



# ThinkEdge SE350 V2 System Configuration Guide



**Machine Types:** 7DA9, 7DBK

## 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/](https://pubs.lenovo.com/safety_documentation/)

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

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

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## Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

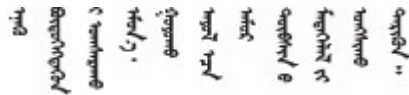
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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



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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

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

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

مەزكۇر مەھسۇلاتنى ئورنىتىشتىن بۇرۇن بىخەتەرلىك ئۇچۇرلىرىنى ئوقۇپ چىقىڭ.

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canjbinj soengq cungj vahgangj ancien siusik.

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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:** This device is not intended for use in the direct field of view at visual display workplaces. To avoid incommoding reflections at visual display workplaces, this device must not be placed in the direct field of view.

### CAUTION:

**This equipment must be installed or serviced by trained personnel, as defined by the NEC, IEC 62368-1 & IEC 60950-1, the standard for Safety of Electronic Equipment within the Field of Audio/Video, Information Technology and Communication Technology. Lenovo assumes you are qualified in the servicing of equipment and trained in recognizing hazards energy levels in products. Access to the equipment is by the use of a tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.**

**Important:** Electrical grounding of the server is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Use the following checklist to verify that there are no potentially unsafe conditions:

1. Make sure that the power is off and the power cord is disconnected.
2. Check the power cord.
  - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
  - Make sure that the power cord is the correct type.

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

- a. Go to:

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

- b. Click **Preconfigured Model** or **Configure to order**.



- c. Enter the machine type and model for your server to display the configurator page.
  - d. Click **Power** → **Power Cables** to see all line cords.
    - Make sure that the insulation is not frayed or worn.
3. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
4. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
5. Check for worn, frayed, or pinched cables.
6. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.
7. For safety, make sure to tighten the top cover safety screw (provided in the accessory kit) after installing the top cover.



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## Chapter 1. Introduction

The ThinkEdge SE350 V2 server (Type 7DA9) 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 SE350 V2 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.

The ThinkEdge SE350 V2 1U2N/2U2N Enclosure (Type 7DBK) is designed to mount the SE350 V2 node(s) in a rack. A single enclosure can contain up to two ThinkEdge SE350 V2 nodes.

*Figure 1. ThinkEdge SE350 V2*



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## Features

Performance, ease of use, reliability, and expansion capabilities were key considerations in the design of ThinkEdge SE350 V2. 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.

ThinkEdge SE350 V2 implements the following features and technologies:

- **Features on Demand**

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

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

- **Lenovo XClarity Controller (XCC)**

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

the server system board. Some of the features that are unique to the Lenovo XClarity Controller are enhanced performance, higher-resolution remote video, and expanded security options.

ThinkEdge SE350 V2 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 in line memory modules (DIMMs) with error correcting code (ECC). For more information about the specific types and maximum amount of memory, see “[Technical specifications](#)” on page 4.

- **Integrated network support**

ThinkEdge SE350 V2 provides network through either of the two following options of I/O module boards.

1. **10/25GbE I/O module board:** with four 10/25GbE SFP28 connectors and two 2.5GbE RJ-45 connectors
2. **1GbE I/O module board:** with four 1GbE RJ-45 connectors and two 2.5GbE RJ-45 connectors

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

ThinkEdge SE350 V2 supports up to two 15mm NVMe hot-swap drives or four 7mm SATA or NVMe hot-swap drives. With the hot-swap feature, the solid state drives can be added, removed, or replaced without turning off the server.

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

ThinkEdge SE350 V2 provides a QR code on the system service label, which is on the cover of the server and can be scanned 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. Through Lenovo XClarity Energy Manager, the power consumption and temperature of Converged, NeXtScale, System x, and ThinkServer servers can be monitored and managed, and energy efficiency can be improved.

- **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 and optional power capabilities**

ThinkEdge SE350 V2 supports a maximum of two 300-watt hot-swap power adapters or direct DC power source and three internal fans, which provide redundancy for a typical configuration. The redundant cooling by the fans in the server enables continued operation if one of the fans fails.

- **ThinkSystem RAID support**

ThinkEdge SE350 V2 provides software redundant array of independent disks (RAID) to create configurations. The software RAID controller supports RAID levels 0, 1, 5, and 10.

- **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.

- **Low-touch deployment**

Low-touch deployment software allows remote deployment, particularly when the server is transported by non-certified carriers to remote environments with no certified personnels to set it up in person.

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## Tech Tips

Lenovo continually updates the support website with the latest tips and techniques that can be used to solve issues that the 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.

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## 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](https://datacentersupport.lenovo.com/product_security/home)

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## 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	<ul style="list-style-type: none"><li>• “Processor” on page 4</li><li>• “Memory” on page 5</li><li>• “M.2 Boot drive” on page 5</li><li>• “Storage expansion” on page 5</li><li>• “Integrated functions and I/O connectors” on page 6</li><li>• “Network” on page 5</li><li>• “Storage controller (software RAID)” on page</li><li>• “System fan” on page 6</li><li>• “Electrical input” on page 7</li><li>• “Minimal configuration for debugging” on page 8</li><li>• “Operating systems” on page 8</li></ul>	<ul style="list-style-type: none"><li>• Dimension</li><li>• Weight</li></ul>	<ul style="list-style-type: none"><li>• Acoustical noise emissions</li><li>• Ambient temperature management</li><li>• Environment</li></ul>

## 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

Processor
<ul style="list-style-type: none"><li>• One Intel® Xeon® processor D-2700 product family</li><li>• Single processor</li></ul> <p>For a list of supported processors, see <a href="https://serverproven.lenovo.com">https://serverproven.lenovo.com</a>.</p>

## Memory

Memory
<p>See “Memory module installation rules and order” in <i>User Guide</i> or <i>Hardware Maintenance Guide</i> for detailed information about memory configuration and setup.</p> <ul style="list-style-type: none"><li>• Slots: 4 DIMM slots</li><li>• Memory module types:<ul style="list-style-type: none"><li>– Double-data-rate 4 (TruDDR4) error correcting code (ECC) 3200 MHz registered DIMM (RDIMM)</li></ul></li></ul> <p><b>Note:</b> Memory operates at up to 2933 MHz, depending on the processor selected.</p> <ul style="list-style-type: none"><li>• Capacity:<ul style="list-style-type: none"><li>– 16 GB (2Rx8)</li><li>– 32 GB (2Rx4, 2Rx8)</li><li>– 64 GB (2Rx4)</li></ul></li><li>• Total capacity<ul style="list-style-type: none"><li>– Minimum: 16 GB</li><li>– Maximum: 256 GB</li></ul></li></ul> <p>For a list of supported memory modules, see: <a href="https://serverproven.lenovo.com">https://serverproven.lenovo.com</a>.</p>

## M.2 Boot Drives

M.2 Boot Drives
<ul style="list-style-type: none"><li>• ThinkEdge SE350 V2 supports up to two 80 mm (2280) M.2 PCIe Gen3x1 on the I/O module board for boot functions.</li></ul>

## Storage expansion

Storage expansion
<p>ThinkEdge SE350 V2 supports one of the following storage configurations:</p> <ul style="list-style-type: none"><li>• Up to four 7mm 2.5-inch hot-swap drives, supporting SATA or NVMe drives</li><li>• Up to two 15mm 2.5-inch hot-swap drives, supporting NVMe drives</li></ul>

## Network

Network
<p>ThinkEdge SE350 V2 supports one of the following groups of network connectors on I/O module board:</p> <ul style="list-style-type: none"><li>• <b>10/25GbE I/O module board</b><ul style="list-style-type: none"><li>– Four 10/25GbE SFP28 connectors</li></ul><p><b>Note:</b> The transmission speed of SFP28 connectors could be 10 Gbps or 25 Gbps, depending on the processor selected. Processors with at least 16 cores support transmission speed of 25 Gbps.</p><ul style="list-style-type: none"><li>– Two 2.5GbE RJ-45 connectors</li><li>– One XCC system management port (1GbE RJ-45)</li></ul></li><li>• <b>1GbE I/O module board</b><ul style="list-style-type: none"><li>– Four 1GbE RJ-45 connectors</li><li>– Two 2.5GbE RJ-45 connectors</li><li>– One XCC system management port (1GbE RJ-45)</li></ul></li></ul>

## Integrated functions and I/O connectors

### 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.
  - ThinkEdge SE350 V2 supports Lenovo XClarity Controller 2 (XCC2). For additional information about Lenovo XClarity Controller 2 (XCC2), refer to <https://pubs.lenovo.com/lxcc-overview/>.
- One XCC system management port (1GbE RJ-45) on the front side to connect to a systems-management network. This RJ-45 connector is dedicated to the Lenovo XClarity Controller functions and runs at 1 GbE speed.
- One USB 2.0 Gen 1 Type-C connector with Lenovo XClarity Controller (XCC) management on the front to connect to a system-management network.
- Depending on the configuration, the I/O connectors on the front of the server include:
  - **10/25GbE I/O module board**
    - Two USB 3.2 Gen 1 Type-A connectors
    - One USB 3.2 Gen 1 Type-C connector (supporting display)
    - One USB 2.0 Gen 1 Type-C connector with Lenovo XClarity Controller (XCC) management
    - Two 2.5GbE RJ-45 connectors
    - Four 10/25GbE SFP28 connectors

**Note:** The transmission speed of SFP28 connectors could be 10 Gbps or 25 Gbps, depending on the processor selected. Processors with at least 16 cores support transmission speed of 25 Gbps.
  - **1GbE I/O module board**
    - Two USB 3.2 Gen 1 Type-A connectors
    - One USB 3.2 Gen 1 Type-C connector (supporting display)
    - One USB 2.0 Gen 1 Type-C connector with Lenovo XClarity Controller (XCC) management
    - Two 2.5GbE RJ-45 connectors
    - Four 1GbE RJ-45 connectors

### Storage controller (software RAID only)

- Software RAID 0, 1, 5, 10
  - Intel VROC SATA RAID: supports RAID level 0, 1
  - Intel VROC NVMe RAID
    - VROC Standard: supports RAID level 0, 1, 10 and requires an activation key.
    - VROC Premium: supports RAID level 0, 1, 5, 10 and requires an activation key.

#### Notes:

- For more information about RAID configuration, see [RAID configuration](#).
- For more information about acquiring and installing the activation key, see <https://fod.lenovo.com/lkms>.

