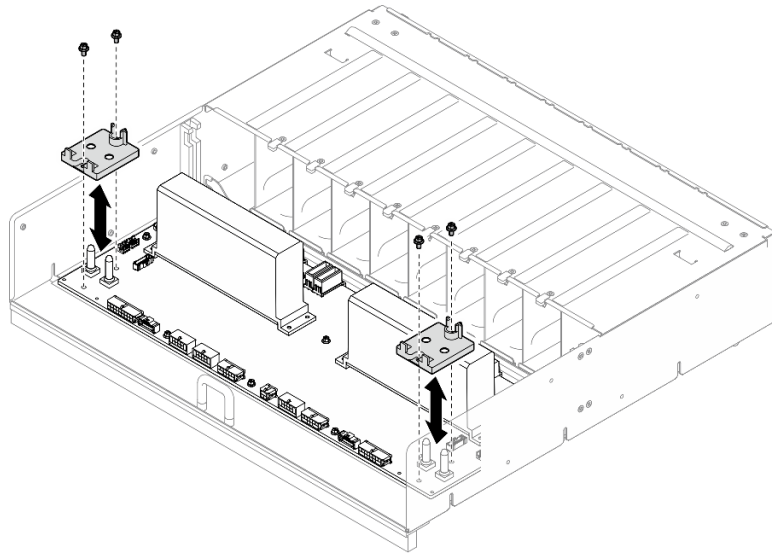


Figure 175. Cable retainer removal

Step 4. Unfasten the ten screws to remove the power distribution board from the PSU cage.

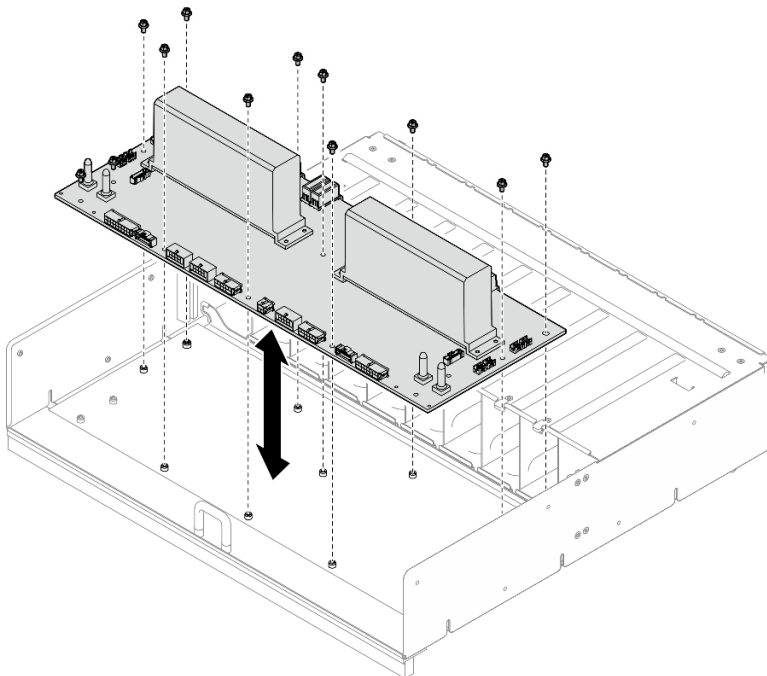


Figure 176. Power distribution board removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the power distribution board

Follow instructions in this section to install the power distribution board. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “Installation Guidelines” on page 37 and “Safety inspection checklist” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 271 for more information on firmware updating tools.

Procedure

- Step 1. Align the power distribution board with the ten standoffs on the PSU cage; then, lower the power distribution board into the PSU cage.
- Step 2. Fasten the ten screws to secure the power distribution board.

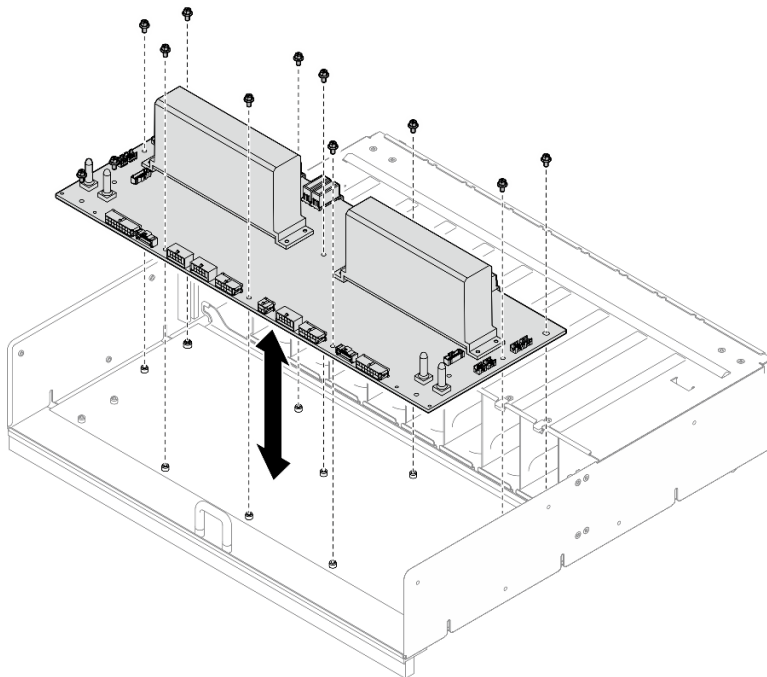


Figure 177. Power distribution board installation

- Step 3. Install the two cable retainers to the power distribution board.
 - a. Align the cable retainer with the screw holes on the power distribution board; then, place the cable retainer onto the power distribution board.

- b. Fasten the two screws to secure the cable retainer.
- c. Repeat to install the other cable retainer.

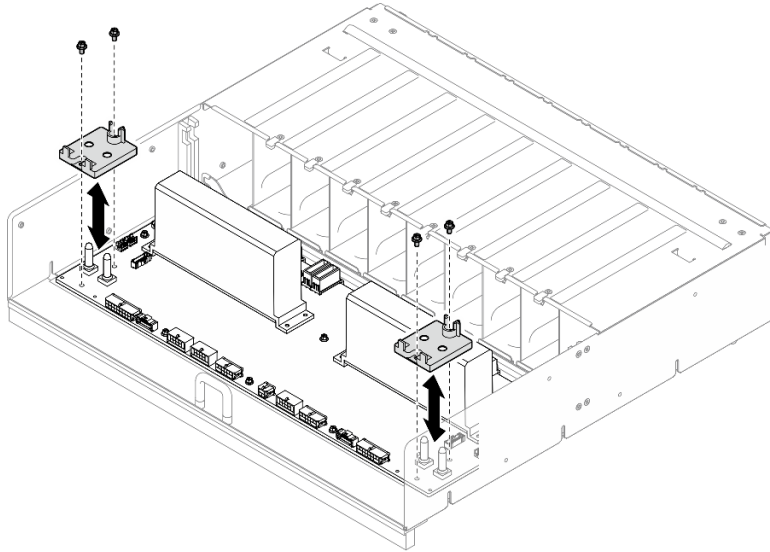


Figure 178. Cable retainer installation

- Step 4. Connect the cables to the power distribution board. See [“2.5-inch drive backplane cable routing” on page 250](#), [“Fan control board cable routing” on page 254](#), [“GPU baseboard cable routing” on page 256](#), [“PCIe switch board cable routing” on page 259](#), and [“PSU interposer cable routing” on page 267](#) for more information.

After you finish

1. Reinstall the PSU interposer. See [“Install the PSU interposer” on page 221](#).
2. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle” on page 71](#).
3. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive” on page 60](#)
4. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
5. Reinstall all the power supply units. See [“Install a hot-swap power supply unit” on page 203](#).
6. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

Power interface board replacement (trained technician only)

Follow instructions in this section to remove and install the power interface board.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the power interface board

Follow instructions in this section to remove the power interface board. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.

Procedure

- Step 1. Remove the 2U compute shuttle. See “[Remove the 2U compute shuttle](#)” on page 67.
- Step 2. Disconnect all the cables from the power interface board.
- Step 3. Remove the power interface board.
 - a. ① Unfasten the three screws that secure the power interface board to the 2U compute shuttle.
 - b. ② Tilt the rear end of the power interface board with an angle to disengage it from the processor board.
 - c. ③ Remove the power interface board from the processor board.

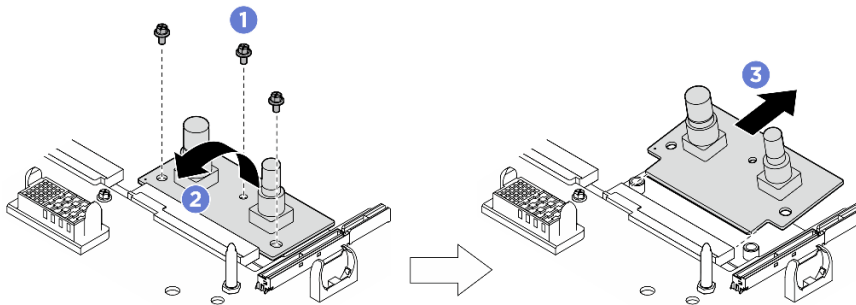


Figure 179. Power interface board removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the power interface board

Follow instructions in this section to install the power interface board. The procedure must be executed by a trained technician.

About this task**Attention:**

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 271 for more information on firmware updating tools.

Procedure

- Step 1. ① Align the power interface board with the connector on the processor board with an angle; then, carefully insert the power interface board into the connector.
- Step 2. ② Lower the rear end of the power interface board into the 2U compute shuttle.
- Step 3. ③ Fasten the three screws to secure the power interface board.

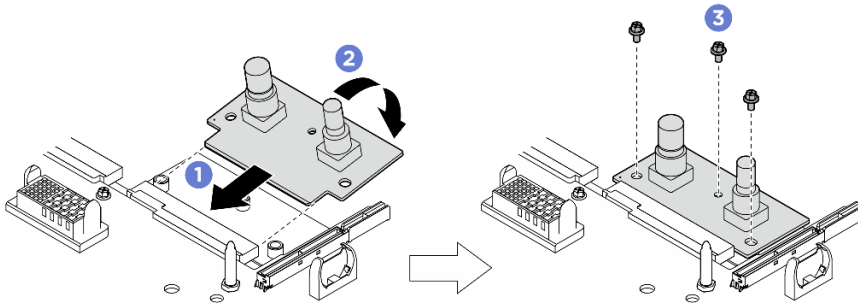


Figure 180. Power interface board installation

- Step 4. Connect the cables to the power interface board. See “Power interface board cable routing” on page 265 for more information.

After you finish

1. Reinstall the 2U compute shuttle. See “Install the 2U compute shuttle” on page 68.
2. Complete the parts replacement. See “Complete the parts replacement” on page 242.

Power supply unit replacement

Follow instructions in this section to remove or install a power supply unit.

Remove a hot-swap power supply unit

Follow instructions in this section to remove a hot-swap power supply unit.

About this task

CAUTION:



High touch current. Connect to earth before connecting to supply.

Attention:

- Read [“Installation Guidelines”](#) on page 37 and [“Safety inspection checklist”](#) on page 38 to ensure that you work safely.
- The following illustration shows the power supply bay numbering:

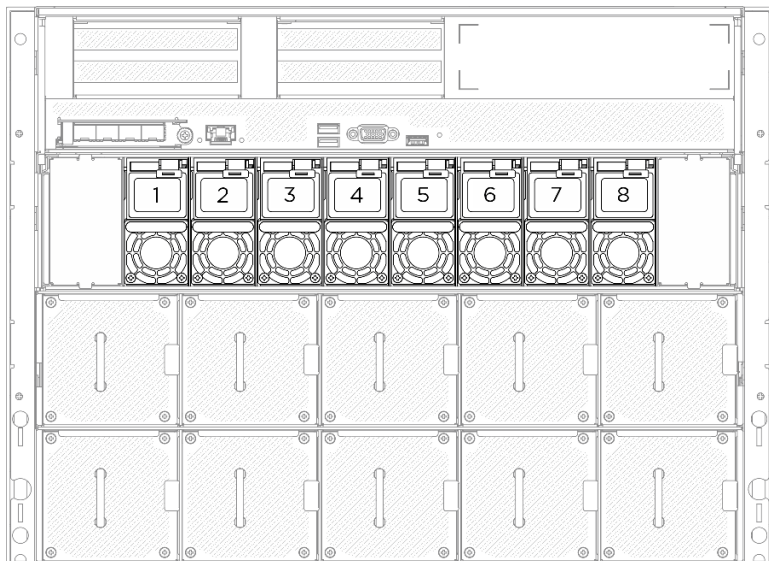


Figure 181. Power supply bay numbering

Procedure

- Step 1. 1 Press and hold the orange release tab.
- Step 2. 2 Grasp the handle, and pull the power supply unit out of the server.

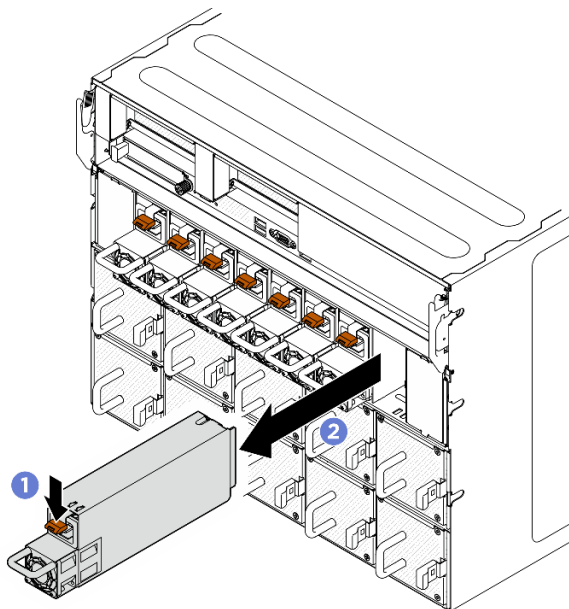


Figure 182. Power supply unit removal

After you finish

1. Install a power supply as soon as possible. See [“Install a hot-swap power supply unit”](#) on page 203.

Important: During normal operation, each power supply bay must contain a power supply unit for proper cooling.

2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a hot-swap power supply unit

Follow instructions in this section to install a hot-swap power supply unit.

About this task

CAUTION:



High touch current. Connect to earth before connecting to supply.

Attention:

- Read “Installation Guidelines” on page 37 and “Safety inspection checklist” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- The following illustration shows the power supply bay numbering:

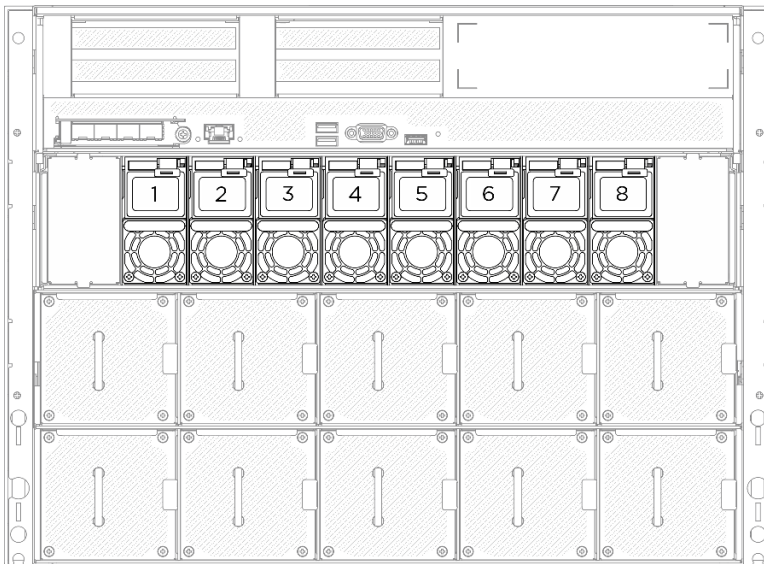


Figure 183. Power supply bay numbering

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 271 for more information on firmware updating tools.

Procedure

Step 1. Grasp the handle and slide the power supply unit into the power supply bay until it clicks into place.

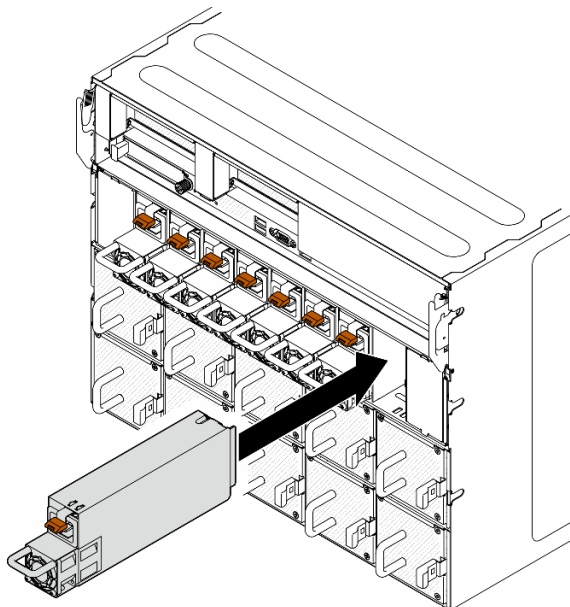


Figure 184. Power supply unit installation

After you finish

1. Pull the handle to see if the power supply unit is properly installed. If it slides out, reinstall it.
2. Connect the power cord to the power supply unit, and make sure it's properly connected to the power.
3. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).
4. If the server is turned off, turn on the server. Ensure that both the power input LED and the power output LED on the power supply are lit, indicating that the power supply is operating properly.

Processor air baffle replacement (trained technician only)

Follow instructions in this section to remove and install the processor air baffle.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the processor air baffle

Follow instructions in this section to remove the processor air baffle. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).

- If you intend to install memory modules in the 2U compute shuttle, you must first remove the processor air baffle from the server.

Procedure

- Step 1. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67](#).
- Step 2. If the M.2 backplane is installed on the processor air baffle, disconnect the M.2 backplane cables from the system board assembly.
- Step 3. Grasp the processor air baffle and carefully lift it out of the 2U compute shuttle.

Attention:

- For proper cooling and airflow, reinstall the processor air baffle before you turn on the server. Operating the server with the processor air baffle removed might damage server components.
- Service label is located on the processor air baffle.

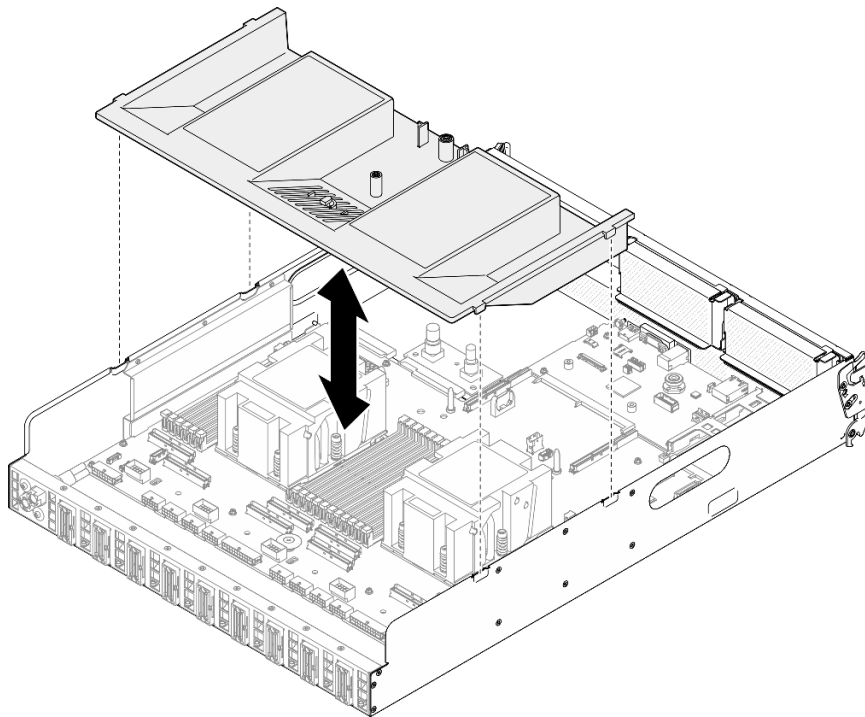


Figure 185. Processor air baffle removal

After you finish

1. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.
2. Remove the M.2 backplane from the processor air baffle. See [“Remove the M.2 backplane” on page 147](#).

Install the processor air baffle

Follow instructions in this section to install the processor air baffle. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Notes:

- If you are installing a new processor air baffle, attach the service label to the surface of the new processor air baffle if necessary.
- Close the retaining clip on each end of the memory module connector before installing the processor air baffle for proper cooling.

Procedure

- Step 1. Align the processor air baffle tabs with the slots on both sides of the 2U compute shuttle; then, lower the processor air baffle into the 2U compute shuttle until it is securely seated.

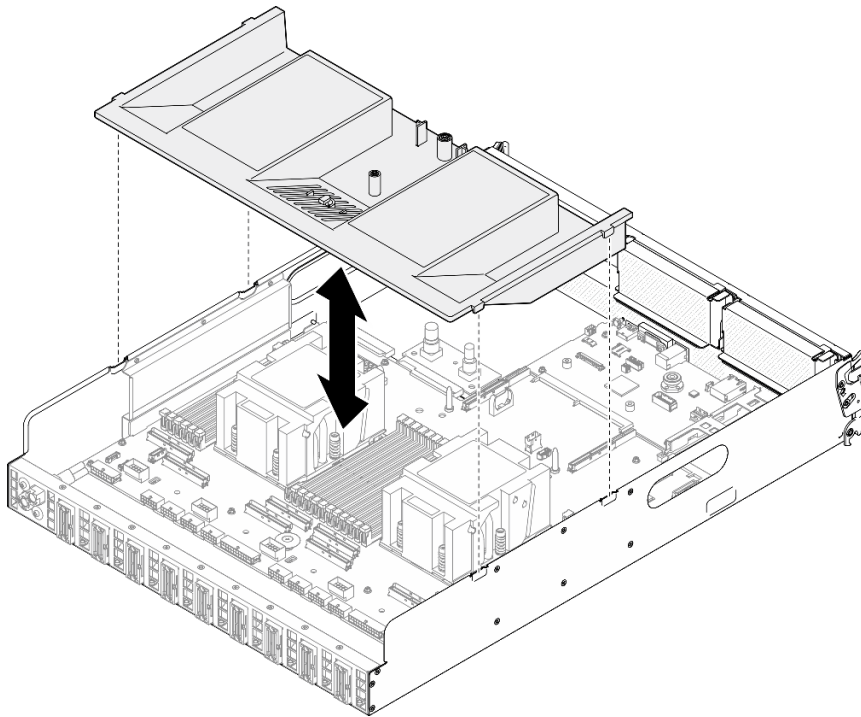


Figure 186. Processor air baffle installation

- Step 2. Slightly press the processor air baffle down until it is securely seated.
- Step 3. If applicable, connect the M.2 backplane cables to the system board assembly.

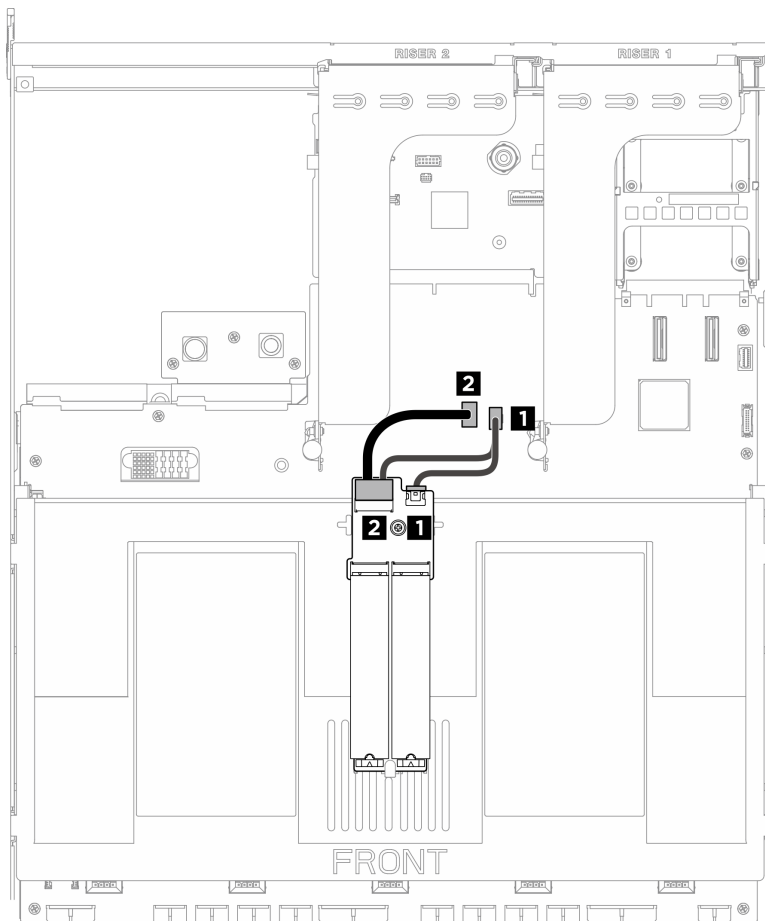


Figure 187. M.2 backplane cable connection

Cable	From	To
1	M.2 backplane: Power connector	System board assembly: M.2 power connector
2	M.2 backplane: Signal connector	System board assembly: M.2 signal connector

After you finish

1. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle” on page 68](#).
2. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

Processor and heat sink replacement (trained technician only)

Follow instructions in this section to remove and install a processor and a heat sink.

Important:

- This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.
- (Lenovo service technicians only) Before replacing a processor, check the current PSB fuse policy. See *Service process before replacement* at [Service process for updating PSB fuse state](#).

- (Lenovo service technicians only) After replacing a processor, ensure that the processor fuse status is expected without unexpected XCC event logs. See *Service process after replacing a processor* at [Service process for updating PSB fuse state](#).

Attention:

- Before reusing a processor or heat sink, make sure you use Lenovo proven alcohol cleaning pad and thermal grease.
- Each processor socket must always contain a cover or a processor. When replacing a processor, protect the empty processor socket with a cover.
- Do not touch the processor socket or processor contacts. Processor-socket contacts are very fragile and easily damaged. Contaminants on the processor contacts, such as oil from your skin, can cause connection failures.
- Do not allow the thermal grease on the processor or heat sink to come in contact with anything. Contact with any surface can compromise the thermal grease, rendering it ineffective. Thermal grease can damage components, such as the electrical connectors in the processor socket.

The following illustration shows the components of the processor and heat sink.

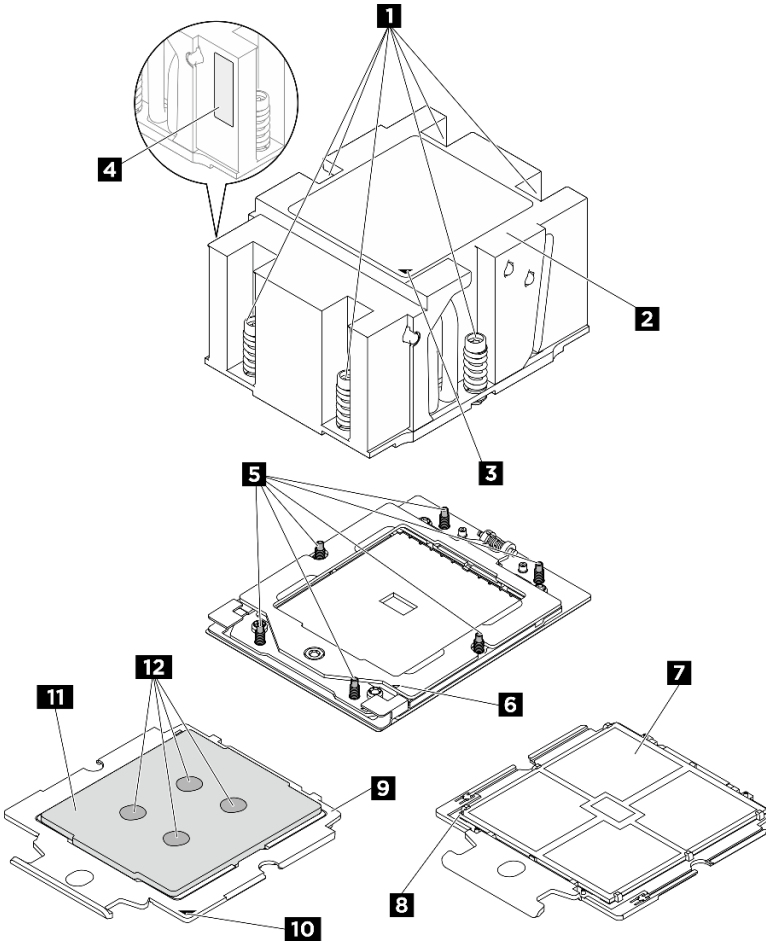


Figure 188. Processor and heat sink components

1 Captive screws (6)	2 Heat sink
3 Heat sink triangular mark	4 Processor identification label

5 Screw bolts (6)	6 Retention frame triangular mark
7 Processor contacts	8 Processor triangular mark
9 Processor carrier	10 Carrier triangular mark
11 Processor heat spreader	12 Thermal grease

Remove a heat sink

Follow instructions in this section to remove a heat sink. The procedure must be executed by a trained technician.

About this task

S002



CAUTION:

The power-control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

S012



CAUTION:

Hot surface nearby.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.

Note: Make sure you have a Torx T20 screwdriver available to properly replace the component.

Procedure

Step 1. Make preparation for this task.

- Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67](#).
- Remove the processor air baffle. See [“Remove the processor air baffle” on page 204](#).

Step 2. Remove the heat sink.

Notes:

- Do not touch the contacts on the bottom of the processor.
- Keep the processor socket clean from any object to prevent possible damages.
- a. ① Fully loosen all the screws on the heat sink **in the removal sequence shown** on the heat-sink label.
- b. ② Carefully lift the heat sink from the processor socket.

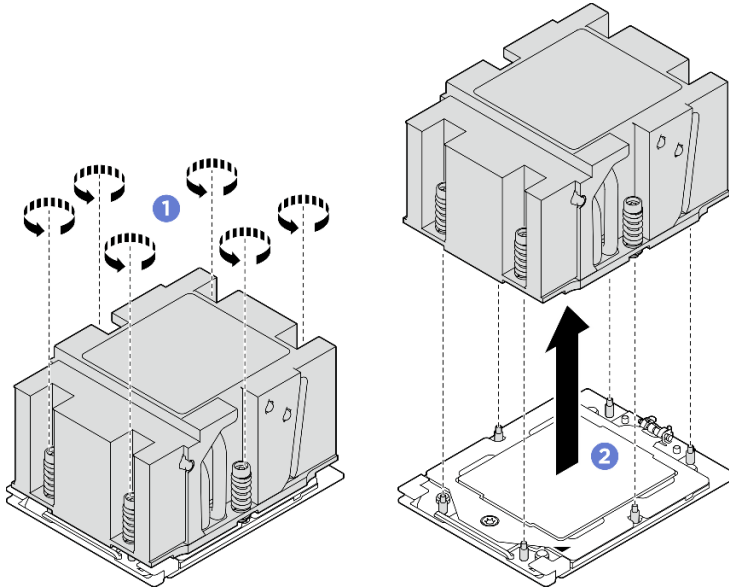


Figure 189. Heat sink removal

After you finish

1. If you are replacing a heat sink, install a new heat sink. See [“Install a heat sink” on page 212](#).
2. If you are replacing a processor, remove the processor. See [“Remove a processor” on page 210](#).
3. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Remove a processor

Follow instructions in this section to remove a processor. The procedure must be executed by a trained technician.

About this task**Attention:**

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.

Note: Make sure you have a Torx T20 screwdriver available to properly replace the component.

Procedure

Step 1. Make preparation for this task.

- a. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67](#).
- b. Remove the processor air baffle. See [“Remove the processor air baffle” on page 204](#).
- c. Remove the heat sink. See [“Remove a heat sink” on page 209](#).

Step 2. Remove the processor.

- a. ① Use a Torx T20 screwdriver to loosen the screw; then, slightly lift up the retention frame.
- b. ② Slightly lift up the rail frame in the direction shown. The processor in the rail frame is spring-loaded.
- c. ③ Hold the blue tab of the processor carrier and slide the processor carrier out of the rail frame.

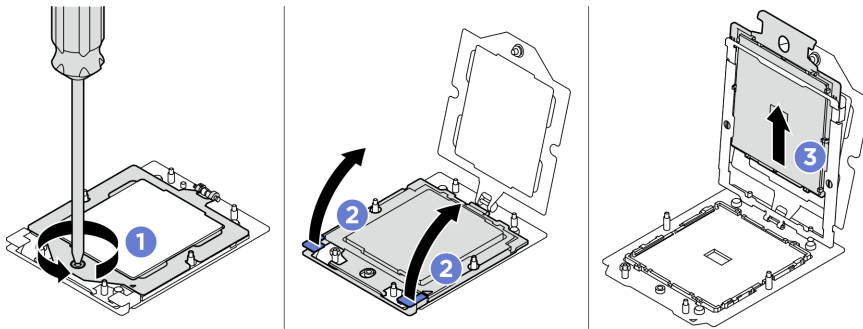


Figure 190. Processor removal

After you finish

1. If you are going to install a new processor. See [“Install a processor” on page 211](#).
2. Empty processor socket must always contain a socket cover and a filler before the server is powered on.
3. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a processor

Follow instructions in this section to install a processor. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.

Notes:

- Make sure you have a Torx T20 screwdriver available to properly replace the component.

- See <https://serverproven.lenovo.com> for a list of processors supported for your server. All processors on the system board assembly must have the same speed, number of cores, and frequency.
- Before you install a new processor, update your system firmware to the latest level. See “[Update the firmware](#)” on page 271.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “[Update the firmware](#)” on page 271 for more information on firmware updating tools.

Procedure

Step 1. Remove the processor socket cover.

Step 2. Install the processor.

- 1 Slide the processor carrier into the rail frame.
- 2 Push the rail frame down until the blue latches lock into place; then, close the retention frame.
- 3 Use a Torx T20 screwdriver to tighten the screw.

Attention:

- Make sure the processor carrier is well seated inside the rail frame.
- Make sure the rear of processor carrier does not float above the rail frame.

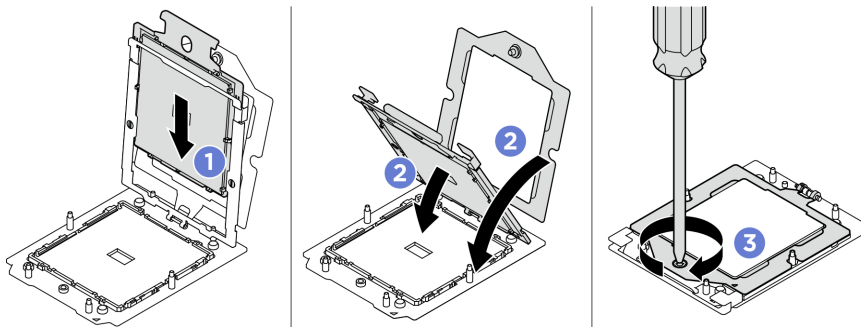


Figure 191. Processor installation

After you finish

1. Install the heat sink. See “[Install a heat sink](#)” on page 212.
2. Reinstall the processor air baffle. See “[Install the processor air baffle](#)” on page 205.
3. Reinstall the 2U compute shuttle. See “[Install the 2U compute shuttle](#)” on page 68.
4. Complete the parts replacement. See “[Complete the parts replacement](#)” on page 242.

