



ThinkSystem SR150 Setup Guide



Machine Type: 7Y54

Note

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

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

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

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

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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



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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

ཐོན་ཁུངས་འདི་བདེ་སྤྱོད་མ་བྱས་གོང་། སྐྱོར་གྱི་ཡིད་གཟབ་
བྱ་འདྲ་མིན་ཡིད་པའི་འོད་ཟེར་བལྟ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

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canjbinj soengq cungj vahgangj ancien siusik.

Safety inspection checklist

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

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.

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.

Chapter 1. Introduction

The ThinkSystem SR150 is a 1U rack server designed for high-volume network transaction processing. This high-performance, multi-core server is ideally suited for networking environments that require superior processor performance, input/output (I/O) flexibility, and high manageability.

Note: ThinkSystem SR150 is the model for the global market, while SR158 is the model only sold in Chinese Mainland.

In addition, the system service label on the top cover of the server provides a QR code for mobile access to service information. You can scan the QR code with a mobile device for quick access to additional information including parts installation, replacement, and error codes.

Following illustration is the QR code:

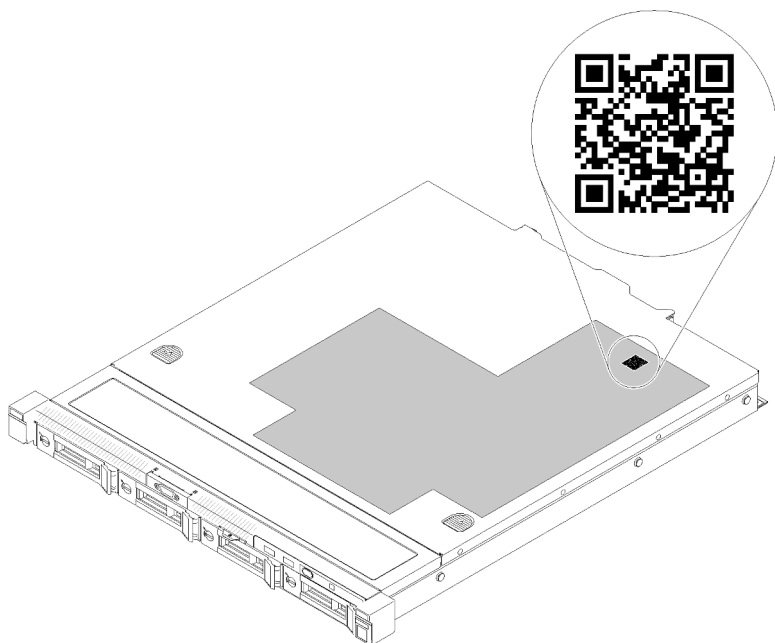


Figure 1. QR code

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 rail installation guide and accessory kit.

Features

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

Your server implements the following features and technologies:

- **Features on Demand**

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

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

- **Lenovo XClarity Controller (XCC)**

The Lenovo XClarity Controller is the common management controller for Lenovo ThinkSystem server hardware. The Lenovo XClarity Controller consolidates multiple management functions in a single chip on the server system board.

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://pubs.lenovo.com/lxcc-overview/>

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://pubs.lenovo.com/lxcc-overview/>.

- **UEFI-compliant server firmware**

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

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

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

- **Large system-memory capacity**

The server supports unbuffered dual inline memory modules (UDIMMs) with error correcting code (ECC). For more information about the specific types and maximum amount of memory, see “Specifications” on page 3.

- **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, when the software is available.

- **Large data-storage capacity**

The server models support the maximum of four 3.5-inch simple-swap Serial Attached SCSI (SAS) or Serial ATA (SATA) hard-disk drives.

- **Light path diagnostics**

Light path diagnostics provides LEDs to help you diagnose problems. For more information about the light path diagnostics, see “Light path diagnostics” in *ThinkSystem SR150 Maintenance Manual*.

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

The server provides a QR code on the system service label, which is on the top 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 and replacement videos, and error codes for server support.

- **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.

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
Size	<p>1U server</p> <ul style="list-style-type: none"> • Height: 43.0 mm (1.7 inches) • Width: <ul style="list-style-type: none"> – With rack latches: 481.7 mm (18.9 inches) – Without rack latches: 434.4 mm (17.1 inches) • Depth: 497.8 mm (19.6 inches) <p>Note: The depth is measured from the front mounting flange of the rack to the rear of the server.</p>
Weight	Approximately 6.1 kg (13.4 lb) to 12.3 kg (27.1 lb) depending on model
Processor (depending on the model)	<ul style="list-style-type: none"> • Support up to one Intel® multi-core processor from Core™, Pentium®, Celeron® and Xeon® E processor family <ul style="list-style-type: none"> – Designed for LGA 1151 sockets – Scalable up to 6 cores – Support up to 80W <p>For a list of supported processors, see: https://serverproven.lenovo.com/.</p>
Memory	<p>See “Memory module installation rules and order” on page 34 for detailed information about memory configuration and setup.</p> <ul style="list-style-type: none"> • Slots: 4 dual inline memory module (DIMM) connectors • Type: Error correcting code (ECC) DDR4 unbuffered DIMM (UDIMM) • Capacity: <ul style="list-style-type: none"> – Minimum capacity: 8 GB (1 x 8 GB) – Max capacity: 128 GB (4 x 32 GB) <p>Note: 32GB DIMM is supported by Intel® Xeon® E processor family with UEFI ISE114H Ver. 2.00 or later.</p>

Table 1. Server Specifications (continued)

Specification	Description
Drive	<p>Depending on the configuration, server supports up to four or two drives</p> <ul style="list-style-type: none"> • Four-drive backplate: <ul style="list-style-type: none"> – Four 3.5-inch simple-swap SAS/SATA drives – Four 2.5-inch simple-swap SAS/SATA drives (with 3.5-inch drive tray) • Two-drive backplate: <ul style="list-style-type: none"> – Two 3.5-inch simple-swap SATA drives – Two 2.5-inch simple-swap SATA drives (with 3.5-inch drive tray) <p>Note: When the fourth SATA drive is installed, the M.2 drive is not supported.</p>
M.2 drive	<p>Supports two different physical sizes of M.2 drives</p> <ul style="list-style-type: none"> • 42 mm • 80 mm <p>Note: When the fourth SATA drive is installed, the M.2 drive is not supported.</p>
PCI expansion slots	<ul style="list-style-type: none"> • Slot 1: PCI Express 3.0 x8 • Slot 2: PCI Express 3.0 x8 (x16 mechanical connector with x8 signal) <p>Notes:</p> <ul style="list-style-type: none"> • ThinkSystem SR150 does not support ARI/SR-IOV • QLogic QL41262 PCIe 25Gb 2-Port SFP28 Ethernet Adapter does not support shared storage V3700v2 and V5030 configurations.
RAID	<p>RAID adapter is supported when PCIe riser assembly is installed</p> <ul style="list-style-type: none"> • Software RAID level: 0, 1, 5, and 10 • Hardware RAID level: 0, 1, 5, 6, and 10 <p>Notes:</p> <ul style="list-style-type: none"> • When all four 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 2 and 3 cannot be used to install the Windows operating system. • If the M.2 drive has 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, the M.2 drive cannot be used to install the Windows operating system.
Fans	<p>Three internal system non-hot-swap fans (40mm x 28mm)</p>
Power supplies	<ul style="list-style-type: none"> • Fixed power supply <ul style="list-style-type: none"> – 300-watt gold power supply – Input voltage 100-127V or 200-240V ac

Table 1. Server Specifications (continued)

Specification	Description
Operating System	<p>Supported and certified operating systems:</p> <ul style="list-style-type: none"> • Microsoft Windows Server • VMware ESXi • Red Hat Enterprise Linux • SUSE Linux Enterprise Server • CentOS • NeoKylin • Ubuntu <p>References:</p> <ul style="list-style-type: none"> • Complete list of available operating systems: https://lenovopress.lenovo.com/osig. • OS deployment instructions: “Deploy the operating system” on page 65.
Minimum configuration for debugging	<ul style="list-style-type: none"> • One processor with heat sink • One memory DIMM in slot 3 • One power supply • Three system fans (fan 1 to fan 3) • One M.2 or one HDD with backplate (if OS is needed for debugging)
Acoustical noise emissions	<p>Approximate sound level:</p> <ul style="list-style-type: none"> • Sound power levels, idle <ul style="list-style-type: none"> – 4.7 bels, minimum – 4.7 bels, typical – 4.9 bels, maximum • Sound power levels, operating <ul style="list-style-type: none"> – 5.2 bels, minimum – 5.2 bels, typical – 5.5 bels, maximum <p>Notes:</p> <ul style="list-style-type: none"> • These sound power levels are measured in controlled acoustical environments according to procedures specified by ISO 7779 and are reported in accordance with ISO 9296. • The declared acoustic noise levels are based on specified configurations, which may change slightly depending on configurations/conditions.

Table 1. Server Specifications (continued)

Specification	Description
Heat output	Approximate heat output: <ul style="list-style-type: none"> • Minimum configuration: 180 BTU, 53 W (in BTU per hour and watts) • Maximum configuration: 771 BTU, 226 W (in BTU per hour and watts)
Environment	The ThinkSystem SR150 server 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 SR150 server is supported in the following environment: <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Operating: <ul style="list-style-type: none"> – 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) – Server off: 5°C to 45°C (41°F to 113°F) – Shipment/Storage: -40°C to 60°C (-40°F to 140°F) • Maximum altitude: 3,050 m (10,000 ft) • Relative Humidity (non-condensing): <ul style="list-style-type: none"> – Operating: <ul style="list-style-type: none"> – ASHRAE Class A2: 8% to 80%, maximum dew point: 21°C (70°F) – Shipment/Storage: 8% to 90% • Particulate contamination <p>Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server. For information about the limits for particulates and gases, see “Particulate contamination” in <i>Maintenance Manual</i>.</p>

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	<p>Severity level G1 as per ANSI/ISA 71.04-1985¹:</p> <ul style="list-style-type: none"> • The copper reactivity level shall be less than 200 Angstroms per month ($\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour}$ weight gain).² • The silver reactivity level shall be less than 200 Angstroms per month ($\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour}$ weight gain).³ • The reactive monitoring of gaseous corrosivity must be conducted approximately 5 cm (2 in.) in front of the rack on the air inlet side at one-quarter and three-quarter frame height off the floor or where the air velocity is much higher.
Airborne particulates	<p>Data centers must meet the cleanliness level of ISO 14644-1 class 8.</p> <p>For data centers without airside economizer, the ISO 14644-1 class 8 cleanliness might be met by choosing one of the following filtration methods:</p> <ul style="list-style-type: none"> • The room air might be continuously filtered with MERV 8 filters. • Air entering a data center might be filtered with MERV 11 or preferably MERV 13 filters. <p>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.</p> <ul style="list-style-type: none"> • The deliquescent relative humidity of the particulate contamination should be more than 60% RH.⁴ • Data centers must be free of zinc whiskers.⁵
<p>¹ ANSI/ISA-71.04-1985. <i>Environmental conditions for process measurement and control systems: Airborne contaminants</i>. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.</p> <p>² The derivation of the equivalence between the rate of copper corrosion growth in the thickness of the corrosion product in $\text{\AA}/\text{month}$ and the rate of weight gain assumes that Cu_2S and Cu_2O grow in equal proportions.</p> <p>³ The derivation of the equivalence between the rate of silver corrosion growth in the thickness of the corrosion product in $\text{\AA}/\text{month}$ and the rate of weight gain assumes that Ag_2S is the only corrosion product.</p> <p>⁴ The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.</p> <p>⁵ Surface debris is randomly collected from 10 areas of the data center on a 1.5 cm diameter disk of sticky electrically conductive tape on a metal stub. If examination of the sticky tape in a scanning electron microscope reveals no zinc whiskers, the data center is considered free of zinc whiskers.</p>	

Management options

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

Overview

Options	Description
Lenovo XClarity Controller	<p>Baseboard management controller. (BMC)</p> <p>Consolidates the service processor functionality, Super I/O, video controller, and remote presence capabilities into a single chip on the server system board.</p> <p>Interface</p> <ul style="list-style-type: none"> • CLI application • Web GUI interface • Mobile application • REST API <p>Usage and downloads</p> <p>https://pubs.lenovo.com/lxcc-overview/</p>
Lenovo XClarity Administrator	<p>Centralized interface for multi-server management.</p> <p>Interface</p> <ul style="list-style-type: none"> • Web GUI interface • Mobile application • REST API <p>Usage and downloads</p> <p>http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/aug_product_page.html</p>
Lenovo XClarity Essentials toolset	<p>Portable and light toolset for server configuration, data collection, and firmware updates. Suitable both for single-server or multi-server management contexts.</p> <p>Interface</p> <ul style="list-style-type: none"> • OneCLI: CLI application • Bootable Media Creator: CLI application, GUI application • UpdateXpress: GUI application <p>Usage and downloads</p> <p>https://pubs.lenovo.com/lxce-overview/</p>

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

Functions

Options		Functions							
		Multi-system mgmt	OS deployment	System configuration	Firmware updates ¹	Event/alert monitoring	Inventory/logs	Power mgmt	Power planning
Lenovo XClarity Controller				√	√ ²	√	√ ⁴		
Lenovo XClarity Administrator		√	√	√	√ ²	√	√ ⁴		
Lenovo XClarity Essentials 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.

[Figure 2 “Location of the machine type, model, and serial number” on page 11](#) shows the location of the label containing the machine type, model, and serial number.

