ThinkSystem SR250 V3
User Guide

Machine Types: 7DCL and 7DCM

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

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.

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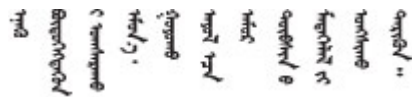
Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

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་སྐྱོད་མ་བྱས་གོང་། སྐོར་གྱི་ཡིད་གཟབ་
བྱ་འདུ་མིན་ཡོད་པའི་འོད་སྐྱེར་བལྟ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

مەزكۇر مەھسۇلاتنى ئورنتشتىن بۇرۇن بىخەتەرلىك ئۇچۇرلىرىنى ئوقۇپ چىقىڭ.

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 installed or serviced by trained personnel, as defined by the NEC, IEC 62368-1 & IEC 60950-1, 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. Access to the equipment is by the use of a tool, lock and key, or other means of security, and 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:

    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.

Chapter 1. Introduction

The ThinkSystem SR250 V3 server (Types 7DCL and 7DCM) is a 1U rack server designed for high-volume network transaction processing. This high-performance, one-core server is ideally suited for networking environments that require superior microprocessor performance, input/output (I/O) flexibility, and high manageability.

Figure 1. SR250 V3

Features

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

Your server implements the following features and technologies:

- **Features on Demand**

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

  https://fod.lenovo.com/lkms

- **Lenovo XClarity Controller (XCC)**

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

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

- **UEFI-compliant server firmware**

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

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

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

- **Large system-memory capacity**

  The server supports up to 4 TruDDR5 DIMMs operating at up to 4800 MHz. For more information about the specific types and maximum amount of memory, see "Technical specifications" on page 3.

- **Integrated network support**

The server comes with an integrated 2-port Gigabit Ethernet controller, which supports connection to a 10 Mbps, 100 Mbps, or 1000 Mbps network. In the initial server configuration, Ethernet 1 and Ethernet 2 are activated.

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

  The hot-swap server models support a maximum of ten 2.5-inch hot-swap Serial Attached SCSI (SAS) hard disk drives or hot-swap Serial ATA (SATA) hard disk drives.

  The simple-swap server models support a maximum of four 3.5-inch simple-swap SATA drives or two 3.5-inch simple-swap SATA drives and two 3.5-inch simple-swap NVMe drives.

- **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 207.

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

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

- **Active Energy Manager**

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

- **Optional power capabilities**

  The server supports a maximum of two 800W hot-swap power supplies, which provide redundancy for a typical configuration.

- **ThinkSystem RAID support**

  The ThinkSystem RAID adapter provides hardware redundant array of independent disks (RAID) support to create configurations. The standard RAID adapter provides RAID levels 0, 1, 5, 6 and 10. An optional RAID adapter is available for purchase.

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 • Integrated functions and I/O connectors • Network • Rear button • RAID adapter • Host bus adapter • System fan • Electrical input • Minimal configuration for debugging • Operating systems	• Dimension • Weight	• Heat output • Acoustical noise emissions • Ambient temperature management • 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
This server comes with one LGA 1700 socket that supports one of the following Intel® processors scalable up to eight cores and up to 95W TDP: • Xeon® 6300 / E-2400 series • Pentium® **Note:** Only the Xeon® E processor supports Intel® Trusted Execution Technology (Intel® TXT) feature. For a list of supported processors, see: https://serverproven.lenovo.com. **Note:** Due to Intel processor transient throttling behavior in turbo, the CPU turbo ratio limit of 95W processor is set to lower frequency as the default setting to avoid processor throttling.

Memory

See "Memory module installation rules and order" on page 46 for detailed information about memory configuration and setup.

- Minimum: 16 GB
- Maximum: 128 GB
- Slots: four DIMM slots (two channels, two DIMMs per channel)
- Memory module type:
  - TruDDR5 4800MHz ECC UDIMM: 16 GB (1Rx8), 32 GB (2Rx8)
  - TruDDR5 5600MHz ECC UDIMM: 16 GB (1Rx8), 32 GB (2Rx8)

Notes:

- Memory operates at up to 4400 MHz, depending on "Memory module installation rules and order" on page 46
- 4800MHz memory is only supported with Intel Xeon® E-2400 series and Pentium® processors, 5600MHz memory is only supported with Intel Xeon® 6300 series and Pentium® processors.

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

M.2 Drive

Supports up to two SATA M.2 drives of the following drive form factors:

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

Supports the following M.2 drive capacity:

- 240 GB
- 480 GB
- 960 GB

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

Notes:

- When a ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit is installed, eight SATA/SAS drives configured with software RAID is not supported.
- Disabling the ThinkSystem M.2 SATA/NVMe 2-Bay Non-Hot-Swap RAID Enablement Kit through UEFI setup menu or LXPM is not supported.

Storage expansion

Available drive bays might vary by model.
 	
 • 2.5-inch models:
 	
    – Supports up to eight hot-swap SAS/SATA drives.
 	
    – Supports up to ten hot-swap SAS/SATA drives.
 	
 • 3.5-inch models:
 	
    – Supports up to four simple-swap SATA drives.
 	
    – Supports up to two simple-swap SATA drives and two NVMe drives.
 	
    – Supports up to four hot-swap SAS/SATA drives.
 	
Note:
 When all eight storage drives have been installed, and the system has been set to software RAID mode in the UEFI settings, regardless if the disks are configured as an array or as separate disks, drives 6 and 7 cannot be used to install the Windows operating system.

Expansion slots

Up to two expansion slots (depending on the server configuration):
 	
 • x16 PCIe riser:
   – Slot 1: Not available
   – Slot 2: PCIe Gen5 x16 in x16 slot, low profile
 • x16/x8 PCIe riser:
   – Slot 1: PCIe Gen4 x8 in x8 slot, low profile (open-end)
   – Slot 2: PCIe Gen4 x8 in x16 slot, low profile
 	
 Notes:

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/.
 • Light Path Diagnostics
 • Front of server:
   – One USB 2.0 connector with XCC mobile support
   – One USB 3.2 Gen 1 connector
   – One VGA connector (optional)
   – One power button and power LED (green)
   – One drive activity LED (green)
   – One network activity LED (green)
   – One ID button and ID LED (blue)
   – One system status LED (yellow)
 • Rear of server:
   – Two USB 3.2 Gen 1 connectors
   – Two Ethernet connectors
   – One Lenovo XClarity Controller network connector
   – One VGA connector
   – One serial connector
   – One NMI button

Network
• Two 1 Gbps RJ45 Ethernet connectors   • One 1 Gbps RJ45 Lenovo XClarity Controller network connector

Rear button
NMI button

RAID adapter

The following options are available:

- Hardware RAID (RAID level 0, 1, 5, and 10):
  - ThinkSystem RAID 9350-16i 4GB Flash PCIe 12Gb Adapter (with flash power module)
  - ThinkSystem RAID 940-8i Flash PCIe Gen4 12Gb Adapter (with flash power module)
  - ThinkSystem RAID 9350-8i 2GB Flash PCIe 12Gb Adapter (with flash power module)
  - ThinkSystem RAID 5350-8i PCIe 12Gb Adapter
  - ThinkSystem RAID 9350-16i 4GB Flash PCIe 12Gb Internal Adapter (with flash power module)
  - ThinkSystem RAID 9350-8i 2GB Flash PCIe 12Gb Internal Adapter (with flash power module)
  - ThinkSystem RAID 5350-8i PCIe 12Gb Internal Adapter
- Software RAID (RAID level 0, 1, 5, and 10):
  - Intel VROC SATA RAID

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

Host bus adapter

- ThinkSystem 4350-8i SAS/SATA 12Gb HBA
- ThinkSystem 440-8e SAS/SATA PCIe Gen4 12Gb HBA

System fan

Four internal system fans (40mm x 28mm)

Electrical input

Depending on your configuration, the server comes with one of the following power supply configurations:

- Supports one fixed power supply: 300W power supply
- Supports up to two hot-swap power supplies for redundancy support: 800W power supply

Important: CRPS power supplies in the chassis must have the same wattage, vendor, and part number (or alternate part number).

Notes:

- ThinkSystem SR250 V3 only supports AC input power. **Do not use 240 VDC input.**
- The actual power efficiency depends on system configuration.

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

Minimal configuration for debugging

- One processor and heat sink
- One memory module in slot 3
- One power supply unit
- One drive with RAID adapter and backplane or backplate (if OS is needed for debugging)
- Four system fans for drives

Operating systems
Supported and certified operating systems: • Microsoft Windows Server • VMware ESXi • Red Hat Enterprise Linux • SUSE Linux Enterprise Server References: • Complete list of available operating systems: https://lenovopress.lenovo.com/osig. • OS deployment instructions, see "Deploy the operating system" on page 202.

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

1U rack
 	
• Height: 43 mm (1.7 inches)
• Width: 435 mm (17.1 inches)
   – With rack handles: 482 mm (18.98 inches)
   – Without rack handles: 435 mm (17.1 inches)
• Depth: 561.2 mm (22 inches)
 	
   Note: The depth is measured from the front mounting flange of the rack to the rear of the server.

Weight
Maximum: 12.3 kg (27.1 lbs)

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.

Heat output
Approximate heat output: • Minimum configuration: 527 BTU per hour (154 watts) • Maximum configuration: 1196 BTU per hour (350 watts)

Acoustical noise emissions

The server has the following acoustic noise emissions declaration:
- Sound power level (L_{WAd}):
  - Idling: 4.9 Bel (Typical), 6.2 Bel (Max.)
  - Operating 1: 6.3 Bel (Typical), 6.4 Bel (Max.)
  - Operating 2: 7.4 Bel (Typical), 7.4 Bel (Max.)
- Sound pressure level (L_{pAm}):
  - Idling: 35.7 dBA (Typical), 46.3 dBA (Max.)
  - Operating 1: 47.9 dBA (Typical), 50.0 dBA (Max.)
  - Operating 2: 60.8 dBA (Typical), 60.4 dBA (Max.)

Notes:

- These sound levels were measured in controlled acoustical environments according to procedures specified by ISO7779 and are reported in accordance with ISO 9296.

- Idle mode is the steady state in which the server is powered on but not operating any intended function. Operating mode 1 is 70% CPU TDP. Operating mode 2 is 100% CPU TDP.

- The declared acoustic sound levels are based on the following configurations, which may change depending on configuration/conditions, for example M.2 drive.

  - Typical: 1x 80W CPU, 1x 16GB DIMM, 2x HDD, 1x 800W GW PSU

  - Max: 1x 95W CPU, 2x 32GB DIMM, 2x HDD , 1x 9350-8i RAID,1x 10G NIC, 2x 800W GW PSU

- Government regulations (such as those prescribed by OSHA or European Community Directives) may govern noise level exposure in the workplace and may apply to you and your server installation. The actual sound pressure levels in your installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room; the noise levels from other equipment; the room ambient temperature, and employee's location in relation to the equipment. Further, compliance with such government regulations depends on a variety of additional factors, including the duration of employees' exposure and whether employees wear hearing protection. Lenovo recommends that you consult with qualified experts in this field to determine whether you are in compliance with the applicable regulations.

Ambient temperature management

Adjust ambient temperature when a specific configuration is applied:

- Keep ambient temperature to 45°C or lower when a 60W (or lower) TDP CPU and an 80W heat sink are installed.

- Keep ambient temperature to 40°C or lower when a 70W (or lower) TDP CPU and an 80W heat sink are installed.

- Keep ambient temperature to 35°C or lower when one of the following is installed:

  - 95W (or lower) TDP CPU and a 95W heat sink.

  - 80W (or lower) TDP CPU and an 80W heat sink.

  - M.2 drives, U.2 drives, U.3 drives, and 25GbE Ethernet adapters.

Environment

ThinkSystem SR250 V3 complies with ASHRAE class A2 specifications. System performance may be impacted when operating temperature is outside ASHRAE A2 specification or fan failed condition.
• Air temperature:
  – Operating
    – ASHRAE Class A2: 10°C to 35°C (50°F to 95°F); decrease the maximum ambient temperature by 1°C for every 300 m (984 ft) increase in altitude above 900 m (2,953 ft).
    – ASHRAE Class A3: 5°C to 40°C (41°F to 104°F); decrease the maximum ambient temperature by 1°C for every 175 m (574 ft) increase in altitude above 900 m (2,953 ft).
    – ASHRAE Class A4: 5°C to 45°C (41°F to 113°F); decrease the maximum ambient temperature by 1°C for every 125 m (410 ft) increase in altitude above 900 m (2,953 ft).
  – Server off: 5°C to 45°C (41°F to 113°F)
  – Shipment/storage: -40°C to 60°C (-40°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)
    – ASHRAE Class A3: 8% to 85%; maximum dew point: 24°C (75°F)
    – ASHRAE Class A4: 8% to 90%; maximum dew point: 24°C (75°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 10.
 	
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]	√	√		
Lenovo XClarity Essen-tials toolset — Bootable Media Creator			√	√[2]		√[4]		
Lenovo XClarity Essen-tials toolset — 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

The front view of the server varies by the model.

3.5-inch simple-swap drives model

The front view of 3.5-inch simple-swap drives model.

Note: Depending on the configuration, your server might be slightly different from the image.

Figure 2. 3.5-inch simple-swap drives model front view

1 VGA connector (optional)	**4** Front I/O module
2 USB 2.0 connector with Lenovo XClarity Controller management	**5** 3.5-inch simple-swap drive bays
3 USB 3.2 Gen 1 (5 Gbps) connector	**6** Rack release latches

1 VGA connector (optional)

Connect a monitor to this connector.

2 **USB 2.0 connector with Lenovo XClarity Controller management**

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

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

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

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

Four types of settings are available:

- **Host only mode**

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

- **BMC only mode**

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

- **Shared mode: owned by BMC**

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

- **Shared mode: owned by host**

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

3 **USB 3.2 Gen 1 (5 Gbps) connector**

The USB 3.2 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 **Front I/O module**

For more information about the front I/O module, see .

5 **3.5-inch simple-swap drive bays**

Install 3.5-inch simple-swap drives to these bays. See .

The server supports the following drive configurations:

- Four SATA drives in bay 0-3
- Two SATA drives in bay 0-1 and two NVMe drives in bay 2-3

6 **Rack release latches**

Press on the latch on both sides to disengage the server from the rack and slide it out.

3.5-inch hot-swap drives model

The front view of 3.5-inch hot-swap drives model.

Note: Depending on the configuration, your server might be slightly different from the image.
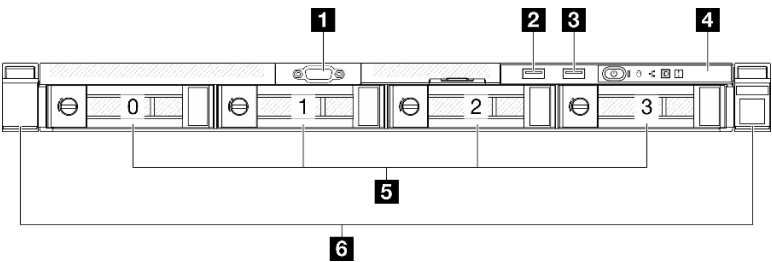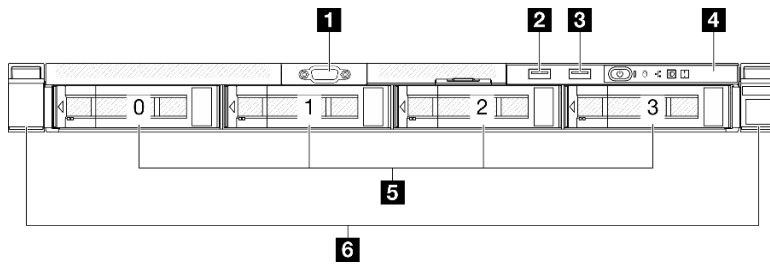
Figure 3. 3.5-inch hot-swap drives model front view

1 VGA connector (optional)	**4** Front I/O module
2 USB 2.0 connector with Lenovo XClarity Controller management	**5** 3.5-inch hot-swap drive bays
3 USB 3.2 Gen 1 (5 Gbps) connector	**6** Rack release latches

1 VGA connector (optional)

Connect a monitor to this connector.

2 USB 2.0 connector with Lenovo XClarity Controller management

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

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

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

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Four types of settings are available:

- **Host only mode**

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

- **BMC only mode**

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

- **Shared mode: owned by BMC**

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

- **Shared mode: owned by host**

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

3 USB 3.2 Gen 1 (5 Gbps) connector

The USB 3.2 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 **Front I/O module**

For more information about the front I/O module, see .

5 **3.5-inch hot-swap drive bays**

Install 3.5-inch hot-swap drives to these bays. See .

6 **Rack release latches**

Press on the latch on both sides to disengage the server from the rack and slide it out.

2.5-inch hot-swap drives model

The front view of 2.5-inch hot-swap drives model.

Note: Depending on the configuration, your server might be slightly different from the image.
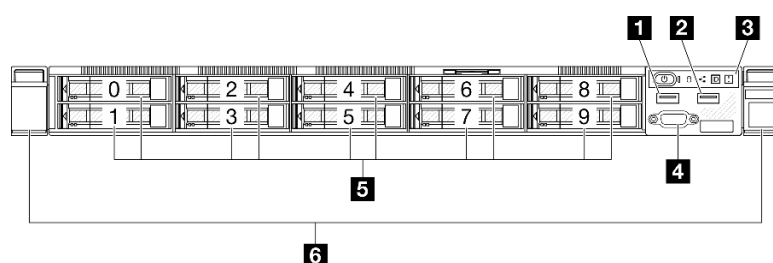
Figure 4. 2.5-inch hot-swap drives model front view

Note: The last two drive bays (8-9) may not be supported if only the eight-bay backplane is installed.

1 USB 2.0 connector with Lenovo XClarity Controller management	**4** VGA connector (optional)
2 USB 3.2 Gen 1 (5 Gbps) connector	**5** 2.5-inch hot-swap drive bays
3 Front I/O module	**6** Rack release latches

◻ USB 2.0 connector with Lenovo XClarity Controller management

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

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

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

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

Four types of settings are available:

- **Host only mode**

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

- **BMC only mode**

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

- **Shared mode: owned by BMC**

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

- **Shared mode: owned by host**

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

◻ USB 3.2 Gen 1 (5 Gbps) connector

The USB 3.2 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.

◻ Front I/O module

For more information about the front I/O module, see "Front I/O module" on page 24.

◻ VGA connector (optional)

Connect a monitor to this connector.

◻ 2.5-inch hot-swap drive bays

Install 2.5-inch hot-swap drives to these bays. See "Install a hot-swap drive" on page 77.

◻ Rack release latches

Press on the latch on both sides to disengage the server from the rack and slide it out.

Rear view

The rear view of the server varies by the model.

Fixed power supply model

The rear of the server provides access to several components, including the power supplies, PCIe adapters, serial port, and Ethernet port.

Note: Depending on the configuration, your server might be slightly different from the image.
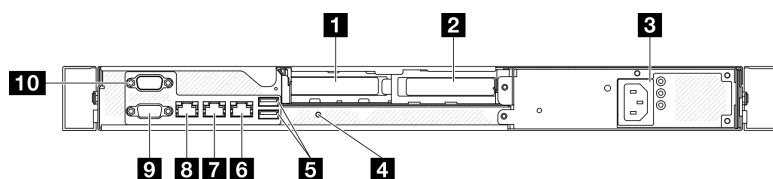
Figure 5. Fixed power supply model rear view

1 PCIe slot 1	**6** Ethernet connector 2	
2 PCIe slot 2	**7** Ethernet connector 1 (shared with XCC network port)	
3 Power supply bay	**8** XCC system management port (10/100/1000 Mbps RJ-45)	
4 NMI button	**9** VGA connector	
5 USB 3.2 Gen 1 (5 Gbps) connectors	**10** Serial port	

1 PCIe slot 1

Install PCIe adapters into this slot.

2 PCIe slot 2

Install PCIe adapters into this slot.

3 Power supply bay

Install a fixed power supply unit to this bay, connect them to power cords. Make sure the power cords are connected properly. See "Install the fixed power supply unit" on page 123.

4 NMI button

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

5 USB 3.2 Gen 1 (5 Gbps) connectors

The USB 3.2 Gen 1 (5 Gbps) connectors are direct connect interfaces (DCIs) for debugging, which can be used to attach a USB-compatible device, such as a USB keyboard, USB mouse, or USB storage device.

6 Ethernet connector 2

Attach an Ethernet cable for LAN. Each Ethernet connector has two status LEDs to help you identify the Ethernet connectivity and activity.

7 Ethernet connector 1 (shared with XCC network port)

Attach an Ethernet cable for LAN. Each Ethernet connector has two status LEDs to help you identify the Ethernet connectivity and activity. If the LOM adapter is not installed, Ethernet connector 1 can be set as Lenovo XClarity Controller Network connector. To set Ethernet connector 1 as Lenovo XClarity Controller Network connector, start Setup Utility and select **BMC Settings ➔ Network Settings ➔ Network Settings Network Interface Port : Shared**. Then, click **Shared NIC on** and select **Share OnLom Port:01**.

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

The server has a 1 GB 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 195
- "XCC system management port (10/100/1000 Mbps RJ-45) LEDs" on page 213

◼9 VGA connector

Connect a monitor to this connector.

◼10 Serial port

Connect a 9-pin serial device to this connector. The serial port is shared with XCC. XCC can take control of the shared serial port to redirect serial traffic, using Serial over LAN (SOL).

Note: If the Serial over LAN (SOL) or Emergency Management Services (EMS) feature is enabled, the serial port will be hidden on Linux and Microsoft Windows. Therefore, it is required to disable SOL and EMS to use the serial port on operating systems for serial devices.

To enable the serial port module on Linux or Microsoft Windows, see https://support.lenovo.com/hk/en/solutions/ht514908-how-to-enable-the-serial-port-on-thinksystem-st50-st50-v2-st250-st250-v2-sr250-and-sr250-v2-lenovo-thinksystem-sr250-v2-sr250-st250-v2-st250-st50-v2-and-st50.

Hot-swap power supply model

The rear of the server provides access to several components, including the power supplies, PCIe adapters, serial port, and Ethernet port.

**Note:** Depending on the configuration, your server might be slightly different from the image.
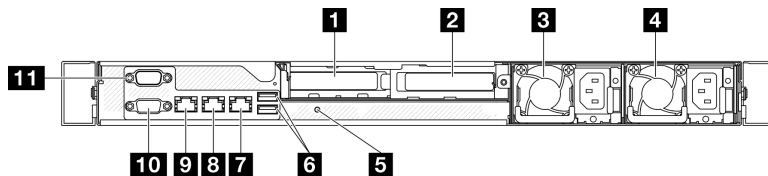
Figure 6. Hot-swap power supply model rear view

◼1 PCIe slot 1	**◼7** Ethernet connector 2
◼2 PCIe slot 2	**◼8** Ethernet connector 1 (shared with XCC network port)
◼3 Power supply bay 1	**◼9** XCC system management port (10/100/1000 Mbps RJ-45)
◼4 Power supply bay 2	**◼10** VGA connector
◼5 NMI button	**◼11** Serial port
◼6 USB 3.2 Gen 1 (5 Gbps) connectors	

◼1 PCIe slot 1

Install PCIe adapters into this slot.

2 PCIe slot 2

Install PCIe adapters into this slot.

3 / 4 Power supply bays

Install hot-swap power supply units to these bay, connect them to power cords. Make sure the power cords are connected properly. See "Install a hot-swap power supply unit" on page 129.

5 NMI button

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

6 USB 3.2 Gen 1 (5 Gbps) connectors

The USB 3.2 Gen 1 (5 Gbps) connectors are direct connect interfaces (DCIs) for debugging, which can be used to attach a USB-compatible device, such as a USB keyboard, USB mouse, or USB storage device.

7 Ethernet connector 2

Attach an Ethernet cable for LAN. Each Ethernet connector has two status LEDs to help you identify the Ethernet connectivity and activity.

8 Ethernet connector 1 (shared with XCC network port)

Attach an Ethernet cable for LAN. Each Ethernet connector has two status LEDs to help you identify the Ethernet connectivity and activity. If the LOM adapter is not installed, Ethernet connector 1 can be set as Lenovo XClarity Controller Network connector. To set Ethernet connector 1 as Lenovo XClarity Controller Network connector, start Setup Utility and select **BMC Settings ➙ Network Settings ➙ Network Settings Network Interface Port : Shared**. Then, click **Shared NIC on** and select **Share OnLom Port:01**.

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

The server has a 1 GB 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 195
- "XCC system management port (10/100/1000 Mbps RJ-45) LEDs" on page 213

10 VGA connector

Connect a monitor to this connector.

11 Serial port

Connect a 9-pin serial device to this connector. The serial port is shared with XCC. XCC can take control of the shared serial port to redirect serial traffic, using Serial over LAN (SOL).

Note: If the Serial over LAN (SOL) or Emergency Management Services (EMS) feature is enabled, the serial port will be hidden on Linux and Microsoft Windows. Therefore, it is required to disable SOL and EMS to use the serial port on operating systems for serial devices.

To enable the serial port module on Linux or Microsoft Windows, see https://support.lenovo.com/hk/en/ solutions/ht514908-how-to-enable-the-serial-port-on-thinksystem-st50-st50-v2-st250-st250-v2-sr250-and-sr250-v2-lenovo-thinksystem-sr250-v2-sr250-st250-v2-st250-st50-v2-and-st50.

Top view

This section contains information on the top view of the server.

Note: Depending on the configuration, your server might be slightly different from the image.

Server top view (2.5-inch drive model)
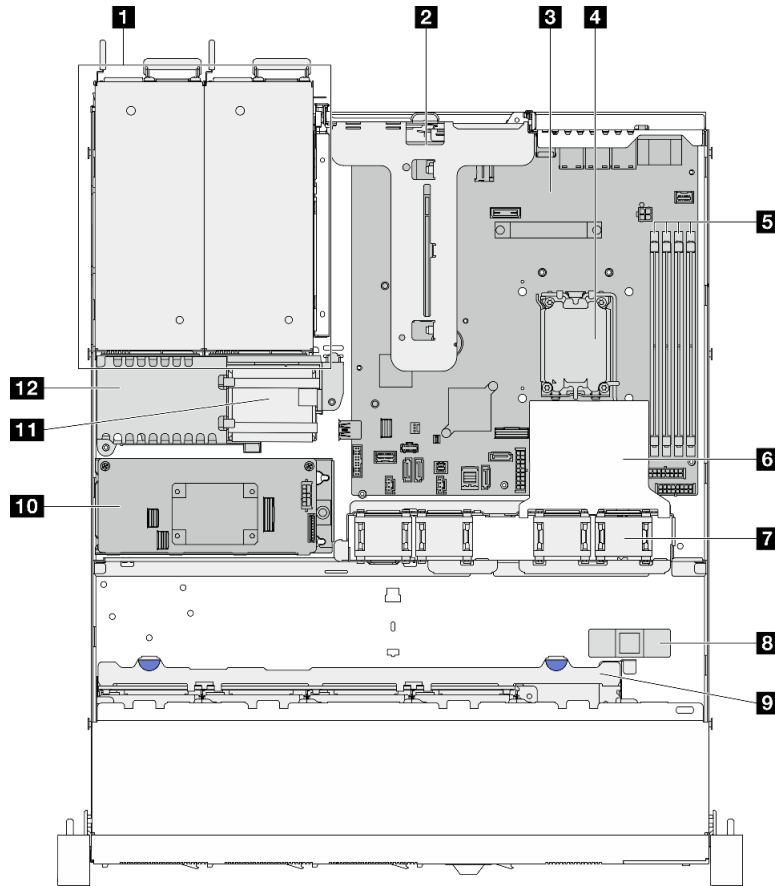
Figure 7. Server top view (2.5-inch drive model)

1 Power supply bays		**7** Fans	
2 PCIe riser		**8** Intrusion switch	
3 System board		**9** Drive backplane	
4 Processor		**10** CFF RAID adapter	
5 Memory module slots		**11** Flash power module	
6 Air baffle		**12** Power distribution board cover	

Server top view (3.5-inch drive model)
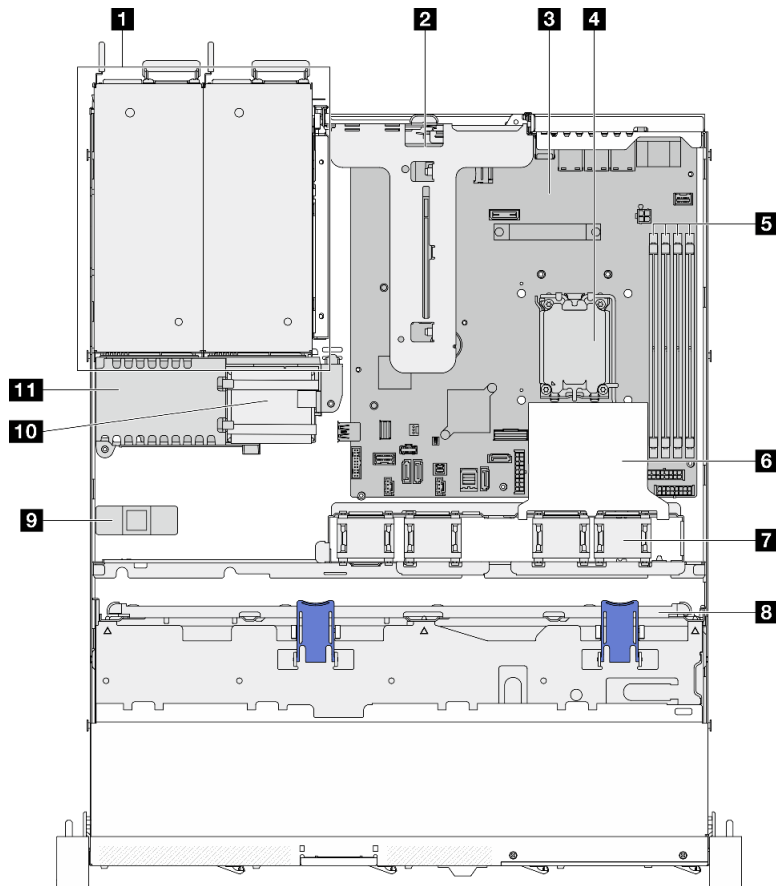
Figure 8. Server top view (3.5-inch drive model)

1 Power supply bays	**7** Fans
2 PCIe riser	**8** Drive backplane or backplate
3 System board	**9** Intrusion switch
4 Processor	**10** Flash power module
5 Memory module slots	**11** Power distribution board cover
6 Air baffle	

Front I/O module

The front I/O module of the server provides controls, connectors, and LEDs. The front I/O module varies by model.
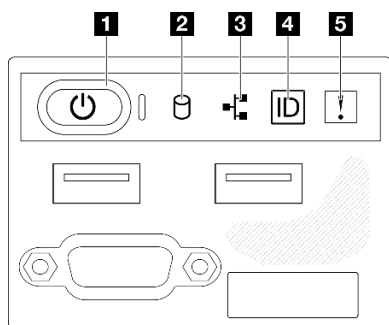
Figure 9. 2.5-inch drive chassis front I/O module
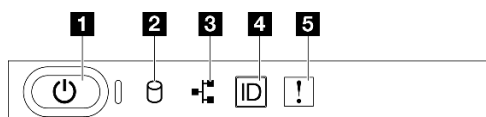
Figure 10. 3.5-inch drive chassis front I/O module

1 Power button/LED (green)	**4** System ID button/LED (blue)
2 Drive activity LED (green)	**5** System error LED (yellow)
3 Network activity LED (green)	

1 Power button/LED (green)

Press this button to turn the server on and off manually. The states of the power LED are as follows:

Status	Color	Description
Off	None	Power is not present, or the power supply has failed.
Fast blinking (about four flashes per second)	Green	• The server is off, but the XClarity Controller is initializing, and the server is not ready to be powered on. • System board power has failed.
Slow blinking (about one flash per second)	Green	The server is off and is ready to be powered on (standby state).
Solid on	Green	The server is on and running.

2 Drive activity LED (green)

The drive activity LED indicates the following status:

- The LED is lit: the drive is powered, but not actively reading or writing data.
- The LED is flashing: the drive is being accessed.

3 Network activity LED (green)

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

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

4 System ID button/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.

5 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 system logs or internal error LEDs to identify the failed part.
Off	None	The server is off or the server is on and is working correctly.	None.

Backplates and backplanes

Use this information to identify the backplate or the backplane you use.

Backplate, four 3.5-inch simple-swap drives (connects to onboard connectors)
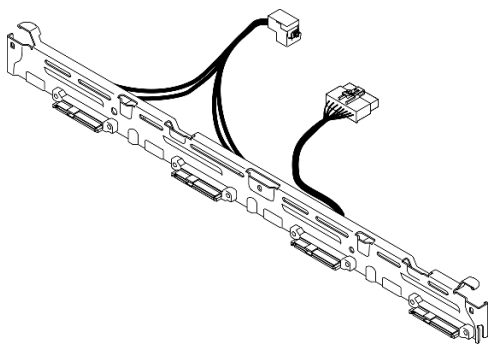
Figure 11. Backplate, four 3.5-inch simple-swap drives (connects to onboard connectors)

Backplate, four 3.5-inch simple-swap drives (connects to Gen 3 RAID adapter)
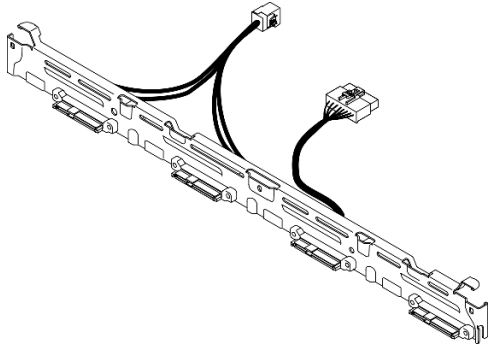
Figure 12. Backplate, four 3.5-inch simple-swap drives (connects to Gen 3 RAID adapter)

Backplate, four 3.5-inch simple-swap drives (connects to Gen 4 RAID adapter)
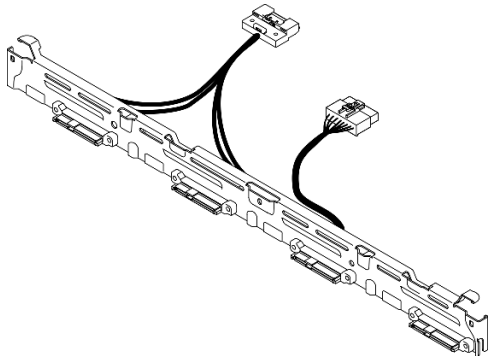
Figure 13. Backplate, four 3.5-inch simple-swap drives (connects to Gen 4 RAID adapter)

Backplate, two 3.5-inch simple-swap SATA drives and two NVMe drives (connects to onboard connectors)
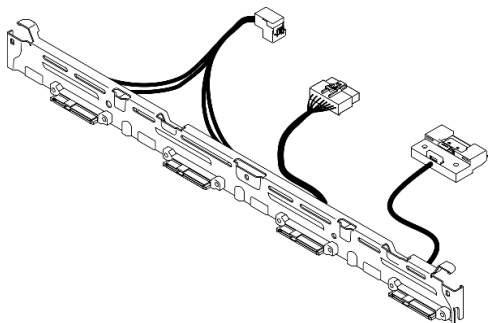
Figure 14. Backplate, two 3.5-inch simple-swap SATA drives and two NVMe drives (connects to onboard connectors)

Backplane, four 3.5-inch hot-swap drives
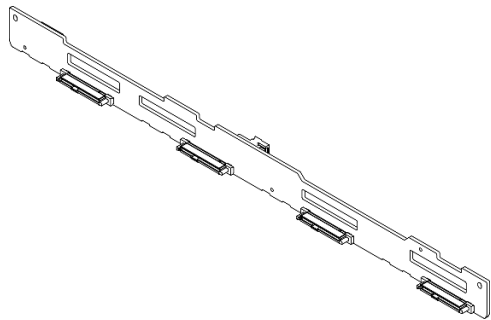
Figure 15. Backplane, four 3.5-inch hot-swap drives

Backplane, eight 2.5-inch hot-swap drives
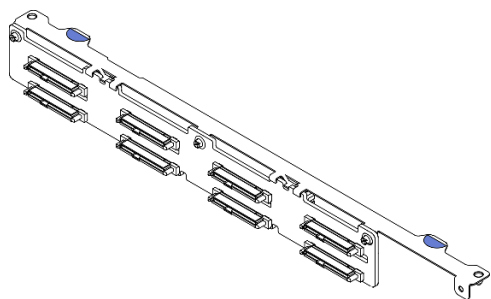
Figure 16. Backplane, eight 2.5-inch hot-swap drives

Backplane, ten 2.5-inch hot-swap drives
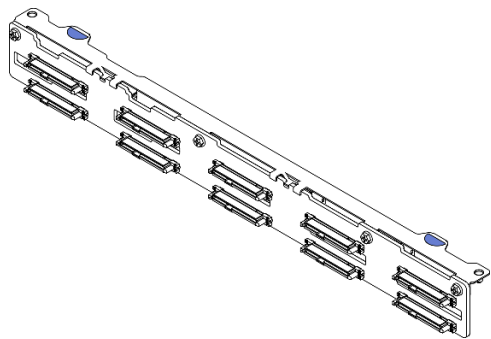
Figure 17. Backplane, ten 2.5-inch hot-swap drives

PCIe riser assembly

Use this information to locate the connectors on the PCIe riser assembly.

x16 PCIe riser
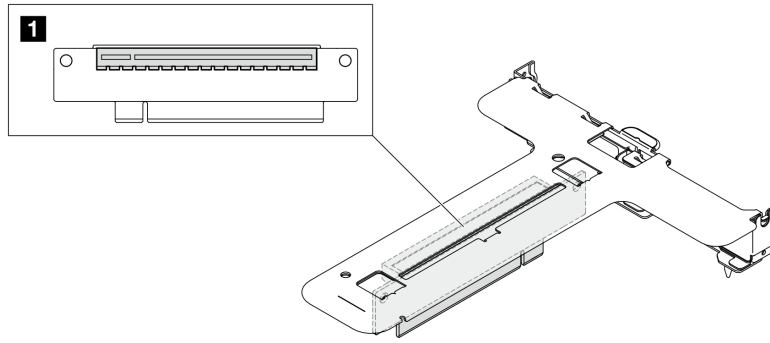
Figure 18. x16 PCIe riser

1 Slot 2: PCIe Gen5 x16 in x16 slot, low profile
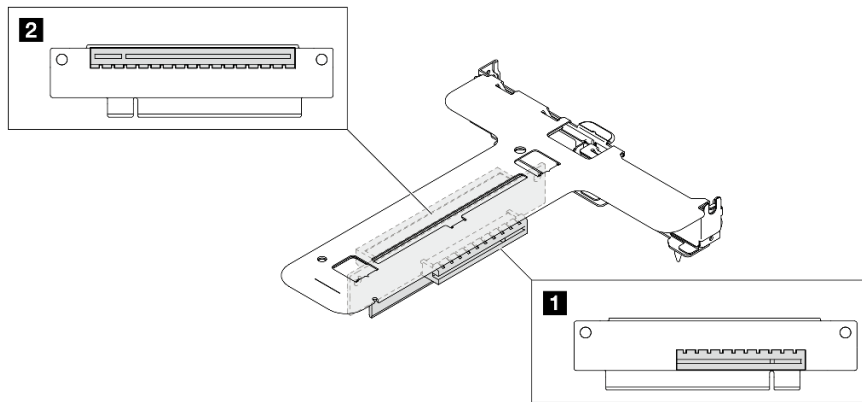
x16/x8 PCIe riser

Figure 19. x16/x8 PCIe riser

1 Slot 1: PCIe Gen4 x8 in x8 slot, low profile (open-end)	**2** Slot 2: PCIe Gen4 x8 in x16 slot, low profile

System-board layout

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

For more information about the connectors, switches, or LEDs that are available on the system board assembly, see:

- "System-board connectors" on page 29
- "System-board switches" on page 30
- "System-board LEDs" on page 210

System-board connectors

The following illustrations show the connectors on the system board.
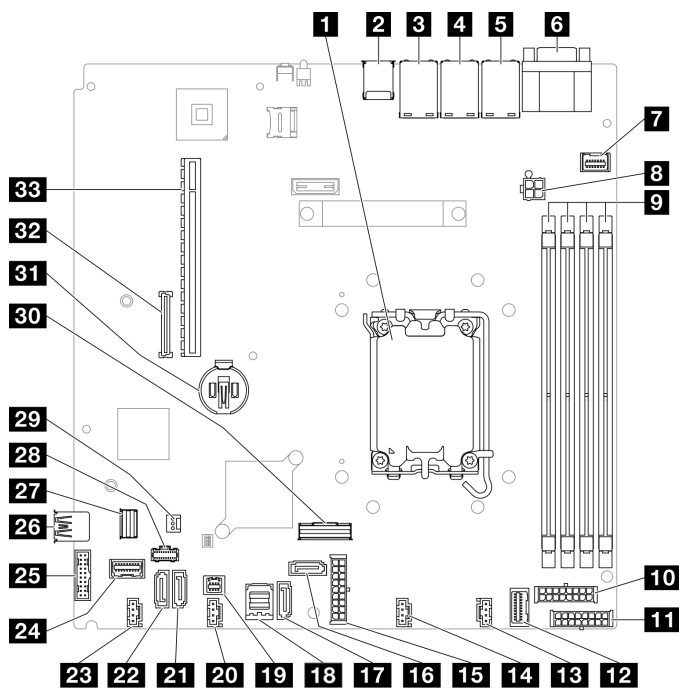
Figure 20. System-board connectors

Table 2. System-board connectors

1 Processor socket	**18** SATA 0-3 connector
2 USB 3.2 Gen 1 connector	**19** SGPIO1 connector
3 Ethernet 2 connector	**20** Fan 3 connector
4 Ethernet 1 connector (shared with XCC network port)	**21** SATA 5 connector
5 Lenovo XClarity Controller (XCC) management port	**22** SATA 4 connector
6 VGA and serial port connector	**23** Fan 4 connector
7 Front VGA connector	**24** Front I/O module connector
8 Processor power connector	**25** Front USB 3.0/2.0 header (DCI support)
9 Memory module 1 to 4 slot	**26** Internal USB 3.2 Gen 1 connector
10 Backplane power connector	**27** M.2 signal connector
11 CFF RAID power connector	**28** M.2 power connector
12 Power distribution board signal connector	**29** Intrusion switch connector
13 Fan 1 connector	**30** SlimSAS x8 connector
14 Fan 2 connector	**31** CMOS battery socket (CR2032)
15 System power connector	**32** Firmware and RoT security module connector
16 SATA 6 connector	**33** PCIe slot
17 SATA 7 connector	

System-board switches

The following illustration indicates the location of the switches on the server.