Install a heat sink

Follow the instructions in this section to install a heat sink. The procedure must be executed by a trained technician.

About this task

S012



CAUTION:
Hot surface nearby.

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.

Note: Make sure you have a Torx T20 screwdriver available to properly replace the component.

Procedure

Step 1. Record the processor identification label.

To replace a processor and reuse the heat sink:

1. Remove the processor identification label from the heat sink and replace it with the new label that comes with the replacement processor.
2. Wipe off old thermal grease on the heat sink with an alcohol cleaning pad.

To replace a heat sink and reuse the processor:

1. Remove the processor identification label from the old heat sink and place it on the new heat sink in the same location.

Note: If you are unable to remove the label and place it on the new heat sink, or if the label is damaged during transfer, write the processor serial number from the processor identification label on the new heat sink in the same location as the label would be placed using a permanent marker.

2. Wipe off old thermal grease on the heat sink with an alcohol cleaning pad.
3. Check whether the manufacturing date on the new heat sink exceeds two years.
 - If yes, wipe off the thermal grease on the new heat sink with an alcohol cleaning pad, and go to [Step 2 Step 2 on page 213](#)
 - If no, go to [Step 3 Step 3 on page 214](#)

Step 2. Apply new thermal grease on the top of the processor with a syringe by forming four uniformly spaced dots, while each dot consists of about 0.1 ml of thermal grease.

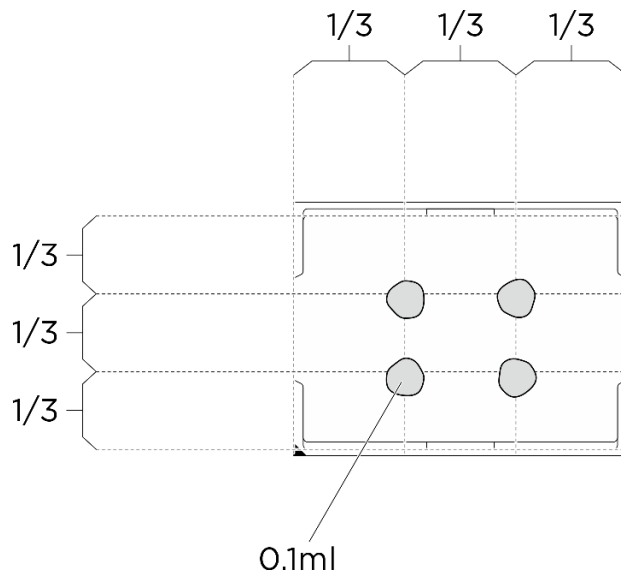


Figure 192. Thermal grease application

Step 3. Install the heat sink.

- a. 1 Align the triangular mark and screws on the heat sink with the triangular mark and threaded posts on the processor socket; then install the heat sink on the processor socket.
- b. 2 Fully tighten all the screws **in the installation sequence shown** on the heat sink label.

Note: For reference, the torque required for the fasteners to fully tighten is 1.22-1.46 newton-meters, 10.8-13.0 inch-pounds.

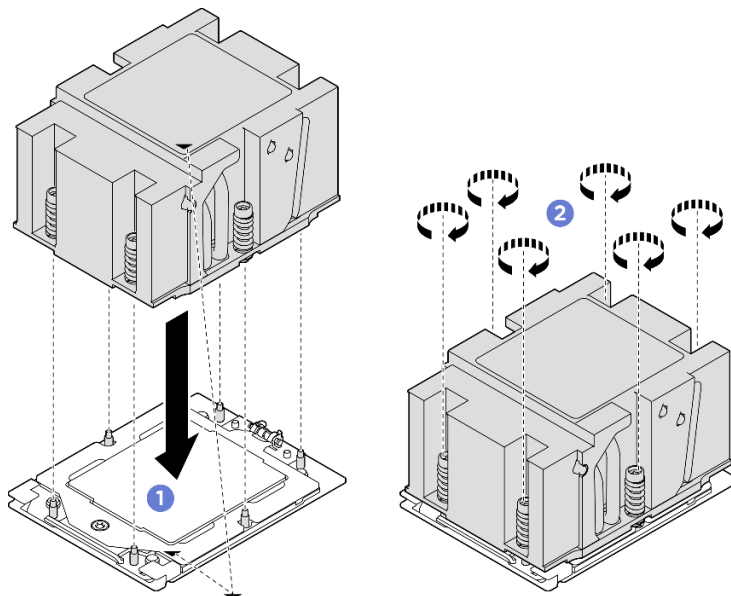


Figure 193. Heat sink installation

After you finish

1. Reinstall the processor air baffle. See [“Install the processor air baffle”](#) on page 205.

2. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle” on page 68](#).
3. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

PSU cage replacement (trained technician only)

Follow instructions in this section to remove and install the PSU cage.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the PSU cage

Follow instructions in this section to remove the PSU cage. The procedure must be executed by a trained technician.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See [“Remove a hot-swap power supply unit” on page 201](#).
- b. Remove all the front fans. See [“Remove a hot-swap fan \(front and rear\)” on page 79](#).
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See [“Remove a 2.5-inch hot-swap drive” on page 58](#).
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See [“Remove the 8U GPU shuttle” on page 69](#).
- e. Remove the power complex. See [“Remove the power complex” on page 192](#).

Step 2. Remove the PSU interposer.

- a. ① Pull out the two plungers.
- b. ② Rotate the two release latches to disengage the PSU interposer from the power distribution board.
- c. ③ Grasp the PSU interposer by its edges and carefully pull it out of the power complex.

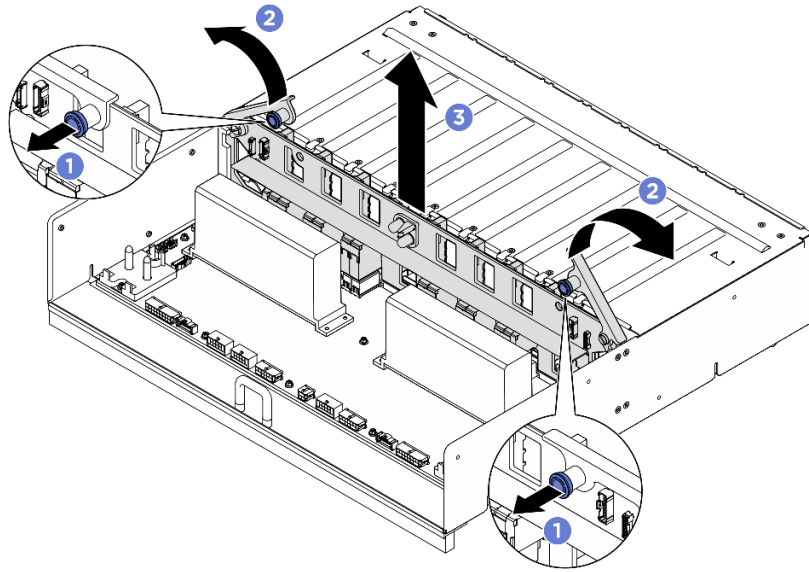


Figure 194. PSU interposer removal

- Step 3. Remove the two cable retainers from the power distribution board.
- a. Unfasten the two screws to lift the cable retainer out of the power distribution board.
 - b. Repeat to remove the other cable retainer.

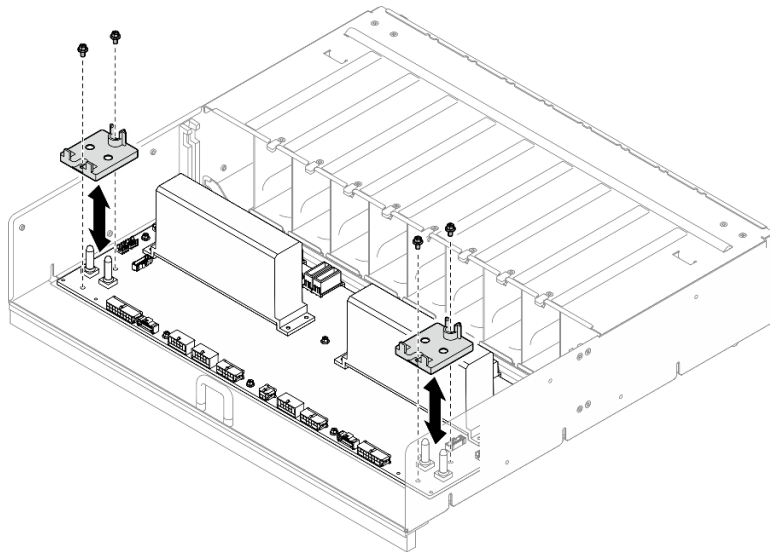


Figure 195. Cable retainer removal

- Step 4. Unfasten the ten screws to remove the power distribution board from the PSU cage.

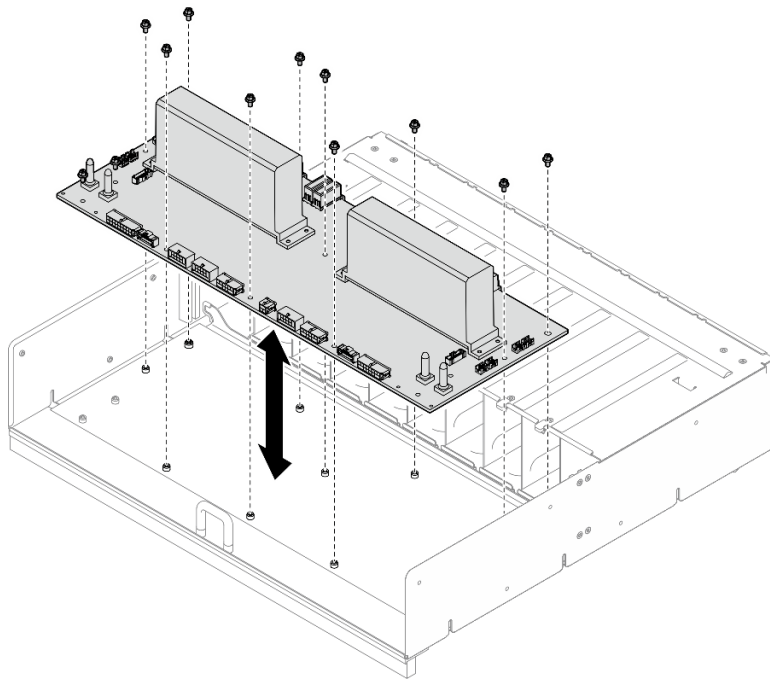


Figure 196. Power distribution board removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the PSU cage

Follow instructions in this section to install the PSU cage. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Install the power distribution board.

- a. Align the power distribution board with the ten standoffs on the PSU cage; then, lower the power distribution board into the PSU cage.
- b. Fasten the ten screws to secure the power distribution board.

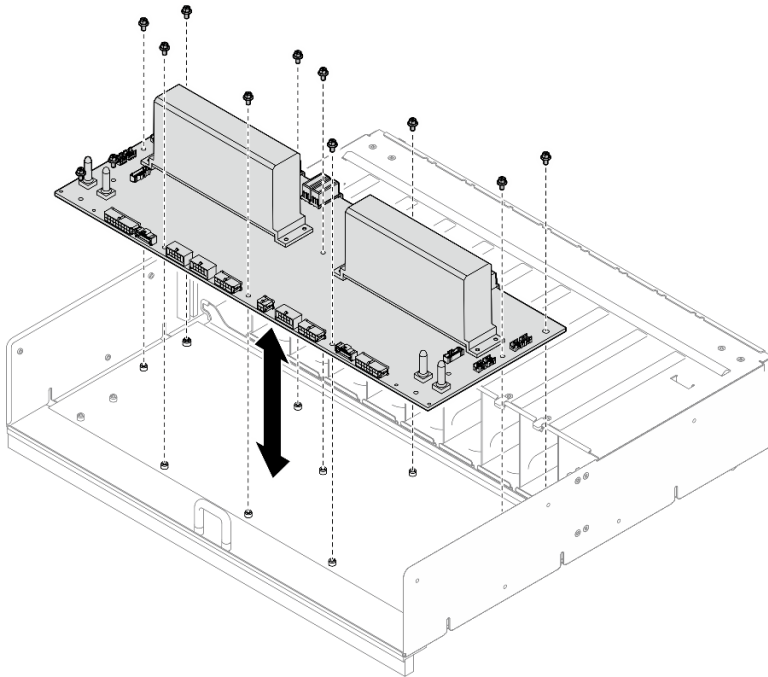


Figure 197. Power distribution board installation

- Step 2. Install the two cable retainers to the power distribution board.
- Align the cable retainer with the screw holes on the power distribution board; then, place the cable retainer onto the power distribution board.
 - Fasten the two screws to secure the cable retainer.
 - Repeat to install the other cable retainer.

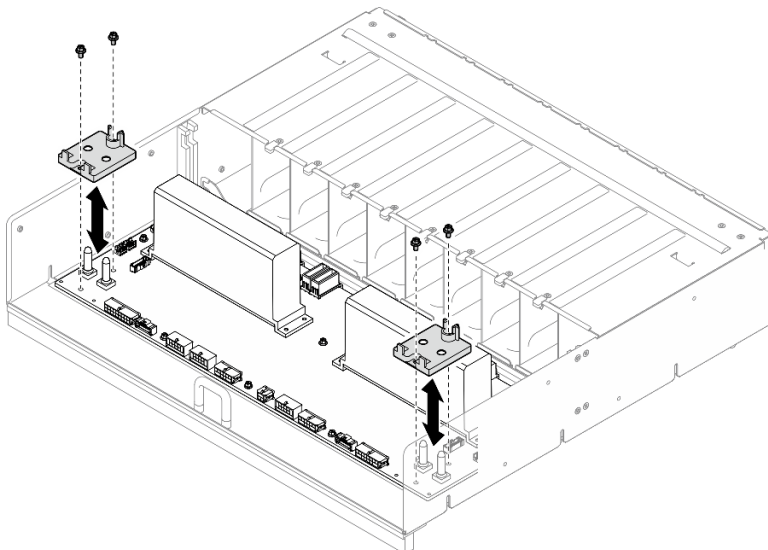


Figure 198. Cable retainer installation

- Step 3. Install the PSU interposer.
- ① Align the PSU interposer with its connectors on the power distribution board; then, press the PSU interposer into the connectors until it is fully seated.

- b. 2 Pull out the two plungers.
- c. 3 Rotate the two release latches down until they stop.

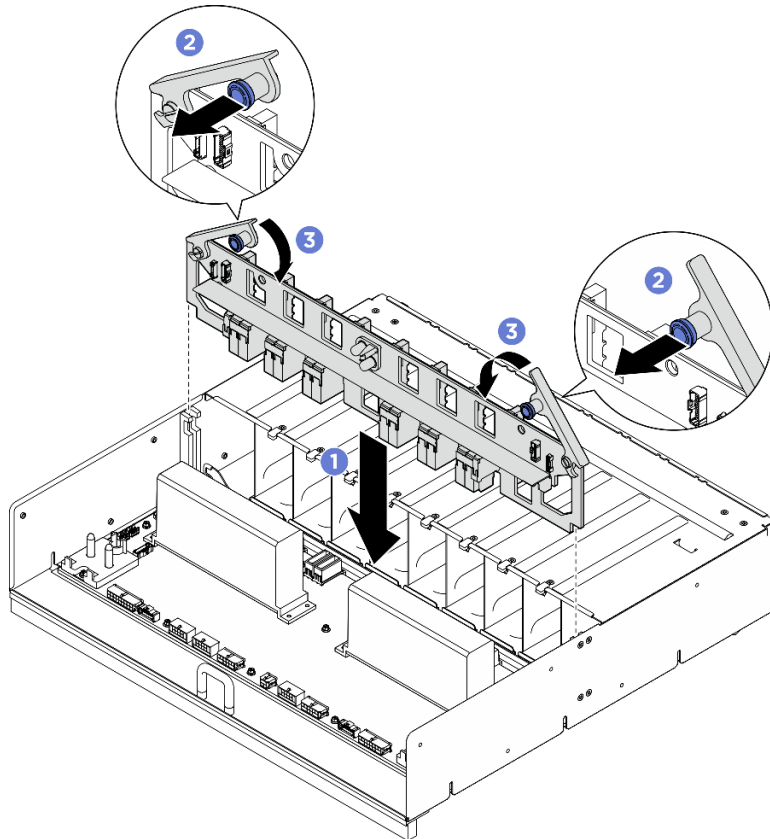


Figure 199. PSU interposer installation

After you finish

1. Reinstall the power complex. See [“Install the power complex” on page 194](#).
2. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle” on page 71](#).
3. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive” on page 60](#)
4. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)” on page 81](#).
5. Reinstall all the power supply units. See [“Install a hot-swap power supply unit” on page 203](#).
6. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).

PSU interposer replacement (trained technician only)

Follow instructions in this section to remove and install the PSU interposer.

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install the part without proper training and qualification.

Remove the PSU interposer

Follow instructions in this section to remove the PSU interposer. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “[Power off the server](#)” on page 43.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Procedure

Step 1. Make preparation for this task.

- a. Remove all the power supply units. See “[Remove a hot-swap power supply unit](#)” on page 201.
- b. Remove all the front fans. See “[Remove a hot-swap fan \(front and rear\)](#)” on page 79.
- c. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See “[Remove a 2.5-inch hot-swap drive](#)” on page 58.
- d. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See “[Remove the 8U GPU shuttle](#)” on page 69.

Step 2. Disconnect the cables from the PSU interposer.

Step 3. Remove the PSU interposer.

- a. ❶ Pull out the two plungers.
- b. ❷ Rotate the two release latches to disengage the PSU interposer from the power distribution board.
- c. ❸ Grasp the PSU interposer by its edges and carefully pull it out of the power complex.

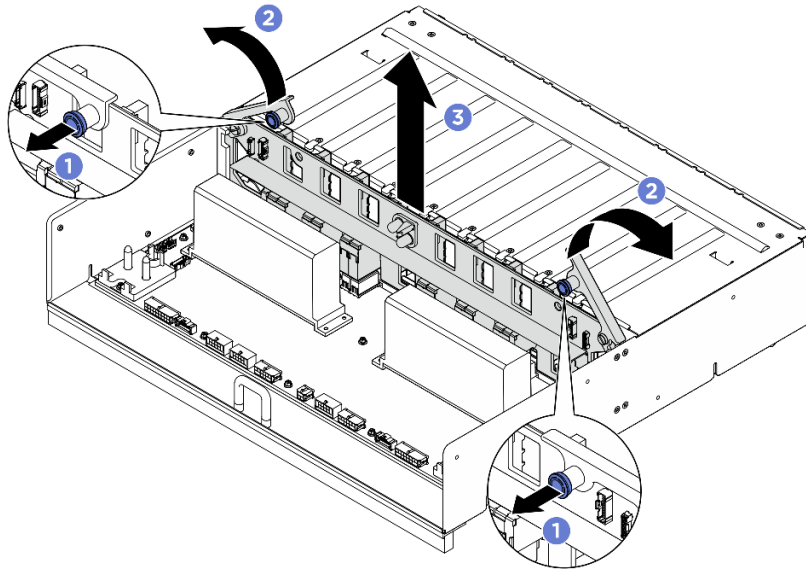


Figure 200. PSU interposer removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the PSU interposer

Follow instructions in this section to install the PSU interposer. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure. If you do not already have a lifting device available, Lenovo offers the Genie Lift GL-8 material lift that can be purchased at Data Center Solution Configurator: <https://dcsc.lenovo.com/#/configuration/cto/7D5YCTO1WW?hardwareType=lifttool>. Make sure to include the Foot-release brake and the Load Platform when ordering the Genie Lift GL-8 material lift.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “[Update the firmware](#)” on page 271 for more information on firmware updating tools.

Procedure

Step 1. ① Align the PSU interposer with its connectors on the power distribution board; then, press the PSU interposer into the connectors until it is fully seated.

Step 2. ② Pull out the two plungers.

Step 3. ③ Rotate the two release latches down until they stop.

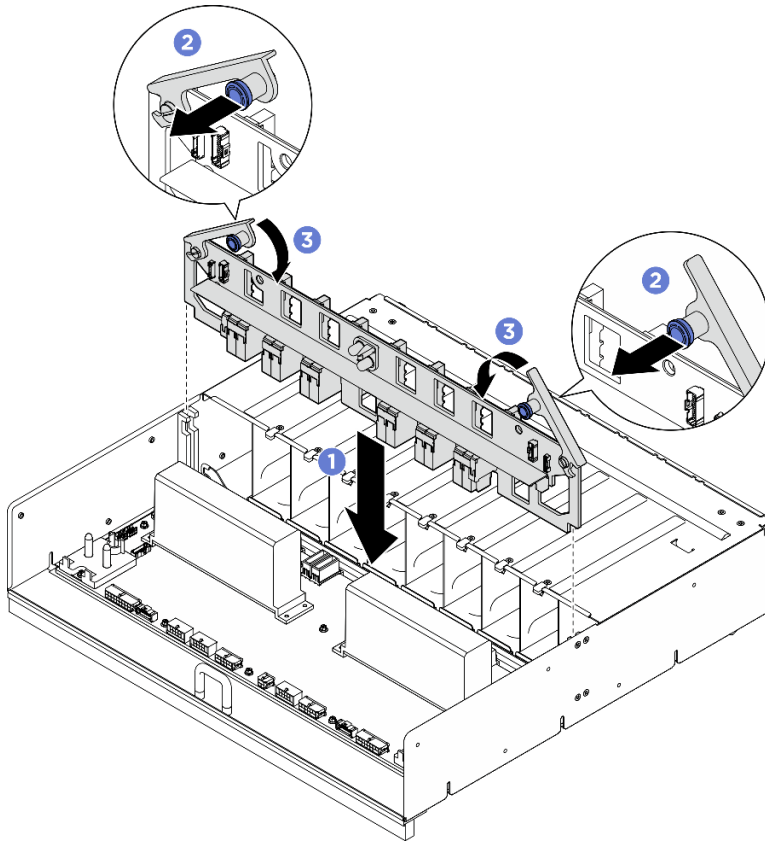


Figure 201. PSU interposer installation

Step 4. Connect the cables to the PSU interposer. See [“Power interface board cable routing”](#) on page 265 and [“PSU interposer cable routing”](#) on page 267 for more information.

After you finish

1. Reinstall the 8U GPU shuttle. See [“Install the 8U GPU shuttle”](#) on page 71.
2. Reinstall all the 2.5-inch hot-swap drives or drive bay fillers (if any) into the drive bays. See [“Install a 2.5-inch hot-swap drive”](#) on page 60
3. Reinstall all the front fans. See [“Install a hot-swap fan \(front and rear\)”](#) on page 81.
4. Reinstall all the power supply units. See [“Install a hot-swap power supply unit”](#) on page 203.
5. Complete the parts replacement. See [“Complete the parts replacement”](#) on page 242.

System board assembly replacement (trained technician only)

Follow instructions in this section to remove and install the system board assembly.

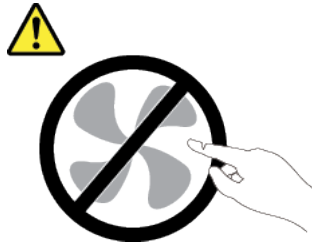
Important:

- This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install it without proper training and qualification.

- If you need to replace a processor board and a firmware and RoT security module together, do the following:
 - (Lenovo service technicians only) Check the current PSB fuse policy before replacement. See *Service process before replacement* at [Service process for updating PSB fuse state](#).
 - (Lenovo service technicians only) Ensure that the processor fuse status is expected without unexpected XCC event logs after replacement. See *Service process after replacing a processor board and a firmware and RoT security module together* at [Service process for updating PSB fuse state](#).

CAUTION:

Hazardous moving parts. Keep fingers and other body parts away.



CAUTION:



The heat sinks and processors might be very hot. Turn off the server and wait several minutes to let the server cool before removing the server cover.

The following illustration shows the layout of the system board assembly which contains the firmware and RoT security module, system I/O board, and processor board.

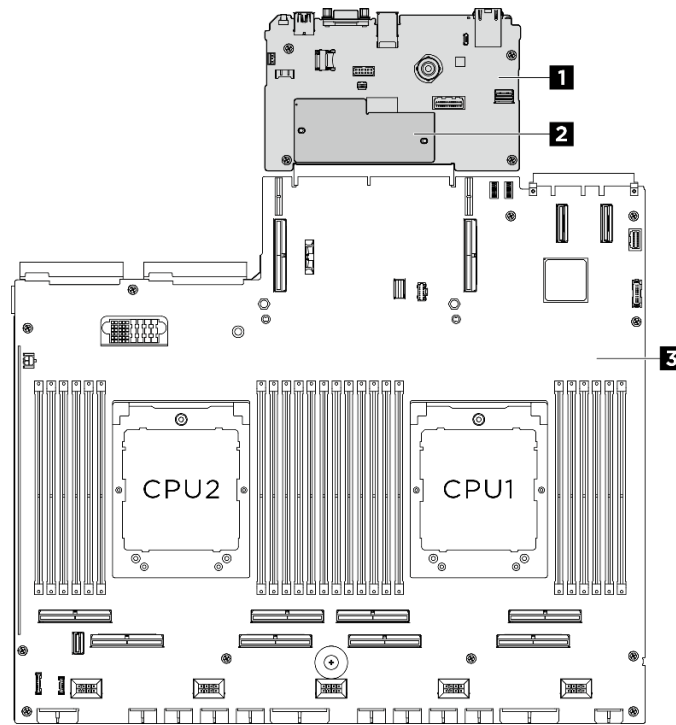


Figure 202. System-board-assembly layout

1 System I/O board	2 Firmware and RoT security module	3 Processor board
--------------------	------------------------------------	-------------------

Remove the firmware and RoT security module

Follow instructions in this section to remove the ThinkSystem V3 Firmware and Root of Trust Security Module (firmware and RoT security module). The procedure must be executed by a trained technician.

About this task

Important: This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install it without proper training and qualification.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.
- After replacing the firmware and RoT security module, update the firmware to the specific version supported by the server. Make sure that you have the required firmware or a copy of the pre-existing firmware before you proceed.

Procedure

Step 1. Make preparation for this task.

- a. Perform OneCLI commands to back up the UEFI settings. See https://pubs.lenovo.com/lxce-onecli/onecli_r_save_command.
- b. Perform both OneCLI commands and XCC actions to back up the XCC settings. See https://pubs.lenovo.com/lxce-onecli/onecli_r_save_command and https://pubs.lenovo.com/xcc2/NN1ia_c_backupthexcc.html.
- c. Remove the 2U compute shuttle. See “Remove the 2U compute shuttle” on page 67.
- d. If applicable, remove the PCIe riser assembly 2. See “Remove a PCIe riser assembly” on page 167.

Step 2. Remove the firmware and RoT security module.

- a. ① Loosen the two screws on the firmware and RoT security module.
- b. ② Lift the firmware and RoT security module out of the system I/O board.

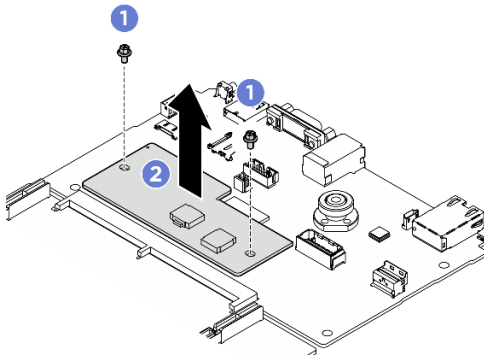


Figure 203. Firmware and RoT security module removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the firmware and RoT security module

Follow instructions in this section to install the ThinkSystem V3 Firmware and Root of Trust Security Module (firmware and RoT security module). The procedure must be executed by a trained technician.

About this task

Important:

- This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install it without proper training and qualification.
- (Lenovo trained technicians only) After replacing the Firmware and RoT Security Module, update the UEFI, XCC and LXPM firmware to the specific version supported by the server. For detailed information on how to update the firmware, see <https://glosse4lenovo.lenovo.com/wiki/glosse4lenovo/view/How%20To/System%20related/How%20to%20do%20RoT%20Module%20FW%20update%20on%20ThinkSystem%20V3%20machines/>.

Attention:

- Read “Installation Guidelines” on page 37 and “Safety inspection checklist” on page 38 to ensure that you work safely.

- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).
- Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to [“Update the firmware” on page 271](#) for more information on firmware updating tools.

Procedure

- Step 1. Touch the static-protective package that contains the new part to any unpainted surface on the outside of the server. Then, take the new part out of the package and place it on a static-protective surface.
- Step 2. Install the firmware and RoT security module.
- 1 Lower the firmware and RoT security module onto the system I/O board and ensure that the connector on the module is correctly inserted into the slot on the system I/O board.
 - 2 Tighten the two screws to secure the firmware and RoT security module in place.

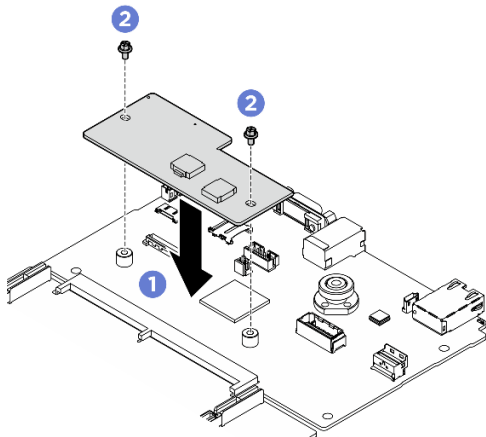


Figure 204. Firmware and RoT security module installation

After you finish

1. If applicable, reinstall the PCIe riser assembly 2. See [“Install a PCIe riser assembly” on page 170](#).
2. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle” on page 68](#).
3. Complete the parts replacement. See [“Complete the parts replacement” on page 242](#).
4. (Lenovo service technicians only) Update the UEFI, XCC and LXPM firmware to the specific version supported by the server. See <https://glosse4lenovo.lenovo.com/wiki/glosse4lenovo/view/How%20To/System%20related/How%20to%20do%20RoT%20Module%20FW%20update%20on%20ThinkSystem%20V3%20machines/>.
5. Perform OneCLI commands to restore the UEFI settings. See https://pubs.lenovo.com/lxce-onecli/onecli_r_restore_command.

6. Perform both OneCLI commands and XCC actions to restore the XCC settings. See https://pubs.lenovo.com/lxce-onecli/onecli_r_restore_command and https://pubs.lenovo.com/xcc2/NN1ia_c_restorethexcc.html.
7. If there is a software (SW) key, for example, XCC FoD key, installed in the system, inject the key again to ensure that the key functions properly. See <https://lenovopress.lenovo.com/redp4895.pdf>.

Note: If you need to replace the processor board together with the firmware and RoT security module, update the VPD before injecting the key. See [Update the Vital Product Data \(VPD\)](#).

8. Optionally, do the following if needed:
 - Hide TPM. See [“Hide/observe TPM” on page 240](#).
 - Update the TPM firmware. See [“Update the TPM firmware” on page 241](#).
 - Enable UEFI Secure Boot. See [“Enable UEFI Secure Boot” on page 242](#).

Remove the system I/O board or processor board

Follow instructions in this section to remove the system I/O board or processor board. The procedure must be executed by a trained technician.

About this task

Important:

- This task must be operated by trained technicians that are certified by Lenovo Service. Do not attempt to remove or install it without proper training and qualification.
- When removing the memory modules, label the slot number on each memory module, remove all the memory modules from the system board assembly, and set them aside on a static-protective surface for reinstallation.
- **When disconnecting cables, make a list of each cable and record the connectors the cable is connected to, and use the record as a cabling checklist after installing the new system board assembly.**

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See [“Power off the server” on page 43](#).

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Phillips #1 screwdriver
- Phillips #2 screwdriver
- 5 mm hex socket screwdriver bit
- 7 mm hex socket screwdriver bit

Procedure

Step 1. Make preparation for this task.

- a. Record all system configuration information, such as Lenovo XClarity Controller IP addresses, vital product data, and the machine type, model number, serial number, Universally Unique Identifier, and asset tag of the server.
- b. Save the system configuration to an external device with Lenovo XClarity Essentials.
- c. Save the system event log to external media.

Step 2. Remove the following components.

- a. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67.](#)
- b. Remove the processor air baffle. See [“Remove the processor air baffle” on page 204.](#)
- c. Remove all the processors and the heat sinks. See [“Remove a processor” on page 210](#) and [“Remove a heat sink” on page 209.](#)
- d. Make sure to label the slot number on each memory module, remove all the memory modules from the system board assembly, and set them aside on a static-protective surface for reinstallation. See [“Remove a memory module” on page 152.](#)

Important: It is advised to print out the layout of memory module slots for reference.

- e. If applicable, remove the PCIe riser assembly(ies). See [“Remove a PCIe riser assembly” on page 167.](#)
- f. If applicable, remove the OCP module. See [“Remove the OCP module” on page 159.](#)

Step 3. Disconnect all the cables from the system board assembly. As you disconnect the cables, make a list of each cable and record the connectors the cables are connected to, and use the record as a cabling checklist after installing the new system board assembly.

Step 4. Remove the two cable guides.

- a. Unfasten the six screws to lift the cable guide out of the 2U compute shuttle.

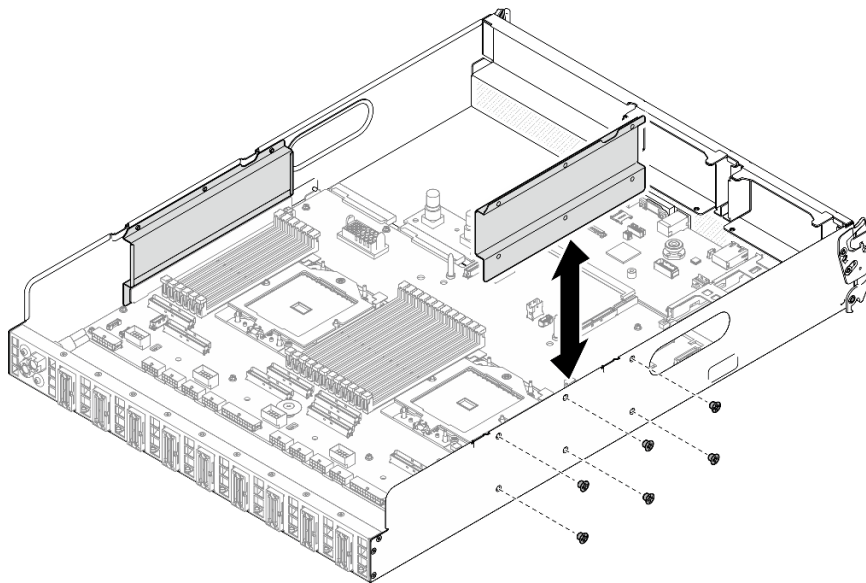


Figure 205. Cable guide removal

- b. Repeat to remove the other cable guide.

Step 5. Disengage the system board assembly.

- a. ① Pull up the rear lifting handle to release the system board assembly.
- b. ② Grasp both lifting handles and slide the system board assembly toward the front of the 2U compute shuttle.

Note: The two lifting handles only serve the purpose of removing system board assembly. Do not attempt to lift the whole 2U compute shuttle with them.