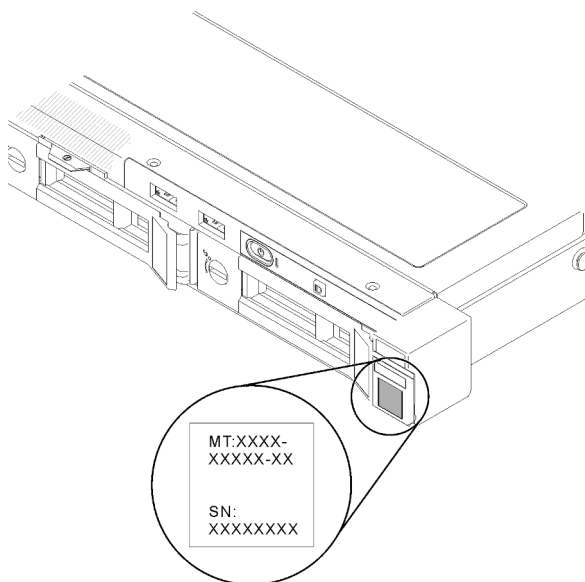


Figure 2. Location of the machine type, model, and serial number

The model number and serial number are on the ID label on the front of the server, as shown in the following illustrations. You can also add other system information labels to the front of the server in the customer label spaces.

XClarity Controller network access label

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

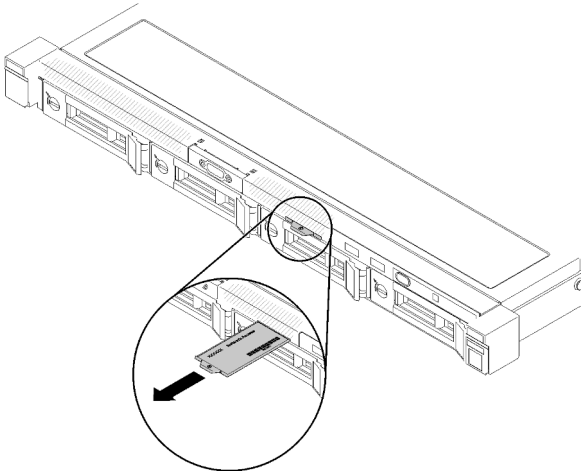


Figure 3. XClarity Controller network access label on the pull-out information tab

QR code

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

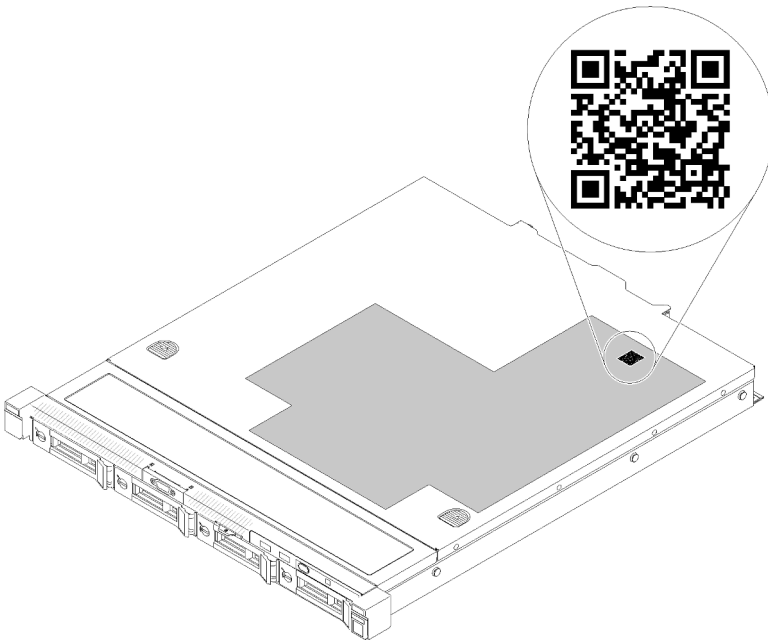


Figure 4. SR150 QR code

Front view

This section contains information about the controls, LEDs, and connectors on the front of the server.

The following illustration shows the controls, LEDs, and connectors on the front of the server.

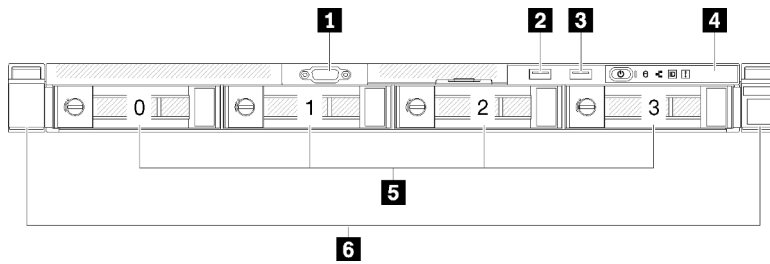


Figure 5. Front view

Table 3. Components on the server front view

1 VGA connector	4 Front operator panel
2 USB 2.0 connector (with Lenovo XClarity Controller)	5 Simple-swap drive bays (numbering 0-3, matching SATA port 4-7 on system board, see “System-board connectors” on page 16)
3 USB 3.1 Gen1 connector	6 Rack latches

1 VGA connector:

Connect a monitor to this connector.

Notes:

- When the front VGA connector is in use, the rear VGA connector will be disabled.
- The maximum video resolution is 1600x1200 at 75 Hz.

2 3 USB connectors:

Connect a USB device, such as a USB mouse, keyboard, or other device, to any of these connectors. Following are detailed descriptions of each connector:

- USB 1: USB 2.0 with Lenovo XClarity Controller management
- USB 2: USB 3.1 Gen1

4 Front operator panel

Front operator panel contains several LED and buttons, see [“Front operator panel” on page 14](#) for more information.

5 Simple-swap drives:

Install drives into these bays. See [“Install a simple-swap disk drive” on page 55](#) for more details.

Notes:

- When SATA drives are installed and connected to SATA connectors 4-7 on system board (without a RAID adapter installed), the drive number will be reported by RAID utility as drives 4, 5, 6, and 7 (different from drive bay number)
- When SAS or SATA drives are installed and connected to RAID adapter, the drive number will be 0, 1, 2, and 3 (same as drive bay number)
- Drive bay 2 and 3 are not available when the two-drive backplate is installed.

6 Rack latches:

Pull the latch on both sides in the front of the server to remove the server out of the rack.

Front operator panel

The following illustration shows the controls and LEDs on the front operator panel.

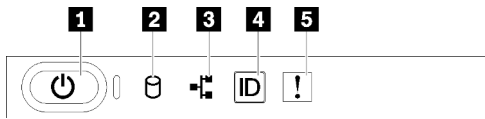


Figure 6. Front operator panel

Table 4. Buttons and LEDs on the front operator panel

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

1 Power button/LED (green)

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

Off: No power supply is properly installed, or the LED itself has failed.

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

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

Solid on: The server is turned on.

2 Drive activity LED (green)

When this LED is flashing, it indicates that the drives are in use.

3 Network activity LED (green)

When this LED is lit, it indicates that the server is transmitting to or receiving signals from the Ethernet LAN.

4 Identification 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.

5 System error LED (yellow)

When this yellow LED is lit, it indicates that a system error has occurred. This LED can be controlled by the Lenovo XClarity Controller.

Rear view

This section contains information about the LEDs and connectors on the rear of the server.

The following illustrations show the connectors and LEDs on the rear of the server.

Connectors and LEDs on the rear server

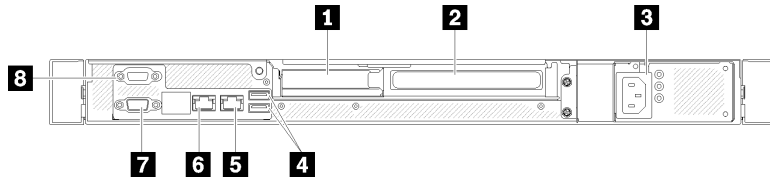


Figure 7. Rear view

Table 5. Components on the server rear view

1 PCIe slot 1	5 Ethernet connector 2
2 PCIe slot 2	6 Ethernet connector 1 (shared with XCC network port)
3 Server power connector	7 VGA connector
4 USB 3.1 Gen1 connectors	8 Serial connector

1 2 PCIe slot 1 and 2

Install the PCIe riser assembly:

- PCIe slot 1: PCI Express 3.0 x8
- PCIe slot 2: PCI Express 3.0 x8 (x16 mechanical connector with x8 signal)

For information about the PCIe slots, see [“PCIe riser assembly” on page 20](#).

3 Server power connector:

Connect the power cord to this connector.

4 USB 3.1 Gen1 connector:

Connect USB devices, such as USB mouse, keyboard, or other devices to these two USB 3.1 Gen1 connectors.

5 6 Ethernet connector 1 and 2:

Each Ethernet connector has two status LEDs to help you identify the Ethernet connectivity and activity.

- Ethernet connector 2: connect server to the internet
- Ethernet connector 1: connect server to the internet, or set server to access Lenovo XClarity Controller

If the LOM adapter is not installed, Ethernet connector 1 can be set as XClarity Controller Network connector. To set Ethernet connector 1 as XClarity Controller Network connector, start Setup Utility and select **BMC Settings → Network Settings → Chapter 2. Server components 15 Network Settings Network Interface Port : Shared**. Then, click **Shared NIC on** and select **Onboard Port 1**.

7 VGA connector:

Connect a monitor to this connector.

Notes:

- When the front VGA connector is in use, the rear VGA connector will be disabled.
- The maximum video resolution is 1600x1200 at 75 Hz.

8 Serial connector:

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

System-board layout

Use this information to locate the connectors, LEDs, and switches on the system board.

System-board LEDs

The following illustrations show the light-emitting diodes (LEDs) on the system board.

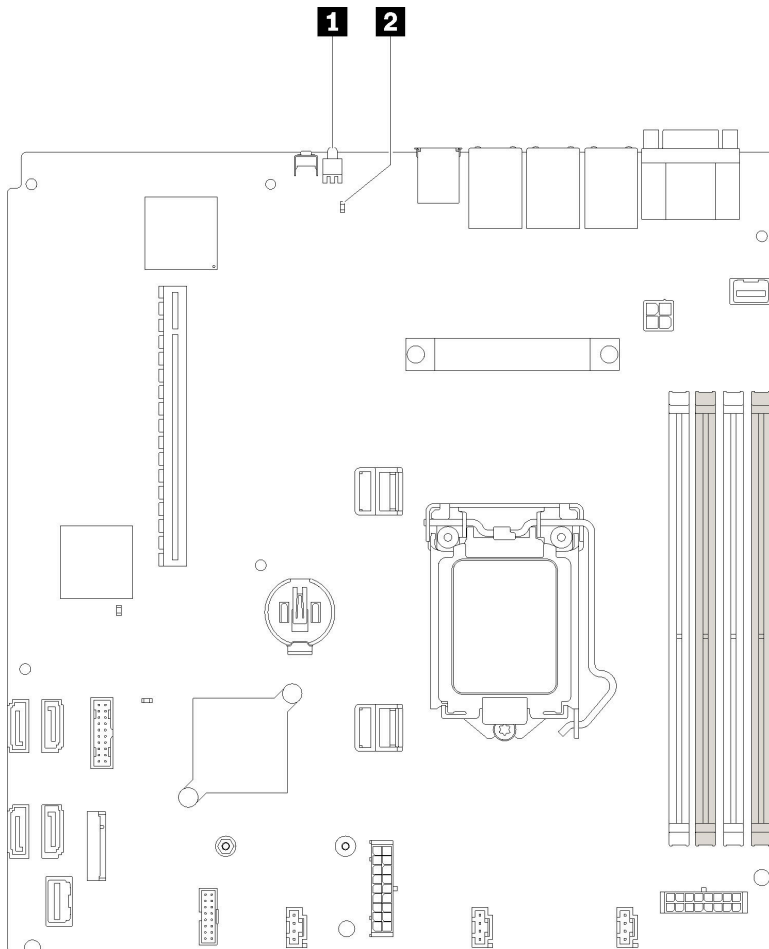


Figure 8. System-board LEDs

Table 6. System-board LEDs

1 Rear identification LED (blue)	2 System error LED (yellow)
---	------------------------------------

System-board connectors

Use this information to locate system-board components and connectors for optional devices.

The following illustration shows the system-board components, including connectors for user-installable optional devices, in the server.

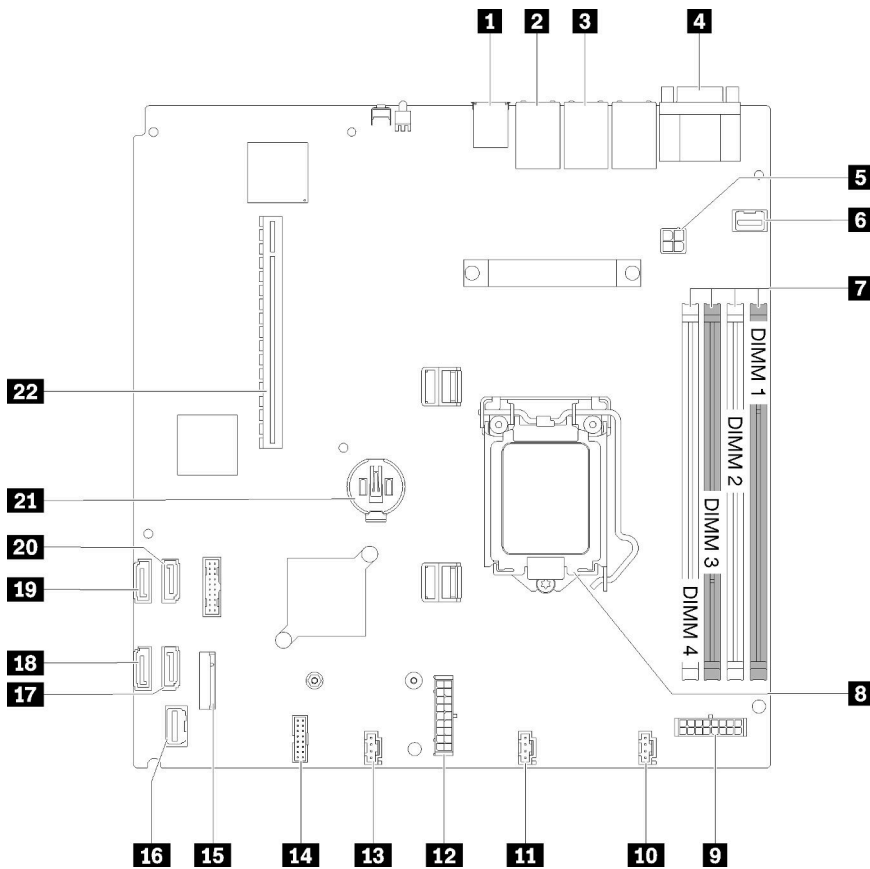


Figure 9. System-board connectors

Table 7. System board connectors

1 USB connector	12 System power connector
2 LAN 2 connector	13 Fan 3 connector
3 LAN 1 connector (shared with Lenovo XClarity Controller)	14 TPM card connector
4 Serial port connector (upper) and VGA connector (bottom)	15 M.2 connector
5 Processor power connector	16 Front operator panel connector
6 Front VGA connector	17 SATA 6 connector
7 DIMM connectors	18 SATA 7 connector
8 Processor socket	19 SATA 4 connector
9 Backplate power connector	20 SATA 5 connector
10 Fan 1 connector	21 CMOS battery connector
11 Fan 2 connector	22 PCIe slot

System-board jumpers and buttons

The following illustrations show 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.

