Lenovo

ThinkEdge SE100
System Configuration Guide

Machine Type: 7DGR

Note

Before using this information and the product it supports, be sure to read and understand the safety information and the safety instructions, which are available at:
https://pubs.lenovo.com/safety_documentation/

In addition, be sure that you are familiar with the terms and conditions of the Lenovo warranty for your server, which can be found at:
http://datacentersupport.lenovo.com/warrantylookup

First Edition (May 2025)

Contents

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

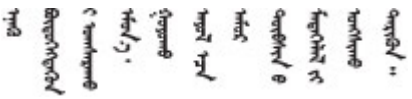
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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



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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

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

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

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Safety inspection checklist

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

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

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.
- Do not remove the black coating on the surface of the server. The black coating on the surface is insulating for electro-static discharge protection

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 ThinkEdge SE100 server (Type 7DGR) is a new edge server offering. It is specifically designed to meet the needs of edge computing, edge AI, hybrid cloud and workloads at the edge locations. ThinkEdge SE100 is a rugged compact sized edge solution with a focus on smart connectivity, business security and manageability for the harsh environment. Built for long life and dependable performance to support your demanding IoT workloads at the Edge. Compact and rugged it is designed for the non-datacenter environment, ideal for remote locations such as retail, manufacturing and factory locations.

Note: Up to two ThinkEdge SE100 nodes with expansion kit can be installed in an 1U2N enclosure while up to three ThinkEdge SE100 nodes can be installed in an 1U3N enclosure.

Figure 1. ThinkEdge SE100

Features

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

Your server implements the following features and technologies:

- **Lenovo XClarity Controller (XCC)**

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

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

- **UEFI-compliant server firmware**

  Lenovo ThinkEdge 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 ThinkEdge 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 synchronous dynamic random-access memory (SDRAM) registered dual inline memory modules (DIMMs) of clocked small outline (CSO) and small outline (SO). For more information about the specific types and maximum amount of memory, see “Technical specifications” on page 4.

- **Integrated network support**

  The server comes with integrated 2-port Gigabit Ethernet controller with RJ-45 connectors, which supports connection to a 1000 Mbps network.

- **Large data-storage capacity**

  The server supports up to two optional M.2 NVMe drives and one M.2 SATA/NVMe drive.

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

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

- **Active Energy Manager**

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

- **Redundant networking connection**

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

- **Redundant cooling**

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

- **Optional power capabilities**

  Power adapter capability is different depending on configuration. The server with the following configurations support up to two 140 watt power adapters.

  – Desktop mount
  – Wall mount
  – Ceiling mount
  – DIN rail mount

  The server installed in an enclosure supports up to two 300 watt power adapters.

- **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.

- **Lenovo XClarity Controllers System Lockdown Mode**

  System lockdown will be enforced under specific circumstances to protect the server from information breach, particularly when the server detects physical movements of the node or enclosure covers. See “System Lockdown Mode” on page 56 for details.

- **Kensington–style cable lock**

You can use a Kensington-style cable lock to secure your server to a desk, table, or other non-permanent fixture. The cable lock attaches to the security-lock slot at the side of your server and is operated with a key or combination depending on the type selected. The cable lock also locks the server cover. This is the same type of lock used with many notebook computers. You can order such a cable lock directly from Lenovo by searching for Kensington at: http://www.lenovo.com/support.

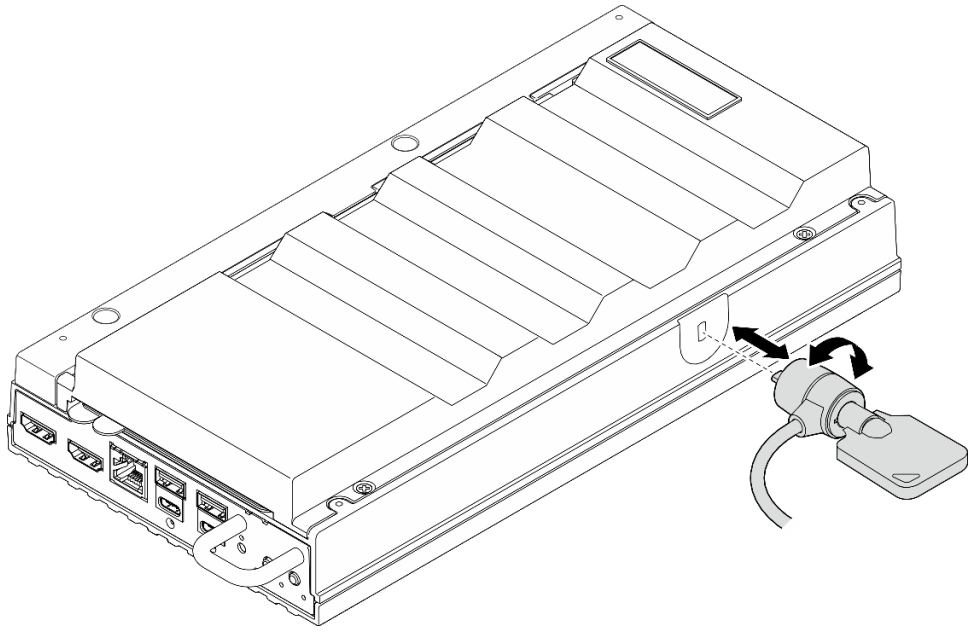


Figure 2. Kensington–style cable lock

Tech Tips

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

To find the Tech Tips available for your server:

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

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

Security advisories

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

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

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

Specifications

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

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

Specification category	Technical specifications	Mechanical specifications	Environmental specifications
Content	• Processor • Memory • M.2 Drive • Expansion slots • GPU • Integrated functions and I/O connectors • Network • System fan • Electrical input • Minimal configuration for debugging • Operating systems	• Dimension • Weight	• Acoustical noise emissions • Ambient temperature management • Environmental

Technical specifications

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

Processor
Supports multi-core Intel Core Ultra 200H series processors in Ball-Grid Array (BGA) package: • Scalable up to 16 cores • Supports TDP up to 28W For a list of supported processors, see: https://serverproven.lenovo.com.

Memory

See “Memory module installation rules and order” in *User Guide* or *Hardware Maintenance Guide* for detailed information about memory configuration and setup.

- Slots: two dual inline memory module (DIMM) slots (two channels, one DIMM per channel)
- Memory module types:
  - TruDDR5 6400MHz CSODIMM
  - TruDDR5 5600MHz SODIMM
- Capacity:
  - CSODIMM: 8 GB (1Rx16), 16 GB (1Rx8), and 32 GB (2Rx8)
  - SODIMM: 16 GB (1Rx8), and 32 GB (2Rx8)
- Total capacity:
  - Minimum: 8 GB
  - Maximum: 64 GB

Notes: Make sure to follow the following rules when installing the memory module to slot 1 and 2:

- Mixing SODIMM and CSODIMM between slot 1 and 2 is not allowed.
- All memory modules to be installed must be the same capacity.

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

M.2 Drive

M.2 boot drive:

- Up to one 80 mm (2280) M.2 SATA/NVMe boot drive on slot 1

M.2 storage drives:

- Up to two M.2 NVMe storage drives on slot 2 and 3, of the following drive form factor
  - 80 mm (2280)
  - 110 mm (22110)

Notes:

- Make sure to follow the following rules when installing M.2 drives to slot 2 and slot 3:
  - All M.2 drives installed should be identical in form factor.
  - Mixing M.2 drives of different vendors and capacity is allowed.

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

Expansion slots

One PCIe slot supports up to 75W:

- PCI Express 4.0 x16 (x8 lanes), HH/HL

Graphics processing unit (GPU)

The server supports the following GPU configuration:

- One PCIe x16, single wide, low profile GPU adapter

Integrated functions and I/O connectors

- Lenovo XClarity Controller (XCC), which provides service processor control and monitoring functions, video controller, and remote keyboard, video, mouse, and remote drive capabilities.
  - The server supports Lenovo XClarity Controller 2 (XCC2). For additional information about Lenovo XClarity Controller 2 (XCC2), refer to https://pubs.lenovo.com/lxcc-overview/.
- **Front I/O connectors**
  - Two USB 3.2 Gen2 (10 Gbps) Type-A connectors
  - Two USB 3.2 Gen 2 (10 Gbps) Type-C connector with display support
  - One RJ-45 RS-232 serial console connector for OS/BIOS or XCC
  - Two HDMI 2.0 connectors
- **Rear I/O connectors**
  - Two USB Type-C power connectors
    - Power connector 2 with Lenovo XClarity Controller (XCC) management
  - One XCC system management port (10/100/1000 Mbps RJ-45) on the rear to connect to a systems-management network. This RJ-45connector is dedicated to the Lenovo XClarity Controller functions and runs at 10/100/1000 Mbps speed.
  - Two 1GbE RJ-45 connectors
  - Two USB 3.2 Gen2 (10 Gbps) Type-A connectors
  - One Fan control board connector for enclosure cooling usage

Network

Ethernet connectors

- Two 1GbE RJ-45 connectors

Ethernet adapters

- Support one low-profile PCIe Ethernet adapter

System fan

Supported fans vary by configuration.

- **Node:** Two 65mm x 13mm non hot-swap frameless blower fans
- **Ethernet adapter expansion kit:** Two 50mm x 50mm x 10mm non-hot swap fans

Note: Proceed to the “System fan numbering” on page 30 section to identify each fan number.

Electrical input

Following is the list of supported power supply types with 1+1 redundancy:

- Up to two 140W (230V/115V) external power adapters

  Notes: When one or two 140W external power adapters are installed, keep ambient temperature lower than 45°C, and the following mounting types are supported:

  - Mounting option: Desktop mount / Wall mount / Ceiling mount

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

  As required by COMMISSION REGULATION (EU) 2019/424 of 1 March 2020 laying down ecodesign requirements for servers and data storage products (ErP lot 9).

ThinkEdge 140W 230V/115V External Power Supply

Information published	Value and precision	Unit
Manufacturer’s name	Lenovo	-
Model identifier	Adapter	-

ThinkEdge 140W 230V/115V External Power Supply		
Input voltage	100-240	V
Input AC frequency	50-60	Hz
Output voltage	28.0	V
Output current	5.0	A
Output power	140.0	W
Average active efficiency	• FSP: 91.0 / 91.0 • Delta: 92.1 / 91.6	%
Efficiency at low load (10 %)	• FSP: 88.5 / 87.5 • Delta: 77.4 / 77.4	%
No-load power consumption	• FSP: 0.065 / 0.08 • Delta: 0.078 / 0.047	W

Minimal configuration for debugging

- One DRAM memory module in DIMM slot 1
- One 140W power supply
- One 2280 SATA/NVMe M.2 drive in slot 1
- Two system fans

Operating systems

Supported and certified operating systems:

- Microsoft Windows
- Canonical Ubuntu

Notes:

- While installing the operating system through the “remote console” functionality in XCC, make sure not to connect the monitor to USB port 4 (with display support) and HDMI connectors on the server to avoid monitor display signal output error. See “Front view” on page 17 to locate the connectors.
- If the system is installed with the operating system Ubuntu 24.04.2, follow the rules in “Front view” on page 17 and “Rear view” on page 21 to connect the monitor.

References:

- Complete list of available operating systems: https://lenovopress.lenovo.com/osig.
- OS deployment instructions, see “Deploy the operating system” on page 60.

Mechanical specifications

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

Dimension
Node • Height: 53 mm (2.09 inches) • Width: 142.3 mm (5.6 inches) • Depth: 278 mm (10.94 inches) Node with expansion kit • Height: 53 mm (2.09 inches) • Width: 214.2 mm (8.43 inches) • Depth: 278 mm (10.94 inches) Node with node sleeve • Height: 111.6 mm (4.39 inches) • Width: 439.4 mm (17.3 inches) • Depth: 345.7 mm (13.61 inches) Enclosure • Height: 43 mm (1.69 inches) • Width: 434.4 mm (17.10 inches) – From EIA bracket to EIA bracket: 481.74 mm (18.97 inches) • Depth: 734.3 mm (28.9 inches)

Weight
Node • Maximum: 2.36 kg (5.2 lbs) Node with expansion kit • Maximum: 3 kg (6.6 lbs) Node with node sleeve • Maximum: 7.3 kg (16 lbs) Node with expansion kit in node sleeve • Maximum: 7.9 kg (17.4 lbs) 1U2N enclosure • Maximum (with two nodes, two expansion kits and two power adapters installed): 13.9 kg (30.6 lbs) 1U3N enclosure • Maximum (with three nodes and two power adapters installed): 15 kg (33 lbs)

Environmental specifications

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

Acoustical noise emissions

The server has the following acoustic noise emissions declaration:

- Sound power level (L_{WAd})
  - Idling:
    - Minimum: 4.2 Bel
    - Typical: 4.1 Bel
    - GPU : 4.1 Bel
  - Operating profile 1:
    - Minimum: 4.2 Bel
    - Typical: 4.1 Bel
    - GPU : 4.1 Bel
  - Operating profile 2:
    - Minimum: 5.0 Bel
    - Typical: 4.9 Bel
    - GPU : 5.0 Bel
- Sound pressure level (L_{pAm}):
  - Idling:
    - Minimum: 25.3 dBA
    - Typical: 25.7 dBA
    - GPU: 25.3 dBA
  - Operating profile 1:
    - Minimum: 25.3 dBA
    - Typical: 25.9 dBA
    - GPU : 25.3 dBA
  - Operating profile 2:
    - Minimum: 34.3 dBA
    - Typical: 34.1 dBA
    - GPU : 33.9 dBA

Notes:

- These sound levels were measured in controlled acoustical environments according to procedures specified by ISO7779 and are reported in accordance with ISO 9296. Operating profile 1 is represented by 50% CPU TDP. Operating profile 2 is represented by 100% CPU TDP or 70%/30% storage write/read or 100% GPU. Testing was conducted at 23°C ± 2°C to align with ISO7779.
- The declared acoustic sound levels are based on the specified configurations, which may change depending on configuration/conditions.
  - Minimum configuration: Intel Ultra5 processors, 2x 8GB DDR5 CSODIMMs, 1x SATA M.2 boot drive.
  - Typical configuration: Intel Ultra7 processors, 2x 32GB DDR5 CSODIMMs, 1x 480GB NVMe M.2 boot drives, 2x 1.92TB NVMe storage M.2 drives.
  - GPU configuration: Intel Ultra7 processors, 2x 32GB DDR5 CSODIMMs, 1x 480GB NVMe M.2 boot drives, 1x 960GB NVMe storage M.2 drives, 1x Nvida RTX2000E ada GPU
- Government regulations (such as those prescribed by OSHA or European Community Directives) may govern noise level exposure in the workplace and may apply to you and your server installation. The actual sound pressure levels in your installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room; the noise levels from other equipment; the room ambient temperature, and employee's location in relation to the equipment. Further, compliance with such government regulations depends on a variety of additional factors, including the duration of employees' exposure and whether employees wear

Acoustical noise emissions

hearing protection. Lenovo recommends that you consult with qualified experts in this field to determine whether you are in compliance with the applicable regulations.

