Lenovo

ThinkSystem SR680a V3
User Guide

Machine Type: 7DM9

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

First Edition (August 2025)

Contents

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

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 ασφάλειας
(safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

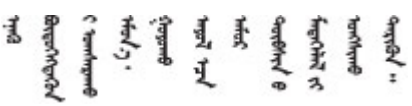
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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 pečítaje 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་རྫས་འདི་བདེ་སྒྲིག་མ་བྱས་གོང་། ་སྙིར་གྱི་ཡིད་གཟབ་
བྱ་འདྲ་ཤིན་ཡོད་པའི་འོད་སྡེར་བལྟ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

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Youq mwngz yungh canjbinj neix gaxgonq, itdingh aeu doeg aen 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.

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 SR680a V3 server (Type 7DM9) is a powerful 8U server that features two 5th Gen Intel® Xeon® Scalable 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.

Note: For more information about the SR680a V3 with NVIDIA H100/H200 GPUs, see SR680a V3 (Type 7DHE): https://pubs.lenovo.com/sr680a-v3/.

Figure 1. ThinkSystem SR680a V3 with NVIDIA B200 GPUs

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 297.

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

  The server provides a QR code on the system service label, which is on the air duct, 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 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	• Processor • Memory • M.2 Drive • Storage expansion • Expansion slots • Graphics processing unit (GPU) • Integrated functions and I/O connectors • Network • RAID adapter • System fan • Electrical input • Minimal configuration for debugging • Operating systems	• Dimension • Weight	• 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

Supports two 5th Gen Intel® Xeon® Scalable processors up to 350W TDP, with integrated memory controller and Intel Mesh UPI (Ultra Path Interconnect) topology.

- Up to two Platinum level processors with LGA 4677 sockets
- Scalable up to 64 cores per socket
- Supports up to 3 UPI links between processors at up to 20 GT/s
- Thermal Design Power (TDP): up to 350 watts

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

Memory

See "Memory module installation rules and order" on page 37 for detailed information about memory configuration and setup.

- Memory module type:
  - TruDDR5 5600 MHz RDIMM: 64 GB (2Rx4), 96 GB (2Rx4), and 128 GB (2Rx4)
- Speed:

  Note: Operating speed depends on processor model and UEFI settings.
  - 5600 MT/s for 1 DIMM per channel
  - 4400 MT/s for 2 DIMMs per channel
- Capacity
  - Minimum: 1 TB
  - Maximum: 4 TB
- Slots: 16 DIMM slots per processor, 32 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
- 1.92 TB

The following form factor is supported:

- 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 (Onboard VROC RAID support)

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

Expansion slots

Ten front FHHL PCIe slots

For more information, see "Front view" on page 11.

Graphics processing unit (GPU)

Eight NVIDIA B200 1000W SXM6 GPUs with 180GB HBM3e memory per GPU

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:
  - Two USB 3.1 Gen 1 (5 Gbps) connectors
  - One XCC system management port (10/100/1000 Mbps RJ-45) to connect to a systems-management network. This RJ-45 connector is dedicated to the Lenovo XClarity Controller functions.
  - 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)

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

Network

Front FHHL PCIe Ethernet Adapter

RAID adapter

Onboard software RAID support for M.2 drives (Intel VROC NVMe RAID):

- Intel VROC standard: requires an activation key and supports RAID level 0 and 1

System fan

- Two front primary fans: 60 mm x 56 mm
- Fifteen rear primary fans: 80 mm x 56 mm
- Four rear auxiliary fans: 40 mm x 56 mm

Electrical input

Following is the list of supported type:

- CRPS Premium (CFFv5) 3200-watt Titanium, input power 200-240V

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

Minimal configuration for debugging

- System board
- Two processors
- Sixteen memory modules
- System I/O board and its cable (for firmware and RoT security module)
- Eight power supplies
- One M.2 drive (If OS is needed by debugging)
- Twenty-one system fans
- One front PCIe Ethernet Adapter (If network is required)

Operating systems
Supported and certified operating system: • Canonical Ubuntu • Red Hat Enterprise Linux References: • Complete list of available operating systems: https://lenovopress.lenovo.com/osig. • OS deployment instructions, see “Deploy the operating system” on page 293.

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
• Height: 351 mm (13.82 inches) • Width: 447 mm (17.60 inches) • Depth (without release levers): 942 mm (37.09 inches) • Depth (with release levers): 990 mm (38.98 inches)

Weight
Approximately 116 kg (256 lbs), 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
ThinkSystem SR680a 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 – ASHARE 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]: • The copper reactivity level shall be less than 200 Angstroms per month (Å/month ≈ 0.0035 µg/cm^2-hour weight gain).[2] • The silver reactivity level shall be less than 200 Angstroms per month (Å/month ≈ 0.0035 µg/cm^2-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: • 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. • The deliquescent relative humidity of the particulate contamination should be more than 60% RH.[4] • Data centers must be free of zinc whiskers.[5]

[1] ANSI/ISA-71.04-1985. *Environmental conditions for process measurement and control systems: Airborne contaminants*. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.

[2] The derivation of the equivalence between the rate of copper corrosion growth in the thickness of the corrosion product in Å/month and the rate of weight gain assumes that Cu_2S and Cu_2O grow in equal proportions.

[3] The derivation of the equivalence between the rate of silver corrosion growth in the thickness of the corrosion product in Å/month and the rate of weight gain assumes that Ag_2S is the only corrosion product.

[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.

[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.

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	Baseboard management controller (BMC) 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). **Interface** • CLI application • Web GUI interface • Mobile application • Redfish API **Usage and downloads** https://pubs.lenovo.com/lxcc-overview/
Lenovo XCC Logger Utility	Application that reports the XCC events to local OS system log. **Interface** • CLI application **Usage and downloads** • https://pubs.lenovo.com/lxcc-logger-linux/ • https://pubs.lenovo.com/lxcc-logger-windows/
Lenovo XClarity Administrator	Centralized interface for multi-server management. **Interface** • Web GUI interface • Mobile application • REST API **Usage and downloads** https://pubs.lenovo.com/lxca/
Lenovo XClarity Essentials toolset	Portable and light toolset for server configuration, data collection, and firmware updates. Suitable both for single-server or multi-server management contexts. **Interface** • **OneCLI**: CLI application • **Bootable Media Creator**: CLI application, GUI application • **UpdateXpress**: GUI application **Usage and downloads** https://pubs.lenovo.com/lxce-overview/

Options	Description
Lenovo XClarity Provisioning Manager	UEFI-based embedded GUI tool on a single server that can simplify management tasks. **Interface** • Web interface (BMC remote access) • GUI application **Usage and downloads** https://pubs.lenovo.com/lxpm-overview/ **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/.
Lenovo XClarity Integrator	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. **Interface** • GUI application **Usage and downloads** https://pubs.lenovo.com/lxci-overview/
Lenovo XClarity Energy Manager	Application that can manage and monitor server power and temperature. **Interface** • Web GUI Interface **Usage and downloads** https://datacentersupport.lenovo.com/solutions/lnvo-lxem
Lenovo Capacity Planner	Application that supports power consumption planning for a server or rack. **Interface** • Web GUI Interface **Usage and downloads** https://datacentersupport.lenovo.com/solutions/lnvo-lcp

Functions

Options		Functions							
		Multi-system mgmt	**OS deploy-ment**	**System configu-ration**	**Firm-ware up-dates[1]**	**Event-s/alert moni-toring**	**Inven-tory/ logs**	**Pow-er mgmt**	**Power planning**
Lenovo XClarity Controller				√	√[2]	√	√[4]		
Lenovo XCC Logger Utility						√			
Lenovo XClarity Administrator		√	√	√	√[2]	√	√[4]		
Lenovo XClarity Essen-tials toolset	OneCLI	√		√	√[2]	√	√		
	Bootable Media Creator			√	√[2]		√[4]		
	UpdateXpress			√	√[2]				
Lenovo XClarity Provisioning Manager			√	√	√[3]		√[5]		
Lenovo XClarity Integrator		√		√	√	√	√	√[6]	
Lenovo XClarity Energy Manager		√				√		√	
Lenovo Capacity Planner									√[7]

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. Power management function is supported only by Lenovo XClarity Integrator for VMware vCenter.
7. 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).

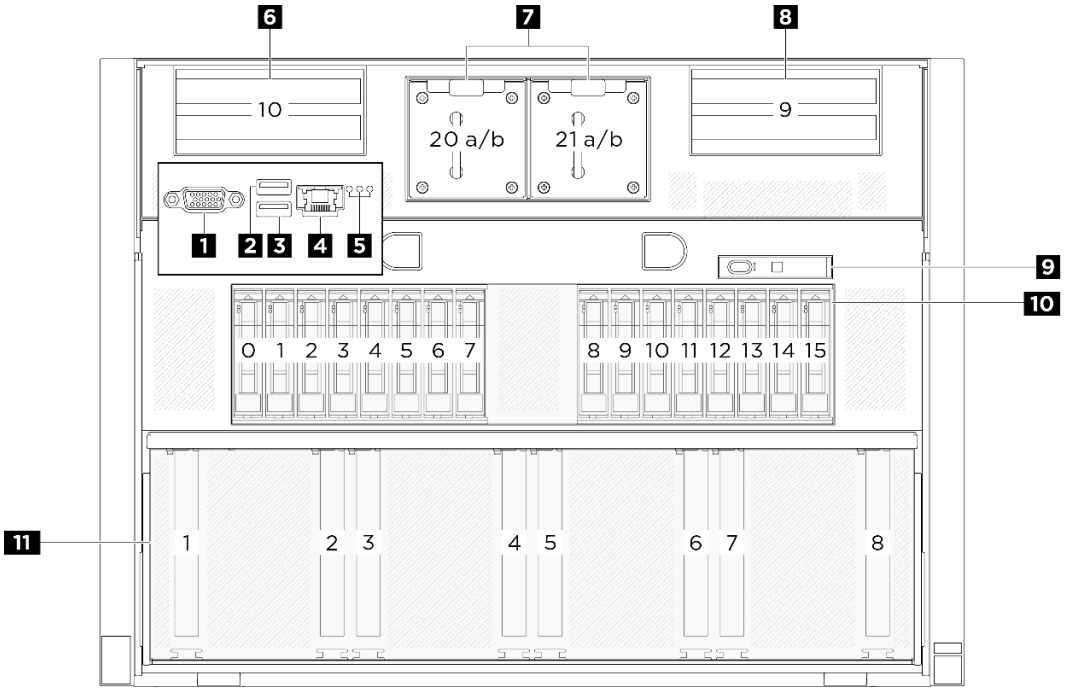


Figure 2. Front view

Table 2. Components on the front view

1 VGA connector	2 USB 3.1 Gen 1 (5 Gbps) connector
3 USB 3.1 Gen 1 (5 Gbps) connector	4 XCC system management port (10/100/1000 Mbps RJ-45)
5 Location LED/System error LED/RoT error LED	6 PCIe riser 2 (PCIe slot 10)
7 Front fans	8 PCIe riser 1 (PCIe slot 9)
9 Integrated diagnostics panel	10 2.5-inch drive bays (bay 0 to 15)
11 PCIe switch shuttle (PCIe slot 1-8)	

1 VGA connector

Connect a monitor to this connector.

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

2 / 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.

4 XCC system management port (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 285
- "Front LEDs" on page 297

5 Identification LED/System error LED/RoT error LED

Table 3. System LEDs

LED	Description and actions
1 Location 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: 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.
3 RoT error LED (Amber)	The RoT error LED helps you identify the RoT status.

For more information on the system LEDs, see "Front LEDs" on page 297.

6 / 8 PCIe riser 2/1

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

Table 4. PCIe riser and corresponding slots

PCIe riser	PCIe slot
6 PCIe riser 2	Slot 10: PCIe Gen5 x16, FH/HL (with CPU direct support)
8 PCIe riser 1	Slot 9: PCIe Gen5 x16, FH/HL (with CPU direct support)

7 Front fans

Install front fans in this space. See "Install a hot-swap fan" on page 87 for more information.

9 Integrated diagnostics panel

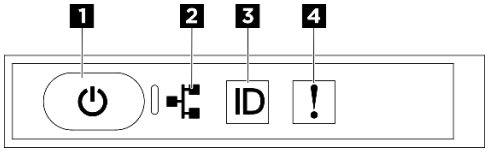


Figure 3. Integrated diagnostics panel LEDs

Table 5. 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.

Note: SR680a V3 does not have the OCP module installed. The network activity LED will blink at a constant 1 Hz rate.

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	An error has been detected on the server. Causes might include one or more of the following errors: • 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 300.

10 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 58 for more information.

For more information on the drive LEDs, see “Front LEDs” on page 297.

11 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

Rear view

This section contains information on the rear 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).

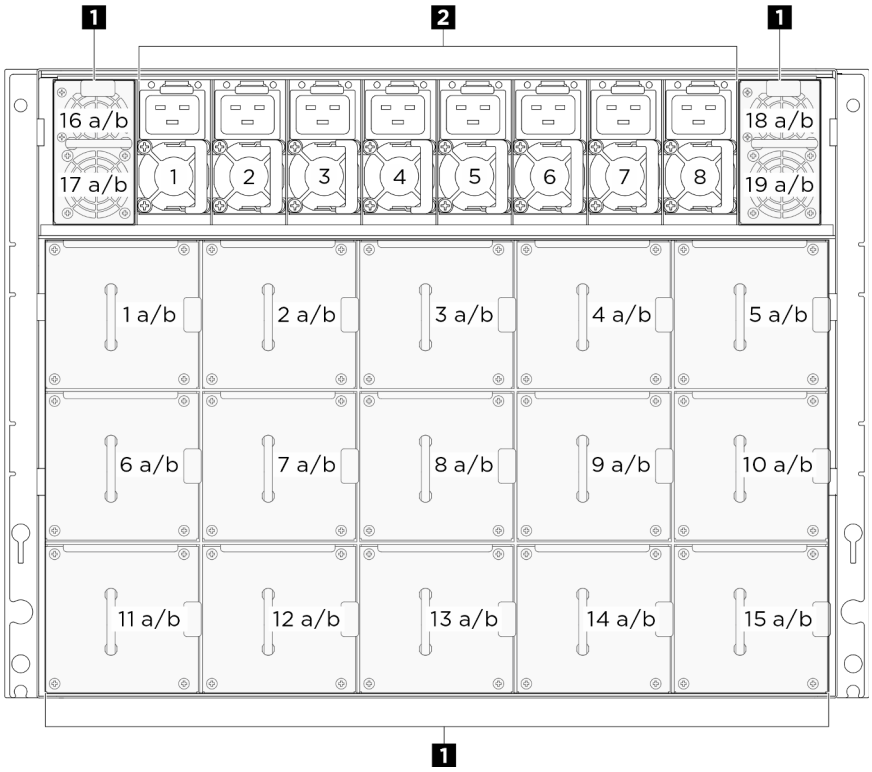


Figure 4. Rear view

Table 6. Components on the rear view

1 Rear fans	2 Power supply units

1 Rear fans

Install rear fans in this space. See "Install a hot-swap fan" on page 87 for more information.

2 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:

- CRPS Premium (CFFv5) 3200-watt Titanium, input power 200-240V

For more information on the power supply LEDs, see "Power supply LEDs" on page 299.

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).

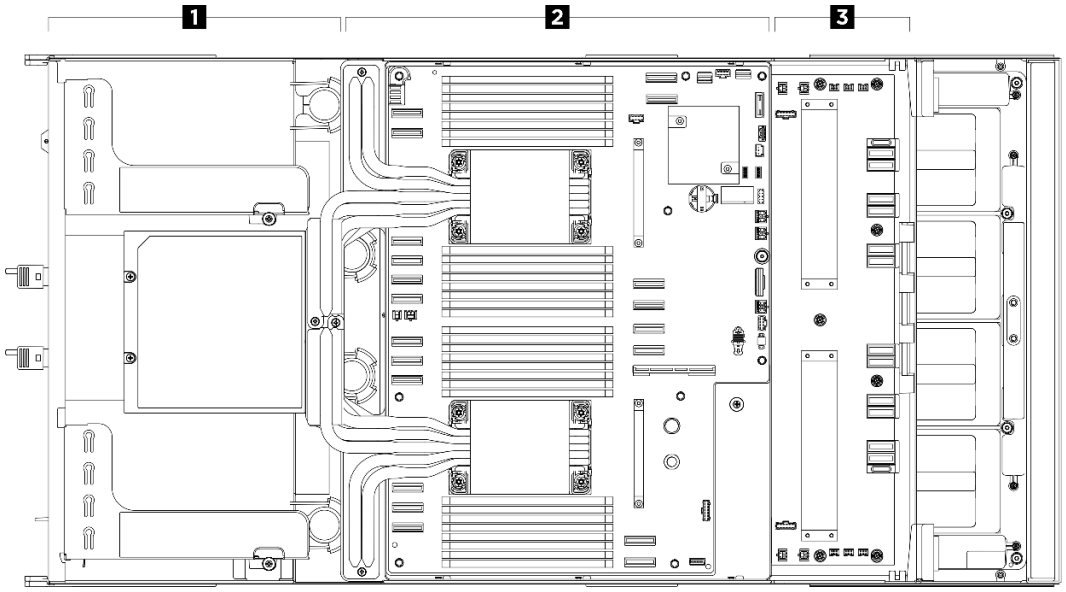


Figure 5. Top view

Table 7. Components on the top view

1 FIO/PCI cage	2 Compute tray
3 Power complex	

System board connectors

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

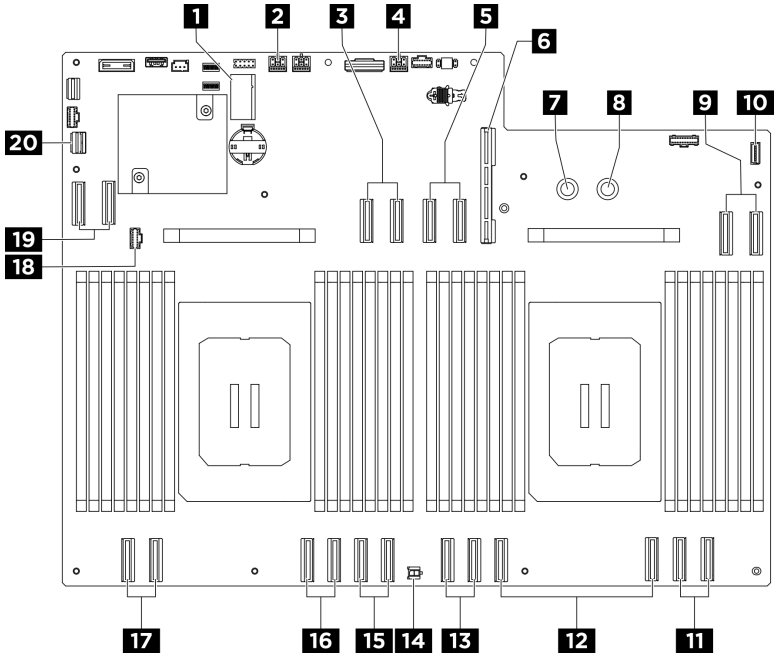


Figure 6. System board connectors

Table 8. System board connectors

1 M.2 slot 1 / M.2 slot 2	2 PCIe Riser 2 power and sideband connector
3 MCIO connector 4 / PCIe Riser 2 signal connectors	4 PCIe Riser 1 power and sideband connector
5 MCIO connector 8 / PCIe Riser 1 signal connectors	6 System I/O board connector (DC-SCM)
7 Ground (-) connector (PSU_GND)	8 12V (+) connector (PSU_P12V)
9 MCIO connector 7	10 Integrated diagnostics panel connector
11 MCIO connector 6	12 MCIO connector 5
13 MCIO connector 10	14 Front fan control board power connector (REAR IO PWR)
15 MCIO connector 3	16 MCIO connector 2
17 MCIO connector 1	18 Front fan control board signal connector (BOT FAN BOARD)
19 MCIO connector 9	20 PCIe switch sideband connector

System board switches

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

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.

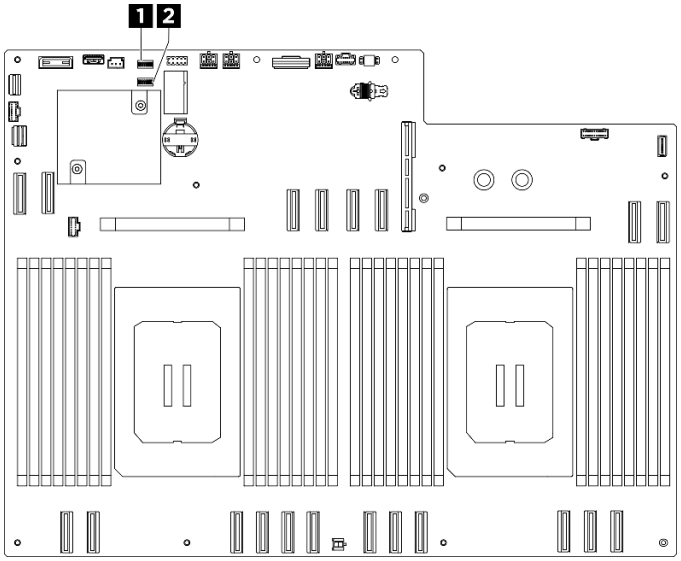


Figure 7. System board switches

Table 9. System board switches

1 Switch block 5 (SW5)	2 Switch block 4 (SW4)

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 33
- “Handling static-sensitive devices” on page 36
- “Power off the server” on page 41

2. Any system-board switch or jumper block that is not shown in the illustrations in this document are reserved.

Switch block 5 (SW5)

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

Table 10. Switch block 5 (SW5) description

Switch number	Switch name	Usage description	
		On	Off
1	XCC Trusted Platform Module (TPM) physical presence	Assert TPM physical presence	Normal (Default)
2	Flash security override	Enable flash security override	Disable flash security override (Default)
3	ME recovery	Enable ME boots to recovery	Normal (Default)
4	Reserved		
5	Reserved		
6	Reserved		
7	Reserved		
8	Reserved		

Switch block 4 (SW4)

The following table describes the functions of the switch block 4 (SW4) on the system board.

Table 11. Switch block 4 (SW4) description

Switch number	Switch name	Usage description	
		On	Off
1	BIOS recovery mode	Boot BIOS into recovery mode	Normal (Default)
2	Clear CMOS	Clear the real-time clock (RTC) registry	Normal (Default)
3	Password clear	Password clear	Normal (Default)
4	BIOS image swap	Enable BIOS image swap	Normal (Default)
5	PCH_TOP_SWAP_OVERRIDE	Swap	No swap (Default)
6	Reserved		
7	Reserved		
8	Reserved		

System I/O board connectors

The following illustration shows the internal connectors on the system I/O board.

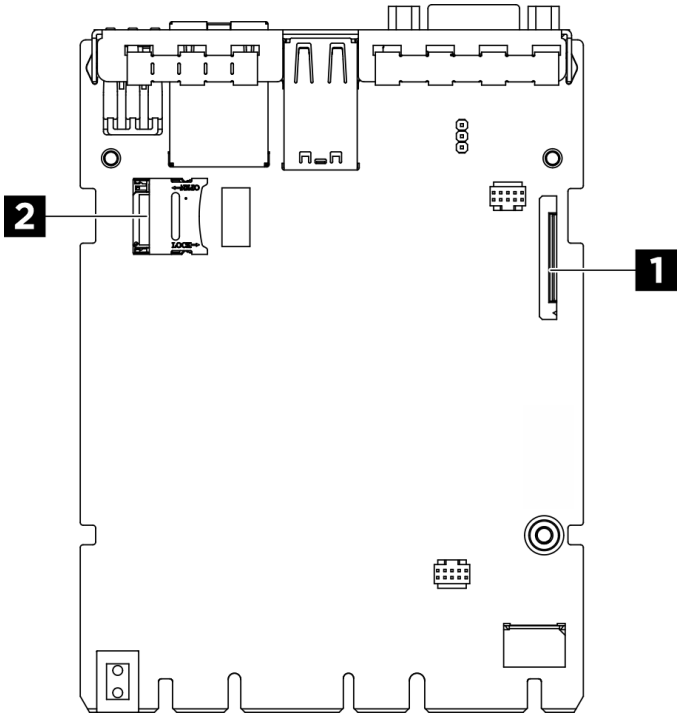


Figure 8. System I/O board connectors

Table 12. System I/O board connectors

1 Second Lenovo XClarity Controller management connector (PHY2_CONN)	2 MicroSD socket

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 297.

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.

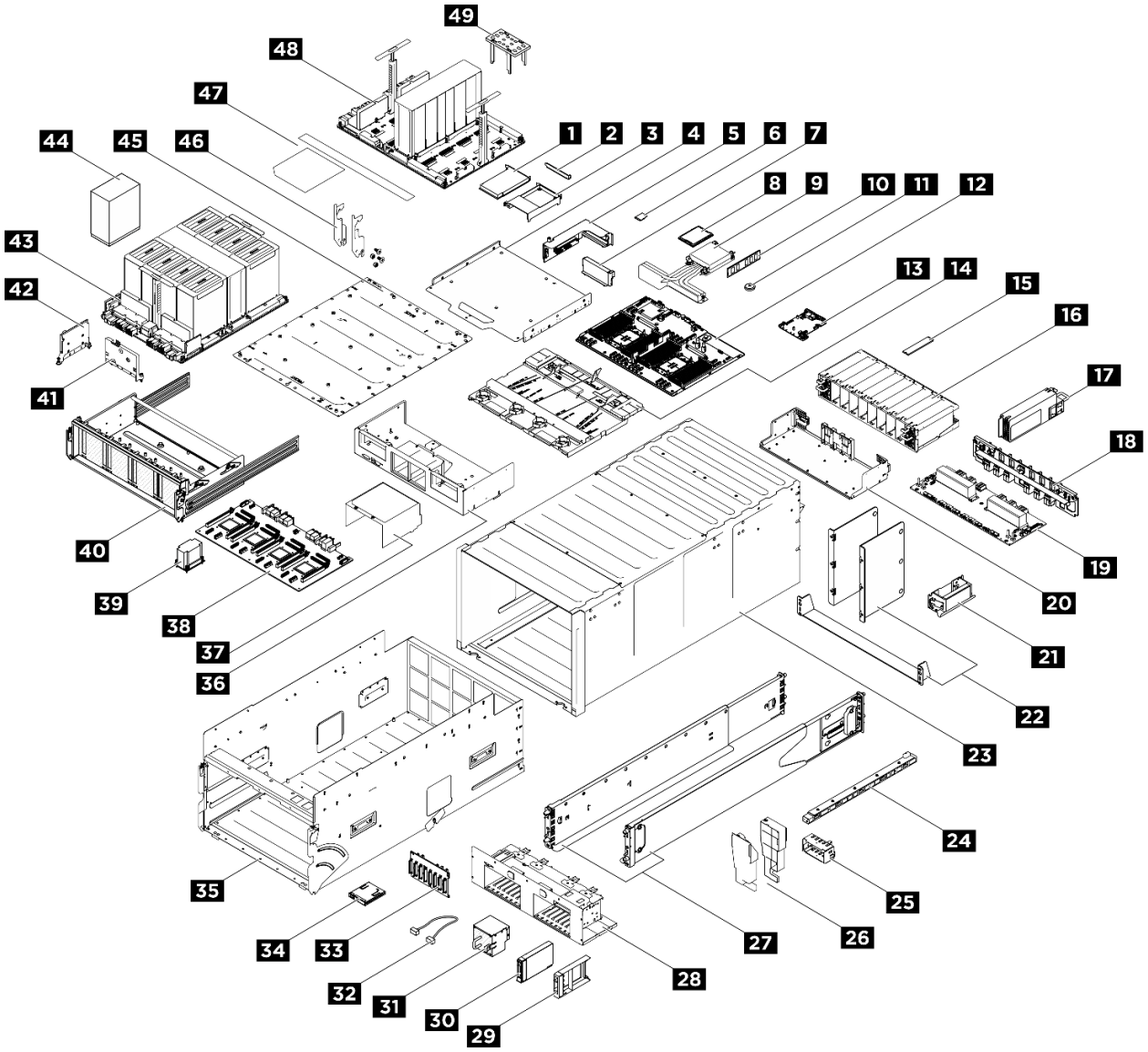


Figure 9. Server components

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
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.		
1	PCIe adapter	F
2	PCIe filler (single-slot)	T1
3	PCIe riser air baffle	F
4	Compute tray	F
5	PCIe riser	T2
6	MicroSD card	F
7	PCIe riser filler	C
8	Processor	F
9	Processor heat sink	F
10	Memory module	T1
11	CMOS battery (CR2032)	C
12	System board	F
13	System I/O board	T2
14	Cable holder frame and baffle assembly	F
15	M.2 drive	F
16	PSU cage	F
17	Power supply unit	T1
18	PSU interposer	F
19	Power distribution board	F
20	Power distribution board tray	F
21	Chassis lift handle	F
22	Chassis support brackets	F
23	Chassis	F
24	Fan control board	F
25	Power supply unit filler	C
26	GPU air duct	F
27	Slide rail kit	C
28	Drive cage	F
29	2.5-inch drive filler (1-bay)	C
30	2.5-inch hot-swap drive	T1
31	Fan	T1

Table 13. Parts list (continued)

Index	Description	Type
32	External cable	T1
	Internal cable	F
33	2.5-inch drive backplane	F
34	Integrated diagnostics panel	F
35	System shuttle	F
36	FIO/PCI cage	F
37	Air duct	F
38	PCIe switch board	F
39	PCIe switch board heat sink	F
40	PCIe switch shuttle	F
41	HMC card	F
42	CX-7 adapter card	F
43	GPU complex	F
44	GPU and heat sink module	F
45	GPU complex adapter plate	F
46	PCIe switch shuttle release levers	T2
47	Label kit	F
48	GPU baseboard	F
49	B200 jig	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 30 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 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.

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.

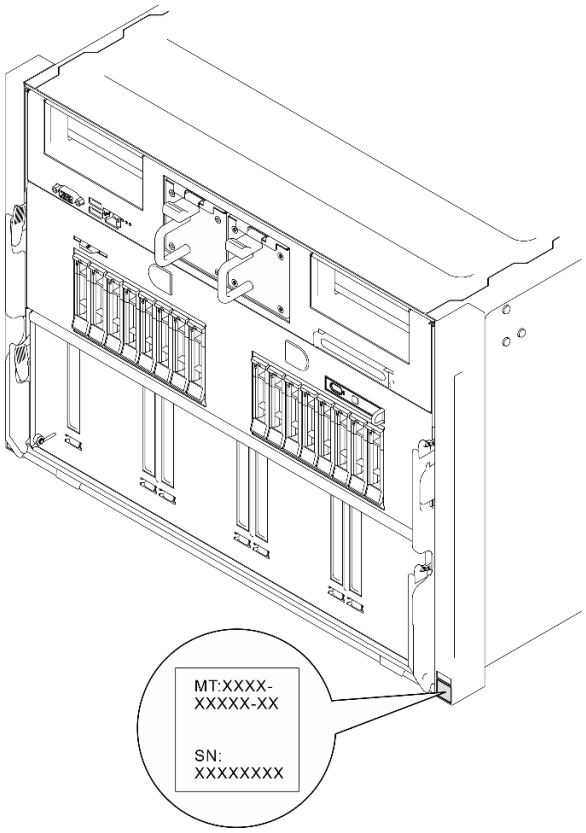


Figure 10. Location of the ID label

Lenovo XClarity Controller network access label

In addition, the Lenovo XClarity Controller network access label is attached to the pull-out information tab located in the front of the system shuttle, with MAC address accessible with a pull.

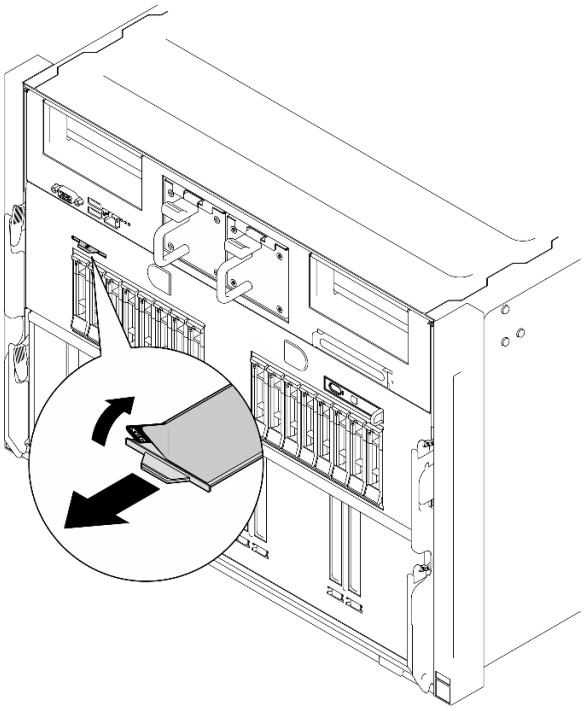


Figure 11. Lenovo XClarity Controller network access label on the pull-out information tab

Service Label and QR code

In addition, the system Service Label is located on the surface of the air duct, 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.

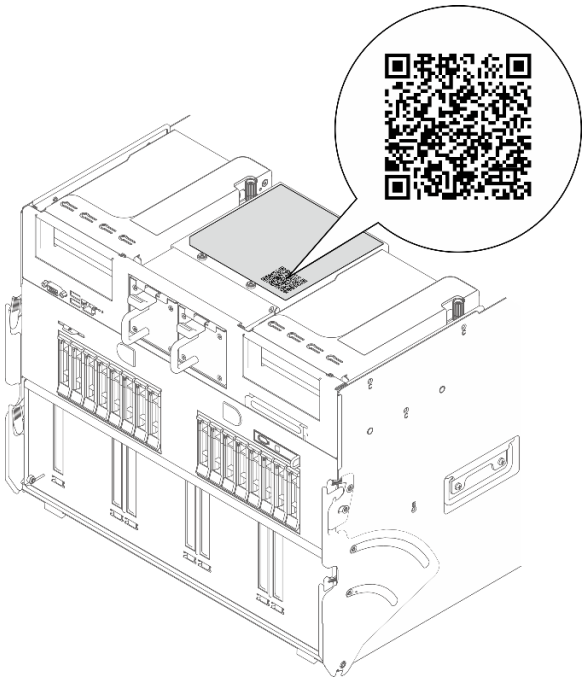


Figure 12. Service Label and QR code

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 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.

1. Unpack the server package. See “Server package contents” on page 27.
2. Install any required hardware or server options. See the related topics in Chapter 5 “Hardware replacement procedures” on page 33.
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 48.

5. Connect all external cables to the server. See Chapter 2 “Server components” on page 11 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 11
   - “Troubleshooting by system LEDs and diagnostics display” on page 297

   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 19 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 285.

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 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.

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 36.
- 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/sr680av3withb200/7dm9/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 287.
- 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 5 mm hex socket screw bit, two torque screwdrivers, one Torx T15 bit, and two Torx T15 extended bits (300 mm 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.
- Except PSU, orange on a component or a 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.
- PSU with a release tab is a hot-swap PSU.
- 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.

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 duct that comes with the server must be installed when the server starts (some servers might come with more than one air duct). Operating the server with a missing air duct 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

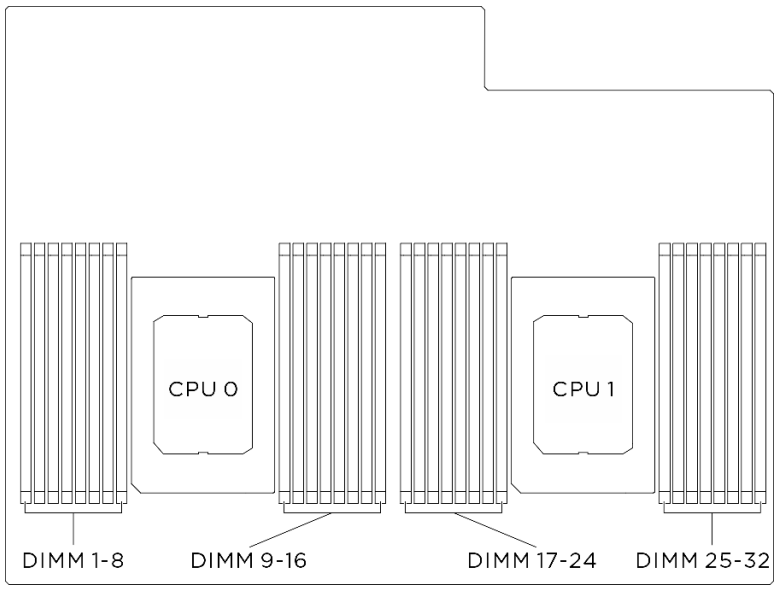


Figure 13. Memory modules and processors layout

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

Processor	**Processor 0**															
Controller	iMC3				iMC2				iMC0				iMC1			
Channel	CH1		CH0		CH1		CH0		CH0		CH1		CH0		CH1	
Slot No.	0	1	0	1	0	1	0	1	1	0	1	0	1	0	1	0
DIMM No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Processor	**Processor 1**															
Controller	iMC3				iMC2				iMC0				iMC1			
Channel	CH1		CH0		CH1		CH0		CH0		CH1		CH0		CH1	
Slot No.	0	1	0	1	0	1	0	1	1	0	1	0	1	0	1	0
DIMM No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

Independent memory mode installation order

Independent memory mode provides the highest level of memory performance, but lacks failover protection. The DIMM installation order for independent memory mode varies based on the number of processors and memory modules installed in the server.

Follow the rules below when installing memory modules in independent mode:

- All DDR5 memory modules must operate at the same speed in the same system.
- Memory population must be identical between processors.
- Memory modules from different vendors are supported.
- In each memory channel, populate the slot farthest from the processor (slot 0) first.

- All memory modules must be DDR5 memory modules.
- x8 memory modules and x4 memory modules cannot be mixed in a system.
- Mixing 16Gbit-based, 24Gbit-based, 32Gbit-based memory module is not allowed in a system.
- All memory modules to be installed must be of the same type. Value RDIMM cannot be mixed with non-value RDIMMs in a system.
- All memory modules in a system must have the same number of ranks.

The following table shows the sequence of populating memory modules for independent mode.

Table 15. Independent mode

Total DIMMs	**Processor 0**															
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
16 DIMMs †‡	1		3		5		7			10		12		14		16
32 DIMMs †‡	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Total DIMMs	**Processor 1**															
	17	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
16 DIMMs †‡	17		19		21		23			26		28		30		32
32 DIMMs †‡	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

Note: † Sub NUMA Clustering (SNC2) feature can only be enabled when DIMMs are populated in this specified sequence. The SNC2 feature can be enabled via UEFI.

‡ DIMM configurations that support Software Guard Extensions (SGX), see “Enable Software Guard Extensions (SGX)” on page 292 to enable this feature.

Memory mirroring mode installation order

Memory-mirroring mode provides full memory redundancy while reducing the total system memory capacity in half. Memory channels are grouped in pairs with each channel receiving the same data. If a failure occurs, the memory controller switches from the DIMMs on the primary channel to the DIMMs on the backup channel. The DIMM installation order for memory mirroring varies based on the number of processors and DIMMs installed in the server.

Memory mirroring guidelines:

- Memory mirroring reduces the maximum available memory by half of the installed memory. For example, if the server has 64 GB of installed memory, only 32 GB of addressable memory is available when memory mirroring is enabled.
- Each DIMM must be identical in size and architecture.
- DIMMs on each memory channel must be of equal density.
- If two memory channels have DIMMs, mirroring occurs across two DIMMs (channels 0/1 will both contain the primary/secondary memory caches).
- Partial Memory Mirroring is a sub-function of memory mirroring. It requires following the memory installation order of memory mirroring mode.

The following table shows the sequence of populating memory modules for mirroring mode.

Table 16. Mirroring mode mode

Total DIMMs	**Processor 0**															
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
16 DIMMs †‡	1		3		5		7			10		12		14		16
32 DIMMs †‡	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Total DIMMs	**Processor 1**															
	17	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
16 DIMMs †‡	17		19		21		23			26		28		30		32
32 DIMMs †‡	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

Note: † Sub NUMA Clustering (SNC2) feature can only be enabled when DIMMs are populated in this specified sequence. The SNC2 feature can be enabled via UEFI.

‡ DIMM configurations that support Software Guard Extensions (SGX), see “Enable Software Guard Extensions (SGX)” on page 292 to enable this feature.

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 11
- “Troubleshooting by system LEDs and diagnostics display” on page 297

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 41.

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 11
- “Troubleshooting by system LEDs and diagnostics display” on page 297

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 40.

Chassis replacement (trained technician only)

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

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 chassis from rack

Follow instructions in this section to remove the chassis from the rack. The procedure must be executed by a trained technician.

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 33 and “Safety inspection checklist” on page 34 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 41.
- 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 system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

b. Remove all the power supply units. See “Remove a hot-swap power supply unit” on page 216.

c. Remove the rear fans (fans 1 to 15). See “Remove a hot-swap fan” on page 84.

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

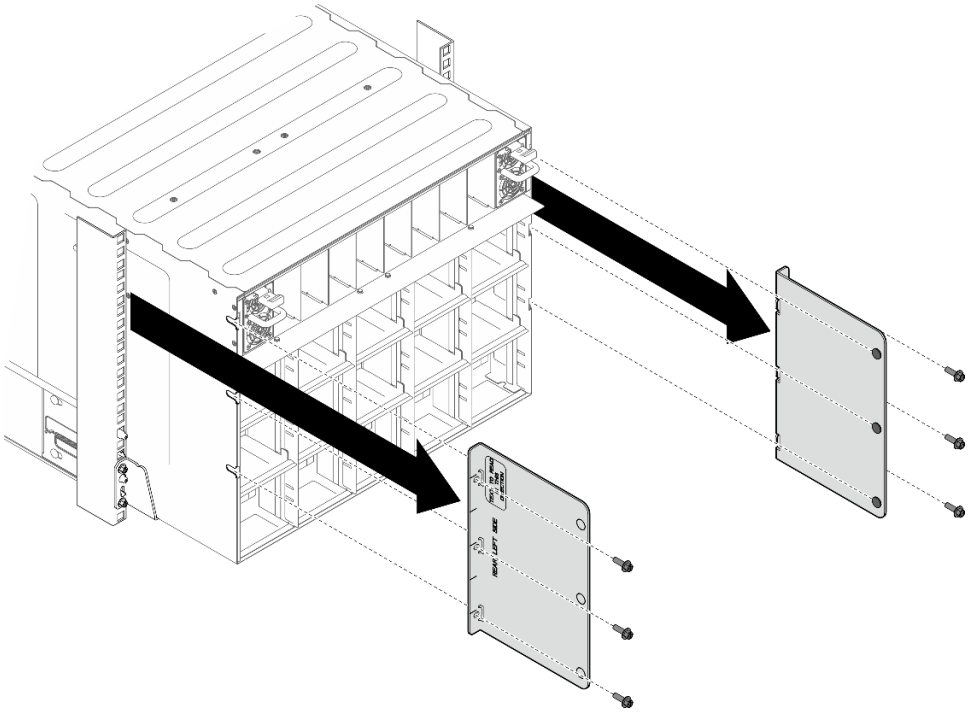


Figure 14. Upper support bracket removal

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

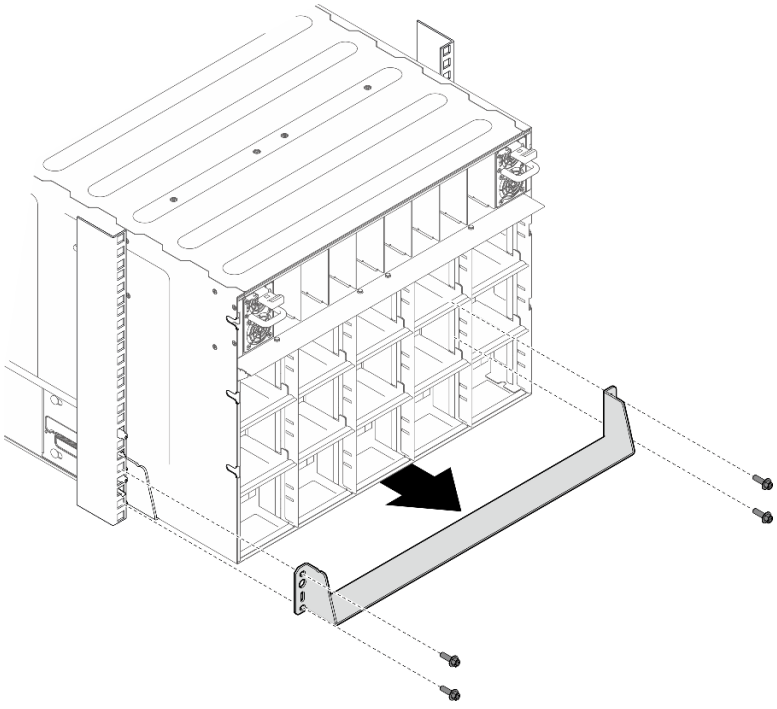


Figure 15. Lower support bracket removal

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.

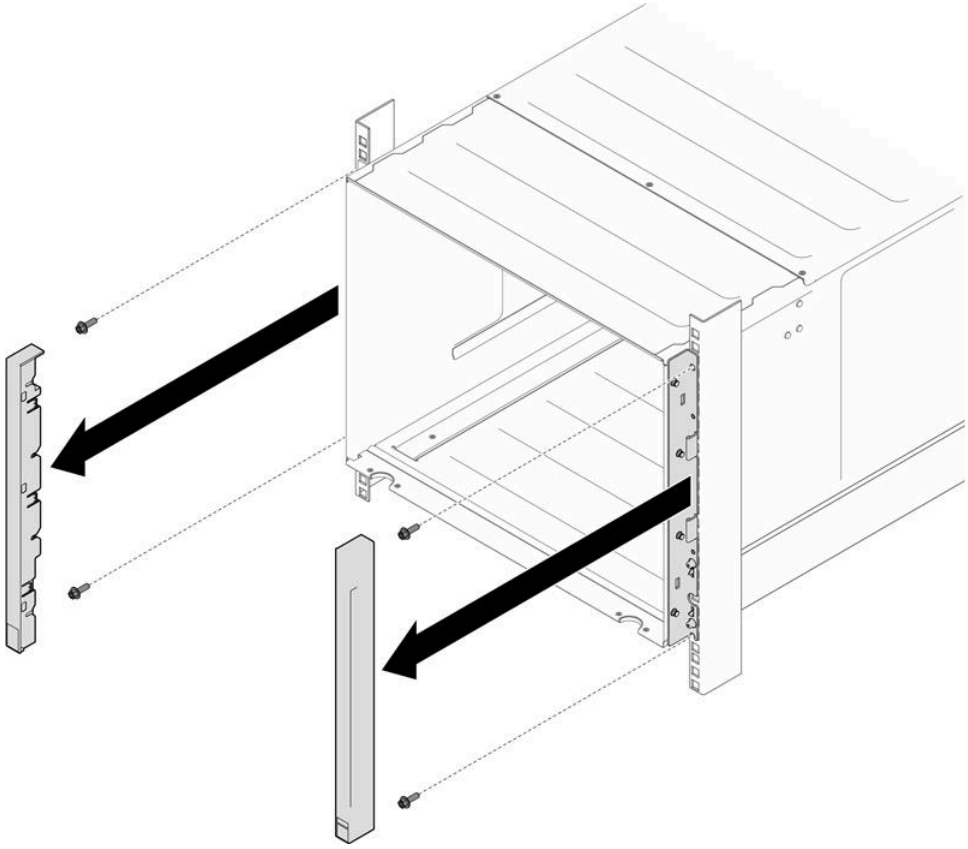


Figure 16. EIA cover removal

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.

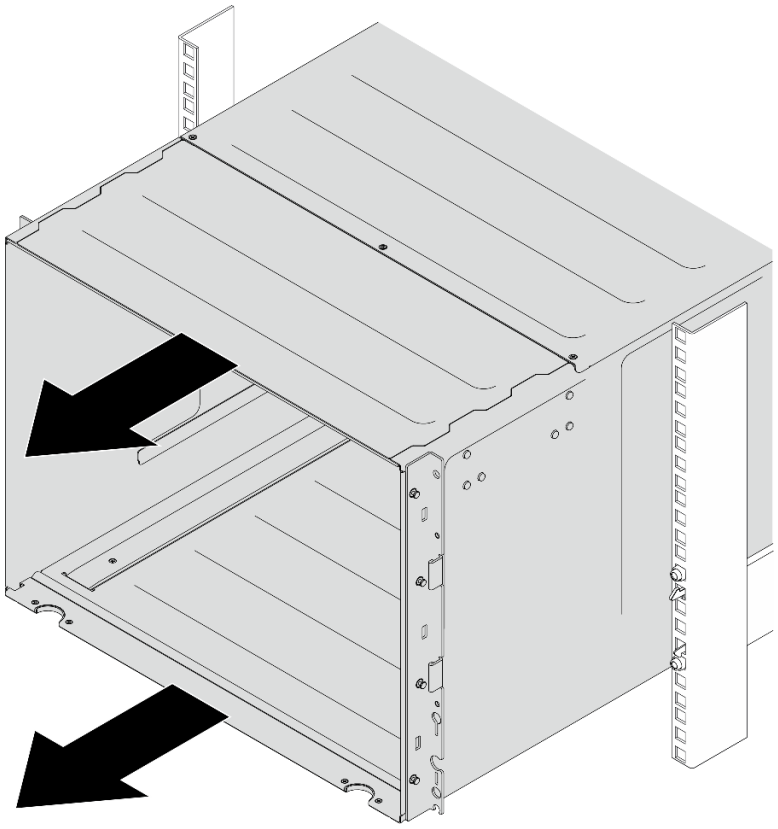


Figure 17. Sliding the chassis

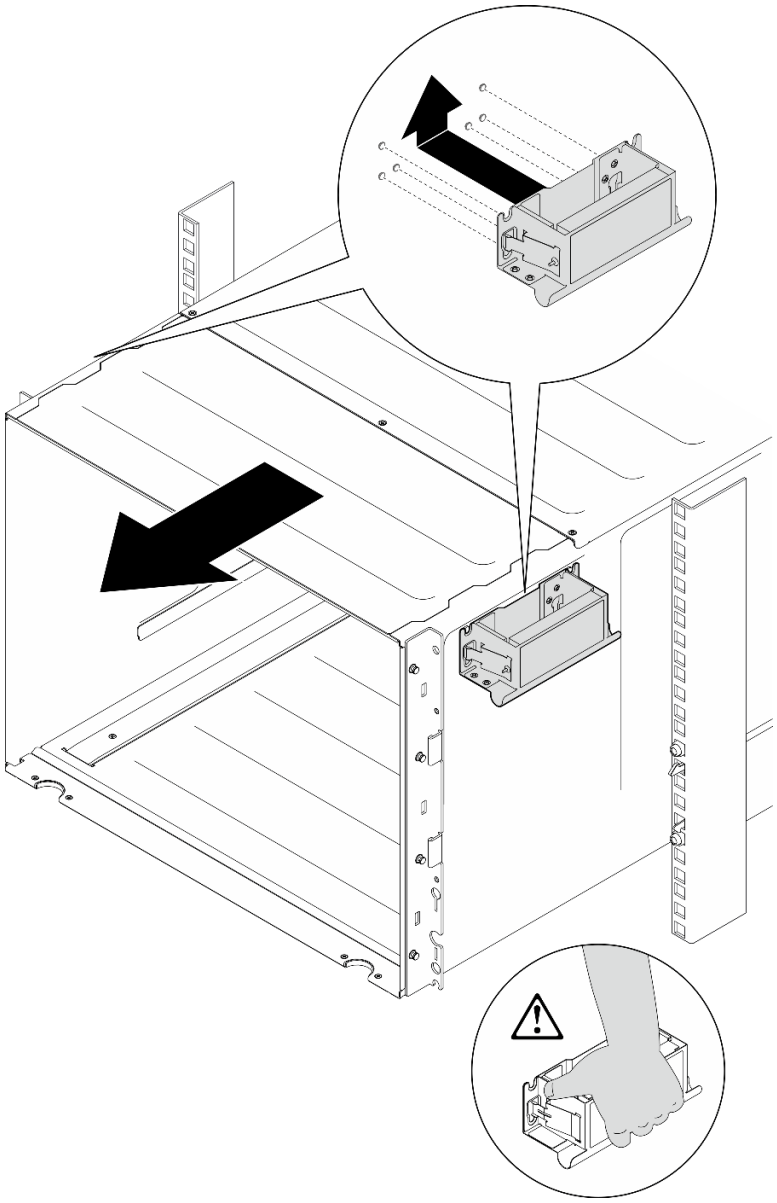


Figure 18. Front handle installation

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.

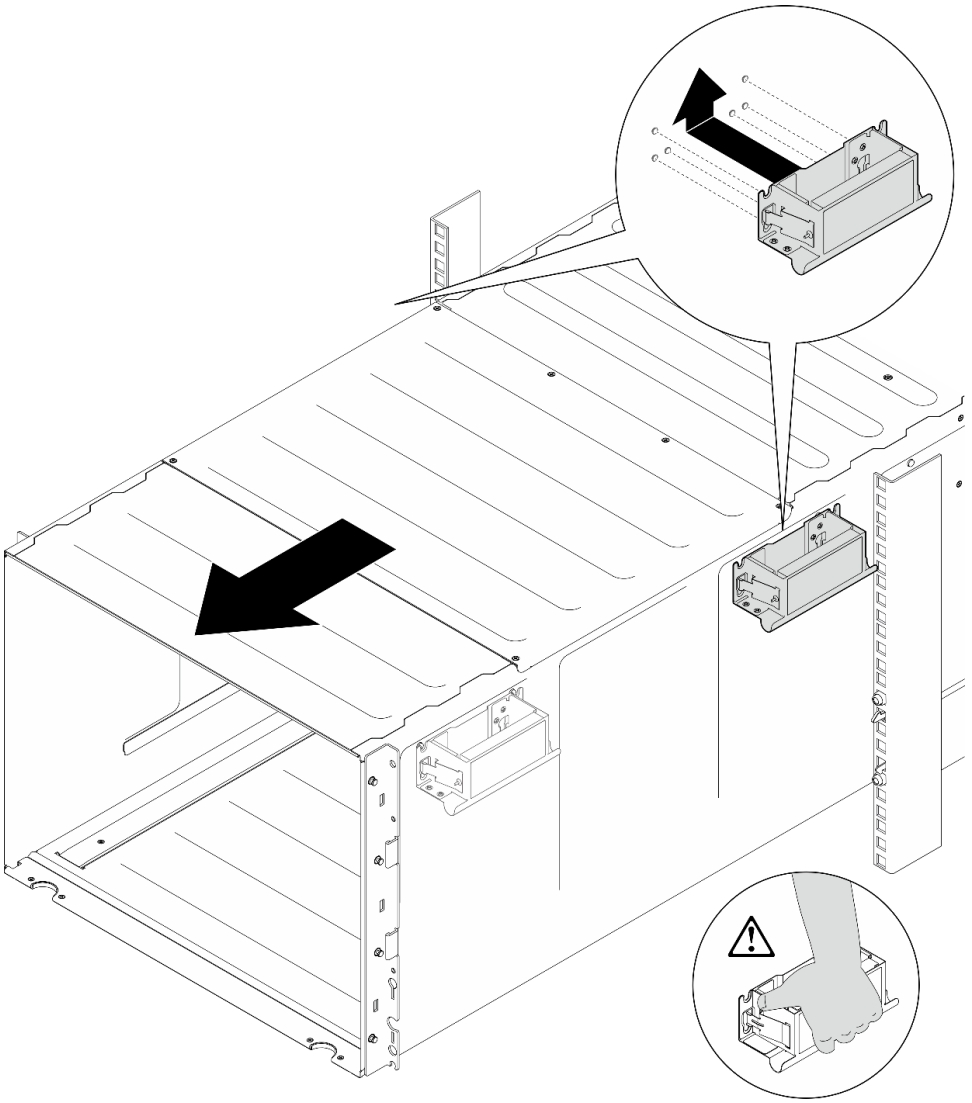


Figure 19. Rear handle installation

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.

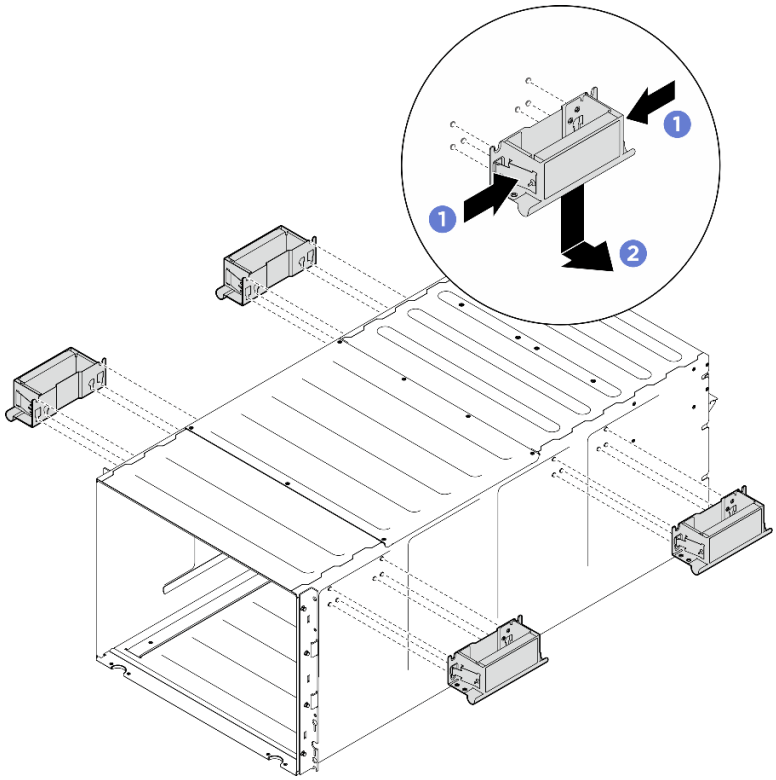


Figure 20. Remove handles

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 rear fans. See “Install a hot-swap fan” on page 87.
3. (Optional) Reinstall all the power supply units. See “Install a hot-swap power supply unit” on page 218.
4. (Optional) Reinstall the system shuttle. See “Install the system shuttle” on page 253.

Install the chassis to rack

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

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 33 and "Safety inspection checklist" on page 34 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 41.
- **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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
  - Go to "Update the firmware" on page 287 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.

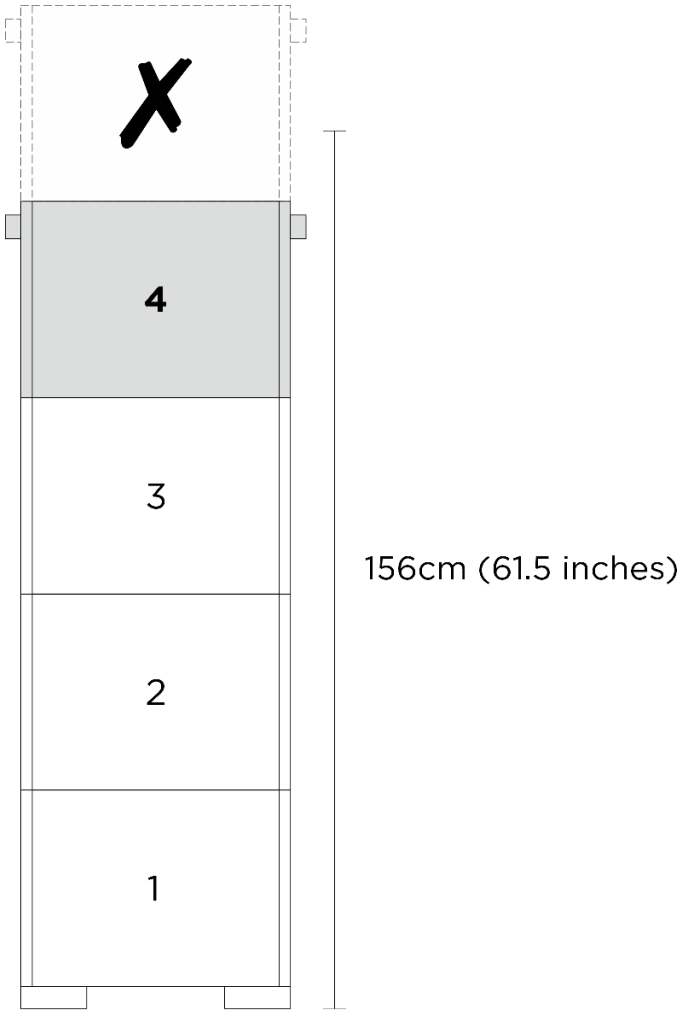


Figure 21. Maximum installation height

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. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

b. Remove all the power supply units. See “Remove a hot-swap power supply unit” on page 216.

c. Remove the rear fans (fans 1 to 15). See “Remove a hot-swap fan” on page 84.

Step 2. Attach four handles to the chassis.

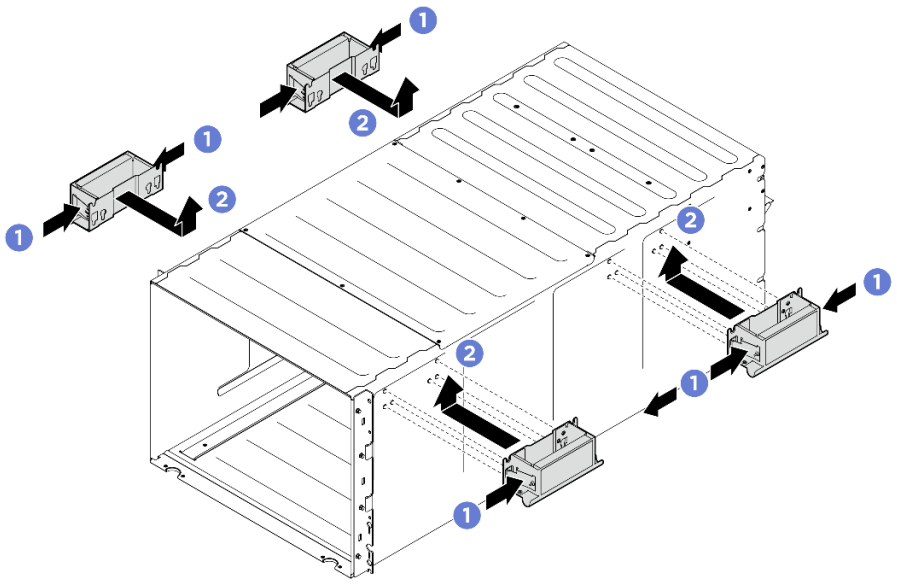


Figure 22. Attaching four handles

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.

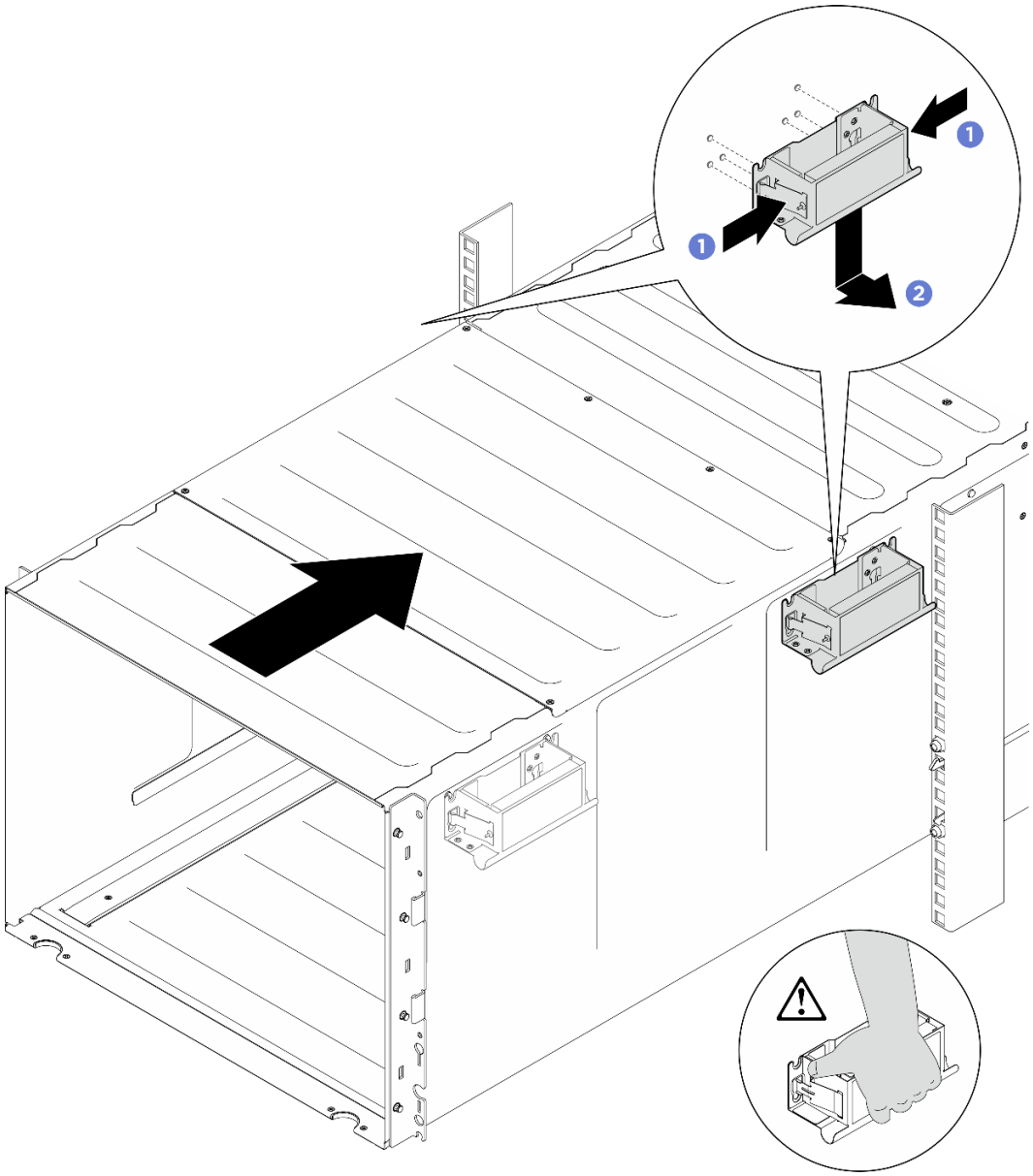


Figure 23. Rear handle removal

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

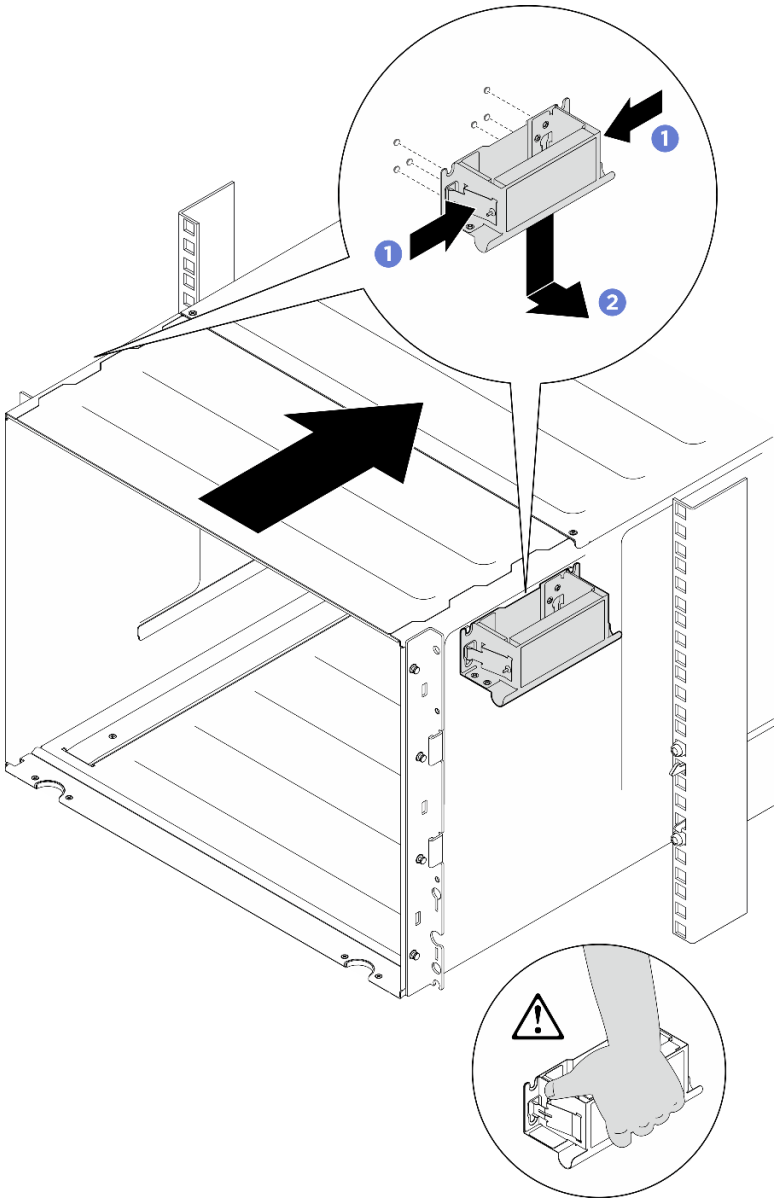


Figure 24. Front handle removal

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

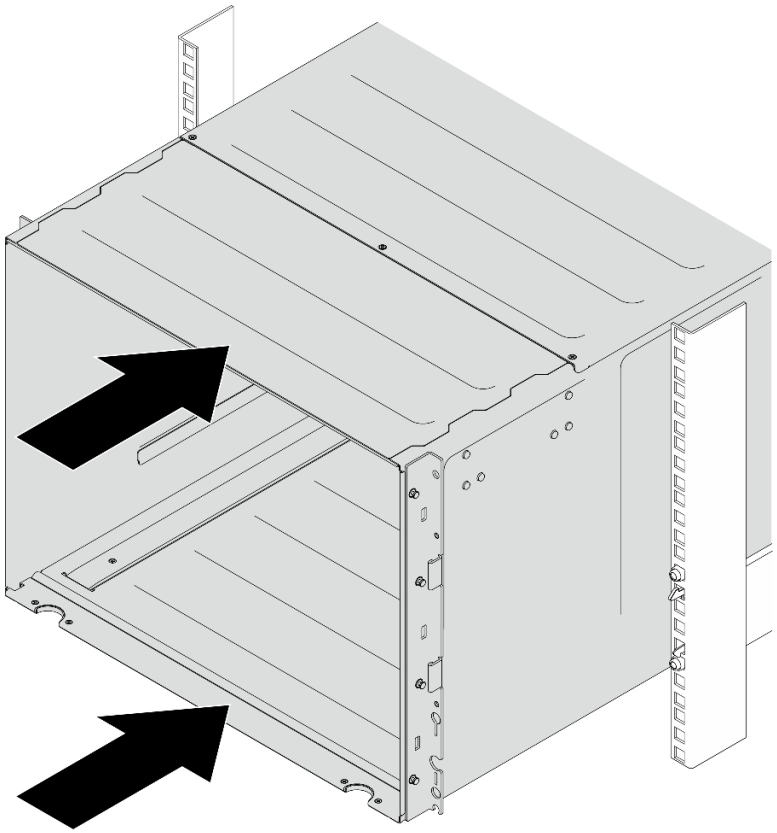


Figure 25. Sliding the chassis

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

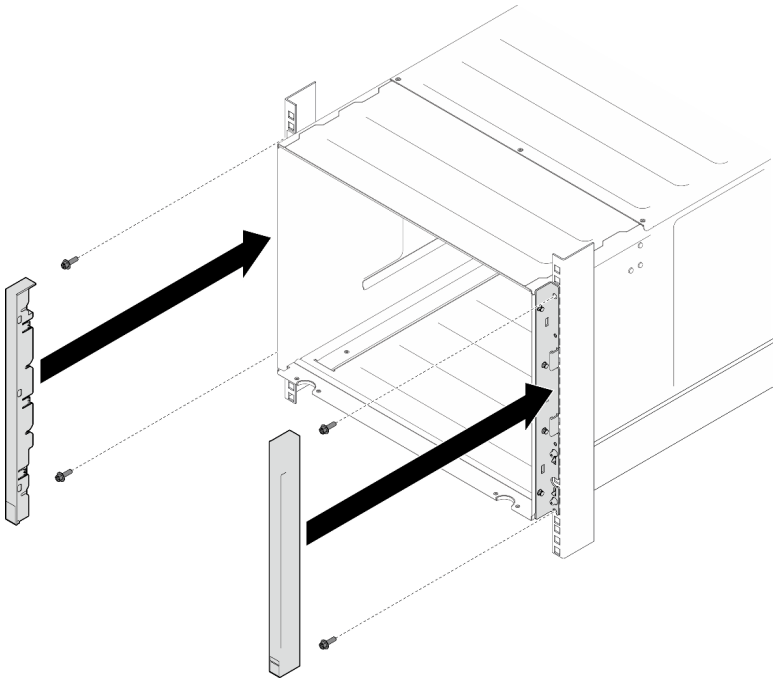


Figure 26. EIA cover installation

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

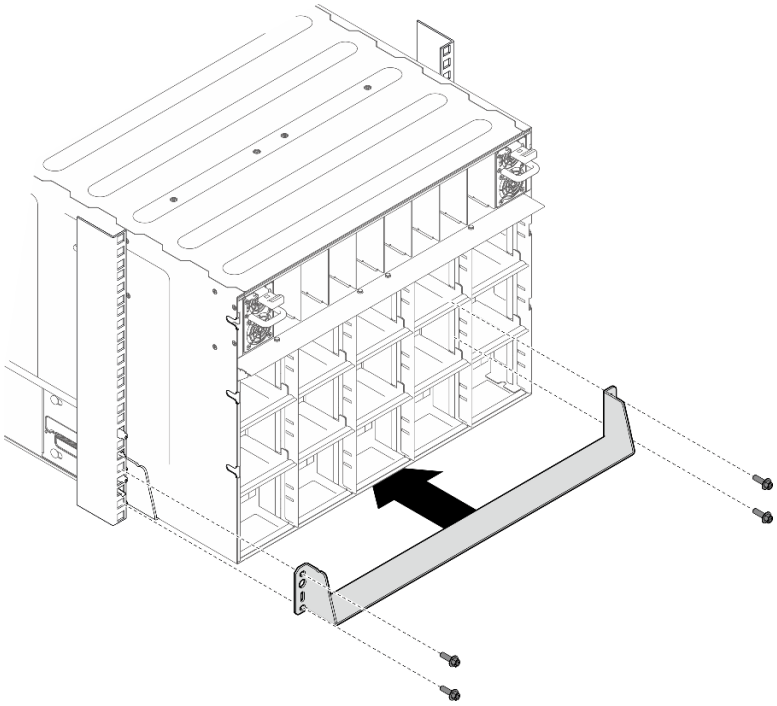


Figure 27. Lower support bracket installation

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

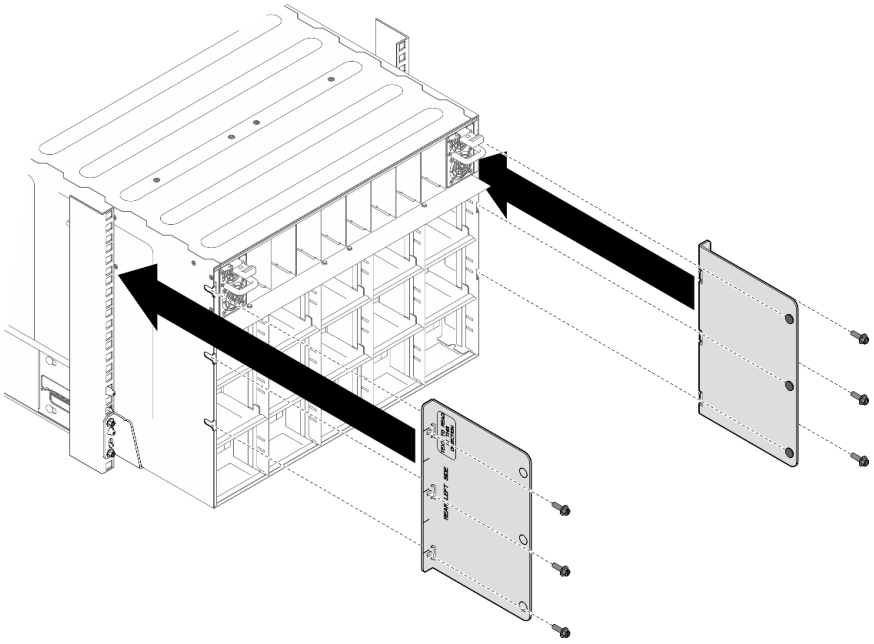


Figure 28. Upper support bracket installation

After you finish

1. Reinstall the rear fans. See “Install a hot-swap fan” on page 87.

2. Reinstall all the power supply units. See “Install a hot-swap power supply unit” on page 218.
3. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
4. Install any other required components.
5. Reconnect the power cords and any cables that you removed.

   Important: For any AI rack server that supports up to eight CFF PSUs in the rear of the server and operates with N+N redundancy, the two rack-level AC lines feeds must alternate between the PSUs to ensure balanced power distribution and redundancy.

   - Rack-level AC line feed A: Connect to PSU 1, 3, 5, 7 (odd numbered PSUs)
   - Rack-level AC line feed B: Connect to PSU 2, 4, 6, 8 (even numbered PSUs)
6. Power on the server and any peripheral devices. See “Power on the server” on page 40.
7. Update the server configuration. See “Complete the parts replacement” on page 255.

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 33 and “Safety inspection checklist” on page 34 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), 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.

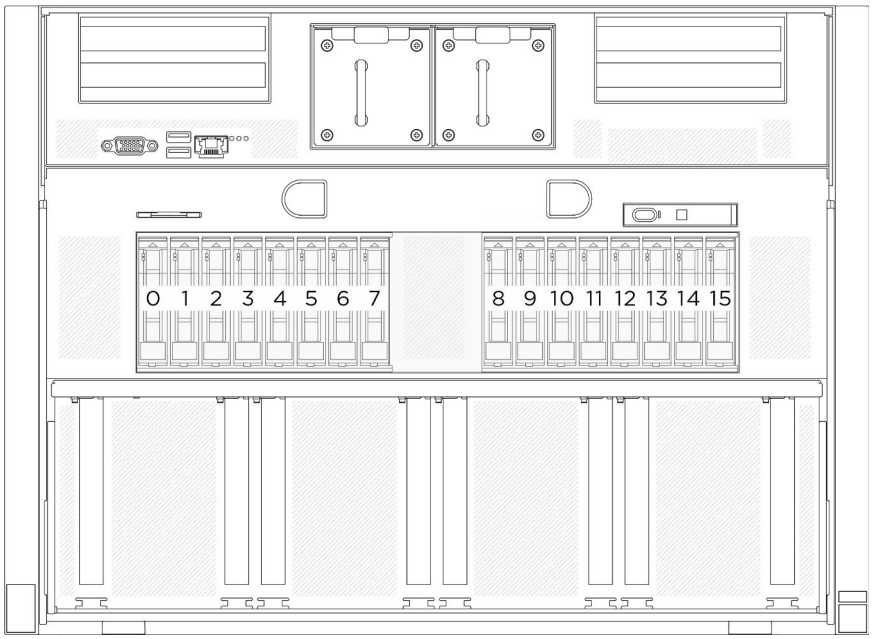


Figure 29. 2.5-inch drive bay numbering

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

Procedure

Step 1. ❶ Slide the release latch to unlock the drive handle.

Step 2. ❷ Rotate the drive handle to the open position.

Step 3. ❸ Grasp the handle and slide the drive out of the drive bay.

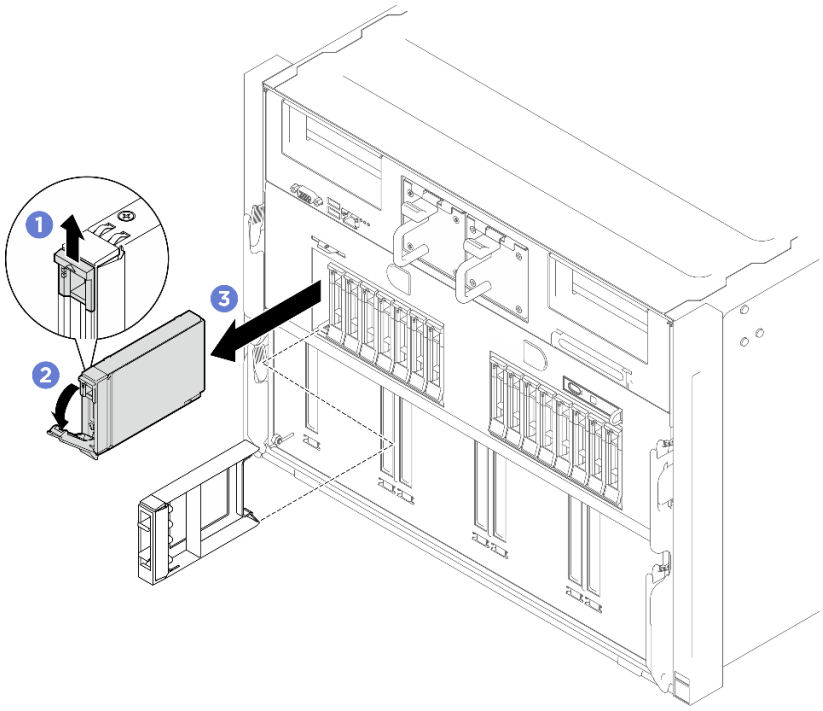


Figure 30. 2.5-inch hot-swap drive removal

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 58.