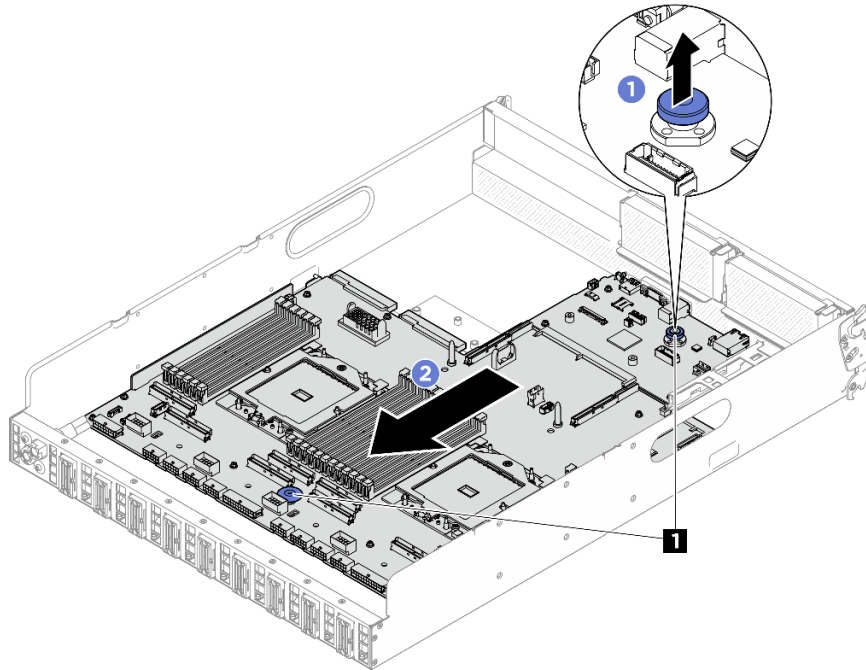


Figure 206. System board assembly disengagement

1 Lifting handles

Step 6. Remove the system board assembly.

- a. **1** Tilt the system board assembly so that its rear end is up.
- b. **2** Hold both lifting handles, and lift the system board assembly out of the 2U compute shuttle.

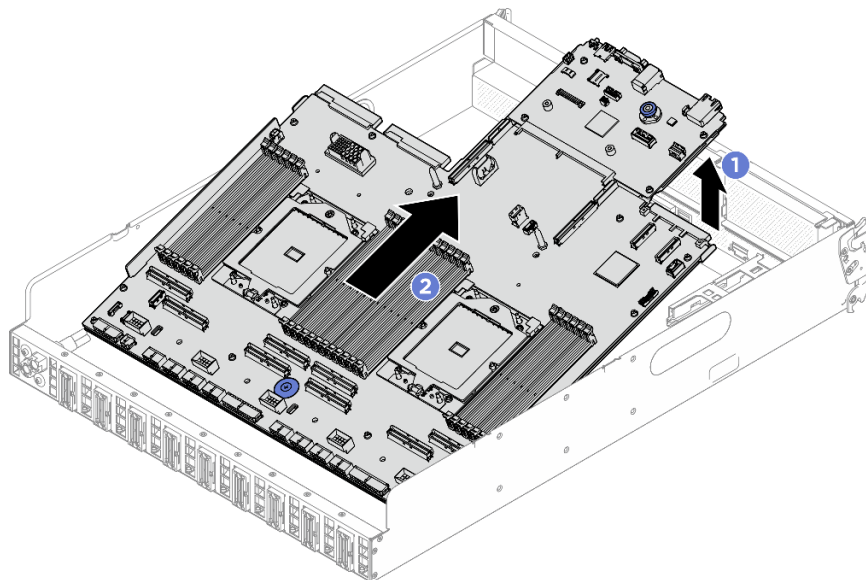


Figure 207. System board assembly removal

Step 7. (Optional) If you are going to replace the system I/O board, remove the firmware and RoT security module from the system I/O board. See [“Remove the firmware and RoT security module”](#) on page 224. If you are going to replace the processor board, go to next step directly.

- Step 8. Remove the system I/O board from the processor board.
- a. Separate the system board assembly from the supporting sheet metal.
 1. Hold the two lifting handles, and carefully turn the system board assembly upside down.

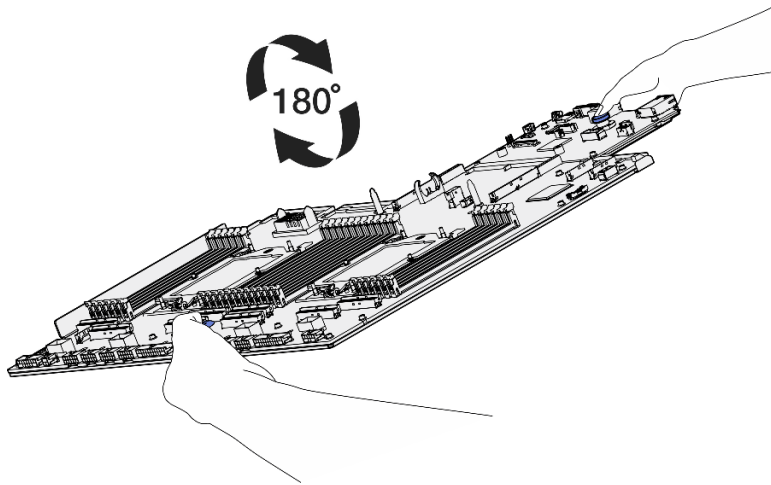


Figure 208. Turning the system board assembly upside down

2. Use a Phillips #1 screwdriver to remove the two screws from the bottom of the supporting sheet metal.

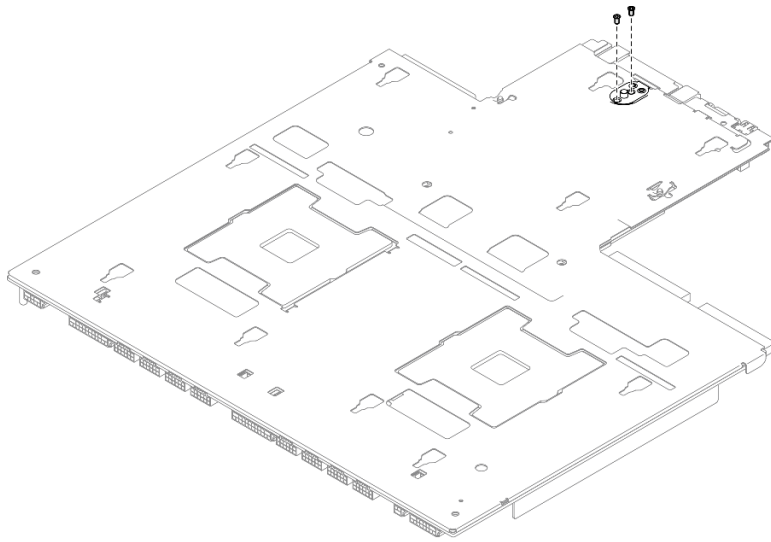


Figure 209. Screw removal

3. Hold the two lifting handles, and carefully turn the system board assembly right-side up.

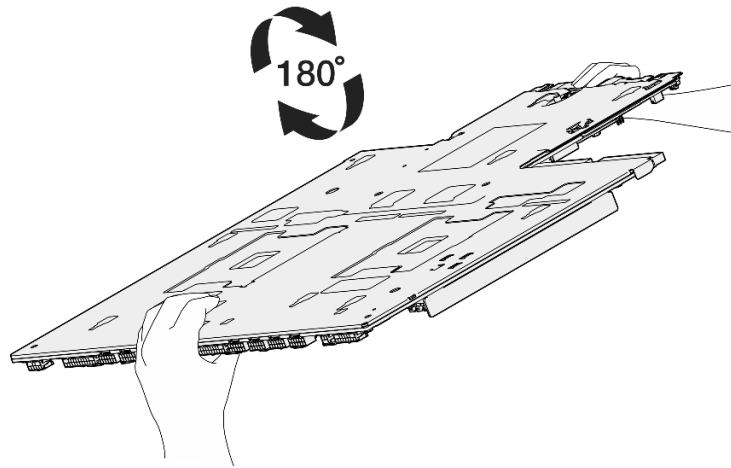


Figure 210. Turning the system board assembly right-side up

4. Remove the following components from the system board assembly as illustrated:
 - Use a 5 mm hex socket with a screwdriver to remove the two hex nuts.
 - Use a 7 mm hex socket with a screwdriver to remove the two guide pins.
 - Use a Phillips #2 screwdriver to remove the lifting handle.
 - Use a Phillips #1 screwdriver to remove the fifteen screws

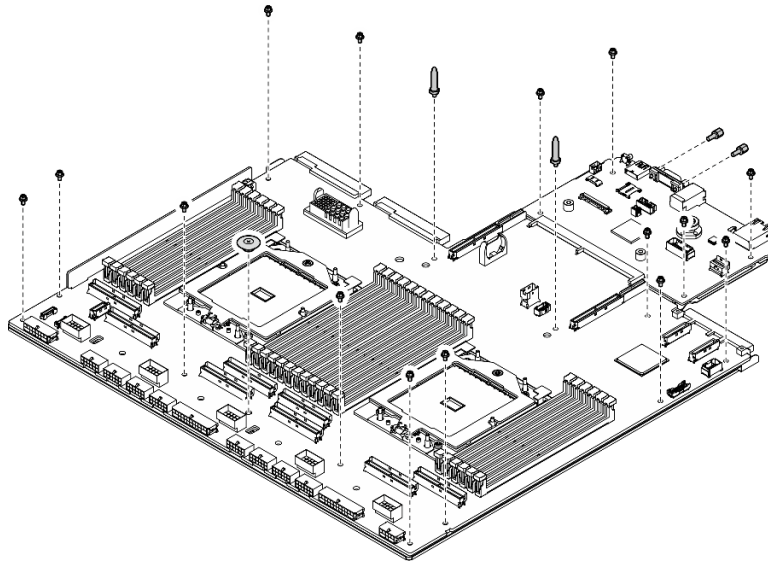


Figure 211. Component removal

5. Separate the system board assembly from the supporting sheet metal.

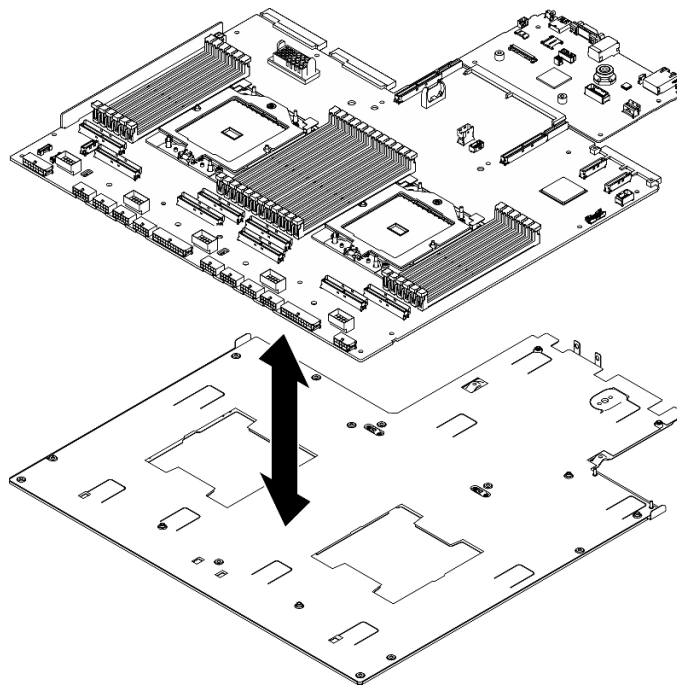


Figure 212. System board assembly disassembly

- b. Grasp the system I/O board by its edges, and carefully pull it out of the processor board.

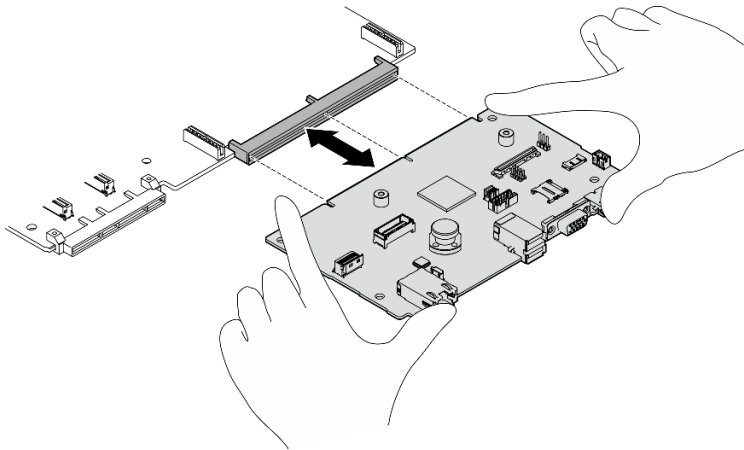


Figure 213. System I/O board removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Important: Before you return the processor board, make sure that you install the processor socket covers from the new processor board. To replace a processor socket cover:

1. Take a socket cover from the processor socket assembly on the new processor board and orient it correctly above the processor socket assembly on the removed processor board.

2. Gently press down the socket cover legs to the processor socket assembly, pressing on the edges to avoid damage to the socket pins. You might hear a click on the socket cover when it is securely attached.
3. **Make sure** that the socket cover is securely attached to the processor socket assembly.

Install the system I/O board or processor board

Follow instructions in this section to install the system I/O board or processor board. The procedure must be executed by a trained technician.

About this task

Important: Removing and installing this component requires trained technicians. **Do not** attempt to remove or install it without proper training.

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Phillips #1 screwdriver
- Phillips #2 screwdriver
- 5 mm hex socket screwdriver bit
- 7 mm hex socket screwdriver bit

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “[Update the firmware](#)” on page 271 for more information on firmware updating tools.

Procedure

Step 1. Depending on the needs, do one of the following:

- If you are going to replace the system I/O board and reuse the processor board, install a new system I/O board onto the processor board.
- If you are going to replace the processor board and reuse the system I/O board, install the existing system I/O board onto a new processor board.
- a. Install the system I/O board onto the processor board.
 1. Align the system I/O board with the connector on the processor board, and use both hands to push the system I/O board and slightly insert it into the connector.

Note: To prevent the contact of the system I/O board from damage, ensure that the system I/O board is aligned correctly with the connector on the processor board, and remains as horizontal as possible during the insertion.

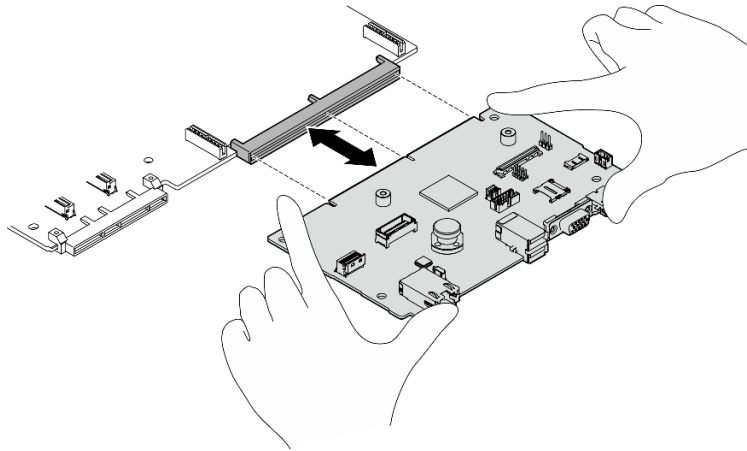


Figure 214. System I/O board installation

- b. Install the system board assembly to the supporting sheet metal.
 1. Lower the system board assembly into the supporting sheet metal.

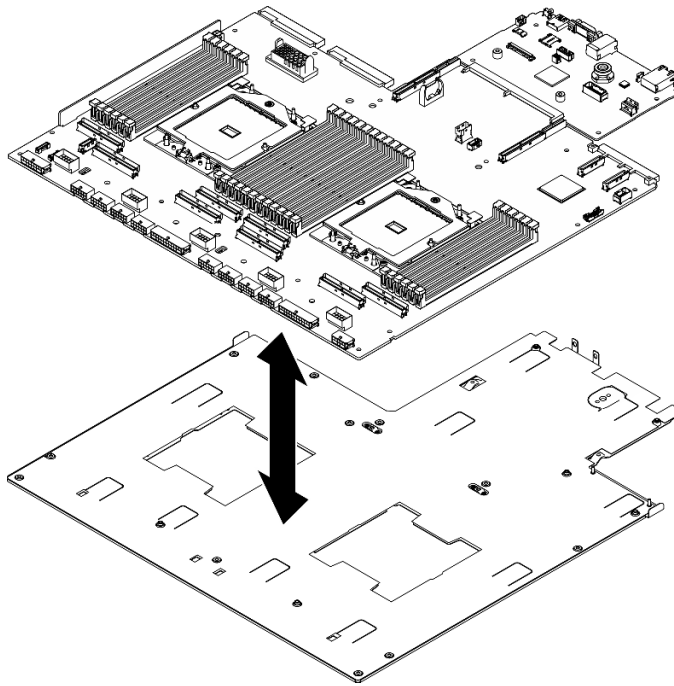


Figure 215. System board assembly installation

2. Install the following components to the system board assembly as illustrated:
 - Use a 5 mm hex socket with a screwdriver to install the two hex nuts.
 - Use a 7 mm hex socket with a screwdriver to install the two guide pins.
 - Use a Phillips #2 screwdriver to install the lifting handle.
 - Use a Phillips #1 screwdriver to install the fifteen screws.

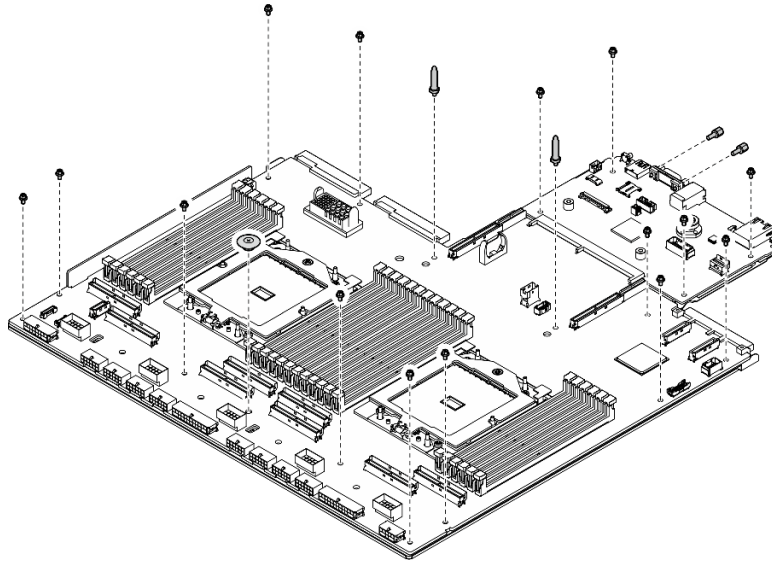


Figure 216. Component installation

3. Hold the two lifting handles, and carefully turn the system board assembly upside down.

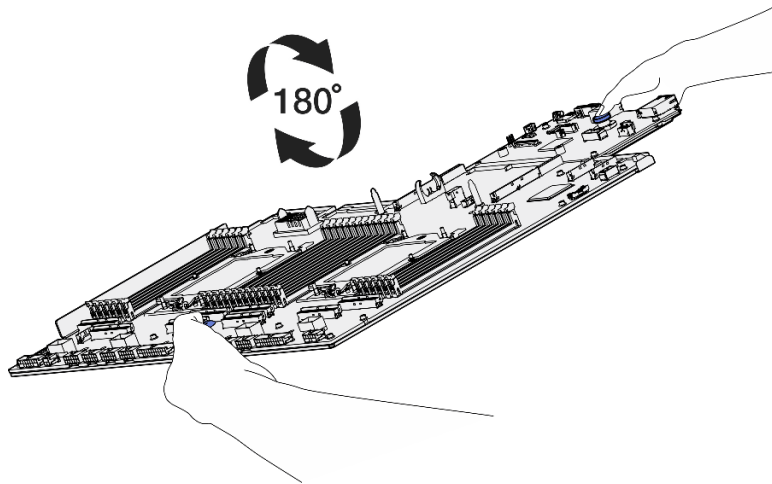


Figure 217. Turning the system board assembly upside down

4. Use a Phillips #1 screwdriver to fasten the two screws on the bottom of the supporting sheet metal.

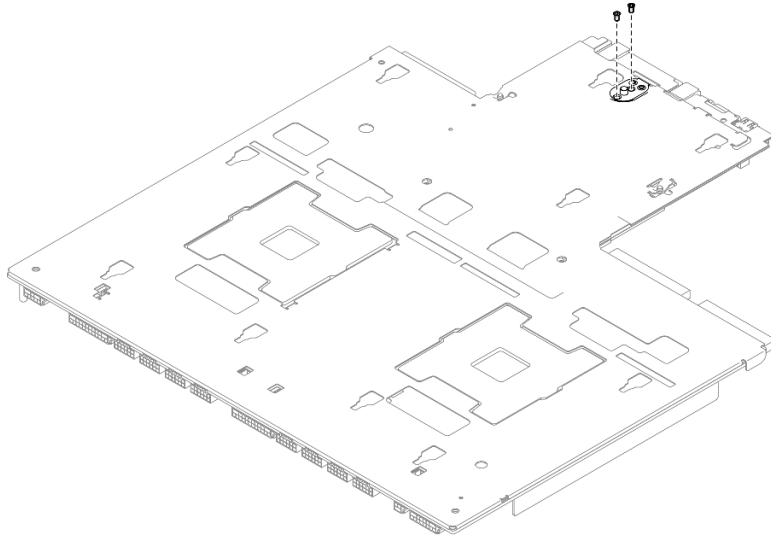


Figure 218. Screw installation

5. Hold the two lifting handles, and carefully turn the system board assembly right-side up.

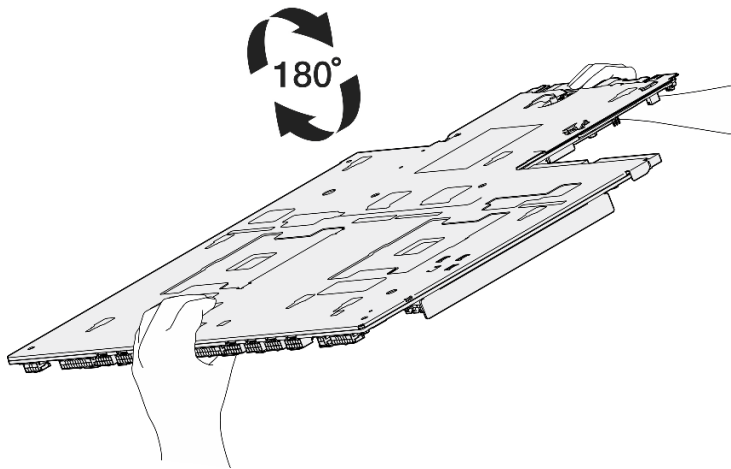


Figure 219. Turning the system board assembly right-side up

- Step 2. (Optional) If you installed a new system I/O board onto the processor board, install the firmware and RoT security module that was removed from the old system I/O board onto the new system I/O board. See [“Install the firmware and RoT security module” on page 225](#).
- Step 3. Place the system board assembly inside the 2U compute shuttle.
 - a. ❶ Grasp the two lifting handles on the system board assembly, and tilt the system board assembly so that its rear end is up.
 - b. ❷ Lower the system board assembly into the 2U compute shuttle.

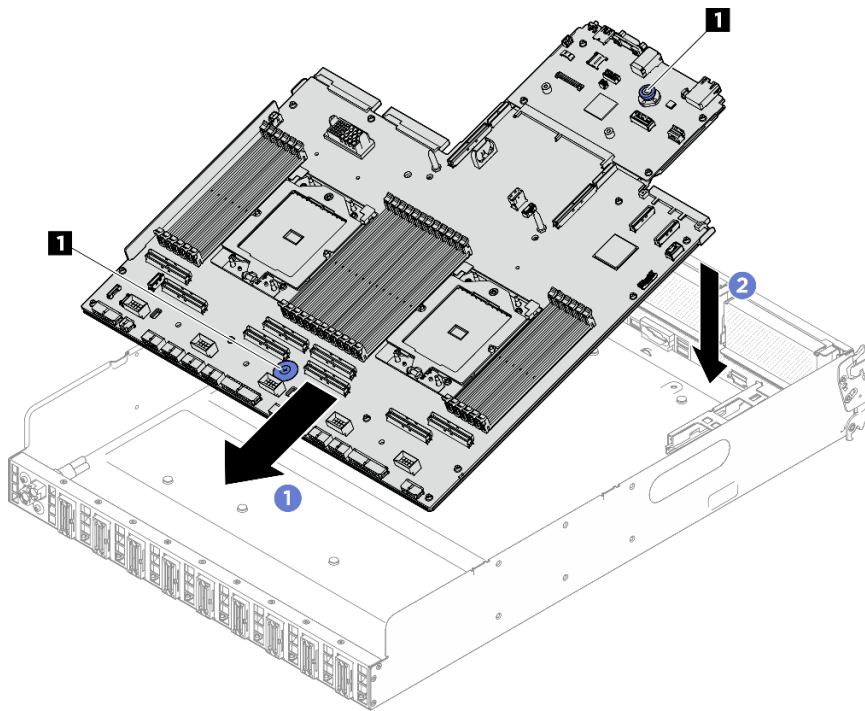


Figure 220. System board assembly installation

1 Lifting handles

Step 4. Grasp the two lifting handles, and slide the system board assembly toward the rear of the 2U compute shuttle until it clicks into place. Make sure that the rear connectors on the new system board assembly are inserted into the corresponding holes in the rear panel.

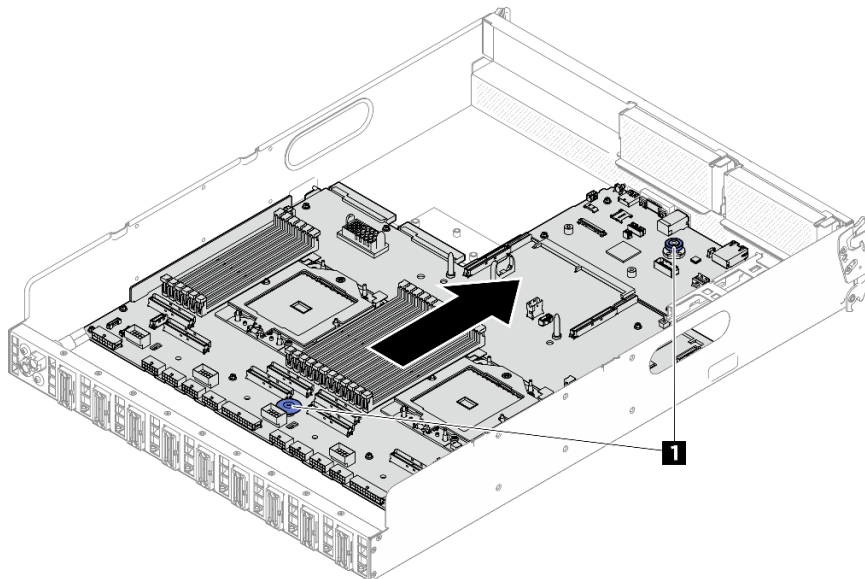


Figure 221. System board assembly installation

1 Lifting handles

Step 5. Install the cable guides.

- a. Align the cable guide with the slots on the 2U compute shuttle; then, lower the cable guide into the 2U compute shuttle until it is securely seated.
- b. Fasten the six screws to secure the cable guide to the 2U compute shuttle.

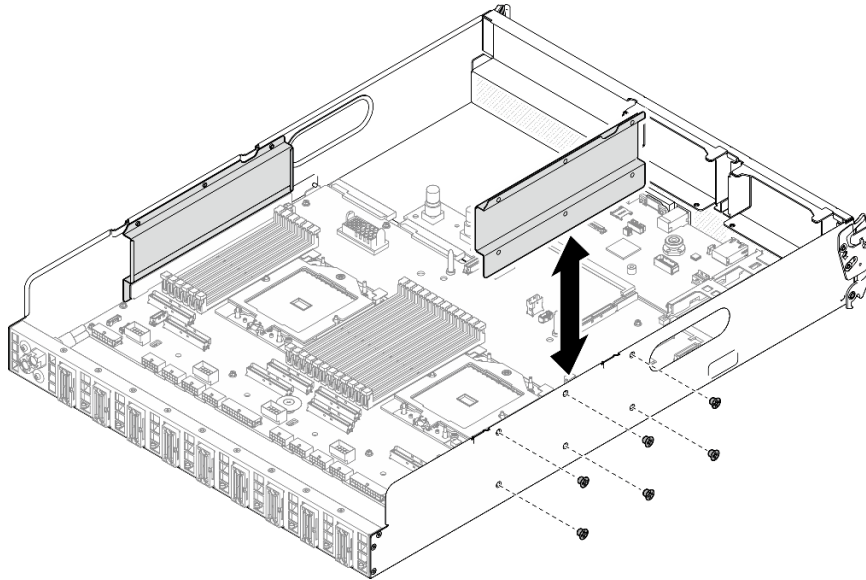


Figure 222. Cable guide installation

- c. Repeat to install the other cable guide.

After you finish

1. Reinstall the following components.
 - a. If applicable, reinstall the OCP module. See [“Install the OCP module” on page 160](#).
 - b. If applicable, reinstall the PCIe riser assembly(ies). See [“Install a PCIe riser assembly” on page 170](#).
 - c. Reinstall each memory module to the same slot on the new system board assembly as on the defective system board assembly until all the memory modules are installed. See [“Install a memory module” on page 155](#).
 - d. Reinstall all the processors and the heat sinks. See [“Install a processor” on page 211](#) and [“Install a heat sink” on page 212](#).
 - e. Reinstall the processor air baffle. See [“Install the processor air baffle” on page 205](#).
2. Reconnect all the required cables to the same connectors on the system board assembly as the defective system board assembly.
3. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside the server.
4. Reinstall the 2U compute shuttle. See [“Install the 2U compute shuttle” on page 68](#).
5. Reconnect the power cords and any cables that you removed.
6. Power on the server and any peripheral devices. See [“Power on the server” on page 43](#).
7. Update the vital product data (VPD). See [“Update the Vital Product Data \(VPD\)” on page 239](#). Machine type number and serial number can be found on the ID label, see [“Identify the server and access the Lenovo XClarity Controller” on page 31](#).
8. Optionally, enable UEFI Secure Boot. See [“Enable UEFI Secure Boot” on page 242](#).

Update the Vital Product Data (VPD)

Use this topic to update the Vital Product Data (VPD).


- **(Required)** Machine type
- **(Required)** Serial number
- **(Required)** System model
- (Optional) Asset tag
- (Optional) UUID

Recommended tools:

- Lenovo XClarity Provisioning Manager
- Lenovo XClarity Essentials OneCLI commands

Using Lenovo XClarity Provisioning Manager

Steps:

1. Start the server and press the key according to the on-screen instructions. The Lenovo XClarity Provisioning Manager interface is displayed by default.
2. Click  on the top right corner of the Lenovo XClarity Provisioning Manager main interface.
3. Click **Update VPD**; then, follow on-screen instructions to update the VPD.

Using Lenovo XClarity Essentials OneCLI commands

- Updating **machine type**
`onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model> [access_method]`
- Updating **serial number**
`onecli config set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n> [access_method]`
- Updating **system model**
`onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifier <system model> [access_method]`
`onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifierEx <system model> --override [access_method]`
- Updating **asset tag**
`onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag> [access_method]`
- Updating **UUID**
`onecli config createuuid SYSTEM_PROD_DATA.SysInfoUUID [access_method]`

Variable	Description
<m/t_model>	The server machine type and model number. Type xxxxyyy, where xxxx is the machine type and yyy is the server model number.
<s/n>	The serial number on the server. Type zzzzzzz, where zzzzzzz is the serial number.
<system model>	The system model on the server. Type system yyyyyyyy, where yyyyyyyy is the product identifier.

<code><asset_tag></code>	<p>The server asset tag number.</p> <p>Type aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa, where aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa is the asset tag number.</p>
<code>[access_method]</code>	<p>The access method that you select to access the target server.</p> <ul style="list-style-type: none"> • Online KCS (unauthenticated and user restricted): You can directly delete <code>[access_method]</code> from the command. • Online authenticated LAN: In this case, specify below LAN account information at the end of the OneCLI command: <code>--bmc-username <user_id> --bmc-password <password></code> • Remote WAN/LAN: In this case, specify below XCC account information and IP address at the end of the OneCLI command: <code>--bmc <bmc_user_id>:<bmc_password>@<bmc_external_IP></code> <p>Notes:</p> <ul style="list-style-type: none"> - <code><bmc_user_id></code> The BMC account name (1 of 12 accounts). The default value is USERID. - <code><bmc_password></code> The BMC account password (1 of 12 accounts).

Hide/observe TPM

TPM is enabled by default to encrypt data transfer for system operation. Optionally, you can disable TPM using Lenovo XClarity Essentials OneCLI.

To disable TPM, do the following:

1. Download and install Lenovo XClarity Essentials OneCLI.

To download Lenovo XClarity Essentials OneCLI, go to the following site:

<https://datacentersupport.lenovo.com/solutions/HT116433>

2. Run the following command:

```
OneCli.exe config set TrustedComputingGroup.HideTPMfromOS "Yes" --imm <userid>:<password>@<ip_address> --override
```

where:

- `<userid>:<password>` are the credentials used to access the BMC (Lenovo XClarity Controller interface) of your server. The default user ID is USERID, and the default password is PASSWORD (zero, not an uppercase o)
- `<ip_address>` is the IP address of the BMC.

Example:

```
D:\onecli>OneCli.exe config set TrustedComputingGroup.HideTPMfromOS "Yes" --imm USERID:PASSWORD=10.245.39.79 --override
Lenovo XClarity Essentials OneCLI 1xce_onecli01p-2.3.0
Licensed Materials - Property of Lenovo
(C) Copyright Lenovo Corp. 2013-2018 All Rights Reserved
If the parameters you input includes password, please Note that:
* The password must consist of a sequence of characters from `0-9a-zA-Z_+.$%!'&*()=` set
* Use "" to quote when password parameters include special characters
* Do not use reserved characters in path name when parameter contains path
Invoking SET command ...
Connected to BMC at IP address 10.245.39.79 by IPMI
TrustedComputingGroup.HideTPMfromOS=Yes
Success.
```

3. Reboot the system.

If you want to enable TPM again, run the following command and reboot the system:

```
OneCli.exe config set TrustedComputingGroup.HideTPMfromOS "No" --imm <userid>:<password>@<ip_address> --override
```

Example:

```
D:\onecli3>OneCli.exe config set TrustedComputingGroup.HideTPMfromOS "No" --imm USERID:PASSWORD=11@10.245.39.79 --override
Lenovo XClarity Essentials OneCLI 1xce_onecli01h-3.0.1
(C) Lenovo 2013-2020 All Rights Reserved

OneCLI License Agreement and OneCLI Legal Information can be found at the following location:
"D:\onecli3\Lic"

[1s]Certificate check finished [100%][=====]
Invoking SET command...
Connected to BMC at IP address 10.245.39.79 by IPMI
TrustedComputingGroup.HideTPMfromOS=No
Configure successfully, please reboot system.
Succeed.
```

Update the TPM firmware

Optionally, you can update the TPM firmware using Lenovo XClarity Essentials OneCLI.

Note: TPM firmware update is irreversible. After update, the TPM firmware cannot be downgraded to earlier versions.