Ambient temperature management

ThinkEdge SE100 (Type 7DGR) supports most of the configurations operating at temperature of 45°C or lower. Adjust ambient temperature when specific components are installed:

- The following components can operate at temperature of 45°C or lower and require proper ambient temperature and redundant cooling by the fans to prevent performance degradation:
  - When one of the following components is installed, keep ambient temperature lower than 40°C for proper operation. When the ambient temperature is over 40°C, performance degradation might occur.
    - NVMe M.2 storage drives
  - When one of the following components is installed, keep ambient temperature lower than 35°C for proper operation. When the ambient temperature is over 35°C, performance degradation might occur.
    - NVMe M.2 boot drives
- The following components can operate at temperature of 35°C or lower and require proper system cooling with N+1 fan redundancy.
  - GPU adapter

Environment

ThinkEdge SE100 complies with ASHRAE Class A4 specifications. System performance may be impacted when operating temperature is outside AHSARE A4 specification or fan failed condition outside A2 Specification. ThinkEdge SE100 is supported in the following environment:

- Air temperature:
  - Operating
    - ASHARE Class A2: 10°C to 35°C (50°F to 95°F); the maximum ambient temperature decreases by 1°C for every 300 m (984 ft) increase in altitude above 900 m (2,953 ft).
    - ASHARE Class A3: 5°C to 40°C (41°F to 104°F); the maximum ambient temperature decreases by 1°C for every 175m (574 ft) increase in altitude above 900 m (2,953 ft).
    - ASHARE Class A4: 5°C to 45°C (41°F to 113°F); the maximum ambient temperature decreases by 1°C for every 125m (410 ft) increase in altitude above 900 m (2,953 ft).
  - Server off: 5°C to 45°C (41°F to 113°F)
- Maximum altitude: 3,050 m (10,000 ft)
- Relative Humidity (non-condensing):
  - Operating: Operating: 8% to 90%, maximum dew point: 24°C (75.2°F)
  - Shipment/storage: 8% to 90%, maximum dew point: 27°C (80.6°F)
  - Non-operating (unpacked) storage can pass the following condition: 5% to 95% at 38.7°C (101.7°F) maximum dry-bulb temperature for 48 hrs.
- Particulate contamination
  - ThinkEdge SE100 complies with IP5X Ingress Protection per ANSI/IEC60529-2020 Degrees of Protection Provided by Enclosures (IP Code).

    Note: PCIe expansion kit installed with your server does not comply with IP5X standard.

  Attention: Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server. For information about the limits for particulates and gases, see “Particulate contamination” on page 11.

Shock and vibration specifications

The following information is a summary of the shock and vibration specifications of the server. Depending on the model, some features might not be available, or some specifications might not apply.

Table 1. Shock and vibration specifications

Mounting type of ThinkEdge SE100	Shock (when the server is in operation)	Shock (when the server is not in operation, such as in shipping)	Vibration (when the server is in operation)	Vibration (when the server is not in operation, such as in shipping)
Desktop mount (standing alone)	Half-sine wave, 15G 11ms	Trapezoidal wave, 50G 152 inch/sec	5-100 Hz, 0.15 Grms, 30 mins	2-200 Hz, 1.04 Grms, 15 mins
DIN-rail mount				
Wall mount				
Ceiling mount				

Particulate contamination

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

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

Table 2. Limits for particulates and gases

Contaminant	Limits
Reactive gases	Severity level G1 as per ANSI/ISA 71.04-1985[1]: • The copper reactivity level shall be less than 200 Angstroms per month (Å/month ≈ 0.0035 µg/cm^2-hour weight gain).[2] • The silver reactivity level shall be less than 200 Angstroms per month (Å/month ≈ 0.0035 µg/cm^2-hour weight gain).[3] • The reactive monitoring of gaseous corrosivity must be conducted approximately 5 cm (2 in.) in front of the rack on the air inlet side at one-quarter and three-quarter frame height off the floor or where the air velocity is much higher.
Airborne particulates	Data centers must meet the cleanliness level of ISO 14644-1 class 8. For data centers without airside economizer, the ISO 14644-1 class 8 cleanliness might be met by choosing one of the following filtration methods: • The room air might be continuously filtered with MERV 8 filters. • Air entering a data center might be filtered with MERV 11 or preferably MERV 13 filters. For data centers with airside economizers, the choice of filters to achieve ISO class 8 cleanliness depends on the specific conditions present at that data center. • The deliquescent relative humidity of the particulate contamination should be more than 60% RH.[4] • Data centers must be free of zinc whiskers.[5]

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

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

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

[4] The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.

[5] Surface debris is randomly collected from 10 areas of the data center on a 1.5 cm diameter disk of sticky electrically conductive tape on a metal stub. If examination of the sticky tape in a scanning electron microscope reveals no zinc whiskers, the data center is considered free of zinc whiskers.

Management options

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

Overview

Options	Description
Lenovo XClarity Controller	Baseboard management controller (BMC) Consolidates the service processor functionality, Super I/O, video controller, and remote presence capabilities into a single chip on the server system board (system board assembly). **Interface** • CLI application • Web GUI interface • Mobile application • Redfish API **Usage and downloads** https://pubs.lenovo.com/lxcc-overview/
Lenovo XCC Logger Utility	Application that reports the XCC events to local OS system log. **Interface** • CLI application **Usage and downloads** • https://pubs.lenovo.com/lxcc-logger-linux/ • https://pubs.lenovo.com/lxcc-logger-windows/
Lenovo XClarity Administrator	Centralized interface for multi-server management. **Interface** • Web GUI interface • Mobile application • REST API **Usage and downloads** https://pubs.lenovo.com/lxca/
Lenovo XClarity Essentials toolset	Portable and light toolset for server configuration, data collection, and firmware updates. Suitable both for single-server or multi-server management contexts. **Important:** To read and configure UEFI and BMC settings, use the latest versions of OneCLI 5.x, BoMC 14.x, and UpdateXpress 5.x. **Interface** • **OneCLI**: CLI application • **Bootable Media Creator**: CLI application, GUI application • **UpdateXpress**: GUI application **Usage and downloads** https://pubs.lenovo.com/lxce-overview/

Options	Description
Lenovo XClarity Provisioning Manager	UEFI-based embedded GUI tool on a single server that can simplify management tasks. **Interface** • Web interface (BMC remote access) • GUI application **Usage and downloads** https://pubs.lenovo.com/lxpm-overview/ **Important:** Lenovo XClarity Provisioning Manager (LXPM) supported version varies by product. All versions of Lenovo XClarity Provisioning Manager are referred to as Lenovo XClarity Provisioning Manager and LXPM in this document, unless specified otherwise. To see the LXPM version supported by your server, go to https://pubs.lenovo.com/lxpm-overview/.
Lenovo XClarity Integrator	Series of applications that integrate the management and monitoring functionalities of the Lenovo physical servers with the software used in a certain deployment infrastructure, such as VMware vCenter, Microsoft Admin Center, or Microsoft System Center while delivering additional workload resiliency. **Interface** • GUI application **Usage and downloads** https://pubs.lenovo.com/lxci-overview/
Lenovo XClarity Energy Manager	Application that can manage and monitor server power and temperature. **Interface** • Web GUI Interface **Usage and downloads** https://datacentersupport.lenovo.com/solutions/lnvo-lxem
Lenovo Capacity Planner	Application that supports power consumption planning for a server or rack. **Interface** • Web GUI Interface **Usage and downloads** https://datacentersupport.lenovo.com/solutions/lnvo-lcp

Functions

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

Notes:

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

Chapter 2. Server components

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

Front view

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

Notes: If the system is installed with the operating system Ubuntu 24.04.2, make sure to follow the following rules before configuring the system in multi-monitor environment:

- The display ports on the server can be separated into two types of groups. To avoid causing any problem to the display function of the connector, it is only allowed to connect the monitors to the connectors in either group A or group B.

Group A	Group B
“USB port 4 (with display support)” on page 18	**“USB port 3 (with display support)” on page 19**
“HDMI 2.0 connectors” on page 19	**“XCC system management port (10/100/1000 Mbps RJ-45)” on page 23** – **Do not support accessing the remote console functionality only. Before accessing the remote console functionality, connecting the monitors to this port and the connectors in group A at the same time, the display function can still work normally.**

- Make sure the display mode is set as “Mirror Display”.
- Depending on the model, your server might look slightly different from the illustration.

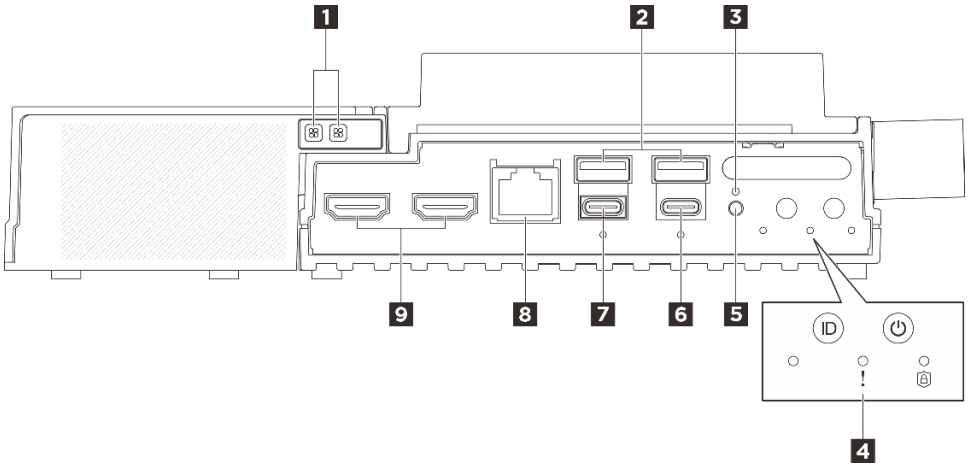


Figure 3. Front view

Table 3. Components on the front view

1 Fan error LED of Ethernet adapter expansion kit (Amber)	2 USB 3.2 Gen2 (10 Gbps) Type-A connectors (USB port 1 and port 2)
3 Lockdown button	4 System buttons and LEDs
5 UART switch button	6 USB 3.2 Gen 2 (10 Gbps) Type-C connector with display support (USB port 4)
7 USB 3.2 Gen 2 (10 Gbps) Type-C connector with display support (USB port 3)	8 RJ-45 RS-232 serial console connector for OS/BIOS or XCC
9 HDMI 2.0 connectors	

1 Fan error LED of Ethernet adapter expansion kit (Amber)

When a fan error LED on the Ethernet adapter expansion kit is lit, it indicates that the corresponding system fan is operating slowly or has failed.

2 USB 3.2 Gen2 (10 Gbps) Type-A connectors (USB port 1 and port 2)

Connect a USB device, such as a mouse, keyboard, or other devices, to either of these connectors.

3 Locked button

After pressing this button, the server will be in System Lockdown Mode for security and the security LED of the server will start blinking. See “Front LEDs” on page 32 to identify the security LED status. The lockdown button will not respond if the button is pressed after the system has already entered BIOS Setup menu or OS.

4 System buttons and LEDs

The buttons and LEDs provide controls and system status. The following buttons and LEDs are in this area:

- UART status LED (white)
- System Error LED (yellow)
- Security LED (green)
- Power button with power status LED (green)
- UID button with LED (blue)

See “Front LEDs” on page 32 for more information.

5 UART switch button

Press this button to switch the UART output between XCC log (Lenovo service technicians only) or CPU log. After powering on the server, the output is CPU log by default. See “Front LEDs” on page 32 to determine the status of the UART output.

6 USB 3.2 Gen 2 (10 Gbps) Type-C connector with display support (USB port 4)

Connect a USB device, such as a mouse, keyboard, monitor, or other devices, to this connector. This connector supports display.

Notes:

- The maximum video resolution is 4K at 60 Hz.
- The connector supports up to 15 watts of power (5V/3A).

7 USB 3.2 Gen 2 (10 Gbps) Type-C connector with display support (USB port 3)

Connect a USB device, such as a mouse, keyboard, monitor, or other devices, to this connector. Configure the UEFI setting through this port as a priority.

Notes:

- When configuring UEFI settings or powering on the system remotely through XCC, make sure to connect the monitor to USB Type-C connectors with display support (USB port 3).
- The maximum video resolution is 1920 x 1200 at 60 Hz.
- The connector can support up to 15 watts of power (5V/3A).

8 RJ-45 RS-232 serial console connector for OS/BIOS or XCC

Connect an external RJ-45 serial COMM console cable to this RS-232 serial console with RJ-45 connector.