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 33 and “Safety inspection checklist” on page 34 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), 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.

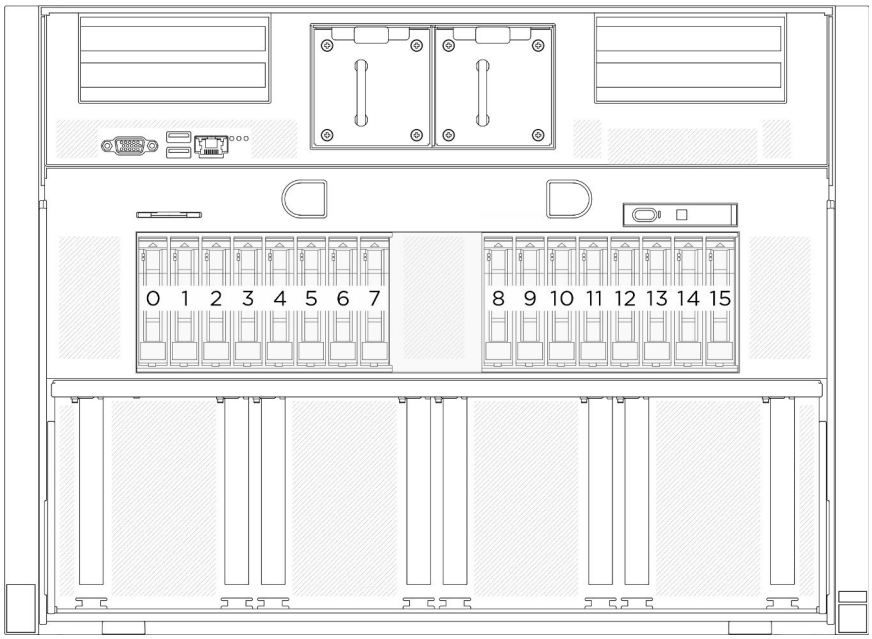


Figure 31. 2.5-inch drive bay numbering

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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 287 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.

a. ❶ 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.

b. ❷ Rotate the drive handle to the fully closed position until the handle latch clicks.

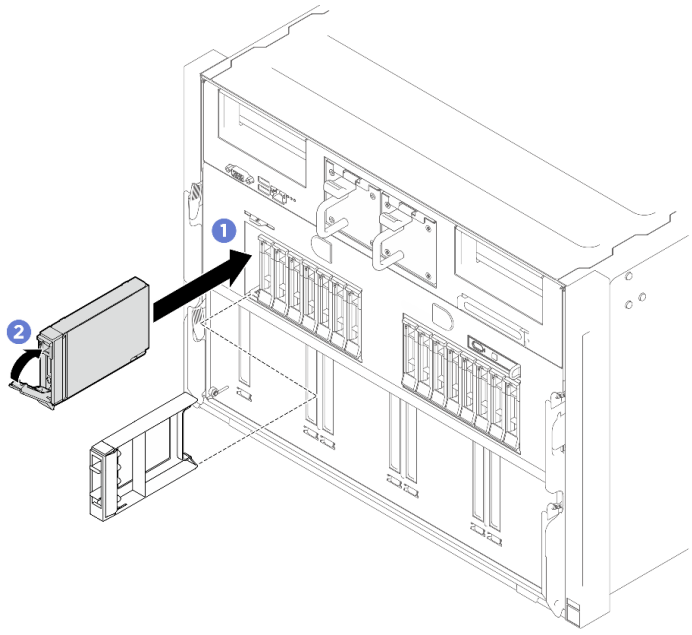


Figure 32. 2.5-inch hot-swap drive installation

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 329.

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 33 and "Safety inspection checklist" on page 34 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 41.

- The server supports up to two 2.5-inch drive backplanes with the following corresponding drive backplane numbering.

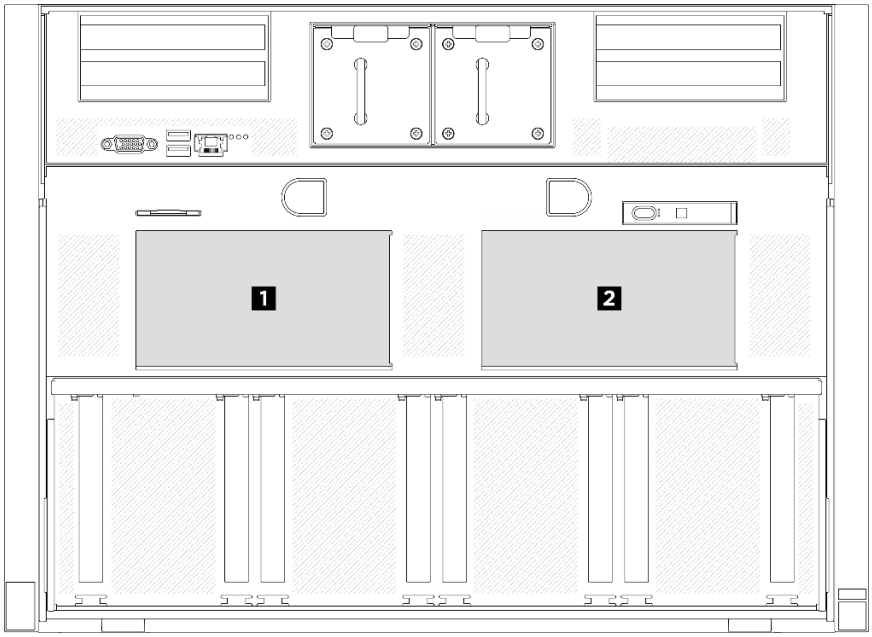


Figure 33. 2.5-inch drive backplane numbering

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle to the stop position.

1. ❶ Press the two blue release latches.
2. ❷ Rotate the two release levers until they are perpendicular to the shuttle.
3. ❸ Pull the shuttle forward until it stops.

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the system shuttle to its stop position.

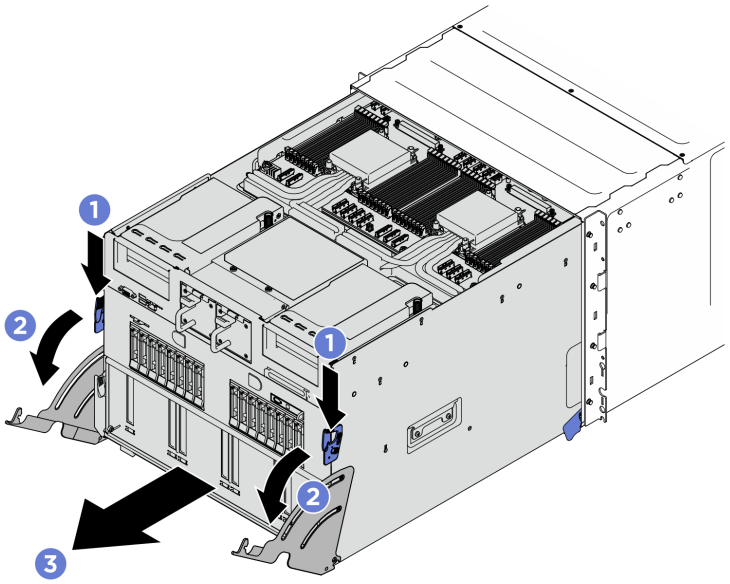


Figure 34. Pulling the system shuttle to the stop position

b. Remove the FIO/PCI cage. See “Remove the FIO/PCI cage” on page 97.

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 56.

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

Step 3. Remove the 2.5-inch drive backplane.

a. (1) Lift and hold the two retention latches on the top of the backplane.

b. (2) Rotate the backplane from the top to disengage it from the retention latches; then, carefully lift the backplane out of the system shuttle.

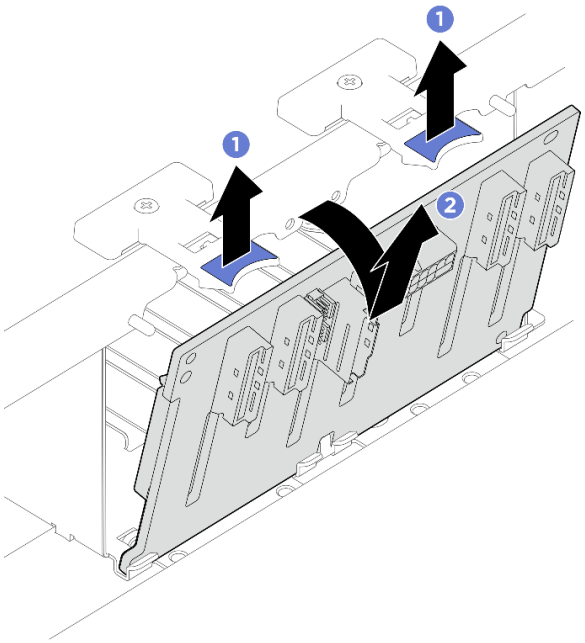


Figure 35. 2.5-inch drive backplane removal

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 33 and “Safety inspection checklist” on page 34 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 supports up to two 2.5-inch drive backplanes with the following corresponding drive backplane numbering.

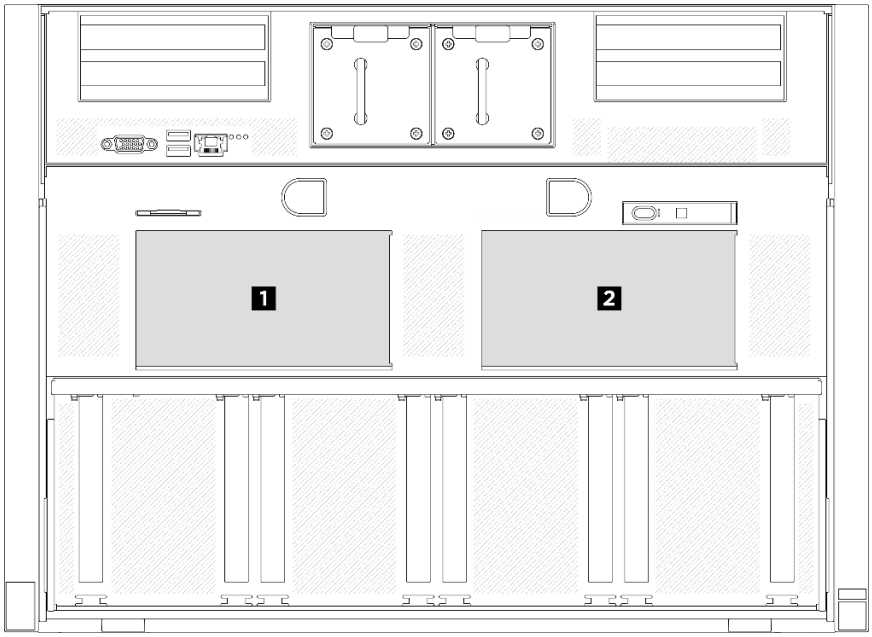


Figure 36. 2.5-inch drive backplane numbering

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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 287 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 front drive cage, and insert them into the slots.

Step 2. ❷ Push the top of the backplane forward until it clicks into place.

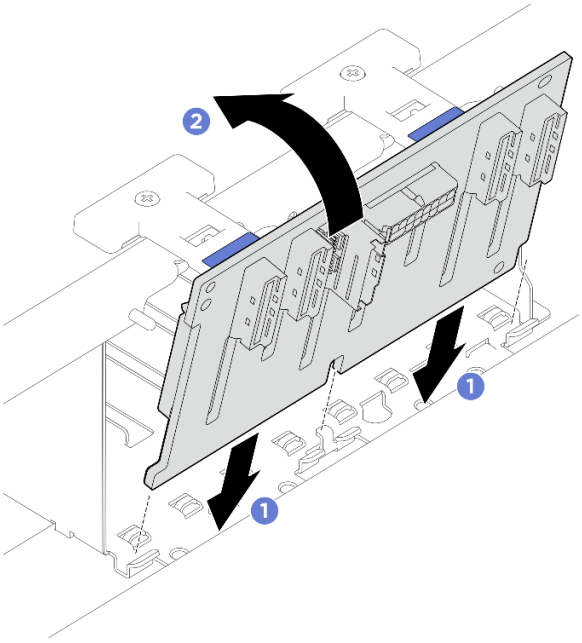


Figure 37. 2.5-inch drive backplane installation

Step 3. If necessary, attach the labels to both ends of the 2.5-inch drive backplane cables.

a. ❶ Attach the white space portion of the label to one end of the cable.

b. ❷ 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.

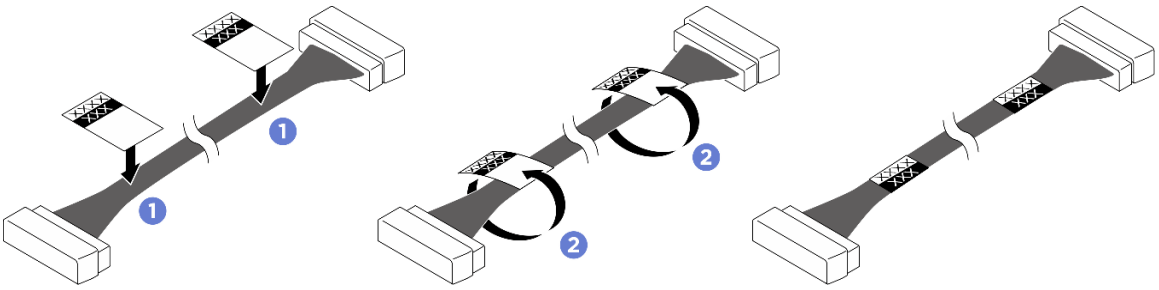


Figure 38. Label application

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)**	**BP1 NVME 0-1** **NVME 1**
Backplane 1: NVMe connector 2-3	**PCIe switch board: NVMe connector 2 (NVME2)**	**BP1 NVME 2-3** **NVME 2**

From	To	Label
Backplane 1: Power connector	**Power distribution board: Backplane 1 power connector (BP1 PWR)**	BP1 PWR BP1 PWR
Backplane 1: NVMe connector 4-5	**PCIe switch board: NVMe connector 3 (NVME3)**	BP1 NVME 4-5 NVME 3
Backplane 1: NVMe connector 6-7	**PCIe switch board: NVMe connector 4 (NVME4)**	BP1 NVME 6-7 NVME 4
Backplane 2: NVMe connector 0-1	**PCIe switch board: NVMe connector 5 (NVME5)**	BP2 NVME 0-1 NVME 5
Backplane 2: NVMe connector 2-3	**PCIe switch board: NVMe connector 6 (NVME6)**	BP2 NVME 2-3 NVME 6
Backplane 2: Power connector	**Power distribution board: Backplane 2 power connector (BP2 PWR)**	BP2 PWR BP2 PWR
Backplane 2: NVMe connector 4-5	**PCIe switch board: NVMe connector 7 (NVME7)**	BP2 NVME 4-5 NVME 7
Backplane 2: NVMe connector 6-7	**PCIe switch board: NVMe connector 8 (NVME8)**	BP2 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 262 for more information.

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 58
2. Reinstall the FIO/PCI cage. See “Install the FIO/PCI cage” on page 98.
3. Push the system shuttle fully into the chassis.
   a. ❶ Lift the two lock latches on both sides of the shuttle.
   b. ❷ Slide the shuttle into the chassis.
   c. ❸ Push the shuttle fully into the chassis.
   d. ❹ Rotate the two release levers until they lock into place.

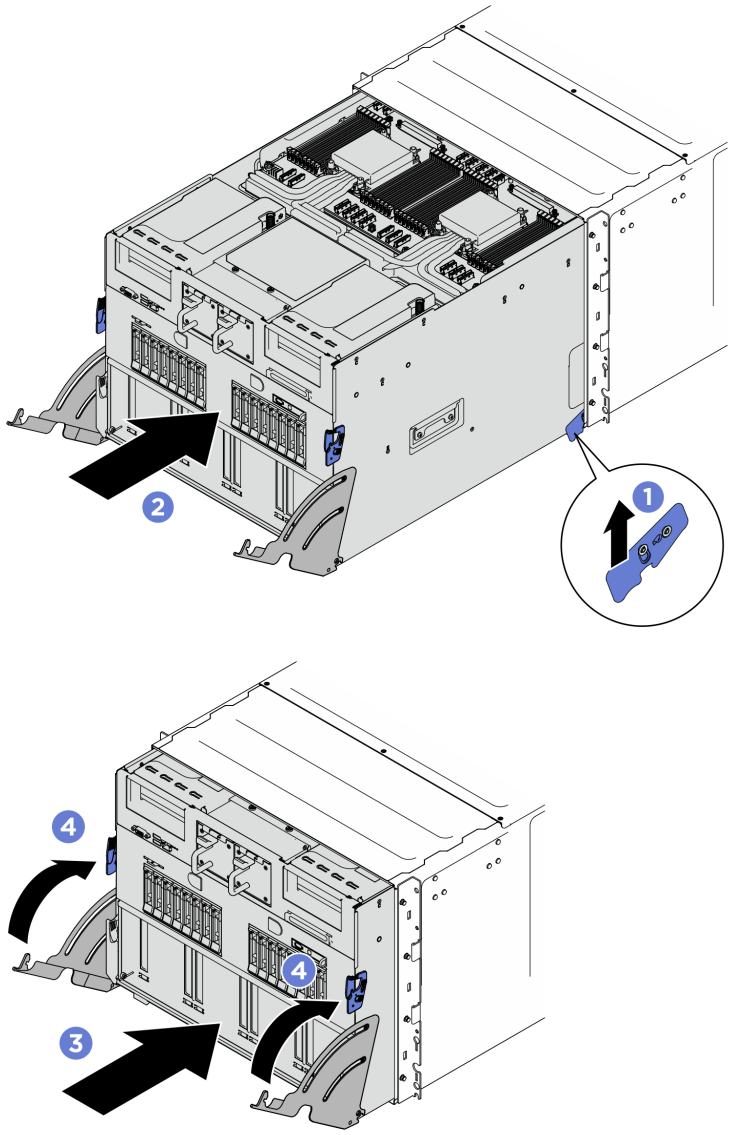


Figure 39. System shuttle installation

4. Complete the parts replacement. See “Complete the parts replacement” on page 255.

Air duct replacement (trained technician only)

Follow instructions in this section to remove and install the 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 the air duct

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.

Procedure

Step 1. Pull the system shuttle to the stop position.

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

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the PCIe switch shuttle to its stop position.

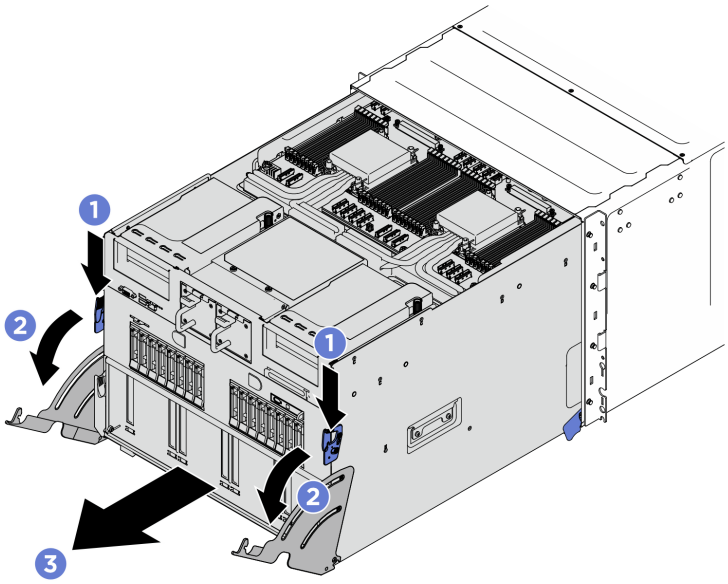


Figure 40. Pulling the system shuttle to the stop position

Step 2. Unfasten the two screws and lift the air duct out of the system shuttle.

Attention:

- For proper cooling and airflow, reinstall the air duct before you turn on the server. Operating the server with the air duct removed might damage server components.
- Service label is located on the air duct.

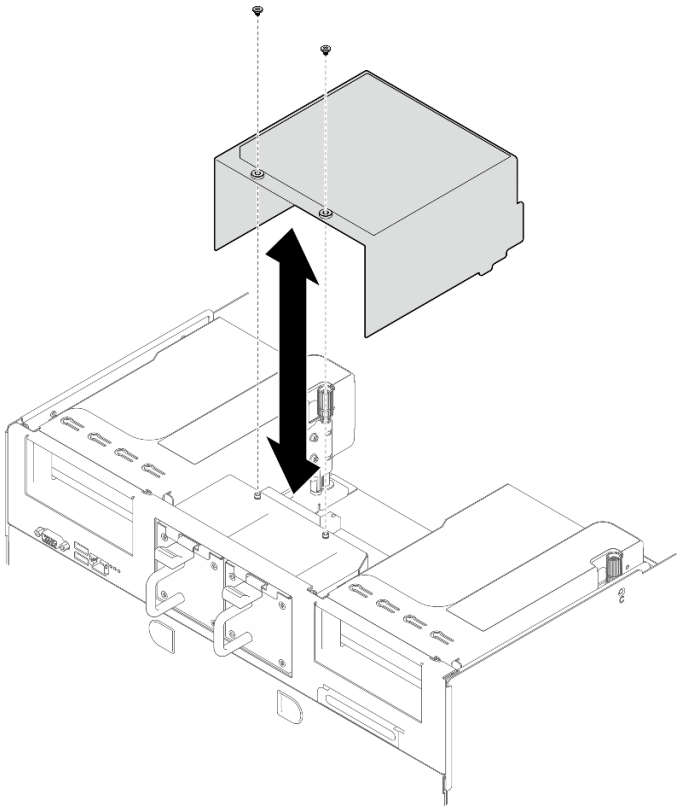


Figure 41. Air duct removal

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 the air duct

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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.

Note: If you are installing a new air duct, attach the service label to the surface of the new air duct if necessary.

Procedure

Step 1. Align the air duct with the standoffs on the front fan cage; then, lower the air duct into the FIO/PCI cage.

Step 2. Fasten the two screws to secure the air duct.

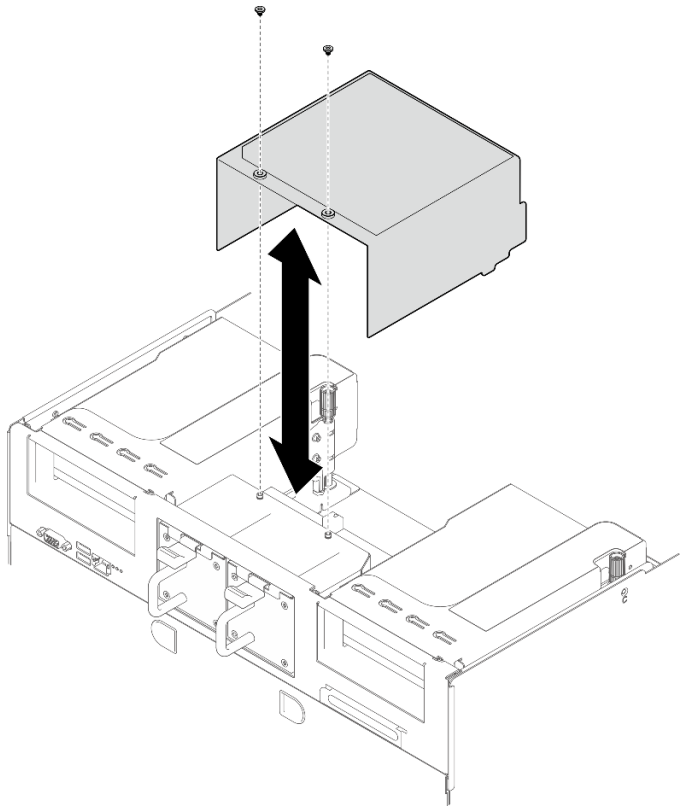


Figure 42. Air duct installation

Step 3. Push the system shuttle fully into the chassis.

a. ❶ Lift the two lock latches on both sides of the shuttle.

b. ❷ Slide the shuttle into the chassis.

c. ❸ Push the shuttle fully into the chassis.

d. ❹ Rotate the two release levers until they lock into place.

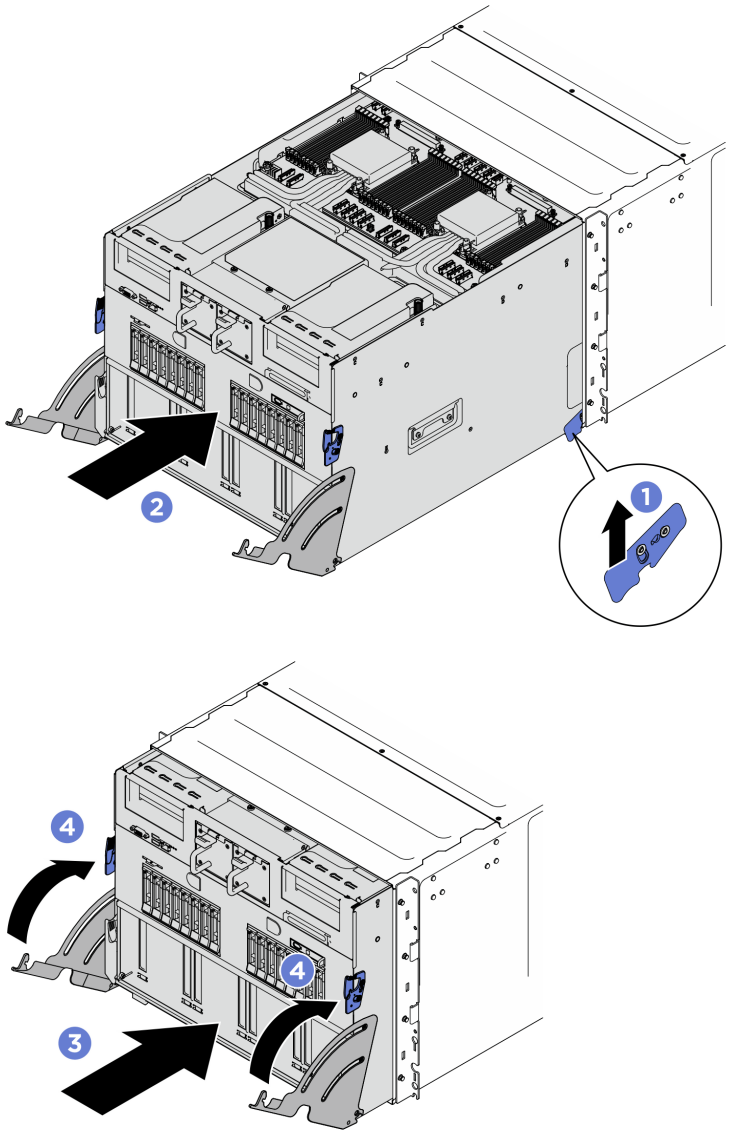


Figure 43. System shuttle installation

After you finish

Complete the parts replacement. See “Complete the parts replacement” on page 255.

Cable holder frame and baffle assembly (trained technician only)

Follow instructions in this section to remove and install the cable holder frame and baffle 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 cable holder frame and baffle assembly

Follow instructions in this section to remove the cable holder frame and baffle assembly. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.
- 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 system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

b. Disconnect all the cables from the PSU interposer.

c. Remove the compute tray. See “Remove the compute tray” on page 74.

d. Disconnect all the cables from the power distribution board.

Step 2. Slide the cable holder frame and baffle assembly toward the rear of the system shuttle, and remove it out of the shuttle.

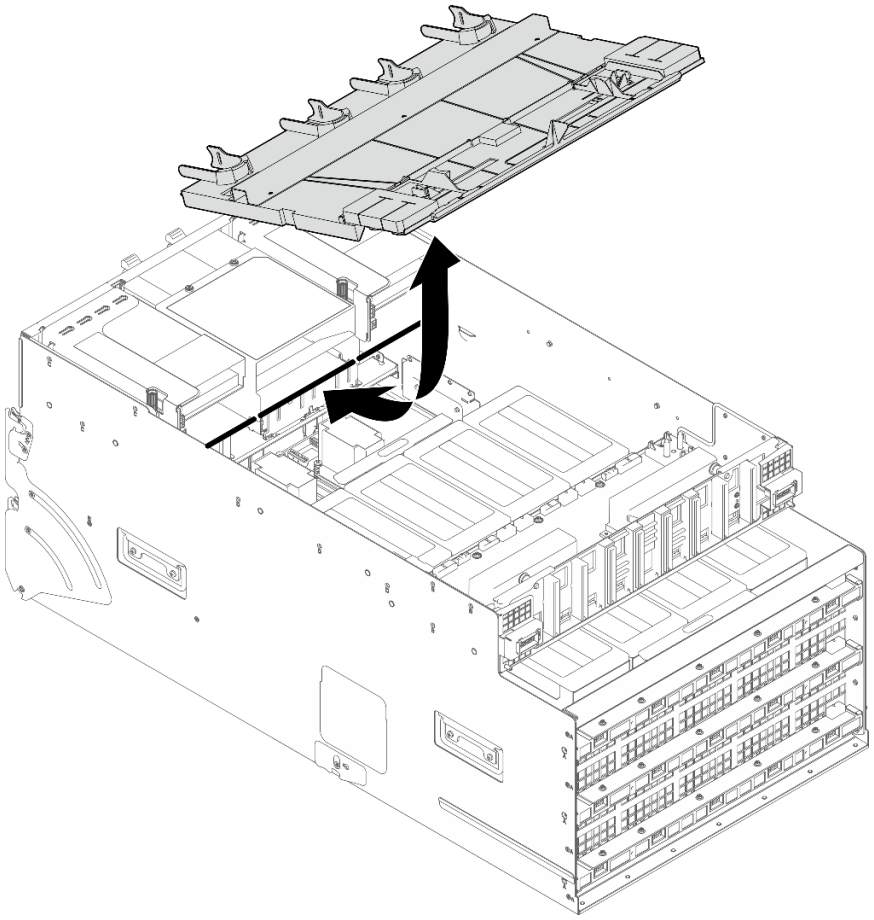


Figure 44. Cable holder frame and baffle assembly removal

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 holder frame and baffle assembly

Follow instructions in this section to install the cable holder frame and baffle assembly. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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. Place the cable holder frame and baffle assembly above the GPU complex, and slide it forward into the system shuttle.

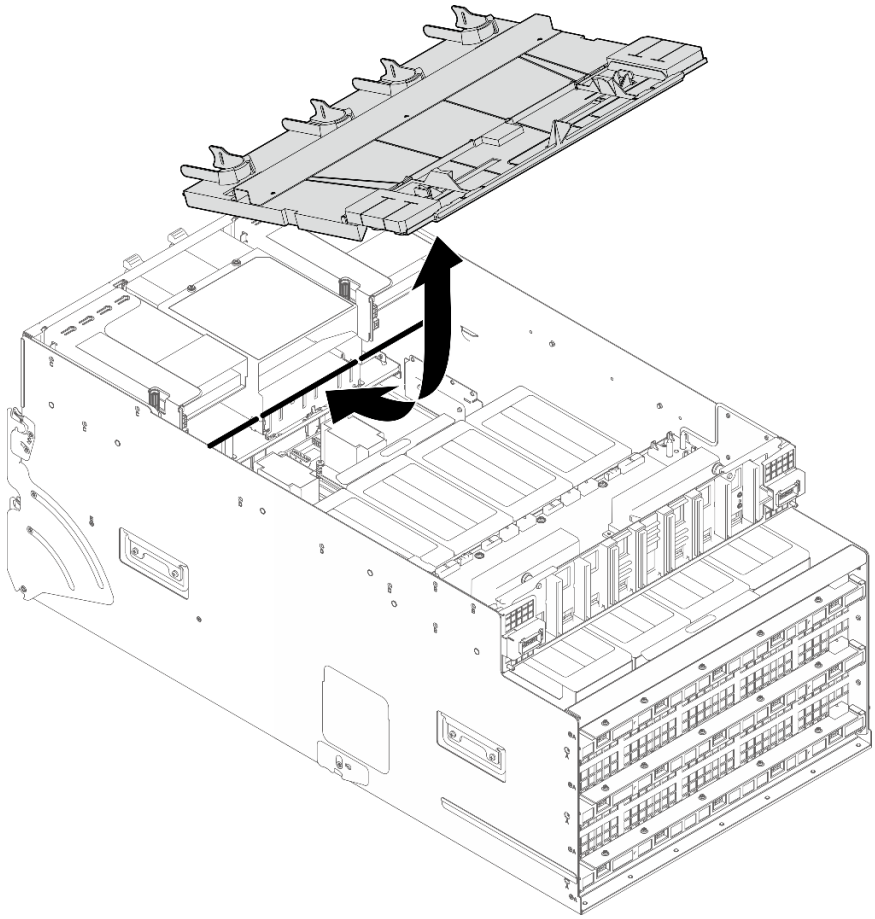


Figure 45. Cable holder frame and baffle assembly installation

After you finish

1. Connect the cables to the power distribution board. See below for more information.
   - “2.5-inch drive backplane cable routing” on page 262
   - “Fan control board cable routing” on page 267
   - “GPU baseboard cable routing” on page 271
   - “PCIe switch board cable routing” on page 274
2. Reinstall the compute tray. See “Install the compute tray” on page 75.
3. Connect the cables to the PSU interposer. See below for more information.
   - “PSU interposer cable routing” on page 282
   - “Rear auxiliary fan cable routing” on page 283
4. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
5. Complete the parts replacement. See “Complete the parts replacement” on page 255.

Compute tray replacement (trained technician only)

Follow instructions in this section to remove and install the compute tray.

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 compute tray

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

About this task

Important: 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 compute tray.

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.
- 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. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

Step 2. Disconnect all the cables from the system board. 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 compute tray.

Attention: To avoid damaging the system board, make sure to follow the instructions in Chapter 6 “Internal cable routing” on page 257 when disconnecting cables from the system board.

Step 3. Remove the compute tray.

a. (1) Unfasten the six screws marked with **D** on both sides of the system shuttle.

b. (2) Lift the compute tray out of the system shuttle.

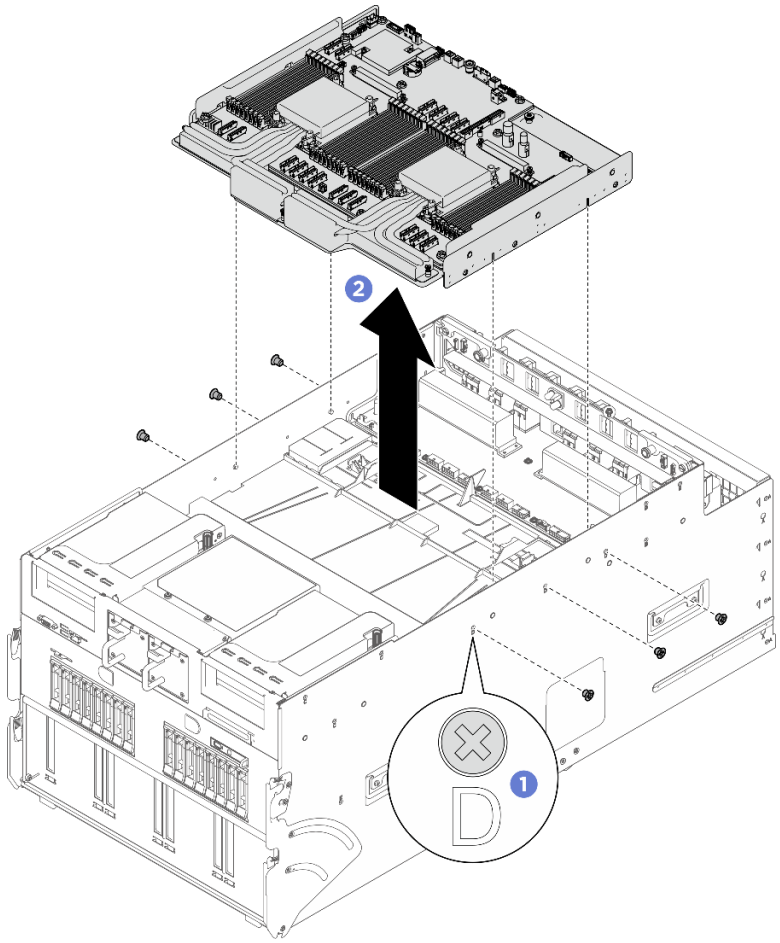


Figure 46. Compute tray removal

After you finish

- To remove the system board from the tray, see "Remove the system board" on page 238.
- 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 compute tray

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

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- 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 Place the compute tray into the system shuttle until it is securely engaged.

Step 2. 2 Locate the six screw holes marked with **D** on both sides of the system shuttle; then, fasten the six screws to secure the compute tray.

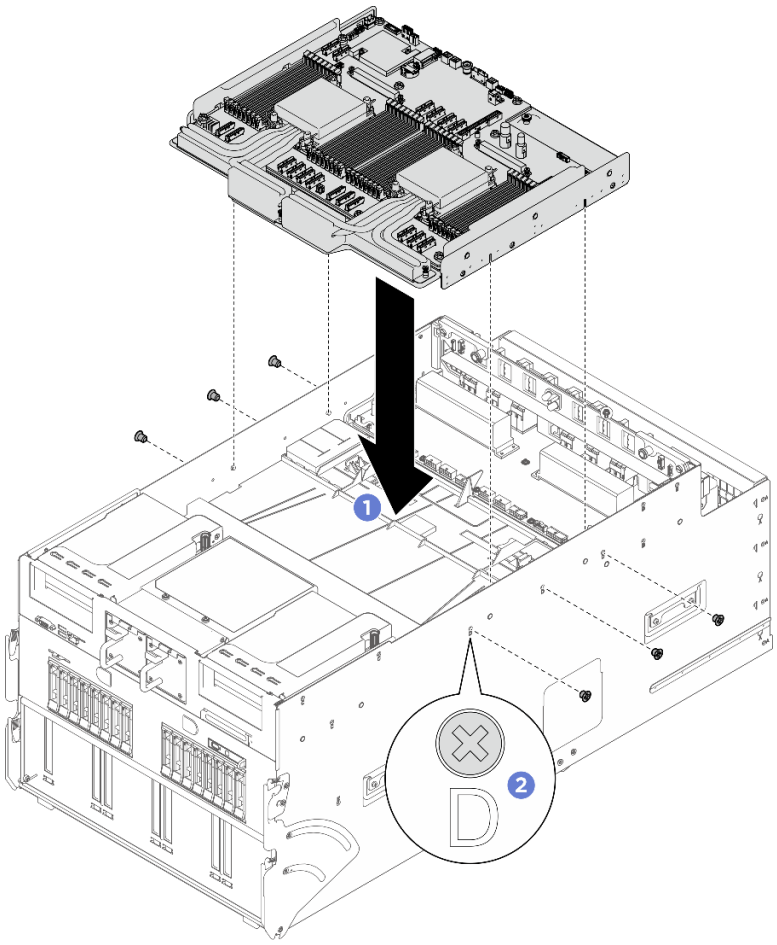


Figure 47. Compute tray installation

Step 3. Reconnect all the required cables to the same connectors on the system board. See below for more information.

- “Fan control board cable routing” on page 267
- “Integrated diagnostics panel cable routing” on page 271
- “PCIe riser cable routing” on page 272
- “PCIe switch board cable routing” on page 274
- “PSU interposer cable routing” on page 282
- “System I/O board cable routing” on page 283

After you finish

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside the server.
2. Reinstall the system shuttle. See “Install the system shuttle” on page 253.

3. Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 33 and “Safety inspection checklist” on page 34 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 41.
- 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 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. Pull the system shuttle out of the chassis, and place it onto the lift platform. See "Remove the system shuttle" on page 251.

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

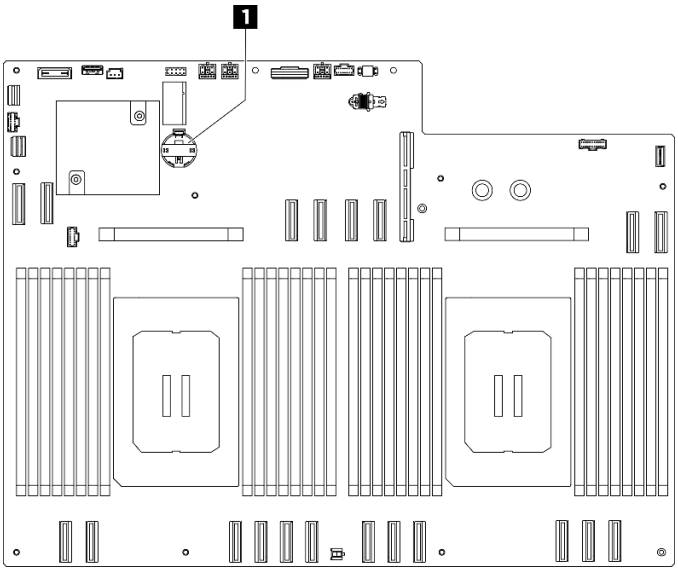


Figure 48. CMOS battery location

1 CMOS battery location

Step 3. Remove the CMOS battery.

a. 1 Gently press on the nub on the side of the CMOS battery as illustrated.

b. 2 Pivot the CMOS battery away from the seat, and lift the CMOS battery out of the battery socket.

Figure 49. 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 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- 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.

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.

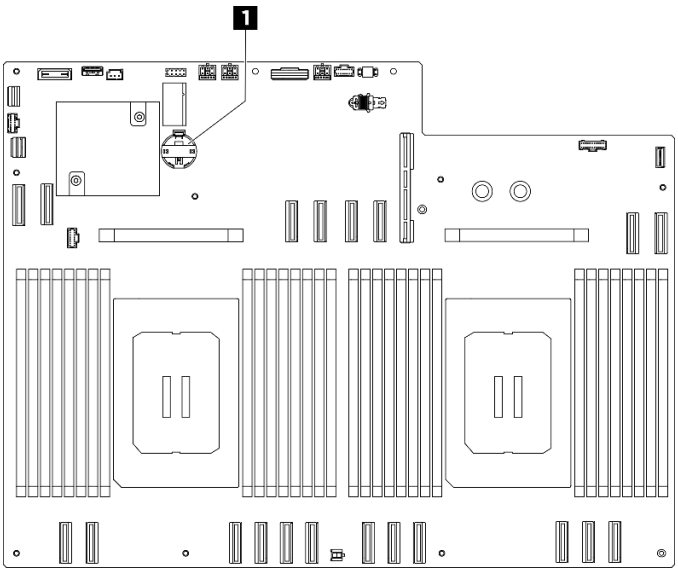


Figure 50. CMOS battery location

1 CMOS battery location

Step 3. 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 4. Install the CMOS battery.

a. 1 Tilt the CMOS battery and insert it to the positive end on the socket, and make sure that the CMOS battery goes tight to the metal clip.

b. 2 Press the CMOS battery down until it clicks into the socket.

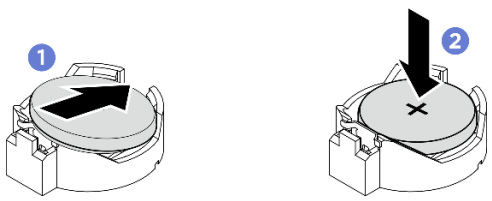


Figure 51. CMOS battery installation

After you finish

1. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
2. Complete the parts replacement. See “Complete the parts replacement” on page 255.

3. Reconfigure the server and reset the system date and time.

Drive cage replacement (trained technician only)

Follow instructions in this section to remove and install the drive 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 drive cage

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

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 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 41.

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle to the stop position.

1. ❶ Press the two blue release latches.
2. ❷ Rotate the two release levers until they are perpendicular to the shuttle.
3. ❸ Pull the shuttle forward until it stops.

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the system shuttle to its stop position.

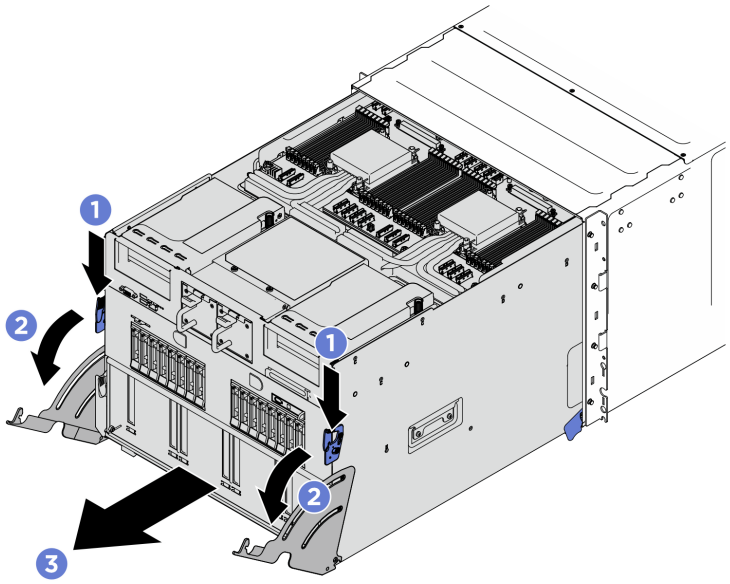


Figure 52. Pulling the system shuttle to the stop position

b. Remove the FIO/PCI cage. See “Remove the FIO/PCI cage” on page 97.

c. Remove the integrated diagnostics panel. See “Remove the integrated diagnostics panel” on page 154.

d. 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 56.

e. Disconnect all the cables from the 2.5-inch drive backplane.

Step 2. Remove the drive cage.

a. ❶ Unfasten the two screws marked with **E** on both sides of the system shuttle, and seven screws on the drive cage.

b. ❷ Hold the drive cage by the finger recesses (**1**), and slide it forward to remove it from the system shuttle.

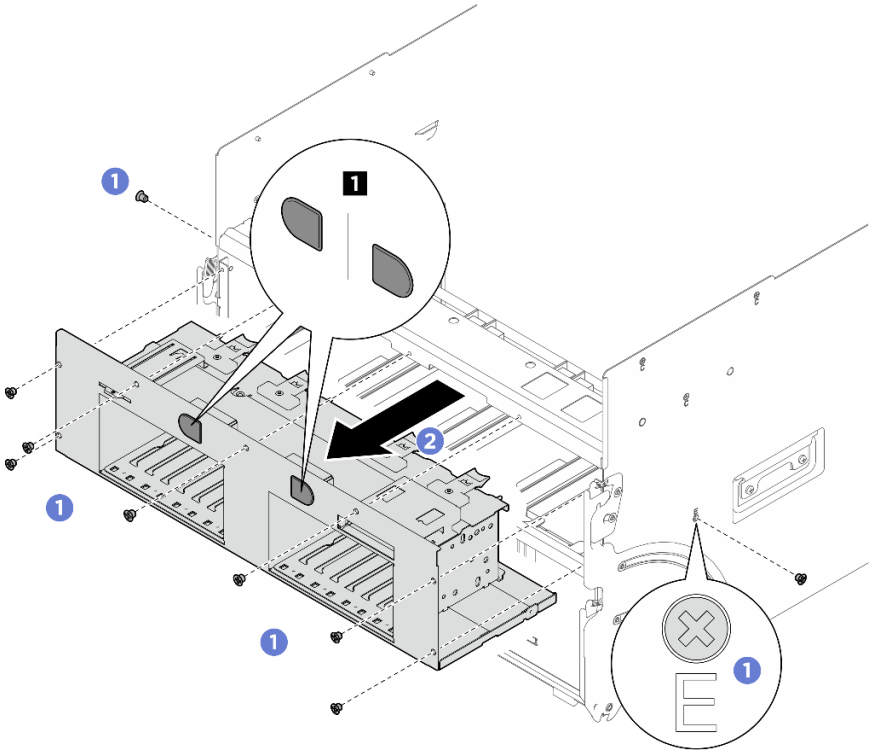


Figure 53. Drive cage removal

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 drive cage

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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. ❶ Align the drive cage with its opening in the front of the system shuttle and push it into the shuttle.

Step 2. ❷ Locate the two screws holes marked with **E** on both sides of the system shuttle, and seven screws holes on the drive cage; then, fasten the nine screws to secure the drive cage.

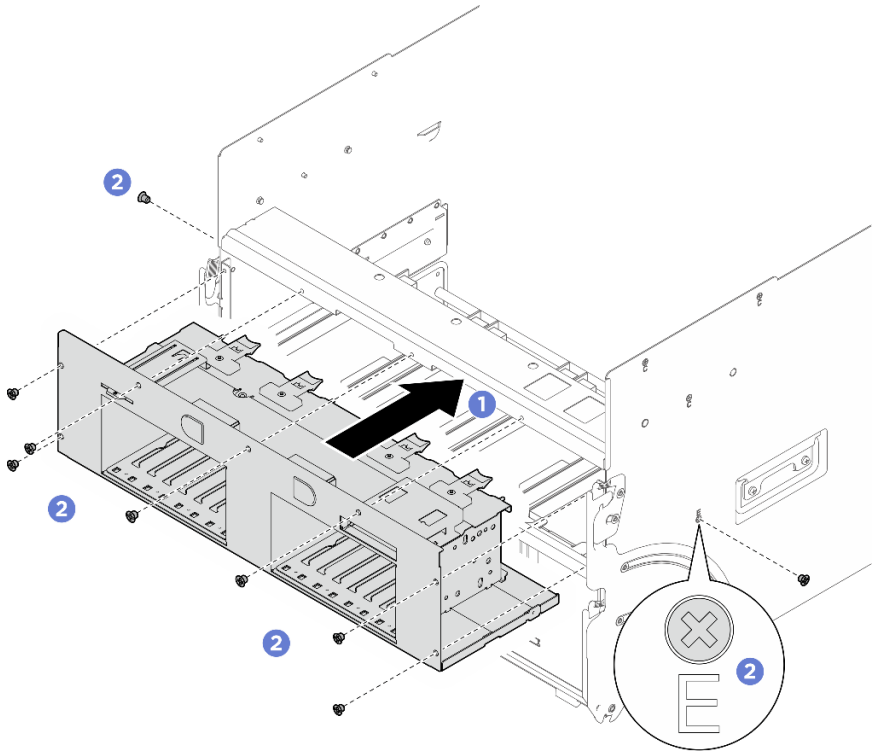


Figure 54. Drive cage installation

Step 3. Connect all the cables to the 2.5-inch drive backplane. See “2.5-inch drive backplane cable routing” on page 262 for more information.

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 58
2. Reinstall the integrated diagnostics panel. See “Install the integrated diagnostics panel” on page 155.
3. Reinstall the FIO/PCI cage. See “Install the FIO/PCI cage” on page 98.
4. Push the system shuttle fully into the chassis.
   a. ❶ Lift the two lock latches on both sides of the shuttle.
   b. ❷ Slide the shuttle into the chassis.
   c. ❸ Push the shuttle fully into the chassis.
   d. ❹ Rotate the two release levers until they lock into place.

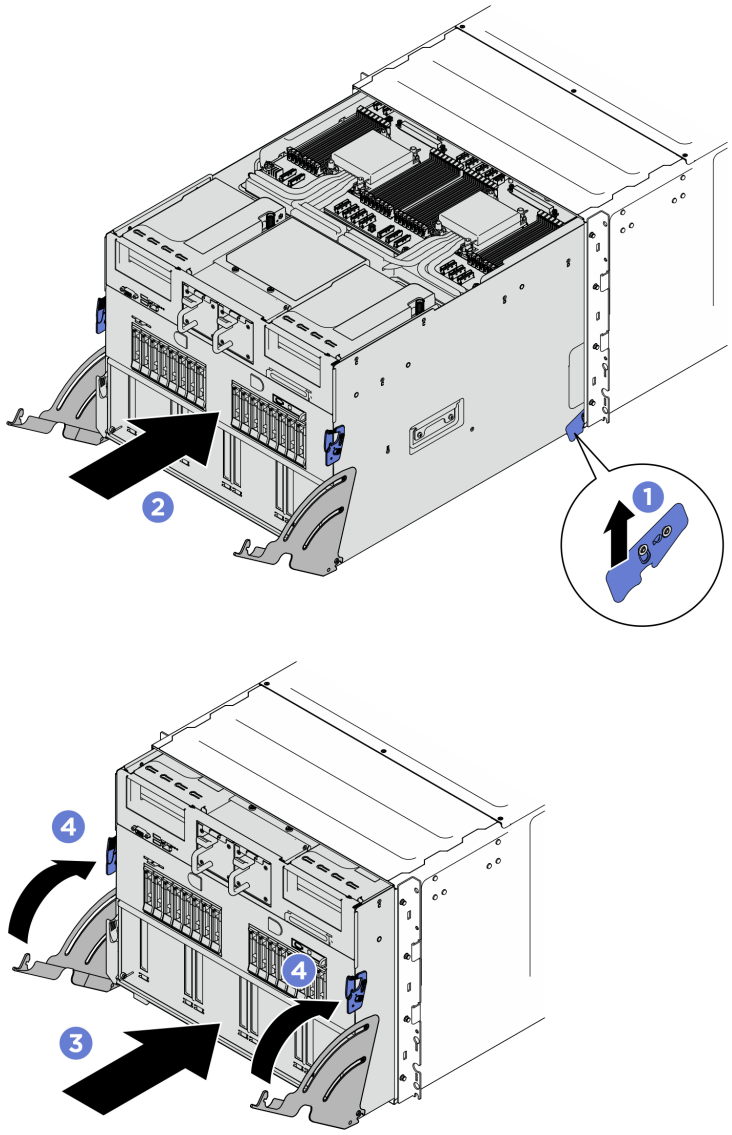


Figure 55. System shuttle installation

5. Complete the parts replacement. See “Complete the parts replacement” on page 255.

Fan replacement

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

Remove a hot-swap fan

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.

- The following illustrations show the front and rear fan numbering:

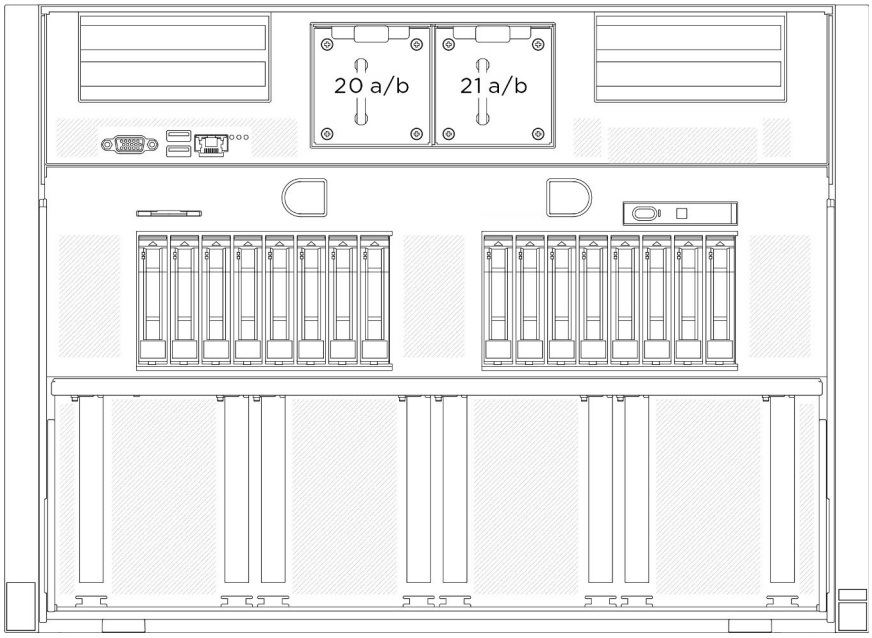


Figure 56. Front fan numbering

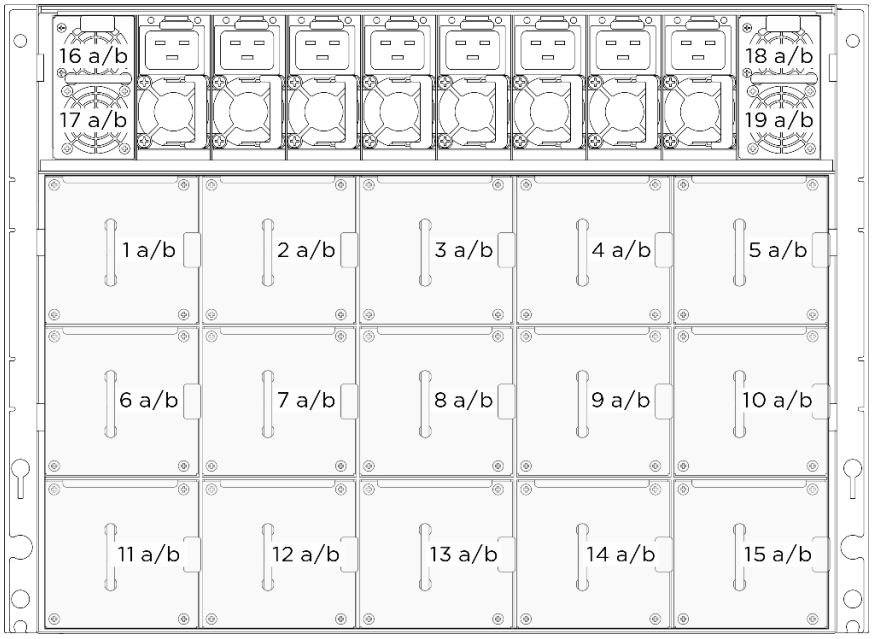


Figure 57. Rear fan numbering

Procedure

Step 1. ❶ Press and hold the orange latch to release the fan.

Step 2. ❷ Grasp the fan and carefully pull it out of the server.

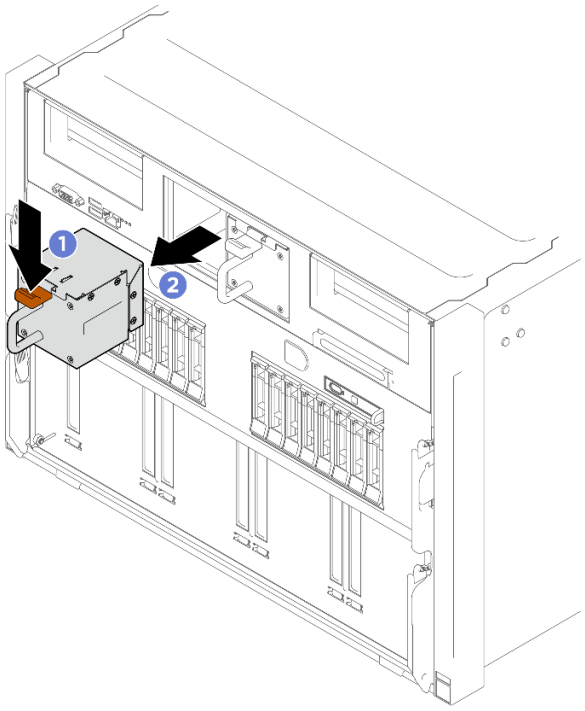


Figure 58. Front fan removal

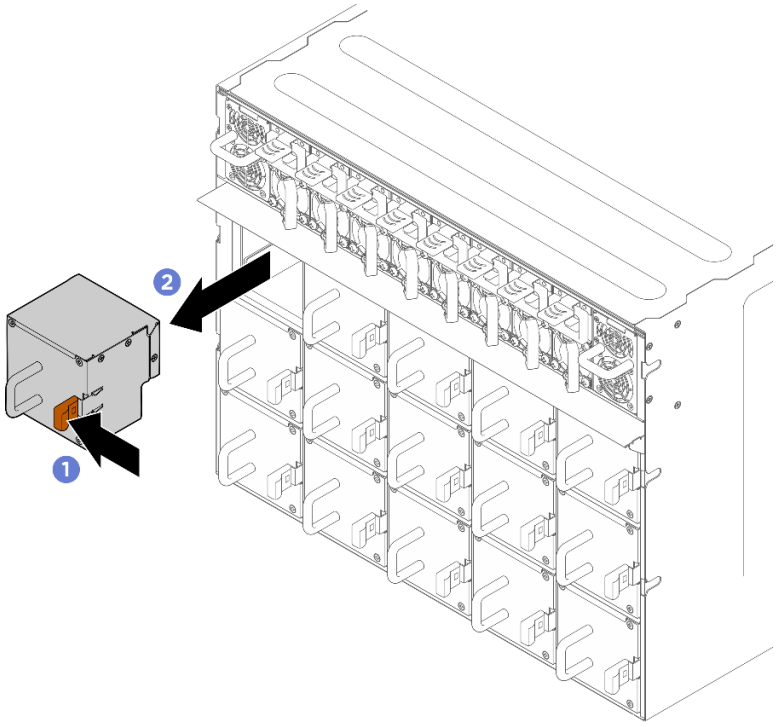


Figure 59. Rear fan removal

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

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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:

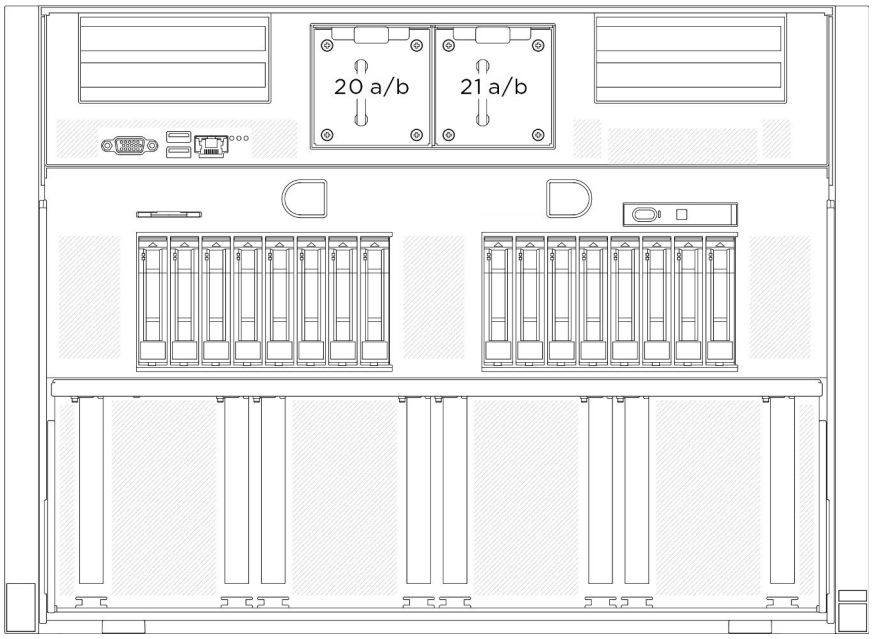


Figure 60. Front fan numbering

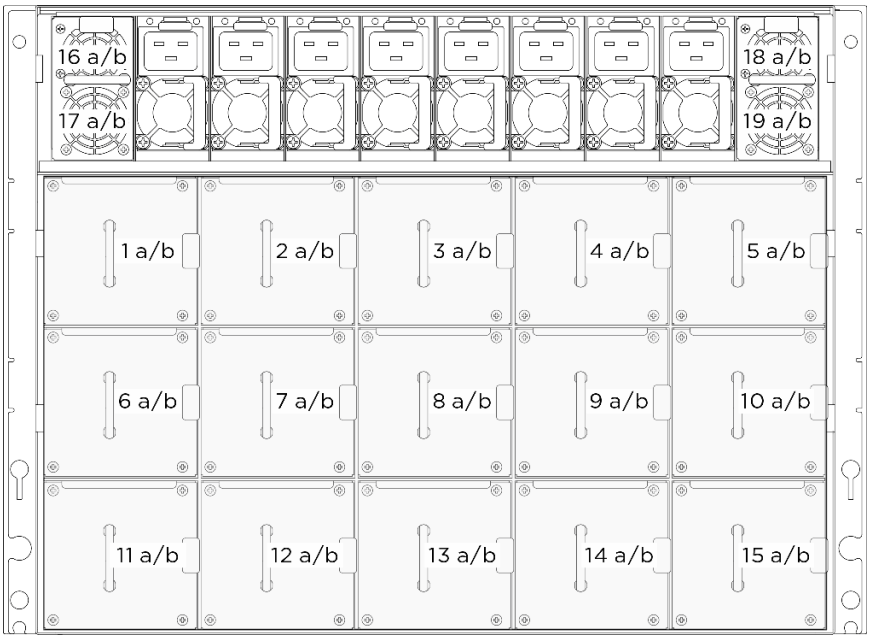


Figure 61. Rear fan numbering

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.

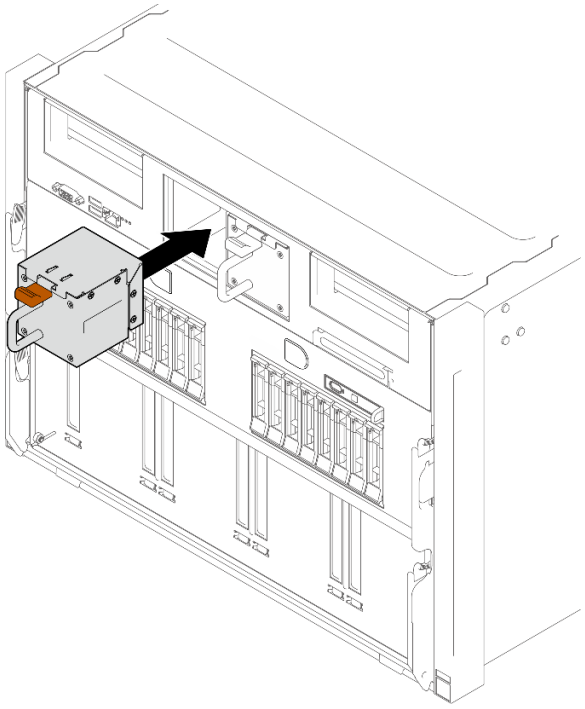


Figure 62. Front fan installation

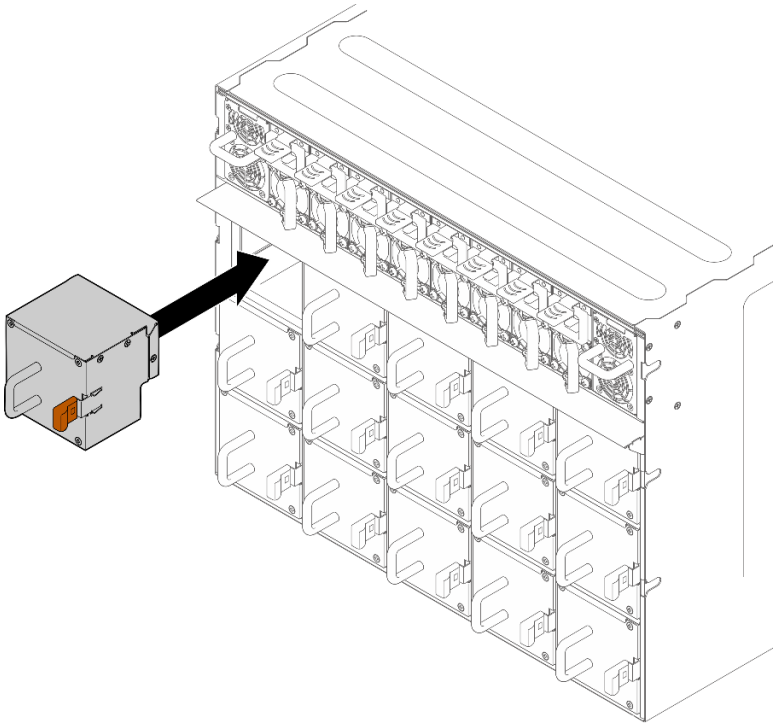


Figure 63. Rear fan installation

After you finish

Complete the parts replacement. See “Complete the parts replacement” on page 255.

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

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle to the stop position.

1. ❶ Press the two blue release latches.
2. ❷ Rotate the two release levers until they are perpendicular to the shuttle.
3. ❸ Pull the shuttle forward until it stops.

   Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the system shuttle to its stop position.

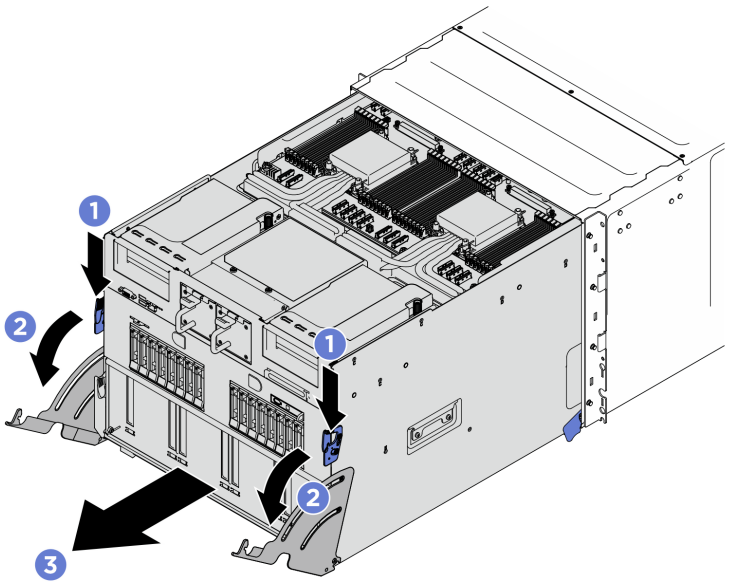


Figure 64. Pulling the system shuttle to the stop position

b. Remove the front fans. See “Remove a hot-swap fan” on page 84.

c. Remove the air duct. See “Remove the air duct” on page 66.

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

Step 3. Unfasten the two screws and lift the front fan control board out of the system shuttle.

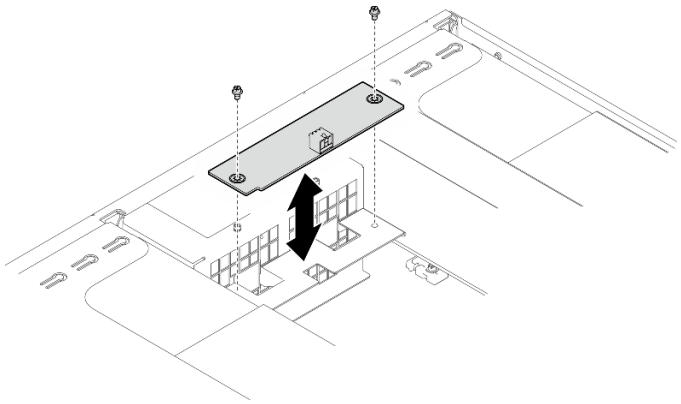


Figure 65. Front fan control board removal

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

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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. Lower the front fan control board into the system shuttle, and fasten the two screws to secure it.

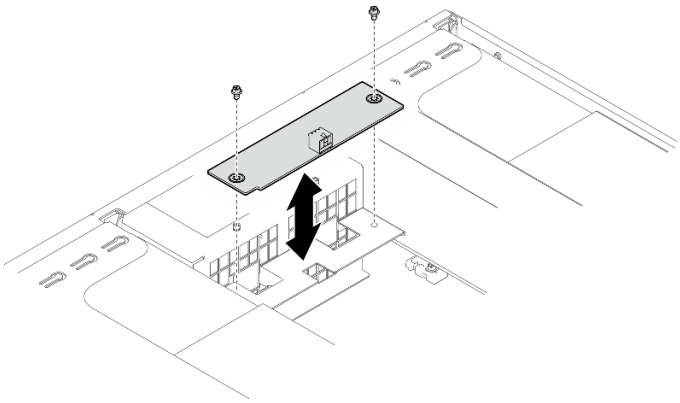


Figure 66. Front fan control board installation

Step 2. Connect the cable to the front fan control board. See “Fan control board cable routing” on page 267.

After you finish

1. Reinstall the air duct. See “Install the air duct” on page 68.
2. Reinstall the front fans. See “Install a hot-swap fan” on page 87.
3. Push the system shuttle fully into the chassis.
   a. ❶ Lift the two lock latches on both sides of the shuttle.
   b. ❷ Slide the shuttle into the chassis.
   c. ❸ Push the shuttle fully into the chassis.
   d. ❹ Rotate the two release levers until they lock into place.

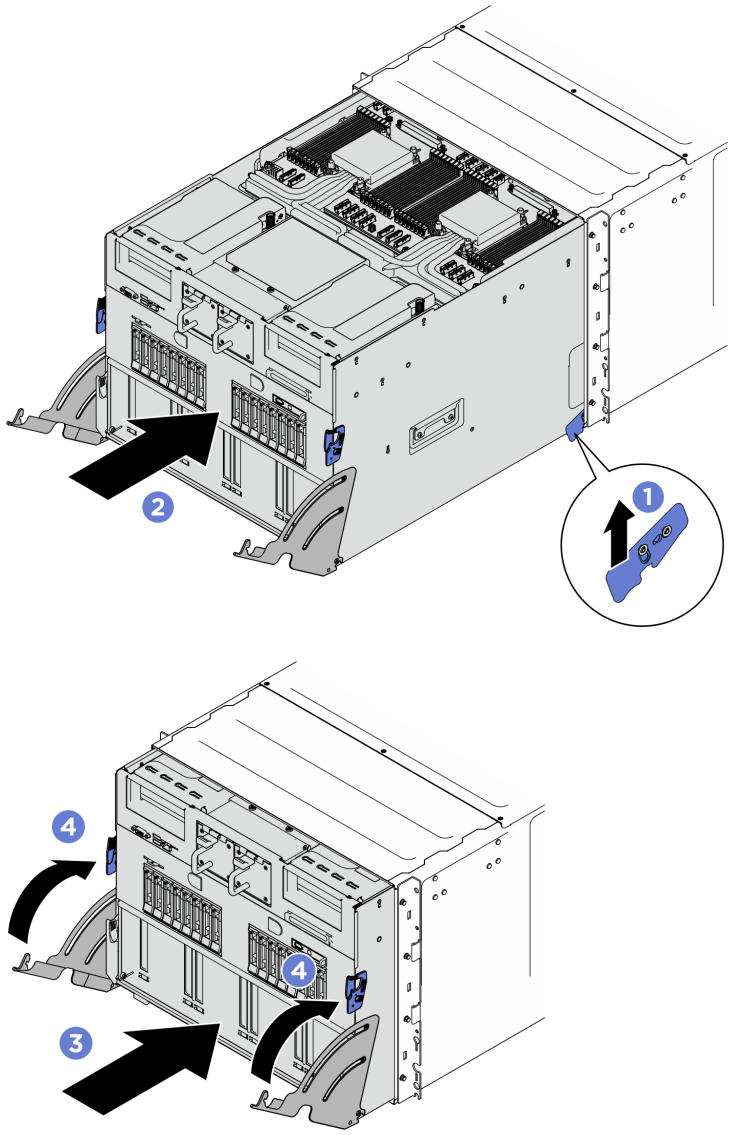


Figure 67. System shuttle installation

4. Complete the parts replacement. See “Complete the parts replacement” on page 255.

Remove the rear fan control board

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.

- 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. Pull the system shuttle out of the chassis, and place it onto the lift platform. See "Remove the system shuttle" on page 251.

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

Step 3. Remove the rear fan control board assembly.

a. ❶ Unfasten the two screws marked with **A** on both sides of the system shuttle.

b. ❷ Remove the rear fan control board assembly from the system shuttle.

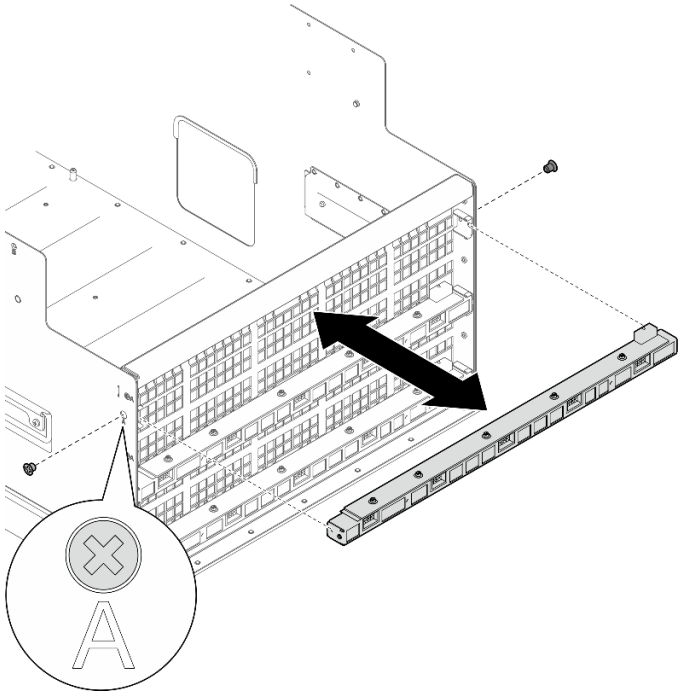


Figure 68. Rear fan control board assembly removal

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

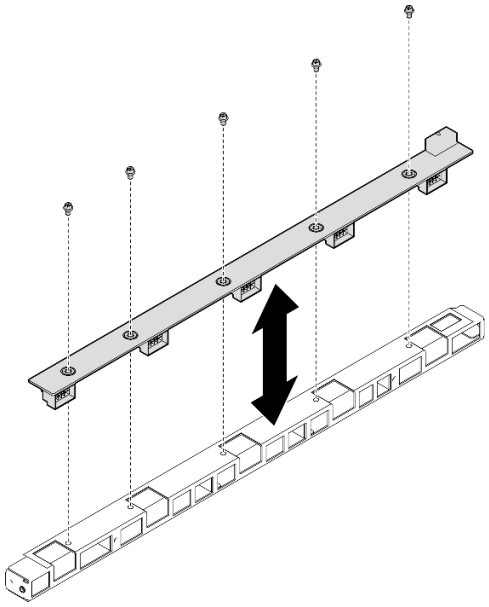


Figure 69. Rear fan control board removal

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 the rear fan control board

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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.

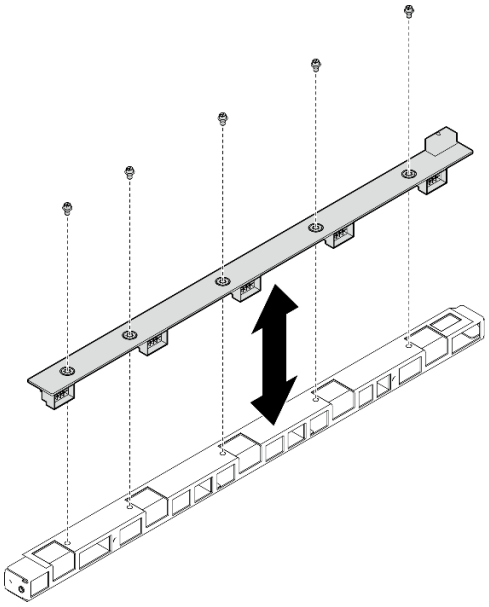


Figure 70. Rear fan control board installation

Step 2. Install the rear fan control board assembly.

a. ❶ Hold the rear fan control board assembly in the correct orientation as illustrated, and slide it into the system shuttle.

b. ❷ Locate the two screw holes marked with **A** on both sides of the system shuttle; then, fasten the two screws to secure the rear fan control board assembly.

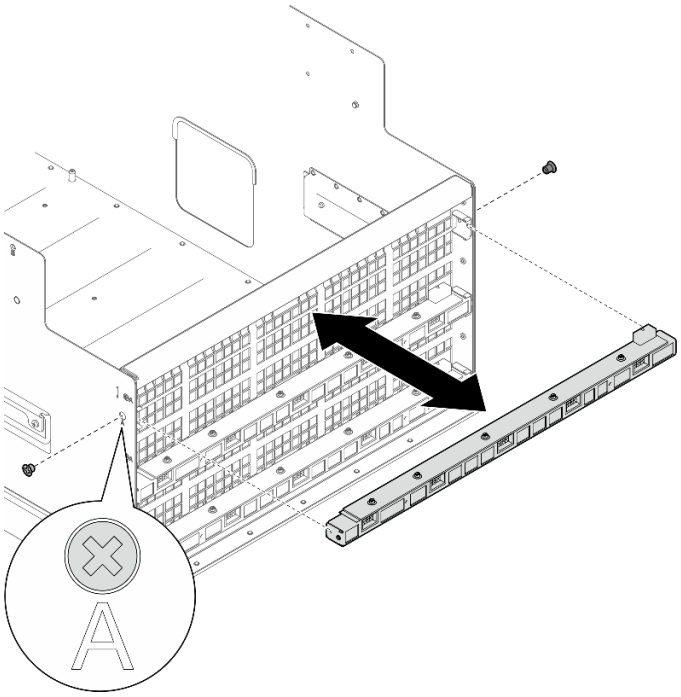


Figure 71. Rear fan control board assembly installation

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

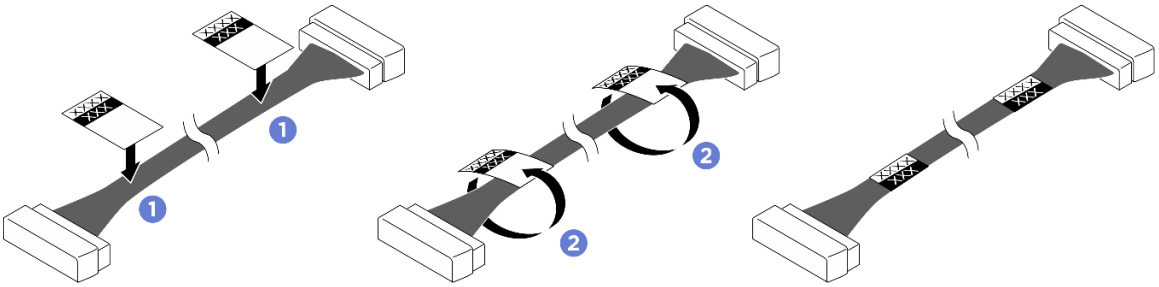


Figure 72. Label application

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

From	To	Label
Rear top fan control board: Power connector	**Power distribution board: Rear top fan control board power connector (RADIATOR FAN)**	**Radiator Fan (PWR) R-TOP Fan PWR**
	Power distribution board: Rear top fan control board signal connector (F-FAN PWR) (green cable)	**F-Fan PWR (SIG) R-TOP Fan PWR**
Rear middle fan control board: Power connector	**Power distribution board: Rear middle fan control board power connector (R-FAN PWR2)**	**R-Fan PWR2 R-MID Fan PWR**
Rear bottom fan control board: Power connector	**Power distribution board: Rear bottom fan control board power connector (R-FAN PWR1)**	**R-Fan PWR1 R-BOT Fan PWR**

Step 4. Connect the cable to the rear fan control board. See “Fan control board cable routing” on page 267.