TPM firmware version

Follow the procedure below to see the TPM firmware version:

From Lenovo XClarity Provisioning Manager

1. Start the server and press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.)
2. If the power-on Administrator password is required, enter the password.
3. From the UEFI Setup page, click **System Settings** → **Security** → **Trusted Platform Module** → **TPM 2.0** → **TPM Firmware Version**.

Update the TPM firmware

To update the TPM firmware, do the following:

1. Download and install Lenovo XClarity Essentials OneCLI.

To download Lenovo XClarity Essentials OneCLI, go to the following site:

<https://datacentersupport.lenovo.com/solutions/HT116433>

2. Run the following command:

```
OneCli.exe config set TrustedComputingGroup.DeviceOperation "Update to TPM 2.0 firmware version <x.x.x.x>" --bmc <userid>:<password>@<ip_address>
```

where:

- <x.x.x.x> is the target TPM version.
e.g. TPM 2.0 (7.2.1.0) -> TPM 2.0 (7.2.2.0):

```
OneCli.exe config set TrustedComputingGroup.DeviceOperation "Update to TPM 2.0 firmware version 7.2.2.0" --bmc <userid>:<password>@<ip_address>
```

- `<userid>:<password>` are the credentials used to access the BMC (Lenovo XClarity Controller interface) of your server. The default user ID is USERID, and the default password is PASSWORD (zero, not an uppercase o).
- `<ip_address>` is the IP address of the BMC.

Enable UEFI Secure Boot

Optionally, you can enable UEFI Secure Boot.

There are two methods available to enable UEFI Secure Boot:

- From Lenovo XClarity Provisioning Manager

To enable UEFI Secure Boot from Lenovo XClarity Provisioning Manager:

1. Start the server and press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.)
2. If the power-on Administrator password is required, enter the password.
3. From the UEFI Setup page, click **System Settings** → **Security** → **Secure Boot**.
4. Enable Secure Boot and save the settings.

Note: If disabling UEFI secure boot is needed, select Disable in step 4.

- From Lenovo XClarity Essentials OneCLI

To enable UEFI Secure Boot from Lenovo XClarity Essentials OneCLI:

1. Download and install Lenovo XClarity Essentials OneCLI.

To download Lenovo XClarity Essentials OneCLI, go to the following site:

<https://datacentersupport.lenovo.com/solutions/HT116433>

2. Run the following command to enable Secure Boot:

```
OneCli.exe config set SecureBootConfiguration.SecureBootSetting Enabled --bmc <userid>:<password>@<ip_address>
```

where:

- `<userid>:<password>` are the credentials used to access the BMC (Lenovo XClarity Controller interface) of your server. The default user ID is USERID, and the default password is PASSWORD (zero, not an uppercase o)
- `<ip_address>` is the IP address of the BMC.

For more information about the Lenovo XClarity Essentials OneCLI `set` command, see:

https://pubs.lenovo.com/lxce-onecli/onecli_r_set_command

Note: If disabling UEFI secure boot is needed, run the following command:

```
OneCli.exe config set SecureBootConfiguration.SecureBootSetting Disabled --bmc <userid>:<password>@<ip_address>
```

Complete the parts replacement

Go through the checklist to complete parts replacement

To complete the parts replacement, do the following:

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your server.

2. Properly route and secure the cables in the server. Refer to the cable connecting and routing information for each component.
3. Reconnect the power cords and any cables that you removed.
4. Power on the server and any peripheral devices. See [“Power on the server” on page 43](#).
5. Update the server configuration.
 - Download and install the latest device drivers: <http://datacentersupport.lenovo.com>.
 - Update the system firmware. See [“Update the firmware” on page 271](#).
 - Update the UEFI configuration. See <https://pubs.lenovo.com/uefi-overview/>.
 - Reconfigure the disk arrays if you have installed or removed a hot-swap drive. See <https://pubs.lenovo.com/lxpm-overview/> for the LXPM documentation compatible with your server.

Chapter 6. Internal cable routing

See this section to do cable routing for specific components.

Note: Disengage all latches, release tabs, or locks on cable connectors when you disconnect cables from the system board. Failing to release them before removing the cables will damage the cable sockets on the system board, which are fragile. Any damage to the cable sockets might require replacing the system board.

Identifying connectors

See this section to locate and identify the connectors on the electric boards.

Drive backplane connectors

See this section to locate the connectors on the drive backplane.

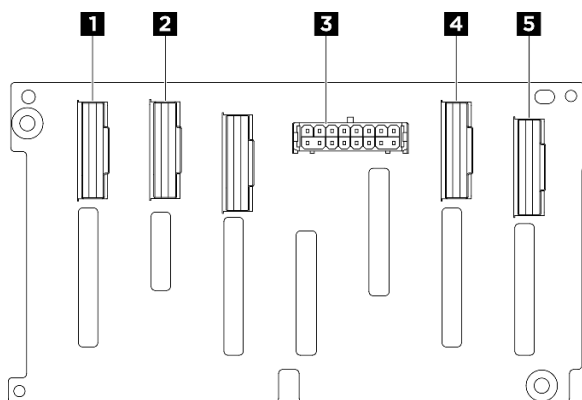


Figure 223. 2.5-inch NVMe backplane connectors

1 NVMe connector 6-7	2 NVMe connector 4-5
3 Power connector	4 NVMe connector 2-3
5 NVMe connector 0-1	

Fan control board connectors

See this section to locate the connectors on the fan control board.

- [“Front fan control board” on page 245](#)
- [“Rear fan control board” on page 246](#)

Front fan control board

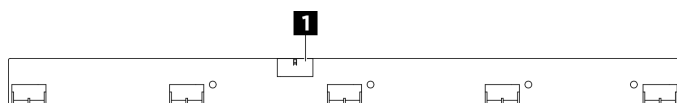


Figure 224. Front fan control board connector

1 Power connector

Rear fan control board

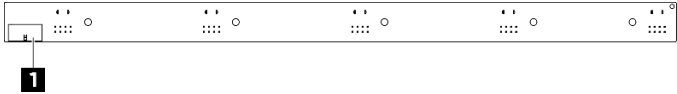


Figure 225. Rear fan control board connector

1 Power connector

PCIe riser card connectors

See this section to locate the connectors on the PCIe riser card.

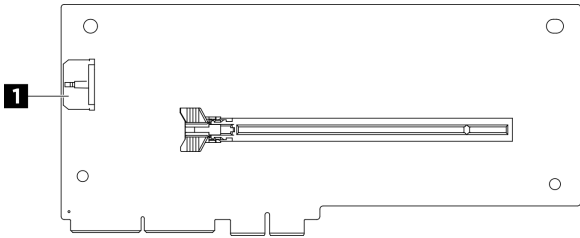


Figure 226. PCIe riser card connector

1 Power connector

PCIe switch board connectors

See this section to locate the connectors on the PCIe switch board.

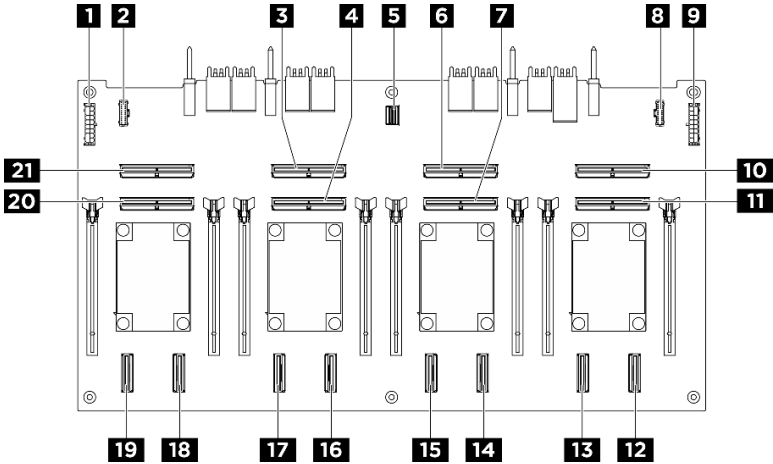


Figure 227. PCIe switch board connectors

1 Power distribution board power connector 1 (PDB PWR1)	2 Power distribution board sideband connector 1 (PDB SB1)
3 MCIO connector 3 (MCIO3)	4 MCIO connector 4 (MCIO4)

5 GPU management connector (MGMT)	6 MCIO connector 5 (MCIO5)
7 MCIO connector 6 (MCIO6)	8 Power distribution board sideband connector 2 (PDB SB2)
9 Power distribution board power connector 2 (PDB PWR2)	10 MCIO connector 7 (MCIO7)
11 MCIO connector 8 (MCIO8)	12 NVMe connector 8 (NVME8)
13 NVMe connector 7 (NVME7)	14 NVMe connector 6 (NVME6)
15 NVMe connector 5 (NVME5)	16 NVMe connector 4 (NVME4)
17 NVMe connector 3 (NVME3)	18 NVMe connector 2 (NVME2)
19 NVMe connector 1 (NVME1)	20 MCIO connector 2 (MCIO2)
21 MCIO connector 1 (MCIO1)	

PCIe switch cable harness cables

See this section to locate the cables on the PCIe switch cable harness.

- “Front PCIe switch cable harness” on page 247
- “Rear PCIe switch cable harness” on page 248

Front PCIe switch cable harness

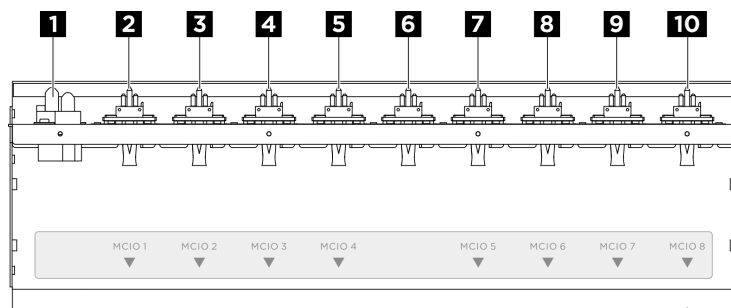


Figure 228. Front PCIe switch cable harness cables

1 Power cables	2 MCIO 1 cable
3 MCIO 2 cable	4 MCIO 3 cable
5 MCIO 4 cable	6 <ul style="list-style-type: none"> • VGA cable • USB cable • Integrated diagnostics panel cable • GPU management cable
7 MCIO 5 cable	8 MCIO 6 cable
9 MCIO 7 cable	10 MCIO 8 cable

Rear PCIe switch cable harness

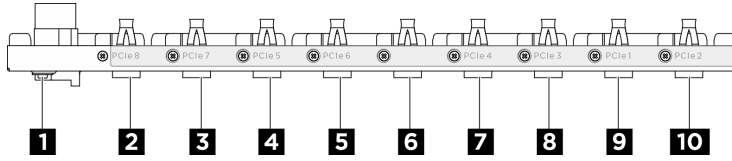


Figure 229. Rear PCIe switch cable harness cables

1 Power cables	2 PCIe 8 cable
3 PCIe 7 cable	4 PCIe 5 cable
5 PCIe 6 cable	6 <ul style="list-style-type: none"> VGA cable USB cable Integrated diagnostics panel cable GPU management cable
7 PCIe 4 cable	8 PCIe 3 cable
9 PCIe 1 cable	10 PCIe 2 cable

Power distribution board connectors

See this section to locate the connectors on the power distribution board.

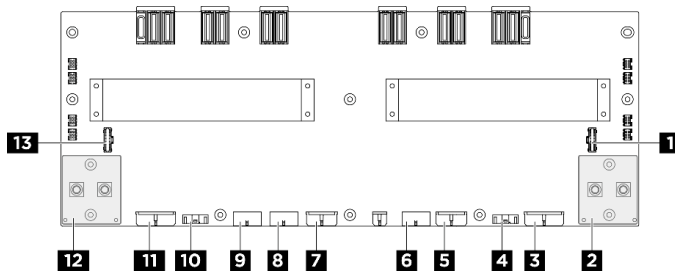


Figure 230. Power distribution board connectors

1 PSU interposer sideband connector 2 (PIB SB2)	2 Right GPU baseboard power connector (GPU PWR)
3 PCIe switch board power connector 2 (FRONT RISER PWR2)	4 PCIe switch board sideband connector 2 (SWSB2)
5 Backplane 2 power connector (BP2 PWR)	6 Front fan control board power connector (FRONT FAN PWR)
7 Backplane 1 power connector (BP1 PWR)	8 Rear fan control board (top) power connector (REAR FAN PWR2)
9 Rear fan control board (bottom) power connector (REAR FAN PWR1)	10 PCIe switch board sideband connector 1 (SWSB1)
11 PCIe switch board power connector 1 (FRONT RISER PWR1)	12 Left GPU baseboard power connector (GPU PWR)
13 PSU interposer sideband connector 1 (PIB SB1)	

Power interface board connectors

See this section to locate the connectors on the power interface board.

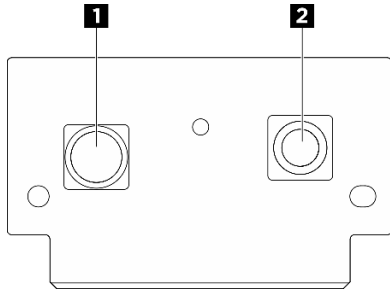


Figure 231. Power interface board connectors

1 Ground connector (GND)	2 Power connector (P12V_PS)
---------------------------------	------------------------------------

PSU interposer connectors

See this section to locate the connectors on the PSU interposer.

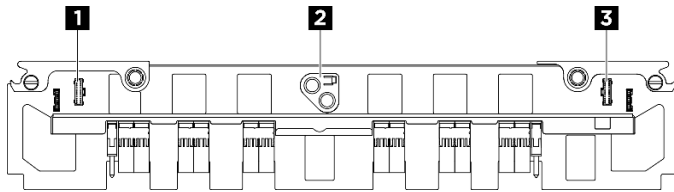


Figure 232. PSU interposer connectors

1 Power distribution board sideband connector 1 (PDB SB1)	2 System board assembly power connector (MB PWR)
3 Power distribution board sideband connector 2 (PDB SB2)	

System-board-assembly connectors for cable routing

The following illustrations show the internal connectors on the system board assembly that are used for internal cable routing.

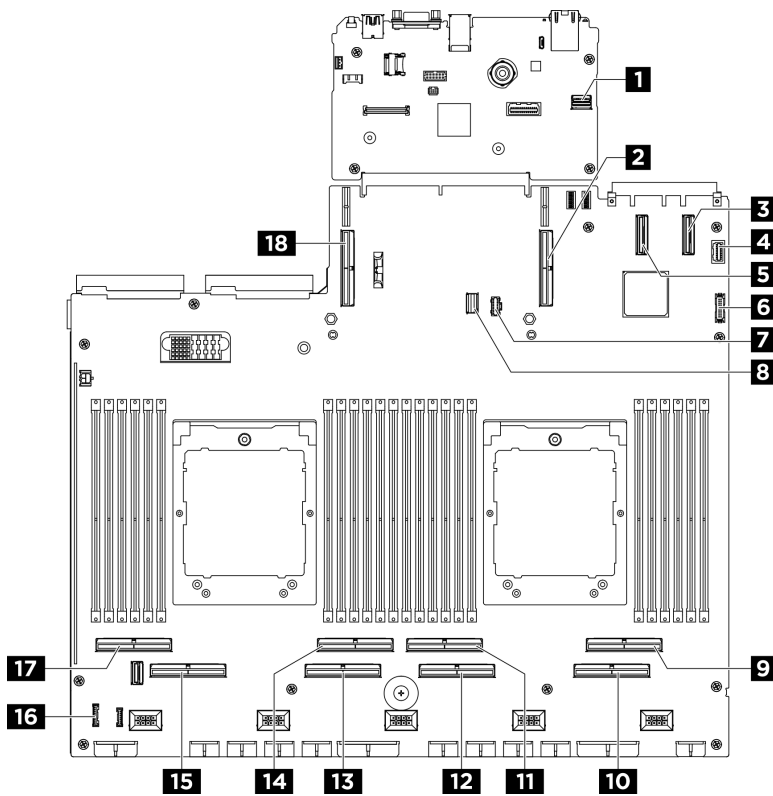


Figure 233. System-board-assembly connectors for cable routing

Table 15. System-board-assembly connectors for cable routing

1 PCIe SW MGMT connector	2 PCIe connector 9
3 PCIe connector 11	4 Front VGA connector
5 PCIe connector 12	6 Front USB connector
7 M.2 power connector	8 M.2 signal connector
9 PCIe connector 2	10 PCIe connector 1
11 PCIe connector 4	12 PCIe connector 3
13 PCIe connector 5	14 PCIe connector 6
15 PCIe connector 7	16 Integrated diagnostics panel connector
17 PCIe connector 8	18 PCIe connector 10

2.5-inch drive backplane cable routing

Use the section to understand the cable routing for the 2.5-inch drive backplane.

Based on the location of the drive backplane, select the corresponding routing plan:

- [“Backplane 1” on page 251](#)
- [“Backplane 2” on page 252](#)

Backplane 1

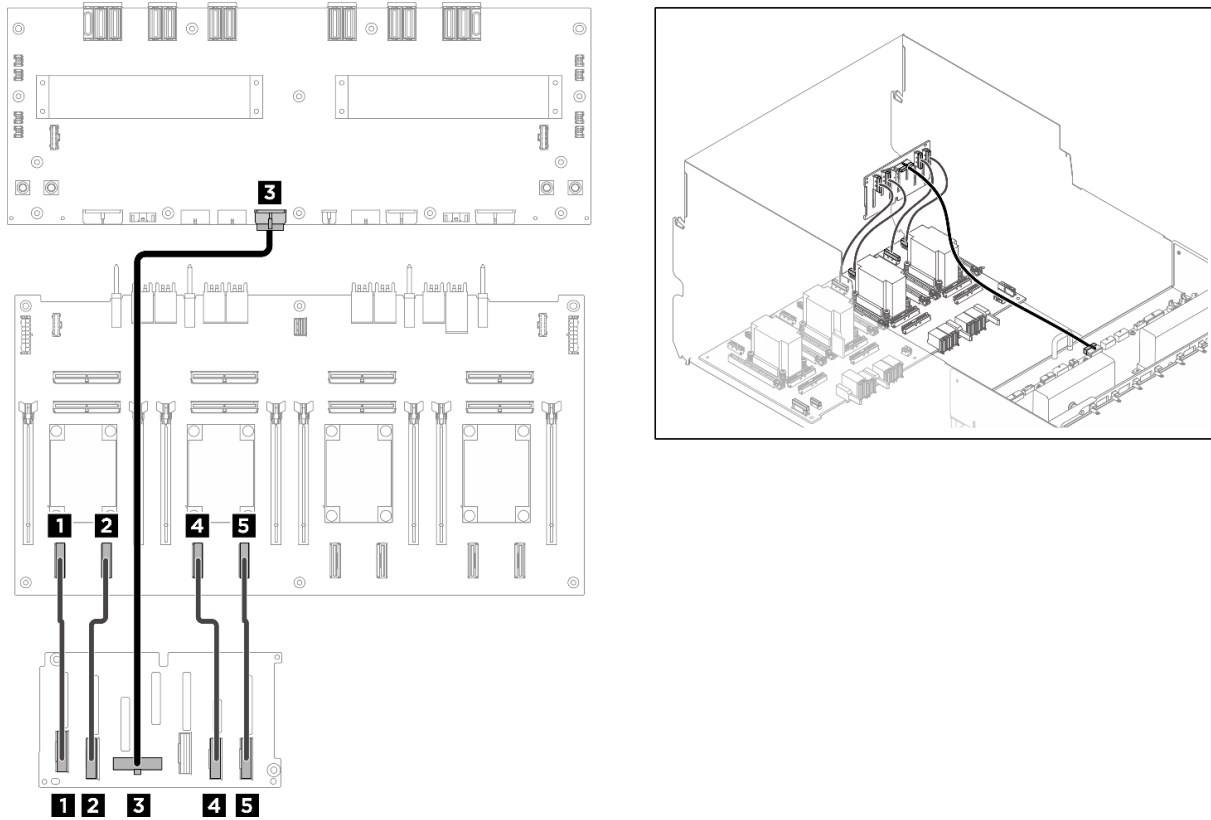


Figure 234. Backplane 1 cable routing

Cable	From	To	Label
1	Backplane 1: NVMe connector 0-1	PCIe switch board: NVMe connector 1 (NVME1)	NVME 0-1 NVME 1
2	Backplane 1: NVMe connector 2-3	PCIe switch board: NVMe connector 2 (NVME2)	NVME 2-3 NVME 2
3	Backplane 1: Power connector	Power distribution board: Backplane 1 power connector (BP1 PWR)	N/A
4	Backplane 1: NVMe connector 4-5	PCIe switch board: NVMe connector 3 (NVME3)	NVME 4-5 NVME 3
5	Backplane 1: NVMe connector 6-7	PCIe switch board: NVMe connector 4 (NVME4)	NVME 6-7 NVME 4

Backplane 2

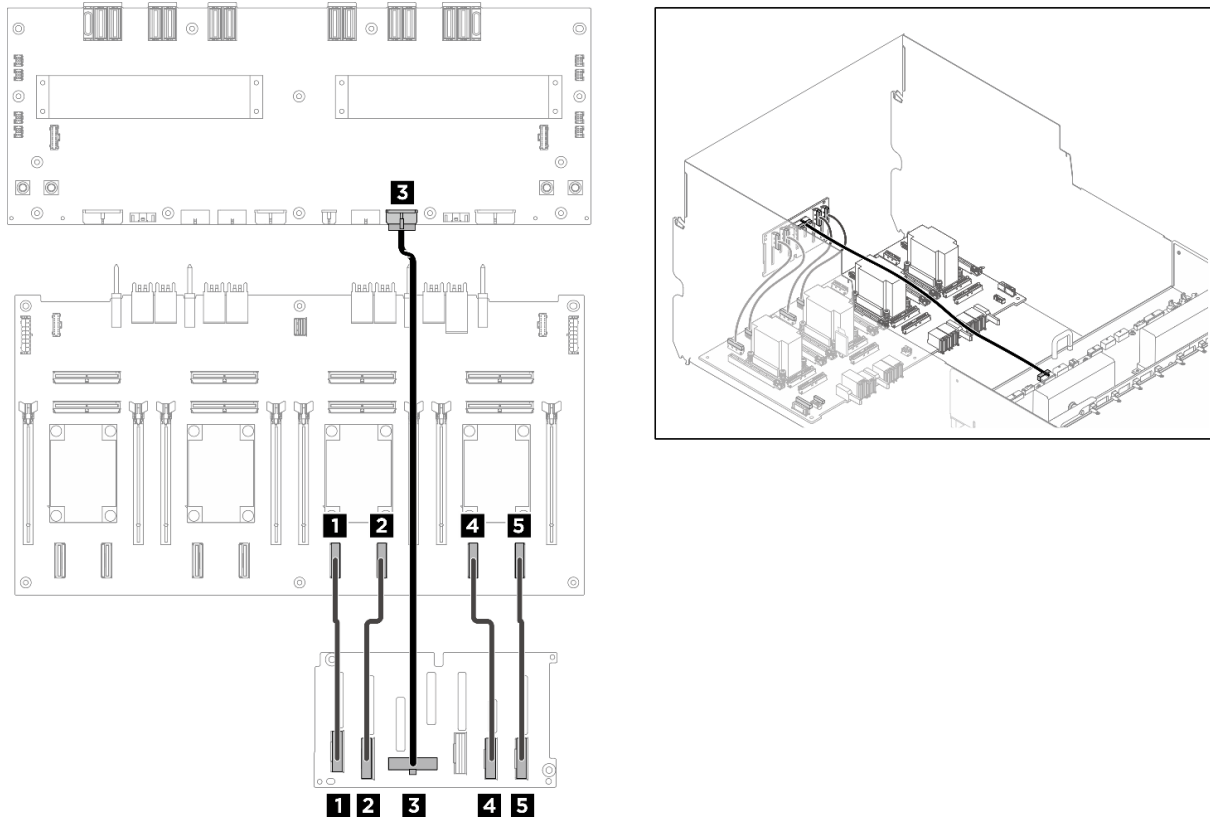
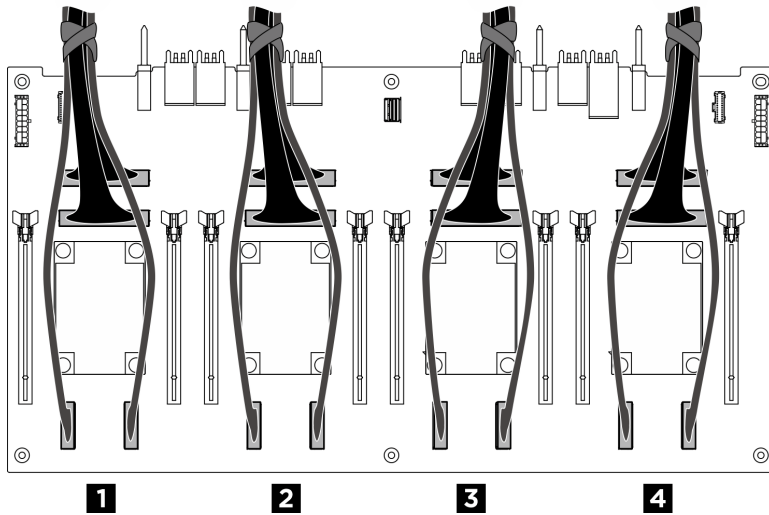


Figure 235. Backplane 2 cable routing

Cable	From	To	Label
1	Backplane 2: NVMe connector 0-1	PCIe switch board: NVMe connector 5 (NVME5)	NVME 0-1 NVME 5
2	Backplane 2: NVMe connector 2-3	PCIe switch board: NVMe connector 6 (NVME6)	NVME 2-3 NVME 6
3	Backplane 2: Power connector	Power distribution board: Backplane 2 power connector (BP2 PWR)	N/A
4	Backplane 2: NVMe connector 4-5	PCIe switch board: NVMe connector 7 (NVME7)	NVME 4-5 NVME 7
5	Backplane 2: NVMe connector 6-7	PCIe switch board: NVMe connector 8 (NVME8)	NVME 6-7 NVME 8

After you finish

Divide the cables connected to the PCIe switch board into four bundles, and secure them with cable ties.



Bundle	Cable
1	<ul style="list-style-type: none"> • Two backplane 1 signal cables (connected to NVMe connectors 1 and 2) • Two PCIe switch board signal cables (connected to MCI/O connectors 1 and 2)
2	<ul style="list-style-type: none"> • Two backplane 1 signal cables (connected to NVMe connectors 3 and 4) • Two PCIe switch board signal cables (connected to MCI/O connectors 3 and 4)
3	<ul style="list-style-type: none"> • Two backplane 2 signal cables (connected to NVMe connectors 5 and 6) • Two PCIe switch board signal cables (connected to MCI/O connectors 5 and 6)
4	<ul style="list-style-type: none"> • Two backplane 2 signal cables (connected to NVMe connectors 7 and 8) • Two PCIe switch board signal cables (connected to MCI/O connectors 7 and 8)

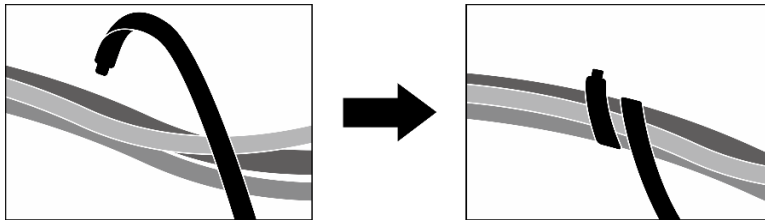


Figure 236. Securing cables with cable ties

DPU adapter cable routing

Use the section to understand the cable routing for the DPU adapter.

Based on the location of the DPU adapter, select the corresponding routing path from the following table:

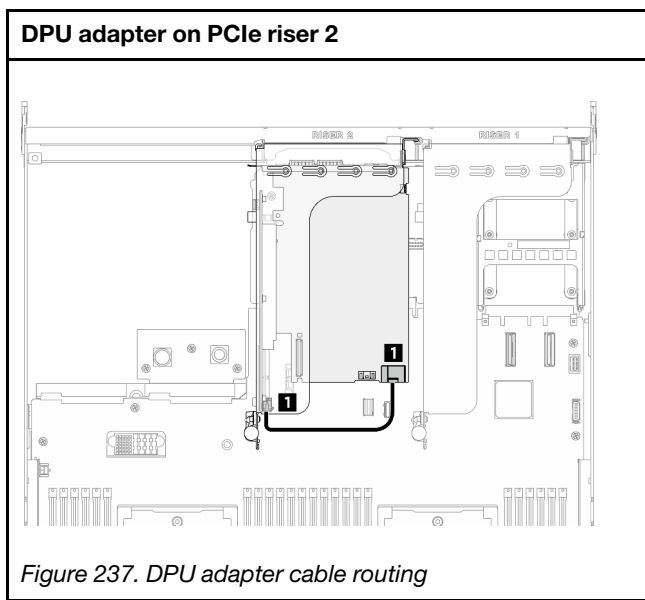


Figure 237. DPU adapter cable routing

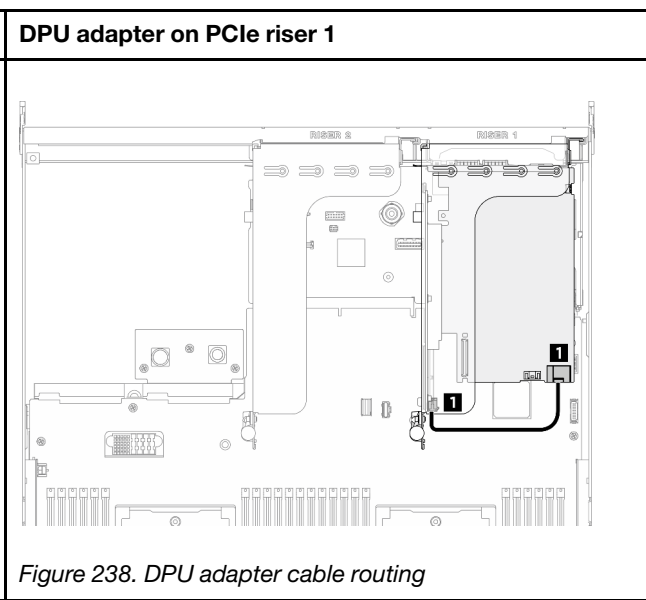


Figure 238. DPU adapter cable routing

Cable	From	To
1	DPU adapter: Power connector	PCIe riser 1 or 2: Power connector

Fan control board cable routing

Use the section to understand the cable routing for the front or rear fan control board.

Based on the location of the fan control board, select the corresponding routing plan:

- [“Front fan control board” on page 254](#)
- [“Rear fan control board \(top\)” on page 255](#)
- [“Rear fan control board \(bottom\)” on page 255](#)

Front fan control board

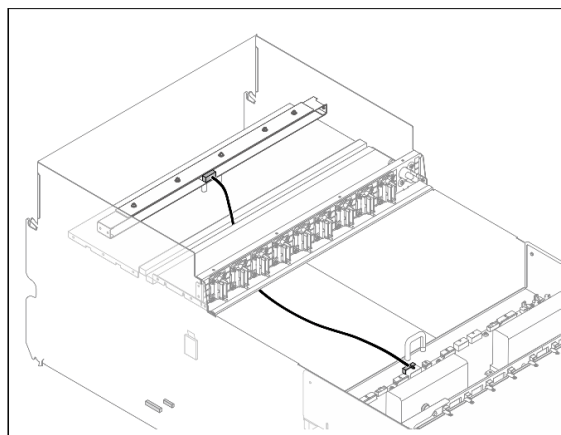
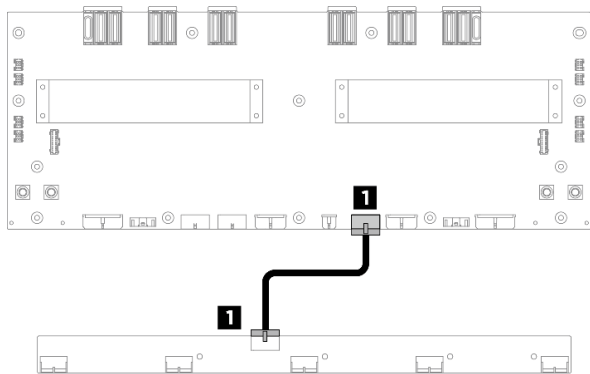


Figure 239. Front fan control board cable routing

Cable	From	To	Label
1	Front fan control board: Power connector	Power distribution board: Front fan control board power connector (FRONT FAN PWR)	F-Fan PWR FNT PWR

Rear fan control board (top)

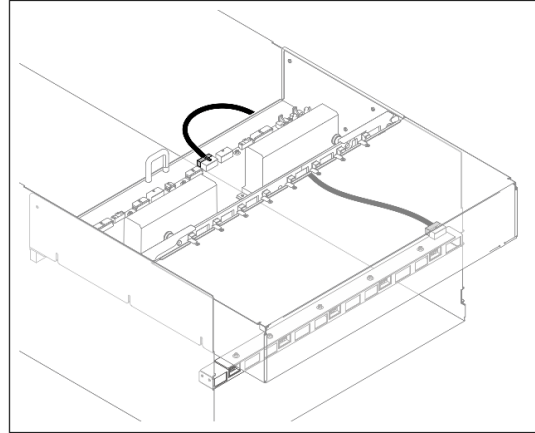
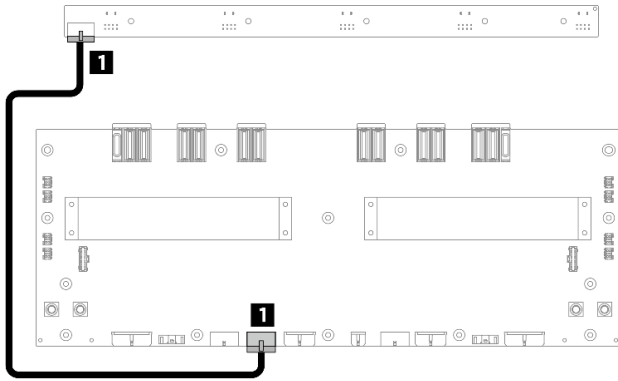


Figure 240. Rear fan control board (top) cable routing

Cable	From	To	Label
1	Rear fan control board (top): Power connector	Power distribution board: Rear fan control board (top) power connector (REAR FAN PWR2)	R-Fan PWR2 TOP PWR

Rear fan control board (bottom)

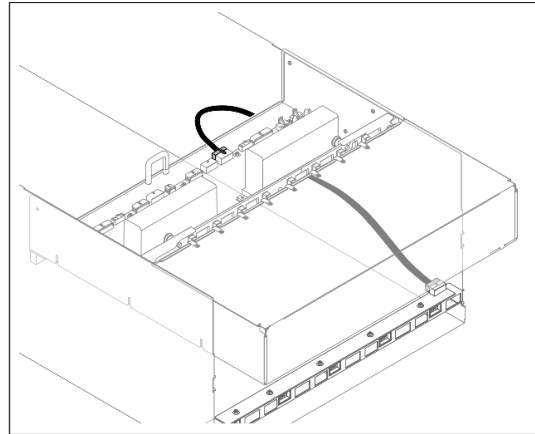
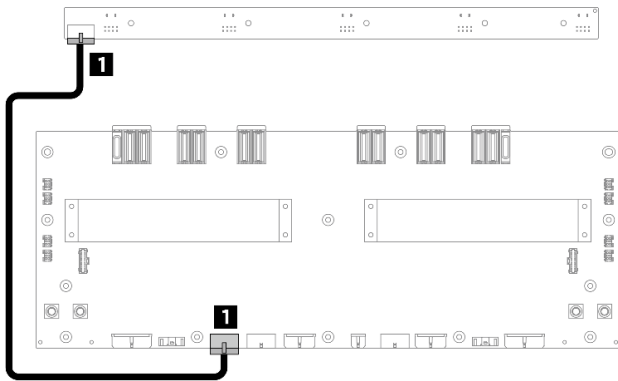


Figure 241. Rear fan control board (bottom) cable routing

Cable	From	To	Label
1	Rear fan control board (bottom): Power connector	Power distribution board: Rear fan control board (bottom) power connector (REAR FAN PWR1)	R-Fan PWR1 LOW PWR

GPU baseboard cable routing

Use the section to understand the cable routing for the GPU baseboard.