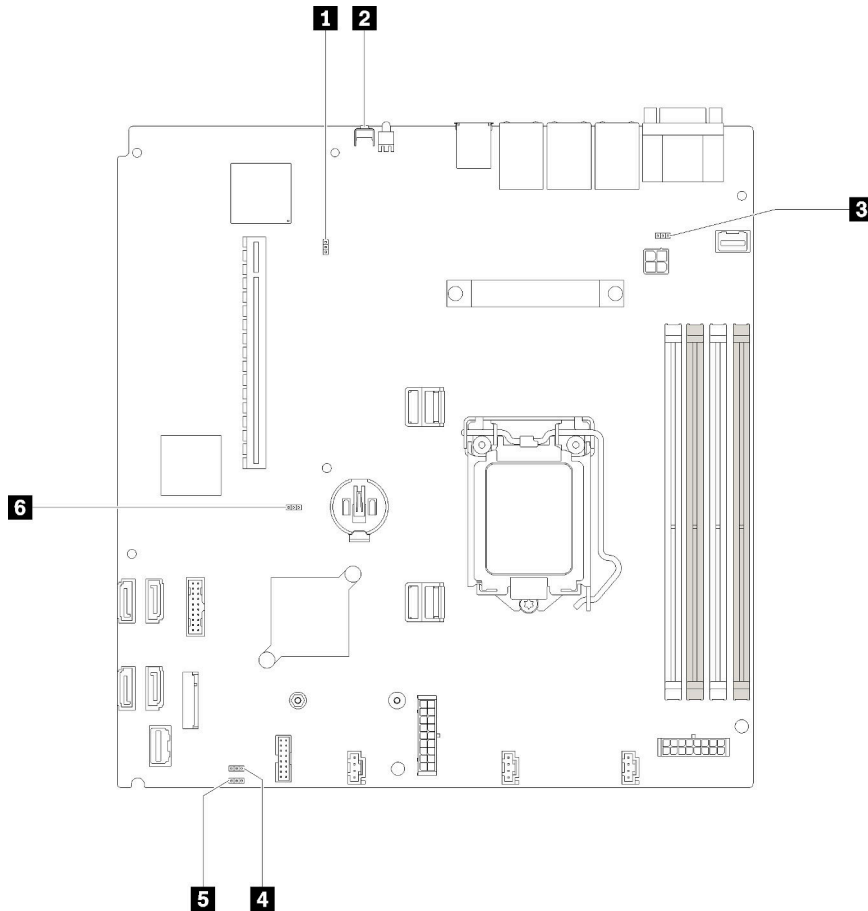


Figure 10. System-board jumpers and buttons

Table 8. System-board jumpers and buttons

Jumper and button name	Jumper setting / button function
1 Force XCC update jumper	<ul style="list-style-type: none"> • Pins 1 and 2: Default • Pins 2 and 3: Force the Lenovo XClarity Controller to update to the latest version
2 NMI button	Press this button to force a nonmaskable interrupt (NMI) to the processor. By this way, you can set the server into blue screen mode and take a memory dump.
3 NCSI function	<ul style="list-style-type: none"> • Pins 1 and 2: Default • Pins 2 and 3: Disable
4 Power permission override jumper	<ul style="list-style-type: none"> • Pins 1 and 2: Default • Pins 2 and 3: Override the power-on permission

Table 8. System-board jumpers and buttons (continued)

<p>5 Clear CMOS jumper</p>	<ul style="list-style-type: none"> • Pins 1 and 2: Default • Pins 2 and 3: Clear the real-time clock (RTC) registry
<p>6 TPM card physical presence jumper</p>	<ul style="list-style-type: none"> • Pins 1 and 2: Default • Pins 2 and 3: TPM card physical presence is asserted

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 https://pubs.lenovo.com/safety_documentation/, “Installation Guidelines” on page 32, “Handling static-sensitive devices” on page 33, and “Power off the server” on page 57.
2. Any system-board switch or jumper block that is not shown in the illustrations in this document are reserved.

PCIe riser assembly

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

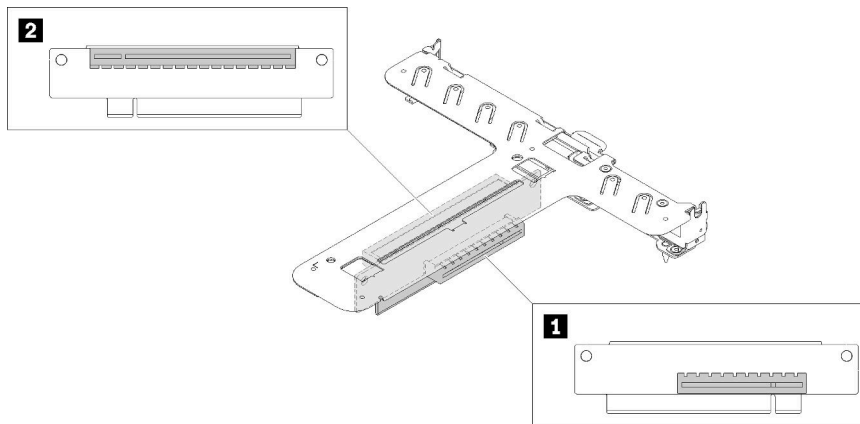


Figure 11. PCIe riser assembly

Table 9. PCIe riser assembly

<p>1 PCI Express 3.0 x8</p>	<p>2 PCI Express 3.0 x8 (x16 mechanical connector with x8 signal)</p>
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Backplate

Use this information to identify the drive backplate you use.

Two 3.5-inch drive backplate

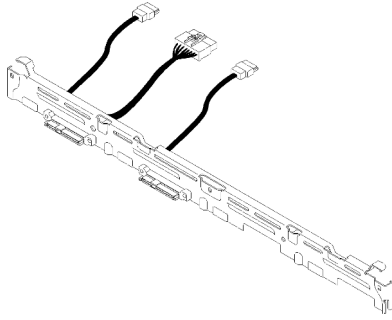


Figure 12. Two 3.5-inch drive backplate

Four 3.5-inch drive backplate (connects to onboard SATA connectors)

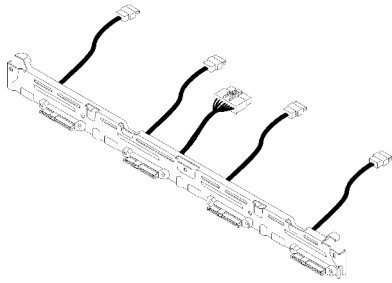


Figure 13. Four 3.5-inch drive backplate (connects to onboard SATA connectors)

Four 3.5-inch drive backplate (connects to RAID x30 adapter)

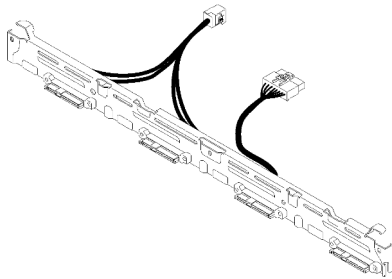


Figure 14. Four 3.5-inch drive backplate (connects to RAID x30 adapter)

Four 3.5-inch simple-swap drives (connects to RAID x40 adapter)

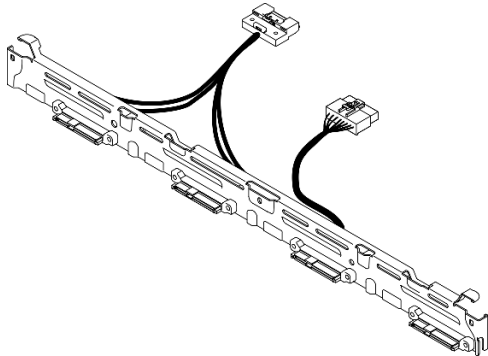


Figure 15. Four 3.5-inch simple-swap drives (connects to RAID x40 adapter)

Internal cable routing

Some of the components in the server have internal cables and cable connectors.

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.

Some options, such as RAID controllers, might require additional internal cabling. See the documentation that is provided for the option to determine any additional cabling requirements and instructions.

Fan cables

Connect the fan cables to the corresponding connectors.

Fan cables

Connect the fan cables to the corresponding connectors. Make sure all cables are connected for proper fan operation.

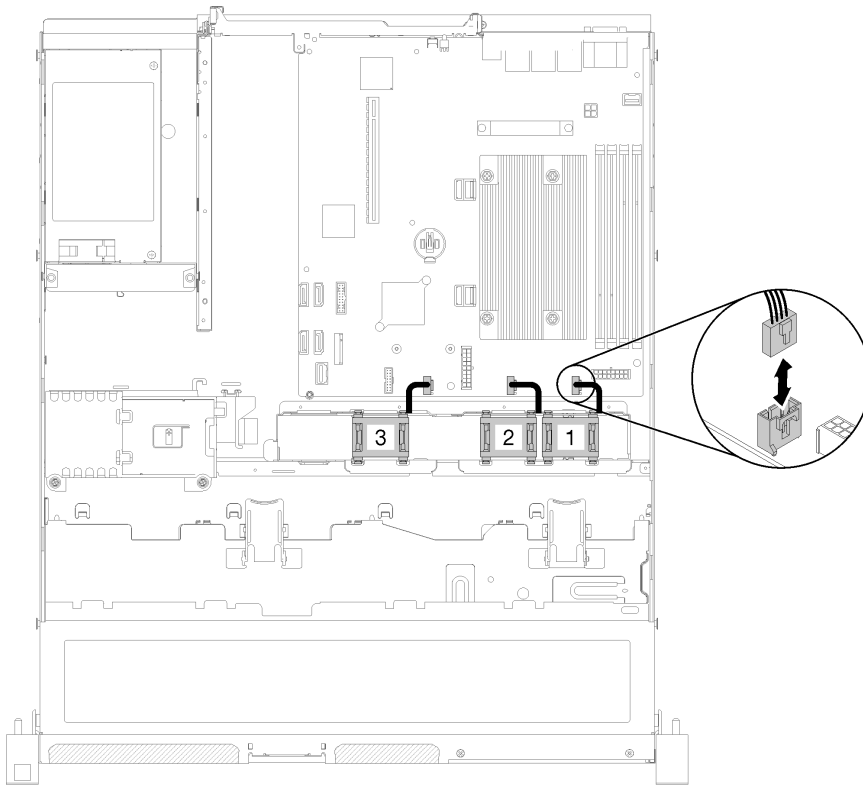


Figure 16. Fan cables

VGA cable

Connect the VGA cable to the VGA connector.

VGA cable

Connect the VGA cable to the connector and route the cable as shown.

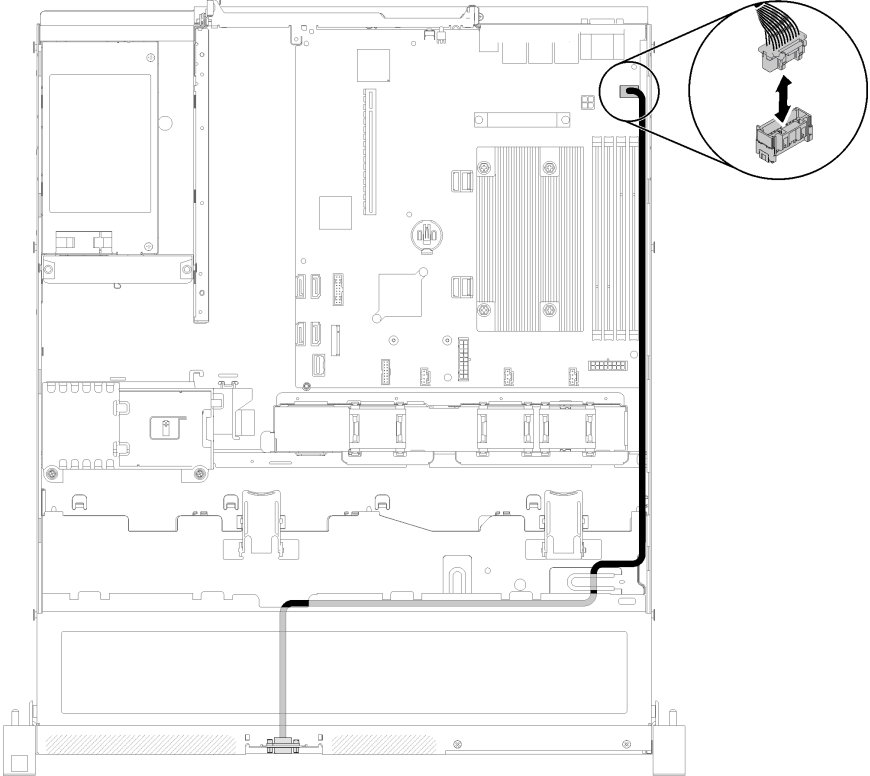


Figure 17. VGA cable

Fixed power supply cables

Connect the fixed power supply cables to the corresponding connectors.