After you finish

1. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
2. Complete the parts replacement. See “Complete the parts replacement” on page 255.

FIO/PCI cage replacement (trained technician only)

Follow instructions in this section to remove and install the FIO/PCI 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 FIO/PCI cage

Follow instructions in this section to remove the FIO/PCI cage. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.

Procedure

Step 1. Pull the system shuttle to the stop position.

1. ❶ Press the two blue release latches.
2. ❷ Rotate the two release levers until they are perpendicular to the shuttle.
3. ❸ Pull the shuttle forward until it stops.

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the PCIe switch shuttle to its stop position.

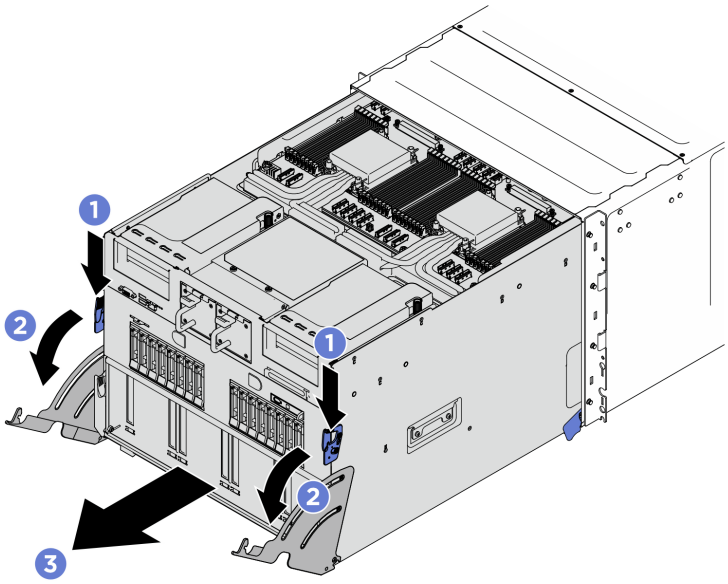


Figure 73. Pulling the system shuttle to the stop position

Step 2. Remove the FIO/PCI cage.

a. ❶ Unfasten the six screws marked with **C** on both sides of the system shuttle.

b. ❷ Lift the FIO/PCI cage out of the system shuttle.

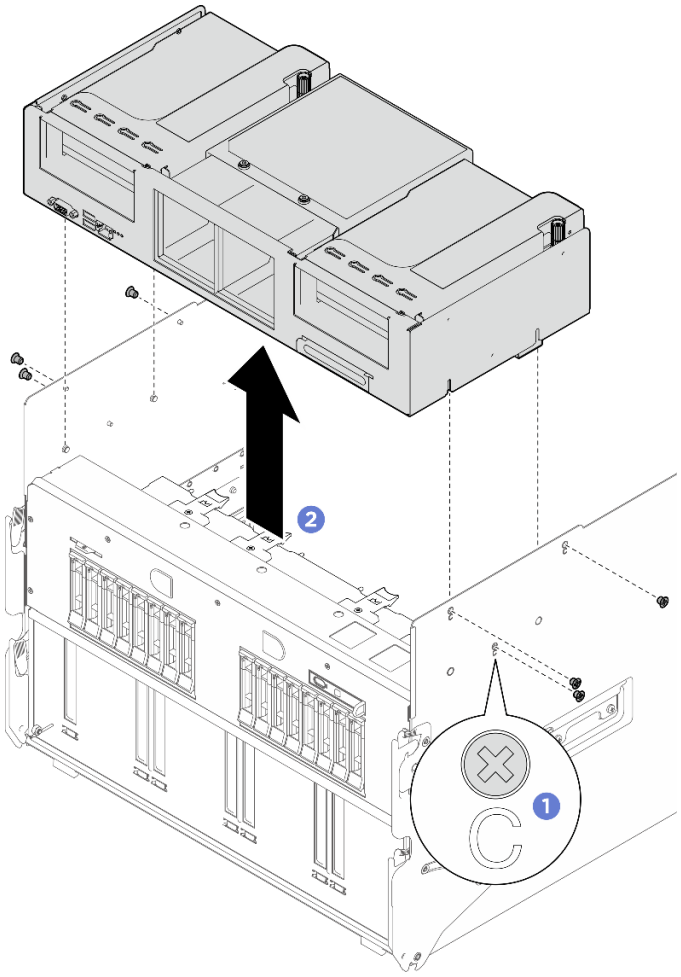


Figure 74. FIO/PCI cage removal

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 FIO/PCI cage

Follow instructions in this section to install the FIO/PCI cage. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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. ❶ Align the FIO/PCI cage with the guide pins on the system shuttle; then, place the cage into the shuttle until it is securely engaged.

Step 2. ❷ Locate the six screw holes marked with **C** on both sides of the system shuttle; then, fasten the six screws to secure the FIO/PCI cage.

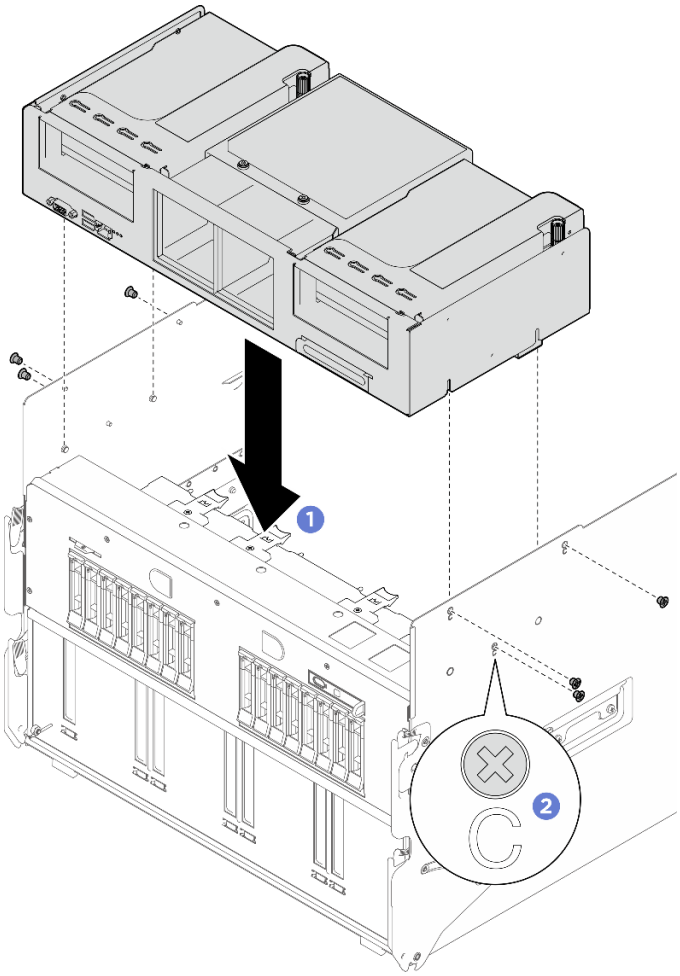


Figure 75. FIO/PCI cage installation

Step 3. Push the system shuttle fully into the chassis.

a. ❶ Lift the two lock latches on both sides of the shuttle.

b. ❷ Slide the shuttle into the chassis.

c. ❸ Push the shuttle fully into the chassis.

d. ❹ Rotate the two release levers until they lock into place.

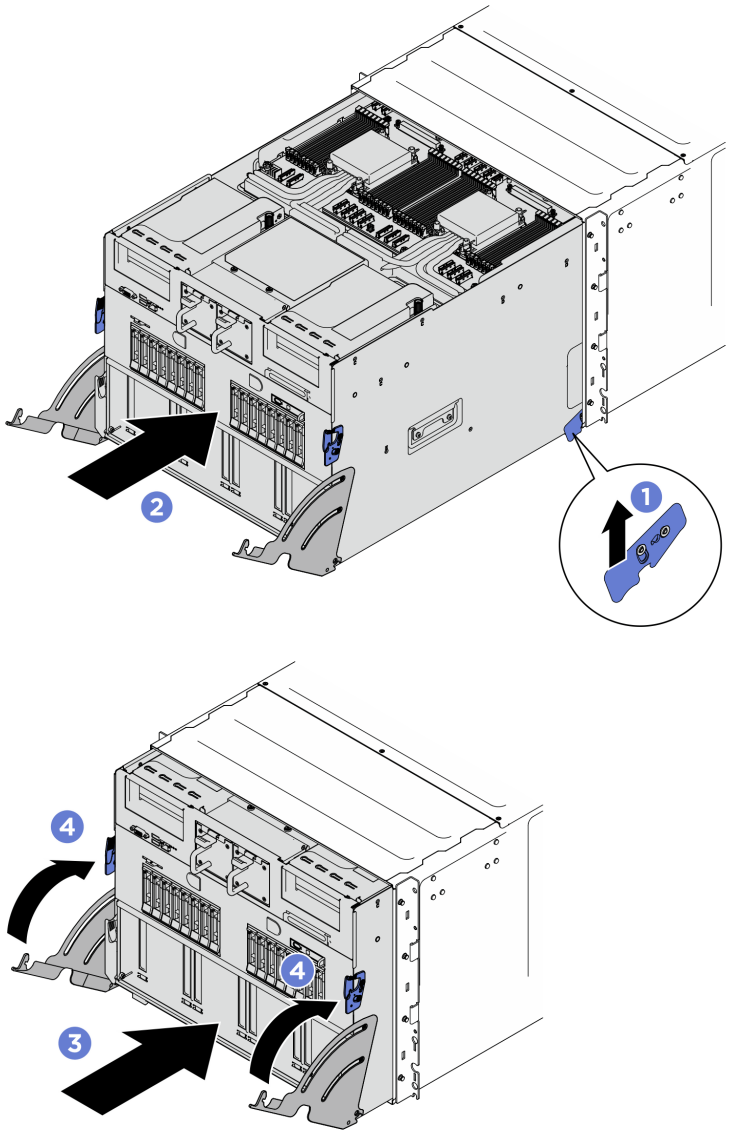


Figure 76. System shuttle installation

After you finish

Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 a GPU air duct

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.
- 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 system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

b. Remove the compute tray. See “Remove the compute tray” on page 74.

c. Remove the cable holder frame and baffle assembly. See “Remove the cable holder frame and baffle assembly” on page 70.

d. Remove the power complex. See “Remove the power complex” on page 209.

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

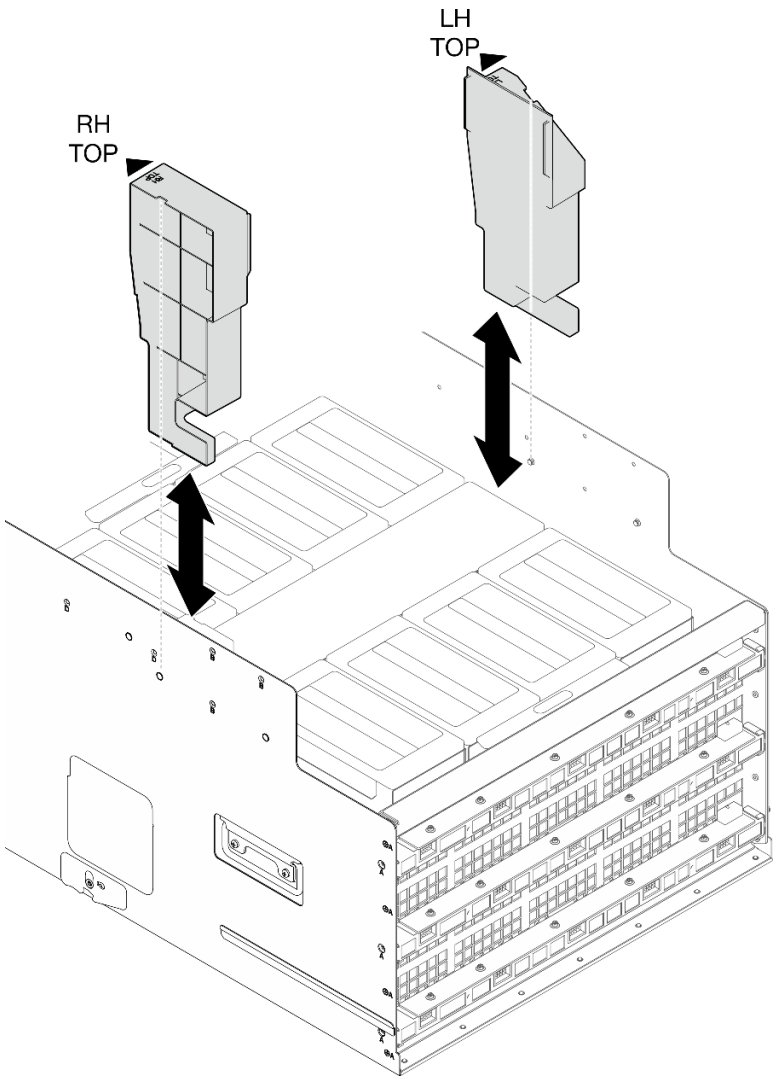


Figure 77. GPU air duct removal

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 a GPU air duct

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 system shuttle from the front).
  - Install the GPU air duct with stamp “RH” on the right side (when looking at the system shuttle from the front).

Procedure

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

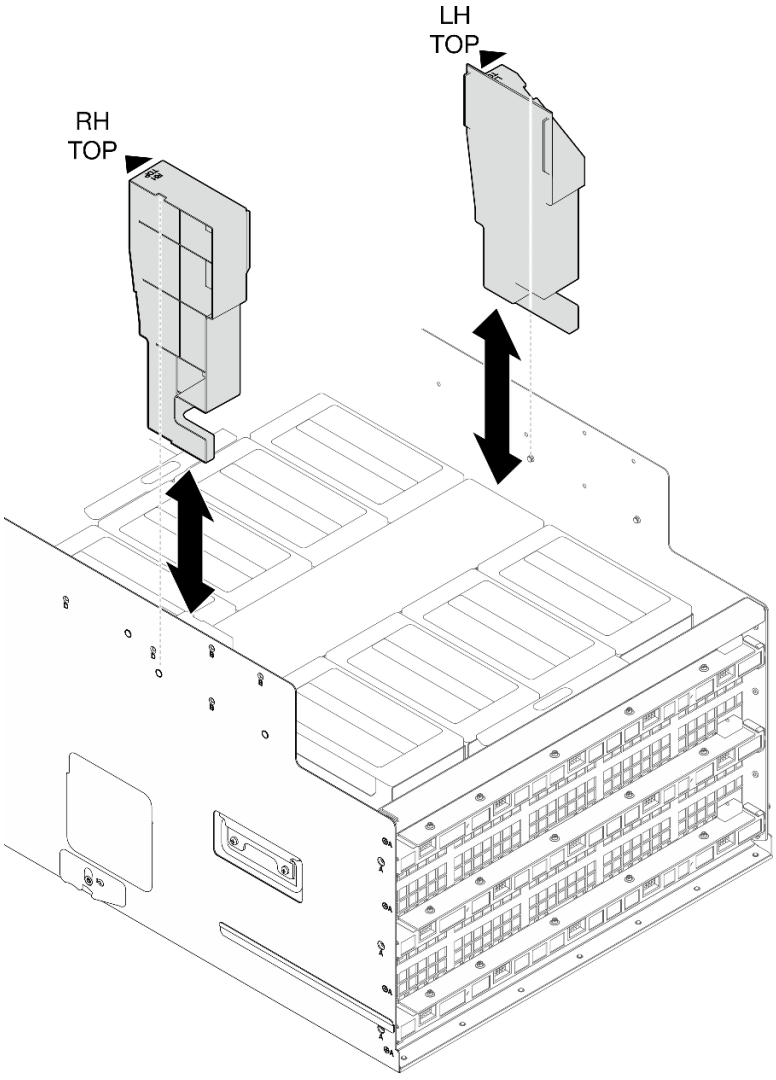


Figure 78. GPU air duct installation

After you finish

1. Reinstall the power complex. See “Install the power complex” on page 210.
2. Reinstall the cable holder frame and baffle assembly. See “Install the cable holder frame and baffle assembly” on page 72.
3. Reinstall the compute tray. See “Install the compute tray” on page 75.
4. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
5. Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 GPU baseboard

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.
- 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 screwdrivers
- Two Torx T15 extended bits (300 mm long)
- One B200 jig

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

b. Remove the compute tray. See “Remove the compute tray” on page 74.

c. Remove the cable holder frame and baffle assembly. See “Remove the cable holder frame and baffle assembly” on page 70.

d. Remove the power complex. See “Remove the power complex” on page 209.

e. Disconnect the cables from the GPU baseboard.

f. Remove all the GPU air ducts. See “Remove a GPU air duct” on page 100.

g. Remove all the GPU and heat sink modules. See “Remove a GPU and heat sink module” on page 141.

Step 2. Pull the PCIe switch shuttle to the first stop position.

a. ❶ Press the two blue release latches.

b. ❷ Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.

c. ❸ Pull the PCIe switch shuttle forward to the first stop position.

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the PCIe switch shuttle to its first stop position.

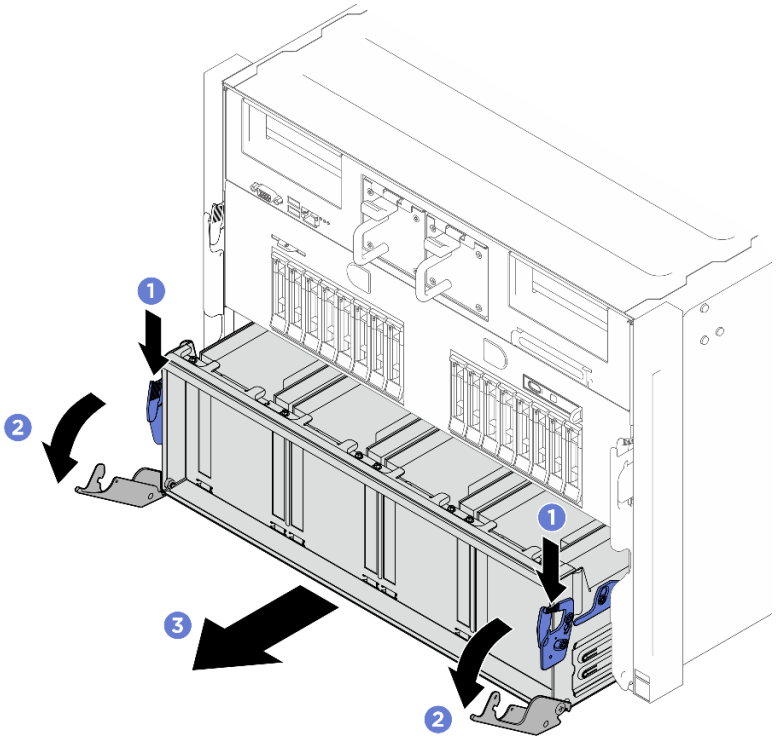


Figure 79. Pulling the PCIe switch shuttle to the first stop position

Step 3. Remove the support bracket.

a. ❶ Unfasten the two screws that secure the support bracket.

b. ❷ Lift the support bracket out of the system shuttle.

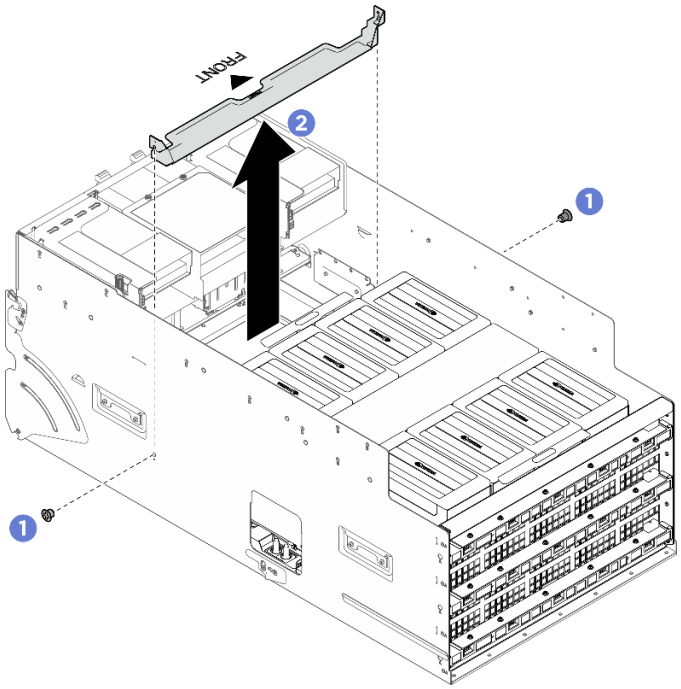


Figure 80. Support bracket removal

Step 4. Remove the bulkhead.

a. 1 Unfasten the eight screws marked with **A** on both sides of the system shuttle.

b. 2 Slide the bulkhead backward and remove it from the system shuttle.

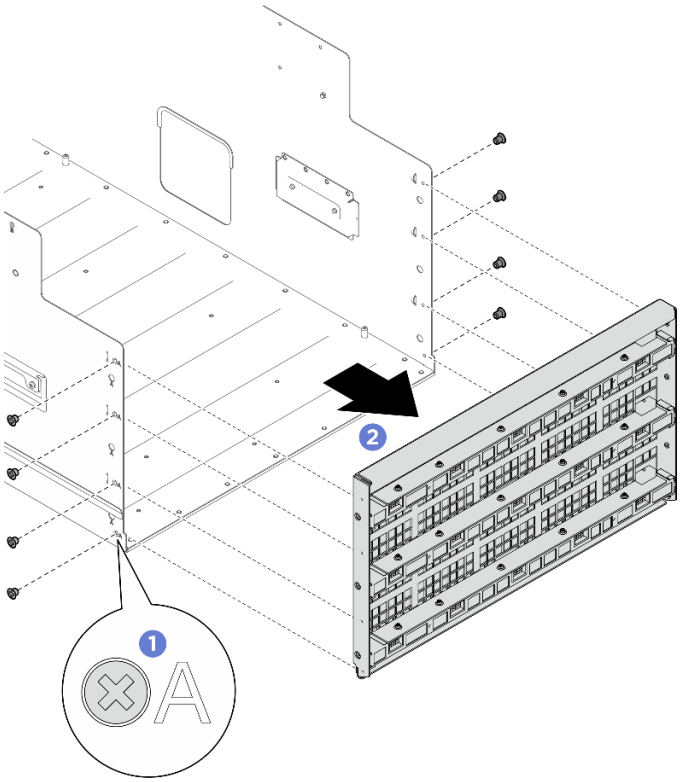


Figure 81. Bulkhead removal

Step 5. Remove the cover from the NVSwitch heat sink.

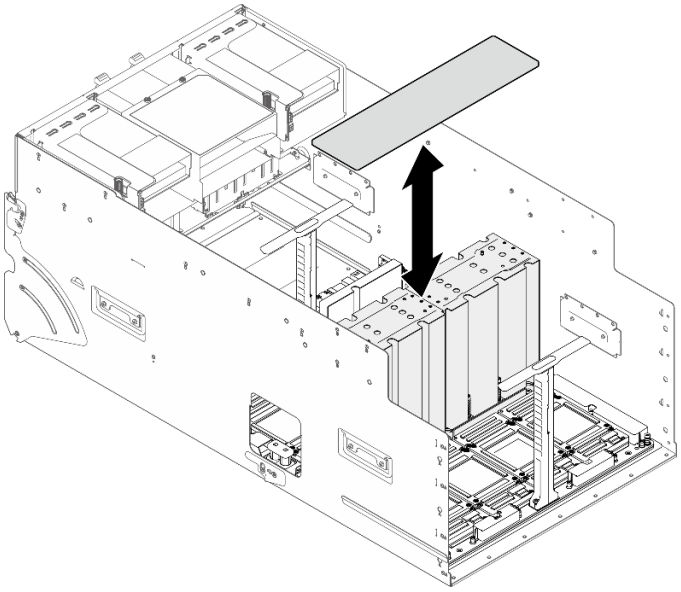


Figure 82. NVSwitch heat sink cover removal

Step 6. Unfasten the eighteen 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±0.024 newton-meters, 5.3±0.212 inch-pounds.

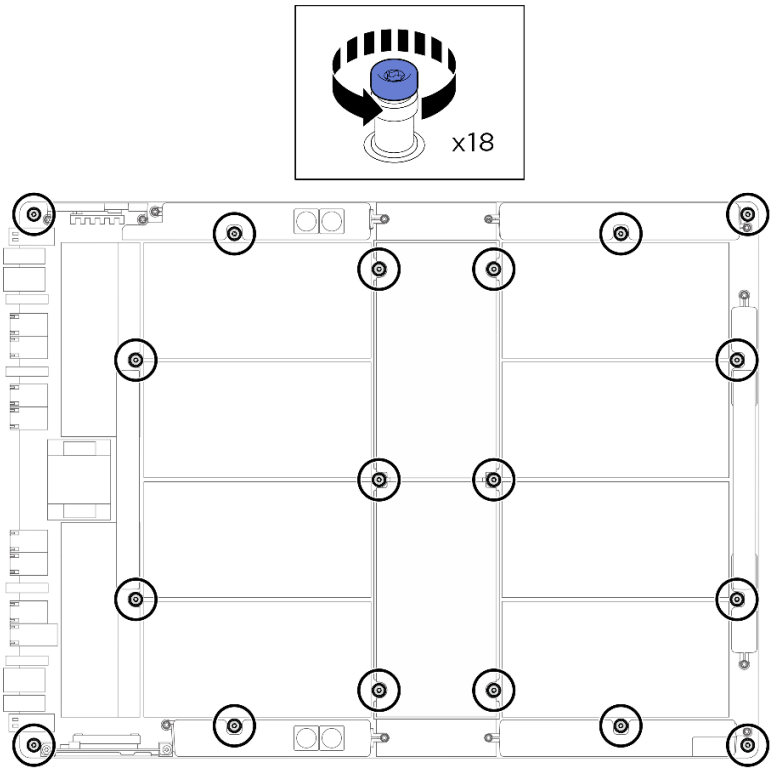


Figure 83. Screw removal

Step 7. Remove the GPU baseboard.

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

b. ❷ Hold the two handles (1), and lift the GPU baseboard out of the system shuttle.

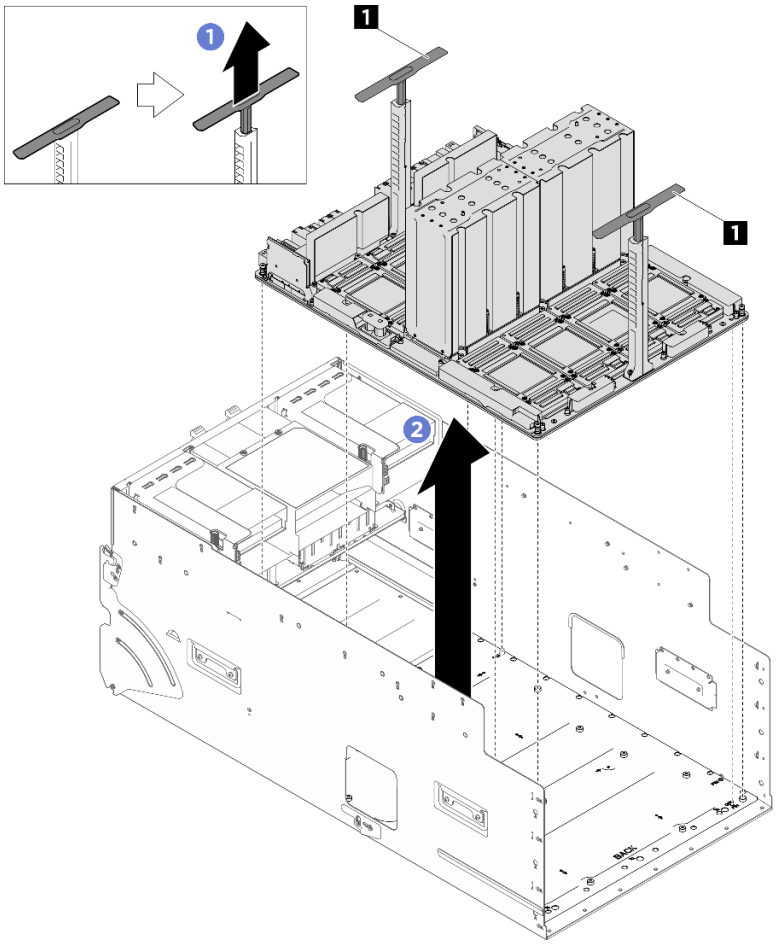


Figure 84. GPU baseboard removal

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 GPU baseboard

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 screwdrivers
- Two Torx T15 extended bits (300 mm long)
- One B200 jig

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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 287 for more information on firmware updating tools.

Procedure

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

a. ❶ Extend the two handles on both sides of the GPU baseboard.

b. ❷ Hold the two handles, and remove the GPU baseboard out from the package box.

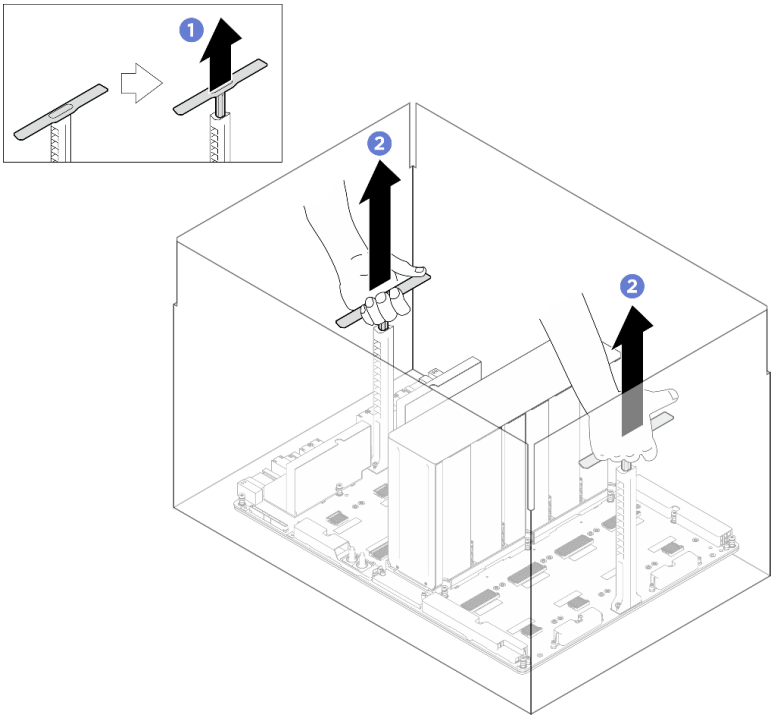


Figure 85. Removing the GPU baseboard from the package box

Step 2. Remove the cover from the NVSwitch heat sink.

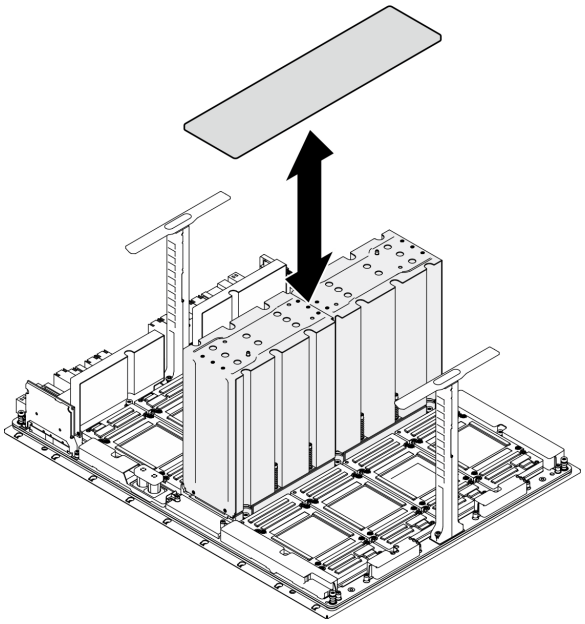


Figure 86. NVSwitch heat sink cover removal

Step 3. Install the GPU baseboard.

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

b. ❷ Push the two handles (1) down.

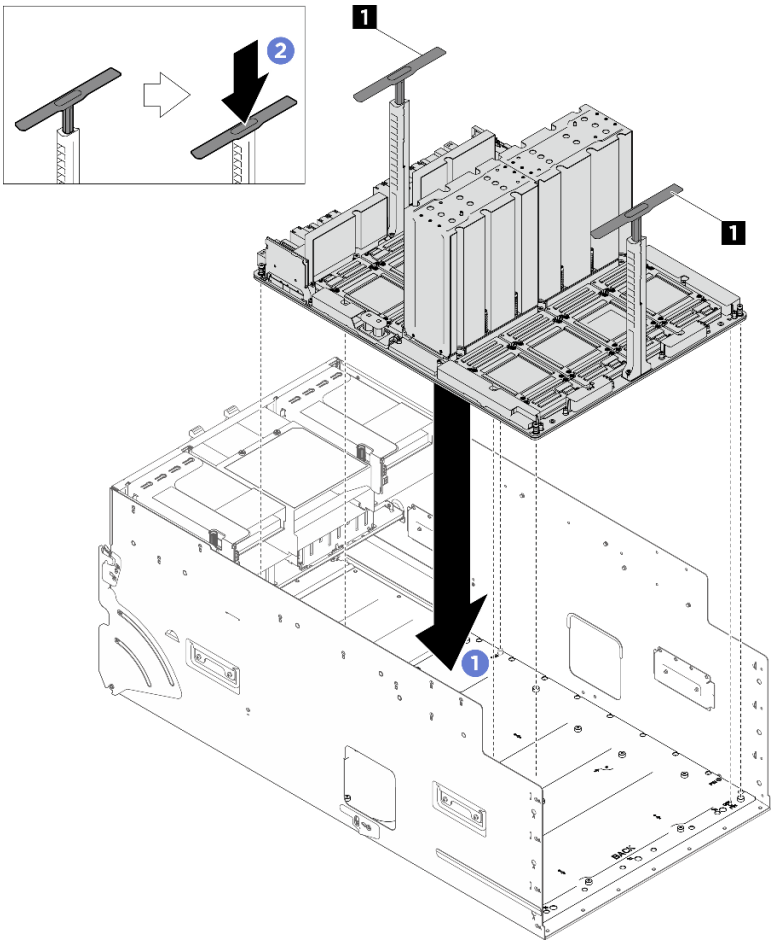


Figure 87. GPU baseboard installation

Step 4. Follow the sequence shown in the illustration below to fasten the eighteen 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±0.024 newton-meters, 5.3±0.212 inch-pounds.

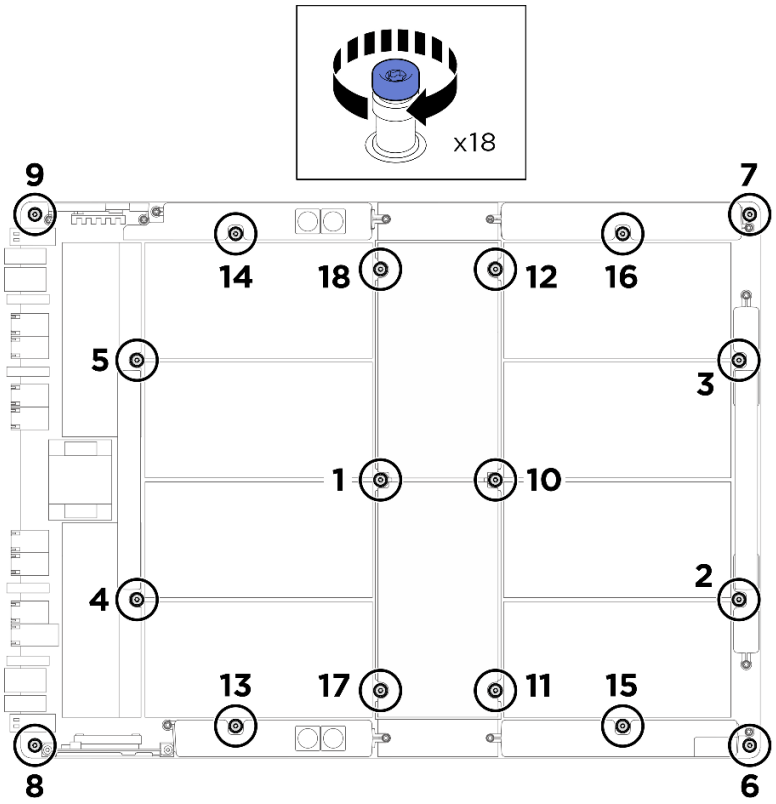


Figure 88. Screw installation

Step 5. Place the cover onto the NVSwitch heat sink until it is securely seated.

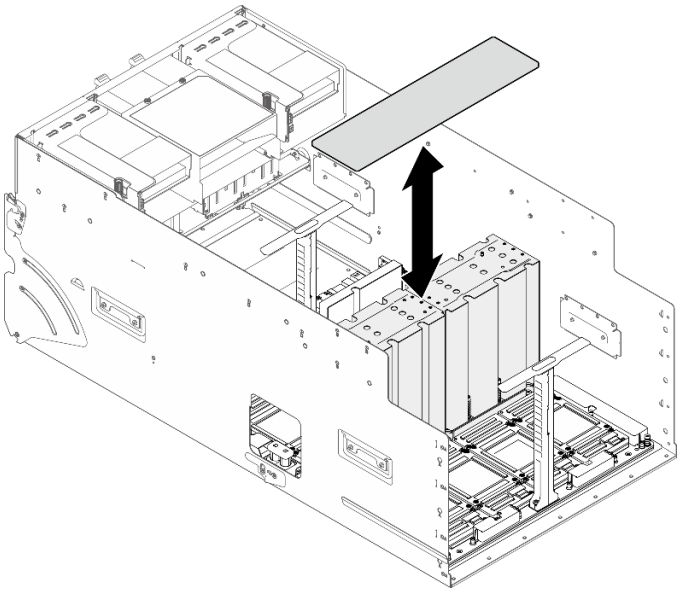
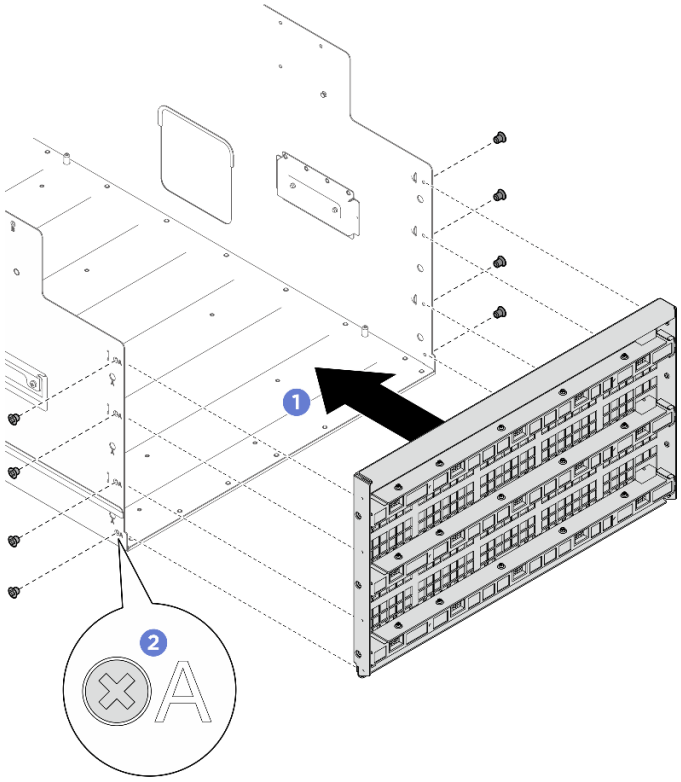


Figure 89. NVSwitch heat sink cover installation

Step 6. Install the bulkhead.

a. ❶ Hold the bulkhead in the correct orientation as illustrated, and slide it into the system shuttle.

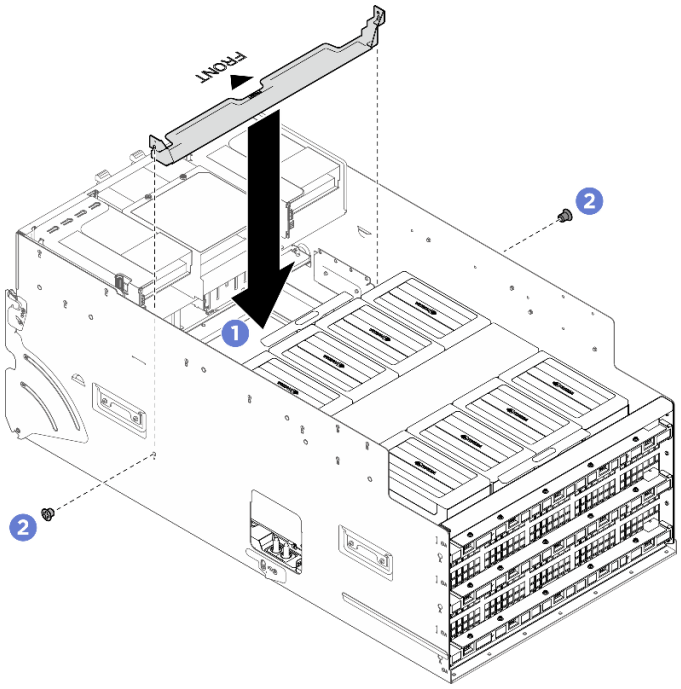
b. 2 Locate the eight screw holes marked with **A** on both sides of the system shuttle; then, fasten the eight screws to secure the bulkhead.



Step 7. Install the support bracket.

a. 1 Hold the bracket in the correct orientation as illustrated, and lower it into the system shuttle.

b. 2 Fasten the two screws to secure the support bracket.



Step 8. Push the PCIe switch shuttle fully into the system shuttle.

a. ❶ Press the two front lock latches on both sides of the PCIe switch shuttle.

b. ❷ Push the PCIe switch shuttle fully into the system shuttle.

c. ❸ Rotate the two release levers until they lock into place.

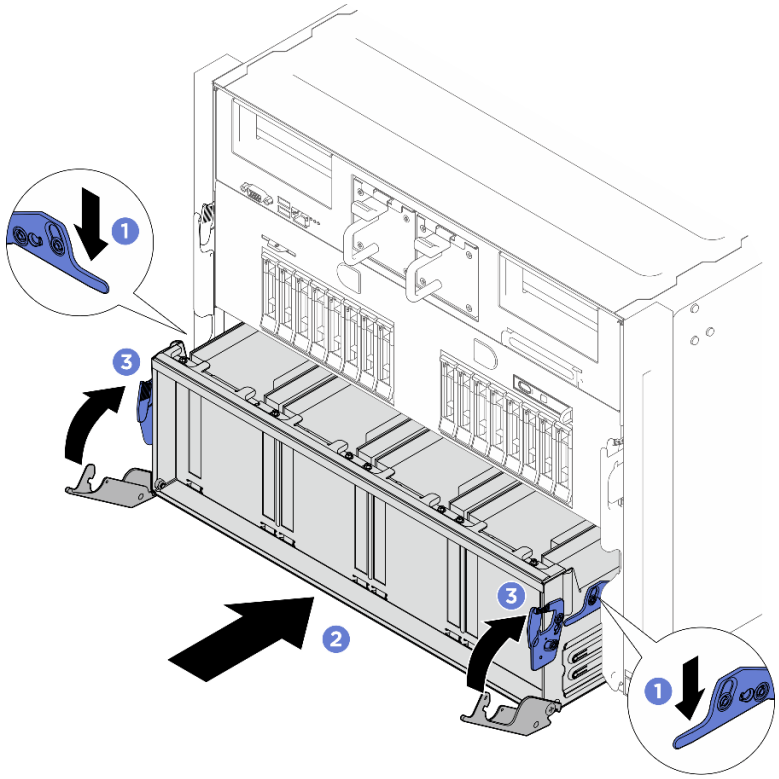


Figure 90. PCIe switch shuttle installation

After you finish

1. Reinstall all the GPU and heat sink modules. See “Install a GPU and heat sink module” on page 145.
2. Reinstall all the GPU air ducts. See “Install a GPU air duct” on page 102.
3. Reconnect the cables to the GPU baseboard. See “GPU baseboard cable routing” on page 271 for more information.
4. Reinstall the power complex. See “Install the power complex” on page 210.
5. Reinstall the cable holder frame and baffle assembly. See “Install the cable holder frame and baffle assembly” on page 72.
6. Reinstall the compute tray. See “Install the compute tray” on page 75.
7. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
8. Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 GPU complex

Follow instructions in this section to remove the 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 33 and “Safety inspection checklist” on page 34 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 41.
- 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:

- One torque screwdriver
- One Torx T15 extended bit (300 mm long)

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

b. Remove the compute tray. See “Remove the compute tray” on page 74.

c. Remove the cable holder frame and baffle assembly. See “Remove the cable holder frame and baffle assembly” on page 70.

d. Remove the power complex. See “Remove the power complex” on page 209.

e. Disconnect the cables from the GPU baseboard.

f. Remove all the GPU air ducts. See “Remove a GPU air duct” on page 100.

Step 2. Pull the PCIe switch shuttle to the first stop position.

a. ❶ Press the two blue release latches.

b. ❷ Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.

c. ❸ Pull the PCIe switch shuttle forward to the first stop position.

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the PCIe switch shuttle to its first stop position.

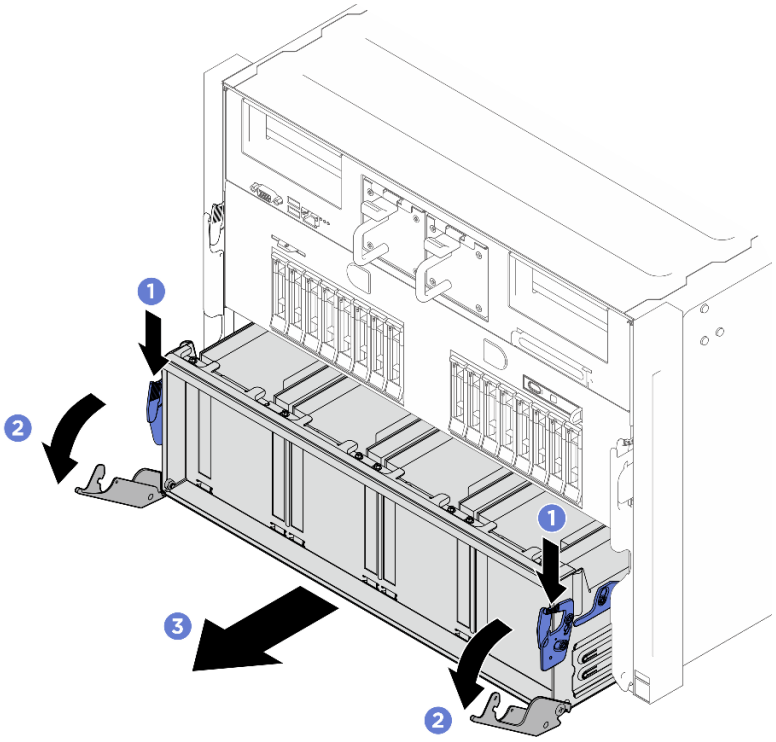


Figure 91. Pulling the PCIe switch shuttle to the first stop position

Step 3. Remove the support bracket.

a. 1 Unfasten the two screws that secure the support bracket.

b. 2 Lift the support bracket out of the system shuttle.

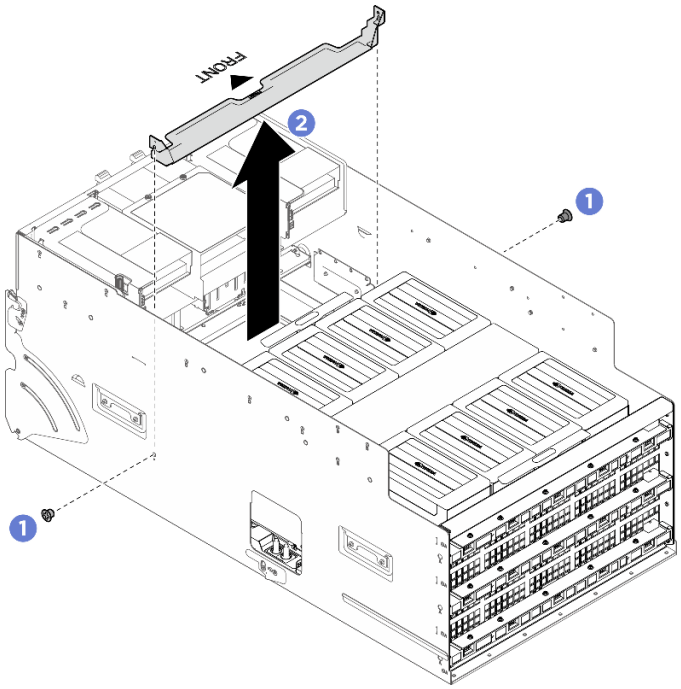


Figure 92. Support bracket removal

Step 4. Remove the bulkhead.

a. 1 Unfasten the eight screws marked with **A** on both sides of the system shuttle.

b. 2 Slide the bulkhead backward and remove it from the system shuttle.

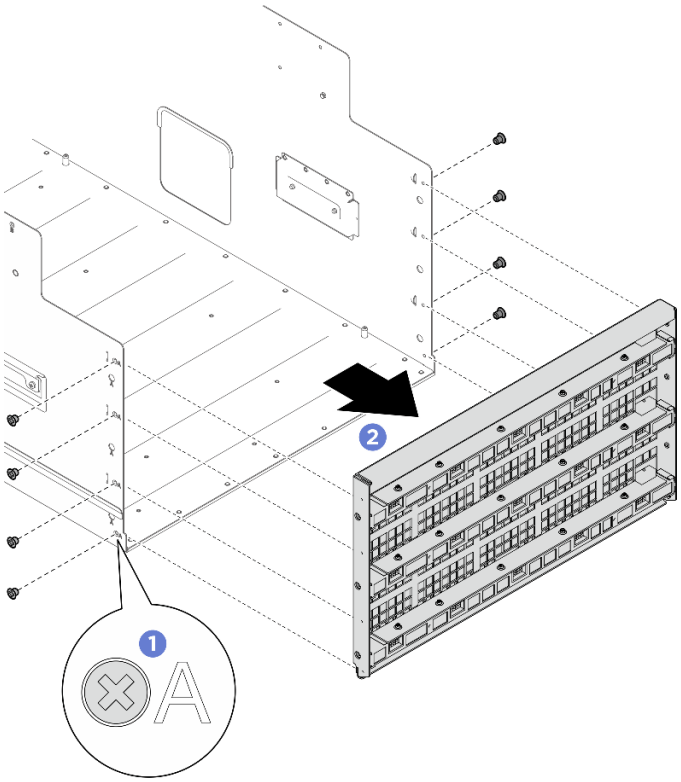


Figure 93. Bulkhead removal

Step 5. Remove the cover from the NVSwitch heat sink.

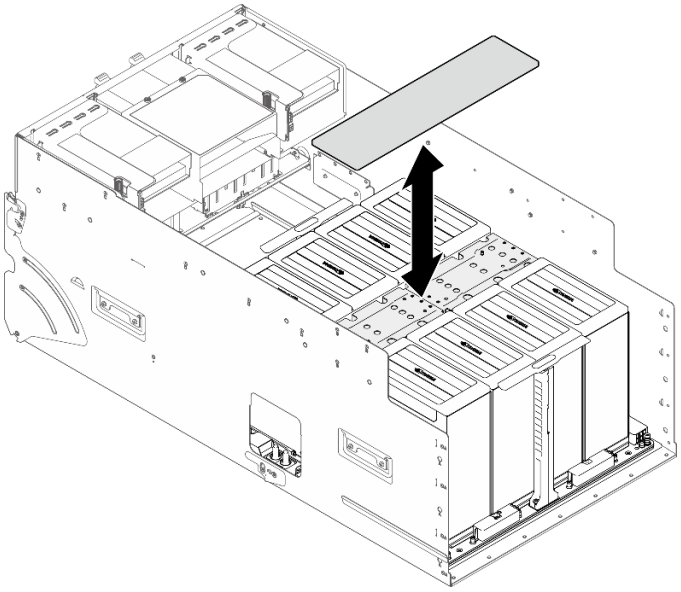


Figure 94. NVSwitch heat sink cover removal

Step 6. Unfasten the eighteen 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±0.024 newton-meters, 5.3±0.212 inch-pounds.

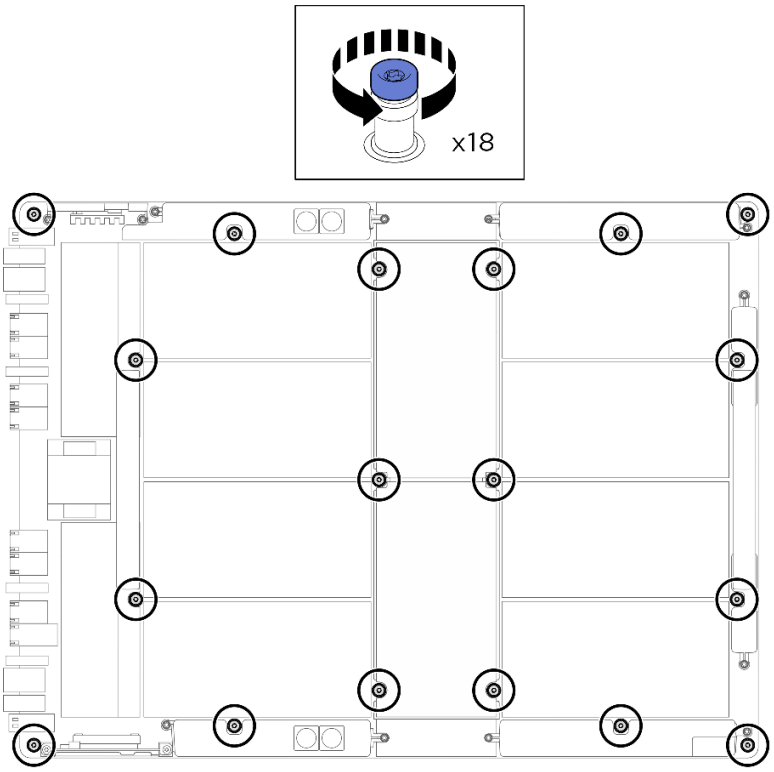


Figure 95. Screw removal

Step 7. Remove the GPU complex.

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

b. ❷ Hold the two handles (1), and lift the GPU complex out of the system shuttle.

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

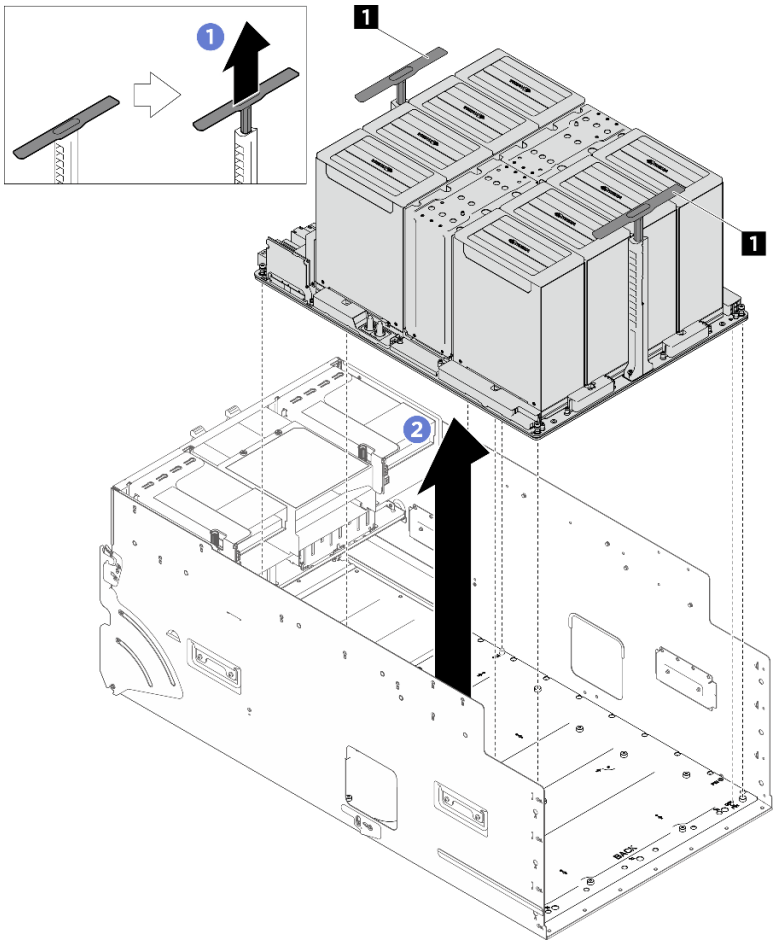


Figure 96. GPU complex removal

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 GPU complex

Follow instructions in this section to install the 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 33 and “Safety inspection checklist” on page 34 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:

- One torque screwdriver
- One Torx T15 extended bit (300 mm 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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 287 for more information on firmware updating tools.

Procedure

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

a. ❶ Extend the two handles on both sides of the GPU baseboard.

b. ❷ 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.

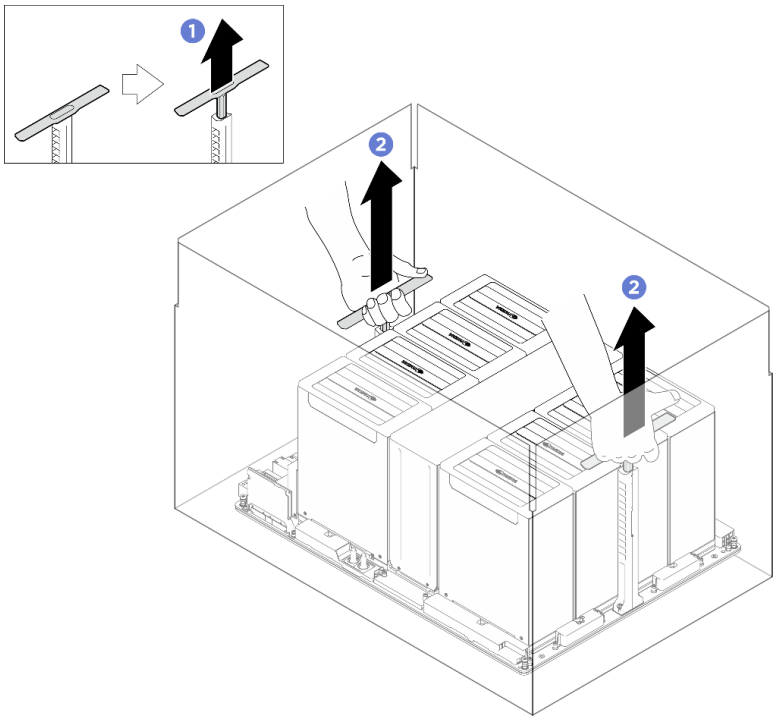


Figure 97. Removing the GPU complex from the package box

Step 2. Remove the cover from the NVSwitch heat sink.

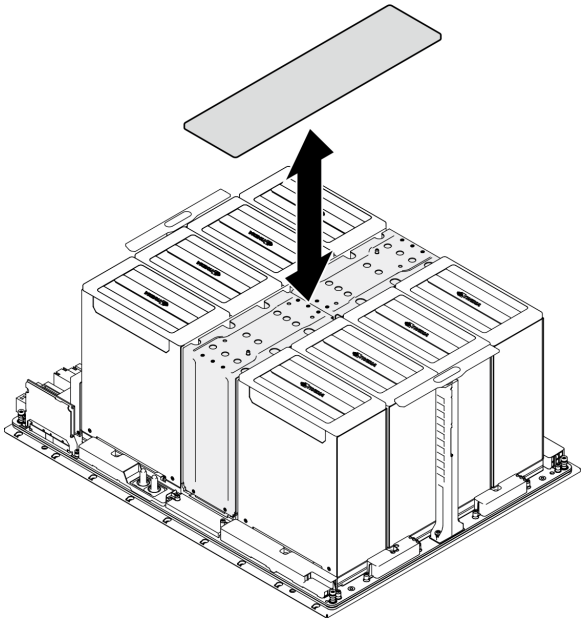


Figure 98. NVSwitch heat sink cover removal

Step 3. 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 standoffs on the GPU complex adapter plate, and gently place it onto the adapter plate.

b. ❷ Push the two handles (❶) down.

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

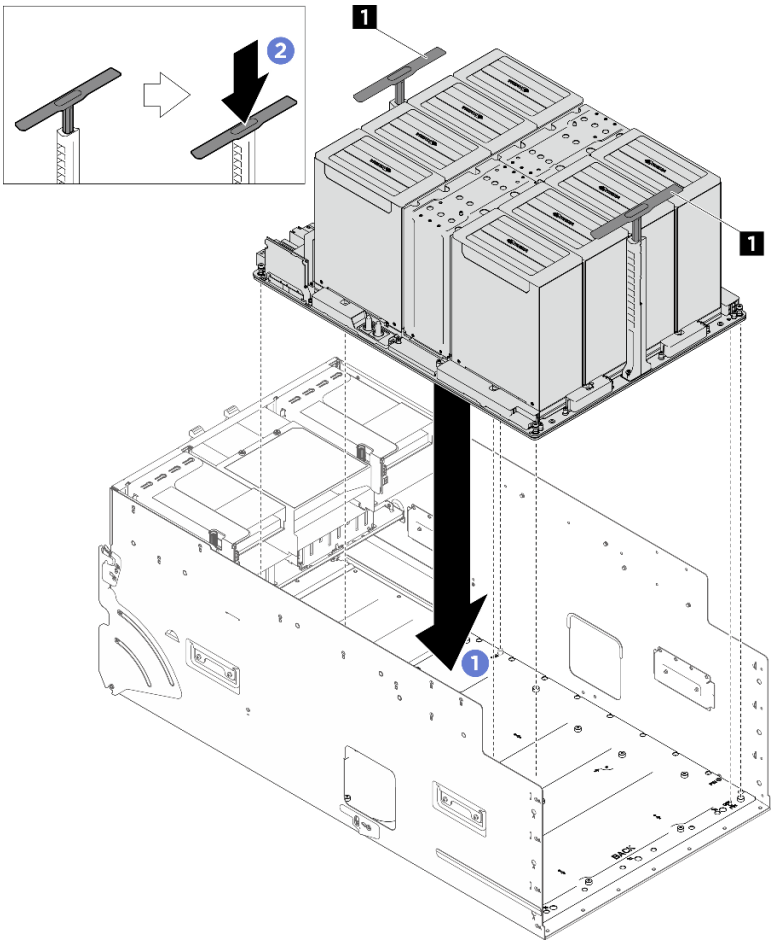


Figure 99. GPU complex installation

Step 4. Follow the sequence shown in the illustration below to fasten the eighteen 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±0.024 newton-meters, 5.3±0.212 inch-pounds.

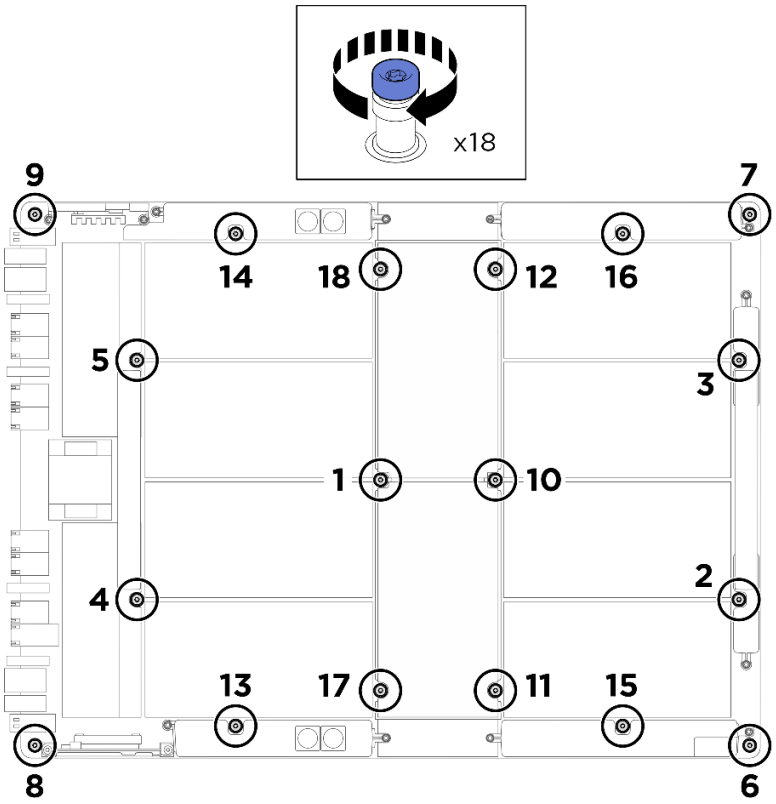


Figure 100. Screw installation

Step 5. Place the cover onto the NVSwitch heat sink until it is securely seated.

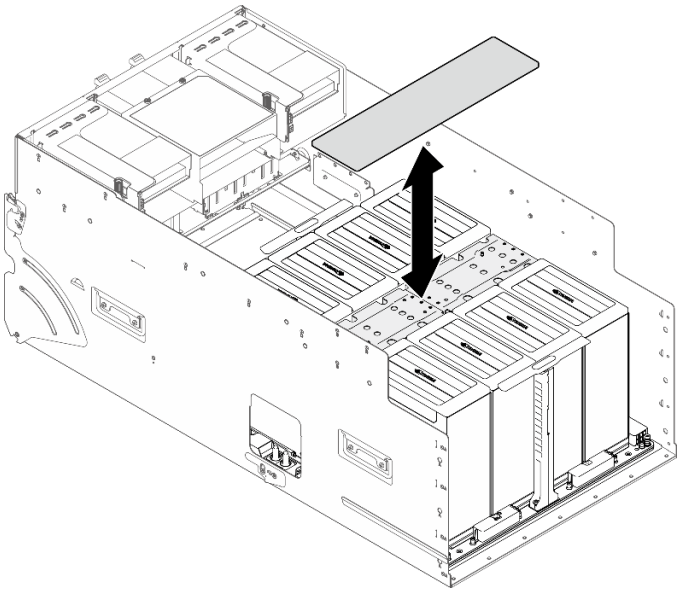
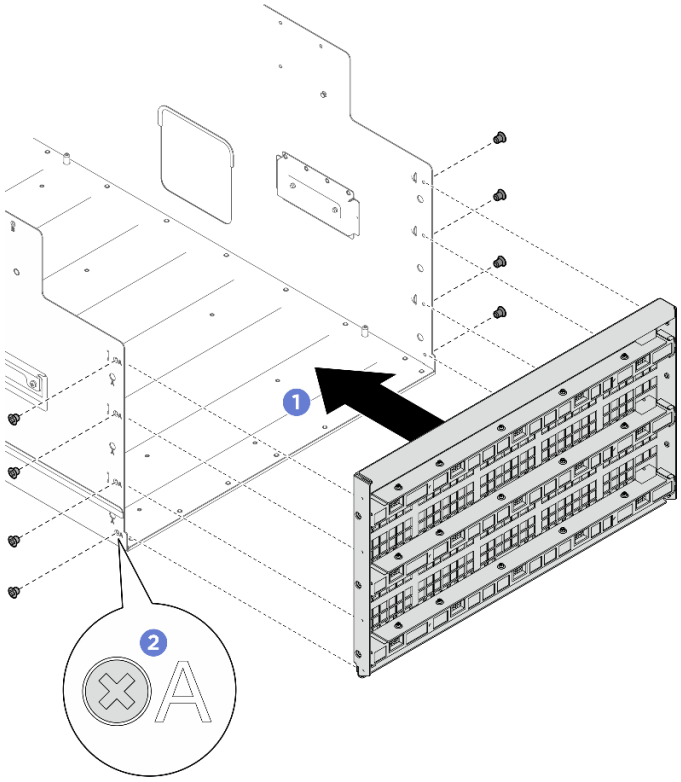


Figure 101. NVSwitch heat sink cover installation

Step 6. Install the bulkhead.

a. ❶ Hold the bulkhead in the correct orientation as illustrated, and slide it into the system shuttle.

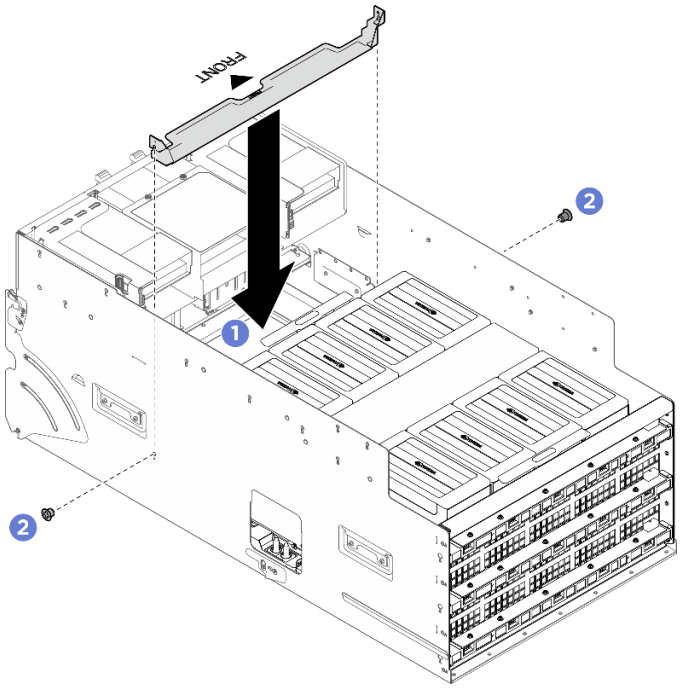
b. 2 Locate the eight screw holes marked with **A** on both sides of the system shuttle; then, fasten the eight screws to secure the bulkhead.



Step 7. Install the support bracket.

a. 1 Hold the bracket in the correct orientation as illustrated, and lower it into the system shuttle.

b. 2 Fasten the two screws to secure the support bracket.



Step 8. Push the PCIe switch shuttle fully into the system shuttle.

a. ❶ Press the two front lock latches on both sides of the PCIe switch shuttle.

b. ❷ Push the PCIe switch shuttle fully into the system shuttle.

c. ❸ Rotate the two release levers until they lock into place.

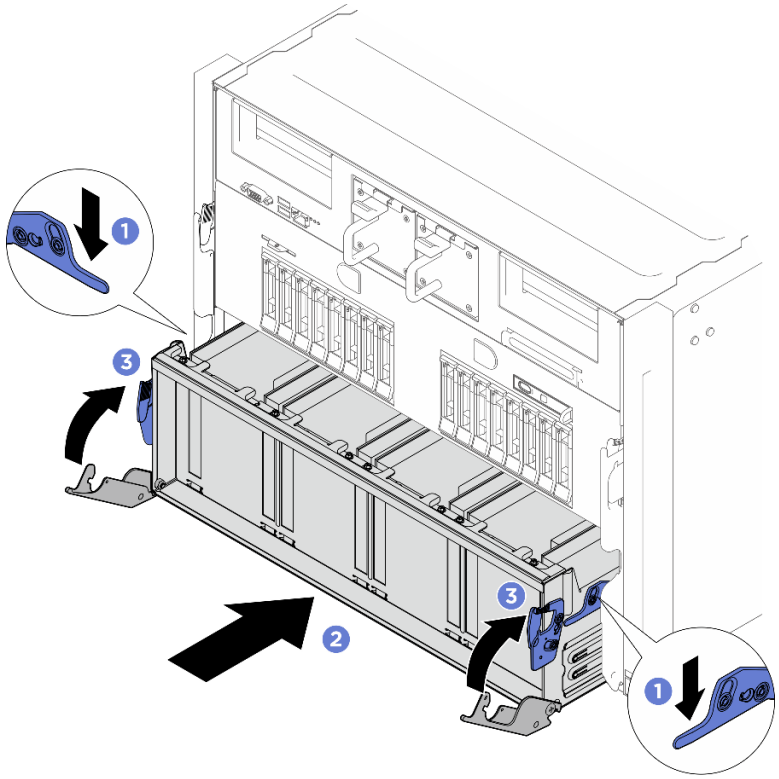


Figure 102. PCIe switch shuttle installation

After you finish

1. Reinstall all the GPU air ducts. See “Install a GPU air duct” on page 102.
2. Reconnect the cables to the GPU baseboard. See “GPU baseboard cable routing” on page 271 for more information.
3. Reinstall the power complex. See “Install the power complex” on page 210.
4. Reinstall the cable holder frame and baffle assembly. See “Install the cable holder frame and baffle assembly” on page 72.
5. Reinstall the compute tray. See “Install the compute tray” on page 75.
6. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
7. Complete the parts replacement. See “Complete the parts replacement” on page 255.

GPU complex adapter plate replacement (trained technician only)

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

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 complex adapter plate

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.
- 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:

- One torque screwdriver
- One Torx T15 extended bit (300 mm long)

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

b. Remove the compute tray. See “Remove the compute tray” on page 74.

c. Remove the cable holder frame and baffle assembly. See “Remove the cable holder frame and baffle assembly” on page 70.

d. Remove the power complex. See “Remove the power complex” on page 209.

e. Disconnect the cables from the GPU baseboard.

f. Remove all the GPU air ducts. See “Remove a GPU air duct” on page 100.

Step 2. Pull the PCIe switch shuttle to the first stop position.

a. ❶ Press the two blue release latches.

b. ❷ Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.

c. ❸ Pull the PCIe switch shuttle forward to the first stop position.

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the PCIe switch shuttle to its first stop position.

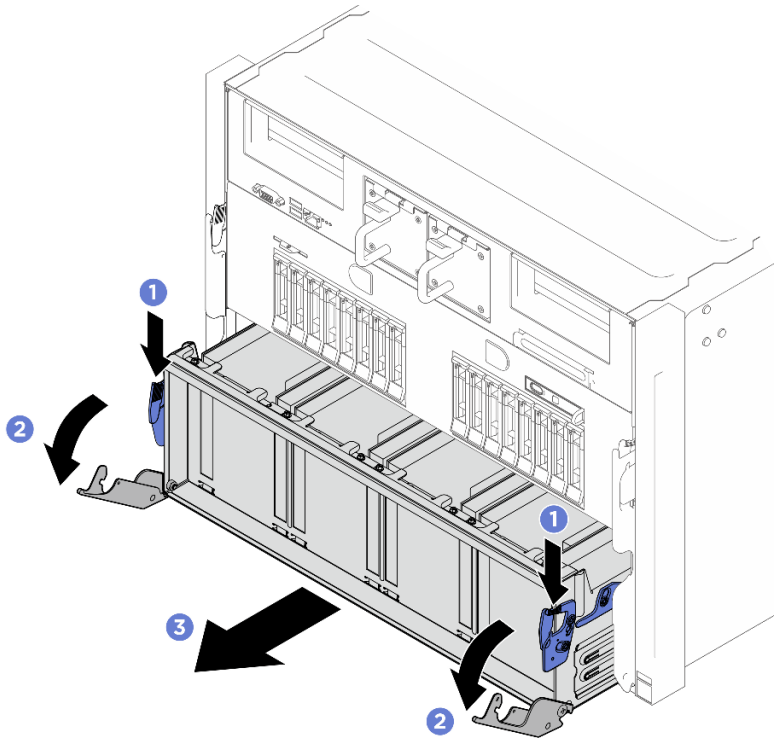


Figure 103. Pulling the PCIe switch shuttle to the first stop position

Step 3. Remove the support bracket.

a. ❶ Unfasten the two screws that secure the support bracket.

b. ❷ Lift the support bracket out of the system shuttle.

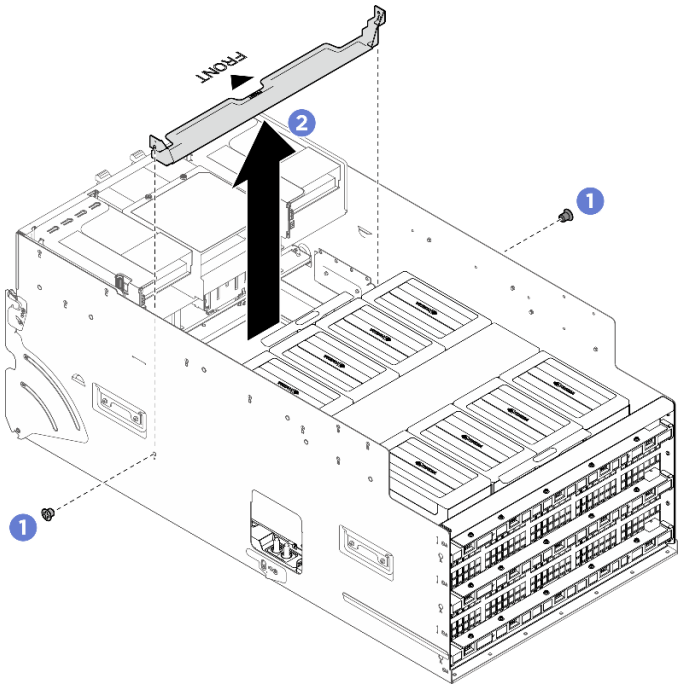


Figure 104. Support bracket removal

Step 4. Remove the bulkhead.

a. 1 Unfasten the eight screws marked with **A** on both sides of the system shuttle.

b. 2 Slide the bulkhead backward and remove it from the system shuttle.

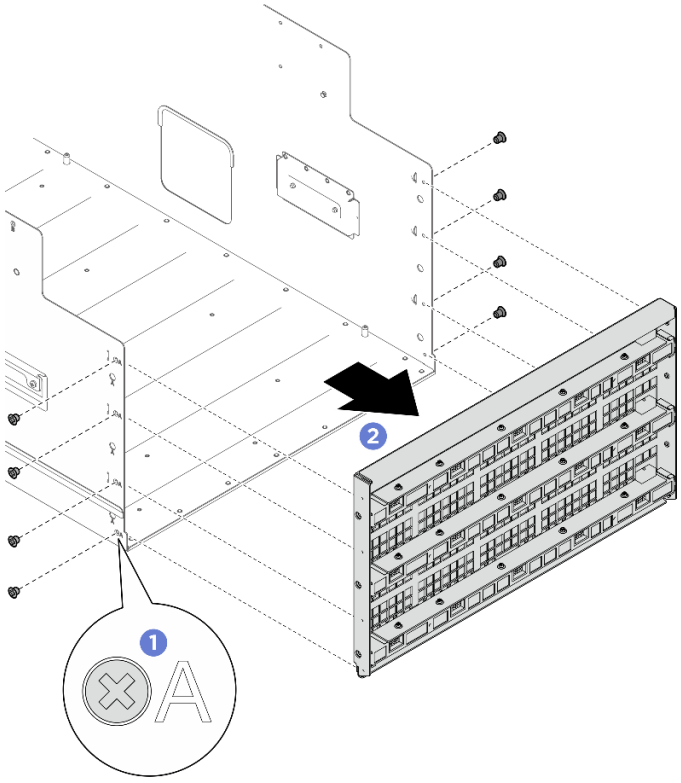


Figure 105. Bulkhead removal

Step 5. Remove the cover from the NVSwitch heat sink.

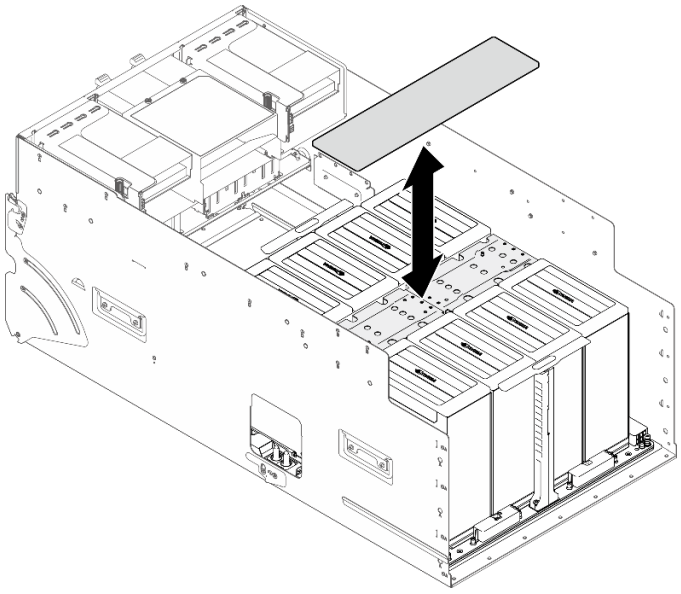


Figure 106. NVSwitch heat sink cover removal

Step 6. Unfasten the eighteen 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±0.024 newton-meters, 5.3±0.212 inch-pounds.