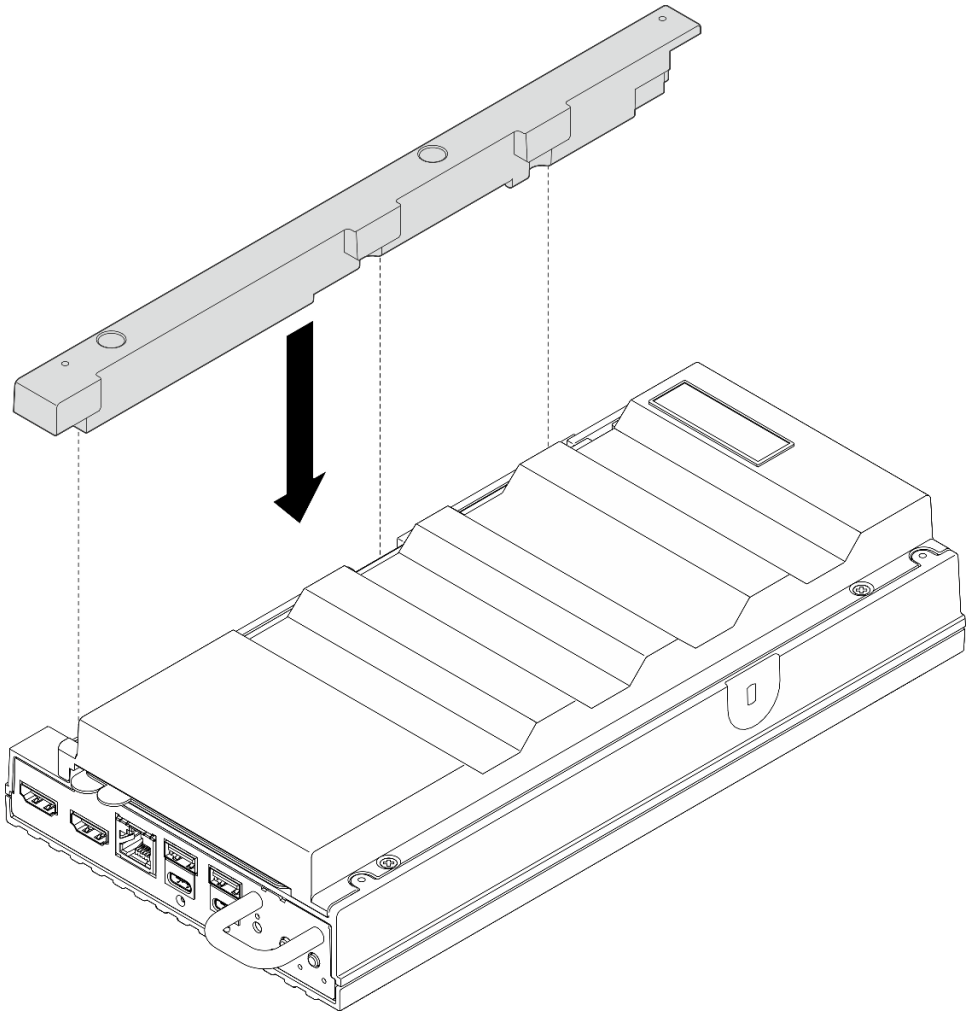
9 HDMI 2.0 connectors

Connect a HDMI-compatible device to either of these connectors.

Note: The maximum video resolution is 4K at 60 Hz.

Expansion filler

Install the expansion filler when the node is not installed with a expansion kit. See “Install the expansion filler” in *User Guide* or *Hardware Maintenance Guide* for more information.



Front I/O fillers

Install the I/O fillers when the connectors are not used. The connectors could be dust-covered without proper protection of the fillers.

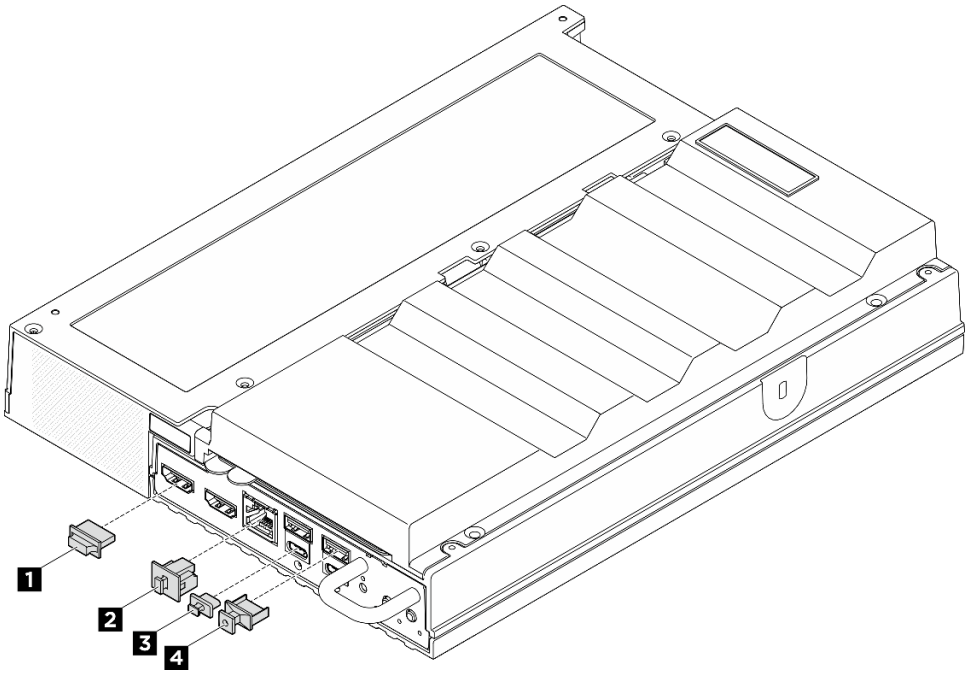


Figure 4. Front I/O fillers

1 HDMI connector filler (x2)	2 RJ-45 filler (x1)
3 USB Type-C filler (x2)	4 USB Type-A filler (x2)

Rear view

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

Notes:

- If the system is installed with the operating system Ubuntu 24.04.2, make sure to follow the following rules before configuring the system in multi-monitor environment:
  - The display ports on the server can be separated into two types of groups. To avoid causing any problem to the display function of the connector, it is only allowed to connect the monitors to the connectors in either group A or group B.

Group A	Group B
“USB port 4 (with display support)” on page 18	**“USB port 3 (with display support)” on page 19**
“HDMI 2.0 connectors” on page 19	**“XCC system management port (10/100/1000 Mbps RJ-45)” on page 23** **– Do not support accessing the remote console functionality only. Before accessing the remote console functionality, connecting the monitors to this port and the connectors in group A at the same time, the display function can still work normally.**

  - Make sure the display mode is set as “Mirror Display”.

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

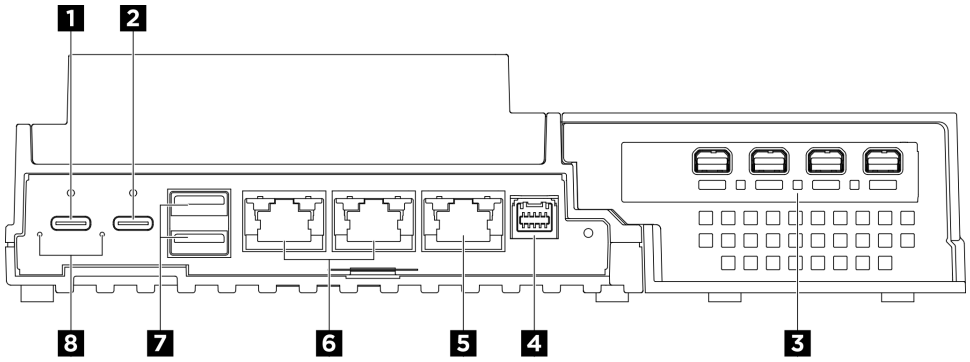


Figure 5. Rear view

Table 4. Components on the rear view

1 USB Type-C power connector 1	2 USB Type-C power connector 2 with USB 2.0 Lenovo XClarity Controller management
3 PCIe slot (expansion kit)	4 Fan control board connector
5 XCC system management port (10/100/1000 Mbps RJ-45)	6 1GbE RJ-45 connectors
7 USB 3.2 Gen2 (10 Gbps) Type-A connectors	8 Power input LED (green/yellow)

1 2 USB Type-C power connectors

Connect the AC power adapters to these connectors. Make sure the power source is connected properly. Power connector 2 also supports USB 2.0 Lenovo XClarity Controller Management.

Note: If only one power adapter is to be installed, it is recommended to connect the power adapter to power connector 1.

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

Only one mode is supported:

- **BMC only mode**

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

3 PCIe slot (expansion kit)

Install a PCIe adapter into this slot. See “Install the PCIe adapter” in *User Guide* or *Hardware Maintenance Guide* for more information.

4 Fan control board connector

Connect a fan control board power cable to this connector for the server installed in the enclosure. See ***SE100 Enclosure Internal Cable Routing Guide*** for more information.

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

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

See the following for more information:

- Set the network connection for the Lenovo XClarity Controller
- "XCC system management port (10/100/1000 Mbps RJ-45) and LAN port LEDs" on page 37

6 1GbE RJ-45 connectors

Connect an Ethernet cable to either of these connectors for LAN connection. See "XCC system management port (10/100/1000 Mbps RJ-45) and LAN port LEDs" on page 37 for more information.

7 USB 3.2 Gen2 (10 Gbps) Type-A connectors

Connect a USB device, such as a mouse, keyboard, or other devices, to either of these connectors.

8 Power input LEDs (green/yellow)

LED	Status	Description
Power input LED	On (green)	The server is connected to the power adapter and working normally.
	On (yellow)	The server is connected to the power adapter but can not be powered on since the power capability is unable to support the system requirement.
	Off	The power adapter is disconnected or a power problem occurs.

Rear I/O fillers

Install the I/O fillers when the connectors are not used. The connectors could be dust-covered without proper protection of the fillers.

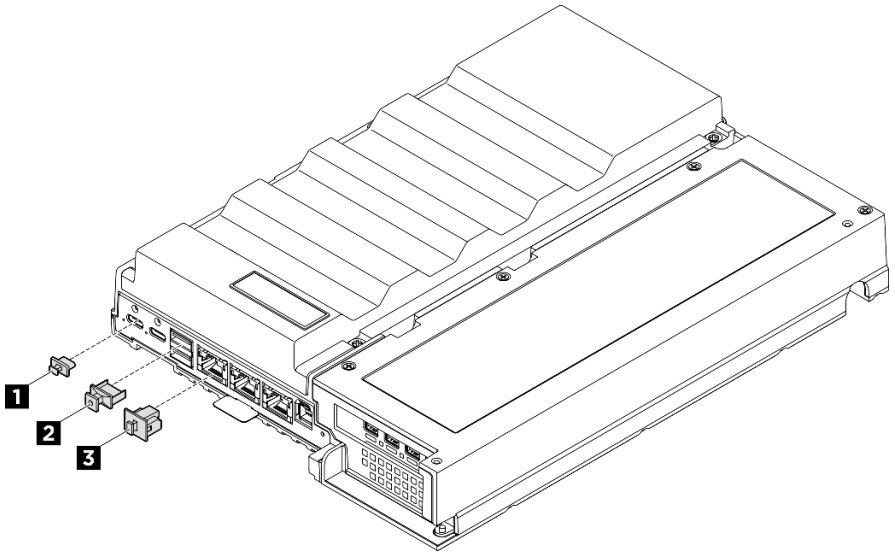


Figure 6. Rear I/O fillers

1 USB Type-C filler (x2)	2 USB Type-A filler (x2)
3 RJ-45 filler (x3)	

Top view

The illustrations in this section provide information about the top view of the server.

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

Top view: top layer

The following illustration is the top view after removing the fan shroud.

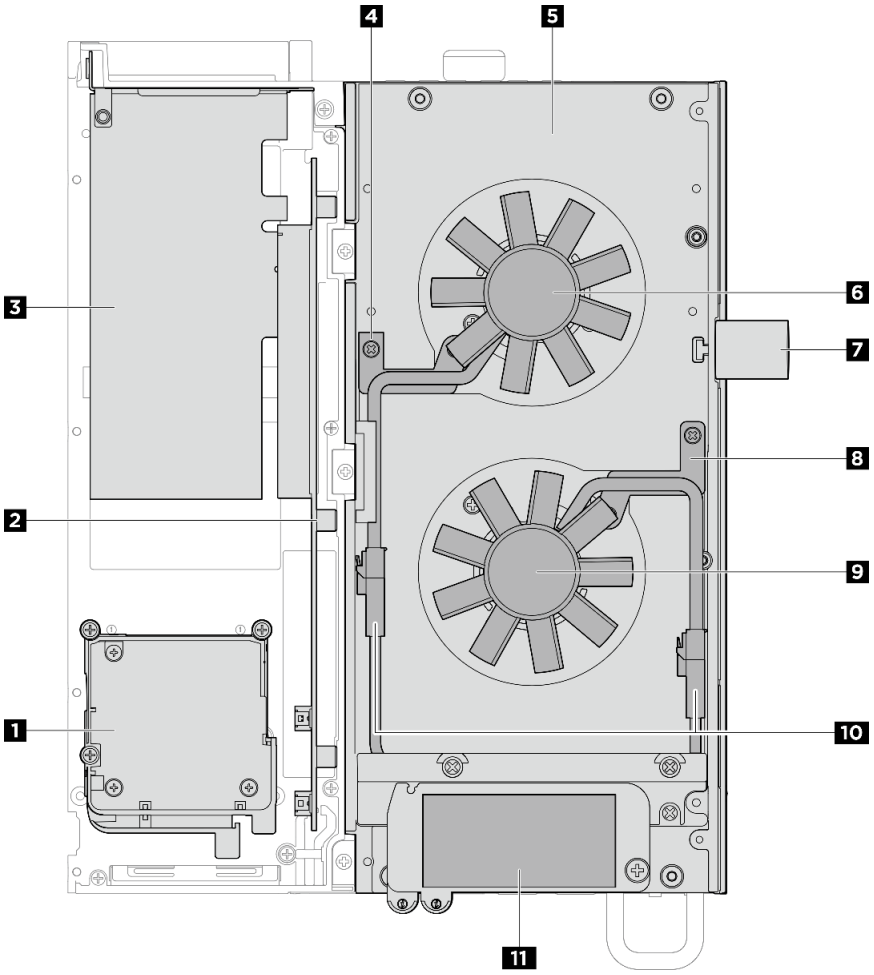


Figure 7. Top view: top layer

Table 5. Top view: top layer

Expansion kit	Server
1 • Ethernet adapter expansion kit: Fan module • GPU adapter expansion kit: Support baffle	4 Fan bridge cable bracket 1
2 PCIe riser card	5 Top cover
3 PCIe adapter	6 Fan 1
	7 Kensington lock
	8 Fan bridge cable bracket 2
	9 Fan 2
	10 Fan bridge cables
	11 Pull-out information tabs

Top view: bottom layer

The following illustration is the top view after removing the expansion kit, fan shroud, and the removable components on the top layer.