## System fan

### System fan

- Three 40 mm non-hot-swappable fans



## Electrical input

Electrical input		
<p><b>Note:</b> Depending on the selected electrical input, SE350 V2 supports different mounting options. See “Configuration guide” in <i>User Guide</i> or <i>Hardware Maintenance Guide</i> for more information.</p> <ul style="list-style-type: none"> <li>The models with DC/DC power module board (Output 12V): one of the following           <ul style="list-style-type: none"> <li>Dual 12-48V variable DC power source input</li> <li>Up to two 300W (230V/115V) external power adapters</li> </ul> </li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>When 300W external power adapter is installed, one of the following mounting options is supported with proper ambient temperature:           <ul style="list-style-type: none"> <li>Desktop mount at lower than 40°C</li> <li>Rack mount with ThinkEdge SE350 V2 1U2N Enclosure at lower than 30°C</li> <li>Rack mount with ThinkEdge SE350 V2 2U2N Enclosure at lower than 40°C</li> </ul> </li> <li>The models with internal power supply:           <ul style="list-style-type: none"> <li>Single 500W (230V/115V) AC power source input</li> </ul> </li> <li><b>Supported external power adapters:</b> <p>As required by COMMISSION REGULATION (EU) 2019/1782 of 1 October 2019 laying down ecodesign requirements for external power supplies pursuant to Directive 2009/125/EC of the European Parliament and of the Council and repealing Commission Regulation (EC) No 278/2009 (ErP Lot7) for the external power supply of the product.</p> <ul style="list-style-type: none"> <li>ThinkEdge 300W 230V/115V External Power Supply</li> </ul> </li> </ul>		
<p>Table 1. ThinkEdge 300W 230V/115V External Power Supply</p>		
Information published	Value and precision	Unit
Manufacturer’s name	Lenovo	-
Model identifier	ADL300SDC3A	-
Input voltage	100-240	V
Input AC frequency	50-60	Hz
Output voltage	20.0	V
Output current	15.0	A
Output power	300.0	W
Average active efficiency	90.00	%
Efficiency at low load (10 %)	88.07	%
No-load power consumption	0.15	W

## Minimal configuration for debugging

### Minimal configuration for debugging

- One DRAM memory module in slot 1
- Depending on the model, one of the following power source:
  - One 300W external power adapter
  - AC power source input
  - DC power source input
- One 2280 NVMe M.2 drive in slot 1 on the I/O module board
- Three non-hot-swappable system fans

## Operating systems

### Operating systems

Supported and certified operating systems:

- Microsoft Windows Server
- VMware ESXi
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server

References:

- Complete list of available operating systems: <https://lenovopress.lenovo.com/osig>.
- OS deployment instructions, see .

## 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: 41.7 mm (1.64 inches) (without rubber feet)
- Width: 209 mm (8.23 inches)
- Depth: 384 mm (15.12 inches)

#### 1U2N enclosure, with external power adapter

- Height: 43 mm (1.69 inches)
- Width: 439.2 mm (17.29 inches) (from EIA bracket to EIA bracket)
- Depth: 773.12 mm (30.44 inches)

#### 1U2N enclosure, with internal power supply

- Height: 43 mm (1.69 inches)
- Width: 439.2 mm (17.29 inches) (from EIA bracket to EIA bracket)
- Depth: 476.12 mm (18.74 inches)

#### 2U2N enclosure

- Height: 86.9 mm (3.42 inches)
- Width: 439.2 mm (17.29 inches) (from EIA bracket to EIA bracket)
- Depth: 476.12 mm (18.74 inches)

## Weight

### Node

- Maximum: 3.75 kg ( 8.267 lbs)

Node installed in a **node sleeve**

- Maximum: 7.818 kg (17.236 lbs) (with two external power adapters)

Node(s) installed in a **1U2N enclosure, with external power adapter**

- Maximum (with 2 nodes and 4 external power adapters): 16.88 kg (37.214 lbs)

Node(s) installed in a **1U2N enclosure, with internal power supply**

- Maximum (with 2 nodes and internal power supplies):
  - DC power input: 9.85 kg (21.67 lbs)
  - AC power input: 10.03 kg (22.11 lbs)

Nodes installed in a **2U2N enclosure**

- Maximum (with 2 nodes and 4 external power adapters): 16.92 kg (37.302 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

### Acoustical noise emissions

The server has the following acoustic noise emissions declaration:

- **Sound power level ( $L_{WAd}$ ):**

- Idling:
  - Minimum: 4.0 bels
  - Typical: 4.0 bels
  - Maximum: 4.0 bels
- Operating:
  - Minimum: 5.3 bels
  - Typical: 5.8 bels
  - Maximum: 5.8 bels

- **Sound pressure level ( $L_{pAm}$ ):**

- Idling:
  - Minimum: 26.0 dBA
  - Typical: 26.2 dBA
  - Maximum: 26.2 dBA
- Operating:
  - Minimum: 39.7 dBA
  - Typical: 44.2 dBA
  - Maximum: 44.2 dBA

#### Notes:

- These sound levels were measured in controlled acoustical environments according to procedures specified by ISO 7779 and are reported in accordance with ISO 9296. The operating profile is represented by 80% CPU TDP or 70%/30% storage read/write.
- The declared acoustic noise levels are based on the following configurations, which may change depending on configurations/conditions.
  - Minimum: 1x 65W CPU, 2x 16GB RDIMMs, 1GbEx4 + 2.5GbE I/O module board, 1x NVMe M.2 boot drive, 2x SATA SSDs, DC PMB, SE350 V2 Desktop mount.
  - Typical: 1x 80W CPU, 4x 64GB RDIMMs, 25/10GbEx4 + 2.5GbE I/O module board, 2x NVMe M.2 boot drives, 4x NVMe SSDs, DC PMB, SE350 V2 Desktop mount.
  - Maximum: 1x 100W CPU, 4x 64GB RDIMMs, 25/10GbEx4 + 2.5GbE I/O module board, 2x NVMe M.2 boot drives, 4x NVMe SSDs, DC PMB, SE350 V2 Desktop mount.
- Government regulations (such as those prescribed by OSHA or European Community Directives) may govern noise level exposure in the workplace and may apply to you and your server installation. The actual sound pressure levels in your installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room; the noise levels from other equipment; the room ambient temperature, and employee's location in relation to the equipment. Further, compliance with such government regulations depends on a variety of additional factors, including the duration of employees' exposure and whether employees wear hearing protection. Lenovo recommends that you consult with qualified experts in this field to determine whether you are in compliance with the applicable regulations.

## Ambient temperature management

Ambient temperature management
Adjust ambient temperature when specific components are installed: <ul style="list-style-type: none"><li>• Keep the ambient temperature to <b>45°C</b> or lower when one or more NVMe drives are installed. If the ambient temperature is over 45°C, the server will have performance degradation.</li><li>• Keep the ambient temperature to <b>40°C</b> or lower when AC adapters are installed.</li><li>• Keep the ambient temperature to <b>30°C</b> or lower to avoid performance degradation when choosing the rack mount with the SE350 V2 1U2N Enclosure. It is advised that the ambient temperature should be kept under <b>27°C</b> when AC adapters are installed.</li></ul>

## Environment

Environment
ThinkEdge SE350 V2 complies with ASHRAE Class A4 specifications. System performance may be impacted when operating temperature is outside AHSARE A4 specification or fan failed condition over <b>30°C</b> ambient temperature. ThinkEdge SE350 V2 is supported in the following environment: <ul style="list-style-type: none"><li>• <b>Air temperature:</b><ul style="list-style-type: none"><li>– <b>Operating</b><ul style="list-style-type: none"><li>– ASHRAE Class H1: 5°C to 25°C (41°F to 77°F); the maximum ambient temperature decreases by 1°C for every 500 m (1640 ft) increase in altitude above 900 m (2,953 ft).</li><li>– ASHRAE 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).</li><li>– ASHRAE Class A3: 5°C to 40°C (41°F to 104°F); the maximum ambient temperature decreases by 1°C for every 175 m (574 ft) increase in altitude above 900 m (2,953 ft).</li><li>– ASHRAE Class A4: 5°C to 45°C (41°F to 113°F); the maximum ambient temperature decreases by 1°C for every 125 m (410 ft) increase in altitude above 900 m (2,953 ft).</li><li>– The ambient temperature can be extended to 0°C to 55°C (32°F to 131°F) with the following restrictions of configuration:<ul style="list-style-type: none"><li>• No AC adapter installed</li><li>• NVMe drives may have performance degradation</li></ul></li></ul></li><li>– <b>Server off:</b> 0°C to 55°C (32°F to 131°F)</li><li>– <b>Shipping/storage:</b> -40°C to 65°C (-40°F to 149°F)</li></ul></li><li>• <b>Maximum altitude:</b> 3,050 m (10,000 ft)</li><li>• <b>Relative Humidity (non-condensing):</b><ul style="list-style-type: none"><li>– <b>Operating:</b> 8% to 90%, maximum dew point : 24°C (75.2°F)</li><li>– <b>Shipment/storage:</b> 8% to 90%, maximum dew point : 27°C (80.6°F)</li><li>– <b>Non-operating (unpacked) storage</b> can pass the following condition: 5% to 95% at 38.7°C (101.7°F) maximum dry-bulb temperature for 48 hrs.</li></ul></li><li>• <b>Particulate contamination</b><ul style="list-style-type: none"><li>– Depending on the specific configuration, SE350 V2 supports a dust filter installed at the front of the enclosure. The dust filter has a Minimum Efficiency Rating Value (MERV) of 5, per ASHRAE 52.2-2017 / 80% Average Arrestance per ASHRAE 52.1-1992.</li></ul></li></ul> <p><b>Attention:</b> 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 <a href="#">“Particulate contamination” on page 12.</a></p>

## 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 2. Shock and vibration specifications

Mounting type of ThinkEdge SE350 V2	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)
<b>Desktop mount (standing alone)</b>	Half-sine wave, 15G 11ms	Trapezoidal wave, 50G 180 inch/sec	5-100 Hz, 0.15 Grms, 30 mins	2-200 Hz, 1.04 Grms, 15 mins
<b>Rack mount (1U2N and 2U2N)</b>	Half-sine wave, 15G 3ms	<ul style="list-style-type: none"> <li>Free-fall drop height: 100mm</li> <li>Equivalent shock: 70 inch/sec, 2-3 ms</li> </ul>	5-500 Hz, 0.21 Grms, 15mins	2-200Hz, 0.8 Grms, 15mins
<b>DIN-rail mount</b>	Half-sine wave, 15G 11ms	Not applicable	5-100 Hz, 0.15 Grms, 30 mins	Not applicable
<b>Wall mount</b>	<ul style="list-style-type: none"> <li><b>All configurations:</b> <ul style="list-style-type: none"> <li>Half-sine wave, 40G 6ms</li> <li>Half-sine wave, 30G 11ms</li> </ul> </li> <li><b>Configurations with 7mm drives:</b> <ul style="list-style-type: none"> <li>Half-sine wave, 30G 18ms</li> </ul> </li> </ul>	Not applicable	<ul style="list-style-type: none"> <li>1.91 Grms, 10-500z, 30 mins</li> <li>1.04 Grms, 10-500z, 1 hr</li> </ul>	Not applicable
<b>Ceiling mount</b>	Not applicable	Not applicable	<ul style="list-style-type: none"> <li>1.91 Grms, 10-500z, 30 mins</li> <li>1.04 Grms, 10-500z, 1 hr</li> </ul>	Not applicable

## 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 3. Limits for particulates and gases

Contaminant	Limits
Reactive gases	<p>Severity level G1 as per ANSI/ISA 71.04-1985<sup>1</sup>:</p> <ul style="list-style-type: none"> <li>• The copper reactivity level shall be less than 200 Angstroms per month (<math>\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour}</math> weight gain).<sup>2</sup></li> <li>• The silver reactivity level shall be less than 200 Angstroms per month (<math>\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour}</math> weight gain).<sup>3</sup></li> <li>• 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.</li> </ul>
Airborne particulates	<p>Data centers must meet the cleanliness level of ISO 14644-1 class 8.</p> <p>For data centers without airside economizer, the ISO 14644-1 class 8 cleanliness might be met by choosing one of the following filtration methods:</p> <ul style="list-style-type: none"> <li>• The room air might be continuously filtered with MERV 8 filters.</li> <li>• Air entering a data center might be filtered with MERV 11 or preferably MERV 13 filters.</li> </ul> <p>For data centers with airside economizers, the choice of filters to achieve ISO class 8 cleanliness depends on the specific conditions present at that data center.</p> <ul style="list-style-type: none"> <li>• The deliquescent relative humidity of the particulate contamination should be more than 60% RH.<sup>4</sup></li> <li>• Data centers must be free of zinc whiskers.<sup>5</sup></li> </ul>

<sup>1</sup> 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.