Fixed power supply unit cables

Connect the cables to the corresponding connectors and route the cables as shown.

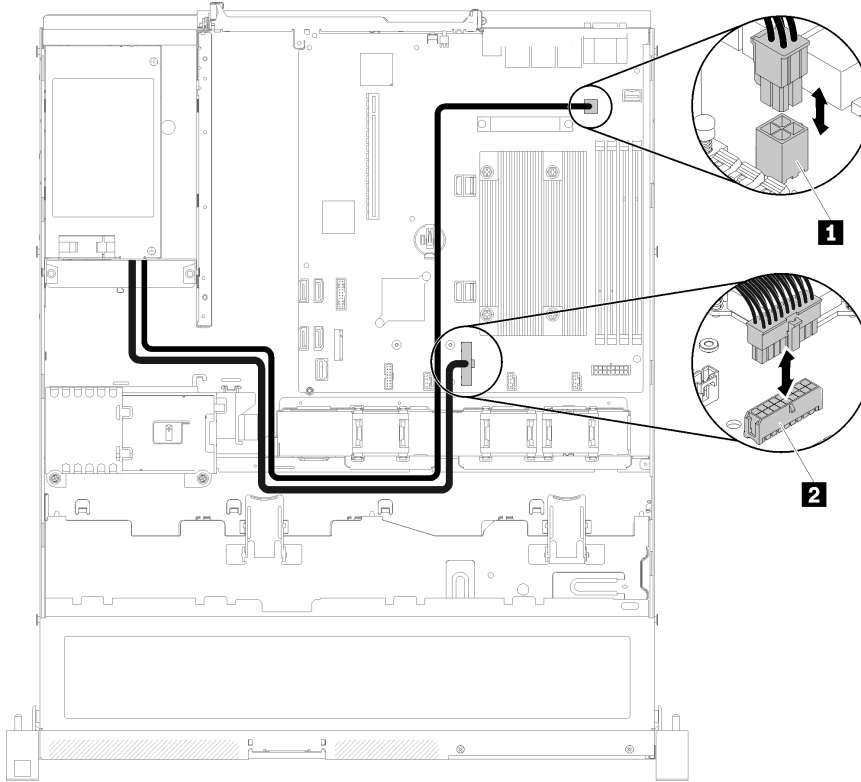


Figure 18. Fixed power supply unit cables

Table 10. Processor and system power connector

1 Processor power connector	2 System-board power connector
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Backplate cables

Connect drive backplate cables to the corresponding connectors.

Check “[System-board connectors](#)” on page 16 for the detailed connectors location.

Two 3.5-inch drive backplate

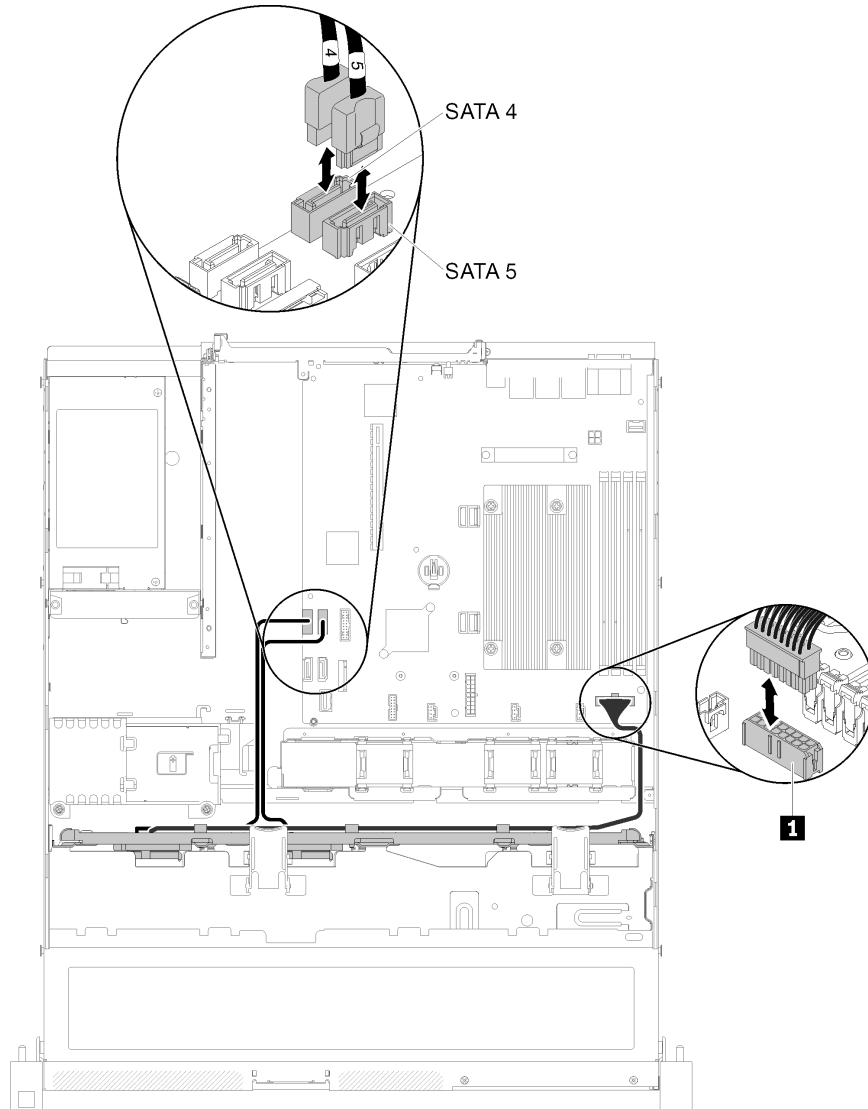


Figure 19. Two 3.5-inch drive backplate

Table 11. Two 3.5-inch drive backplate

1 Backplate power connector

Four 3.5-inch drive backplate (connects to onboard connectors)

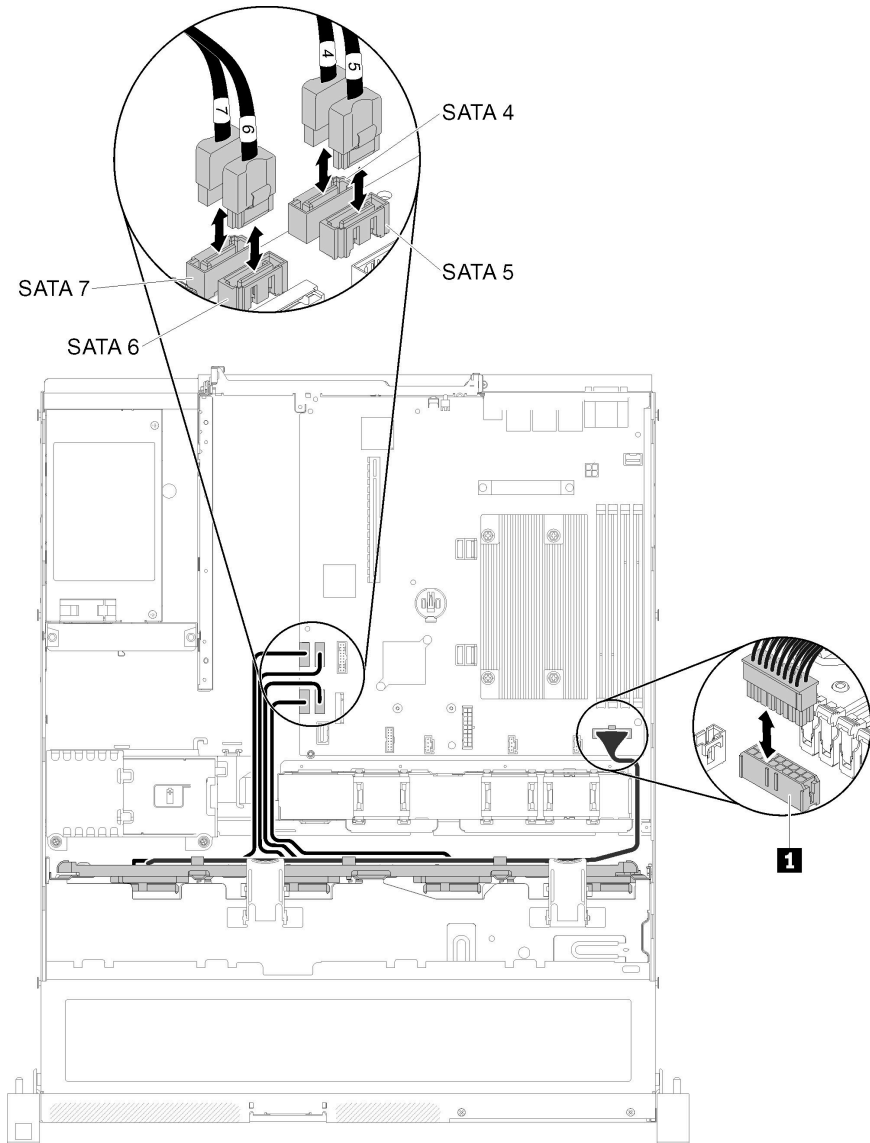


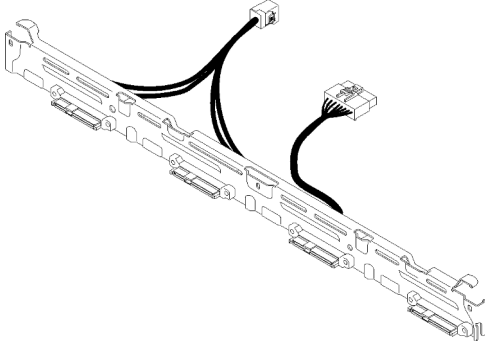
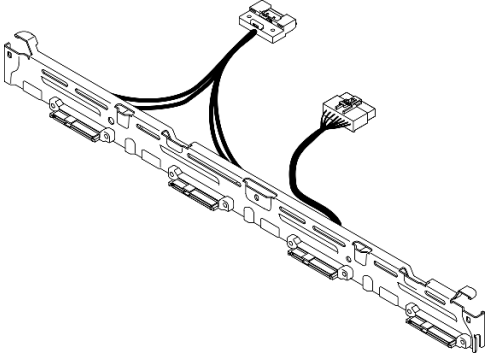
Figure 20. Four 3.5-inch drive backplate (connects to onboard connectors)

Table 12. Four 3.5-inch drive backplate (connects to onboard connectors)

1 Backplate power connector

Four 3.5-inch drive backplate (connects to RAID adapter)

Table 13. Backplates for RAID x30 / x40 adapter

For RAID x30 adapter:	For RAID x40 adapter:
	
4 x 3.5" simple-swap backplate, miniSAS HD to SAS	4 x 3.5" simple-swap backplate, slimSAS HD to SAS

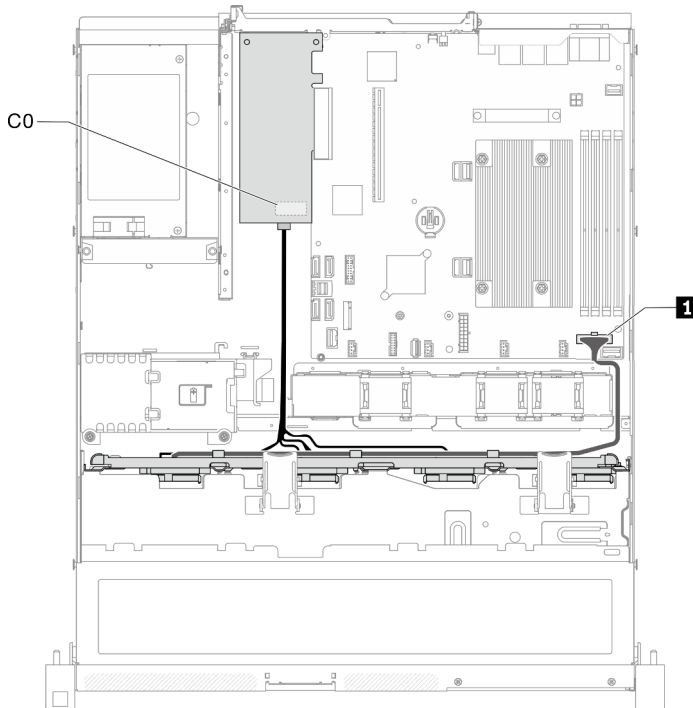


Figure 21. 3.5-inch simple-swap drive model with hardware RAID

Table 14. 3.5-inch simple-swap drive model with hardware RAID

1 Backplane power connector

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 [Figure 22 “Server components” on page 28](#):