Note: Make sure to route the cables through the cable clips as instructed.

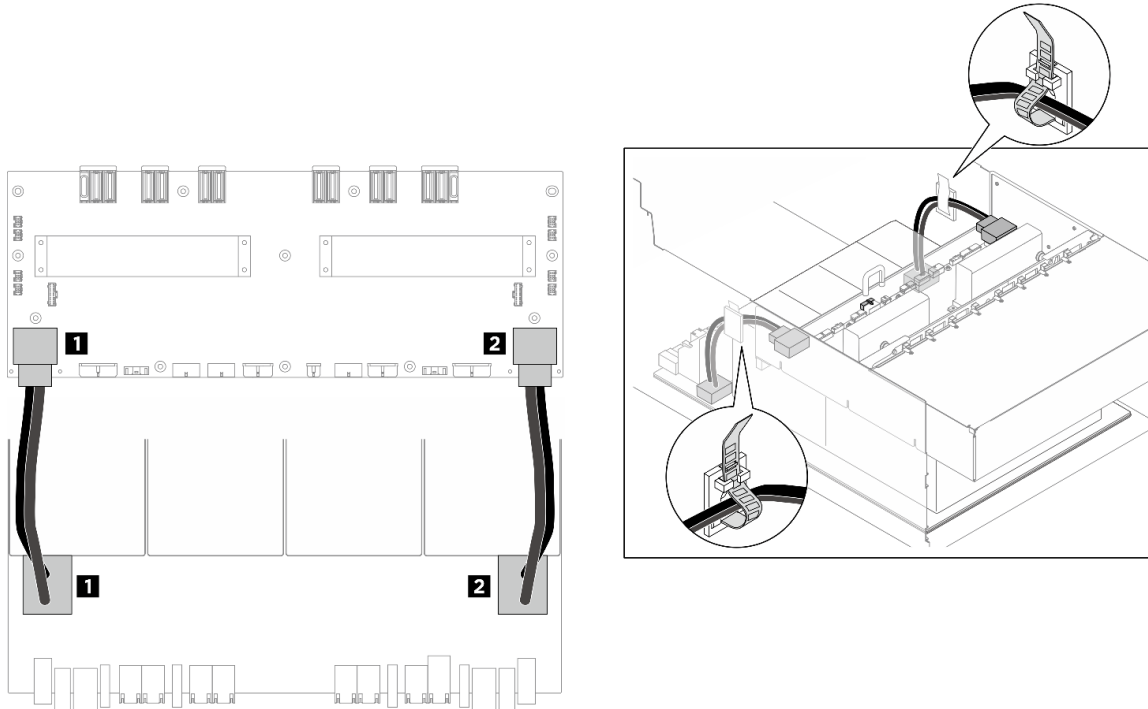


Figure 242. GPU baseboard cable routing

Cable	From	To
1	GPU baseboard: Left power connector	Power distribution board: Left GPU baseboard power connector (GPU PWR)
2	GPU baseboard: Right power connector	Power distribution board: Right GPU baseboard power connector (GPU PWR)

Front I/O module and integrated diagnostics panel cable routing

Use the section to understand the cable routing for the front I/O module and the integrated diagnostics panel.

Based on the location, select the corresponding routing plan:

- [“In 2U compute shuttle” on page 256](#)
- [“In 8U GPU shuttle” on page 258](#)

In 2U compute shuttle

Note: Make sure to route the cables through the cable guide as instructed.

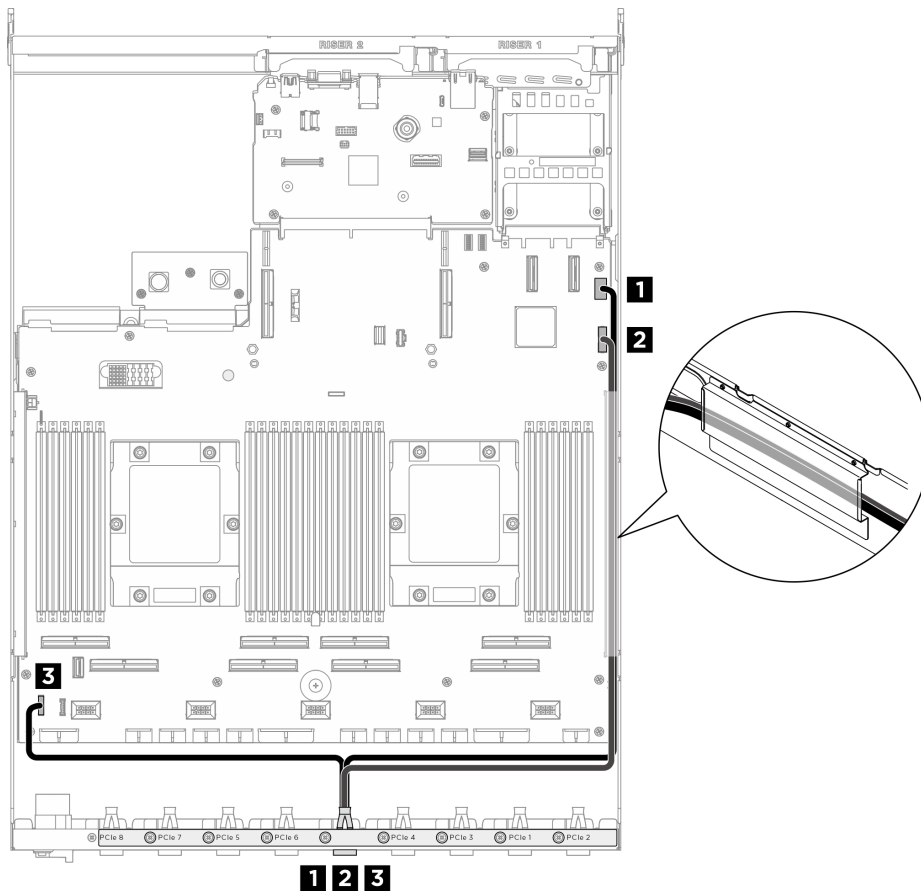


Figure 243. Front I/O module and integrated diagnostics panel cable routing

Cable	From	To
1	Rear PCIe switch cable harness: VGA cable	System board assembly: Front VGA connector
2	Rear PCIe switch cable harness: USB cable	System board assembly: Front USB connector
3	Rear PCIe switch cable harness: Integrated diagnostics panel cable	System board assembly: Integrated diagnostics panel connector

For GPU management cable routing on the system board assembly, see [“PCIe switch board cable routing”](#) on page 259.

In 8U GPU shuttle

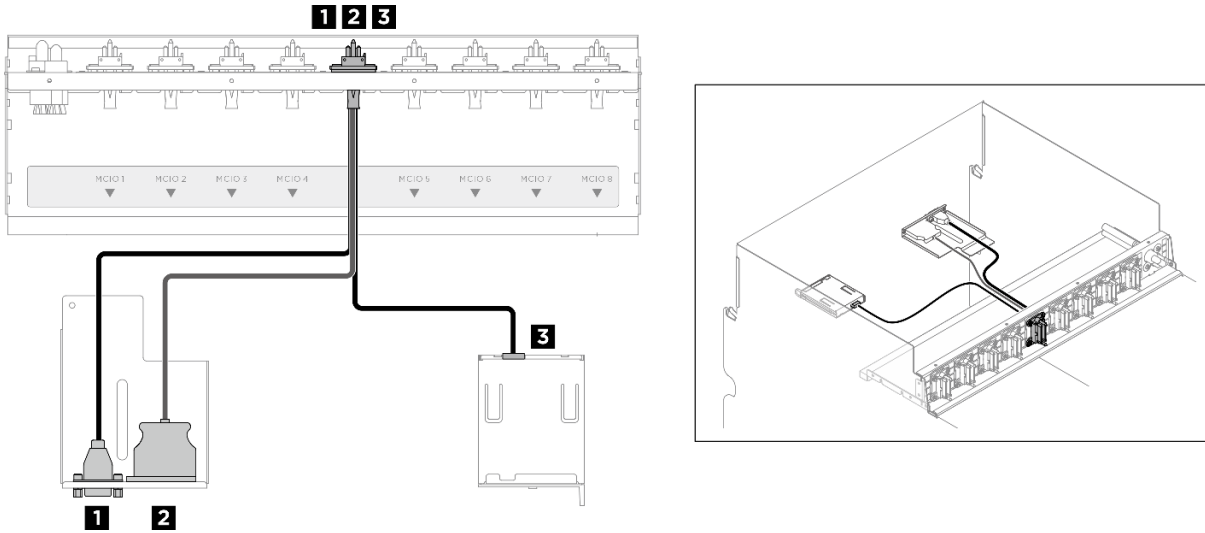


Figure 244. Front I/O module and integrated diagnostics panel cable routing

Cable	From	To
1	Front PCIe switch cable harness: VGA cable	Front I/O module
2	Front PCIe switch cable harness: USB cable	Front I/O module
3	Front PCIe switch cable harness: Integrated diagnostics panel cable	Integrated diagnostics panel

For GPU management cable routing on the PCIe switch board, see [“PCIe switch board cable routing” on page 259](#).

OCP module cable routing

Use the section to understand the cable routing for the OCP module.

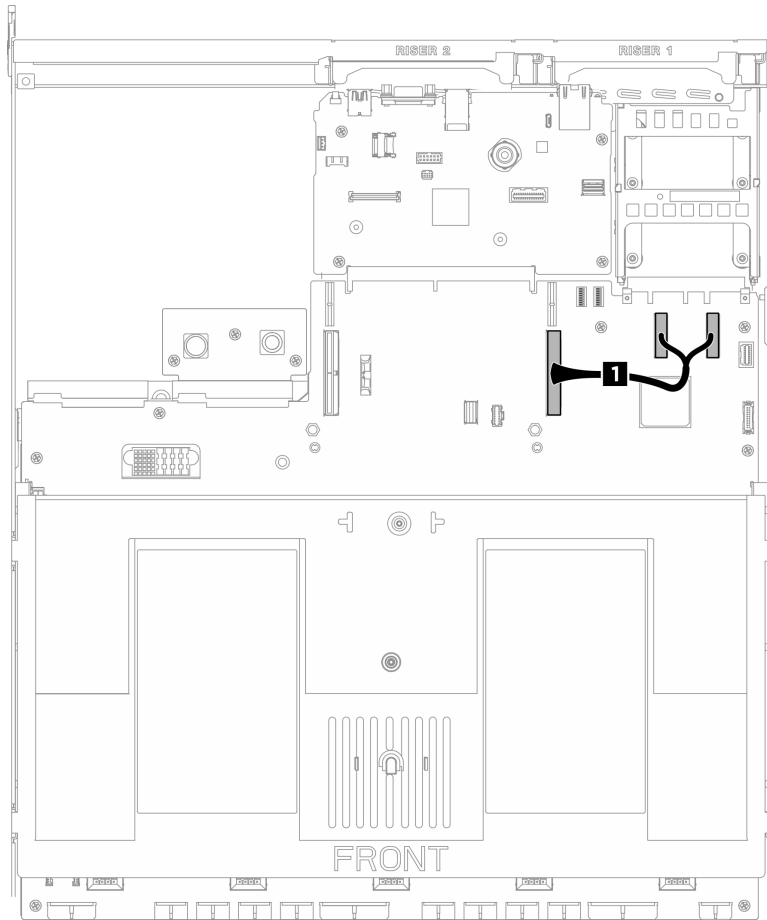


Figure 245. OCP module cable routing

Cable	From	To
1	System board assembly: PCIe connectors 11 and 12	System board assembly: PCIe connector 9

PCIe switch board cable routing

Use the section to understand the cable routing for the PCIe switch board.

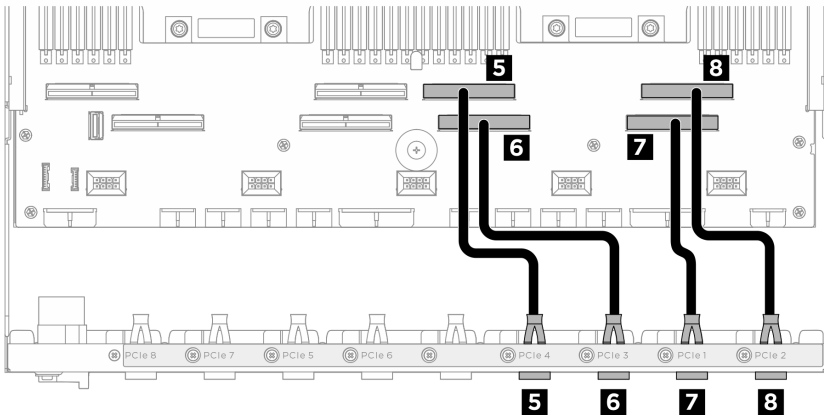
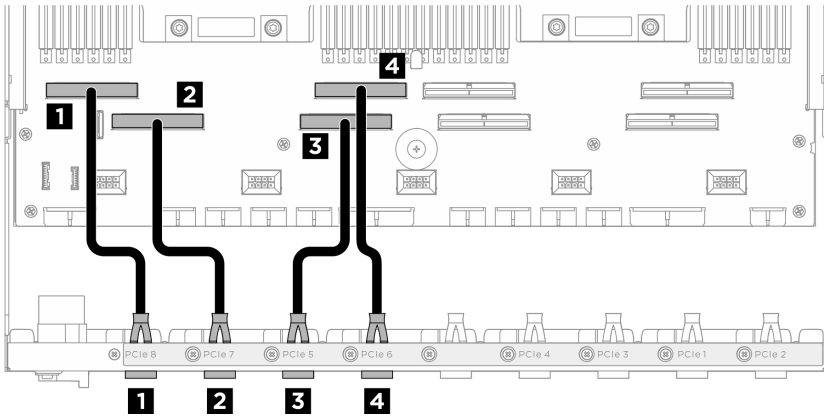
Based on the location, select the corresponding routing plan:

- [“In 2U compute shuttle” on page 259](#)
- [“In 8U GPU shuttle” on page 261](#)

In 2U compute shuttle

- [Signal cables](#)
- [GPU management cable](#)

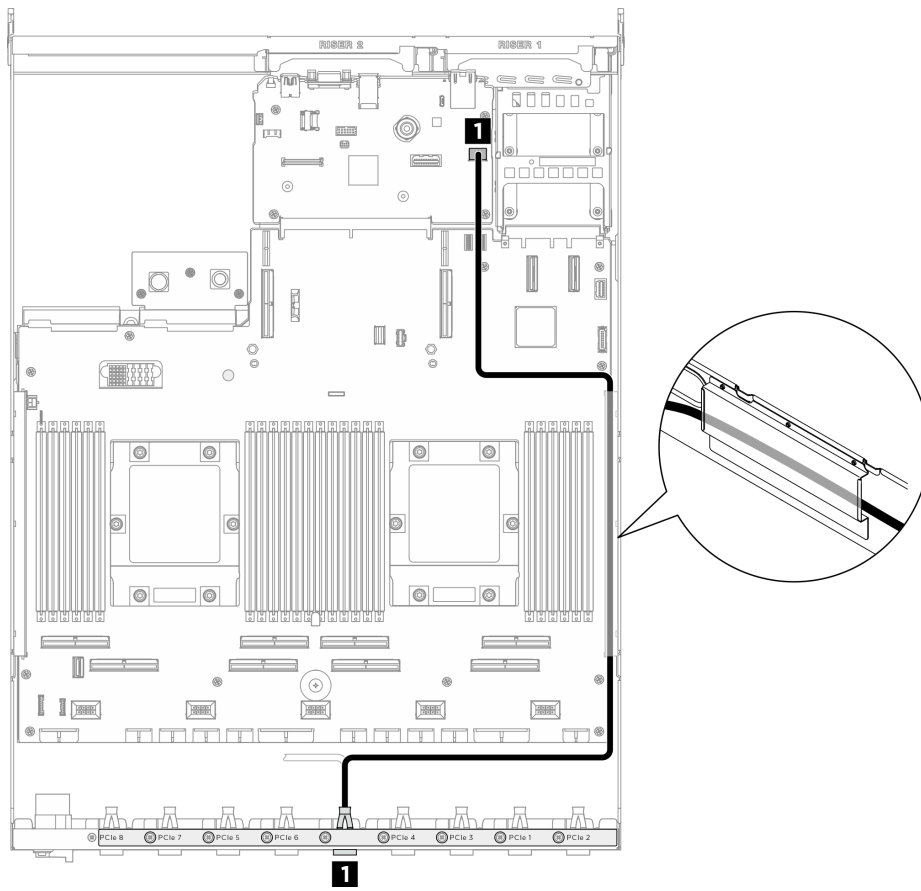
Signal cables



Cable	From	To
1	Rear switch cable harness: PCIe 8 cable	System board assembly: PCIe connector 8
2	Rear switch cable harness: PCIe 7 cable	System board assembly: PCIe connector 7
3	Rear switch cable harness: PCIe 5 cable	System board assembly: PCIe connector 5
4	Rear switch cable harness: PCIe 6 cable	System board assembly: PCIe connector 6
5	Rear switch cable harness: PCIe 4 cable	System board assembly: PCIe connector 4
6	Rear switch cable harness: PCIe 3 cable	System board assembly: PCIe connector 3
7	Rear switch cable harness: PCIe 1 cable	System board assembly: PCIe connector 1
8	Rear switch cable harness: PCIe 2 cable	System board assembly: PCIe connector 2

GPU management cable

Note: Make sure to route the cable through the cable guide as instructed.



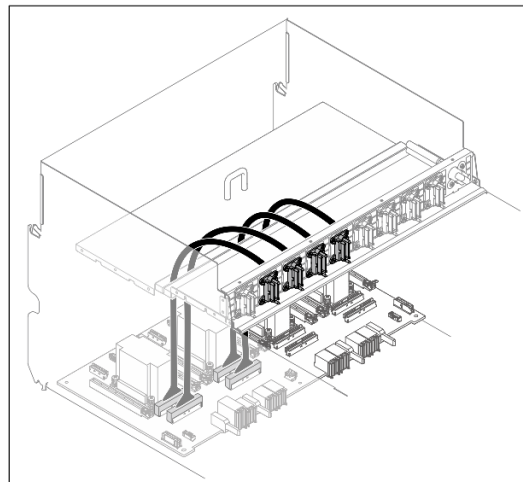
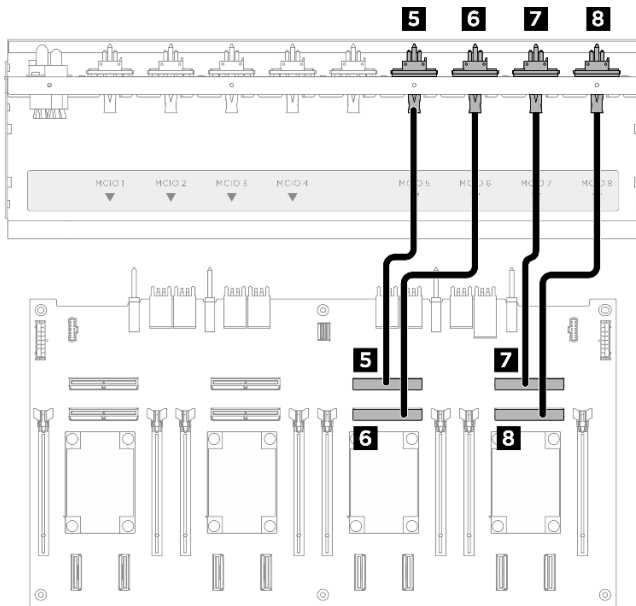
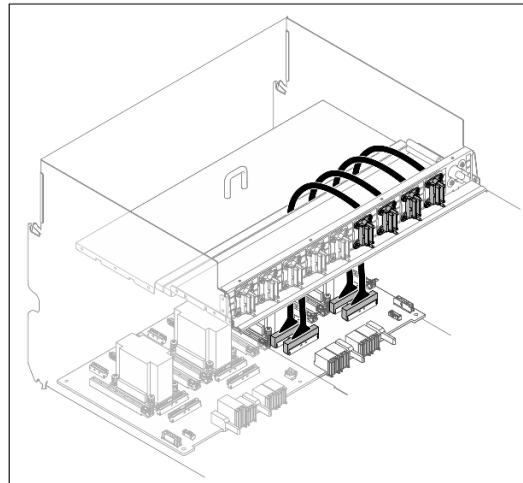
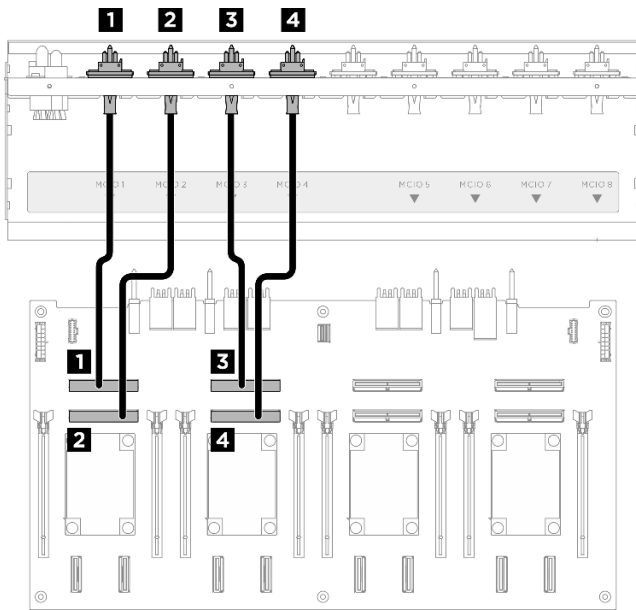
Cable	From	To
1	PCIe switch board: GPU management cable	System board assembly: PCIe SW MGMT connector

Figure 246. PCIe switch board cable routing (GPU management cable)

In 8U GPU shuttle

- Signal cables
- GPU management cable
- Power and sideband cables

Signal cables

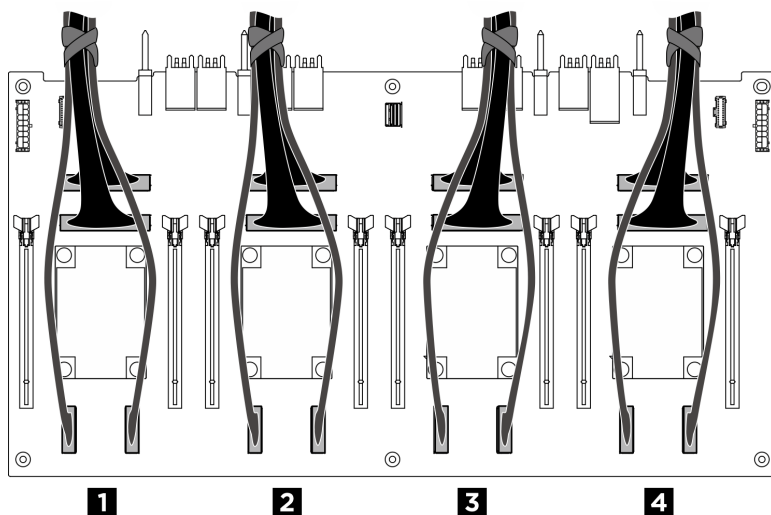


Cable	From	To	Label
1	Front PCIe switch cable harness: MCIO 1 cable	PCIe switch board: MCIO connector 1 (MCIO1)	MCIO 1
2	Front PCIe switch cable harness: MCIO 2 cable	PCIe switch board: MCIO connector 2 (MCIO2)	MCIO 2
3	Front PCIe switch cable harness: MCIO 3 cable	PCIe switch board: MCIO connector 3 (MCIO3)	MCIO 3
4	Front PCIe switch cable harness: MCIO 4 cable	PCIe switch board: MCIO connector 4 (MCIO4)	MCIO 4
5	Front PCIe switch cable harness: MCIO 5 cable	PCIe switch board: MCIO connector 5 (MCIO5)	MCIO 5
6	Front PCIe switch cable harness: MCIO 6 cable	PCIe switch board: MCIO connector 6 (MCIO6)	MCIO 6

Cable	From	To	Label
7	Front PCIe switch cable harness: MCIO 7 cable	PCIe switch board: MCIO connector 7 (MCIO7)	MCIO 7
8	Front PCIe switch cable harness: MCIO 8 cable	PCIe switch board: MCIO connector 8 (MCIO8)	MCIO 8

After you finish

Divide the cables connected to the PCIe switch board into four bundles, and secure them with cable ties.



Bundle	Cable
1	<ul style="list-style-type: none"> Two backplane 1 signal cables (connected to NVMe connectors 1 and 2) Two PCIe switch board signal cables (connected to MCIO connectors 1 and 2)
2	<ul style="list-style-type: none"> Two backplane 1 signal cables (connected to NVMe connectors 3 and 4) Two PCIe switch board signal cables (connected to MCIO connectors 3 and 4)
3	<ul style="list-style-type: none"> Two backplane 2 signal cables (connected to NVMe connectors 5 and 6) Two PCIe switch board signal cables (connected to MCIO connectors 5 and 6)
4	<ul style="list-style-type: none"> Two backplane 2 signal cables (connected to NVMe connectors 7 and 8) Two PCIe switch board signal cables (connected to MCIO connectors 7 and 8)

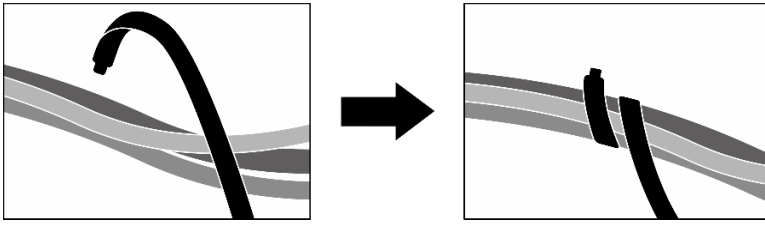
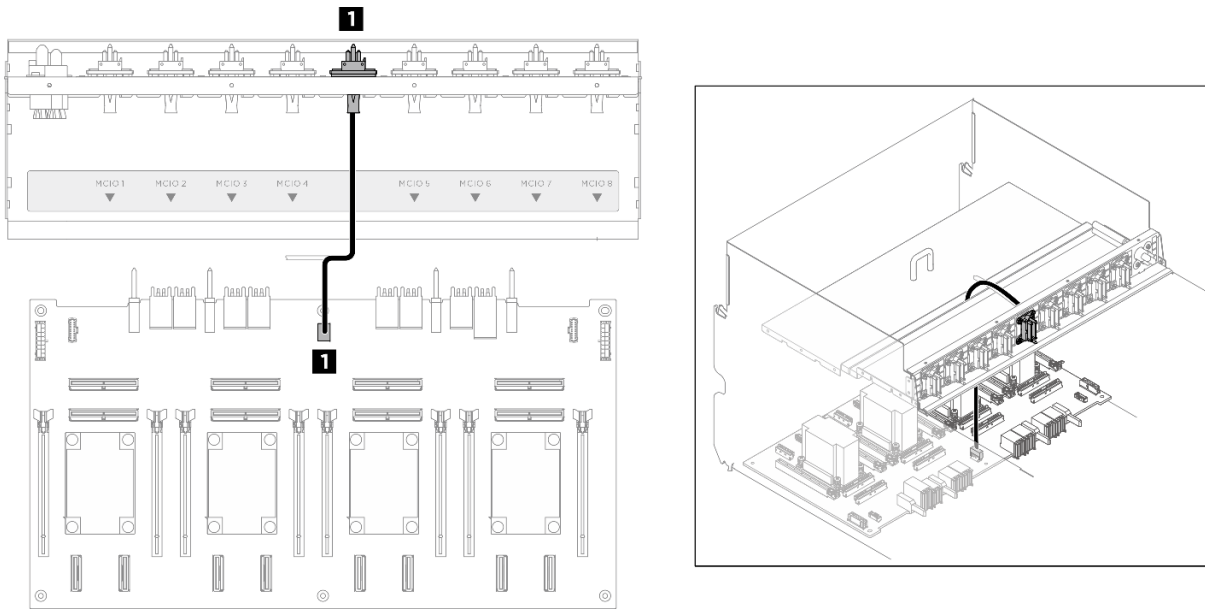


Figure 247. Securing cables with cable ties

GPU management cable

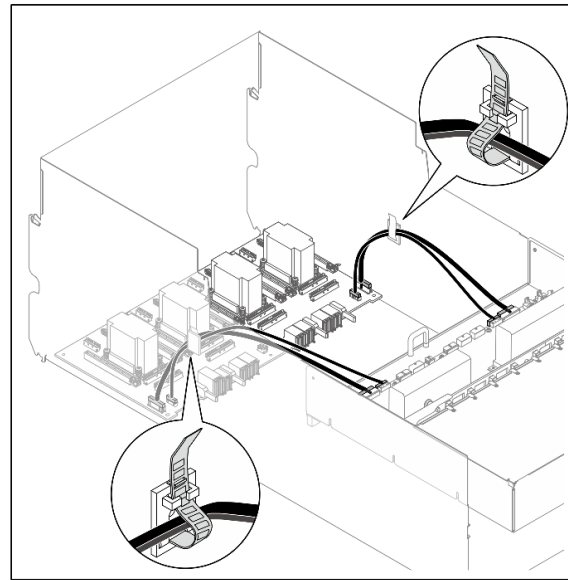
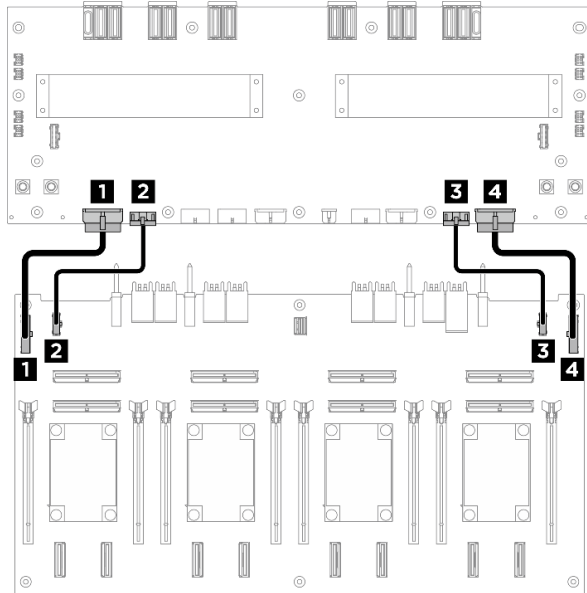


Cable	From	To
1	Front PCIe switch cable harness: GPU management cable	PCIe switch board: GPU management connector (MGMT)

Figure 248. PCIe switch board cable routing (GPU management cable)

Power and sideband cables

Note: Make sure to route the cables through the cable clips as instructed.



Cable	From	To
1	PCIe switch board: Power distribution board power connector 1 (PDB PWR1)	Power distribution board: PCIe switch board power connector 1 (FRONT RISER PWR1)
2	PCIe switch board: Power distribution board sideband connector 1 (PDB SB1)	Power distribution board: PCIe switch board sideband connector 1 (SWSB1)
3	PCIe switch board: Power distribution board power connector 2 (PDB PWR2)	Power distribution board: PCIe switch board power connector 2 (FRONT RISER PWR2)
4	PCIe switch board: Power distribution board sideband connector 2 (PDB SB2)	Power distribution board: PCIe switch board sideband connector 2 (SWSB2)

Figure 249. PCIe switch board cable routing (power and sideband cables)

Power interface board cable routing

Use the section to understand the cable routing for the power interface board.

Based on the location, select the corresponding routing plan:

- [“In 2U compute shuttle” on page 265](#)
- [“In 8U GPU shuttle” on page 266](#)

In 2U compute shuttle

Note: Make sure to route the cables through the cable guide as instructed.

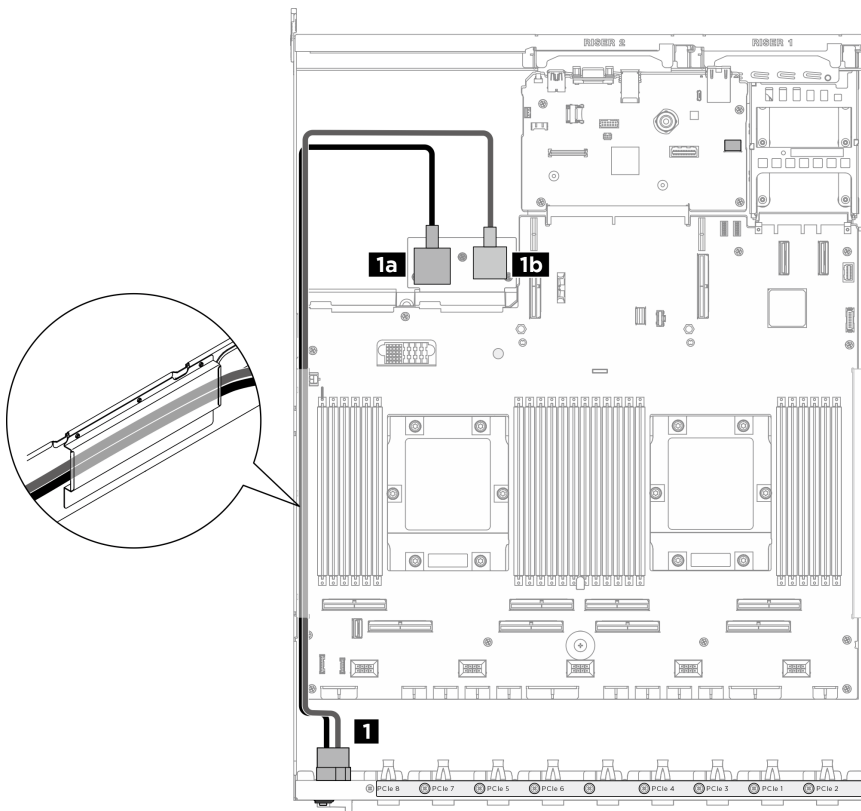


Figure 250. Power interface board cable routing

Cable	From	To
1	Rear PCIe switch cable harness: Power cables	1a Power interface board: Ground connector (GND)
		1b Power interface board: Power connector (P12V_PS)

In 8U GPU shuttle

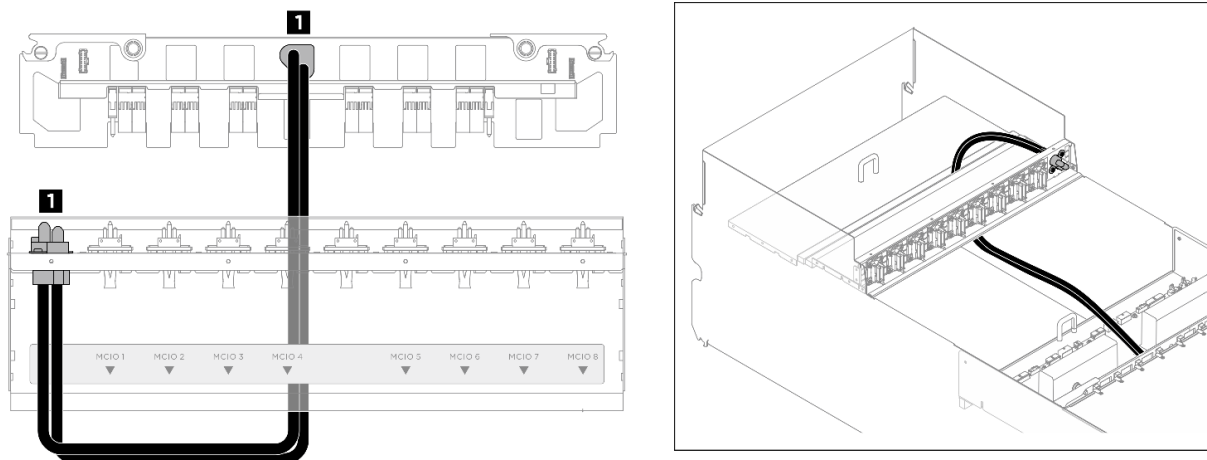


Figure 251. Power interface board cable routing

Cable	From	To
1	Front PCIe switch cable harness: Power cables	PSU interposer: System board assembly power connector (MB PWR)

PSU interposer cable routing

Use the section to understand the cable routing for the PSU interposer.