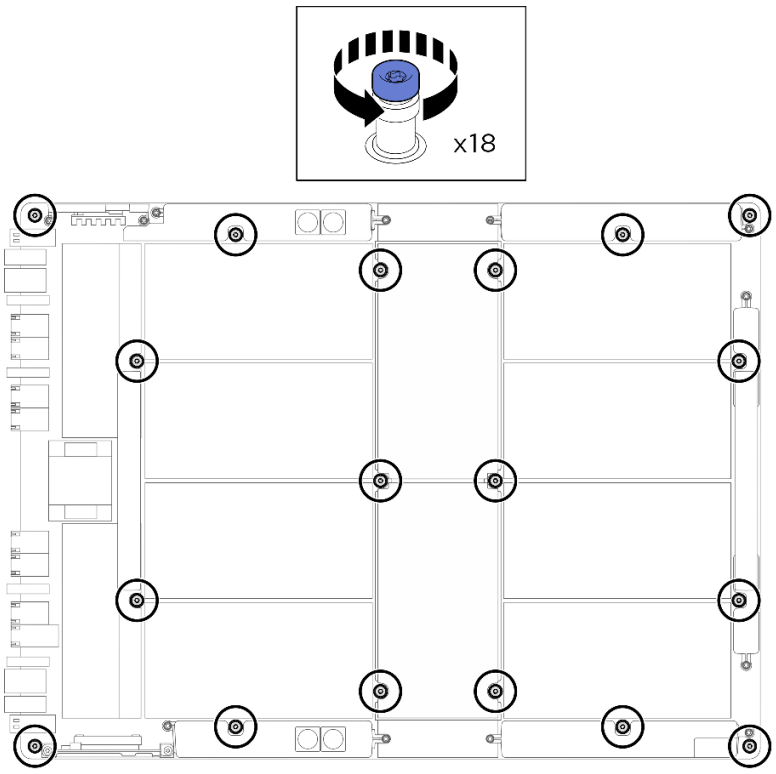


Figure 107. Screw removal

Step 7. Remove the GPU complex.

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

b. ❷ Hold the two handles (1), and lift the GPU complex out of the system shuttle.

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

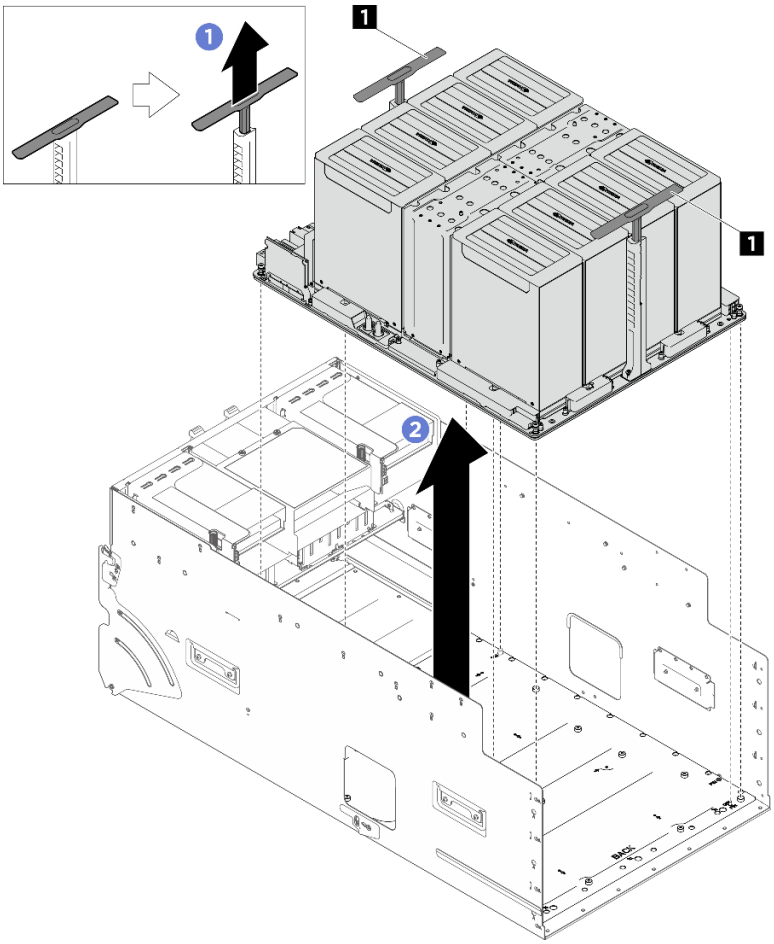


Figure 108. GPU complex removal

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

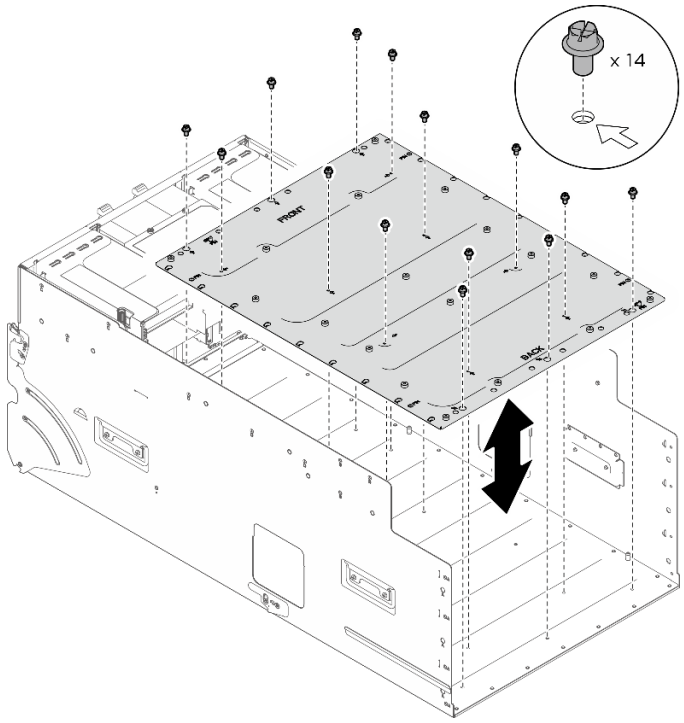


Figure 109. GPU complex adapter plate removal

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 adapter plate

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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:

- One torque screwdriver
- One Torx T15 extended bit (300 mm long)

Procedure

Step 1. Align the GPU complex adapter plate with the guide pins in the bottom of the system shuttle; then, lower the adapter plate into the shuttle.

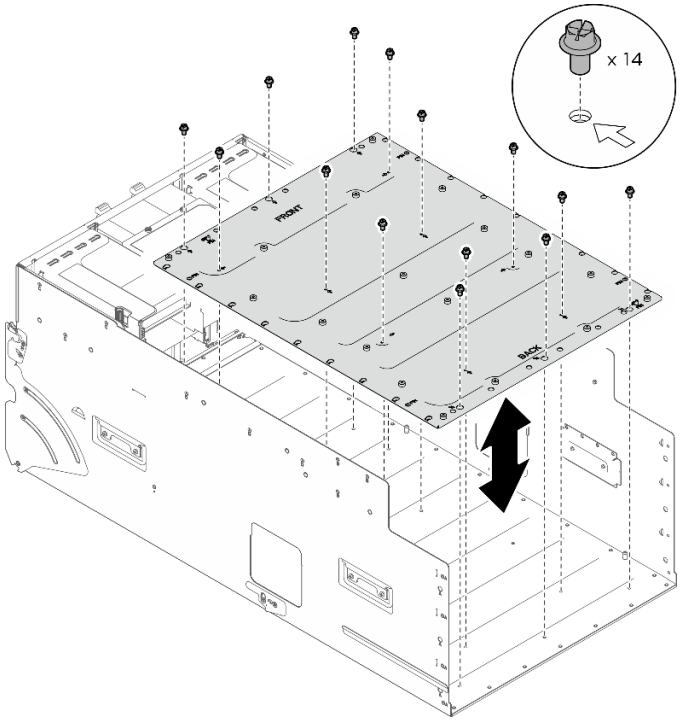


Figure 110. GPU complex adapter plate installation

Step 2. Locate the fourteen screw holes marked with an arrow; then, follow the sequence shown in the illustration below to fasten the fourteen screws to secure the GPU complex adapter plate.

Note: Tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully tighten is 0.5 newton-meters, 4.3 inch-pounds.

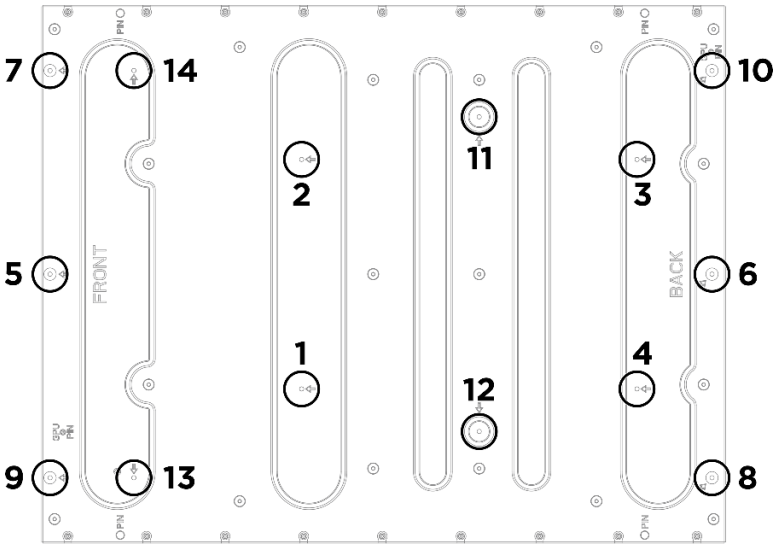


Figure 111. Screw tightening sequence

Step 3. Install the GPU complex.

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

b. ❷ 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).

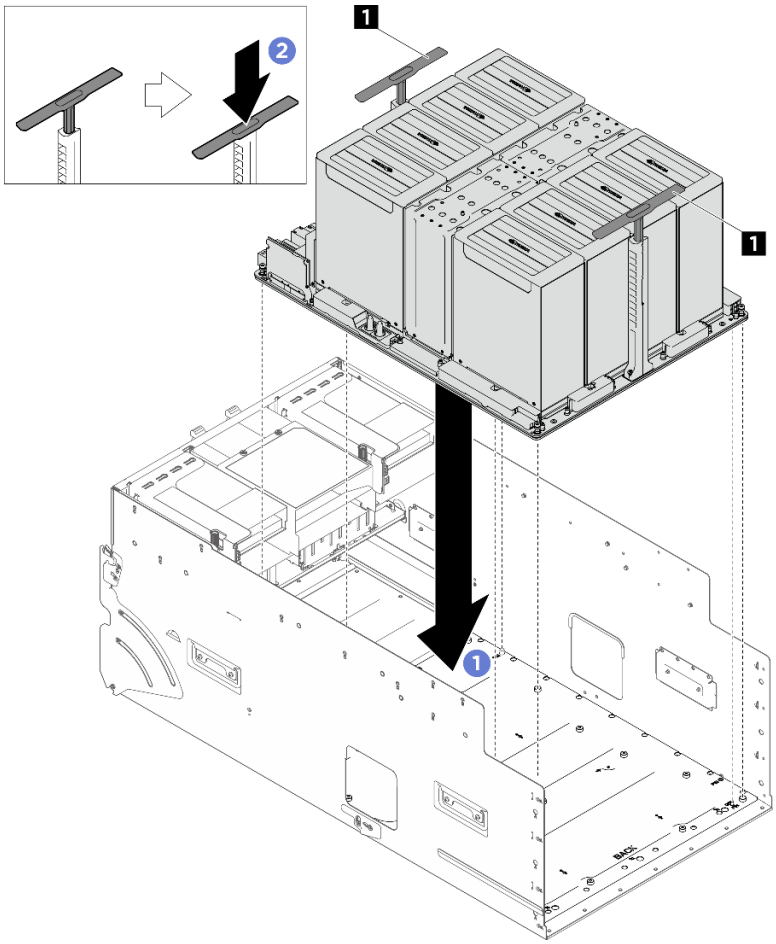


Figure 112. GPU complex installation

Step 4. Follow the sequence shown in the illustration below to fasten the eighteen 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±0.024 newton-meters, 5.3±0.212 inch-pounds.

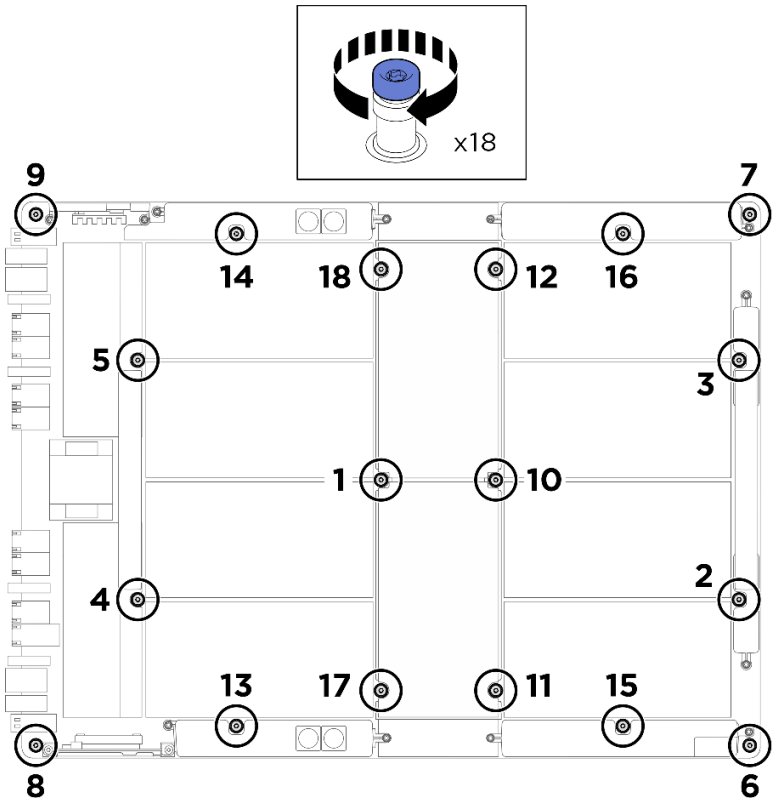


Figure 113. Screw installation

Step 5. Place the cover onto the NVSwitch heat sink until it is securely seated.

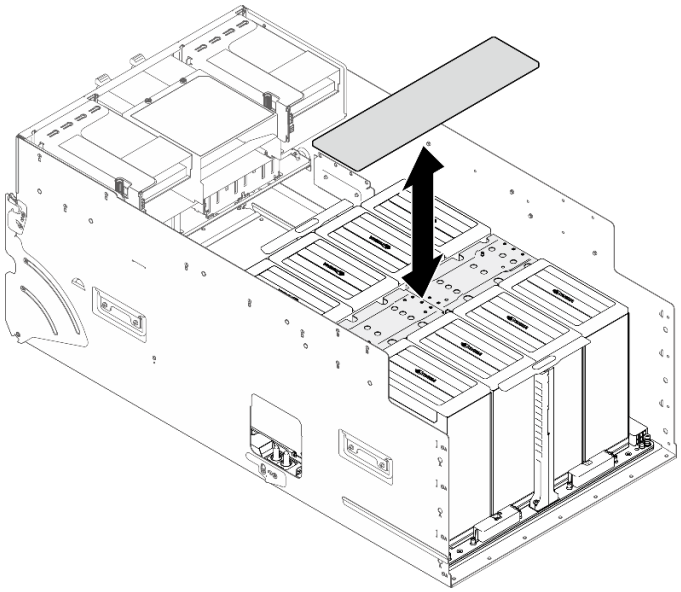
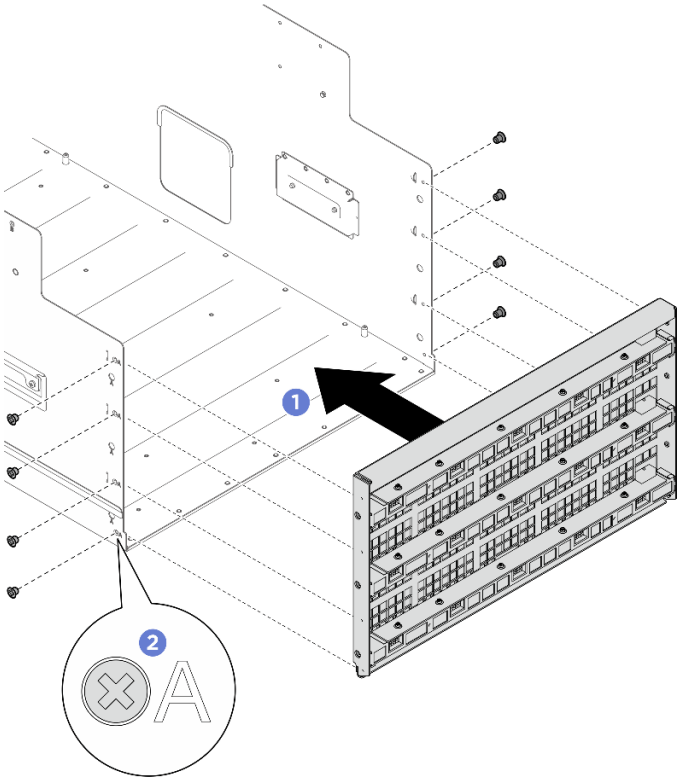


Figure 114. NVSwitch heat sink cover installation

Step 6. Install the bulkhead.

a. ❶ Hold the bulkhead in the correct orientation as illustrated, and slide it into the system shuttle.

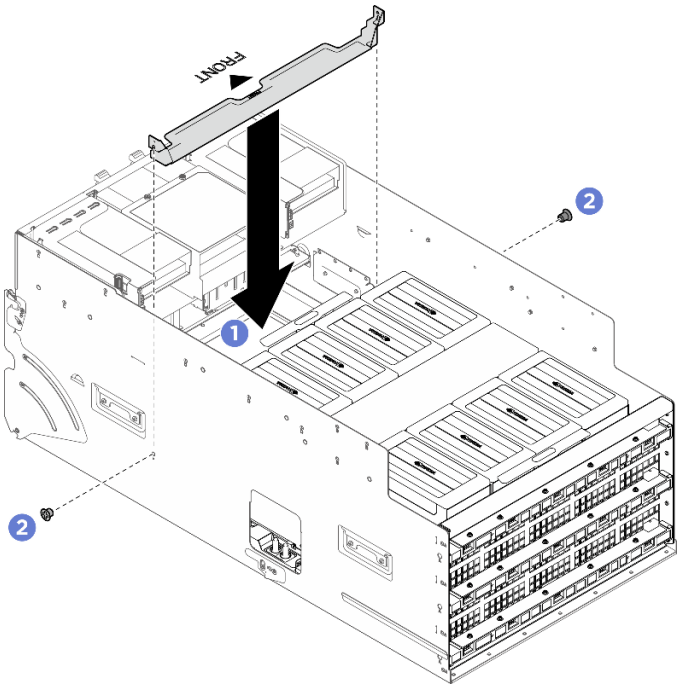
b. 2 Locate the eight screw holes marked with **A** on both sides of the system shuttle; then, fasten the eight screws to secure the bulkhead.



Step 7. Install the support bracket.

a. 1 Hold the bracket in the correct orientation as illustrated, and lower it into the system shuttle.

b. 2 Fasten the two screws to secure the support bracket.



Step 8. Push the PCIe switch shuttle fully into the system shuttle.

a. ❶ Press the two front lock latches on both sides of the PCIe switch shuttle.

b. ❷ Push the PCIe switch shuttle fully into the system shuttle.

c. ❸ Rotate the two release levers until they lock into place.

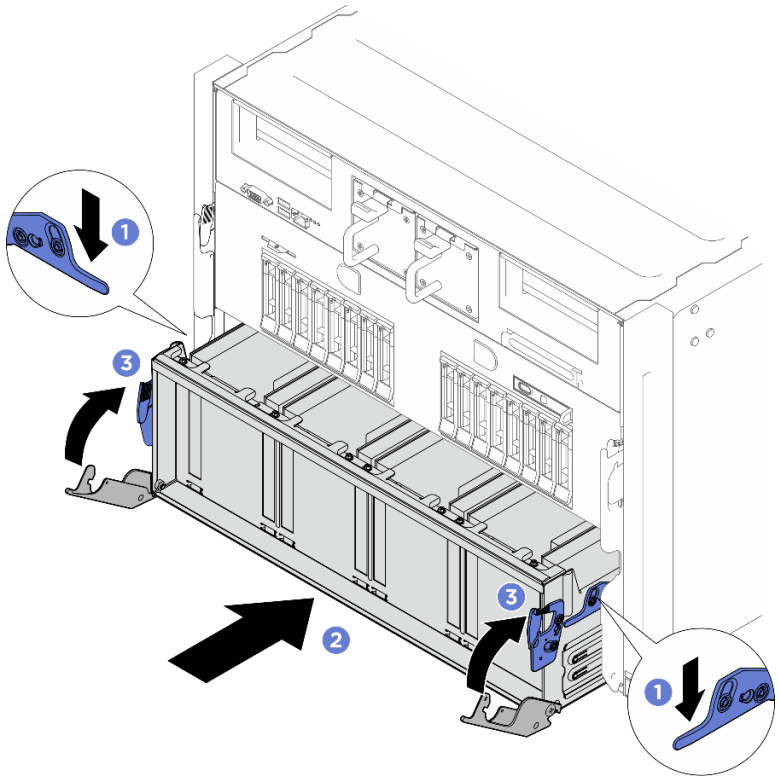


Figure 115. PCIe switch shuttle installation

After you finish

1. Reinstall all the GPU air ducts. See “Install a GPU air duct” on page 102.
2. Reconnect the cables to the GPU baseboard. See “GPU baseboard cable routing” on page 271 for more information.
3. Reinstall the power complex. See “Install the power complex” on page 210.
4. Reinstall the cable holder frame and baffle assembly. See “Install the cable holder frame and baffle assembly” on page 72.
5. Reinstall the compute tray. See “Install the compute tray” on page 75.
6. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
7. Complete the parts replacement. See “Complete the parts replacement” on page 255.

GPU direct attached CX-7 adapter card replacement (trained technician only)

Follow instructions in this section to remove or install the GPU direct attached CX-7 adapter 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 GPU direct attached CX-7 adapter card

Follow instructions in this section to remove the GPU direct attached CX-7 adapter card. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.
- 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:

- One torque screwdriver
- One Torx T15 bit

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

b. Remove the compute tray. See “Remove the compute tray” on page 74.

c. Remove the cable holder frame and baffle assembly. See “Remove the cable holder frame and baffle assembly” on page 70.

Step 2. Unfasten the two screws to remove the CX-7 adapter card from 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 0.59±0.059 newton-meters, 5.22±0.522 inch-pounds.

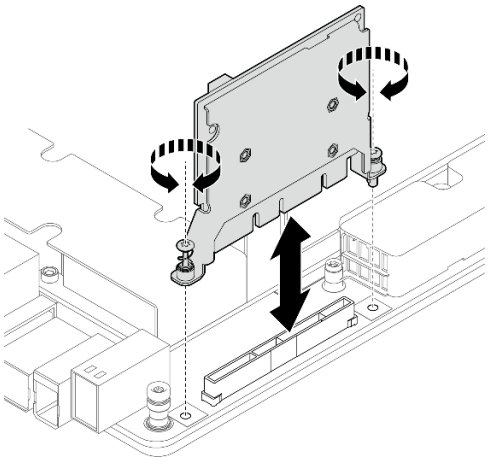


Figure 116. CX-7 adapter card removal

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 GPU direct attached CX-7 adapter card

Follow instructions in this section to install the GPU direct attached CX-7 adapter card. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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:

- One torque screwdriver
- One Torx T15 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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 287 for more information on firmware updating tools.

Procedure

Step 1. Align the CX-7 adapter card with its connector on the GPU baseboard; then, press the CX-7 adapter card into the connector until it is fully seated.

Step 2. Fasten the two screws to secure the CX-7 adapter card.

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 0.59±0.059 newton-meters, 5.22±0.522 inch-pounds.

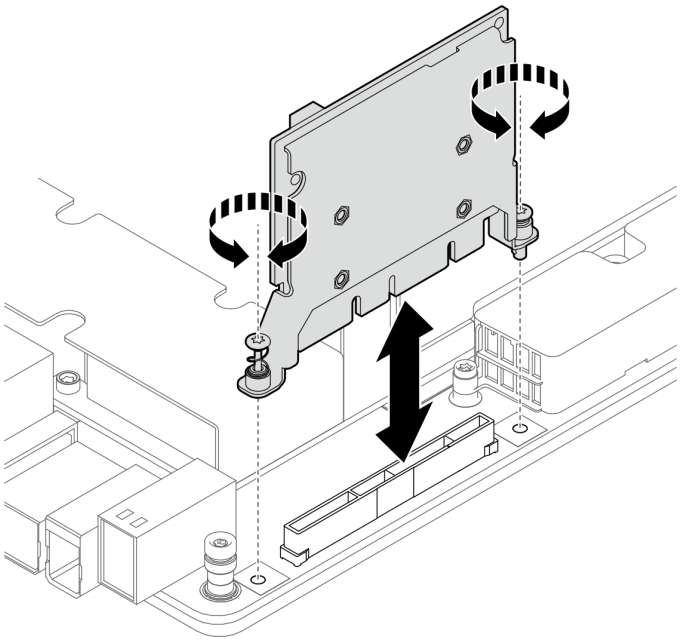


Figure 117. CX-7 adapter card installation

After you finish

1. Reinstall the cable holder frame and baffle assembly. See “Install the cable holder frame and baffle assembly” on page 72.
2. Reinstall the compute tray. See “Install the compute tray” on page 75.
3. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
4. Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 a GPU and heat sink module

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

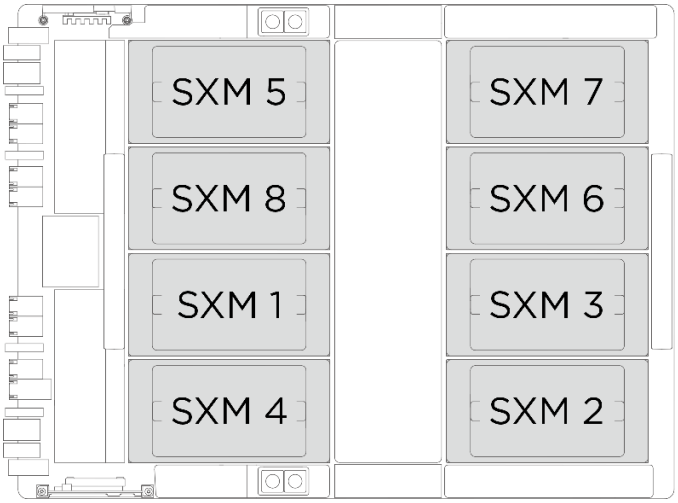
About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.
- 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 table shows the mapping information about the physical GPU sockets, slot numbering in XCC, and module IDs in nvidia-smi.



Physical GPU socket	Slot numbering in XCC	Module ID in nvidia-smi
SXM 1	**Slot 21**	**1**
SXM 2	**Slot 24**	**2**
SXM 3	**Slot 22**	**3**
SXM 4	**Slot 23**	**4**
SXM 5	**Slot 17**	**5**
SXM 6	**Slot 20**	**6**
SXM 7	**Slot 18**	**7**
SXM 8	**Slot 19**	**8**

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

- One torque screwdriver
- One Torx T15 extended bit (300 mm long)
- One B200 jig

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

b. Remove the compute tray. See “Remove the compute tray” on page 74.

c. Remove the cable holder frame and baffle assembly. See “Remove the cable holder frame and baffle assembly” on page 70.

d. Remove the power complex. See “Remove the power complex” on page 209.

e. (GPU and heat sink module 2, 4, 5, and 7 only) Remove the GPU air duct. See “Remove a GPU air duct” on page 100.

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

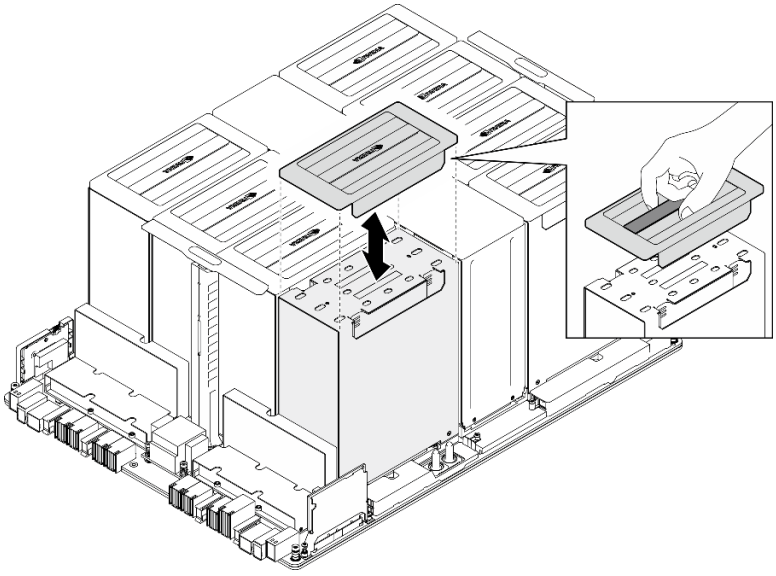


Figure 118. Plastic cover removal

Step 3. Align the jig with the GPU heat sink and carefully install it onto the GPU heat sink.

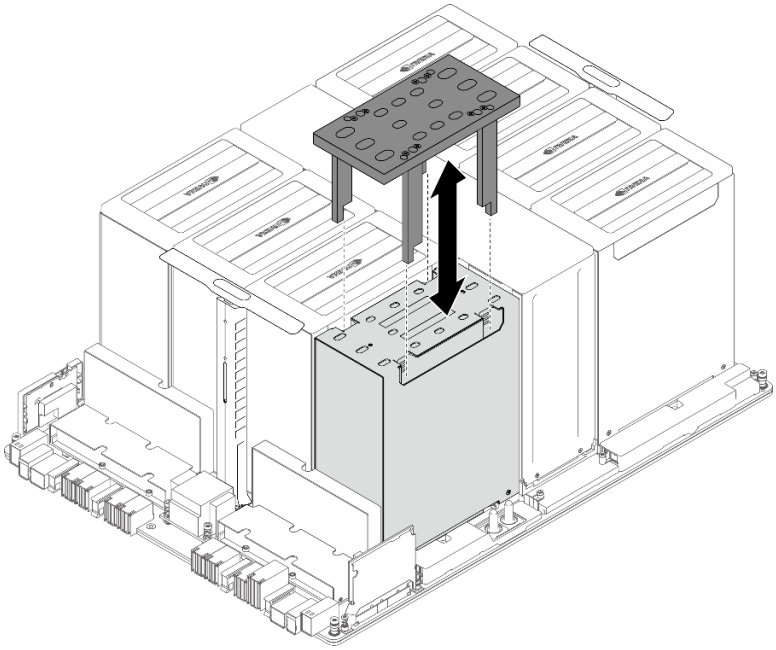


Figure 119. Jig installation

Step 4. Remove the four Torx T15 screws from the GPU and heat sink module.

a. Set the torque screwdriver to 0.81 newton-meters, 7.17 inch-pounds.

b. Insert the torque screwdriver into the designated holes on the jig, and loosen the four screws in the sequence shown in the illustration below (1 > 2 > 3 > 4).

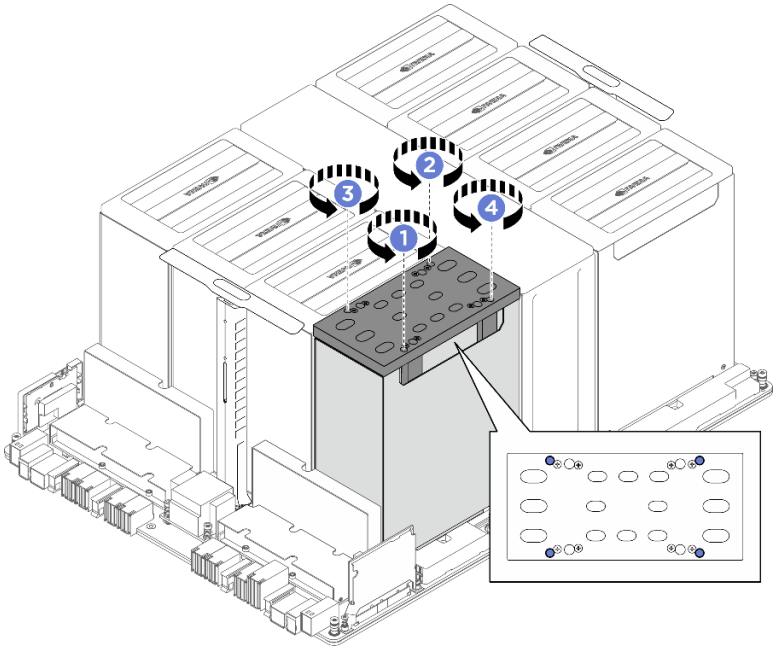


Figure 120. Screw removal

Step 5. Remove the jig from the GPU heat sink.

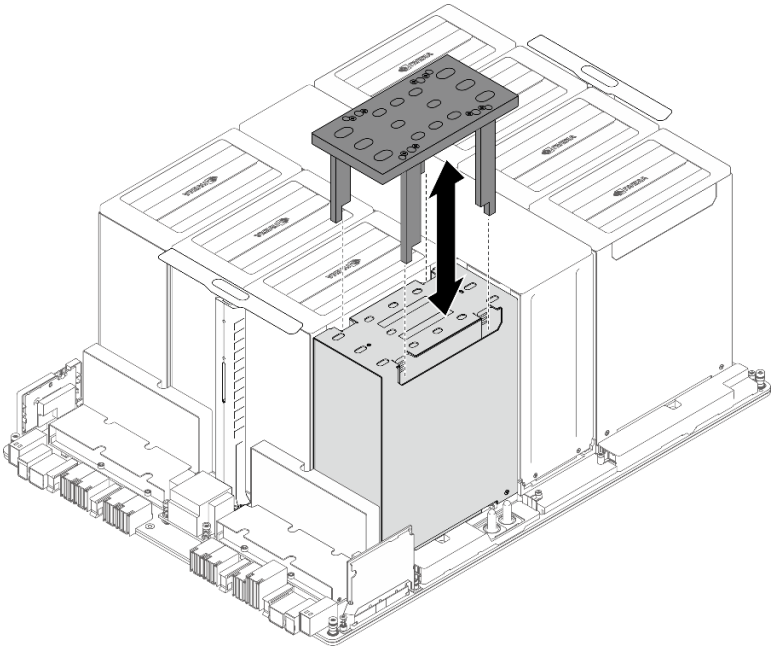


Figure 121. Jig removal

Step 6. Use both hands to grasp the recessed area of the GPU and heat sink module (1), and remove it out of the GPU baseboard.

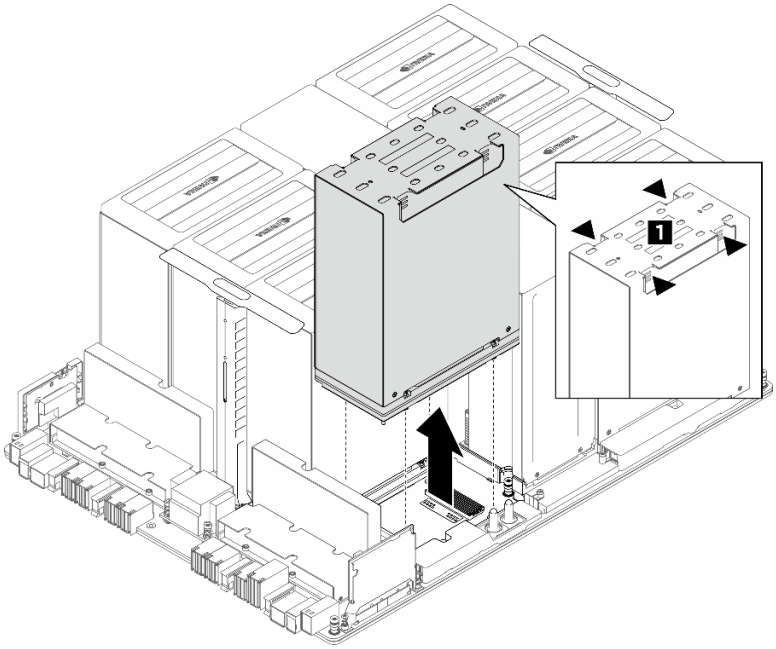


Figure 122. GPU and heat sink module removal

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 a GPU and heat sink module

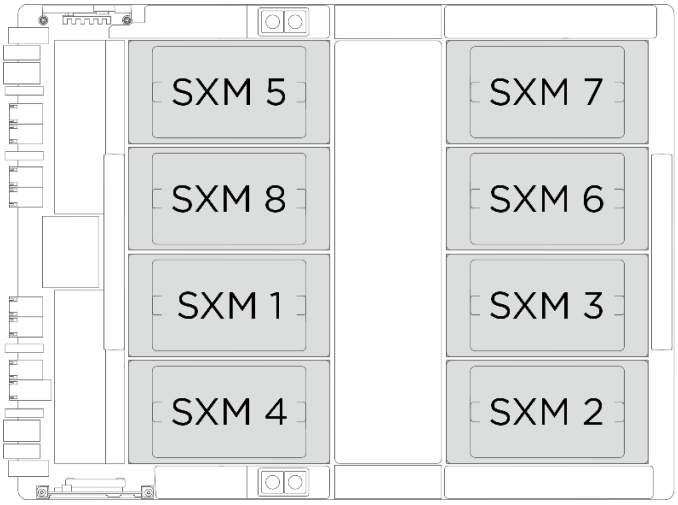
Follow instructions in this section to install a GPU and heat sink module. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 table shows the mapping information about the physical GPU sockets, slot numbering in XCC, and module IDs in nvidia-smi.



Physical GPU socket	Slot numbering in XCC	Module ID in nvidia-smi
SXM 1	Slot 21	1
SXM 2	Slot 24	2
SXM 3	Slot 22	3
SXM 4	Slot 23	4
SXM 5	Slot 17	5
SXM 6	Slot 20	6
SXM 7	Slot 18	7
SXM 8	Slot 19	8

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

- Torque screwdrivers
- Two Torx T15 extended bits (300 mm long)
- One B200 jig

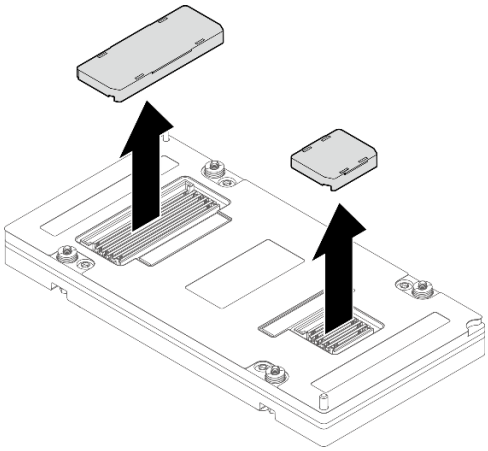
Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 287 for more information on firmware updating tools.

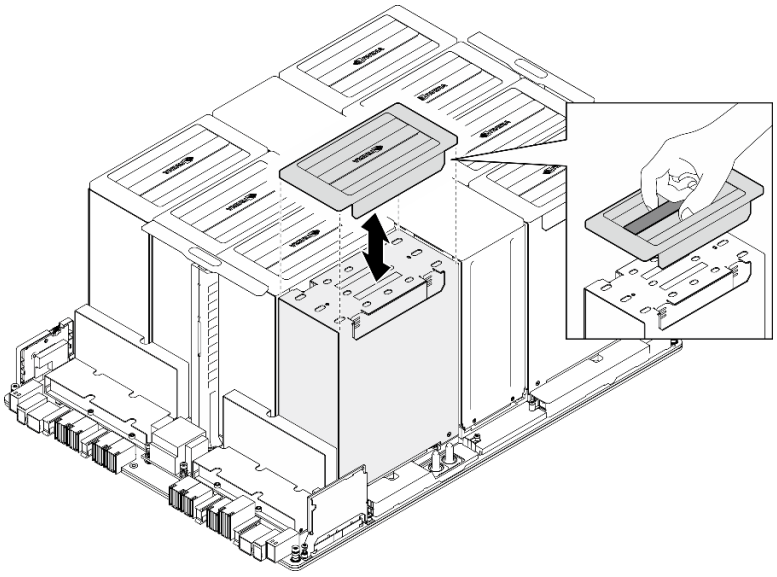
Procedure

Step 1. (Optional) Complete the following steps for the new GPU and heat sink module.

- Remove the connector covers at the bottom.



- Remove the protective film from the heat sink.
- Remove the plastic cover from the heat sink.



Step 2. Use both hands to grasp the recessed area of the GPU and heat sink module (1); then, align the module with the two guide holes on the GPU baseboard and gently place it onto the GPU baseboard.

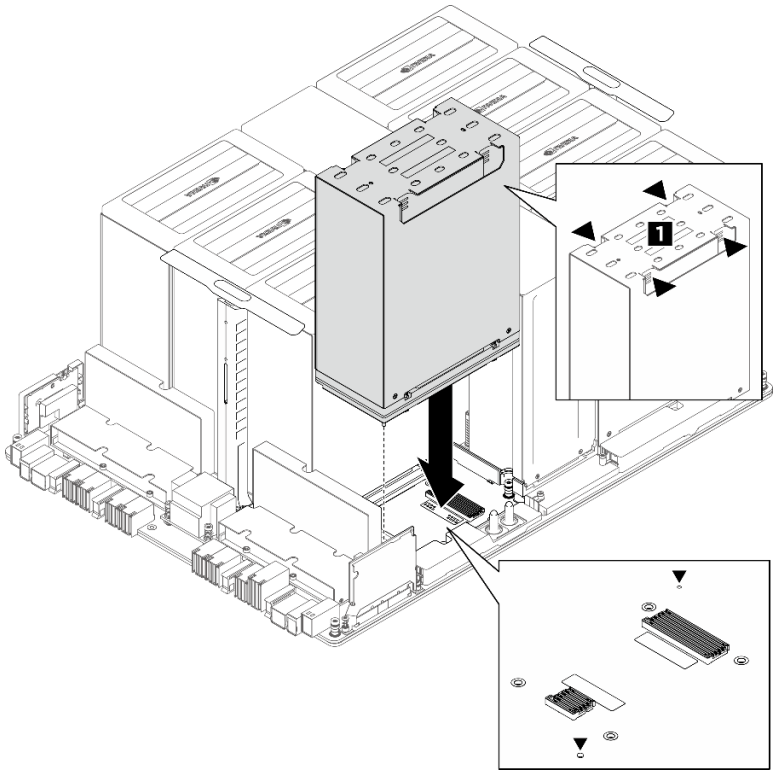


Figure 123. GPU and heat sink module installation

Step 3. Align the jig with the GPU heat sink and carefully install it onto the GPU heat sink.

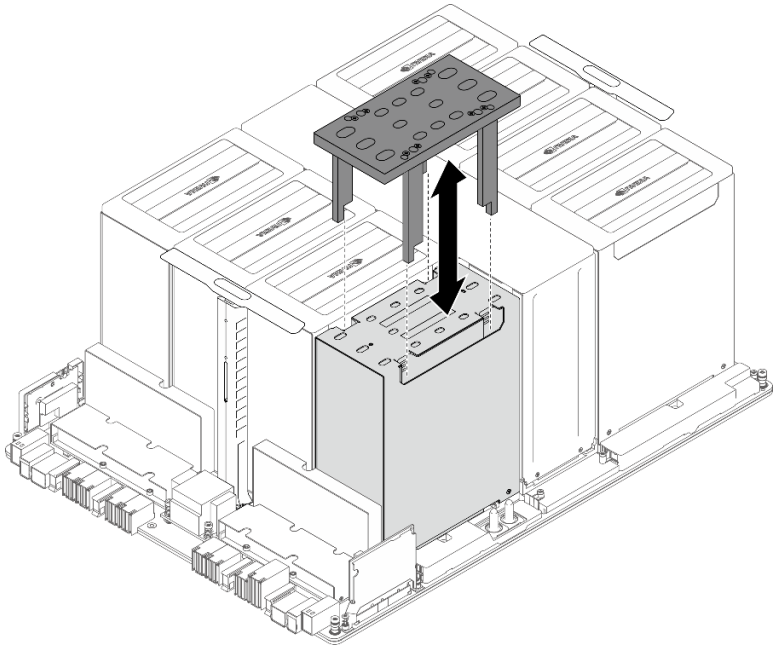


Figure 124. Jig installation

Step 4. Install the four Torx T15 screws to secure the GPU and heat sink module.

a. First torque setting:

1. Set the torque screwdrivers to 0.11±0.011 newton-meters, 0.97±0.097 inch-pounds.
2. Insert the two screwdrivers into the designated holes on the jig to simultaneously fasten the two diagonal screws (1) for a few rounds.
3. Insert the two screwdrivers into the designated holes on the jig to simultaneously fasten the two diagonal screws (2) for a few rounds.

b. Second torque setting:
   1. Set the torque screwdrivers to 0.78±0.031 newton-meters, 6.90±0.274 inch-pounds.
   2.
   3.

c. Final torque setting:
   1. Set the torque screwdrivers to 0.81±0.032 newton-meters, 7.17±0.283 inch-pounds.
   2. Insert the two screwdrivers into the designated holes on the jig and fully tighten the two diagonal screws (1) simultaneously.
   3. Insert the two screwdrivers into the designated holes on the jig and fully tighten the two diagonal screws (2) simultaneously.

Note: Two people are required to fasten the screws simultaneously.

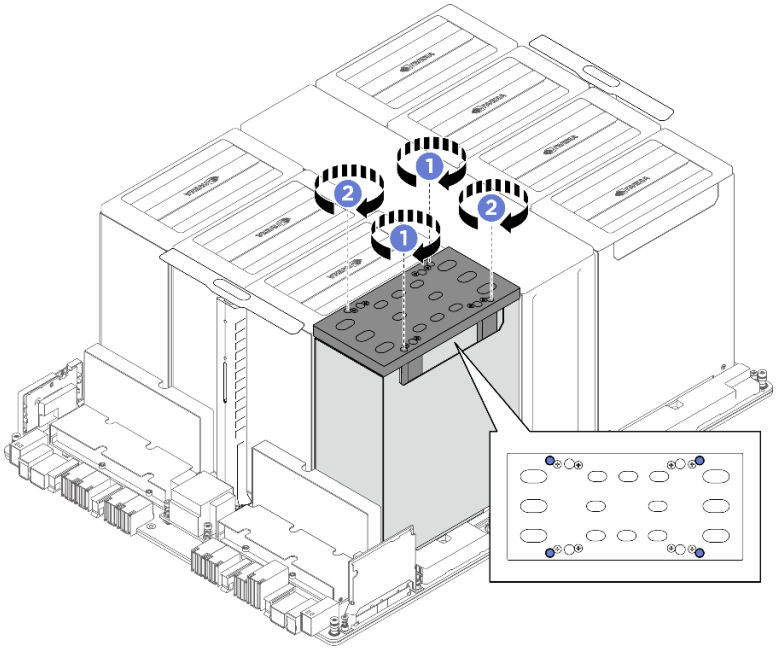


Figure 125. Screw installation

Step 5. Remove the jig from the GPU heat sink.

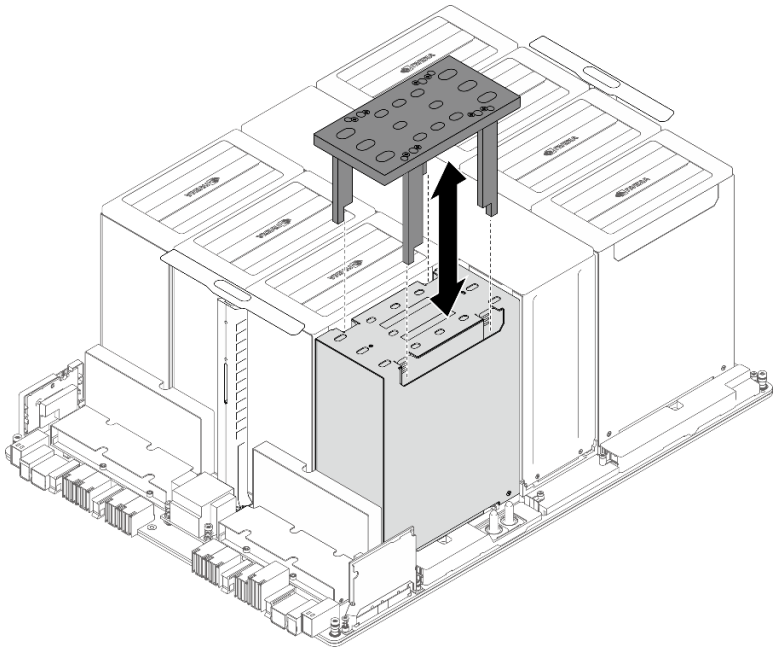


Figure 126. Jig removal

Step 6. Place the plastic cover onto the GPU and heat sink module until it is securely seated.

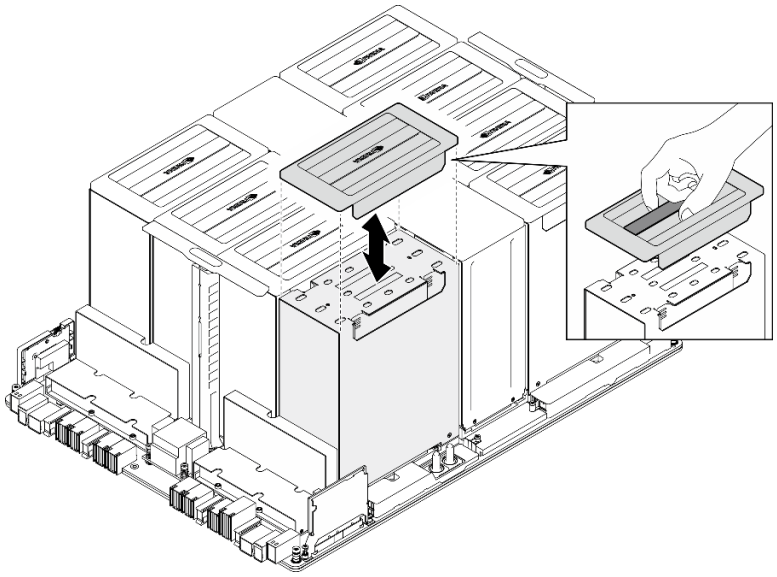


Figure 127. Plastic cover installation

After you finish

1. (GPU and heat sink module 2, 4, 5, and 7 only) Reinstall the GPU air duct. See “Install a GPU air duct” on page 102.
2. Reinstall the power complex. See “Install the power complex” on page 210.
3. Reinstall the cable holder frame and baffle assembly. See “Install the cable holder frame and baffle assembly” on page 72.
4. Reinstall the compute tray. See “Install the compute tray” on page 75.

5. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
6. Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 the part 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 33 and “Safety inspection checklist” on page 34 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 41.
- 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:

- One torque screwdriver
- One Torx T15 bit

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

b. Remove the compute tray. See “Remove the compute tray” on page 74.

c. Remove the cable holder frame and baffle assembly. See “Remove the cable holder frame and baffle assembly” on page 70.

Step 2. Unfasten the two screws to remove the HMC card from 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 0.2±0.02 newton-meters, 1.77±0.177 inch-pounds.

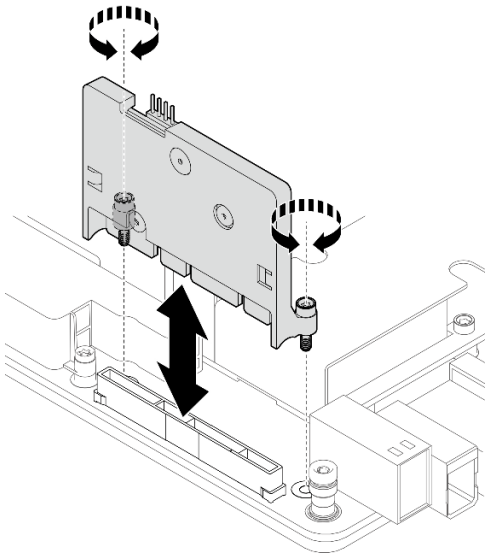


Figure 128. HMC card removal

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 33 and “Safety inspection checklist” on page 34 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:

- One torque screwdriver
- One Torx T15 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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 287 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.

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 0.2±0.02 newton-meters, 1.77±0.177 inch-pounds.

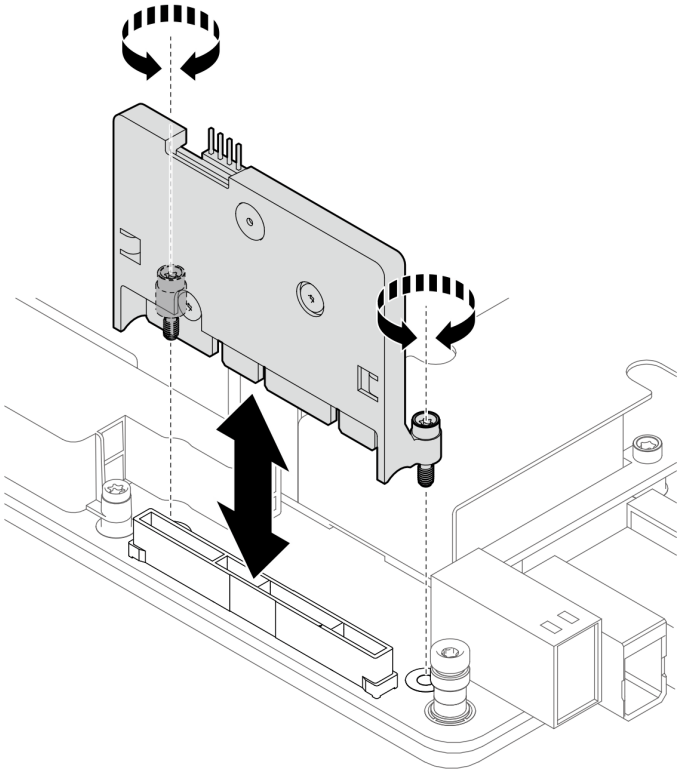


Figure 129. HMC card installation

After you finish

1. Reinstall the cable holder frame and baffle assembly. See “Install the cable holder frame and baffle assembly” on page 72.
2. Reinstall the compute tray. See “Install the compute tray” on page 75.
3. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
4. Complete the parts replacement. See “Complete the parts replacement” on page 255.

Integrated diagnostics panel replacement

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

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 integrated diagnostics panel

Follow instructions in this section to remove the integrated diagnostics panel. The procedure must be executed by a trained technician.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle to the stop position.

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

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the system shuttle to its stop position.

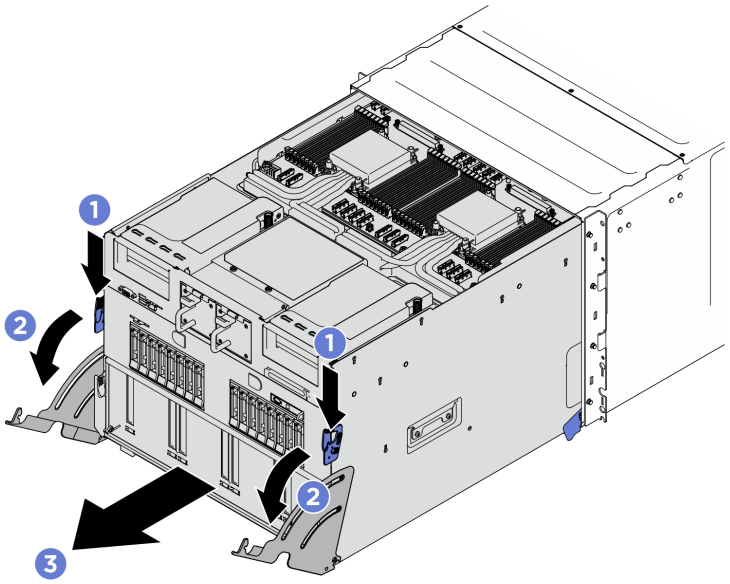


Figure 130. Pulling the system shuttle to the stop position

b. Remove the FIO/PCI cage. See “Remove the FIO/PCI cage” on page 97.

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 system shuttle.

c. ③ Disconnect the cable from the integrated diagnostics panel.

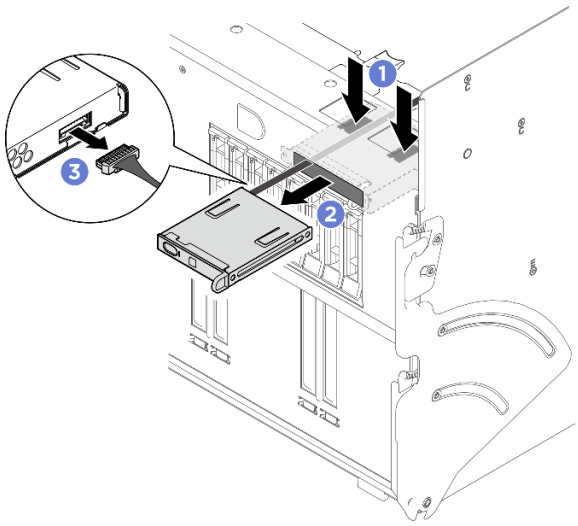


Figure 131. Integrated diagnostics panel removal

Step 3. Remove the integrated diagnostics panel from the system 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. The procedure must be executed by a trained technician.

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 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, attach the label to the end of the cable that connects to the system board.

a. ❶ Attach the white space portion of the label.

b. ❷ Wrap the label around the cable and attach it to the white space portion.

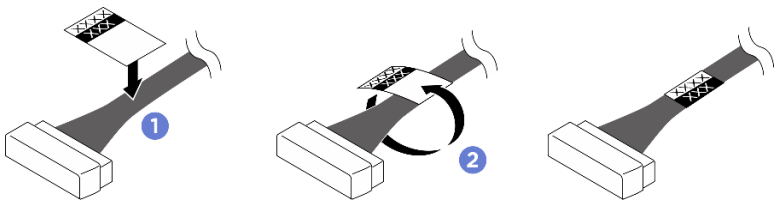


Figure 132. Label application

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

From	To	Label
Integrated diagnostics panel cable	**System board: Integrated diagnostics panel connector (FRONT IO2)**	FRONT IO 2 PONG

Step 2. Install the integrated diagnostics panel.

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

b. 2 Align the integrated diagnostics panel with the slot in the front of the system shuttle, and slide it in.

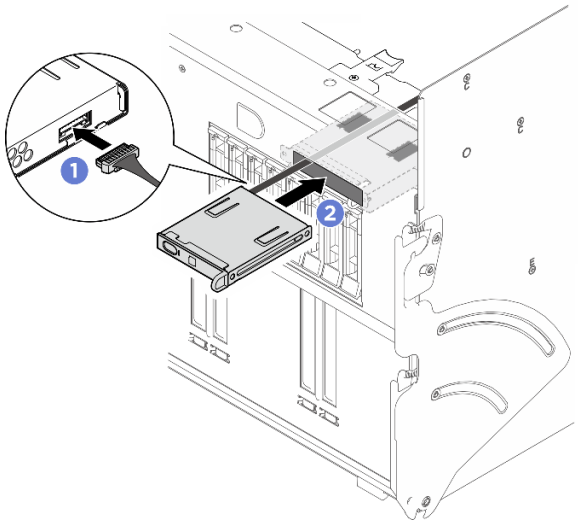


Figure 133. Integrated diagnostics panel installation

After you finish

1. Reinstall the FIO/PCI cage. See "Install the FIO/PCI cage" on page 98.
2. Push the system shuttle fully into the chassis.
   a. 1 Lift the two lock latches on both sides of the shuttle.
   b. 2 Slide the shuttle into the chassis.
   c. 3 Push the shuttle fully into the chassis.
   d. 4 Rotate the two release levers until they lock into place.

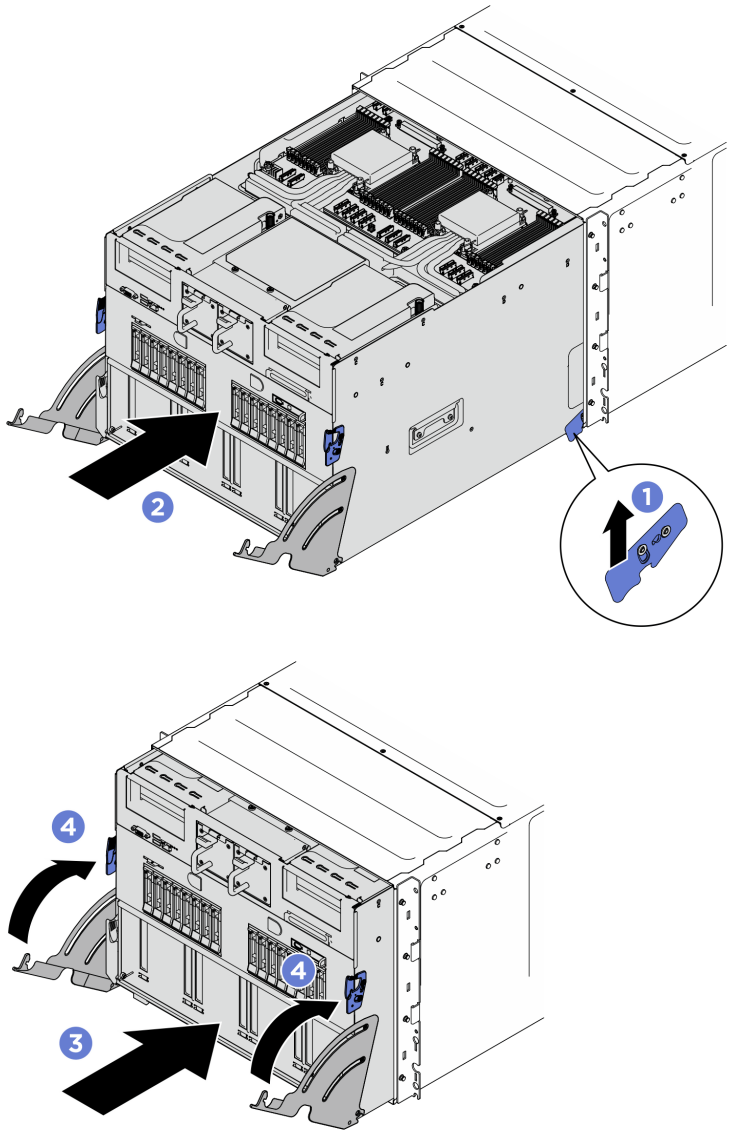


Figure 134. System shuttle installation

3. Complete the parts replacement. See "Complete the parts replacement" on page 255.

M.2 drive replacement (trained technician only)

Follow instructions in this section to remove and install 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 33 and “Safety inspection checklist” on page 34 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 41.
- 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.
- 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), 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. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

Step 2. Locate the M.2 drive slots on the system board.

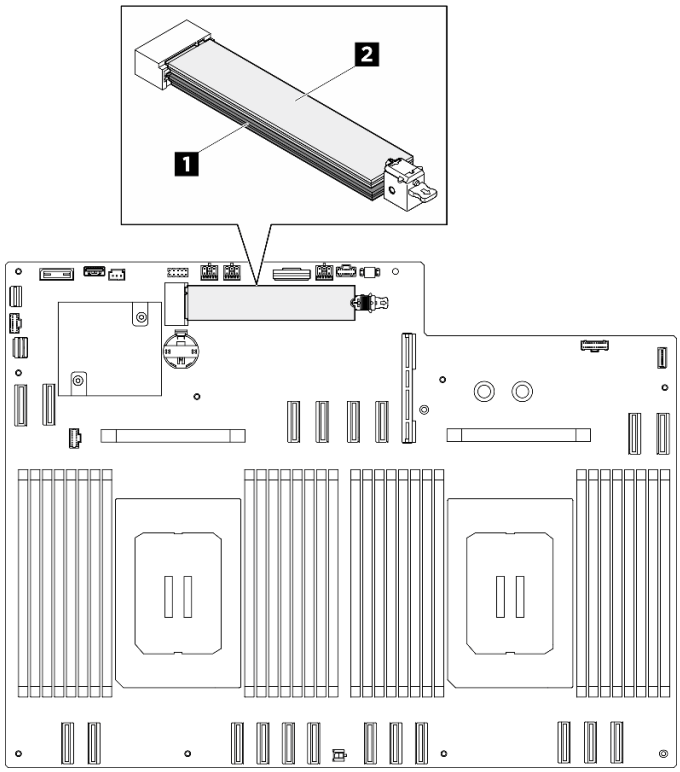


Figure 135. M.2 drive slots

1 Slot 1	2 Slot 2

Step 3. Remove the upper M.2 drive.

a. (1) Slide the upper retainer backward as illustrated to disengage the M.2 drive.

b. ❷ The M.2 drive will slightly lift away from the system board.

c. ❸ Hold the edge of the M.2 drive to pull it out of the M.2 drive slot at an angle of approximately 15 degrees.

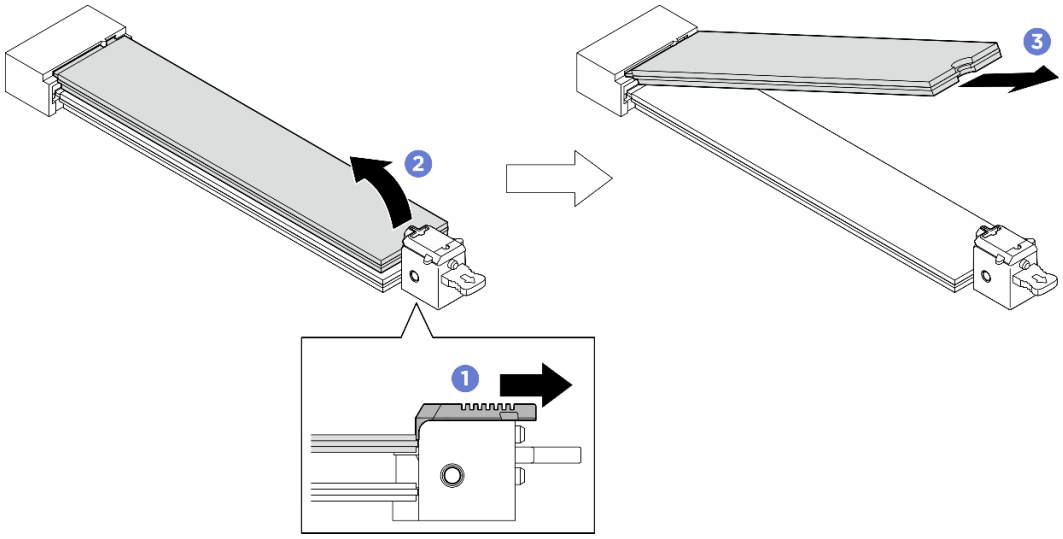


Figure 136. Removing upper M.2 drive

Step 4. Remove the lower M.2 drive.

a. ❶ Pull the lower retainer as illustrated to disengage the M.2 drive.

b. ❷ The M.2 drive will slightly lift away from the system board.

c. ❸ Hold the edge of the M.2 drive to pull it out of the M.2 drive slot at an angle of approximately 15 degrees.

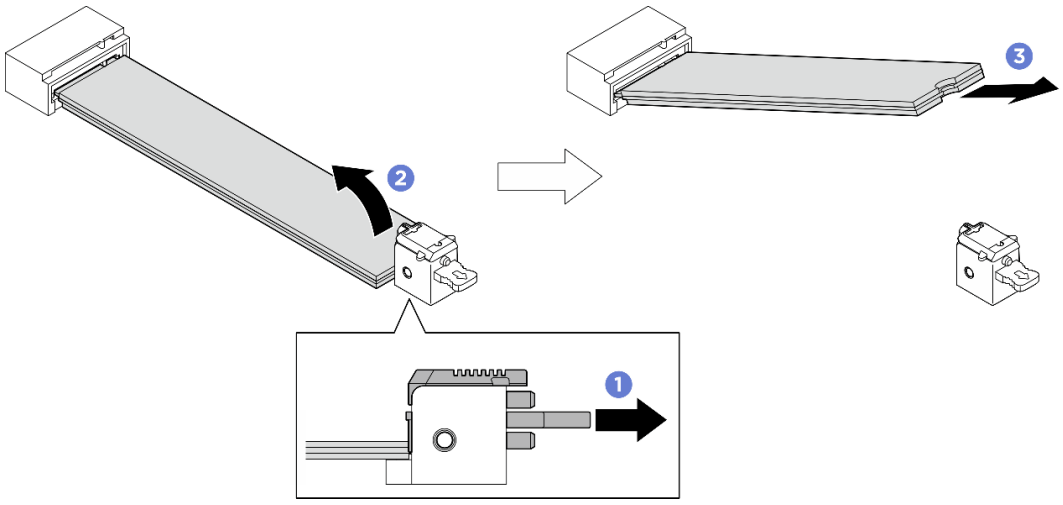


Figure 137. Removing lower M.2 drive

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 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 33 and “Safety inspection checklist” on page 34 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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 287 for more information on firmware updating tools.

Procedure

Step 1. Locate the M.2 drive slots on the system board.

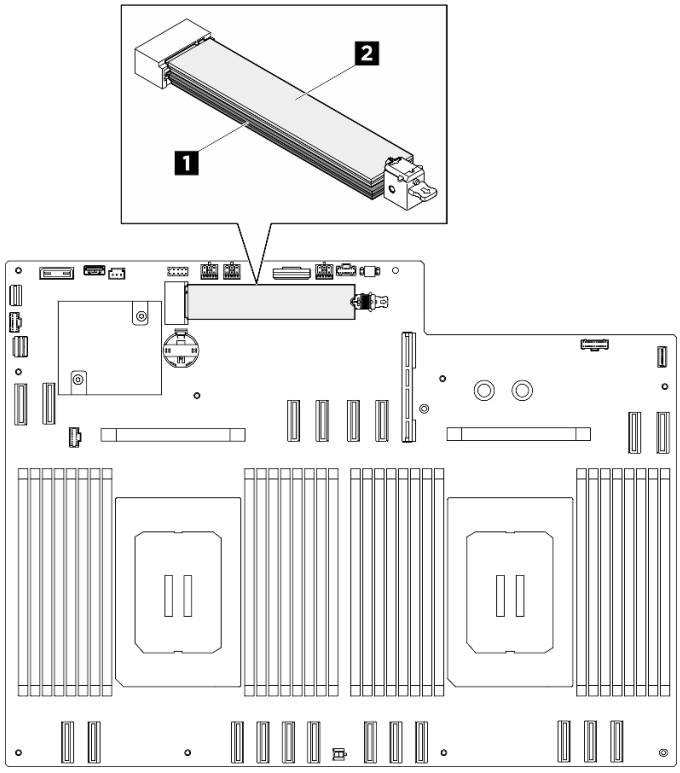


Figure 138. M.2 drive slots

1 Slot 1	2 Slot 2

Step 2. Install the lower M.2 drive.

a. 1 Pull and hold the lower retainer as illustrated.

b. 2 Insert the M.2 drive into the lower M.2 slot at an angle of approximately 15 degrees.

c. 3 Pivot the other end of the M.2 drive down and slide the retainer toward the M.2 drive to secure it in place.

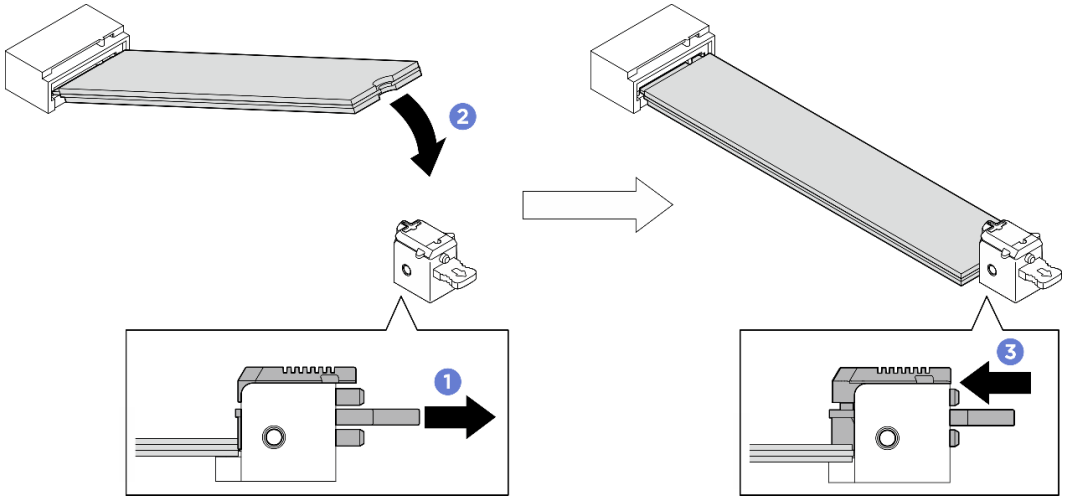


Figure 139. Installing lower M.2 drive

Step 3. Install upper M.2 drive.

a. 1 Insert the M.2 drive into the upper M.2 slot at an angle of approximately 15 degrees.

b. 2 Pivot the other end of the M.2 drive downward until it securely locks into place with the retainer.

c. 3 The upper retainer will automatically lock into position, securing the M.2 drive in place.

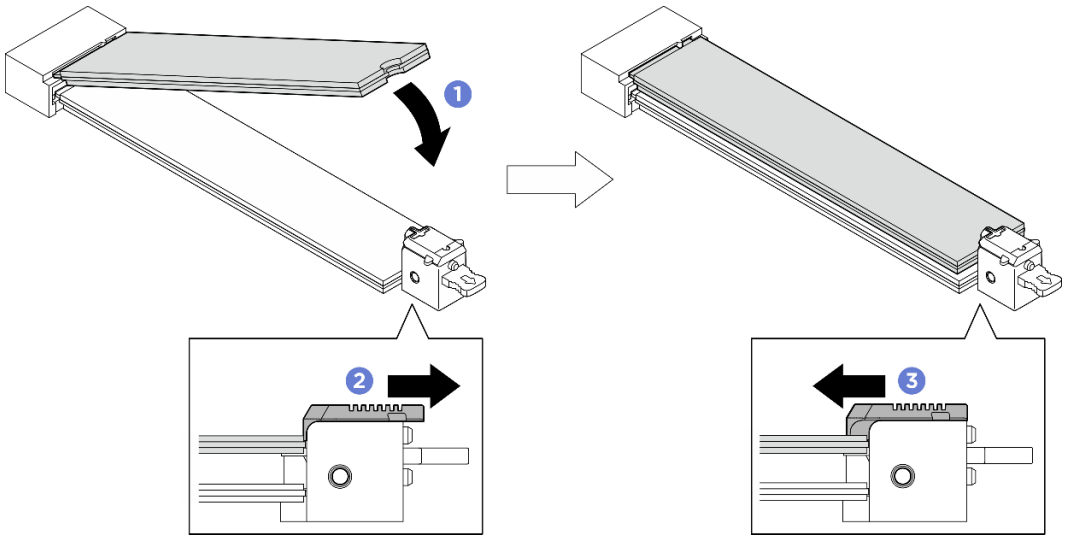


Figure 140. Installing upper M.2 drive

After you finish

1. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
2. Complete the parts replacement. See “Complete the parts replacement” on page 255.

Memory module replacement

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

Remove a memory module

Use this information to remove a memory module.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.
- 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 36.
  - 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. Pull the system shuttle to the stop position.

a. ❶ Press the two blue release latches.

b. ❷ Rotate the two release levers until they are perpendicular to the shuttle.

c. ❸ Pull the shuttle forward until it stops.

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the system shuttle to its stop position.

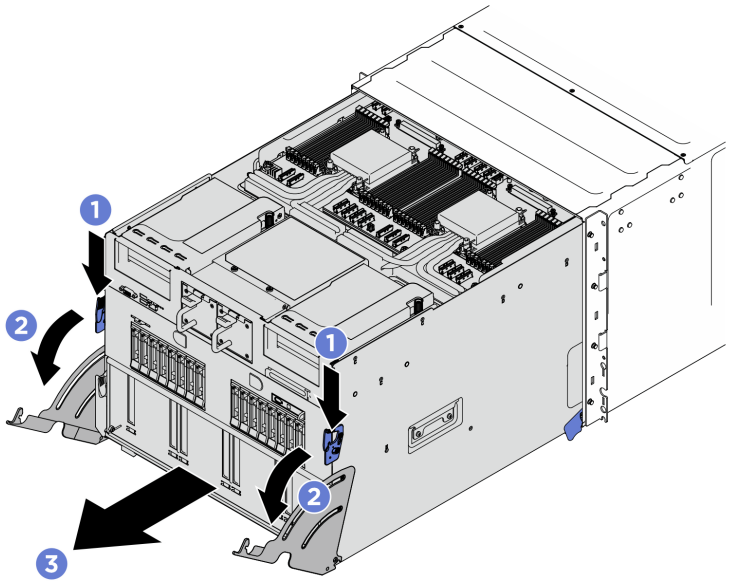


Figure 141. Pulling the system shuttle to the stop position

Step 2. Locate the memory module slots and determine which memory module to be removed.

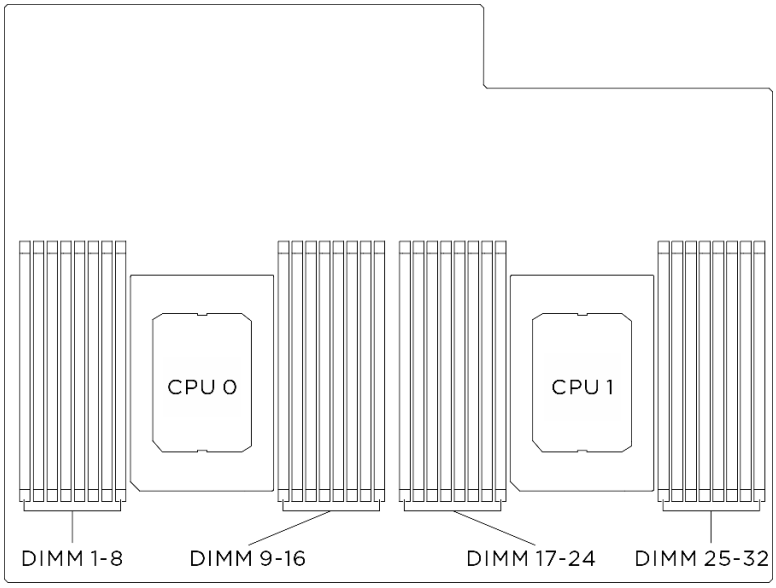


Figure 142. Memory modules and processors layout

Step 3. 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.

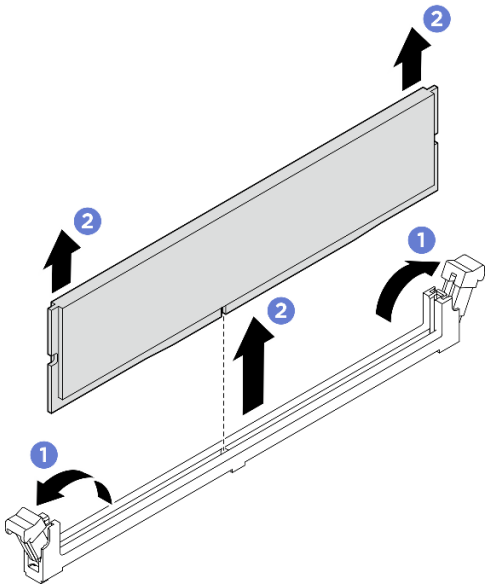


Figure 143. Memory module removal

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 164.
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.

About this task

See “Memory module installation rules and order” on page 37 for detailed information about memory configuration and setup.

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 37.
- Memory modules are sensitive to static discharge and require special handling. Refer to the standard guidelines at “Handling static-sensitive devices” on page 36:
  - 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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 287 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.

> **Note:** Ensure that you observe the installation rules and sequence order in “Memory module installation rules and order” on page 37.

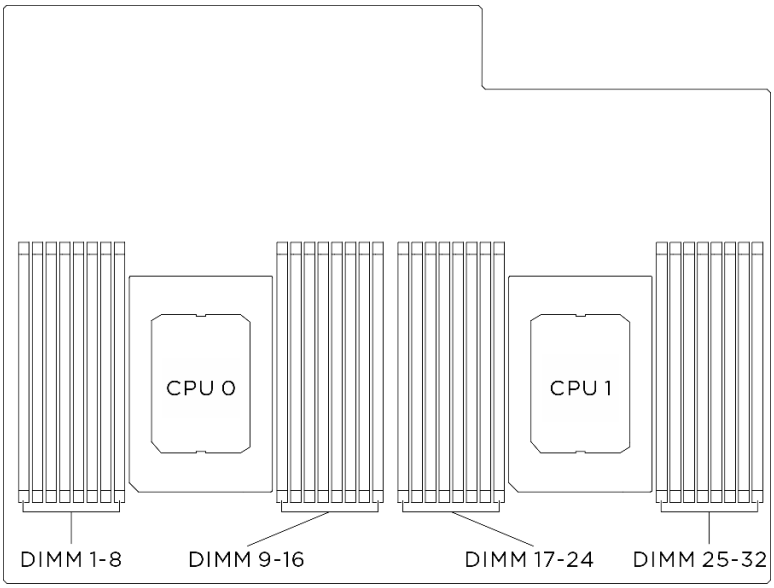


Figure 144. Memory modules and processors layout

Step 2. Install the memory module into the slot.

a. ❶ Gently open the retaining clip on each end of the memory module slot.

b. ❷ Align the memory module with the slot, and gently place the memory module on the slot with both hands.

c. ❸ 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.