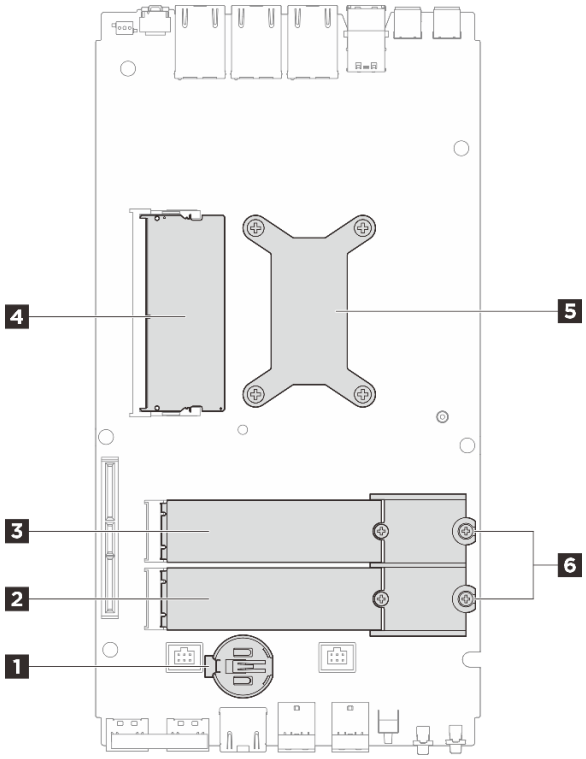


Figure 8. Top view: bottom layer

Table 6. Top view: bottom layer

1 CMOS battery	2 M.2 drive slot 3
3 M.2 drive slot 2	4 DIMM slot 1
5 Processor & processor heatsink	6 M.2 holder (For M.2 2280 drive only)

Bottom view

This section contains the components visible from the bottom of the server.

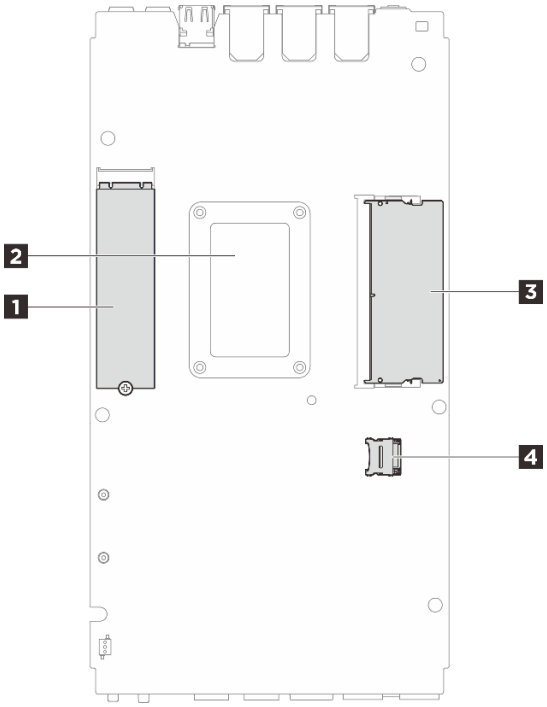


Figure 9. Bottom view

Table 7. Bottom view

1 M.2 drive slot 1	2 Processor backplate
3 DIMM slot 2	4 MicroSD socket

System-board layout

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

For more information about the LEDs that are available on the system board, see “System-board LEDs” on page 35.

System-board connectors

The following illustrations show the internal connectors on the system board.

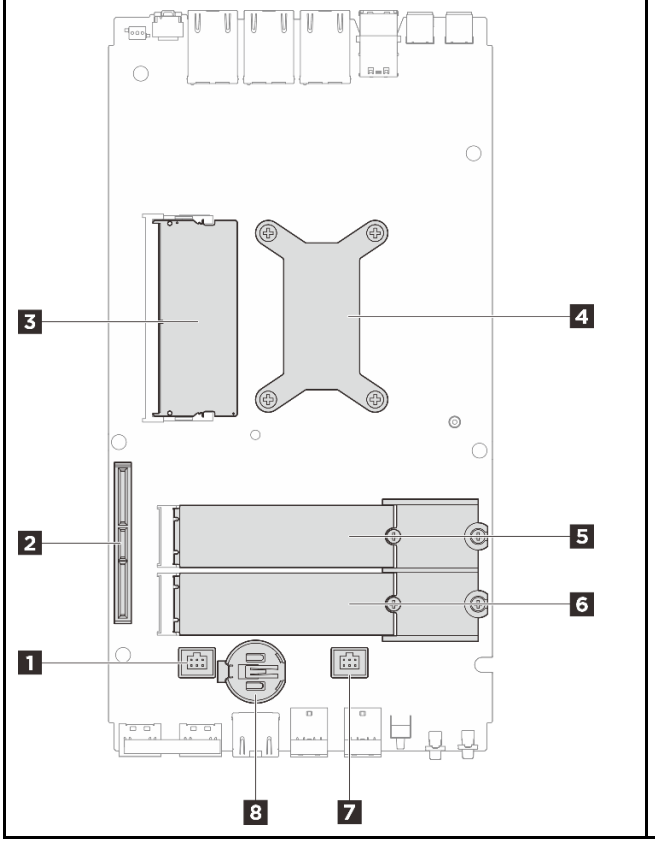
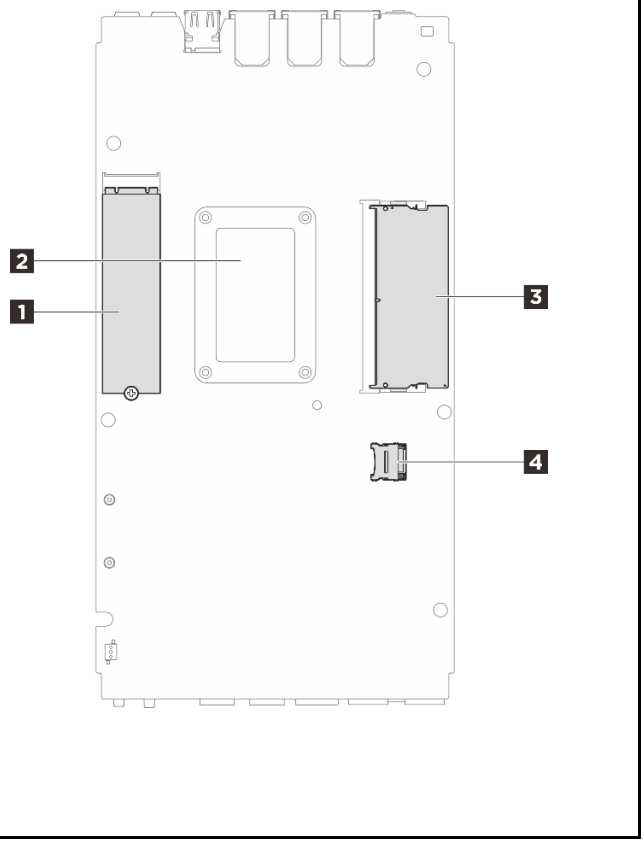
Top side	Bottom side
	

Figure 10. System-board connectors

Table 8. System-board connectors

Top side	Bottom side
1 Fan connector 1	1 M.2 slot 1
2 GenZ 4C connector for expansion kit	2 Processor backplate
3 DIMM slot 1	3 DIMM slot 2
4 Processor & processor heatsink	4 MicroSD socket
5 M.2 slot 2	
6 M.2 slot 3	
7 Fan connector 2	
8 CMOS battery (CR2032)	

System-board switches

The following illustrations show the location of the switches, 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.

Important:

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

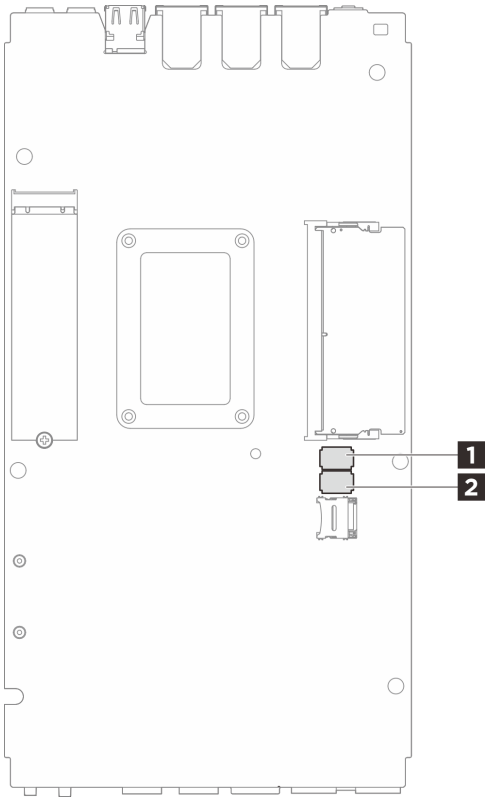


Figure 11. System-board switches (System board bottom side)

The following table describes the functions of the switches on the bottom side of the system board.

Table 9. System-board switches

Switches block	Switch number	Switch name	Usage description	
			On	Off
1 SW1	1	XClarity Controller boot backup	The node boots by using a backup of the XCC firmware	Normal (default)
	2	CMOS clear	Clears the real-time clock (RTC) registry	Normal (default)
	3	Password override	Overrides the power-on password	Normal (default)
	4	(Reserved)	(Reserved)	Normal (default)
	5	Serial function selection	Accesses XCC via the serial console connector	Normal (default)

Table 9. System-board switches (continued)

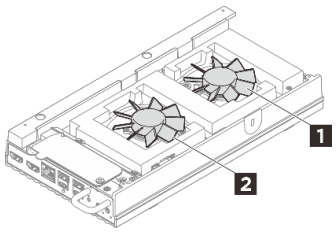
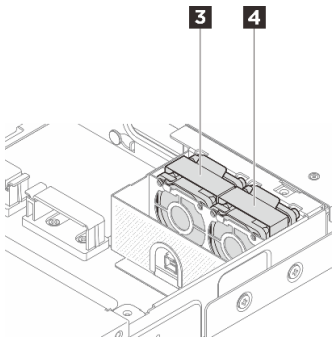
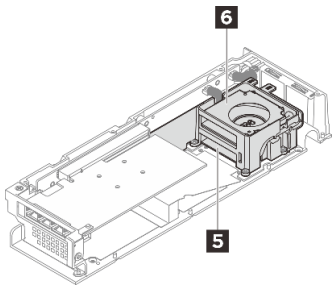
Switches block	Switch number	Switch name	Usage description	
			On	Off
	6	Machine Engine (ME) recovery override	ME boots to recovery	Normal (default)
	7	(Reserved)	(Reserved)	Normal (default)
	8	(Reserved)	(Reserved)	Normal (default)
2 SW2	1	Machine Engine (ME) firmware security override	Enables ME update mode	Normal (default)
	2	XCC force update	Enables XCC force update	Normal (default)
	3	FPGA power permission override	Ignores Power Permission and allows system to power-on	Normal (default)
	4	Force XCC reset	Forces XCC to reset	Normal (default)
	5	Force XCC CPU reset	Forces XCC and CPU to reset	Normal (default)
	6	Force DnX reload	Enter DnX mode	Normal (default)
	7	Force FPGA reset	Forces FPGA to reset	Normal (default)
	8	(Reserved)	(Reserved)	Normal (default)

System fan numbering

This section contains system fan numbering information of SE100. Understanding the system fan numbering helps you correctly install and configure fans in the system.

Fan support matrix

Table 10. Fan support matrix

Location						
Numbering	1 Fan 1	2 Fan 2	3 Fan 3	4 Fan 4	5 Fan 5	6 Fan 6
Node	√	√				
Node with Ethernet adapter expansion kit	√	√			√	√
1U2N enclosure			√	√	√	√
1U3N enclosure			√	√		

Note: Before installing the node to the enclosure, to avoid the node interfering with the enclosure, make sure to remove the fan 1 & 2 from the node.

- 1 2 **Node fan module:** Two 6513 non-hot swap fans for each node.
- 5 6 **Expansion kit fan module:** Ethernet adapter expansion kit supports two 5010 blower fans.
- 3 4 **Enclosure fan module:**
  - 1U2N enclosure supports up to four 4028 non-hot swap fans, two for each node
  - 1U3N enclosure supports up to six 4028 non-hot swap fans, three for each node

System LEDs

See the following section for information on available system LEDs.

For more information, refer to “Troubleshooting by system LEDs” on page 31.

Troubleshooting by system LEDs

See the following section for information on available system LEDs.

Ethernet adapter expansion kit LEDs

The following table describes the problems that are indicated by fan error LEDs.

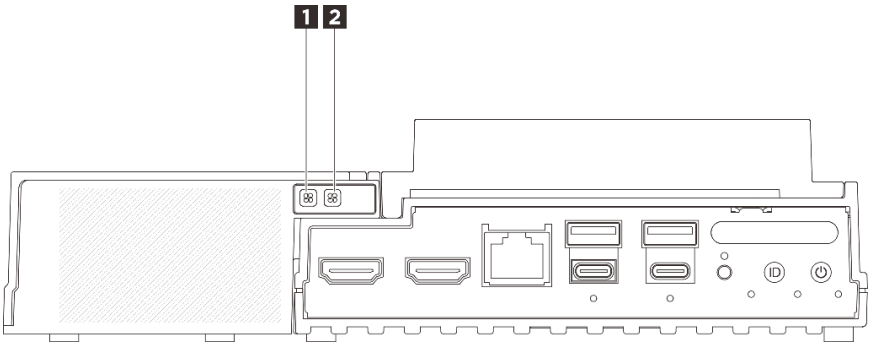


Figure 12. Ethernet adapter expansion kit LEDs

Table 11. Ethernet adapter expansion kit LEDs

1 Fan 5 error LED	2 Fan 6 error LED

1 2 Fan error LEDs

When a fan error LED on the expansion kit with Ethernet adapter is lit, it indicates that the corresponding system fan is operating slowly or has failed.