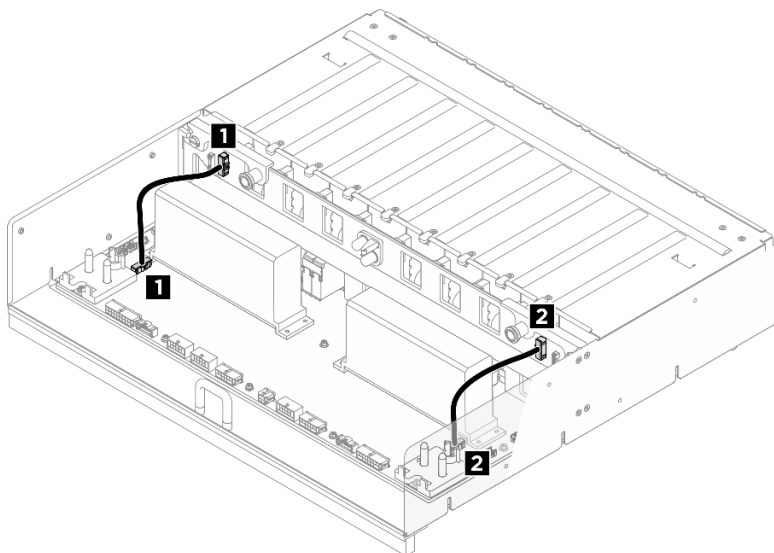


Figure 252. PSU interposer cable routing

Cable	From	To
1	PSU interposer: Power distribution board sideband connector 1 (PDB SB1)	Power distribution board: PSU interposer sideband connector 1 (PIB SB1)
2	PSU interposer: Power distribution board sideband connector 2 (PDB SB2)	Power distribution board: PSU interposer sideband connector 2 (PIB SB2)

Chapter 7. System configuration

Complete these procedures to configure your system.

Set the network connection for the Lenovo XClarity Controller

Before you can access the Lenovo XClarity Controller over your network, you need to specify how Lenovo XClarity Controller will connect to the network. Depending on how the network connection is implemented, you might need to specify a static IP address as well.

The following methods are available to set the network connection for the Lenovo XClarity Controller if you are not using DHCP:

- If a monitor is attached to the server, you can use Lenovo XClarity Provisioning Manager to set the network connection.

Complete the following steps to connect the Lenovo XClarity Controller to the network using the Lenovo XClarity Provisioning Manager.

1. Start the server.
2. Press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.)
3. Go to **LXPM → UEFI Setup → BMC Settings** to specify how the Lenovo XClarity Controller will connect to the network.
 - If you choose a static IP connection, make sure that you specify an IPv4 or IPv6 address that is available on the network.
 - If you choose a DHCP connection, make sure that the MAC address for the server has been configured in the DHCP server.
4. Click **OK** to apply the setting and wait for two to three minutes.
5. Use an IPv4 or IPv6 address to connect Lenovo XClarity Controller.

Important: The Lenovo XClarity Controller is set initially with a user name of USERID and password of PASSW0RD (with a zero, not the letter O). This default user setting has Supervisor access. It is required to change this user name and password during your initial configuration for enhanced security.

- If no monitor is attached to the server, you can set the network connection through the Lenovo XClarity Controller interface. Connect an Ethernet cable from your laptop to XCC system management port (10/100/1000 Mbps RJ-45) on your server. For the location of the XCC system management port (10/100/1000 Mbps RJ-45), see [Chapter 2 “Server components” on page 13](#).

Note: Make sure that you modify the IP settings on the laptop so that it is on the same network as the server default settings.

The default IPv4 address and the IPv6 Link Local Address (LLA) is provided on the Lenovo XClarity Controller Network Access label that is affixed to the Pull Out Information Tab. See [“Identify the server and access the Lenovo XClarity Controller” on page 31](#).

- If you are using the Lenovo XClarity Administrator Mobile app from a mobile device, you can connect to the Lenovo XClarity Controller through the Lenovo XClarity Controller USB connector on the server. For the location of the Lenovo XClarity Controller USB connector, see [Chapter 2 “Server components” on page 13](#).

Note: The Lenovo XClarity Controller USB connector mode must be set to manage the Lenovo XClarity Controller (instead of normal USB mode). To switch from normal mode to Lenovo XClarity Controller management mode, hold the ID button on the server for at least 3 seconds until its LED flashes slowly (once every couple of seconds). See [Chapter 2 “Server components” on page 13](#) for the location of the ID button.

To connect using the Lenovo XClarity Administrator Mobile app:

1. Connect the USB cable of your mobile device to the Lenovo XClarity Controller USB connector on the server.
2. On your mobile device, enable USB tethering.
3. On your mobile device, launch the Lenovo XClarity Administrator mobile app.
4. If automatic discovery is disabled, click **Discovery** on the USB Discovery page to connect to the Lenovo XClarity Controller.

For more information about using the Lenovo XClarity Administrator Mobile app, see:

https://pubs.lenovo.com/lxca/lxca_usemobileapp

Set USB port for Lenovo XClarity Controller connection

Before you can access the Lenovo XClarity Controller through the USB port, you need to configure the USB port for Lenovo XClarity Controller connection.

Server support

To see if your server supports accessing Lenovo XClarity Controller through the USB port, check one of the following:

- Refer to [Chapter 2 “Server components” on page 13](#).



- If there is a wrench icon on the USB port of your server, you can set the management USB port to connect to Lenovo XClarity Controller. It is also the only USB port that supports USB automation update of the firmware and RoT security module.

Setting the USB port for Lenovo XClarity Controller connection

You can switch the USB port between normal and Lenovo XClarity Controller management operation by performing one of the following steps.

- Hold the ID button for at least 3 second until its LED flashes slowly (once every couple of seconds). See [Chapter 2 “Server components” on page 13](#) for ID button location.
- From the Lenovo XClarity Controller management controller CLI, run the `usbfp` command. For information about using the Lenovo XClarity Controller CLI, see the “Command-line interface” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.
- From the Lenovo XClarity Controller management controller web interface, click **BMC Configuration → Network → USB Management Port Assignment**. For information about Lenovo XClarity Controller web interface functions, see the “Description of XClarity Controller functions on web interface” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.

Checking USB port current setting

You can also check the current setting of the USB port using the Lenovo XClarity Controller management controller CLI (`usbfp` command) or the Lenovo XClarity Controller management controller web interface (**BMC Configuration → Network → USB Management Port Assignment**). See the “Command-line

interface” and “Description of XClarity Controller functions on web interface” sections in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.

Update the firmware

Several options are available to update the firmware for the server.

You can use the tools listed here to update the most current firmware for your server and the devices that are installed in the server.

- Best practices related to updating firmware is available at the following site:
 - <https://lenovopress.lenovo.com/lp0656-lenovo-thinksystem-firmware-and-driver-update-best-practices>
- The latest firmware can be found at the following site:
 - <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/>
- You can subscribe to product notification to stay up to date on firmware updates:
 - <https://datacentersupport.lenovo.com/solutions/ht509500>

Update Bundles (Service Packs)

Lenovo typically releases firmware in bundles called Update Bundles (Service Packs). To ensure that all of the firmware updates are compatible, you should update all firmware at the same time. If you are updating firmware for both the Lenovo XClarity Controller and UEFI, update the firmware for Lenovo XClarity Controller first.

Update method terminology

- **In-band update.** The installation or update is performed using a tool or application within an operating system that is executing on the server’s core CPU.
- **Out-of-band update.** The installation or update is performed by the Lenovo XClarity Controller collecting the update and then directing the update to the target subsystem or device. Out-of-band updates have no dependency on an operating system executing on the core CPU. However, most out-of-band operations do require the server to be in the S0 (Working) power state.
- **On-Target update.** The installation or update is initiated from an installed operating system executing on the target server itself.
- **Off-Target update.** The installation or update is initiated from a computing device interacting directly with the server’s Lenovo XClarity Controller.
- **Update Bundles (Service Packs).** Update Bundles (Service Packs) are bundled updates designed and tested to provide the interdependent level of functionality, performance, and compatibility. Update Bundles (Service Packs) are server machine-type specific and are built (with firmware and device driver updates) to support specific Windows Server, Red Hat Enterprise Linux (RHEL) and SUSE Linux Enterprise Server (SLES) operating system distributions. Machine-type-specific firmware-only Update Bundles (Service Packs) are also available.

Firmware updating tools

See the following table to determine the best Lenovo tool to use for installing and setting up the firmware:

Tool	Update Methods Supported	Core System Firmware Updates	I/O Devices Firmware Updates	Drive Firmware Updates	Graphical user interface	Command line interface	Supports Update Bundles (Service Packs)
Lenovo XClarity Provisioning Manager (LXPM)	In-band ² On-Target	√			√		
Lenovo XClarity Controller (XCC)	In-band ⁴ Out-of-band Off-Target	√	Selected I/O devices	√ ³	√		√
Lenovo XClarity Essentials OneCLI (OneCLI)	In-band Out-of-band On-Target Off-Target	√	All I/O devices	√ ³		√	√
Lenovo XClarity Essentials UpdateXpress (LXCE)	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√		√
Lenovo XClarity Essentials Bootable Media Creator (BoMC)	In-band Out-of-band Off-Target	√	All I/O devices		√ (BoMC application)	√ (BoMC application)	√
Lenovo XClarity Administrator (LXCA)	In-band ¹ Out-of-band ² Off-Target	√	All I/O devices		√		√
Lenovo XClarity Integrator (LXCI) for VMware vCenter	Out-of-band Off-Target	√	Selected I/O devices		√		
Lenovo XClarity Integrator (LXCI) for Microsoft Windows Admin Center	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√		√

Tool	Update Methods Supported	Core System Firmware Updates	I/O Devices Firmware Updates	Drive Firmware Updates	Graphical user interface	Command line interface	Supports Update Bundles (Service Packs)
Lenovo XClarity Integrator (LXCI) for Microsoft System Center Configuration Manager	In-band On-Target	√	All I/O devices		√		√
Notes: <ol style="list-style-type: none"> For I/O firmware updates. For BMC and UEFI firmware updates. Drive firmware update is only supported by the tools and methods below: <ul style="list-style-type: none"> XCC Bare Metal Update (BMU): In-band, and requires system reboot. Lenovo XClarity Essentials OneCLI: <ul style="list-style-type: none"> For drives supported by ThinkSystem V2 and V3 products (legacy drives): In-band, and does not require system reboot. For drives supported only by ThinkSystem V3 products (new drives): Staging to XCC and complete the update with XCC BMU (In-band, and requires system reboot.). Bare Metal Update (BMU) only. 							

- **Lenovo XClarity Provisioning Manager**

From Lenovo XClarity Provisioning Manager, you can update the Lenovo XClarity Controller firmware, the UEFI firmware, and the Lenovo XClarity Provisioning Manager software.

Note: By default, the Lenovo XClarity Provisioning Manager Graphical User Interface is displayed when you start the server and press the key specified in the on-screen instructions. If you have changed that default to be the text-based system setup, you can bring up the Graphical User Interface from the text-based system setup interface.

For additional information about using Lenovo XClarity Provisioning Manager to update firmware, see:

“Firmware Update” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>

- **Lenovo XClarity Controller**

If you need to install a specific update, you can use the Lenovo XClarity Controller interface for a specific server.

Notes:

- To perform an in-band update through Windows or Linux, the operating system driver must be installed and the Ethernet-over-USB (sometimes called LAN over USB) interface must be enabled.

For additional information about configuring Ethernet over USB, see:

“Configuring Ethernet over USB” section in the XCC documentation version compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>

- If you update firmware through the Lenovo XClarity Controller, make sure that you have downloaded and installed the latest device drivers for the operating system that is running on the server.

For additional information about using Lenovo XClarity Controller to update firmware, see:

“Updating Server Firmware” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>

- **Lenovo XClarity Essentials OneCLI**

Lenovo XClarity Essentials OneCLI is a collection of command line applications that can be used to manage Lenovo servers. Its update application can be used to update firmware and device drivers for your servers. The update can be performed within the host operating system of the server (in-band) or remotely through the BMC of the server (out-of-band).

For additional information about using Lenovo XClarity Essentials OneCLI to update firmware, see:

https://pubs.lenovo.com/lxce-onecli/onecli_c_update

- **Lenovo XClarity Essentials UpdateXpress**

Lenovo XClarity Essentials UpdateXpress provides most of OneCLI update functions through a graphical user interface (GUI). It can be used to acquire and deploy Update Bundles (Service Packs) update packages and individual updates. Update Bundles (Service Packs) contain firmware and device driver updates for Microsoft Windows and for Linux.

You can obtain Lenovo XClarity Essentials UpdateXpress from the following location:

<https://datacentersupport.lenovo.com/solutions/Invo-xpress>

- **Lenovo XClarity Essentials Bootable Media Creator**

You can use Lenovo XClarity Essentials Bootable Media Creator to create bootable media that is suitable for firmware updates, VPD updates, inventory and FFDC collection, advanced system configuration, FoD Keys management, secure erase, RAID configuration, and diagnostics on supported servers.

You can obtain Lenovo XClarity Essentials BoMC from the following location:

<https://datacentersupport.lenovo.com/solutions/Invo-bomc>

- **Lenovo XClarity Administrator**

If you are managing multiple servers using the Lenovo XClarity Administrator, you can update firmware for all managed servers through that interface. Firmware management is simplified by assigning firmware-compliance policies to managed endpoints. When you create and assign a compliance policy to managed endpoints, Lenovo XClarity Administrator monitors changes to the inventory for those endpoints and flags any endpoints that are out of compliance.

For additional information about using Lenovo XClarity Administrator to update firmware, see:

https://pubs.lenovo.com/lxca/update_fw

- **Lenovo XClarity Integrator offerings**

Lenovo XClarity Integrator offerings can integrate management features of Lenovo XClarity Administrator and your server with software used in a certain deployment infrastructure, such as VMware vCenter, Microsoft Admin Center, or Microsoft System Center.

For additional information about using Lenovo XClarity Integrator to update firmware, see:

<https://pubs.lenovo.com/lxci-overview/>

Configure the firmware

Several options are available to install and set up the firmware for the server.

Important: Lenovo does not recommend setting option ROMs to **Legacy**, but you can conduct this setting if necessary. Note that this setting prevents UEFI drivers for the slot devices from loading, which may cause negative side effects to Lenovo software, such as LXCA, OneCLI, and XCC. These side effects include but

are not limited to the inability to determine adapter card details, such as model name and firmware levels. In some cases, the functionality on a specific PCIe adapter may not be enabled properly.

- **Lenovo XClarity Provisioning Manager (LXPM)**

From Lenovo XClarity Provisioning Manager, you can configure the UEFI settings for your server.

Notes: The Lenovo XClarity Provisioning Manager provides a Graphical User Interface to configure a server. The text-based interface to system configuration (the Setup Utility) is also available. From Lenovo XClarity Provisioning Manager, you can choose to restart the server and access the text-based interface. In addition, you can choose to make the text-based interface the default interface that is displayed when you start LXPM. To do this, go to **Lenovo XClarity Provisioning Manager → UEFI Setup → System Settings → <F1>Start Control → Text Setup**. To start the server with Graphic User Interface, select **Auto** or **Tool Suite**.

See the following documentations for more information:

- Search for the LXPM documentation version compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>
- *UEFI User Guide* at <https://pubs.lenovo.com/uefi-overview/>

- **Lenovo XClarity Essentials OneCLI**

You can use the config application and commands to view the current system configuration settings and make changes to Lenovo XClarity Controller and UEFI. The saved configuration information can be used to replicate or restore other systems.

For information about configuring the server using Lenovo XClarity Essentials OneCLI, see:

https://pubs.lenovo.com/lxce-onecli/onecli_c_settings_info_commands

- **Lenovo XClarity Administrator**

You can quickly provision and pre-provision all of your servers using a consistent configuration. Configuration settings (such as local storage, I/O adapters, boot settings, firmware, ports, and Lenovo XClarity Controller and UEFI settings) are saved as a server pattern that can be applied to one or more managed servers. When the server patterns are updated, the changes are automatically deployed to the applied servers.

Specific details about updating firmware using Lenovo XClarity Administrator are available at:

https://pubs.lenovo.com/lxca/server_configuring

- **Lenovo XClarity Controller**

You can configure the management processor for the server through the Lenovo XClarity Controller Web interface, the command-line interface, or Redfish API.

For information about configuring the server using Lenovo XClarity Controller, see:

“Configuring the Server” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>

Memory module configuration

Memory performance depends on several variables, such as memory mode, memory speed, memory ranks, memory population and processor.

Information about optimizing memory performance and configuring memory is available at the Lenovo Press website:

<https://lenovopress.lenovo.com/servers/options/memory>

In addition, you can take advantage of a memory configurator, which is available at the following site:

https://dcsc.lenovo.com/#/memory_configuration

Enable Software Guard Extensions (SGX)

Intel® Software Guard Extensions (Intel® SGX) operates under the assumption that the security perimeter includes only the internals of the CPU package, and leaves the DRAM untrusted.

Complete the following steps to enable SGX.

- Step 1. **Make sure** to refer to “[Memory module installation rules and order](#)” on page 41, which specifies whether your server supports SGX and lists the memory module population sequence for SGX configuration. (DIMM configuration must be at least 8 DIMMs per socket to support SGX.)
- Step 2. Restart the system. Before the operating system starts up, press the key specified in the on-screen instructions to enter the Setup Utility. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.)
- Step 3. Go to **System settings** → **Processors** → **UMA-Based Clustering** and disable the option.
- Step 4. Go to **System settings** → **Processors** → **Total Memory Encryption (TME)** and enable the option.
- Step 5. Save the changes, then go to **System settings** → **Processors** → **SW Guard Extension (SGX)** and enable the option.

RAID configuration

Using a Redundant Array of Independent Disks (RAID) to store data remains one of the most common and cost-efficient methods to increase server's storage performance, availability, and capacity.

RAID increases performance by allowing multiple drives to process I/O requests simultaneously. RAID can also prevent data loss in case of a drive failure by reconstructing (or rebuilding) the missing data from the failed drive using the data from the remaining drives.

RAID array (also known as RAID drive group) is a group of multiple physical drives that uses a certain common method to distribute data across the drives. A virtual drive (also known as virtual disk or logical drive) is a partition in the drive group that is made up of contiguous data segments on the drives. Virtual drive is presented up to the host operating system as a physical disk that can be partitioned to create OS logical drives or volumes.

An introduction to RAID is available at the following Lenovo Press website:

<https://lenovopress.lenovo.com/lp0578-lenovo-raid-introduction>

Detailed information about RAID management tools and resources is available at the following Lenovo Press website:

<https://lenovopress.lenovo.com/lp0579-lenovo-raid-management-tools-and-resources>

Deploy the operating system

Several options are available to deploy an operating system on the server.

Available operating systems

- Canonical Ubuntu

Complete list of available operating systems: <https://lenovopress.lenovo.com/osig>.

Tool-based deployment

• Multi-server

Available tools:

- Lenovo XClarity Administrator
https://pubs.lenovo.com/lxca/compute_node_image_deployment
- Lenovo XClarity Essentials OneCLI
https://pubs.lenovo.com/lxce-onecli/onecli_r_uxspi_proxy_tool
- Lenovo XClarity Integrator deployment pack for SCCM (for Windows operating system only)
https://pubs.lenovo.com/lxci-deploypack-sccm/dpsccm_c_endtoend_deploy_scenario

• Single-server

Available tools:

- Lenovo XClarity Provisioning Manager
“OS Installation” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>
- Lenovo XClarity Essentials OneCLI
https://pubs.lenovo.com/lxce-onecli/onecli_r_uxspi_proxy_tool
- Lenovo XClarity Integrator deployment pack for SCCM (for Windows operating system only)
https://pubs.lenovo.com/lxci-deploypack-sccm/dpsccm_c_endtoend_deploy_scenario

Manual deployment

If you cannot access the above tools, follow the instructions below, download the corresponding OS *Installation Guide*, and deploy the operating system manually by referring to the guide.

1. Go to <https://datacentersupport.lenovo.com/solutions/server-os>.
2. Select an operating system from the navigation pane and click **Resources**.
3. Locate the “OS Install Guides” area and click the installation instructions. Then, follow the instructions to complete the operation system deployment task.

Back up the server configuration

After setting up the server or making changes to the configuration, it is a good practice to make a complete backup of the server configuration.

Make sure that you create backups for the following server components:

• Management processor

You can back up the management processor configuration through the Lenovo XClarity Controller interface. For details about backing up the management processor configuration, see:

“Backing up the BMC configuration” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.

Alternatively, you can use the `save` command from Lenovo XClarity Essentials OneCLI to create a backup of all configuration settings. For more information about the `save` command, see:

https://pubs.lenovo.com/lxce-onecli/onecli_r_save_command

- **Operating system**

Use your backup methods to back up the operating system and user data for the server.

Chapter 8. Problem determination

Use the information in this section to isolate and resolve issues that you might encounter while using your server.

Lenovo servers can be configured to automatically notify Lenovo Support if certain events are generated. You can configure automatic notification, also known as Call Home, from management applications, such as the Lenovo XClarity Administrator. If you configure automatic problem notification, Lenovo Support is automatically alerted whenever a server encounters a potentially significant event.

To isolate a problem, you should typically begin with the event log of the application that is managing the server:

- If you are managing the server from the Lenovo XClarity Administrator, begin with the Lenovo XClarity Administrator event log.
- If you are using some other management application, begin with the Lenovo XClarity Controller event log.

Web resources

- **Tech tips**

Lenovo continually updates the support website with the latest tips and techniques that you can use to solve issues that your server might encounter. These Tech Tips (also called retain tips or service bulletins) provide procedures to work around issues or solve problems related to the operation of your server.

To find the Tech Tips available for your server:

1. Go to <http://datacentersupport.lenovo.com> and navigate to the support page for your server.
2. Click on **How To's** from the navigation pane.
3. Click **Article Type** → **Solution** from the drop-down menu.

Follow the on-screen instructions to choose the category for the problem that you are having.

- **Lenovo Data Center Forum**

- Check https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg to see if someone else has encountered a similar problem.

Event logs

An *alert* is a message or other indication that signals an event or an impending event. Alerts are generated by the Lenovo XClarity Controller or by UEFI in the servers. These alerts are stored in the Lenovo XClarity Controller Event Log. If the server is managed by the Chassis Management Module 2 or by the Lenovo XClarity Administrator, alerts are automatically forwarded to those management applications.

Note: For a listing of events, including user actions that might need to be performed to recover from an event, see the *Messages and Codes Reference*, which is available at https://pubs.lenovo.com/sr685a-v3/pdf_files.html.

Lenovo XClarity Administrator event log

If you are using Lenovo XClarity Administrator to manage server, network, and storage hardware, you can view the events from all managed devices through the XClarity Administrator.

Logs

The Event log provides a history of hardware and management conditions that have been detected.

Severity icons: [Green checkmark], [Yellow warning triangle], [Blue information 'i'], [Red error 'x']

Show: [Red error 'x'] [Yellow warning triangle] [Blue information 'i']

All Event Sources [Dropdown] Filter [Text Box]

All Dates [Dropdown]

Severity	Serviceability	Date and Time	System	Event	System Type	Source ID
Warning	Support	Jan 30, 2017, 7:48:07 AM	Chassis114:...	Node Node 08 device	Chassis	Jan 30, 20
Warning	Support	Jan 30, 2017, 7:48:07 AM	Chassis114:...	Node Node 02 device	Chassis	Jan 30, 20
Warning	User	Jan 30, 2017, 7:48:07 AM	Chassis114:...	I/O module IO Module	Chassis	Jan 30, 20
Warning	User	Jan 30, 2017, 7:48:07 AM	Chassis114:...	Node Node 08 incom	Chassis	Jan 30, 20

Figure 253. Lenovo XClarity Administrator event log

For more information about working with events from XClarity Administrator, see:

https://pubs.lenovo.com/lxca/events_vieweventlog

Lenovo XClarity Controller event log

The Lenovo XClarity Controller monitors the physical state of the server and its components using sensors that measure internal physical variables such as temperature, power-supply voltages, fan speeds, and component status. The Lenovo XClarity Controller provides various interfaces to systems management software and to system administrators and users to enable remote management and control of a server.

The Lenovo XClarity Controller monitors all components of the server and posts events in the Lenovo XClarity Controller event log.

ThinkSystem System name: XCC0023579PK

Event Log Audit Log Maintenance History

Customize Table Clear Logs Refresh

Type: [Red error 'x'] [Yellow warning triangle] [Blue information 'i'] All Source All Date

Severity	Source	Event ID	Message	Date
[Red error 'x']	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM
[Yellow warning triangle]	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM
[Blue information 'i']	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM
[Blue information 'i']	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM

Figure 254. Lenovo XClarity Controller event log

For more information about accessing the Lenovo XClarity Controller event log, see:

“Viewing Event Logs” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>

Troubleshooting by system LEDs and diagnostics display

See the following section for information on available system LEDs and diagnostics display.

Drive LEDs

This topic provides information on drive LEDs.

The following table describes the problems that are indicated by drive activity LED and drive status LED.

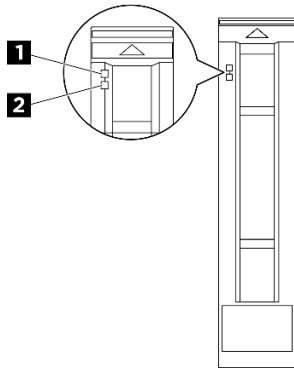


Figure 255. Drive LEDs

Table 16. Drive LEDs

LED	Description
1 Drive activity LED (green)	Each hot-swap drive comes with an activity LED. When this LED is flashing, it indicates that the drive is in use.
2 Drive status LED (yellow)	The drive status LED indicates the following status: <ul style="list-style-type: none">• The LED is lit: the drive has failed.• The LED is flashing slowly (once per second): the drive is being rebuilt.• The LED is flashing rapidly (three times per second): the drive is being identified.

Power supply LEDs

This topic provides information about various power supply LED status and corresponding action suggestions.

The following minimal configuration is required for the server to start:

- Two processors
- Twenty-four memory modules
- Eight power supplies
- One M.2 drive or one 2.5-inch drive (If OS is needed by debugging)
- Fifteen system fans
- One OCP module with required cable (if network is required)

The following table describes the problems that are indicated by various combinations of the power-supply LEDs and the power-on LED and suggested actions to correct the detected problems.

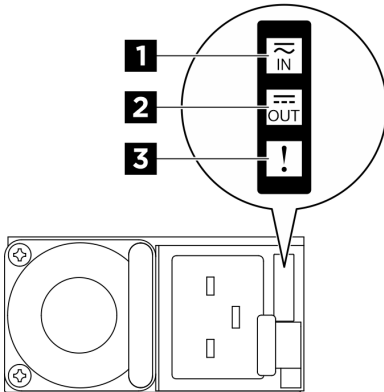


Figure 256. CFFv4 power supply LEDs

Table 17. CFFv4 power supply LEDs

LED	Description
1 Input status	<p>The input status LED can be in one of the following states:</p> <ul style="list-style-type: none"> Off: The power supply is disconnected from the AC power source. Green: The power supply is connected to the AC power source.
2 Output status	<p>The output status LED can be in one of the following states:</p> <ul style="list-style-type: none"> Off: The server is powered off, or the power supply is not working properly. If the server is powered on but the output status LED is off, replace the power supply. Slow blinking green (about one flash every two seconds): The power supply is in cold redundancy active mode. Fast blinking green (about 2 flashes each second): The power supply is in cold redundancy sleep mode. Green: The server is on and the power supply is working normally.
3 Fault LED	<ul style="list-style-type: none"> Off: The power supply is working normally Amber: The power supply may have failed. Dump the FFDC log from the system and contact Lenovo back end support team for PSU data log reviewing.

Rear system LEDs

This topic provides information on system LEDs on the rear of the server.

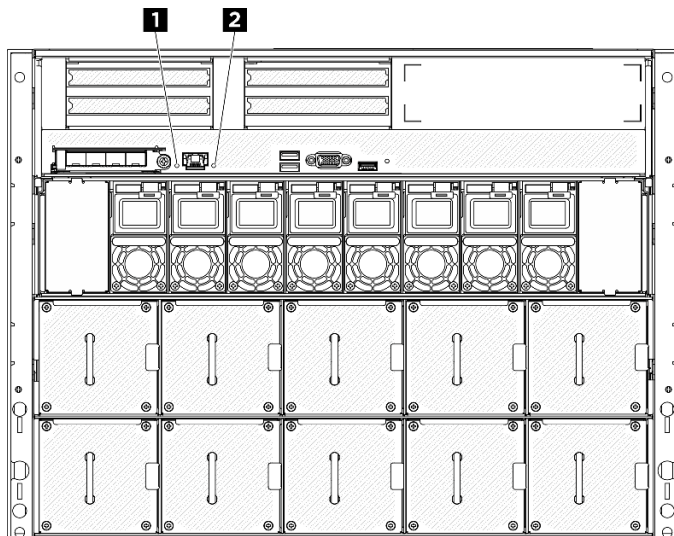


Figure 257. System LEDs on the rear view

Table 18. System LEDs on the rear view

LED	Description and actions
1 Identification LED (blue)	This LED is used as a presence detection LED. You can use Lenovo XClarity Controller to light this LED remotely. Use this LED to locate the server among other servers visually.
2 System error LED (yellow)	LED on: an error has occurred. Complete the following steps: <ol style="list-style-type: none"> 1. Check the identification LED and check log LED and follow the instructions. 2. Check the Lenovo XClarity Controller event log and the system error log for information about the error. 3. Save the log if necessary, and clear the log afterwards.

XCC system management port LEDs

This topic provides information on LEDs of XCC system management port (10/100/1000 Mbps RJ-45).

The following table describes the problems that are indicated by LEDs on XCC system management port (10/100/1000 Mbps RJ-45).

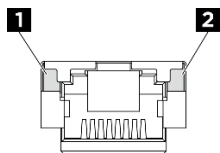


Figure 258. XCC system management port (10/100/1000 Mbps RJ-45) LEDs

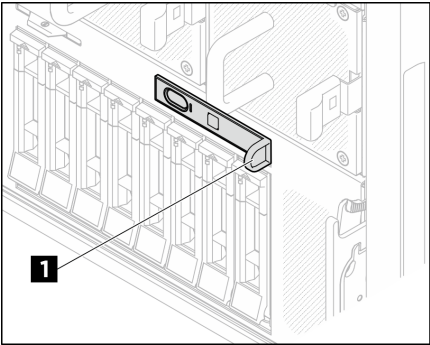
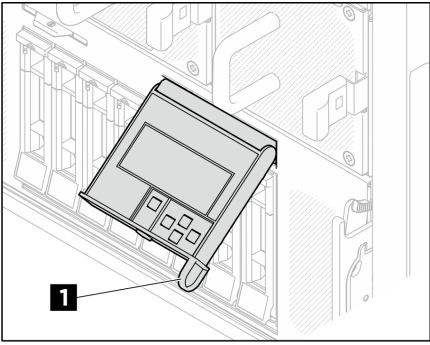
Table 19. XCC system management port (10/100/1000 Mbps RJ-45) LEDs

LED	Description
1 XCC system management port (10/100/1000 Mbps RJ-45) Ethernet port link LED	Use this green LED to distinguish the network connectivity status: <ul style="list-style-type: none"> • Off: The network link is disconnected. • Green: The network link is established.
2 XCC system management port (10/100/1000 Mbps RJ-45) Ethernet port activity LED	Use this green LED to distinguish the network activity status: <ul style="list-style-type: none"> • Off: The server is disconnected from a LAN. • Green: The network is connected and active.

Integrated diagnostics panel

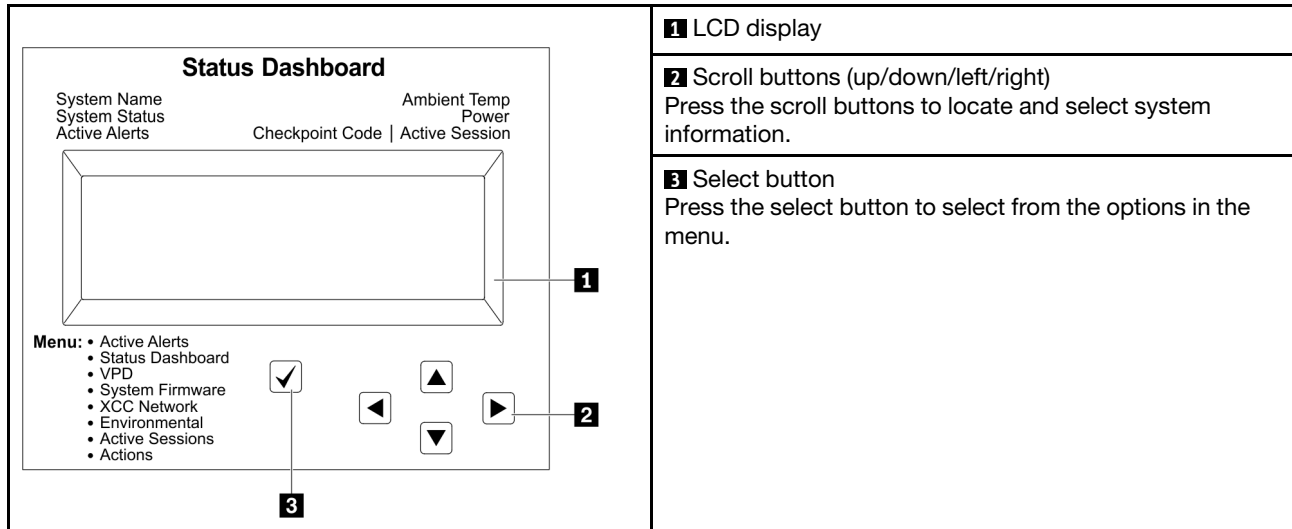
The Integrated diagnostics panel is attached to the front of the server, while it allows quick access to system information such as errors, system status, firmware, network, and health information. The Integrated Diagnostics Panel may also provide front operator panel function.