<sup>2</sup> The derivation of the equivalence between the rate of copper corrosion growth in the thickness of the corrosion product in  $\text{\AA}/\text{month}$  and the rate of weight gain assumes that  $\text{Cu}_2\text{S}$  and  $\text{Cu}_2\text{O}$  grow in equal proportions.

<sup>3</sup> The derivation of the equivalence between the rate of silver corrosion growth in the thickness of the corrosion product in  $\text{\AA}/\text{month}$  and the rate of weight gain assumes that  $\text{Ag}_2\text{S}$  is the only corrosion product.

<sup>4</sup> 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.

<sup>5</sup> 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	<p>Baseboard management controller (BMC)</p> <p>Consolidates the service processor functionality, Super I/O, video controller, and remote presence capabilities into a single chip on the server system board (system board assembly).</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• CLI application</li> <li>• Web GUI interface</li> <li>• Mobile application</li> <li>• Redfish API</li> </ul> <p><b>Usage and downloads</b></p> <p><a href="https://pubs.lenovo.com/lxcc-overview/">https://pubs.lenovo.com/lxcc-overview/</a></p>
Lenovo XCC Logger Utility	<p>Application that reports the XCC events to local OS system log.</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• CLI application</li> </ul> <p><b>Usage and downloads</b></p> <ul style="list-style-type: none"> <li>• <a href="https://pubs.lenovo.com/lxcc-logger-linux/">https://pubs.lenovo.com/lxcc-logger-linux/</a></li> <li>• <a href="https://pubs.lenovo.com/lxcc-logger-windows/">https://pubs.lenovo.com/lxcc-logger-windows/</a></li> </ul>
Lenovo XClarity Administrator	<p>Centralized interface for multi-server management.</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• Web GUI interface</li> <li>• Mobile application</li> <li>• REST API</li> </ul> <p><b>Usage and downloads</b></p> <p><a href="https://pubs.lenovo.com/lxca/">https://pubs.lenovo.com/lxca/</a></p>
Lenovo XClarity Essentials toolset	<p>Portable and light toolset for server configuration, data collection, and firmware updates. Suitable both for single-server or multi-server management contexts.</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• <b>OneCLI:</b> CLI application</li> <li>• <b>Bootable Media Creator:</b> CLI application, GUI application</li> <li>• <b>UpdateXpress:</b> GUI application</li> </ul> <p><b>Usage and downloads</b></p> <p><a href="https://pubs.lenovo.com/lxce-overview/">https://pubs.lenovo.com/lxce-overview/</a></p>



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

## Functions

Options		Functions							
		Multi-system mgmt	OS deployment	System configuration	Firmware updates <sup>1</sup>	Event/alert monitoring	Inventory/logs	Power mgmt	Power planning
Lenovo XClarity Controller				√	√ <sup>2</sup>	√	√ <sup>4</sup>		
Lenovo XCC Logger Utility						√			
Lenovo XClarity Administrator		√	√	√	√ <sup>2</sup>	√	√ <sup>4</sup>		
Lenovo XClarity Essentials toolset	OneCLI	√		√	√ <sup>2</sup>	√	√		
	Bootable Media Creator			√	√ <sup>2</sup>		√ <sup>4</sup>		
	UpdateXpress			√	√ <sup>2</sup>				
Lenovo XClarity Provisioning Manager			√	√	√ <sup>3</sup>		√ <sup>5</sup>		
Lenovo XClarity Integrator		√	√ <sup>6</sup>	√	√	√	√	√ <sup>7</sup>	
Lenovo XClarity Energy Manager		√				√		√	
Lenovo Capacity Planner									√ <sup>8</sup>

### Notes:

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

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## Chapter 2. Server components

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

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### Front view

This section contains information about the controls, LEDs, and connectors in the front of the server, including the front I/O modules.

Based on two types of drive assemblies and two types of I/O module boards, there are four possible configurations of ThinkEdge SE350 V2.

- One of the following drive assemblies:
  - (Selectable) Up to four 7mm 2.5-inch hot-swap drives, supporting SATA or NVMe drives
  - (Selectable) Up to two 15mm 2.5-inch hot-swap drives, supporting NVMe drives
- One of the following I/O module:
  - (Selectable) 10/25GbE I/O module
  - (Selectable) 1GbE I/O module

### Server front views of different configurations

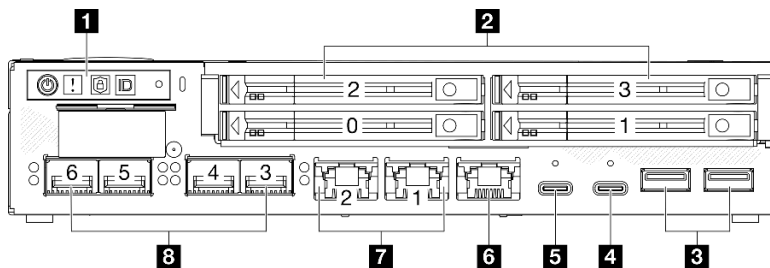


Figure 2. Front view of SE350 V2, 7mm drives with 10/25GbE I/O module

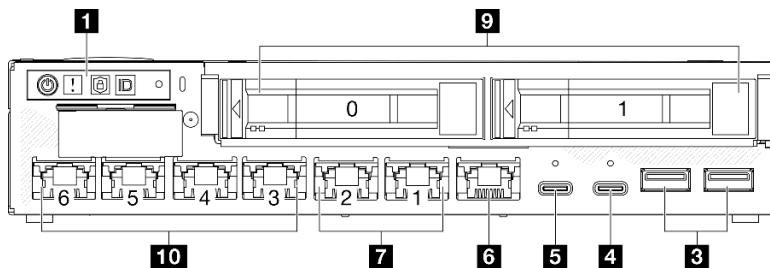


Figure 3. Front view of SE350 V2, 15mm drives with 1GbE I/O module

### Notes:

- Above are the front views of
  - 7mm drives with 10/25GbE I/O module; and
  - 15mm drives with 1GbE I/O module.
- In addition, the other two configurations of ThinkEdge SE350 V2 include:
  - 7mm drives with 1GbE I/O module; and
  - 15mm drives with 10/25GbE I/O module.

Table 4. Components in the front view

<b>1</b> Front operator panel buttons and LEDs	<b>6</b> “XCC system management port (1GbE RJ-45)” on page 19
<b>2</b> 7mm 2.5-inch drive bays (bays 0 to 3)	<b>7</b> “2.5GbE RJ-45 connectors” on page 20
<b>3</b> “USB 3.2 Gen 1 Type-A connectors” on page 19	<b>8</b> “10/25GbE SFP28 connectors” on page 20
<b>4</b> “USB 3.2 Gen 1 Type-C connector (supporting display)” on page 19	<b>9</b> 15mm 2.5-inch drive bays (bays 0 to 1)
<b>5</b> “USB 2.0 Gen 1 Type-C connector with Lenovo XClarity Controller (XCC) management” on page 19	<b>10</b> “1GbE RJ-45 connectors” on page 20

### 1 Front operator panel buttons and LEDs

For more information about the front operator panel buttons and LEDs, see “Front operator panel LEDs” in the *User Guide*.

#### Notes:

- When the security bezel is installed, the front operator panel and the USB Type-C connectors are not accessible.
- When the shipping bracket is installed, the front operator panel is not accessible.

### 2 9 2.5-inch drive bays (bay 0 to 3)

- Install 2.5-inch drives or drive bay fillers to these bays (see “Install a 2.5-/3.5-inch hot-swap drive” in the *User Guide* or *Hardware Maintenance Guide*).
- For more information about the drive LEDs, see “Drive LEDs” on page 27.

### 3 4 5 6 7 8 10 Front I/O Module

#### Notes:

- The following illustrations show the front I/O module of ThinkEdge SE350 V2.
- Depending on the configuration, the front I/O module is determined by one of the following networking options:
  - 10/25GbE I/O module
  - 1GbE I/O module
- For more information about LAN port LEDs, see “LAN port LEDs” in the *User Guide*.

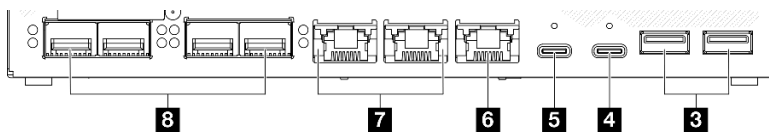


Figure 4. Front I/O of 10/25GbE I/O module

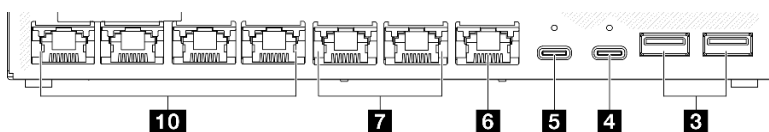


Figure 5. Front I/O of 1GbE I/O module

Table 5. Components in the front I/O module

<b>3</b> “USB 3.2 Gen 1 Type-A connectors” on page 19	<b>7</b> “2.5GbE RJ-45 connectors” on page 20
<b>4</b> “USB 3.2 Gen 1 Type-C connector (supporting display)” on page 19	<b>8</b> “10/25GbE SFP28 connectors” on page 20
<b>5</b> “USB 2.0 Gen 1 Type-C connector with Lenovo XClarity Controller (XCC) management” on page 19	<b>10</b> “1GbE RJ-45 connectors” on page 20
<b>6</b> “XCC system management port (1GbE RJ-45)” on page 19	

### **3** USB 3.2 Gen 1 Type-A connectors

There are two USB 3.2 Gen 1 Type-A connectors in the front of the server. These connectors are available for a device that requires USB 2.0 or 3.0 Type-A connection, such as a keyboard, a mouse, or a USB flash drive.

### **4** USB 3.2 Gen 1 Type-C connector (supporting display)

This USB 3.2 Gen 1 Type-C connector (supporting display) in the front of the server is available for a video device compatible with the display port, such as a monitor with USB 2.0 or 3.0 Type-C connections.

#### **Notes:**

- When the security bezel is installed, the front operator panel and the USB Type-C connectors are not accessible.