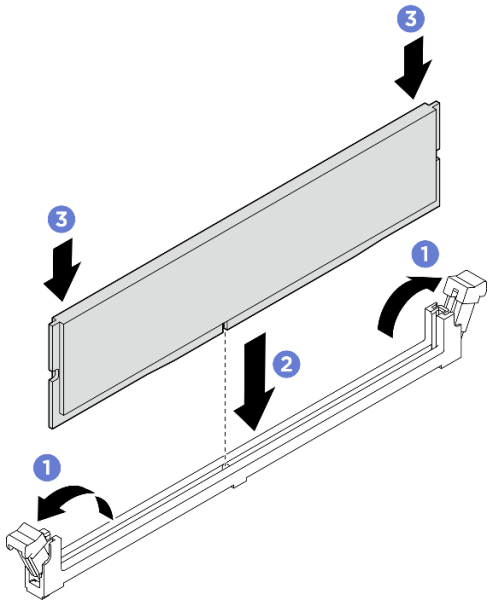


Figure 145. Memory module installation

After you finish

1. Push the system shuttle fully into the chassis.
   a. ❶ Lift the two lock latches on both sides of the shuttle.
   b. ❷ Slide the shuttle into the chassis.
   c. ❸ Push the shuttle fully into the chassis.
   d. ❹ Rotate the two release levers until they lock into place.

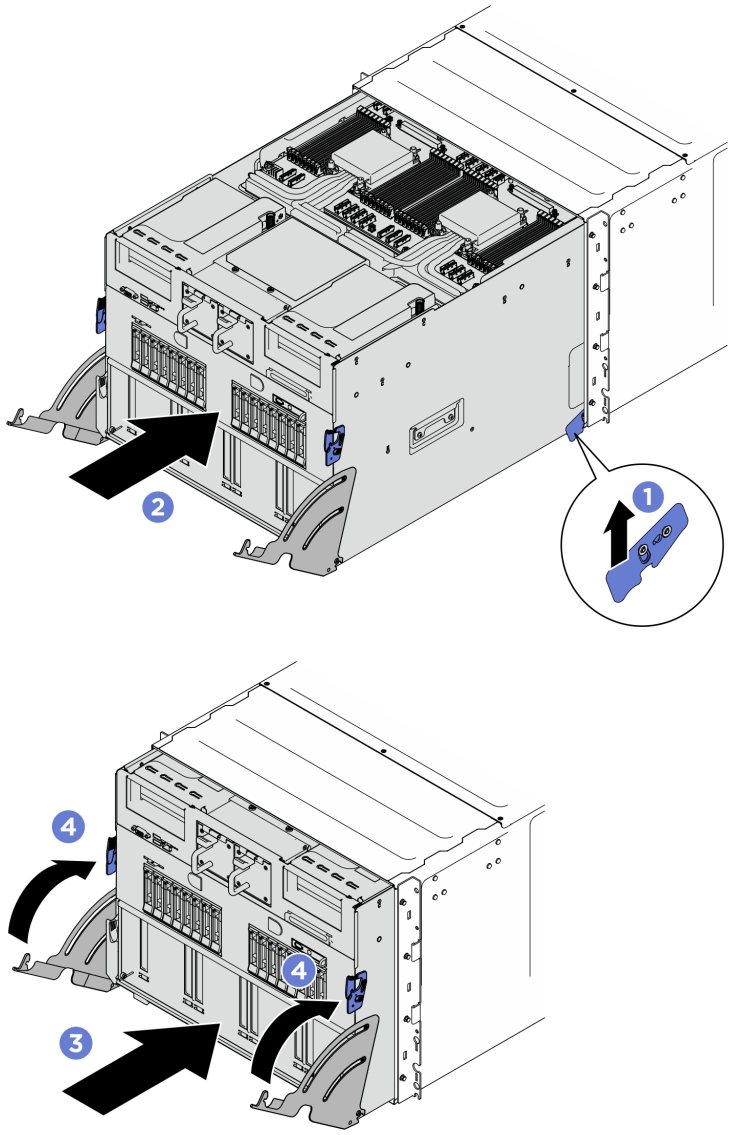


Figure 146. System shuttle installation

2. Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 33 and “Safety inspection checklist” on page 34 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 41.

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle to the stop position.

1. ❶ Press the two blue release latches.
2. ❷ Rotate the two release levers until they are perpendicular to the shuttle.
3. ❸ Pull the shuttle forward until it stops.

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the system shuttle to its stop position.

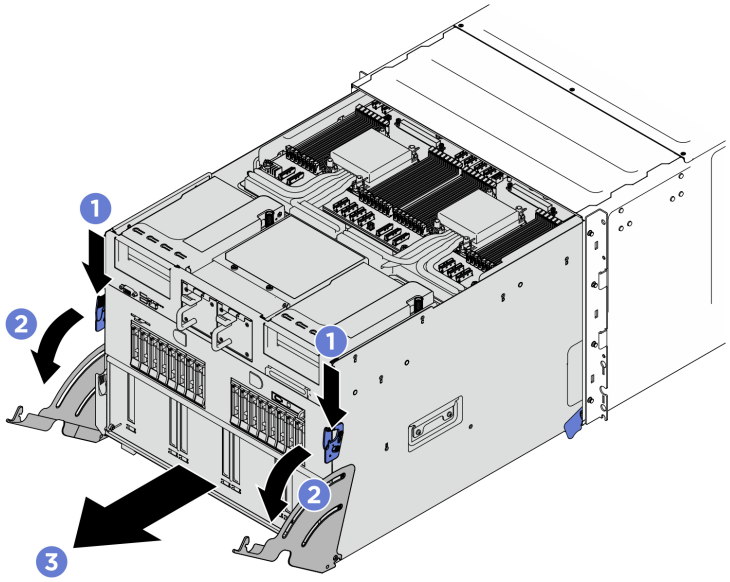


Figure 147. Pulling the system shuttle to the stop position

b. If applicable, remove the PCIe riser assembly 2. See “Remove a PCIe riser assembly” on page 201.

Step 2. Remove the MicroSD card.

a. ❶ Slide the socket lid to the open position.

b. ❷ Lift open the socket lid.

c. ❸ Remove the MicroSD card from the socket.

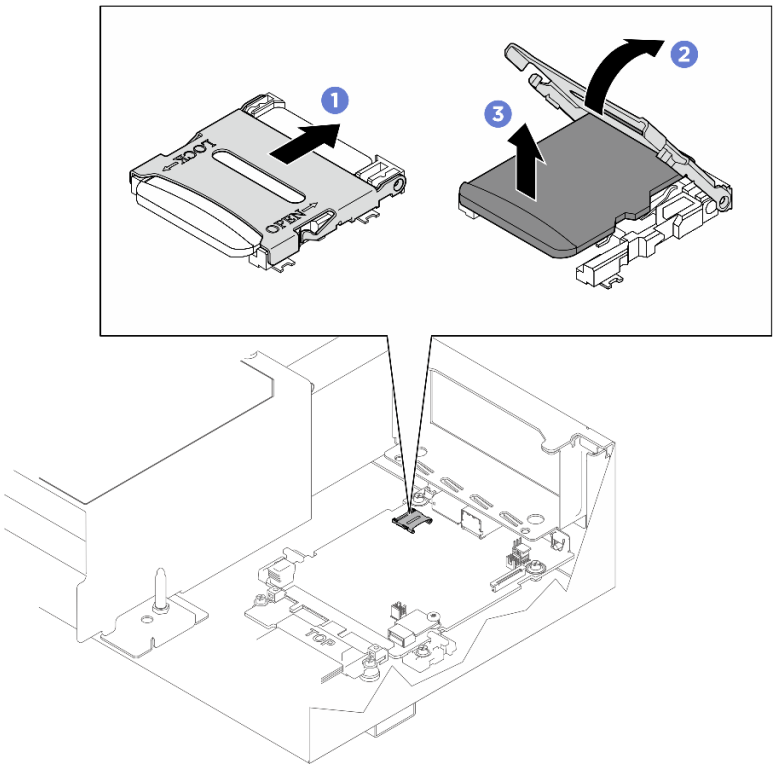


Figure 148. MicroSD card removal

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 33 and “Safety inspection checklist” on page 34 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. ❶ Place the MicroSD card into the socket.

Step 2. ❷ Close the socket lid.

Step 3. ❸ Slide the socket lid to the lock position.

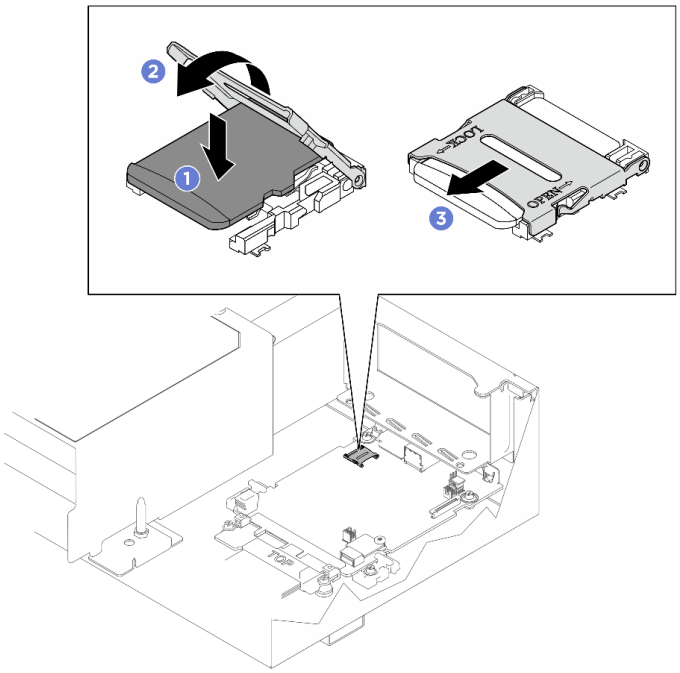


Figure 149. MicroSD card installation

After you finish

1. If applicable, reinstall the PCIe riser assembly 2. See "Install a PCIe riser assembly" on page 205.
2. Push the system shuttle fully into the chassis.
   a. ❶ Lift the two lock latches on both sides of the shuttle.
   b. ❷ Slide the shuttle into the chassis.
   c. ❸ Push the shuttle fully into the chassis.
   d. ❹ Rotate the two release levers until they lock into place.

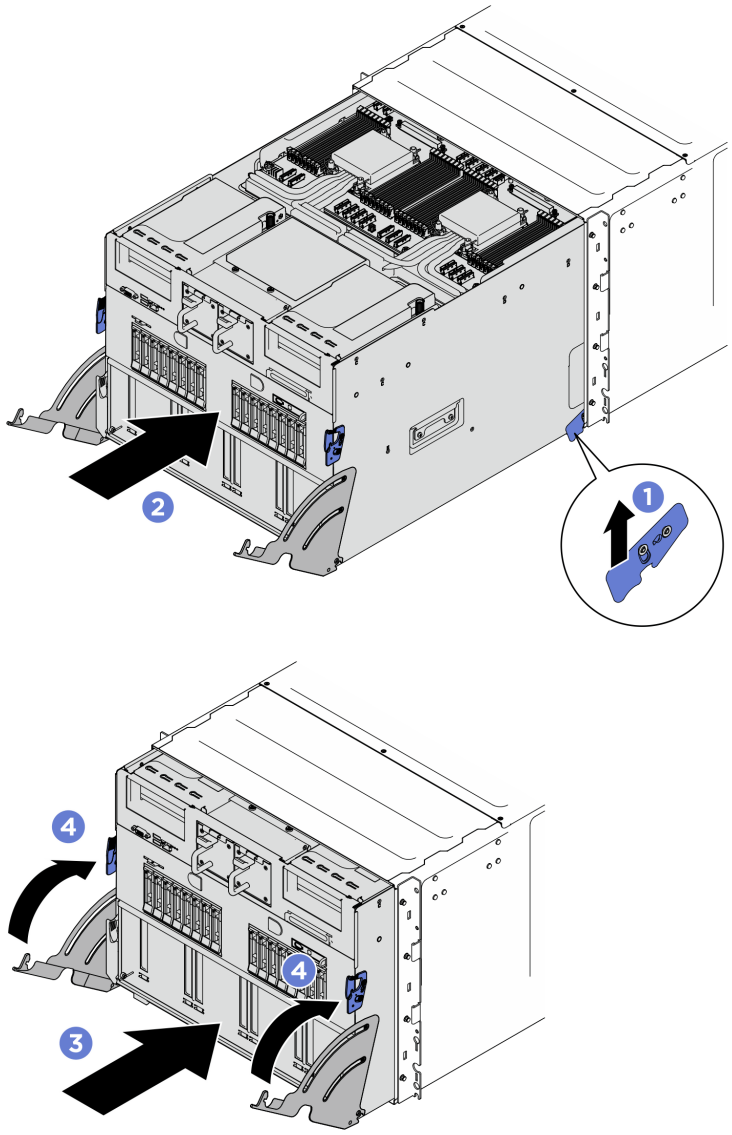


Figure 150. System shuttle installation

3. Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 lower PCIe adapter

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.

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

Procedure

Step 1. Pull the PCIe switch shuttle to the first stop position.

a. ❶ Press the two blue release latches.

b. ❷ Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.

c. ❸ Pull the PCIe switch shuttle forward to the first stop position.

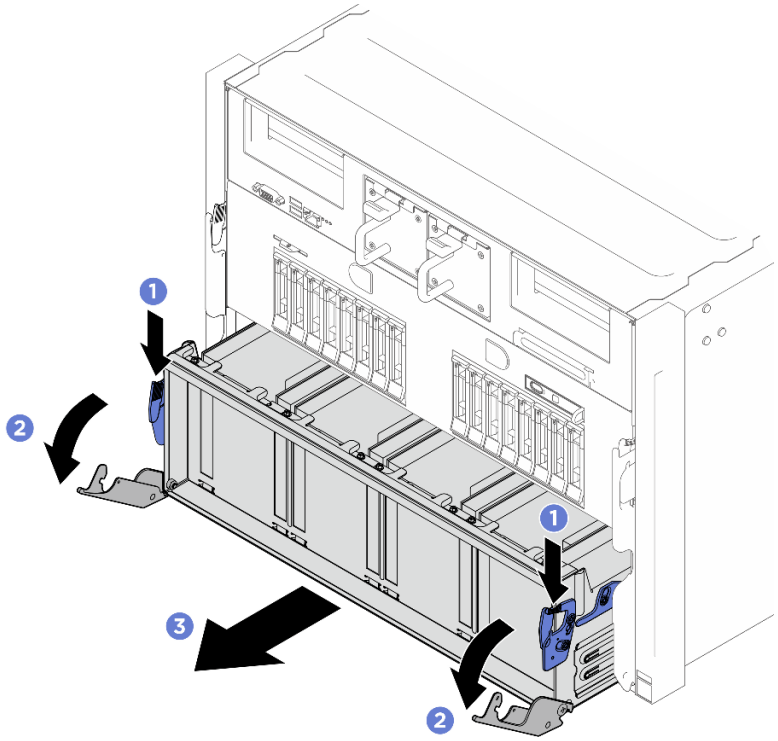


Figure 151. Pulling the PCIe switch shuttle to the first stop position

Step 2. Pull the PCIe switch shuttle to the second stop position.

a. ❶ Press the two front lock latches on both sides of the PCIe switch shuttle.

b. ❷ Pull the PCIe switch shuttle forward to the second stop position.

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

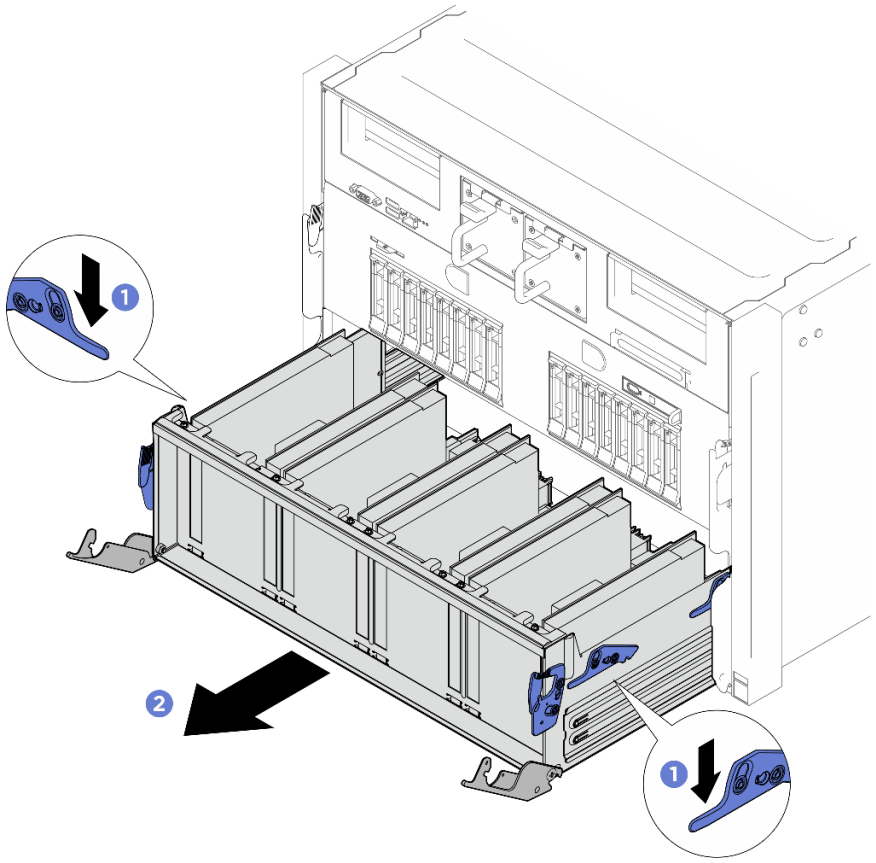


Figure 152. Pulling the PCIe switch shuttle to the second stop position

Step 3. Unfasten the screw that secures the PCIe adapter to the PCIe switch shuttle; then, lift the PCIe adapter out of the PCIe slot.

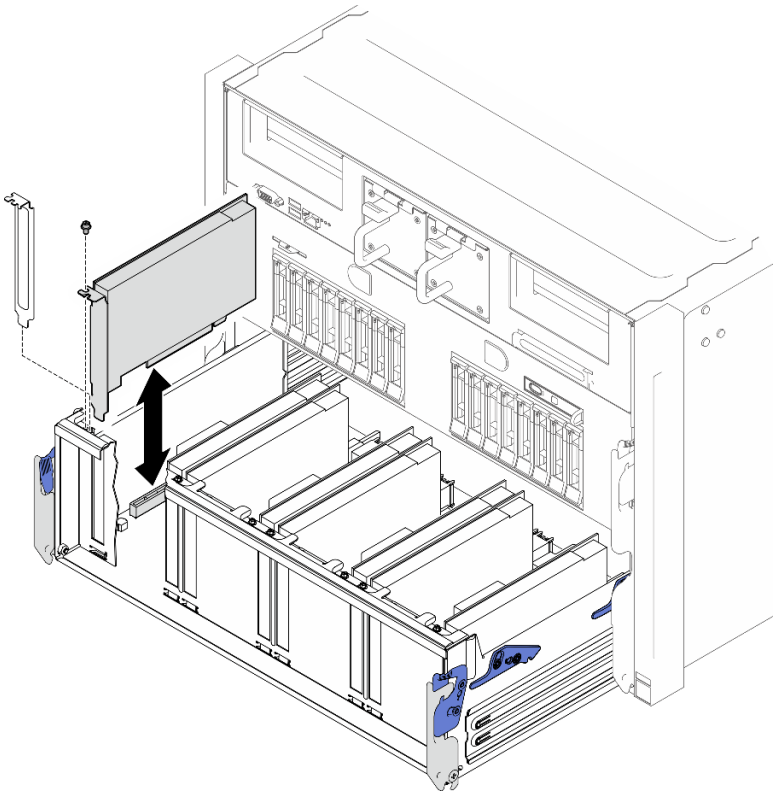


Figure 153. Lower PCIe adapter removal

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 lower PCIe adapter

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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.

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

Procedure

Step 1. Align the PCIe adapter with the PCIe slot on the PCIe switch board; then, press the PCIe adapter into the slot until it is fully seated.

Step 2. Fasten the screw to secure the PCIe adapter.

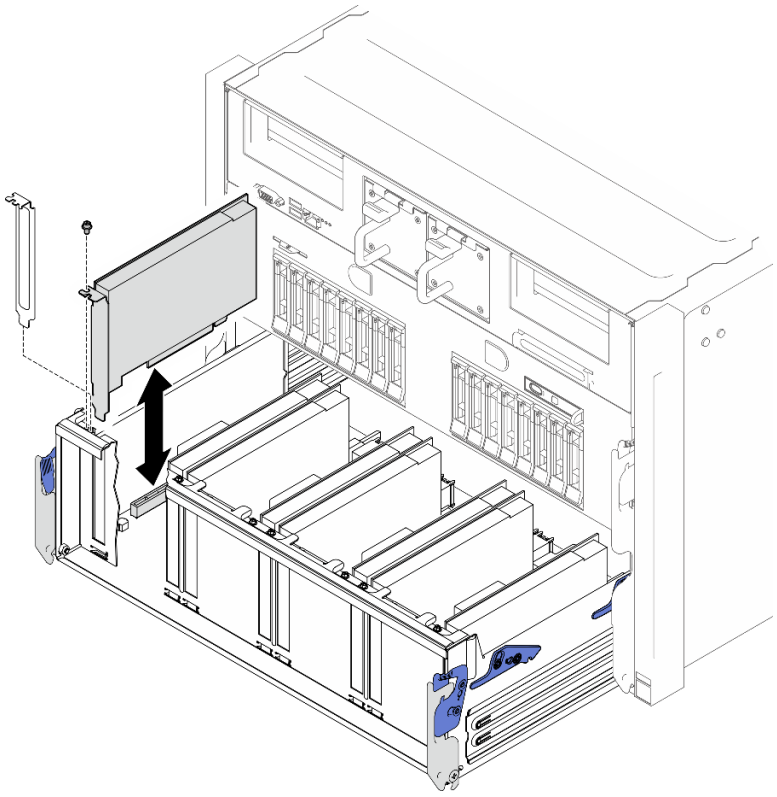


Figure 154. Lower PCIe adapter installation

Step 3. Slide the PCIe switch shuttle to the first stop position.

a. ❶ Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.

b. ❷ Press the two rear lock latches on both sides of the PCIe switch shuttle.

c. ❸ Slide the PCIe switch shuttle into the system shuttle until it stops at the first stop position.

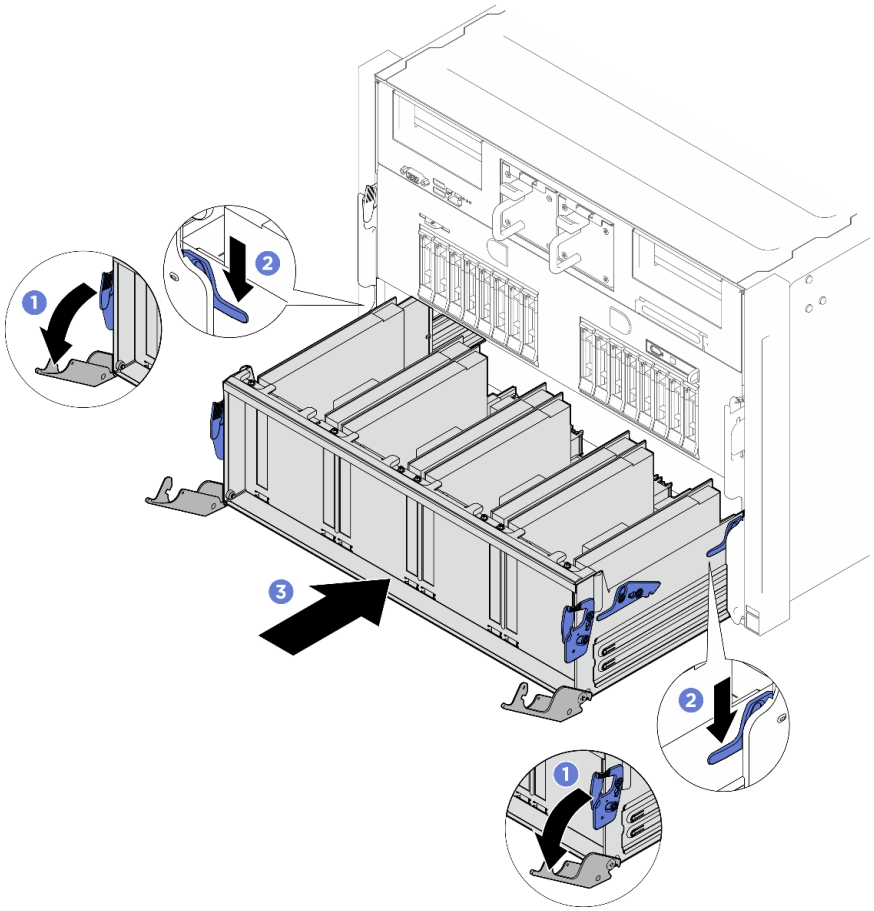


Figure 155. Sliding the PCIe switch shuttle to the first stop position

Step 4. Push the PCIe switch shuttle fully into the system shuttle.

a. ❶ Press the two front lock latches on both sides of the PCIe switch shuttle.

b. ❷ Push the PCIe switch shuttle fully into the system shuttle.

c. ❸ Rotate the two release levers until they lock into place.

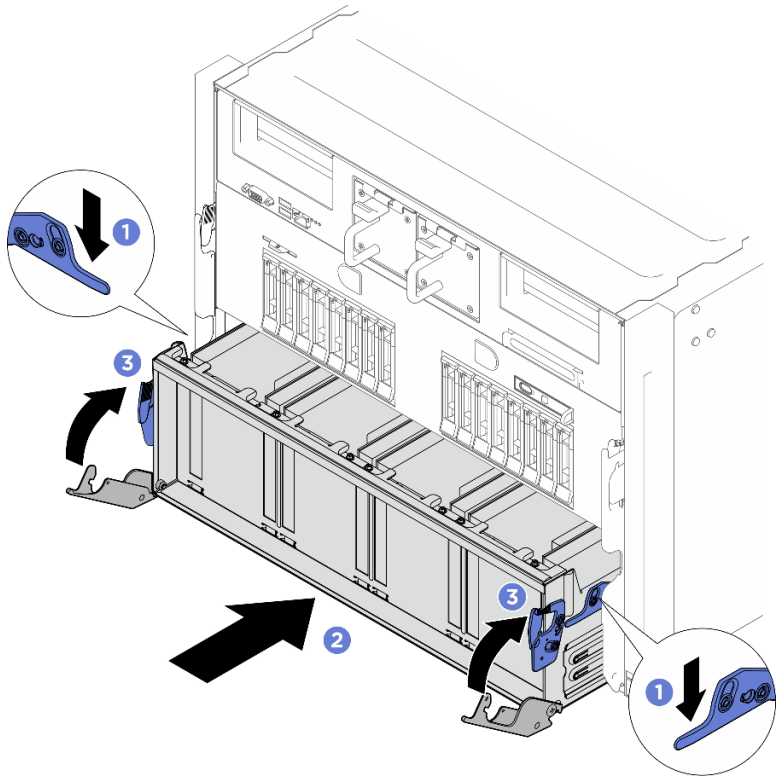


Figure 156. PCIe switch shuttle installation

After you finish

Complete the parts replacement. See “Complete the parts replacement” on page 255.

Remove an upper PCIe adapter

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.

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

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle to the stop position.

1. ❶ Press the two blue release latches.
2. ❷ Rotate the two release levers until they are perpendicular to the shuttle.
3. ❸ Pull the shuttle forward until it stops.

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the system shuttle to its stop position.

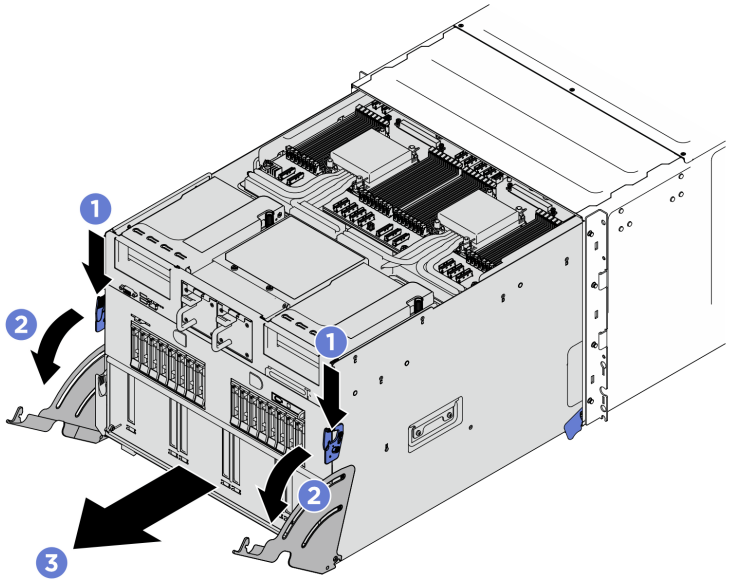


Figure 157. Pulling the system shuttle to the stop position

b. Remove the PCIe riser assembly. See "Remove a PCIe riser assembly" on page 201.

c. If applicable, remove the PCIe riser air baffle. See "Remove a PCIe riser air baffle" on page 197.

d. If applicable, disconnect the cable from the upper PCIe adapter.

Step 2. Remove the upper PCIe adapter.

a. ❶ Unfasten the screw that secures the PCIe adapter to the PCIe riser.

b. ❷ Grasp the PCIe adapter by its edges and carefully pull it out of the PCIe slot.

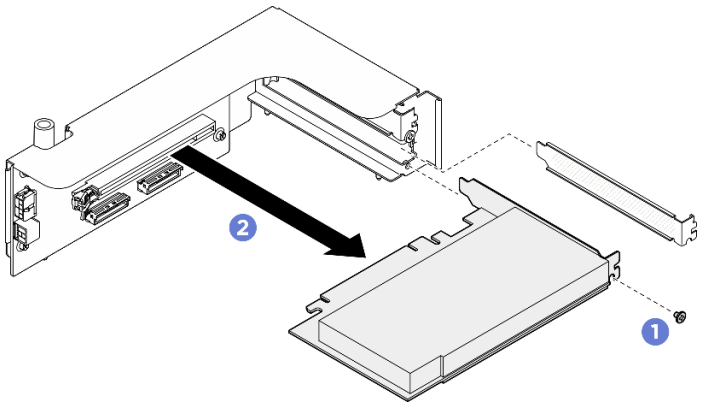


Figure 158. Upper PCIe adapter removal

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 an upper PCIe adapter

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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.

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

Procedure

Step 1. ❶ Insert the PCIe adapter into the PCIe riser.

Step 2. ❷ Fasten the screw to secure the PCIe adapter.

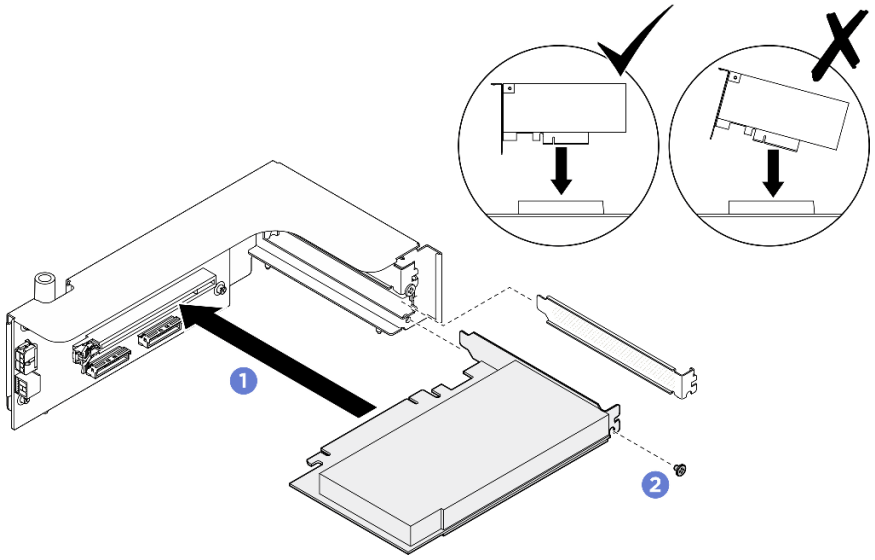


Figure 159. Upper PCIe adapter installation

Step 3. If applicable, connect the cable to the PCIe adapter.

After you finish

1. (ThinkSystem NVIDIA BlueField-3 B3220 VPI QSFP112 2P 200G PCIe Gen5 x16 Adapter only) Reinstall the PCIe riser air baffle. See “Install a PCIe riser air baffle” on page 199.
2. Reinstall the PCIe riser assembly. See “Install a PCIe riser assembly” on page 205.
3. Push the system shuttle fully into the chassis.
   a. ❶ Lift the two lock latches on both sides of the shuttle.
   b. ❷ Slide the shuttle into the chassis.
   c. ❸ Push the shuttle fully into the chassis.
   d. ❹ Rotate the two release levers until they lock into place.

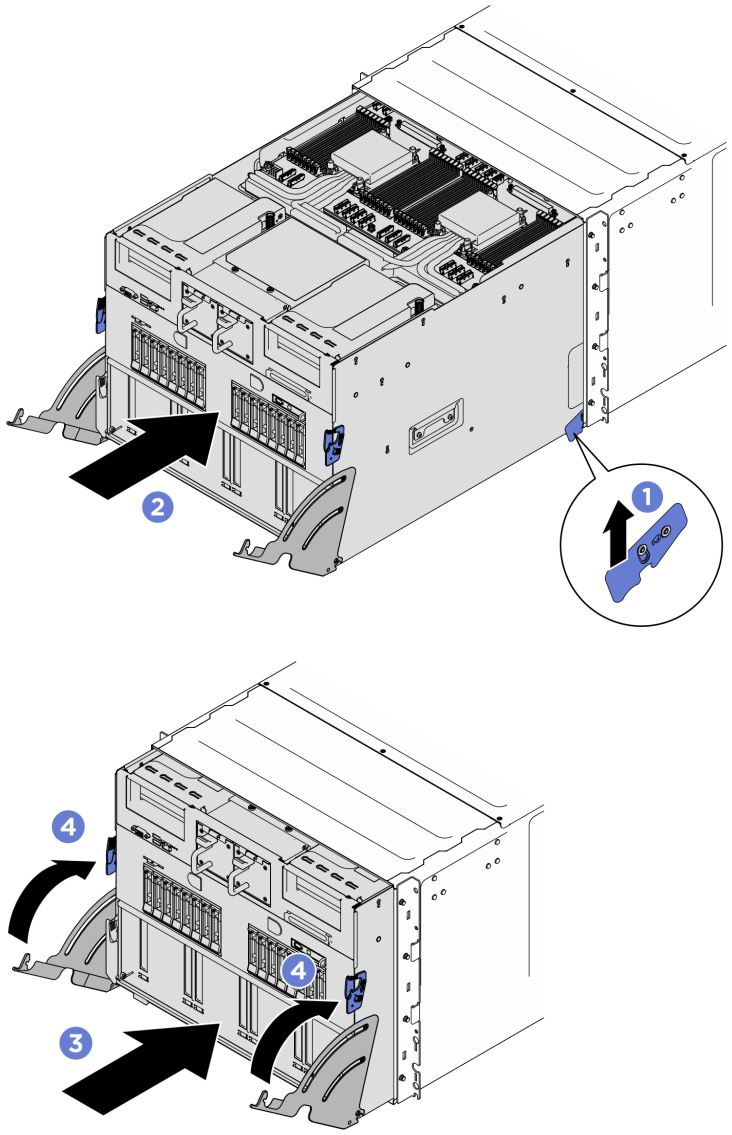


Figure 160. System shuttle installation

4. Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 33 and “Safety inspection checklist” on page 34 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 41.

Note: Make sure you have an alcohol cleaning pad to wipe off thermal grease.

Procedure

Step 1. Make preparation for this task.

a. Remove the PCIe switch shuttle. See “Remove the PCIe switch shuttle” on page 187.

b. Remove all the lower PCIe adapters. See “Remove a lower PCIe adapter” on page 172.

Step 2. Remove the PCIe switch board heat sink.

a. 1 Fully loosen all the screws on the heat sink in the diagonal pattern.

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.

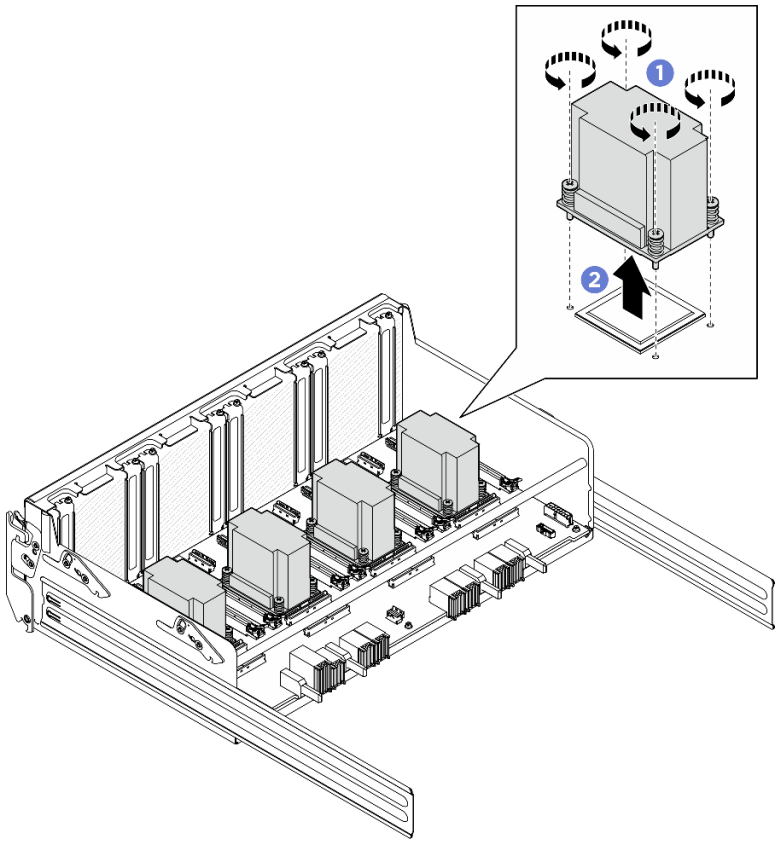


Figure 161. PCIe switch board heat sink removal

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 185.
2. If you are replacing the PCIe switch board, remove it. See “Remove the PCIe switch board” on page 183.
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 33 and “Safety inspection checklist” on page 34 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 41.

Procedure

Step 1. Make preparation for this task.

a. Remove the PCIe switch shuttle. See “Remove the PCIe switch shuttle” on page 187.

b. Remove all the lower PCIe adapters. See “Remove a lower PCIe adapter” on page 172.

c. Remove all the PCIe switch board heat sinks. See “Remove a PCIe switch board heat sink” on page 181.

Step 2. Unfasten the six screws on the PCIe switch board; then, lift the PCIe switch board out of the PCIe switch shuttle.

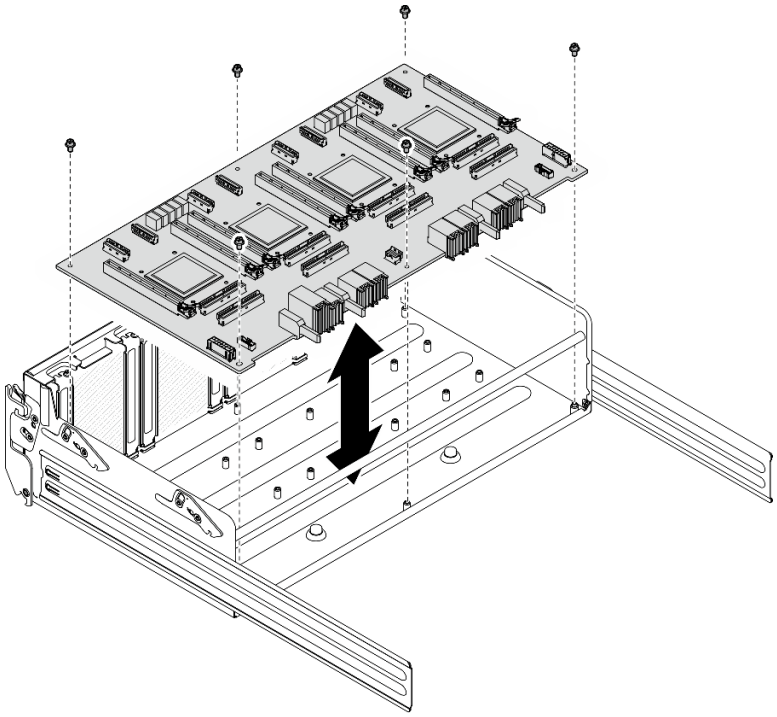


Figure 162. PCIe switch board removal

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 33 and “Safety inspection checklist” on page 34 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 shuttle.

Step 2. Fasten the six screws to secure the PCIe switch board.

Note: 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.

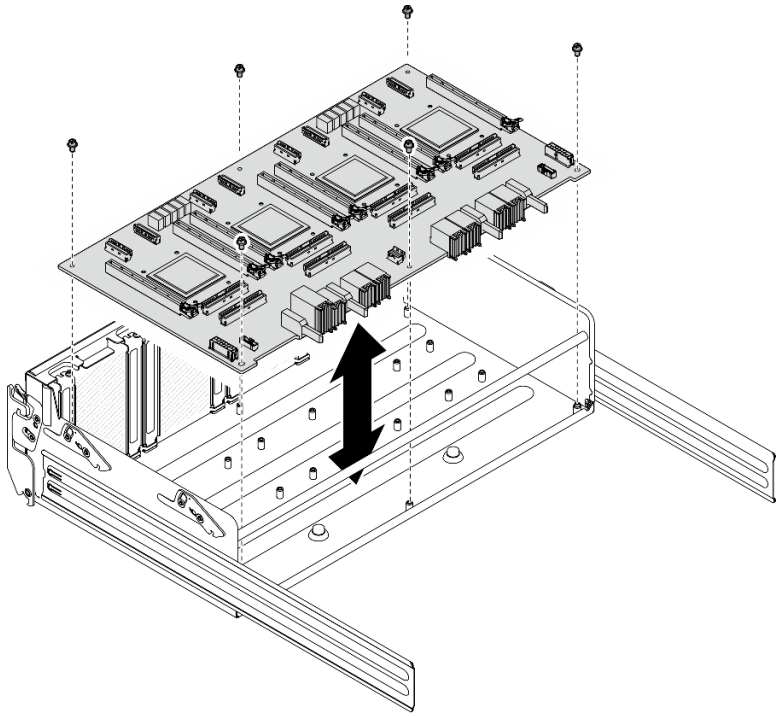


Figure 163. PCIe switch board installation

After you finish

1. Reinstall all the PCIe switch board heat sinks. See “Install a PCIe switch board heat sink” on page 185.
2. Reinstall all the lower PCIe adapters. See “Install a lower PCIe adapter” on page 175.
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 255.

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 33 and “Safety inspection checklist” on page 34 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.

Note: Before installing the PCIe switch board heat sinks, make sure you have four pieces of thermal grease.

Procedure

Step 1. Apply a blob of new thermal grease (0.3 ml) onto the center of the heat spreader.

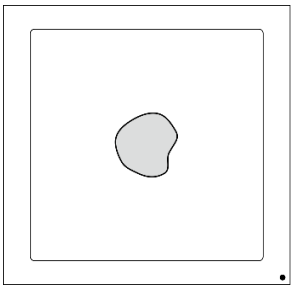


Figure 164. Thermal grease application

Step 2. Install the PCIe switch board heat sink.

a. ❶ Align the heat sink with the four screw holes on the PCIe switch board; then, gently place the heat sink onto the PCIe switch board.

b. ❷ Follow the screw sequence specified on the heat-sink label, and turn the four screws clockwise a few turns until the screw threads engage in the PCIe switch board.

c. ❷ Follow the screw sequence specified on the heat-sink label, and fully tighten the four screws to secure the heat sink.

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.

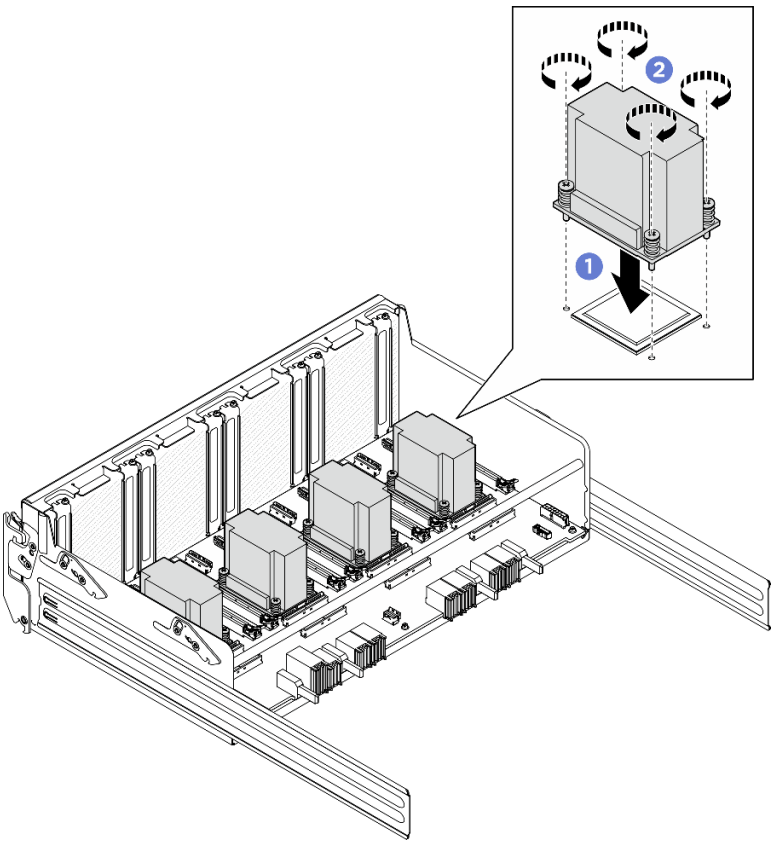


Figure 165. PCIe switch board heat sink installation

After you finish

1. Reinstall all the lower PCIe adapters. See “Install a lower PCIe adapter” on page 175.
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 255.

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 33 and “Safety inspection checklist” on page 34 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 41.
- Anti-static gloves are recommended as a precaution while disconnecting cables from the PCIe switch board.

Procedure

Step 1. Pull the PCIe switch shuttle to the first stop position.

a. ❶ Press the two blue release latches.

b. ❷ Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.

c. ❸ Pull the PCIe switch shuttle forward to the first stop position.

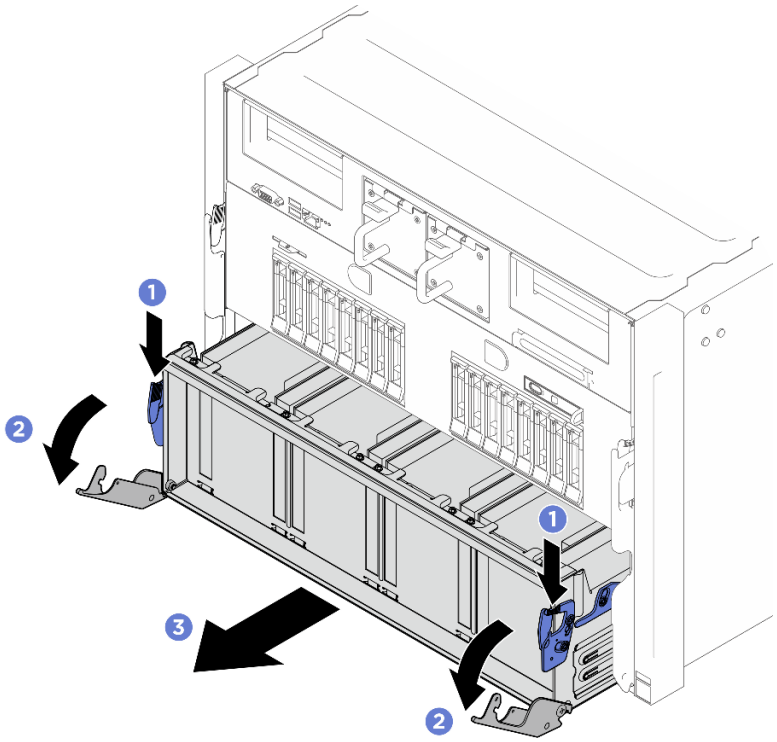


Figure 166. Pulling the PCIe switch shuttle to the first stop position

Step 2. Pull the PCIe switch shuttle to the second stop position.

a. ❶ Press the two front lock latches on both sides of the PCIe switch shuttle.

b. ❷ Pull the PCIe switch shuttle forward to the second stop position.

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

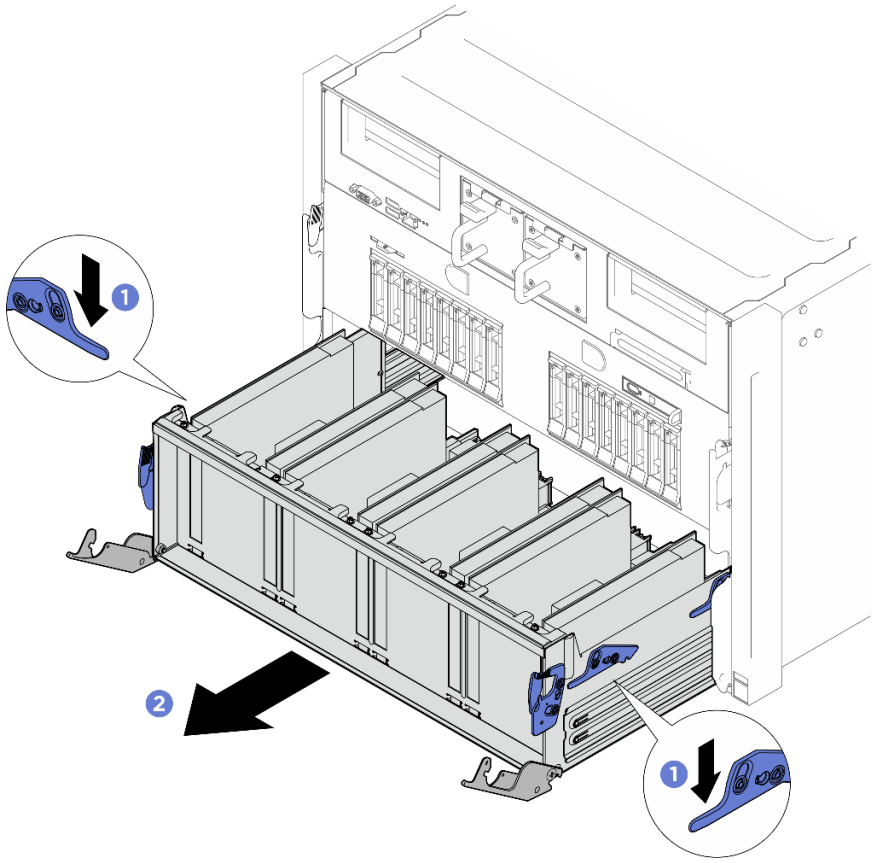


Figure 167. Pulling the PCIe switch shuttle to the second stop position

Step 3. Disconnect the cables from the PCIe switch board.

Step 4. Remove the PCIe switch shuttle.

a. ❶ Press the two rear lock latches on both sides of the PCIe switch shuttle.

b. ❷ Slide the PCIe switch shuttle fully forward and remove it from the system shuttle.

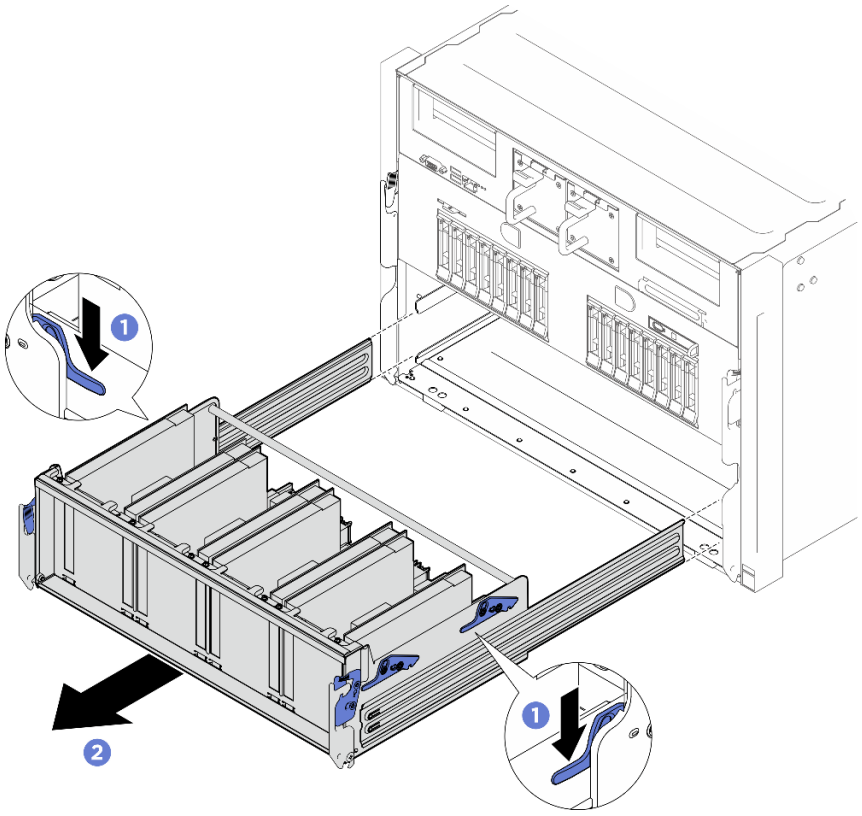


Figure 168. PCIe switch shuttle removal

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 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 33 and "Safety inspection checklist" on page 34 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. Align the PCIe switch shuttle with the opening in the front of the system shuttle, and slide it into the system shuttle until it snaps into place at the second stop position.

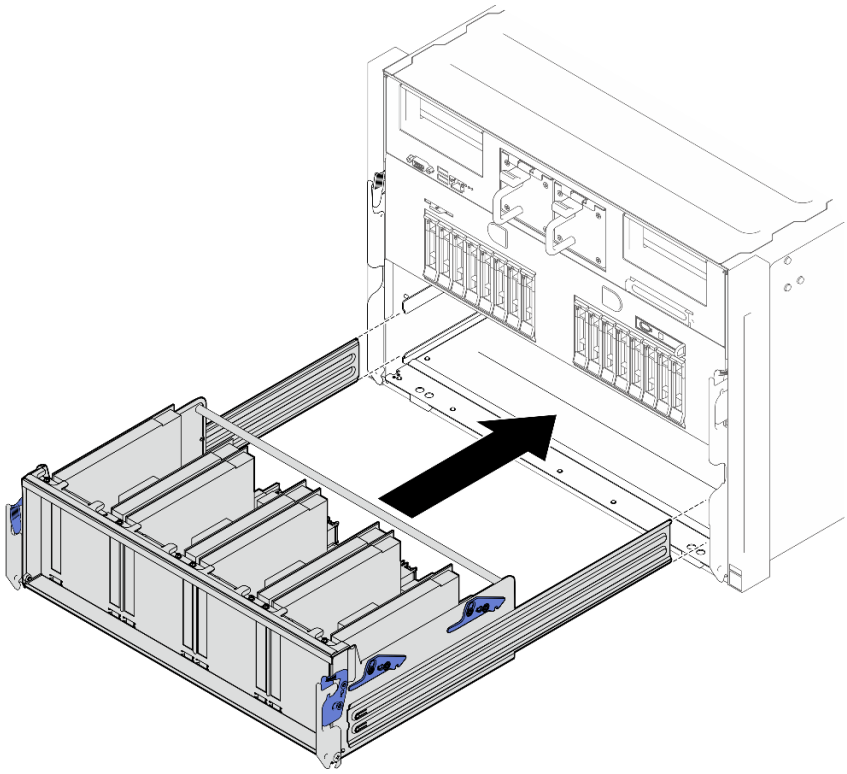


Figure 169. Sliding the PCIe switch shuttle to the second stop position

Step 2. Connect the cables to the PCIe switch board. See below for more information.

- “2.5-inch drive backplane cable routing” on page 262
- “PCIe switch board cable routing” on page 274

Step 3. Slide the PCIe switch shuttle to the first stop position.

a. ❶ Rotate the two release levers until they are perpendicular to the PCIe switch shuttle.

b. ❷ Press the two rear lock latches on both sides of the PCIe switch shuttle.

c. ❸ Slide the PCIe switch shuttle into the system shuttle until it stops at the first stop position.

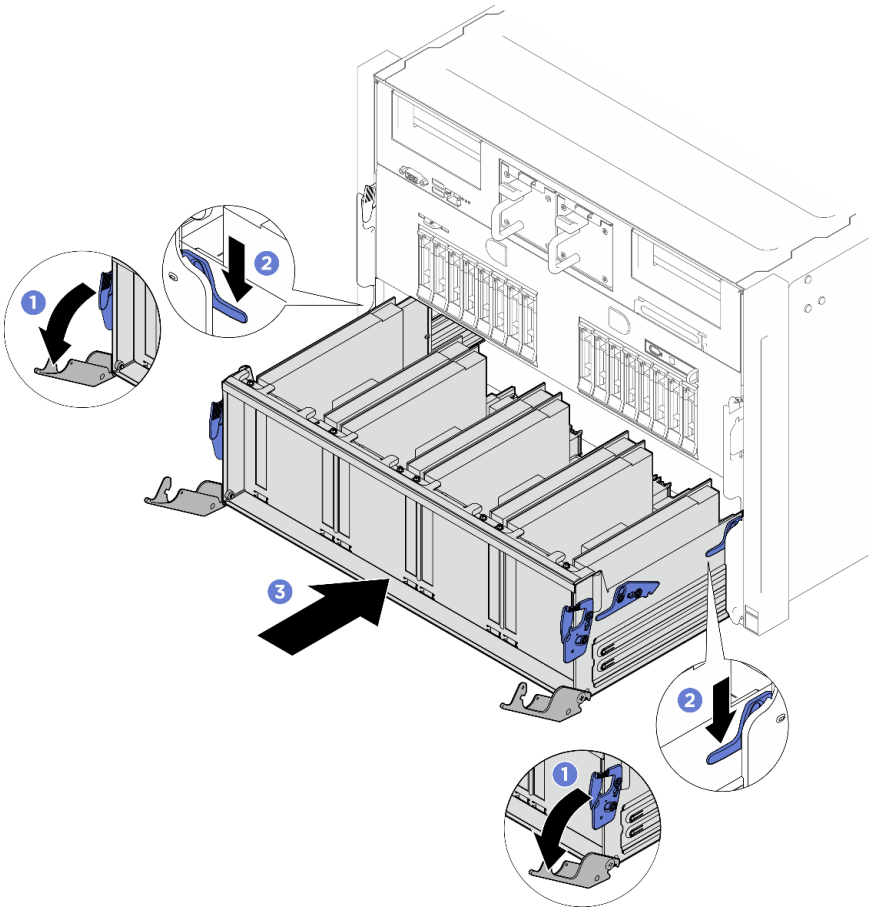


Figure 170. Sliding the PCIe switch shuttle to the first stop position

Step 4. Push the PCIe switch shuttle fully into the system shuttle.

a. ❶ Press the two front lock latches on both sides of the PCIe switch shuttle.

b. ❷ Push the PCIe switch shuttle fully into the system shuttle.

c. ❸ Rotate the two release levers until they lock into place.

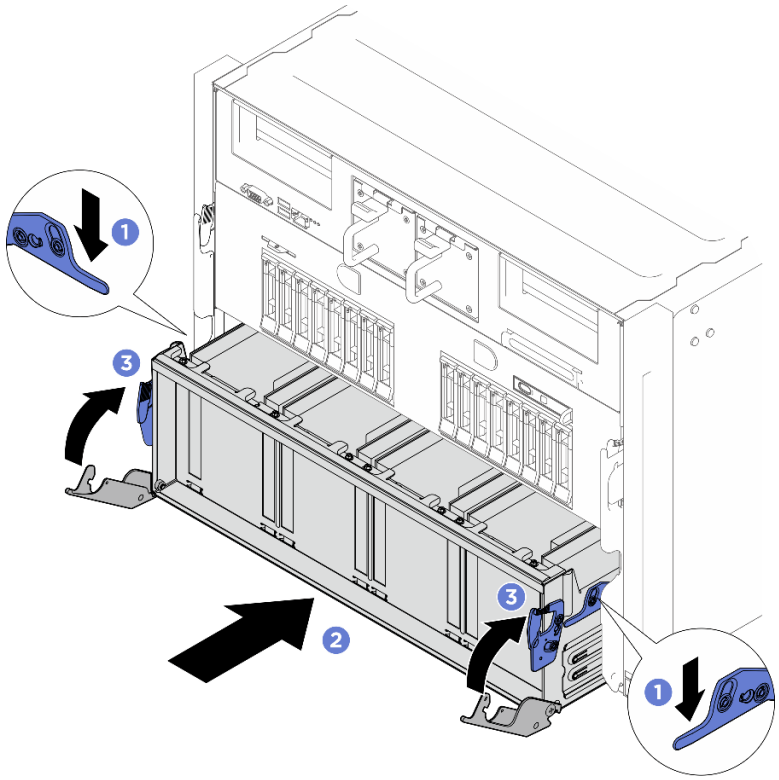


Figure 171. PCIe switch shuttle installation

After you finish

Complete the parts replacement. See “Complete the parts replacement” on page 255.

PCIe switch shuttle release levers replacement

Follow instructions in this section to remove and install the PCIe switch shuttle release levers.

Remove the PCIe switch shuttle release levers

Follow instructions in this section to remove the PCIe switch shuttle release levers.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.

Procedure

Step 1. Pull the PCIe switch shuttle to the first stop position.

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 to the first stop position.

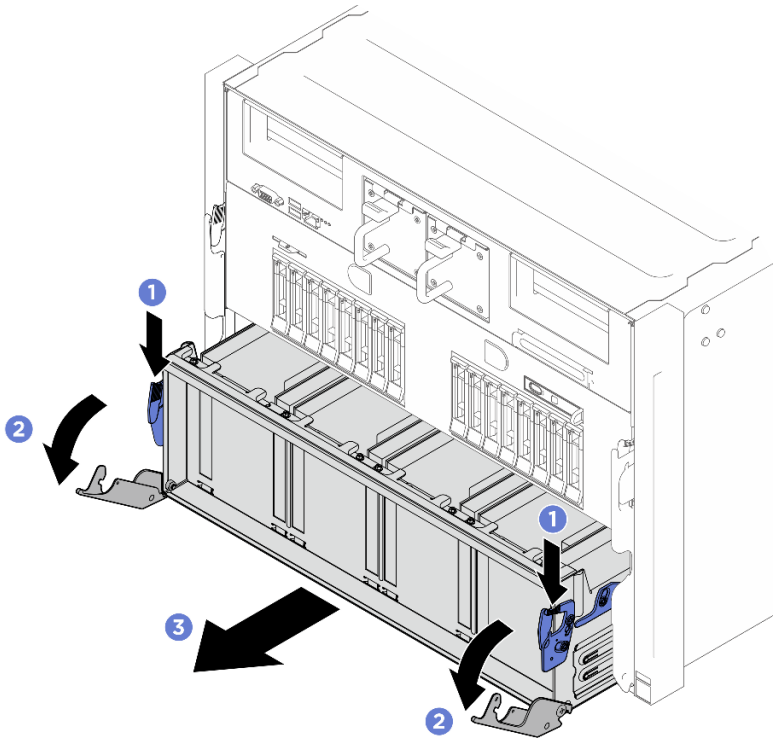


Figure 172. Pulling the PCIe switch shuttle to the first stop position

Step 2. Remove the PCIe switch shuttle release levers.

a. Unfasten the screw on the release lever to remove it from the PCIe switch shuttle.

b. Repeat to remove the other release lever.

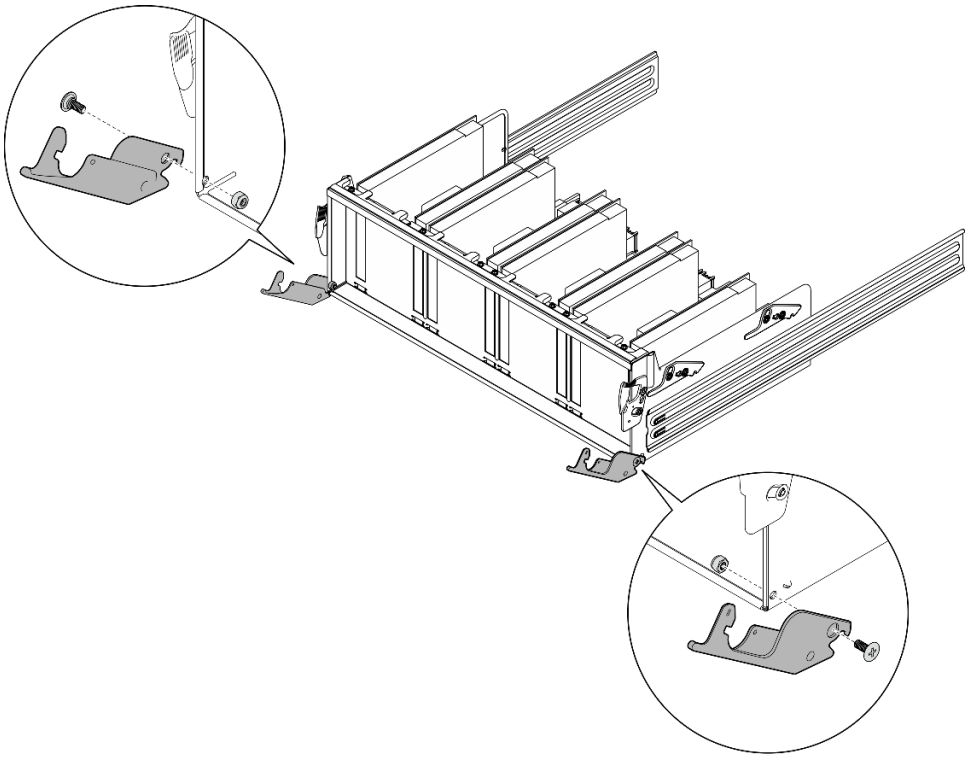


Figure 173. Release lever removal

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 shuttle release levers

Follow instructions in this section to install the PCIe switch shuttle release levers.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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. Install the PCIe switch shuttle release levers.

a. Fasten the screw to secure the release lever to the PCIe switch shuttle.

b. Repeat to install the other release lever.

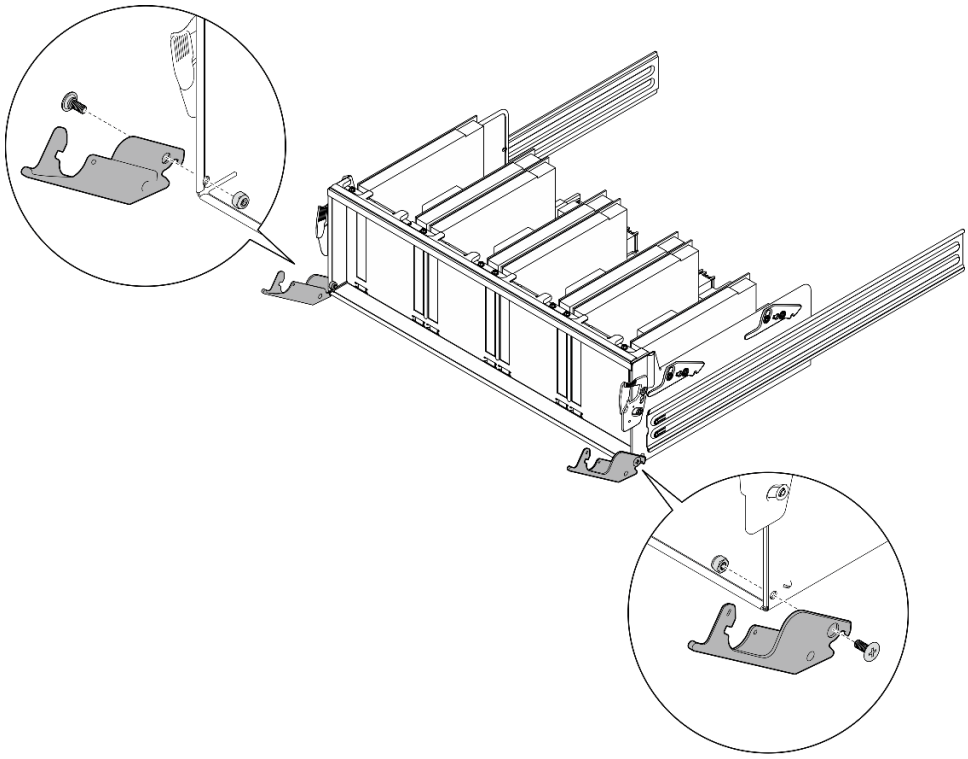


Figure 174. Release lever installation

Step 2. Push the PCIe switch shuttle fully into the system shuttle.

a. ❶ Press the two front lock latches on both sides of the PCIe switch shuttle.

b. ❷ Push the PCIe switch shuttle fully into the system shuttle.

c. ❸ Rotate the two release levers until they lock into place.

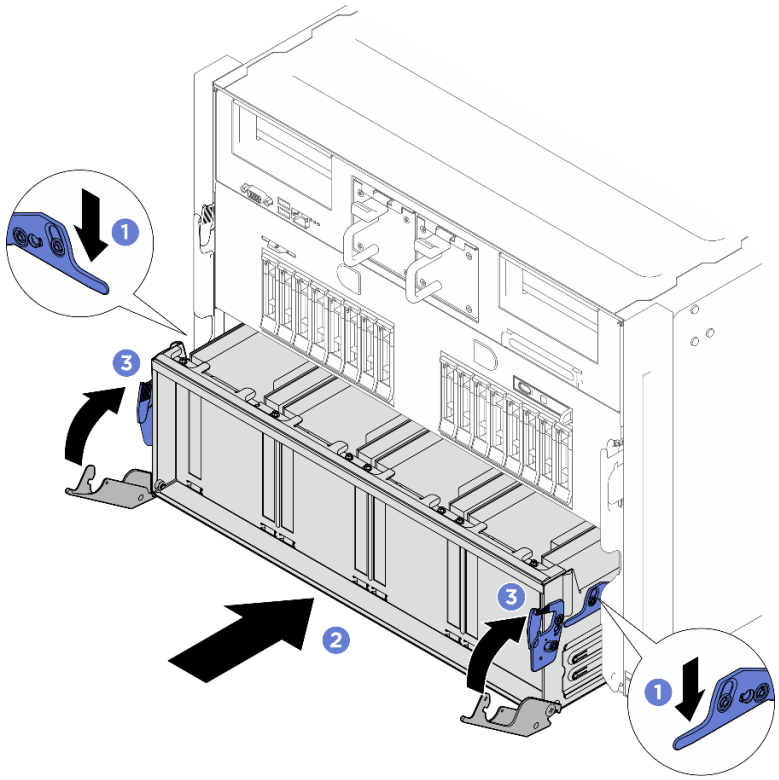


Figure 175. PCIe switch shuttle installation

After you finish

Complete the parts replacement. See “Complete the parts replacement” on page 255.

PCIe riser air baffle replacement (trained technician only)

Follow instructions in this section to remove and install a PCIe riser 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 a PCIe riser air baffle

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

About this task

S012

CAUTION:
Hot surface nearby.

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.

Procedure

Step 1. Make preparation for this task.

a. Pull the system shuttle to the stop position.

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

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the system shuttle to its stop position.

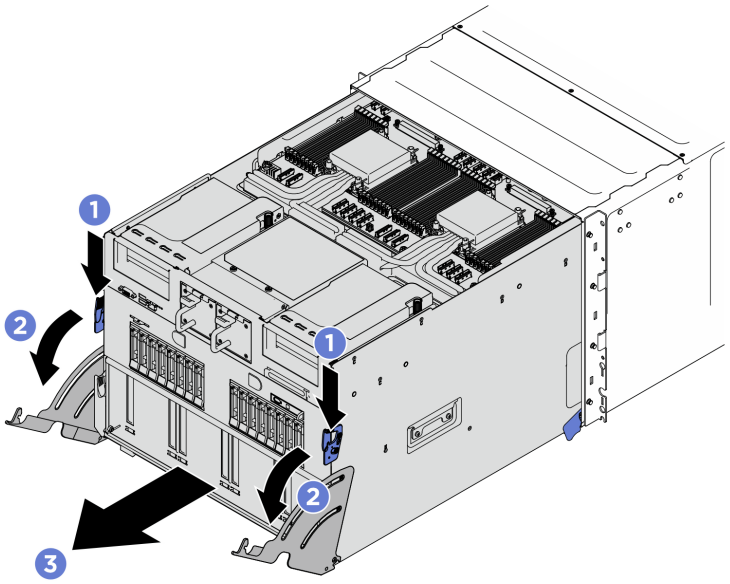


Figure 176. Pulling the system shuttle to the stop position

b. Remove the PCIe riser assembly. See “Remove a PCIe riser assembly” on page 201.

Step 2. Remove the PCIe riser air baffle.

a. Unfasten the two screws that secures the PCIe riser air baffle to the PCIe riser.

b. Grasp the PCIe riser air baffle and carefully pull it out.

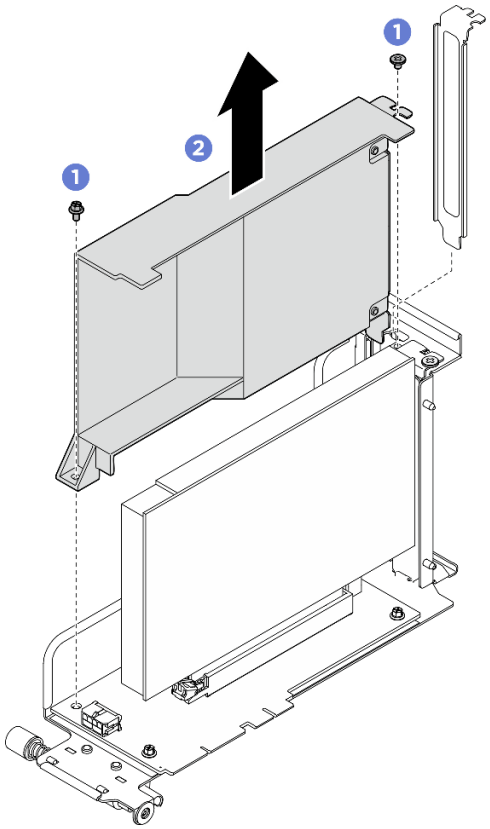


Figure 177. PCIe riser air baffle removal

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 a PCIe riser air baffle

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

S012

CAUTION:
Hot surface nearby.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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.
- Install the PCIe riser air baffle when ThinkSystem NVIDIA BlueField-3 B3220 VPI QSFP112 2P 200G PCIe Gen5 x16 Adapter is installed in the system.

Procedure

Step 1. ❶ Insert the PCIe riser air baffle into the PCIe riser.

Step 2. ❷ Fasten the two screws to secure the PCIe riser air baffle.

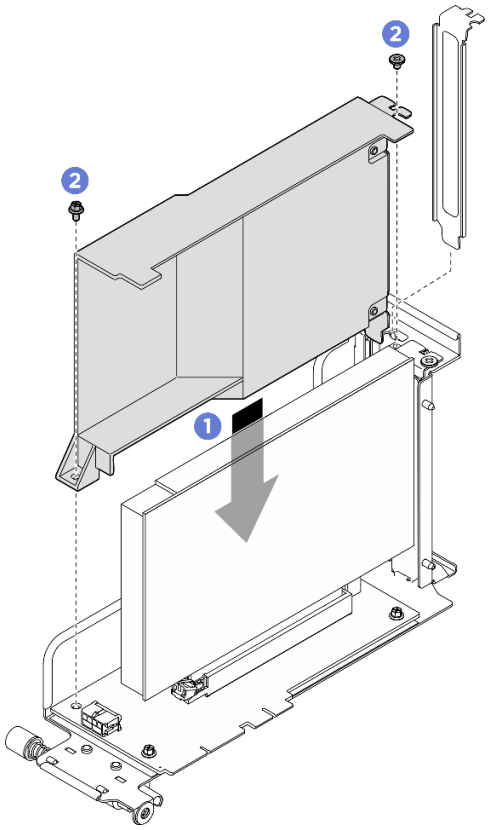


Figure 178. PCIe riser air baffle installation

After you finish

1. Reinstall the PCIe riser assembly. See "Install a PCIe riser assembly" on page 205.
2. Push the system shuttle fully into the chassis.
   a. ❶ Lift the two lock latches on both sides of the shuttle.
   b. ❷ Slide the shuttle into the chassis.
   c. ❸ Push the shuttle fully into the chassis.
   d. ❹ Rotate the two release levers until they lock into place.

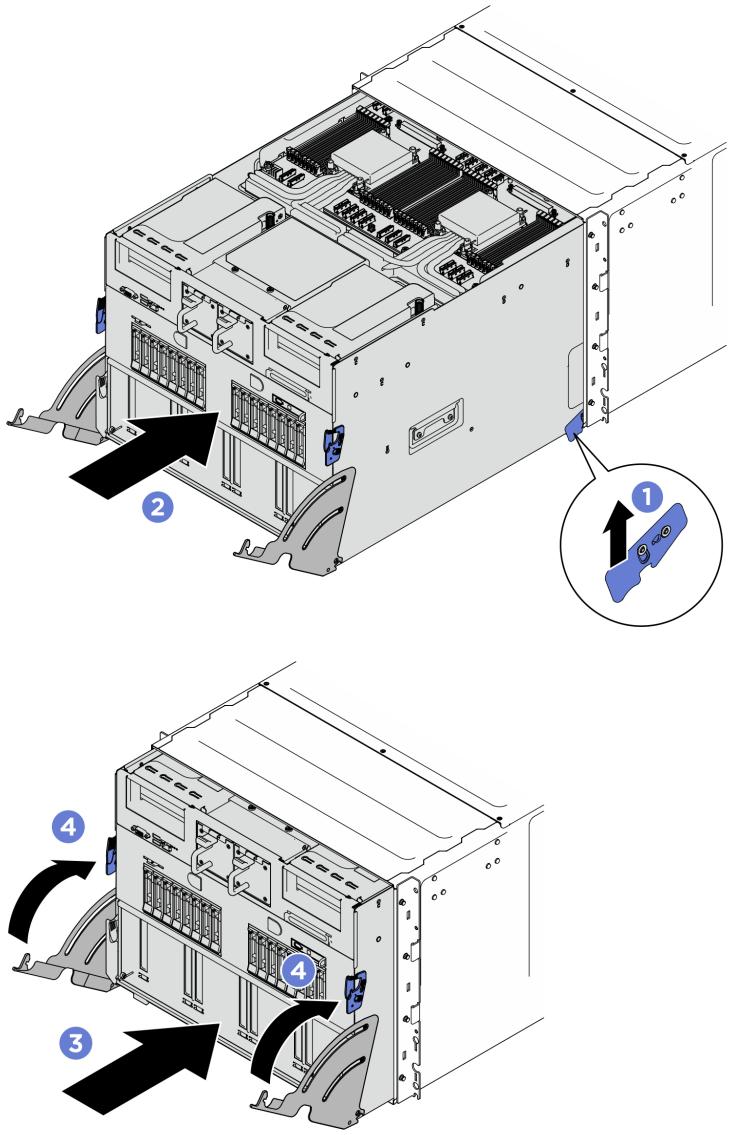


Figure 179. System shuttle installation

3. Complete the parts replacement. See “Complete the parts replacement” on page 255.

PCIe riser assembly replacement (trained technician only)

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

Remove a PCIe riser assembly

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.
- The server support up to two PCIe risers, see the following illustration for corresponding locations.

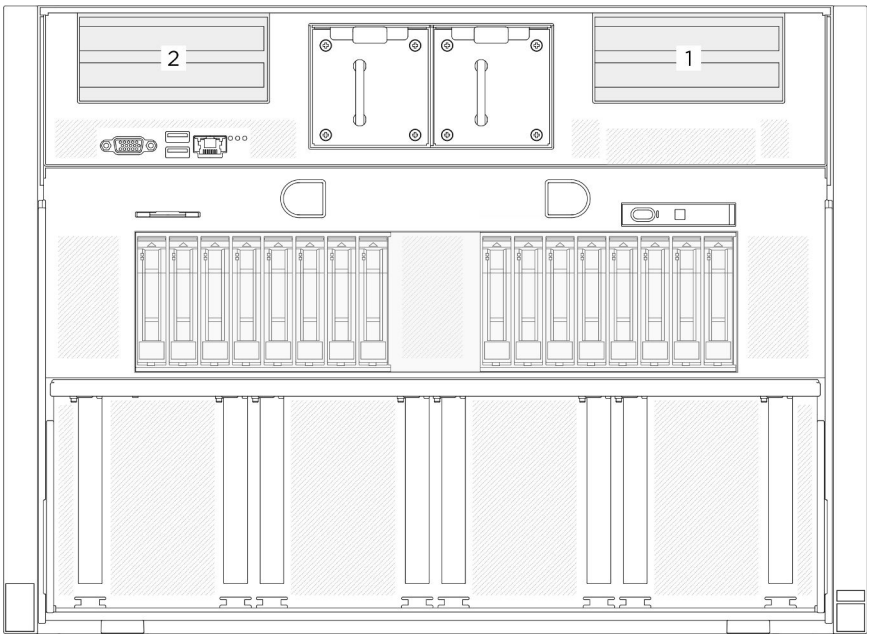


Figure 180. PCIe riser locations

Notes:

- To maintain proper system cooling, do not operate the server without a PCIe riser or a riser filler installed in the system.
- The PCIe riser assembly might look different from the illustration.

Procedure

Step 1. Pull the system shuttle to the stop position.

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

   Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the PCIe switch shuttle to its stop position.