Location of the integrated diagnostics panel

Location	<p>The integrated diagnostics panel is attached to the front of the 8U GPU shuttle.</p> <div style="display: flex; justify-content: space-around;">   </div>
Callout	<p>1 The handle with which the panel can be pulled out from the server.</p> <p>Notes:</p> <ul style="list-style-type: none"> • The panel can be pushed in or pulled out regardless of the system power status. • When pulling it out, do it gently to avoid damage.

Display panel overview

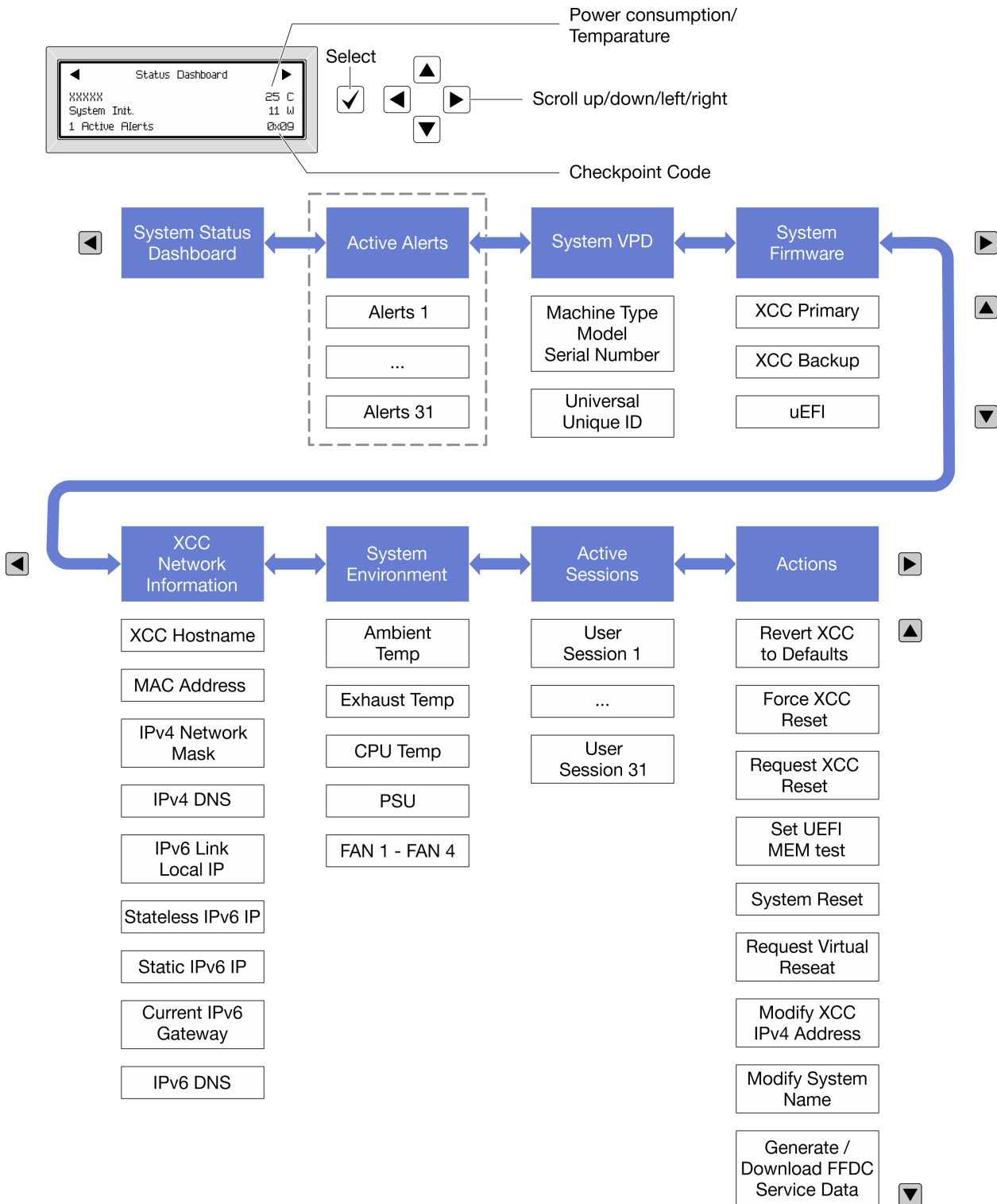
The diagnostics device consists of an LCD display and 5 navigation buttons.



Option flow diagram

The LCD panel displays various system information. Navigate through the options with the scroll keys.

Depending on the model, the options and entries on the LCD display might be different.



Full menu list

Following is the list of available options. Switch between an option and the subordinate information entries with the select button, and switch among options or information entries with the scroll buttons.

Depending on the model, the options and entries on the LCD display might be different.

Home Menu (System Status Dashboard)

Home Menu	Example
<ul style="list-style-type: none"> 1 System name 2 System status 3 Active alert quantity 4 Temperature 5 Power consumption 6 Checkpoint code 	<p>The screenshot shows a 'Status Dashboard' screen with the following elements: <ul style="list-style-type: none"> 1: System name (displayed as 'xxxxxx') 2: System status (displayed as 'System Init.') 3: Active alert quantity (displayed as '1 Active Alerts') 4: Temperature (displayed as '25 C') 5: Power consumption (displayed as '11 W') 6: Checkpoint code (displayed as '0x09') </p>

Active Alerts

Sub Menu	Example
Home screen: Active error quantity Note: The “Active Alerts” menu displays only the quantity of active errors. If no errors occur, the “Active Alerts” menu will not be available during navigation.	1 Active Alerts
Details screen: <ul style="list-style-type: none"> • Error message ID (Type: Error/Warning/Information) • Occurrence time • Possible sources of the error 	Active Alerts: 1 Press ▼ to view alert details FQXSPPU009N(Error) 04/07/2020 02:37:39 PM CPU 1 Status: Configuration Error

System VPD Information

Sub Menu	Example
<ul style="list-style-type: none"> • Machine type and serial number • Universal Unique ID (UUID) 	Machine Type: xxxx Serial Num: xxxxxx Universal Unique ID: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

System Firmware

Sub Menu	Example
XCC Primary <ul style="list-style-type: none"> Firmware level (status) Build ID Version number Release date 	XCC Primary (Active) Build: DVI399T Version: 4.07 Date: 2020-04-07
XCC Backup <ul style="list-style-type: none"> Firmware level (status) Build ID Version number Release date 	XCC Backup (Active) Build: D8BT05I Version: 1.00 Date: 2019-12-30
UEFI <ul style="list-style-type: none"> Firmware level (status) Build ID Version number Release date 	UEFI (Inactive) Build: D0E101P Version: 1.00 Date: 2019-12-26

XCC Network Information

Sub Menu	Example
<ul style="list-style-type: none"> XCC hostname MAC address IPv4 Network Mask IPv4 DNS IPv6 Link Local IP Stateless IPv6 IP Static IPv6 IP Current IPv6 Gateway IPv6 DNS <p>Note: Only the MAC address that is currently in use is displayed (extension or shared).</p>	XCC Network Information XCC Hostname: XCC-xxxx-SN MAC Address: xx:xx:xx:xx:xx:xx IPv4 IP: xx.xx.xx.xx IPv4 Network Mask: x.x.x.x IPv4 Default Gateway: x.x.x.x

System Environmental Information

Sub Menu	Example
<ul style="list-style-type: none"> • Ambient temperature • Exhaust temperature • CPU temperature • PSU status • Spinning speed of fans by RPM 	Ambient Temp: 24 C Exhaust Temp: 30 C CPU1 Temp: 50 C PSU1: Vin= 213 w Inlet= 26 C FAN1 Front: 21000 RPM FAN2 Front: 21000 RPM FAN3 Front: 21000 RPM FAN4 Front: 21000 RPM

Active Sessions

Sub Menu	Example
Quantity of active sessions	Active User Sessions: 1

Actions

Sub Menu	Example
Several quick actions are available: <ul style="list-style-type: none"> • Revert XCC to Defaults • Force XCC Reset • Request XCC Reset • Set UEFI Memory Test • Request Virtual Reseat • Modify XCC Static IPv4 Address/Net mask/Gateway • Modify System Name • Generate/Download FFDC Service Data 	Request XCC Reset? This will request the BMC to reboot itself. Hold √ for 3 seconds

General problem determination procedures

Use the information in this section to resolve problems if the event log does not contain specific errors or the server is inoperative.

If you are not sure about the cause of a problem and the power supplies are working correctly, complete the following steps to attempt to resolve the problem:

1. Power off the server.
2. Make sure that the server is cabled correctly.
3. Remove or disconnect the following devices if applicable, one at a time, until you find the failure. Power on and configure the server each time you remove or disconnect a device.
 - Any external devices.
 - Surge-suppressor device (on the server).
 - Printer, mouse, and non-Lenovo devices.
 - Each adapter.

- Hard disk drives.
- Memory modules until you reach the minimal configuration for debugging that is supported for the server.

To determine the minimal configuration for your server, see “Minimal configuration for debugging” in [“Technical specifications” on page 3](#).

4. Power on the server.

If the problem is solved when you remove an adapter from the server, but the problem recurs when you install the same adapter again, suspect the adapter. If the problem recurs when you replace the adapter with a different one, try a different PCIe slot.

If the problem appears to be a networking problem and the server passes all system tests, suspect a network cabling problem that is external to the server.

Resolving suspected power problems

Power problems can be difficult to solve. For example, a short circuit can exist anywhere on any of the power distribution buses. Usually, a short circuit will cause the power subsystem to shut down because of an overcurrent condition.

Complete the following steps to diagnose and resolve a suspected power problem.

Step 1. Check the event log and resolve any errors related to the power.

Note: Start with the event log of the application that is managing the server. For more information about event logs, see [“Event logs” on page 279](#).

Step 2. Check for short circuits, for example, if a loose screw is causing a short circuit on a circuit board.

Step 3. Remove the adapters and disconnect the cables and power cords to all internal and external devices until the server is at the minimal configuration for debugging that is required for the server to start. To determine the minimal configuration for your server, see “Minimal configuration for debugging” in [“Technical specifications” on page 3](#).

Step 4. Reconnect all AC power cords and turn on the server. If the server starts successfully, reseal the adapters and devices one at a time until the problem is isolated.

If the server does not start from the minimal configuration, replace the components in the minimal configuration one at a time until the problem is isolated.

Resolving suspected Ethernet controller problems

The method that you use to test the Ethernet controller depends on which operating system you are using. See the operating-system documentation for information about Ethernet controllers, and see the Ethernet controller device-driver readme file.

Complete the following steps to attempt to resolve suspected problems with the Ethernet controller.

Step 1. Make sure that the correct device drivers, which come with the server are installed and that they are at the latest level.

Step 2. Make sure that the Ethernet cable is installed correctly.

- The cable must be securely attached at all connections. If the cable is attached but the problem remains, try a different cable.
- If you set the Ethernet controller to operate at 100 Mbps or 1000 Mbps, you must use Category 5 cabling.

- Step 3. Determine whether the hub supports auto-negotiation. If it does not, try configuring the integrated Ethernet controller manually to match the speed and duplex mode of the hub.
- Step 4. Check the Ethernet controller LEDs on the server. These LEDs indicate whether there is a problem with the connector, cable, or hub.

Ethernet controller LED locations are specified in [“Troubleshooting by system LEDs and diagnostics display” on page 281](#).

- The Ethernet link status LED is lit when the Ethernet controller receives a link pulse from the hub. If the LED is off, there might be a defective connector or cable or a problem with the hub.
 - The Ethernet transmit/receive activity LED is lit when the Ethernet controller sends or receives data over the Ethernet network. If the Ethernet transmit/receive activity is off, make sure that the hub and network are operating and that the correct device drivers are installed.
- Step 5. Check the Network activity LED on the server. The Network activity LED is lit when data is active on the Ethernet network. If the Network activity LED is off, make sure that the hub and network are operating and that the correct device drivers are installed.

Network activity LED location is specified in [“Troubleshooting by system LEDs and diagnostics display” on page 281](#).

- Step 6. Check for operating-system-specific causes of the problem, and also make sure that the operating system drivers are installed correctly.
- Step 7. Make sure that the device drivers on the client and server are using the same protocol.

If the Ethernet controller still cannot connect to the network but the hardware appears to be working, the network administrator must investigate other possible causes of the error.

Troubleshooting by symptom

Use this information to find solutions to problems that have identifiable symptoms.

To use the symptom-based troubleshooting information in this section, complete the following steps:

1. Check the event log of the application that is managing the server and follow the suggested actions to resolve any event codes.
 - If you are managing the server from the Lenovo XClarity Administrator, begin with the Lenovo XClarity Administrator event log.
 - If you are using some other management application, begin with the Lenovo XClarity Controller event log.

For more information about event logs (see [“Event logs” on page 279](#)).

2. Review this section to find the symptoms that you are experiencing and follow the suggested actions to resolve the issue.
3. If the problem persists, contact support (see [“Contacting Support” on page 317](#)).

Intermittent problems

Use this information to solve intermittent problems.

- [“Intermittent external device problems” on page 292](#)
- [“Intermittent KVM problems” on page 292](#)
- [“Intermittent unexpected reboots” on page 292](#)

Intermittent external device problems

Complete the following steps until the problem is solved.

1. Update the UEFI and XCC firmware to the latest versions.
2. Make sure that the correct device drivers are installed. See the manufacturer's website for documentation.
3. For a USB device:
 - a. Make sure that the device is configured correctly.

Restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Then, click **System Settings** → **Devices and I/O Ports** → **USB Configuration**.

- b. Connect the device to another port. If using a USB hub, remove the hub and connect the device directly to the server. Make sure that the device is configured correctly for the port.

Intermittent KVM problems

Complete the following steps until the problem is solved.

Video problems:

1. Make sure that all cables and the console breakout cable are properly connected and secure.
2. Make sure that the monitor is working properly by testing it on another server.
3. Test the console breakout cable on a working server to ensure that it is operating properly. Replace the console breakout cable if it is defective.

Keyboard problems:

Make sure that all cables and the console breakout cable are properly connected and secure.

Mouse problems:

Make sure that all cables and the console breakout cable are properly connected and secure.

Intermittent unexpected reboots

Note: Some uncorrectable errors require that the server reboot so that it can disable a device, such as a memory DIMM or a processor to allow the machine to boot up properly.

1. If the reset occurs during POST and the POST watchdog timer is enabled, make sure that sufficient time is allowed in the watchdog timeout value (POST Watchdog Timer).

To check the POST watchdog time, restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Then, click **BMC Settings** → **POST Watchdog Timer**.

2. If the reset occurs after the operating system starts, do one of the followings:
 - Enter the operating system when the system operates normally and set up operating system kernel dump process (Windows and Linux base operating systems will be using different method). Enter the UEFI setup menus and disable the feature, or disable it with the following OneCli command.
`OneCli.exe config set SystemRecovery.RebootSystemOnNMI Disable --bmc XCC_USER:XCC_PASSWORD@XCC_IPAddress`
 - Disable any automatic server restart (ASR) utilities, such as the Automatic Server Restart IPMI Application for Windows, or any ASR devices that are installed.

3. See the management controller event log to check for an event code that indicates a reboot. See “[Event logs](#)” on page 279 for information about viewing the event log. If you are using Linux base operating system, then capture all logs back to Lenovo support for further investigation.

Keyboard, mouse, KVM switch or USB-device problems

Use this information to solve problems related to a keyboard, mouse, KVM switch or USB-device problems.

- “[All or some keys on the keyboard do not work](#)” on page 293
- “[Mouse does not work](#)” on page 293
- “[KVM switch problems](#)” on page 293
- “[USB-device does not work](#)” on page 293

All or some keys on the keyboard do not work

1. Make sure that:
 - The keyboard cable is securely connected.
 - The server and the monitor are turned on.
2. If you are using a USB keyboard, run the Setup utility and enable keyboardless operation.
3. If you are using a USB keyboard and it is connected to a USB hub, disconnect the keyboard from the hub and connect it directly to the server.
4. Replace the keyboard.

Mouse does not work

1. Make sure that:
 - The mouse cable is securely connected to the server.
 - The mouse device drivers are installed correctly.
 - The server and the monitor are turned on.
 - The mouse option is enabled in the Setup utility.
2. If you are using a USB mouse and it is connected to a USB hub, disconnect the mouse from the hub and connect it directly to the server.
3. Replace the mouse.

KVM switch problems

1. Make sure that the KVM switch is supported by your server.
2. Make sure that the KVM switch is powered on correctly.
3. If the keyboard, mouse or monitor can be operated normally with direct connection to the server, then replace the KVM switch.

USB-device does not work

1. Make sure that:
 - The correct USB device driver is installed.
 - The operating system supports USB devices.
2. Make sure that the USB configuration options are set correctly in system setup.

Restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Then, click **System Settings → Devices and I/O Ports → USB Configuration**.

3. If you are using a USB hub, disconnect the USB device from the hub and connect it directly to the server.

Memory problems

See this section to resolve issues related to memory.

Common memory problems

- [“Multiple memory modules in a channel identified as failing” on page 294](#)
- [“Displayed system memory is less than installed physical memory” on page 294](#)
- [“Invalid memory population detected” on page 295](#)

Multiple memory modules in a channel identified as failing

Note: Each time you install or remove a memory module, you must disconnect the server from the power source; then, wait 10 seconds before restarting the server.

Complete the following procedure to solve the problem.

1. Reseat the memory modules; then, restart the server.
2. Remove the highest-numbered memory module of those that are identified and replace it with an identical known good memory module; then, restart the server. Repeat as necessary. If the failures continue after all identified memory modules are replaced, go to step 4.
3. Return the removed memory modules, one at a time, to their original connectors, restarting the server after each memory module, until a memory module fails. Replace each failing memory module with an identical known good memory module, restarting the server after each memory module replacement. Repeat step 3 until you have tested all removed memory modules.
4. Replace the highest-numbered memory module of those identified; then, restart the server. Repeat as necessary.
5. Reverse the memory modules between the channels (of the same processor), and then restart the server. If the problem is related to a memory module, replace the failing memory module.
6. (Trained technician only) Install the failing memory module into a memory module connector for processor 2 (if installed) to verify that the problem is not the processor or the memory module connector.
7. (Trained technician only) Replace the system board (system board assembly).

Displayed system memory is less than installed physical memory

Complete the following procedure to solve the problem.

Note: Each time you install or remove a memory module, you must disconnect the server from the power source; then, wait 10 seconds before restarting the server.

1. Make sure that:
 - No error LEDs are lit. See [“Troubleshooting by system LEDs and diagnostics display” on page 281](#).
 - No memory module error LEDs are lit on the system board (system board assembly).
 - Memory mirrored channel does not account for the discrepancy.
 - The memory modules are seated correctly.
 - You have installed the correct type of memory module (see [“Memory module installation rules and order” on page 41](#) for requirements).
 - After changing or replacing a memory module, memory configuration is updated accordingly in the Setup Utility.

- All banks of memory are enabled. The server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.
 - There is no memory mismatch when the server is at the minimum memory configuration.
2. Reseat the memory modules, and then restart the server.
 3. Check the POST error log:
 - If a memory module was disabled by a systems-management interrupt (SMI), replace the memory module.
 - If a memory module was disabled by the user or by POST, reseat the memory module; then, run the Setup Utility and enable the memory module.
 4. Re-enable all memory modules using the Setup Utility, and then restart the server.
 5. (Trained technician only) Install the failing memory module into a memory module connector for processor 2 (if installed) to verify that the problem is not the processor or the memory module connector.
 6. (Trained technician only) Replace the system board (system board assembly).

Invalid memory population detected

If this warning message appears, complete the following steps:

Invalid memory population (unsupported DIMM population) detected. Please verify memory configuration is valid.

1. See [“Memory module installation rules and order” on page 41](#) to make sure the present memory module population sequence is supported.
2. If the present sequence is indeed supported, see if any of the modules is displayed as “disabled” in Setup Utility.
3. Reseat the module that is displayed as “disabled,” and reboot the system.
4. If the problem persists, replace the memory module.

Monitor and video problems

Use this information to solve problems related to a monitor or video.

- [“Incorrect characters are displayed” on page 295](#)
- [“Screen is blank” on page 295](#)
- [“Screen goes blank when you start some application programs” on page 296](#)
- [“The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted” on page 296](#)
- [“The wrong characters appear on the screen” on page 296](#)

Incorrect characters are displayed

Complete the following steps:

1. Verify that the language and locality settings are correct for the keyboard and operating system.
2. If the wrong language is displayed, update the server firmware to the latest level. See [“Update the firmware” on page 271](#).

Screen is blank

Note: Make sure that the expected boot mode has not been changed from the UEFI to Legacy or vice versa.

1. If the server is attached to a KVM switch, bypass the KVM switch to eliminate it as a possible cause of the problem: connect the monitor cable directly to the correct connector on the rear of the server.
2. The management controller remote presence function is disabled if you install an optional video adapter. To use the management controller remote presence function, remove the optional video adapter.

3. If the server is installed with the graphical adapters while turning on the server, the Lenovo logo is displayed on the screen after approximately 3 minutes. This is normal operation while the system loads.
4. Make sure that:
 - The server is turned on and there is power supplied to the server.
 - The monitor cables are connected correctly.
 - The monitor is turned on and the brightness and contrast controls are adjusted correctly.
5. Make sure that the correct server is controlling the monitor, if applicable.
6. Make sure that the video output is not affected by corrupted server firmware; See [“Update the firmware” on page 271](#).
7. If the problem remains, contact Lenovo Support.

Screen goes blank when you start some application programs

1. Make sure that:
 - The application program is not setting a display mode that is higher than the capability of the monitor.
 - You installed the necessary device drivers for the application.

The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted

1. If the monitor self-tests show that the monitor is working correctly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescents, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor.

Attention: Moving a color monitor while it is turned on might cause screen discoloration.

Move the device and the monitor at least 305 mm (12 in.) apart, and turn on the monitor.

Notes:

- a. To prevent diskette drive read/write errors, make sure that the distance between the monitor and any external diskette drive is at least 76 mm (3 in.).
 - b. Non-Lenovo monitor cables might cause unpredictable problems.
2. Reseat the monitor cable.
 3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time:
 - a. Monitor cable
 - b. Video adapter (if one is installed)
 - c. Monitor
 - d. (Trained technician only) System board (system board assembly)

The wrong characters appear on the screen

Complete the following steps until the problem is solved:

1. Verify that the language and locality settings are correct for the keyboard and operating system.
2. If the wrong language is displayed, update the server firmware to the latest level. See [“Update the firmware” on page 271](#).

Network problems

Use this information to resolve issues related to networking.

- [“Cannot wake server using Wake on LAN” on page 297](#)

- [“Could not log in using LDAP account with SSL enabled” on page 297](#)

Cannot wake server using Wake on LAN

Complete the following steps until the problem is resolved:

1. If you are using the dual-port network adapter and the server is connected to the network using Ethernet 5 connector, check the system-error log or IMM2 system event log (see [“Event logs” on page 279](#)), make sure:
 - a. Fan 3 is running in standby mode, if Emulex dual port 10GBase-T embedded adapter is installed.
 - b. The room temperature is not too high (see [“Specifications” on page 3](#)).
 - c. The air vents are not blocked.
 - d. The air baffle is installed securely.
2. Reseat the dual-port network adapter.
3. Turn off the server and disconnect it from the power source; then, wait 10 seconds before restarting the server.
4. If the problem still remains, replace the dual-port network adapter.

Could not log in using LDAP account with SSL enabled

Complete the following steps until the problem is resolved:

1. Make sure that the license key is valid.
2. Generate a new license key and log in again.

Observable problems

Use this information to solve observable problems.

- [“Server hangs during the UEFI boot process” on page 297](#)
- [“The server immediately displays the POST Event Viewer when it is turned on” on page 298](#)
- [“Server is unresponsive \(POST is complete and operating system is running\)” on page 298](#)
- [“Server is unresponsive \(POST failed and cannot start System Setup\)” on page 298](#)
- [“Voltage planar fault is displayed in the event log” on page 299](#)
- [“Unusual smell” on page 299](#)
- [“Server seems to be running hot” on page 299](#)
- [“Cracked parts or cracked chassis” on page 299](#)

Server hangs during the UEFI boot process

If the system hangs during the UEFI boot process with the message UEFI: DXE INIT on the display, make sure that Option ROMs were not configured with a setting of **Legacy**. You can remotely view the current settings for Option ROMs by running the following command using the Lenovo XClarity Essentials OneCLI:

```
onecli config show EnableDisableAdapterOptionROMSupport --bmc xcc_userid:xcc_password@xcc_ipaddress
```

To recover a system that hangs during the boot process with Legacy Option ROM settings, see the following Tech Tip:

<https://datacentersupport.lenovo.com/solutions/ht506118>

If legacy Option ROMs must be used, do not set slot Option ROMs to **Legacy** on the Devices and I/O Ports menu. Instead, set slot Option ROMs to **Auto** (the default setting), and set the System Boot Mode to **Legacy Mode**. Legacy option ROMs will be invoked shortly before the system boots.

The server immediately displays the POST Event Viewer when it is turned on

Complete the following steps until the problem is solved.

1. Correct any errors that are indicated by the system LEDs and diagnostics display.
2. Make sure that the server supports all the processors and that the processors match in speed and cache size.

You can view processor details from system setup.

To determine if the processor is supported for the server, see <https://serverproven.lenovo.com>.

3. (Trained technician only) Make sure that processor 1 is seated correctly.
4. (Trained technician only) Remove processor 2 and restart the server.
5. Replace the following components one at a time, in the order shown, restarting the server each time:
 - a. (Trained technician only) Processor
 - b. (Trained technician only) System board (system board assembly)

Server is unresponsive (POST is complete and operating system is running)

Complete the following steps until the problem is solved.

- If you are in the same location as the compute node, complete the following steps:
 1. If you are using a KVM connection, make sure that the connection is operating correctly. Otherwise, make sure that the keyboard and mouse are operating correctly.
 2. If possible, log in to the compute node and verify that all applications are running (no applications are hung).
 3. Restart the compute node.
 4. If the problem remains, make sure that any new software has been installed and configured correctly.
 5. Contact your place of purchase of the software or your software provider.
- If you are accessing the compute node from a remote location, complete the following steps:
 1. Make sure that all applications are running (no applications are hung).
 2. Attempt to log out of the system and log back in.
 3. Validate the network access by pinging or running a trace route to the compute node from a command line.
 - a. If you are unable to get a response during a ping test, attempt to ping another compute node in the enclosure to determine whether it is a connection problem or compute node problem.
 - b. Run a trace route to determine where the connection breaks down. Attempt to resolve a connection issue with either the VPN or the point at which the connection breaks down.
 4. Restart the compute node remotely through the management interface.
 5. If the problem remains, verify that any new software has been installed and configured correctly.
 6. Contact your place of purchase of the software or your software provider.

Server is unresponsive (POST failed and cannot start System Setup)

Configuration changes, such as added devices or adapter firmware updates, and firmware or application code problems can cause the server to fail POST (the power-on self-test).

If this occurs, the server responds in either of the following ways:

- The server restarts automatically and attempts POST again.
- The server hangs, and you must manually restart the server for the server to attempt POST again.

After a specified number of consecutive attempts (automatic or manual), the server reverts to the default UEFI configuration and starts System Setup so that you can make the necessary corrections to the configuration and restart the server. If the server is unable to successfully complete POST with the default configuration, there might be a problem with the system board (system board assembly).

You can specify the number of consecutive restart attempts in System Setup. Restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Then, click **System Settings → Recovery and RAS → POST Attempts → POST Attempts Limit**. Available options are 3, 6, 9, and disable.

Voltage planar fault is displayed in the event log

Complete the following steps until the problem is solved.

1. Revert the system to the minimum configuration. See “Specifications” on page 3 for the minimally required number of processors and DIMMs.
2. Restart the system.
 - If the system restarts, add each of the removed items one at a time and restart the system each time until the error occurs. Replace the item for which the error occurs.
 - If the system does not restart, suspect the system board (system board assembly).

Unusual smell

Complete the following steps until the problem is solved.

1. An unusual smell might be coming from newly installed equipment.
2. If the problem remains, contact Lenovo Support.

Server seems to be running hot

Complete the following steps until the problem is solved.

Multiple compute nodes or chassis:

1. Make sure that the room temperature is within the specified range (see “Specifications” on page 3).
2. Make sure that the fans are installed correctly.
3. Update the UEFI and XCC to the latest versions.
4. Make sure that the fillers in the server are installed correctly (see Chapter 5 “Hardware replacement procedures” on page 37 for detailed installation procedures).
5. Use the IPMI command to ramp up the fan speed to the full fan speed to see whether the issue can be resolved.

Note: The IPMI raw command should only be used by trained technician and the each system has its own specific PMI raw command.

6. Check the management processor event log for rising temperature events. If there are no events, the compute node is running within normal operating temperatures. Note that you can expect some variation in temperature.

Cracked parts or cracked chassis

Contact Lenovo Support.

Optional-device problems

Use this information to solve problems related to optional devices.

- [“External USB device is not recognized” on page 300](#)
- [“PCIe adapter is not recognized or is not functioning” on page 300](#)
- [“Insufficient PCIe resources are detected.” on page 300](#)
- [“A Lenovo optional device that was just installed does not work.” on page 301](#)
- [“A Lenovo optional device that worked previously does not work now” on page 301](#)

External USB device is not recognized

Complete the following steps until the problem is resolved:

1. Update the UEFI firmware to the latest version.
2. Make sure that the proper drivers are installed on the compute node. See the product documentation for the USB device for information about device drivers.
3. Use the Setup utility to make sure that the device is configured correctly.
4. If the USB device is plugged into a hub or the console breakout cable, unplug the device and plug it directly into the USB port on the front of the compute node.

PCIe adapter is not recognized or is not functioning

Complete the following steps until the problem is resolved:

1. Update the UEFI firmware to the latest version.
2. Check the event log and resolve any issues related to the device.
3. Validate that the device is supported for the server (see <https://serverproven.lenovo.com>). Make sure that the firmware level on the device is at the latest supported level and update the firmware if applicable.
4. Make sure that the adapter is installed in a correct slot.
5. Make sure that the proper device drivers are installed for the device.
6. Resolve any resource conflicts if running legacy mode (UEFI). Check legacy ROM boot orders and modify the UEFI setting for MM config base.

Note: Ensure that you modify the ROM boot order associated with the PCIe adapter to the first execution order.

7. Check <http://datacentersupport.lenovo.com> for any tech tips (also known as retain tips or service bulletins) that might be related to the adapter.
8. Ensure any adapter external connections are correct and that the connectors are not physically damaged.
9. Make sure that the PCIe adapter is installed with the supported operating system.

Insufficient PCIe resources are detected.

If you see an error message stating “Insufficient PCI Resources Detected,” complete the following steps until the problem is resolved:

1. Press Enter to access System Setup Utility.
2. Select **System Settings → Devices and I/O Ports → MM Config Base**; then, modify the setting to increase the device resources. For example, modify 3 GB to 2 GB or modify 2 GB to 1 GB.
3. Save the settings and restart the system.
4. If the error recurs with the highest device resource setting (1GB), shutdown the system and remove some PCIe devices; then, power on the system.

5. If the reboot failed, repeat step 1 to step 4.
6. If the error recurs, press Enter to access System Setup Utility.
7. Select **System Settings** → **Devices and I/O Ports** → **PCI 64-Bit Resource Allocation**, then; modify the setting from **Auto** to **Enable**.
8. If the Boot Device does not support MMIO above 4GB for Legacy Boot, use UEFI Boot Mode or remove/disable some PCIe devices.
9. DC cycle the system and ensure the system is enter UEFI boot menu or the operating system; then, capture the FFDC log.
10. Contact Lenovo technical support.

A Lenovo optional device that was just installed does not work.

1. Make sure that:
 - The device is supported for the server (see <https://serverproven.lenovo.com>).
 - You followed the installation instructions that came with the device and the device is installed correctly.
 - You have not loosened any other installed devices or cables.
 - You updated the configuration information in system setup. When you start a server and press the key according to the on-screen instructions to display the Setup Utility. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Whenever memory or any other device is changed, you must update the configuration.
2. Reseat the device that you have just installed.
3. Replace the device that you have just installed.
4. Reseat the cable connection and check there is no physical damage to the cable.
5. If there is any cable damages, then replace the cable.

A Lenovo optional device that worked previously does not work now

1. Make sure that all of the cable connections for the device are secure.
2. If the device comes with test instructions, use those instructions to test the device.
3. Reseat the cable connection and check if any physical parts have been damaged.
4. Replace the cable.
5. Reseat the failing device.
6. Replace the failing device.

Performance problems

Use this information to solve performance problems.

- “Network performance” on page 301
- “Operating system performance” on page 302

Network performance

Complete the following steps until the problem is solved:

1. Isolate which network is operating slowly (such as storage, data, and management). You might find it helpful to use ping tools or operating-system tools such as task manager or resource manager.
2. Check for traffic congestion on the network.
3. Update the NIC device driver, or the storage device controller device driver.

4. Use the traffic-diagnostic tools that are provided by the IO-module manufacturer.

Operating system performance

Complete the following steps until the problem is solved:

1. If you have recently made changes to the compute node (for example updated device drivers or installed software applications) remove the changes.
2. Check for any networking issues.
3. Check the operating system logs for performance related errors.
4. Check for events related to high temperatures and power issues as the compute node might be throttled to help with cooling. If it is throttled, reduce the workload on the compute node to help improve performance.
5. Check for events related to disabled DIMMs. If you do not have enough memory for the application workload, your operating system will have poor performance.
6. Ensure that the workload is not too high for the configuration.

Power on and power off problems

Use this information to resolve issues when powering on or powering off the server.

- [“The power button does not work \(server does not start\)” on page 302](#)
- [“Server does not power on” on page 303](#)

The power button does not work (server does not start)

Note: The power button will not function until approximately 1 to 3 minutes after the server has been connected to ac power to allow time for BMC to initialize.

Complete the following steps until the problem is resolved:

1. Make sure that the power button on the server is working correctly:
 - a. Disconnect the server power cords.
 - b. Reconnect the server power cords.
 - c. Reseat the front operator panel cable, and then repeat steps 1a and 2b.
 - If the server starts, reseat the front operator panel.
 - If the problem remains, replace the front operator panel.
2. Make sure that:
 - The power cords are correctly connected to the server and to a working electrical outlet.
 - The LEDs on the power supply do not indicate a problem.
 - The Power button LED is lit on and is flashing slowly.
 - The push force is enough and with button force response.
3. If the power button LED is not lit on or is not flashing correctly, reseat all the power supplies and make sure AC LED on PSU rear side are lit on.
4. If you have just installed an optional device, remove it, and restart the server.
5. If the issue is still observed or without power button LED lit on, implement the minimum configuration to check whether any specific components lock the power permission. Replace the each power supply and check the power button function after installing the each one.
6. If everything is still done and the issue cannot be resolved, collect the failure information with system logs captured to Lenovo support.

