Lenovo

ThinkSystem SR250 V2
Setup Guide

Machine Types: 7D7Q and 7D7R

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:
http://thinksystem.lenovofiles.com/help/topic/safety_documentation/pdf_files.html

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

Fifth Edition (March 2023)

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Contents

Safety iii
Safety inspection checklist iv

Chapter 1. Introduction 1
Server package contents 1
Features. 1
Specifications 3
Particulate contamination 7
Management options. 8

Chapter 2. Server components 13
Front view 14
Front operator panel 16
Rear view 17
System-board switches, jumpers, and buttons. . . . 19
System-board LEDs 19
System-board connectors 19
System-board jumpers and buttons 21
Backplates and backplanes 22
PCIe riser assembly 24
Parts list. 25
Power cords 32

Chapter 3. Internal cable routing . . . 33
Front panel cable routing 33
Fan cable routing 35
Fixed power supply unit cable routing 36
Hot-swap power supply unit cable routing 37
Flash power module cable routing 38
M.2 boot adapter cable routing. 39
Backplane and backplate cable routing 40
Four 3.5-inch simple-swap drive cable routing 40
Four 3.5-inch hot-swap drive cable routing . . 43
Eight 2.5-inch hot-swap drive cable routing . . 45
Ten 2.5-inch hot-swap drive cable routing. . . 47

Chapter 4. Server hardware setup . . 51
Server setup checklist 51
Installation Guidelines 52
System reliability guidelines 53
Working inside the server with the power on . . 53
Handling static-sensitive devices 54
Memory module installation rules and order 54
Technical rules 54
Technical rules for memory modules 54
Technical rules for PCIe slots. 56
Install server hardware options 57
Remove the top cover 57
Remove the air baffle 59
Remove the PCIe riser assembly 60
Install the M.2 boot adapter 61
Install an M.2 drive 62
Install a PCIe adapter (Riser) 63
Install the PCIe adapter (Slot 3) 65
Install the PCIe riser assembly 66
Install the flash power module 66
Install a memory module 68
Install the 2.5-inch backplane 71
Install the 3.5-inch backplane 71
Install the 3.5-inch backplate 72
Install the air baffle 73
Install the top cover 74
Install a hot-swap power supply unit 75
Install a 2.5-inch drive into a 3.5-inch drive bay 77
Install a simple-swap drive. 78
Install a hot-swap drive 80
Install the server in a rack 81
Cable the server 81
Power on the server 81
Validate server setup. 81
Power off the server 82

Chapter 5. System configuration . . . 83
Set the network connection for the Lenovo XClarity Controller 83
Update the firmware 84
Configure the firmware 87
Memory configuration 88
RAID configuration 89
Deploy the operating system. 89
Back up the server configuration 90
Update the Vital Product Data (VPD). 90
Update the Universal Unique Identifier (UUID). 90
Update the asset tag 92

Chapter 6. Resolving installation issues 95

Appendix A. Getting help and technical assistance 99
Before you call 99
Collecting service data 100

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Contacting Support 101

Appendix B. Trademarks 103

Index 105

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

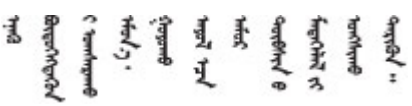
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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



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

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

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

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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་སྤྱོད་མ་བྱས་གོང་། ·སྐྱོན་ཉི་ཡིད་གཟབ·
བྱ་འདྲ་མིན་ཡོད་པའི་འོད་སྣེར་བལྟ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

ھەزكۇر مەھسۇلاتنى ئورنىتىشتىن 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.

Notes:

1. The product is not suitable for use at visual display workplaces according to §2 of the Workplace Regulations.
2. The set-up of the server is made in the server room only.

Attention: This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

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.

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Chapter 1. Introduction

The ThinkSystem SR250 V2 server (Types 7D7Q and 7D7R) 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 V2

The server comes with a limited warranty. For details about the warranty, see:
https://support.lenovo.com/us/en/solutions/ht503310

For details about your specific warranty, see:
http://datacentersupport.lenovo.com/warrantylookup

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:

Note: Some of the items listed are available on select models only.

- Server
- Rail installation kit (optional). Detailed instructions for installing the rail installation kit are provided in the package with the rail installation kit.
- Material box, including items such as power cords, rack installation template, and accessory kit.

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)**

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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.

Some of the features that are unique to the Lenovo XClarity Controller are enhanced performance, higher-resolution remote video, and expanded security options. For additional information about the Lenovo XClarity Controller, refer to the XCC documentation compatible with your server at:

https://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html

Important: Lenovo XClarity Controller (XCC) supported version varies by product. All versions of Lenovo XClarity Controller are referred to as Lenovo XClarity Controller and XCC in this document, unless specified otherwise. To see the XCC version supported by your server, go to https://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html.

- **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).

- **Active Memory**

  The Active Memory feature improves the reliability of memory through memory mirroring. Memory mirroring mode replicates and stores data on two pairs of memory modules within two channels simultaneously. If a failure occurs, the memory controller switches from the primary pair of memory memory modules to the backup pair of memory modules.

- **Large system-memory capacity**

  The server supports synchronous dynamic random-access memory (SDRAM) registered dual inline memory modules (DIMMs) with error correcting code (ECC). For more information about the specific types and maximum amount of memory, see “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.

- **Integrated Trusted Platform Module (TPM)**

  This integrated security chip performs cryptographic functions and stores private and public secure keys. It provides the hardware support for the Trusted Computing Group (TCG) specification. You can download the software to support the TCG specification.

  Trusted Platform Module (TPM) has two versions - TPM 1.2 and TPM 2.0. You can change the TPM version from 1.2 to 2.0 and back again.

  For more information on TPM configurations, see “Enable TPM/TCM” in the *Maintenance Manual*.

  Note: For customers in Chinese Mainland, a Lenovo-qualified TPM 2.0 adapter or a TPM card may be pre-installed.

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

  The hot-swap server models support a maximum of eight 2.5-inch hot-swap Serial Attached SCSI (SAS) hard disk drives or hot-swap Serial ATA (SATA) hard disk drives with two NVMe drives. The simple-swap server models support a maximum of four 2.5-inch and 3.5-inch simple-swap SATA hard disk drives.

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

- **Front operator panel**

  Front operator panel provides LEDs to help you diagnose problems. For more information about the front operator panel, see “Front operator panel” on page 16.

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

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

- **Active Energy Manager**

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

- **Redundant cooling and optional power capabilities**

  The server supports a maximum of two 450-watt hot-swap power supplies and four internal fans, which provide redundancy for a typical configuration. The redundant cooling by the fans in the server enables continued operation if one of the fans fails.

- **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.

Specifications

The following information is a 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.

Table 1. Server Specifications

Specification	Description
Dimensions	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: 545 mm (21.5 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)
Processor (depending on the model)	This server supports one of the following Intel® processors: • Xeon® E • Pentium® **Notes:** 1. For a list of supported processors, see https://serverproven.lenovo.com/. 2. Energy Star Certification is with limited configurations.

Table 1. Server Specifications (continued)

Specification	Description
Memory	See “Memory module installation rules and order” on page 54 for detailed information about memory configuration and setup. • Slots: 4 memory module slots • Minimum: 8 GB (1 x 8GB DIMM) • Maximum: 128 GB (4 x 32 GB DIMM) • Type: – ThinkSystem 8GB TruDDR4 3200 MHz (1Rx8, 1.2V) ECC UDIMM – ThinkSystem 16GB TruDDR4 3200 MHz (2Rx8, 1.2V) ECC UDIMM – ThinkSystem 32GB TruDDR4 3200 MHz (2Rx8, 1.2V) ECC UDIMM
Drive bays (depending on the model)	• 2.5-inch models: – Supports up to eight hot-swap SAS/SATA drive bays. – Supports up to ten hot-swap SAS/SATA drive bays. • 3.5-inch models: – Supports up to four simple-swap SATA drive bays. – Supports up to three simple-swap SATA drive bays and one NVMe drive bay. – Supports up to four hot-swap SAS/SATA drive bays. **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.
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: • 128 GB • 240 GB • 480 GB (supported when ambient temperature is below 30°C) • 960 GB (supported when ambient temperature is below 30°C) **Note:** When an M.2 adapter is installed, eight SATA/SAS drives configured with software RAID is not supported.

Table 1. Server Specifications (continued)

Specification	Description
PCIe riser cards and expansion slots	Up to two expansion slots (depending on the server configuration): • Slot 1-2: PCIe Gen4 x16 lane in x16 slot for Riser, the following slots are available depending on the riser card installed: 1. X16 PCIe Riser card PCIe Gen4: – Slot 1: Not available – Slot 2, PCIe Gen4 x16 in x16 slot, full height 2. X16/X8 PCIe Riser card PCIe Gen4: – Slot 1, PCIe Gen4 x8 in x8 slot, half-length (open-end) – Slot 2, PCIe Gen4 x8 in x16 slot, full-height • Slot 3 (on-board): PCIe Gen3 x4 lane in x8 slot **Notes:** • GPU adapters are only supported on servers with redundant power supply. • 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
Integrated functions	• Lenovo XClarity Controller, which provides service processor control and monitoring functions, video controller, and remote keyboard, video, mouse, and remote drive capabilities. • Light Path Diagnostics • Front standard connectors (front of server): – One USB 2.0 connector with XCC mobile support – One USB 3.2 Gen 1 connector – One front operator panel – One VGA connector (optional) • Rear standard connectors (rear of server): – Two USB 3.2 Gen 2 connectors – Two Ethernet connectors – One Lenovo XClarity Controller network connector – One VGA connector – One serial connector – One NMI button
RAID controllers (depending on the model)	• Hardware RAID: Additional RAID levels supported when an optional RAID controller is installed. The hardware RAID controller supports RAID levels 0, 1, 5, and 10. • Intel VROC SATA RAID (Software RAID): A software RAID controller is integrated on the system board. The software RAID controller supports RAID levels 0, 1, 5, and 10. • ThinkSystem M.2 SATA/NVMe 2-Bay Enablement Kit (SATA only)

Table 1. Server Specifications (continued)

Specification	Description
Video controller (integrated into Lenovo XClarity Controller)	Matrox G200 • ASPEED • SVGA compatible video controller • Avocent Digital Video Compression • 16 MB of video memory (not expandable) **Note:** Maximum video resolution is 1600 x 1200 at 75 Hz.
Fans	Four internal system fans (40mm x 28mm)
Power supplies	• Supports one fixed power supply: 300W Gold Power Supply • Supports up to two power supplies for redundancy support: 450W Platinum Power Supply
Operating System	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.com/osig. • OS deployment instructions: “Deploy the operating system” on page 89.
Acoustical noise emissions (base configuration)	The server has the following acoustic noise emissions declaration: • Sound power level (L_{WAd}): – Idling: 4.7 Bel (Typical), 5.7 Bel (Max) – Operating: 6.6 Bel (Typical), 6.8 Bel (Max) • Sound pressure level (L_{pAm}): – Idling: 33.1 dBA (Typical), 43.3 dBA (Max) – Operating: 52.6 dBA (Typical), 53.6 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, SPL is measured by bystander position (1m). • The declared acoustic sound levels are based on the following configurations, which may change depending on the configuration or conditions, for example M.2 drive, Broadcom 57414 25Gb NIC, Broadcom 57416 10Gb NIC, T1000 etc. – Typical: 1x 80W CPU, 4x 32GB DIMM, 2x HDD or SSD, RAID 5350-8i, 1x 300W PSU – Max: 1x 95W CPU, 4x 32GB DIMM, 2x HDD or SSD, 2x 450W PSU
Heat output	Approximate heat output: • Minimum configuration: 379.08 BTU per hour (111 watts) • Maximum configuration : 802.5 BTU per hour (235 watts)

Table 1. Server Specifications (continued)

Specification	Description
Electrical input	Sine-wave input (50–60 Hz) required • 300-Watt power supply: 100-127 V ac /200-240 V ac, 4/2A • 450-Watt power supply: 100-127 V ac /200-240 V ac, 5.8/2.9A
Environment	The ThinkSystem SR250 V2 complies with ASHRAE class A2 specifications. System performance may be impacted when operating temperature is outside ASHRAE A2 specification or fan failed condition. The ThinkSystem SR250 V2 is supported in the following environment: • Air temperature: – Server on: – 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). – Sever off: 5°C to 45°C (41°F to 113°F) – Shipping/storage: -40 to 60°C (-40 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: 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 solution. For information about the limits for particulates and gases, see *Particulate contamination* .

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 2. 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. **Interface** • CLI application • Web GUI interface • Mobile application • REST API **Usage and downloads** https://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html
Lenovo XClarity Administrator	Centralized interface for multi-server management. **Interface** • Web GUI interface • Mobile application • REST API **Usage and downloads** http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/aug_product_page.html
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** http://sysmgt.lenovofiles.com/help/topic/xclarity_essentials/overview.html

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://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html **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://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.
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://sysmgt.lenovofiles.com/help/topic/lxci/lxci_product_page.html
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 XClarity Administrator		√	√	√	√[2]	√	√[4]		
Lenovo XClarity Essen-tials toolset	OneCLI	√		√	√[2]	√	√[4]		
	Bootable Media Creator			√	√[2]		√[4]		
	UpdateXpress			√	√[2]				
Lenovo XClarity Provisioning Manager			√	√	√[3]		√[5]		
Lenovo XClarity Integrator		√	√[6]	√	√	√	√	√[7]	
Lenovo XClarity Energy Manager		√				√		√	
Lenovo Capacity Planner									√[8]

Notes:

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

Chapter 2. Server components

Use the information in this section to learn about each of the components associated with your server.

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 model number and serial number are on the ID label on the front of the server. The following illustration shows the location of the ID label containing the machine type, model, and serial number.

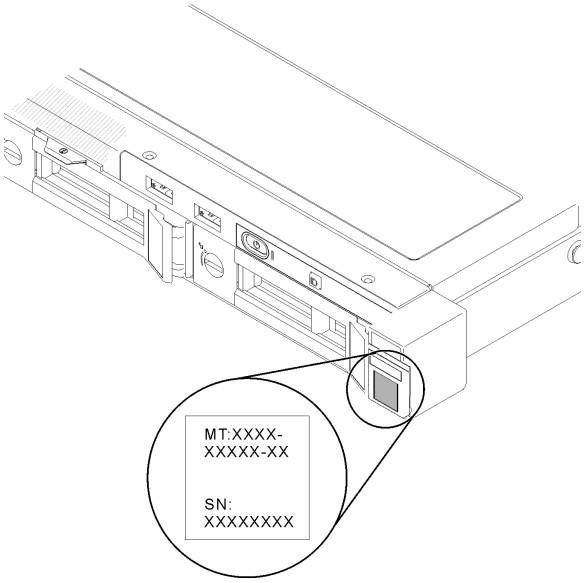

Figure 2. Location of the machine type, model, and serial number

Network access tag

The network access tag can be found on the front of the server. You can pull way the network access tag to paste your own label for recording some information such as the hostname, the system name and the inventory bar code. Please keep the network access tag for future reference.

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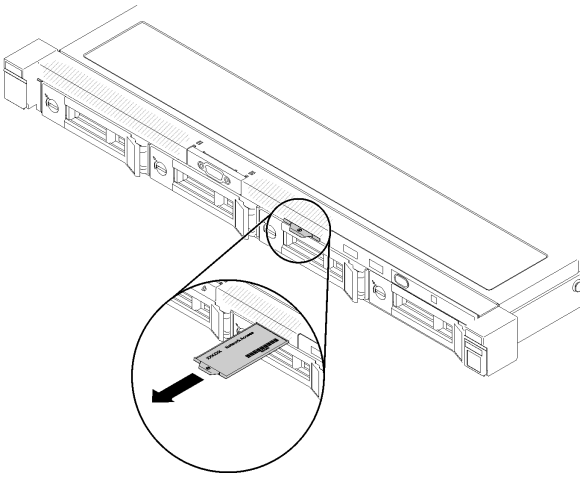


Figure 3. Network access tag

QR code

In addition, the system Service Card that is located on the top cover of the server, provides a quick response (QR) code for mobile access to service information. You can scan the QR code with a mobile device using a QR code reader application and get quick access to the Service Information web page. The Service Information web page provides additional information for parts installation and replacement videos, and error codes for server support.

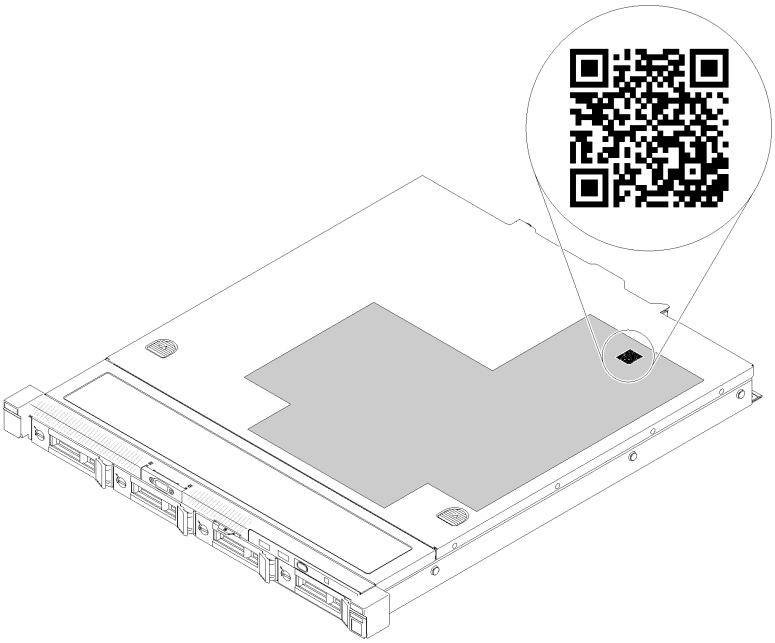


Figure 4. SR250 V2 QR code

Front view

The front view of the server varies by the model.