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 43
   - "Handling static-sensitive devices" on page 46
   - "Power off the server" on page 49

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

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.
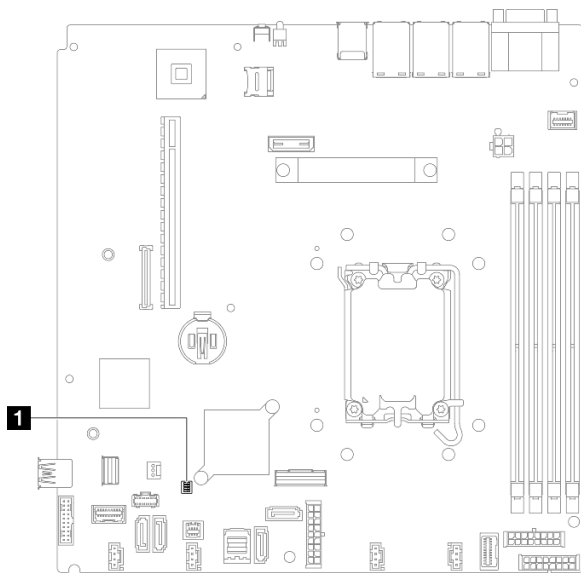
Figure 21. System-board switch

1 SW1 switch block

SW1 switch block

The following table describes the functions of the SW1 switch block on the system board.

Switch number	Default position	Description	Definition
1	Off	Clear CMOS jumper	• Off: Normal (default). • On: Clear the real-time clock (RTC) registry.
2	Off	Reserved	Reserved

Switch number	Default position	Description	Definition
3	Off	Force XCC update jumper	• Off: Normal (default). • On: Force the Lenovo XClarity Controller to update to the latest version.
4	Off	Reserved	Reserved

System LEDs and diagnostics display

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

For more information, refer to "Troubleshooting by system LEDs and diagnostics display" on page 207.

Chapter 3. Parts list

Use the parts list to identify each of the components that are available for your server.

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.

For more information about ordering the parts shown in the Figure 22 "Server components - 2.5-inch drive model" on page 34 or Figure 23 "Server components - 3.5-inch drive model" on page 36:

https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr250v3/7dcl/parts/display/compatible

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

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.

2.5-inch drive model
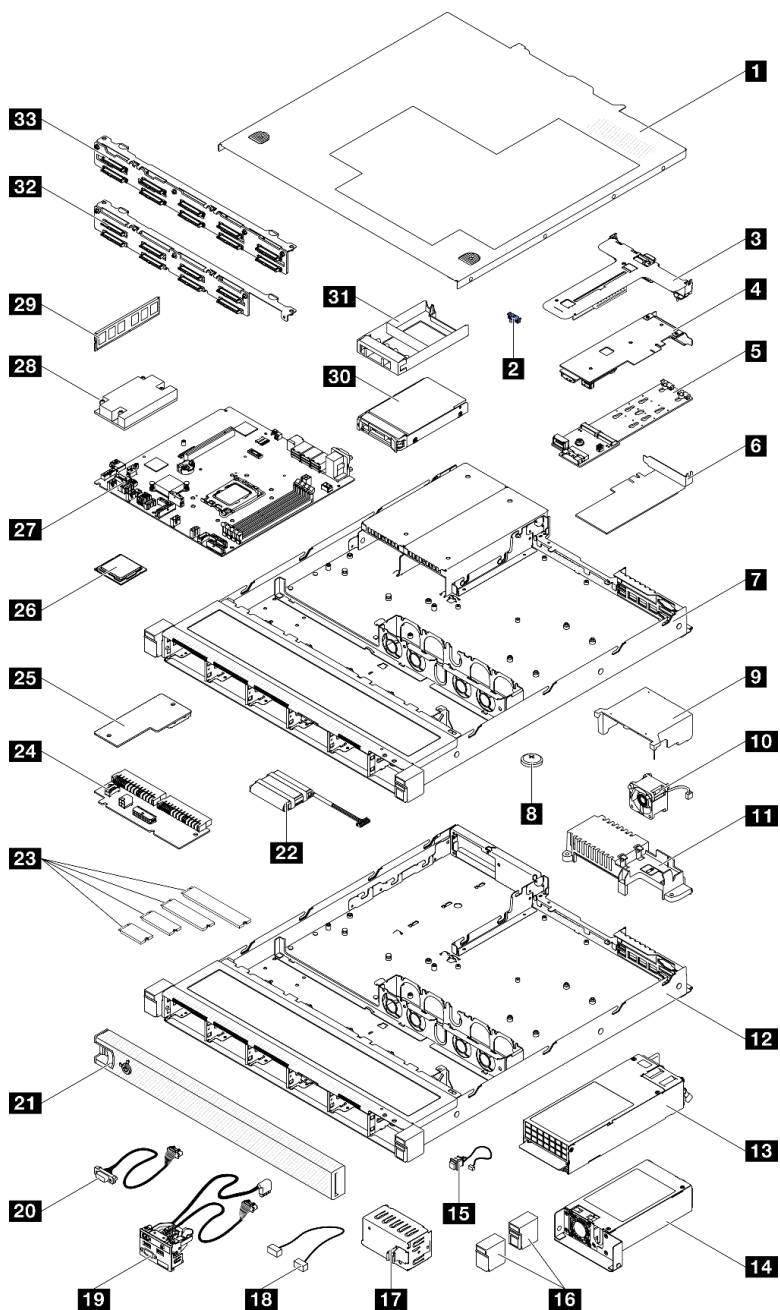
Figure 22. Server components - 2.5-inch drive model

Table 3. Parts list - 2.5-inch drive model

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	Top cover	T1

Table 3. Parts list - 2.5-inch drive model (continued)

Index	Description	Type
2	M.2 retainer clip	T1
3	PCIe riser assembly	T1
4	PCIe adapter	T1
5	M.2 boot adapter	T1
6	PCIe adapter for M.2 boot adapter	T1
7	Chassis for CRPS hot-swap power supply unit	F
8	CMOS battery (CR2032)	C
9	Air baffle	T1
10	Fan	T1
11	Power distribution board cover	T1
12	Chassis for fixed power supply	F
13	CRPS hot-swap power supply unit	T2
14	Fixed power supply unit	T2
15	Intrusion switch	T1
16	Rack latches	T1
17	CRPS hot-swap power supply filler	C
18	Cables	T1
19	Front I/O module	T2
20	VGA cable	T1
21	Security bezel	T1
22	Flash power module	T1
23	M.2 drive	T1
24	Power distribution board	T2
25	Firmware and RoT security module	F
26	Processor	F
27	System board	F
28	Heat sink	F
29	Memory module	T1
30	2.5-inch hot-swap drive	T1
31	Drive filler	C
32	Backplane, eight 2.5-inch hot-swap drives	T1
33	Backplane, ten 2.5-inch hot-swap drives	T1

3.5-inch drive model
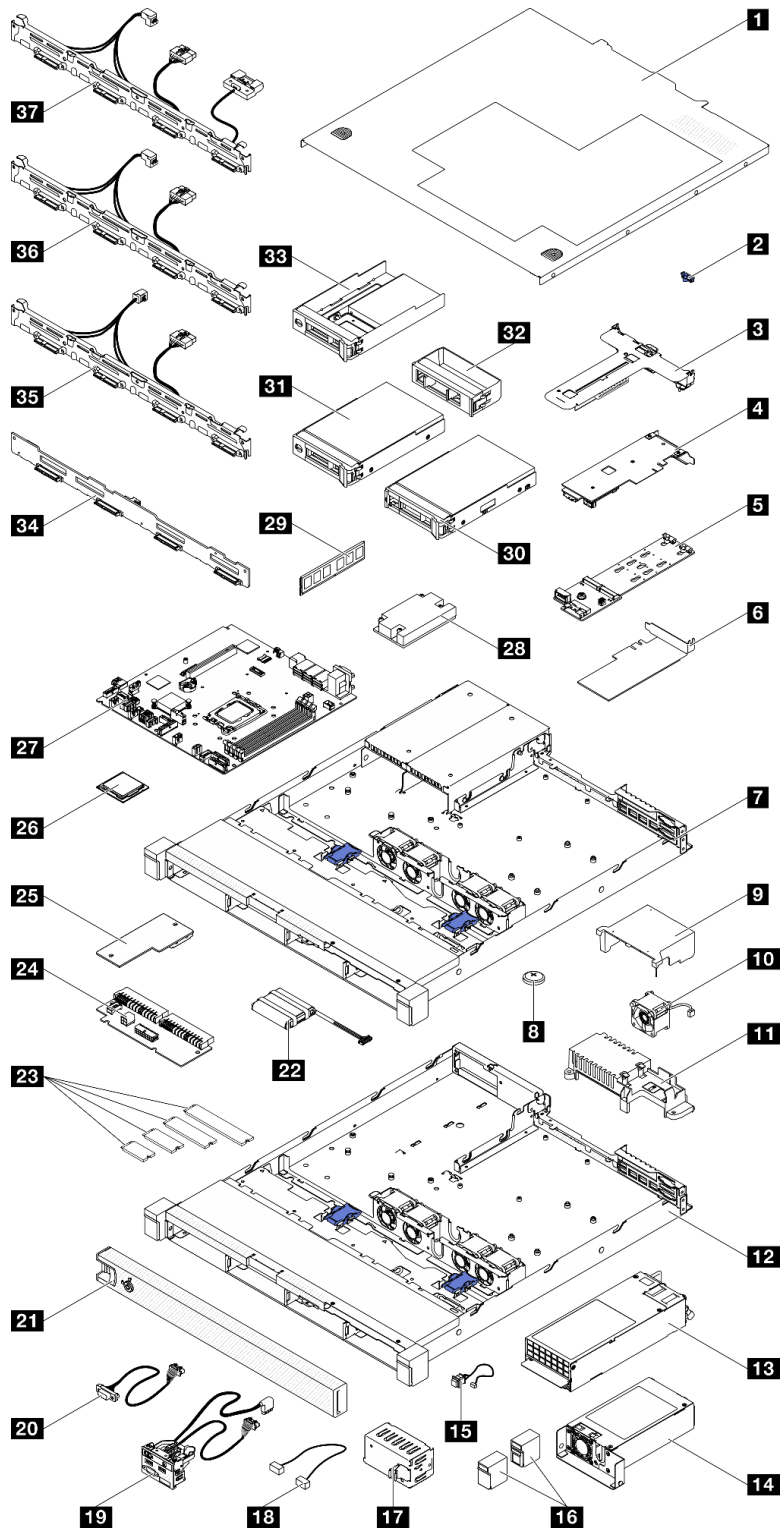
Figure 23. Server components - 3.5-inch drive model

Table 4. Parts list - 3.5-inch drive model

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	Top cover	T1
2	M.2 retainer clip	T1
3	PCIe riser assembly	T1
4	PCIe adapter	T1
5	M.2 boot adapter	T1
6	PCIe adapter for M.2 boot adapter	T1
7	Chassis for redundant power supply	F
8	CMOS battery (CR2032)	C
9	Air baffle	T1
10	Fan	T1
11	Power distribution board cover	T1
12	Chassis for fixed power supply	F
13	Redundant power supply unit	T1
14	Fixed power supply unit	T2
15	Intrusion switch	T2
16	Rack latches	T1
17	CRPS hot-swap power supply filler	C
18	Cables	T1
19	Front I/O module	T1
20	VGA cable	T1
21	Security bezel	T1
22	Flash power module	T1
23	M.2 drive	T1
24	Power distribution board	T2
25	Firmware and RoT security module	F
26	Processor	F
27	System board	F
28	Heat sink	F
29	Memory module	T1
30	3.5-inch hot-swap drive	T1
31	3.5-inch simple-swap drive	T1

Table 4. Parts list - 3.5-inch drive model (continued)

Index	Description	Type
32	Drive filler	C
33	2.5-inch simple-swap drive with 3.5-inch drive tray	T1
34	Backplane, four 3.5-inch hot-swap drives	T1
35	Backplate, four 3.5-inch simple-swap drives (connects to RAID card)	T1
36	Backplate, four 3.5-inch simple-swap drives (connects to onboard connectors)	T1
37	Backplate, two 3.5-inch simple-swap SATA drives and two NVMe drives (connects to onboard connectors)	T1

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 when setting up the server.

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.
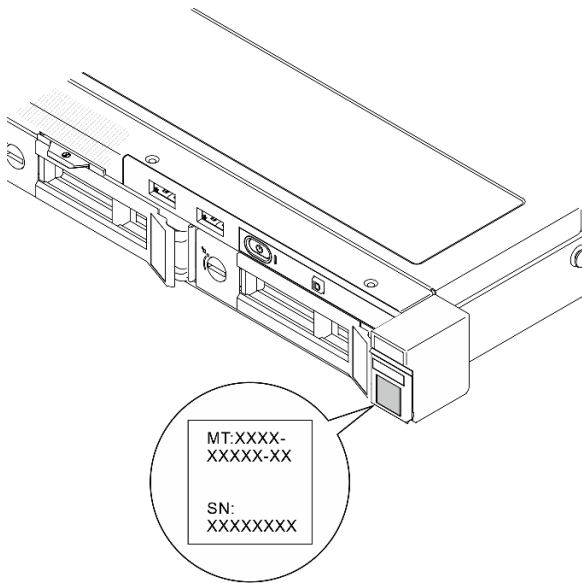
Figure 24. Location of the ID label

Lenovo XClarity Controller network access label

In addition, the Lenovo XClarity Controller network access label is attached to the pull-out information tab located near the top center on the front of the chassis, with MAC address accessible with a pull.
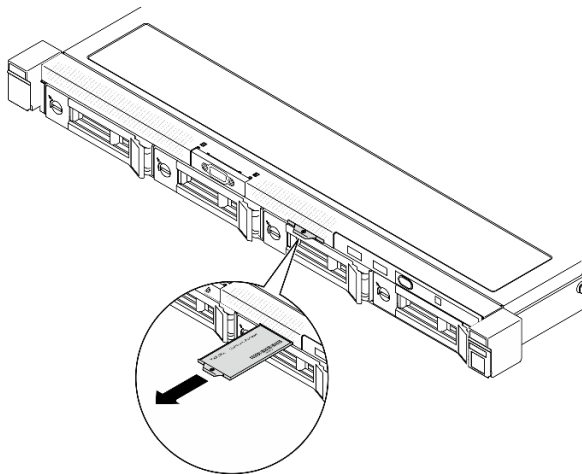
Figure 25. Lenovo XClarity Controller network access label on the pull-out information tab

Service information QR code

On the inside surface of the front top cover, there is a quick response (QR) code that provides 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 server support.
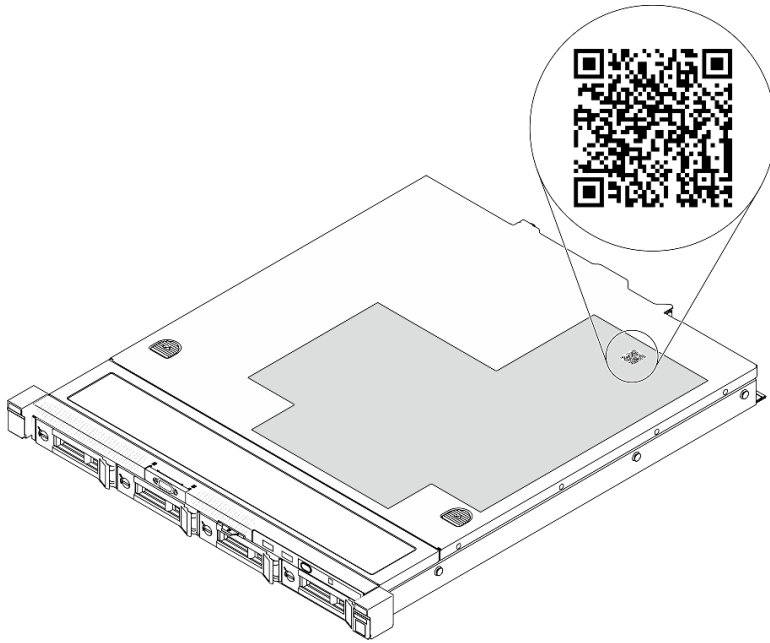
Figure 26. Service information QR code

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.

1. Unpack the server package. See "Server package contents" on page 39.

2. Install any required hardware or server options. See the related topics in Chapter 5 "Hardware replacement procedures" on page 43.

3. If necessary, install the rail to a standard rack cabinet. Follow the instructions in *Rail Installation Guide* that come with the rail kit.

4. If necessary, install the server into a standard rack cabinet. Follow the instructions in *Rail Installation Guide* that come with the rail kit.

5. Connect all external cables to the server. See Chapter 2 "Server components" on page 15 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 15
   - "Troubleshooting by system LEDs and diagnostics display" on page 207

   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 "Troubleshooting by system LEDs and diagnostics display" on page 207 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 195.

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.

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 guidelines are available as well: "Working inside the server with the power on" on page 46 and "Handling static-sensitive devices" on page 46.
- 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/sr250v3/7dcl/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 197.
- 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 small flat-blade screwdriver, a small Phillips screwdriver, and a T8 torx screwdriver 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 color of the release tab does not affect the serviceability of the 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 installed or serviced by trained personnel, as defined by the NEC, IEC 62368-1 & IEC 60950-1, 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. Access to the equipment is by the use of a tool, lock and key, or other means of security, and 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.

System reliability guidelines

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

Make sure the following requirements are met:

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

Working inside the server with the power on

You might need to keep the power on with the server cover removed to look at system information on the display panel or to replace hot-swap components. Review these guidelines before doing so.

Attention: The server might stop and data loss might occur when internal server components are exposed to static electricity. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding systems when working inside the server with the power on.

- Avoid loose-fitting clothing, particularly around your forearms. Button or roll up long sleeves before working inside the server.
- Prevent your necktie, scarf, badge rope, or hair from dangling into the server.
- Remove jewelry, such as bracelets, necklaces, rings, cuff links, and wrist watches.
- Remove items from your shirt pocket, such as pens and pencils, in case they fall into the server as you lean over it.
- Avoid dropping any metallic objects, such as paper clips, hairpins, and screws, into the server.

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 of the server.

Numbers and the location of memory module slots

This server comes with four memory module slots. The following illustration shows the location of the memory module slots on the system board:
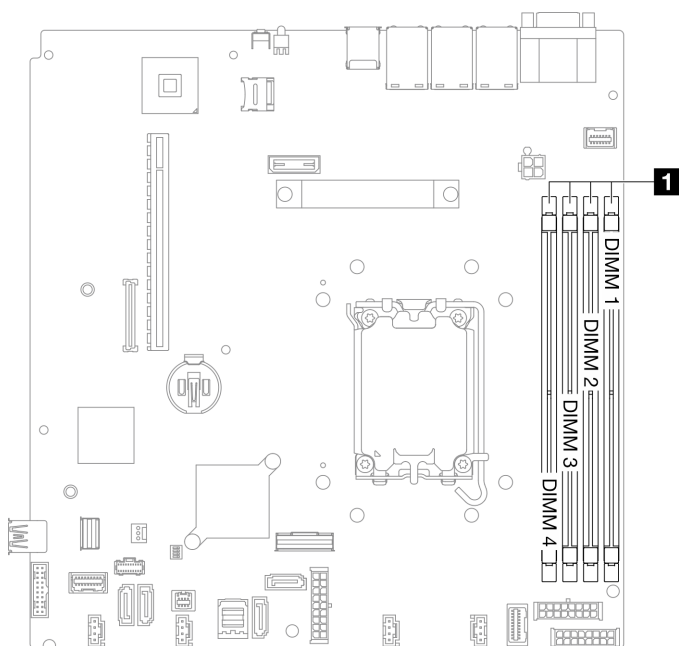
1 Memory module slots

Figure 27. Memory module slots location

For a list of supported memory module options, see: https://serverproven.lenovo.com.

Supported type of memory modules

This server supports the following type of memory modules:

- TruDDR5 4800MHz ECC UDIMM: 16 GB (1Rx8), 32 GB (2Rx8)
- TruDDR5 5600MHz ECC UDIMM: 16 GB (1Rx8), 32 GB (2Rx8)

Memory mode and installation order

Independent mode

Independent mode provides high performance memory capability. You can populate all channels with no matching requirements. Individual channels can run at different memory module timings, but all channels must run at the same interface frequency.

Notes:

- All memory modules to be installed must be the same type.
- All memory modules to be installed must be the same capacity.
- For best performance, make sure all memory modules have the same memory capacity, speed, and vendor.
- Mixing single rank (1R) and dual-rank (2R) memory modules in the same memory channel or across memory channels are not allowed.
- 4800MHz memory is only supported with Intel Xeon® E-2400 series and Pentium® processors, 5600MHz memory is only supported with Intel Xeon® 6300 series and Pentium® processors.

The following table shows the memory module installation order:

Table 5. Memory module installation sequence

Total memory module installed	Memory module slot number				Memory speed
	1	2	3	4	
One			√		• 1R: 4400MHz • 2R: 4400MHz
Two	√		√		
Three	√		√	√	• 1R: 4000MHz • 2R: 3600MHz
Four	√	√	√	√	

Technical rules for PCIe slots

PCIe adapters must be installed in a specific order in your server.

Notes:

- Performance may degrade when a x16 PCIe adapter is installed in a x8 PCIe slot.

- When a ThinkSystem Intel E810-DA2 Ethernet Adapter is installed, the following adapters are not supported:

  – ThinkSystem RAID 9350-16i 4GB Flash PCIe 12Gb Adapter

  – ThinkSystem RAID 9350-8i 2GB Flash PCIe 12Gb Adapter

  – ThinkSystem RAID 5350-8i PCIe 12Gb Adapter

  – ThinkSystem 4350-8i SAS/SATA 12Gb HBA

  – ThinkSystem RAID 9350-16i 4GB Flash PCIe 12Gb Internal Adapter

  – ThinkSystem RAID 9350-8i 2GB Flash PCIe 12Gb Internal Adapter

  – ThinkSystem RAID 5350-8i PCIe 12Gb Internal Adapter

- The following GPU adapters is only supported with Intel Xeon® E-2400 series and Pentium® processors.

  – ThinkSystem NVIDIA Quadro RTX A1000 next PCIe Active GPU

  – ThinkSystem NVIDIA RTX A400 4Gb PCIe Active GPU

Install PCIe adapters in the following sequence:

1. PCIe adapter for M.2 boot adapter: Slot 1, then slot 2

2. RAID/HBA adapters: Slot 2, then slot 1

3. Ethernet adapters: Slot 1, then slot 2

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:

-

-

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

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:

-
-

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 .

Server replacement

Follow the instructions in *Rail Installation Guide* that come with the rail kit to remove or install the server from the rack.

2.5-inch backplane replacement

Use the following information to remove and install the 2.5-inch backplane.

Remove the 2.5-inch backplane

Use this information to remove the 2.5-inch drive backplane.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Note: Depending on the configuration, the following illustration might differ slightly from your backplane.

Procedure

Step 1. Make preparations for this task.

    a. Remove all drives and drive bay fillers from the drive bays. See "Remove a hot-swap drive" on page 75.

    b. Remove the top cover. See "Remove the top cover" on page 159.

    c. Disconnect the cables from the backplane. See "Backplane and backplate cable routing" on page 184.

Step 2. Grasp the backplane and carefully lift it out of the chassis.
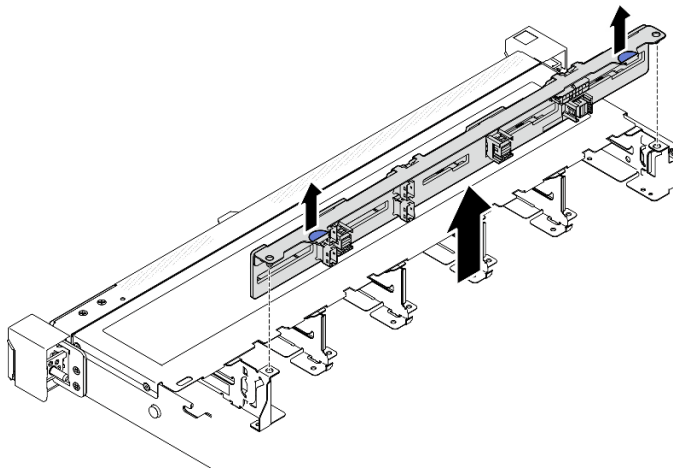
Figure 28. Ten 2.5-inch hot-swap drive backplane removal
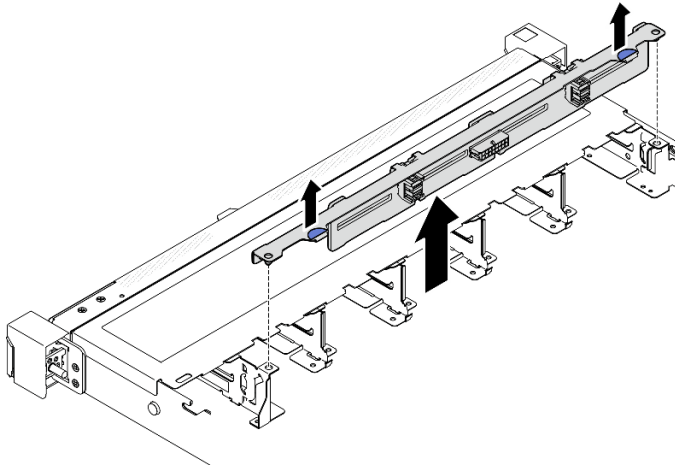
Figure 29. Eight 2.5-inch hot-swap drive backplane removal

After you finish

1. Install a replacement unit. See "Install the 2.5-inch backplane" on page 51.
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.

Demo video

Watch the procedure on YouTube

Install the 2.5-inch backplane

Use this information to install the 2.5-inch backplane.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Note: Depending on the configuration, the following illustration might differ slightly from your backplane.

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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 197 for more information on firmware updating tools.

Procedure

Step 1. Align the two pins on the backplane with the corresponding holes in the chassis.

Step 2. Lower the backplane into the chassis. Ensure that the pins pass through the holes and the backplane is fully seated in place.

Figure 30. Ten 2.5-inch hot-swap drive backplane installation

1 Pins	**2** Corresponding holes
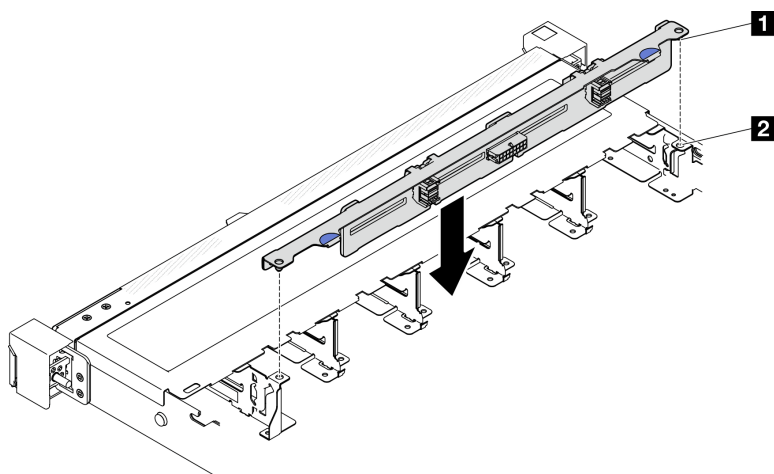
Figure 31. Eight 2.5-inch hot-swap drive backplane installation

1 Pin	**2** Corresponding holes

After you finish

1. Connect the cables to the backplane. See "Backplane and backplate cable routing" on page 184.
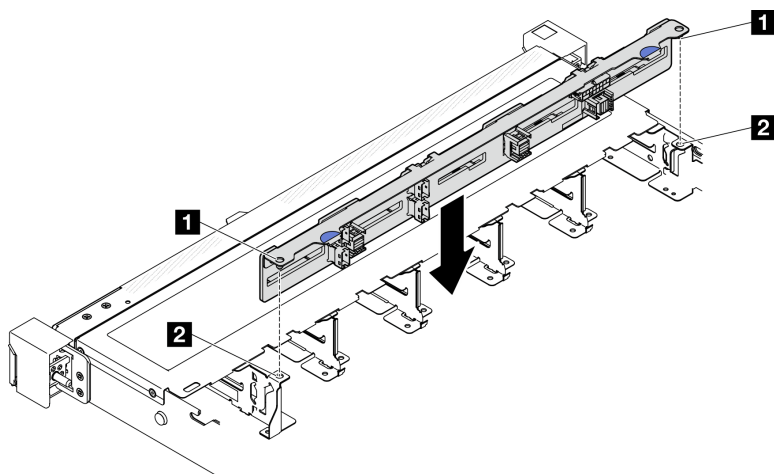
2. Install the top cover. See "Install the top cover" on page 161.

3. Install drives and drive bay fillers into the drive bays. See "Install a hot-swap drive" on page 77.

4. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

2.5-inch drive replacement from 3.5-inch drive bay

Use this information to remove and install a 2.5-inch drive from a 3.5-inch drive bay.

The EMI integrity and cooling of the server are protected by having all drive bays covered or occupied. The number of the installed drives in your server varies depending on the server model. The vacant bays are occupied by dummy trays. When you install a drive, save the removed dummy tray from the drive bay in case you later remove the drive and need the dummy tray to cover the place.

Attention: An unoccupied drive bay without any other protection might impact the EMI integrity and cooling of the server, which might result in overheating or component damage. To maintain the EMI integrity and cooling of the server, install a new drive as soon as you remove the failing one or the dummy tray.

Remove a 2.5-inch drive from a 3.5-inch drive bay

Use this information to remove 2.5-inch drive from a 3.5-inch drive bay.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- If the server is installed in a rack, remove the server from the rack.

- To avoid damage to the drive connectors, make sure that the server top cover is in place and fully closed whenever you install or remove a simple-swap drive.

- For proper system cooling, do not operate the server for more than 2 minutes without either a drive or a filler panel installed in each bay.

- Before you remove or make changes to drives, drive controllers (including controllers that are integrated on the system board), drive backplates or drive cables, back up all important data that is stored on drives.

- If an NVMe drive is to be removed, it is recommended to disable it beforehand via the operating system.

- Before you remove any component of a RAID array, back up all RAID configuration information.

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

Procedure

Step 1. Remove the simple-swap drive. See "Remove a simple-swap drive" on page 73.

Step 2.   Remove the five screws that secure the 2.5-inch drive and the drive adapter; then, remove the 2.5-inch drive and the drive adapter from the tray.
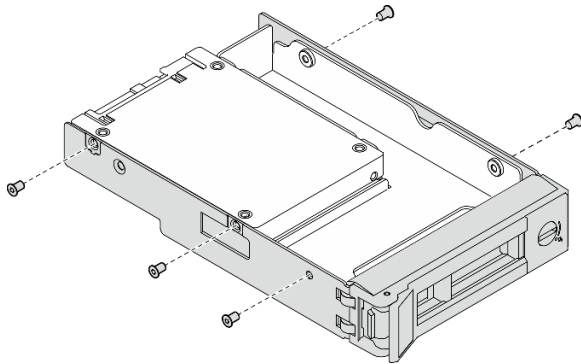
Figure 32. Removing the screws from drive adapter

Step 3.   Remove the two screws that secure the 2.5-inch drive; then, lift the drive up to remove it from the drive adapter.
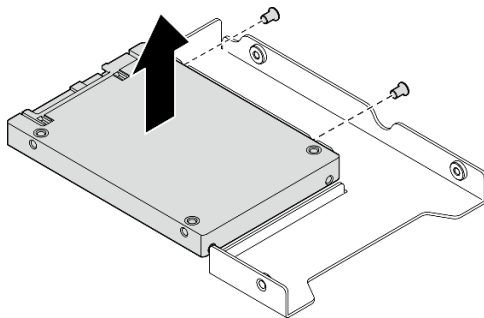
Figure 33. Removing 2.5-inch drive from drive adapter

After you finish

1. Install a replacement unit or filler. See "Install a 2.5-inch drive into a 3.5-inch drive bay" on page 54.
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.

Demo video

Watch the procedure on YouTube

Install a 2.5-inch drive into a 3.5-inch drive bay

Use this information to install a 2.5-inch drive into a 3.5-inch drive bay.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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.
- To avoid damage to the drive connectors, make sure that the server top cover is in place and fully closed whenever you install or remove a drive.
- For proper system cooling, do not operate the server for more than 2 minutes without either a drive or a filler panel installed in each bay.
- Before you remove or make changes to drives, drive controllers (including controllers that are integrated on the system board), drive backplates or drive cables, back up all important data that is stored on drives.
- If an NVMe drive is to be removed, it is recommended to disable it beforehand via the operating system.
- Before you remove any component of a RAID array, back up all RAID configuration information.

Notes:

- Locate the documentation that comes with the drive and follow those instructions in addition to the instructions in this chapter.
- The drive bays are numbered to indicate the installation order (starting from number "0"). Follow the installation order when you install a drive. See "Front view" on page 15.
- The drives in a single RAID array must be the same type, same size, and same capacity.
- For a complete list of supported optional devices for the server, see https://serverproven.lenovo.com.

Procedure

Step 1. Position the 2.5-inch drive into the 2.5-inch to 3.5-inch drive adapter.

Step 2. Align the two screw holes in the drive with the corresponding holes in the drive adapter; then, install the two screws to secure the drive to the drive adapter.
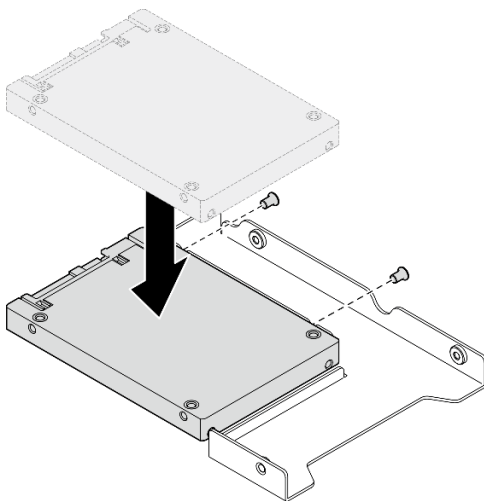

Figure 34. Installing 2.5-inch drive to drive adapter

Step 3. Position the drive adapter with the drive into the 3.5-inch drive tray. Align the screw holes in the drive adapter and the drive with the corresponding holes in the tray; then, install the five screws to secure the drive adapter and the drive into the tray.
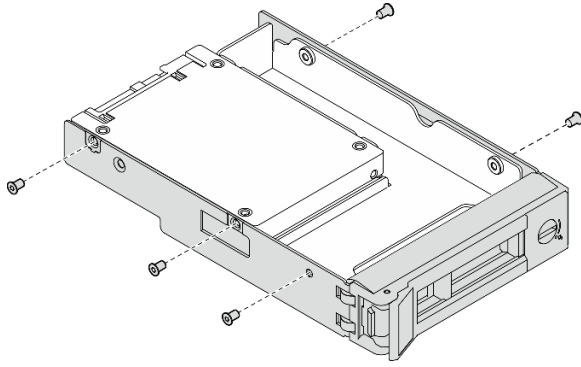
Figure 35. Installing screws to drive adapter

Step 4. Slide the tray with the drive into the drive bay from the front until it snaps into position and then completely close the handle. See "Install a simple-swap drive" on page 74.

After you finish

1. Install other drives or drive fillers if necessary.

2. Complete the parts replacement. See "Complete the parts replacement" on page 169.

3. Check the drive activity LED on the front I/O module to verify if the drive is operating correctly. See "Front I/O module LEDs" on page 207.

   Note: If the server is configured for RAID operation through a ThinkSystem RAID adapter, you might have to reconfigure your disk arrays after you install drives. See the ThinkSystem RAID adapter documentation for additional information about RAID operation and complete instructions for using ThinkSystem RAID adapter.

Demo video

Watch the procedure on YouTube

3.5-inch backplane replacement

Use the following information to remove and install the 3.5-inch backplane.

Remove the 3.5-inch backplane

Use this information to remove the 3.5-inch drive backplane.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Note: Depending on the configuration, the following illustration might differ slightly from your backplane.

Procedure

Step 1.   Make preparations for this task.

     a.   Remove all drives and drive bay fillers from the drive bays. See "Remove a hot-swap drive" on page 75.

     b.   Remove the top cover. See "Remove the top cover" on page 159.

     c.   Disconnect the cables from the backplane. See "Backplane and backplate cable routing" on page 184.

Step 2.   Remove the backplane.

     a.   ❶ Open the retaining clips by rotating them up.

     b.   ❷ Rotate the backplane down towards the center of the server.

     c.   ❸ Lift the backplane out of the server.
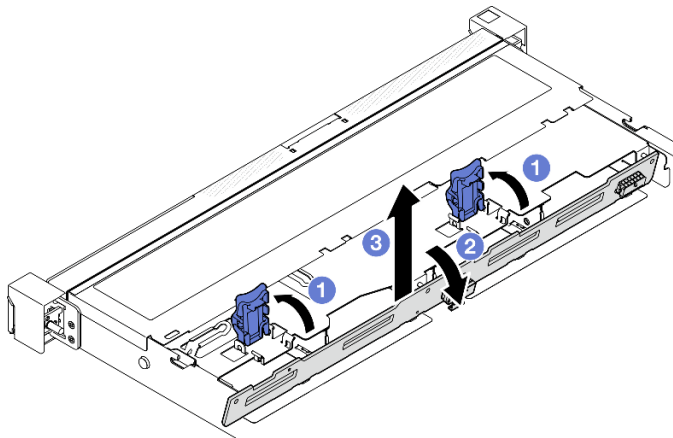
Figure 36. 3.5-inch backplane removal

After you finish

1. Install a replacement unit. See "Install the 3.5-inch backplane" on page 57.
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.