### **5** USB 2.0 Gen 1 Type-C connector with Lenovo XClarity Controller (XCC) management

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

#### **Notes:**

- When the security bezel is installed, the front operator panel and the USB Type-C connectors are not accessible.

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.

The following mode is supported:

- **BMC only mode**

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

See the following for more information:

- [“Set the network connection for the Lenovo XClarity Controller” on page 45](#)

### **6** XCC system management port (1GbE RJ-45)

The server has a 1 GbE RJ-45 connector dedicated to Lenovo XClarity Controller (XCC) functions. Use this connector to manage the server, by using a dedicated management network. If you use this connector, the Lenovo XClarity Controller cannot be accessed directly from the production network. A dedicated management network provides additional security by physically separating the management network traffic from the production network. You can use the Setup utility to configure the server to use a dedicated systems-management network or a shared network.

See the following for more information:

- “Set the network connection for the Lenovo XClarity Controller” on page 45
- “XCC system management port LEDs” on page 34

**7 8 10 Ethernet connectors**

- **7** 2.5GbE RJ-45 connectors
- **8** 10/25GbE SFP28 connectors
- **10** 1GbE RJ-45 connectors

These ports are used to attach Ethernet cables for LANs. Each Ethernet connector has status LEDs to help identify the Ethernet connectivity and activity. For more information about these LEDs, see “LAN port LEDs” in the *User Guide*.

**Note:** The transmission speed of SFP28 connectors could be 10 Gbps or 25 Gbps, depending on the processor selected. Processors with at least 16 cores support transmission speed of 25 Gbps.

**Install I/O fillers**

Install the I/O fillers when the connectors are not in use. The connectors could be damaged without proper protection of the fillers.

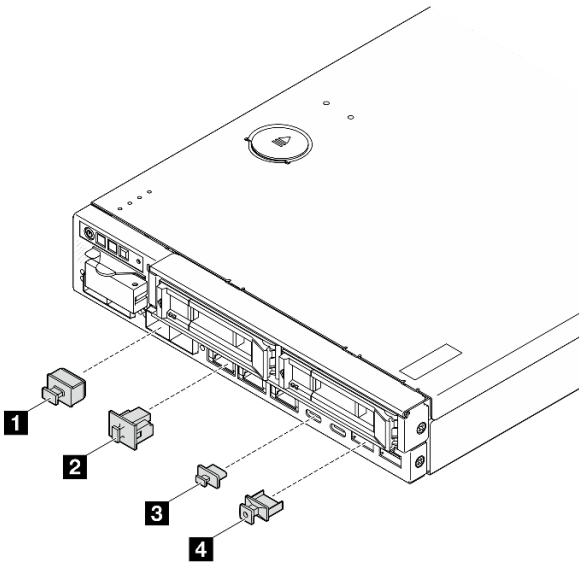


Figure 6. Front I/O fillers

<b>1</b> SFP+ filler (x4, if applicable for the server configuration)	<b>3</b> USB Type-A filler (x2)
<b>2</b> RJ-45 filler (x7 or x3, depending on the server configuration)	<b>4</b> USB Type-C filler (x2)

## Rear view

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

### Rear view of ThinkEdge SE350 V2, DC power input

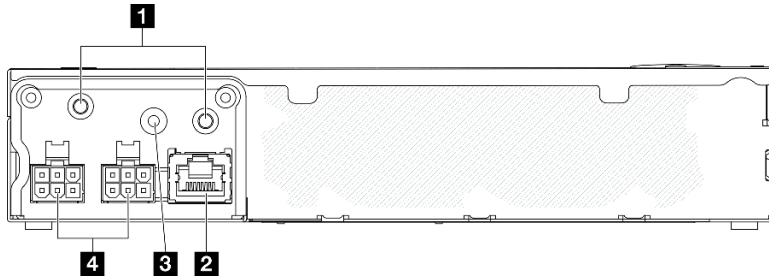


Figure 7. Rear view of ThinkEdge SE350 V2, DC power input

Table 6. Components on the rear view, DC power input

<b>1</b> Threaded studs for grounding	<b>3</b> PMB status LED
<b>2</b> RJ-45 RS-232 serial console connector	<b>4</b> DC power inputs (two 6-pins 12V-48V power connectors)

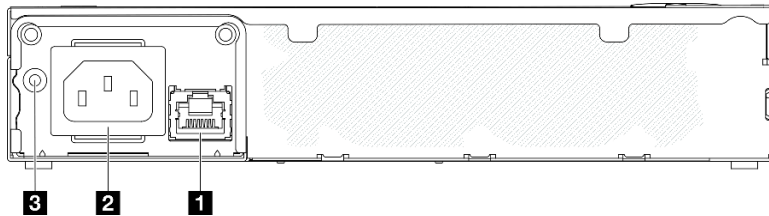


Figure 8. Rear view of ThinkEdge SE350 V2, AC power input

Table 7. Components on the rear view, AC power input

<b>1</b> RJ-45 RS-232 serial console connector	<b>3</b> PMB status LED
<b>2</b> AC power input (3-pins 120V-240 VAC)	

### Power connectors

Connect DC or AC power source directly or external power adapters to these connectors. Make sure the power cords are connected properly. For more information, see “Install a power adapter” in *User Guide* or *Hardware Maintenance Guide*.

#### RJ-45 RS-232 serial console connector without LED

Connect a external RJ-45 serial COMM console cable to this connector.

#### PMB status LED

For more information about this LED, see “PMB status LED” on page 32.

#### Threaded studs for grounding

Connect the grounding wires to these lugs.

## Install I/O fillers

Install the I/O fillers when the connectors are not in use. The connectors could be damaged without proper protection of the fillers.

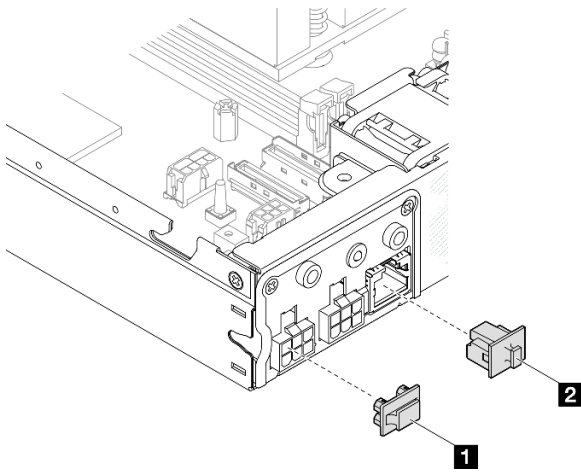


Figure 9. Rear I/O fillers

<b>1</b> Power-connector filler (x2)	<b>2</b> RJ-45 filler (x1)
--------------------------------------	----------------------------



## Top view

This section contains information about the top view of SE350 V2.

Refer to the following table for top-view identification of ThinkEdge SE350 V2.

### Top view of SE350 V2

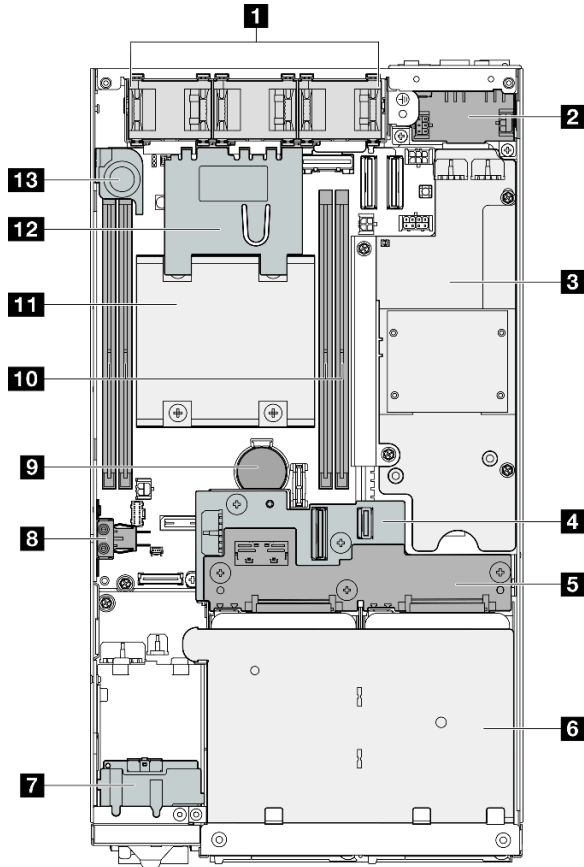


Figure 10. Top view of SE350 V2

Table 8. Components in the top view of SE350 V2

<b>1</b> Fans	<b>8</b> Anti-tampering keylock switch
<b>2</b> Power input board module	<b>9</b> CMOS 3V security battery (CR 2032)
<b>3</b> Power module board	<b>10</b> Memory modules
<b>4</b> Drive backplane 1 (lower)	<b>11</b> Processor and heat sink
<b>5</b> Drive backplane 2 (upper)	<b>12</b> Air baffle
<b>6</b> Drive cage	<b>13</b> Intrusion switch
<b>7</b> Front operator assembly	

---

## Server locks

Locking the server cover prevents unauthorized access to the inside of the server. Locking the front bezel prevents unauthorized access to the installed drives.

### Kensington lock

ThinkEdge SE350 V2 is designed to be used with various mounting options, including desktop mount, DIN-rail mount, wall mount, and rack mount. Depending on the mounting option, the node can stand alone in desktop mount or be installed in an **enclosure** or a **node sleeve**.

- For a node installed in an enclosure, there is no external lock for the server.
- For a node installed in a node sleeve or in desktop mount, the ThinkEdge SE350 V2 Anti-Tampering Keylock Kit—including a Kensington lock on the outside and an internal lock mechanism with electronic switch on the inside—can be used to secure the top cover to the node as well as the node to the node sleeve.