Server does not power on

Complete the following steps until the problem is resolved:

1. Check the event log for any events related to the server not powering on.
2. Check for any LEDs that are flashing amber.
3. Check the power LED on the system board (system board assembly).
4. Check if AC power LED is lit on or the amber LED is lit on at the PSU rear side.
5. AC cycle the system.
6. Remove the CMOS battery for at least ten seconds, then, reinstall the CMOS battery.
7. Try to power on the system by IPMI command through XCC or by the power button.
8. Implement the minimum configuration (see [“Technical specifications” on page 3](#)).
9. Reseat all power supplies and make sure that AC LEDs on the PSU rear side are lit.
10. Replace the each power supply and check the power button function after installing the each one.
11. If the issue cannot be resolved by above actions, call service to review the issue symptom and see whether the system board (system board assembly) replacement is necessary.

Power problems

Use this information to resolve issues related to power.

System error LED is on and event log "Power supply has lost input" is displayed

To resolve the problem, ensure that:

1. The power supply is properly connected to a power cord.
2. The power cord is connected to a properly grounded electrical outlet for the server.
3. Make sure that the power supply AC source is stable within the supported range.
4. Swap the power supply to see if the issue follows the power supply, if it follows the power supply, then replace the failing one.
5. Review the event log and see how the problem it is to follow the event log actions to resolved the problems.

Serial-device problems

Use this information to solve problems with serial ports or devices.

- [“Number of displayed serial ports is less than the number of installed serial ports” on page 303](#)
- [“Serial device does not work” on page 303](#)

Number of displayed serial ports is less than the number of installed serial ports

Complete the following steps until the problem is solved.

1. Make sure that:
 - Each port is assigned a unique address in the Setup utility and none of the serial ports is disabled.
 - The serial-port adapter (if one is present) is seated correctly.
2. Reseat the serial port adapter.
3. Replace the serial port adapter.

Serial device does not work

1. Make sure that:

- The device is compatible with the server.
 - The serial port is enabled and is assigned a unique address.
 - The device is connected to the correct connector (see [“System-board-assembly connectors” on page 21](#)).
2. Reseat the following components:
 - a. Failing serial device.
 - b. Serial cable.
 3. Replace the following components:
 - a. Failing serial device.
 - b. Serial cable.
 4. (Trained technician only) Replace the system board (system board assembly).

Software problems

Use this information to solve software problems.

1. To determine whether the problem is caused by the software, make sure that:
 - The server has the minimum memory that is needed to use the software. For memory requirements, see the information that comes with the software.

Note: If you have just installed an adapter or memory, the server might have a memory-address conflict.

 - The software is designed to operate on the server.
 - Other software works on the server.
 - The software works on another server.
2. If you receive any error messages while you use the software, see the information that comes with the software for a description of the messages and suggested solutions to the problem.
3. Contact your place of purchase of the software.

Storage drive problems

Use this information to resolve issues related to the storage drives.

- [“Server cannot recognize a drive” on page 304](#)
- [“Multiple drives fail” on page 305](#)
- [“Multiple drives are offline” on page 305](#)
- [“A replacement drive does not rebuild” on page 306](#)
- [“Green drive activity LED does not represent actual state of associated drive” on page 306](#)
- [“Yellow drive status LED does not represent actual state of associated drive” on page 306](#)
- [“U.3 NVMe drive can be detected in NVMe connection, but cannot be detected in Tri-mode” on page 306](#)

Server cannot recognize a drive

Complete the following steps until the problem is solved.

1. Observe the associated yellow drive status LED. If the LED is lit, it indicates a drive fault.
2. If the status LED is lit, remove the drive from the bay, wait 45 seconds, and reinsert the drive, making sure that the drive assembly connects to the drive backplane.
3. Observe the associated green drive activity LED and the yellow status LED and perform corresponding operations in different situations:

- If the green activity LED is flashing and the yellow status LED is not lit, the drive is recognized by the controller and is working correctly. Run the diagnostics tests for the drives. When you start a server and press the key according to the on-screen instructions, the LXPM is displayed by default. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) You can perform drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → Disk Drive Test**.
 - If the green activity LED is flashing and the yellow status LED is flashing slowly, the drive is recognized by the controller and is rebuilding.
 - If neither LED is lit or flashing, check whether the drive backplane is correctly seated. For details, go to step 4.
 - If the green activity LED is flashing and the yellow status LED is lit, replace the drive.
4. Make sure that the drive backplane is correctly seated. When it is correctly seated, the drive assemblies correctly connect to the backplane without bowing or causing movement of the backplane.
 5. Reseat the backplane power cable and repeat steps 1 through 3.
 6. Reseat the backplane signal cable and repeat steps 1 through 3.
 7. Suspect the backplane signal cable or the backplane:
 - Replace the affected backplane signal cable.
 - Replace the affected backplane.
 8. Run the diagnostics tests for the drives. When you start a server and press the key according to the on-screen instructions, the LXPM is displayed by default. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) You can perform drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → Disk Drive Test**.

Based on those tests:

- If the backplane passes the test but the drives are not recognized, replace the backplane signal cable and run the tests again.
- Replace the backplane.
- If the adapter fails the test, disconnect the backplane signal cable from the adapter and run the tests again.
- If the adapter fails the test, replace the adapter.

Multiple drives fail

Complete the following steps until the problem is solved:

- View the Lenovo XClarity Controller event log for events related to power supplies or vibration issues and resolve those events.
- Make sure that the device drivers and firmware for the drive and server are at the latest level.

Important: Some cluster solutions require specific code levels or coordinated code updates. If the device is part of a cluster solution, verify that the latest level of code is supported for the cluster solution before you update the code.

Multiple drives are offline

Complete the following steps until the problem is solved:

- View the Lenovo XClarity Controller event log for events related to power supplies or vibration issues and resolve those events.
- View the storage subsystem log for events related to the storage subsystem and resolve those events.

A replacement drive does not rebuild

Complete the following step until the problem is solved:

1. Make sure that the drive is recognized by the adapter (the green drive activity LED is flashing).

Green drive activity LED does not represent actual state of associated drive

Complete the following steps until the problem is solved:

1. If the green drive activity LED does not flash when the drive is in use, run the diagnostics tests for the drives. When you start a server and press the key according to the on-screen instructions, the LXPM is displayed by default. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) You can perform drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → Disk Drive Test**
2. If the drive passes the test, replace the backplane.
3. If the drive fails the test, replace the drive.

Yellow drive status LED does not represent actual state of associated drive


Complete the following steps until the problem is solved:

1. Turn off the server.
2. Reseat the SAS/SATA adapter.
3. Reseat the backplane signal cable and backplane power cable.
4. Reseat the drive.
5. Power on the server and observe the activity of the drive LEDs.

U.3 NVMe drive can be detected in NVMe connection, but cannot be detected in Tri-mode

In Tri-mode, NVMe drives are connected via a PCIe x1 link to the controller. To support Tri-mode with U.3 NVMe drives, **U.3 x1 mode** must be enabled for the selected drive slots on the backplane through the XCC Web GUI. By default, the backplane setting is **U.2 x4 mode**.

Complete the following steps to enable **U.3 x1 mode**:

1. Log into the XCC Web GUI, and choose **Storage → Detail** from the navigation tree on the left.
2. In the window that is displayed, click the icon  next to **Backplane**.
3. In the dialog box that is displayed, select the target drive slots and click **Apply**.
4. Do a DC power cycle to make the setting take effect.

Appendix A. Hardware disassembling for recycle

Follow the instructions in this section to recycle components with compliance with local laws or regulations.

Disassemble the 2U compute shuttle

Follow the instructions in this section to disassemble the 2U compute shuttle before recycling.

About this task

Refer to local environmental, waste or disposal regulations to ensure compliance.

Procedure

- Step 1. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67](#).
- Step 2. Remove the processor air baffle. See [“Remove the processor air baffle” on page 204](#).
- Step 3. Remove the rear PCIe switch cable harness. See [“Remove the rear PCIe switch cable harness” on page 184](#).
- Step 4. If applicable, remove the PCIe riser assembly(ies). See [“Remove a PCIe riser assembly” on page 167](#).
- Step 5. If applicable, remove the OCP module. See [“Remove the OCP module” on page 159](#).
- Step 6. Remove all the processors and the heat sinks. See [“Remove a processor” on page 210](#) and [“Remove a heat sink” on page 209](#).
- Step 7. Remove all the memory modules. See [“Remove a memory module” on page 152](#).
- Step 8. Remove the CMOS battery (CR2032). See [“Remove the CMOS battery \(CR2032\)” on page 75](#).
- Step 9. Remove the power interface board. See [“Remove the power interface board” on page 199](#).
- Step 10. Remove the system board assembly. See [“Remove the system I/O board or processor board” on page 227](#).

After you finish

After disassembling the 2U compute shuttle, recycle the unit in compliance with local regulations.

Disassemble the 8U GPU shuttle

Follow the instructions in this section to disassemble the 8U GPU shuttle before recycling.

About this task

Refer to local environmental, waste or disposal regulations to ensure compliance.

Procedure

- Step 1. Remove all the power supply units. See [“Remove a hot-swap power supply unit” on page 201](#).
- Step 2. Remove all the rear fans. See [“Remove a hot-swap fan \(front and rear\)” on page 79](#).
- Step 3. Remove all the front fans. See [“Remove a hot-swap fan \(front and rear\)” on page 79](#).
- Step 4. Remove all the 2.5-inch hot-swap drives and the drive bay fillers (if any) from the drive bays. See [“Remove a 2.5-inch hot-swap drive” on page 58](#).

- Step 5. Remove the PCIe switch shuttle. See [“Remove the PCIe switch shuttle” on page 188](#).
- Step 6. Pull the 8U GPU shuttle out of the chassis, and place it onto the lift platform. See [“Remove the 8U GPU shuttle” on page 69](#).
- Step 7. Remove the cable cover. See [“Remove the cable cover” on page 73](#).
- Step 8. Remove the front fan control board assembly. See [“Remove the front fan control board assembly” on page 83](#).
- Step 9. Remove the I/O cover. See [“Remove the I/O cover” on page 143](#).
- Step 10. Remove all the 2.5-inch drive backplanes. See [“Remove a 2.5-inch drive backplane” on page 62](#).
- Step 11. Remove the integrated diagnostics panel. See [“Remove the integrated diagnostics panel” on page 141](#).
- Step 12. Remove the front PCIe switch cable harness. See [“Remove the front PCIe switch cable harness” on page 177](#).
- Step 13. Remove the power complex. See [“Remove the power complex” on page 192](#).
- Step 14. Remove all the rear fan control board assemblies. See [“Remove a rear fan control board assembly” on page 87](#).
- Step 15. Remove all the GPU air ducts. Depending on the configuration, see [“Remove an H100 GPU air duct” on page 94](#) or [“Remove an MI300X GPU air duct” on page 96](#).
- Step 16. Remove the GPU complex. Depending on the configuration, see [“Remove the H100 GPU complex” on page 107](#) or [“Remove the MI300X GPU complex” on page 114](#).
- Step 17. Remove the GPU complex adaptor plate. See [“Remove the GPU complex adaptor plate” on page 121](#).

After you finish

After disassembling the 8U GPU shuttle, recycle the unit in compliance with local regulations.

Disassemble the system board assembly for recycle

Follow the instructions in this section to disassemble the system board assembly before recycling.

Notes: Make sure you have the required tools listed below available to properly replace the component:

- Phillips #1 screwdriver
- Phillips #2 screwdriver
- 5 mm hex socket screwdriver bit
- 7 mm hex socket screwdriver bit

About this task

Before disassembling the system board assembly:

1. Remove the 2U compute shuttle. See [“Remove the 2U compute shuttle” on page 67](#).
2. Remove the processor air baffle. See [“Remove the processor air baffle” on page 204](#).
3. If applicable, remove the PCIe riser assembly(ies). See [“Remove a PCIe riser assembly” on page 167](#).
4. If applicable, remove the OCP module. See [“Remove the OCP module” on page 159](#).
5. Remove all the processors and the heat sinks. See [“Remove a processor” on page 210](#) and [“Remove a heat sink” on page 209](#).
6. Remove all the memory modules. See [“Remove a memory module” on page 152](#).

7. Remove the CMOS battery (CR2032). See [“Remove the CMOS battery \(CR2032\)”](#) on page 75.
8. Remove the firmware and RoT security module. See [“Remove the firmware and RoT security module”](#) on page 224.
9. Refer to local environmental, waste or disposal regulations to ensure compliance.

Procedure

Step 1. Remove the two cable guides.

- a. Unfasten the six screws to lift the cable guide out of the 2U compute shuttle.

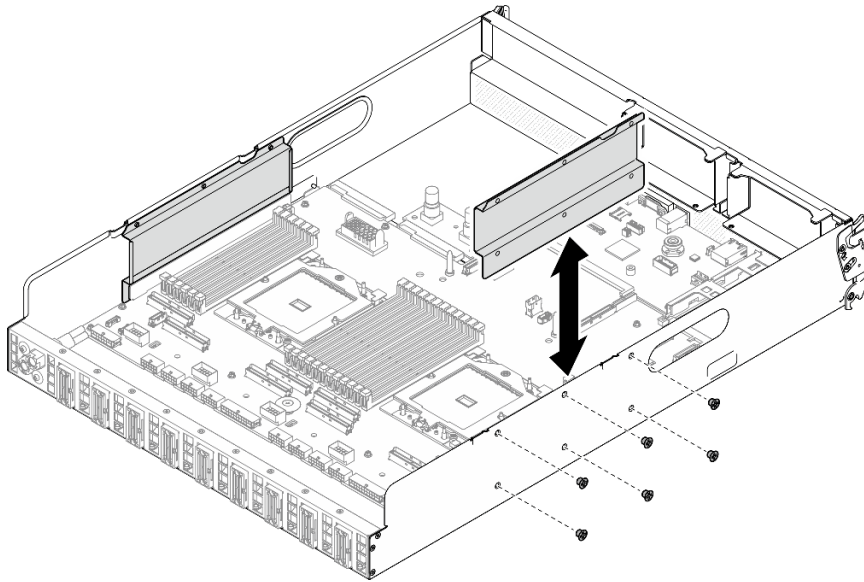


Figure 259. Cable guide removal

- b. Repeat to remove the other cable guide.

Step 2. Disengage the system board assembly.

- a. ① Pull up the rear lifting handle to release the system board assembly.
- b. ② Grasp both lifting handles and slide the system board assembly toward the front of the 2U compute shuttle.

Note: The two lifting handles only serve the purpose of removing system board assembly. Do not attempt to lift the whole 2U compute shuttle with them.

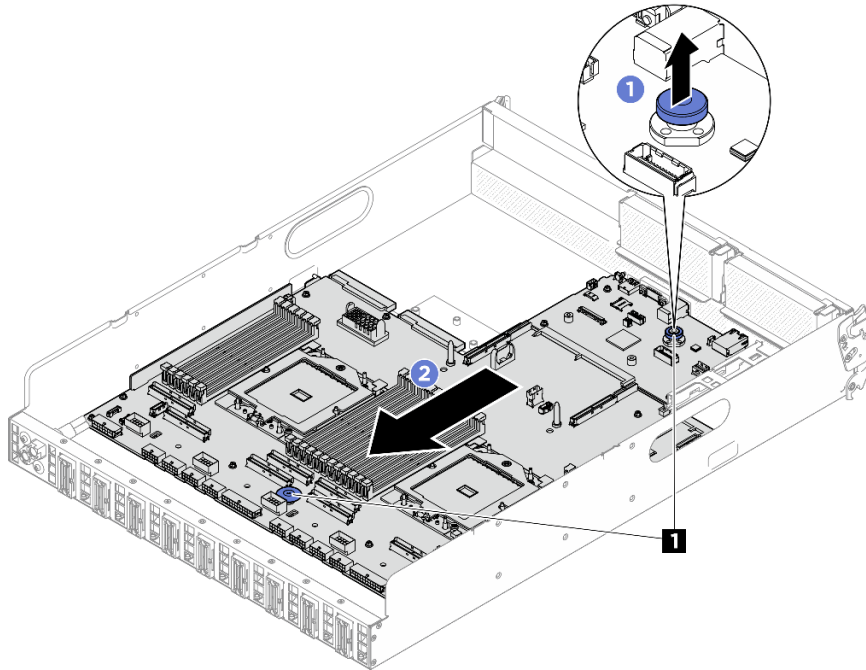


Figure 260. System board assembly disengagement

1 Lifting handles

Step 3. Remove the system board assembly.

- a. **1** Tilt the system board assembly so that its rear end is up.
- b. **2** Hold both lifting handles, and lift the system board assembly out of the 2U compute shuttle.

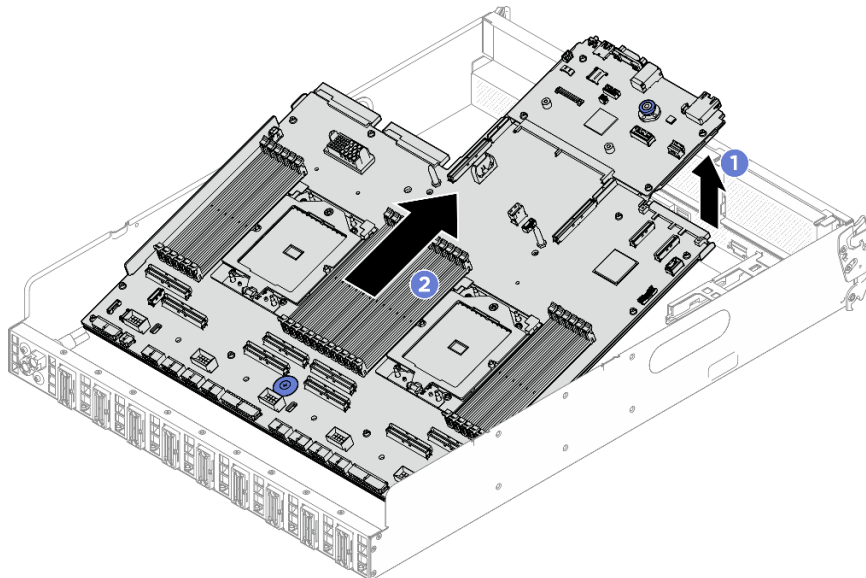


Figure 261. System board assembly removal

Step 4. Separate the system board assembly from the supporting sheet metal.

1. Hold the two lifting handles, and carefully turn the system board assembly upside down.

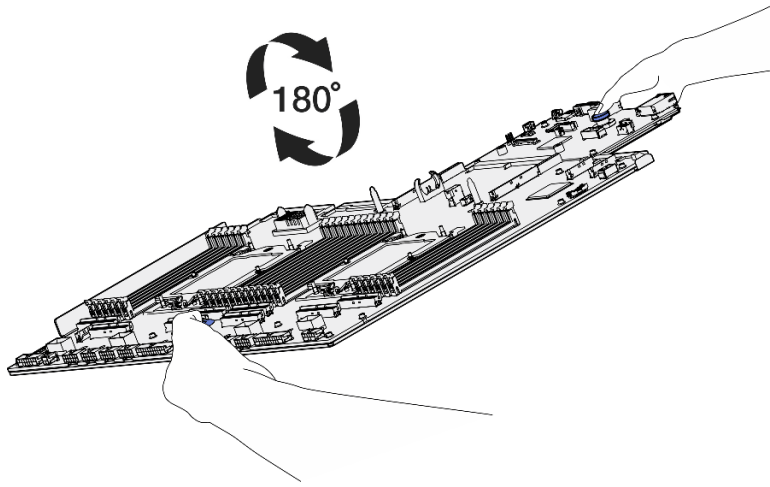


Figure 262. Turning the system board assembly upside down

2. Use a Phillips #1 screwdriver to remove the two screws from the bottom of the supporting sheet metal.

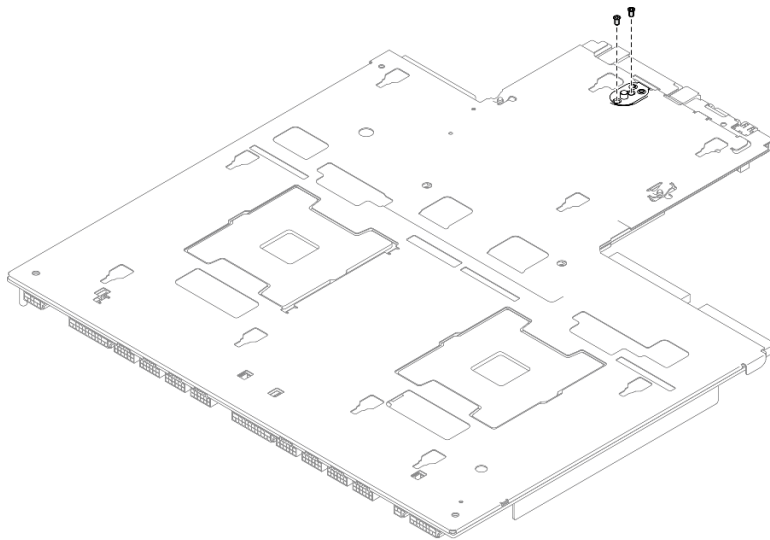


Figure 263. Screw removal

3. Hold the two lifting handles, and carefully turn the system board assembly right-side up.

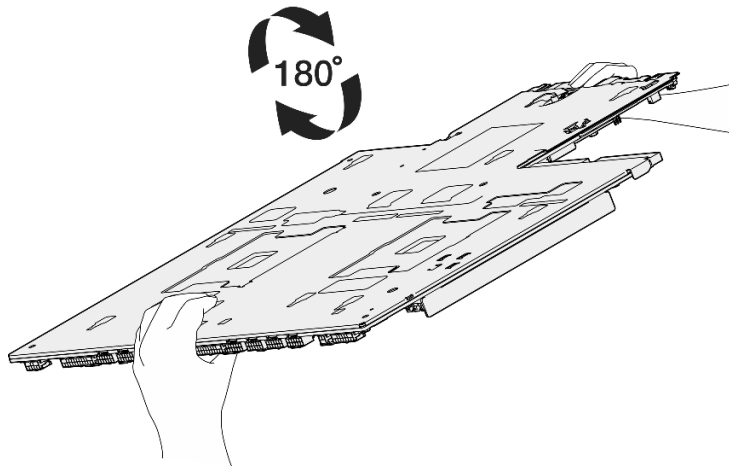


Figure 264. Turning the system board assembly right-side up

4. Remove the following components from the system board assembly as illustrated:
 - Use a 5 mm hex socket with a screwdriver to remove the two hex nuts.
 - Use a 7 mm hex socket with a screwdriver to remove the two guide pins.
 - Use a Phillips #2 screwdriver to remove the lifting handle.
 - Use a Phillips #1 screwdriver to remove the fifteen screws.

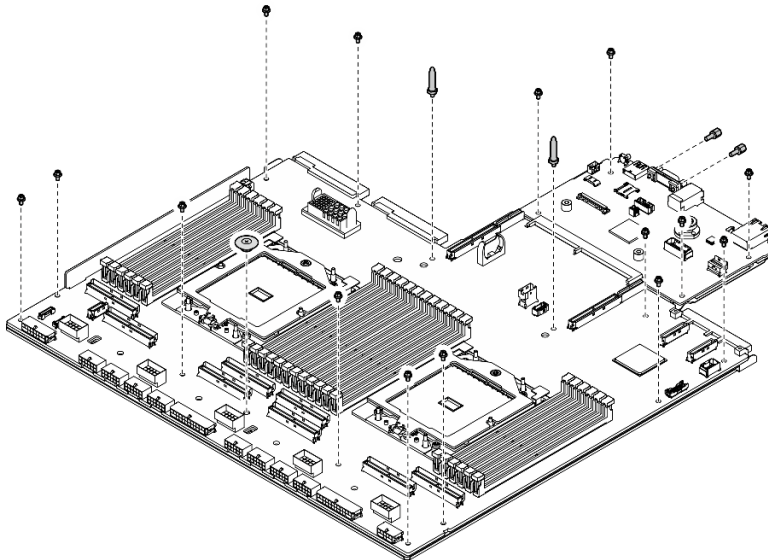


Figure 265. Component removal

5. Separate the system board assembly from the supporting sheet metal.

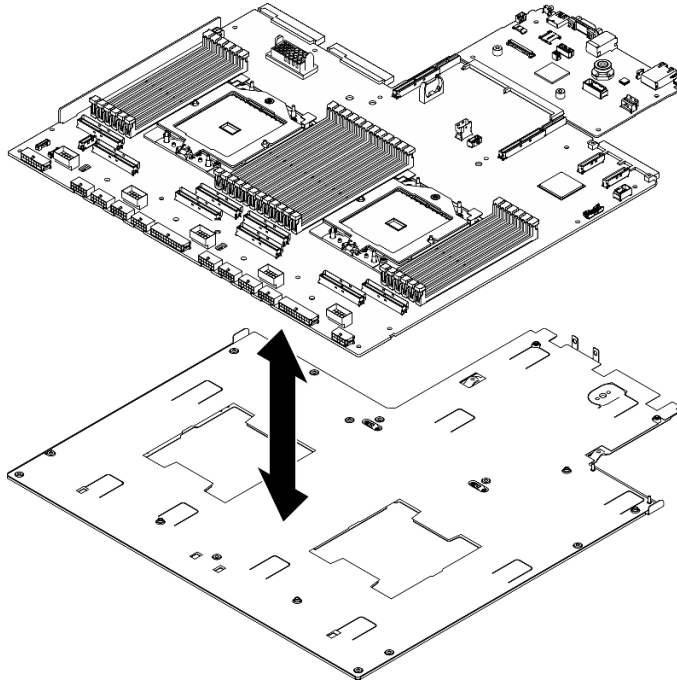


Figure 266. System board assembly disassembly

After you finish

After disassembling the system board assembly, recycle the unit in compliance with local regulations.

Appendix B. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about Lenovo products, you will find a wide variety of sources available from Lenovo to assist you.

On the World Wide Web, up-to-date information about Lenovo systems, optional devices, services, and support are available at:

<http://datacentersupport.lenovo.com>

Note: IBM is Lenovo's preferred service provider for ThinkSystem.

Before you call

Before you call, there are several steps that you can take to try and solve the problem yourself. If you decide that you do need to call for assistance, gather the information that will be needed by the service technician to more quickly resolve your problem.

Attempt to resolve the problem yourself

You can solve many problems without outside assistance by following the troubleshooting procedures that Lenovo provides in the online help or in the Lenovo product documentation. The online help also describes the diagnostic tests that you can perform. The documentation for most systems, operating systems, and programs contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

You can find the product documentation for your ThinkSystem products at the following location:

<https://pubs.lenovo.com/>

You can take these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Check for updated software, firmware, and operating-system device drivers for your Lenovo product. (See the following links) The Lenovo Warranty terms and conditions state that you, the owner of the Lenovo product, are responsible for maintaining and updating all software and firmware for the product (unless it is covered by an additional maintenance contract). Your service technician will request that you upgrade your software and firmware if the problem has a documented solution within a software upgrade.
 - Drivers and software downloads
 - <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/>
 - Operating system support center
 - <https://datacentersupport.lenovo.com/solutions/server-os>
 - Operating system installing instructions
 - <https://pubs.lenovo.com/thinksystem#os-installation>
- If you have installed new hardware or software in your environment, check <https://serverproven.lenovo.com> to make sure that the hardware and software are supported by your product.
- Refer to [Chapter 8 “Problem determination” on page 279](#) for instructions on isolating and solving issues.

- Go to <http://datacentersupport.lenovo.com> and check for information to help you solve the problem.

To find the Tech Tips available for your server:

1. Go to <http://datacentersupport.lenovo.com> and navigate to the support page for your server.
2. Click on **How To's** from the navigation pane.
3. Click **Article Type** → **Solution** from the drop-down menu.

Follow the on-screen instructions to choose the category for the problem that you are having.

- Check Lenovo Data Center Forum at https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg to see if someone else has encountered a similar problem.

Gathering information needed to call Support

If you require warranty service for your Lenovo product, the service technicians will be able to assist you more efficiently if you prepare the appropriate information before you call. You can also go to <http://datacentersupport.lenovo.com/warrantylookup> for more information about your product warranty.

Gather the following information to provide to the service technician. This data will help the service technician quickly provide a solution to your problem and ensure that you receive the level of service for which you might have contracted.

- Hardware and Software Maintenance agreement contract numbers, if applicable
- Machine type number (Lenovo 4-digit machine identifier). Machine type number can be found on the ID label, see “[Identify the server and access the Lenovo XClarity Controller](#)” on page 31.
- Model number
- Serial number
- Current system UEFI and firmware levels
- Other pertinent information such as error messages and logs

As an alternative to calling Lenovo Support, you can go to <https://support.lenovo.com/servicerequest> to submit an Electronic Service Request. Submitting an Electronic Service Request will start the process of determining a solution to your problem by making the pertinent information available to the service technicians. The Lenovo service technicians can start working on your solution as soon as you have completed and submitted an Electronic Service Request.

Collecting service data

To clearly identify the root cause of a server issue or at the request of Lenovo Support, you might need collect service data that can be used for further analysis. Service data includes information such as event logs and hardware inventory.

Service data can be collected through the following tools:

- **Lenovo XClarity Provisioning Manager**

Use the Collect Service Data function of Lenovo XClarity Provisioning Manager to collect system service data. You can collect existing system log data or run a new diagnostic to collect new data.

- **Lenovo XClarity Controller**

You can use the Lenovo XClarity Controller web interface or the CLI to collect service data for the server. The file can be saved and sent to Lenovo Support.

- For more information about using the web interface to collect service data, see the “Backing up the BMC configuration” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.

- For more information about using the CLI to collect service data, see the “XCC `ffdc` command” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.

- **Lenovo XClarity Administrator**

Lenovo XClarity Administrator can be set up to collect and send diagnostic files automatically to Lenovo Support when certain serviceable events occur in Lenovo XClarity Administrator and the managed endpoints. You can choose to send diagnostic files to Lenovo Support using Call Home or to another service provider using SFTP. You can also manually collect diagnostic files, open a problem record, and send diagnostic files to the Lenovo Support.

You can find more information about setting up automatic problem notification within the Lenovo XClarity Administrator at https://pubs.lenovo.com/lxca/admin_setupcallhome.

- **Lenovo XClarity Essentials OneCLI**

Lenovo XClarity Essentials OneCLI has inventory application to collect service data. It can run both in-band and out-of-band. When running in-band within the host operating system on the server, OneCLI can collect information about the operating system, such as the operating system event log, in addition to the hardware service data.

To obtain service data, you can run the `getinfor` command. For more information about running the `getinfor`, see https://pubs.lenovo.com/lxce-onecli/onecli_r_getinfor_command.

Contacting Support

You can contact Support to obtain help for your issue.

You can receive hardware service through a Lenovo Authorized Service Provider. To locate a service provider authorized by Lenovo to provide warranty service, go to <https://datacentersupport.lenovo.com/serviceprovider> and use filter searching for different countries. For Lenovo support telephone numbers, see <https://datacentersupport.lenovo.com/supportphonenumber> for your region support details.

Appendix C. Documents and supports

This section provides handy documents, driver and firmware downloads, and support resources.

Documents download

This section provides introduction and download link for handy documents.

Documents

Download the following product documentations at:

https://pubs.lenovo.com/sr685a-v3/pdf_files.html

- **Rail Installation Guides**
 - Rail installation in a rack
- **User Guide**
 - Complete overview, system configuration, hardware components replacing, and troubleshooting.
Selected chapters from *User Guide*:
 - **System Configuration Guide** : Server overview, components identification, system LEDs and diagnostics display, product unboxing, setting up and configuring the server.
 - **Hardware Maintenance Guide** : Installing hardware components, cable routing, and troubleshooting.
- **Messages and Codes Reference**
 - XClarity Controller, LXPM, and uEFI events
- **UEFI Manual**
 - UEFI setting introduction

Support websites

This section provides driver and firmware downloads and support resources.

Support and downloads

- Drivers and Software download website for ThinkSystem SR685a V3
 - <https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr685av3/7dhc/downloads/driver-list/>
- Lenovo Data Center Forum
 - https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg
- Lenovo Data Center Support for ThinkSystem SR685a V3
 - <https://datacentersupport.lenovo.com/products/servers/thinksystem/sr685av3/7dhc>
- Lenovo License Information Documents
 - <https://datacentersupport.lenovo.com/documents/Invo-eula>
- Lenovo Press website (Product Guides/Datasheets/White papers)
 - <https://lenovopress.lenovo.com/>

- Lenovo Privacy Statement
 - <https://www.lenovo.com/privacy>
- Lenovo Product Security Advisories
 - https://datacentersupport.lenovo.com/product_security/home
- Lenovo Product Warranty Plans
 - <http://datacentersupport.lenovo.com/warrantylookup>
- Lenovo Server Operating Systems Support Center website
 - <https://datacentersupport.lenovo.com/solutions/server-os>
- Lenovo ServerProven website (Options compatibility lookup)
 - <https://serverproven.lenovo.com>
- Operating System Installation Instructions
 - <https://pubs.lenovo.com/thinksystem#os-installation>
- Submit an eTicket (service request)
 - <https://support.lenovo.com/servicerequest>
- Subscribe to Lenovo Data Center Group product notifications (Stay up to date on firmware updates)
 - <https://datacentersupport.lenovo.com/solutions/ht509500>

Appendix D. Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area.

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Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

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Important notes

Processor speed indicates the internal clock speed of the processor; other factors also affect application performance.

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1 024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity can vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard-disk-drive bays with the largest currently supported drives that are available from Lenovo.

Maximum memory might require replacement of the standard memory with an optional memory module.

Each solid-state memory cell has an intrinsic, finite number of write cycles that the cell can incur. Therefore, a solid-state device has a maximum number of write cycles that it can be subjected to, expressed as total bytes written (TBW). A device that has exceeded this limit might fail to respond to system-generated commands or might be incapable of being written to. Lenovo is not responsible for replacement of a device that has exceeded its maximum guaranteed number of program/erase cycles, as documented in the Official Published Specifications for the device.

Lenovo makes no representations or warranties with respect to non-Lenovo products. Support (if any) for the non-Lenovo products is provided by the third party, not Lenovo.

Some software might differ from its retail version (if available) and might not include user manuals or all program functionality.

Electronic emission notices

When you attach a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices that are supplied with the monitor.

Additional electronic emissions notices are available at:

https://pubs.lenovo.com/important_notices/

Taiwan Region BSMI RoHS declaration

單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁶⁺)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機架	○	○	○	○	○	○
外部蓋板	○	○	○	○	○	○
機械組零件	-	○	○	○	○	○
空氣傳動設備	-	○	○	○	○	○
冷卻組零件	-	○	○	○	○	○
內存模組	-	○	○	○	○	○
處理器模組	-	○	○	○	○	○
電纜組零件	-	○	○	○	○	○
電源供應器	-	○	○	○	○	○
儲備設備	-	○	○	○	○	○
印刷電路板	-	○	○	○	○	○

備考1. “超出0.1 wt %”及“超出0.01 wt %”係指限用物質之百分比含量超出百分比含量基準值。
 Note1: “exceeding 0.1wt%” and “exceeding 0.01 wt%” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考2. “○”係指該項限用物質之百分比含量未超出百分比含量基準值。
 Note2: “○”indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考3. “-”係指該項限用物質為排除項目。
 Note3: The “-” indicates that the restricted substance corresponds to the exemption.

Taiwan Region import and export contact information

Contacts are available for Taiwan Region import and export information.

委製商/進口商名稱: 台灣聯想環球科技股份有限公司
 進口商地址: 台北市南港區三重路 66 號 8 樓
 進口商電話: 0800-000-702

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