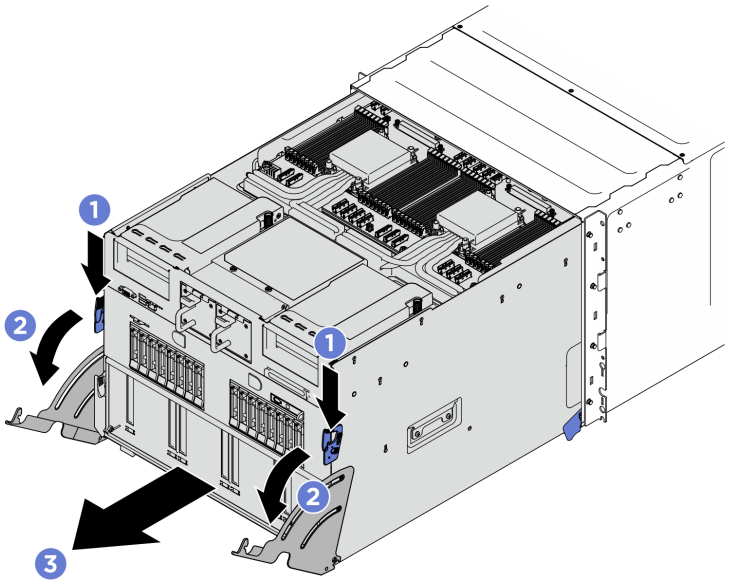


Figure 181. Pulling the system shuttle to the stop position

Step 2. Slightly lift the PCIe riser assembly, and disconnect the cables from the assembly.

Step 3. Remove the PCIe riser assembly.

a. ❶ Unfasten the thumbscrew on the PCIe riser.

b. ❷ Lift the PCIe riser assembly out of the FIO/PCI cage.

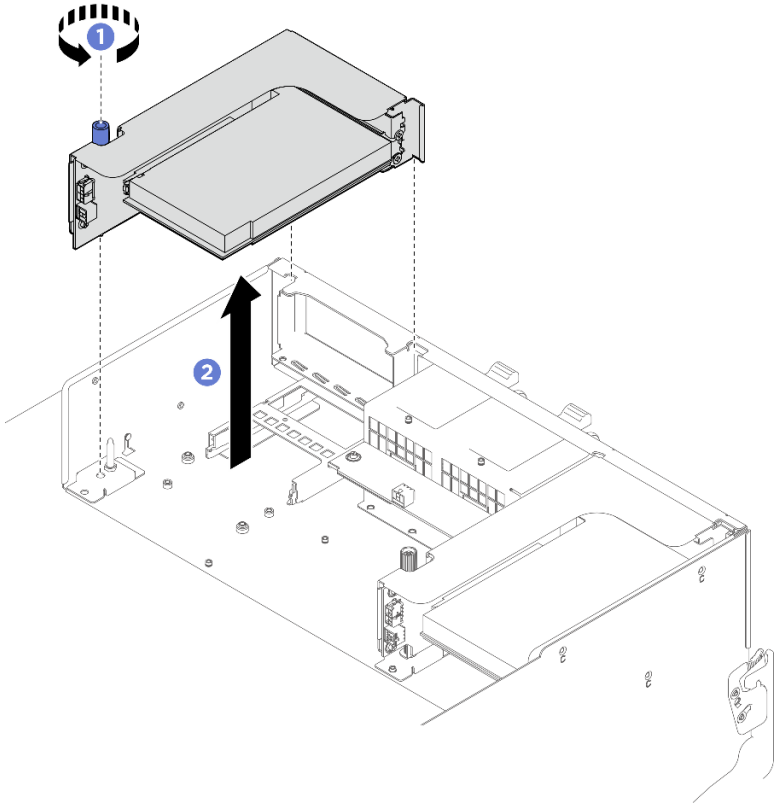


Figure 182. PCIe riser assembly removal

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. (Optional) If the PCIe riser air baffle is installed, remove it.
      1) ❶ Unfasten the two screws that secures the PCIe riser air baffle to the PCIe riser.
      2) ❷ Grasp the PCIe riser air baffle and carefully pull it out.

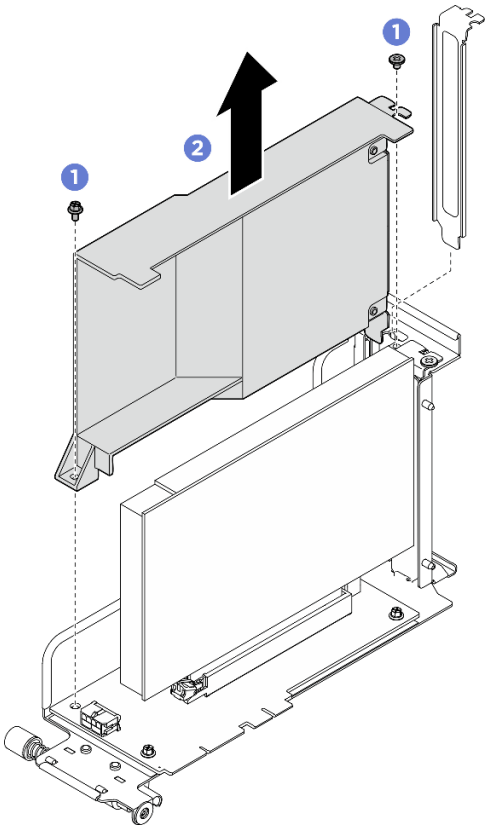


Figure 183. PCIe riser air baffle removal

   b. Remove the PCIe adapter from the PCIe riser.
      1) ❶ Unfasten the screw that secures the PCIe adapter to the PCIe riser.
      2) ❷ Grasp the PCIe adapter by its edges and carefully pull it out of the PCIe slot.

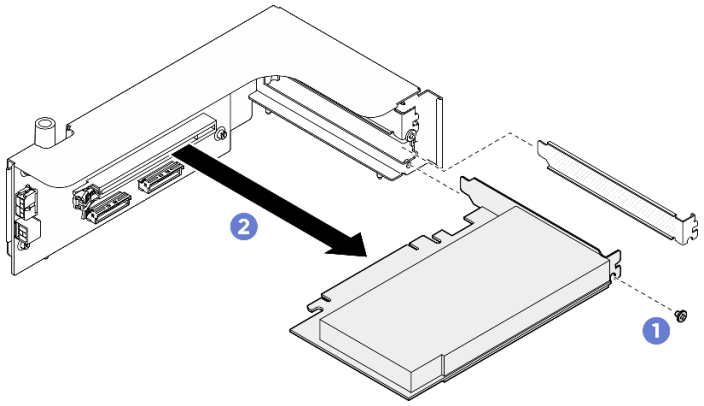


Figure 184. PCIe adapter removal

c. Unfasten the screws to remove the PCIe riser card from the PCIe riser cage.

Note: Depending on the configuration, unfasten three or four screws on the PCIe riser card.

PCIe riser without PCIe riser air baffle	PCIe riser with PCIe riser air baffle

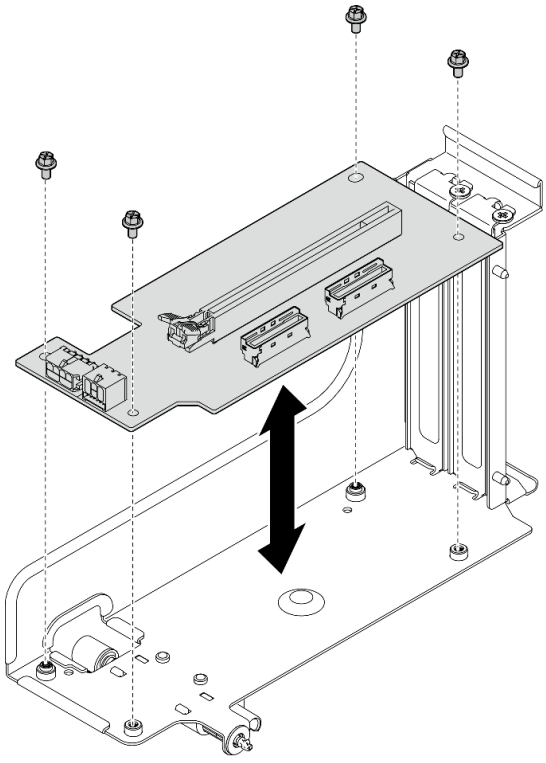
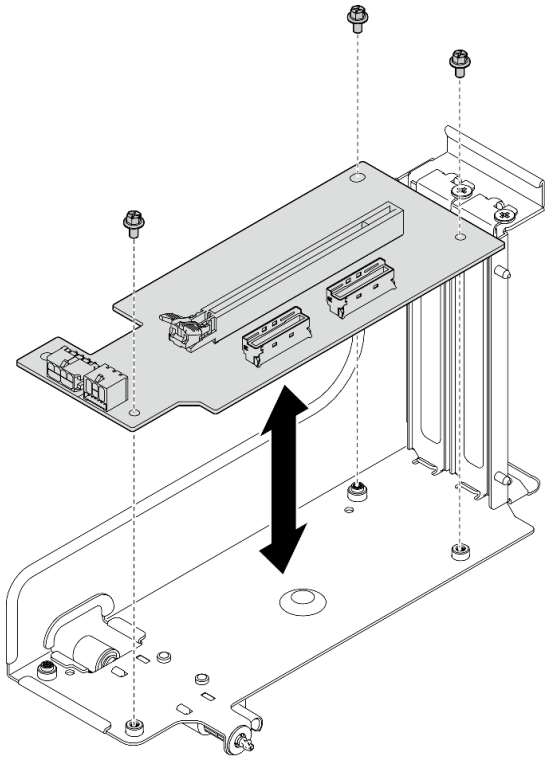

	

Figure 185. PCIe riser card removal	*Figure 186. PCIe riser card removal*

d. Recycle the component in compliance with local regulations.

Install a PCIe riser assembly

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

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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.

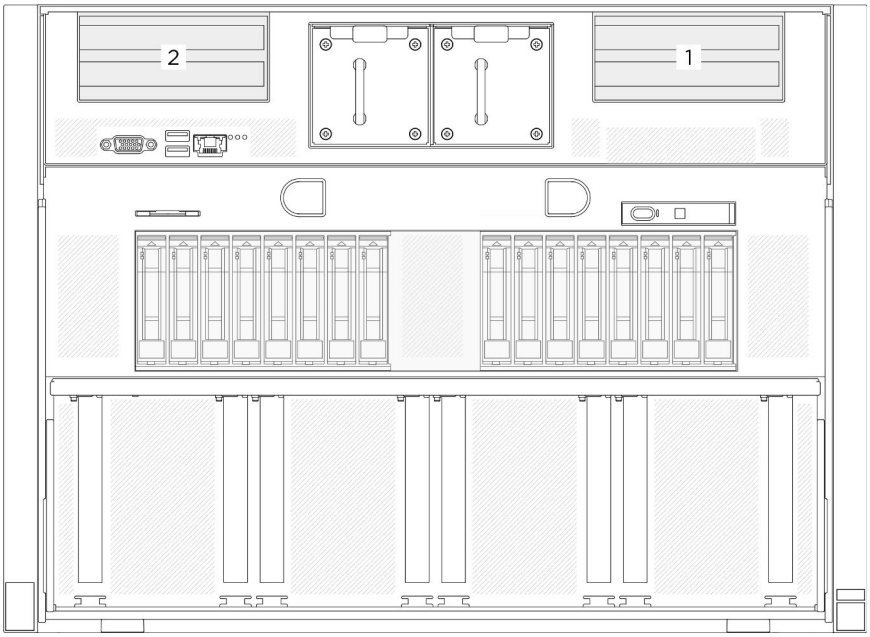


Figure 187. PCIe riser locations

Note: The PCIe riser assembly might look different from the illustration.

Procedure

Step 1. If necessary, attach the labels to both ends of the cable(s).

a. ❶ Attach the white space portion of the label to one end of the cable.

b. ❷ 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.

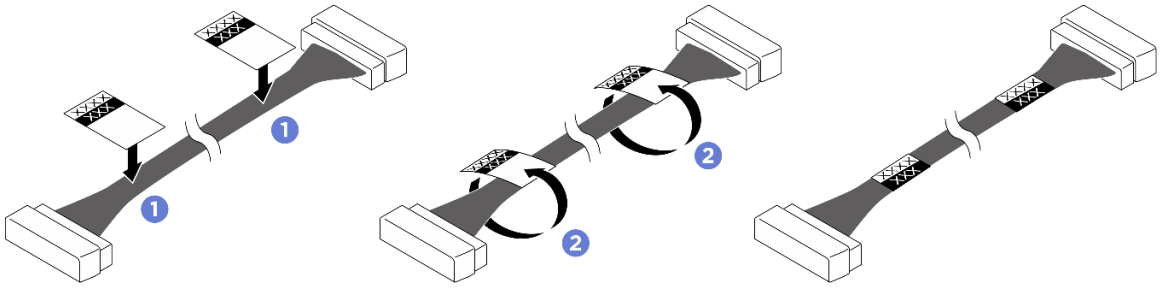


Figure 188. Label application

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

From	To	Label
PCIe riser 1 signal connector (MCIO 1)	System board: PCIe Riser 1 signal connectors (MCIO8A)	R1 MCIO 1 MCIO 8A
PCIe riser 1 signal connector (MCIO 2)	System board: PCIe Riser 1 signal connectors (MCIO8B)	R1 MCIO 2 MCIO 8B
PCIe Riser 1 power connector (RISER PWR)	System board: PCIe Riser 1 power and sideband connector (BP PWR/SIG 3)	R1 PWR SIG 3
PCIe riser 2 signal connector (MCIO 1)	System board: PCIe Riser 2 signal connectors (MCIO4B)	R2 MCIO 1 MCIO 4B
PCIe riser 2 signal connector (MCIO 2)	System board: PCIe Riser 2 signal connectors (MCIO4A)	R2 MCIO 2 MCIO 4A
PCIe Riser 2 power connector (RISER PWR)	System board: PCIe Riser 2 power and sideband connector (BP PWR/SIG 2)	R2 PWR SIG 2

Step 2. Install the PCIe riser assembly.

a. 1 Align the guide hole on the PCIe riser with the guide post on the shuttle; then, lower the PCIe riser assembly into the shuttle.

b. 2 Fasten the thumbscrew to secure the PCIe riser assembly.

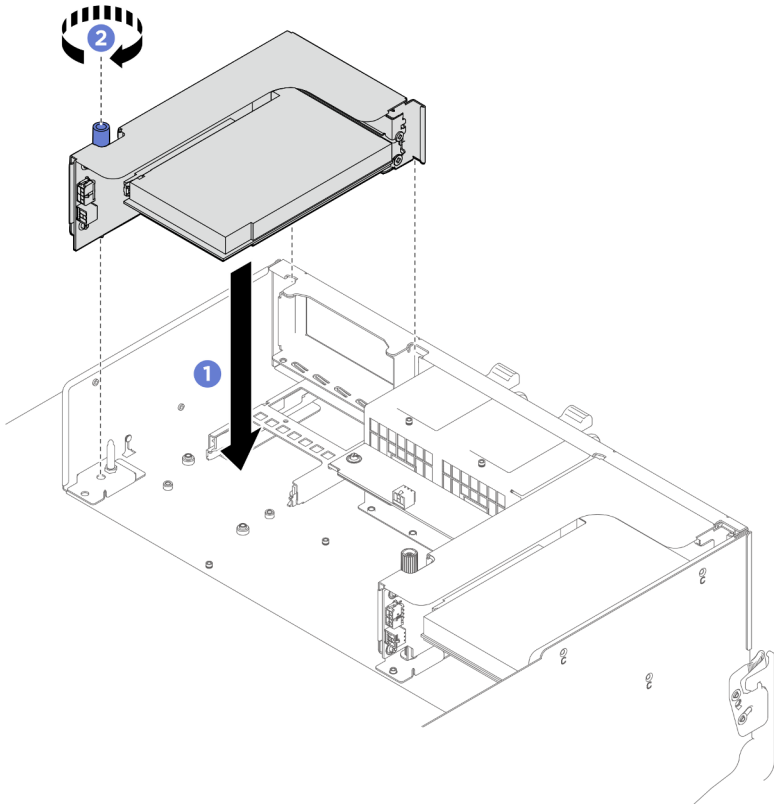


Figure 189. PCIe riser assembly installation

Step 3. Push the system shuttle fully into the chassis.

a. ❶ Lift the two lock latches on both sides of the shuttle.

b. ❷ Slide the shuttle into the chassis.

c. ❸ Push the shuttle fully into the chassis.

d. ❹ Rotate the two release levers until they lock into place.

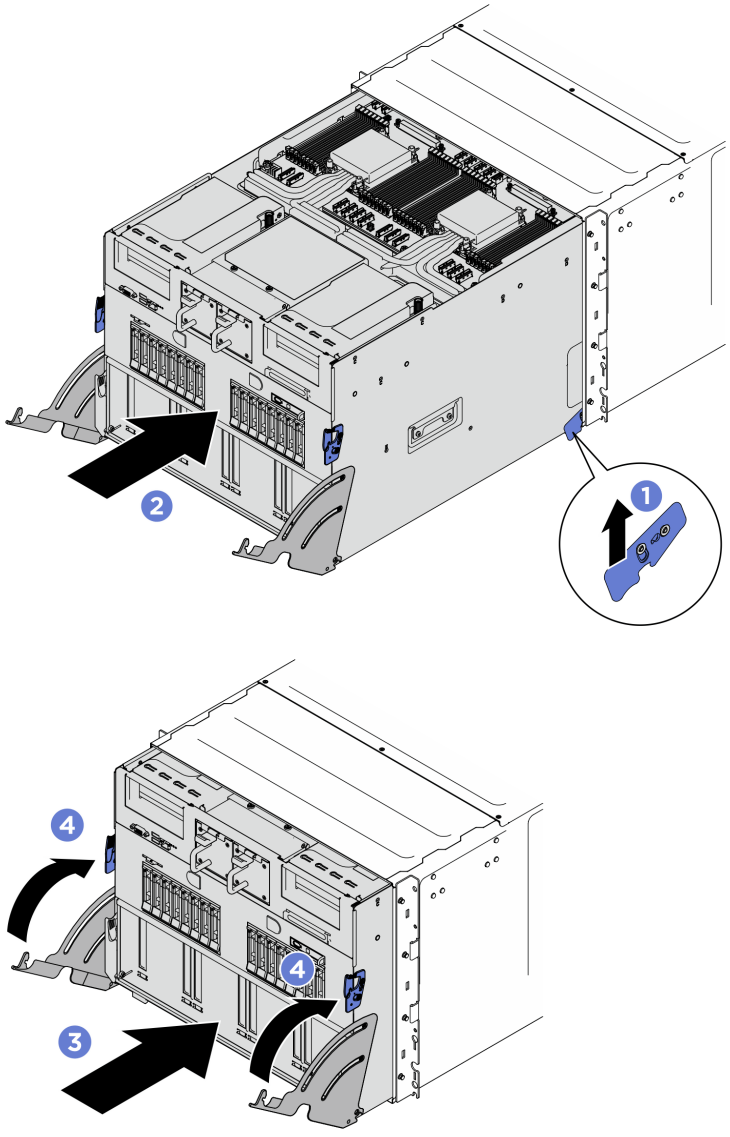


Figure 190. System shuttle installation

After you finish

Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 33 and “Safety inspection checklist” on page 34 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 41.
- 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 system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

b. Disconnect all the cables from the PSU interposer.

c. Remove the compute tray. See “Remove the compute tray” on page 74.

d. Disconnect all the cables from the power distribution board.

e. Remove the cable holder frame and baffle assembly. See “Remove the cable holder frame and baffle assembly” on page 70.

Step 2. Remove the power complex.

a. ❶ Unfasten the six screws marked with **B** on both sides of the system shuttle.

b. ❷ Lift the power complex out of the system shuttle.

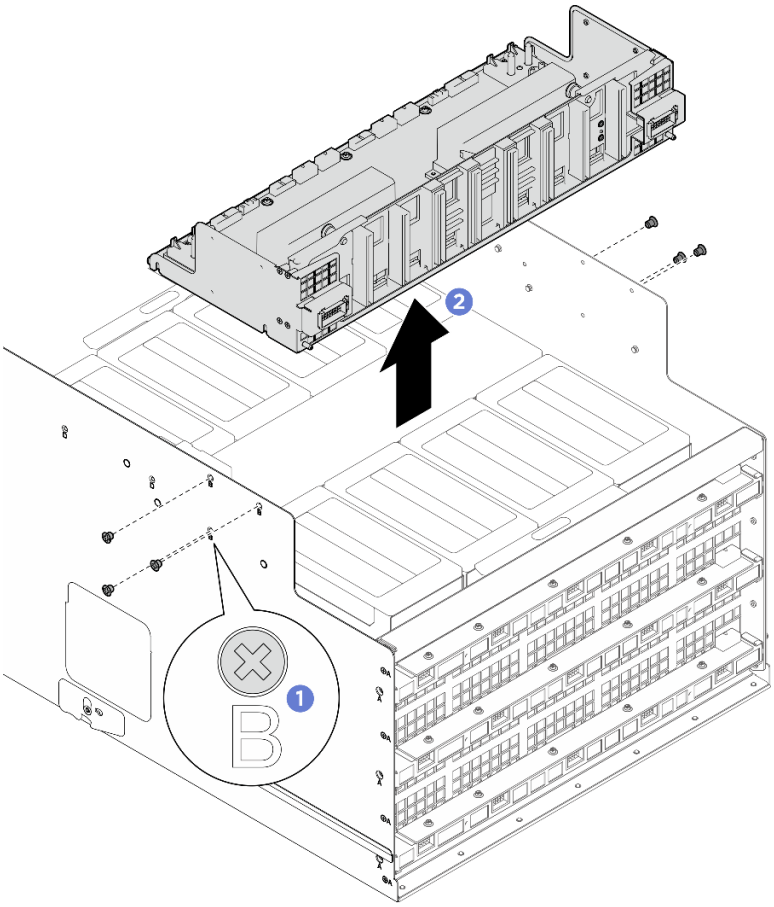


Figure 191. Power complex removal

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 33 and “Safety inspection checklist” on page 34 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 guide pins on the system shuttle; then, lower the power complex into the system shuttle until it is securely engaged.

Step 2. 2 Locate the six screw holes marked with **B** on both sides of the system shuttle; then, fasten the six screws to secure the power complex.

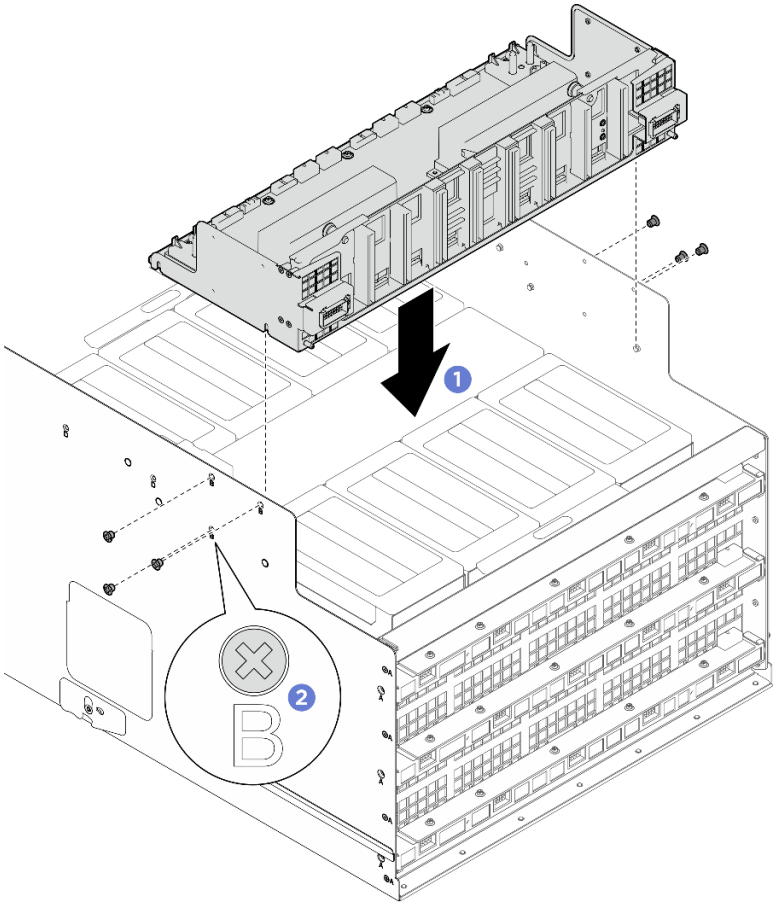


Figure 192. Power complex installation

After you finish

1. Reinstall the cable holder frame and baffle assembly. See “Install the cable holder frame and baffle assembly” on page 72.
2. Connect the cables to the power distribution board. See below for more information.
   - “2.5-inch drive backplane cable routing” on page 262
   - “Fan control board cable routing” on page 267
   - “GPU baseboard cable routing” on page 271
   - “PCIe switch board cable routing” on page 274
3. Reinstall the compute tray. See “Install the compute tray” on page 75.
4. Connect the cables to the PSU interposer. See below for more information.
   - “PSU interposer cable routing” on page 282
   - “Rear auxiliary fan cable routing” on page 283

5. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
6. Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 33 and “Safety inspection checklist” on page 34 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 41.
- 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 system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.
   b. Remove the PSU interposer. See “Remove the PSU interposer” on page 236.

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.

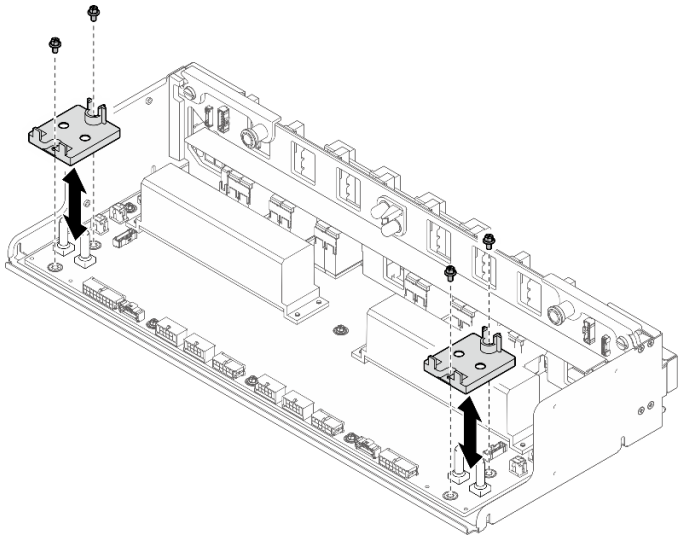


Figure 193. Cable retainer removal

Step 4. Unfasten the ten screws to remove the power distribution board from the tray.

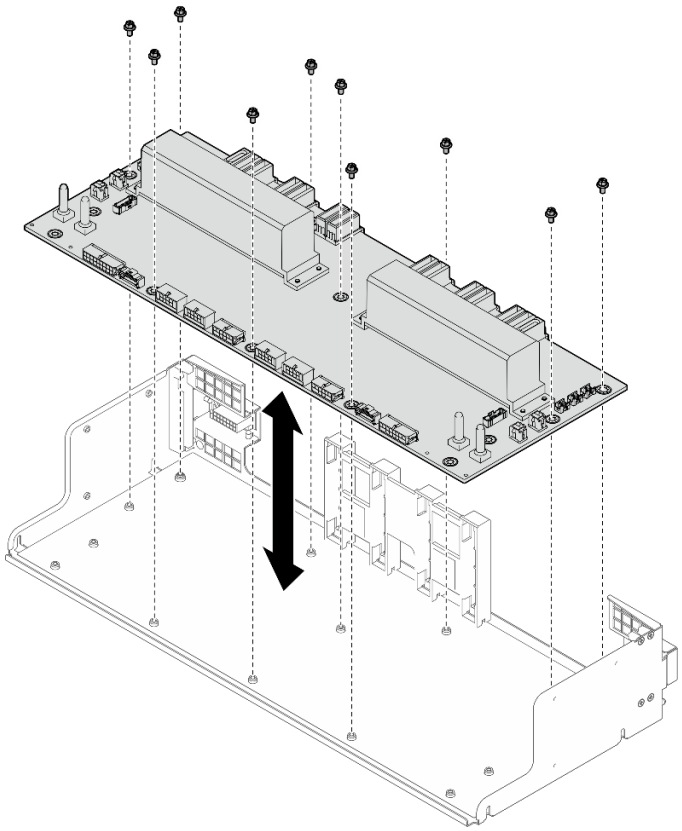


Figure 194. Power distribution board removal

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 33 and “Safety inspection checklist” on page 34 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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 287 for more information on firmware updating tools.

Procedure

Step 1. Align the power distribution board with the standoffs on the tray; then, lower the power distribution board into the tray.

Step 2. Fasten the ten screws to secure the power distribution board.

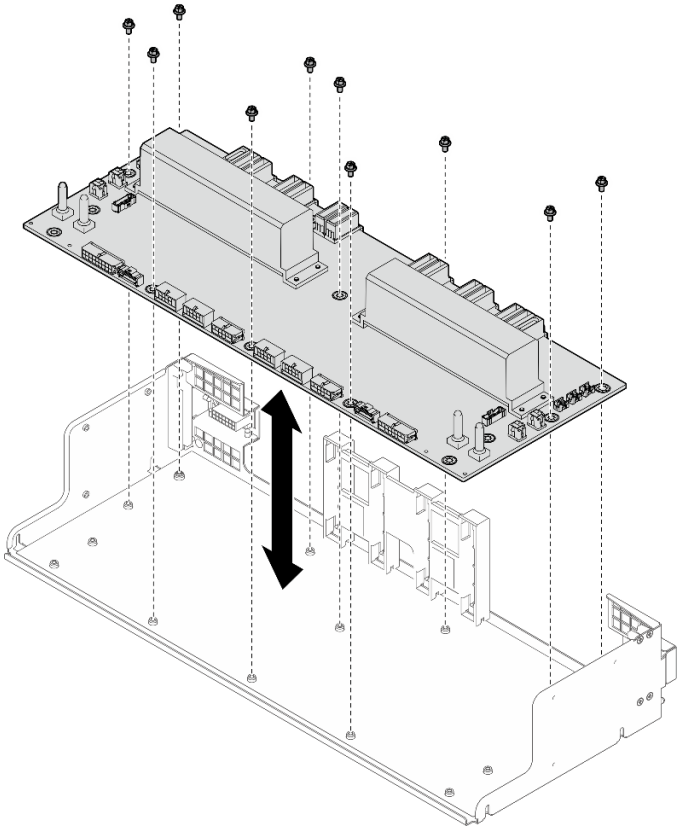


Figure 195. Power distribution board installation

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.

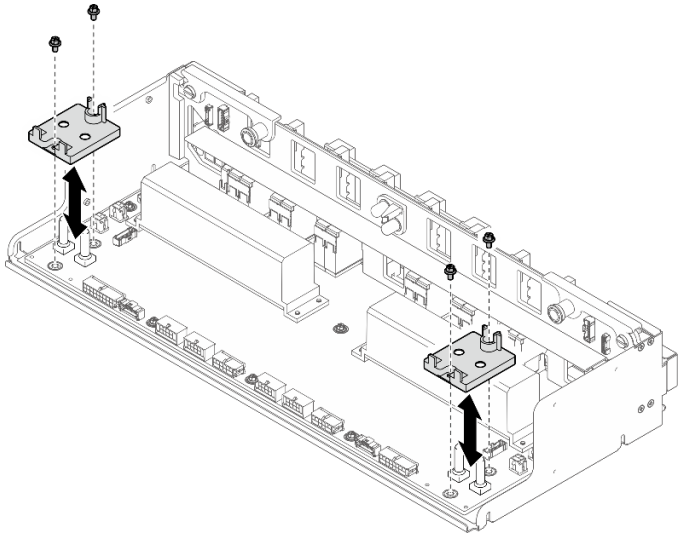


Figure 196. Cable retainer installation

Step 4. Connect the cables to the power distribution board. See below for more information.

- “2.5-inch drive backplane cable routing” on page 262
- “Fan control board cable routing” on page 267
- “GPU baseboard cable routing” on page 271
- “PCIe switch board cable routing” on page 274
- “PSU interposer cable routing” on page 282
- “Rear auxiliary fan cable routing” on page 283

After you finish

1. Reinstall the PSU interposer. See “Install the PSU interposer” on page 237.
2. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
3. Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- Make sure you have a power supply unit filler available if some power supply bays will be left empty after the removal.
- The following illustration shows the power supply bay numbering:

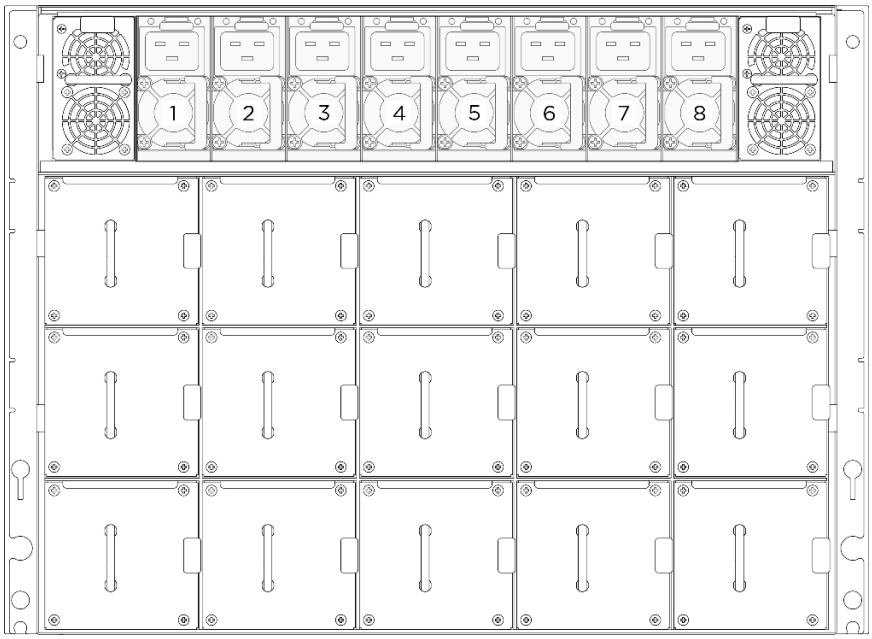


Figure 197. Power supply bay numbering

Procedure

Step 1. ❶ Press and hold the orange release tab.

Step 2. ❷ Grasp the handle, and pull the power supply unit out of the server.

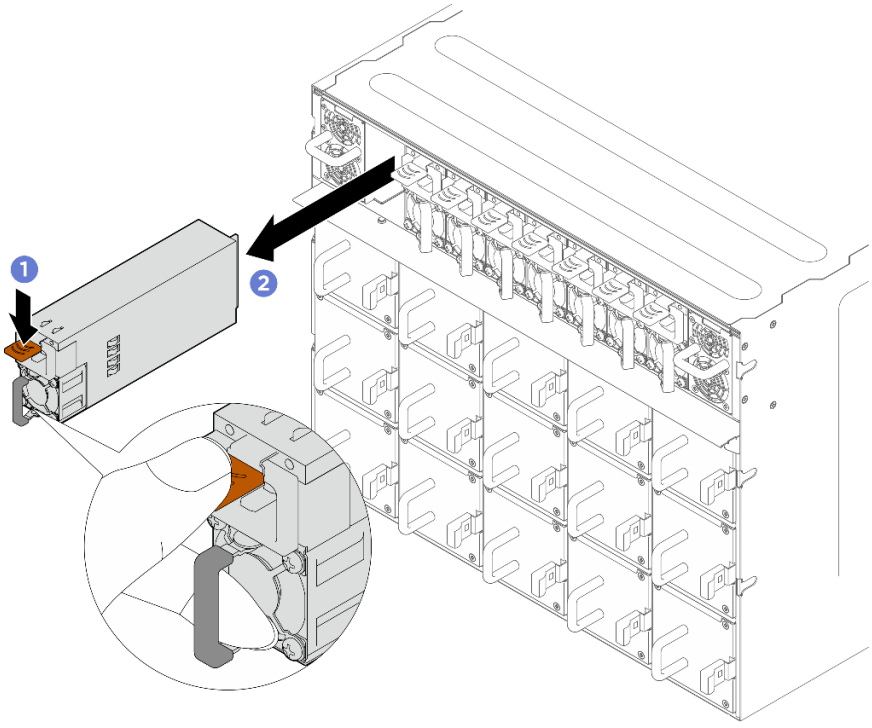


Figure 198. Power supply unit removal

After you finish

1. Install a power supply unit as soon as possible. See “Install a hot-swap power supply unit” on page 218.

   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 33 and “Safety inspection checklist” on page 34 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:

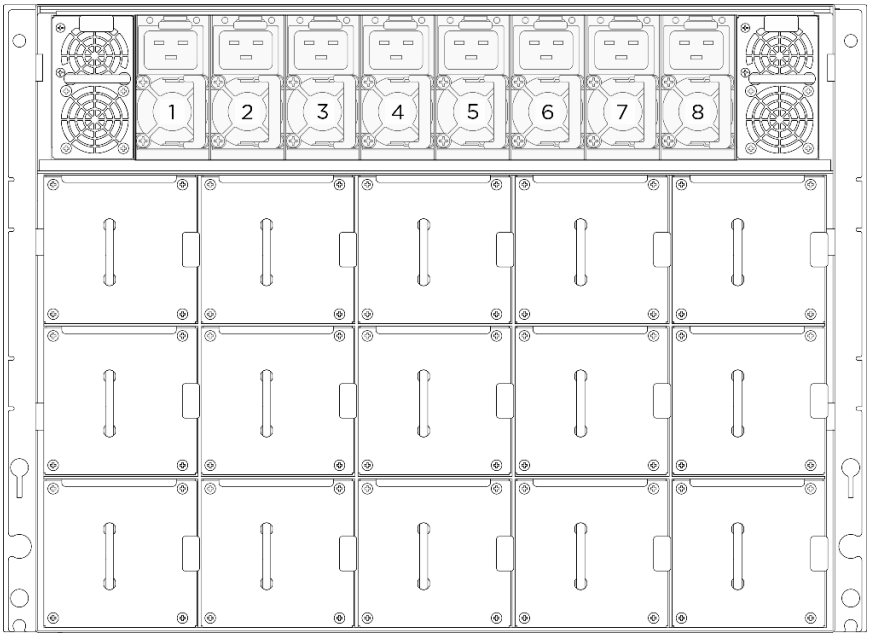


Figure 199. Power supply bay numbering

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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 287 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.

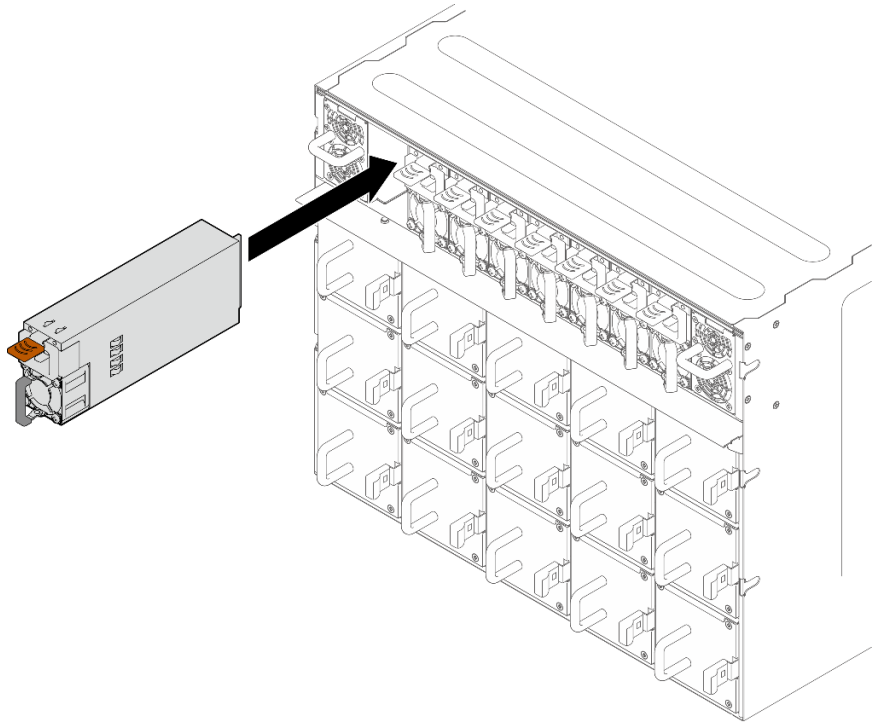


Figure 200. Power supply unit installation

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 255.
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 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.
- Before replacing a processor, check the current PSB fuse policy. See *Service process before replacement* at Service process for updating PSB fuse state.

- 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.

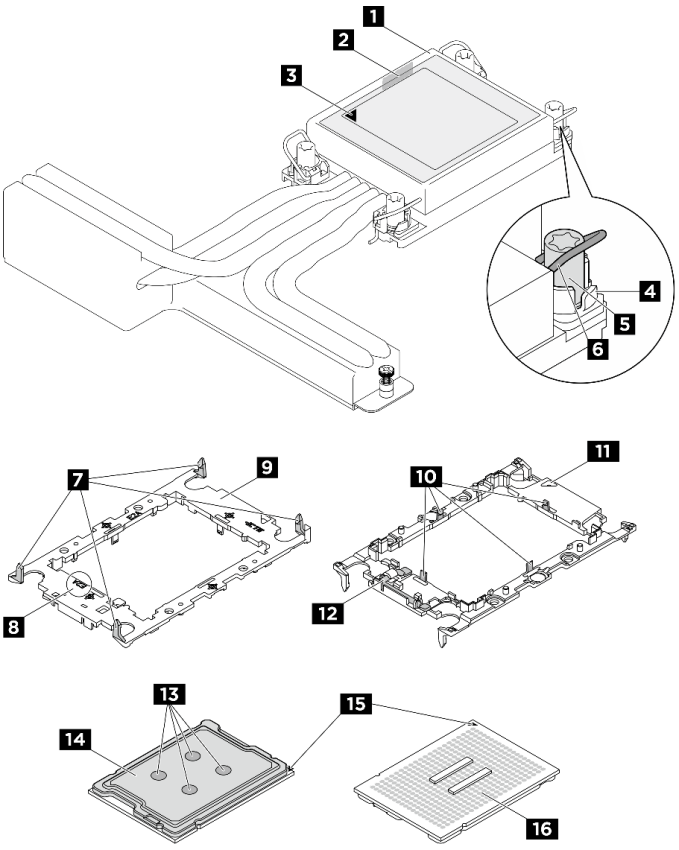


Figure 201. PHM components

1 Heat sink	2 Processor identification label
3 Heat sink triangular mark	4 Nut and wire bail retainer
5 Torx T30 nut	6 Anti-tilt wire bail
7 Clips to secure carrier to a heat sink	8 Processor carrier code marking

9 Processor carrier	10 Clips to secure processor in a carrier
11 Carrier triangular mark	12 Processor ejector handle
13 Thermal grease	14 Processor heat spreader
15 Processor triangular mark	16 Processor contacts

Remove a processor and heat sink

This task has instructions for removing an assembled processor and heat sink, known as a processor-heat-sink module (PHM). This task requires a Torx T30 driver. This 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.

S011

CAUTION:
Sharp edges, corners, or joints nearby.

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.

- 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.
- Each processor socket must always contain a cover or a PHM. When removing or installing a PHM, protect empty processor sockets 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.
- Remove and install only one PHM at a time. If the system supports multiple processors, install the PHMs starting with the first processor socket.

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

- Phillips #1 bit
- Torx T30 bit
- Torque screwdriver

The following illustration shows the components of the processor and heat sink.

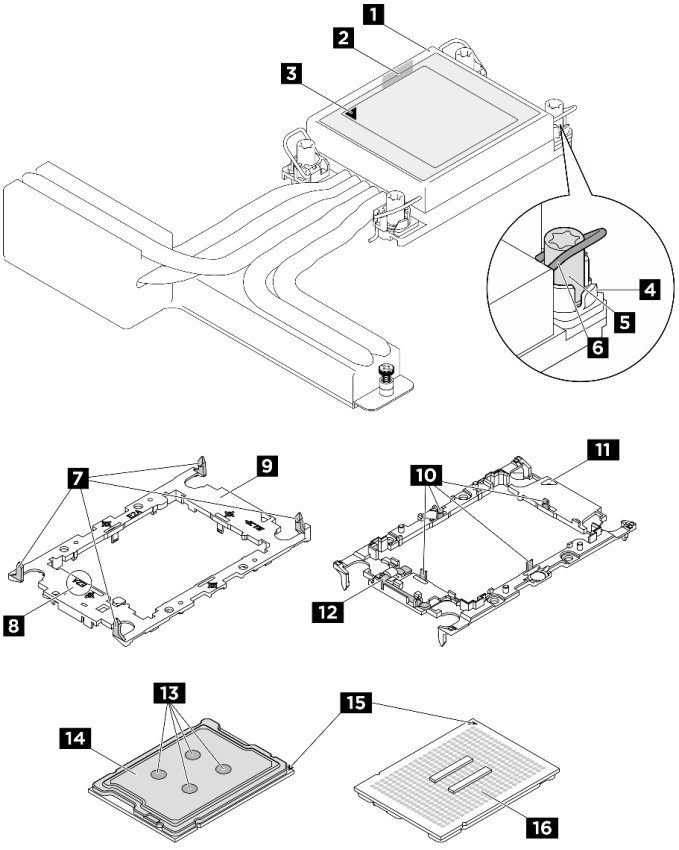


Figure 202. PHM components

1 Heat sink	2 Processor identification label
3 Heat sink triangular mark	4 Nut and wire bail retainer
5 Torx T30 nut	6 Anti-tilt wire bail
7 Clips to secure carrier to a heat sink	8 Processor carrier code marking
9 Processor carrier	10 Clips to secure processor in a carrier
11 Carrier triangular mark	12 Processor ejector handle
13 Thermal grease	14 Processor heat spreader
15 Processor triangular mark	16 Processor contacts

Procedure

Step 1. Pull the system shuttle to the stop position.

1. ❶ Press the two blue release latches.
2. ❷ Rotate the two release levers until they are perpendicular to the shuttle.
3. ❸ Pull the shuttle forward until it stops.

Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the PCIe switch shuttle to its stop position.

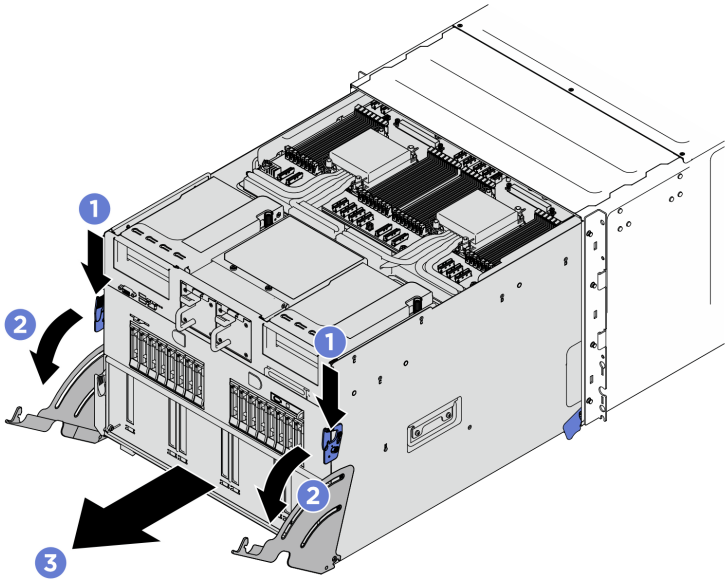


Figure 203. Pulling the system shuttle to the stop position

Step 2. Remove the PHM from the system board.

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. Set the torque screwdriver to 5.1-5.5 lbf-inch (0.58-0.62 N-m); then, follow the sequence (❶ > ❷) to fully loosen the two Phillips #1 screws.

b. Set the torque screwdriver to 10±2.0 lbf-inch (1.1±0.2 N-m); then, follow the sequence (❸ > ❹ > ❺ > ❻) to fully loosen the four Torx T30 nuts.

c. 7 Rotate the anti-tilt wire bails outward.

d. 8 Carefully lift the PHM from the processor socket. If the PHM cannot be fully lifted out of the socket, further loosen the Torx T30 nuts and try lifting the PHM again.

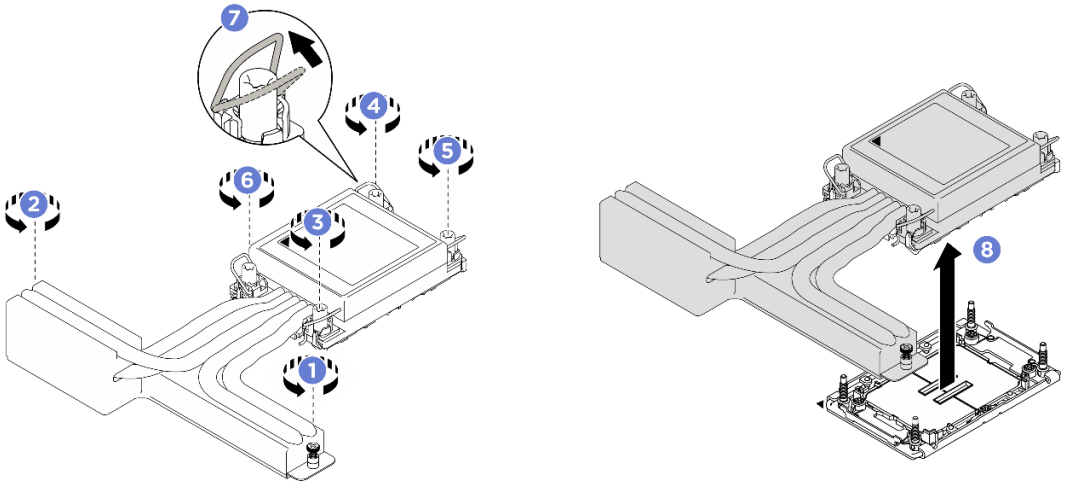


Figure 204. PHM removal

After you finish

1. Each processor socket must always contain a cover or a PHM. Protect empty processor sockets with a cover or install a new PHM.
2. If you are removing the PHM as part of a system board, set the PHM aside.
3. If you are replacing the PHM with a new one. See “Install a processor and heat sink” on page 226.
4. If you are reusing the processor or heat sink, separate the processor from its retainer. See “Separate the processor from carrier and heat sink” on page 224.
5. 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.

Separate the processor from carrier and heat sink

This task has instructions for separating a processor and its carrier from an assembled processor and heat sink, known as a processor-heat-sink module (PHM). This procedure must be executed by a trained technician.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.
- 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.
- Do not touch the processor contacts. 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.

Note: The heat sink, processor, and processor carrier for your system might be different from those shown in the illustrations.

Procedure

Step 1. Separate the processor from the heat sink and carrier.

a. ❶ Lift the handle to release the processor from the carrier.

b. ❷ Hold the processor by its edges; then, lift the processor from the heat sink and carrier.

c. ❸ Without putting the processor down, wipe the thermal grease from the top of the processor with an alcohol cleaning pad; then, place the processor on a static protective surface with the processor-contact side up.

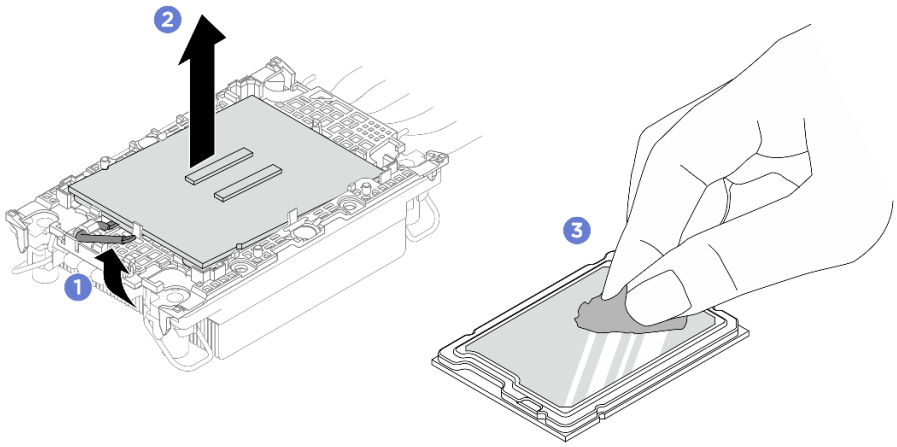


Figure 205. Separating a processor from the heat sink and carrier

Note: Do not touch the contacts on the processor.

Step 2. Separate the processor carrier from the heat sink.

a. ❶ Release the retaining clips from the heat sink.

b. ❷ Lift the carrier from the heat sink.

c. ❸ Wipe the thermal grease from the bottom of the heat sink with an alcohol cleaning pad.

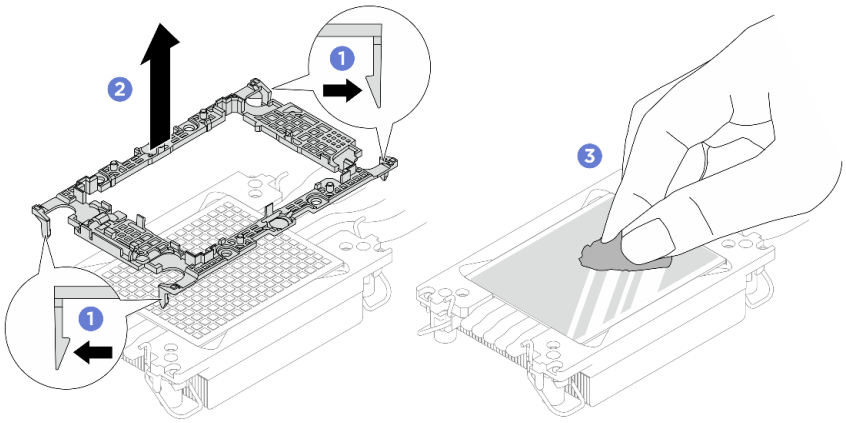


Figure 206. Separating a processor carrier the from heat sink

Note: The processor carrier will be discarded and replaced with a new one.

After you finish

1. Install the PHM. See "Install a processor and heat sink" on page 226.
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 processor and heat sink

This task has instructions for installing an assembled processor and heat sink, known as a processor-heat-sink module (PHM). This task requires a Torx T30 driver. This procedure must be executed by a trained technician.

About this task

S012

CAUTION:
Hot surface nearby.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 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 41.
- 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.
- Each processor socket must always contain a cover or a PHM. When removing or installing a PHM, protect empty processor sockets 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.
- Remove and install only one PHM at a time. If the system supports multiple processors, install the PHMs starting with the first processor socket.

Notes:

- The heat sink, processor, and processor carrier for your system might be different from those shown in the illustrations.
- PHMs are keyed for the socket where they can be installed and for their orientation in the socket.
- See https://serverproven.lenovo.com for a list of processors supported for your server. All processors must have the same speed, number of cores, and frequency.
- Before you install a new PHM or replacement processor, update your system firmware to the latest level. See “Update the firmware” on page 287.

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

- Phillips #1 bit
- Torx T30 bit
- Torque screwdriver

The following illustration shows the components of the processor and heat sink.

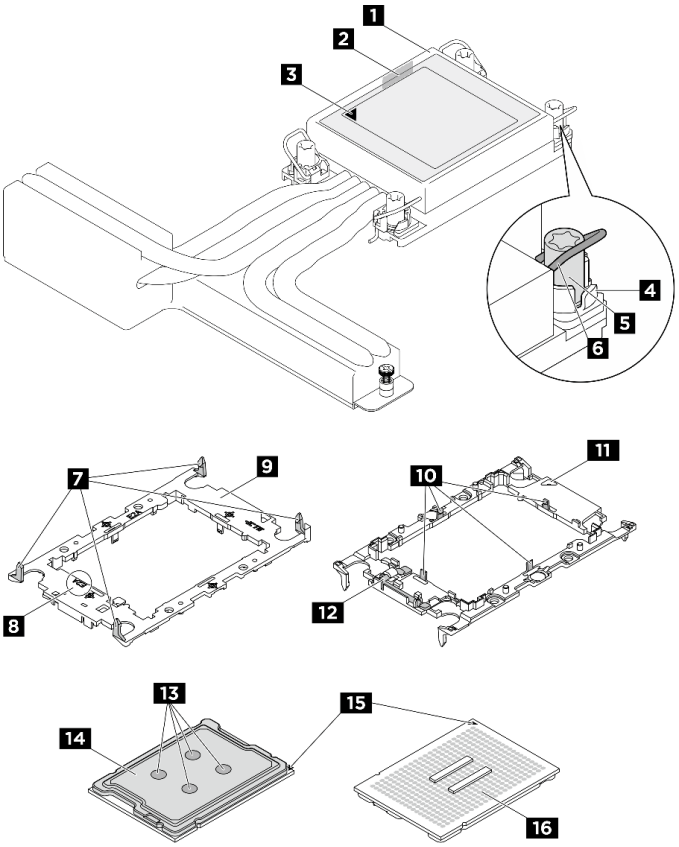


Figure 207. PHM components

1 Heat sink	2 Processor identification label
3 Heat sink triangular mark	4 Nut and wire bail retainer
5 Torx T30 nut	6 Anti-tilt wire bail
7 Clips to secure carrier to a heat sink	8 Processor carrier code marking
9 Processor carrier	10 Clips to secure processor in a carrier
11 Carrier triangular mark	12 Processor ejector handle
13 Thermal grease	14 Processor heat spreader
15 Processor triangular mark	16 Processor contacts

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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 287 for more information on firmware updating tools.

Procedure

Step 1. Record the processor identification label.

- If you are replacing a processor and reusing the heat sink, remove the processor identification label from the heat sink and replace it with the new label that comes with the replacement processor.
- If you are replacing a heat sink and reusing the processor, 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.

Step 2. Install the processor in the new carrier.

Notes:

- If you are replacing the processor and reusing the heat sink, use the new carrier that comes with the new processor.
- If you are replacing the heat sink and reusing the processor, and if the new heat sink comes with two processor carriers, make sure to use the same type of carrier as the one you discarded.

1. ❶ Make sure the handle on the carrier is in the closed position.
2. ❷ Align the processor on the new carrier so that the triangular marks align; then, insert the marked end of the processor into the carrier.
3. ❸ Hold the inserted end of the processor in place; then, pivot the unmarked end of the carrier down and away from the processor.
4. ❹ Press the processor and secure the unmarked end under the clip on the carrier.
5. ❺ Carefully pivot the sides of the carrier down and away from the processor.
6. ❻ Press the processor and secure the sides under the clips on the carrier.

   Note: To prevent the processor from falling out of the carrier, keep the processor-contact side up and hold the processor-carrier assembly by the sides of the carrier.

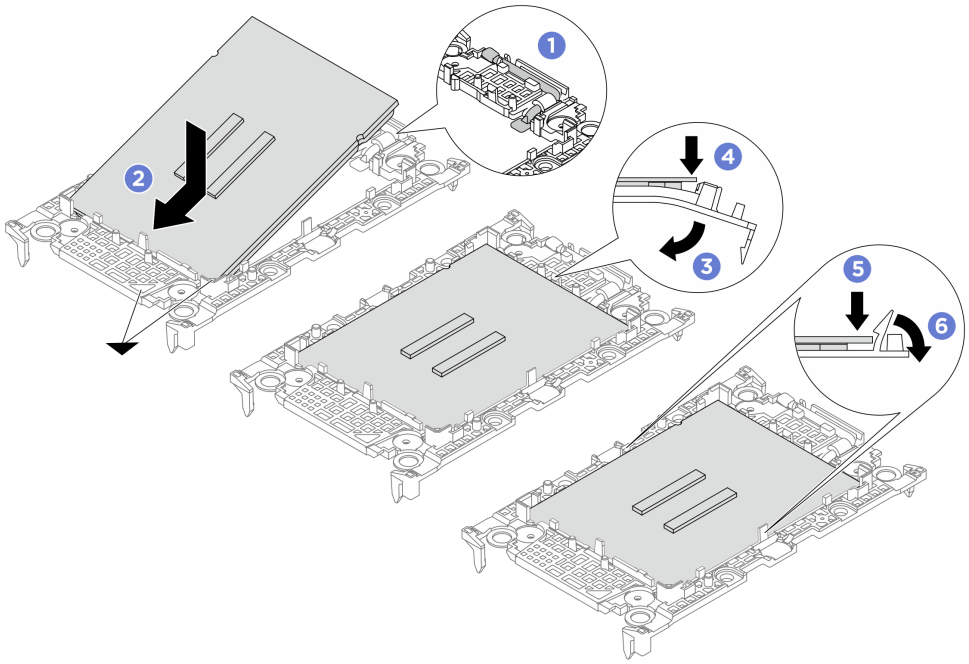


Figure 208. Processor carrier installation

Step 3. Apply thermal grease.

- If you are replacing the heat sink and reusing the processor, a new heat sink comes with thermal grease and you do not need to apply new thermal grease.

  Note: To ensure the best performance, check the manufacturing date on the new heat sink and make sure it does not exceed two years. Otherwise, wipe off the existing thermal grease and apply new thermal grease.

- If you are replacing the processor and reusing the heat sink, do the following steps to apply thermal grease:

  1. If there is any old thermal grease on the heat sink, wipe off the thermal grease with an alcohol cleaning pad.
  2. Carefully place the processor and carrier in the shipping tray with the processor-contact side down. Make sure the triangular mark on the carrier is oriented in the shipping tray as shown below.
  3. Apply the thermal grease on the top of the processor with syringe by forming four uniformly spaced dots, while each dot consists of about 0.1 ml of thermal grease.

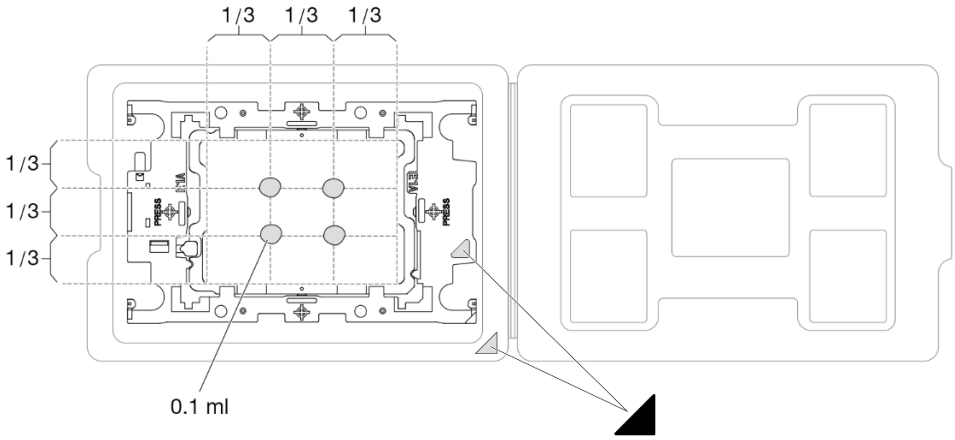


Figure 209. Thermal grease application with processor in shipping tray

Step 4. Assemble the processor and heat sink.

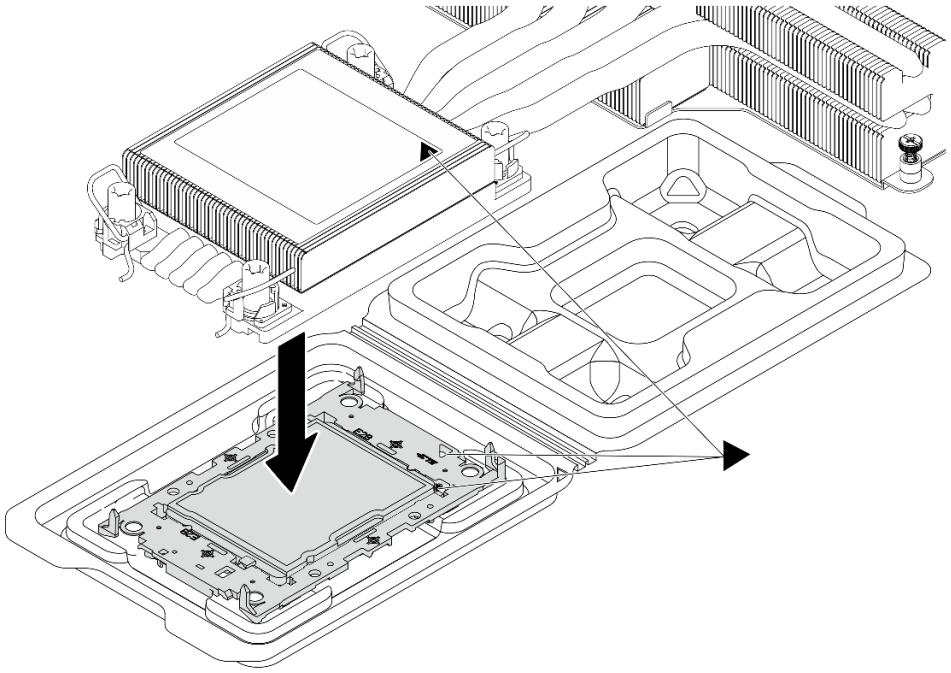


Figure 210. Assembling the PHM with processor in shipping tray

a. Align the triangular mark on the heat sink label with the triangular mark on the processor carrier and processor.

b. Install the heat sink onto the processor-carrier.

c. Press the carrier into place until the clips at all four corners engage. Visually inspect to make sure that there is no gap between the processor carrier and the heat sink.

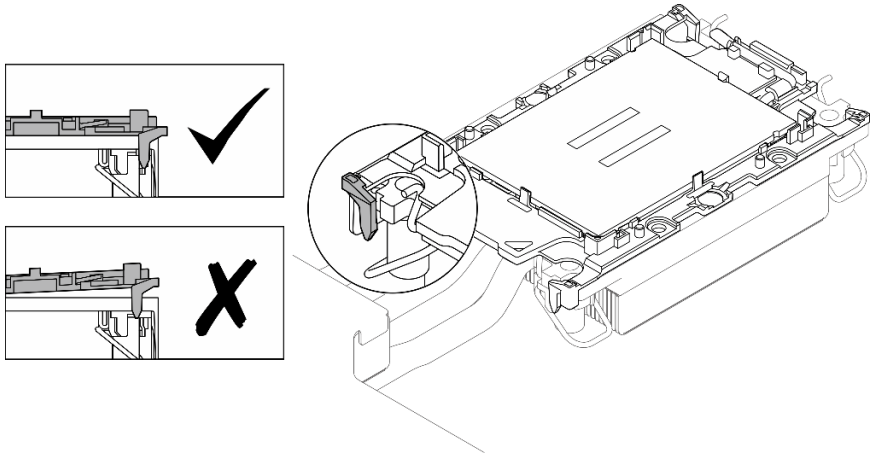


Figure 211. Visually inspect carrier clips

Step 5. Install the processor-heat-sink module into the processor socket.

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. ❶ Rotate the anti-tilt wire bails outward.

b. ❷ Align the triangular mark and four Torx T30 nuts on the PHM with the triangular mark and threaded posts of the processor socket; then, insert the PHM into the processor socket.

c. ❸ Rotate the anti-tilt wire bails inward until they engage with the hooks in the socket.

d. Set the torque screwdriver to 10±2.0 lbf-inch (1.1±0.2 N-m); then, follow the sequence (❹ > ❺ > ❻ > ❼) to fully tighten the four Torx T30 nuts; then, visually inspect to make sure that there is no gap between the screw shoulder beneath the heat sink and the processor socket.

e. Set the torque screwdriver to 5.1-5.5 lbf-inch (0.58-0.62 N-m); then, follow the sequence (❽ > ❾) to fully tighten the two Phillips #1 screws.

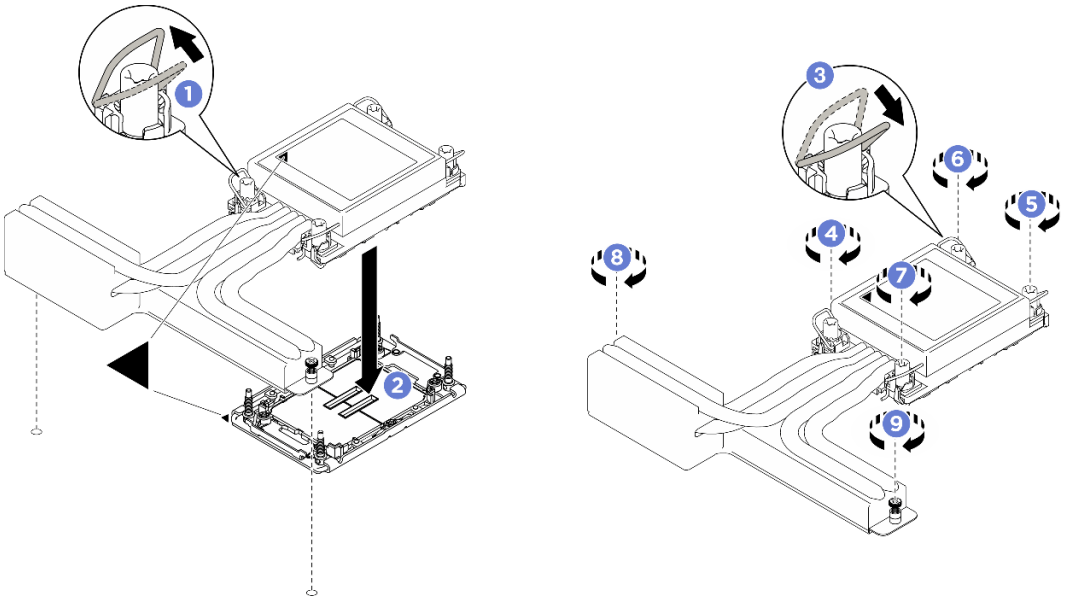


Figure 212. PHM installation

Step 6. Push the system shuttle fully into the chassis.

a. ❶ Lift the two lock latches on both sides of the shuttle.

b. ❷ Slide the shuttle into the chassis.

c. ❸ Push the shuttle fully into the chassis.

d. ❹ Rotate the two release levers until they lock into place.

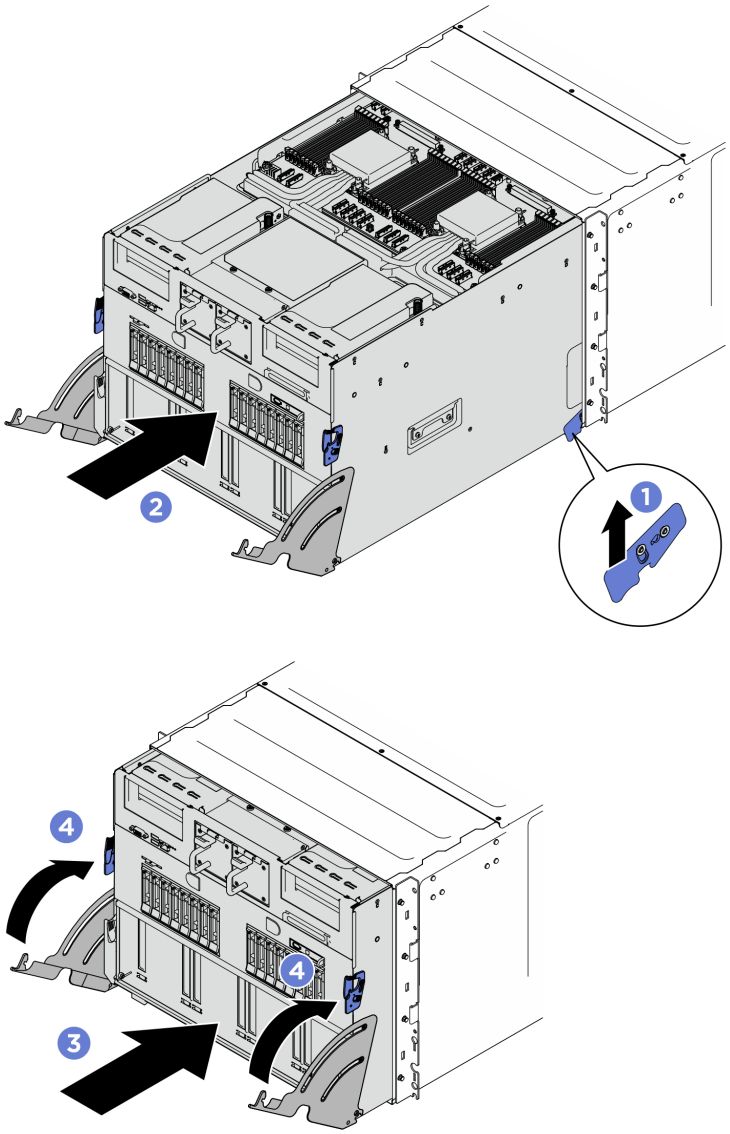


Figure 213. System shuttle installation

After you finish

Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 33 and “Safety inspection checklist” on page 34 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 41.
- 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 216.

b. Remove the rear auxiliary fans (fans 16 to 19). See “Remove a hot-swap fan” on page 84

Step 2. Remove the PSU cage.

a. ① Unfasten the sixteen screws that secure the PSU cage.

b. ② Slide the PSU cage backward to remove it from the chassis.

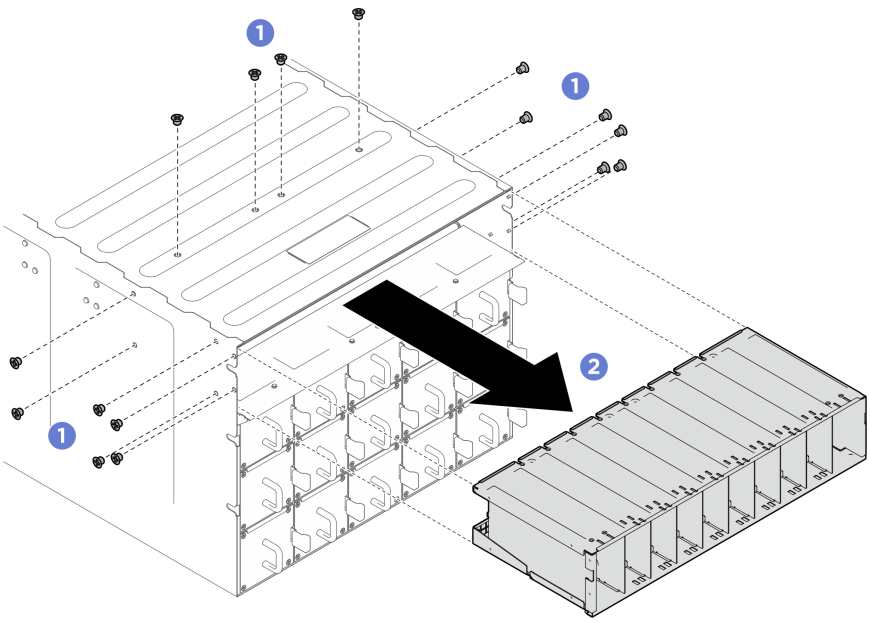


Figure 214. PSU cage removal

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 33 and “Safety inspection checklist” on page 34 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. ❶ Align the PSU cage with the opening in the rear of the chassis, and slide it into the chassis until it snaps into place.

Step 2. ❷ Fasten the sixteen screws to secure the PSU cage.

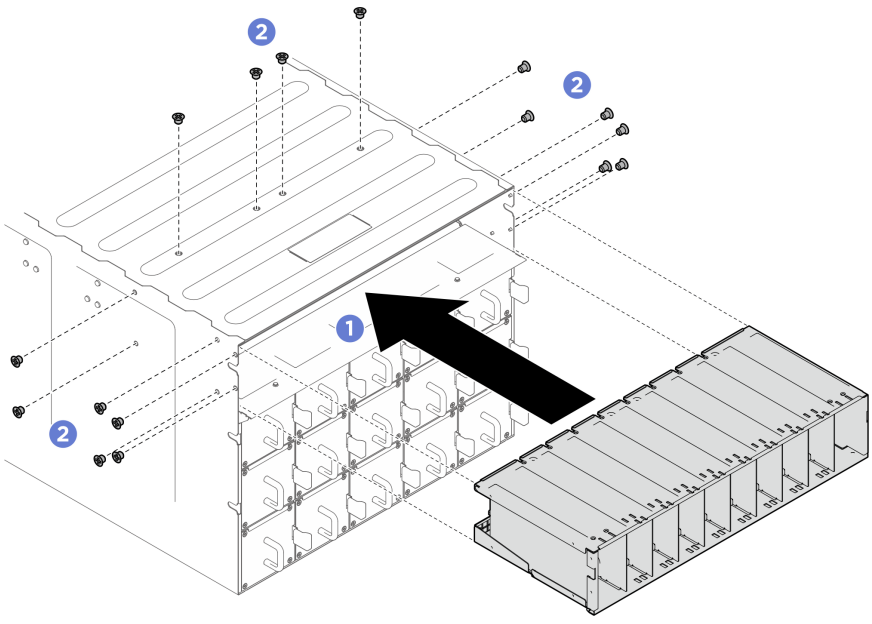


Figure 215. PSU cage installation

After you finish

1. Reinstall the rear auxiliary fans. See “Install a hot-swap fan” on page 87.
2. Reinstall all the power supply units. See “Install a hot-swap power supply unit” on page 218.
3. Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 33 and “Safety inspection checklist” on page 34 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 41.
- 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. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

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.

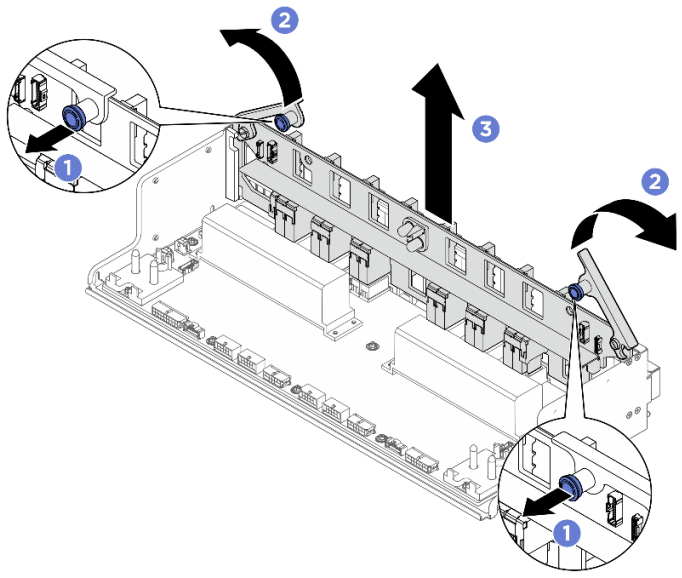


Figure 216. PSU interposer removal

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 33 and "Safety inspection checklist" on page 34 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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 287 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.

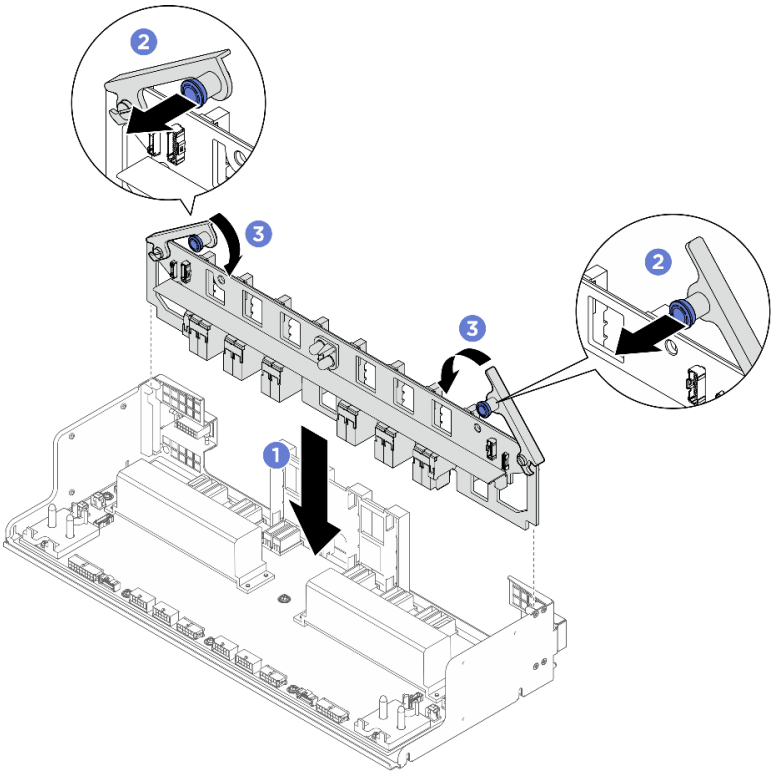


Figure 217. PSU interposer installation

Step 4. Connect the cables to the PSU interposer. See below for more information.

- “Rear auxiliary fan cable routing” on page 283
- “PSU interposer cable routing” on page 282

After you finish

1. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
2. Complete the parts replacement. See “Complete the parts replacement” on page 255.

System board replacement (trained technician only)

Follow instructions in this section to remove and install the system 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 system board

Follow instructions in this section to remove the system 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 the part 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, 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.**

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.
- 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. 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. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

b. Disconnect all the cables from the system board. 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.

Attention: To avoid damaging the system board, make sure to follow the instructions in Chapter 6 “Internal cable routing” on page 257 when disconnecting cables from the system board.

c. Remove the compute tray. See “Remove the compute tray” on page 74.

d. Remove all the processors and the heat sinks. See “Remove a processor and heat sink” on page 221.

e. Make sure to label the slot number on each memory module, remove all the memory modules from the system board, and set them aside on a static-protective surface for reinstallation. See “Remove a memory module” on page 162.

Important: It is advised to print out the layout of memory module slots for reference.