Demo video

Watch the procedure on YouTube

Install the 3.5-inch backplane

Use this information to install the 3.5-inch backplane.

About this task

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Note: Depending on the configuration, the following illustration might differ slightly from your backplane.

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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 197 for more information on firmware updating tools.

Procedure

Step 1. Install the backplane.

    a. ❶ Insert the backplane into the chassis at an angle. Make sure the pins are against the backplane on the backside.

    b. ❷ Rotate the backplane up towards the front of the server.

    c. ❸ Close the retaining clips to secure the backplane in place.
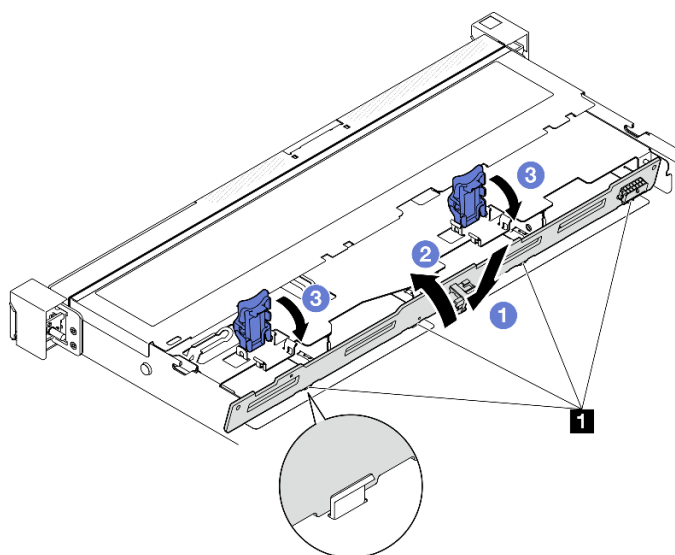
Figure 37. 3.5-inch backplane installation

1 Pin

After you finish

1. Connect the cables to the backplane. See "Backplane and backplate cable routing" on page 184.

2. Install the top cover. See "Install the top cover" on page 161.

3. Install drives and drive bay fillers into the drive bays. See "Install a hot-swap drive" on page 77.

4. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

3.5-inch backplate replacement

Use the following information to remove and install the 3.5-inch backplate.

Remove the 3.5-inch backplate

Use this information to remove the 3.5-inch backplate.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- If the server is installed in a rack, remove the server from the rack.

Note: Depending on the configuration, the following illustration might differ slightly from your backplate.

Procedure

Step 1. Make preparations for this task.

    a. Remove all drives and drive bay fillers from the drive bays. See "Remove a hot-swap drive" on page 75.

    b. Remove the top cover. See "Remove the top cover" on page 159.

    c. Disconnect the cables from the system board or the RAID adapter. See "Backplane and backplate cable routing" on page 184.

    Attention: To avoid damaging the system board, make sure to follow the instructions in Chapter 6 "Internal cable routing" on page 171 when disconnecting cables from the system board.

Step 2. Remove the backplate.

    a. ❶ Open the retaining clips by rotating them up.

    b. ❷ Rotate the backplate down towards the center of the server.

    c. ❸ Lift the backplate out of the server.
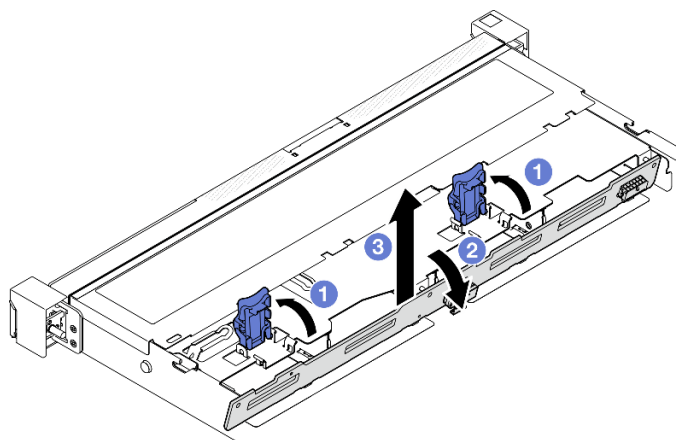
Figure 38. Backplate removal

After you finish

1. Install a replacement unit. See "Install the 3.5-inch backplate" on page 60.
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.

Demo video

Watch the procedure on YouTube

Install the 3.5-inch backplate

Use this information to install the 3.5-inch backplate.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- If the server is installed in a rack, remove the server from the rack.

Note: Depending on the configuration, the following illustration might differ slightly from your backplate.

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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.

- Go to "Update the firmware" on page 197 for more information on firmware updating tools.

Procedure

Step 1. Install the backplate.

a. **①** Insert the backplate into the chassis at an angle. Make sure the pins are against the backplate on the backside.

b. **②** Rotate the backplate up towards the front of the server.

c. **③** Close the retaining clips to secure the backplate in place.
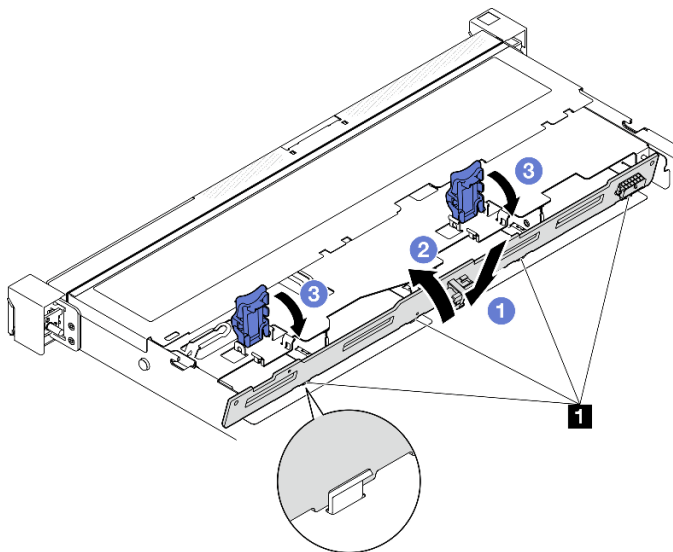
Figure 39. Backplate installation

1 Pin

After you finish

1. Connect the backplate cables to the system board or RAID adapter. See "Backplane and backplate cable routing" on page 184.

2. Install the top cover. See "Install the top cover" on page 161.

3. Install drives and drive bay fillers into the drive bays. See "Install a hot-swap drive" on page 77.

4. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Air baffle replacement

Use the following information to remove and install the air baffle.

Remove the air baffle

Use this information to remove the air baffle.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- For proper cooling and airflow, reinstall the air baffle before you turn on the server. Operating the server with the air baffle removed might damage server components.

Procedure

Step 1.   Remove the top cover. See "Remove the top cover" on page 159.

Step 2.   Lift the air baffle up and set it aside.
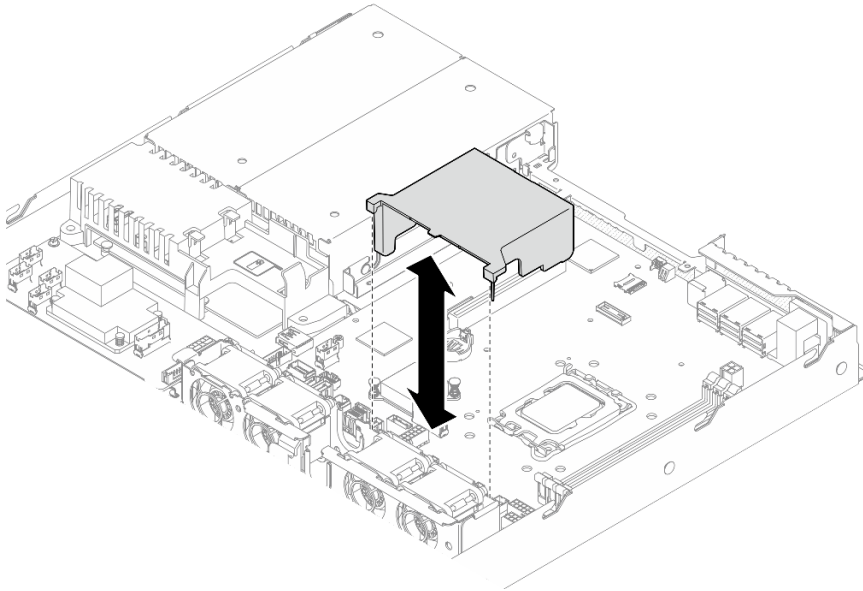
Figure 40. Air baffle removal

After you finish

1. Install a replacement unit. See "Install the air baffle" on page 63.
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.

Demo video

Watch the procedure on YouTube

Install the air baffle

Use this information to install the air baffle.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- If the server is installed in a rack, remove the server from the rack.

- For proper cooling and airflow, reinstall the air baffle before you turn on the server. Operating the server with the air baffle removed might damage server components.

Procedure

Step 1. Align the air baffle hooks with the slots on the top of the fan cage; then, hook the air baffle onto the slots.
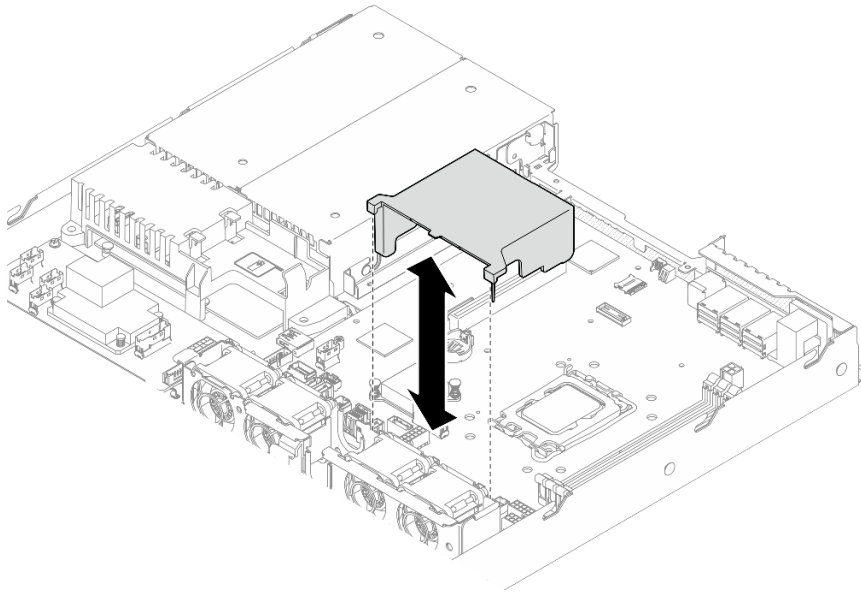
Figure 41. Air baffle installation

After you finish

1. Install the top cover. See "Install the top cover" on page 161.
2. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

CFF RAID adapter replacement

Use the following information to remove and install the CFF RAID adapter.

Remove the CFF RAID adapter

Use this information to remove the CFF RAID adapter.

About this task

<u>S002</u>

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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.
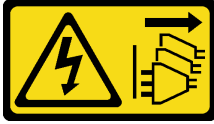- Replacing the RAID adapter might impact your RAID configurations. Back up your data before the replacement to avoid any data loss due to a RAID configuration change.

Procedure

Step 1. Remove the top cover. See "Remove the top cover" on page 159.

Step 2. Record the cable connections on the CFF RAID adapter; then, disconnect all cables from the adapter.

Step 3. Remove the CFF RAID adapter.
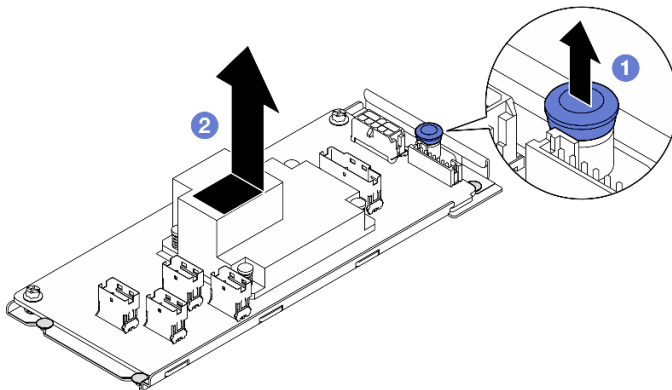
Figure 42. Internal CFF adapter removal

    a.   ❶ Lift and hold the release pin to disengage the CFF RAID adapter from the chassis.

    b.   ❷ Slightly slide the CFF RAID adapter toward the pin; then, carefully pull it out of the chassis.

Step 4. (Optional) If necessary, loosen the two screws on the CFF RAID adapter; then, separate the RAID adapter from the tray.
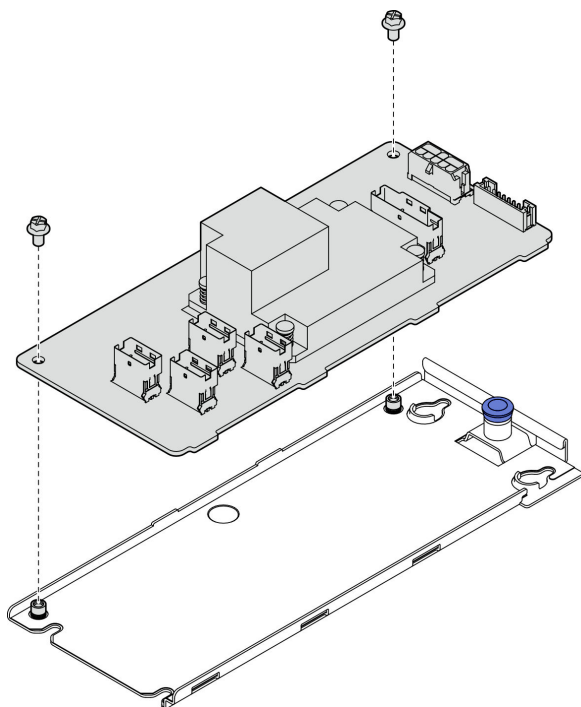
Figure 43. Internal CFF adapter tray removal

After you finish

1. Install a replacement unit. See "Install the CFF RAID adapter" on page 66.

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.

Demo video

Watch the procedure on YouTube

Install the CFF RAID adapter

Use this information to install the CFF RAID adapter.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 197 for more information on firmware updating tools.

Procedure

Step 1. If necessary, align and lower the CFF RAID adapter with the guide pins and screw holes on the adapter tray; then, tighten the two screws to secure the CFF RAID adapter to the tray.
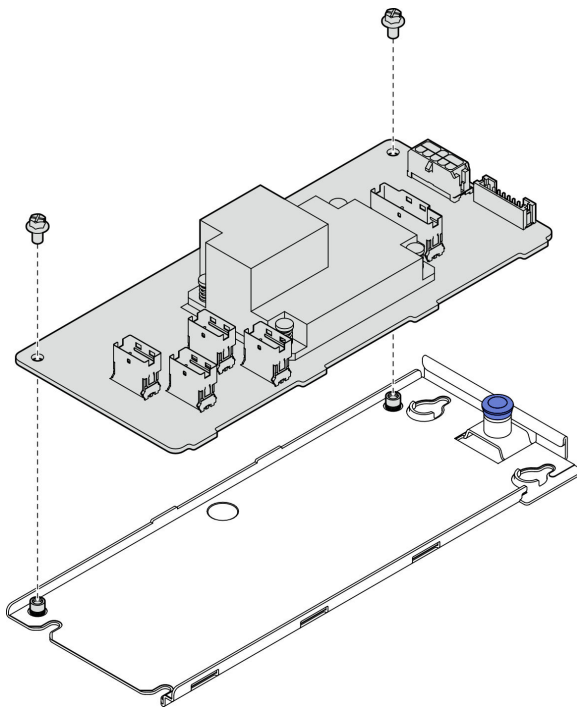
Figure 44. Internal CFF adapter tray installation

Step 2. Align the notches of the tray with the guide pins on the chassis; then slide the tray to one side until the CFF RAID adapter is securely seated in the chassis.
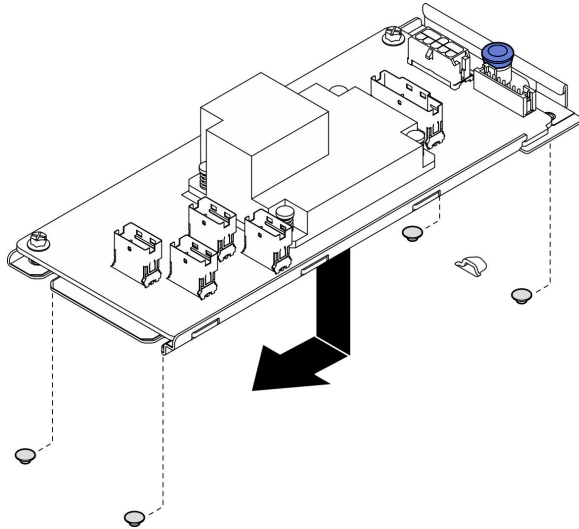
Figure 45. Internal CFF adapter installation

Step 3. Reconnect all cables to the adapter. See "Backplane and backplate cable routing" on page 184.

After you finish

1. Install the top cover. See "Install the top cover" on page 161.
2. Complete the parts replacement. See "Complete the parts replacement" on page 169.
3. Configure the RAID array using the Setup utility configuration.

Demo video

Watch the procedure on YouTube

CMOS battery (CR2032) replacement

Use the following information to remove and install the CMOS battery.

Remove the CMOS battery (CR2032)

Use this information to remove the CMOS battery.

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.

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 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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.
- When replacing the CMOS battery, you must replace it with another CMOS battery of the same type from the same manufacturer.
- Do not make the CMOS battery come in contact with a metal surface when replacing it. The contact with metal surface, such as server side, can cause damage to the battery.
- After replacing the CMOS battery, make sure to reconfigure the server and reset system date and time.

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 solution and reset the system date and time.

Procedure

Step 1.   Remove the top cover. See "Remove the top cover" on page 159.

Step 2.   Locate the CMOS battery on the system board.
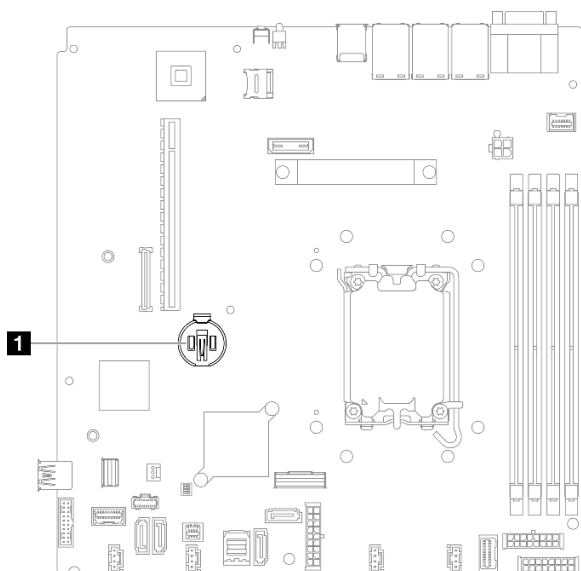
Figure 46. CMOS battery location

1 CMOS battery location

Step 3.   Remove the CMOS battery.
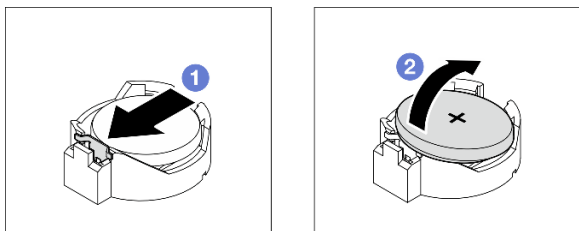
Figure 47. CMOS battery removal

Attention: Do not use excessive force to tilt or push the battery, it might damage the socket.

a.   **1** Press the battery clip in the direction as shown.

b.   **2** Carefully tilt and lift CMOS battery out of the socket.

After you finish

1. Install a replacement unit. See "Install the CMOS battery (CR2032)" on page 71.

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.

Demo video

Install the CMOS battery (CR2032)

Use this information to install the CMOS battery (CR2032).

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.

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 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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.
- When replacing the CMOS battery, you must replace it with another CMOS battery of the same type from the same manufacturer.
- Do not make the CMOS battery come in contact with a metal surface when replacing it. The contact with metal surface, such as server side, can cause damage to the battery.
- After replacing the CMOS battery, make sure to reconfigure the server and reset system date and time.

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 solution and reset the system date and time.

Procedure

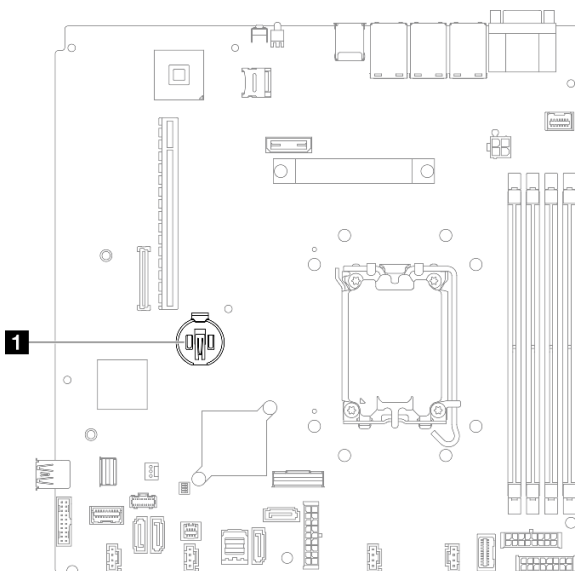Step 1. Locate the CMOS battery on the system board.

Figure 48. CMOS battery location

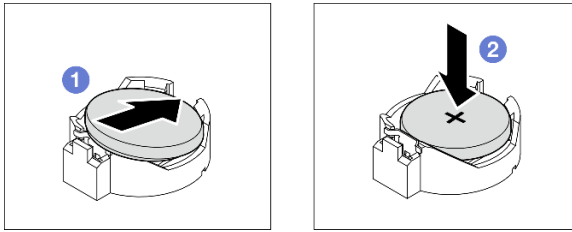| **1** CMOS battery location |
| --- |

Step 2. Install the CMOS battery.

Figure 49. CMOS battery installation

a. ❶ Pivot the CMOS battery to insert it into the socket, with positive (+) side faces up.

b. ❷ Press the battery straight down until it clicks in place.

After you finish

1. Install the top cover. See "Install the top cover" on page 161.
2. Complete the parts replacement. See "Complete the parts replacement" on page 169.
3. Reset date, time, and all the passwords.

Demo video

Watch the procedure on YouTube

Drive replacement

Use the following information to remove and install drives.

The EMI integrity and cooling of the server are protected by having all drive bays covered or occupied. The number of the installed drives in your server varies depending on the server model. The vacant bays are occupied by dummy trays. When you install a drive, save the removed dummy tray from the drive bay in case you later remove the drive and need the dummy tray to cover the place.

Remove a simple-swap drive

Use this information to remove a simple-swap drive.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- To avoid damage to the drive connectors, make sure that the server top cover is in place and fully closed whenever you install or remove a simple-swap drive.
- For proper system cooling, do not operate the server for more than 2 minutes without either a drive or a filler panel installed in each bay.
- Before you remove or make changes to drives, drive controllers (including controllers that are integrated on the system board), drive backplates or drive cables, back up all important data that is stored on drives.
- If an NVMe drive is to be removed, it is recommended to disable it beforehand via the operating system.
- Before you remove any component of a RAID array, back up all RAID configuration information.

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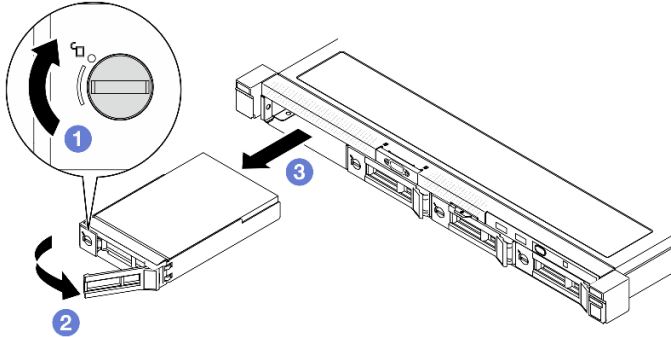
Procedure

Step 1.   Remove the simple-swap drive.

Figure 50. Simple-swap drive removal

a.   **1** Use a flat-blade screwdriver to rotate the drive lock clockwise.

b.   **2** Make sure the drive handle is released after unlocking.

c.   **3** Carefully grab the handle and slide the drive out of the drive bay.

After you finish

1. Install a replacement unit or filler. See "Install a simple-swap drive" on page 74.

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.

Demo video

Watch the procedure on YouTube

Install a simple-swap drive

Use this information to install a simple-swap drive.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- 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.

- To avoid damage to the drive connectors, make sure that the server top cover is in place and fully closed whenever you install or remove a drive.

- For proper system cooling, do not operate the server for more than 2 minutes without either a drive or a filler panel installed in each bay.

- Make sure you save the data on your drive, especially if it is part of a RAID array.
- Before you remove or make changes to drives, drive controllers (including controllers that are integrated on the system board), drive backplates or drive cables, back up all important data that is stored on drives.

Notes:

- Locate the documentation that comes with the drive and follow those instructions in addition to the instructions in this chapter.
- The drive bays are numbered to indicate the installation order (starting from number "0"). Follow the installation order when you install a drive. See "Front view" on page 15.
- The drives in a single RAID array must be the same type, same size, and same capacity.
- For a complete list of supported optional devices for the server, see https://serverproven.lenovo.com.

Procedure

Step 1. If the drive bay has a drive filler installed, remove it.

Step 2. Install the simple-swap drive.
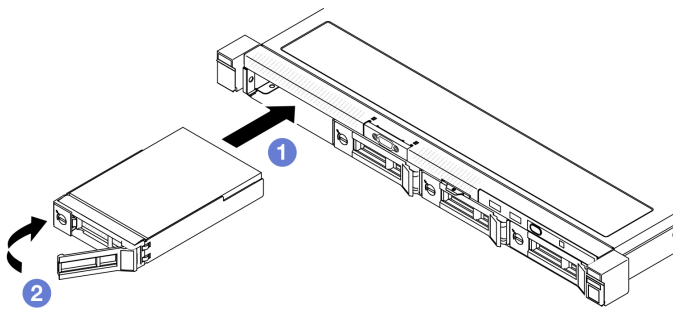
Figure 51. Simple-swap drive installation

a.   ❶ Make sure the drive handle is in the open position. Slide the drive into the drive bay, and push it until it stops.

b.   ❷ Rotate the drive handle inwards until it clicks and lock the drive in place.

After you finish

1. Install other drives or drive fillers if necessary.
2. Complete the parts replacement. See "Complete the parts replacement" on page 169.
3. Check the drive activity LED on the front I/O module to verify if the drive is operating correctly. See "Front I/O module LEDs" on page 207.

   Note: If the server is configured for RAID operation through a ThinkSystem RAID adapter, you might have to reconfigure your disk arrays after you install drives. See the ThinkSystem RAID adapter documentation for additional information about RAID operation and complete instructions for using ThinkSystem RAID adapter.

Demo video

Watch the procedure on YouTube

Remove a hot-swap drive

Use this information to remove a hot-swap drive.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- For proper system cooling, do not operate the server for more than 2 minutes without either a drive or a filler panel installed in each bay.
- 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, back up all RAID configuration information.

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

Procedure

Step 1. Remove the hot-swap drive.

Note: Install a drive bay filler or replacement drive as soon as possible. See "Install a hot-swap drive" on page 77.
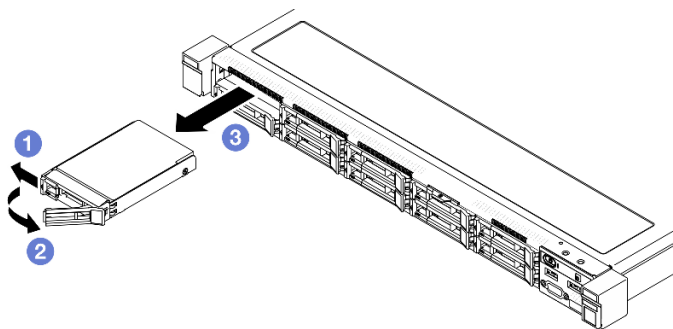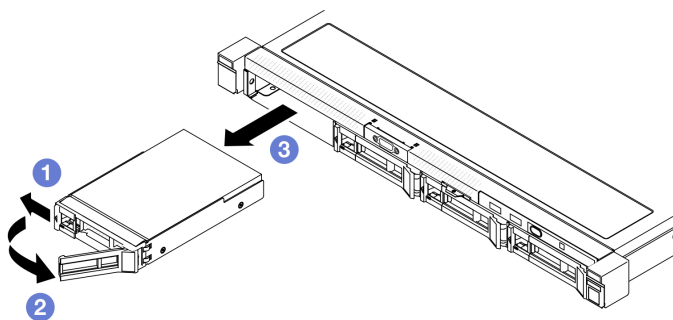

Figure 52. 2.5-inch hot-swap drive removal

Figure 53. 3.5-inch hot-swap drive removal

    a. ❶ Slide the release latch to unlock the drive handle.

    b. ❷ Make sure the drive handle is released after unlocking.

    c. ❸ Carefully grasp the handle and slide the drive out of the drive bay.

After you finish

1. Install a replacement unit or filler. See .

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.

Demo video

Watch the procedure on YouTube

Install a hot-swap drive

Use this information to install a hot-swap drive.

About this task

Attention:

- Read and 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.

- For proper system cooling, do not operate the server for more than 2 minutes without either a drive or a filler panel installed in each bay.

- To avoid damage to the drive connectors, make sure that the server top cover is in place and fully closed whenever you install or remove a drive.

- Make sure you save the data on your drive, especially if it is part of a RAID array.

- 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.

Notes:

- Locate the documentation that comes with the drive and follow those instructions in addition to the instructions in this chapter.

- The drive bays are numbered to indicate the installation order (starting from number "0"). Follow the installation order when you install a drive. See .

- The drives in a single RAID array must be the same type, same size, and same capacity.

- For a complete list of supported optional devices for the server, see https://serverproven.lenovo.com.

Procedure

Step 1.   If the drive bay has a drive filler installed, remove it.

Step 2.   Install the hot-swap drive.
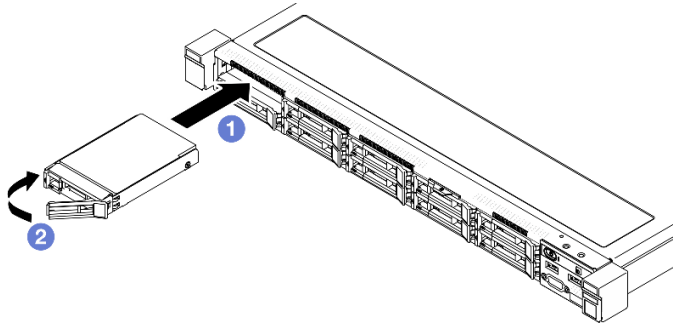
Figure 54. 2.5-inch hot-swap drive installation
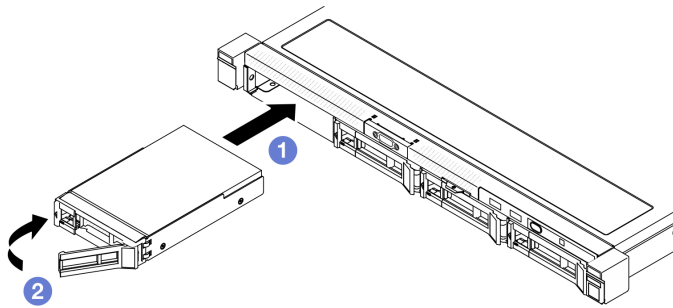
Figure 55. 3.5-inch hot-swap drive installation

a.   ❶ Make sure the drive handle is in the open position. Slide the drive into the drive bay, and push it until it stops.

b.   ❷ Rotate the drive handle inwards until it clicks and lock the drive in place.

After you finish

1. Check the drive status LED to verify if the drive is operating correctly.

   - If the yellow LED is lit continuously, it is malfunctioning and must be replaced.
   - If the green LED is flashing, the drive is functioning.

   Note: If the server is configured for RAID operation through a ThinkSystem RAID adapter, you might have to reconfigure your disk arrays after you install drives. See the ThinkSystem RAID adapter documentation for additional information about RAID operation and complete instructions for using ThinkSystem RAID adapter.

2. Install other drives or drive fillers if necessary.

3. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Fan replacement

Use the following information to remove and install the fan.

Remove a fan

Use this information to remove a fan.

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.

S009

CAUTION:
To avoid personal injury, disconnect the fan cables before removing the fan from the device.

S017

CAUTION:
Hazardous moving fan blades nearby. Keep fingers and other body parts away.

S033

CAUTION:
Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in spattered metal, burns, or both.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1. Make preparations for this task.

a. Remove the top cover. See "Remove the top cover" on page 159.

b. Remove the air baffle. See "Remove the air baffle" on page 62.

Step 2. Remove the fan.
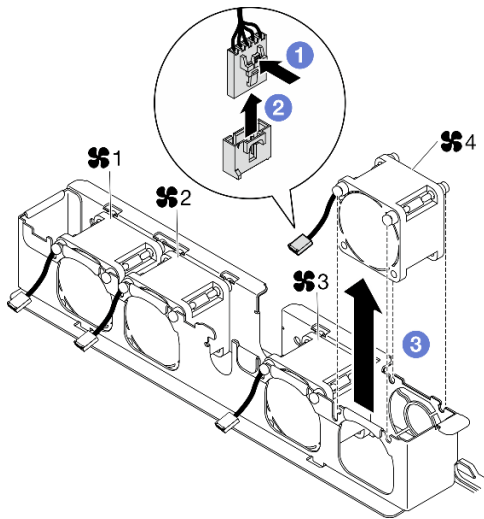
Figure 56. Fan removal

a. ❶ Press and hold the fan cable latch.

b. ❷ Disconnect the cable from the connector.

Attention: To avoid damaging the system board, make sure to follow the instructions in Chapter 6 "Internal cable routing" on page 171 when disconnecting cables from the system board.

c. ❸ Lift the fan out from the fan cage.

After you finish

1. Install a replacement unit. See "Install a fan" on page 80.

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.

Demo video

Watch the procedure on YouTube

Install a fan

Use this information to install a fan.

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.

S009

CAUTION:
To avoid personal injury, disconnect the fan cables before removing the fan from the device.

S017

CAUTION:
Hazardous moving fan blades nearby. Keep fingers and other body parts away.

S033

CAUTION:
Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in spattered metal, burns, or both.
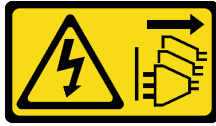
Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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 replace a defective fan with another unit of the exact same type.

Procedure

Step 1.   Install the fan.
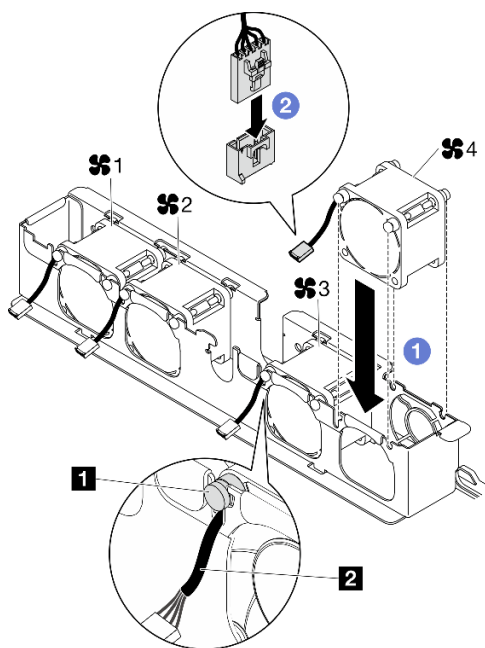
Figure 57. Fan installation

1 Rubber pad	**2** Fan cable

a. **1** Align the fan with the slot in the fan cage; then, place the fan into the slot.

   Attention: Make sure the fan cable is under the rubber pad and are inserted into the cable slot as shown.

b. **2** Connect the fan cable to the connector by pressing it down until it clicks.

After you finish

1. Install the air baffle. See "Install the air baffle" on page 63.
2. Install the top cover. See "Install the top cover" on page 161.
3. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Flash power module replacement

Use the following information to remove and install the flash power module

Remove the flash power module

Use this information to remove the flash power module.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
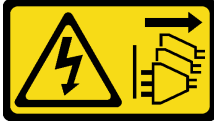- If the server is installed in a rack, remove the server from the rack.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Make preparations for this task.

   a. Remove the top cover. See "Remove the top cover" on page 159.

   b. Disconnect the flash power module cable from the RAID adapter. See "Flash power module cable routing" on page 179.

Step 2. Remove the flash power module.
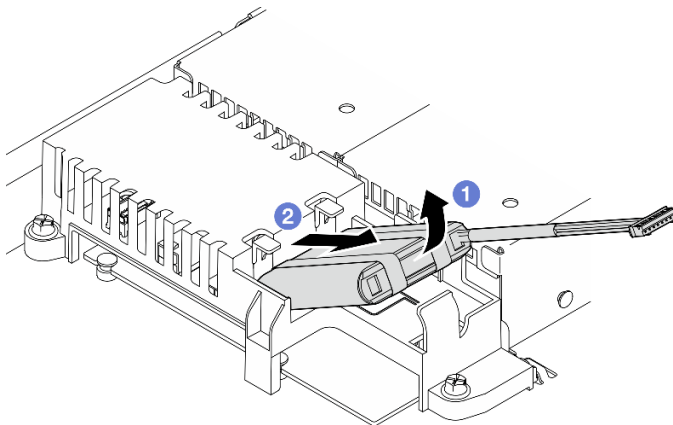
Figure 58. Flash power module removal

   a. ❶ Use your finger to lift the flash power module slightly.

   b. ❷ Slide the flash power module out of the server.

After you finish

1. Install a replacement unit. See "Install the flash power module" on page 84.

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.

Demo video

Install the flash power module

Use this information to install the flash power module.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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 flash power module.

Figure 59. Flash power module installation

a.   ❶ Insert the end of the flash power module into its carrier.

b. ❷ Rotate the flash power module down into the carrier until the tab clicks in place to secure it.

After you finish

1. Connect the flash power module cable to the RAID adapter. See "Flash power module cable routing" on page 179.

2. Install the top cover. See "Install the top cover" on page 161.

3. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Front I/O module replacement

Use this procedure to remove or install the front I/O module.

Remove the front I/O module (2.5-inch drive model)

Use this information to remove the front I/O module (2.5-inch drive model).

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1. Make preparations for this task.

a. Remove the top cover. See "Remove the top cover" on page 159.

b. Disconnect the front I/O module cables from the system board. See "Front I/O module cable routing" on page 174.

Attention: To avoid damaging the system board, make sure to follow the instructions in Chapter 6 "Internal cable routing" on page 171 when disconnecting cables from the system board.