Front view of the server

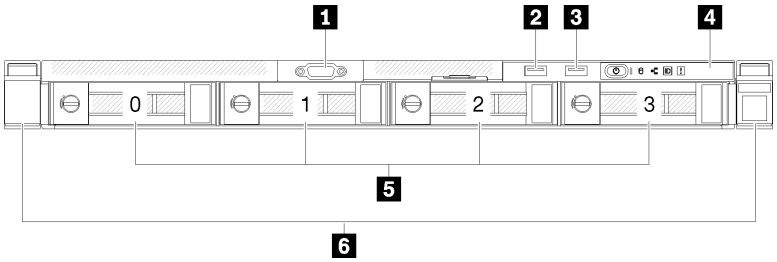


Figure 5. Four 3.5-inch simple-swap drives model front view

1 VGA connector (optional)	4 Front operator panel
2 USB 2.0 connector with Lenovo XClarity Controller management	5 Four 3.5-inch simple-swap drive bays (0-3)
3 USB 3.2 Gen 1 connector	6 Rack release latches

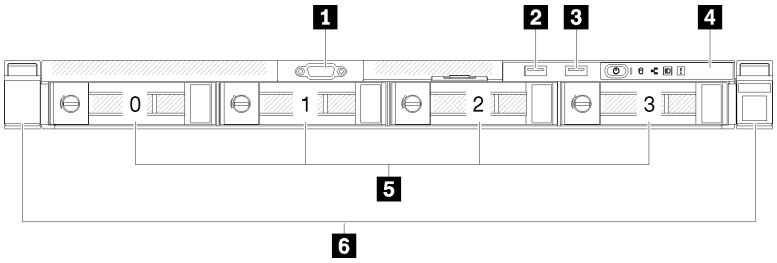


Figure 6. Three 3.5-inch simple-swap drives and one 3.5-inch NVMe drive model front view

1 VGA connector (optional)	4 Front operator panel
2 USB 2.0 connector with Lenovo XClarity Controller management	5 Three 3.5-inch simple-swap drive bays (0-2) and one 3.5-inch NVMe drive bay (3)
3 USB 3.2 Gen 1 connector	6 Rack release latches

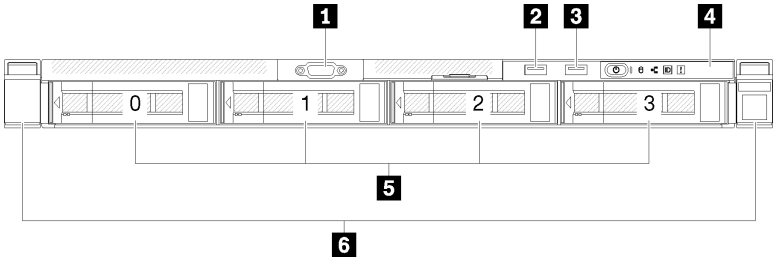


Figure 7. Four 3.5-inch hot-swap drives model front view

1 VGA connector (optional)	4 Front operator panel
2 USB 2.0 connector with Lenovo XClarity Controller management	5 Four 3.5-inch hot-swap drive bays (0-3)
3 USB 3.2 Gen 1 connector	6 Rack release latches

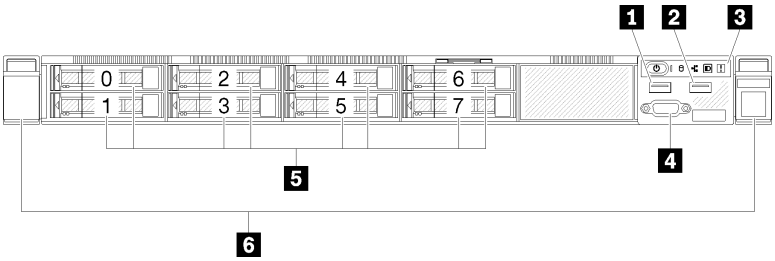


Figure 8. Eight 2.5-inch hot-swap drives model front view

1 USB 2.0 connector with Lenovo XClarity Controller management	4 VGA connector (optional)
2 USB 3.2 Gen 1 connector	5 Eight 2.5-inch hot-swap drive bays (0-7)
3 Front operator panel	6 Rack release latches

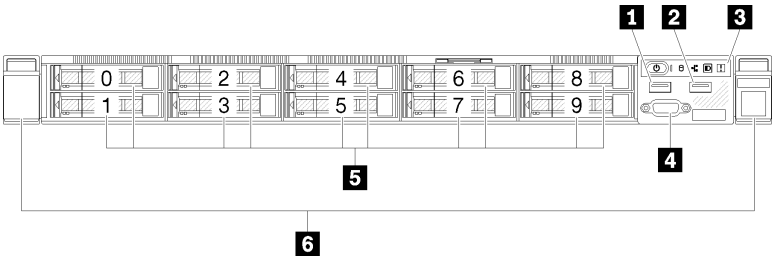


Figure 9. Ten 2.5-inch hot-swap drives model front view

Note: The last two drive bays 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 connector	5 Ten 2.5-inch hot-swap drive bays (0-9)
3 Front operator panel	6 Rack release latches

Front operator panel

The front operator information panel of the server provides controls, connectors, and LEDs. The front operator panel varies by model.

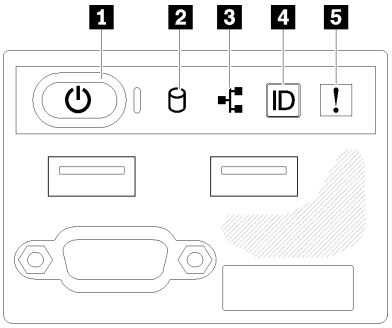


Figure 10. 2.5-inch drive chassis front I/O assembly

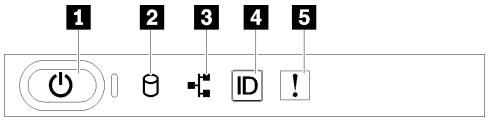


Figure 11. 3.5-inch drive chassis front operator panel

Table 3. Front operator panel controls and indicators

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

Off: Power is not present, or the power supply / the LED itself is failed.

Flashing rapidly (4 times per second): The server is turned off and is not ready to be turned on. The power button is disabled. This will last approximately 5 to 10 seconds.

Flashing slowly (once per second): The server is turned off and is ready to be turned on. You can press the power button to turn on the server.

On: The server is turned on.

2 Drive activity LED (green): Each hot-swap drive comes with an activity LED. If the LED is lit, it indicates that the drive is powered, but not actively reading or writing data. If the LED is flashing, the drive is being accessed.

3 Network activity LED (green): When this LED flickers, it indicates that the server is transmitting to or receiving signals from the Ethernet LAN.

4 System ID button/LED (blue): Use this blue LED to visually locate the server among other servers. This LED is also used as a presence detection button. You can use Lenovo XClarity Administrator to light this LED remotely.

If the XClarity Controller USB connector is set to have both the USB 2.0 function and XClarity Controller management function, you can press the system ID button for three seconds to switch between the two functions.

5 System error LED (yellow): When this yellow LED is lit, it indicates that a system error has occurred.

Rear view

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

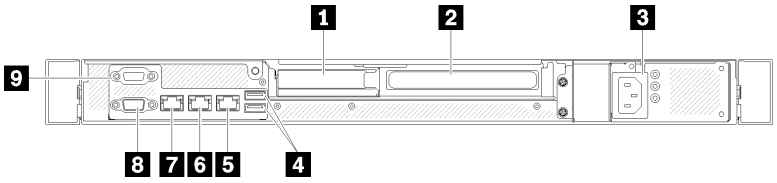


Figure 12. Rear view - Non-redundant power supply model

Table 4. Rear view - Non-redundant power supply model

1 PCIe slot 1	6 Ethernet connector 1 (shared with XCC network port)
2 PCIe slot 2	7 Dedicated Lenovo XClarity Controller (XCC) network connector
3 Power connector	8 VGA connector
4 USB 3.2 Gen 2 connectors	9 Serial connector
5 Ethernet connector 2	

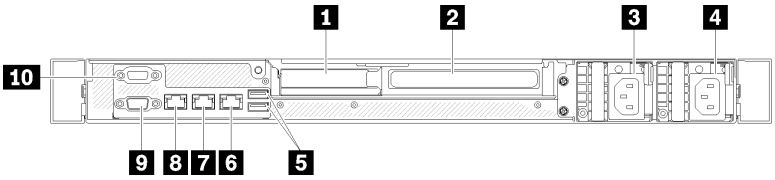


Figure 13. Rear view - Redundant power supply model

Table 5. Rear view - Redundant power supply model

1 PCIe slot 1	6 Ethernet connector 2
2 PCIe slot 2	7 Ethernet connector 1 (shared with XCC network port)
3 Power connector 1	8 Dedicated Lenovo XClarity Controller (XCC) network connector
4 Power connector 2	9 VGA connector
5 USB 3.2 Gen 2 connectors	10 Serial connector

PCIe slot 1 and 2: Your server has PCIe slots on the system board for you to install appropriate PCIe adapters. For information about the PCIe slots, see “PCIe riser assembly” on page 24.

Power connector 1 and 2: Connect the power cord to this component.

USB 3.2 Gen 2 connectors: Used to attach a device that requires a USB 3.2 connection, such as a keyboard, a mouse, or a USB flash drive.

Ethernet connector 1 and 2: Used to attach an Ethernet cable for a 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 **Onboard Port 1**.

Dedicated Lenovo XClarity Controller (XCC) network connector : Used to attach an Ethernet cable to manage the system using Lenovo XClarity Controller.

VGA connector : Used to attach a VGA-compatible video device, such as a VGA monitor.

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

System-board switches, jumpers, and buttons

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

For more information about the LEDs that are available on the system board, see “System-board LEDs” on page 19.

System-board LEDs

The following illustration indicates the light-emitting diodes (LEDs) on the system board.

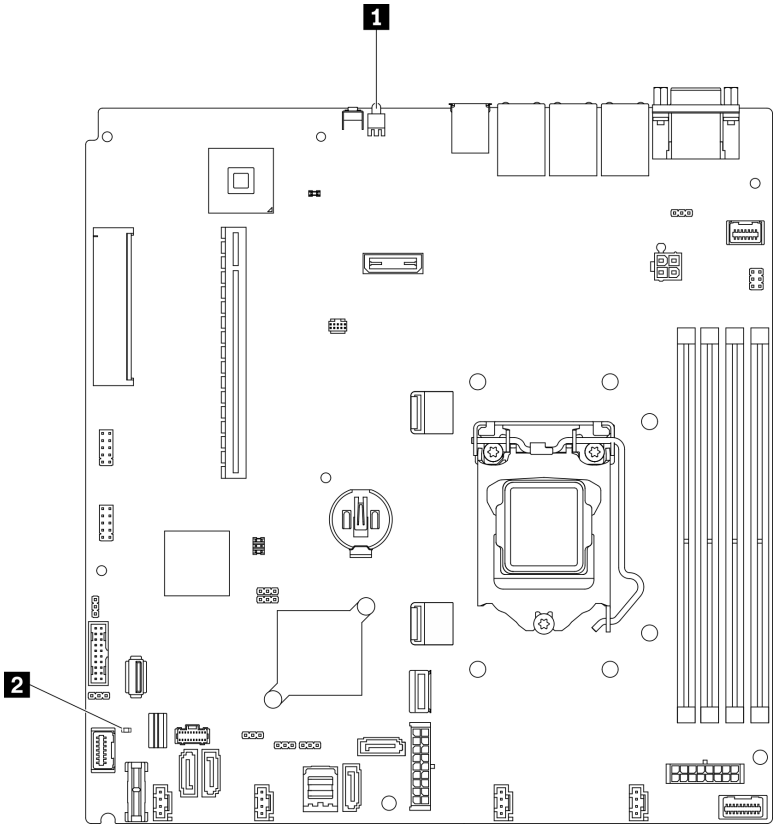


Figure 14. System-board LEDs

Table 6. System-board LEDs

1 Rear identification LED (blue)	2 System error LED (amber)

System-board connectors

The following illustrations show the connectors on the system board.

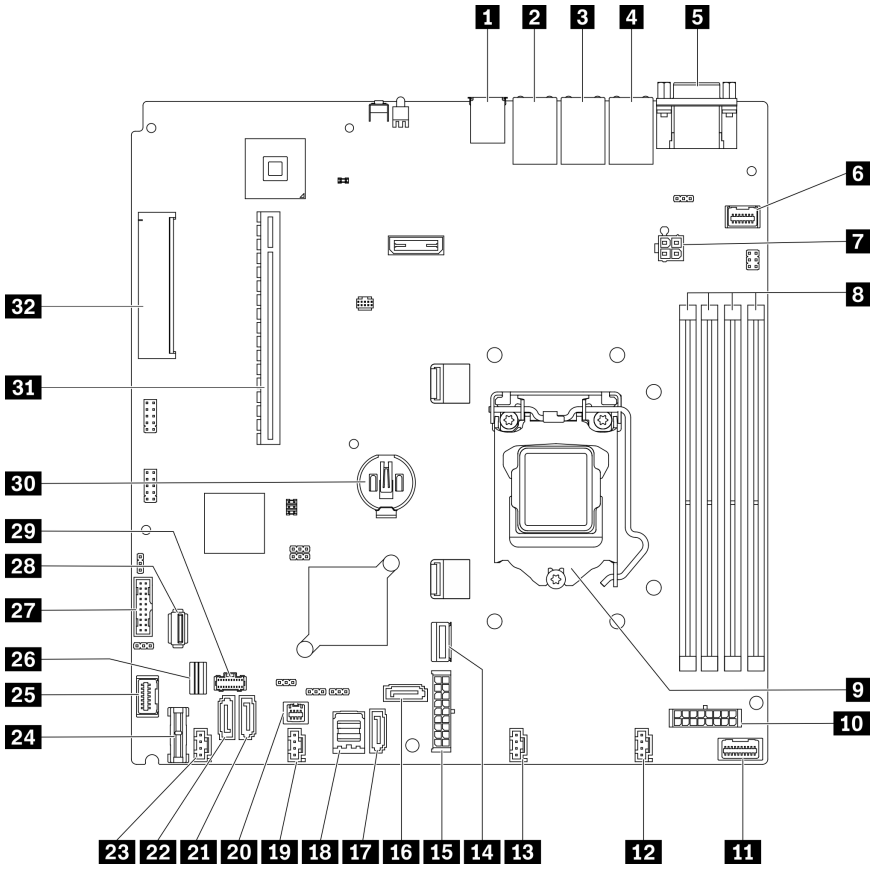


Figure 15. System-board connectors

Table 7. System-board connectors

1 USB 3.2 Gen 2 connector	17 SATA connector 7
2 Ethernet connector 2	18 SATA connector 0-3
3 Ethernet connector 1 (shared with XCC network port)	19 Fan 3 connector
4 Lenovo XClarity Controller (XCC) management port	20 SGPIO1 connector
5 VGA and serial port connector	21 SATA connector 5
6 Front VGA connector	22 SATA connector 4
7 Processor power connector	23 Fan 4 connector
8 Memory module slot 1 to 4	24 TPM/TCM card connector
9 Processor	25 Front panel connector
10 Backplane power connector	26 M.2 signal connector
11 Power distribution board signal connector	27 Front USB 3.0/2.0 header (DCI support)
12 Fan 1 connector	28 Internal USB 3.2 Gen 1 connector
13 Fan 2 connector	29 M.2 power connector
14 MCIO x4 connector for NVMe	30 CMOS battery - CR2032

Table 7. System-board connectors (continued)

15 System power connector	31 PCIe 4.0 x16 slot 1 to 2
16 SATA connector 6	32 PCIe 3.0 x8 slot 3

System-board jumpers and buttons

The following illustration indicates the location of the jumpers and buttons on the server.

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.

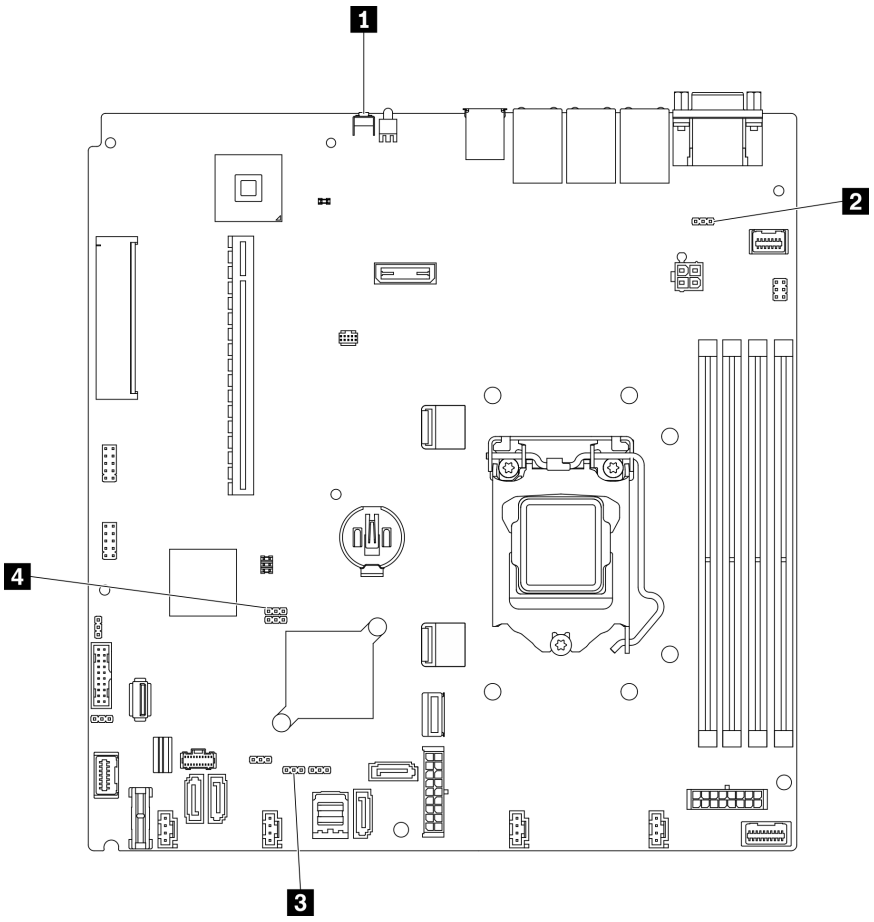


Figure 16. System-board jumpers and buttons

The following table describes the jumpers and buttons on the system board.

Table 8. System-board jumpers and buttons

Jumper and button name	Jumper setting / Button function
1 Force NMI button	This button is on the rear of the server. 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).
2 Power permission override jumper	• Pins 1 and 2: Normal (default). • Pins 2 and 3: Override the power-on permission.
3 Force XCC update jumper	• Pins 1 and 2: Normal (default). • Pins 2 and 3: Force the Lenovo XClarity Controller to update to the latest version.
4 Clear CMOS jumper	• Pins 1 and 2: Normal (default). • Pins 2 and 3: Clear the real-time clock (RTC) registry.

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 information in http://thinksystem.lenovofiles.com/help/topic/safety_documentation/pdf_files.html, “Installation Guidelines” on page 52, “Handling static-sensitive devices” on page 54, and “Power off the server” on page 82.
2. Any system-board switch or jumper block that is not shown in the illustrations in this document are reserved.