Status	Color	Description	Action
On	Amber	The system fan of Ethernet adapter has failed.	If the fan error LED is on, do the following: 1. Replace the failed fan with a new one and check if the new fan can work normally. See ***https://pubs.lenovo.com/se100/replace_nic_fan***. 2. If the new fan still can not work normally, replace the PCIe riser card with the new one. See ***https://pubs..lenovo.com/se100/replace_pcie_riser_card***
Off	None	The system fan of Ethernet adapter is working normally.	

Front LEDs

The following illustration shows LEDs on the front of the solution. By viewing the status of LEDs, you can often identify the source of the error.

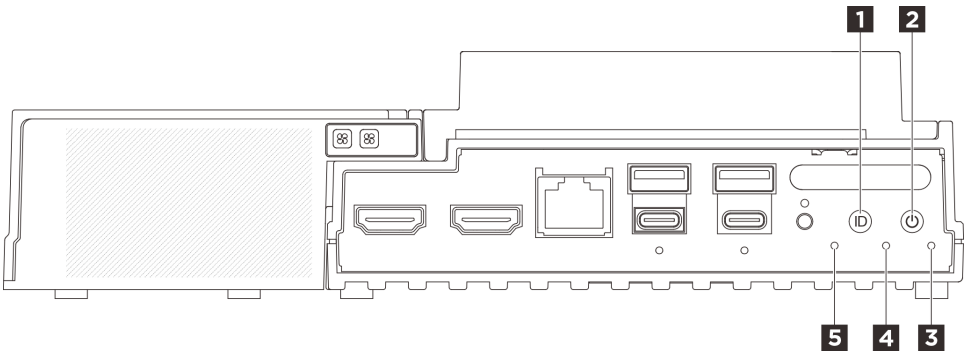


Figure 13. Front LEDs

Table 12. Front LEDs

1 UID button with LED (blue)	2 Power button with power status LED (green)
3 Security LED (green)	4 System Error LED (yellow)
5 UART status LED (white)	

1 UID button with LED (blue)

Use this UID button and the blue UID LED to visually locate the server.

Each time you press the UID button, the state of both the UID LEDs changes. The LEDs can be changed to on, blinking, or off. Press the UID button down and hold for five seconds, you can reset BMC.

You can also use BMC or a remote management program to change the state of the UID LEDs to assist in visually locating the server among other servers.

2 Power button with power status LED (green)

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

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

3 Security LED (green)

The states of Security LED are as following:

Solid on: The server is operating with security feature enabled (SED enabled or intrusion enabled).

Blinking: The server is in System Lockdown Mode. Activate or unlock the system for operation. See “Activate or unlock the system” on page 54.

Off: System is activated but no security feature is enabled on the server.

4 System Error LED (yellow)

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

Status	Color	Description	Action
On	Yellow	An error has been detected on the server. Causes might include one or more of the following errors: • The temperature of the server reached the non-critical temperature threshold. • The voltage of the server reached the non-critical voltage threshold. • A fan has been detected to be running at low speed. • The power supply has a critical error.	Check the Event log to determine the exact cause of the error.
Off	None	The server is off or the server is on and is working correctly.	None.

5 UART status LED (white)

Status	Color	Description
On	White	UART output with XCC log.
Off (Default)	None	UART output with CPU log.

Rear LEDs

The following illustration shows LEDs on the rear of the server. By viewing the status of LEDs, you can often identify the source of the error.

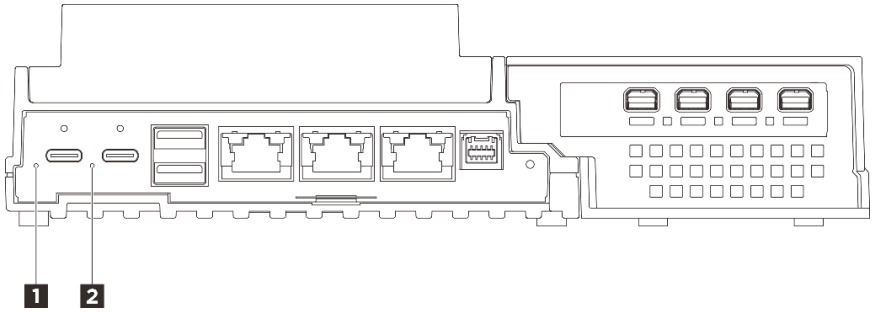


Figure 14. Rear LEDs

Table 13. Rear LEDs

1 Power input LED 1 (green yellow)	2 Power input LED 2 (green yellow)

1 2 Power input LED (green/yellow)

LED	Status	Description
Power input LED	On (green)	The server is connected to the power adapter and working normally.
	On (yellow)	The server is connected to the power adapter but can not be powered on since the power capability is unable to support the system requirement.

	Off	The power adapter is disconnected or a power problem occurs.

System-board LEDs

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

Top side

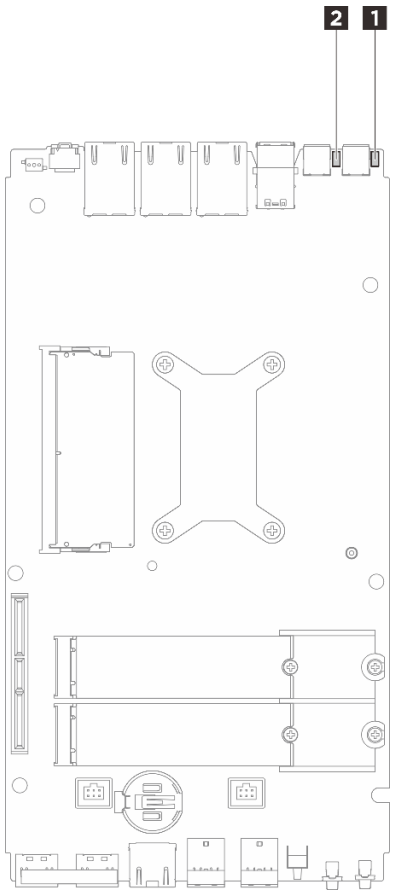


Figure 15. System board LEDs on top side

Bottom side

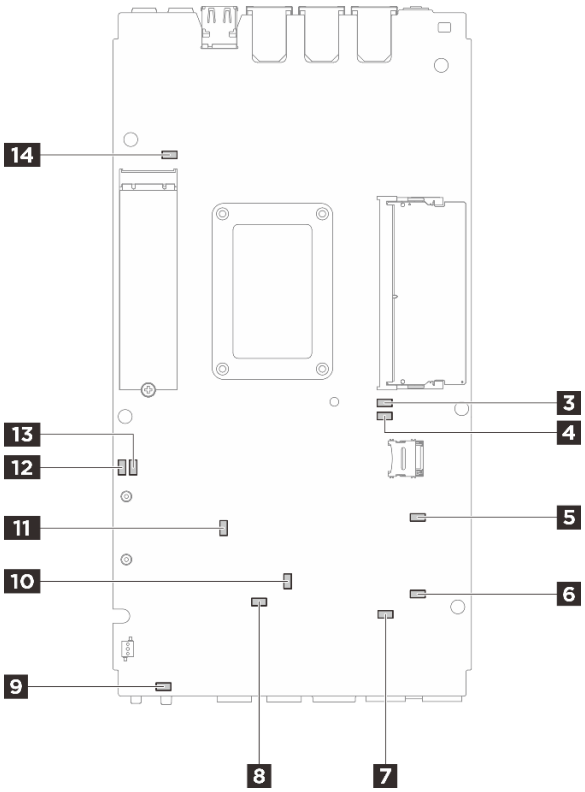


Figure 16. System board LEDs on bottom side

Figure 17. System-board LEDs

Table 14. System board LEDs description and actions

LED	Description and actions
1 Adapter 1 status LED 2 Adapter 2 status LED	The states of the adapter LED are as follows: • **On (green):** The server is connected to the power adapter and working normally. • **On (yellow):** The server is connected to the power adapter but can not be powered on since the power capability is unable to support the system requirement. • **Off:** The power adapter is disconnected or a power problem occurs.
3 DIMM 1 error LED 4 DIMM 2 error LED	**LED on:** an error has occurred to the DIMM the LED represents.
5 M.2 slot 2 status LED 6 M.2 slot 3 status LED 14 M.2 slot 1 status LED	The states of the M.2 LED are as follows: • **LED on/flashing :** M.2 drive is operating normally. • **LED off:** an error has occurred to the M.2 the LED represents or the M.2 drive is not powered.
7 Fan 1 error LED 8 Fan 2 error LED	**LED on:** an error has occurred to the fan the LED represents.
9 System error LED (yellow)	**LED on:** an error has occurred. Complete the following steps: • Check the identification LED and check log LED and follow the instructions. • Check the Lenovo XClarity Controller event log and the system error log for information about the error. • Save the log if necessary, and clear the log afterwards.
10 XCC status LED	The states of the XCC status LED are as follows: • **On:** XCC is alive. • **Off:** XCC is not ready or not alive. The LED is in this state when the server is first connected to the power source. It does not turn on until the SSP (Synchronous Serial Port) is ready.
11 XCC heartbeat LED (green)	This LED indicates the XCC heartbeat and boot process: • **LED blinking rapidly:** XCC code is in the loading process. • **LED going off momentarily and then starts blinking slowly:** XCC is fully operational. You can now press the power-control button to power on the server.
12 FPGA power status LED (green)	The FPGA power LED helps to identify different FPGA errors. • **LED blinking rapidly (four times per second):** The FPGA permission is delayed. • **LED blinking slowly (once per second):** The FPGA is ready to power on. • **LED on:** The FPGA power is on.
13 FPGA heartbeat LED (green)	This LED indicates power-on and power-off sequencing. • **LED blinking:** the system is functioning properly, and no action is necessary. • **LED not blinking:** replace the system board (trained technician only). See “System board replacement” in *User Guide* or *Hardware Maintenance Guide*.

XCC system management port (10/100/1000 Mbps RJ-45) and LAN port LEDs

This topic provides information on LEDs of XCC system management port (10/100/1000 Mbps RJ-45) and LAN ports.

The following table describes the problems that are indicated by LEDs on XCC system management port (10/100/1000 Mbps RJ-45).

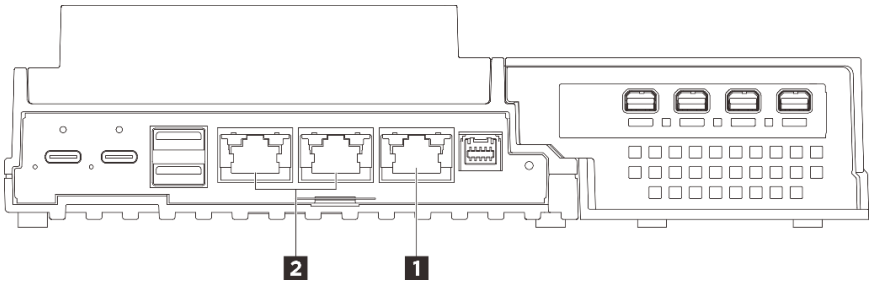


Figure 18. XCC system management port (10/100/1000 Mbps RJ-45) LEDs and LAN port LEDs

1 "XCC system management port (10/100/1000 Mbps RJ-45)" on page 37	2 "1GbE RJ-45 LAN port link and activity LEDs" on page 37 (LAN 1 to 2)

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

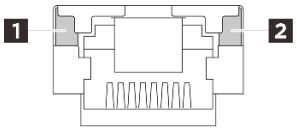


Figure 19. XCC system management port (10/100/1000 Mbps RJ-45) LED

LED	Description
1 Network link LED (green)	• **Off:** The network link is disconnected. • **On:** The network is connected.
2 Network activity LED (green)	**Blinking:** The network is connected and active.

2 1GbE RJ-45 LAN port link and activity LEDs

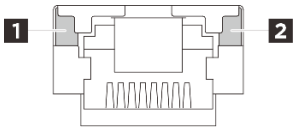


Figure 20. 1GbE RJ-45 LAN port link and activity LEDs

LED	Description
1 Network link LED (green)	• **Off:** The network link is disconnected. • **On:** The network link is connected with LAN speed of 10/100/1000 Mbps.
2 Network activity LED (green)	**Blinking:** The network is connected and active.