Step 2. Remove two screws that secure the front I/O module.
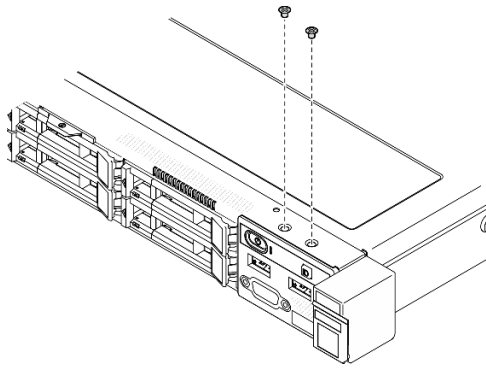
Figure 60. Front I/O module screws removal

Step 3. Slide the front I/O module out of the server.
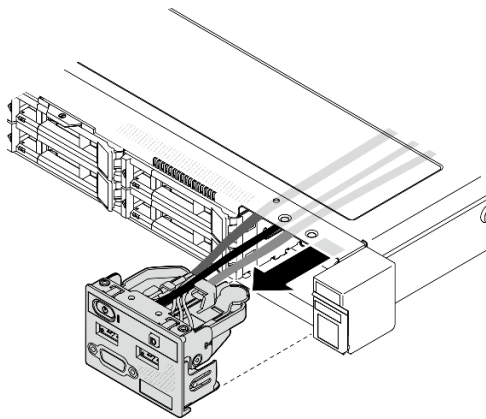
Figure 61. Front I/O module removal

After you finish

1. Install a replacement unit. See "Install the front I/O module (2.5-inch drive model)" on page 86.
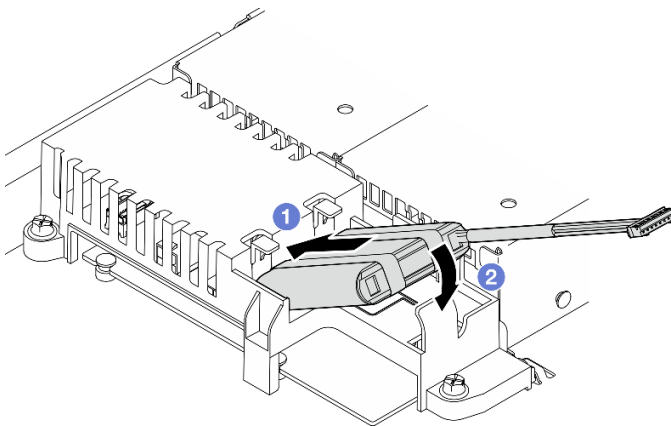2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Demo video

Watch the procedure on YouTube

Install the front I/O module (2.5-inch drive model)

Use this information to install the front I/O module (2.5-inch drive model).

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 197 for more information on firmware updating tools.

Procedure

Step 1.   Slide the front I/O module into the server.
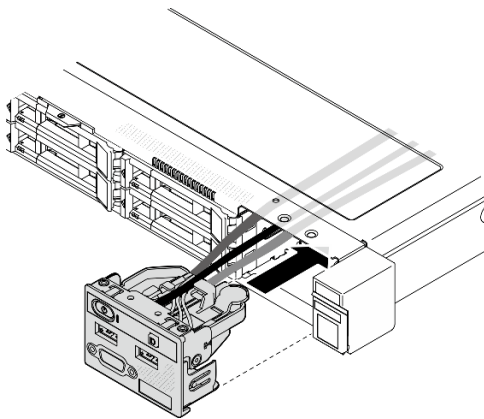
Figure 62. Front I/O module (2.5-inch drive model) installation

Step 2.   Install the two screws to secure the front I/O module.
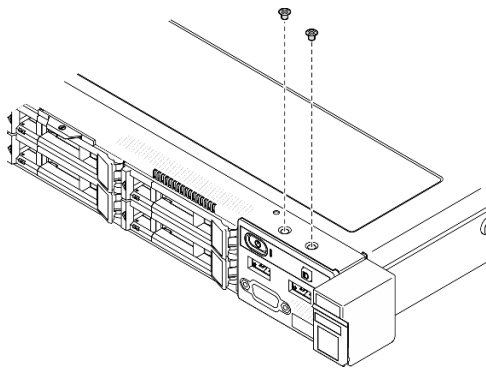
Figure 63. Screws installation

After you finish

1. Connect the front I/O module cables to the system board. See "Front I/O module cable routing" on page 174.

2. Install the top cover. See "Install the top cover" on page 161.

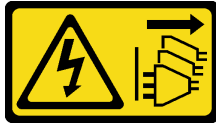3. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Remove the front I/O module (3.5-inch drive model)

Use this information to remove the front I/O module (3.5-inch drive model).

About this task

<u>S002</u>

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1. Make preparations for this task.

    a. Remove the top cover. See "Remove the top cover" on page 159.

    b. Disconnect the front I/O module cables from the system board. See "Front I/O module cable routing" on page 174.

       Attention: To avoid damaging the system board, make sure to follow the instructions in Chapter 6 "Internal cable routing" on page 171 when disconnecting cables from the system board.

Step 2. Remove the two screws that secure the front I/O module.

Figure 64. Front I/O module removal

Step 3. Pull out the front I/O module from the server.
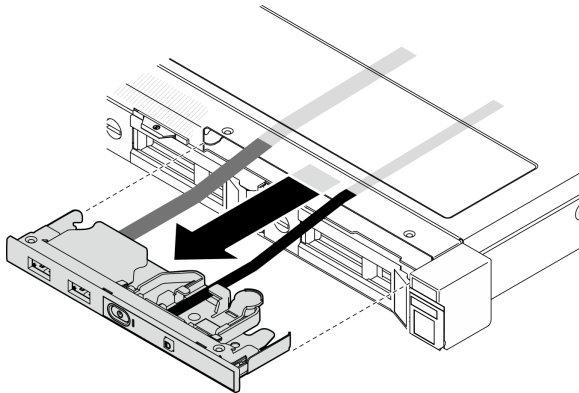
Figure 65. Front I/O module removal

After you finish

1. Install a replacement unit. See "Install the front I/O module (3.5-inch drive model)" on page 90.
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.

Demo video

Watch the procedure on YouTube

Install the front I/O module (3.5-inch drive model)

Use this information to install the front I/O module (3.5-inch drive model).

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 197 for more information on firmware updating tools.

Procedure

Step 1.   Slide the front I/O module and cables into the slot on the front server.
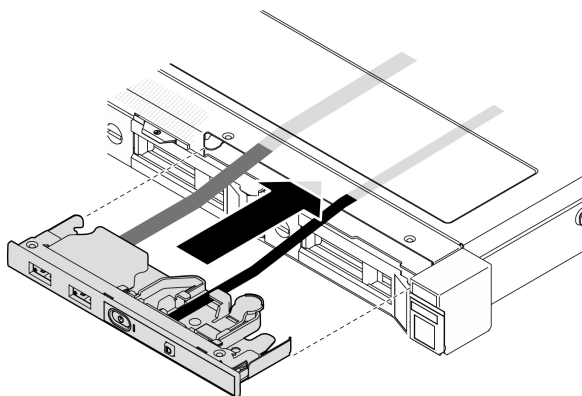
Figure 66. Front I/O module installation

Step 2.   Install the two screws that secure the front I/O module.
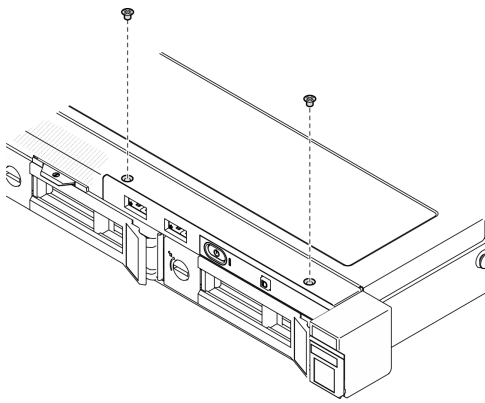
Figure 67. Front I/O module installation

After you finish

1. Connect the front I/O module cables to the system board. See "Front I/O module cable routing" on page 174.

2. Install the top cover. See "Install the top cover" on page 161.

3. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Heat sink replacement

Follow this procedure to remove and install the heat sink.

Remove the heat sink

Use this information to remove the heat sink. 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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- If the server is installed in a rack, remove the server from the rack.

- 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. Remove the top cover. See "Remove the top cover" on page 159.

Step 2. Loosen screw 1 and 2:

    a. Partially loosen screw 1.

    b. Fully loosen screw 2.

    c. Fully loosen screw 1.

    Notes:

      1. Gently remove the four screws to avoid any possible damage to the system board.

      2. Always keep the four screws attached to the heat sink.

      3. Do not touch the thermal grease while handling the heat sink.

Step 3. Loosen screw 3 and 4:

    a. Partially loosen screw 3.

    b. Fully loosen screw 4.

    c. Fully loosen screw 3.
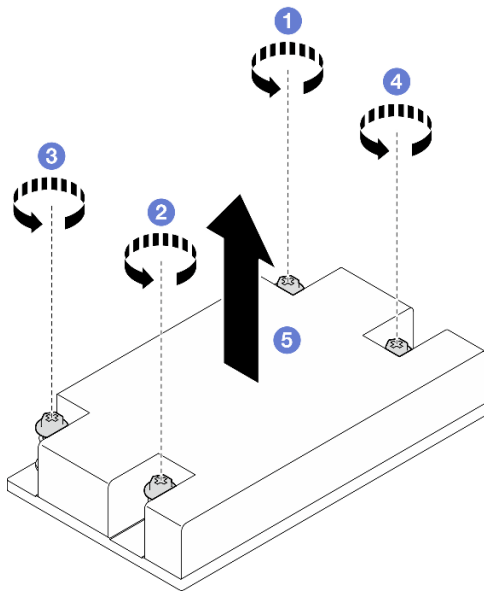
Figure 68. Heat sink removal

Step 4. Lift evenly and remove the heat sink from the server.

After you finish

1. Install a replacement unit. See "Install the heat sink" on page 93.

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.

Demo video

[Watch the procedure on YouTube](#)

Install the heat sink

Use this information to install the heat sink. 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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- If the server is installed in a rack, remove the server from the rack.

- 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.

- 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.

Procedure

Step 1.   Align the four screws on the heat sink with the corresponding screw holes on the system board.

Step 2. Tighten screw 1 and 2:

    a. Partially tighten screw 1.

    b. Fully tighten screw 2.

    c. Fully tighten screw 1.
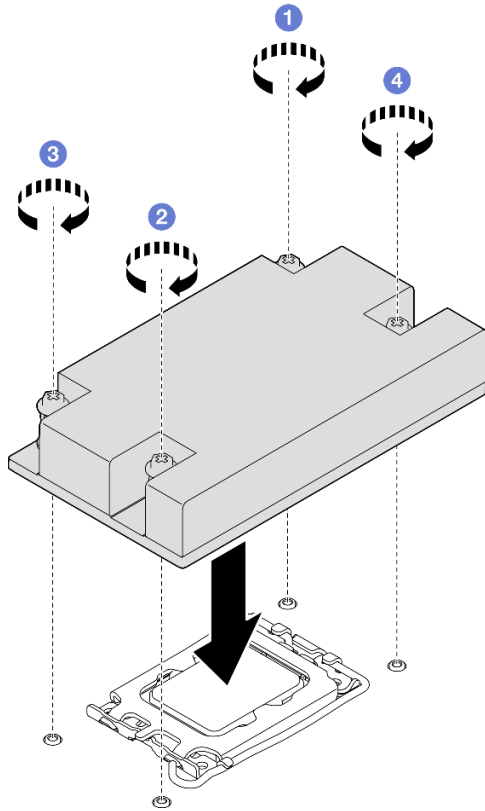
Figure 69. Heat sink installation

Step 3. Tighten screw 3 and 4:

    a. Partially tighten screw 3.

    b. Fully tighten screw 4.

    c. Fully tighten screw 3.

After you finish

1. Install the top cover. See "Install the top cover" on page 161.
2. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Intrusion switch replacement

Follow instructions in this section to remove and install the intrusion switch. The intrusion switch informs you that the server cover is not properly installed or closed by creating an event in the system event log (SEL).

Remove the intrusion switch

Follow instructions in this section to remove the intrusion switch.

About this task

To avoid potential danger, read and follow the following safety statements.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1. Remove the top cover. See "Remove the top cover" on page 159.

Step 2. Locate intrusion switch location in the chassis.

Table 6. Intrusion switch location

Figure 70. Intrusion switch location in 2.5-inch drive model	Figure 71. Intrusion switch location in 3.5-inch drive model

1 Intrusion switch location

Step 3. Disconnect the cable of the intrusion switch from the system board. See "System-board connectors" on page 29.

> **Attention:** To avoid damaging the system board, make sure to follow the instructions in Chapter 6 "Internal cable routing" on page 171 when disconnecting cables from the system board.

Step 4. Pinch the two tabs on the intrusion switch towards each other, and pull the intrusion switch out.
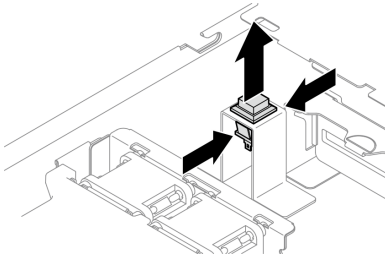
Figure 72. Removing the intrusion switch

After you finish

1. Install a replacement unit. See "Install the intrusion switch" on page 97.

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.
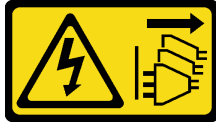
Demo video

Watch the procedure on YouTube

Install the intrusion switch

Follow instructions in this section to install the intrusion switch.

About this task

To avoid potential danger, read and follow the following safety statements.

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.
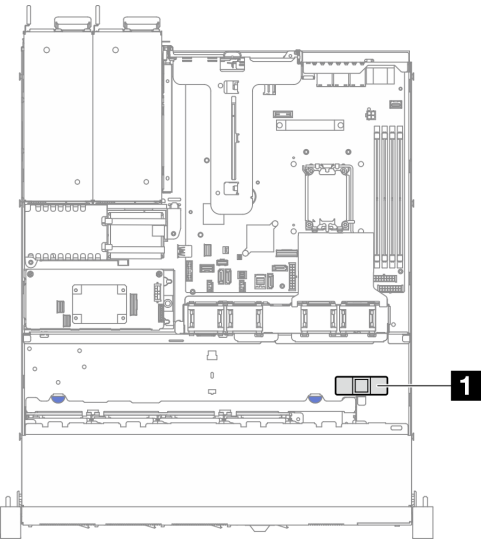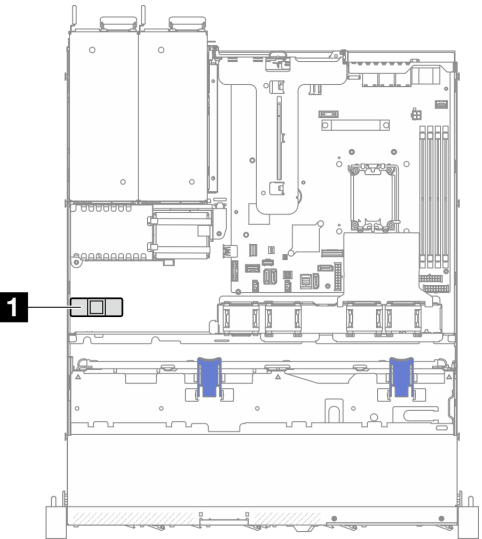
Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1.   Locate intrusion switch location in the chassis.

Table 7. Intrusion switch location

Figure 73. Intrusion switch location in 2.5-inch drive model	*Figure 74. Intrusion switch location in 3.5-inch drive model*

1 Intrusion switch location

Step 2.   Push the intrusion switch in the slot until it clicks into place.
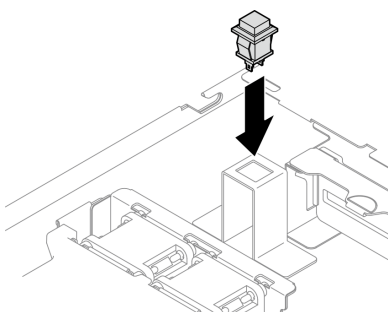
Figure 75. Installing the intrusion switch

Step 3.   Connect the cable to the corresponding connector on the system board. See "Intrusion switch cable routing" on page 180.

After you finish

1. Install the top cover. See "Install the top cover" on page 161.
2. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

M.2 drive and M.2 boot adapter replacement

Use the following information to remove and install the M.2 drive and M.2 boot adapter.

Remove an M.2 drive

Use this information to remove an M.2 drive.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
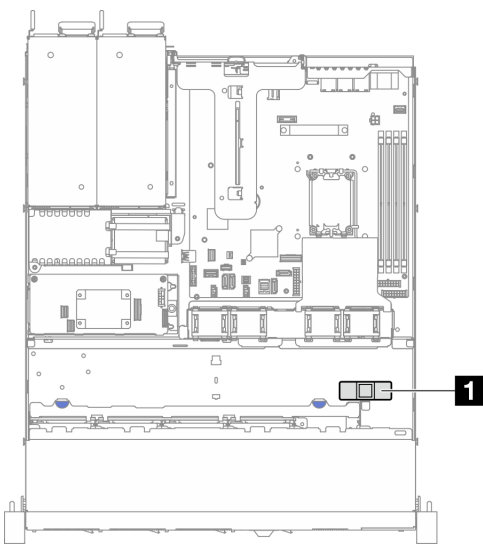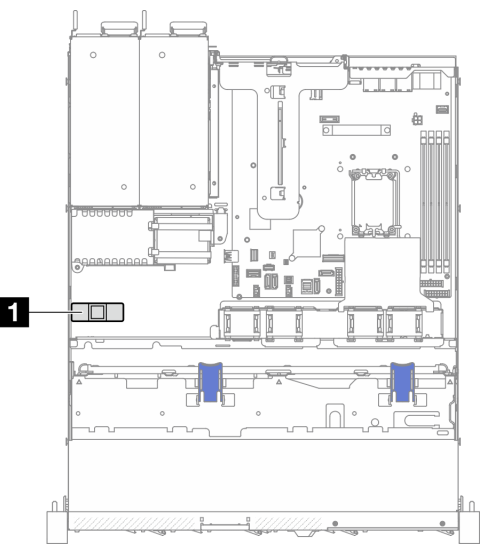- Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 49.
- If the server is installed in a rack, remove the server from the rack.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Make preparations for this task.

    a. Remove the top cover. See "Remove the top cover" on page 159.

    b. Disconnect the M.2 boot adapter cables from the system board. See "M.2 boot adapter cable routing" on page 182.

    c. Remove the PCIe riser assembly. See "Remove the PCIe riser assembly" on page 112.

    d. Remove the M.2 boot adapter assembly from the PCIe riser assembly. See "Remove a PCIe adapter" on page 114.

Step 2. Remove the M.2 drive.

Figure 76. M.2 drive removal

    a. ❶ Press both sides of the retainer.

    b. ❷ Slide the retainer backwards to loosen the M.2 drive from the M.2 boot adapter.

    c. ❸ Pivot the M.2 drive away from the M.2 boot adapter.

    d. ❹ Pull the M.2 drive away from the connector at an angle.

After you finish

1. Install a replacement unit. See "Install an M.2 drive" on page 106.

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.

Demo video

Watch the procedure on YouTube

Remove the M.2 boot adapter

Follow instructions in this section to remove the M.2 boot adapter.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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. Make preparations for this task.

   a. Remove the top cover. See "Remove the top cover" on page 159.

   b. Disconnect the M.2 boot adapter cables from the system board. See "M.2 boot adapter cable routing" on page 182.

   Attention: To avoid damaging the system board, make sure to follow the instructions in Chapter 6 "Internal cable routing" on page 171 when disconnecting cables from the system board.

   c. Remove the PCIe riser assembly. See "Remove the PCIe riser assembly" on page 112.

   d. Remove the M.2 boot adapter assembly from the PCIe riser assembly. See "Remove a PCIe adapter" on page 114.

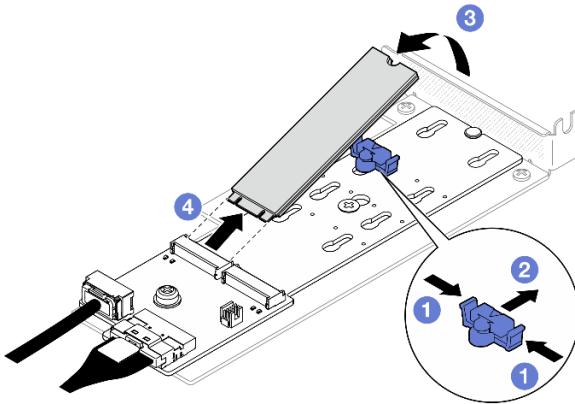   e. Remove the M.2 drives from the M.2 boot adapter. See "Remove an M.2 drive" on page 99.

Step 2. Disconnect the cables from the M.2 boot adapter.

   SATA/x4 NVMe M.2 boot adapter
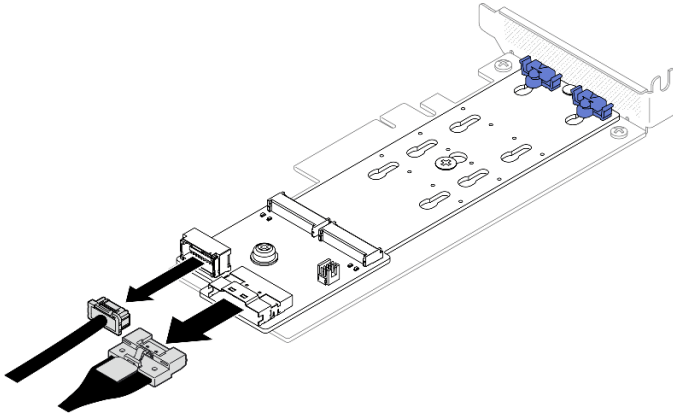
Figure 77. Disconnecting cable from ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit

ThinkSystem M.2 RAID B540i-2i SATA/NVMe Adapter
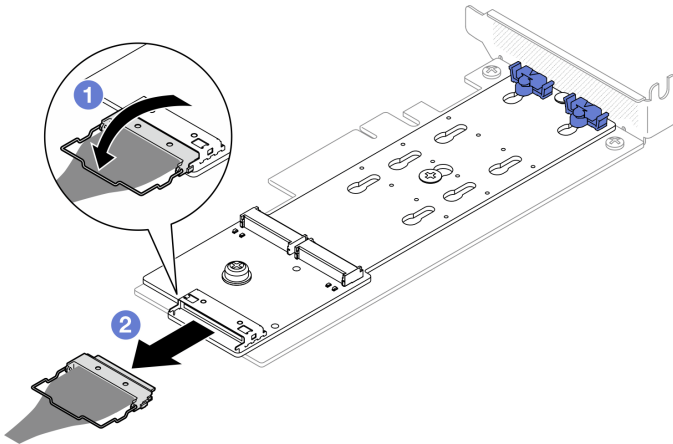
Figure 78. Disconnecting cable from ThinkSystem M.2 RAID B540i-2i SATA/NVMe Adapter

1. ❶ Unhook the wire bail on the cable from the connector.
2. ❷ Disconnect the cable from the M.2 boot adapter.

Step 3. Remove the M.2 boot adapter from the PCIe adapter.

   a. ❶ Remove the screw that secures the M.2 boot adapter to the PCIe adapter.

   b. ❷ Loosen the captive screw on the M.2 boot adapter.

   c. ❸ Slightly slide the M.2 boot adapter and carefully separate it from the PCIe adapter as shown.
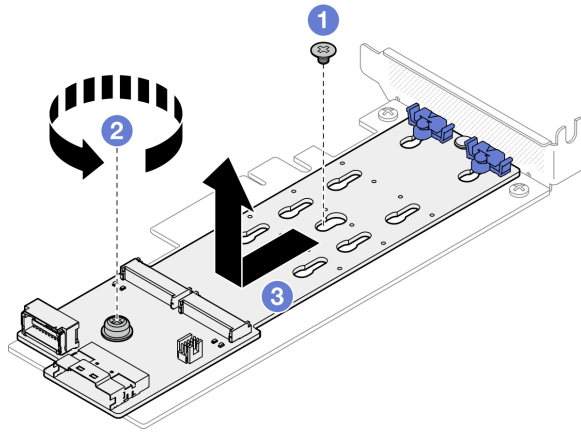
Figure 79. Removing M.2 boot adapter

After you finish

1. Install a replacement unit. See "Install the M.2 boot adapter" on page 103.
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.

Demo video

Watch the procedure on YouTube

Adjust the retainer on the M.2 boot adapter

Follow instructions in this section to adjust the retainer on the M.2 boot adapter.

About this task

To avoid potential danger, read and follow the following safety statements.

- **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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

- 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.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-CTkyVDu-5Lhy1r9G-4PQGl.

Procedure

Step 1. Before adjusting the retainer on the M.2 boot adapter, locate the correct keyhole that the retainer should be installed into to accommodate the particular size of the M.2 drive to be installed.

Note: The M.2 boot adapter might be different from the following illustrations, but the adjustment method is the same.

Step 2. Adjust the retainer on the M.2 boot adapter.
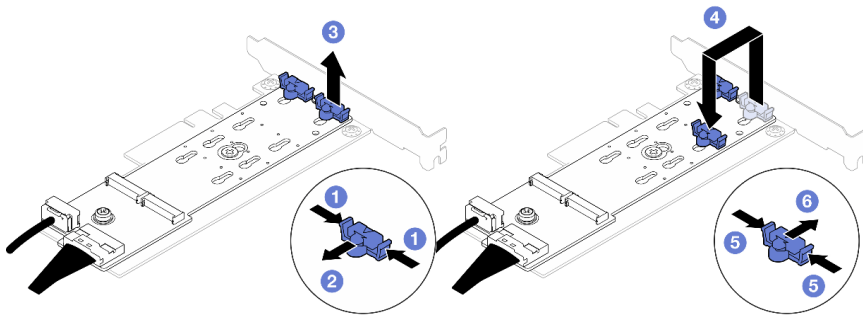
Figure 80. Adjusting the M.2 retainer

a. ❶ Press both sides of the retainers.

b. ❷ Move the retainer forward until it is in the large opening of the keyhole.

c. ❸ Take the retainer out of the keyhole.

d. ❹ Insert the retainer into the correct keyhole to accommodate the particular size of the M.2 drive to be installed.

e. ❺ Press both sides of the retainer.

f. ❻ Slide the retainer backwards until it is seated in place.

Install the M.2 boot adapter

Use this information to install the M.2 boot adapter.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 197 for more information on firmware updating tools.

Procedure

Step 1. The system only supports PCIe adapters with low-profile bracket. If the PCIe adapter for M.2 boot adapter is installed with a full-height bracket, replace it with the low-profile bracket.
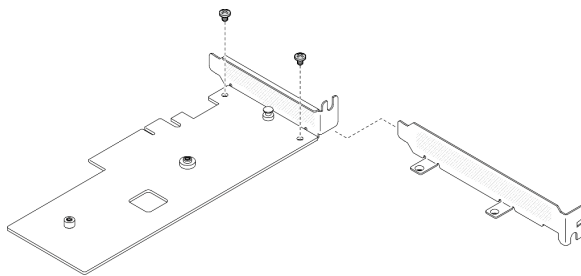
Figure 81. Low-profile bracket installation

Step 2. Install the M.2 boot adapter to the PCIe adapter.

    a. ❶ Align the M.2 boot adapter with the T-head pin on the PCIe adapter and slide it in place as shown.

    b. ❷ Tighten the captive screw on the M.2 boot adapter.

    c. ❸ Tighten the screw to secure the M.2 boot adapter to the PCIe adapter.
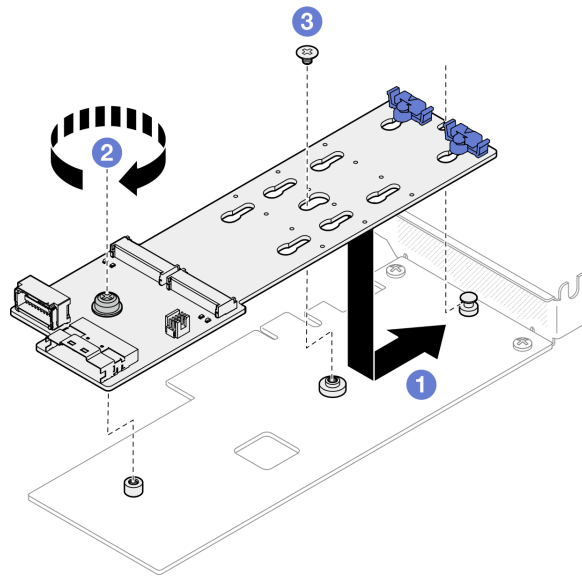
Figure 82. Installing the M.2 boot adapter

Step 3. Connect the cables to the M.2 boot adapter.

ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit
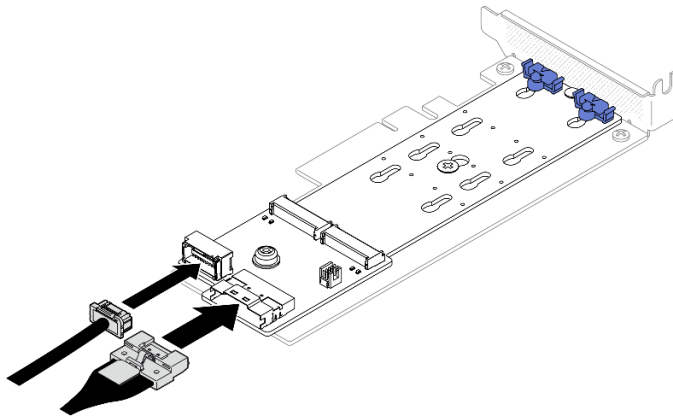
Figure 83. Connecting cable to ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit

ThinkSystem M.2 RAID B540i-2i SATA/NVMe Adapter
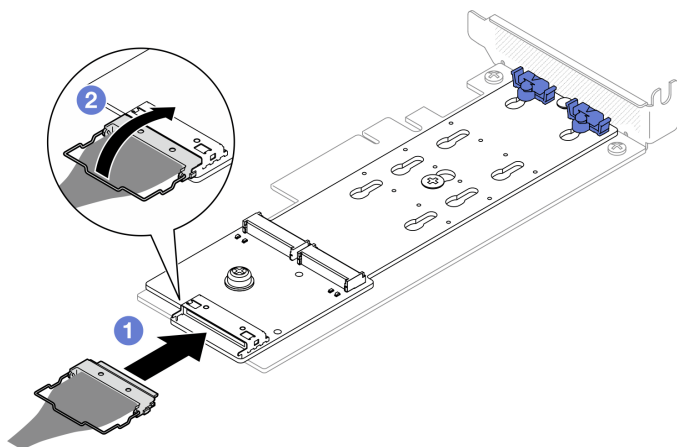
Figure 84. Connecting cable to ThinkSystem M.2 RAID B540i-2i SATA/NVMe Adapter

1. ❶ Connect the cable to the M.2 boot adapter.
2. ❷ Hook the wire bail on the cable onto the connector.

After you finish

1. Install the M.2 drives to the M.2 boot adapter. See "Install an M.2 drive" on page 106.
2. Install the M.2 boot adapter assembly to the PCIe riser assembly. See "Install a PCIe adapter" on page 116.
3. Install the PCIe riser assembly. See "Install the PCIe riser assembly" on page 118.
4. Connect the M.2 boot adapter cables to the system board. See "M.2 boot adapter cable routing" on page 182.
5. Install the top cover. See "Install the top cover" on page 161.
6. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Install an M.2 drive

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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.
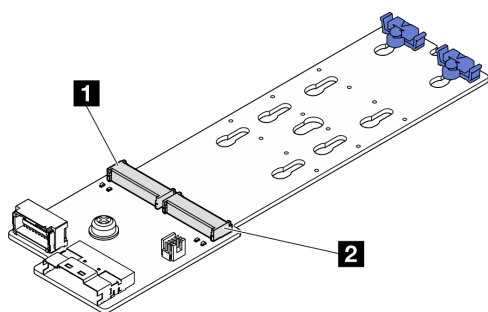
Figure 85. M.2 drive slot

Table 8. M.2 drive slot locations on M.2 boot adapter

1 M.2 boot adapter slot 1	**2** M.2 boot adapter slot 0

Procedure

Step 1.   Install the M.2 drive.

a.   ❶ Hold the M.2 drive at an angle, and insert it into the M.2 slot.

b.   ❷ Lower the M.2 drive.

c.   ❸ Slide the retainer towards the M.2 drive to secure it in place.
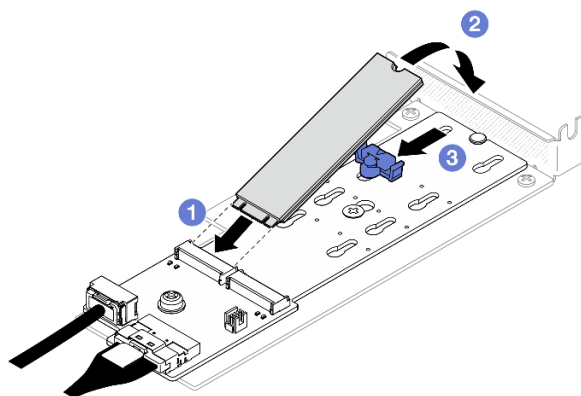
Figure 86. M.2 drive installation

After you finish

1. Install the M.2 boot adapter assembly to the PCIe riser assembly. See "Install a PCIe adapter" on page 116.
2. Install the PCIe riser assembly. See "Install the PCIe riser assembly" on page 118.
3. Connect the M.2 boot adapter cables to the system board. See "M.2 boot adapter cable routing" on page 182.
4. Install the top cover. See "Install the top cover" on page 161.
5. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Memory module replacement

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

Remove a memory module

Use this information to remove a memory module.

About this task

To avoid potential danger, read and follow the following safety statements.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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.
- Memory modules are sensitive to static discharge and require special handling. Refer to the standard guidelines for "Handling static-sensitive devices" on page 46.
  - 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.

Procedure

Step 1.   Make preparations for this task.

a.   Remove the top cover. See "Remove the top cover" on page 159.

b.   Remove the air baffle when removing the memory module from slot 4. This provides more space for the removal. See "Remove the air baffle" on page 62.

Step 2.   Locate the memory module slot. Determine which memory module you want to remove from the server.
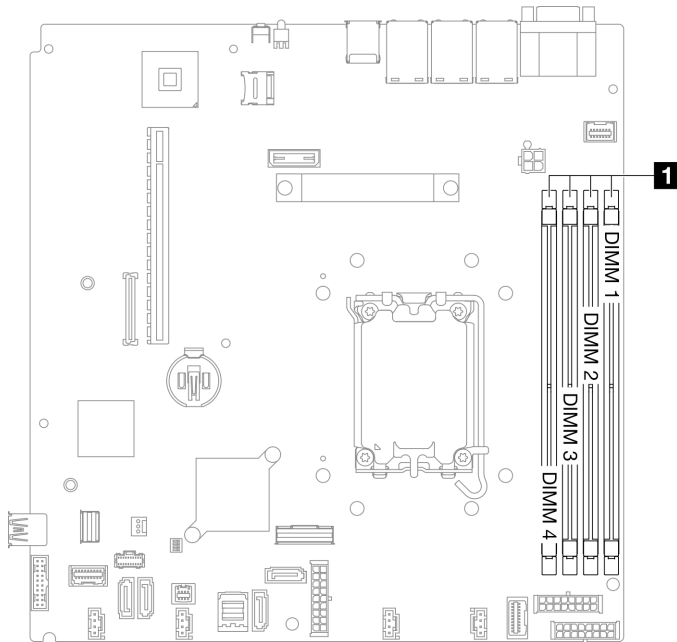
1 Memory module slots

Figure 87. Memory module slots location

Step 3.   Remove the memory module.
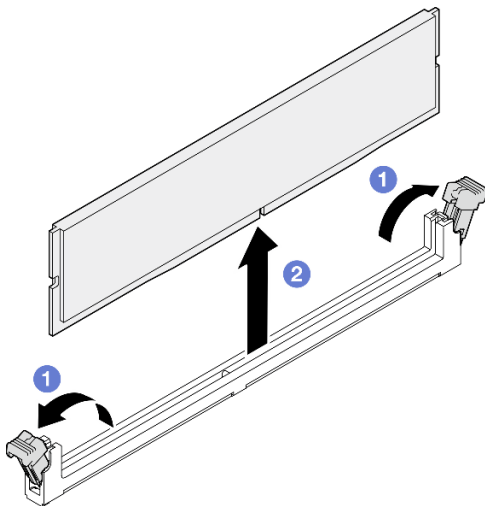
Figure 88. Memory module removal

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

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

b. ❷ Grasp the memory module at both ends and carefully lift it out of the slot.

After you finish

1. Install a replacement unit. See "Install a memory module" on page 110.

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.

Demo video

Watch the procedure on YouTube

Install a memory module

Use this information to install a memory module.

About this task

See "Memory module installation rules and order" on page 46 for detailed information about memory configuration and setup.

To avoid potential danger, read and follow the following safety statements.

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.

See "Memory module installation rules and order" on page 46 for detailed information about memory configuration and setup.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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 adopt one of the supported configurations listed in "Memory module installation rules and order" on page 46.
- Memory modules are sensitive to static discharge and require special handling. Refer to the standard guidelines at "Handling static-sensitive devices" on page 46:

– 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.

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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.

- Go to "Update the firmware" on page 197 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 memory module slot on the system board.
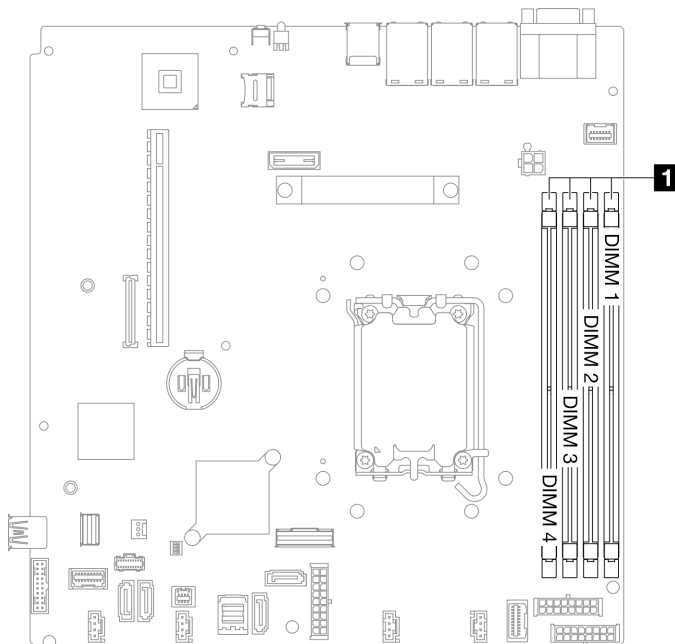
1 Memory module slots

Figure 89. Memory module slots location

Step 2. Touch the static-protective package that contains the memory module to any unpainted surface on the outside of the server. Then, take the memory module out of the package and place it on a static-protective surface.

Step 3. Install the memory module into the slot.

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.
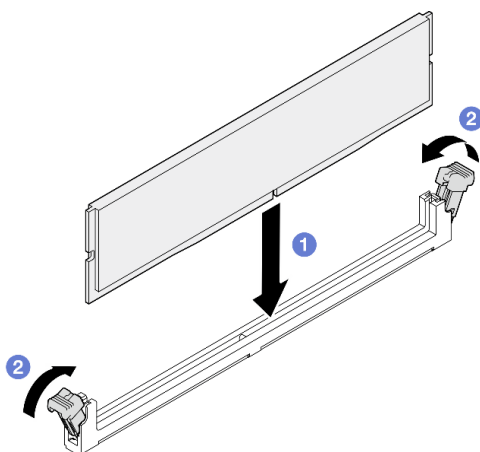
Figure 90. Memory module installation

a. ❶ Make sure they are in the fully-open position. Align the keys on the memory module with the connector.

b. ❷ Firmly press both ends of the memory module straight down into the connector until the retaining clips snap into the locked position.

After you finish

1. Reinstall the air baffle if it is removed. See "Install the air baffle" on page 63.
2. Install the top cover. See "Install the top cover" on page 161.
3. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

PCIe adapter and PCIe riser assembly replacement

Use this procedure to remove or install a PCIe adapter and PCIe riser assembly.

Remove the PCIe riser assembly

Use this information to remove the PCIe riser assembly.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1. Remove the top cover. See "Remove the top cover" on page 159.

Step 2. Disconnect cables that are connected to the adapters.

Step 3. Grasp the PCIe riser assembly by its edges and carefully lift it out of the server.