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)

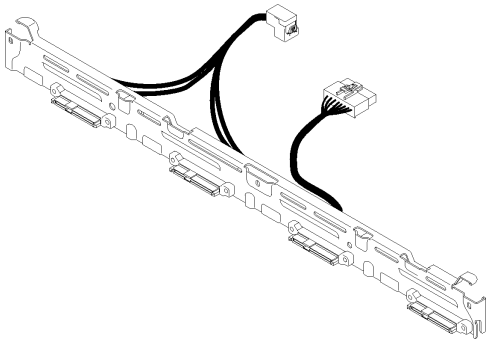


Figure 17. Backplate, four 3.5-inch simple-swap drives (connects to onboard connectors)

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

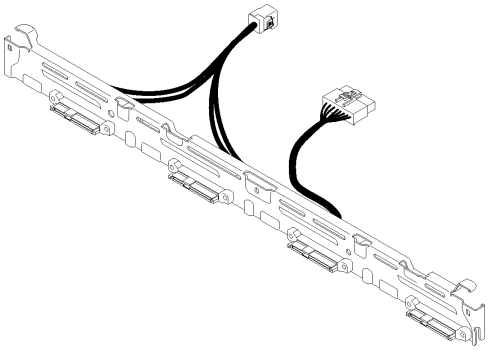


Figure 18. Backplate, four 3.5-inch simple-swap drives (connects to Gen 3 RAID adapter)

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

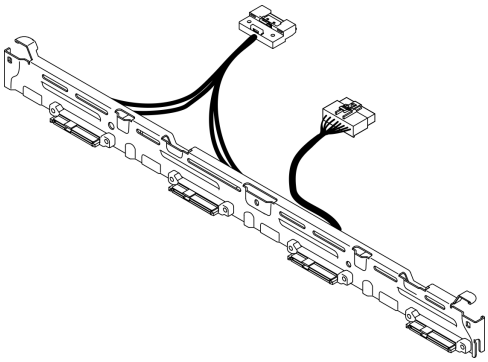


Figure 19. Backplate, four 3.5-inch simple-swap drives (connects to Gen 4 RAID adapter)

Backplate, three 3.5-inch simple-swap drives and one NVMe drive (connects to onboard connectors)

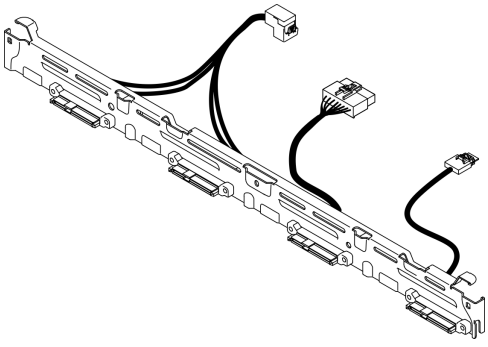


Figure 20. Backplate, three 3.5-inch simple-swap drives and one NVMe drive (connects to onboard connectors)

Backplane, four 3.5-inch hot-swap drives

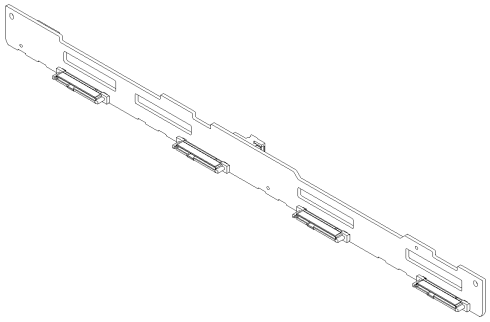


Figure 21. Backplane, four 3.5-inch hot-swap drives

Backplane, eight 2.5-inch hot-swap drives

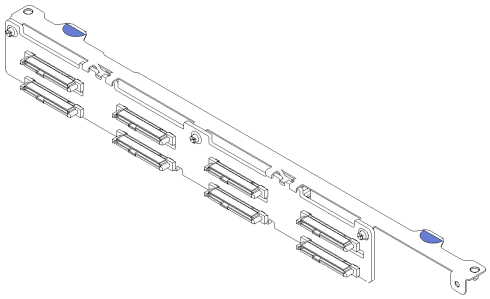


Figure 22. Backplane, eight 2.5-inch hot-swap drives

Backplane, ten 2.5-inch hot-swap drives

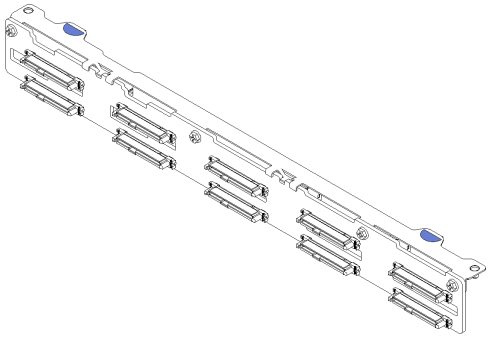


Figure 23. Backplane, ten 2.5-inch hot-swap drives

PCIe riser assembly

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

x16 PCIe riser assembly

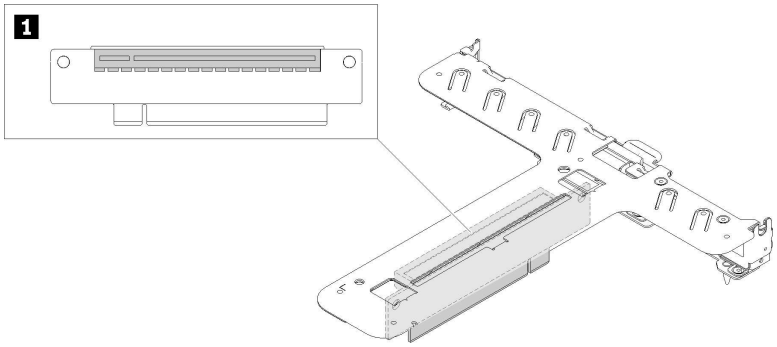


Figure 24. x16 PCIe riser assembly

Table 9. x16 PCIe riser assembly

1 Slot 2, PCIe Gen4 x16 in x16 slot, full height

x8/x8 Butterfly riser assembly

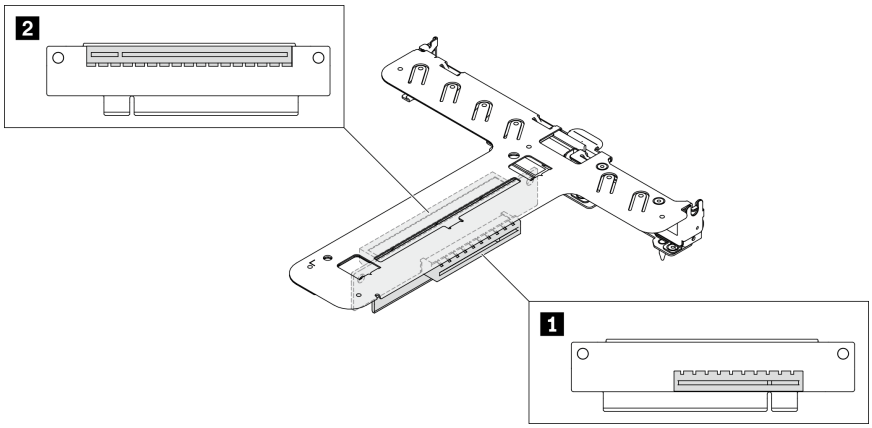


Figure 25. x8/x8 Butterfly riser assembly

Table 10. x8/x8 Butterfly riser assembly

1 Slot 1, PCIe Gen4 x8 in x8 slot, half-length (open-end)	2 Slot 2, PCIe Gen4 x8 in x16 slot, full-height

Parts list

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

For more information about ordering the parts shown in the Figure 26 “Server components - 2.5-inch drive model” on page 26 or Figure 27 “Server components - 3.5-inch drive model” on page 29:

http://datacentersupport.lenovo.com/products/servers/thinksystem/sr250v2/parts

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:

- **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.
- **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.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.
- **Consumable and Structural parts:** Purchase and replacement of consumable and structural parts (components, such as a cover 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

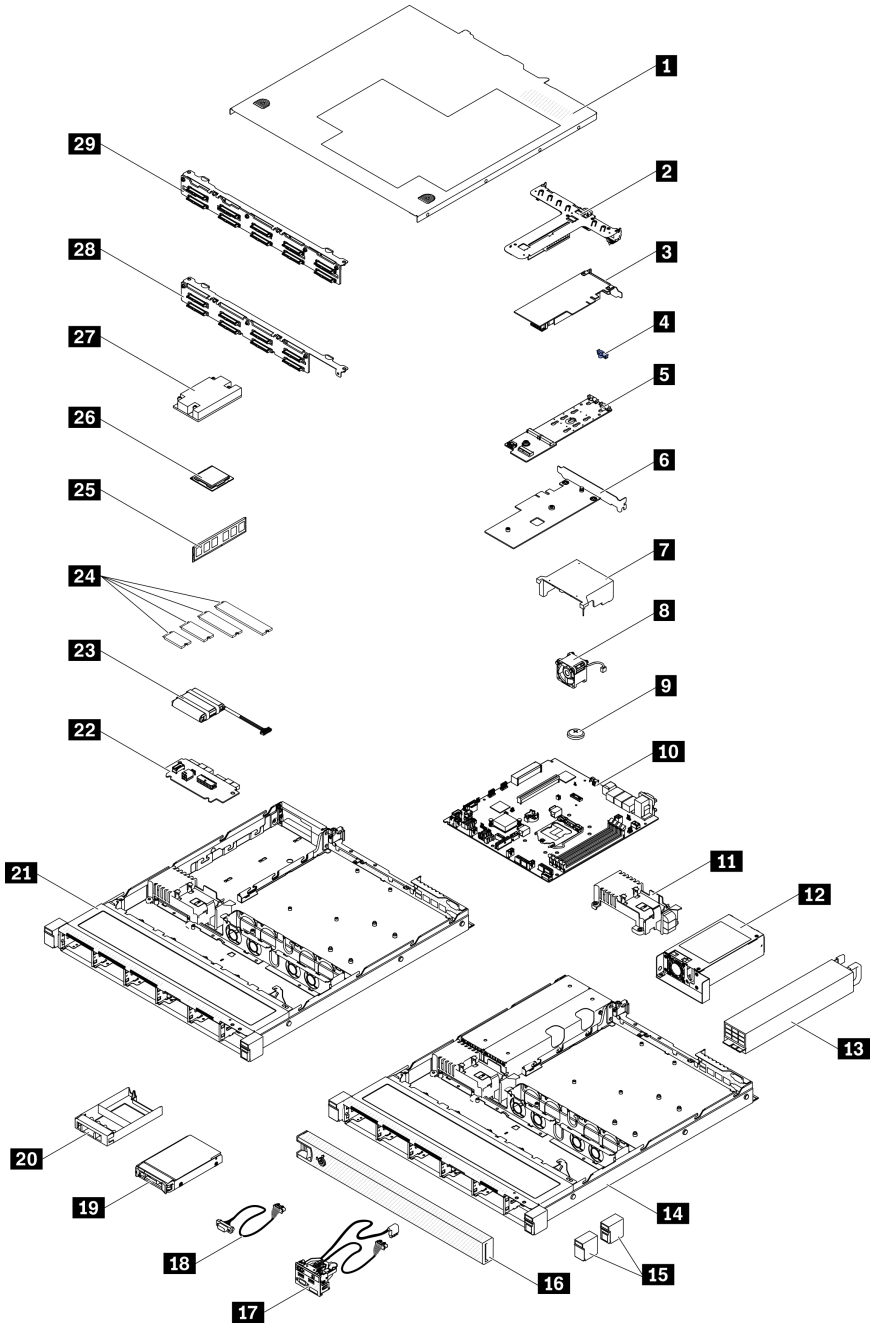


Figure 26. Server components - 2.5-inch drive model

Table 11. Parts list - 2.5-inch drive model

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
For more information about ordering the parts shown in Figure 26 “Server components - 2.5-inch drive model” on page 26: http://datacentersupport.lenovo.com/products/servers/thinksystem/sr250v2/parts It is highly recommended that you check the power summary data for your server using Lenovo Capacity Planner before purchasing any new parts.					
1	Top cover	√			
2	PCIe riser assembly	√			
3	RAID adapter	√			
4	M.2 retainer clip	√			
5	M.2 boot adapter	√			
6	PCIe adapter for M.2 boot adapter	√			
7	Air baffle	√			
8	Fan	√			
9	CMOS battery (CR2032)				√
10	System board			√	
11	Power distribution board cover	√			
12	Fixed power supply unit		√		
13	Redundant power supply unit	√			
14	Chassis for redundant power supply			√	
15	Rack latches	√			
16	Security bezel	√			
17	Front I/O assembly	√			
18	VGA cable	√			
19	2.5-inch hot-swap drive	√			
20	Drive filler				√
21	Chassis for fixed power supply			√	
22	Power distribution board		√		
23	Flash power module	√			
24	M.2 drive	√			
25	Memory module	√			
26	Processor			√	
27	Heat sink			√	

Table 11. Parts list - 2.5-inch drive model (continued)

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
28	Backplane, eight 2.5-inch hot-swap drives	√			
29	Backplane, ten 2.5-inch hot-swap drives	√			

3.5-inch drive model

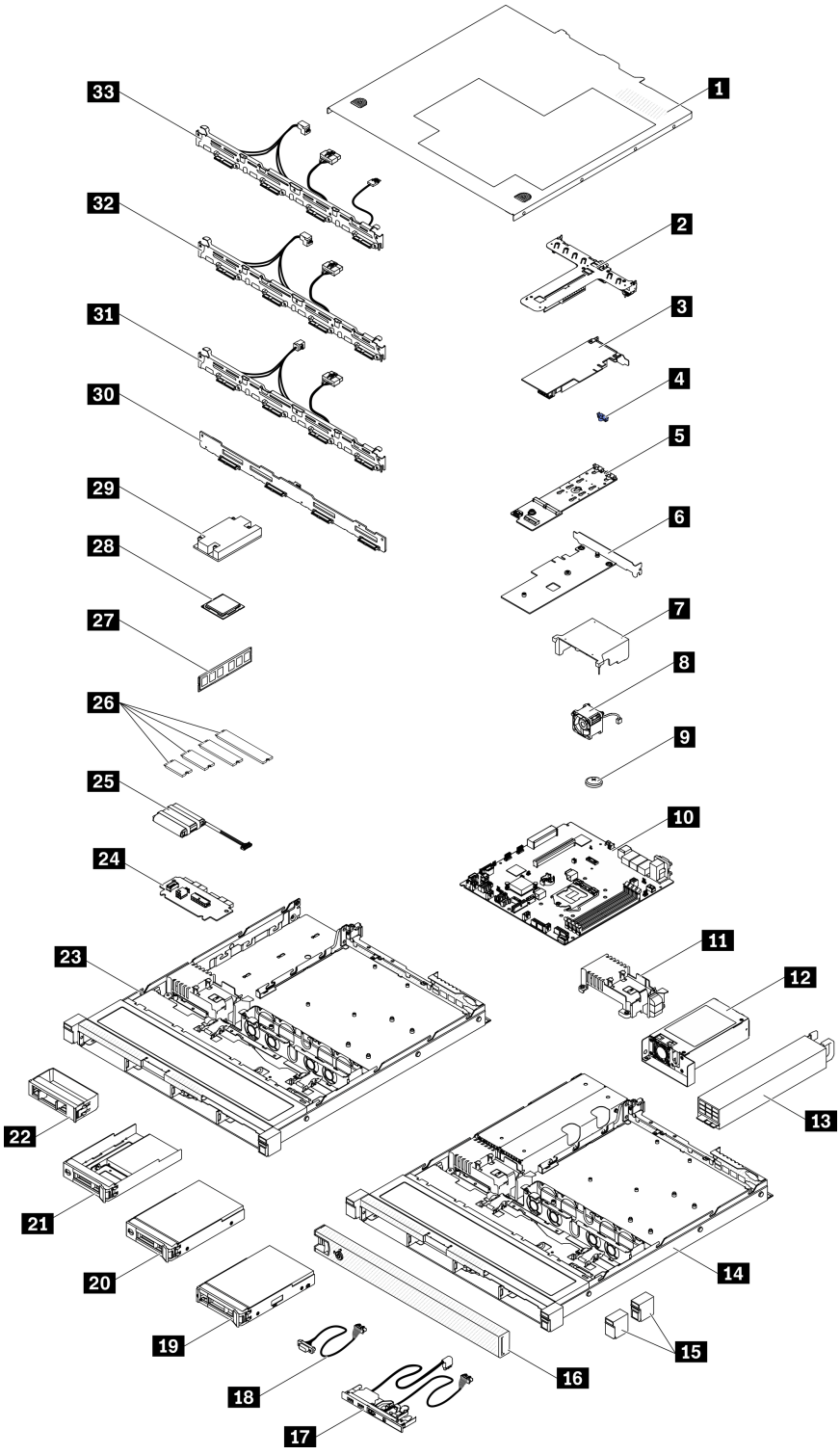


Figure 27. Server components - 3.5-inch drive model

Table 12. Parts listing - 3.5-inch drive model

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
For more information about ordering the parts shown in Figure 27 “Server components - 3.5-inch drive model” on page 29: http://datacentersupport.lenovo.com/products/servers/thinksystem/sr250v2/parts It is highly recommended that you check the power summary data for your server using Lenovo Capacity Planner before purchasing any new parts.					
1	Top cover	√			
2	PCIe riser assembly	√			
3	RAID adapter	√			
4	M.2 retainer clip	√			
5	M.2 boot adapter	√			
6	PCIe adapter for M.2 boot adapter	√			
7	Air baffle	√			
8	Fan	√			
9	CMOS battery (CR2032)				√
10	System board			√	
11	Power distribution board cover	√			
12	Fixed power supply unit		√		
13	Redundant power supply unit	√			
14	Chassis for redundant power supply			√	
15	Rack latches	√			
16	Security bezel	√			
17	Front operator panel	√			
18	VGA cable	√			
19	3.5-inch hot-swap drive	√			
20	3.5-inch simple-swap drive	√			
21	2.5-inch simple-swap drive with 3.5-inch drive tray	√			
22	Drive filler				√
23	Chassis for fixed power supply			√	
24	Power distribution board		√		
25	Flash power module	√			
26	M.2 drive	√			
27	Memory module	√			

Table 12. Parts listing - 3.5-inch drive model (continued)

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
28	Processor			√	
29	Heat sink			√	
30	Backplane, four 3.5-inch hot-swap drives	√			
31	Backplate, four 3.5-inch simple-swap drives (connects to RAID card)	√			
32	Backplate, four 3.5-inch simple-swap drives (connects to onboard connectors)	√			
33	Backplate, three 3.5-inch simple-swap drives and one NVMe drive (connects to onboard connectors)	√			

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.

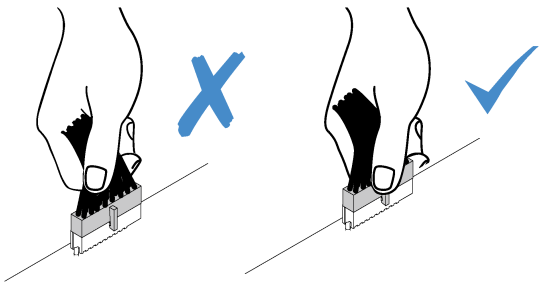
Chapter 3. Internal cable routing

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.

Note: Disengage all latches, release tabs, or locks on cable connectors when you disconnect cables from the system board. Failing to release them before removing the cables will damage the cable sockets on the system board, which are fragile. Any damage to the cable sockets might require replacing the system board.



Front panel cable routing

Use the section to understand the cable routing for the front panel.

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.