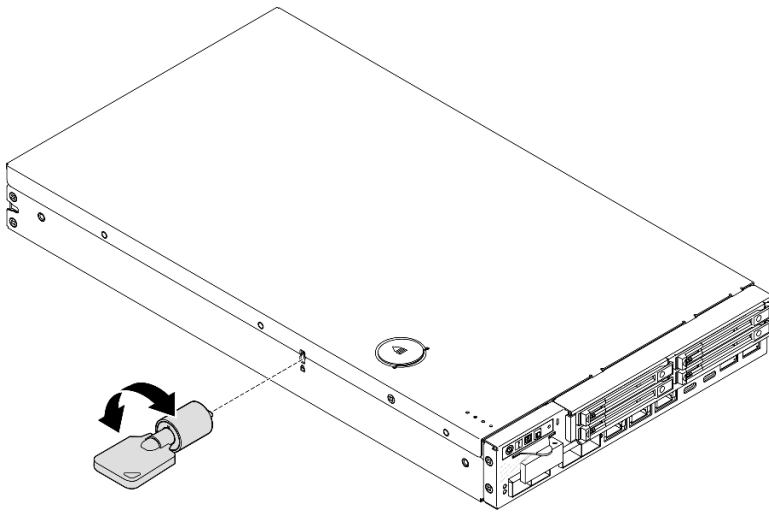


Figure 11. Kensington lock securing the node and top cover

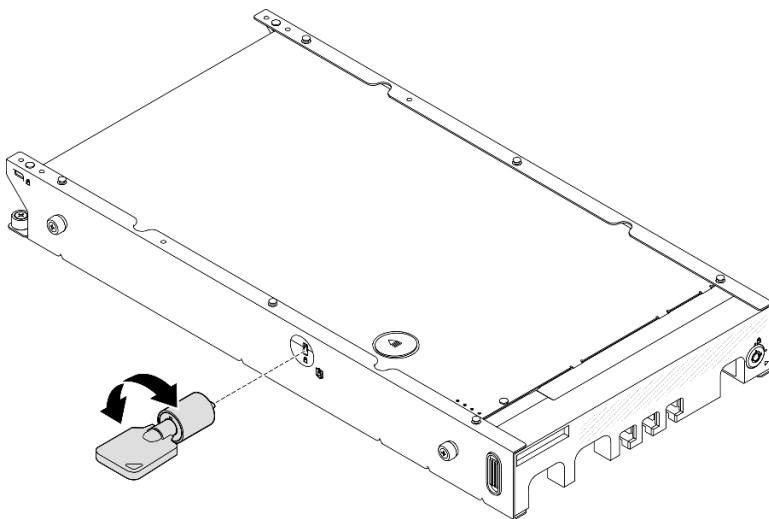


Figure 12. Kensington lock securing the node, the top cover, and the node sleeve

- For the removal and installation of the internal lock switch with cable of this anti-tampering keylock inside the node, see “Keylock switch with cable replacement” in the *User Guide* or *Hardware Maintenance Guide*.

### Security bezel of the node sleeve

For a node installed in a node sleeve, the security bezel in the front of the node sleeve can be locked to prevent unauthorized access to the installed drives. For the removal and installation of a security bezel from and to a node sleeve, see “Configuration guide” in the *User Guide* or *Hardware Maintenance Guide*.

## System-board layout

The illustrations in this section provide information about the connectors and switches 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 33](#).

### System-board connectors

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

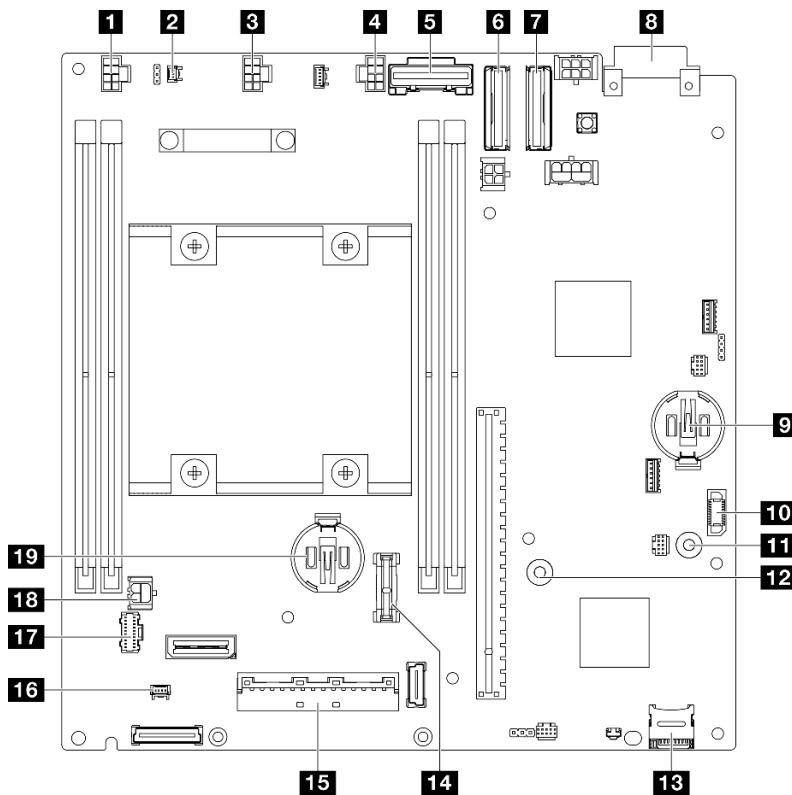


Figure 13. System-board connectors

Table 9. System-board connectors

<b>1</b> Fan 1 connector	<b>11</b> GND busbar for the power module board
<b>2</b> Intrusion switch connector	<b>12</b> P12V busbar for the power module board
<b>3</b> Fan 2 connector	<b>13</b> MicroSD card socket

Table 9. System-board connectors (continued)

<b>4</b> Fan 3 connector	<b>14</b> TCM/TPM connector
<b>5</b> SATA connector	<b>15</b> I/O module board signal connector
<b>6</b> MCIO 1 connector	<b>16</b> Lock position switch cable connector
<b>7</b> MCIO 2 connector	<b>17</b> Front operator assembly connector
<b>8</b> Power input board connector	<b>18</b> I/O module board power connector
<b>9</b> 3V system battery (CR 2032)	<b>19</b> 3V security battery (CR 2032)
<b>10</b> Power module board connector	

## System-board switches

The following illustration shows the location of the switches on the system board.

### Notes:

- If there is a clear protective sticker on the top of the switch blocks, remove and discard it to access the switches.

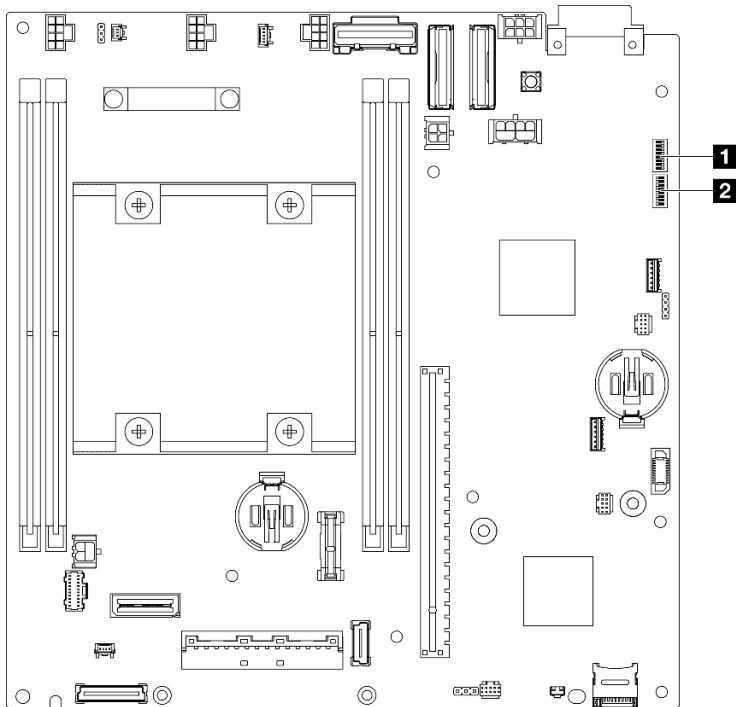


Figure 14. System-board switches

Table 10. System-board switches

<b>1</b> Switch block (SW1)	<b>2</b> Switch block (SW18)
-----------------------------	------------------------------

### Important:

1. Before changing any switch settings or moving any jumpers, make sure to turn off the server; then, disconnect all power cords and external cables. Review the following information:
  - [https://pubs.lenovo.com/safety\\_documentation/](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.

The following table describes the switches on the system board.

Table 11. System-board switches

Switches block	Switch number	Switch name	Usage description	
			On	Off
SW1	1	XCC boot backup	The node will boot 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	XCC COM port	Enables XCC to the serial port	Normal (default)
	6	Machine Engine (ME) recovery override	ME boots to recovery	Normal (default)
	7	(Reserved)	(Reserved)	Normal (default)
	8	(Reserved)	(Reserved)	Normal (default)
SW18	1	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 XClarity Controller and CPU to reset	Normal (default)
	6	(Reserved)	(Reserved)	Normal (default)
	7	Force FPGA reset	Forces FPGA to reset	Normal (default)
	8	(Reserved)	(Reserved)	Normal (default)

---

## System LEDs and diagnostics display

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

For more information, refer to [“Troubleshooting by system LEDs” on page 27](#).

---

## Troubleshooting by system LEDs

See the following sections for information on available system LEDs.

### Drive LEDs

This topic provides information on the drive LEDs on the front of the server.

The following table describes the problems that are indicated by drive activity LED and drive status LED.

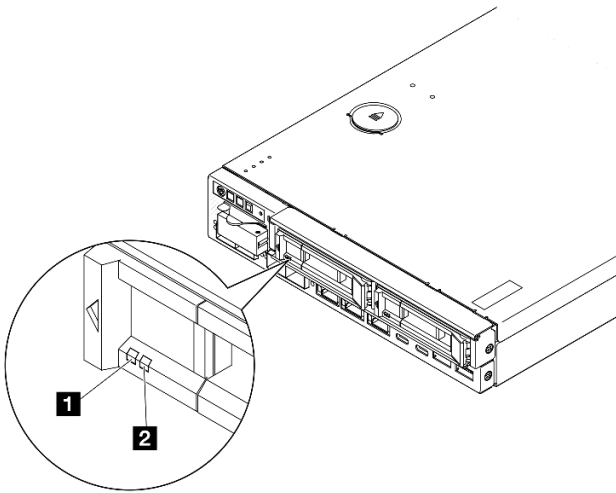


Figure 15. Drive LEDs

LED	Description
<b>1</b> Drive activity LED (green)	Each hot-swap drive comes with an activity LED. When this LED is flashing, it indicates the drive activity.
<b>2</b> Drive status LED (yellow)	The drive status LED indicates the following status: <ul style="list-style-type: none"> <li>• The LED is lit: the drive has failed.</li> <li>• The LED is flashing slowly (once per second): the drive is being rebuilt.</li> <li>• The LED is flashing rapidly (three times per second): the drive is being identified.</li> </ul>

## Front operator panel LEDs

The front operator panel of the server provides controls and LEDs.

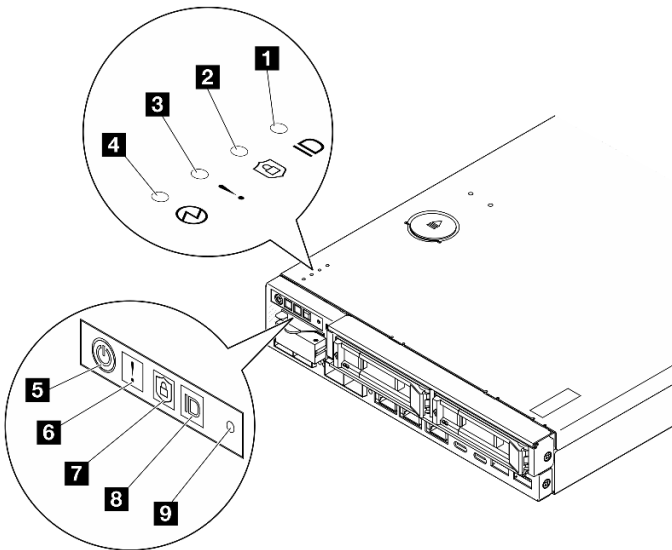


Figure 16. Front operator panel LEDs

Table 12. Front operator panel LEDs

<b>1 &amp; 8</b> “System ID button with system ID LED (blue)” on page 29	<b>4 &amp; 5</b> “Power button with power status LED (green)” on page 29
<b>2 &amp; 7</b> “Security LED (green)” on page 29	<b>9</b> “NMI button” on page 30
<b>3 &amp; 6</b> “System Error LED (yellow)” on page 29	

### **1 8 System ID button with system ID LED (blue)**

Use this system ID button and the blue system ID LED to visually locate the server. Each time you press the system ID button, the state of the system ID LED changes. The LED can be changed to on, blinking, or off. You can also use the Lenovo XClarity Controller or a remote management program to change the state of the system ID LED to assist in visually locating the server among other servers.