> **Notes:**
>
> 1. The following illustration might differ slightly from your hardware.
> 2. Carefully lift the PCIe riser assembly straight up. Avoid tilting the PCIe riser assembly at a large angle, tilting might cause damage to the connector.
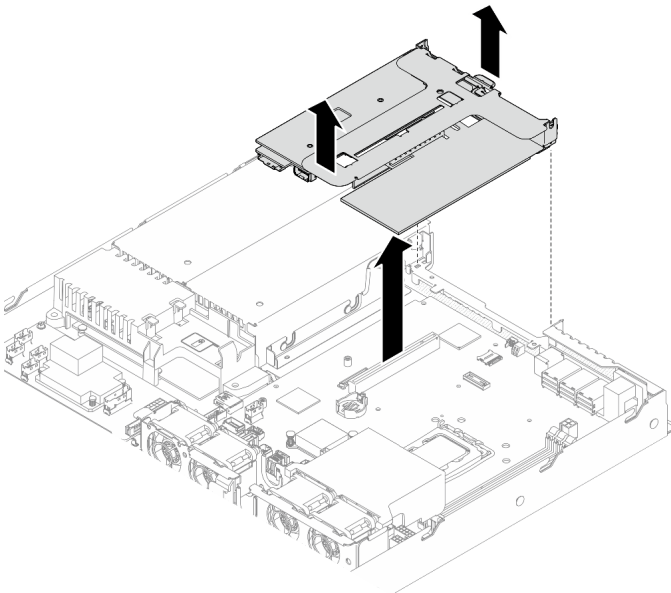
Figure 91. PCIe riser assembly removal

After you finish

1. Install a replacement unit. See .

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.

3. If you need to disassemble the PCIe riser assembly for recycle, remove the two screws and carefully pull the PCIe riser card out of the riser cage.

   Attention: You can only disassemble the PCIe riser assembly for recycle. Do not disassemble it for any other purposes.
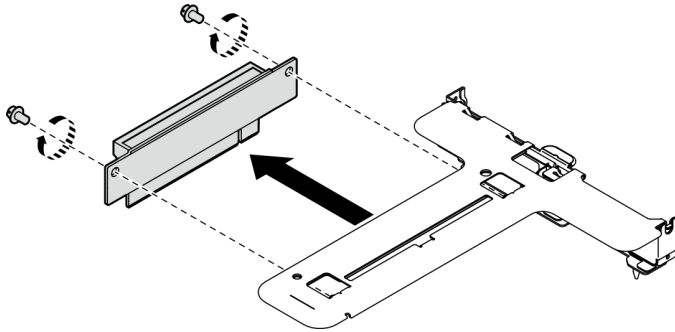
Figure 92. PCIe riser card removal

Demo video

Remove a PCIe adapter

Use this information to remove a PCIe adapter from the riser.

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.

Attention:

- Read and to ensure that you work safely.

- Power off the server and peripheral devices and disconnect the power cords and all external cables. See .

- If the server is installed in a rack, remove the server from the rack.

- Replacing the adapter might impact your RAID configurations. Back up your data before the replacement to avoid any data loss due to a RAID configuration change.

Procedure

Step 1. Make preparations for this task.

    a. Remove the top cover. See "Remove the top cover" on page 159.

    b. Remove the PCIe riser assembly. See "Remove the PCIe riser assembly" on page 112.

Step 2. Remove the PCIe adapter.

    a. ❶ Disengage the adapter by pulling it straight out of the riser cage.

    b. ❷ If necessary, install the fillers.
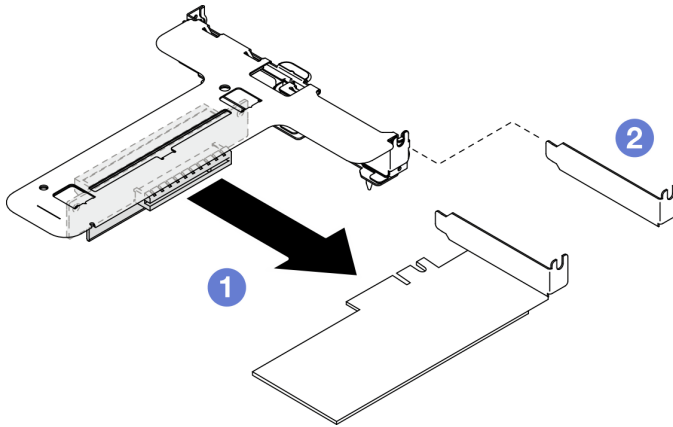
Figure 93. PCIe adapter removal (slot 1)
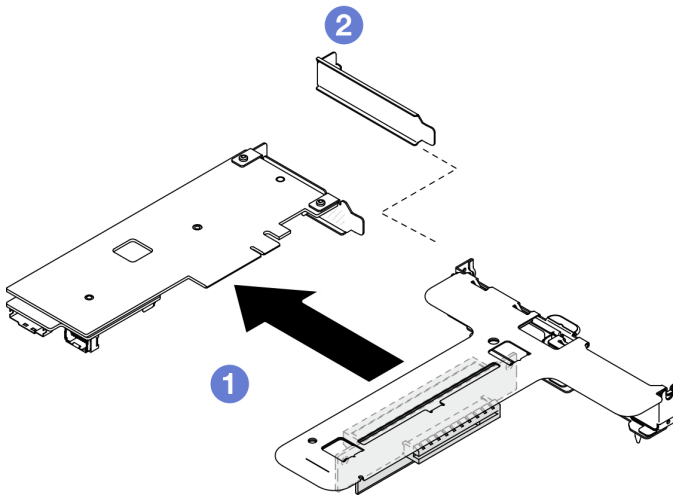
Figure 94. PCIe adapter removal (slot 2)

Note: Remove one adapter at a time, do not pull out two adapters at the same time.

Step 3. Record the cable connections on the adapter; then, disconnect all cables from the adapter.

After you finish

1. Install a replacement unit. See "Install a PCIe adapter" on page 116.

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.

Demo video

[Watch the procedure on YouTube](#)

Install a PCIe adapter

Use this information to install a PCIe adapter to the riser.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Notes:

- When a ThinkSystem Intel E810-DA2 Ethernet Adapter is installed, the following adapters are not supported:
  - ThinkSystem RAID 9350-16i 4GB Flash PCIe 12Gb Adapter
  - ThinkSystem RAID 9350-8i 2GB Flash PCIe 12Gb Adapter
  - ThinkSystem RAID 5350-8i PCIe 12Gb Adapter
  - ThinkSystem 4350-8i SAS/SATA 12Gb HBA
  - ThinkSystem RAID 9350-16i 4GB Flash PCIe 12Gb Internal Adapter
  - ThinkSystem RAID 9350-8i 2GB Flash PCIe 12Gb Internal Adapter
  - ThinkSystem RAID 5350-8i PCIe 12Gb Internal Adapter

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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.

- Go to "Update the firmware" on page 197 for more information on firmware updating tools.

Procedure

Step 1.   Connect all cables to the adapter.

Step 2.   The system only supports low-profile bracket. Install the low-profile bracket to the PCIe adapter.

> **Note:** Store the removed bracket in case that you later need to return the PCIe adapter.

Step 3.   Install the PCIe adapter.

> **Note:** Ensure that you observe the installation rules and sequence in "Technical rules for PCIe slots" on page 48.
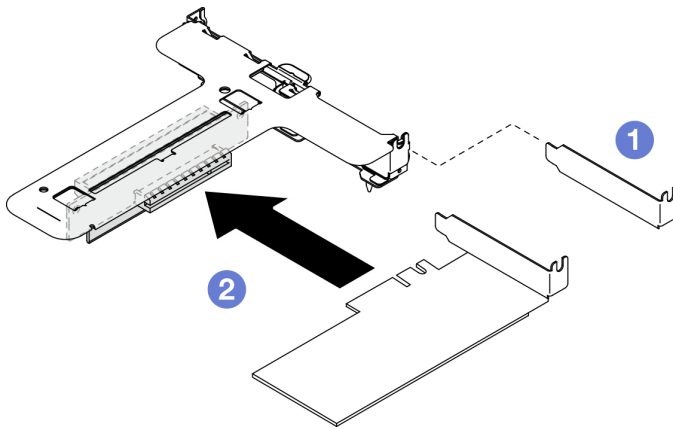
Figure 95. PCIe adapter installation (slot 1)
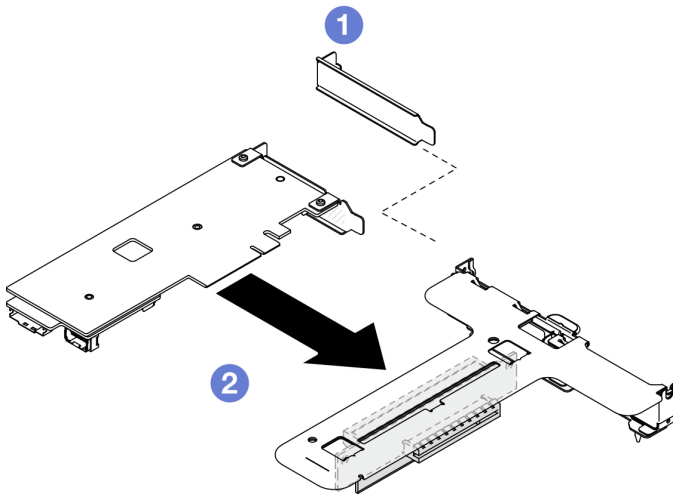
Figure 96. PCIe adapter installation (slot 2)

Notes:

- For more information on the connectors on the PCIe riser card, see "PCIe riser assembly" on page 28.
- Install one adapter at a time, do not insert two adapters to the riser card at the same time.

a.   **1** If fillers are installed on the rear side of the riser cage, remove them.

b. ❷ Align and insert the PCIe adapter assembly into the slot on the PCIe riser. Make sure you install the PCIe adapter into the correct slot.

After you finish

1. Install the PCIe riser assembly. See "Install the PCIe riser assembly" on page 118.
2. Install the top cover. See "Install the top cover" on page 161.
3. If necessary, configure the RAID array using the Setup utility configuration.
4. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Install the PCIe riser assembly

Use this information to install the PCIe riser assembly.

About this task

<u>S002</u>

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.

Attention:
- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 197 for more information on firmware updating tools.

Procedure

Step 1. If necessary, align the screw holes of the PCIe riser card with the corresponding holes on the riser cage; then, insert the PCIe riser card and tighten it with two screws.
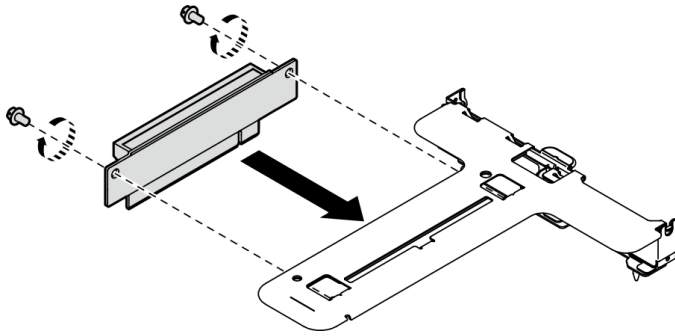
Figure 97. PCIe riser card installation

Step 2. Align the two tabs on PCIe riser assembly with the slots on the rear chassis; then, insert the PCIe riser assembly into the connector on the system board.
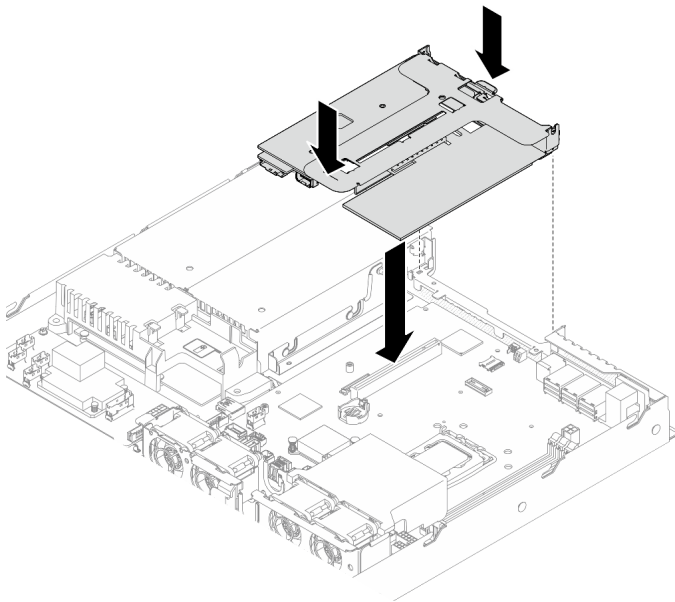
Figure 98. PCIe riser assembly installation

Step 3. Carefully press the riser assembly straight down into the slot until it is fully seated.

Step 4. Connect all cables to the adapter.

After you finish

1. Install the top cover. See "Install the top cover" on page 161.
2. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Power supply unit replacement

Use this procedure to install or remove the power supply unit.

Remove the fixed power supply unit

Use this information to remove the fixed power supply unit.

About this task

S001

DANGER

> Electrical current from power, telephone, and communication cables is hazardous.
> To avoid a shock hazard:
>
> - Connect all power cords to a properly wired and grounded electrical outlet/source.
> - Connect any equipment that will be attached to this product to properly wired outlets/sources.
> - When possible, use one hand only to connect or disconnect signal cables.
> - Never turn on any equipment when there is evidence of fire, water, or structural damage.
> - The device 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.

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.

S035

CAUTION:
Never remove the cover on a power supply or any part that has this label attached. Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1. Remove the top cover. See "Remove the top cover" on page 159.

Step 2. Disconnect the power cables from the system board. See "Fixed power supply unit cable routing" on page 177.

> **Attention:** To avoid damaging the system board, make sure to follow the instructions in Chapter 6 "Internal cable routing" on page 171 when disconnecting cables from the system board.

Step 3. Remove the screw on the power supply unit bracket.
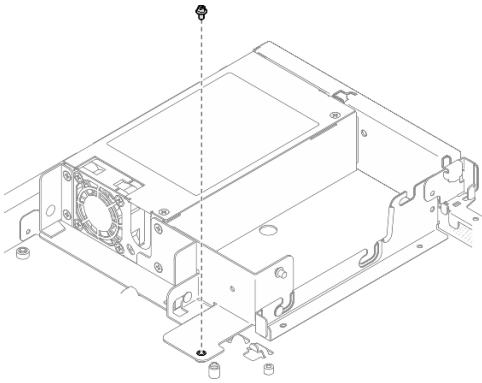
Figure 99. Power supply unit bracket screw removal

Step 4. Slide the power supply unit bracket towards the rear of the chassis and remove it from the chassis.
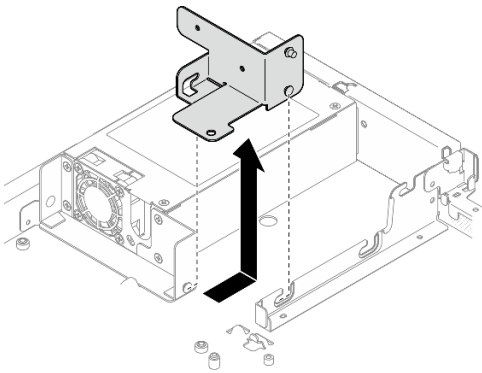
Figure 100. Power supply unit bracket removal

Step 5. Remove the four screws on the rear bracket.
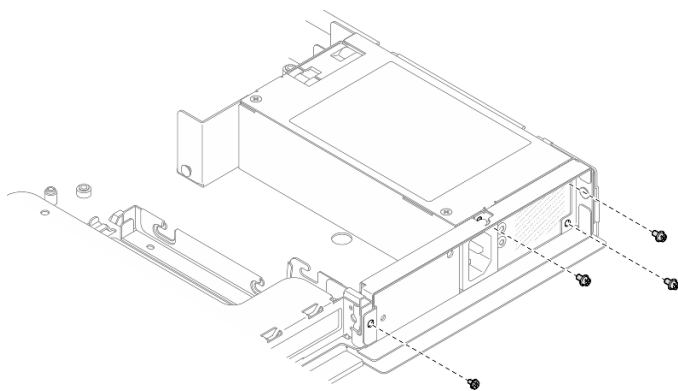
Figure 101. Rear bracket screw removal

Step 6.   Remove the rear bracket.
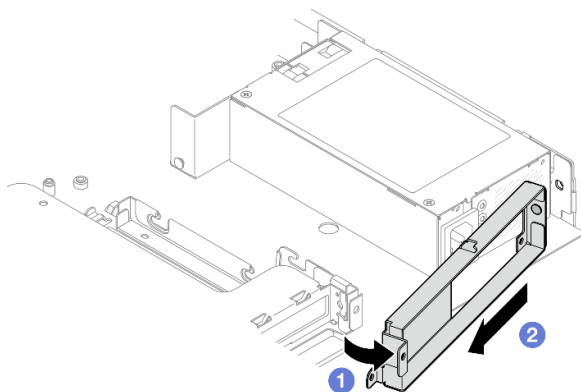
Figure 102. Rear bracket removal

a.   ❶ Lift the rear bracket away from the chassis in the direction as shown.

b.   ❷ Remove the rear bracket from the chassis.

Step 7.   Slide the fixed power supply unit towards the rear of the chassis and lift it out of the chassis.
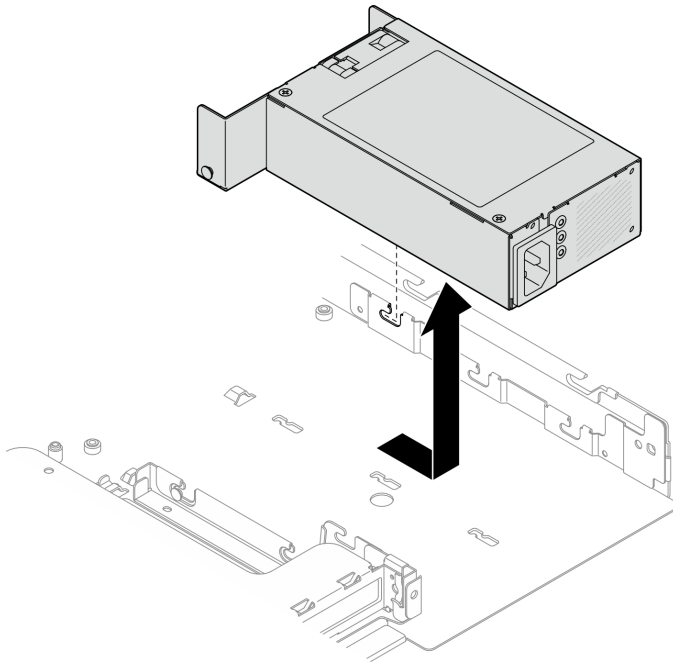
Figure 103. Fixed power supply unit removal

After you finish

1. Install a replacement unit. See .
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.

Demo video

[Watch the procedure on YouTube](#)

Install the fixed power supply unit

Use this information to install the fixed power supply unit.

About this task

S001

⚠ DANGER

> **Electrical current from power, telephone, and communication cables is hazardous.**
> **To avoid a shock hazard:**
>
> - **Connect all power cords to a properly wired and grounded electrical outlet/source.**
> - **Connect any equipment that will be attached to this product to properly wired outlets/sources.**
> - **When possible, use one hand only to connect or disconnect signal cables.**
> - **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
> - **The device 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.**

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.
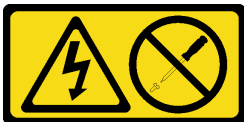
S035

CAUTION:
Never remove the cover on a power supply or any part that has this label attached. Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1.   Align the pin on the fixed power supply unit with the slot on the chassis; then, lower the power supply unit into the chassis and slide the it towards the front of the chassis to lock the pin into the slot.
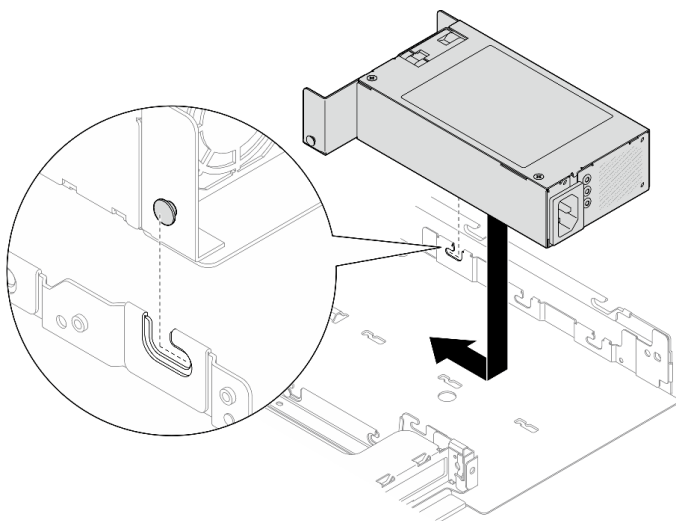
Figure 104. Fixed power supply unit installation

Step 2.   Install the rear bracket.
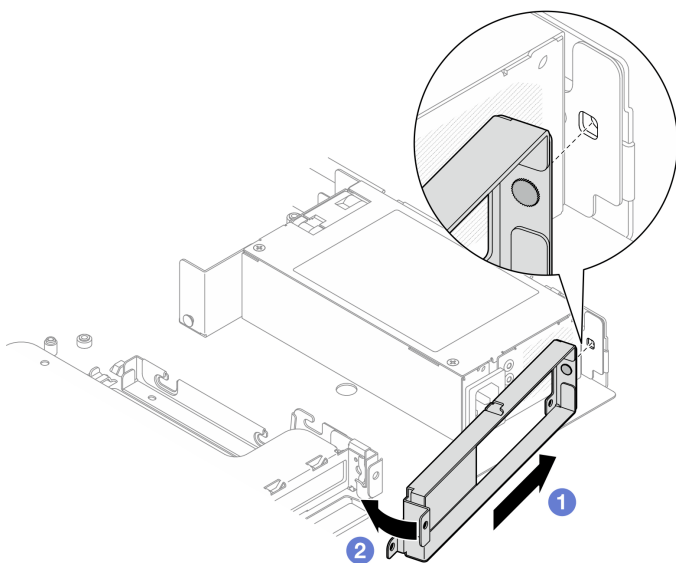
Figure 105. Rear bracket installation

a.   ❶ Insert the pin on the rear bracket into the slot on the rear of the chassis.

b.   ❷ Install the rear bracket into the chassis in the direction as shown.

Step 3.   Install four screws to secure the rear bracket.
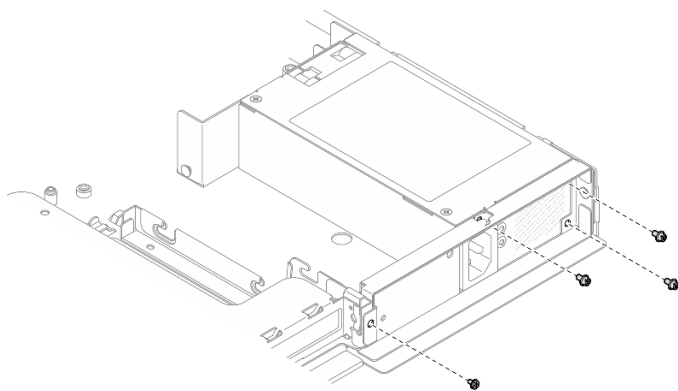
Figure 106. Rear bracket screw installation

Step 4. Align the pins on the power supply unit bracket with the slots on the chassis; then, lower the power supply unit bracket into the chassis and slide it towards the front of the chassis.
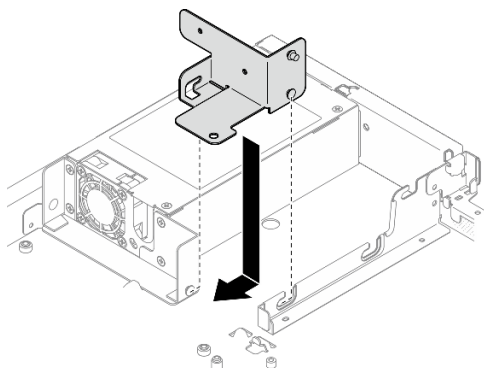
Figure 107. Power supply unit bracket installation

Step 5. Install the screw on the power supply unit bracket to secure it.
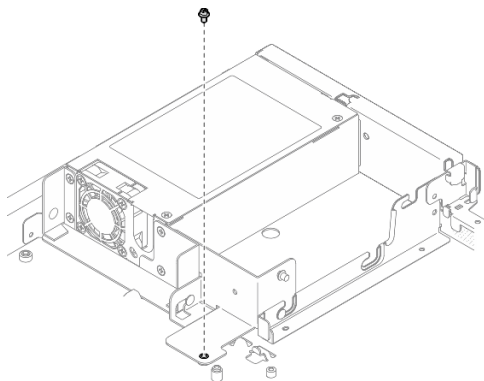
Figure 108. Power supply unit bracket screw installation

After you finish

1. Connect the power cables to the system board. See "Fixed power supply unit cable routing" on page 177.
2. Install the top cover. See "Install the top cover" on page 161.

3. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Remove a hot-swap power supply unit

Use this information to remove a hot-swap power supply unit.

About this task

<u>S001</u>

DANGER

> **Electrical current from power, telephone, and communication cables is hazardous.**
> **To avoid a shock hazard:**
>
> • **Connect all power cords to a properly wired and grounded electrical outlet/source.**
>
> • **Connect any equipment that will be attached to this product to properly wired outlets/sources.**
>
> • **When possible, use one hand only to connect or disconnect signal cables.**
>
> • **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
>
> • **The device 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.**

<u>S002</u>

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.

<u>S035</u>

CAUTION:

Never remove the cover on a power supply or any part that has this label attached. Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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. Locate the hot-swap power supply in the rear of your server and disconnect the power cord from the power supply.

Step 2. Remove the hot-swap power supply unit.

Note: PSU with a release tab is a hot-swap PSU. The color of the release tab does not affect the serviceability of the PSU.

Figure 109. Hot-swap power supply unit
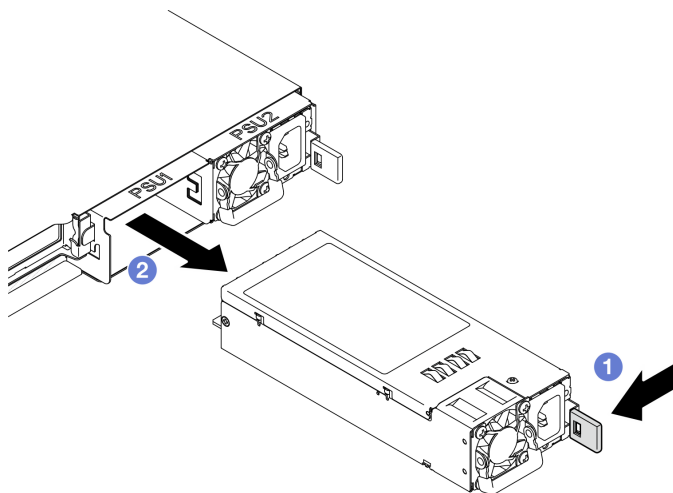
- a.   ❶ Press the release latch towards the handle.
- b.   ❷ Carefully pull the handle to slide the hot-swap power supply unit out of the chassis.

After you finish

1. Install a replacement unit or filler. See "Install a hot-swap power supply unit" on page 129.
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.

Demo video

Watch the procedure on YouTube

Install a hot-swap power supply unit

Use this information to install a hot-swap power supply unit.

About this task

<u>S001</u>

DANGER

Electrical current from power, telephone, and communication cables is hazardous.
To avoid a shock hazard:

- Connect all power cords to a properly wired and grounded electrical outlet/source.
- Connect any equipment that will be attached to this product to properly wired outlets/sources.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- The device 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.

<u>S002</u>

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.

<u>S035</u>

CAUTION:
Never remove the cover on a power supply or any part that has this label attached. Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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. Make preparations for this task.

    a. Make sure that the power supply unit to be installed is the same as the installed ones. Otherwise, remove all existing power supply units and replace them all with the same power supply units.

       Notes:

- Power supply units in the chassis must have the same wattage, vendor, and part number (or alternate part number).
- PSU with a release tab is a hot-swap PSU. The color of the release tab does not affect the serviceability of the PSU.

    b. If there is a PSU filler installed, perform the following steps:

       1. ❶ Press the latch on the PSU filler.

       2. ❷ Pull the filler out of the PSU slot.
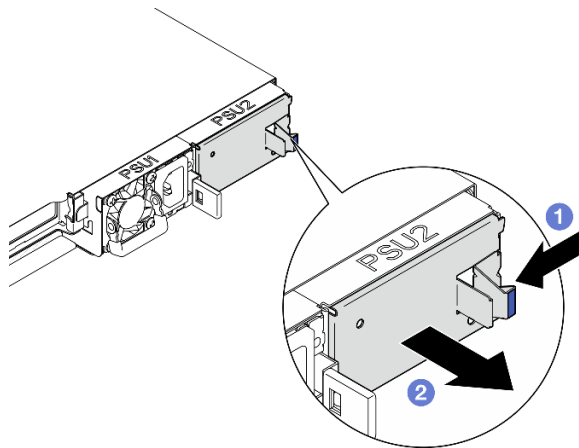
Figure 110. PSU filler removal

Step 2. Make sure the label on the power supply is facing up; then, grasp the handle and slide it into the power supply bay until it clicks into place.
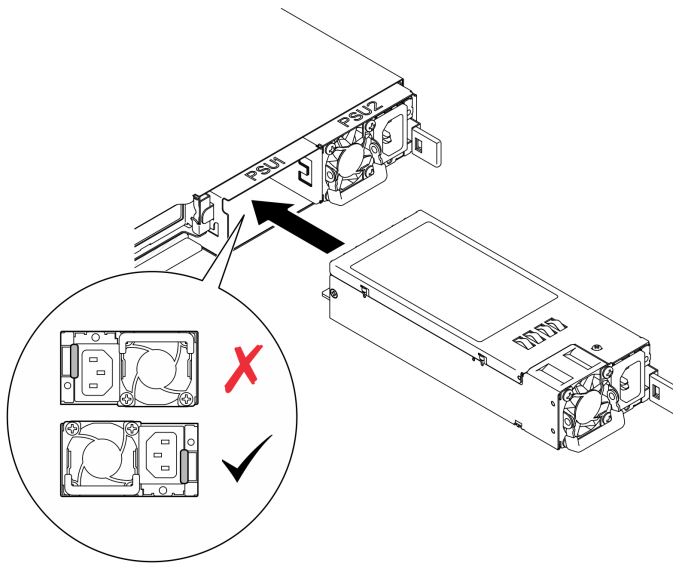
Figure 111. Hot-swap power supply unit installation

After you finish

Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Power distribution board replacement

Use the following information to remove and install the power distribution board.

Remove the power distribution board

Use this information to remove the power distribution board.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- If the server is installed in a rack, remove the server from the rack.

- 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. Make preparations for this task.

    a. Remove the top cover. See "Remove the top cover" on page 159.

    b. Remove all the hot-swap power supply units. See "Remove a hot-swap power supply unit" on page 127.

    c. Disconnect the flash power module cable from the RAID adapter. See "Flash power module cable routing" on page 179.

    d. Remove the flash power module. See "Remove the flash power module" on page 82.

Step 2. Remove the two screws.
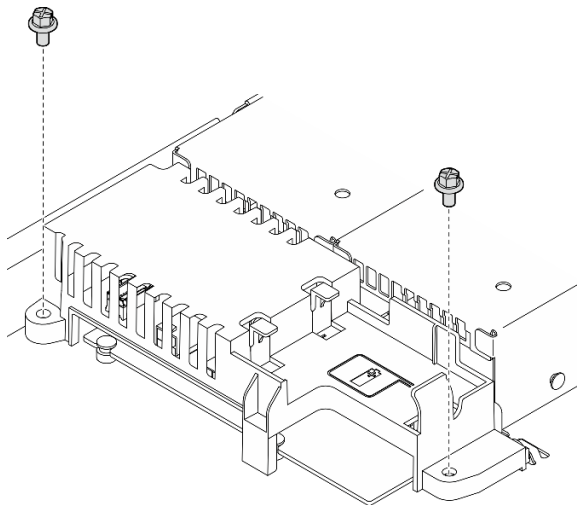
Figure 112. PDB cover screw removal

Step 3. Carefully slide the power distribution board cover forward and lift it out of the server.
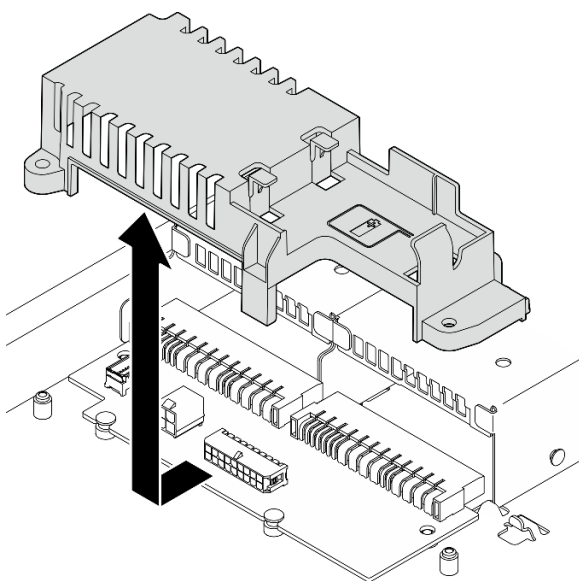
Figure 113. Power distribution board cover removal

Step 4. Disconnect the cables from the power distribution board. See "Power distribution board cable routing" on page 178.

Step 5. Remove the two screws on the power distribution board.
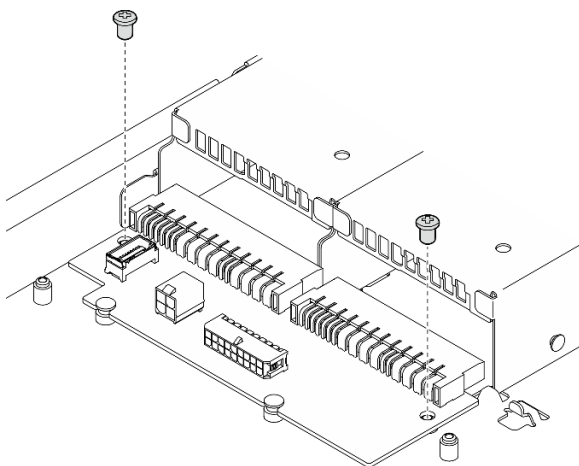
Figure 114. Power distribution board screw removal

Step 6. Remove the power distribution board.

    a. ❶ Lift the power distribution board at an angle.

    b. ❷ Carefully slide the power distribution board backwards and remove it out of the server.
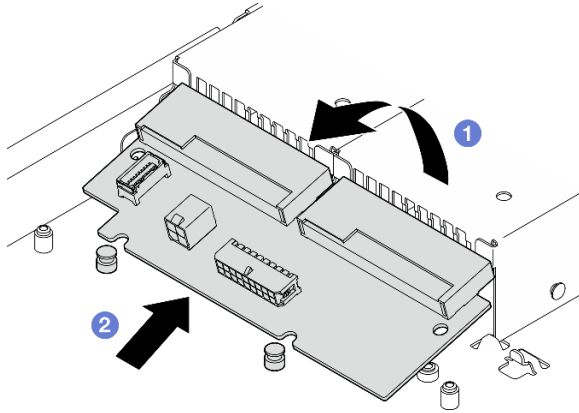
Figure 115. Power distribution board removal

After you finish

1. Install a replacement unit. See "Install the power distribution board" on page 134.
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.

Demo video

Watch the procedure on YouTube

Install the power distribution board

Use this information to install the power distribution board.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 197 for more information on firmware updating tools.

Procedure

Step 1.   Install the power distribution board.

a.   ❶ Align the power distribution board slots with the alignment pins **1**.

b.   ❷ Lower the power distribution board onto the server.
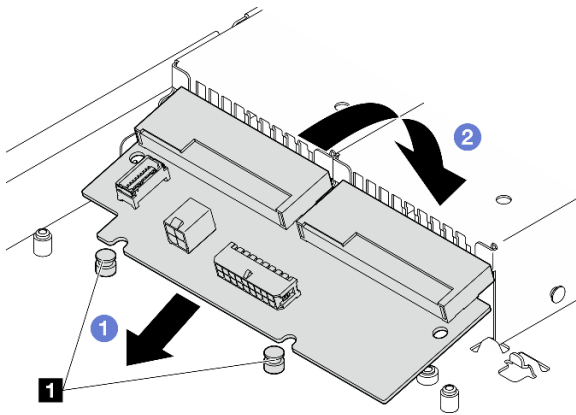
Figure 116. Power distribution board installation

1 Alignment pins

Step 2.   Fasten the two screws to secure the power distribution board.
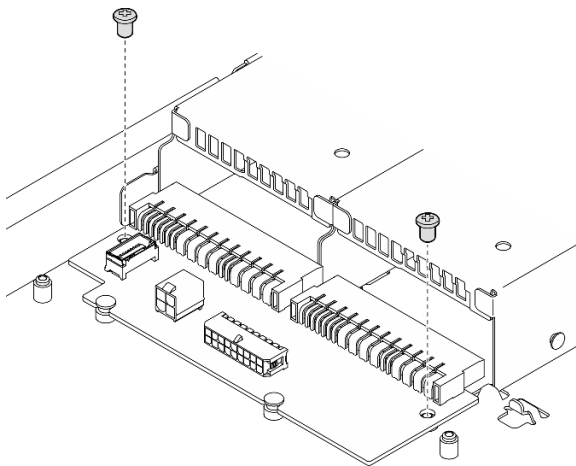
Figure 117. Screw installation

Step 3.   Connect the cables to the power distribution board. See "Power distribution board cable routing" on page 178.

Step 4.   Align the power distribution board cover pin **1** with the hook **2** and lower it into the server; then, slightly slide the power distribution board cover backwards to insert it.
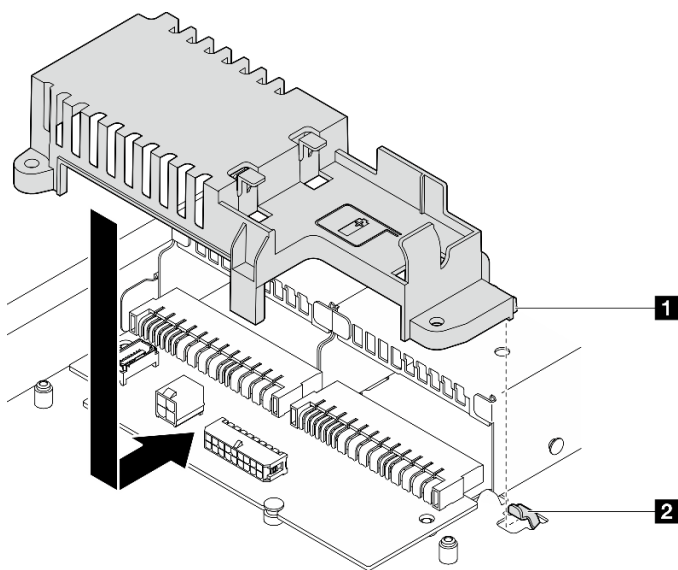
Figure 118. Power distribution board cover installation

1 Power distribution board cover pin	**2** Hook

Step 5. Fasten the two screws to secure the power distribution board cover.
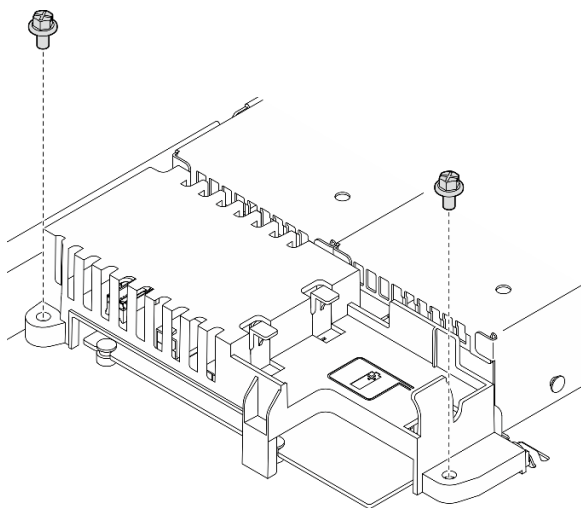
Figure 119. PDB cover screw installation

After you finish

1. Install the flash power module. See "Install the flash power module" on page 84.

2. Connect the flash power module cable to the RAID adapter. See "Flash power module cable routing" on page 179.

3. Install all the power supply units. See "Install a hot-swap power supply unit" on page 129.

4. Install the top cover. See "Install the top cover" on page 161.

5. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Processor replacement

Use the following procedures to remove and install a processor.

Attention: Before reusing a processor or heat sink, make sure you use Lenovo proven alcohol cleaning pad and thermal grease.