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3.5-inch model

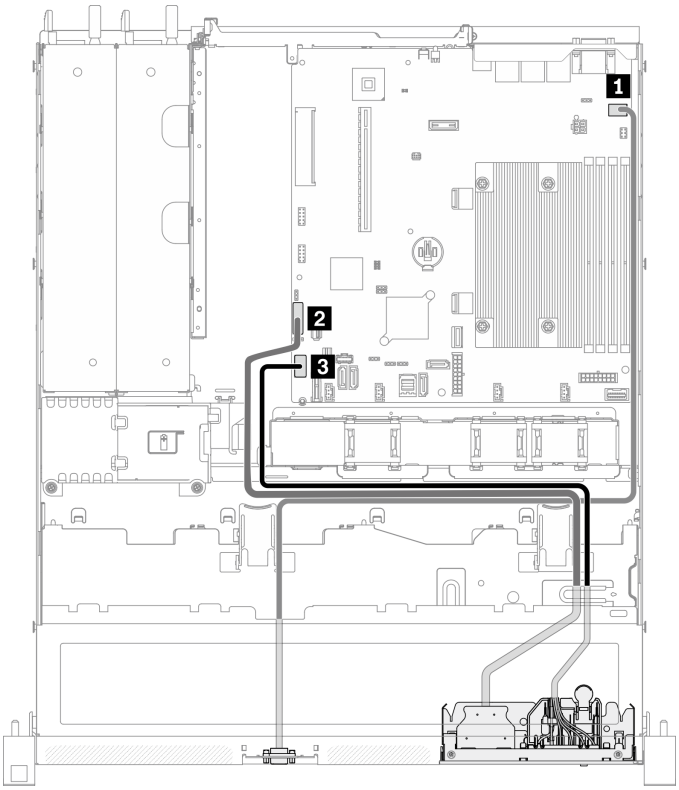


Figure 28. Front panel cable routing for 3.5-inch model

2.5-inch model

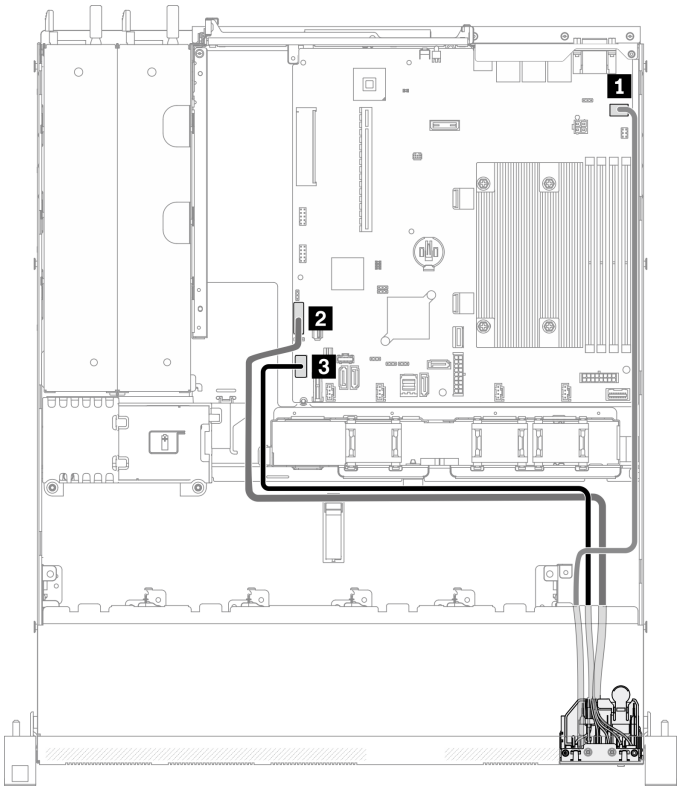


Figure 29. Front panel cable routing for 2.5-inch model

1 Front VGA connector	3 Front panel connector
2 Front USB 3.0/2.0 header (DCI support)	

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.

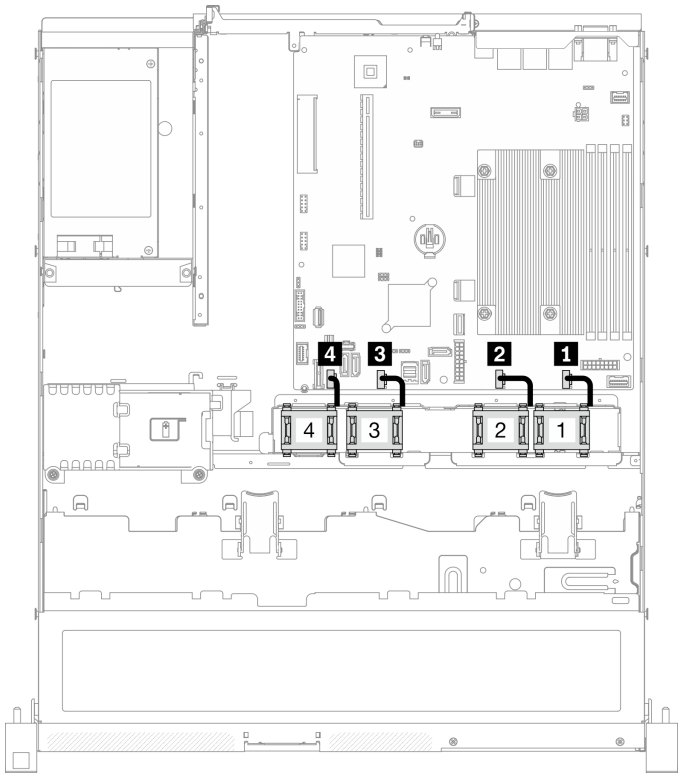


Figure 30. Fan cable routing

1 Fan 1 connector	3 Fan 3 connector
2 Fan 2 connector	4 Fan 4 connector

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.

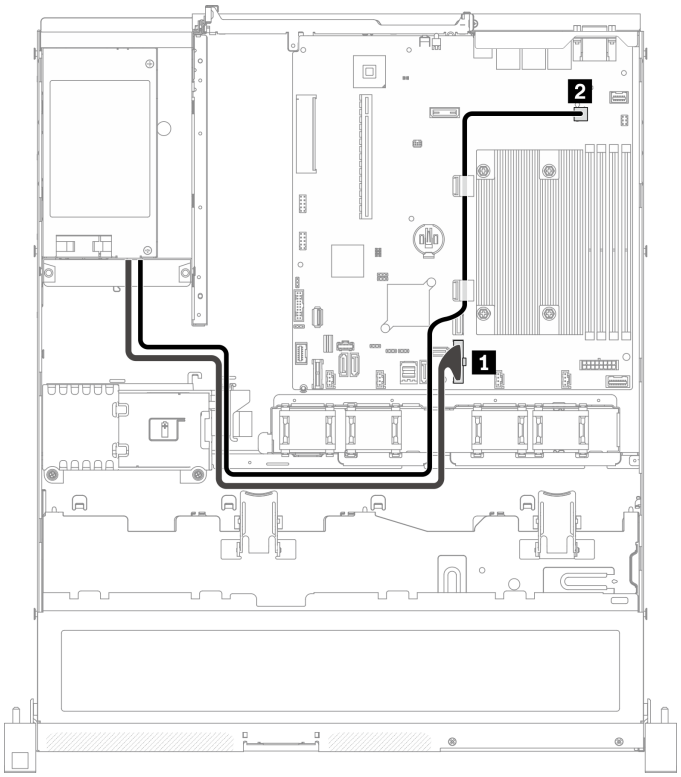


Figure 31. Fixed power supply unit cable routing

1 System power connector	2 Processor power connector

Hot-swap power supply unit cable routing

Use the section to understand the internal routing and connectors for the hot-swap power supply units.

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.

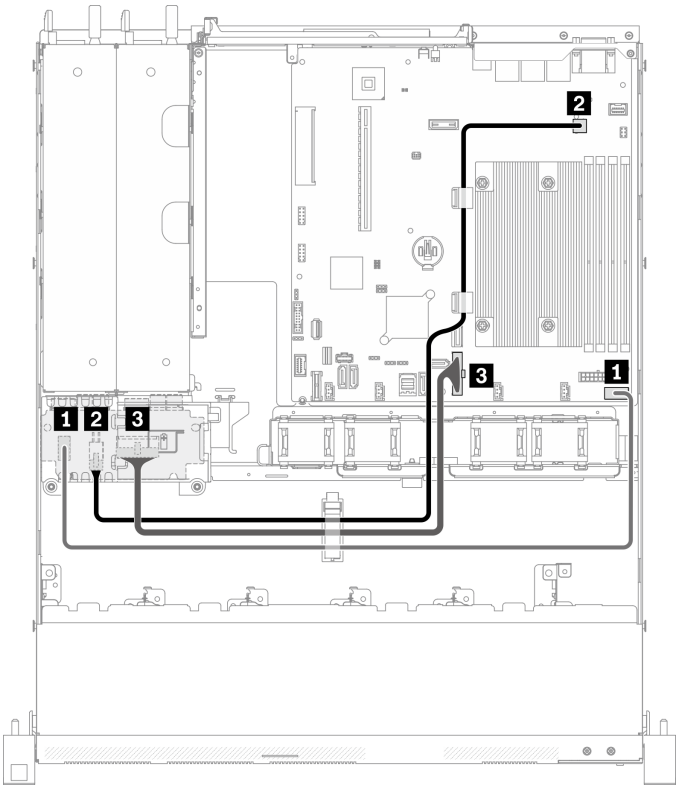


Figure 32. Hot-swap power supply unit cable routing

From	To
1 PDB: Power distribution board signal connector	System board: Power distribution board signal connector
2 PDB: Processor power connector	System board: Processor power connector
3 PDB: System power connector	System board: System power connector

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.

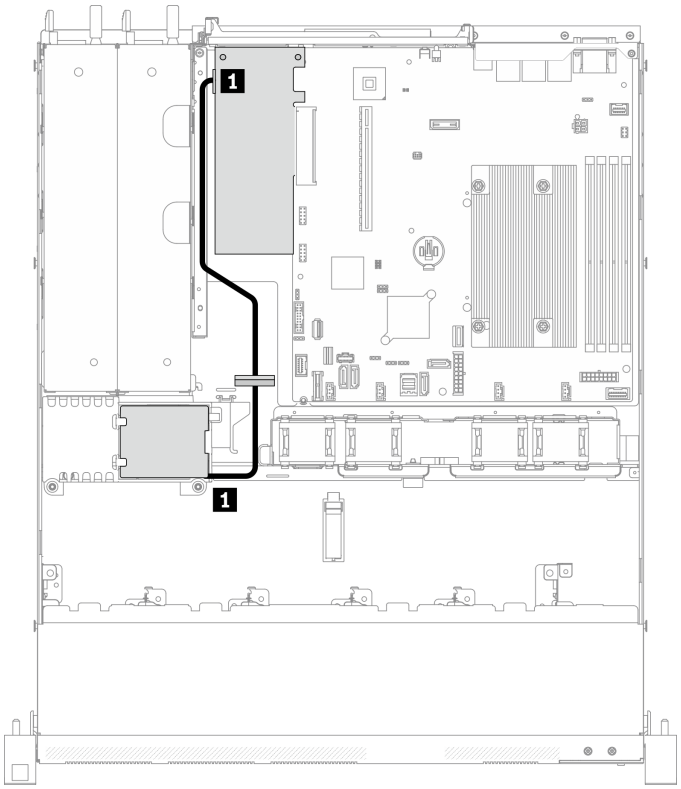


Figure 33. Flash power module cable routing

1 Flash power module

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 an M.2 adapter is installed, eight SATA/SAS drives configured with software RAID is not supported.

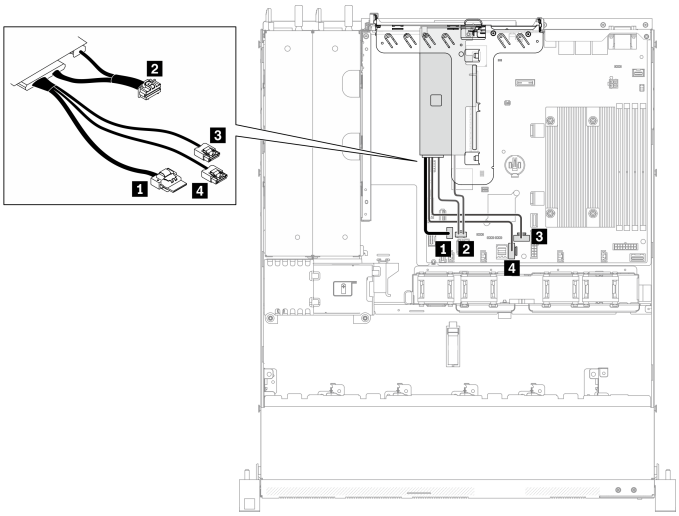


Figure 34. M.2 boot adapter cable routing

From	To
1 M.2 signal connector on the M.2 boot adapter	System board: M.2 signal connector
2 M.2 power connector on the M.2 boot adapter	System board: M.2 power connector
3 M.2 signal connector on the M.2 boot adapter	System board: SATA connector 6
4 M.2 signal connector on the M.2 boot adapter	System board: SATA connector 7

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)

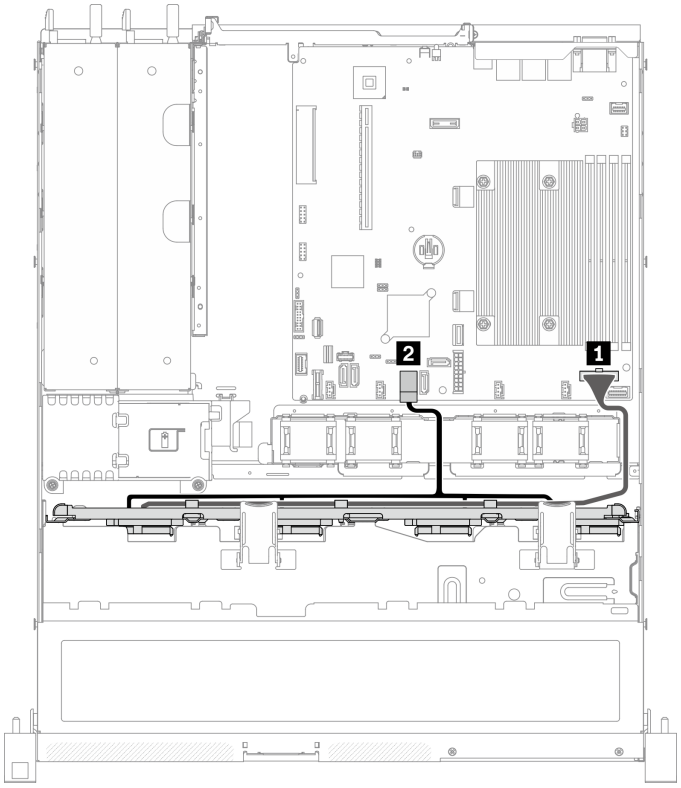


Figure 35. Four SATA drives (Software RAID)

From	To
1 Backplate: Power cable	System board: Backplane power connector
2 Backplate: SATA cable	System board: SATA connector 0-3

Three SATA drives and one NVMe drive (Software RAID)

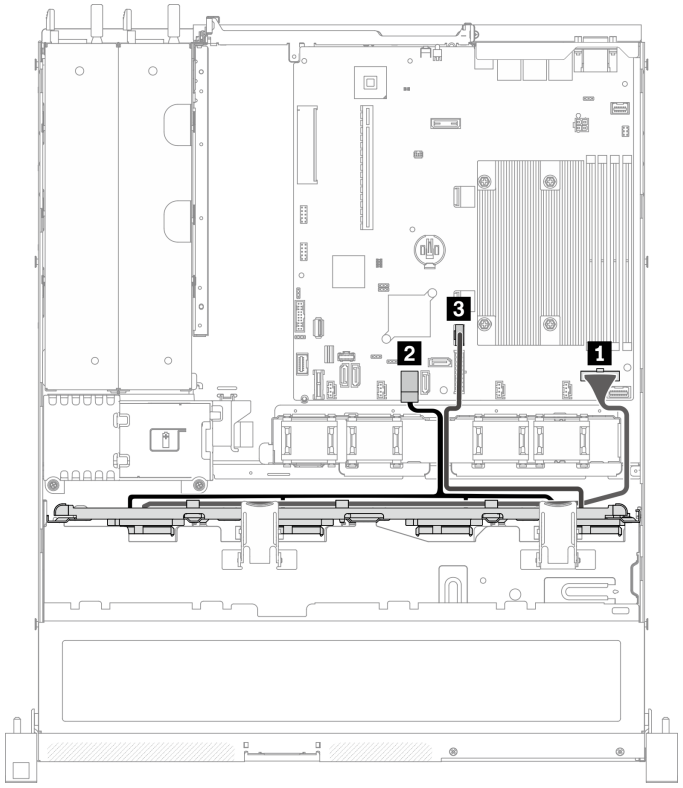


Figure 36. Three SATA drives and one NVMe drive (Software RAID)

From	To
1 Backplate: Power cable	System board: Backplane power connector
2 Backplate: SATA cable	System board: SATA connector 0-3
3 Backplate: NVMe cable	System board: MCIO x4 connector for NVMe

Four SATA drives (Hardware RAID/HBA)

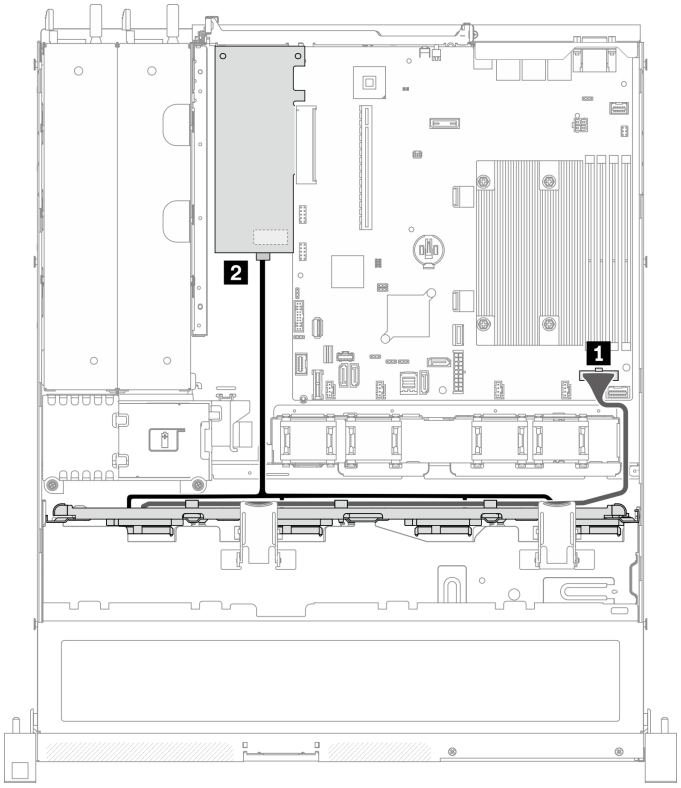


Figure 37. Four SATA drives (Hardware RAID/HBA)