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

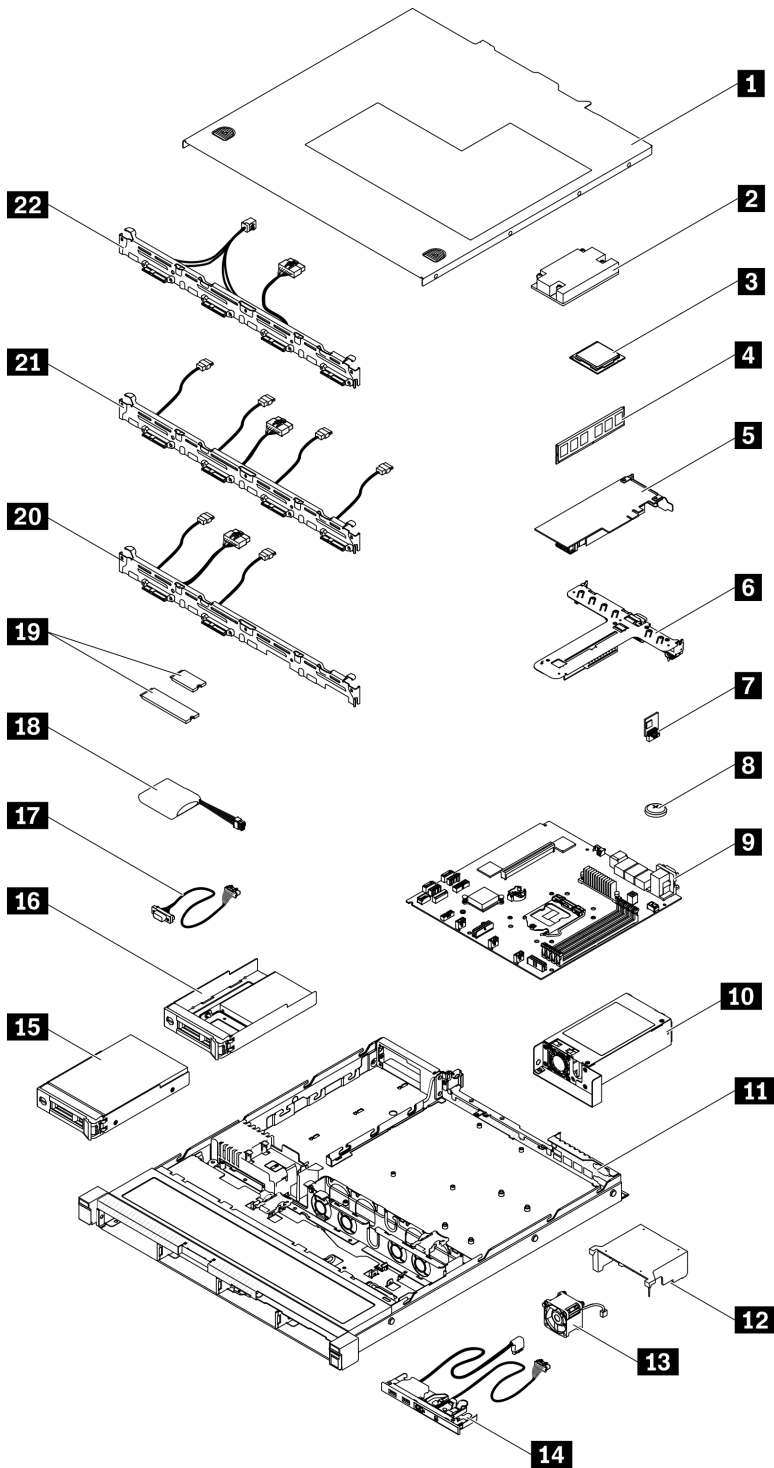


Figure 22. Server components

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.

Table 15. Parts list

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
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	Heat sink			√	
3	Processor			√	
4	DIMM	√			
5	PCIe adapter	√			
6	PCIe riser assembly	√			
7	TPM card	√			
8	CMOS battery (CR2032)				√
9	System board			√	
10	Power supply unit				√
11	Chassis				√
12	Air baffle				√
13	Fan	√			
14	Front operator panel	√			
15	3.5-inch simple-swap drive	√			
16	2.5-inch simple-swap drive with 3.5-inch drive tray	√			
17	VGA cable	√			
18	Flash power module	√			
19	M.2 drive (42 mm and 80 mm)	√			
20	Two 3.5-inch drive backplate	√			
21	Four 3.5-inch drive backplate (connects to onboard connectors)	√			
22	Four 3.5-inch drive backplate (connects to RAID adapter)	√			

Chapter 3. 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 34](#).
 - 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 14](#) to locate the connectors. See [“Cable the server” on page 56](#) for cabling best practices.
 - d. Power on the server. See [“Power on the server” on page 56](#).

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:

<https://pubs.lenovo.com/lxcc-overview/>

- e. Validate that the server hardware was set up successfully. See [“Validate server setup” on page 57](#).
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 59](#).
 - b. Update the firmware for the server, if necessary. See [“Update the firmware” on page 60](#).
 - c. Configure the firmware for the server. See [“Configure the firmware” on page 63](#).

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 65](#).
 - e. Back up the server configuration. See [“Back up the server configuration” on page 66](#).
 - f. Install the applications and programs for which the server is intended to be used.

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:
https://pubs.lenovo.com/safety_documentation/
 - The following guidelines are available as well: “[Handling static-sensitive devices](#)” on page 33
- Make sure the components you are installing are supported by the 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 SR150 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 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 two 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.
- Every air baffle that comes with the server must be installed when the server starts (some servers might come with more than one air baffle). Operating the server with a missing air baffle might damage the processor.
- All processor sockets must contain either a socket cover or a processor with heat sink.
- When more than one processor is installed, fan population rules for each server must be strictly followed.

Handling static-sensitive devices

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

Memory modules must be installed in a specific order based on the memory configuration that you implement on your server.

The following illustration shows the system-board components, including DIMM connectors.

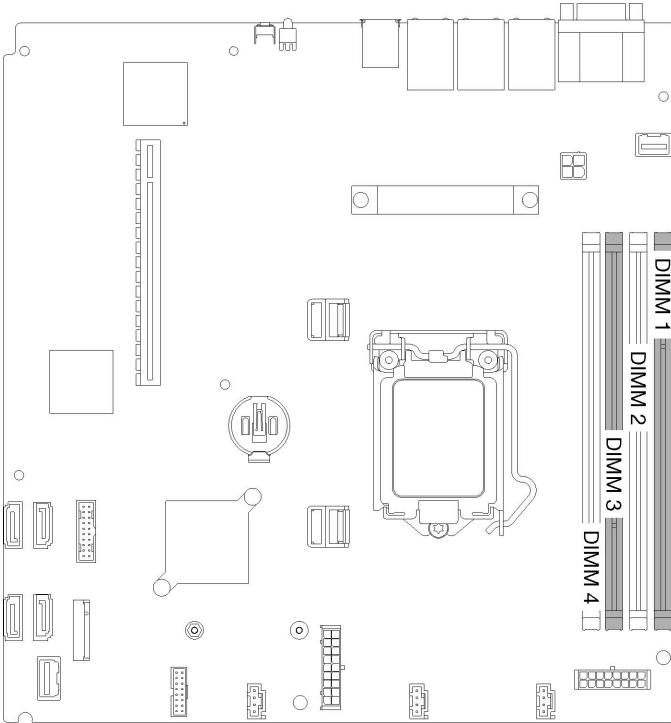


Figure 23. DIMM connectors

The following table show the sequence of DIMM installation.

Total DIMMs installed	DIMM 1	DIMM 2	DIMM 3	DIMM 4
1			✓	
2	✓		✓	
3	✓		✓	✓
4	✓	✓	✓	✓

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 the 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 SR150 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 security bezel

Use this information to remove the security bezel.

Before removing the security bezel:

1. Read “[Safety](#)” on page iii and “[Installation Guidelines](#)” on page 32 to ensure that you work safely.
2. If the server is installed in a rack, extend or remove the server from the rack.

To remove the security bezel, complete the following steps:

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

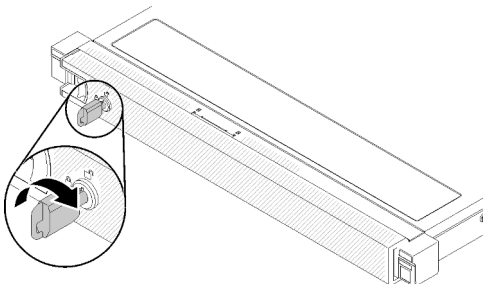


Figure 24. Unlocking the security bezel

Step 2. Press the release latch and rotate the security bezel outward to remove it from the chassis.

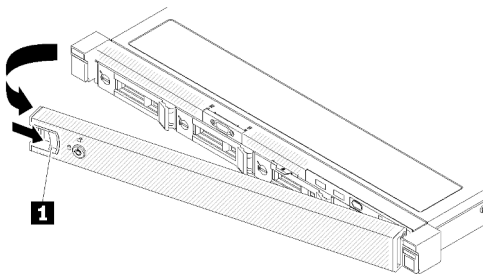



Figure 25. Security bezel removal

Table 16. Security bezel removal

 Release latch

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

Remove the top cover

Use this information to remove the top cover.

To avoid possible danger, read and follow the following safety information.

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.

Before you remove the top cover, complete the following steps:

1. Read "[Safety](#)" on page iii and "[Installation Guidelines](#)" on page 32 to ensure that you work safely.
2. Turn off the server. Disconnect the power cords and all external cables (see "[Power off the server](#)" on page 57).
3. If server is installed in a rack, remove the server from the rack.

To remove the top cover, complete the following steps:

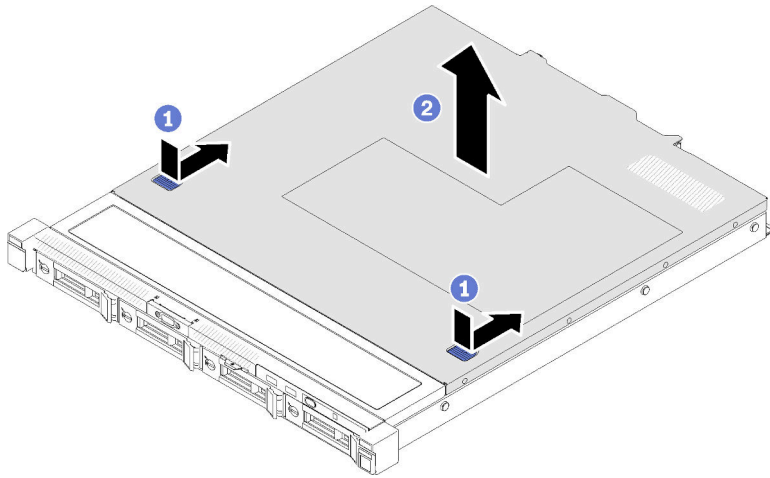


Figure 26. Top cover removal

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

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

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

Remove the air baffle

Use this information to remove the air baffle.

Before you remove the air baffle, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 57](#)).
3. If server is installed in a rack, remove the server from the rack.
4. Remove the top cover (see [“Remove the top cover” on page 36](#)).

To remove the air baffle, complete the following steps:

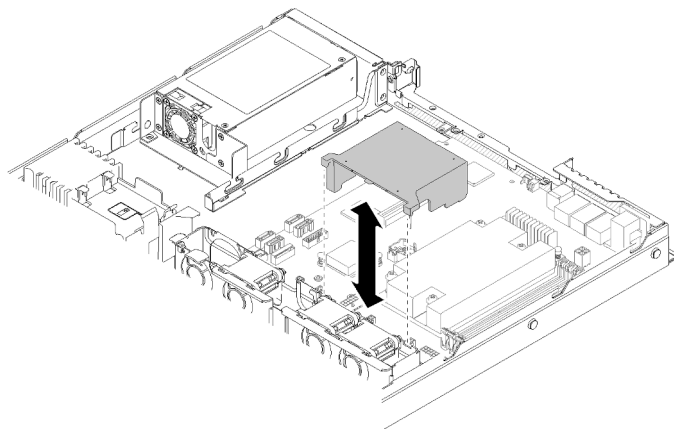


Figure 27. Air baffle removal

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.

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

Install a fan

Use this information to install a fan.

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.

S009



CAUTION:

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

Before you install a fan, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.

To install a fan, complete the following steps:

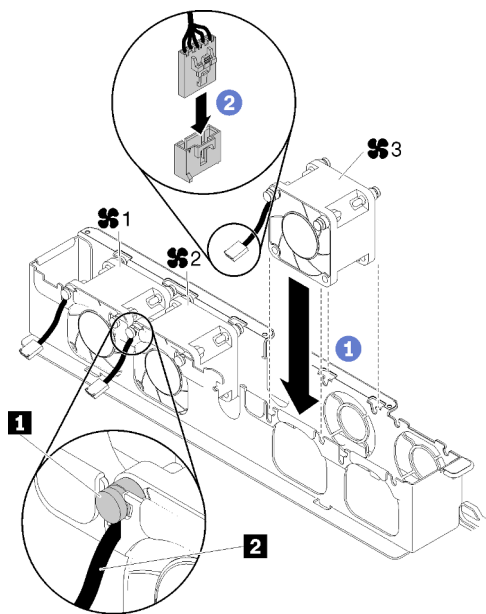


Figure 28. Fan installation

Table 17. Fan installation

1 Rubber mounting pin	2 Fan cable
------------------------------	--------------------

Step 1. Align the fan with the slot in the fan cage; then, place the fan into the slot. Make sure the fan cable goes in the cable slot, under the rubber mounting pin as shown.

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

Note: Each fan has a corresponding cable connector on system board. Make sure you connect the cable to the right connector (see [“System-board connectors” on page 16](#)).

After you install the fan, complete the following steps:

1. Reinstall the air baffle if it was removed (see [“Install the air baffle” on page 53](#)).
2. Install the top cover onto the server (see [“Install the top cover” on page 54](#)).
3. Install the server into the rack if necessary.
4. Reconnect power cords and all external cables.

Install the simple-swap drive backplate

Use this information to install the drive backplate.

Before you install a simple-swap drive backplate, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.

To install the simple-swap drive backplate, complete the following steps:

Notes: There are three types of backplate supported by the server, all are removed and installed in a similar method.