Chapter 3. Parts list

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

For more information about ordering parts:

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

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

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

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

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

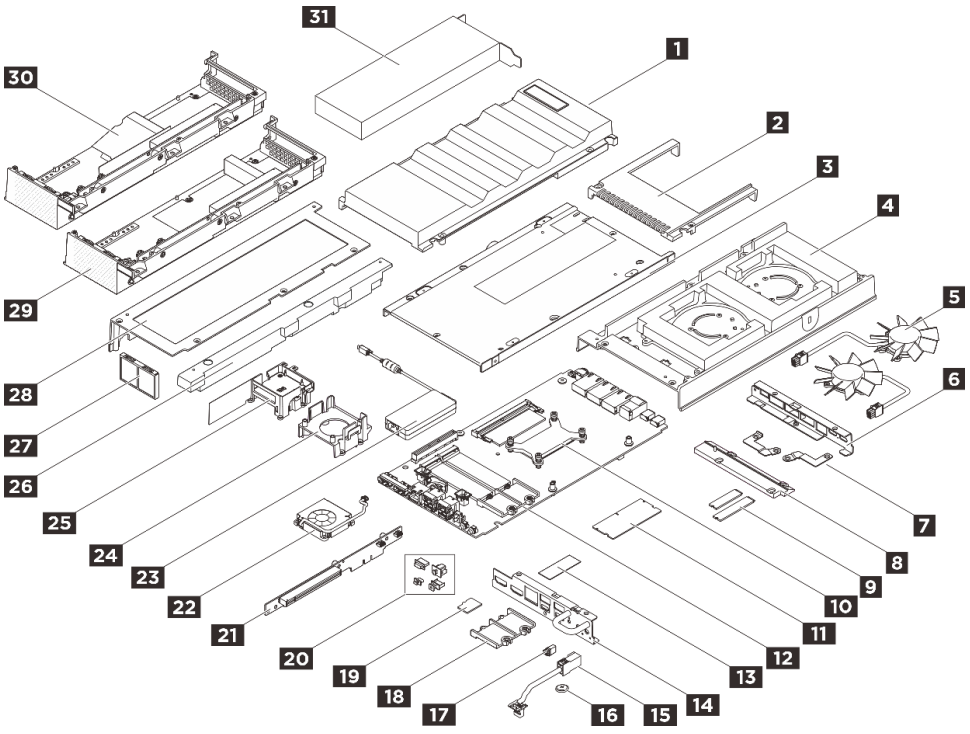


Figure 21. Server components

Table 15. Parts list

Index	Description	Type
For more information about ordering parts: 1. Go to **http://datacentersupport.lenovo.com** and navigate to the support page for your server. 2. Click **Parts**. 3. Enter the serial number to view a listing of parts for your server.		
1	Fan shroud (Desktop mount)	T2
2	Rack fan shroud (Rack mount)	T2
3	Bottom cover	F
4	Top cover	F
5	Node fan module	T2
6	Rear I/O bracket	F
7	Fan bridge cable brackets	T2
8	Fan bridge cable cover	T2
9	M.2 drive	F
10	Processor heat sink	F
11	Memory module	F
12	System board	F
13	Thermal pad kits	F
14	Front I/O bracket	F
15	Fan bridge cable	F
16	CMOS battery (CR2032)	C
17	Fan bridge cable dust cover	T2
18	M.2 holder for M.2 2280 drive	F
19	MicroSD card	T1
20	Front/rear I/O fillers	T1
21	PCIe riser card	F
22	Expansion kit fan module (Ethernet adapter)	T2
23	140W 230V/115V external power adapter	T1
24	Expansion kit support baffle (GPU adapter)	T2
25	Expansion kit fan holder (Ethernet adapter)	T2
26	Expansion filler	T1
27	Expansion kit dust filter	T1
28	Expansion kit top cover	T2
29	Expansion kit bottom base assembly (GPU adapter)	T2
30	Expansion kit bottom base assembly (Ethernet adapter)	T2
31	PCIe adapter	T2/T1[1]

Notes: [1] Depending on the configuration, the service type of the adapter might be different:

- GPU adapter: T2
- Ethernet adapter: T1

Power cords

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

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

1. Go to:

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

2. Click **Preconfigured Model** or **Configure to order**.
3. Enter the machine type and model for your server to display the configurator page.
4. Click **Power → Power Cables** to see all line cords.

Notes:

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

Chapter 4. Unboxing and setup

Information in this section assists you on unboxing and setting up the server. When unboxing the server, check if the items in the package are correct, and learn where to find information of server serial number and Lenovo XClarity Controller access. Make sure to follow the instructions in “Server setup checklist” on page 45 when setting up the server.

Server package contents

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

The server package includes the following items:

- Server
- Wall mount / Ceiling mount kit*.
- DIN-rail mount kit*.
- Material box, including items such as power cords*, accessory kit, and printed documents.

Notes:

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

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

Identify the server and access the Lenovo XClarity Controller

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

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

Identifying your server

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

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

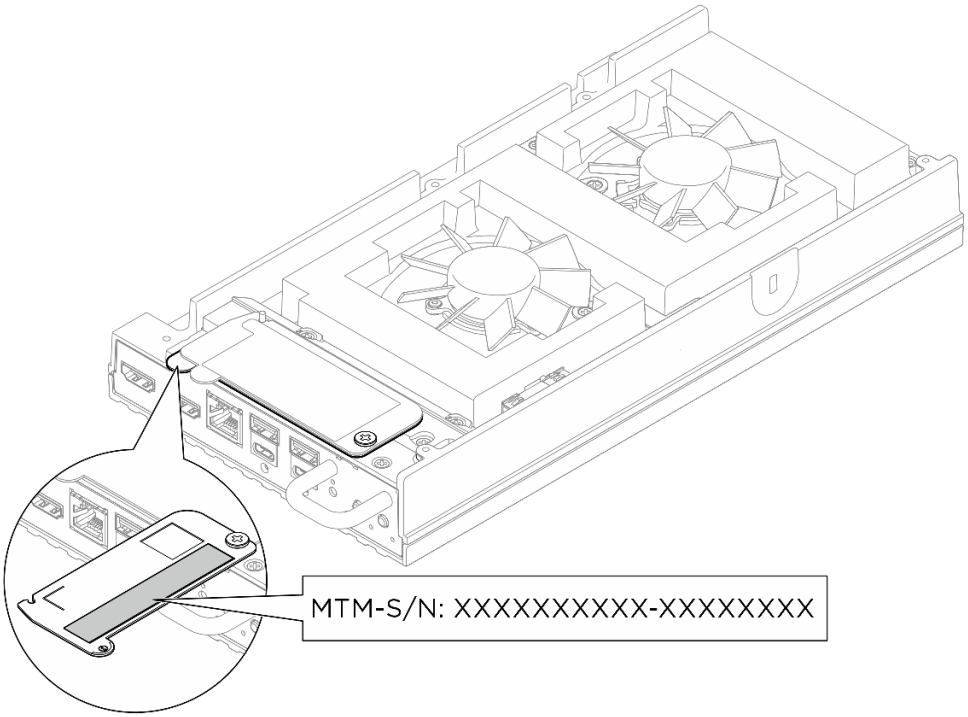


Figure 22. ID label on the pull-out information tab

Lenovo XClarity Controller network access label

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

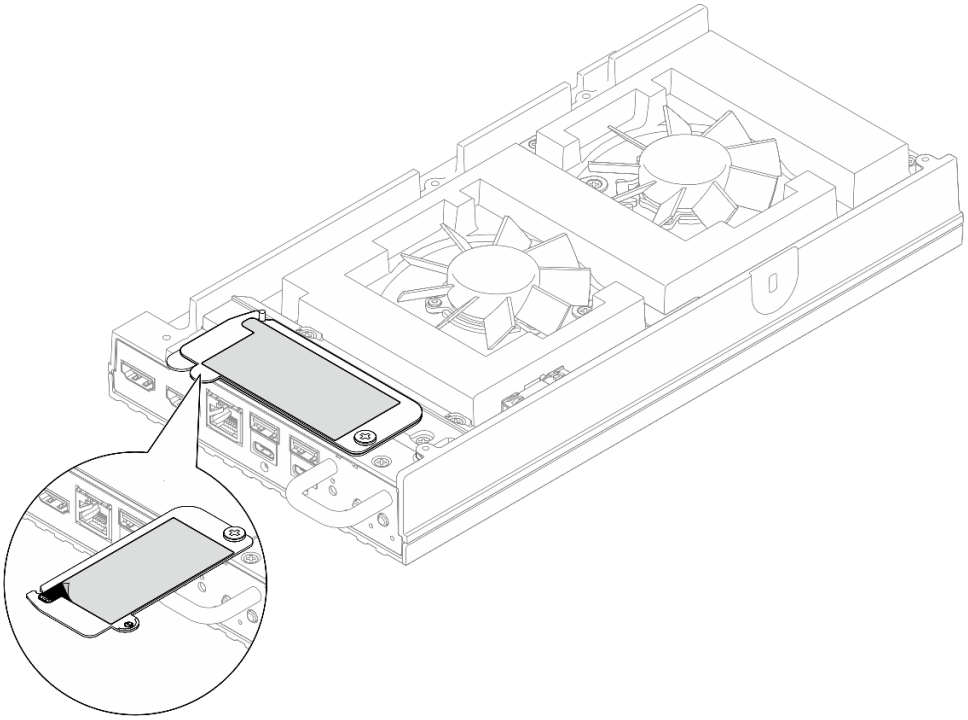


Figure 23. Lenovo XClarity Controller network access label on the pull-out information tab

Service information QR code

On the inside surface of the fan shroud, there is a quick response (QR) code that provides mobile access to service information. You can scan the QR code with a mobile device using a QR code reader application and get quick access to the Service Information web page. The Service Information web page provides additional information for parts installation and replacement videos, and error codes for solution support.

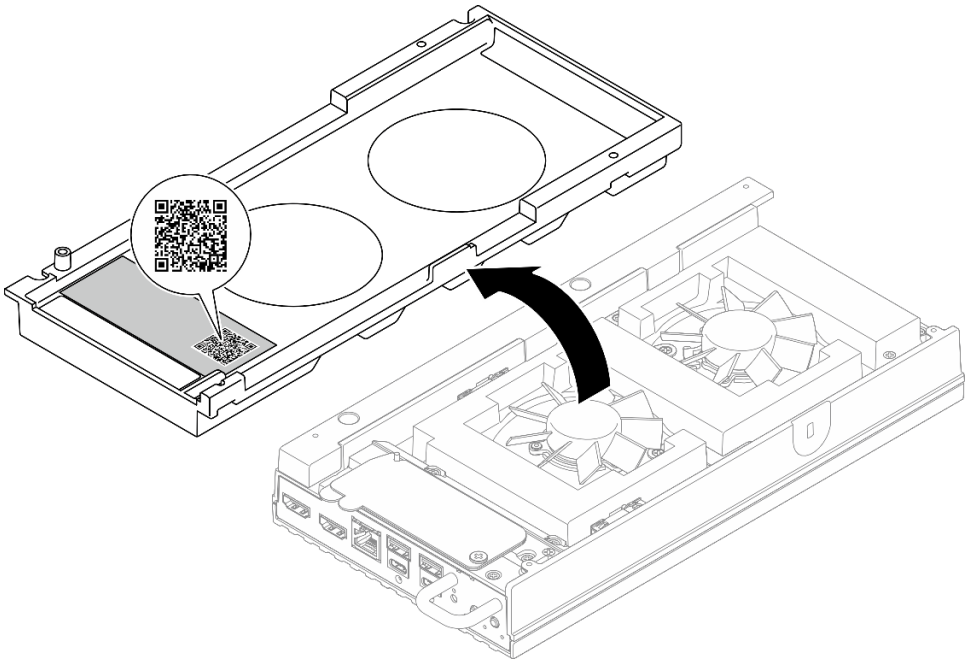


Figure 24. Service information QR code on the desktop mount fan shroud

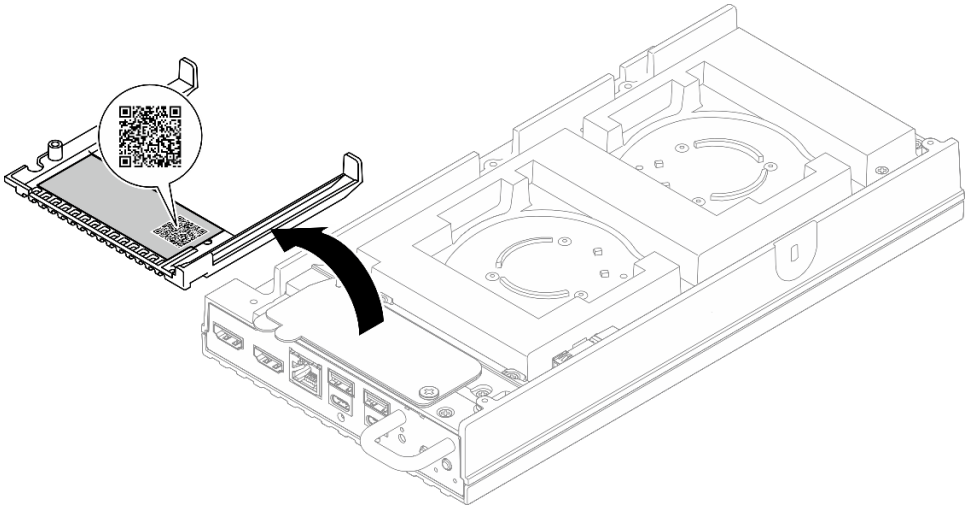


Figure 25. Service information QR code on the rack mount fan shroud

Server setup checklist

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

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

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

Setup the server hardware

Complete the following procedures to setup the server hardware.

1. Unpack the server package. See “Server package contents” on page 43.
2. Install any required hardware or server options. See the related topics in “Hardware replacement procedures” in *User Guide* or *Hardware Maintenance Guide*.
3. If necessary, mount the server or install the server to an enclosure. Follow the instruction in “Configuration guide” in *User Guide* or *Hardware Maintenance Guide*.
4. Connect all external cables to the server. See Chapter 2 “Server components” on page 17 for connectors locations.

   Typically, you will need to connect the following cables:

   - Connect server to the power source
   - Connect server to the data network
   - Connect the server to the storage device
   - Connect the server to the management network
5. Install the I/O fillers when the connectors are not used. The connectors could be dust-covered without proper protection of the fillers. The I/O fillers are in the material box. See “Front I/O fillers” on page 20 and “Rear I/O fillers” on page 23 to distinguish the I/O fillers.
6. If the security LED of the server is blinking, the server is in System Lockdown Mode. Activate or unlock the system for operation. See “Activate or unlock the system” on page 54.
7. Power on the server.

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

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

   Note: You can access the management processor interface to configure the system without powering on the server. Whenever the server is connected to power, the management processor interface is available. For details about accessing the management server processor, see “Opening and Using the XClarity Controller Web Interface” section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/.
8. Validate the server. Make sure that the power LED, Ethernet connector LED, and network LED are lit with green light, which means the server hardware was set up successfully.

   See “Troubleshooting by system LEDs” on page 31 for more information on the LED indications.

Configure the system

Complete the following procedures to configure the system. For detailed instructions, refer to Chapter 5 “System configuration” on page 49.

1. Set the network connection for the Lenovo XClarity Controller to the management network.

2. Update the firmware for the server, if necessary.
3. Configure the firmware for the server.
4. Install the operating system.
5. Back up the server configuration.
6. Install the applications and programs for which the server is intended to be used.
7. Configure ThinkEdge security features. See “Activate/unlock the system and configure ThinkEdge security features” on page 53.

Chapter 5. System configuration

Complete these procedures to configure your system.

Set the network connection for the Lenovo XClarity Controller

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

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

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

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

  1. Start the server.
  2. Press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at https://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.

Update the firmware

Several options are available to update the firmware for the server.

You can use the tools listed here to update the most current firmware for your server and the devices that are installed in the server.