From	To
1 Backplate: Power cable	System board: Backplane power connector
2 Backplate: SATA cable	8i G3: 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)

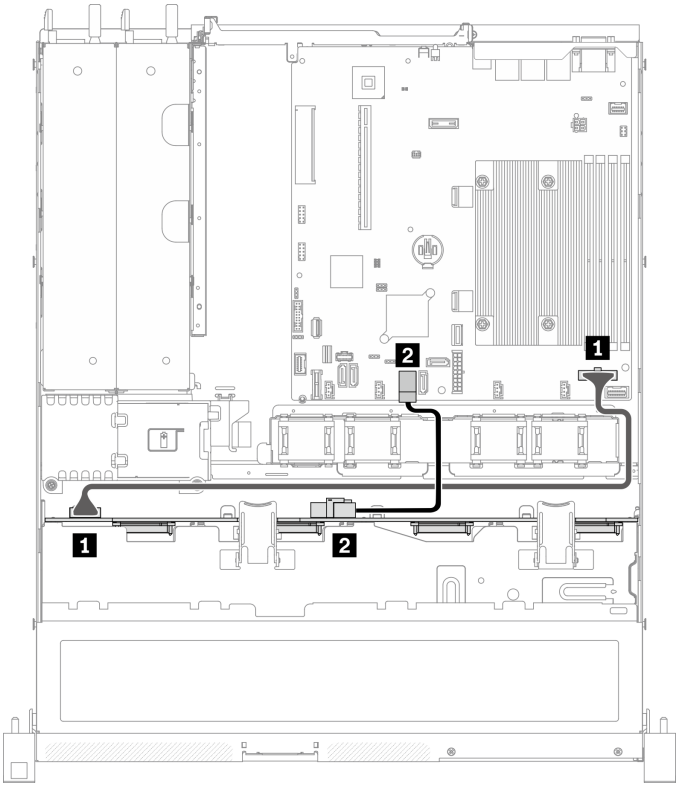
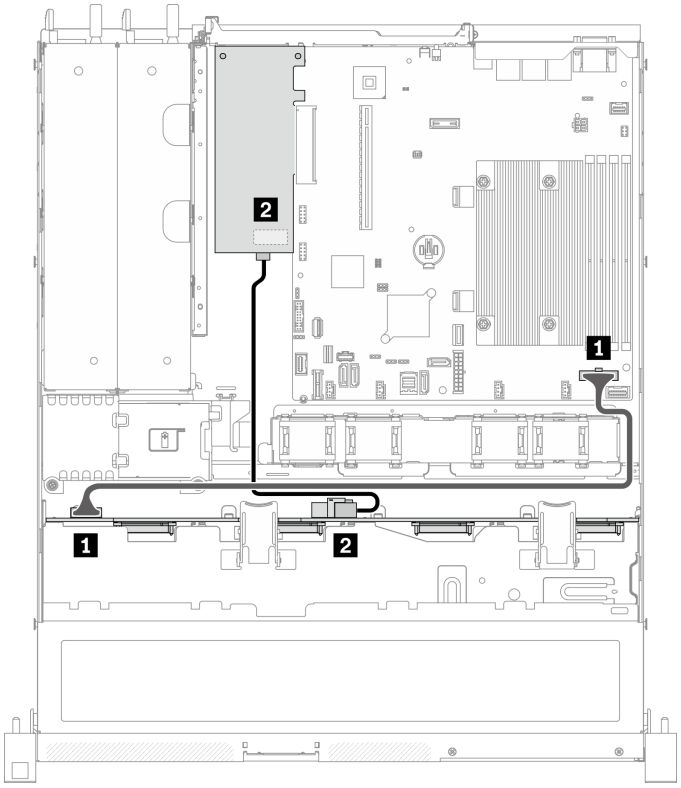


Figure 38. Four SATA/SAS drives (Software RAID)

From	To
1 Backplane: Power connector	System board: Backplane power connector
2 Backplane: SATA signal connector	System board: SATA connector 0-3

Four SATA/SAS drives (Hardware RAID/HBA)



From	To
1 Backplane: Power connector	System board: Backplane power connector
2 Backplane: SATA signal connector	8i G3: C0

Figure 39. 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 an M.2 adapter is installed, eight SATA/SAS drives configured with software RAID is not supported.

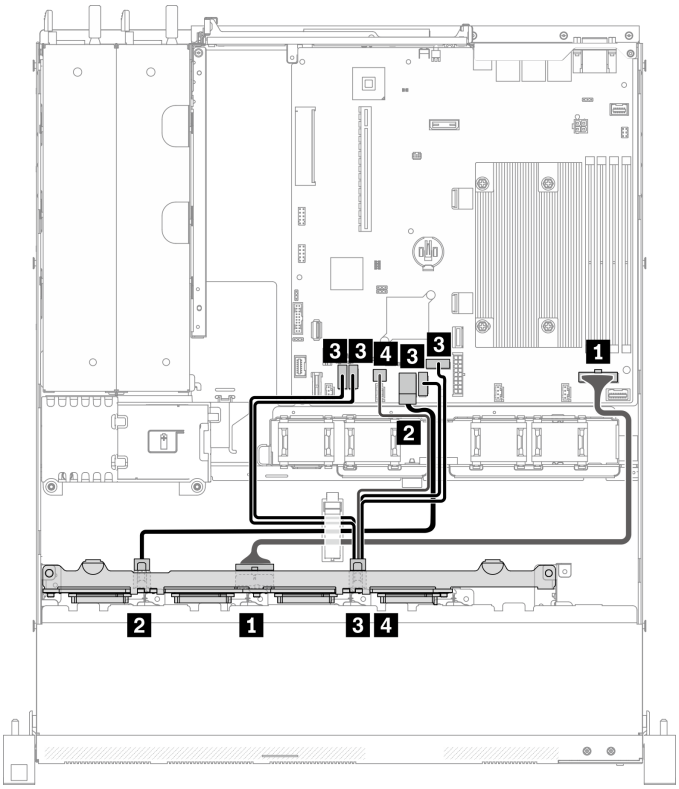


Figure 40. Eight SATA/SAS drives (Software RAID)

From	To
1 Backplane: Power connector	System board: Backplane power connector
2 Backplane: SATA signal connector 1	System board: SATA connector 0-3
3 Backplane: SATA signal connector 2 (Signal)	System board: SATA connector 4/5/6/7
4 Backplane: SATA signal connector 2 (SGPIO)	System board: SGPIO1 connector

Eight SATA/SAS drives (Hardware RAID/HBA)

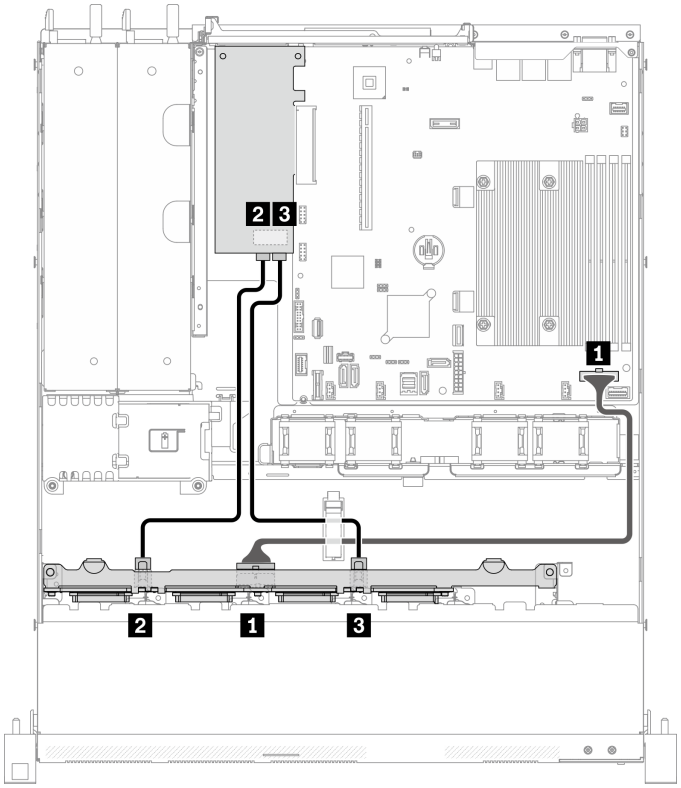


Figure 41. Eight SATA/SAS drives (Hardware RAID/HBA)

From	To
1 Backplane: Power connector	System board: Backplane power connector
2 Backplane: SATA signal connector 1	8i G3: C0
3 Backplane: SATA signal connector 2	8i G3: C1

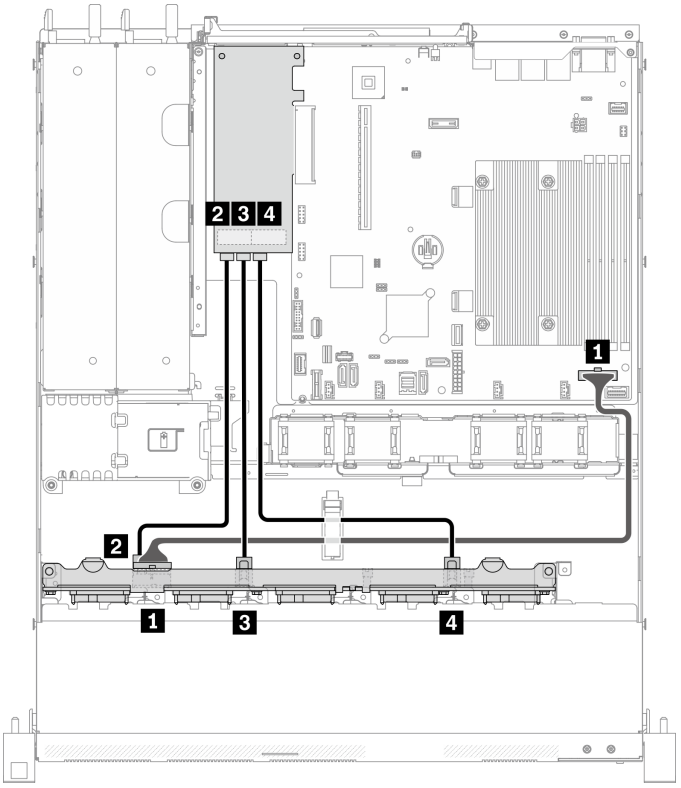
Ten 2.5-inch hot-swap drive cable routing

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.

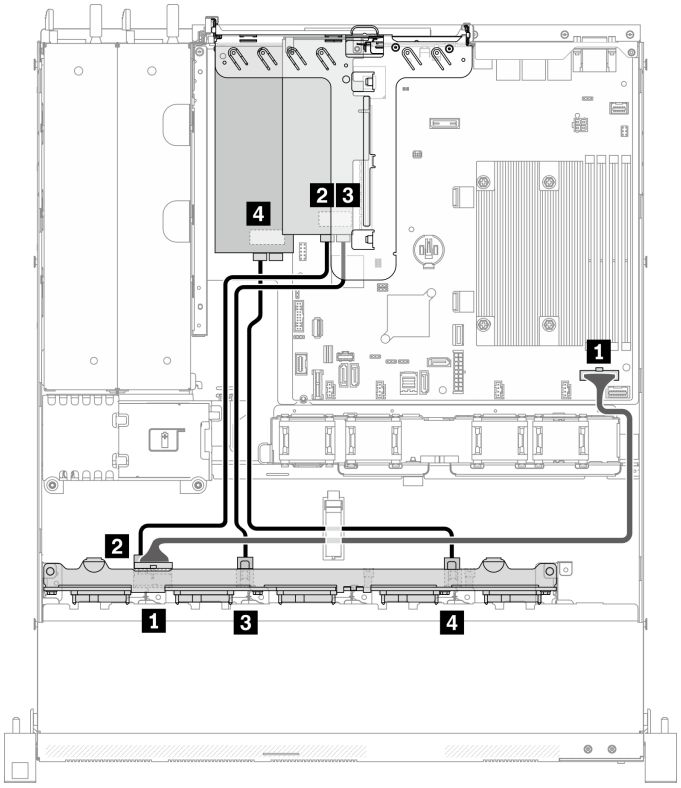
Ten SATA/SAS drives with one 16i (Hardware RAID/HBA)



From	To
1 Backplane: Power connector	System board: Backplane power connector
2 Backplane: SATA signal connector 1	16i: C0
3 Backplane: SATA signal connector 2	16i: C1
4 Backplane: SATA signal connector 3	16i: C2

Figure 42. Ten SATA/SAS drives with one 16i (Hardware RAID/HBA)

Ten SATA/SAS drives with two 8i (Hardware RAID/HBA)



From	To
1 Backplane: Power connector	System board: Backplane power connector
2 Backplane: SATA signal connector 1	8i: C0
3 Backplane: SATA signal connector 2	8i: C1
4 Backplane: SATA signal connector 3	8i: C0

Figure 43. Ten SATA/SAS drives with two 8i (Hardware RAID/HBA)

Chapter 4. Server hardware setup

To set up the server, install any options that have been purchased, cable the server, configure and update the firmware, and install the operating system.

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:

1. Unpack the server package. See “Server package contents” on page 1.
2. Set up the server hardware.
   a. Install any required hardware or server options. See the related topics in “Install server hardware options” on page 57.
   b. If necessary, install the server into a standard rack cabinet by using the rail kit shipped with the server. See the *Rack Installation Instructions* that comes with optional rail kit.
   c. Connect the Ethernet cables and power cords to the server. See “Rear view” on page 17 to locate the connectors. See “Cable the server” on page 81 for cabling best practices.
   d. Power on the server. See “Power on the server” on page 81.

      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 version compatible with your server at https://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html.
   e. Validate that the server hardware was set up successfully. See “Validate server setup” on page 81.
3. Configure the system.
   a. Connect the Lenovo XClarity Controller to the management network. See “Set the network connection for the Lenovo XClarity Controller” on page 83.
   b. Update the firmware for the server, if necessary. See “Update the firmware” on page 84.
   c. Configure the firmware for the server. See “Configure the firmware” on page 87.

      The following information is available for RAID configuration:

      - https://lenovopress.com/lp0578-lenovo-raid-introduction
      - https://lenovopress.com/lp0579-lenovo-raid-management-tools-and-resources
   d. Install the operating system. See “Deploy the operating system” on page 89.
   e. Back up the server configuration. See “Back up the server configuration” on page 90.
   f. Install the applications and programs for which the server is intended to be used.

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Installation Guidelines

Use the installation guidelines to install components in your server.

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:

    http://thinksystem.lenovofiles.com/help/topic/safety_documentation/pdf_files.html
  - The following guidelines are available as well: “Handling static-sensitive devices” on page 54 and “Working inside the server with the power on” on page 53.
- 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/.
- 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 ThinkSystem SR250 V2 Drivers and Software 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.
- 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.
- Make sure that you have an adequate number of properly grounded electrical outlets for the server, monitor, and other devices.
- 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 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.
- 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.
- Terra-cotta on a component or a terra-cotta label 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. (Terra-cotta can also indicate

touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.

- The Red strip on the drives, adjacent to the release latch, indicates that the drive can be hot-swapped if the server and operating system support hot-swap capability. This means that you can remove or install the drive while the server is still running.

  Note: See the system specific instructions for removing or installing a hot-swap drive for any additional procedures that you might need to perform before you remove or install the drive.
- After finishing working on the server, make sure you reinstall all safety shields, guards, labels, and ground wires.

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 since 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

Guidelines to work inside the server with the power on.

Attention: The server might stop and loss of data 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 long 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

Use this information to handle static-sensitive devices.

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

There are a number of criteria that must be followed when selecting and installing memory modules in your server.

See "Technical rules for memory modules" on page 54 for more information.

Technical rules

This topic provides technical rules for the server.

- "Memory module installation rules and order" on page 54
- "Technical rules for PCIe slots" on page 56

Technical rules for memory modules

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:

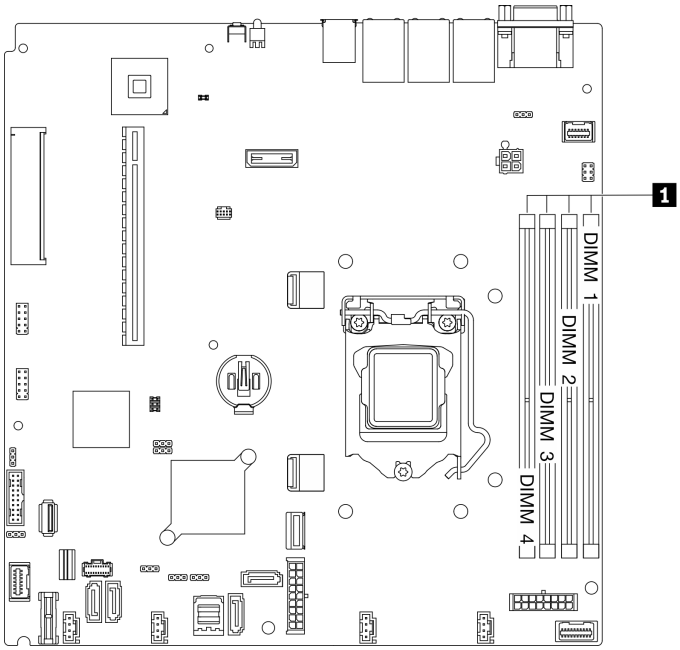


Figure 44. Location of the memory module slots on the system board

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:

- ThinkSystem 8GB TruDDR4 3200 MHz (1Rx8, 1.2V) ECC UDIMM
- ThinkSystem 16GB TruDDR4 3200 MHz (2Rx8, 1.2V) ECC UDIMM
- ThinkSystem 32GB TruDDR4 3200 MHz (2Rx8, 1.2V) ECC UDIMM

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.

The following table shows the memory module installation order:

Table 13. Memory module installation sequence

Total memory module installed	Memory module slot number			
	1	2	3	4
One			√	
Two	√		√	
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 card is installed in PCIe slot 1.
- 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

Installation priority	Component	PCIe slot priorities
1	• ThinkSystem NVIDIA Quadro RTX T1000 8GB PCIe Active GPU • ThinkSystem NVIDIA Quadro RTX T400 2GB PCIe Active GPU	Slot 2
2	Dummy PCIe card + M.2 SATA 2-Bay RAID Enablement Kit	Slot 2, then slot 3
3	• 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	Slot 2, then slot 3
4	ThinkSystem 430-8e SAS/SATA 12Gb HBA	Slot 2, then slot 1
5	Intel X710-DA4 4x10Gb SFP+ Adapter	Slot 2

Installation priority	Component	PCIe slot priorities
6	• Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter • Broadcom 57414 10/25GbE SFP28 2-port PCIe Ethernet Adapter • ThinkSystem Intel E810-DA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	Slot 1, then slot 2
7	• ThinkSystem Intel X710-T4L 10GBASE-T 4-Port PCIe Ethernet Adapter	Slot 2
8	• ThinkSystem Intel I350-T2 PCIe 1Gb 2-Port RJ45 Ethernet Adapter	Slot 1, then slot 2
9	• ThinkSystem Intel I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter • Broadcom 5719 1GbE RJ45 4-Port PCIe Ethernet Adapter	Slot 2
10	• Intel X550-T2 Dual Port 10G Base-T Adapter • Broadcom 5720 1GbE RJ45 2-Port PCIe Ethernet Adapter	Slot 1, then slot 2

Install server hardware options

This section includes instructions for performing initial installation of optional hardware. Each component installation procedure references any tasks that need to be performed to gain access to the component being replaced.