- Two 3.5-inch drive backplate
- Four 3.5-inch drive backplate (connects to onboard connectors)

- Four 3.5-inch drive backplate (connects to RAID adapter)

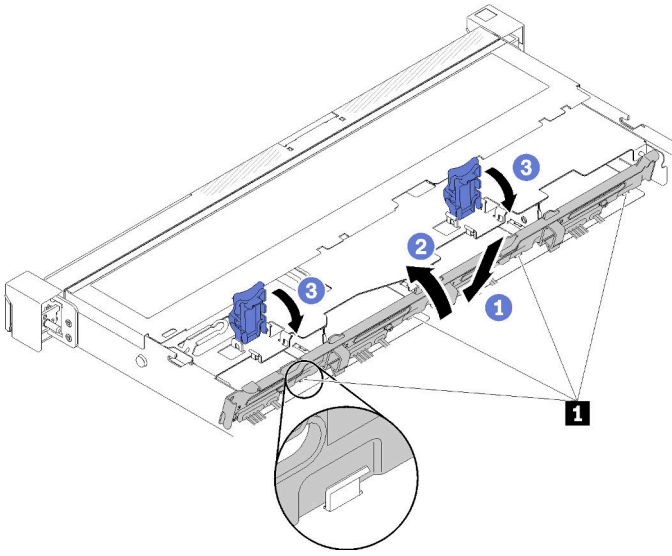


Figure 29. Simple-swap drive backplate installation

Table 18. Pin in the chassis

1 Pin

- Step 1. Insert the backplate into the chassis with an angle as shown. Make sure the pins are against the backplate on the backside.
- Step 2. Rotate the backplate up toward the front of the server.
- Step 3. Close the retaining clips to secure the backplate.
- Step 4. Connect the backplate cables to the system board and the RAID adapter (if installed). See [“Backplate cables” on page 25](#).

After you install the simple-swap drive backplate, complete the following steps:

1. Install the top cover onto the server (see [“Install the top cover” on page 54](#)).
2. Install the server into the rack if necessary.
3. Reconnect power cords and all external cables.

Install an adapter

Use this information to install an adapter.

Before you install an adapter, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.
2. Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Notes:

- ThinkSystem SR150 does not support ARI/SR-IOV
- QLogic QL41262 PCIe 25Gb 2-Port SFP28 Ethernet Adapter does not support shared storage V3700v2 and V5030 configurations.

To install an adapter, complete the following steps:

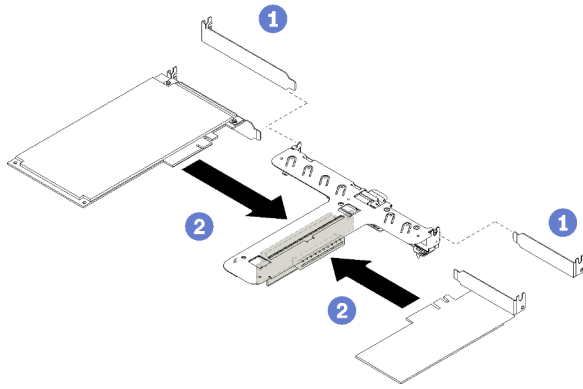


Figure 30. Adapter installation

Step 1. Remove the fillers on the rear side of the riser cage.

Step 2. Align and insert an adapter into the slot on the riser card. Make sure you install the adapter into the right slot.

Notes:

- For the detail connectors on the PCIe riser card, see [“PCIe riser assembly” on page 20](#).
- Install one adapter at a time, do not insert two adapters to the riser card at the same time.

After you install an adapter, complete the following steps:

1. Reconnect the cables.
2. Reinstall the PCIe riser assembly (see [“Install the PCIe riser assembly” on page 43](#)).
3. Install the top cover onto the server (see [“Install the top cover” on page 54](#)).
4. Install the server into the rack if necessary.
5. Reconnect power cords and all external cables.
6. If necessary, configure the RAID array using the Setup utility configuration.

Install the flash power module

Use this information to install the flash power module.

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.

Before you install the flash power module, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.

To install the flash power module, complete the following steps:

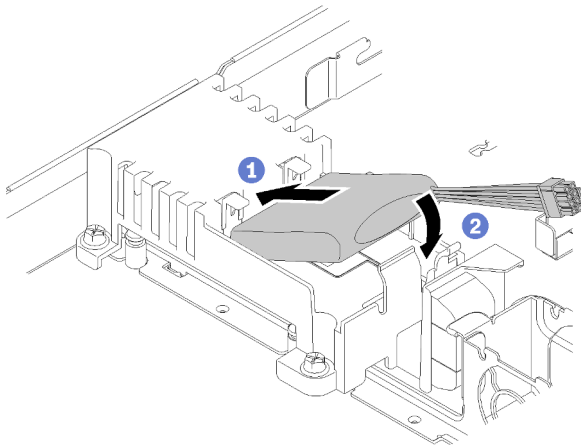


Figure 31. Flash power module installation

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

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

Step 3. Connect the flash power module cable to the RAID adapter.

After you install the flash power module, complete the following steps:

1. Install the top cover onto the server (see [“Install the top cover” on page 54](#)).
2. Install the server into the rack if necessary.
3. Reconnect power cords and all external cables.

Install the PCIe riser assembly

Use this information to install the PCIe riser assembly.

Before you install the PCIe riser assembly, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.
2. Install adapters (see [“Install an adapter” on page 40](#)).

To install the PCIe riser assembly, complete the following steps:

- Step 1. Align the two screw slots on the PCIe riser card with the riser cage. Make sure two screw slot are aligned at the same time; then, fasten the screws to secure the riser card to the riser cage.

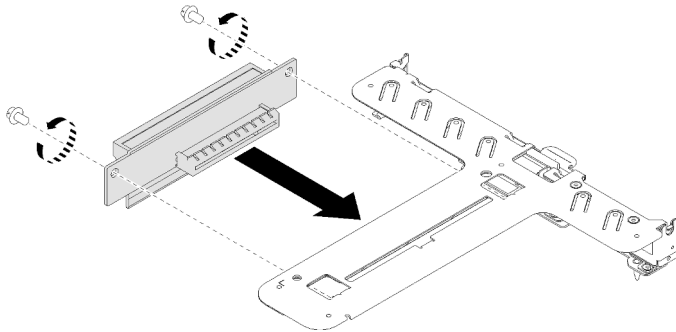


Figure 32. PCIe riser assembly installation

- Step 2. Attach the label to the front side of the PCIe riser assembly.

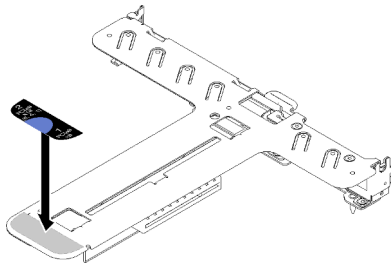


Figure 33. PCIe riser assembly installation

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

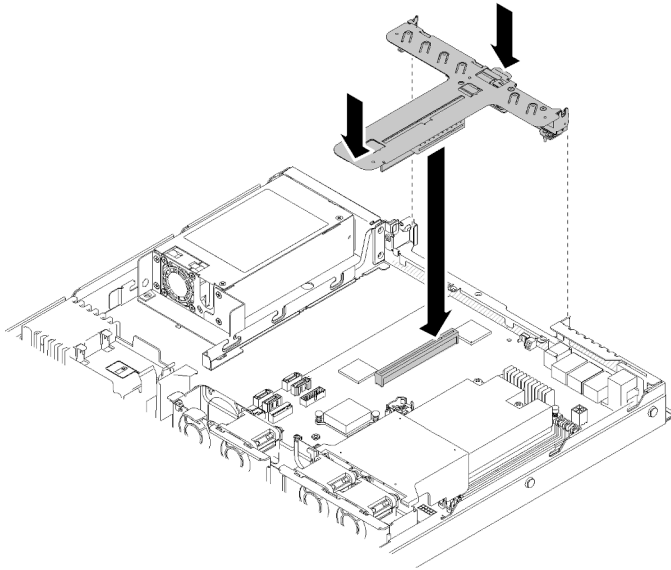


Figure 34. PCIe riser assembly installation

After you install the PCIe riser assembly, complete the following steps:

1. Install the top cover onto the server (see [“Install the top cover” on page 54](#)).
2. Install the server into the rack if necessary.
3. Reconnect power cords and all external cables.

Install the M.2 drive

Use this information to install the M.2 drive.

Before you install the M.2 drive, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.
2. Require a #1 Phillips and Hex 4.5 mm screwdriver.

Note: There are two dimensions of M.2 drive supported by the server, each with different length. Both are removed and installed in a similar method.

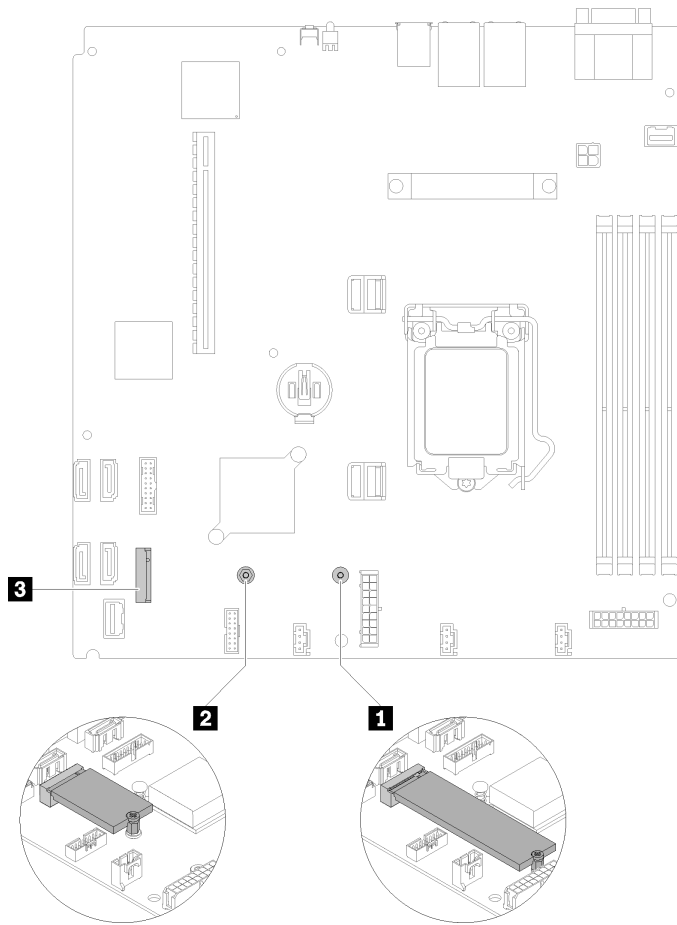


Figure 35. M.2 drive location

Table 19. M.2 drive location

<p>1 Screw for 80 mm M.2 drive (requires a #1 Phillips and Hex 4.5 mm screwdriver)</p>	<p>3 M.2 connector</p>
<p>2 Screw for 42 mm M.2 drive (requires a #1 Phillips and Hex 4.5 mm screwdriver)</p>	

Note: When you install the 80 mm or the 42 mm M.2 drive, you need to change the hex screw location accordingly as the following illustration.

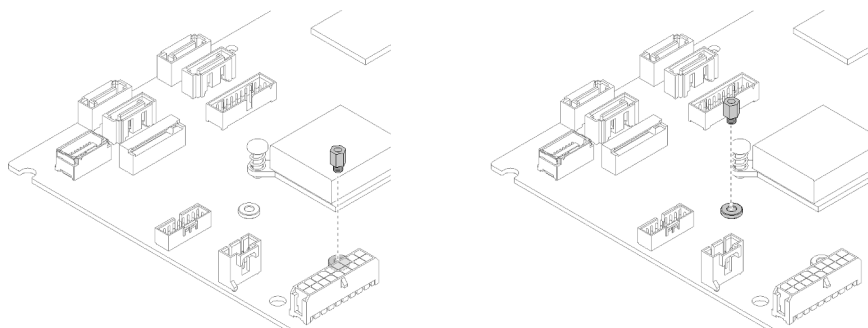


Figure 36. Hex screw location for 80 mm/42 mm M.2 drive

To install the M.2 drive, complete the following steps:

Note: When the fourth SATA drive is installed, the M.2 drive is not supported.

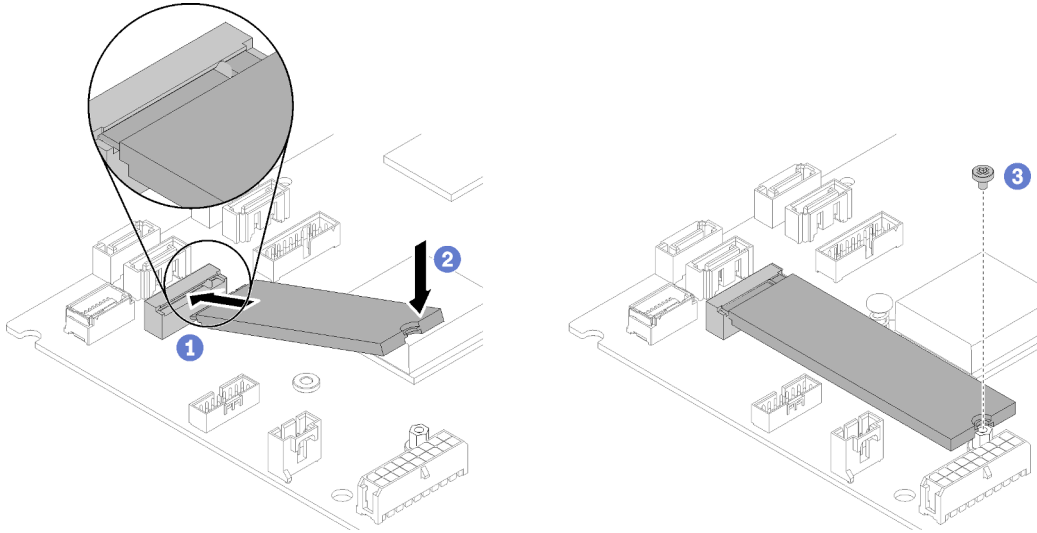


Figure 37. M.2 drive installation

- Step 1. Insert the M.2 drive at an angle to the connector as shown.
- Step 2. Lower down the other side of the M.2 drive to system board.
- Step 3. Fasten the screw to secure the M.2 drive.

After you install the M.2 drive, complete the following steps:

1. Install the top cover onto the server (see [“Install the top cover”](#) on page 54).
2. Install the server into the rack if necessary.
3. Reconnect power cords and all external cables.

Install the CMOS battery (CR2032)

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

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.