- **On:** System is identified. Press the button once to turn on the LED. Pressing the button a second time will make the LED blink. Pressing it a third time will turn off this LED.
- **Off:** System is not identified.

### **2 7 Security LED (green)**

The states of security LED are as following:

**Solid on:** The server is operating with security feature enabled.

**Blinking:** The server is in System Lockdown Mode. Activate or unlock the system for operation. See [“Activate or unlock the system” on page 50.](#)

**Off:** No security feature is enabled on the server.

See to activate the system.

### **3 6 System Error LED (yellow)**

When this yellow LED is on, it indicates that one or more system errors have occurred.

Status	Color	Description	Action
On	Yellow	An error has been detected on the server. Causes might include one or more of the following errors: <ul style="list-style-type: none"> <li>• The temperature of the server has reached a non-critical temperature threshold.</li> <li>• The voltage of the server has reached a non-critical voltage threshold.</li> <li>• A fan has been detected to be running at low speed.</li> <li>• A critical error has occurred to the power supply.</li> <li>• The power supply is not connected.</li> </ul>	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.

### **4 5 Power button with power status LED (green)**

Press this button to turn the server on and off manually. Following are the states of the LED:

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

### 9 NMI button

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

## LAN port LEDs

This section provides information on LEDs of the Ethernet LAN ports.

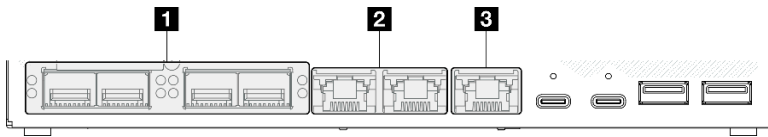


Figure 17. LAN port LEDs of the 10/25GbE I/O module

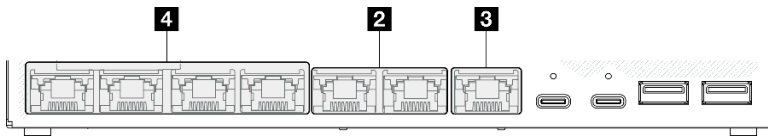


Figure 18. LAN port LEDs of the 1GbE I/O module

Table 13. LAN port LEDs

<b>1</b> “10/25GbE SFP28 connectors” on page 30	<b>3</b> “XCC system management port link LED and activity LED (green)” on page 31
<b>2</b> “2.5GbE RJ-45 connectors” on page 31	<b>4</b> “1GbE RJ-45 connectors” on page 31

### 10/25GbE SFP28 connectors link LED (yellow or green) and activity LED (green)

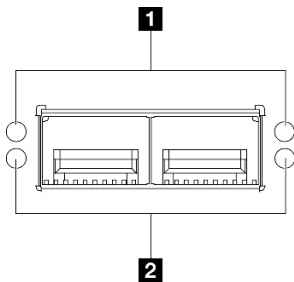


Figure 19. LEDs of 10/25GbE SFP28 connectors



LED	Description
<b>1</b> Network link LED <ul style="list-style-type: none"> <li>Yellow: 25 GbE</li> <li>Green: 10 GbE</li> </ul>	<ul style="list-style-type: none"> <li><b>Off:</b> Network link is disconnected.</li> <li><b>On:</b> Network link is connected.</li> </ul>
<b>2</b> Network activity LED (green)	<ul style="list-style-type: none"> <li><b>Blinking:</b> The network is connected and active.</li> </ul>

### 2.5GbE RJ-45 connectors link LED (green) and activity LED (green)

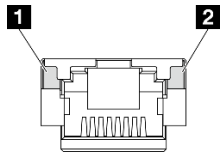


Figure 20. LEDs of 2.5GbE RJ-45 connectors

LED	Description
<b>1</b> Network link LED (green)	<ul style="list-style-type: none"> <li><b>Off:</b> Network link is disconnected; or, the network link is connected but the LAN speed is on 100M.</li> <li><b>On:</b> Network link is connected, and LAN speed is on 2.5G/1G.</li> </ul>
<b>2</b> Network activity LED (green)	<ul style="list-style-type: none"> <li><b>Blinking:</b> The network is connected and active.</li> </ul>

### XCC system management port (1GbE RJ-45) link LED (green) and activity LED (green)

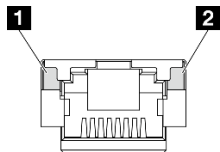


Figure 21. LEDs of XCC system management port (1GbE RJ-45)

LED	Description
<b>1</b> Network link LED (green)	<ul style="list-style-type: none"> <li><b>Off:</b> Network link is disconnected.</li> <li><b>On:</b> Network link is connected.</li> </ul>
<b>1</b> Network activity LED (green)	<ul style="list-style-type: none"> <li><b>Blinking:</b> The network is connected and active.</li> </ul>

### 1GbE RJ-45 connectors link LED (green) and activity LED (green)

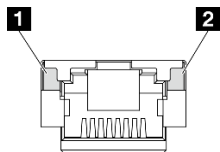


Figure 22. LEDs of 1GbE RJ-45 connectors

LED	Description
<b>1</b> Network link LED (green)	<ul style="list-style-type: none"> <li>• <b>Off:</b> Network link is disconnected.</li> <li>• <b>On:</b> Network link is connected.</li> </ul>
<b>2</b> Network activity LED (green)	<ul style="list-style-type: none"> <li>• <b>Blinking:</b> The network is connected and active.</li> </ul>

## PMB status LED

This topic provides information about the PMB status LED and corresponding action suggestions.

The following minimal configuration is required for the server to start:

- One DRAM memory module in slot 1
- Depending on the model, one of the following power source:
  - One 300W external power adapter
  - AC power source input
  - DC power source input
- One 2280 NVMe M.2 drive in slot 1 on the I/O module board
- Three non-hot-swappable system fans

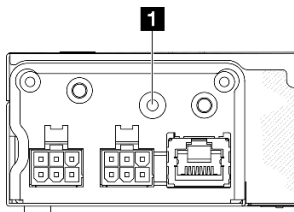


Figure 23. PMB status LED, DC power input

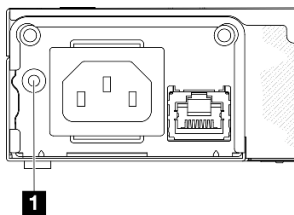


Figure 24. PMB status LED, AC power input

1 LED	Description
The PMB status LED can be in one of the following states:	
Off	<p>The source power is not delivered to the system board normally:</p> <ul style="list-style-type: none"> <li>• The DC power source may not be connected or working properly.</li> <li>• The 300-watt power adapter is not working properly.</li> </ul> <p>To resolve the issue:</p> <ul style="list-style-type: none"> <li>• Check to see if the external power cords are correctly connected to the server and to a working electrical output.</li> <li>• Check to see if the connection of the cables between the power module board and the power input board module is stable (see “Cable routing for the power module board and power input board module ” in the <i>User Guide</i> or <i>Hardware Maintenance Guide</i>).</li> <li>• Replace the power input board module or the power module board (DC PMB) or internal power supply (AC PMB)(see “power input board module replacement” or “Power module board replacement” or “Internal power supply (AC PMB) replacement” in the <i>User Guide</i> or <i>Hardware Maintenance Guide</i>).</li> </ul>
Green	The source power is delivered to the system board normally. The server is or is ready to be powered on.

## System-board LEDs

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

Press the power button to light the LEDs on the system board when the power source has been removed from the server.