- Best practices related to updating firmware is available at the following site:
  - https://lenovopress.lenovo.com/lp0656-lenovo-thinksystem-firmware-and-driver-update-best-practices
- The latest firmware can be found at the following site:
  - https://datacentersupport.lenovo.com/tw/en/products/servers/thinkedge/se100/7dgr/downloads/driver-list/
- You can subscribe to product notification to stay up to date on firmware updates:

– https://datacentersupport.lenovo.com/solutions/ht509500

Update Bundles (Service Packs)

Lenovo typically releases firmware in bundles called Update Bundles (Service Packs). To ensure that all of the firmware updates are compatible, you should update all firmware at the same time. If you are updating firmware for both the Lenovo XClarity Controller and UEFI, update the firmware for Lenovo XClarity Controller first.

Update method terminology

- **In-band update**. The installation or update is performed using a tool or application within an operating system that is executing on the server's core CPU.
- **Out-of-band update**. The installation or update is performed by the Lenovo XClarity Controller collecting the update and then directing the update to the target subsystem or device. Out-of-band updates have no dependency on an operating system executing on the core CPU. However, most out-of-band operations do require the server to be in the S0 (Working) power state.
- **On-Target update.** The installation or update is initiated from an installed operating system executing on the target server itself.
- **Off-Target update.** The installation or update is initiated from a computing device interacting directly with the server's Lenovo XClarity Controller.
- **Update Bundles (Service Packs)**. Update Bundles (Service Packs) are bundled updates designed and tested to provide the interdependent level of functionality, performance, and compatibility. Update Bundles (Service Packs) are server machine-type specific and are built (with firmware and device driver updates) to support specific Microsoft Windows, Red Hat Enterprise Linux (RHEL) and Canonical Ubuntu operating system distributions. Machine-type-specific firmware-only Update Bundles (Service Packs) are also available.

Firmware updating tools

See the following table to determine the best Lenovo tool to use for installing and setting up the firmware:

Tool	Update Methods Supported	Core System Firmware Updates	I/O Devices Firmware Updates	Drive Firmware Updates	Graphical user interface	Command line interface	Supports Update Bundles (Service Packs)
Lenovo XClarity Provisioning Manager (LXPM)	In-band[2] On-Target	√			√		
Lenovo XClarity Controller (XCC)	In-band[4] Out-of-band Off-Target	√	Selected I/O devices	√[3]	√		√
Lenovo XClarity Essentials OneCLI (OneCLI)	In-band Out-of-band On-Target Off-Target	√	All I/O devices	√[3]		√	√

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

Notes:

1. For I/O firmware updates.
2. For BMC and UEFI firmware updates.
3. Drive firmware update is only supported by the tools and methods below:
   - XCC Bare Metal Update (BMU): In-band, and requires system reboot.
   - Lenovo XClarity Essentials OneCLI:
     - For drives supported by ThinkSystem V2 and V3 products (legacy drives): In-band, and does not require system reboot.
     - For drives supported only by ThinkSystem V3 products (new drives): Staging to XCC and complete the update with XCC BMU (In-band, and requires system reboot.).
4. Bare Metal Update (BMU) only.

- **Lenovo XClarity Provisioning Manager**

  From Lenovo XClarity Provisioning Manager, you can update the Lenovo XClarity Controller firmware, the UEFI firmware, and the Lenovo XClarity Provisioning Manager software.

  Note: By default, the Lenovo XClarity Provisioning Manager Graphical User Interface is displayed when you start the server and press the key specified in the on-screen instructions. If you have changed that default to be the text-based system setup, you can bring up the Graphical User Interface from the text-based system setup interface.

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

  "Firmware Update" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/

- **Lenovo XClarity Controller**

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

  Notes:

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

    For additional information about configuring Ethernet over USB, see:

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

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

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

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

- **Lenovo XClarity Essentials OneCLI**

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

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

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

- **Lenovo XClarity Essentials UpdateXpress**

  Lenovo XClarity Essentials UpdateXpress provides most of OneCLI update functions through a graphical user interface (GUI). It can be used to acquire and deploy Update Bundles (Service Packs) update packages and individual updates. Update Bundles (Service Packs) contain firmware and device driver updates for Microsoft Windows and for Linux.

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

  https://datacentersupport.lenovo.com/solutions/lnvo-xpress

- **Lenovo XClarity Essentials Bootable Media Creator**

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

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

https://datacentersupport.lenovo.com/solutions/lnvo-bomc

- **Lenovo XClarity Administrator**

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

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

  https://pubs.lenovo.com/lxca/update_fw

- **Lenovo XClarity Integrator offerings**

  Lenovo XClarity Integrator offerings can integrate management features of Lenovo XClarity Administrator and your server with software used in a certain deployment infrastructure, such as VMware vCenter, Microsoft Admin Center, or Microsoft System Center.

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

  https://pubs.lenovo.com/lxci-overview/

Activate/unlock the system and configure ThinkEdge security features

ThinkEdge SE100 supports ThinkEdge unique security features. With the security features enabled, the system will enter System Lockdown Mode when tamper events occur, and encrypted data can not be accessed before the system is activated or unlocked. The status of ThinkEdge unique security features can be changed in Lenovo XClarity Controller.

Important: If Lenovo XClarity Controller web interface of the server is different from the information in this section, update the firmware for the server.

Setup the security features

Complete the following steps to setup the security features:

1. If the security LED of the server is blinking, the server is in System Lockdown Mode. Activate or unlock the system for operation. See “Activate or unlock the system” on page 54.
2. Maintain backup of SED AK. See “Manage the Self Encryption Drive Authentication Key (SED AK) ” on page 56.
3. Configure the security features in Lenovo XClarity Controller. See “System Lockdown Mode” on page 56 to change the status of security features.

Note: The following sections contain the procedure of configuring ThinkEdge security features in Lenovo XClarity Controller web interface. For more information, see ***https://lenovopress.lenovo.com/lp1725-thinkedge-security***.

Customer's responsibility:

- Keep the Secure Activation Code (provided in flyer).
- To use ThinkShield Edge Mobile Management App, prepare proper USB cable for mobile phone if necessary.
- Maintain backup of SED AK. See “Manage the Self Encryption Drive Authentication Key (SED AK) ” on page 56.
  - Set and remember the password of SED AK backup file to restore SED AK in the future.

- Engage IT department so they can help to claim or activate device when required.
- Confirm if the SE100 system is claimed by your organization. If not, work with IT department to claim the device.
- Confirm the wireless (network) connectivity is working. Service technician cannot help examine the network connection of the device.
- Move SE100 system to a safe working place for service.
- Place SE100 system back to the working place after service.

Activate or unlock the system

Being shipped or encountering tamper events, the server would be in System Lockdown Mode for security. Before operation, the server needs to be activated or unlocked to be able to boot up and go fully functional. Complete the steps in this topic to activate or unlock the system.

If the security LED of the server is blinking, the server is in System Lockdown Mode. Activate or unlock the system for operation. See “Activate or unlock the system” on page 54. See ***https://pubs.lenovo.com/se100/server_front_leds*** to locate the security LED.

System Lockdown Mode Control

To distinguish whether the system needs to be activated or unlocked, see **System Lockdown Mode Control** status on the home page of Lenovo XClarity Controller web interface. System Lockdown Mode Control status would be one of the following:

- **ThinkShield Portal:** The system can be activated through ThinkShield Key Vault Portal. See “Activate the system” on page 54 to activate the system.
- **XClarity Controller:** The system can be unlocked through Lenovo XClarity Controller. See “Unlock the system” on page 56 to unlock the system.

Important:

- When System Lockdown Mode Control status is XClarity Controller, if XClarity Controller is reset to defaults, the default credentials can be used to login to XClarity Controller and unlock the system. It is important to use security controls such as an UEFI PAP to prevent unauthorized users from executing an XClarity Controller reset to defaults. For the highest level of security, it is recommended to set System Lockdown Mode Control to ThinkShield Portal.
- Once the System Lockdown Mode Control status is changed to ThinkShield Portal, it cannot be changed back to XClarity Controller.
- To set System Lockdown Mode Control to ThinkShield Portal, use Lenovo XClarity Essentials UpdateXpress. See “Upgrading lockdown control mode” section in https://pubs.lenovo.com/lxce-ux/ for the details.

Activate the system

Complete the following steps to activate the system through ThinkShield Key Vault Portal.

Have a Lenovo ID with proper permission

Before activating a system for the first time, make sure to have a Lenovo ID with proper permission to log in to the ThinkShield Key Vault Portal web interface or ThinkShield mobile app.

Note: The role of Lenovo ID should be **Organization Admin**, **Maintenance User** or **Edge User** to activate the system.

- For Lenovo ID setup, see https://passport.lenovo.com.
- To log in to the Lenovo ThinkShield Key Vault Portal, see https://portal.thinkshield.lenovo.com.

Activation methods

There are different methods to activate the system through ThinkShield Key Vault Portal. Depending on the environment of the server, decide the most suitable way to activate the system.

- **Mobile App activation**

  Attention: To activate the system through Mobile App activation method, the system does not support power redundancy mode since the connector is shared with the second power adapter connection.

  For Mobile App activation method, you will need an Android or iOS based smart phone with cellular data connection. Follow the following procedure to complete Mobile App activation:

  Connection with the USB cable that came with the smart phone

  1. Connect the power cable to your ThinkEdge SE100.
  2. Download the ThinkShield Edge Mobile Management App from Google Play Store or Apple App Store to your Android or iOS based smart phone (search term: “ThinkShield Edge”).
  3. Log-in to the ThinkShield Edge Mobile Management App using your Organization registered ID.
  4. When App instructs to do so, connect USB cable with USB mobile phone charging cable to the ThinkEdge SE100.

     Note: When the smart phone prompts for the USB connection purpose, choose data transfer.
  5. Follow the “Activate Device” on-screen instructions to complete secure activation of the system.
  6. When activated successfully, ThinkShield Edge Mobile Management App will provide “Device Activated” screen. will provide “Device Activated” screen.

     Note: For the detailed steps, see *ThinkShield Edge Mobile Management Application User Guide* in ***https://lenovopress.lenovo.com/lp1725-thinkedge-security***.

- **Portal automatic activation**

  Note: To activate the system through ThinkShield Key Vault Portal web interface for the first time, the system should be claimed by your organization. **Machine Type**, **Serial Number**, and **Activation Code** are required to claim a device. For more information of claiming the device, see ***https://lenovopress.lenovo.com/lp1725-thinkedge-security***.

  1. Connect the power cable to your ThinkEdge SE100.
  2. Connect the XClarity Controller Management Ethernet port to a network that has access to the internet.

     Note: Outbound TCP port 443 (HTTPS) must be open for activation to occur.
  3. Log in to the ThinkShield Key Vault Portal with your Organization registered ID.
  4. If the server is not claimed by your organization, claim the server. Add the device by clicking the **Claim device** button in **Device Manager**. Enter machine type, serial number, and secure activation code in the corresponding fields.
  5. From the **Device Manager**, select the server you plan to activate and click **activate**. The status of the server will change to Ready.
  6. Server will be activated within 15 minutes and power on automatically. After successful activation, the status of the server will change to Active on the ThinkShield Key Vault Portal.

  Notes:

  – If the server activation is not initiated within 2 hours after the power cable plug in, perform a disconnect then re-connect of the power cable to your ThinkEdge SE100.

– For the detailed steps, see *ThinkShield Key Vault Portal Web Application User Guide* in ***https://lenovopress.lenovo.com/lp1725-thinkedge-security***.

Unlock the system

Important:

- When System Lockdown Mode Control status is XClarity Controller, if XClarity Controller is reset to defaults, the default credentials can be used to login to XClarity Controller and unlock the system. It is important to use security controls such as an UEFI PAP to prevent unauthorized users from executing an XClarity Controller reset to defaults. For the highest level of security, it is recommended to set System Lockdown Mode Control to ThinkShield Portal. See "System Lockdown Mode Control" on page 54 for the details.

Complete the following steps to unlock the system in Lenovo XClarity Controller web interface

Notes: To unlock the system, the role of XCC user should be one of the following:

- Administrator
- Administrator+

1. Log in to Lenovo XClarity Controller web interface, and go to **BMC Configuration → Security → System Lockdown Mode**.
2. Press **Active** button, and then press **Apply** button. When the status of System Lockdown Mode switches to Inactive, the system is unlocked.

System Lockdown Mode

See this topic to learn about System Lockdown Mode and related features in Lenovo XClarity Controller.

When System Lockdown Mode is active, the system can not be booted up, and the access to SED AK is not allowed.

Log in to Lenovo XClarity Controller web interface, and go to **BMC Configuration → Security → System Lockdown Mode** to configure the security features.

Note: When the **System Lockdown Mode Control** status on the home page of Lenovo XClarity Controller web interface is XClarity Controller, the status of System Lockdown Mode can be changed in XCC. See "Unlock the system" on page 56 for more information.

Chassis Intrusion Detection

When Chassis Intrusion Detection is **Enabled**, the system detects physical movements of the node covers. If one of the node covers is opened unexpectedly, the system enters System Lockdown Mode automatically.

Manage the Self Encryption Drive Authentication Key (SED AK)

For ThinkEdge SE100 with SED installed, the SED AK can be managed in Lenovo XClarity Controller. After setting up the server or making changes to the configuration, backing up the SED AK is a must operation to prevent data loss in the hardware failure case.

SED Authentication Key (AK) Manager

Log in to Lenovo XClarity Controller web interface, and go to **BMC Configuration → Security → SED Authentication Key (AK) Manager** to manage the SED AK.

Notes: The operation of SED AK Manager is not allowed in the following conditions:

- System Lockdown Mode is in **Active** state. SED AK is locked until the system is activated or unlocked. See "Activate or unlock the system" on page 54 to activate or unlock the system.
- Current user does not have the authority to manage SED AK.
  - To generate, backup, and recover the SED AK with passphrase or backup file, the role of XCC user should be **Administrator**.
  - To recover the SED AK from automatic backup, the role of XCC user should be **Administrator+**.

SED encryption

The status of SED encryption can be changed from Disabled to Enabled. Complete the following process to enable SED encryption.

1. Press **Enabled** button.
2. Select the SED AK generation method:
   - **Generate key using Passphrase:** Set the password and re-enter it for the confirmation.
   - **Generate key randomly:** A Random SED AK will be generated.
3. Press **Apply** button.