Installation procedures are presented in the optimum sequence to minimize work.

Attention: To ensure the components you install work correctly without problems, read the following precautions carefully.

- 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/.
- Always 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 ThinkSystem SR250 V2 Drivers and Software to download firmware updates for your server.
- It is good practice to make sure that the server is working correctly before you install an optional component.
- Follow the installation procedures in this section and use appropriate tools. Incorrectly installed components can cause system failure from damaged pins, damaged connectors, loose cabling, or loose components.

Remove the top cover

Use this information to remove the top cover.

About this task

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 the following section(s) to ensure that you work safely.
  - “Installation Guidelines” on page 52
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 82.
- If the server is installed in a rack, remove the server from the rack.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

Procedure

Step 1. Remove the top cover

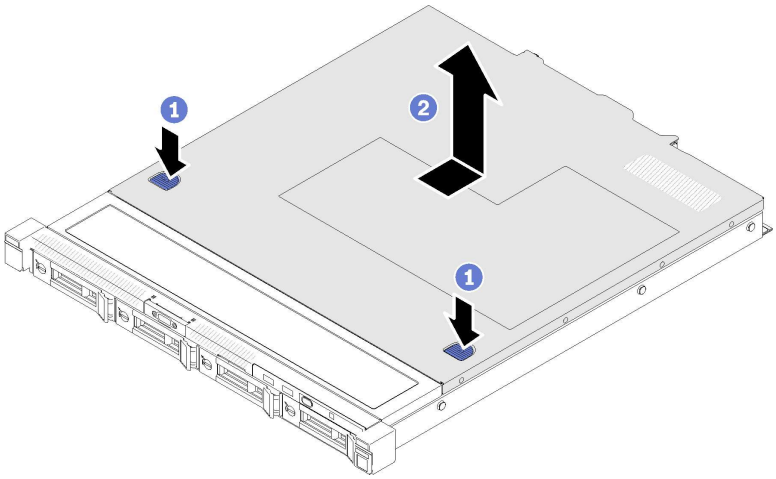


Figure 45. Top cover removal

a. 1 Press the release button and the push point at the same time; then, slide the cover toward the rear of the server.

b. 2 Lift the top cover away from the server.

Remove the air baffle

Use this information to remove the air baffle.

About this task

Attention:

- Read the following section(s) to ensure that you work safely.
  - "Installation Guidelines" on page 52
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 82.
- If the server is installed in a rack, remove the server from the rack.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

Procedure

Step 1. Lift the air baffle up and set it aside.

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.

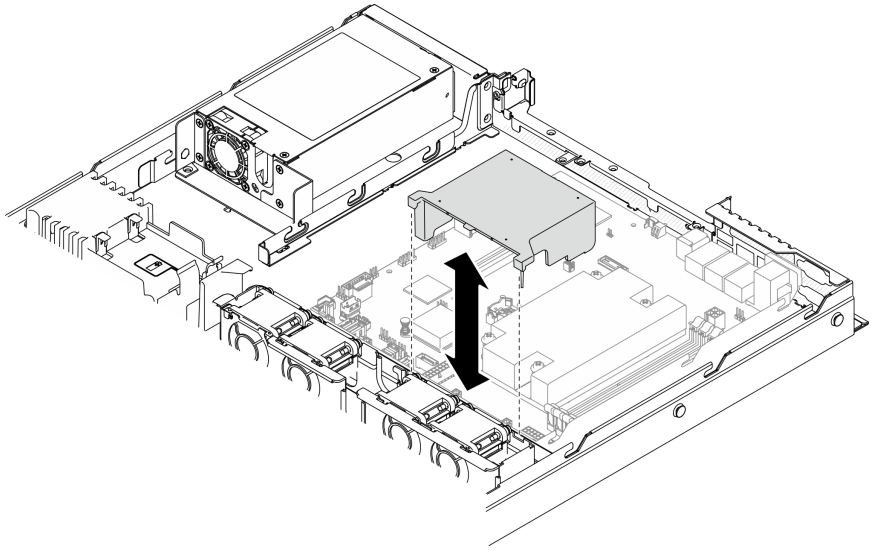


Figure 46. Air baffle removal

Remove the PCIe riser assembly

Use this information to remove the PCIe riser assembly.

About this task

Attention:

- Read the following section(s) to ensure that you work safely.
  - "Installation Guidelines" on page 52
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 82.
- If the server is installed in a rack, remove the server from the rack.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

Procedure

Step 1. 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.

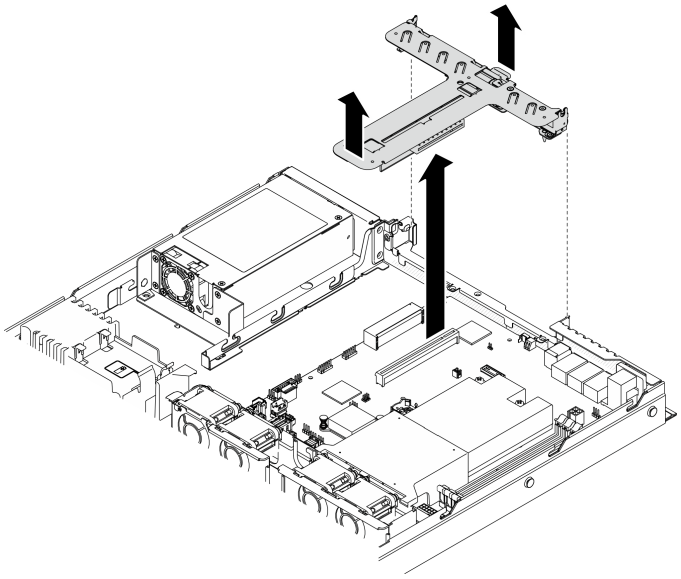


Figure 47. PCIe riser assembly removal

Install the M.2 boot adapter

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

About this task

Attention:

- Read the following section(s) to ensure that you work safely.
  - "Installation Guidelines" on page 52
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Note: The following illustration might differ slightly from your hardware, but the installation method is the same

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

Procedure

Step 1. 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.

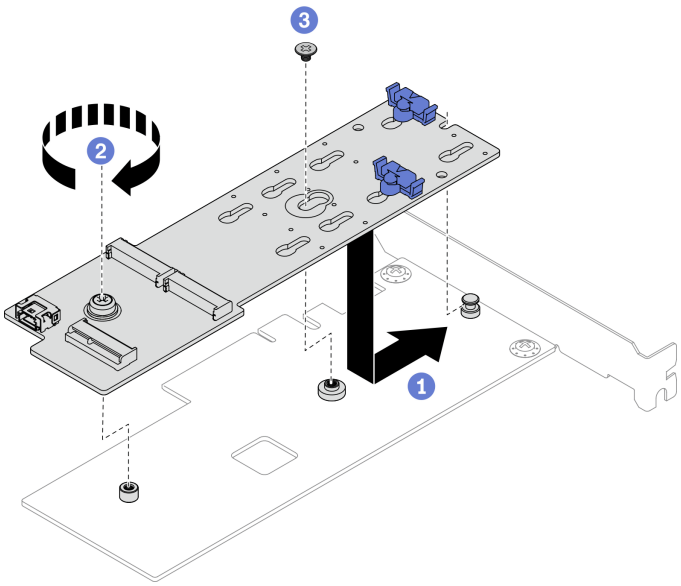


Figure 48. Installing the M.2 boot adapter

Step 2. Install the power and signal cables to the M.2 boot adapter.

a. ❶ Connect both the cables.

b. ❷ Fasten the screw that secures the signal cable to the M.2 boot adapter.

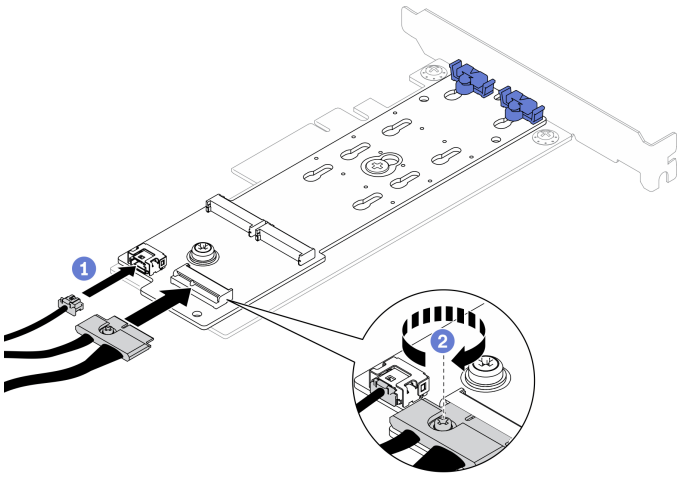


Figure 49. Connecting the power and signal cables

Install an M.2 drive

Use this information to install an M.2 drive.

Attention:

- Read the following section(s) to ensure that you work safely.
  - "Installation Guidelines" on page 52
- 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.

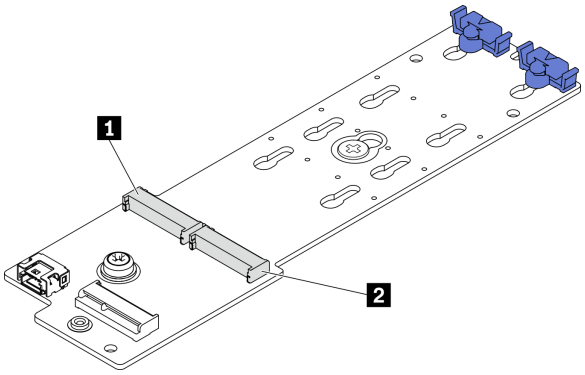


Figure 50. M.2 drive slot

Table 14. M.2 drive slot locations on M.2 boot adapter

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

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

Procedure

Step 1. Install the M.2 drive.

a. 1 Hold the M.2 drive at an angle, and insert it into the M.2 slot.

b. 2 Lower the M.2 drive.

c. 3 Slide the retainer toward the M.2 drive to secure it in place.

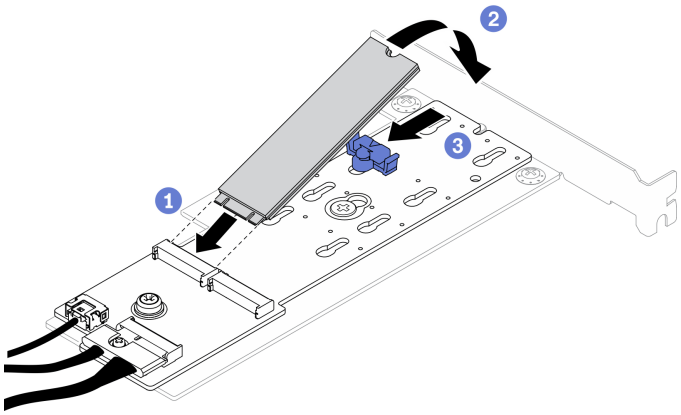


Figure 51. M.2 drive installation

Install a PCIe adapter (Riser)

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

About this task

Attention:

- Read the following section(s) to ensure that you work safely.

– “Installation Guidelines” on page 52

- 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:

- GPU adapters are only supported on servers with redundant power supply.
- 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

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

Procedure

Step 1. Connect all cables to the adapter.

Step 2. Install the bracket to 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 56.

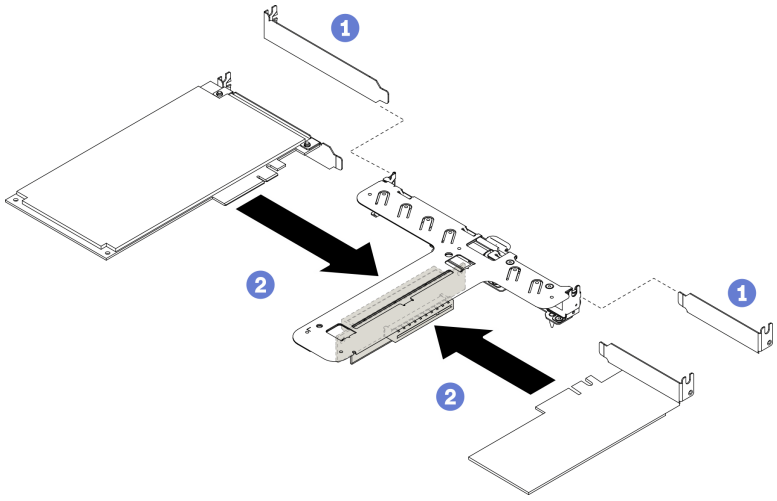


Figure 52. PCIe adapter installation

Notes:

- For the detail connectors on the PCIe riser card, see “PCIe riser assembly” on page 24.
- 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. 2 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.

Install the PCIe adapter (Slot 3)

Use this information to install the PCIe adapter to PCIe slot 3.

About this task

Attention:

- Read the following section(s) to ensure that you work safely.
  - “Installation Guidelines” on page 52
- 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:

- Locate the PCIe 3.0 x8 slot 3 connector. See “System-board connectors” on page 19.
- PCIe 3.0 x8 slot 3 connector is dedicated for a RAID adapter or M.2 boot adapter. Depending on your configuration, you can also install a RAID adapter or M.2 boot adapter in the PCIe riser assembly.
- The following illustration might differ slightly from your hardware, but the installation method is the same

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

Step 1. If a bracket is installed on the PCIe adapter, remove the two screws and remove the bracket.

Step 2. Connect all cables to the 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 56.

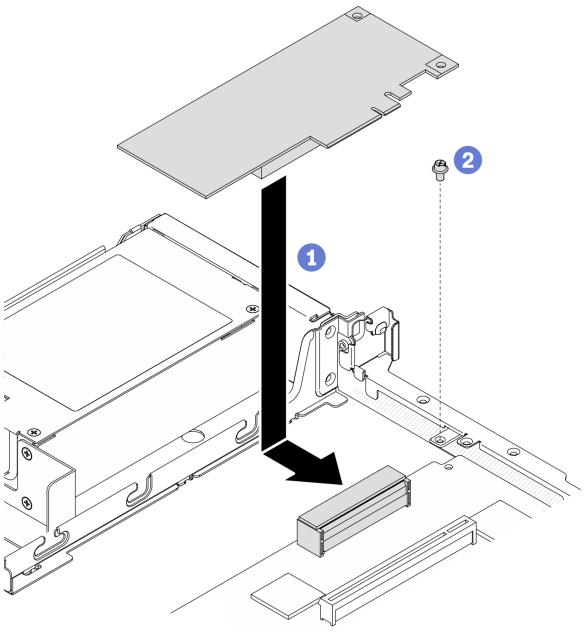


Figure 53. PCIe adapter installation

a. ❶ Lower the PCIe adapter into the server; then, firmly press it into the connector.

b. ❷ Install the screw to secure the PCIe adapter.

Install the PCIe riser assembly

Use this information to install the PCIe riser assembly.

About this task

Attention: Read the following section(s) to ensure that you work safely.

- “Installation Guidelines” on page 52

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

Procedure

Step 1. 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.

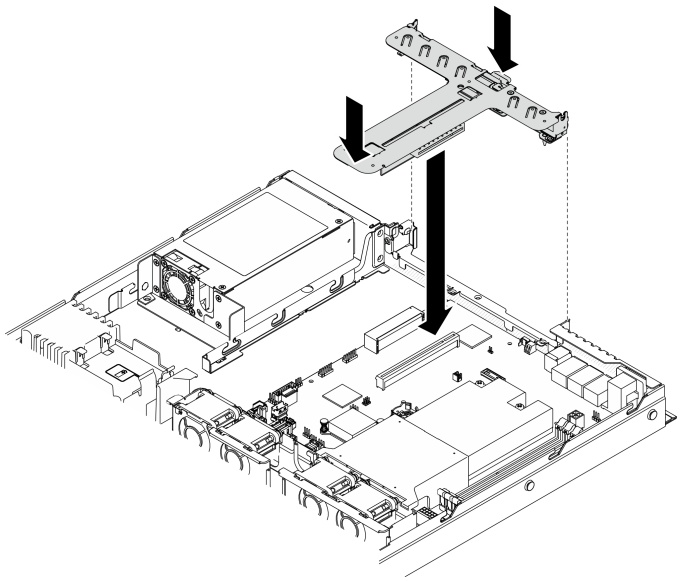


Figure 54. PCIe riser assembly installation

Step 2. Carefully press the riser assembly straight down into the slot until it is fully seated.

Install the flash power module

Use this information to install the flash power module.

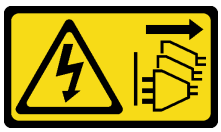
About this task

Attention:

- Read the following section(s) to ensure that you work safely.
  - “Installation Guidelines” on page 52

- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 82.
- If the server is installed in a rack, remove the server from the rack.
- To avoid possible danger, read and follow the following safety information.

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 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.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

Step 1. Install the flash power module.

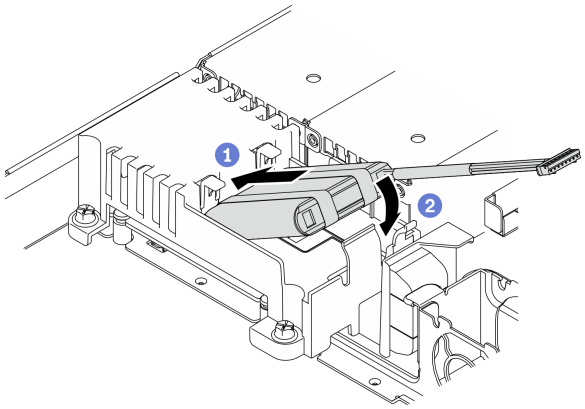


Figure 55. Flash power module installation

a. 1 Insert the end of the flash power module into its carrier.

b. 2 Rotate the flash power module down into the carrier until the tab clicks in place to secure it.

Install a memory module

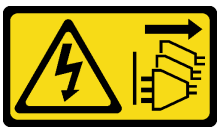
Use this information to install a memory module.

About this task

See “Memory module installation rules and order” on page 54 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.

Attention:

- Read the following section(s) to ensure that you work safely.
  - “Installation Guidelines” on page 52
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 82.
- 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. In addition to the standard guidelines for “Handling static-sensitive devices” on page 54:

- 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 touch. 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.