Important: The processor in your server can throttle in response to thermal conditions, temporarily lowering its speed to reduce heat output. In instances where a few processor cores are throttled for an extremely short time period (100 ms or less), the only indication might be an entry in the operating system event log with no corresponding entry in the system XCC event log. If this situation occurs, the event can be ignored and processor replacement is not required.

Remove the processor

Use this information to remove the processor. This procedure must be executed by a trained technician.

About this task

To avoid potential danger, read and follow the following safety statements.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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. Make preparations for this task.

    a. Remove the top cover. See "Remove the top cover" on page 159.

    b. Remove the air baffle. See "Remove the air baffle" on page 62.

    c. Remove the heat sink. See "Remove the heat sink" on page 91.

Step 2. Remove the processor.

a. ❶ Gently pull the handle away from the processor retainer.

b. ❷ Lift the handle.

c. ❸ Lift the processor retainer to the fully open position as illustrated.

d. ❹ Hold the processor by both sides and gently lift it away from the processor socket.

Notes:

1. Do not touch the gold contacts on the bottom of the processor.

2. Keep the processor socket clean from any object to prevent possible damages.
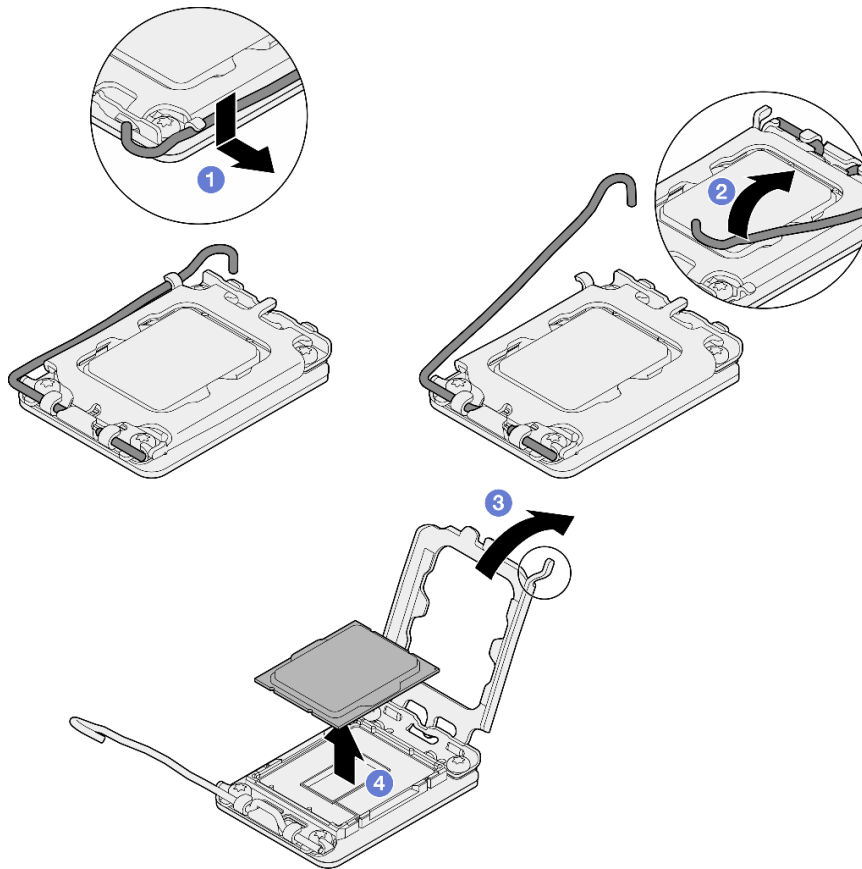
Figure 120. Opening the processor retainer

After you finish

1. Install a new processor. See "Install the processor" on page 138.

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.

Demo video

Watch the procedure on YouTube

Install the processor

Use this information to install the processor. This procedure must be executed by a trained technician.

About this task

To avoid potential danger, read and follow the following safety statements.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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.
- 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.
- Before reusing a processor that was removed from another system board, wipe the thermal grease from the processor with an alcohol cleaning pad, and dispose of the cleaning pad after all of the thermal grease is removed.

  Note: If you are applying new thermal grease on the top of the processor, make sure to do it after the alcohol has fully evaporated.

Procedure

Step 1. Hold the processor by both sides, and align the following:

1. Align **1** the small notches on the processor to **2** the tabs on the socket.
2. Align **3** the small triangle of the processor to **4** the beveled corner on the socket.

Then, gently lower the processor evenly into the socket.
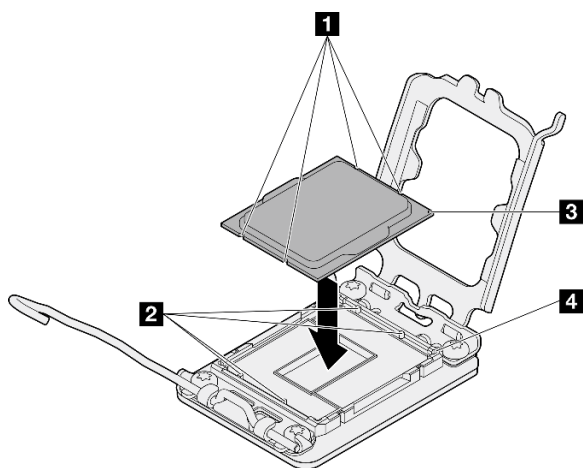
Figure 121. Installing the processor

Step 2. Close the processor retainer, and push the handle to the locked position.
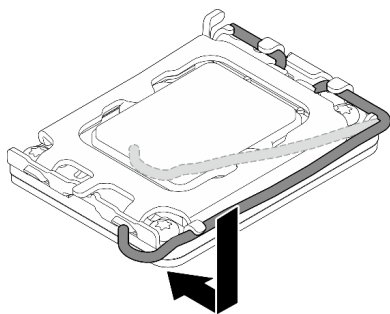
Figure 122. Closing the processor retainer

Step 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.
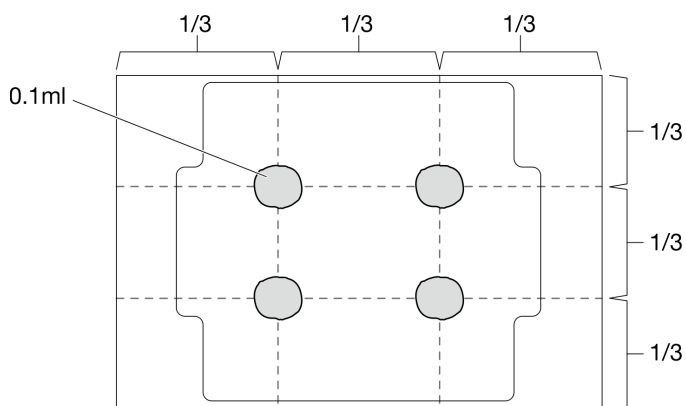
Figure 123. Proper shape of the thermal grease

After you finish

1. Reinstall the heat sink. See "Install the heat sink" on page 93.
2. Install the air baffle. See "Install the air baffle" on page 63.

3. Install the top cover. See "Install the top cover" on page 161.

4. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Rack latches replacement

Use the following information to remove and install the rack latches.

Remove the rack latches

Use this information to remove the rack latches.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Note: Both rack latches are removed and installed in a similar method.

Procedure

Step 1. Remove the security bezel if it is installed. See "Remove the security bezel" on page 144.

Step 2. Use a flat-blade screwdriver to remove the ID label plate on the right rack latch and place it in a safe place.
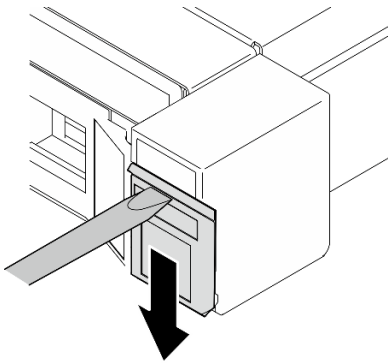
Figure 124. ID label removal

Step 3. Remove the two screws on the side of the server that secure the rack latch.
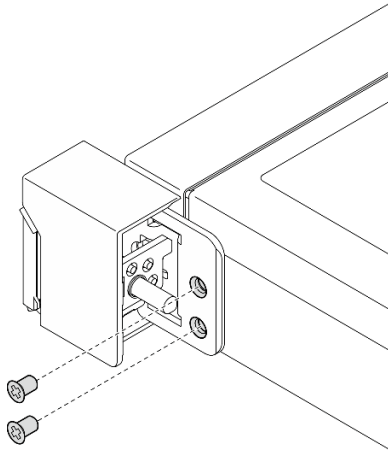
Figure 125. Rack latches removal

Step 4.   Slide the latch backwards and remove it from the server.
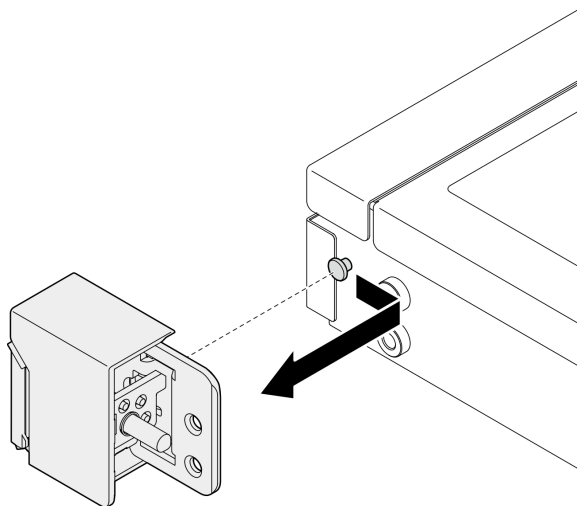
Figure 126. Rack latches removal

Step 5.   Remove the other rack latch if necessary.

After you finish

1. Install a replacement unit. See "Install the rack latches" on page 142.

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.
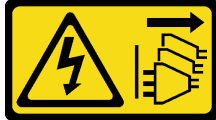
Demo video

Watch the procedure on YouTube

Install the rack latches

Use this information to install the rack latches.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Note: Both rack latches are removed and installed in a similar method.

Procedure

Step 1. Align the pin hole with the pin on the chassis; then, press the rack latch onto the chassis and slightly slide it forward.
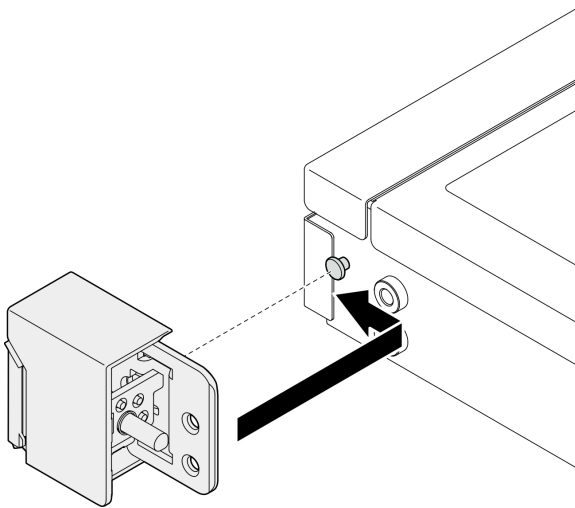
Figure 127. Rack latches installation

Step 2. Install the two screws to secure the rack latch on the side of the server.
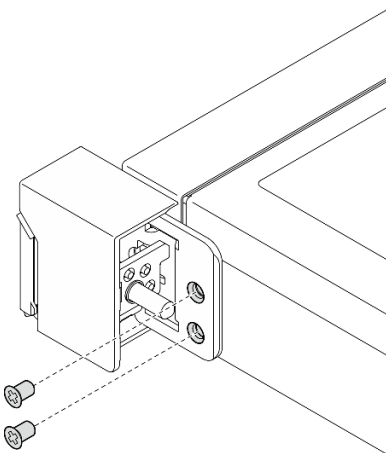
Figure 128. Rack latches installation

Step 3. If necessary, install the ID label to the right rack latch by inserting the label onto the right rack latch.
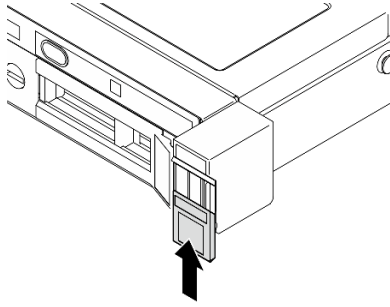
Figure 129. ID label installation

Step 4.   If necessary, install the other rack latch.

After you finish

1. Install the security bezel. See "Install the security bezel" on page 145.
2. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Security bezel replacement

Use this procedure to remove or install the security bezel.

Remove the security bezel

Use this information to remove the security bezel.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1.   Use the key to unlock the security bezel to the open position.
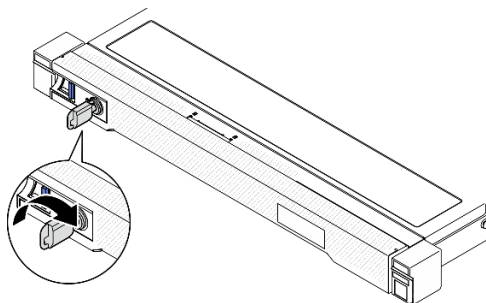
Figure 130. Unlocking the security bezel

Step 2. Press the release latch and rotate the security bezel outwards to remove it from the chassis.
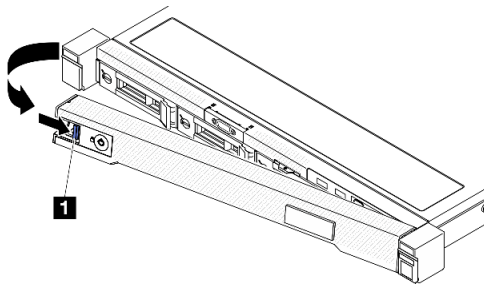
Figure 131. Security bezel removal

Table 9. Security bezel removal

1 Release latch

After you finish

1. Install a replacement unit. See "Install the security bezel" on page 145.
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.

Demo video

Watch the procedure on YouTube

Install the security bezel

Use this information to install the security bezel.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1. Carefully insert the tabs on the security bezel into the slots on the right rack handle. Press and hold the release latch; then, pivot the security bezel inwards until it clicks in place.
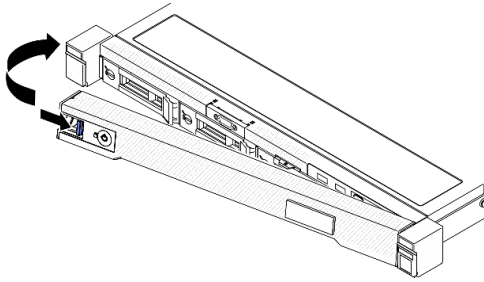
Figure 132. Security bezel installation

Step 2.   Use the key to lock the security bezel to the closed position.
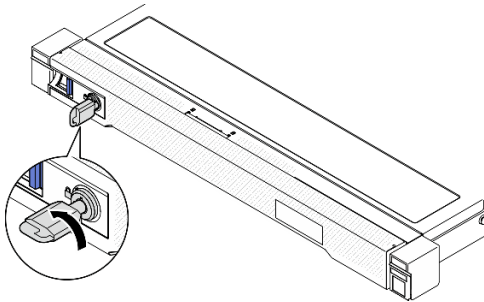
Figure 133. Locking the security bezel

After you finish

Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

System board replacement (trained technician only)

Use this procedure to remove or install the system board.

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:

1. 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.
2. Gently press down the socket cover legs to the processor socket assembly, pressing on the edges to avoid damage to the socket pins. You might hear a click on the socket cover is securely attached.
3. **Make sure** that the socket cover is securely attached to the processor socket assembly.

Remove the firmware and RoT security module

Follow instructions in this section to remove the ThinkSystem V3 Firmware and Root of Trust Security Module (firmware and RoT security module).

About this task

S002
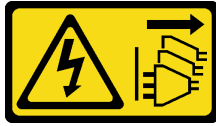
CAUTION:
The power-control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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.
- After replacing the Firmware and RoT Security Module, update the firmware to the specific version supported by the server. Make sure that you have the required firmware or a copy of the pre-existing firmware before you proceed.

Procedure

Step 1. Make preparation for this task.

   a.   Perform OneCLI commands to back up the UEFI settings. See https://pubs.lenovo.com/lxce-onecli/onecli_r_save_command.

   b.   Perform both OneCLI commands and XCC actions to back up the XCC settings. See https://pubs.lenovo.com/lxce-onecli/onecli_r_save_command and https://pubs.lenovo.com/xcc2/NN1ia_c_backupthexcc.html.

   c.   Remove the top cover. See "Remove the top cover" on page 159.

   d.   Remove the PCIe riser assembly. See "Remove the PCIe riser assembly" on page 112.

Step 2. Remove the Firmware and RoT Security Module.
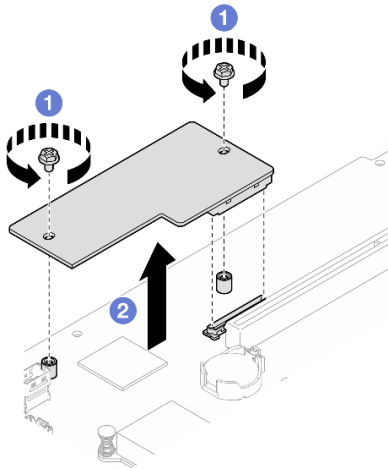
Figure 134. Firmware and RoT Security Module removal

    a.   ❶ Loosen the two screws on the Firmware and RoT Security Module.

    b.   ❷ Lift the Firmware and RoT Security Module out of the chassis.

After you finish

1. Install a replacement unit. See "Install the firmware and RoT security module" on page 148.

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.

Demo video

Watch the procedure on YouTube

Install the firmware and RoT security module

Follow instructions in this section to install the ThinkSystem V3 Firmware and Root of Trust Security Module (firmware and RoT security module).

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.

(Lenovo trained technician only) After replacing the Firmware and RoT Security Module, update the UEFI firmware to the specific version supported by the server. For detailed information on how to update the firmware, see https://glosse4lenovo.lenovo.com/wiki/glosse4lenovo/view/How%20To/System%20related/ How%20to%20do%20RoT%20Module%20FW%20update%20on%20ThinkSystem%20V3%20machines/ (Lenovo service technicians only).

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- 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.

- If the server is installed in a rack, remove the server from the rack.

- After replacing the Firmware and RoT Security Module, update the firmware to the specific version supported by the server. Make sure that you have the required firmware or a copy of the pre-existing firmware before you proceed.

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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.

- Go to "Update the firmware" on page 197 for more information on firmware updating tools.

Procedure

Step 1. Remove the PCIe riser assembly. See "Remove the PCIe riser assembly" on page 112.

Step 2. 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.

Step 3. Install the Firmware and RoT Security Module.
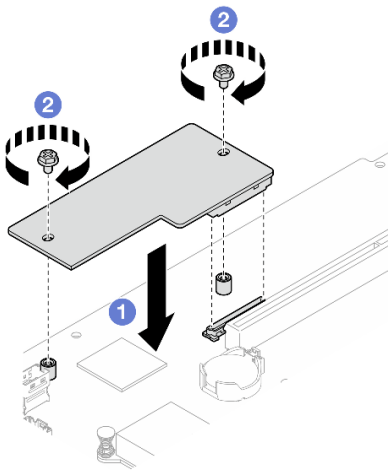
Figure 135. Firmware and RoT Security Module installation

    a.   ❶ Lower the Firmware and RoT Security Module onto the system board and ensure that the connector on the module is correctly inserted into the slot on the system board.

    b.   ❷ Tighten the two screws to secure the Firmware and RoT Security Module in place.

After you finish

1. Install the PCIe riser assembly. See "Install the PCIe riser assembly" on page 118.

2. Install the top cover. See "Install the top cover" on page 161.

3. Complete the parts replacement. See "Complete the parts replacement" on page 169.

4. Update the UEFI, XCC and LXPM firmware to the specific version supported by the server. See https://glosse4lenovo.lenovo.com/wiki/glosse4lenovo/view/How%20To/System%20related/How%20to%20do%20RoT%20Module%20FW%20update%20on%20ThinkSystem%20V3%20machines/ (Lenovo service technicians only).

5. Perform OneCLI commands to restore the UEFI settings. See https://pubs.lenovo.com/lxce-onecli/onecli_r_restore_command.

6. Perform both OneCLI commands and XCC actions to restore the XCC settings. See https://pubs.lenovo.com/lxce-onecli/onecli_r_restore_command and https://pubs.lenovo.com/xcc2/NN1ia_c_restorethexcc.html.

7. If there is a software (SW) key, for example, XCC FoD key, installed in the system, inject the key again to ensure that the key functions properly. See https://lenovopress.lenovo.com/redp4895.pdf.

   Note: If you need to replace the system board together with the Firmware and RoT Security Module, update the VPD before injecting the key. See Update the Vital Product Data (VPD).

8. Optionally, do the following if needed:

   • Hide TPM. See "Hide/observe TPM" on page 157.

   • Update the TPM firmware. See "Update the TPM firmware" on page 158.

   • Enable UEFI Secure Boot. See "Enable UEFI Secure Boot" on page 159.

Demo video

Watch the procedure on YouTube

Remove the system board

Use this information to remove the system board.

About this task

Attention:

• 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.

• Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

• If the server is installed in a rack, remove the server from the rack.

• 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.   Make preparations 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.

   d.   Remove the top cover. See "Remove the top cover" on page 159.

   e.   Remove the air baffle. See "Remove the air baffle" on page 62.

   f.   Disconnect the backplate or the backplane cables from the system board. See "Backplane and backplate cable routing" on page 184.

   g.   Disconnect the M.2 boot adapter cables from the system board. See "M.2 boot adapter cable routing" on page 182.

   h.   Remove the PCIe riser assembly. See "Remove the PCIe riser assembly" on page 112.

i. Disconnect the fan cables from the system board. See "Fan cable routing" on page 176.

j. Disconnect the front I/O module cables from the system board. See "Front I/O module cable routing" on page 174.

k. Remove the memory modules. See "Remove a memory module" on page 108.

l. Remove the heat sink. See "Remove the heat sink" on page 91.

m. Remove the processor. See "Remove the processor" on page 137.

n. Remove the firmware and RoT security module. See "Remove the firmware and RoT security module" on page 146

Step 2. Remove all eight screws that secure the system board to the chassis.
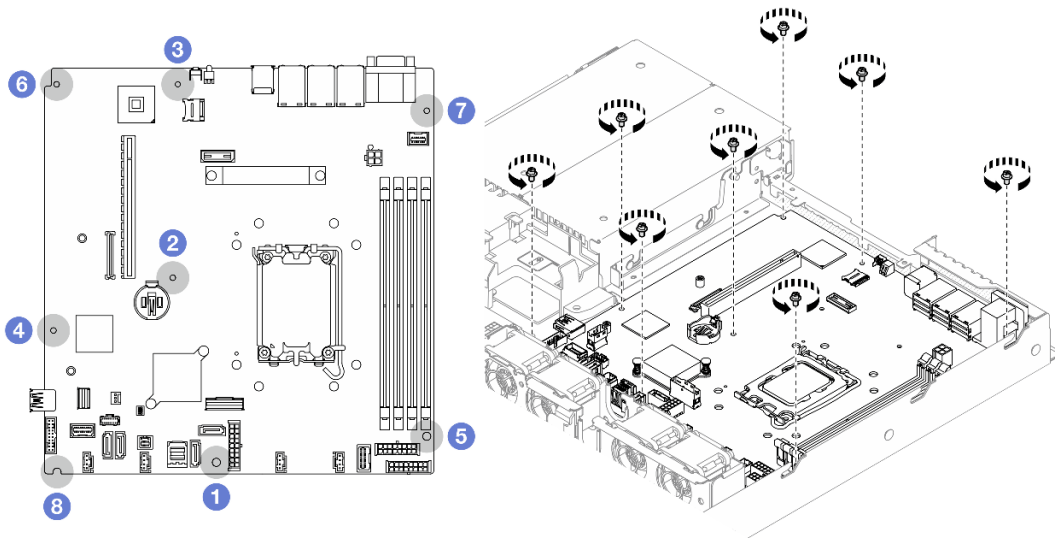
Figure 136. System-board screws location

Notes:

- The order and locations of screws removal:

❶ **between the SATA connectors and the system power connector**	❺ **the lower right side**
❷ **near the CMOS battery**	❻ **the upper left side**
❸ **near NMI button**	❼ **the upper right side**
❹ **near front USB 3.0 / 2.0 header**	❽ **the lower left side**

- For reference, the torque which is required for the screws to be fully tightened or removed is 5.0 +/- 0.5 lb-in.

Step 3. Slightly lift up the front side of the system board; then, slide the system board towards the front of the server and lift it out of the server.
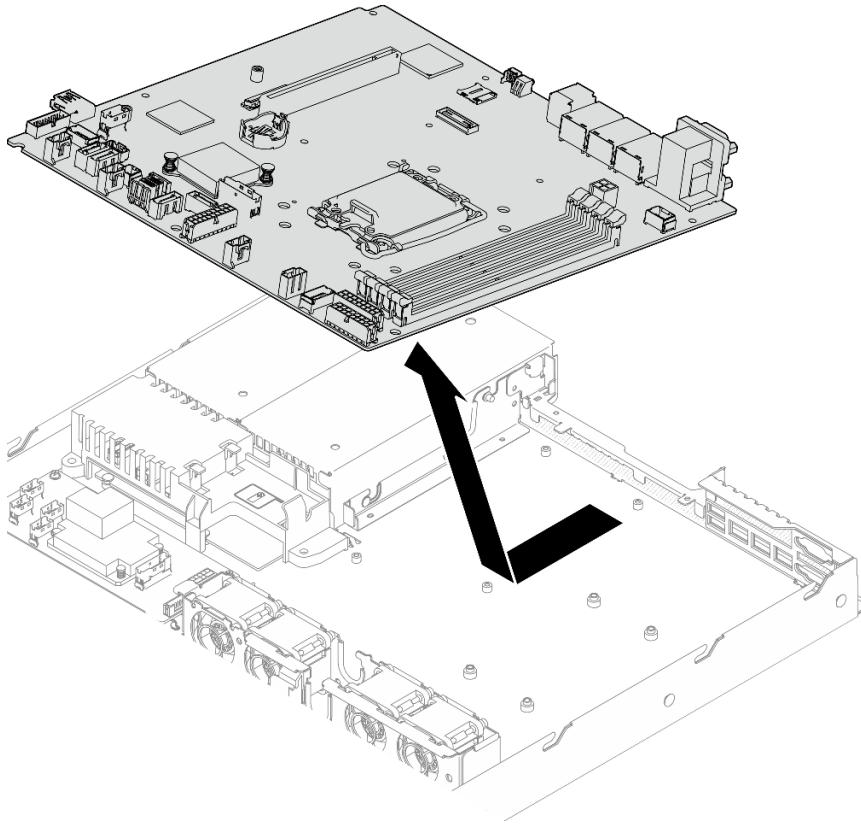
Figure 137. System board removal

After you finish

1. Install a replacement unit. See "Install the system board" on page 152.

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.

   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. Insert the new system board into the chassis. See "Install the system board" on page 152.

   b. 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.

   c. 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.

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

Demo video

Watch the procedure on YouTube

Install the system board

Use this information to install the system board.

About this task

Attention:

- 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.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 49.
- If the server is installed in a rack, remove the server from the rack.
- 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/sr250v3/7dcl/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 197 for more information on firmware updating tools.

Procedure

Step 1.   Align the system board with serial and VGA ports on the rear side of the chassis; then, carefully lower the system board and place the system board flat into the chassis. Make sure the screw slots on the system board match the corresponding slots on the chassis.

   Note: Move the fan cables aside and make sure these cables will not interfere the installation of the system board.
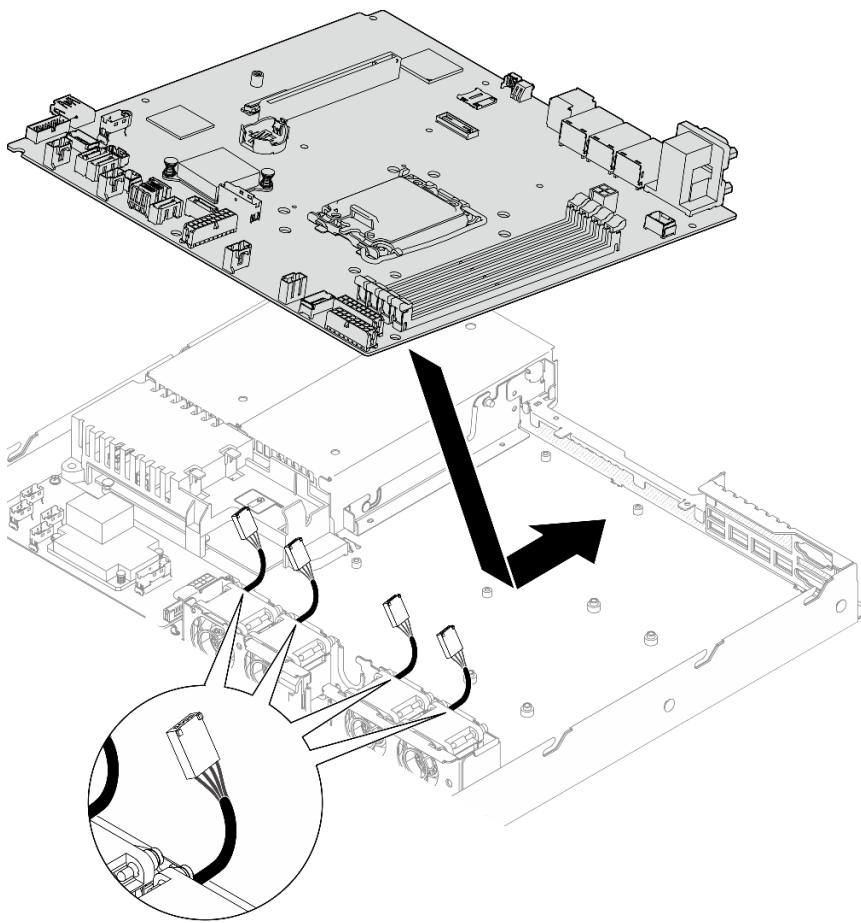
Figure 138. System board installation

Step 2. Install all eight screws to secure the system board to the chassis according to the installation orders as shown.
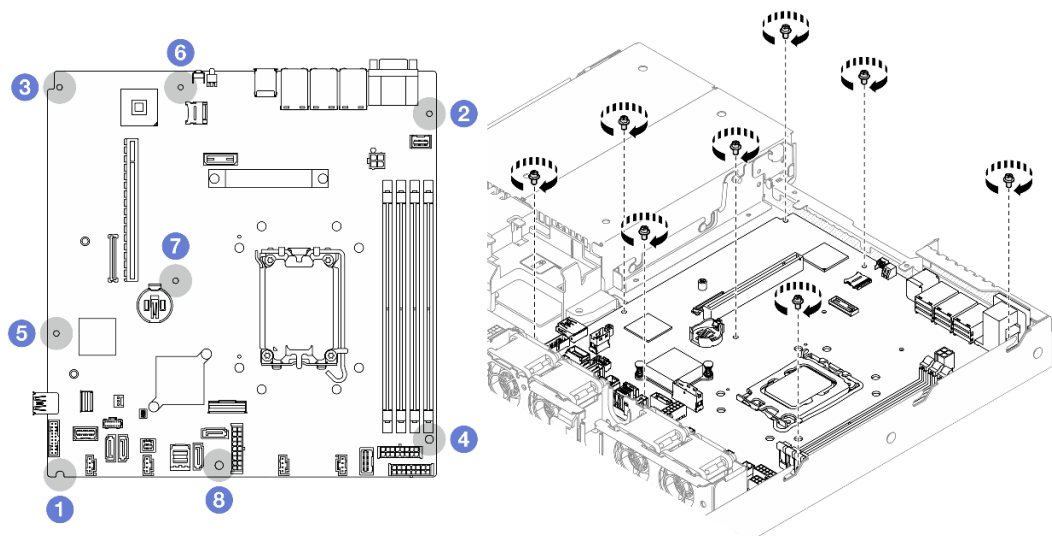
Figure 139. System-board screws location

Notes:

- The order and locations of screws installation :

❶ the lower left side	❺ near front USB 3.0 / 2.0 header
❷ the upper right side	❻ near NMI button
❸ the upper left side	❼ near the CMOS battery
❹ the lower right side	❽ between the SATA connectors and the system power connector

- For reference, the torque which is required for the screws to be fully tightened or removed is 5.0 +/- 0.5 lb-in.

After you finish

1. Install the firmware and RoT security module. See "Install the firmware and RoT security module" on page 148

2. Install the processor. See "Install the processor" on page 138.

3. Install the heat sink. See "Install the heat sink" on page 93.

4. Install the memory modules. See "Install a memory module" on page 110.

5. Connect the front I/O module cables to the system board. See "Front I/O module cable routing" on page 174.

6. Connect the fan cables to the system board by pressing it down until it clicks. See "Fan cable routing" on page 176.

7. Install the PCIe riser assembly. See "Install the PCIe riser assembly" on page 118.

8. Connect the M.2 boot adapter cables to the system board. See "M.2 boot adapter cable routing" on page 182.

9. Connect the backplate or the backplane cables to the system board. See "Backplane and backplate cable routing" on page 184.

10. Install the air baffle. See "Install the air baffle" on page 63.

11. Install the top cover. See "Install the top cover" on page 161.

12. Complete the parts replacement. See "Complete the parts replacement" on page 169.

13. Reconnect the power cords and any cables that you removed.

14. Update the vital product data (VPD). See "Update the Vital Product Data (VPD)" on page 155.

    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 39.

15. If hiding TPM or updating TPM firmware is needed, see "Hide/observe TPM" on page 157 or "Update the TPM firmware" on page 158.

16. Optionally, enable UEFI Secure Boot. See "Enable UEFI Secure Boot" on page 159.

Demo video

Watch the procedure on YouTube

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.

	The server asset tag number.
<asset_tag>	Type `aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa`, where `aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa` 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).