Before you install the CMOS battery, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.
2. Locate the CMOS battery on the system board (see [“System-board connectors” on page 16](#)).
3. Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

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

- You must replace the CMOS battery with a lithium CMOS battery of the same type (CR2032).
- After you replace the CMOS battery, you must reconfigure the server and reset the system date and time.
- Dispose of the battery as required by local ordinances or regulations.

Attention:

- Do not make CMOS battery in contact with a metal surface when replacing it. The contact with metal surface, such as server side, can cause damage to the battery.
- Make sure that all server power cords are disconnected from their power sources before performing this procedure.

To install the CMOS battery, complete the following steps:

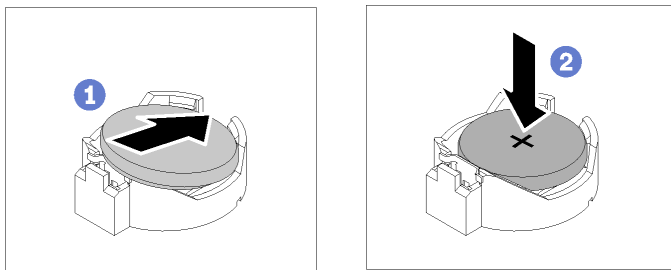


Figure 38. CMOS battery installation

Step 1. Pivot the CMOS battery to insert it into the socket, with positive (+) side faces up.

Step 2. Press the battery straight down until it clicks in place.

After you install the CMOS battery, complete the following steps:

1. Install the top cover onto the server (see [“Install the top cover” on page 54](#)).
2. Install the server into the rack if necessary.
3. Reconnect power cords and all external cables.

Install the fixed power supply unit

Use this information to install the fixed power supply unit.

To avoid possible danger, read and follow the following safety information.

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.

Before you install the fixed power supply unit, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.

Note: If the server is installed with Delta fixed 300W PSU: when the AC power is dropout without the proper server power off process, wait for at least 10 seconds to re-plug the AC power to the server.

To install the fixed power supply, complete the following steps:

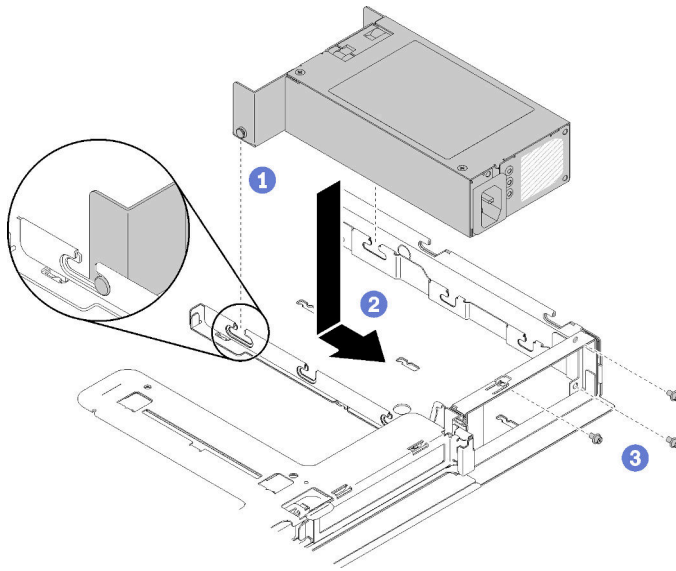


Figure 39. Power supply unit installation

- Step 1. Align the pins with the slots on the chassis; then, lower the power supply unit into the server.
- Step 2. Slide the power supply unit backward to lock the pins into the slots.
- Step 3. Install the screws that secure the power supply unit.
- Step 4. Connect the internal power cable to system board, see [“Fixed power supply cables” on page 24](#).

After you install the fixed power supply unit, complete the following steps:

1. Install the top cover onto the server (see [“Install the top cover” on page 54](#)).
2. Install the server into the rack if necessary.
3. Reconnect power cords and all external cables.

Install a DIMM

Use this information to install a DIMM.

See [“Memory module installation rules and order” on page 34](#) for detailed information about memory configuration and setup.

Before you install a DIMM, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.
2. Remove the air baffle if necessary (see [“Remove the air baffle” on page 37](#)).
3. Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

The following illustration shows the system-board components, including DIMM connectors.

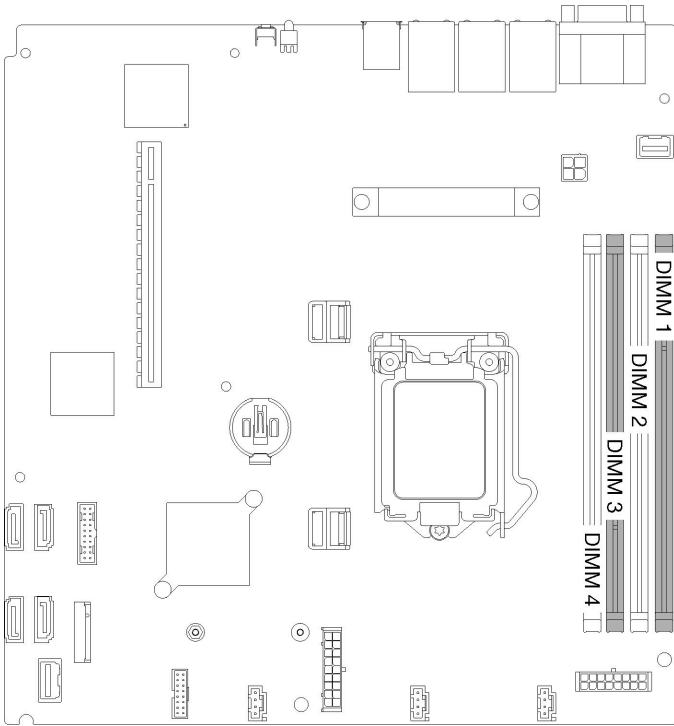


Figure 40. DIMM connectors

To install a DIMM, complete the following steps:

Attention: Memory modules are sensitive to static discharge and require special handling. In addition to the standard guidelines for [“Handling static-sensitive devices” on page 33:](#)

- 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.

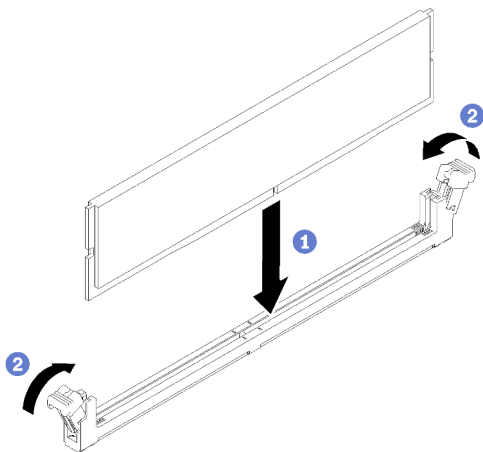


Figure 41. DIMM installation

- Step 1. Make sure the retaining clips are in the fully-open position; then, align the keys on the DIMM with the connector.
- Step 2. Firmly press both ends of the DIMM straight down into the connector until the retaining clips snap into the locked position.
- Step 3. If you are installing additional DIMMs, do so now.

After you install the DIMM, complete the following steps:

1. Reinstall the air baffle if it is removed (see [“Install the air baffle” on page 53](#)).
2. Install the top cover onto the server (see [“Install the top cover” on page 54](#)).
3. Install the server into the rack if necessary.
4. Reconnect power cords and all external cables.

Install the processor

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

Before you install the processor, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.
2. If there is any old thermal grease on the processor, gently clean the top of the processor using an alcohol cleaning pad. Dispose of the cleaning pad after all of the thermal grease is removed.

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

3. Apply the thermal grease on the top of the processor with syringe by forming four uniformly spaced dots, while each dot consists of about 0.1 ml of thermal grease.

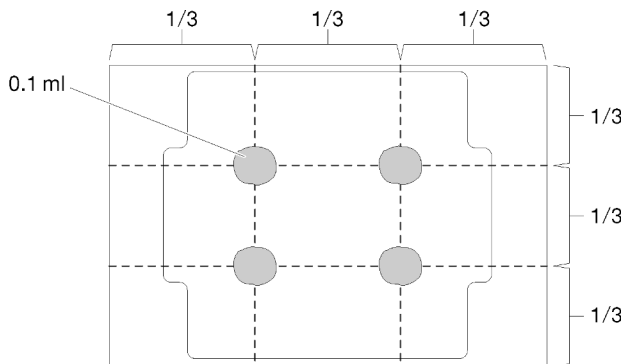


Figure 42. Proper shape of the thermal grease

4. Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

To install the processor, complete the following steps:

- Step 1. Hold the processor by both sides, and align the following:
 1. Align **1** the small notches on the processor to **2** the tabs on the socket.
 2. Align **3** the small triangle of the processor to **4** the beveled corner on the socket.

Then, gently lower the processor evenly into the socket.

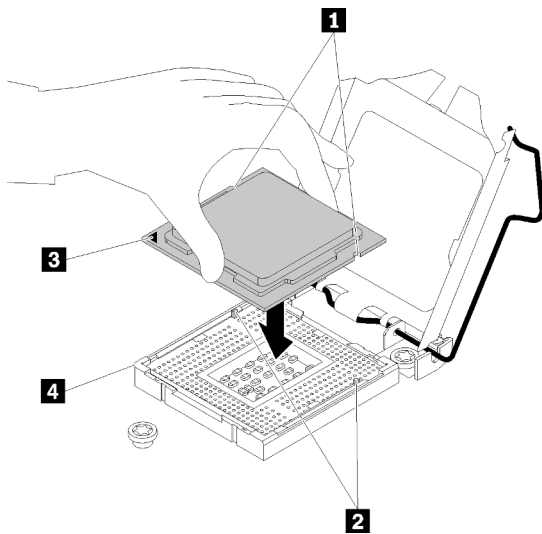


Figure 43. Installing the processor

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

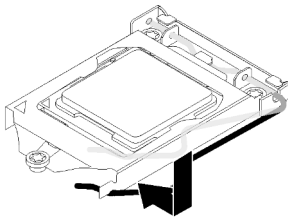


Figure 44. Closing the processor retainer

After you install the processor, complete the following steps:

1. Reinstall the heat sink (see [“Install the heat sink” on page 52](#)).
2. Install the top cover onto the server (see [“Install the top cover” on page 54](#)).
3. Install the server into the rack if necessary.
4. Reconnect power cords and all external cables.

Install the heat sink

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

Before you install the heat sink, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.

To install the heat sink, complete the following steps:

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

- Step 2. Tighten screw 1 and 2:
- Partially tighten screw 1.
 - Fully tighten screw 2.
 - Fully tighten screw 1.

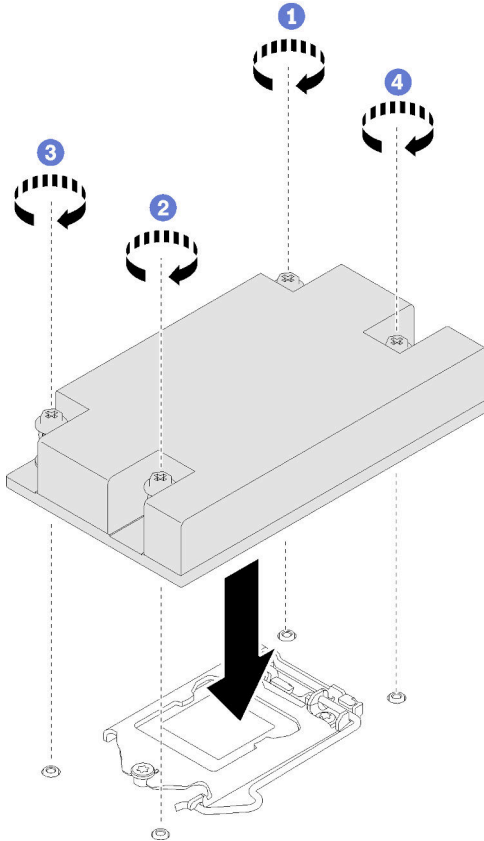


Figure 45. Heat sink installation

- Step 3. Tighten screw 3 and 4:
- Partially tighten screw 3.
 - Fully tighten screw 4.
 - Fully tighten screw 3.

After you install the heat sink, complete the following steps:

1. Install the top cover onto the server (see [“Install the top cover” on page 54](#)).
2. Install the server into the rack if necessary.
3. Reconnect power cords and all external cables.

Install the air baffle

Use this information to install the air baffle.

Before you install the air baffle, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.

To install the air baffle, complete the following steps:

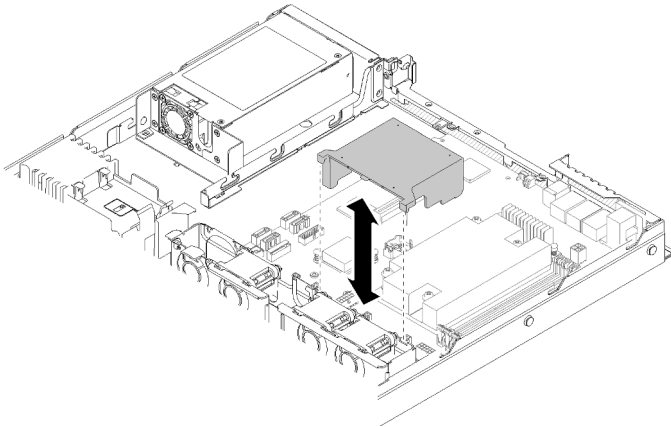


Figure 46. Air baffle installation

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.

After you install the air baffle, complete the following steps:

1. Install the top cover onto the server (see [“Install the top cover”](#) on page 54 for instructions).
2. Install the server into the rack if necessary.
3. Reconnect power cords and all external cables.

Install the top cover

Use this information to install the top cover.

To avoid possible danger, read and follow the following safety information.

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.

Before you install the top cover, complete the following steps:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.
2. Make sure all the removed components are installed, and all the disconnected cables inside the server are reconnected.