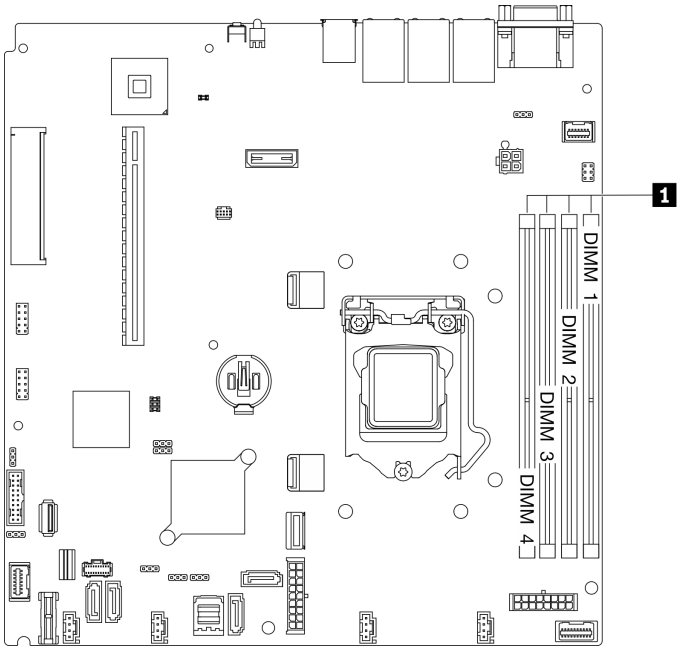
Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

Procedure

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

Note: Ensure that you observe the installation rules and sequence in “Memory module installation rules and order” on page 54.



1 Memory module slots

Figure 56. Memory module slots location

Step 2. Open the retaining clips outward on each end of the memory module slot.

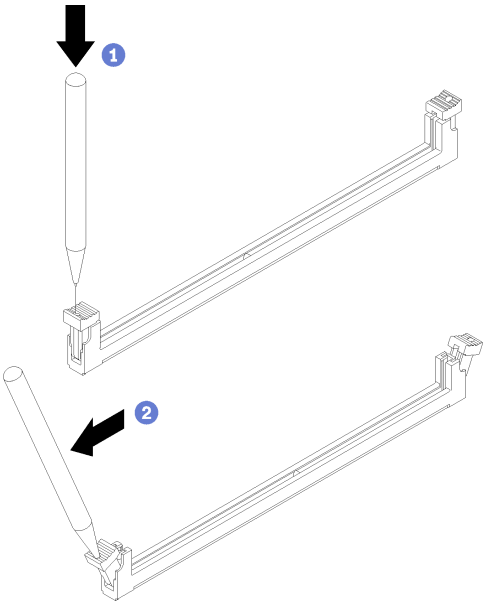


Figure 57. Opening retaining clips

Attention:

- To avoid breaking the retaining clips or damaging the memory module slots, handle the clips gently.
- If necessary, you can use a pointed tool to open the retaining clips due to space constraints. Pencils are not recommended as a tool as they may not be strong enough.

a. 1 Place the tip of the tool in the recess on the top of the retaining clip.

b. 2 Carefully rotate the retaining clip away from the memory module slot.

Step 3. Install the memory module.

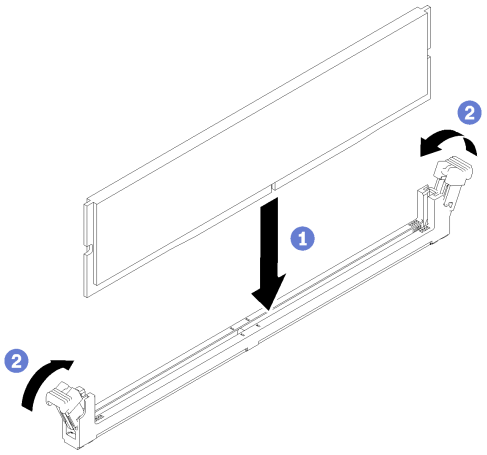


Figure 58. Memory module installation

a. 1 Make sure they are in the fully-open position. Align the keys on the memory module with the connector.

b. 2 Firmly press both ends of the memory module straight down into the connector until the retaining clips snap into the locked position.

Install the 2.5-inch backplane

Use this information to install the 2.5-inch backplane.

About this task

Attention:

- Read the following section(s) to ensure that you work safely.
  - “Installation Guidelines” on page 52

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

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

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.

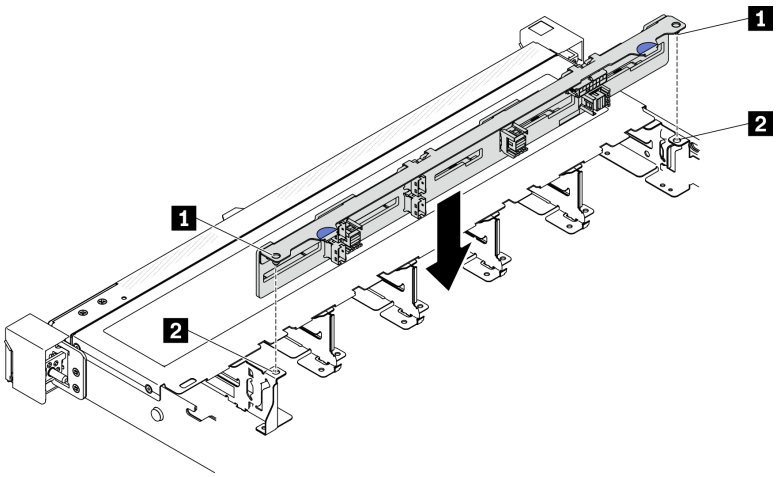


Figure 59. 2.5-inch backplane installation

1 Pins	2 Corresponding holes

Install the 3.5-inch backplane

Use this information to install the 3.5-inch backplane.

About this task

Attention:

- Read the following section(s) to ensure that you work safely.
  - “Installation Guidelines” on page 52

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

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

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.

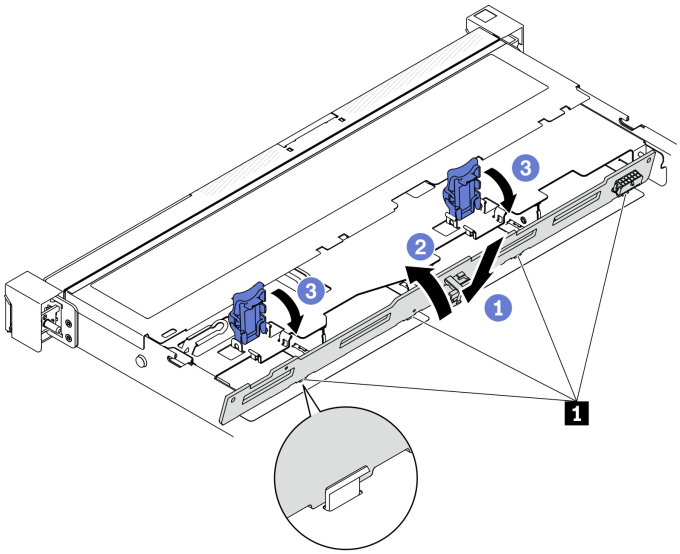


Figure 60. 3.5-inch backplane installation

1 Pin

Install the 3.5-inch backplate

Use this information to install the 3.5-inch backplate.

About this task

Attention:

- Read the following section(s) to ensure that you work safely.
  - "Installation Guidelines" on page 52
- Depending on the configuration, the following illustration might differ slightly from your backplate.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

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.

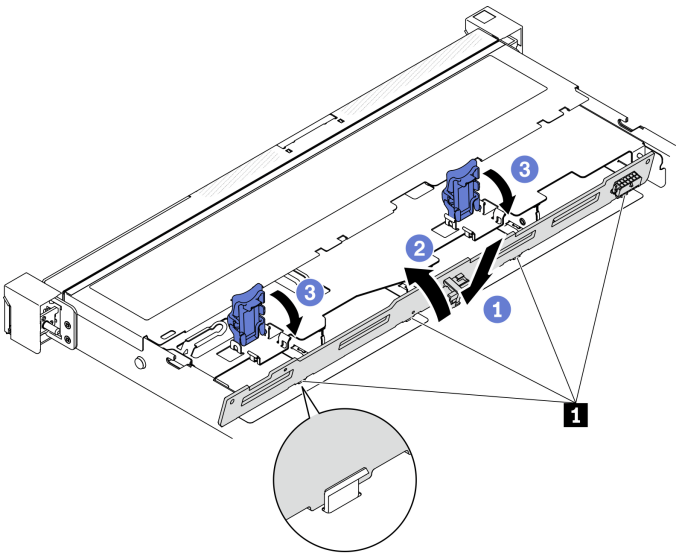


Figure 61. Backplate installation

1 Pin

Install the air baffle

Use this information to install the air baffle.

About this task

Attention:

- Read the following section(s) to ensure that you work safely.
  - "Installation Guidelines" on page 52
- 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.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

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.

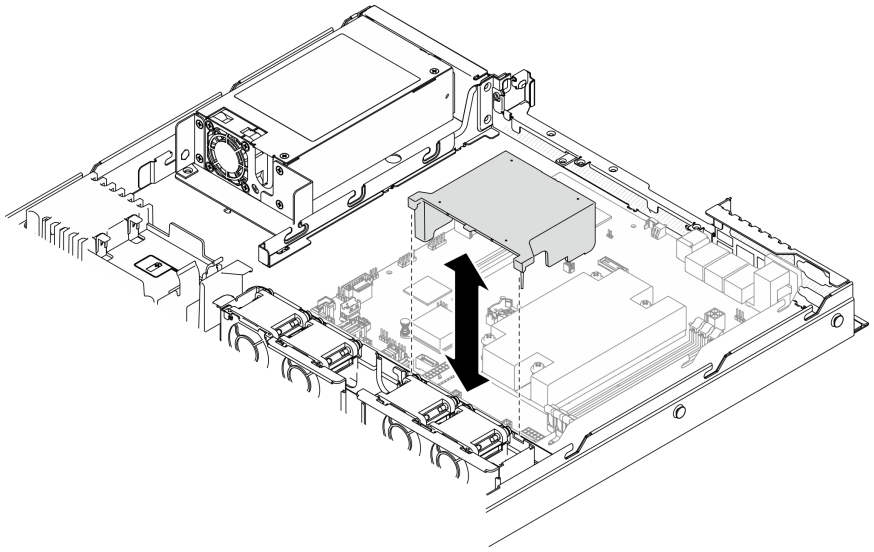


Figure 62. Air baffle installation

Install the top cover

Use this information to install the top cover.

About this task

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 the following section(s) to ensure that you work safely.
  - “Installation Guidelines” on page 52
- 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 3 “Internal cable routing” on page 33.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

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 toward the front of the server until it clicks into place.

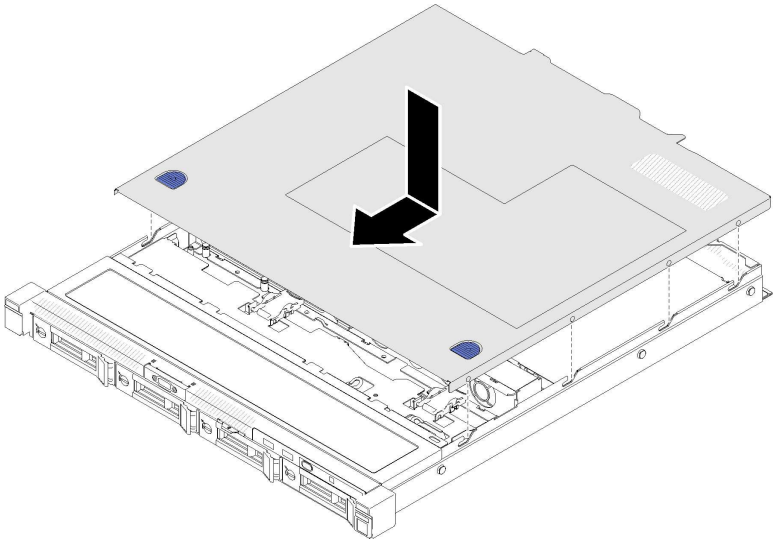


Figure 63. Top cover installation

Install a hot-swap power supply unit

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

About this task

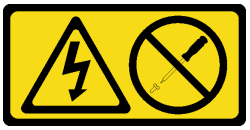
S001

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.**

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 the following section(s) to ensure that you work safely.
  - "Installation Guidelines" on page 52
- 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-BPZOAqQMD37KjuxaVHVBkH.

Procedure

Step 1. Remove the power supply filler if necessary.

Step 2. Align the power supply unit with the bay; then, slide the power supply unit into the bay until it snaps into position.

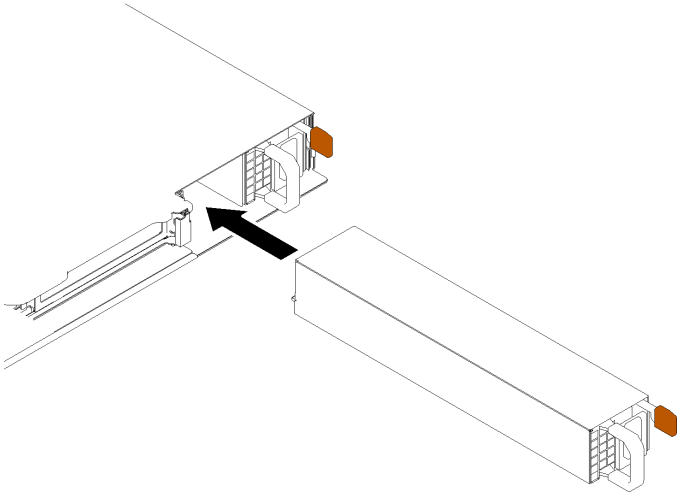


Figure 64. Hot-swap power supply unit installation

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 the following section(s) to ensure that you work safely.
  - "Installation Guidelines" on page 52
- Turn off the server. Disconnect the power cords and all external cables. See "Power off the server" on page 82.
- Touch the static-protective package that contains the drive to any unpainted metal surface on the server; then, remove the drive 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.
- 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.
- 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.

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 14.
- 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/.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

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.

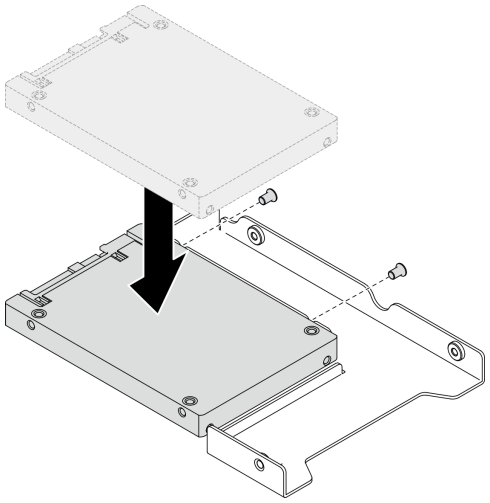


Figure 65. 2.5-inch drive installation to drive adapter

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.

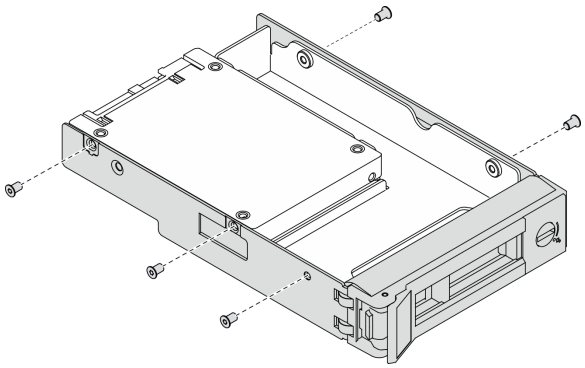


Figure 66. Installing the screws that secure the 2.5-inch drive and the drive adapter

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 78.

Install a simple-swap drive

Use this information to install a simple-swap drive.

About this task

Attention:

- Read the following section(s) to ensure that you work safely.
  - “Installation Guidelines” on page 52
- Touch the static-protective package that contains the drive to any unpainted metal surface on the server; then, remove the drive 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 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 backplanes or drive cables, back up all important data that is stored on drives.
- Before you remove any component of a RAID array (drive, RAID card, etc.), back up all RAID configuration information.

Notes:

- Locate the documentation that comes with the drive and follow those instructions in addition to the instructions in this chapter.
- Depending on your server models, your server supports the following drive types:
  - Four 3.5-inch simple-swap SATA drives
  - Three 3.5-inch simple-swap SATA drives and one NVMe drive
- 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 14.
- 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/.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

Procedure

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

Step 2. Install the simple-swap drive.

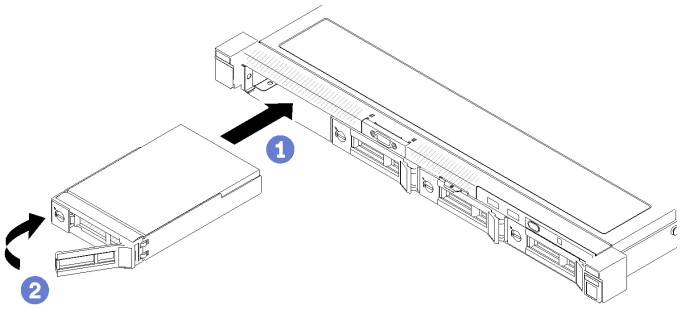


Figure 67. Simple-swap drive installation

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.

Install a hot-swap drive

Use this information to install a hot-swap drive.

About this task

Attention:

- Read the following section(s) to ensure that you work safely.
  - “Installation Guidelines” on page 52
- Remove the filler panel from the drive bay. Keep the filler panel in a safe place.
- Touch the static-protective package that contains the drive to any unpainted metal surface on the server; then, remove the drive 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 simple-swap 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.
- 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.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BPZOAqQMD37KjuxaVHVBkH.

Procedure

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

Step 2. Install the hot-swap drive.

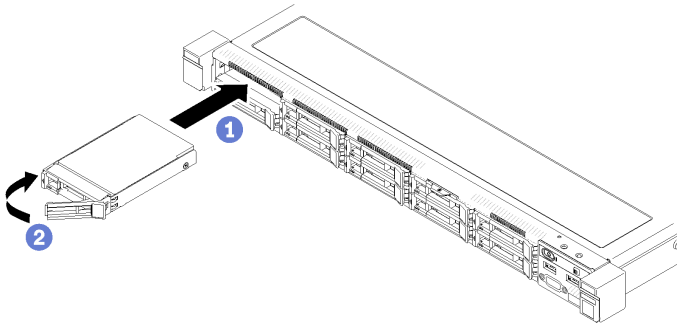


Figure 68. 2.5-inch hot-swap drive installation

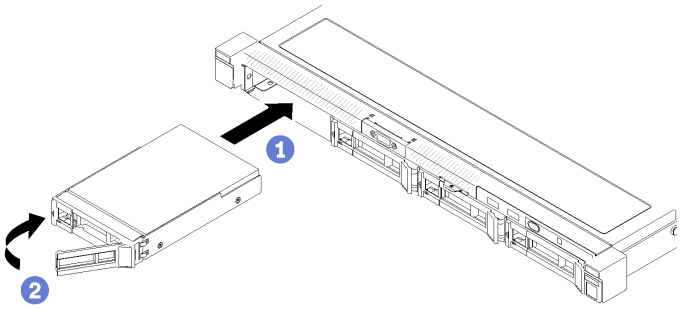


Figure 69. 3.5-inch hot-swap drive installation

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.