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>
  ```

Top cover replacement

Use the following information to remove and install the top cover.

Remove the top cover

Use this information to remove the top cover.

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.

S014

CAUTION:
Hazardous voltage, current, and energy levels might be present. Only a qualified service technician is authorized to remove the covers where the label is attached.

S033

CAUTION:
Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in spattered metal, burns, or both.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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.   Remove the top cover

Figure 140. Top cover removal

a. ❶ Press the release button and the push point at the same time; then, slide the cover toward the rear of the server.

b. ❷ Lift the top cover away from the server.

After you finish

1. Install a replacement unit. See .

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.

Demo video

[Watch the procedure on YouTube](#)

Install the top cover

Use this information to install the top cover.

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.

S014

CAUTION:
Hazardous voltage, current, and energy levels might be present. Only a qualified service technician is authorized to remove the covers where the label is attached.

S033

CAUTION:
Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in spattered metal, burns, or both.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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 171.

Procedure

Step 1. Align the posts inside the top cover with the slots on the chassis.

Step 2. Hold the front of the server and slide the top cover towards the front of the server until it clicks into place.
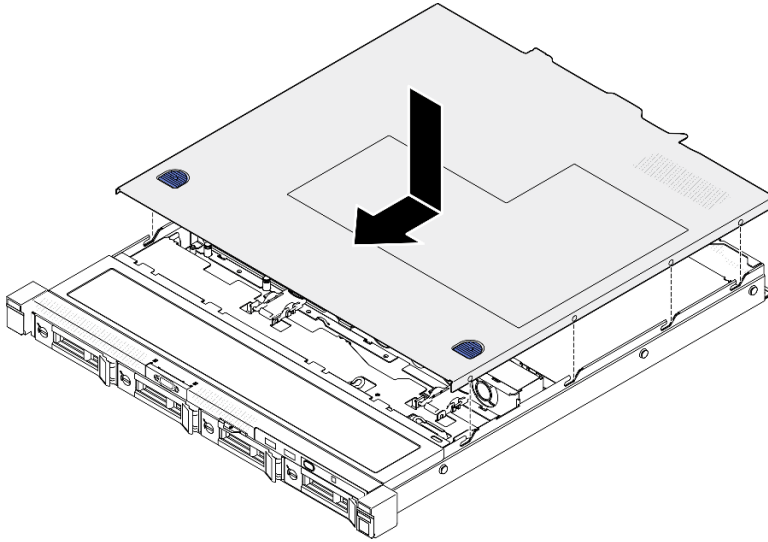
Figure 141. Top cover installation

After you finish

Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

VGA cable replacement

Use the following information to remove and install the VGA cable.

Remove the VGA cable (2.5-inch drive model)

Use this information to remove the VGA cable for the 2.5-inch drive model.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.

- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1. Make preparations for this task.

    a. Remove the top cover. See "Remove the top cover" on page 159.

    b. Disconnect the VGA cable from the system board. See "Front I/O module cable routing" on page 174.

        Attention: To avoid damaging the system board, make sure to follow the instructions in Chapter 6 "Internal cable routing" on page 171 when disconnecting cables from the system board.

Step 2. Remove the VGA cable.

Figure 142. VGA cable removal

    a. ❶ Remove the two screws that secure the VGA connector.

    b. ❷ Push the VGA connector out of the front I/O module.

After you finish

1. Install a replacement unit. See "Install the VGA cable (2.5-inch drive model)" 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.

Demo video

Watch the procedure on YouTube

Install the VGA cable (2.5-inch drive model)

Use this information to install the VGA cable for the 2.5-inch drive model.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1.   Install the VGA cable.

Figure 143. VGA cable installation

a.   ❶ Insert the VGA cable into the front I/O module.

b.   ❷ Install and fasten two screws to secure the VGA cable.

After you finish

1. Connect the VGA cable to the system board. See "Front I/O module cable routing" on page 174.
2. Install the top cover. See "Install the top cover" on page 161.
3. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

Remove the VGA cable (3.5-inch drive model)

Use this information to remove the VGA cable for the 3.5-inch drive model.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1. Make preparations for this task.

    a. Remove the top cover. See "Remove the top cover" on page 159.

    b. Disconnect the VGA cable from the system board. See "Front I/O module cable routing" on page 174.

       Attention: To avoid damaging the system board, make sure to follow the instructions in Chapter 6 "Internal cable routing" on page 171 when disconnecting cables from the system board.

Step 2. Remove the VGA cover.

Figure 144. VGA cover removal

a. ① Use a tool to press both clips.

b. ② Pull the cover of the VGA cable out.

Step 3.   Remove the VGA cable.
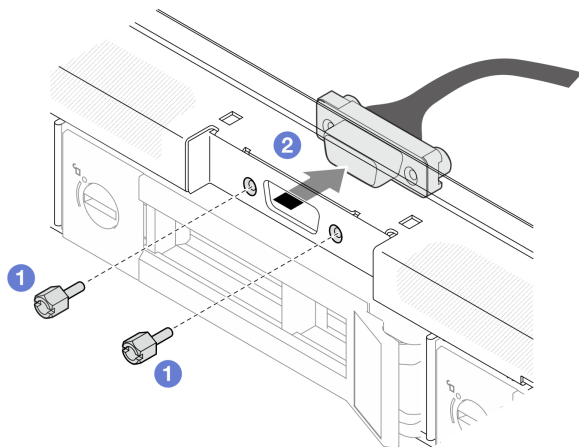
Figure 145. VGA cable removal

a. ① Remove the screws that secure the VGA cable.

b. ② Pull out the VGA cable out of the server.

After you finish

1. Install a replacement unit. See "Install the VGA cable (3.5-inch drive model)" on page 168.

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.

Demo video

Install the VGA cable (3.5-inch drive model)

Use this information to install the VGA cable for the 3.5-inch drive model.

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.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.

Procedure

Step 1.   Install the VGA cable.
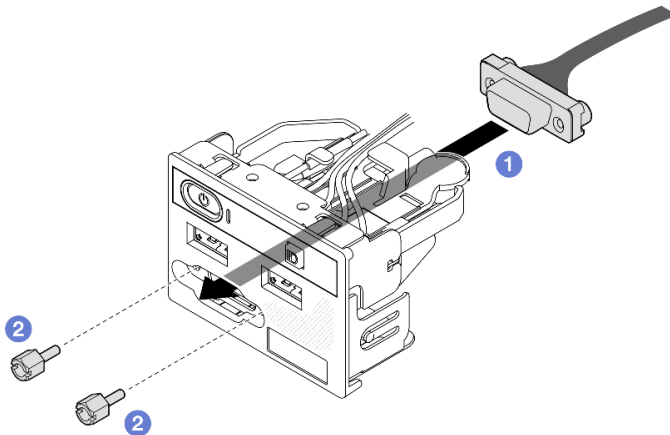

Figure 146. VGA cable installation

a.   ❶ Insert the VGA cable into the slot on the front chassis.

b.   ❷ Install the screws to secure the VGA cable.

Step 2.   Push the VGA cable cover into the slot until the clips are locked.
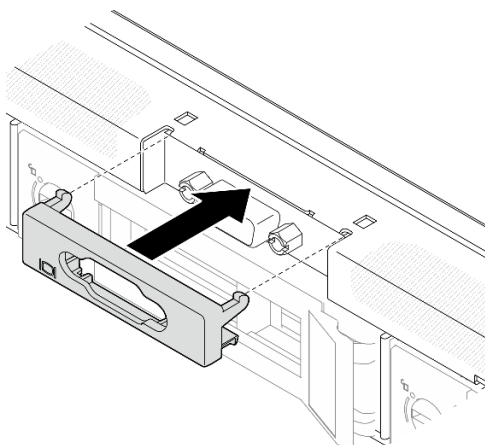
Figure 147. VGA cover installation

After you finish

1. Connect the VGA cable to the system board. See "Front I/O module cable routing" on page 174.

2. Install the top cover. See "Install the top cover" on page 161.

3. Complete the parts replacement. See "Complete the parts replacement" on page 169.

Demo video

Watch the procedure on YouTube

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. Reinstall the air baffle. See "Install the air baffle" on page 63.

   Attention: For proper cooling and airflow, reinstall the air baffle before you turn on the server. Operating the server with the air baffle removed might damage server components.

4. Reinstall the top cover. See "Install the top cover" on page 161.

5. If the server was installed in a rack, reinstall the server into the rack. Follow the instructions in *Rail Installation Guide* that come with the rail kit.

6. Reconnect the power cords and any cables that you removed.

7. Power on the server and any peripheral devices. See "Power on the server" on page 48.

8. 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 197.

   - 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 or a RAID adapter. See https://pubs.lenovo.com/lxpm-overview/ for the LXPM documentation compatible with your server.

Chapter 6. Internal cable routing

Some of the components in the server have internal cables and cable connectors.

To connect cables, observe the following guidelines:

- Turn off the server before you connect or disconnect any internal cables.
- See the documentation that comes with any external devices for additional cabling instructions. It might be easier for you to route cables before you connect the devices to the server.
- Cable identifiers of some cables are printed on the cables that come with the server and optional devices. Use these identifiers to connect the cables to the correct connectors.
- Ensure that the cable is not pinched and does not cover any connectors or obstruct any components on the system board.
- Ensure that the relevant cables pass through the cable clips and guides.

Attention: Disengage all latches, release tabs, or locks on cable connectors when you disconnect cables from the system board. Failing to release them before removing the cables will damage the cable sockets on the system board, which are fragile. 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.
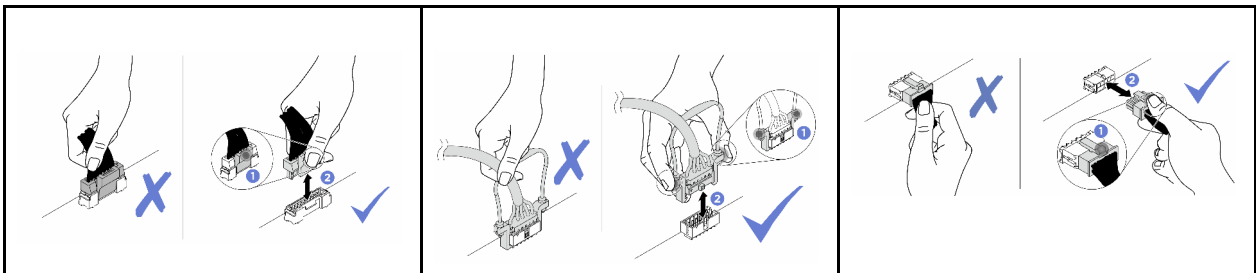
Identifying connectors

See this section to locate and identify the connectors on the electric boards.

CFF RAID adapter connectors

See this section to locate the connectors in the CFF RAID adapter.
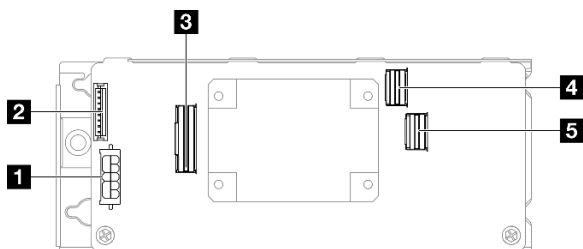
Figure 148. CFF 8i RAID adapter connectors

Table 10. CFF 8i RAID adapter connectors

1 Power connector	**4** SAS/SATA C0 connector
2 Flash power module connector	**5** SAS/SATA C1 connector
3 Signal connector	
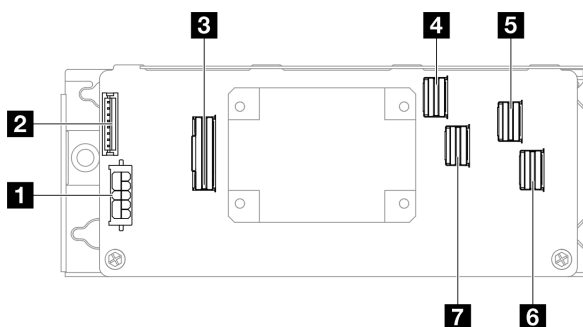
Figure 149. CFF 16i RAID adapter connectors

Table 11. CFF 16i RAID adapter connectors

1 Power connector	**5** SAS/SATA C2 connector
2 Flash power module connector	**6** SAS/SATA C3 connector
3 Signal connector	**7** SAS/SATA C1 connector
4 SAS/SATA C0 connector	

Drive backplane connectors

See this section to locate the connectors in the drive backplanes.
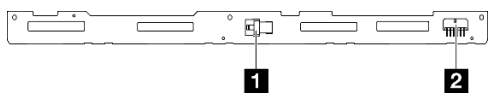
Figure 150. Four 3.5-inch hot-swap drive backplane connectors

Table 12. Four 3.5-inch hot-swap drive backplane connectors

1 SATA signal connector	**2** Power connector
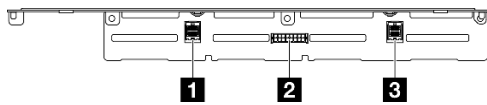
Figure 151. Eight 2.5-inch hot-swap drive backplane connectors

Table 13. Eight 2.5-inch hot-swap drive backplane connectors

1 SATA signal connector 2	**3** SATA signal connector 1
2 Power connector	
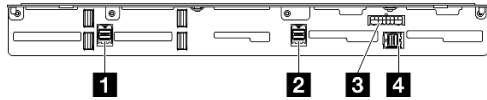
Figure 152. Ten 2.5-inch hot-swap drive backplane connectors

Table 14. Ten 2.5-inch hot-swap drive backplane connectors

1 SATA signal connector 3	**3** Power connector
2 SATA signal connector 2	**4** SATA signal connector 1

Power distribution board connectors

See this section to locate the connectors in the power distribution board .
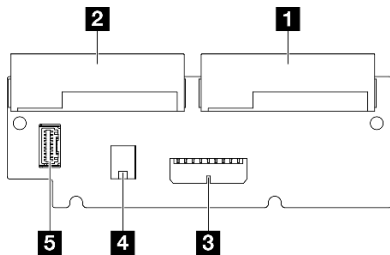
Figure 153. Power distribution board connectors

Table 15. Power distribution board connectors

1 PSU 1 connector	**4** Processor power connector
2 PSU 2 connector	**5** Power distribution board signal connector
3 System power connector	

System-board connectors for cable routing

The following illustrations show the internal connectors on the system board that are used for internal cable routing.
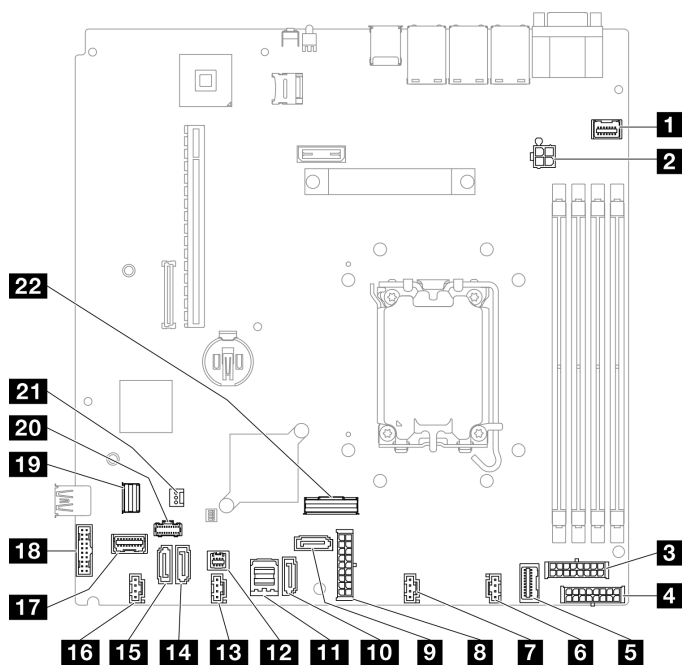
Figure 154. System-board connectors

Table 16. System-board connectors

1 Front VGA connector	**12** SGPIO1 connector
2 Processor power connector	**13** Fan 3 connector
3 Backplane power connector	**14** SATA connector 5
4 CFF RAID power connector	**15** SATA connector 4
5 Power distribution board signal connector	**16** Fan 4 connector
6 Fan 1 connector	**17** Front I/O module connector
7 Fan 2 connector	**18** Front USB 3.0/2.0 header (DCI support)
8 System power connector	**19** M.2 signal connector
9 SATA connector 6	**20** M.2 power connector
10 SATA connector 7	**21** Intrusion switch connector
11 SATA connector 0-3	**22** SlimSAS x8 connector

Front I/O module cable routing

Use the section to understand the cable routing for the front I/O module.

Notes:

- Connections between connectors; **1**↔**1**, **2**↔**2**, **3**↔**3**, ... **n**↔**n**

- When routing the cables, ensure that all cables are routed appropriately through the cable guides and cable clips.
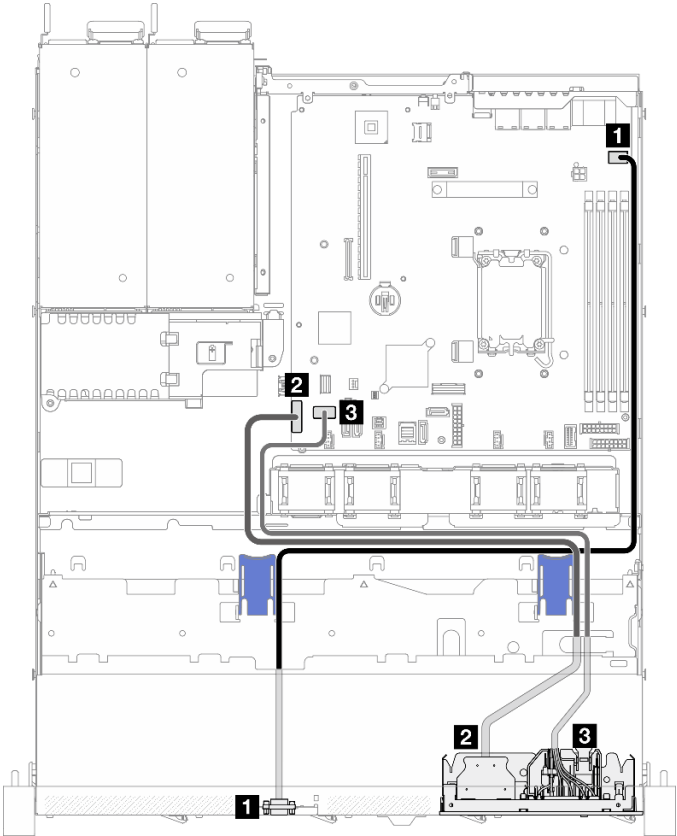
3.5-inch model

Figure 155. Front I/O module cable routing for 3.5-inch model

From	To
1 Front VGA	System board: Front VGA connector
2 Front USB 3.0/2.0	System board: Front USB 3.0/2.0 header (DCI support)
3 Front I/O module	System board: Front I/O module connector

2.5-inch model
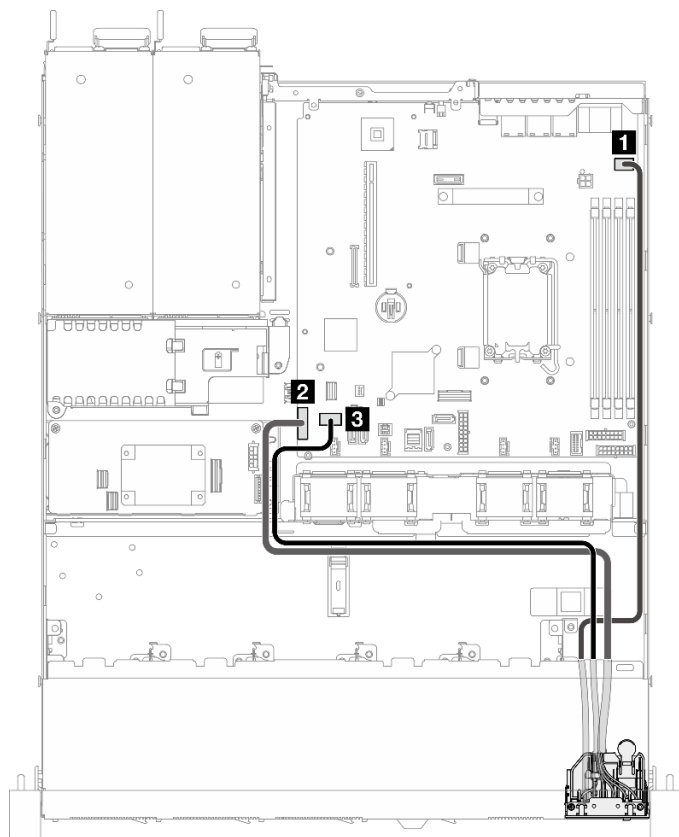
Figure 156. Front I/O module cable routing for 2.5-inch model

From	To
1 Front VGA	System board: Front VGA connector
2 Front USB 3.0/2.0	System board: Front USB 3.0/2.0 header (DCI support)
3 Front I/O module	System board: Front I/O module connector

Fan cable routing

Use the section to understand the internal routing and connectors for fan cables.

Notes:

- Connections between connectors; **1**↔**1**, **2**↔**2**, **3**↔**3**, ... **n**↔**n**
- When routing the cables, ensure that all cables are routed appropriately through the cable guides and cable clips.

Figure 157. Fan cable routing

1 Fan 1	**3** Fan 3
2 Fan 2	**4** Fan 4

Fixed power supply unit cable routing

Use the section to understand the internal routing and connectors for the fixed power supply unit.

Notes:

- Connections between connectors; **1**↔**1**, **2**↔**2**, **3**↔**3**, … **n**↔**n**
- When routing the cables, ensure that all cables are routed appropriately through the cable guides and cable clips.

Figure 158. Fixed power supply unit cable routing

From	To
1 PSU: System power cable	System board: System power
2 PSU: Processor power cable	System board: Processor power

Power distribution board cable routing

Use the section to understand the internal routing and connectors for the power distribution board.

Notes:

- Connections between connectors; **1**↔**1**, **2**↔**2**, **3**↔**3**, ... **n**↔**n**
- When routing the cables, ensure that all cables are routed appropriately through the cable guides and cable clips.
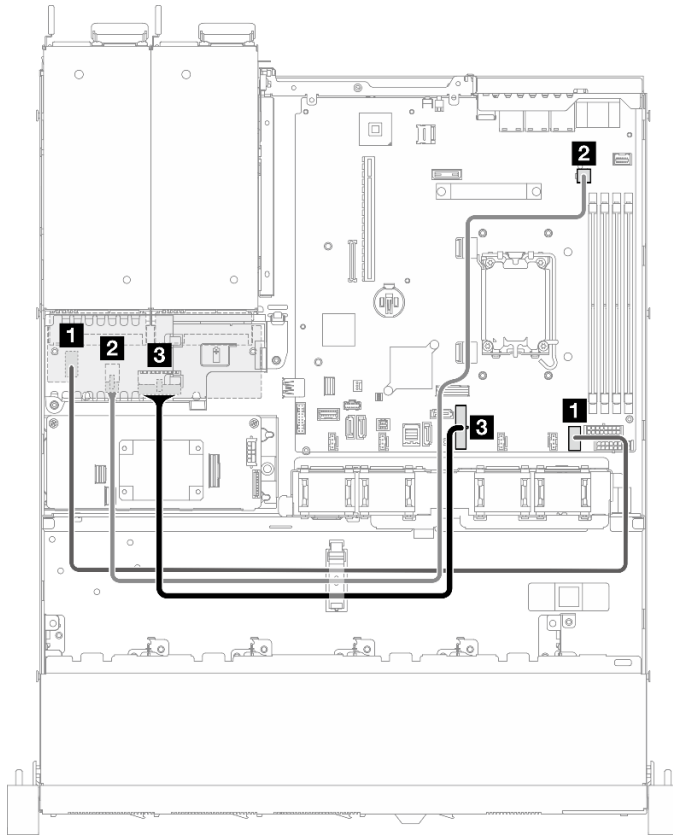
Figure 159. Power distribution board cable routing

From	To	Cable
1 PDB: Power distribution board signal	System board: Power distribution board signal	PDB sideband (550 mm)
2 PDB: Processor power	System board: Processor power	Power 2x2 pin to power 2x2 pin (650 mm)
3 PDB: System power	System board: System power	Power 2x9 pin to power 2x9 pin (440 mm)

Flash power module cable routing

Use the section to understand the internal routing and connectors for the flash power module.

Notes:

- Connections between connectors; **1**↔**1**, **2**↔**2**, **3**↔**3**, ... **n**↔**n**

- When routing the cables, ensure that all cables are routed appropriately through the cable guides and cable clips.
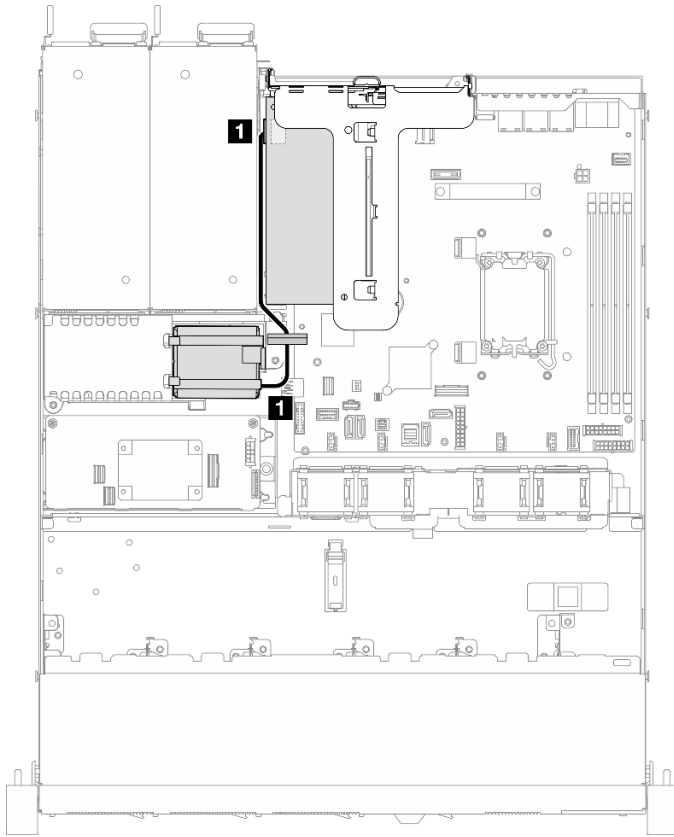
Figure 160. Flash power module cable routing

From	To
1 Flash power module	RAID adapter

Intrusion switch cable routing

Use the section to understand the cable routing for the intrusion switch.

Notes:

- Connections between connectors; **1**↔**1**, **2**↔**2**, **3**↔**3**, ... **n**↔**n**
- When routing the cables, ensure that all cables are routed appropriately through the cable guides and cable clips.
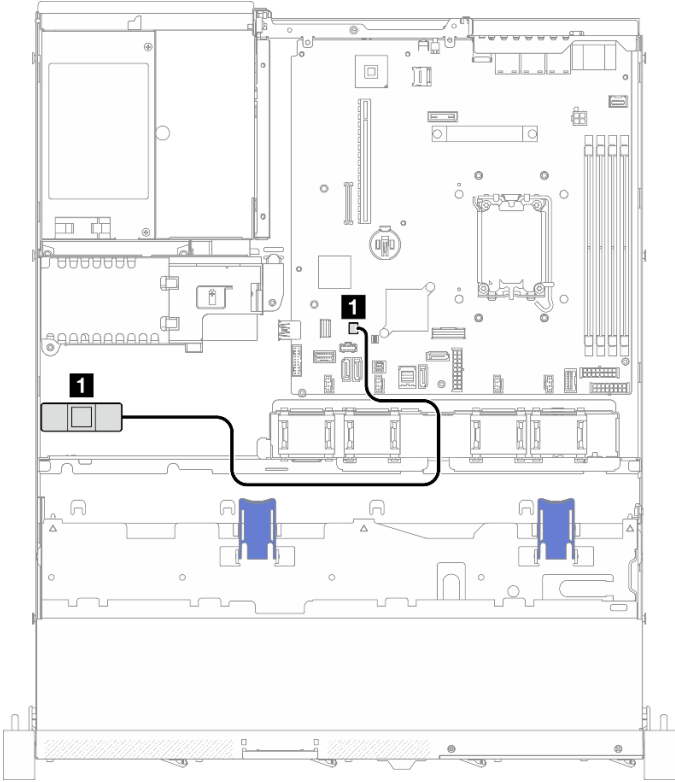
3.5-inch model

Figure 161. Intrusion switch cable routing for 3.5-inch model

From	To
1 Intrusion switch	System board: Intrusion switch connector

2.5-inch model
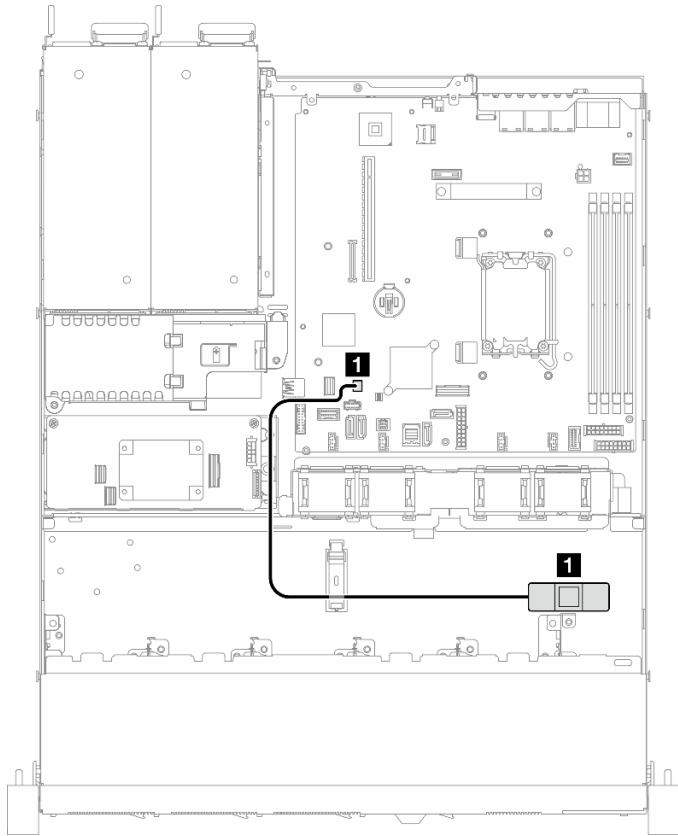
Figure 162. Intrusion switch cable routing for 2.5-inch model

From	To
1 Intrusion switch	System board: Intrusion switch connector

M.2 boot adapter cable routing

Use the section to understand the internal routing and connectors for the M.2 boot adapter.

Notes:

- Connections between connectors; **1**↔**1**, **2**↔**2**, **3**↔**3**, ... **n**↔**n**

- When routing the cables, ensure that all cables are routed appropriately through the cable guides and cable clips.

- When a ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit is installed, eight SATA/SAS drives configured with software RAID is not supported.

ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit
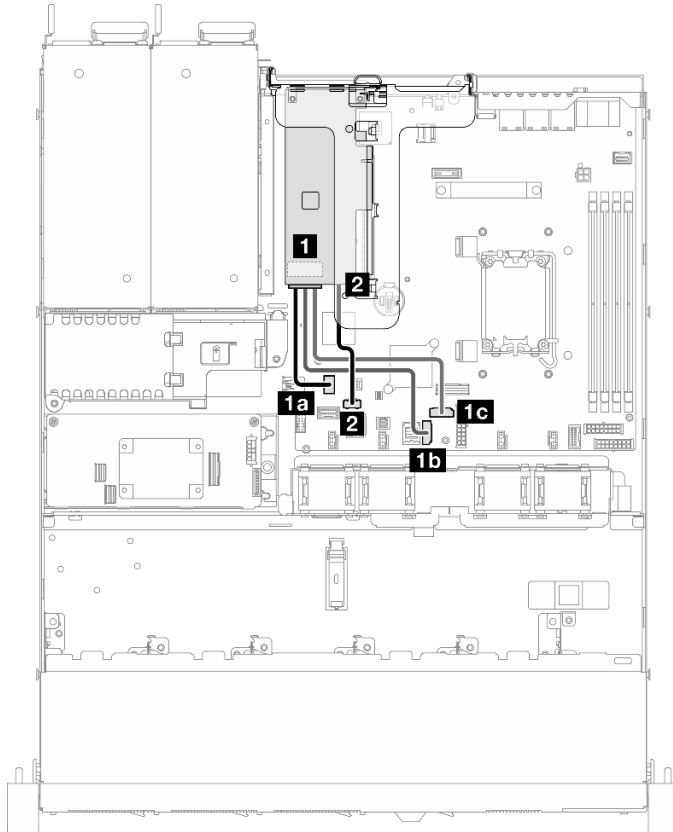
Figure 163. ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit cable routing

From	To
1 M.2 signal on the M.2 boot adapter	**1a** System board: M.2 signal
	1b System board: SATA 7
	1c System board: SATA 6
2 M.2 power on the M.2 boot adapter	System board: M.2 power

ThinkSystem M.2 RAID B540i-2i SATA/NVMe Adapter
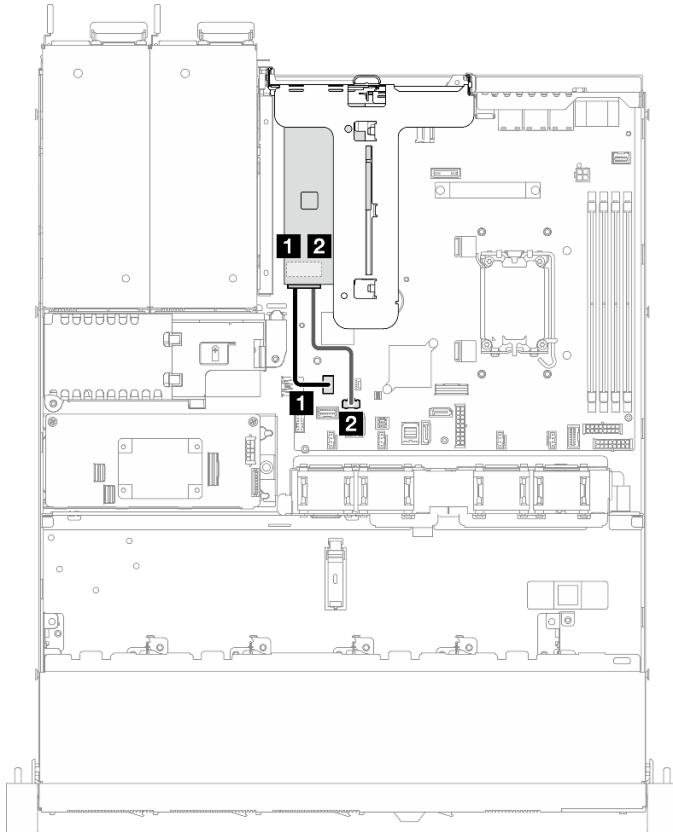
Figure 164. ThinkSystem M.2 RAID B540i-2i SATA/NVMe Adapter cable routing

From	To
1 M.2 signal on the M.2 boot adapter	System board: M.2 signal
2 M.2 power on the M.2 boot adapter	System board: M.2 power

Backplane and backplate cable routing

Use the information in this section to route the cables for the backplates and backplanes.

Four 3.5-inch simple-swap drive cable routing

Use this section to understand how to route cables for four 3.5-inch simple-swap drive model.

Notes:

- Connections between connectors; **1**↔**1**, **2**↔**2**, **3**↔**3**, ... **n**↔**n**
- When routing the cables, ensure that all cables are routed appropriately through the cable guides and cable clips.

Four SATA drives (Software RAID)
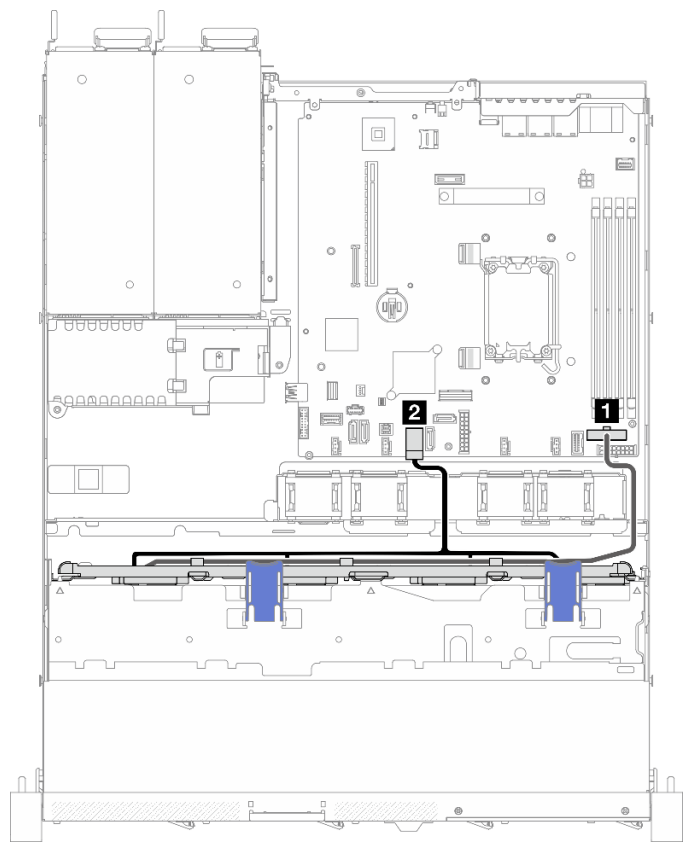
Figure 165. Four SATA drives (Software RAID)

From	To
1 Backplate: Power cable	System board: Backplane power
2 Backplate: SATA cable	System board: SATA 0-3

Two SATA drives and two NVMe drive (Software RAID)
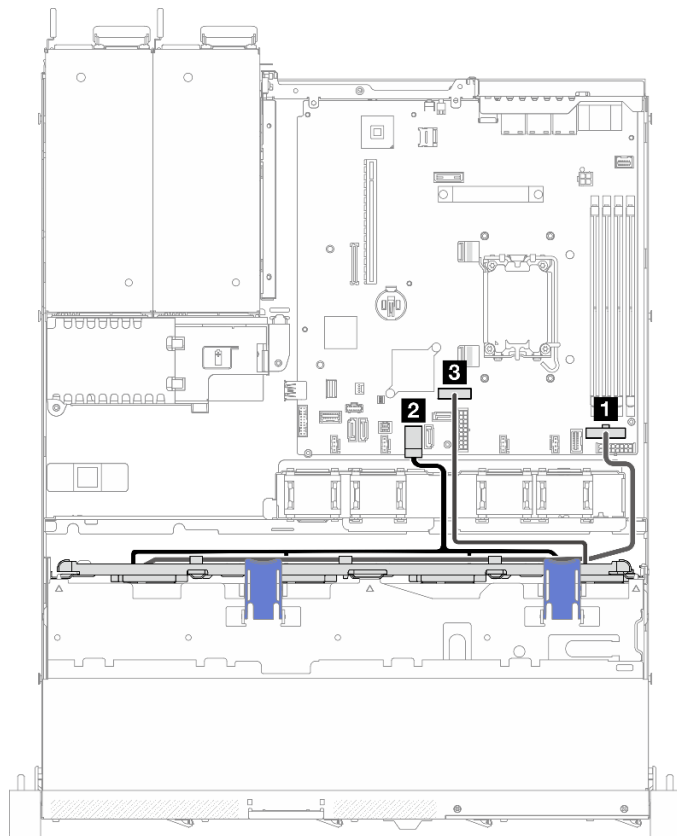
Figure 166. Two SATA drives and two NVMe drive (Software RAID)

From	To
1 Backplate: Power cable	System board: Backplane power
2 Backplate: SATA cable	System board: SATA 0-3
3 Backplate: NVMe cable	System board: Slimline x8

Four SATA drives (Hardware RAID/HBA)
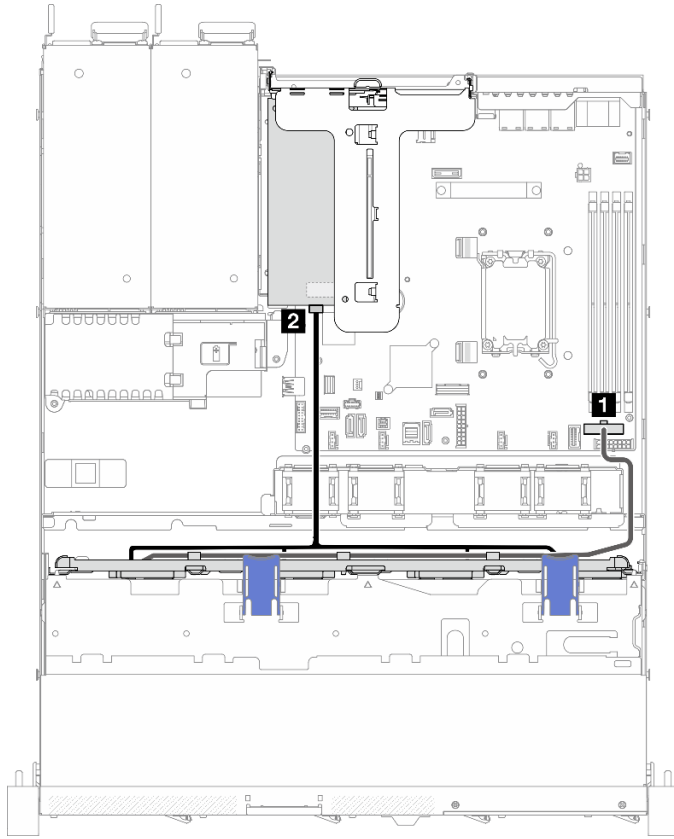
Figure 167. Four SATA drives (Hardware RAID/HBA)

From	To
1 Backplate: Power cable	System board: Backplane power
2 Backplate: SATA cable	• 8i Gen 4: C0 • 8i Gen 3: C0

Four 3.5-inch hot-swap drive cable routing

Use this section to understand how to route cables for four 3.5-inch hot-swap drive model.

Notes:

- Connections between connectors; **1**↔**1**, **2**↔**2**, **3**↔**3**, … **n**↔**n**

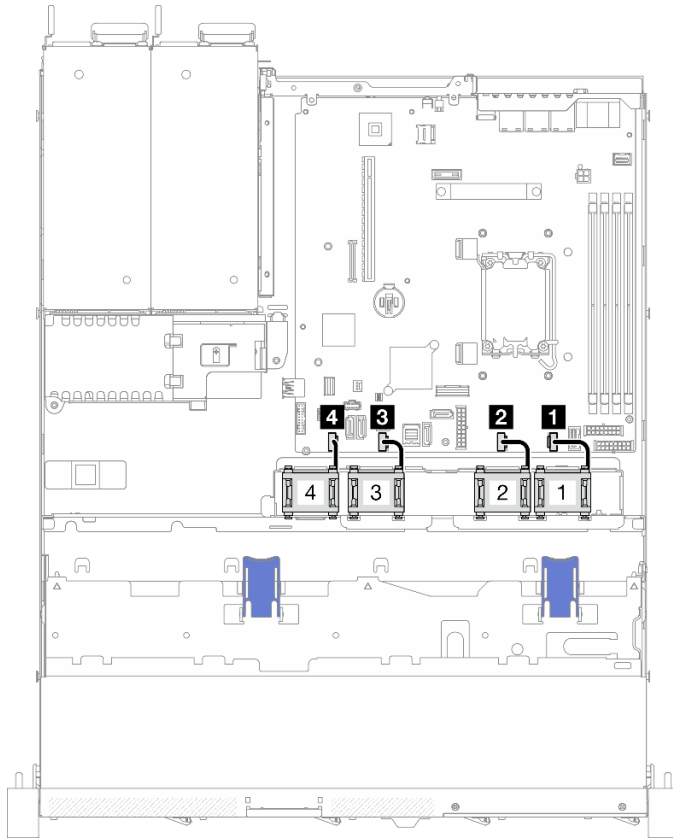- When routing the cables, ensure that all cables are routed appropriately through the cable guides and cable clips.

Four SATA/SAS drives (Software RAID)
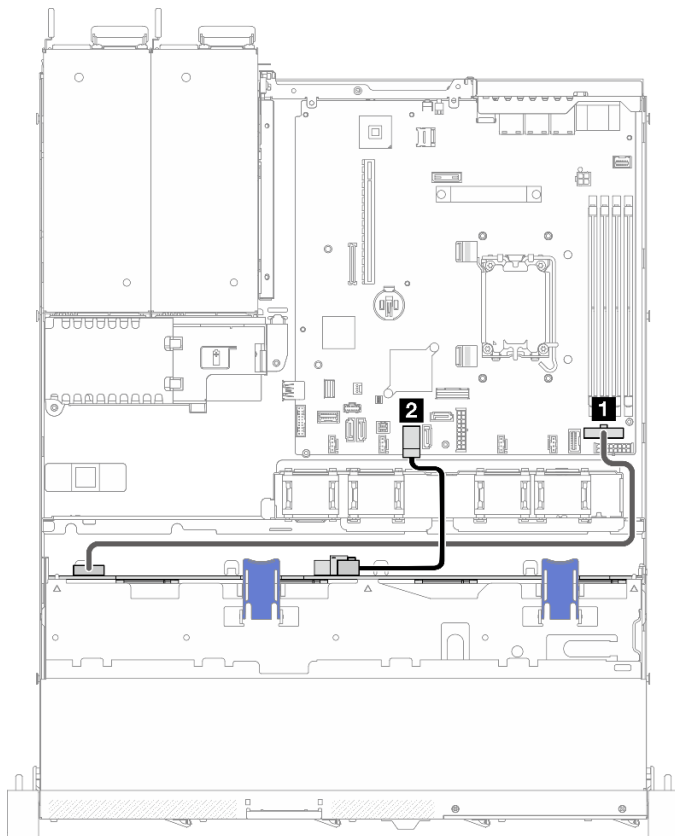
Figure 168. Four SATA/SAS drives (Software RAID)

From	To	Cable
1 Backplane: Power	System board: Backplane power	Power 2x8 pin to power 2x6 pin (550 mm)
2 Backplane: SATA signal	System board: SATA 0-3	Mini-SAS HD x4 to Mini-SAS HD x4 (310 mm)

Four SATA/SAS drives (Hardware RAID/HBA)

From	To	Cable
1 Backplane: Power	System board: Backplane power	Power 2x8 pin to power 2x6 pin (550 mm)
2 Backplane: SATA signal	8i Gen 4: C0 8i Gen 3: C0	8i Gen 4: SlimSAS x8 to Mini-SAS HD x4 (450 mm) 8i Gen 3: Mini-SAS HD x4 to Mini-SAS HD x4 (450 mm)

Figure 169. Four SATA/SAS drives (Hardware RAID/HBA)

Eight 2.5-inch hot-swap drive cable routing

Use this section to understand how to route cables for eight 2.5-inch hot-swap drive model.

Notes:

- Connections between connectors; **1**↔**1**, **2**↔**2**, **3**↔**3**, … **n**↔**n**
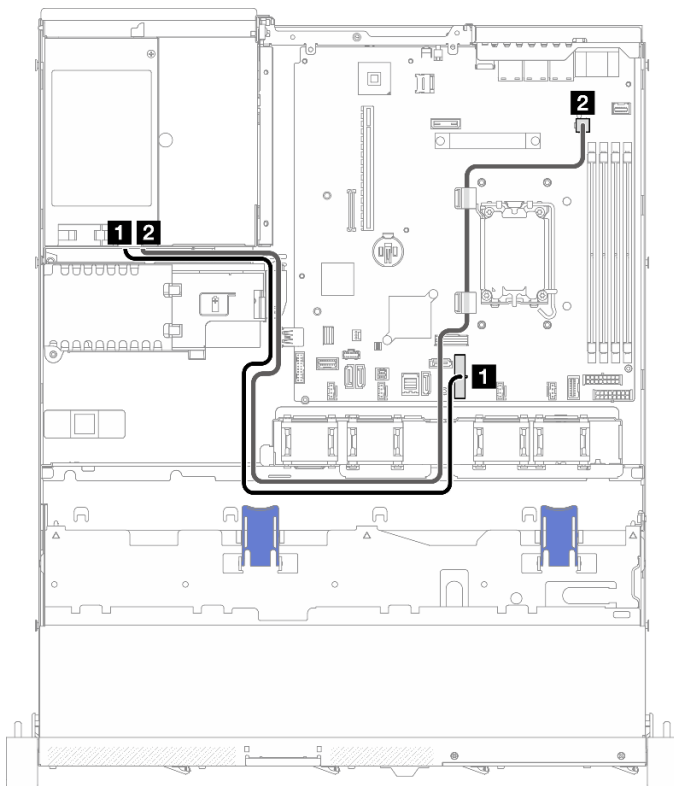- When routing the cables, ensure that all cables are routed appropriately through the cable guides and cable clips.

Eight SATA/SAS drives (Software RAID)

Note: When a ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit is installed, eight SATA/SAS drives configured with software RAID is not supported.
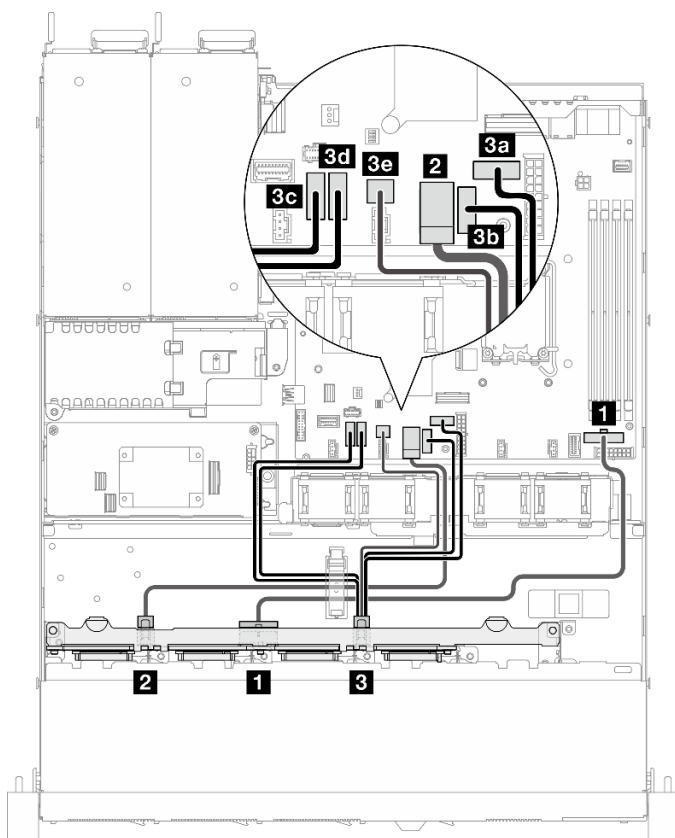
Figure 170. Eight SATA/SAS drives (Software RAID)

From	To	Cable
1 Backplane: Power	System board: Backplane power	Power 2x8 pin to power 2x8 pin (430 mm)
2 Backplane: SATA signal 1	System board: SATA 0-3	Mini-SAS HD x4 + 4 x SATA + SGPIO to 2 x Mini-SAS HD x4 (350/315/315/310/250/240 mm)
3 Backplane: SATA signal 2	**3a** System board: SATA 6	
	3b System board: SATA 7	
	3c System board: SATA 4	
	3d System board: SATA 5	
	3e System board: SGPIO1	

Eight SATA/SAS drives with one 8i (Hardware RAID/HBA)
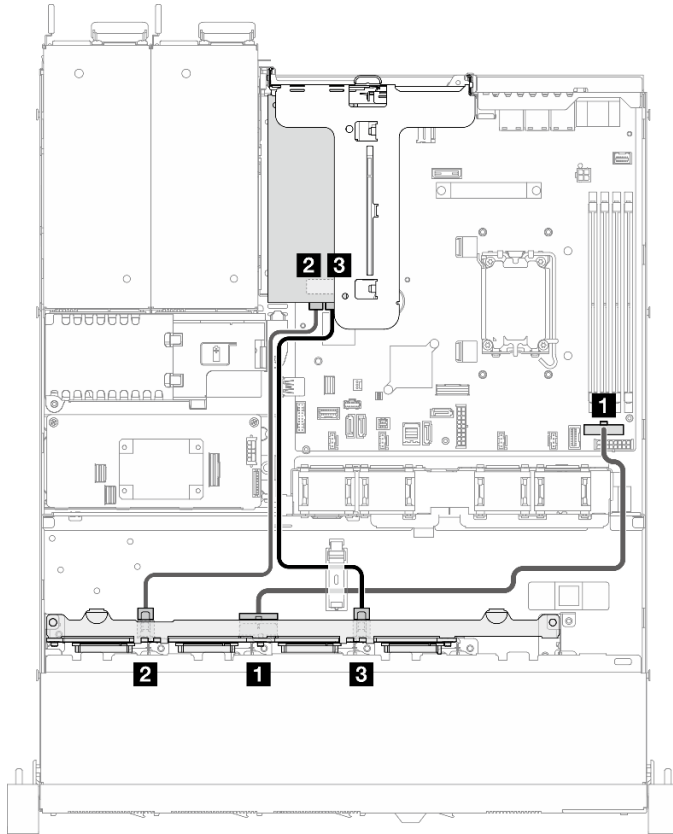
Figure 171. Eight SATA/SAS drives with one 8i (Hardware RAID/HBA)

From	To	Cable
1 Backplane: Power	System board: Backplane power	Power 2x8 pin to power 2x8 pin (430 mm)
2 Backplane: SATA signal 1	• 8i Gen 4: C0 • 8i Gen 3: C0	• 8i Gen 4: SlimSAS x8 to 2 x Mini-SAS HD x4 (300/300 mm) • 8i Gen 3: Mini-SAS HD x4 to Mini-SAS HD x4 (450 mm)
3 Backplane: SATA signal 2	• 8i Gen 4: C0 • 8i Gen 3: C1	• 8i Gen 4: SlimSAS x8 to 2 x Mini-SAS HD x4 (300/300 mm) • 8i Gen 3: Mini-SAS HD x4 to Mini-SAS HD x4 (450 mm)

Eight SATA/SAS drives with one CFF RAID (Hardware RAID/HBA)
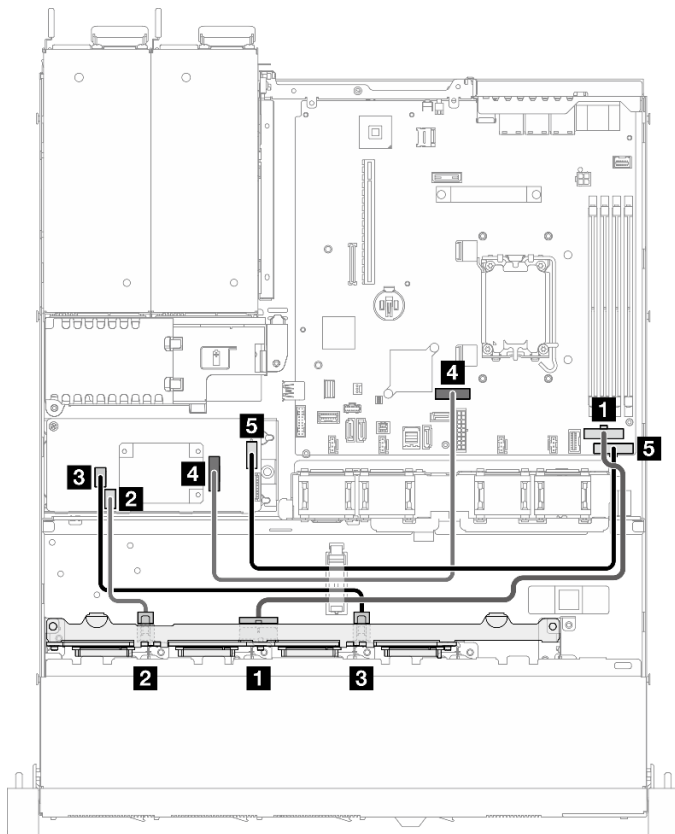
From	To	Cable
1 Backplane: Power	System board: Backplane power	Power 2x8 pin to power 2x8 pin (430 mm)
2 Backplane: SATA signal 1	CFF RAID: SAS/SATA C0	2 x SlimSAS x4 to 2 x Mini-SAS HD x4 (240/120 mm)
3 Backplane: SATA signal 2	CFF RAID: SAS/SATA C1	
4 CFF RAID: Signal	System board: Slimline x8	SlimSAS x8 to SlimSAS x8 (450 mm)
5 CFF RAID: Power	System board: CFF RAID power	Power 2x8 pin to power 2x5 pin (420 mm)

Figure 172. Eight SATA/SAS drives with one CFF RAID (Hardware RAID/HBA)

Ten 2.5-inch hot-swap drive cable routing

Use this section to understand how to route cables for ten 2.5-inch hot-swap drive model.

Notes:

- Connections between connectors; **1**↔**1**, **2**↔**2**, **3**↔**3**, ... **n**↔**n**
- When routing the cables, ensure that all cables are routed appropriately through the cable guides and cable clips.

**Ten SATA/SAS drives with one 16i (Hardware RAID/HBA)**
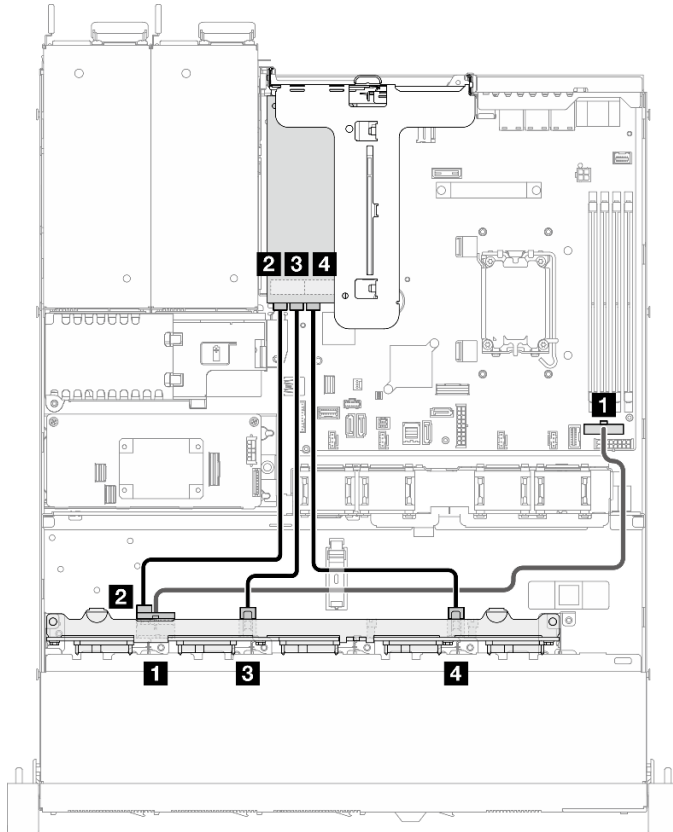
From	To	Cable
1 Backplane: Power connector	System board: Backplane power connector	Power 2x8 pin to power 2x8 pin (480 mm)
2 Backplane: SATA signal connector 1	16i: C0	8i Gen 3: Mini-SAS HD x4 to Mini-SAS HD x4 (450 mm)
3 Backplane: SATA signal connector 2	16i: C1	8i Gen 3: Mini-SAS HD x4 to Mini-SAS HD x4 (450 mm)
4 Backplane: SATA signal connector 3	16i: C2	8i Gen 3: Mini-SAS HD x4 to Mini-SAS HD x4 (450 mm)

Figure 173. Ten SATA/SAS drives with one 16i (Hardware RAID/HBA)

Ten SATA/SAS drives with one CFF RAID (Hardware RAID/HBA)
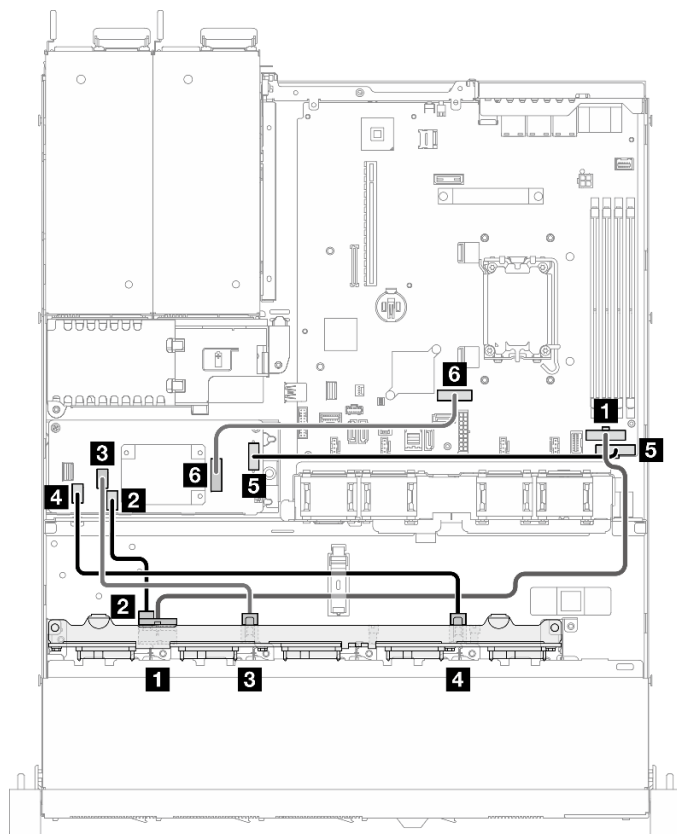
From	To	Cable
1 Backplane: Power	System board: Backplane power	Power 2x8 pin to power 2x8 pin (430 mm)
2 Backplane: SATA signal 1	CFF RAID: SAS/SATA C0	3 x SlimSAS x4 to 3 x Mini-SAS HD x4 (320/190/130 mm)
3 Backplane: SATA signal 2	CFF RAID: SAS/SATA C1	
4 Backplane: SATA signal 3	CFF RAID: SAS/SATA C2	
5 CFF RAID: Power	System board: CFF RAID power	Power 2x8 pin to power 2x5 pin (420 mm)
6 CFF RAID: Signal	System board: Slimline x8	SlimSAS x8 to SlimSAS x8 (450 mm)

Figure 174. Ten SATA/SAS drives with one CFF RAID (Hardware RAID/HBA)

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 15.

  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 39.

- 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 15.

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 15 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 15.

- 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 15 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/sr250v3/7dcl/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

RAID configuration

Using a Redundant Array of Independent Disks (RAID) to store data remains one of the most common and cost-efficient methods to increase server's storage performance, availability, and capacity.

RAID increases performance by allowing multiple drives to process I/O requests simultaneously. RAID can also prevent data loss in case of a drive failure by reconstructing (or rebuilding) the missing data from the failed drive using the data from the remaining drives.

RAID array (also known as RAID drive group) is a group of multiple physical drives that uses a certain common method to distribute data across the drives. A virtual drive (also known as virtual disk or logical drive) is a partition in the drive group that is made up of contiguous data segments on the drives. Virtual drive is presented up to the host operating system as a physical disk that can be partitioned to create OS logical drives or volumes.

An introduction to RAID is available at the following Lenovo Press website:

https://lenovopress.lenovo.com/lp0578-lenovo-raid-introduction

Detailed information about RAID management tools and resources is available at the following Lenovo Press website:

https://lenovopress.lenovo.com/lp0579-lenovo-raid-management-tools-and-resources

Deploy the operating system

Several options are available to deploy an operating system on the server.

Available operating systems

- Microsoft Windows Server
- VMware ESXi
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server

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.

ThinkSystem SR250 V3 User Guide

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/sr250-v3/pdf_files.

Lenovo XClarity Administrator event log

If you are using Lenovo XClarity Administrator to manage server, network, and storage hardware, you can view the events from all managed devices through the XClarity Administrator.

Logs

Figure 175. 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 176. Lenovo XClarity Controller event log

For more information about accessing the Lenovo XClarity Controller event log, see:

"Viewing Event Logs" section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/