Attention:

- Once SED encryptoin is Enabled, it cannot be changed back to Disabled.
- When SED encryption is enabled, if emergency XCC password reset is performed, the SED AK stored in the server will be cleared as the default action. Data stored on the SED will no longer be accessible unless the SED AK is restored. Backing up the SED AK is strongly advised to reduce the risk of data loss. See "Emergency XCC Password Reset" on page 58.

Change the SED AK

- **Generate key using Passphrase:** Set the password and re-enter it for the confirmation. Click **Re-generate** to get the new SED AK.
- **Generate key randomly:** Click **Re-generate** to get a Random SED AK.

Backup the SED AK

Set the password and re-enter it for the confirmation. Click **Start Backup** to backup the SED AK; then, download the SED AK file and store it safely for future use.

Note: If you use the backup SED AK file to restore a configuration, the system will ask for the password that you set here.

Recover the SED AK

- **Recover SED AK using Passphrase:** Use the password that was set in **Generate key using Passphrase** to recover the SED AK.
- **Recover SED AK from Backup file:** Upload the backup file generated in **Backup the SED AK** mode and enter the corresponding backup file password to recover the SED AK.
- **Recover SED AK from Automatic backup:** After system board replacement, use automatic backup to recover the SED AK for the installed SED.

  Note: To recover the SED AK from automatic backup, the role of XCC user should be **Administrator+**.

Emergency XCC Password Reset

When emergency XCC password reset is performed, the SED AK stored in the server will be cleared at default for security. Check the emergency XCC password reset settings to enhance data security and prevent data loss.

Log in to Lenovo XClarity Controller web interface, and go to **BMC Configuration → Security → Emergency XCC Password Reset** to see the settings.

Emergency XCC password reset

If both XCC and UEFI password are lost, emergency XCC password reset feature allows the user to regain the access by resetting XCC password. Emergency XCC password reset feature does not include the normal XCC password reset methods, which can be performed with authorized access to tools like XCC, UEFI, BoMC, OneCLI, etc. See the following information to learn the capability of emergency XCC password reset feature.

For ThinkEdge SE100, emergency XCC password reset can be performed with ThinkShield Edge Mobile Management App.

When the server's System Lockdown Control status is ThinkShield Portal, users with proper permission can perform emergency XCC password reset through mobile app.

See "Activate or unlock the system" on page 54 for the details of System Lockdown Mode and mobile app settings.

For *ThinkShield Edge Mobile Management Application User Guide*, see ***https://lenovopress.lenovo.com/lp1725-thinkedge-security***.

Clear SED AK as part of Emergency XCC Password Reset

When SED encryption is enabled, if emergency XCC password reset is performed, the SED AK stored in the server will be cleared as the default action. Data stored on the SED will no longer be accessible unless the SED AK is restored. Backing up the SED AK is strongly advised to reduce the risk of data loss. See "Manage the Self Encryption Drive Authentication Key (SED AK) " on page 56 for more information.

The clearing SED AK action can be changed in XCC.

- Clear SED AK as part of Emergency XCC Password Reset
  - The default status is **Enabled**. Press the button to change the status to **Disabled**.

Important: When the server's System Lockdown Mode status is XClarity Controller and Clear SED AK is disabled, the data in SED might be accessed by login with default credentials after password reset. To prevent security risk, it is recommended to keep Clear SED AK as **Enabled**.

Note: If users reset XCC password not by emergency XCC password reset but by tools like XCC, UEFI, BoMC, OneCLI, etc., the SED AK stored in the server will not be cleared.

Configure the firmware

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

Note: UEFI **Legacy Mode** is not supported by ThinkSystem V4 products.

- **Lenovo XClarity Provisioning Manager (LXPM)**

  From Lenovo XClarity Provisioning Manager, you can configure the UEFI settings for your server.

Notes: The Lenovo XClarity Provisioning Manager provides a Graphical User Interface to configure a server. The text-based interface to system configuration (the Setup Utility) is also available. From Lenovo XClarity Provisioning Manager, you can choose to restart the server and access the text-based interface. In addition, you can choose to make the text-based interface the default interface that is displayed when you start LXPM. To do this, go to **Lenovo XClarity Provisioning Manager → UEFI Setup → System Settings → <F1>Start Control → Text Setup**. To start the server with Graphic User Interface, select **Auto** or **Tool Suite**.

See the following documentations for more information:

- Search for the LXPM documentation version compatible with your server at https://pubs.lenovo.com/lxpm-overview/
- *UEFI User Guide* at https://pubs.lenovo.com/uefi-overview/

- **Lenovo XClarity Essentials OneCLI**

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

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

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

- **Lenovo XClarity Administrator**

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

  Specific details about configuring the server using Lenovo XClarity Administrator are available at:

  https://pubs.lenovo.com/lxca/server_configuring

- **Lenovo XClarity Controller**

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

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

  "Configuring the Server" section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/

Memory module configuration

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

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

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

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

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

Deploy the operating system

Several options are available to deploy an operating system on the server.

Available operating systems

- Microsoft Windows
- Canonical Ubuntu

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

Tool-based deployment

- **Multi-server**

  Available tools:

  – Lenovo XClarity Administrator

  https://pubs.lenovo.com/lxca/compute_node_image_deployment

  – Lenovo XClarity Essentials OneCLI

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

- **Single-server**

  Available tools:

  – Lenovo XClarity Provisioning Manager

  "OS Installation" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/

  – Lenovo XClarity Essentials OneCLI

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

Manual deployment

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

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

Back up the server configuration

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

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

- **Management processor**

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

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

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

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

- **Operating system**

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

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: IBM is Lenovo's preferred service provider for ThinkSystem.

Before you call

Before you call, there are several steps that you can take to try and solve the problem yourself. If you decide that you do need to call for assistance, gather the information that will be needed by the service technician to more quickly resolve your problem.

Attempt to resolve the problem yourself

You can solve many problems without outside assistance by following the troubleshooting procedures that Lenovo provides in the online help or in the Lenovo product documentation. The online help also describes the diagnostic tests that you can perform. The documentation for most systems, operating systems, and programs contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

You can find the product documentation for your ThinkSystem products at the following location:

https://pubs.lenovo.com/

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Check for updated software, firmware, and operating-system device drivers for your Lenovo product. (See the following links) The Lenovo Warranty terms and conditions state that you, the owner of the Lenovo product, are responsible for maintaining and updating all software and firmware for the product (unless it is covered by an additional maintenance contract). Your service technician will request that you upgrade your software and firmware if the problem has a documented solution within a software upgrade.
  - Drivers and software downloads
    - https://datacentersupport.lenovo.com/tw/en/products/servers/thinkedge/se100/7dgr/downloads/driver-list/
  - Operating system support center
    - https://datacentersupport.lenovo.com/solutions/server-os
  - Operating system installing instructions
    - https://pubs.lenovo.com/thinkedge#os-installation
- If you have installed new hardware or software in your environment, check https://serverproven.lenovo.com to make sure that the hardware and software are supported by your product.
- Refer to “Problem Determination” in *User Guide* or *Hardware Maintenance Guide* for instructions on isolating and solving issues.

- Go to http://datacentersupport.lenovo.com and check for information to help you solve the problem.

  To find the Tech Tips available for your server:

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

     Follow the on-screen instructions to choose the category for the problem that you are having.
- Check Lenovo Data Center Forum at https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg to see if someone else has encountered a similar problem.

Gathering information needed to call Support

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

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

- Hardware and Software Maintenance agreement contract numbers, if applicable
- Machine type number (Lenovo 4-digit machine identifier). Machine type number can be found on the ID label, see "Identify the server and access the Lenovo XClarity Controller" on page 43.
- Model number
- Serial number
- Current system UEFI and firmware levels
- Other pertinent information such as error messages and logs

As an alternative to calling Lenovo Support, you can go to https://support.lenovo.com/servicerequest to submit an Electronic Service Request. Submitting an Electronic Service Request will start the process of determining a solution to your problem by making the pertinent information available to the service technicians. The Lenovo service technicians can start working on your solution as soon as you have completed and submitted an Electronic Service Request.

Collecting service data

To clearly identify the root cause of a server issue or at the request of Lenovo Support, you might need collect service data that can be used for further analysis. Service data includes information such as event logs and hardware inventory.

Service data can be collected through the following tools:

- **Lenovo XClarity Provisioning Manager**

  Use the Collect Service Data function of Lenovo XClarity Provisioning Manager to collect system service data. You can collect existing system log data or run a new diagnostic to collect new data.
- **Lenovo XClarity Controller**

  You can use the Lenovo XClarity Controller web interface or the CLI to collect service data for the server. The file can be saved and sent to Lenovo Support.

  – For more information about using the web interface to collect service data, see the "Backing up the BMC configuration" section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/.

  - For more information about using the CLI to collect service data, see the “XCC `servicelog` command” section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/.

- **Lenovo XClarity Administrator**

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

  You can find more information about setting up automatic problem notification within the Lenovo XClarity Administrator at https://pubs.lenovo.com/lxca/admin_setupcallhome.

- **Lenovo XClarity Essentials OneCLI**

  Lenovo XClarity Essentials OneCLI has inventory application to collect service data. It can run both in-band and out-of-band. When running in-band within the host operating system on the server, OneCLI can collect information about the operating system, such as the operating system event log, in addition to the hardware service data.

  To obtain service data, you can run the `getinfor` command. For more information about running the `getinfor`, see https://pubs.lenovo.com/lxce-onecli/onecli_r_getinfor_command.

Contacting Support

You can contact Support to obtain help for your issue.

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

Appendix B. Documents and supports

This section provides handy documents, driver and firmware downloads, and support resources.

Documents download

This section provides introduction and download link for handy documents.

Documents

Download the following product documentations at:

https://pubs.lenovo.com/se100/pdf_files

- ***Rail Installation Guides for 1U2N and 1U3N Enclosure***
  - Rail installation in a rack
- ***Activation Guide***
  - Activation process and activation code
- ***SE100 User Guide***
  - Complete overview, system configuration, hardware components replacing, and troubleshooting.

    Selected chapters from *User Guide*:
    - ***SE100 System Configuration Guide* :** Server overview, components identification, system LEDs and diagnostics display, product unboxing, setting up and configuring the server.
    - ***SE100 Hardware Maintenance Guide* :** Installing hardware components, cable routing, and troubleshooting.
- ***SE100 Cable Routing Guide***
  - Cable routing information.
- ***SE100 Messages and Codes Reference***
  - XClarity Controller, LXPM, and uEFI events
- ***UEFI Manual***
  - UEFI setting introduction

Notes: ThinkEdge SE100 node can be installed in the ThinkEdge SE100 1U2N and 1U3N Enclosure.

- *ThinkEdge SE100 1U2N and 1U3N Enclosure User Guide*

Support websites

This section provides driver and firmware downloads and support resources.

Support and downloads

- Drivers and Software download website for ThinkEdge SE100
  - https://datacentersupport.lenovo.com/tw/en/products/servers/thinkedge/se100/7dgr/downloads/driver-list/
- Lenovo Data Center Forum
  - https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg
- Lenovo Data Center Support for ThinkEdge SE100

  - https://datacentersupport.lenovo.com/products/servers/thinkedge/se100/7dgr
- Lenovo License Information Documents
  - https://datacentersupport.lenovo.com/documents/lnvo-eula
- Lenovo Press website (Product Guides/Datasheets/White papers)
  - https://lenovopress.lenovo.com/
- Lenovo Privacy Statement
  - https://www.lenovo.com/privacy
- Lenovo Product Security Advisories
  - https://datacentersupport.lenovo.com/product_security/home
- Lenovo Product Warranty Plans
  - http://datacentersupport.lenovo.com/warrantylookup
- Lenovo Server Operating Systems Support Center website
  - https://datacentersupport.lenovo.com/solutions/server-os
- Lenovo ServerProven website (Options compatibility lookup)
  - https://serverproven.lenovo.com
- Operating System Installation Instructions
  - https://pubs.lenovo.com/thinkedge#os-installation
- Submit an eTicket (service request)
  - https://support.lenovo.com/servicerequest
- Subscribe to Lenovo Data Center Group product notifications (Stay up to date on firmware updates)
  - https://datacentersupport.lenovo.com/solutions/ht509500

Appendix C. Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area.

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Important notes

Processor speed indicates the internal clock speed of the processor; other factors also affect application performance.

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1 024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity can vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard-disk-drive bays with the largest currently supported drives that are available from Lenovo.

Maximum memory might require replacement of the standard memory with an optional memory module.

Each solid-state memory cell has an intrinsic, finite number of write cycles that the cell can incur. Therefore, a solid-state device has a maximum number of write cycles that it can be subjected to, expressed as `total bytes written` (TBW). A device that has exceeded this limit might fail to respond to system-generated commands or might be incapable of being written to. Lenovo is not responsible for replacement of a device that has exceeded its maximum guaranteed number of program/erase cycles, as documented in the Official Published Specifications for the device.

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When you attach a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices that are supplied with the monitor.

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Taiwan Region BSMI RoHS declaration

單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr^{+6})	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機架	○	○	○	○	○	○
外部蓋板	○	○	○	○	○	○
機械組合件	–	○	○	○	○	○
空氣傳動設備	–	○	○	○	○	○
冷卻組合件	–	○	○	○	○	○
內存模組	–	○	○	○	○	○
處理器模組	–	○	○	○	○	○
電纜組合件	–	○	○	○	○	○
電源供應器	–	○	○	○	○	○
儲備設備	–	○	○	○	○	○
印刷電路板	–	○	○	○	○	○

備考1. 〝超出0.1 wt %〞及〝超出0.01 wt %〞係指限用物質之百分比含量超出百分比含量基準值。

Note1 : “exceeding 0.1wt%” and “exceeding 0.01 wt%” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考2. 〝○〞係指該項限用物質之百分比含量未超出百分比含量基準值。

Note2 : “○”indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考3. 〝-〞係指該項限用物質為排除項目。

Note3 : The “-“ indicates that the restricted substance corresponds to the exemption.

Taiwan Region import and export contact information

Contacts are available for Taiwan Region import and export information.

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