Install the server in a rack

To install the server in a rack, follow the instructions that are provided in the Rail Installation Kit for the rails on which the server will be installed.

Cable the server

Attach all external cables to the server. Typically, you will need to connect the server to a power source, to the data network, and to storage. In addition, you will need to connect the server to the management network.

Connect to power

Connect the server to power.

Connect to the network

Connect the server to the network.

Connect to storage

Connect the server to any storage devices.

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).

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

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

For information about powering off the server, see “Power off the server” on page 82.

Validate server setup

After powering up the server, make sure that the LEDs are lit and that they are green.

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.

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

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

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

When in a standby state, the server can respond to remote power-on requests sent to the Lenovo XClarity Controller. For information about powering on the server, see “Power on the server” on page 81.

Chapter 5. 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://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.)
  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 attached to the server, you can set the network connection through the Lenovo XClarity Controller interface. Connect an Ethernet cable from your laptop to Lenovo XClarity Controller connector, which is located at the rear of the server. For the location of the Lenovo XClarity Controller connector, see “Rear view” on page 17.

  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.
- 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 front of the server. For the location of the Lenovo XClarity Controller USB connector, see “Front view” on page 14.

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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 blue ID button on the front panel for at least 3 seconds until its LED flashes slowly (once every couple of seconds).

To connect using the Lenovo XClarity Administrator Mobile app:

1. Connect the USB cable of your mobile device to the Lenovo XClarity Administrator USB connector on the front panel.
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:

http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/lxca_usemobileapp.html

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:
  - http://lenovopress.com/LP0656
- The latest firmware can be found at the following site:
  - https://datacentersupport.lenovo.com/products/servers/thinksystem/sr250v2/downloads/driver-list/
- You can subscribe to product notification to stay up to date on firmware updates:
  - https://datacentersupport.lenovo.com/tw/en/solutions/ht509500

UpdateXpress System Packs (UXSPs)

Lenovo typically releases firmware in bundles called UpdateXpress System Packs (UXSPs). 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.
- **UpdateXpress System Packs (UXSPs)**. UXSPs are bundled updates designed and tested to provide the interdependent level of functionality, performance, and compatibility. UXSPs 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 UXSPs 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	Graphical user interface	Command line interface	Supports UXSPs
Lenovo XClarity Provisioning Manager (LXPM)	In-band[2] On-Target	√		√		
Lenovo XClarity Controller (XCC)	Out-of-band Off-Target	√	Selected I/O devices	√		
Lenovo XClarity Essentials OneCLI (OneCLI)	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√	√
Lenovo XClarity Essentials UpdateXpress (LXCE)	In-band Out-of-band On-Target Off-Target	√	All I/O devices	√		√
Lenovo XClarity Essentials Bootable Media Creator (BoMC)	In-band Out-of-band Off-Target	√	All I/O devices	√ (BoMC application)	√ (BoMC application)	√
Lenovo XClarity Administrator (LXCA)	In-band[1] Out-of-band[2] Off-Target	√	All I/O devices	√		√
Lenovo XClarity Integrator (LXCI) for VMware vCenter	Out-of-band Off-Target	√	Selected I/O devices	√		
Lenovo XClarity Integrator (LXCI) for Microsoft Windows Admin Center	In-band Out-of-band On-Target Off-Target	√	All I/O devices	√		√

Tool	Update Methods Supported	Core System Firmware Updates	I/O Devices Firmware Updates	Graphical user interface	Command line interface	Supports UXSPs
Lenovo XClarity Integrator (LXCI) for Microsoft System Center Configuration Manager	In-band On-Target	√	All I/O devices	√		√

Notes:

1. For I/O firmware updates.
2. For BMC and UEFI firmware updates.

- **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://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html

- **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://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html

  – 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://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html

- **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:

  http://sysmgt.lenovofiles.com/help/topic/toolsctr_cli_lenovo/onecli_c_update.html

- **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 UpdateXpress System Pack (UXSP) update packages and individual updates. UpdateXpress System 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:

  http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/update_fw.html

- **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://sysmgt.lenovofiles.com/help/topic/lxci/lxci_product_page.html

Configure the firmware

Several options are available to install and set up the firmware for the server.

Important: Do not configure option ROMs to be set to **Legacy** unless directed to do so by Lenovo Support. This setting prevents UEFI drivers for the slot devices from loading, which can cause negative side effects for Lenovo software, such as Lenovo XClarity Administrator and Lenovo XClarity Essentials OneCLI, and to the Lenovo XClarity Controller. The side effects include the inability to determine adapter card details, such as model name and firmware levels. When adapter card information is not available, generic information for the model name, such as "Adapter 06:00:00" instead of the actually model name, such as "ThinkSystem RAID 930-16i 4GB Flash." In some cases, the UEFI boot process might also hang.

- **Lenovo XClarity Provisioning Manager**

  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:

- *Lenovo XClarity Provisioning Manager User Guide*
  - Search for the LXPM documentation version compatible with your server at https://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html
- *UEFI User Guide*
  - https://thinksystem.lenovofiles.com/help/topic/dcg_uefi/overview_dcg_uefi.html

- **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:

  http://sysmgt.lenovofiles.com/help/topic/toolsctr_cli_lenovo/onecli_c_settings_info_commands.html

- **Lenovo XClarity Administrator**

  You can quickly provision and pre-provision all of your servers using a consistent configuration. Configuration settings (such as local storage, I/O adapters, boot settings, firmware, ports, and Lenovo XClarity Controller and UEFI settings) are saved as a server pattern that can be applied to one or more managed servers. When the server patterns are updated, the changes are automatically deployed to the applied servers.

  Specific details about updating firmware using Lenovo XClarity Administrator are available at:

  http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/server_configuring.html

- **Lenovo XClarity Controller**

  You can configure the management processor for the server through the Lenovo XClarity Controller Web interface or through the command-line interface.

  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://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html

Memory configuration

Memory performance depends on several variables, such as memory mode, memory speed, memory ranks, memory population and processor.

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

https://lenovopress.com/servers/options/memory

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

http://1config.lenovo.com/#/memory_configuration

For specific information about the required installation order of memory modules in your server based on the system configuration and memory mode that you are implementing, see the *ThinkSystem SR250 V2 Memory Population Reference*.

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.com/lp0578-lenovo-raid-introduction

Detailed information about RAID management tools and resources is available at the following Lenovo Press website:

https://lenovopress.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.com/osig.

Tool-based deployment

- **Multi-server**

  Available tools:

  - Lenovo XClarity Administrator

    http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/compute_node_image_deployment.html
  - Lenovo XClarity Essentials OneCLI

    http://sysmgt.lenovofiles.com/help/topic/toolsctr_cli_lenovo/onecli_r_uxspi_proxy_tool.html
  - Lenovo XClarity Integrator deployment pack for SCCM (for Windows operating system only)

https://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxci_deploypack_sccm.doc/dpsccm_c_endtoend_deploy_scenario.html

- **Single-server**

  Available tools:

  – Lenovo XClarity Provisioning Manager

  “OS Installation” section in the LXPM documentation compatible with your server at https://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html

  – Lenovo XClarity Essentials OneCLI

  http://sysmgt.lenovofiles.com/help/topic/toolsctr_cli_lenovo/onecli_r_uxspi_proxy_tool.html

  – Lenovo XClarity Integrator deployment pack for SCCM (for Windows operating system only)

  https://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxci_deploypack_sccm.doc/dpsccm_c_endtoend_deploy_scenario.html

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://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html.

  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:

  http://sysmgt.lenovofiles.com/help/topic/toolsctr_cli_lenovo/onecli_r_save_command.html

- **Operating system**

  Use your backup methods to back up the operating system and user data for the server.

Update the Vital Product Data (VPD)

After initial setup of the system, you can update some Vital Product Data (VPD), such as asset tag and Universal Unique Identifier (UUID).

Update the Universal Unique Identifier (UUID)

Optionally, you can update the Universal Unique Identifier (UUID).

There are two methods available to update the UUID:

- From Lenovo XClarity Provisioning Manager

  To update the UUID from Lenovo XClarity Provisioning Manager:

  1. Start the server and press the key according to the on-screen instructions. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at https://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.) The Lenovo XClarity Provisioning Manager interface is displayed by default.
  2. If the power-on Administrator password is required, enter the password.
  3. From the System Summary page, click **Update VPD**.
  4. Update the UUID.

- From Lenovo XClarity Essentials OneCLI

  Lenovo XClarity Essentials OneCLI sets the UUID in the Lenovo XClarity Controller. Select one of the following methods to access the Lenovo XClarity Controller and set the UUID:

  – Operate from the target system, such as LAN or keyboard console style (KCS) access
  – Remote access to the target system (TCP/IP based)

  To update the UUID 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. Copy and unpack the OneCLI package, which also includes other required files, to the server. Make sure that you unpack the OneCLI and the required files to the same directory.
  3. After you have Lenovo XClarity Essentials OneCLI in place, type the following command to set the UUID:

     ```
     onecli config createuuid SYSTEM_PROD_DATA.SysInfoUUID [access_method]
     ```

     Where:

     [access_method]
     The access method that you select to use from the following methods:

     – Online authenticated LAN access, type the command:
     `[--bmc-username <xcc_user_id> --bmc-password <xcc_password>]`

       Where:

       xcc_user_id
       The BMC/IMM/XCC account name (1 of 12 accounts). The default value is USERID.

       xcc_password
       The BMC/IMM/XCC account password (1 of 12 accounts).

       Example command is as follows:
       ```
       onecli config createuuid SYSTEM_PROD_DATA.SysInfoUUID --bmc-username <xcc_user_id>
       --bmc-password <xcc_password>
       ```

     – Online KCS access (unauthenticated and user restricted):

       You do not need to specify a value for *access_method* when you use this access method.

       Example command is as follows:

```
onecli config createuuid SYSTEM_PROD_DATA.SysInfoUUID
```

Note: The KCS access method uses the IPMI/KCS interface, which requires that the IPMI driver be installed.

– Remote LAN access, type the command:
```
[--bmc <xcc_user_id>:<xcc_password>@<xcc_external_ip>]
```

Where:

xcc_external_ip
The BMC/IMM/XCC external IP address. There is no default value. This parameter is required.

xcc_user_id
The BMC/IMM/XCC account name (1 of 12 accounts). The default value is USERID.

xcc_password
The BMC/IMM/XCC account password (1 of 12 accounts).

Note: BMC, IMM, or XCC external IP address, account name, and password are all valid for this command.

Example command is as follows:
```
onecli config createuuid SYSTEM_PROD_DATA.SysInfoUUID --bmc <xcc_user_id>:<xcc_
password>@<xcc_external_ip>
```

4. Restart the Lenovo XClarity Controller.
5. Restart the server.

Update the asset tag

Optionally, you can update the asset tag.

There are two methods available to update the asset tag:

- From Lenovo XClarity Provisioning Manager

  To update the asset tag 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.
  2. If the power-on Administrator password is required, enter the password.
  3. From the System Summary page, click **Update VPD**.
  4. Update the asset tag information.

- From Lenovo XClarity Essentials OneCLI

  Lenovo XClarity Essentials OneCLI sets the asset tag in the Lenovo XClarity Controller. Select one of the following methods to access the Lenovo XClarity Controller and set the asset tag:

  – Operate from the target system, such as LAN or keyboard console style (KCS) access
  – Remote access to the target system (TCP/IP based)

  To update the asset tag 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. Copy and unpack the OneCLI package, which also includes other required files, to the server. Make sure that you unpack the OneCLI and the required files to the same directory.
3. After you have Lenovo XClarity Essentials OneCLI in place, type the following command to set the DMI:
   `onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag> [access_method]`

   Where:

   <asset_tag>
   The server asset tag number. Type `aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa`, where *aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa* is the asset tag number.

   [access_method]
   The access method that you select to use from the following methods:

   - Online authenticated LAN access, type the command:
     `[--bmc-username <xcc_user_id> --bmc-password <xcc_password>]`

     Where:

     xcc_user_id
     The BMC/IMM/XCC account name (1 of 12 accounts). The default value is USERID.

     xcc_password
     The BMC/IMM/XCC account password (1 of 12 accounts).

     Example command is as follows:

     ```
     onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag> --bmc-username <xcc_
     user_id> --bmc-password <xcc_password>
     ```

   - Online KCS access (unauthenticated and user restricted):

     You do not need to specify a value for *access_method* when you use this access method.

     Example command is as follows:

     ```
     onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag>
     ```

     Note: The KCS access method uses the IPMI/KCS interface, which requires that the IPMI driver be installed.

   - Remote LAN access, type the command:
     `[--bmc <xcc_user_id>:<xcc_password>@<xcc_external_ip>]`

     Where:

     xcc_external_ip
     The BMC/IMM/XCC IP address. There is no default value. This parameter is required.

     xcc_user_id
     The BMC/IMM/XCC account (1 of 12 accounts). The default value is USERID.

     xcc_password
     The BMC/IMM/XCC account password (1 of 12 accounts).

     Note: BMC, IMM, or XCC internal LAN/USB IP address, account name, and password are all valid for this command.

     Example command is as follows:

```
onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag> --bmc <xcc_user_id>:
<xcc_password>@<xcc_external_ip>
```

4. Reset the Lenovo XClarity Controller to the factory defaults. See “Resetting the BMC to Factory Default” section in the XCC documentation compatible with your server at https://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html.

Chapter 6. Resolving installation issues

Use this information to resolve issues that you might have when setting up your system.

Use the information in this section to diagnose and resolve problems that you might encounter during the initial installation and setup of your server.

- “Server does not power on” on page 95
- “The server immediately displays the POST Event Viewer when it is turned on” on page 95
- “Embedded hypervisor is not in the boot list” on page 96
- “Server cannot recognize a hard drive” on page 96
- “Displayed system memory is less than installed physical memory” on page 97
- “A Lenovo optional device that was just installed does not work.” on page 97
- “Voltage planar fault is displayed in the event log” on page 98

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.
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 (one processor, one memory module and one PSU without any adapter and any drive installed).
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 replacement is necessary.

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 light path diagnostics LEDs.
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

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Embedded hypervisor is not in the boot list

Complete the following steps until the problem is solved.

1. If the server has been installed, moved, or serviced recently, or if this is the first time the embedded hypervisor is being used, make sure that the device is connected properly and that there is no physical damage to the connectors.
2. See the documentation that comes with the optional embedded hypervisor flash device for setup and configuration information.
3. Check https://serverproven.lenovo.com/ to validate that the embedded hypervisor device is supported for the server.
4. Make sure that the embedded hypervisor device is listed in the list of available boot options. From the management controller user interface, click **Server Configuration → Boot Options**.

   For information about accessing the management controller user interface, see "Opening and Using the XClarity Controller Web Interface" section in the XCC documentation compatible with your server at:

   https://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html
5. Check http://datacentersupport.lenovo.com for any tech tips (service bulletins) related to the embedded hypervisor and the server.
6. Make sure that other software works on the server to ensure that it is working properly.

Server cannot recognize a hard drive

Complete the following steps until the problem is solved.

1. Observe the associated yellow hard disk 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 hard disk drive backplane.
3. Observe the associated green hard disk 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 hard disk 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://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.)You can perform hard drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → HDD test/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 hard disk 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. If the activity of the LEDs remains the same, go to step Hard disk drive problems. If the activity of the LEDs changes, return to step 1.
4. Make sure that the hard disk 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 hard disk 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://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.) You can perform hard drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → HDD test/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.

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 on the operator information panel.
   - No memory module error LEDs are lit on the system board.
   - Memory mirrored channel does not account for the discrepancy.
   - The memory modules are seated correctly.
   - You have installed the correct type of memory module.
   - After changing or replacing a memory module, memory configuration is updated accordingly in the Setup Utility.
   - All banks of memory are enabled. The server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.
   - There is no memory mismatch when the server is at the minimum memory configuration.
2. Reseat the memory modules, and then restart the server.
3. Check the POST error log:
   - If a memory module was disabled by a systems-management interrupt (SMI), replace the memory module.
   - If a memory module was disabled by the user or by POST, reseat the memory module; then, run the Setup Utility and enable the memory module.
4. Re-enable all memory modules using the Setup Utility, and then restart the server.
5. (Trained technician only) Install the failing memory module into a memory module connector for processor 2 (if installed) to verify that the problem is not the processor or the memory module connector.
6. (Trained technician only) Replace the system board.

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://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.) Whenever memory or any other device is changed, you must update the configuration.

2. Reseat the device that you have just installed.
3. Replace the device that you have just installed.
4. Reseat the cable connection and check there is no physical damage to the cable.
5. If there is any cable damages, then replace the cable.

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 memory modules.
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.

Appendix A. 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: This section includes references to IBM web sites and information about obtaining service. 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 Lenovo product documentation 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:

http://thinksystem.lenovofiles.com/help/index.jsp

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. 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.
- If you have installed new hardware or software in your environment, check https://serverproven.lenovo.com/ to make sure that the hardware and software is supported by your product.
- Go to http://datacentersupport.lenovo.com and check for information to help you solve the problem.
  - Check the Lenovo forums at https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg to see if someone else has encountered a similar problem.

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 Lenovo product documentation 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

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messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

Gathering information needed to call Support

If you believe that you require warranty service for your Lenovo product, the service technicians will be able to assist you more efficiently if you prepare before you call. You can also see 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)
- 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 “Downloading service data” section in the XCC documentation version compatible with your server at https://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html.
  - For more information about using the CLI to collect service data, see the “ffdc command” section in the XCC documentation version compatible with your server at https://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html.

- **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 Center.

You can find more information about setting up automatic problem notification within the Lenovo XClarity Administrator at http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/admin_setupcallhome.html.

- **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 http://sysmgt.lenovofiles.com/help/topic/toolsctr_cli_lenovo/onecli_r_getinfor_command.html.

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 B. Trademarks

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Index

2.5-inch drive into a 3.5-inch drive bay
  installing 77

B

back up the server configuration 90

C

collecting service data 100
configure the firmware 87
contamination, particulate and gaseous 7
creating a personalized support web page 99
custom support web page 99

G

gaseous contamination 7
Getting help 99

H

hardware service and support telephone numbers 101
help 99

I

installing
  2.5-inch drive into a 3.5-inch drive bay 77

L

Lenovo Capacity Planner 8
Lenovo XClarity Essentials 8
Lenovo XClarity Provisioning Manager 8

M

management offerings 8

P

particulate contamination 7

S

safety iii
safety inspection checklist iv
server setup checklist 51
service and support
  before you call 99
  hardware 101
  software 101
service data 100
software service and support telephone numbers 101
support web page, custom 99

T

technical rules 54
telephone numbers 101
trademarks 103

U

update the firmware 84
updating
  asset tag 92
  Universal Unique Identifier (UUID) 90

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