To install the top cover, complete the following steps:

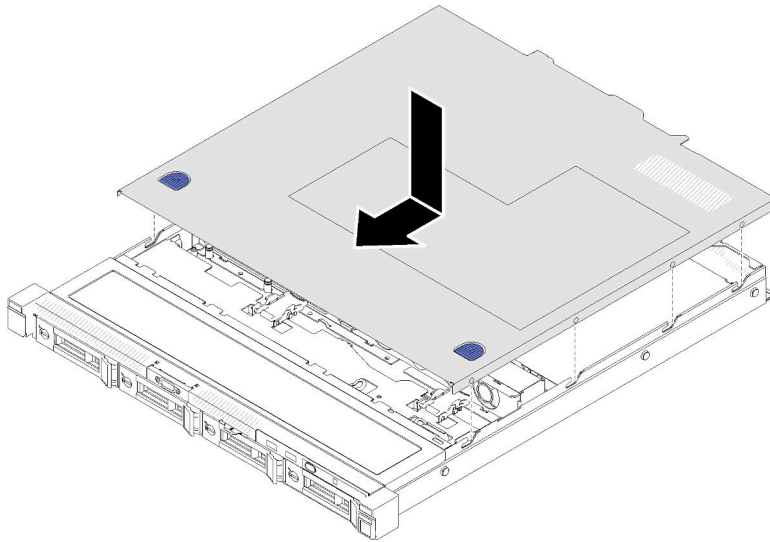


Figure 47. Top cover installation

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 server until it clicks into place.

After you install the top cover, complete the following steps:

1. Install the server into rack if necessary.
2. Reconnect power cords and all external cables.
3. Turn on the server (see [“Power on the server” on page 56](#)).

Install a simple-swap disk drive

Use this information to install a simple-swap disk drive.

Before you install a simple-swap disk drive:

1. Read [“Safety” on page iii](#) and [“Installation Guidelines” on page 32](#) to ensure that you work safely.
2. 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.
3. Identify the drive bay in which you plan to install the simple-swap drive.

Notes:

- When SATA drives are installed and connected to SATA connectors 4-7 on system board (without a RAID adapter installed), the drive number will be reported by RAID utility as drives 4, 5, 6, and 7 (different from drive bay number)
- When SAS or SATA drives are installed and connected to RAID adapter, the drive number will be 0, 1, 2, and 3 (same as drive bay number)

- Drive bay 2 and 3 are not available when the two-drive backplate is installed.

To install a simple-swap disk drive, complete the following steps:

Note: When the fourth SATA drive is installed, the M.2 drive is not supported.

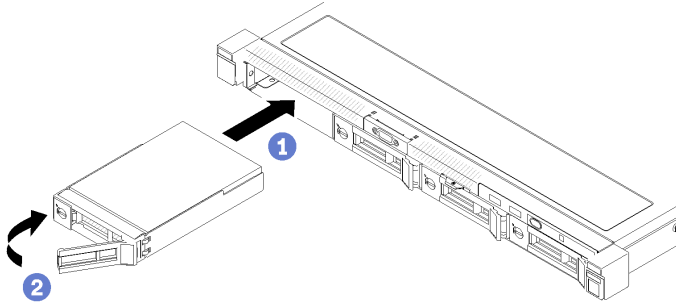


Figure 48. Simple-swap disk drive installation

Step 1. Slide the drive into the drive bay. Make sure the drive handle is in the open position.

Step 2. Lock the drive into place by rotating the drive handle inward until it clicks.

After you install all simple-swap disk drives, complete the following steps:

1. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.
2. Reconnect power cords and all external cables.

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 57](#).

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 56](#).

Chapter 4. System configuration

Complete these procedures to configure your system.

Set the network connection for the Lenovo XClarity Controller

Before you can access the Lenovo XClarity Controller over your network, you need to specify how Lenovo XClarity Controller will connect to the network. Depending on how the network connection is implemented, you might need to specify a static IP address as well.

The following methods are available to set the network connection for the Lenovo XClarity Controller if you are not using DHCP:

- If a monitor is attached to the server, you can use Lenovo XClarity Provisioning Manager to set the network connection.

Complete the following steps to connect the Lenovo XClarity Controller to the network using the Lenovo XClarity Provisioning Manager.

1. Start the server.
2. Press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.)
3. Go to **LXPM → UEFI Setup → BMC Settings** to specify how the Lenovo XClarity Controller will connect to the network.
 - If you choose a static IP connection, make sure that you specify an IPv4 or IPv6 address that is available on the network.
 - If you choose a DHCP connection, make sure that the MAC address for the server has been configured in the DHCP server.
4. Click **OK** to apply the setting and wait for two to three minutes.
5. Use an IPv4 or IPv6 address to connect Lenovo XClarity Controller.

Important: The Lenovo XClarity Controller is set initially with a user name of USERID and password of PASSW0RD (with a zero, not the letter O). This default user setting has Supervisor access. It is required to change this user name and password during your initial configuration for enhanced security.

- If no monitor 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 14.

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 12.

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/sr150/7y54/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:						
<ol style="list-style-type: none"> 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://pubs.lenovo.com/lxpm-overview/>

- **Lenovo XClarity Controller**

If you need to install a specific update, you can use the Lenovo XClarity Controller interface for a specific server.

Notes:

- To perform an in-band update through Windows or Linux, the operating system driver must be installed and the Ethernet-over-USB (sometimes called LAN over USB) interface must be enabled.

For additional information about configuring Ethernet over USB, see:

“Configuring Ethernet over USB” section in the XCC documentation version compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>

- If you update firmware through the Lenovo XClarity Controller, make sure that you have downloaded and installed the latest device drivers for the operating system that is running on the server.

For additional information about using Lenovo XClarity Controller to update firmware, see:

“Updating Server Firmware” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>

- **Lenovo XClarity Essentials OneCLI**

Lenovo XClarity Essentials OneCLI is a collection of command line applications that can be used to manage Lenovo servers. Its update application can be used to update firmware and device drivers for your servers. The update can be performed within the host operating system of the server (in-band) or remotely through the BMC of the server (out-of-band).

For additional information about using Lenovo XClarity Essentials OneCLI to update firmware, see:

https://pubs.lenovo.com/lxce-onecli/onecli_c_update

- **Lenovo XClarity Essentials UpdateXpress**

Lenovo XClarity Essentials UpdateXpress provides most of OneCLI update functions through a graphical user interface (GUI). It can be used to acquire and deploy 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/Invo-xpress>

- **Lenovo XClarity Essentials Bootable Media Creator**

You can use Lenovo XClarity Essentials Bootable Media Creator to create bootable media that is suitable for firmware updates, VPD updates, inventory and FFDC collection, advanced system configuration, FoD Keys management, secure erase, RAID configuration, and diagnostics on supported servers.

You can obtain Lenovo XClarity Essentials BoMC from the following location:

<https://datacentersupport.lenovo.com/solutions/Invo-bomc>

- **Lenovo XClarity Administrator**

If you are managing multiple servers using the Lenovo XClarity Administrator, you can update firmware for all managed servers through that interface. Firmware management is simplified by assigning firmware-compliance policies to managed endpoints. When you create and assign a compliance policy to managed endpoints, Lenovo XClarity Administrator monitors changes to the inventory for those endpoints and flags any endpoints that are out of compliance.

For additional information about using Lenovo XClarity Administrator to update firmware, see:

http://sysmgmt.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://pubs.lenovo.com/lxci-overview/>

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://pubs.lenovo.com/lxpm-overview/>
- *UEFI User Guide*
 - <https://pubs.lenovo.com/uefi-overview/>

- **Lenovo XClarity Essentials OneCLI**

You can use the config application and commands to view the current system configuration settings and make changes to Lenovo XClarity Controller and UEFI. The saved configuration information can be used to replicate or restore other systems.

For information about configuring the server using Lenovo XClarity Essentials OneCLI, see:

https://pubs.lenovo.com/lxce-onecli/onecli_c_settings_info_commands

- **Lenovo XClarity Administrator**

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

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

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://pubs.lenovo.com/lxcc-overview/>

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 “Install a DIMM” on page 49.

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
- CentOS
- NeoKylin
- Ubuntu

Complete list of available operating systems: <https://lenovopress.lenovo.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

https://pubs.lenovo.com/lxce-onecli/onecli_r_uxspi_proxy_tool

- Lenovo XClarity Integrator deployment pack for SCCM (for Windows operating system only)
https://pubs.lenovo.com/lxci-deploypack-sccm/dpsccm_c_endtoend_deploy_scenario

- **Single-server**

Available tools:

- Lenovo XClarity Provisioning Manager
“OS Installation” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>
- Lenovo XClarity Essentials OneCLI
https://pubs.lenovo.com/lxce-onecli/onecli_r_uxspi_proxy_tool
- Lenovo XClarity Integrator deployment pack for SCCM (for Windows operating system only)
https://pubs.lenovo.com/lxci-deploypack-sccm/dpsccm_c_endtoend_deploy_scenario

Manual deployment

If you cannot access the above tools, follow the instructions below, download the corresponding OS *Installation Guide*, and deploy the operating system manually by referring to the guide.

1. Go to <https://datacentersupport.lenovo.com/solutions/server-os>.
2. Select an operating system from the navigation pane and click **Resources**.
3. Locate the “OS Install Guides” area and click the installation instructions. Then, follow the instructions to complete the operation system deployment task.

Back up the server configuration

After setting up the server or making changes to the configuration, it is a good practice to make a complete backup of the server configuration.

Make sure that you create backups for the following server components:

- **Management processor**

You can back up the management processor configuration through the Lenovo XClarity Controller interface. For details about backing up the management processor configuration, see:

“Backing up the BMC configuration” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.

Alternatively, you can use the `save` command from Lenovo XClarity Essentials OneCLI to create a backup of all configuration settings. For more information about the `save` command, see:

https://pubs.lenovo.com/lxce-onecli/onecli_r_save_command

- **Operating system**

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

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://pubs.lenovo.com/lxpm-overview/>.) 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 aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa, where aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa 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://pubs.lenovo.com/lxcc-overview/>.

Chapter 5. Resolving installation issues

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 71
- “The server immediately displays the POST Event Viewer when it is turned on” on page 71
- “Embedded hypervisor is not in the boot list” on page 72
- “Server cannot recognize a hard drive” on page 72
- “Displayed system memory less than installed physical memory” on page 73
- “A Lenovo optional device that was just installed does not work.” on page 74

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 DIMM 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

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://pubs.lenovo.com/lxcc-overview/>

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 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:
 - 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://pubs.lenovo.com/lxpm-overview/>.) 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 the hard disk drive backplane (go to step Hard disk drive problems).
 - 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://pubs.lenovo.com/lxpm-overview/>.) 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 adapter 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 less than installed physical memory

Complete the following steps until the problem is resolved:

Note: Each time you install or remove a DIMM, 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 (see “Specifications” on page 3 for requirements).
 - After changing or replacing a memory module, memory configuration is updated accordingly in the Setup Utility.
 - All banks of memory are enabled. The server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.
 - There is no memory mismatch when the server is at the minimum memory configuration.
2. Reseat the DIMMs, and then restart the server.
3. Check the POST error log:
 - If a memory module was disabled by a systems-management interrupt (SMI), replace the memory module.
 - If a memory module was disabled by the user or by POST, reseat the memory module; then, run the Setup Utility and enable the memory module.
4. Run memory diagnostics. When you start a solution and press the key according to the on-screen instructions, the LXPM interface is displayed by default. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) You can perform memory diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → Memory test.**
5. Re-enable all memory modules using the Setup Utility, and then restart the server.
6. (Trained technician only) Install the failing memory module into a memory module connector for processor 2 (if installed) to verify that the problem is not the processor or the memory module connector.
7. (Trained technician only) Replace the system board.

A Lenovo optional device that was just installed does not work.

1. Make sure that:
 - The device is supported for the server (see <https://serverproven.lenovo.com/>).
 - You followed the installation instructions that came with the device and the device is installed correctly.
 - You have not loosened any other installed devices or cables.
 - You updated the configuration information in system setup. When you start a server and press the key according to the on-screen instructions to display the Setup Utility. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Whenever memory or any other device is changed, you must update the configuration.
2. Reseat the device that you have just installed.
3. Replace the device that you have just installed.
4. Reseat the cable connection and check there is no physical damage to the cable.
5. If there is any cable damages, then replace the cable.

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 <https://pubs.lenovo.com/>

You can take these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Check for updated software, firmware, and operating-system device drivers for your Lenovo product. 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 are 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.

Gathering information needed to call Support

If you require warranty service for your Lenovo product, the service technicians will be able to assist you more efficiently if you prepare the appropriate information before you call. You can also go to <http://datacentersupport.lenovo.com/warrantylookup> for more information about your product warranty.

Gather the following information to provide to the service technician. This data will help the service technician quickly provide a solution to your problem and ensure that you receive the level of service for which you might have contracted.

- Hardware and Software Maintenance agreement contract numbers, if applicable
- Machine type number (Lenovo 4-digit machine identifier)
- 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://pubs.lenovo.com/lxcc-overview/>.
- 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://pubs.lenovo.com/lxcc-overview/>.

- **Lenovo XClarity Administrator**

Lenovo XClarity Administrator can be set up to collect and send diagnostic files automatically to Lenovo Support when certain serviceable events occur in Lenovo XClarity Administrator and the managed endpoints. You can choose to send diagnostic files to Lenovo Support using Call Home or to another service provider using SFTP. You can also manually collect diagnostic files, open a problem record, and send diagnostic files to the Lenovo Support 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 https://pubs.lenovo.com/lxce-onecli/onecli_r_getinfor_command.

Contacting Support

You can contact Support to obtain help for your issue.

You can receive hardware service through a Lenovo Authorized Service Provider. To locate a service provider authorized by Lenovo to provide warranty service, go to <https://datacentersupport.lenovo.com/serviceprovider> and use filter searching for different countries. For Lenovo support telephone numbers, see <https://datacentersupport.lenovo.com/supportphonenumberlist> for your region support details.

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