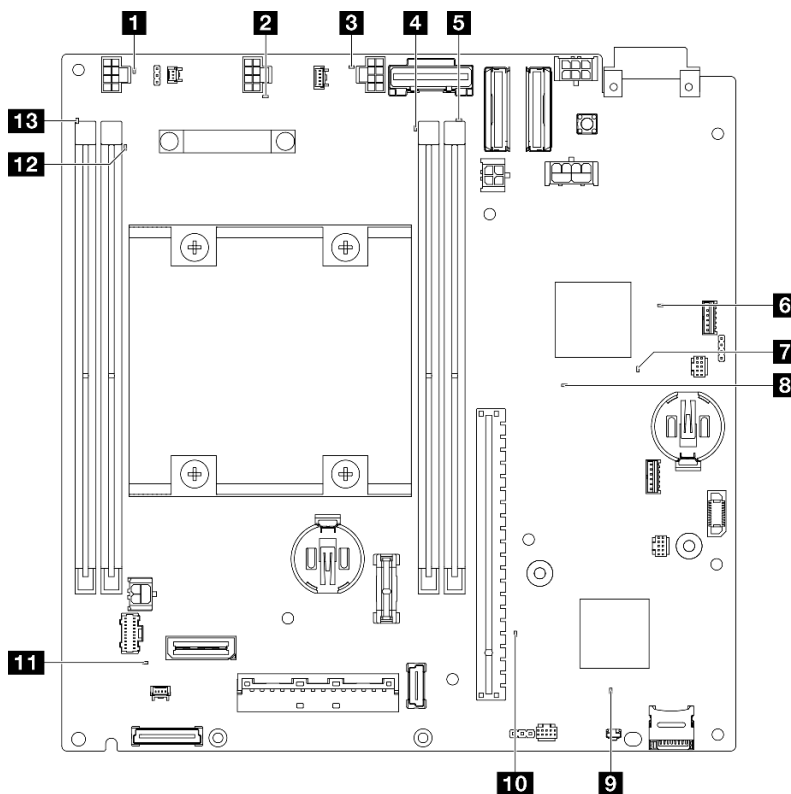


Figure 25. System-board LEDs

Table 14. Description and actions for the system-board LEDs

LED	Description and actions
<b>1 2 3</b> Fans 1-3 error LED	<b>LED on:</b> an error has occurred to the fan the LED represents.
<b>4 5 12 13</b> DIMMs 1-4 error LED (amber)	<b>LED on:</b> an error has occurred to the DIMM the LED represents.
<b>6</b> FPGA power status LED (green)	<p>The FPGA power LED helps to identify different FPGA errors.</p> <ul style="list-style-type: none"> <li>• <b>LED blinking rapidly (four times per second):</b> The FPGA permission is delayed.</li> <li>• <b>LED blinking slowly (once per second):</b> the FPGA is read to power on.</li> <li>• <b>LED on:</b> The FPGA power is on.</li> </ul>
<b>7</b> FPGA heartbeat LED (green)	<p>This LED indicates power-on and power-off sequencing.</p> <ul style="list-style-type: none"> <li>• <b>LED blinking:</b> the system is functioning properly, and no action is necessary.</li> <li>• <b>LED not blinking:</b> replace the system board (trained technician only). See “System board replacement” in <i>User Guide</i> or <i>Hardware Maintenance Guide</i>.</li> </ul>
<b>8</b> System power LED	<p>The states of the system power LED are as follows:</p> <ul style="list-style-type: none"> <li>• <b>Off:</b> No power supply is properly installed, or the LED itself has failed.</li> <li>• <b>Flashing rapidly (four times per second):</b> The server is turned off and is not ready to be turned on. The power-control button is disabled. This will last approximately 5 to 10 seconds.</li> <li>• <b>Flashing slowly (once per second):</b> The server is turned off and is ready to be turned on. Press the power-control button to turn on the server.</li> <li>• <b>On:</b> The server is turned on.</li> </ul>
<b>9</b> XCC status LED	<p>The states of the XCC status LED are as follows:</p> <ul style="list-style-type: none"> <li>• <b>On:</b> The XCC is alive.</li> <li>• <b>Off:</b> The 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.</li> </ul>
<b>10</b> XCC heartbeat LED (green)	<p>This LED indicates the XCC heartbeat and boot process:</p> <ul style="list-style-type: none"> <li>• <b>LED blinking rapidly:</b> XCC code is in the loading process.</li> <li>• <b>LED going off momentarily and then starts blinking slowly:</b> XCC is fully operational. You can now press the power-control button to power on the server.</li> </ul>
<b>11</b> System error LED (yellow)	<p><b>LED on:</b> an error has occurred. Complete the following steps:</p> <ul style="list-style-type: none"> <li>• Check the identification LED and check log LED and follow the instructions.</li> <li>• Check the Lenovo XClarity Controller event log and the system error log for information about the error.</li> <li>• Save the log if necessary, and clear the log afterwards.</li> </ul>

## XCC system management port LEDs

This topic provides information on LEDs of the XCC system management port.

The following table describes the problems that are indicated by LEDs on XCC system management port. For more information about other LEDs, see “[Drive LEDs](#)” on page 27, “Front operator panel LEDs” in the *User Guide*, and “LAN port LEDs” in the *User Guide*.

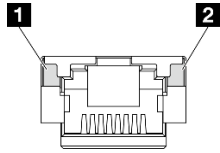


Figure 26. XCC system management port LEDs

LED	Description
<b>1</b> XCC system management port (1GbE RJ-45) port link LED	Use this green LED to distinguish the network connectivity status: <ul style="list-style-type: none"> <li>• <b>Off:</b> The network link is disconnected.</li> <li>• <b>Green:</b> The network link is established.</li> </ul>
<b>2</b> XCC system management port (1 GbE RJ-45) Ethernet port activity LED	Use this green LED to distinguish the network activity status: <ul style="list-style-type: none"> <li>• <b>Blinking:</b> Network link is transmitting and receiving actions.</li> <li>• <b>Off:</b> Normal.</li> </ul>



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## Chapter 3. Parts list

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

For more information about ordering parts:

1. Go to <http://datacentersupport.lenovo.com> and navigate to the support page for the specific server.
2. Click **Parts**.
3. Enter the serial number to view a listing of parts for the specific 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 is your responsibility. If Lenovo acquires or installs a structural component at your request, you will be charged for the service.

### Enclosure components

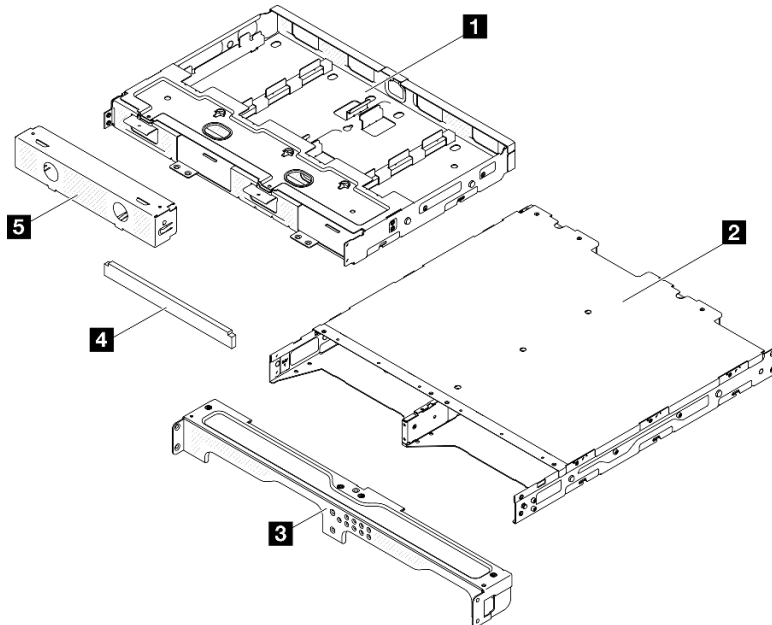


Figure 27. Enclosure components

Table 15. Enclosure parts listing

Description	Type	Description	Type
<b>1</b> Power adapter support bracket	T1	<b>4</b> Enclosure bracket dust filter set	T1
<b>2</b> ThinkEdge SE350 V2 Enclosure	F	<b>5</b> Node dummy filler	T1
<b>3</b> Enclosure front shipping bracket	T1		

Node components

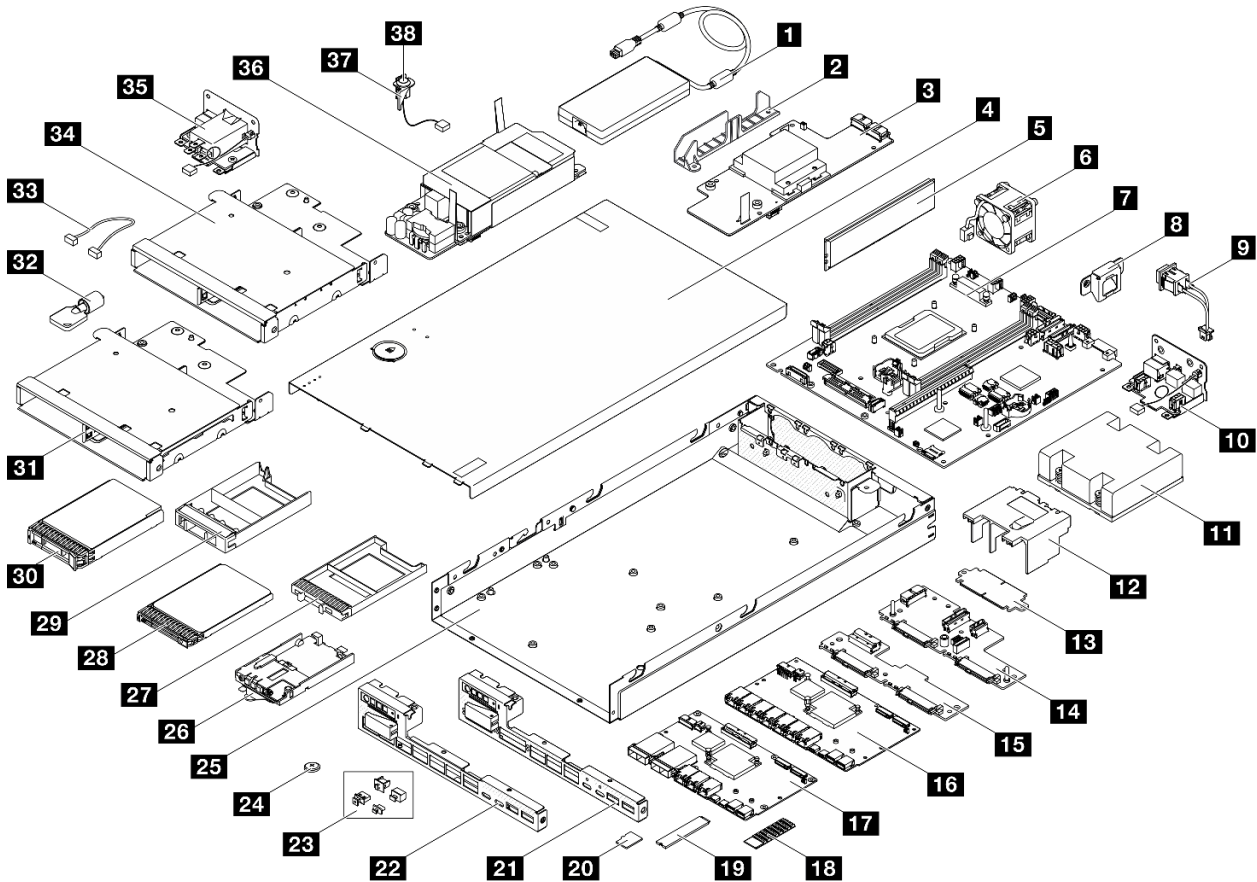


Figure 28. Server components

Description	Type	Description	Type
<b>1</b> ThinkEdge 300W 230V/115V external power adapter	T1	<b>20</b> MicroSD card	T1
<b>2</b> Cable wall	T1	<b>21</b> 25GbE/10GbE front I/O bezel	T1
<b>3</b> 12-48V DC power module board	F	<b>22</b> 1GbE front I/O bezel	T1
<b>4</b> Top cover	T1	<b>23</b> I/O fillers	C
<b>5</b> Memory module	T2	<b>24</b> CMOS battery (CR2032)	C
<b>6</b> Fan	T1	<b>25</b> Node chassis	F



Description	Type	Description	Type
<b>7</b> System board with processor	F	<b>26</b> Front operator panel assembly	F
<b>8</b> Anti-tampering keylock switch bracket	T1	<b>27</b> 7mm 2.5-inch drive filler	C
<b>9</b> Anti-tampering keylock switch with cable	T2	<b>28</b> 7mm 2.5-inch hot-swap drive	T1
<b>10</b> DC power input board module	F	<b>29</b> 15mm 2.5-inch drive filler	C
<b>11</b> Processor heat sink	F	<b>30</b> 15mm 2.5-inch hot-swap drive	T1
<b>12</b> Air baffle	T1	<b>31</b> 7mm drive cage	T1
<b>13</b> Bridge board	F	<b>32</b> Kensington lock (exterior)	T1
<b>14</b> 15mm/7mm Drive Backplane 1 (lower)	F	<b>33</b> Cables	T1
<b>15</b> 7mm Drive Backplane 2 (upper)	F	<b>34</b> 15mm drive cage	T1
<b>16</b> 1GbE I/O module board	F	<b>35</b> AC power input board module	F
<b>17</b> 10/25GbE I/O module board	F	<b>36</b> Internal power supply unit (AC power module board)	F
<b>18</b> M.2 heat sink	F	<b>37</b> Intrusion switch holder	T2
<b>19</b> M.2 boot drive	T1	<b>38</b> Intrusion switch with cable	T2

## 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.



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## Chapter 4. Unboxing and setup

Information in this section provides assistance regarding 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 43](#) when setting up the server.

---

### Server package contents

When receiving the server, verify that the shipment contains everything that is expected to receive.