Troubleshooting by system LEDs and diagnostics display

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

Drive LEDs

This topic provides information on drive LEDs.

The following table describes the problems that are indicated by drive activity LED and drive status LED.
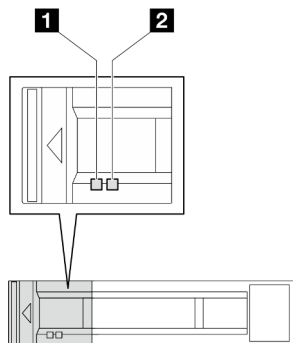
Figure 177. Drive LEDs

LED	Description
1 Drive activity LED (green)	Each hot-swap drive comes with an activity LED. When this LED is flashing, it indicates that the drive is in use.
2 Drive status LED (yellow)	The drive status LED indicates the following status: • 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.

Front I/O module LEDs

The front I/O module of the server provides controls, connectors, and LEDs. The front I/O module varies by model.
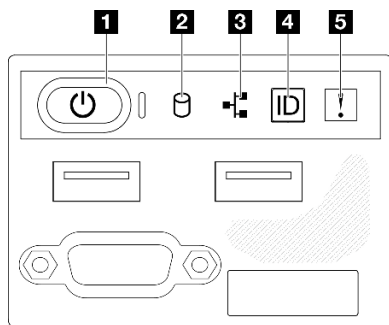
Figure 178. 2.5-inch drive chassis front I/O module
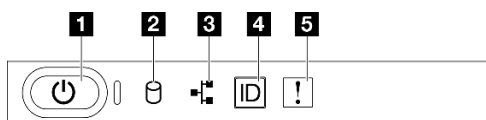
Figure 179. 3.5-inch drive chassis front I/O module

� 1 Power button/LED (green)	� 4 System ID button/LED (blue)
� 2 Drive activity LED (green)	� 5 System error LED (yellow)
� 3 Network activity LED (green)	

� 1 Power button/LED (green)

Press this button to turn the server on and off manually. The states of the power LED are as follows:

Status	Color	Description
Off	None	Power is not present, or the power supply has failed.
Fast blinking (about four flashes per second)	Green	• The server is off, but the XClarity Controller is initializing, and the server is not ready to be powered on. • System board power has failed.
Slow blinking (about one flash per second)	Green	The server is off and is ready to be powered on (standby state).
Solid on	Green	The server is on and running.

� 2 Drive activity LED (green)

The drive activity LED indicates the following status:

• The LED is lit: the drive is powered, but not actively reading or writing data.

• The LED is flashing: the drive is being accessed.

� 3 Network activity LED (green)

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

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

� 4 System ID button/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.

� 5 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 system logs or internal error LEDs to identify the failed part.
Off	None	The server is off or the server is on and is working correctly.	None.

Rear system LEDs

This topic provides information on the system LEDs on the rear of the server.
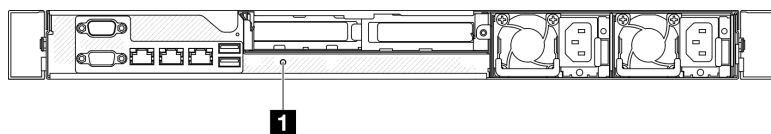
Figure 180. Rear system LEDs

Table 17. Rear system LEDs

LED	Description	Action
1 System ID LED (blue)	This LED helps you to visually locate the server.	A system ID button with LED is also located on the front of the server. You can press the system ID button to turn on/off or blink the front and rear ID LEDs.

Power supply LEDs

The illustration in this section shows the LEDs on the power supply.

Fixed power supply unit LEDs
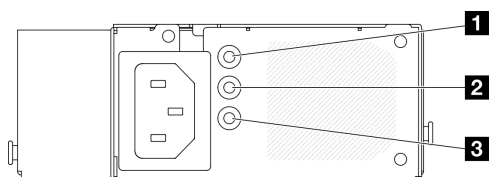
Figure 181. Fixed power supply unit LEDs

Table 18. Fixed power supply unit LEDs

LED	Description
1 Power input LED (green)	• Off: The power supply is disconnected from the ac power source or a power problem occurs. • Green: The power supply is connected to the ac power source.
2 Power output LED (green)	• Off: The server is powered off, or the power supply is not working properly. If the server is powered on but the power output LED is off, replace the power supply. • Green: The server is on and the power supply is working normally.
3 Power supply error LED (yellow)	• Off: The power supply is working normally. • Yellow: The power supply has failed. To resolve the issue, replace the power supply.

Hot-swap power supply unit LED
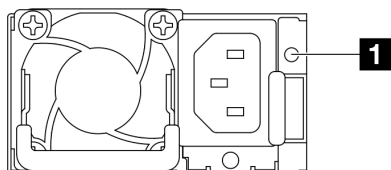
Figure 182. Hot-swap power supply unit LED

LED	Description
1 Power supply status	The power supply status LED can be in one of the following states: • Green: The power supply is connected to the AC power source and working normally. • Off: The power supply is disconnected from the AC power source. • Slow blinking green (about one flash every second): The power supply is in PSU standby state with AC present, cold standby state, or always standby state. • Amber: The AC power cord is unplugged, AC power lost (with a second power supply in parallel still in AC power input power), or power supply has failed. To resolve the issue, replace the power supply. • Slow blinking amber (about one flash every second): Power supply warning events where the power supply continues to operate. • Fast blinking green (about 2 flashes each second): Power supply firmware updating.

System-board LEDs

The following illustration indicates the light-emitting diodes (LEDs) on the system board.
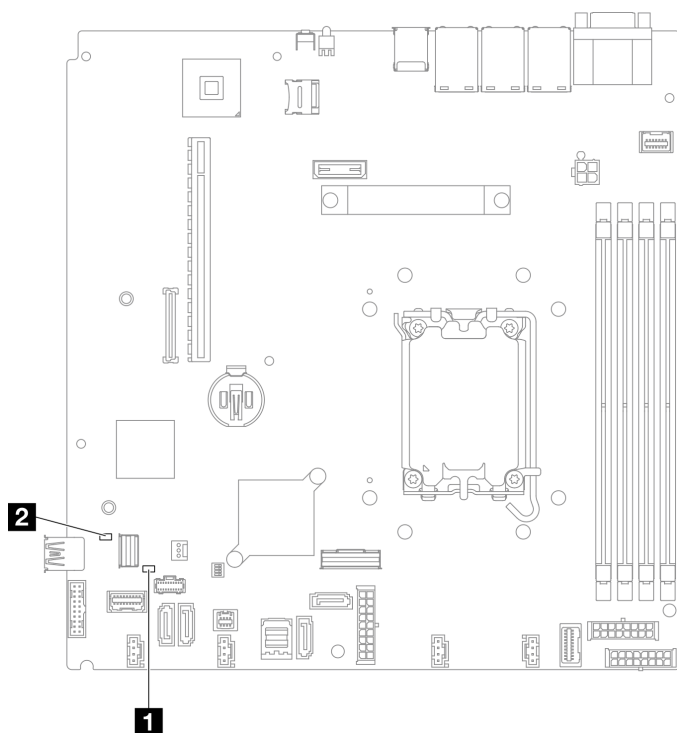
Figure 183. System-board LEDs

Table 19. System board LEDs description and actions

LED	Description and actions
1 System error LED (amber)	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. Complete the following steps: • Check system logs or internal error LEDs to identify the failed part.
2 System power LED (green)	The states of the system power LED are as follows: • **Off:** No power supply is properly installed, or the LED itself has failed. • **Flashing rapidly (four times per second):** The server is turned off and is not ready to be turned on. The power-control button is disabled. This will last approximately 5 to 10 seconds. • **Flashing slowly (once per second):** The server is turned off and is ready to be turned on. Press the power-control button to turn on the server. • **On:** The server is turned on.

Firmware and RoT security module LEDs

The following illustrations show the light-emitting diodes (LEDs) on the ThinkSystem V3 Firmware and Root of Trust Security Module (Firmware and RoT Security Module).
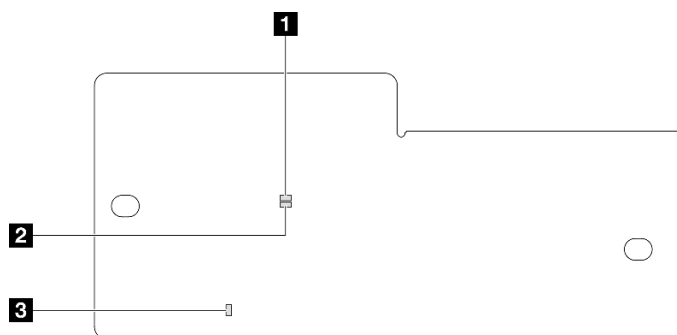
Figure 184. LEDs on the firmware and RoT security module

1 AP0 LED (Green)	**2** AP1 LED (Green)	**3** Fatal Error LED (Amber)

Table 20. LEDs description

Scenario	AP0 LED	AP1 LED	Fatal Error LED	FPGA heart-beat LED	XCC heart-beat LED	Actions
RoT security module fatal firmware failure	Off	Off	On	N/A	N/A	Replace the Firmware and RoT Security Module.
	Blink	N/A	On	N/A	N/A	Replace the Firmware and RoT Security Module.
No system power (FPGA heartbeat LED off)	Off	Off	Off	Off	Off	If the AC power is on, but the system board assembly does not have power, then: 1. Check the power supply unit (PSU) or power distribution board (PDB) if any. If the PSU or PDB has any error, replace it. 2. If the PSU or PDB is good, do the following: a. Replace the system I/O board. b. Replace the processor board.
XCC firmware recoverable error	Blink	N/A	Off	N/A	N/A	Information only. No action is required.
XCC firmware is recovered from error	Blink	N/A	Off	N/A	N/A	Information only. No action is required.
UEFI firmware authentication failure	N/A	Blink	Off	N/A	N/A	Information only. No action is required.

Table 20. LEDs description (continued)

Scenario	AP0 LED	AP1 LED	Fatal Error LED	FPGA heart-beat LED	XCC heart-beat LED	Actions
UEFI firmware is recovered from authentication failure	N/A	On	Off	N/A	N/A	Information only. No action is required.
System is OK (FPGA heartbeat LED is On)	On	On	Off	On	Blink (1 Hz)	Information only. No action is required.

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

This topic provides information on LEDs of XCC system management port (10/100/1000 Mbps RJ-45).

The following table describes the problems that are indicated by LEDs on XCC system management port (10/100/1000 Mbps RJ-45).
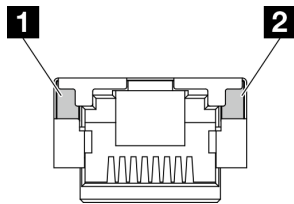
Figure 185. XCC system management port (10/100/1000 Mbps RJ-45) LEDs

LED	Description
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.

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 205.

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 207.

- 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 207.

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 205).

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 237).

Intermittent problems

Use this information to solve intermittent problems.

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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 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.

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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 218
- "Displayed system memory is less than installed physical memory" on page 218
- "Invalid memory population detected" on page 219

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 207.
   - 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 46 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. Run memory diagnostics. When you start a server and press the key according to the on-screen instructions, the LXPM interface 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 memory diagnostics with this interface. From the Diagnostic page, go to **Run Diagnostic → Memory test → Advanced Memory Test**.

5. Reverse the 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. Re-enable all memory modules using the Setup Utility, and then restart the server.

7. (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.

8. (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 46 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 197.

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 197.
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 197.

Network problems

Use this information to resolve issues related to networking.

- "Cannot wake server using Wake on LAN" on page 221
- "Could not log in using LDAP account with SSL enabled" on page 221

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 205), make sure:

    a. Fan 3 is running in standby mode, if Emulex dual port 10GBase-T embedded adapter is installed.

    b. The room temperature is not too high (see "Specifications" on page 3).

    c. The air vents are not blocked.

    d. The air baffle is installed securely.

2. Reseat the dual-port network adapter.

3. Turn off the server and disconnect it from the power source; then, wait 10 seconds before restarting the server.

4. If the problem still remains, replace the dual-port network adapter.

Could not log in using LDAP account with SSL enabled

Complete the following steps until the problem is resolved:

1. Make sure that the license key is valid.

2. Generate a new license key and log in again.

Observable problems

Use this information to solve observable problems.

- "Server hangs during the UEFI boot process" on page 222
- "The server immediately displays the POST Event Viewer when it is turned on" on page 222
- "Server is unresponsive (POST is complete and operating system is running)" on page 222
- "Server is unresponsive (POST failed and cannot start System Setup)" on page 223
- "Voltage planar fault is displayed in the event log" on page 223
- "Unusual smell" on page 223
- "Server seems to be running hot" on page 223
- "Cannot enter legacy mode after installing a new adapter" on page 224
- "Cracked parts or cracked chassis" on page 224

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 43 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.

Cannot enter legacy mode after installing a new adapter

Complete the following procedure to solve the problem.

1. Go to **UEFI Setup ➔ Devices and I/O Ports ➔ Set Option ROM Execution Order**.

2. Move the RAID adapter with operation system installed to the top of the list.

3. Select **Save**.

4. Reboot the system and auto boot to operation system.

Cracked parts or cracked chassis

Contact Lenovo Support.

Optional-device problems

Use this information to solve problems related to optional devices.

- "External USB device is not recognized" on page 224
- "PCIe adapter is not recognized or is not functioning" on page 224
- "Insufficient PCIe resources are detected." on page 225
- "A Lenovo optional device that was just installed does not work." on page 225
- "A Lenovo optional device that worked previously does not work now" on page 225
- "CPU does not reach the maximum Turbo frequency" on page 226
- "Errors occur when installing Windows operating system" on page 226
- "PCIe slots cannot be disabled" on page 226

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 ➜ PCI 64–Bit Resource Allocation**, then; modify the setting from **Auto** to **Enable**.

3. If the Boot Device does not support MMIO above 4GB for Legacy Boot, use UEFI Boot Mode or remove/disable some PCIe devices.

4. DC cycle the system and ensure the system is enter UEFI boot menu or the operating system; then, capture the FFDC log.

5. 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.

CPU does not reach the maximum Turbo frequency

Due to Intel processor transient throttling behavior in turbo, the CPU turbo ratio limit of 95W processor is set to lower frequency as the default setting to avoid processor throttling.

Errors occur when installing Windows operating system

When all eight storage drives have been installed, and the system has been set to software RAID mode in the UEFI settings, regardless if the disks are configured as an array or as separate disks, drives 6 and 7 cannot be used to install the Windows operating system.

1. If errors occur, install the Windows operating system in other drives.

PCIe slots cannot be disabled

When the ThinkSystem M.2 SATA/NVMe 2-Bay Non-Hot-Swap RAID Enablement Kit is installed, disabling PCIe slots through UEFI setup menu or LXPM is not supported.

Performance problems

Use this information to solve performance problems.

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)

Note: The power button will not function until approximately 1 to 3 minutes after the server has been connected to ac power to allow time for BMC to initialize.

Complete the following steps until the problem is resolved:

1. Make sure that the power button on the server is working correctly:

    a. Disconnect the server power cords.

    b. Reconnect the server power cords.

    c. Reseat the front operator panel cable, and then repeat steps 1a and 2b.

       - If the server starts, reseat the front operator panel.
       - If the problem remains, replace the front operator panel.

2. Make sure that:

    - The power cords are correctly connected to the server and to a working electrical outlet.
    - The LEDs on the power supply do not indicate a problem.
    - The Power button LED is lit on and is flashing slowly.
    - The push force is enough and with button force response.

3. If the power button LED is not lit on or is not flashing correctly, reseat all the power supplies and make sure AC LED on PSU rear side are lit on.

4. If you have just installed an optional device, remove it, and restart the server.

5. If the issue is still observed or without power button LED lit on, implement the minimum configuration to check whether any specific components lock the power permission. Replace the each power supply and check the power button function after installing the each one.

6. If everything is still done and the issue cannot be resolved, collect the failure information with system logs captured to Lenovo support.

Server does not power on

Complete the following steps until the problem is resolved:

1. Check the event log for any events related to the server not powering on.

2. Check for any LEDs that are flashing amber.

3. Check the power LED on the system board (system board assembly).

4. Check if AC power LED is lit on or the amber LED is lit on at the PSU rear side.

5. AC cycle the system.

6. Remove the CMOS battery for at least ten seconds, then, reinstall the CMOS battery.

7. Try to power on the system by IPMI command through XCC or by the power button.

8. Implement the minimum configuration (see "Technical specifications" on page 3).

9. Reseat all power supplies and make sure that AC LEDs on the PSU rear side are lit.

10. Replace the each power supply and check the power button function after installing the each one.

11. If the issue cannot be resolved by above actions, call service to review the issue symptom and see whether the system board (system board assembly) replacement is necessary.

Power problems

Use this information to resolve issues related to power.

System error LED is on and event log "Power supply has lost input" is displayed

To resolve the problem, ensure that:

1. The power supply is properly connected to a power cord.

2. The power cord is connected to a properly grounded electrical outlet for the server.

3. Make sure that the power supply AC source is stable within the supported range.

4. Swap the power supply to see if the issue follows the power supply, if it follows the power supply, then replace the failing one.

5. Review the event log and see how the problem it is to follow the event log actions to resolved the problems.

Serial-device problems

Use this information to solve problems with serial ports or devices.

-
-
-

Number of displayed serial ports is less than the number of installed serial ports

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 29).

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).

Enabling the serial port on supported operating system

To enable the serial port module on Linux or Microsoft Windows, do one of the followings according to the installed operating system:

Note: If the Serial over LAN (SOL) or Emergency Management Services (EMS) feature is enabled, the serial port will be hidden on Linux and Microsoft Windows. Therefore, it is required to disable SOL and EMS to use the serial port on operating systems for serial devices.

- For Linux:

  Open the ipmitool and enter the following command to disable the Serial over LAN (SOL) feature:

  `-I lanplus -H IP -U USERID -P PASSWORD sol deactivate`

- For Microsoft Windows:

  1. Open the ipmitool and enter the following command to disable the SOL feature:

     `-I lanplus -H IP -U USERID -P PASSWORD sol deactivate`

  2. Open Windows PowerShell and enter the following command to disable the Emergency Management Services (EMS) feature:

     `Bcdedit /ems off`

  3. Restart the server to ensure that the EMS setting takes effect.

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

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 steps until the problem is solved:

1. Make sure that the drive is recognized by the adapter (the green drive activity LED is flashing).
2. Review the SAS/SATA RAID adapter documentation to determine the correct configuration parameters and settings.

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.

Appendix A. Hardware disassembling for recycle

Follow the instructions in this section to recycle components with compliance with local laws or regulations.

Disassemble the server for chassis recycle

Follow the instructions in this section to disassemble the server before recycling the chassis.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 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 49.
- If the server is installed in a rack, remove the server from the rack.
- 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.

Step 1. Remove the power supply unit. See "Remove a hot-swap power supply unit" on page 127.

Step 2. Remove the security bezel. See "Remove the security bezel" on page 144.

Step 3. Remove the rack latches. See "Remove the rack latches" on page 141.

Step 4. Remove all the drives. See "Remove a simple-swap drive" on page 73 or "Remove a hot-swap drive" on page 75.

Step 5. Remove the top cover. See "Remove the top cover" on page 159.

Step 6. Remove the air baffle. See "Remove the air baffle" on page 62.

Step 7. Remove the PCIe riser assembly. See "Remove the PCIe riser assembly" on page 112.

Step 8. Remove the flash power module. See "Remove the flash power module" on page 82.

Step 9. Remove the fixed power supply unit. See "Remove the fixed power supply unit" on page 120.

Step 10. Remove the power distribution board. See "Remove the power distribution board" on page 131.

Step 11. Remove all the fans. See "Remove a fan" on page 79.

Step 12. Remove all the backplanes and backplates. See "Remove the 2.5-inch backplane" on page 49, "Remove the 3.5-inch backplane" on page 56, or "Remove the 3.5-inch backplate" on page 59.

Step 13. Remove the front I/O module. See "Remove the front I/O module (2.5-inch drive model)" on page 85 or "Remove the front I/O module (3.5-inch drive model)" on page 88.

Step 14. Remove the VGA cable. See "Remove the VGA cable (2.5-inch drive model)" on page 163 or "Remove the VGA cable (3.5-inch drive model)" on page 166.

Step 15. Remove the CMOS battery (CR2032). See "Remove the CMOS battery (CR2032)" on page 68.

Step 16. Remove the memory modules. See "Remove a memory module" on page 108.

Step 17. Remove the heat sink. See "Remove the heat sink" on page 91.

Step 18. Remove the processor. See "Remove the processor" on page 137.

Step 19. Remove the system board. See "Remove the system board" on page 150.

After disassembling the server, 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/sr250v3/7dcl/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 205 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 39.
- 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/sr250-v3/pdf_files

- *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 SR250 V3
  - https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/sr250v3/7dcl/downloads/driver-list/
- Lenovo Data Center Forum
  - https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg
- Lenovo Data Center Support for ThinkSystem SR250 V3
  - https://datacentersupport.lenovo.com/products/servers/thinksystem/sr250v3/7dcl
- 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

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area.

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Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

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Linux is a registered trademark of Linus Torvalds.

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Important notes

Processor speed indicates the internal clock speed of the processor; other factors also affect application performance.

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1 024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity can vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard-disk-drive bays with the largest currently supported drives that are available from Lenovo.

Maximum memory might require replacement of the standard memory with an optional memory module.

Each solid-state memory cell has an intrinsic, finite number of write cycles that the cell can incur. Therefore, a solid-state device has a maximum number of write cycles that it can be subjected to, expressed as `total bytes written` (TBW). A device that has exceeded this limit might fail to respond to system-generated commands or might be incapable of being written to. Lenovo is not responsible for replacement of a device that has exceeded its maximum guaranteed number of program/erase cycles, as documented in the Official Published Specifications for the device.

Lenovo makes no representations or warranties with respect to non-Lenovo products. Support (if any) for the non-Lenovo products is provided by the third party, not Lenovo.

Some software might differ from its retail version (if available) and might not include user manuals or all program functionality.

Electronic emission notices

When you attach a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices that are supplied with the monitor.

Additional electronic emissions notices are available at:

https://pubs.lenovo.com/important_notices/

Taiwan Region BSMI RoHS declaration

單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (PB)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr^{+6})	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機架	○	○	○	○	○	○
外部蓋板	○	○	○	○	○	○
機械組合件	–	○	○	○	○	○
空氣傳動設備	–	○	○	○	○	○
冷卻組合件	–	○	○	○	○	○
內存模組	–	○	○	○	○	○
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.

Taiwan Region import and export contact information

Contacts are available for Taiwan Region import and export information.

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