Step 3. Disengage the system board.

a. 1 Loosen the thumbscrew (1) to release the system board.

b. 2 Slide the system board towards the front of the compute tray as illustrated to disengage it from the tray.

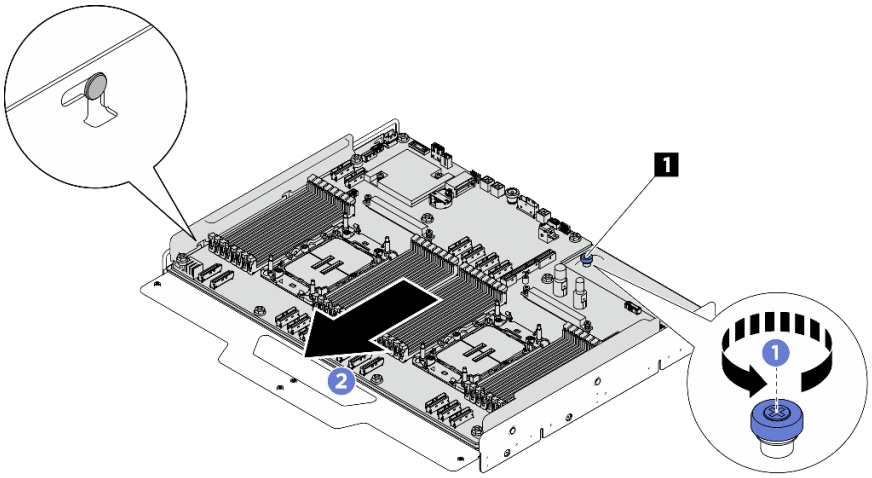


Figure 218. System board disengagement

Step 4. Remove the system board from the tray.

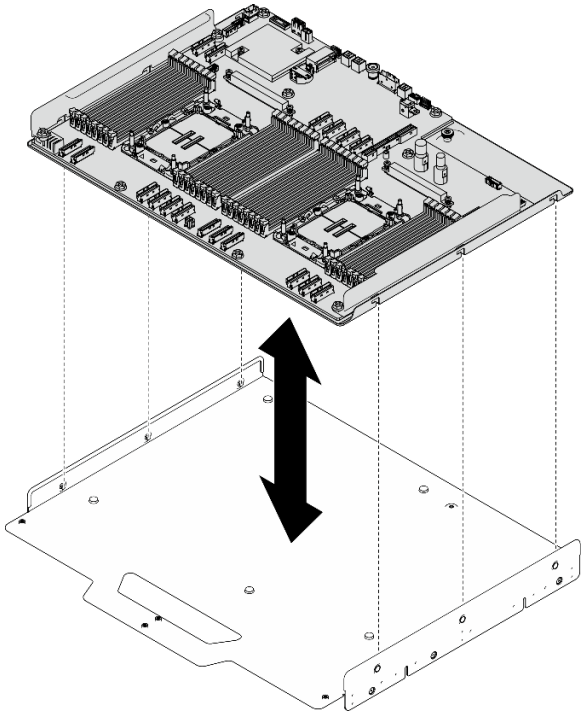


Figure 219. System board removal

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.

Important: Before you return the system board, make sure that you install the processor socket covers from the new system board. To replace a processor socket cover:

a. Take a socket cover from the processor socket assembly on the new system board and orient it correctly above the processor socket assembly on the removed system board.

b. 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.

c. **Make sure** that the socket cover is securely attached to the processor socket assembly.

2. If you plan to recycle the component, see "Disassemble the system board for recycle" on page 331.

Install the system board

Follow instructions in this section to install the system 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 33 and "Safety inspection checklist" on page 34 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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 287 for more information on firmware updating tools.

Procedure

Step 1. Align the system board with the guide pins and lower the system board into the compute tray.

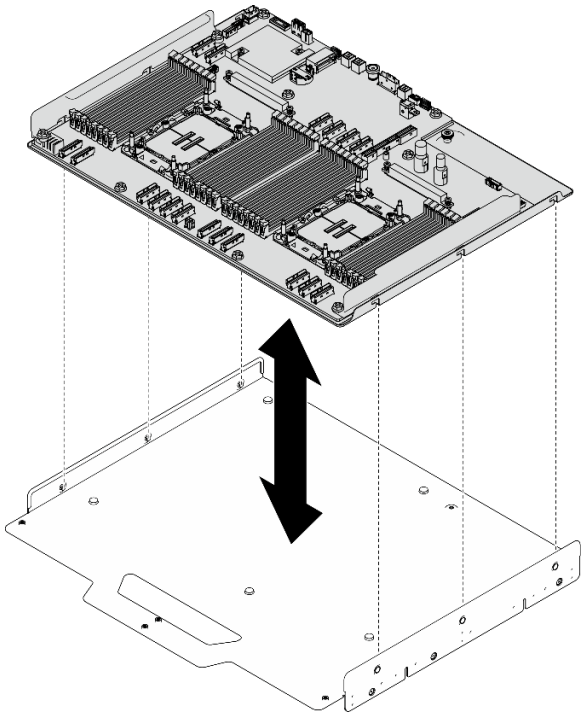


Figure 220. System board installation

Step 2. Secure the system board in the compute tray.

a. 1 Slide the system board towards the rear of the compute tray until it is engaged with the pins as illustrated.

b. 2 Tighten the thumbscrew (1) to secure the system board in place.

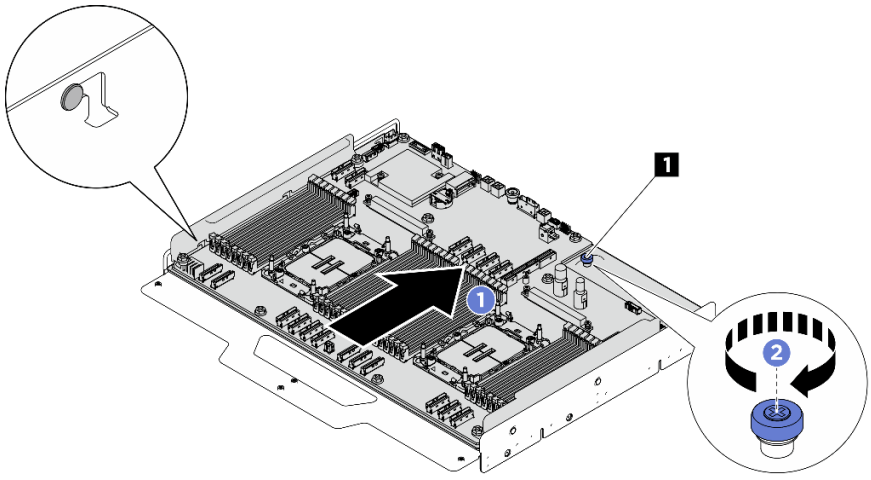


Figure 221. Securing the system board

After you finish

1. Reinstall each memory module to the same slot on the new system board as on the defective system board until all the memory modules are installed. See “Install a memory module” on page 164.
2. Reinstall all the processors and the heat sinks. See “Install a processor and heat sink” on page 226.
3. Reinstall the compute tray. See “Install the compute tray” on page 75.

4. Reinstall the system shuttle. See “Install the system shuttle” on page 253.
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 40.
7. Update the vital product data (VPD). See “Update the Vital Product Data (VPD)” on page 243. 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 27.
8. Optionally, enable UEFI Secure Boot. See “Enable UEFI Secure Boot” on page 250.

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]`
- 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 `xxxxyyyyyy`, where `xxxx` is the machine type and `yyyyyy` is the server model number.

<s/n>	The serial number on the server. Type `zzzzzzzz` (length 8-10 characters), where `zzzzzzzz` is the serial number.
<system model>	The system model on the server. Type `system yyyyyyyy`, where *yyyyyyyy* is the product identifier.
<asset_tag>	The server asset tag number. Type `aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa`, where `aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa` is the asset tag number.
[access_method]	The access method that you select to access the target server. • Online KCS (unauthenticated and user restricted): You can directly delete *[access_method]* from the command. • Online authenticated LAN: In this case, specify below LAN account information at the end of the OneCLI command: `--bmc-username` *<user_id>* `--bmc-password` *<password>* • Remote WAN/LAN: In this case, specify below XCC account information and IP address at the end of the OneCLI command: `--bmc` *<bmc_user_id>*:*<bmc_password>*`@`*<bmc_external_IP>* **Notes:** – *<bmc_user_id>* The BMC account name (1 of 12 accounts). The default value is USERID. – *<bmc_password>* The BMC account password (1 of 12 accounts).

System I/O board replacement

Follow the instructions in this section to install or remove the system I/O board.

Remove the system I/O board

Follow instructions in this section to remove the system I/O board.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 41.
- 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 system I/O board, 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 preparations for this task.

a. Pull the system shuttle to the stop position.
   1. ❶ Press the two blue release latches.
   2. ❷ Rotate the two release levers until they are perpendicular to the shuttle.
   3. ❸ Pull the shuttle forward until it stops.

      Important: To avoid damage, push the two release levers back and ensure they lock into place after extending the system shuttle to its stop position.

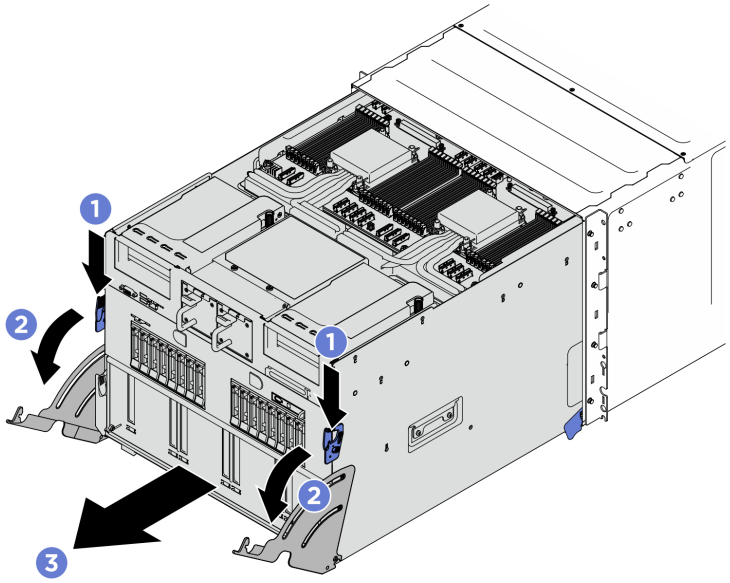


Figure 222. Pulling the system shuttle to the stop position

b. If applicable, remove the PCIe riser assembly 2. See "Remove a PCIe riser assembly" on page 201.

Step 2. Remove the system I/O board.

a. ❶ Loosen the four screws securing both the system I/O board and the cable.

b. ❷ Disconnect the cable from the system I/O board.

c. ❸ Slide the system I/O board towards the rear of the FIO/PCI cage until the notches are aligned to the retainer as illustrated.

d. ❹ Rotate the rear end of the system I/O board to an angle, and remove it from the FIO/PCI cage.

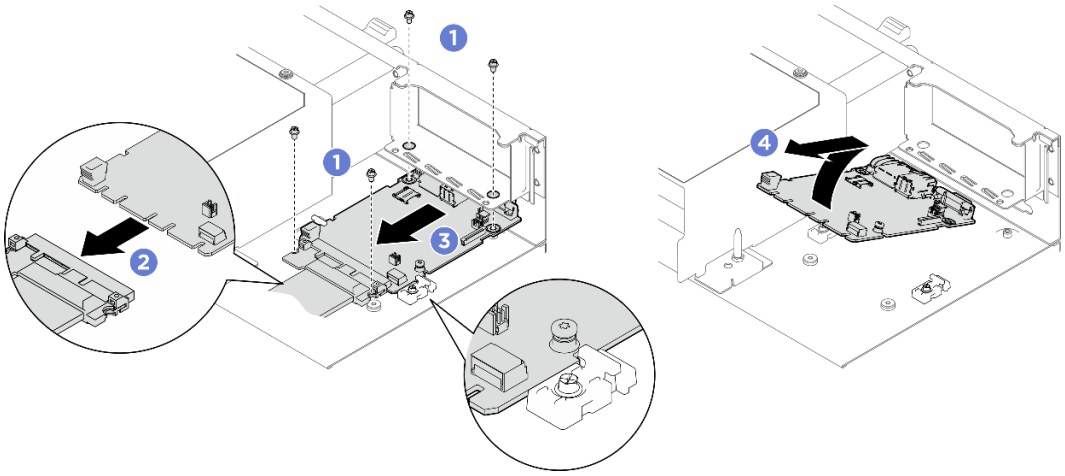


Figure 223. Removing the system I/O board

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 system I/O board

Follow instructions in this section to install the system I/O board.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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.
- 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/sr680av3withb200/7dm9/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 287 for more information on firmware updating tools.

Procedure

Step 1. ❶ Hold the system I/O board at an angle, and insert it into the FIO/PCI cage.

Step 2. ❷ Lower the system I/O board; then, align the notches on the system I/O board with the retainers as illustrated.

Step 3. ❸ Connect the cable to the system I/O board.

Step 4. ❹ Tighten the four screws to secure the system I/O board and the cable.

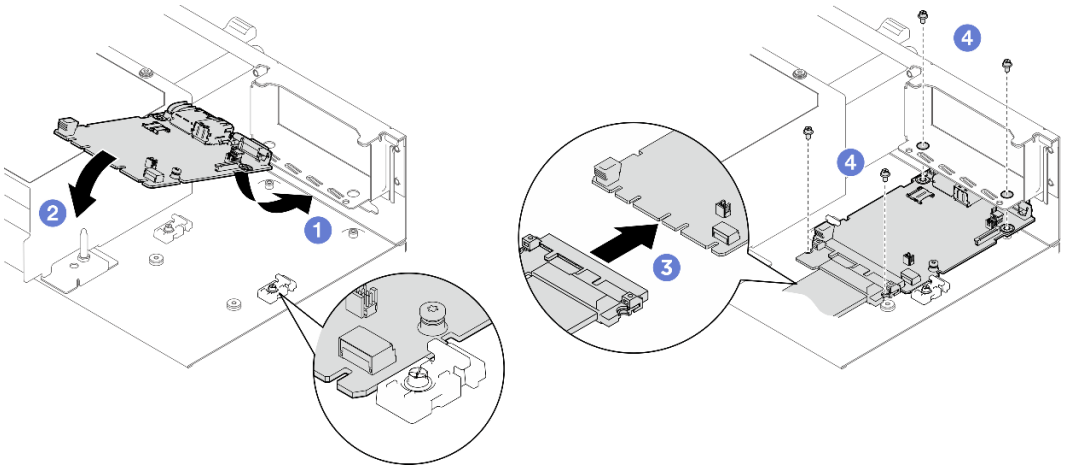


Figure 224. Installing system I/O board

After you finish

1. If applicable, reinstall the PCIe riser assembly 2. See “Install a PCIe riser assembly” on page 205.
2. Push the system shuttle fully into the chassis.
   a. ❶ Lift the two lock latches on both sides of the shuttle.
   b. ❷ Slide the shuttle into the chassis.
   c. ❸ Push the shuttle fully into the chassis.
   d. ❹ Rotate the two release levers until they lock into place.

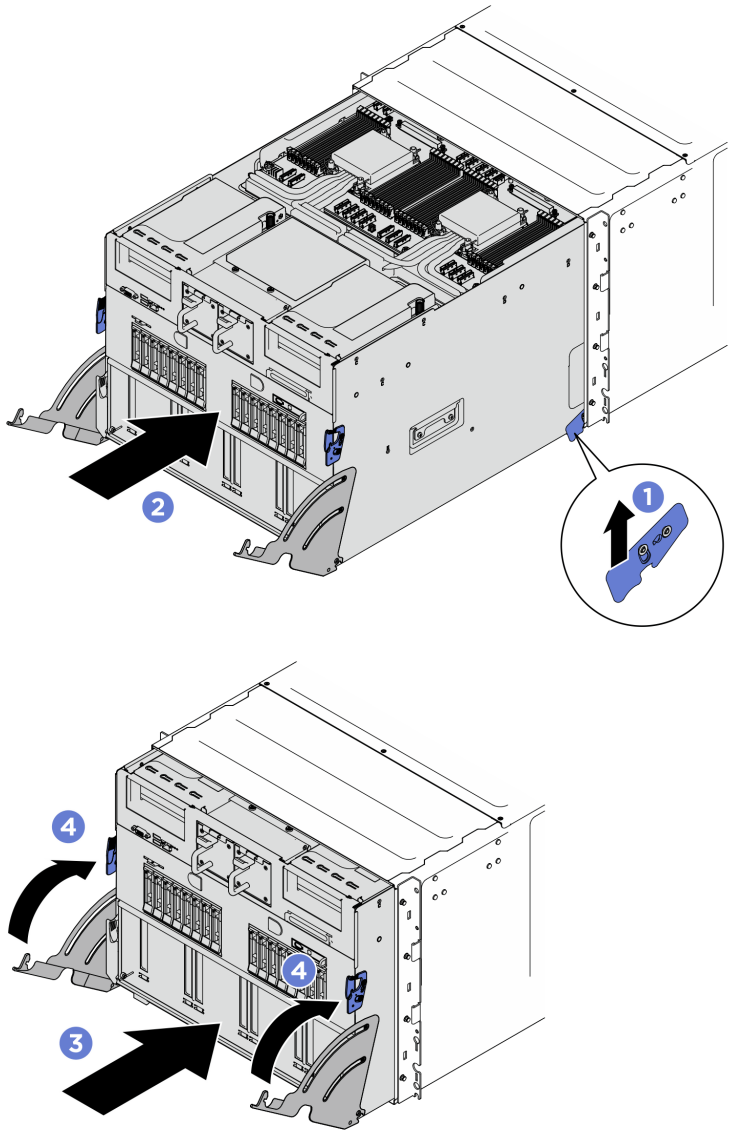


Figure 225. System shuttle installation

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 40.
5. Update the XCC/UEFI/LXPM/SCM FPGA firmware. See “Update the firmware” on page 287
6. Restore the server configuration. See Restore the server configuration.
7. Re-install the FoD key.
8. Optionally, enable Secure Boot. See “Enable UEFI Secure Boot” on page 250.

Hide/observe TPM

TPM is enabled by default to encrypt data transfer for system operation. Optionally, you can disable TPM using Unified Extensible Firmware Interface (UEFI) or Lenovo XClarity Essentials OneCLI.

Using UEFI

For details, see “Hide TPM from OS” in *UEFI User Guide* at https://pubs.lenovo.com/uefi-overview/.

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" -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 PASSW0RD (zero, not an uppercase o)
   - *<ip_address>* is the IP address of the BMC.

   Example:

```
D:\onecli>OneCli.exe config set UEFI.TrustedComputingGroup_TPMDevice "Disabled" --bmc USERID:PASSWORD@10.245.38.64
[1s]Certificate check finished [100%][=======================================================================>]
Start to connect BMC at 10.245.38.64 to apply config set
Invoking SET command ...
UEFI.TrustedComputingGroup_TPMDevice=Disabled
Changes completed successfully, but these changes will not take effect until next reboot.
Succeed.
```

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" -bmc <userid>:<password>@<ip_address>`

Example:

```
D:\onecli>OneCli.exe config set UEFI.TrustedComputingGroup_TPMDevice "Enabled" --bmc USERID:PASSWORD@10.245.38.64
[1s]Certificate check finished [100%][=======================================================================>]
Start to connect BMC at 10.245.38.64 to apply config set
Invoking SET command ...
UEFI.TrustedComputingGroup_TPMDevice=Enabled
Changes completed successfully, but these changes will not take effect until next reboot.
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 PASSW0RD (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 Configuration → Secure Boot Setting**.
  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 UEFI.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 PASSW0RD (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 UEFI.SecureBootConfiguration_SecureBootSetting Disabled --bmc` *<userid>:<password>@<ip_address>*

System shuttle replacement (trained technician only)

Follow instructions in this section to remove and install the system 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 system shuttle

Follow instructions in this section to remove the system 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 33 and “Safety inspection checklist” on page 34 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 41.
- 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. Pull the system shuttle to the stop position.
a. ❶ Press the two blue release latches.
b. ❷ Rotate the two release levers until they are perpendicular to the shuttle.

c. 3 Pull the shuttle forward until it stops.

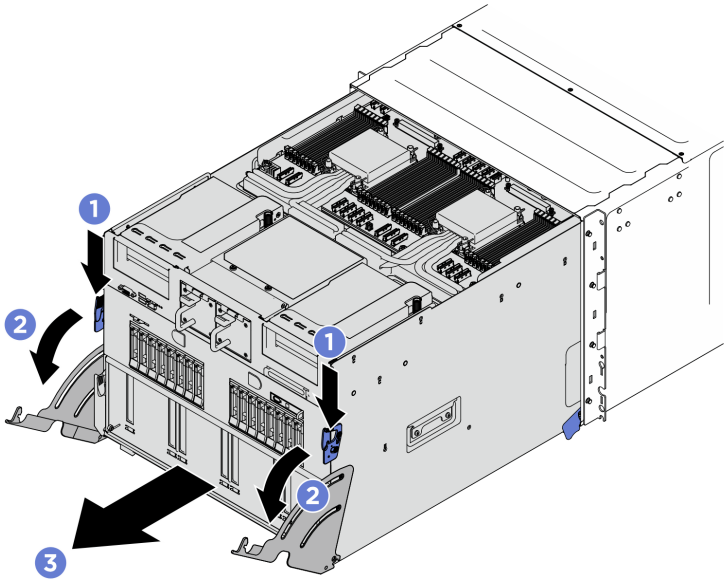


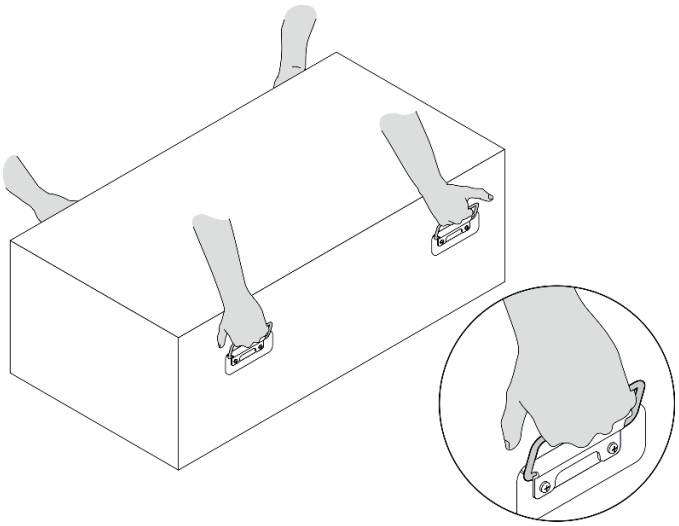
Figure 226. Pulling the system shuttle to the stop position

Step 2. Remove the system shuttle out of the chassis.

a. 1 Lift the two lock latches on both sides of the shuttle.

b. 2 Remove the shuttle out of the chassis.

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



Important: Push the two release levers back until they lock into place after pulling out the system shuttle to avoid damage.

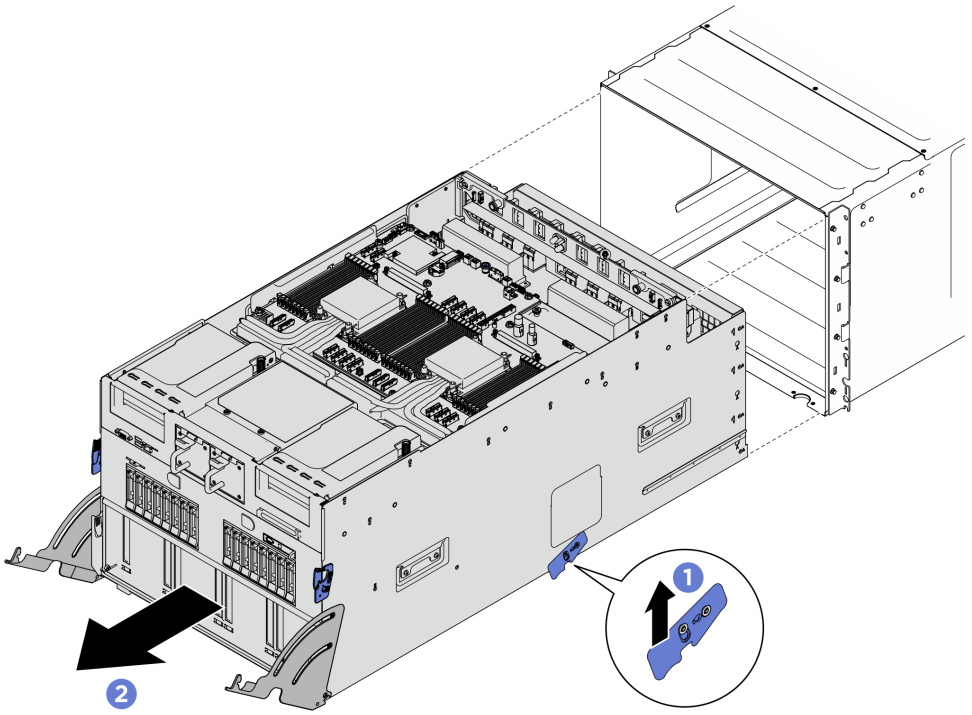


Figure 227. System shuttle removal

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 system shuttle

Follow instructions in this section to install the system 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.

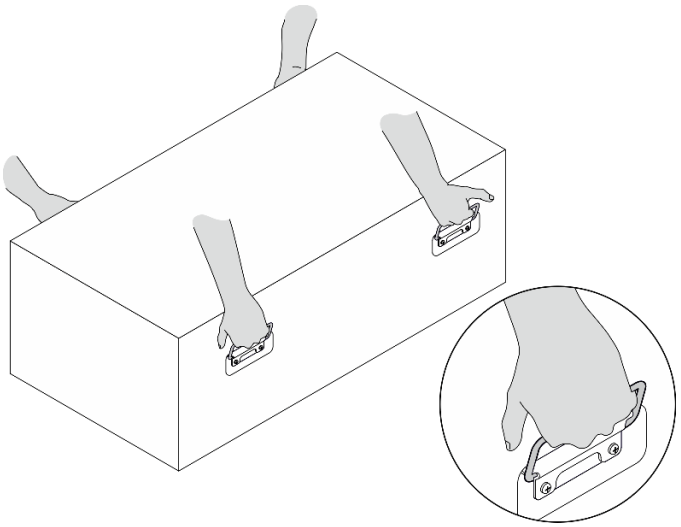
Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 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 257.

- 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 shuttle by holding the four handles on both sides of the system shuttle. Then, slide the shuttle on a lifting device to move the shuttle.



Step 1. Align the system shuttle with the opening in the front of the chassis, and insert it into the chassis until it snaps into place at the stop position.

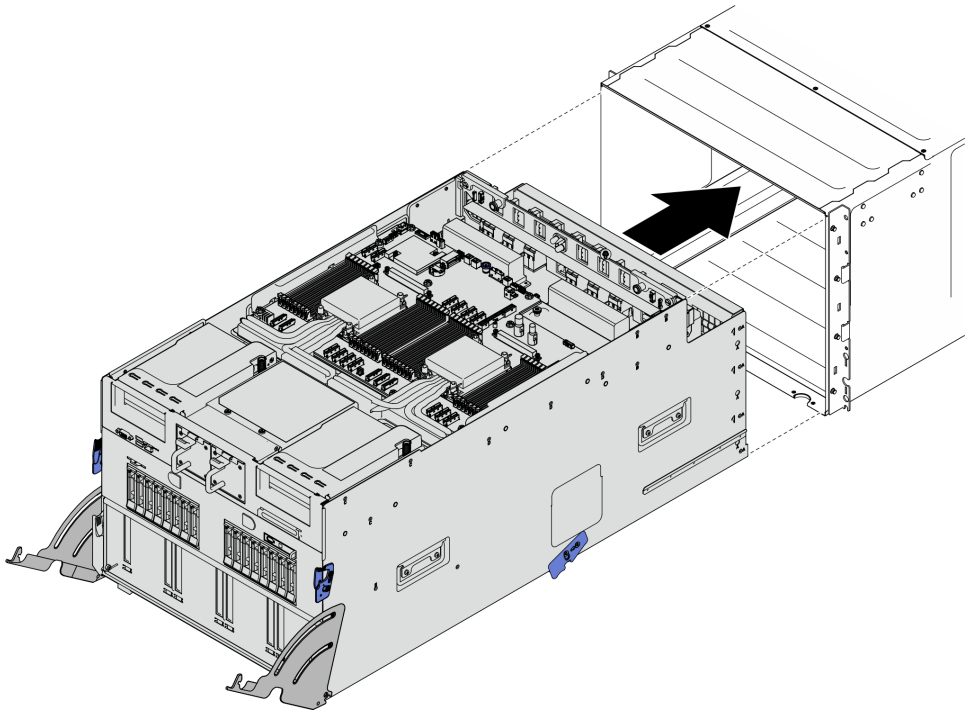


Figure 228. Pushing the system shuttle to the stop position

Step 2. Push the system shuttle fully into the chassis.

a. ❶ Lift the two lock latches on both sides of the shuttle.

b. ❷ Slide the shuttle into the chassis.

c. ❸ Push the shuttle fully into the chassis.

d. ❹ Rotate the two release levers until they lock into place.

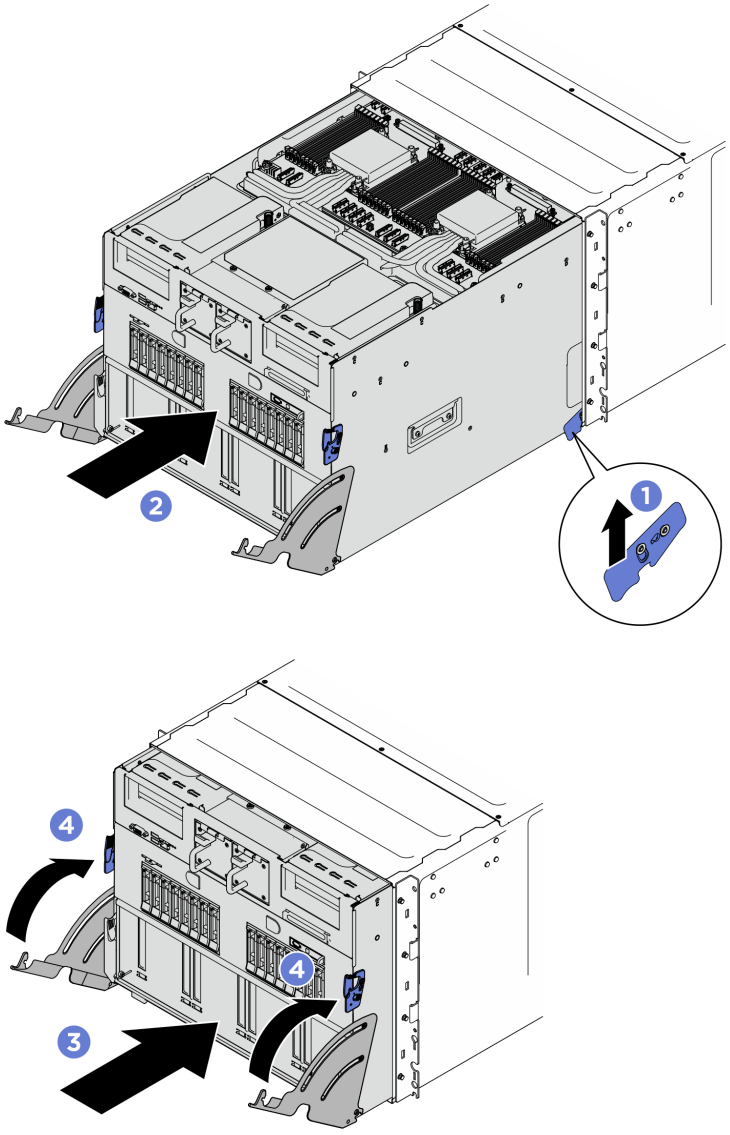


Figure 229. System shuttle installation

After you finish

Complete the parts replacement. See “Complete the parts replacement” on page 255.

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 40.
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 287.
   - 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.

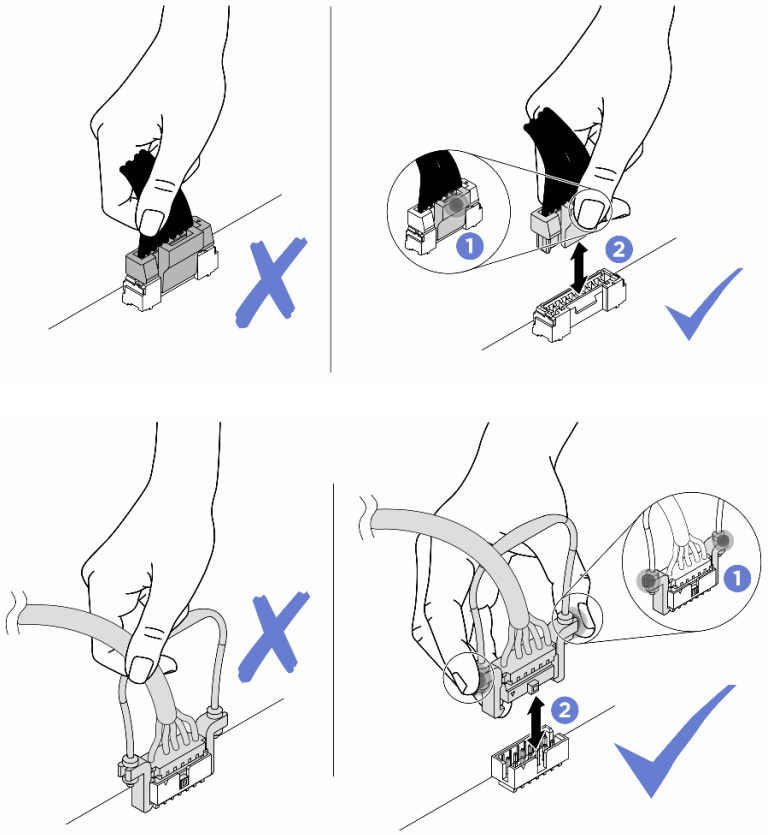
Chapter 6. Internal cable routing

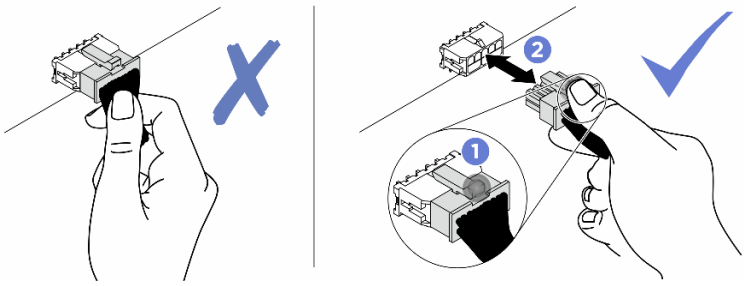
See this section to do cable routing for specific components.

Attention: Strictly observe the following instructions to avoid damaging cable sockets on the system board. Any damage to the cable sockets might require replacing the system board.

- Connect cable connectors vertically or horizontally in alignment with the orientations of the corresponding cable sockets, avoiding any tilt.
- To disconnect cables from the system board, do as follows:
  1. Press and hold all latches, release tabs, or locks on cable connectors to release the cable connectors.
  2. Remove the cable connectors vertically or horizontally in alignment with the orientations of the corresponding cable sockets, avoiding any tilt.

     Note: The cable connectors might look different from those in the illustration, but the removal procedure is the same.





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.

8x 2.5-inch NVMe backplane

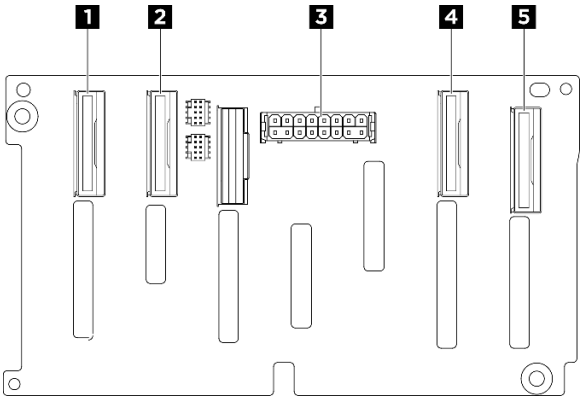


Figure 230. 8x 2.5-inch NVMe backplane connectors

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 259
- “Rear fan control board” on page 259

Front fan control board

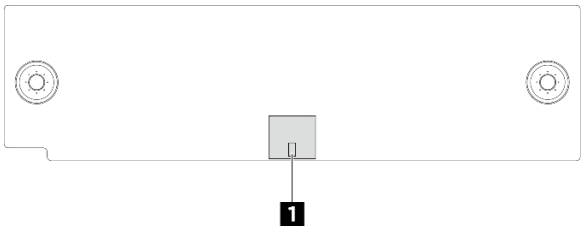


Figure 231. Front fan control board connector

1 Power connector

Rear fan control board

Figure 232. Rear fan control board connector

1 Power connector

PCIe riser card connectors

See this section to locate the connectors on the PCIe riser card.

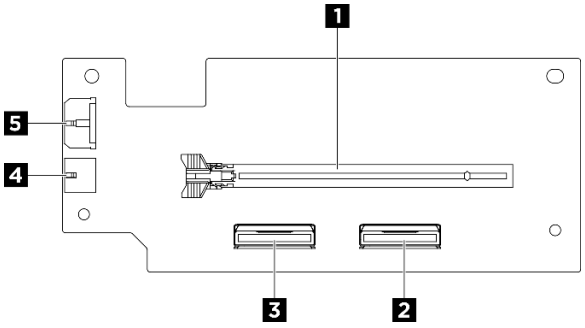


Figure 233. PCIe riser card connectors

1 PCIe x16 (Gen5) slot	2 PCIe riser signal connector (MCIO 2)
3 PCIe riser signal connector (MCIO 1)	4 PCIe riser power connector (RISER PWR)
5 DPU power connector (AUX_PWR)	

PCIe switch board connectors

See this section to locate the connectors on the PCIe switch board.

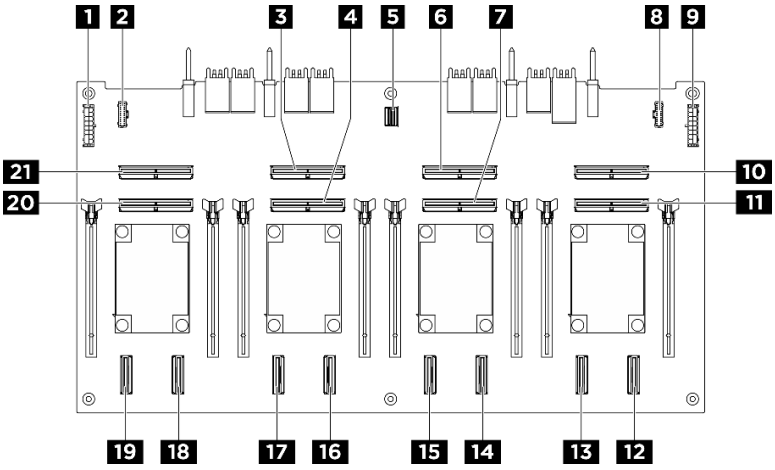


Figure 234. PCIe switch boardconnectors

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)	

Power distribution board connectors

See this section to locate the connectors on the power distribution board.

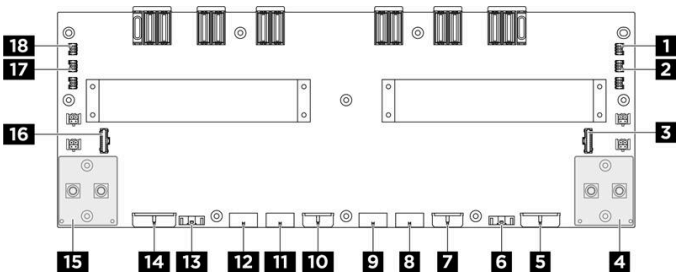


Figure 235. Power distribution board connectors

1 Fan 17 power and signal connector (PUMP4)	2 Fan 17 power connector (PUMP5)
3 PSU interposer sideband connector 2 (PIB SB2)	4 Right GPU baseboard power connector (GPU PWR)
5 PCIe switch board power connector 2 (F-RISER PWR2)	6 PCIe switch board sideband connector 2 (SWSB2)
7 Backplane 2 power connector (BP2 PWR)	8 Rear top fan control board signal connector (F-FAN PWR)
9 Rear top fan control board power connector (RADIATOR FAN)	10 Backplane 1 power connector (BP1 PWR)
11 Rear middle fan control board power connector (R-FAN PWR2)	12 Rear bottom fan control board power connector (R-FAN PWR1)
13 PCIe switch board sideband connector 1 (SWSB1)	14 PCIe switch board power connector 1 (F-RISER PWR1)
15 Left GPU baseboard power connector (GPU PWR)	16 PSU interposer sideband connector 1 (PIB SB1)
17 Fan 19 power connector (PUMP2)	18 Fan 19 power and signal connector (PUMP1)

PSU interposer connectors

See this section to locate the connectors on the PSU interposer.

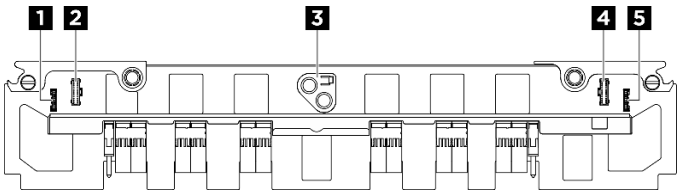


Figure 236. PSU interposer connectors

1 Fan 18 power and signal connector (FAN2 LEAK2)	2 Power distribution board sideband connector 1 (PDB SB1)
3 System board power connector (MB PWR)	4 Power distribution board sideband connector 2 (PDB SB2)
5 Fan 16 power and signal connector (FAN1 LEAK1)	

System board connectors for cable routing

The following illustrations show the internal connectors on the system board that are used for internal cable routing.

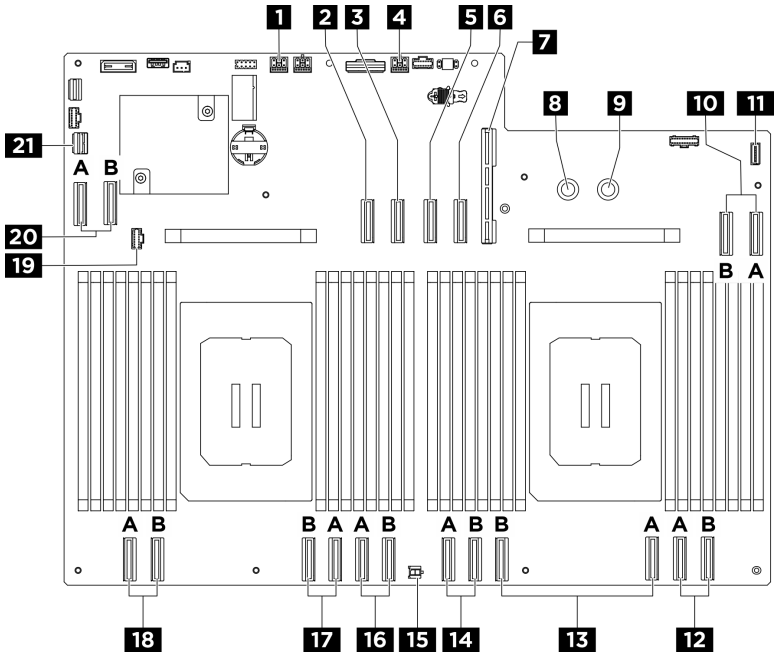


Figure 237. System board connectors for cable routing

Table 17. System board connectors for cable routing

1 PCIe Riser 2 power and sideband connector (BP PWR/ SIG 2)	2 PCIe Riser 2 signal connector (MCIO4B)
3 PCIe Riser 2 signal connector (MCIO4A)	4 PCIe Riser 1 power and sideband connector (BP PWR/ SIG 3)
5 PCIe Riser 1 signal connector (MCIO8A)	6 PCIe Riser 1 signal connector (MCIO8B)
7 System I/O board connector (DC-SCM)	8 Ground (-) connector (PSU_GND)
9 12V (+) connector (PSU_P12V)	10 MCIO connector 7 (MCIO7A/MCIO7B)
11 Integrated diagnostics panel connector (FRONT IO2)	12 MCIO connector 6 (MCIO6A/MCIO6B)
13 MCIO connector 5 (MCIO5A/MCIO5B)	14 MCIO connector 10 (MCIO10A/MCIO10B)
15 Front fan control board power connector (Rear IO PWR)	16 MCIO connector 3 (MCIO3A/MCIO3B)
17 MCIO connector 2 (MCIO2A/MCIO2B)	18 MCIO connector 1 (MCIO1A/MCIO1B)
19 Front fan control board signal connector (BOT FAN BOARD)	20 MCIO connector 9 (MCIO9A/MCIO9B)
21 PCIe switch sideband connector (PCIE SW SIDEBAND)	

2.5-inch drive backplane cable routing

Use the section to understand the cable routing for the 2.5-inch drive backplane.

Notes:

- If necessary, attach the labels to both ends of the cables.
  1. 1 Attach the white space portion of the label to one end of the cable.

2. ❷ Wrap the label around the cable and attach it to the white space portion.
3. Repeat to attach the other label to the opposite end of the cable.

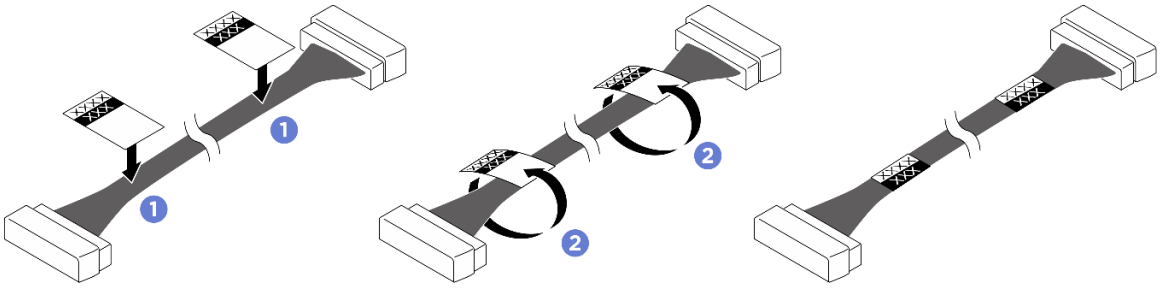


Figure 238. Label application

- Pass the power cables through the cable holder and baffle assembly, then route them under the compute tray as illustrated below.

Based on the location of the drive backplane, select the corresponding routing plan:

- “Backplane 1” on page 263
- “Backplane 2” on page 264

After you finish cable routing, bundle the cables with cable ties. See “Bundle cables connected to the PCIe switch board” on page 265 (bundles 2, 3, 4, and 5).

Backplane 1

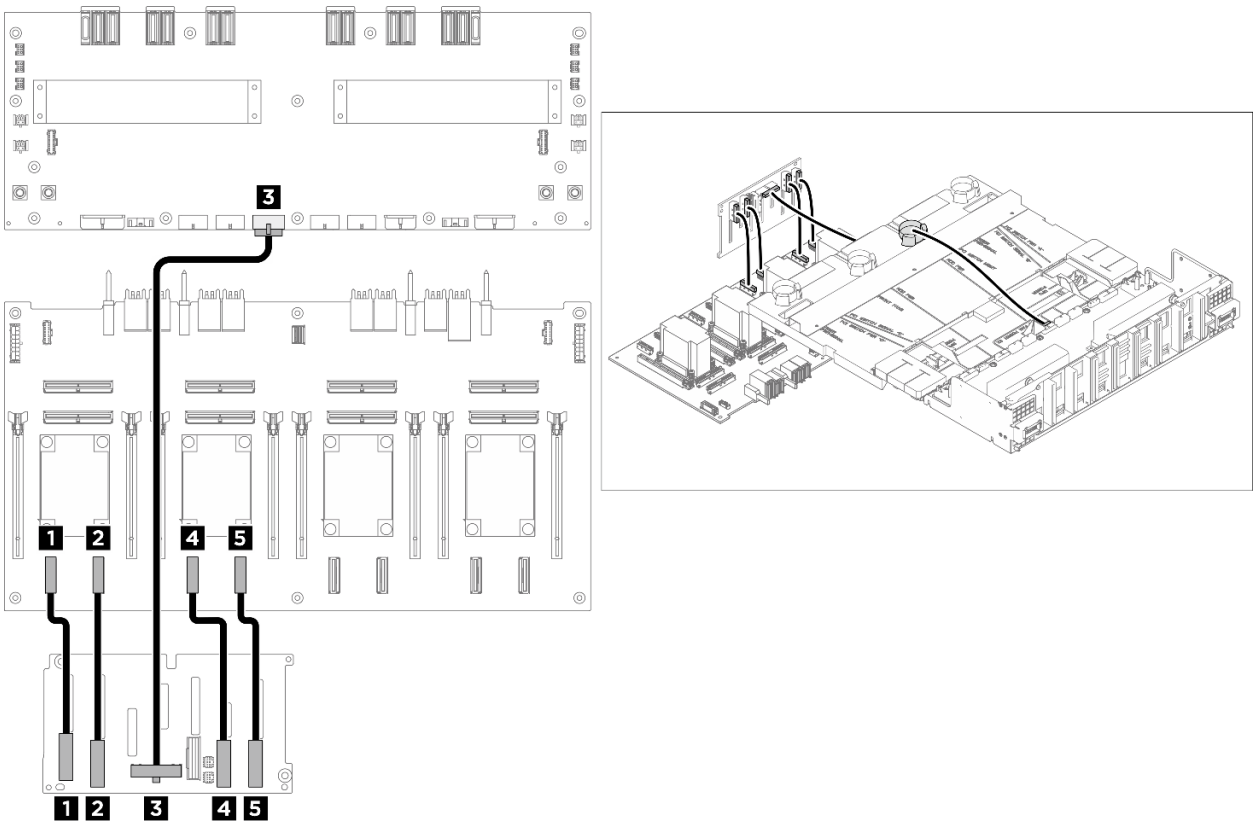


Figure 239. Backplane 1 cable routing

From	To	Label
1 Backplane 1: NVMe connector 0-1	1 PCIe switch board: NVMe connector 1 (NVME1)	BP1 NVME 0-1 NVME 1
2 Backplane 1: NVMe connector 2-3	2 PCIe switch board: NVMe connector 2 (NVME2)	BP1 NVME 2-3 NVME 2
3 Backplane 1: Power connector	3 Power distribution board: Backplane 1 power connector (BP1 PWR)	BP1 PWR BP1 PWR
4 Backplane 1: NVMe connector 4-5	4 PCIe switch board: NVMe connector 3 (NVME3)	BP1 NVME 4-5 NVME 3
5 Backplane 1: NVMe connector 6-7	5 PCIe switch board: NVMe connector 4 (NVME4)	BP1 NVME 6-7 NVME 4

Backplane 2

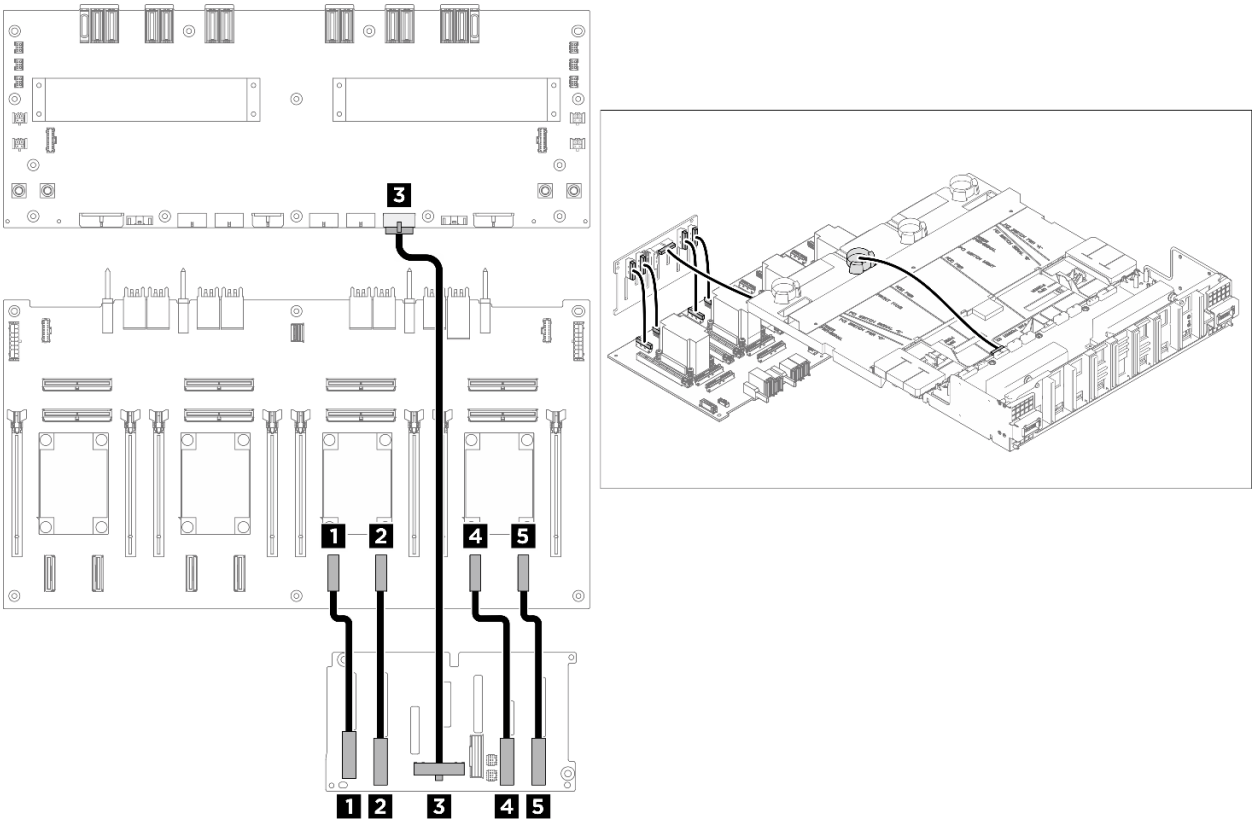


Figure 240. Backplane 2 cable routing

From	To	Label
1 Backplane 2: NVMe connector 0-1	1 PCIe switch board: NVMe connector 5 (NVME5)	BP2 NVME 0-1 NVME 5
2 Backplane 2: NVMe connector 2-3	2 PCIe switch board: NVMe connector 6 (NVME6)	BP2 NVME 2-3 NVME 6
3 Backplane 2: Power connector	3 Power distribution board: Backplane 2 power connector (BP2 PWR)	BP2 PWR BP2 PWR
4 Backplane 2: NVMe connector 4-5	4 PCIe switch board: NVMe connector 7 (NVME7)	BP2 NVME 4-5 NVME 7
5 Backplane 2: NVMe connector 6-7	5 PCIe switch board: NVMe connector 8 (NVME8)	BP2 NVME 6-7 NVME 8

Bundle cables connected to the PCIe switch board

- Divide the cables connected to the PCIe switch board into six bundles, and secure them to the crossbar with cable ties.
- Keep the cables away from the PCIe switch board heat sinks.

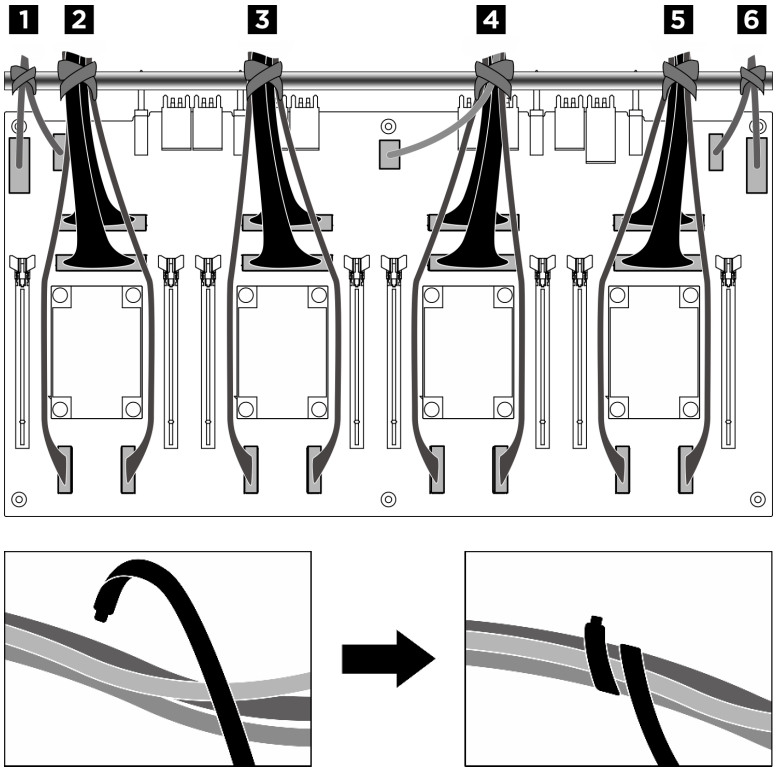


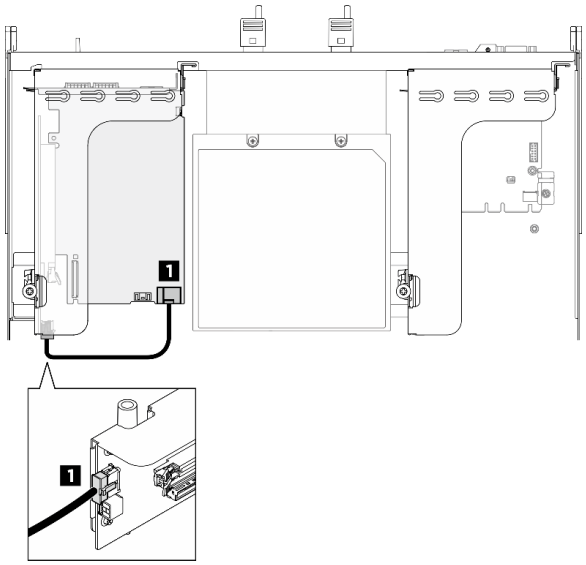
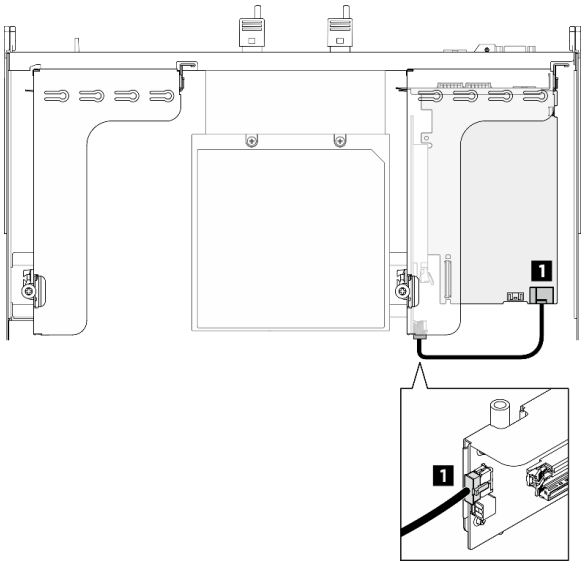
Figure 241. Securing cables with cable ties

Bundle	Cable	Connector (on PCIe switch board)
1	Two cables: • One PCIe switch board power cable • One PCIe switch board sideband cable	• Power distribution board power connector 1 (PDB PWR1) • Power distribution board sideband connector 1 (PDB SB1)
2	Four cables: • Two backplane 1 signal cables • Two PCIe switch board signal cables	• NVMe connector 1 (NVME1) • NVMe connector 2 (NVME2) • MCIO connector 1 (MCIO1) • MCIO connector 2 (MCIO2)
3	Four cables: • Two backplane 1 signal cables • Two PCIe switch board signal cables	• NVMe connector 3 (NVME3) • NVMe connector 4 (NVME4) • MCIO connector 3 (MCIO3) • MCIO connector 4 (MCIO4)
4	Five cables: • One GPU management cable • Two backplane 2 signal cables • Two PCIe switch board signal cables	• GPU management connector (MGMT) • NVMe connector 5 (NVME5) • NVMe connector 6 (NVME6) • MCIO connector 5 (MCIO5) • MCIO connector 6 (MCIO6)
5	Four cables: • Two backplane 2 signal cables • Two PCIe switch board signal cables	• NVMe connector 7 (NVME7) • NVMe connector 8 (NVME8) • MCIO connector 7 (MCIO7) • MCIO connector 8 (MCIO8)
6	Two cables: • One PCIe switch board power cable • One PCIe switch board sideband cable	• Power distribution board power connector 2 (PDB PWR2) • Power distribution board sideband connector 2 (PDB SB2)

DPU adapter power cable routing

Use the section to understand the power cable routing for the DPU adapter.

DPU adapter power cable routing

DPU adapter on PCIe riser 1	DPU adapter on PCIe riser 2
	

From	To
1 DPU adapter: Power connector	1 PCIe riser 1 or 2: DPU power connector (AUX_PWR)

Fan control board cable routing

Use the section to understand the cable routing for the front or rear fan control board.

Notes: If necessary, attach the labels to both ends of the cables.

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

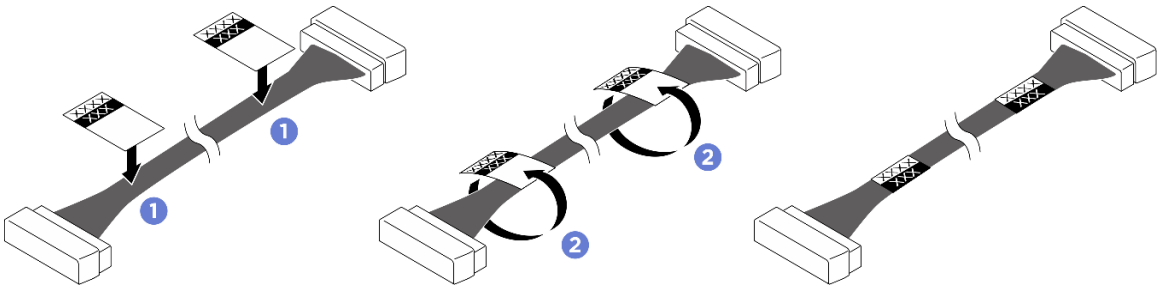


Figure 242. Label application

Based on the location of the fan control board, select the corresponding routing plan:

- “Front fan control board” on page 268
- “Rear top fan control board” on page 268
- “Rear middle fan control board” on page 269

- “Rear bottom fan control board” on page 270

Front fan control board

Note: Pass the cable under the heat pipe at the center, then route it over the system board as illustrated below.

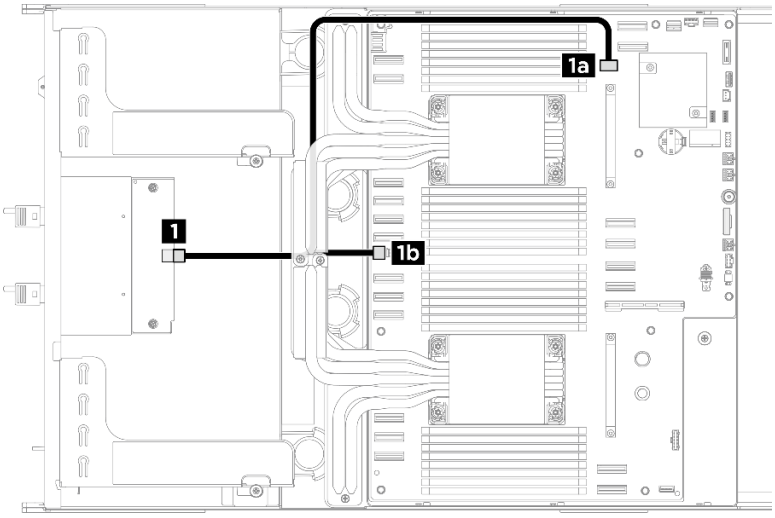


Figure 243. Front fan control board cable routing

From	To	Label
1 Front fan control board: Power connector	1a System board: Front fan control board signal connector (BOT FAN BOARD)	N/A
	1b System board: Front fan control board power connector (REAR IO PWR)	

Rear top fan control board

Notes:

- Connect the green cable to the rear top fan control board signal connector (F-FAN PWR) on the power distribution board.
- Pass the cable through the cable holder and baffle assembly, then route it under the compute tray as illustrated below.

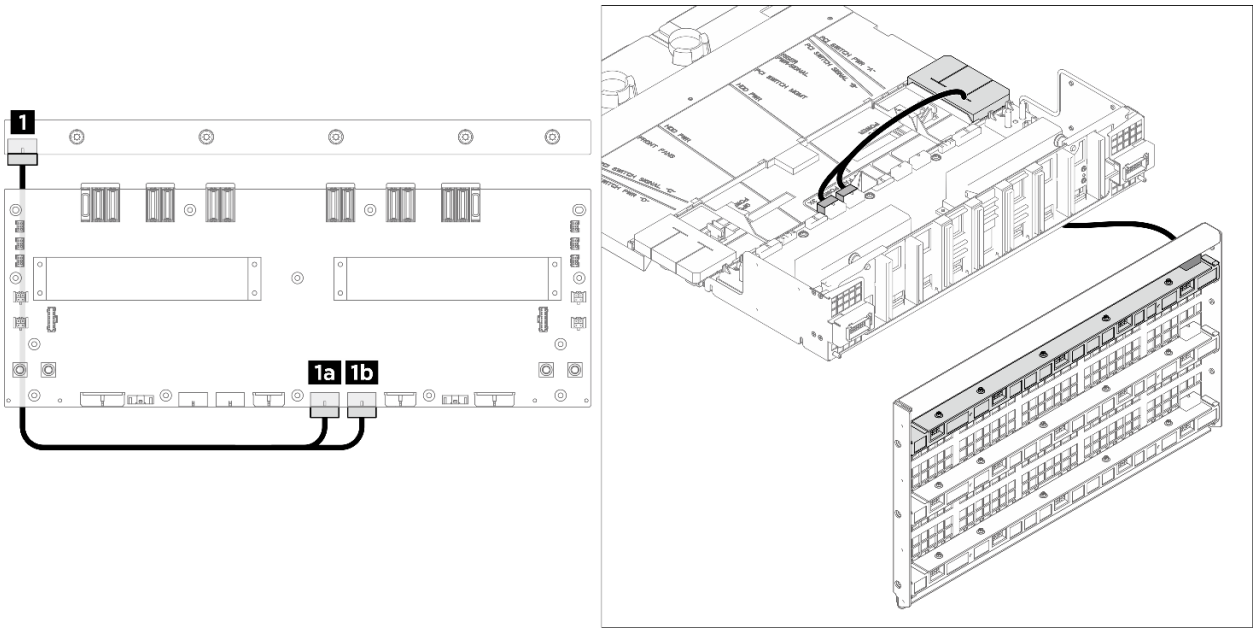


Figure 244. Rear top fan control board cable routing

From	To	Label
1 Rear top fan control board: Power connector	1a Power distribution board: Rear top fan control board power connector (RADIATOR FAN) (black cable)	Radiator Fan (PWR) R-TOP Fan PWR
	1b Power distribution board: Rear top fan control board signal connector (F-FAN PWR) (green cable)	F-Fan PWR (SIG) R-TOP Fan PWR

Rear middle fan control board

Note: Pass the cable through the cable holder and baffle assembly, then route it under the compute tray as illustrated below.

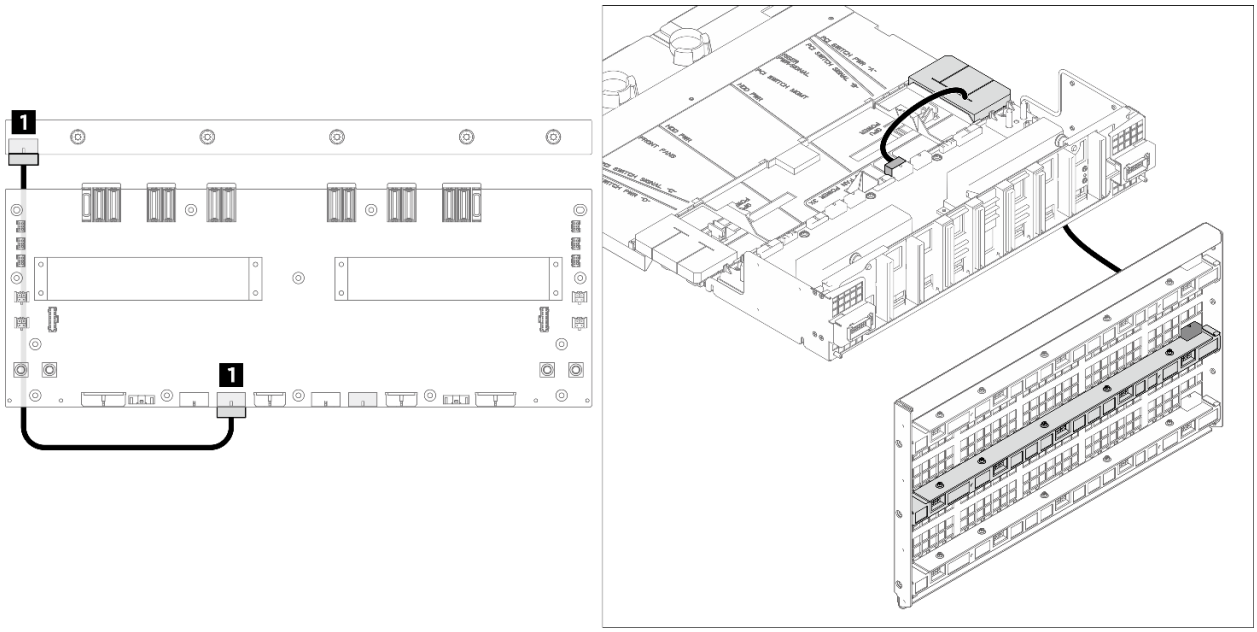


Figure 245. Rear middle fan control board cable routing

From	To	Label
1 Rear middle fan control board: Power connector	1 Power distribution board: Rear middle fan control board power connector (R-FAN PWR2)	R-Fan PWR2 R-MID Fan PWR

Rear bottom fan control board

Note: Pass the cable through the cable holder and baffle assembly, then route it under the compute tray as illustrated below.

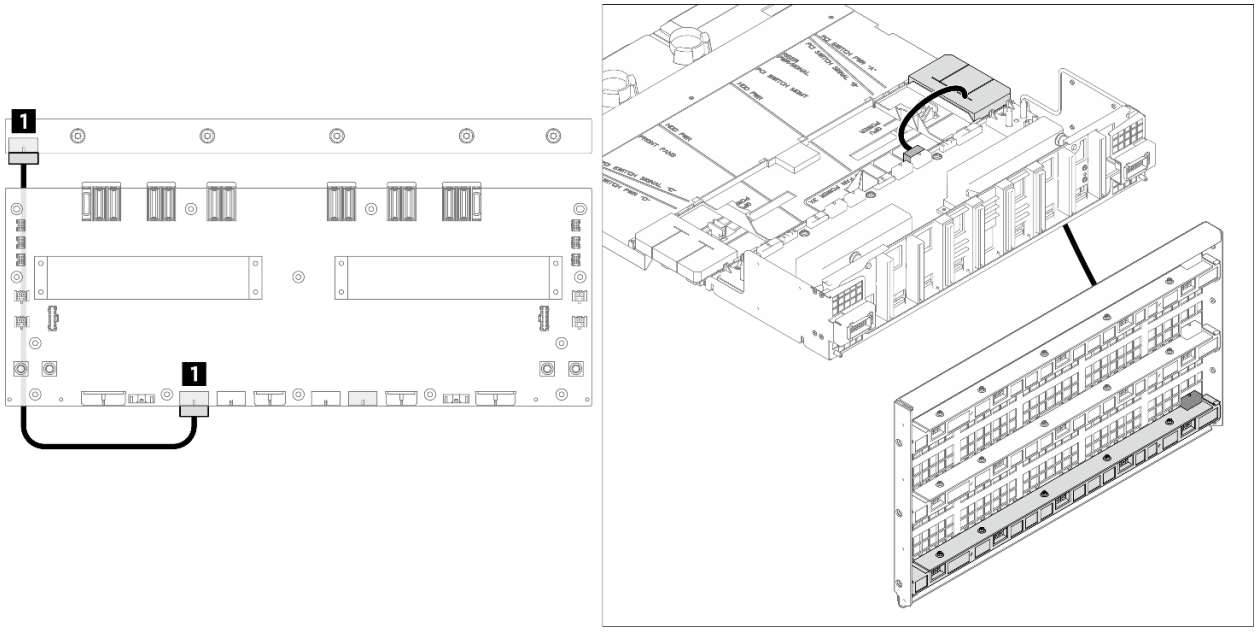


Figure 246. Rear bottom fan control board cable routing

From	To	Label
1 Rear bottom fan control board: Power connector	1 Power distribution board: Rear bottom fan control board power connector (R-FAN PWR1)	R-Fan PWR1 R-BOT Fan PWR

GPU baseboard cable routing

Use the section to understand the cable routing for the GPU baseboard.

Note: Pass the cables through the cable holder and baffle assembly, then route them under the compute tray as illustrated below.

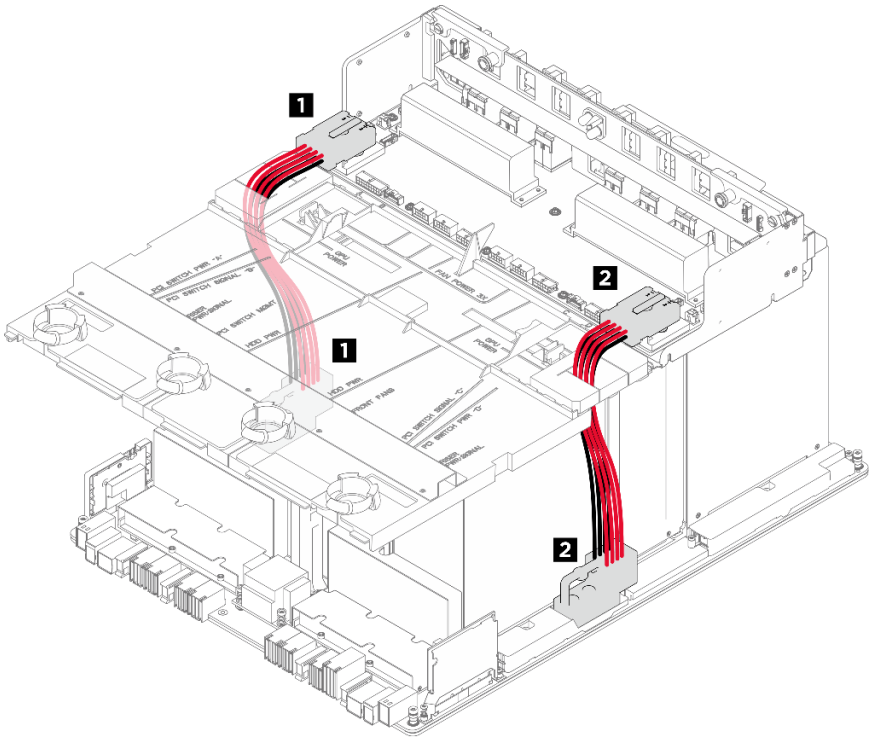


Figure 247. GPU baseboard cable routing

From	To
1 GPU baseboard: Left power connector	1 Power distribution board: Left GPU baseboard power connector (GPU PWR)
2 GPU baseboard: Right power connector	2 Power distribution board: Right GPU baseboard power connector (GPU PWR)

Integrated diagnostics panel cable routing

Use the section to understand the cable routing for the integrated diagnostics panel.

Notes:

- If necessary, attach the labels to the end of the cable that connects to the system board.
  1. 1 Attach the white space portion of the label.

2. ❷ Wrap the label around the cable and attach it to the white space portion.

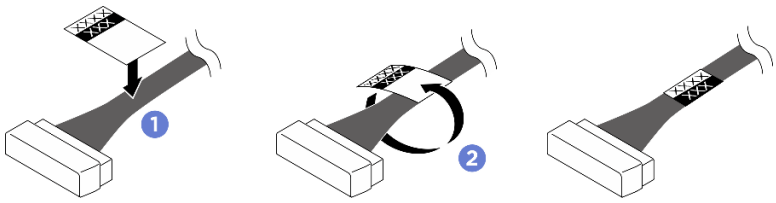


Figure 248. Label application

- Pass the cable through the cable holder and baffle assembly, then route it over the system board as illustrated below.

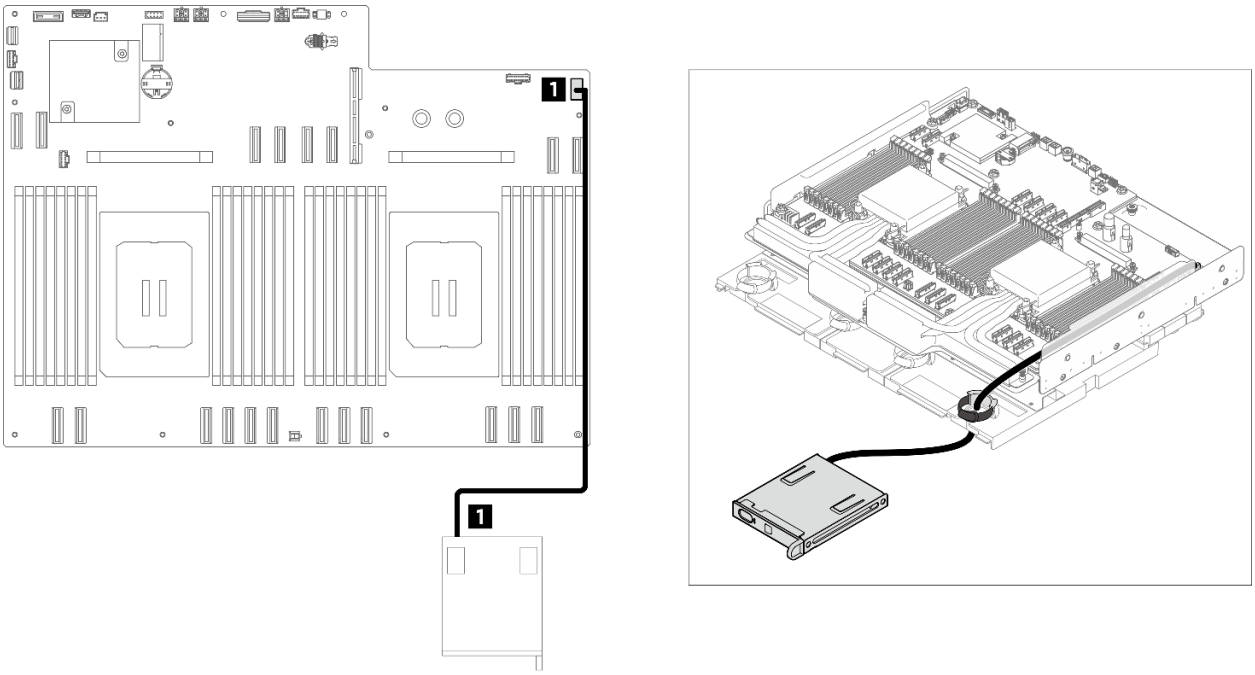


Figure 249. Integrated diagnostics panel cable routing

From	To	Label
1 Integrated diagnostics panel cable	1 System board: Integrated diagnostics panel connector (FRONT IO2)	FRONT IO2 PONG

PCIe riser cable routing

Use the section to understand the cable routing for the PCIe risers.

Notes:

- If necessary, attach the labels to both ends of the cables.
  1. ❶ Attach the white space portion of the label to one end of the cable.
  2. ❷ Wrap the label around the cable and attach it to the white space portion.
  3. Repeat to attach the other label to the opposite end of the cable.

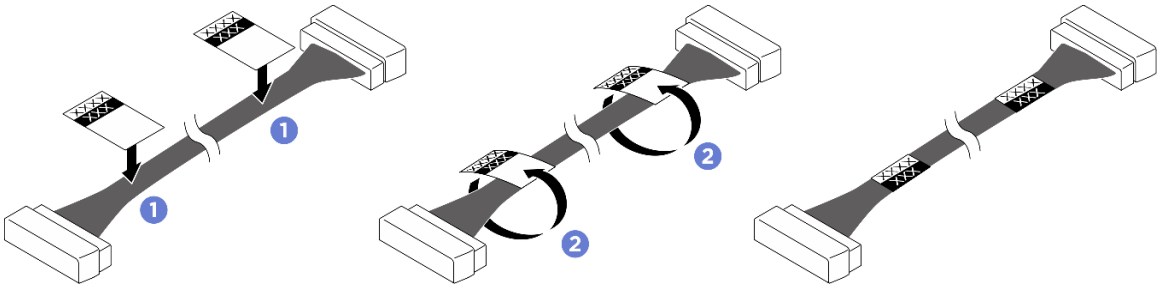


Figure 250. Label application

- Route the power cables under the compute tray as illustrated below.
- Route the signal cables over the system board as illustrated below.
- For DPU adapter power cable routing, see “DPU adapter power cable routing” on page 266.

PCIe riser cable routing

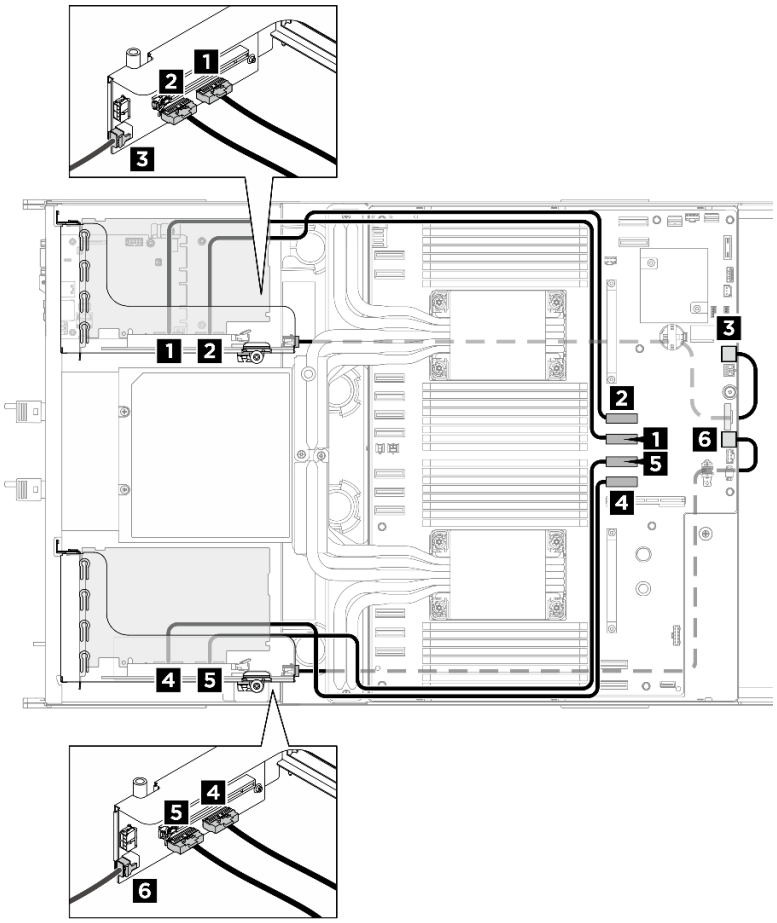


Figure 251. PCIe riser cable routing

From	To	Label
1 PCIe riser 2 signal connector (MCIO 2)	2 System board: PCIe Riser 2 signal connectors (MCIO4A)	R2 MCIO 2 MCIO 4A
2 PCIe riser 2 signal connector (MCIO 1)	1 System board: PCIe Riser 2 signal connectors (MCIO4B)	R2 MCIO 1 MCIO 4B
3 PCIe Riser 2 power connector (RISER PWR)	3 System board: PCIe Riser 2 power and sideband connector (BP PWR/ SIG 2)	R2 PWR SIG 2
4 PCIe riser 1 signal connector (MCIO 2)	5 System board: PCIe Riser 1 signal connectors (MCIO8B)	R1 MCIO 2 MCIO 8B
5 PCIe riser 1 signal connector (MCIO 1)	4 System board: PCIe Riser 1 signal connectors (MCIO8A)	R1 MCIO 1 MCIO 8A
6 PCIe Riser 1 power connector (RISER PWR)	6 System board: PCIe Riser 1 power and sideband connector (BP PWR/ SIG 3)	R1 PWR SIG 3

PCIe switch board cable routing

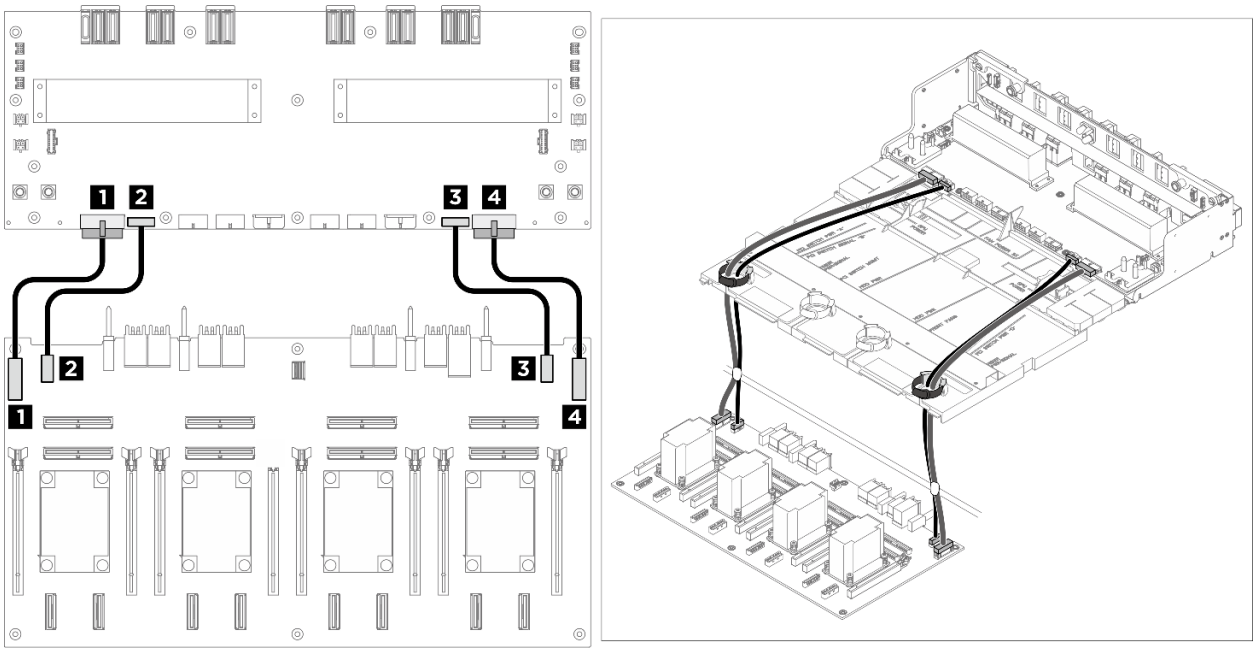
Use the section to understand the cable routing for the PCIe switch board.

- “Power and sideband cables” on page 274
- “Signal cables” on page 275
- “GPU management cable” on page 279

Power and sideband cables

Notes:

- Pass the cables through the cable holder and baffle assembly, then route them under the compute tray as illustrated below.
- The PCIe switch board is positioned as illustrated below. When routing cables while the board is slid out, the actual cable length required will be longer than shown in the illustrations.
- After you finish cable routing, bundle the cables with cable ties. See “Bundle cables connected to the PCIe switch board” on page 280.



From	To
1 PCIe switch board: Power distribution board power connector 1 (PDB PWR1)	1 Power distribution board: PCIe switch board power connector 1 (F-RISER PWR1)
2 PCIe switch board: Power distribution board sideband connector 1 (PDB SB1)	2 Power distribution board: PCIe switch board sideband connector 1 (SWSB1)
3 PCIe switch board: Power distribution board power connector 2 (PDB PWR2)	3 Power distribution board: PCIe switch board power connector 2 (F-RISER PWR2)
4 PCIe switch board: Power distribution board sideband connector 2 (PDB SB2)	4 Power distribution board: PCIe switch board sideband connector 2 (SWSB2)

Figure 252. Power and sideband cable routing

Signal cables

Notes:

- If necessary, attach the labels to both ends of the cables.
  1. ❶ Attach the white space portion of the label to one end of the cable.
  2. ❷ Wrap the label around the cable and attach it to the white space portion.
  3. Repeat to attach the other label to the opposite end of the cable.

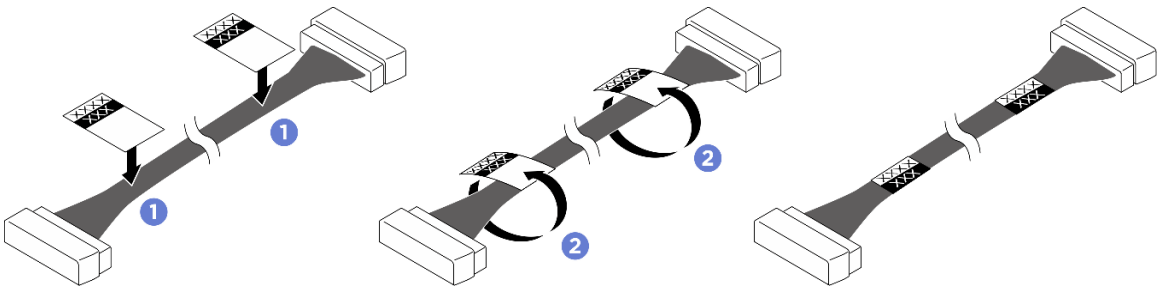
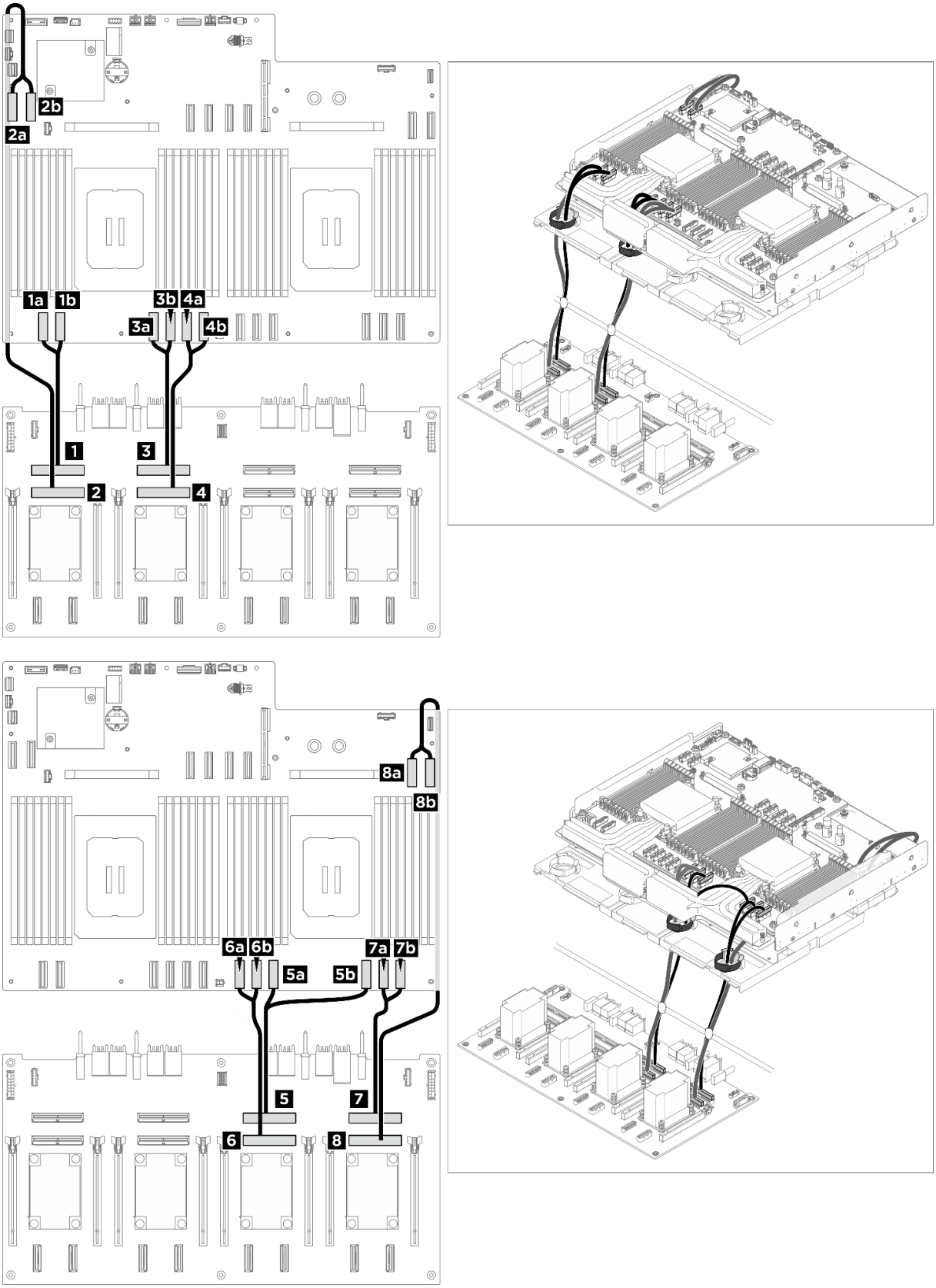


Figure 253. Label application

- Pass the cables through the cable holder and baffle assembly as illustrated below.
- Route the cables that connect to MCIO connectors 7 and 9 under the compute tray as illustrated below.
-
-

Figure 254. Signal cable routing



From	To	Label
1 PCIe switch board: MCIO connector 1 (MCIO1)	1a System board: MCIO connector 1 (MCIO1A)	A - 1A MCIO 1
	1b System board: MCIO connector 1 (MCIO1B)	B - 1B MCIO 1
2 PCIe switch board: MCIO connector 2 (MCIO2)	2a System board: MCIO connector 9 (MCIO9A)	A - 9A MCIO 2
	2b System board: MCIO connector 9 (MCIO9B)	B - 9B MCIO 2
3 PCIe switch board: MCIO connector 3 (MCIO3) **Notes:** • Cable end A plugs into connector B. • Cable end B plugs into connector A.	3a System board: MCIO connector 2 (MCIO2B)	A - 2B MCIO 3
	3b System board: MCIO connector 2 (MCIO2A)	B - 2A MCIO 3
4 PCIe switch board: MCIO connector 4 (MCIO4)	4a System board: MCIO connector 3 (MCIO3A)	A - 3A MCIO 4
	4b System board: MCIO connector 3 (MCIO3B)	B - 3B MCIO 4
5 PCIe switch board: MCIO connector 5 (MCIO5) **Notes:** • Cable end A plugs into connector B. • Cable end B plugs into connector A.	5a System board: MCIO connector 5 (MCIO5B)	A - 5B MCIO 5
	5b System board: MCIO connector 5 (MCIO5A)	B - 5A MCIO 5
6 PCIe switch board: MCIO connector 6 (MCIO6)	6a System board: MCIO connector 10 (MCIO10A)	A - 10A MCIO 6
	6b System board: MCIO connector 10 (MCIO10B)	B - 10B MCIO 6
7 PCIe switch board: MCIO connector 7 (MCIO7)	7a System board: MCIO connector 6 (MCIO6A)	A - 6A MCIO 7
	7b System board: MCIO connector 6 (MCIO6B)	B - 6B MCIO 7
8 PCIe switch board: MCIO connector 8 (MCIO8) **Notes:** • Cable end A plugs into connector B. • Cable end B plugs into connector A.	8a System board: MCIO connector 7 (MCIO7B)	A - 7B MCIO 8
	8b System board: MCIO connector 7 (MCIO7A)	B - 7A MCIO 8

GPU management cable

Notes:

- If necessary, attach the labels to both ends of the cables.
  1. ❶ Attach the white space portion of the label to one end of the cable.
  2. ❷ Wrap the label around the cable and attach it to the white space portion.
  3. Repeat to attach the other label to the opposite end of the cable.

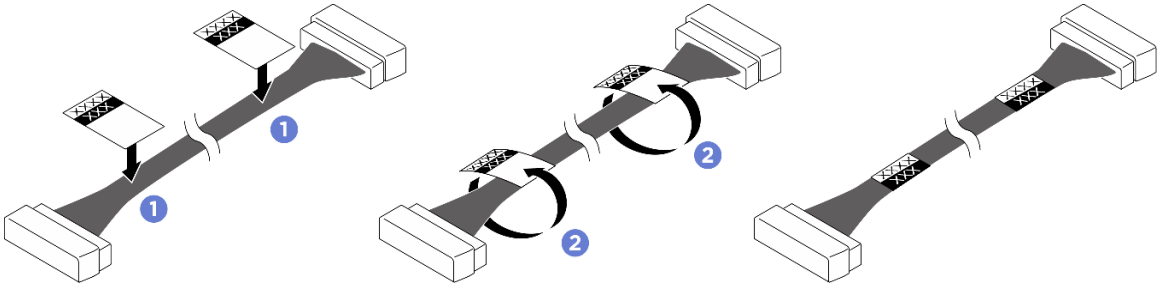
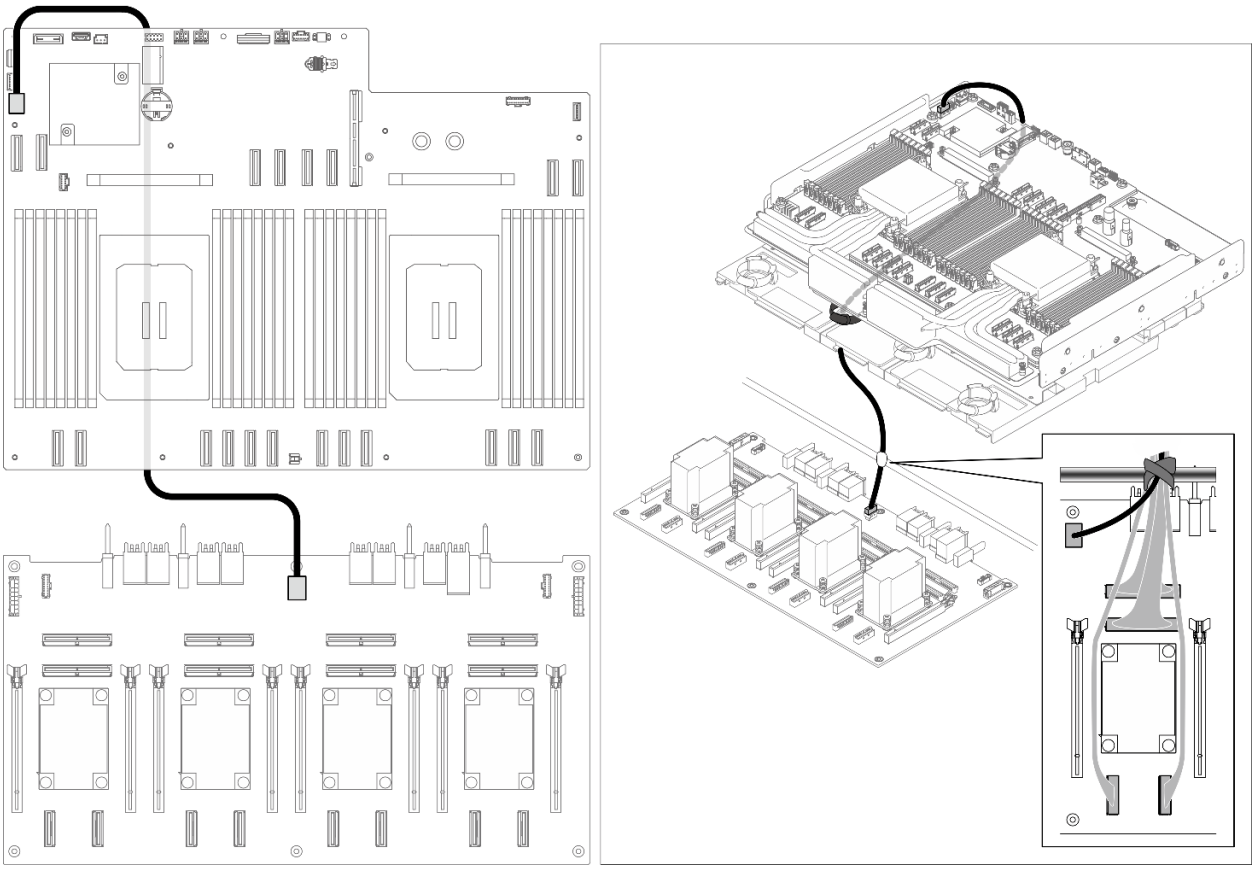


Figure 255. Label application

- Pass the cable through the cable holder and baffle assembly, then route it under the compute tray as illustrated below.
-
-



From	To	Label
1 PCIe switch board: GPU management connector (MGMT)	1 System board: PCIe switch sideband connector (PCIE SW SIDEBAND)	PCIE SW SB MGMT

Figure 256. GPU management cable routing

Bundle cables connected to the PCIe switch board

- Divide the cables connected to the PCIe switch board into six bundles, and secure them to the crossbar with cable ties.
- Keep the cables away from the PCIe switch board heat sinks.

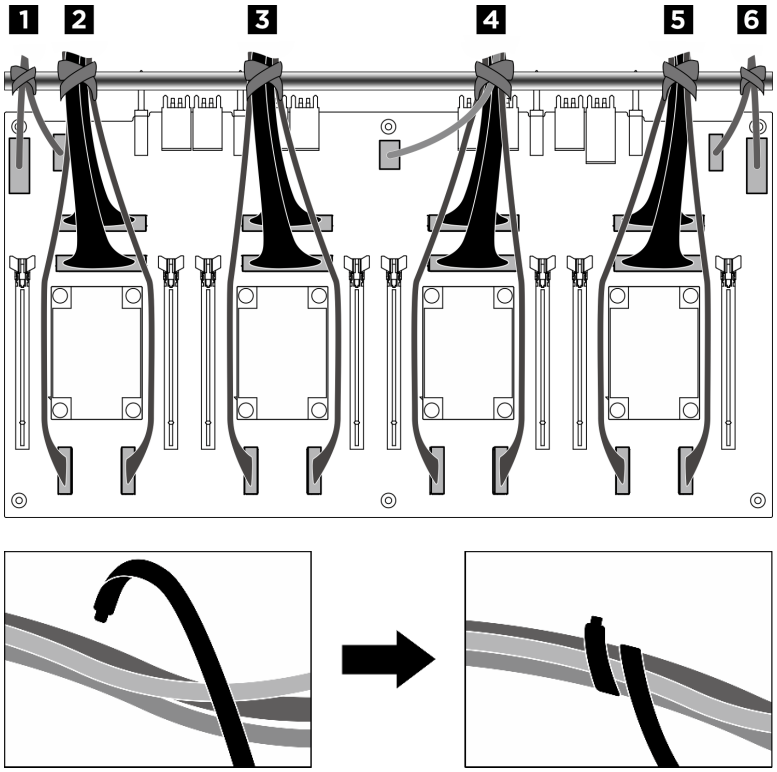


Figure 257. Securing cables with cable ties

Bundle	Cable	Connector (on PCIe switch board)
1	Two cables: • One PCIe switch board power cable • One PCIe switch board sideband cable	• Power distribution board power connector 1 (PDB PWR1) • Power distribution board sideband connector 1 (PDB SB1)
2	Four cables: • Two backplane 1 signal cables • Two PCIe switch board signal cables	• NVMe connector 1 (NVME1) • NVMe connector 2 (NVME2) • MCIO connector 1 (MCIO1) • MCIO connector 2 (MCIO2)
3	Four cables: • Two backplane 1 signal cables • Two PCIe switch board signal cables	• NVMe connector 3 (NVME3) • NVMe connector 4 (NVME4) • MCIO connector 3 (MCIO3) • MCIO connector 4 (MCIO4)
4	Five cables: • One GPU management cable • Two backplane 2 signal cables • Two PCIe switch board signal cables	• GPU management connector (MGMT) • NVMe connector 5 (NVME5) • NVMe connector 6 (NVME6) • MCIO connector 5 (MCIO5) • MCIO connector 6 (MCIO6)

Bundle	Cable	Connector (on PCIe switch board)
5	Four cables: • Two backplane 2 signal cables • Two PCIe switch board signal cables	• NVMe connector 7 (NVME7) • NVMe connector 8 (NVME8) • MCIO connector 7 (MCIO7) • MCIO connector 8 (MCIO8)
6	Two cables: • One PCIe switch board power cable • One PCIe switch board sideband cable	• Power distribution board power connector 2 (PDB PWR2) • Power distribution board sideband connector 2 (PDB SB2)

PSU interposer cable routing

Use the section to understand the cable routing for the PSU interposer.

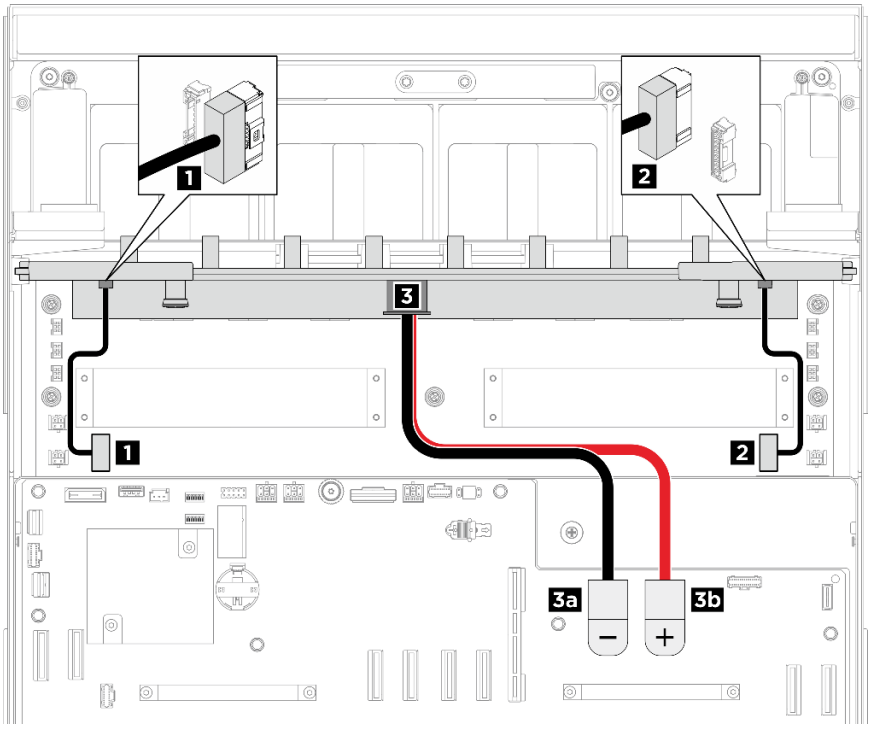


Figure 258. PSU interposer cable routing

From	To
1 PSU interposer: Power distribution board sideband connector 1 (PDB SB1)	1 Power distribution board: PSU interposer sideband connector 1 (PIB SB1)
2 PSU interposer: Power distribution board sideband connector 2 (PDB SB2)	2 Power distribution board: PSU interposer sideband connector 2 (PIB SB2)
3 PSU interposer: System board power connector (MB PWR)	3a System board: Ground (-) connector (PSU_GND) (black cable)
	3b System board: 12V (+) connector (PSU_P12V) (red cable)

Rear auxiliary fan cable routing

Use the section to understand the cable routing for the rear auxiliary fans.

Notes: Connect the green cables to the following two connectors on the power distribution board.

- Fan 19 power connector (PUMP2)
- Fan 17 power connector (PUMP5)

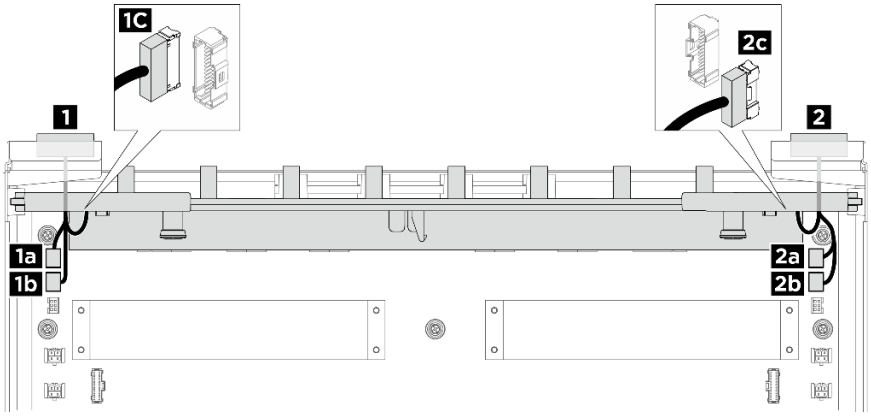


Figure 259. Rear auxiliary fan cable routing

From	To
1 Fans 18 and 19 cable	1a Power distribution board: Fan 19 power and signal connector (PUMP1) (black cable)
	1b Power distribution board: Fan 19 power connector (PUMP2) (green cable)
	1c PSU interposer: Fan 18 power and signal connector (FAN2 LEAK2)
2 Fans 16 and 17 cable	2a Power distribution board: Fan 17 power and signal connector (PUMP4) (black cable)
	2b Power distribution board: Fan 17 power connector (PUMP5) (green cable)
	2c PSU interposer: Fan 16 power and signal connector (FAN1 LEAK1)

System I/O board cable routing

Use the section to understand the cable routing for the system I/O board.

Note: Pass the cable through the cable holder and baffle assembly, then route it over the system board as illustrated below.

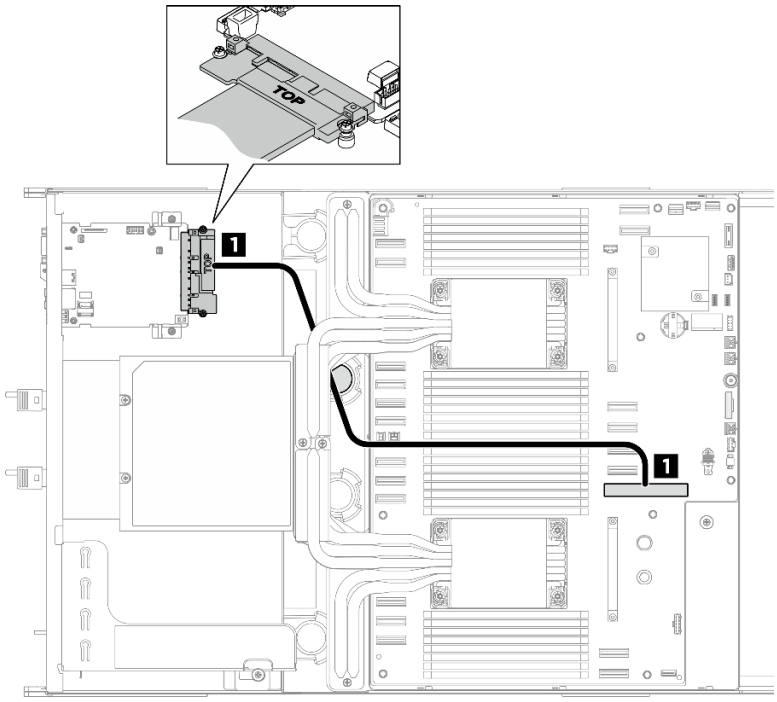


Figure 260. System I/O board cable routing

From	To
1 System I/O board: System board connector	1 System board: System I/O board connector (DC-SCM)

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 11.

  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 27.
- 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 11.

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 11 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 11.
-  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 system I/O board (or 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 seconds until its LED flashes slowly (once every couple of seconds). See Chapter 2 “Server components” on page 11 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/sr680av3withb200/7dm9/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		√		

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 Windows Admin Center	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√		√

Notes:

1. For I/O firmware updates.
2. For BMC and UEFI firmware updates.
3. Drive firmware update is only supported by the tools and methods below:
   - XCC Bare Metal Update (BMU): In-band, and requires system reboot.
   - Lenovo XClarity Essentials OneCLI:
     - For OneCLI version earlier than 5.0.0:
       - 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.).
     - For OneCLI 5.0.0 and later versions: In-band, and does not require system reboot.
4. 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/lnvo-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/lnvo-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.

Note: UEFI **Legacy Mode** is not supported by ThinkSystem V4 products.

- **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 configuring the server 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 37, which specifies whether your sever 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 → Total Memory Encryption (TME)** and enable the option.

Step 4. 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

Intel VROC

Enabling Intel VROC

Before setting up RAID for NVMe drives, follow the below steps to enable VROC:

1. 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/.)

2. Go to **System settings → Devices and I/O Ports → Intel® VMD technology → Enable/Disable Intel® VMD** and enable the option.
3. Save the changes and reboot the system.

Intel VROC configurations

Intel offers various VROC configurations with different RAID level and SSD support. See the following for more details.

Notes:
- Supported RAID levels varies by model. For the RAID level supported by SR680a V3, see Technical specifications.
- For more information about acquiring and installing the activation key, see https://fod.lenovo.com/lkms.

Intel VROC configurations for PCIe NVMe SSDs	**Requirements**
Intel VROC Standard	• Supports RAID levels 0, 1, and 10 • Requires an activation key
Intel VROC Premium	• Supports RAID levels 0, 1, 5, and 10 • Requires an activation key
Bootable RAID	• RAID 1 only • Requires an activation key • Supported processors: – 5th Gen Intel® Xeon® Scalable processors (formerly codenamed as Emerald Rapids, EMR) – 6th Gen Intel® Xeon® Scalable processors with P-cores (formerly codenamed as Granite Rapids-SP, GNR-SP) – 6th Gen Intel® Xeon® Scalable processors with E-cores (formerly codenamed as Sierra Forest-SP, SRF-SP)
Intel VROC configurations for SATA SSDs	**Requirements**
Intel VROC SATA RAID	• Supports RAID levels 0, 1, 5, and 10. • Not supported by Granite Rapids-SP (GNR-SP) processors and Sierra Forest-SP (SRF-SP) processors.

Deploy the operating system

Several options are available to deploy an operating system on the server.

Available operating systems

- Canonical Ubuntu
- Red Hat Enterprise Linux

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

- **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

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/sr680a-v3-7dm9/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.

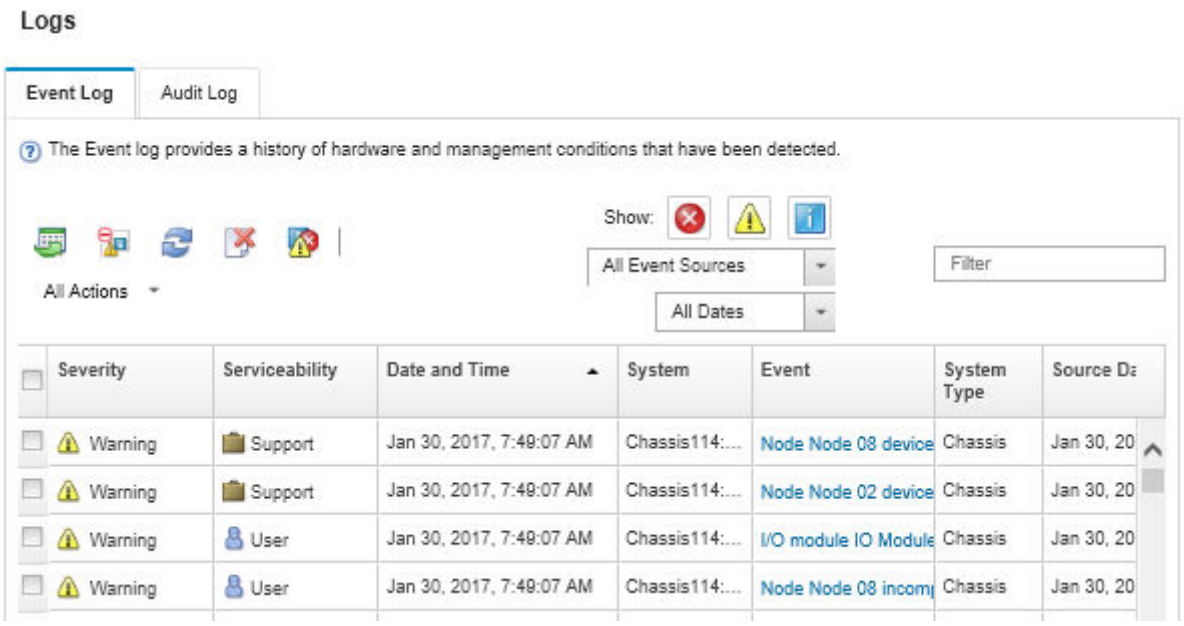


Figure 261. Lenovo XClarity Administrator event log

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.

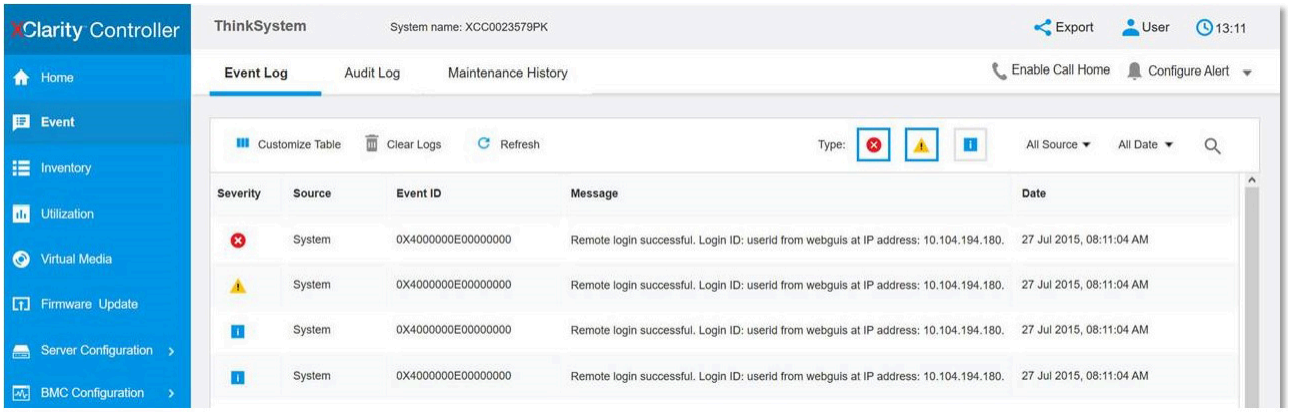


Figure 262. Lenovo XClarity Controller event log

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.

Front LEDs

This topic provides information about LEDs on the front of the server.

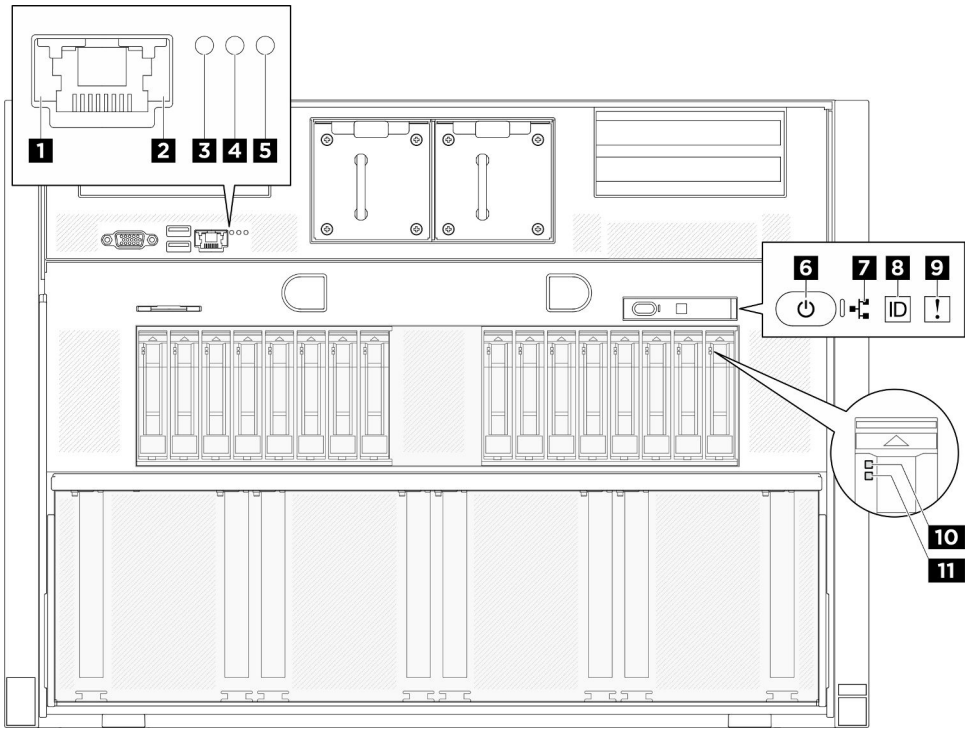


Figure 263. Front LEDs

1 XCC system management port (10/100/1000 Mbps RJ-45) link LED

Use this green LED to distinguish the network connectivity status:

- Off: The network link is disconnected.
- Green: The network link is established.

2 XCC system management port (10/100/1000 Mbps RJ-45) activity LED

Use this green LED to distinguish the network activity status:

- Off: The server is disconnected from a LAN.
- Green: The network is connected and active.

3 Location 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.

4 System error LED (yellow)

LED on: an error has occurred. Complete the following steps:

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.

5 RoT error LED (amber)

The RoT error LED indicates that there is a Root of Trust failure on either the XCC or UEFI image.

6 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.

7 Network activity LED (green)

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

Note: SR680a V3 does not have the OCP module installed. The network activity LED will blink at a constant 1 Hz rate.

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.

8 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.

9 System Error LED (yellow)

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

Status	Color	Description	Action
On	Yellow	An error has been detected on the server. Causes might include one or more of the following errors: • 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 300.

10 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.

11 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.

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:

- System board
- Two processors
- Sixteen memory modules
- System I/O board and its cable (for firmware and RoT security module)
- Eight power supplies
- One M.2 drive (If OS is needed by debugging)
- Twenty-one system fans
- One front PCIe Ethernet Adapter (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.

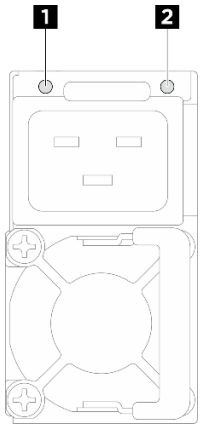


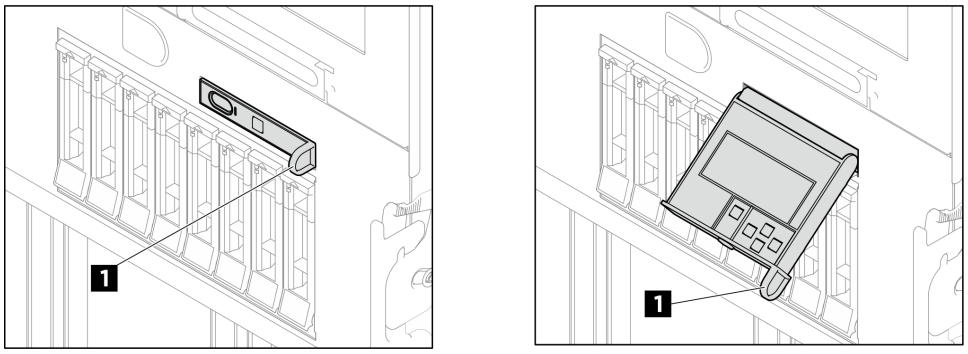
Figure 264. Power supply LEDs

LED	Description
1 Output and fault status (bi-color, green and yellow)	The output and fault status LED can be in one of the following states: • Off: The server is powered off, or the power supply unit is not working properly. If the server is powered on but the LED is off, replace the power supply unit. • Fast blinking green (about five flashes per second): The power supply unit is in firmware update mode. • Green: The server is on and the power supply unit is working normally. • Yellow: The power supply unit may have failed. Dump the FFDC log from the system and contact Lenovo back-end support team for PSU data log reviewing.
2 Input status (single color, green)	The input status LED can be in one of the following states: • Off: The power supply unit is disconnected from the input power source. • Green: The power supply unit is connected to the input power source. • Blinking (1Hz): The input power is unhealthy.

Integrated diagnostics panel

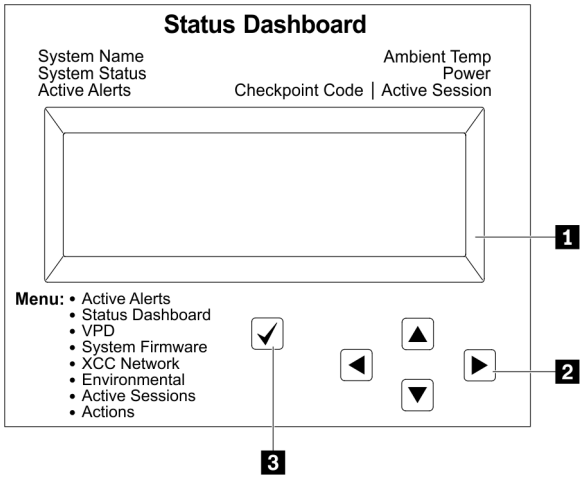
The Integrated diagnostics panel is attached to the front of the server, while it allows quick access to system information such as errors, system status, firmware, network, and health information. The Integrated Diagnostics Panel may also provide front operator panel function.

Location of the integrated diagnostics panel

Location	The integrated diagnostics panel is attached to the front of the system shuttle.  *Figure 265. Integrated diagnostics panel attached to the front of the system shuttle*
Callout	**1** The handle with which the panel can be pulled out from the server. **Notes:** • 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.

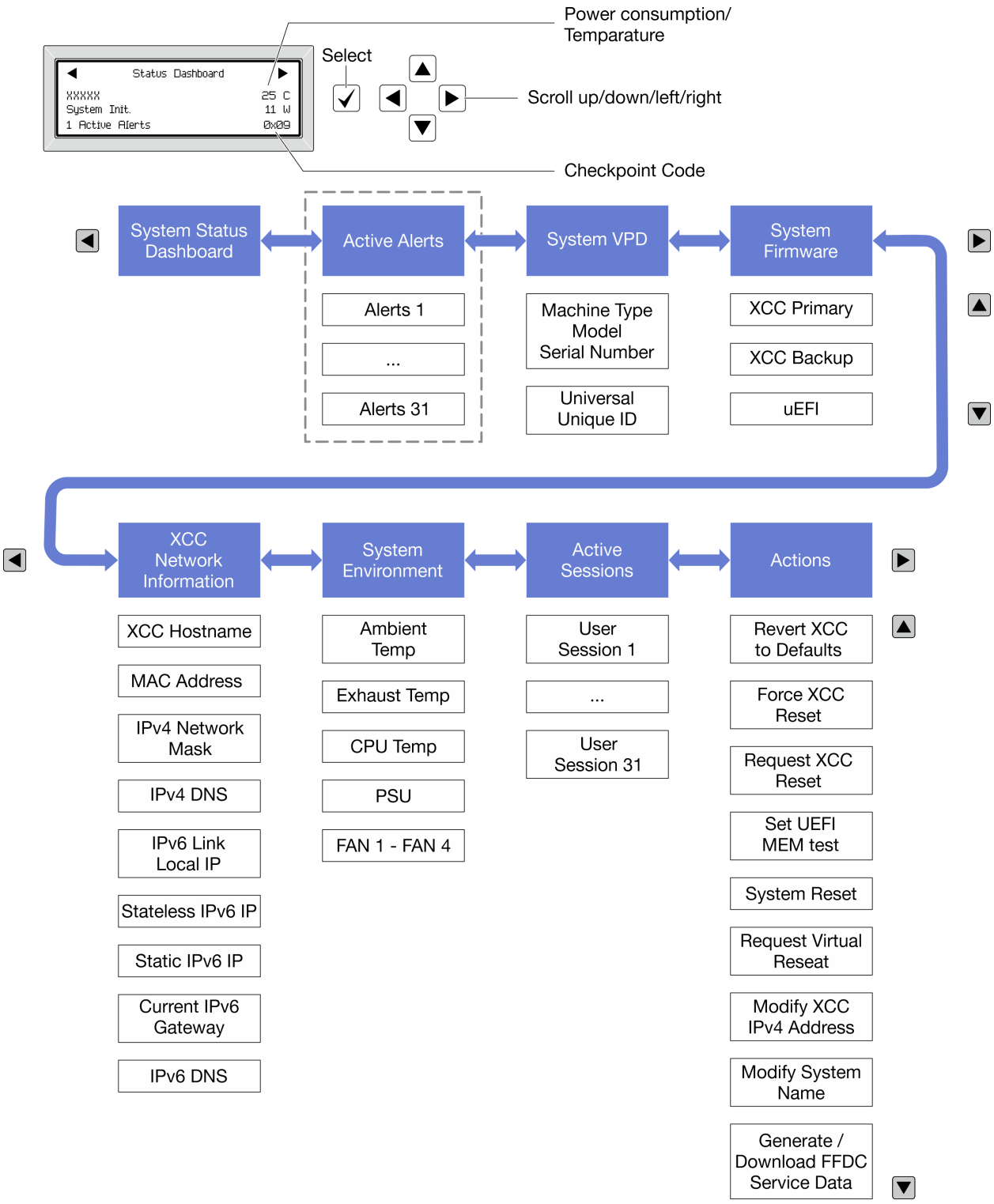


1 LCD display
2 Scroll buttons (up/down/left/right) Press the scroll buttons to locate and select system information.
3 Select button Press the select button to select from the options in the menu.

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.

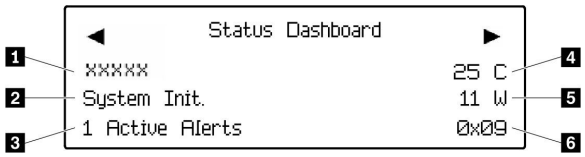


Full menu list

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
1 System name 2 System status 3 Active alert quantity 4 Temperature 5 Power consumption 6 Checkpoint code	

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: • 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
• Machine type and serial number • Universal Unique ID (UUID)	Machine Type: xxxx Serial Num: xxxxxx Universal Unique ID: xxxxxxxxxxxxxxxxxxxxxxxxxxxx

System Firmware

Sub Menu	Example
XCC Primary • Firmware level (status) • Build ID • Version number • Release date	XCC Primary (Active) Build: DVI399T Version: 4.07 Date: 2020-04-07
XCC Backup • Firmware level (status) • Build ID • Version number • Release date	XCC Backup (Active) Build: D8BT05I Version: 1.00 Date: 2019-12-30
UEFI • 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
• XCC hostname • MAC address • IPv4 Network Mask • IPv4 DNS • IPv6 Link Local IP • Stateless IPv6 IP • Static IPv6 IP • Current IPv6 Gateway • IPv6 DNS **Note:** Only the MAC address that is currently in use is displayed (extension or shared).	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
• 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: • 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 295.

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, reseat 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.
- Make sure that the cable rating is applicable for the network speed selected. For example, an SFP+ cable is only suitable for 10G operation. An SFP25 cable is needed for 25G operation. Likewise for Base-T operation, a CAT5 cable is required for 1G Base-T operation while a CAT6 cable is required for 10G Base-T operation.

Step 3. Set both the adapter port and the switch port to auto-negotiation. If auto-negotiation is not supported on one of the ports, try configuring both ports manually to match each other.

Step 4. Check the Ethernet controller LEDs on the server. These LEDs indicate whether there is a problem with the connector, cable, or hub.

Although some adapters may vary, when installed vertically the adapter link LED is typically on the left of the port and the activity LED is typically on the right.

The server front panel LED is described in "Troubleshooting by system LEDs and diagnostics display" on page 297.

- The Ethernet link status LED is lit when the Ethernet controller receives a link indication from the switch. If the LED is off, there might be a defective connector or cable or a problem with the switch.
- 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 297.

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 295).
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 339).

GPU problems

Use this information to resolve problems that are related to GPUs.

- “System fails to detect a specific GPU” on page 313

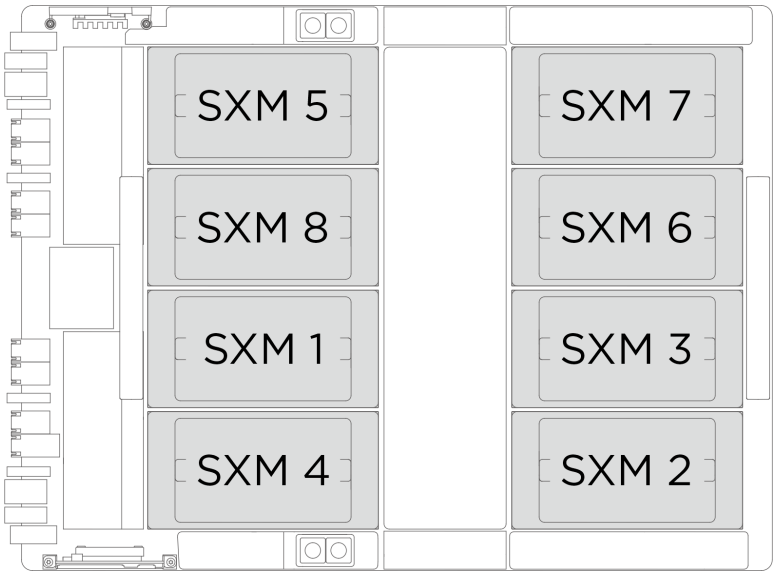
Health check for GPUs

Notes:

- Use one of the following utilities to check the GPU health status. Make sure to update GPU driver, which includes the following utilities required. Latest driver can be found at https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr680av3withb200/7dm9/downloads/driver-list/.

  For more information about System Management Interface (SMI) information, see https://developer.nvidia.com/system-management-interface.

- The following table shows the mapping information between module IDs and physical GPU sockets.

Module ID	Physical GPU socket	Location of the GPU socket
1	SXM 1	
2	SXM 2	
3	SXM 3	
4	SXM 4	
5	SXM 5	
6	SXM 6	
7	SXM 7	
8	SXM 8	

- nvidia-smi

  Run the `nvidia-smi` utility to display the eight GPUs online.

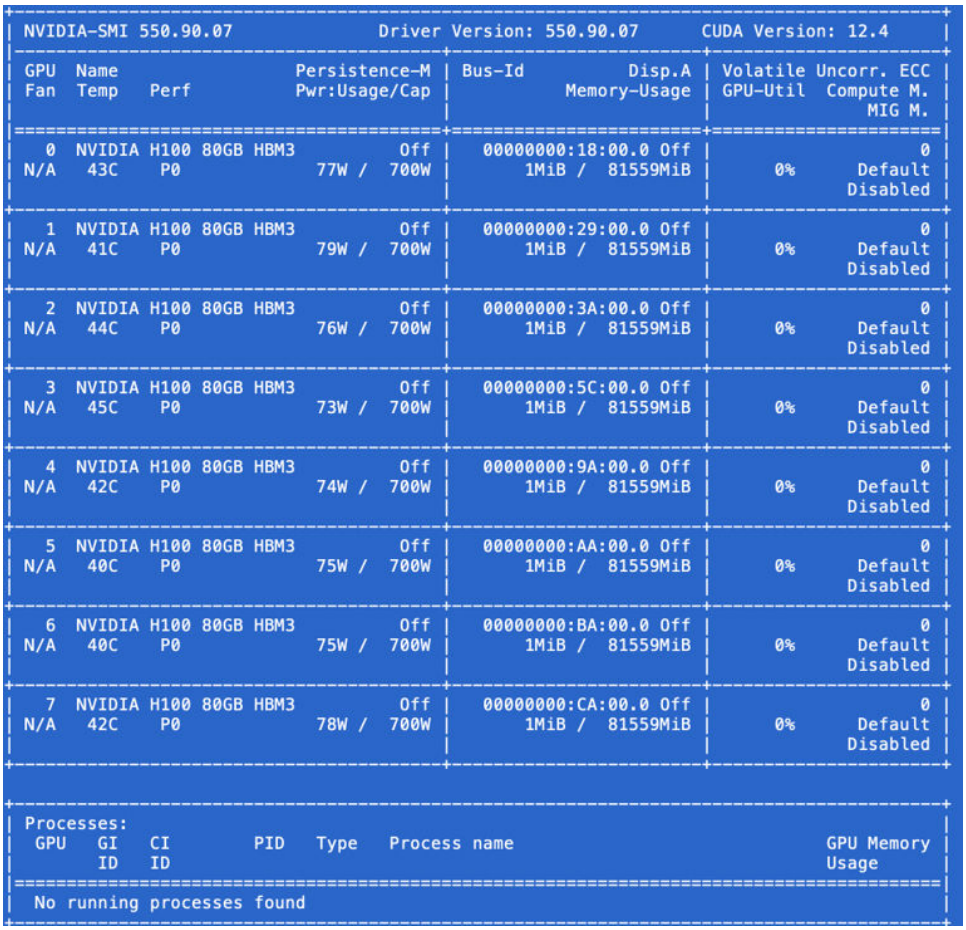


Figure 266. nvidia-smi

- nvidia-smi -L

  Run the `nvidia-smi -L` utility to display the eight GPUs online with UUID.

```
GPU 0: NVIDIA H100 80GB HBM3 (UUID: GPU-6e0a65fb-718e-5b02-59f6-8299cf79d5ff)
GPU 1: NVIDIA H100 80GB HBM3 (UUID: GPU-1feb659e-68d7-989b-f7a5-ee58dd99022e)
GPU 2: NVIDIA H100 80GB HBM3 (UUID: GPU-0896702e-cdb2-6600-b0a7-8ccc184e6d1d)
GPU 3: NVIDIA H100 80GB HBM3 (UUID: GPU-0963c80d-fb0a-136e-895a-243459c6023f)
GPU 4: NVIDIA H100 80GB HBM3 (UUID: GPU-e30aaa97-7c92-5395-899f-fb09ab23b9e2)
GPU 5: NVIDIA H100 80GB HBM3 (UUID: GPU-94ab9e89-76fb-7428-df61-023cf4b7751e)
GPU 6: NVIDIA H100 80GB HBM3 (UUID: GPU-6fc98cc6-d0d4-a04b-16b1-1e629800d849)
GPU 7: NVIDIA H100 80GB HBM3 (UUID: GPU-4cf011b1-5de1-d8d6-a26a-b48961e1d5c8)
```

Figure 267. nvidia-smi -L

- nvidia-smi -q --id=1 -f <output file name>

  Run the `nvidia-smi -q --id=1 -f <output file name>` utility to export GPU inventory information.

  Type the desired file name in <output file name> to store the output. For example: `nvidia-smi -q --id=1 -f /tmp/queryoam1.txt`.

```
==============NVSMI LOG==============

Timestamp                                 : Sat Jun 15 15:12:42 2024
Driver Version                            : 550.90.07
CUDA Version                              : 12.4

Attached GPUs                             : 8
GPU 00000000:29:00.0
    Product Name                          : NVIDIA H100 80GB HBM3
    Product Brand                         : NVIDIA
    Product Architecture                  : Hopper
    Display Mode                          : Enabled
    Display Active                        : Disabled
    Persistence Mode                      : Disabled
    Addressing Mode                       : None
    MIG Mode
        Current                           : Disabled
        Pending                           : Disabled
    Accounting Mode                       : Disabled
    Accounting Mode Buffer Size           : 4000
    Driver Model
        Current                           : N/A
        Pending                           : N/A
    Serial Number                         : 1654123019435
    GPU UUID                              : GPU-1feb659e-68d7-989b-f7a5-ee58dd99022e
    Minor Number                          : 1
    VBIOS Version                         : 96.00.89.00.01
    MultiGPU Board                        : No
    Board ID                              : 0x2900
    Board Part Number                     : 692-2G520-0200-000
    GPU Part Number                       : 2330-885-A1
    FRU Part Number                       : N/A
    Module ID                             : 8
    Inforom Version
        Image Version                     : G520.0200.00.05
        OEM Object                        : 2.1
        ECC Object                        : 7.16
        Power Management Object           : N/A
    Inforom BBX Object Flush
        Latest Timestamp                  : N/A
        Latest Duration                   : N/A
    GPU Operation Mode
        Current                           : N/A
        Pending                           : N/A
    GPU C2C Mode                          : Disabled
    GPU Virtualization Mode
        Virtualization Mode               : None
        Host VGPU Mode                    : N/A
        vGPU Heterogeneous Mode           : N/A
    GPU Reset Status
        Reset Required                    : No
```

Figure 268. nvidia-smi -q --id=1 -f <output file name>

- nvidia-smi --id=0 -q -d ECC,PAGE_RETIREMENT

  Run the `nvidia-smi --id=0 -q -d ECC,PAGE_RETIREMENT` utility to export ECC (Error Checking and Correction) errors and status of retired pages.

```
ECC Mode
    Current                           : Enabled
    Pending                           : Enabled
Ecc Errirs
    Volatile
        SRAM Correctable              : 0
        SRAM Uncorrectable Parity     : 0
        SRAM Uncorrectable SEC-DED    : 0
        DRAM Correctable              : 0
        DRAM Uncorrectable:           : 0
    Aggregate
        SRAM Correctable              : 0
        SRAM Uncorrectable Parity     : 0
        SRAM Uncorrectable SEC-DED    : 0
        DRAM Correctable              : 0
        DRAM Uncorrectable            : 0
        SRAM Threshold Exceeded       : No
```

```
    Aggregate Uncorrectable SRAM Sources
        SRAM L2                         : 0
        SRAM SM                         : 0
        SRAM Microcontroller          : 0
        SRAM PCIE                       : 0
        SRAM Other                      : 0
    Retired Pages
        Single Bit ECC                : N/A
        Double Bit ECC                : N/A
        Pending Page Blacklist        : N/A
```

- nvidia-smi pci --getErrorCounters

  Run the `nvidia-smi pci --getErrorCounters` utility to display error counters of the eight GPUs.

```
          ~$ nvidia-smi pci --getErrorCounters
GPU 0: NVIDIA H100 80GB HBM3 (UUID: GPU-6e0a65fb-718e-5b02-59f6-8299cf79d5ff)
    REPLAY_COUNTER:          0
    REPLAY_ROLLOVER_COUNTER: 0
    L0_TO_RECOVERY_COUNTER:  5
    CORRECTABLE_ERRORS:      0
    NAKS_RECEIVED:           0
    RECEIVER_ERROR:          0
    BAD_TLP:                 0
    NAKS_SENT:               0
    BAD_DLLP:                0
    NON_FATAL_ERROR:         0
    FATAL_ERROR:             0
    UNSUPPORTED_REQ:         0
    LCRC_ERROR:              0
    LANE_ERROR:
         lane  0: 0
         lane  1: 0
         lane  2: 0
         lane  3: 0
         lane  4: 0
         lane  5: 0
         lane  6: 0
         lane  7: 0
         lane  8: 0
         lane  9: 0
         lane 10: 0
         lane 11: 0
         lane 12: 0
GPU 1: NVIDIA H100 80GB HBM3 (UUID: GPU-1feb659e-68d7-989b-f7a5-ee58dd99022e)
    REPLAY_COUNTER:          0
    REPLAY_ROLLOVER_COUNTER: 0
    L0_TO_RECOVERY_COUNTER:  5
    CORRECTABLE_ERRORS:      0
    NAKS_RECEIVED:           0
    RECEIVER_ERROR:          0
```

Figure 269. nvidia-smi pci --getErrorCounters

- nvidia-smi pci --getErrorCounters --id=<id number>

  Run the `nvidia-smi pci --getErrorCounters --id=<id number>` utility to display error counters of a specific GPU.

  Type the ID number of a specific GPU in <id number>. For example: `nvidia-smi pci --getErrorCounters --id=2`.

```
          :~$ nvidia-smi pci --getErrorCounters --id=2
GPU 2: NVIDIA H100 80GB HBM3 (UUID: GPU-0896702e-cdb2-6600-b0a7-8ccc184e6d1d)
    REPLAY_COUNTER:           0
    REPLAY_ROLLOVER_COUNTER: 0
    L0_TO_RECOVERY_COUNTER:  5
    CORRECTABLE_ERRORS:       0
    NAKS_RECEIVED:            0
    RECEIVER_ERROR:           0
    BAD_TLP:                  0
    NAKS_SENT:                0
    BAD_DLLP:                 0
    NON_FATAL_ERROR:          0
    FATAL_ERROR:              0
    UNSUPPORTED_REQ:          0
    LCRC_ERROR:               0
    LANE_ERROR:
         lane  0: 0
         lane  1: 0
         lane  2: 0
         lane  3: 0
         lane  4: 0
         lane  5: 0
         lane  6: 0
         lane  7: 0
         lane  8: 0
         lane  9: 0
         lane 10: 0
         lane 11: 0
         lane 12: 0
```

Figure 270. nvidia-smi pci --getErrorCounters --id=<id number>

System fails to detect a specific GPU

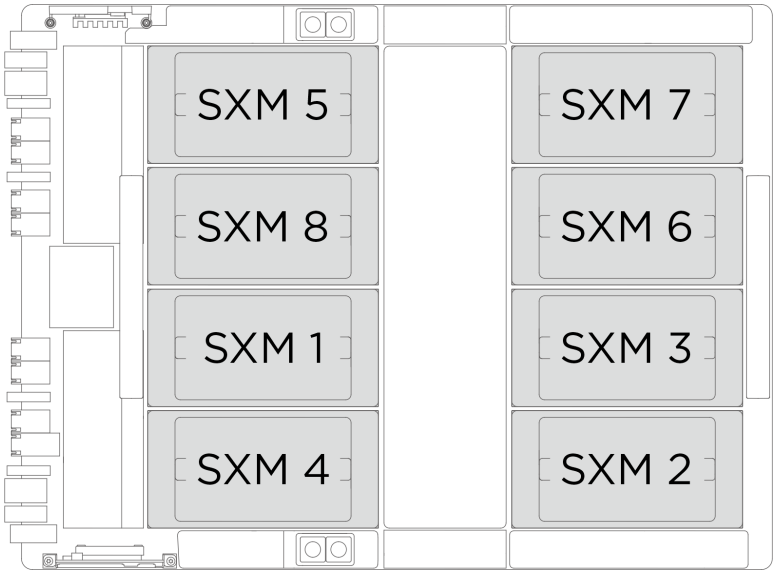
When one of the events appears in the XCC web event log, it indicates the system fails to detect one or more specific GPUs.

- When event **FQXSPIO0015M: Fault in slot [PhysicalConnectorSystemElementName] on system [ComputerSystemElementName].** appears, see Messages and Codes Reference to solve the problem.
- When event **FQXSFIO0010M: An Uncorrectable PCIe Error has Occurred at Bus [arg1] Device [arg2] Function [arg3]. The Vendor ID for the device is [arg4] and the Device ID is [arg5]. The physical [arg6] number is [arg7].** appears, see Messages and Codes Reference to solve the problem.

  Notes: Parameters:

  - [arg1] Bus
  - [arg2] Device
  - [arg3] Function
  - [arg4] VID
  - [arg5] DID
  - [arg6] Slot/Bay
  - [arg7] Instance number
- When event **FQXSPUN0019M : Sensor [SensorElementName] has transitioned to critical from a less severe state.** appears, see Messages and Codes Reference to solve the problem.
- When event **FQXSPPW4001I : PCIe Power Brake for [arg1] has been [arg2].** appears, see Messages and Codes Reference to solve the problem.

Note: The following table shows the mapping information between the slot numbering in XCC and physical GPU sockets.

Slot numbering in XCC	Physical GPU sockets	Location of the GPU sockets
Slot 17	SXM 5	
Slot 18	SXM 7	
Slot 19	SXM 8	
Slot 20	SXM 6	
Slot 21	SXM 1	
Slot 22	SXM 3	
Slot 23	SXM 4	
Slot 24	SXM 2	

Intermittent problems

Use this information to solve intermittent problems.

- “Intermittent external device problems” on page 314
- “Intermittent KVM problems” on page 314
- “Intermittent unexpected reboots” on page 315

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 295 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

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 316
- “Displayed system memory is less than installed physical memory” on page 317
- “Invalid memory population detected” on page 317

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 297.
   - 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 37 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 37 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

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 287.

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 287.
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 287.

Network problems

Use this information to resolve issues related to networking.

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 295), 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

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 33 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 each system has its own specific IPMI 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

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 damage, 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 324
- "Operating system performance" on page 324

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 325
- "Server does not power on" on page 325

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 integrated diagnostics panel cable, and then repeat steps 1a and 2b.
      - If the server starts, reseat the integrated diagnostics panel.
      - If the problem remains, replace the integrated diagnostics 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 326
- "Serial device does not work" on page 326

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 connectors" on page 16).
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 327
- “Multiple drives fail” on page 328
- “Multiple drives are offline” on page 328
- “A replacement drive does not rebuild” on page 328
- “Green drive activity LED does not represent actual state of associated drive” on page 328
- “Yellow drive status LED does not represent actual state of associated drive” on page 328
- “U.3 NVMe drive can be detected in NVMe connection, but cannot be detected in Tri-mode” on page 329

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 system shuttle

Follow the instructions in this section to disassemble the system shuttle before recycling.

About this task

Refer to local environmental, waste or disposal regulations to ensure compliance.

Procedure

Step 1. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.

Step 2. 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 56.

Step 3. Remove the FIO/PCI cage. See “Remove the FIO/PCI cage” on page 97.

Step 4. Remove the drive cage. See “Remove the drive cage” on page 81.

Step 5. Remove the PCIe switch shuttle. See “Remove the PCIe switch shuttle” on page 187.

Step 6. Remove the compute tray. See “Remove the compute tray” on page 74.

Step 7. Remove the cable holder frame and baffle assembly. See “Remove the cable holder frame and baffle assembly” on page 70.

Step 8. Remove the power complex. See “Remove the power complex” on page 209.

Step 9. Remove all the GPU air ducts. See “Remove a GPU air duct” on page 100.

Step 10. Remove the GPU complex. See “Remove the GPU complex” on page 116.

Step 11. Remove the GPU complex adapter plate. See “Remove the GPU complex adapter plate” on page 128.

After you finish

After disassembling the system shuttle, recycle the unit in compliance with local regulations.

Disassemble the system board for recycle

Follow the instructions in this section to disassemble the system board before recycling.

About this task

Before disassembling the system board:

1. Pull the system shuttle out of the chassis, and place it onto the lift platform. See “Remove the system shuttle” on page 251.
2. Remove the compute tray. See “Remove the compute tray” on page 74.
3. Remove all the processors and the heat sinks. See “Remove a processor and heat sink” on page 221.
4. Remove all the memory modules. See “Remove a memory module” on page 162.
5. Remove the CMOS battery (CR2032). See “Remove the CMOS battery (CR2032)” on page 77.

6. Remove all the M.2 drives. See “Remove an M.2 drive” on page 157.
7. Refer to local environmental, waste or disposal regulations to ensure compliance.

Procedure

Step 1. Disengage the system board.

a. 1 Loosen the thumbscrew (1) to release the system board.

b. 2 Slide the system board towards the front of the compute tray as illustrated to disengage it from the tray.

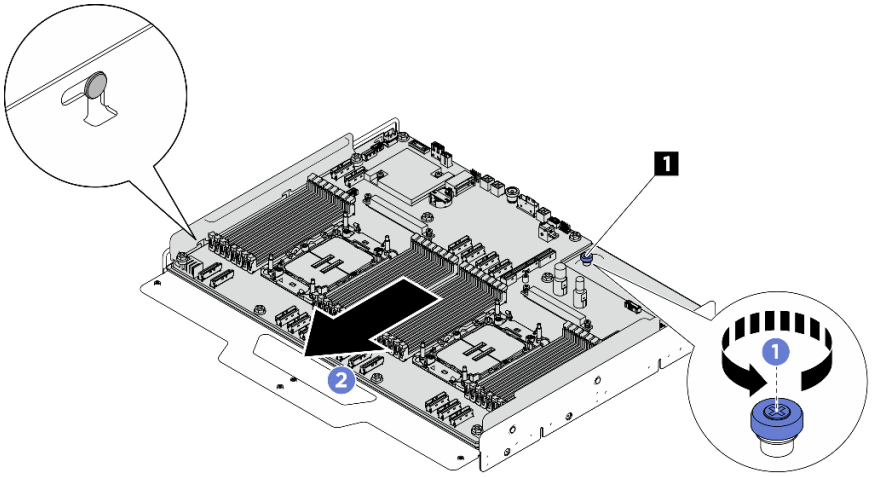


Figure 271. System board disengagement

Step 2. Remove the system board from the tray.

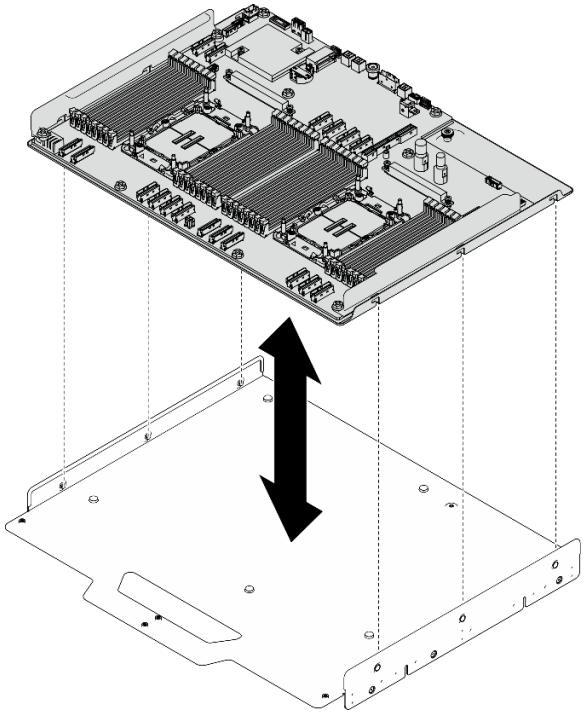


Figure 272. System board removal

Step 3. Separate the system board from the supporting sheet metal.

1. Carefully turn the system board upside down.

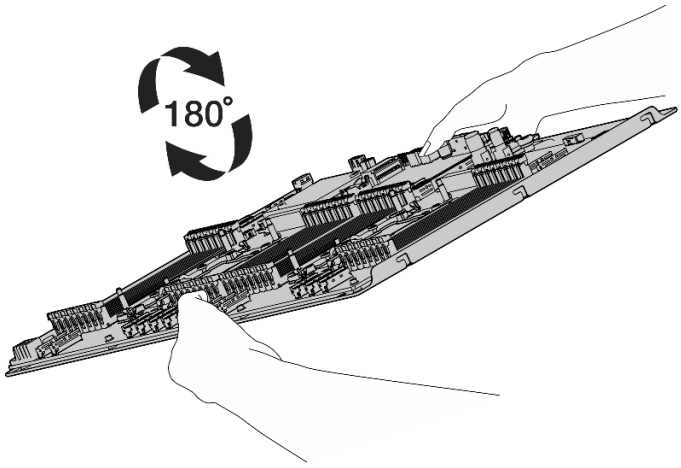


Figure 273. Turning the system board upside down

2. Unfasten the two screws from the bottom of the supporting sheet metal to remove the power connectors.

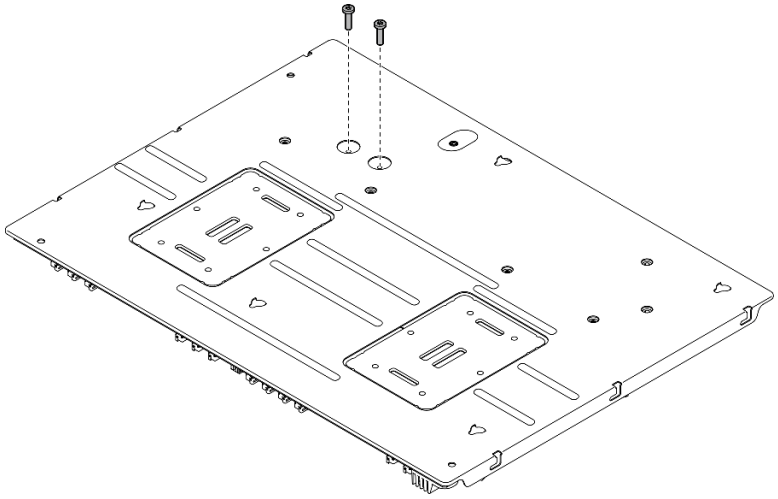


Figure 274. Screw removal

3. Carefully turn the system board right-side up.

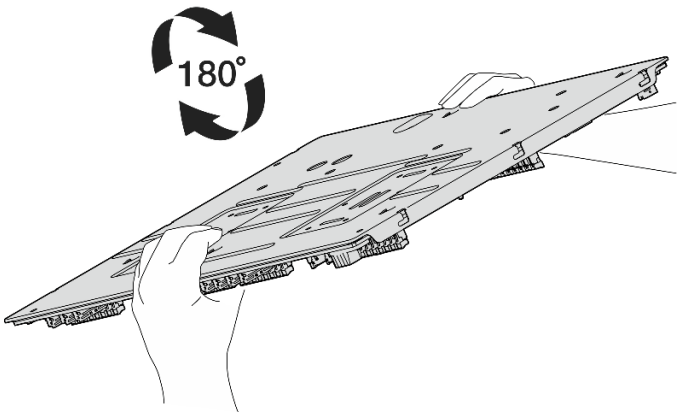


Figure 275. Turning the system board right-side up

4. Remove the thumbscrew and ten screws from the system board as illustrated:

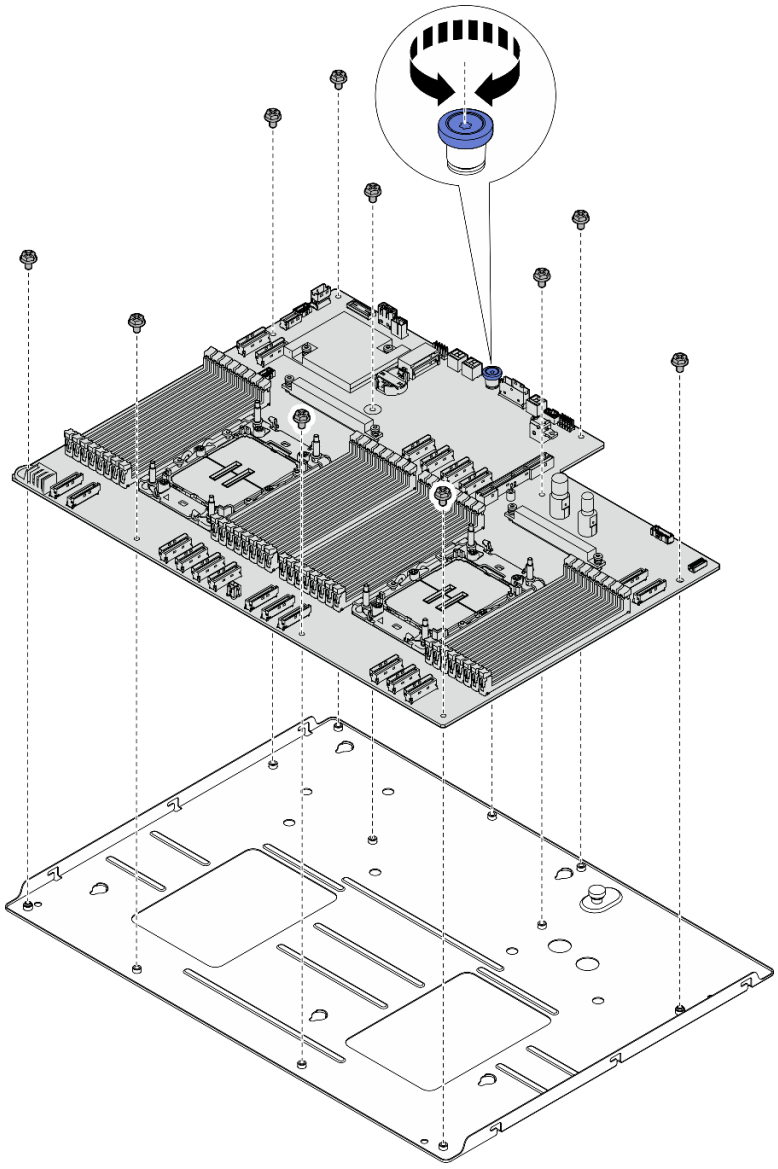


Figure 276. Component removal

5. Separate the system board from the supporting sheet metal.

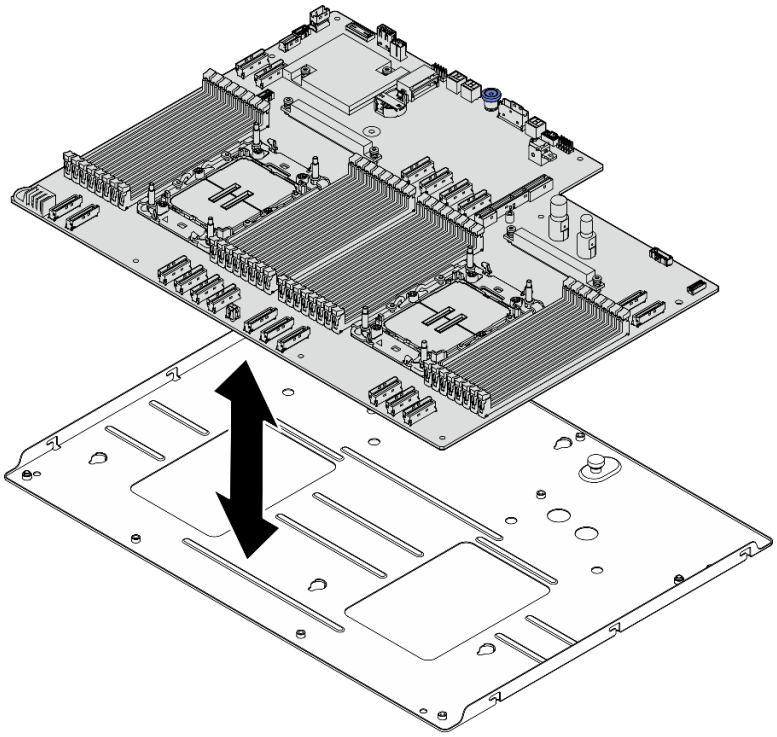


Figure 277. System board disassembly

After you finish

After disassembling the system board, 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/sr680av3withb200/7dm9/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 295 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 27.
- 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/supportphonelist 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/sr680a-v3-7dm9/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 SR680a V3
  - https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr680av3withb200/7dm9/downloads/driver-list/
- Lenovo Data Center Forum
  - https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg
- Lenovo Data Center Support for ThinkSystem SR680a V3
  - https://datacentersupport.lenovo.com/products/servers/thinksystem/sr680av3withb200/7dm9
- Lenovo License Information Documents
  - https://datacentersupport.lenovo.com/documents/lnvo-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

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Internet Explorer, Microsoft, and Windows are trademarks of the Microsoft group of companies.

Linux is a registered trademark of Linus Torvalds.

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	○	○	○	○	○	○
機械組合件	–	○	○	○	○	○
空氣傳動設備	–	○	○	○	○	○
冷卻組合件	–	○	○	○	○	○
內存模組	–	○	○	○	○	○
處理器模組	–	○	○	○	○	○
圖形處理器模組	–	○	○	○	○	○
電纜組合件	–	○	○	○	○	○
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.

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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