The server package includes the following items:

- Server (node)
- (Optional) Rail installation kit and enclosure kit. \* Rail installation guide is provided in the package.
- (Optional) Cable Management Arm (CMA) kit. \* CMA installation guide is provided in the package.
- (Optional) Node sleeve kit for wall-mount or DIN-rail mount. \*
- Material box, including items such as power cords,\* accessory kit, and printed documents.

#### Notes:

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

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

---

### Identify the server and access the Lenovo XClarity Controller

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

#### Identifying your server

When you contact Lenovo for assistance, the machine type, model, and serial number information can 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.

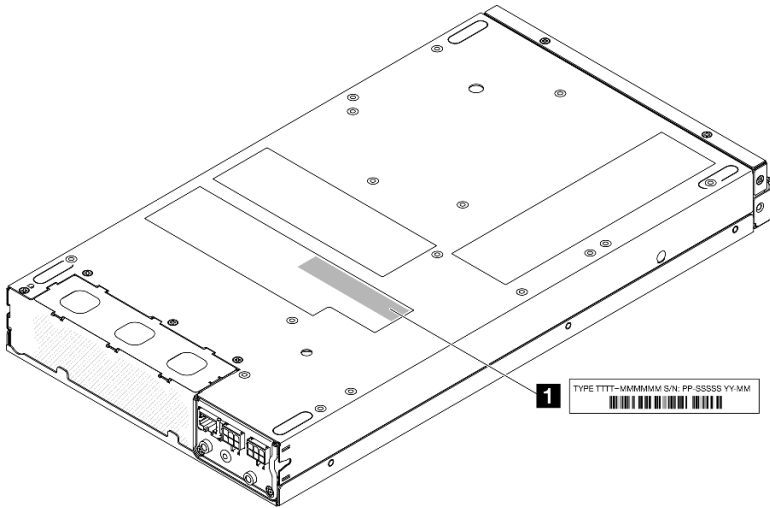


Figure 29. Location of the ID label

Table 16. ID label

<p><b>1</b> ID label (machine type and model information)</p>
---

### Lenovo XClarity Controller network access tag

In addition, the Lenovo XClarity Controller network access label is attached to the pull-out information tab located on the front of the node, with MAC address and secure activation code accessible with a pull.

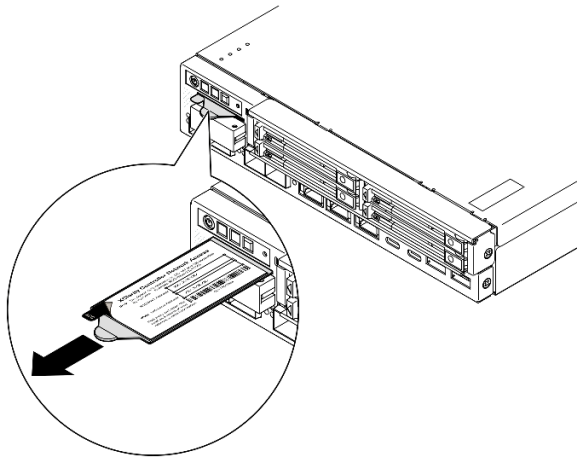


Figure 30. Lenovo XClarity Controller network access label on the pull-out information tab

### Service label and QR code

In addition, the system Service Label is located on the inside surface of the top cover and provides a quick response (QR) code for mobile access to service information (see the illustration below as well as the section “Remove the top cover” in *User Guide* or *Hardware Maintenance Guide*). 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.

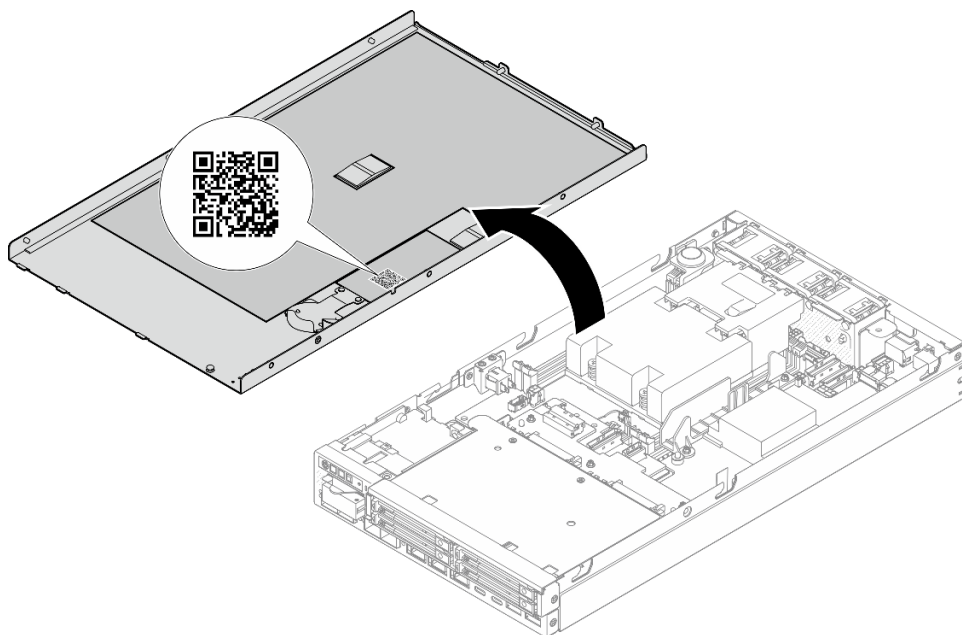


Figure 31. Service Label and QR code

---

## Server setup checklist

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

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 a 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 41](#)).
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. See the “Configuration Guide” in the *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, the following cables need to be connected:

- Connect the server to the power source
- Connect the server to the data network
- Connect the server to the storage device
- Connect the server to the management network

5. If the security LED of the server is blinking, activate or unlock the system. See [“Activate or unlock the system” on page 50](#).
6. Power on the server.

Power button location and power LED are specified in:

- [Chapter 2 “Server components” on page 17](#)
- [“Troubleshooting by system LEDs” on page 27](#)

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:** The management processor interface can be accessed to configure the system without powering on the server. Whenever the server is connected to power, the management processor interface is available. For details about accessing the management server processor, see “Opening and Using the XClarity Controller Web Interface” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.

7. Validate the server. Make sure that the power LED, Ethernet connector LEDs, and network LEDs are lit with green light, which means the server hardware has been set up successfully.

See [“System LEDs and diagnostics display” on page 27](#) for more information about 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 45](#).

1. Set the network connection for the Lenovo XClarity Controller to the management network.
2. Update the firmware for the server, if necessary.
3. Configure the firmware for the server.

The following information is available for RAID configuration:

- <https://lenovopress.lenovo.com/lp0578-lenovo-raid-introduction>
- <https://lenovopress.lenovo.com/lp0579-lenovo-raid-management-tools-and-resources>

4. Install the operating system.
5. Back up the server configuration.
6. Install the applications and programs for which the server is intended to be used.
7. Configure ThinkEdge security features. See [“Activate/unlock the system and configure ThinkEdge security features” on page 49](#).

---

## Chapter 5. System configuration

Complete these procedures to configure your system.

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### 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/products/servers/thinkedge/se350v2/7da9/downloads/driver-list>
- You can subscribe to product notification to stay up to date on firmware updates:

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

## Update Bundles (Service Packs)

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

## Update method terminology

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

## Firmware updating tools

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

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



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)
<b>Lenovo XClarity Essentials UpdateXpress (LXCE)</b>	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√		√
<b>Lenovo XClarity Essentials Bootable Media Creator (BoMC)</b>	In-band Out-of-band Off-Target	√	All I/O devices		√ (BoMC application)	√ (BoMC application)	√
<b>Lenovo XClarity Administrator (LXCA)</b>	In-band <sup>1</sup> Out-of-band <sup>2</sup> Off-Target	√	All I/O devices		√		√
<b>Lenovo XClarity Integrator (LXCI) for VMware vCenter</b>	Out-of-band Off-Target	√	Selected I/O devices		√		
<b>Lenovo XClarity Integrator (LXCI) for Microsoft Windows Admin Center</b>	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√		√
<b>Lenovo XClarity Integrator (LXCI) for Microsoft System Center Configuration Manager</b>	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](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/Invo-xpress>

- **Lenovo XClarity Essentials Bootable Media Creator**

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

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

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

- **Lenovo XClarity Administrator**

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

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

[https://pubs.lenovo.com/lxca/update\\_fw](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/>

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## Activate/unlock the system and configure ThinkEdge security features

ThinkEdge SE350 V2 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 50](#).
2. Maintain backup of SED AK. See [“Manage the Self Encryption Drive Authentication Key \(SED AK\)” on page 53](#).
3. Configure the security features in Lenovo XClarity Controller. See [“System Lockdown Mode” on page 52](#) 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 53](#).
  - 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 SE350 V2 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 SE350 V2 system to a safe working place for service.
- Place SE350 V2 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 [“Front operator panel LEDs” on page 28](#) 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 50](#) to activate the system.
- **XClarity Controller:** The system can be unlocked through Lenovo XClarity Controller. See [“Unlock the system” on page 52](#) 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**

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 SE350 V2.
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 SE350 V2.

**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.

**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 SE350 V2.
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 SE350 V2.
- 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 50](#) 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 52](#) for more information.

## Motion Detection

When Motion Detection is enabled, the system detects physical movements and enters System Lockdown Mode automatically when the system is moved unexpectedly.

**Note:** Motion Detection would be **Disabled** automatically when the system enters System Lockdown Mode.

Select one of the following options for Motion Detection to control the feature:

- **Disabled:** The feature is disabled.

**Note:** Enable Motion Detection feature after the system locates at the final operating location. When Motion Detection is enabled, the security battery would be consumed, and the system enters System Lockdown Mode if the security battery is exhausted.

- **Step Counter:** The system detects the movement and counts the steps. When the counted steps reach the threshold, the system enters System Lockdown Mode. To reset the step counter, click the **Reset Step Counter** button.
- **Significant Motion:** The system detects the significant motion that indicates the system being unexpectedly moved from the operating location. When a significant motion is detected, the system enters System Lockdown Mode.

## 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 SE350 V2 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 50](#) 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 encryption is Enabled, it cannot be changed back to Disabled.
- When SED encryption is enabled, rebooting the system is required after installing a drive; without rebooting, the drive will not be recognized by the host OS.

### 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+**.

---

## Configure the firmware

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

**Important:** Lenovo does not recommend setting option ROMs to **Legacy**, but you can conduct this setting if necessary. Note that this setting prevents UEFI drivers for the slot devices from loading, which may cause negative side effects to Lenovo software, such as LXCA, OneCLI, and XCC. These side effects include but are not limited to the inability to determine adapter card details, such as model name and firmware levels. For example, "ThinkSystem RAID 930-16i 4GB Flash" may be displayed as "Adapter 06:00:00". In some cases, the functionality on a specific PCIe adapter may not be enabled properly.

- **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](https://pubs.lenovo.com/lxce-onecli/onecli_c_settings_info_commands)

- **Lenovo XClarity Administrator**

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



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

[https://pubs.lenovo.com/lxca/server\\_configuring](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](https://dcsc.lenovo.com/#/memory_configuration)

---

## Enable Software Guard Extensions (SGX)

Intel® Software Guard Extensions (Intel® SGX) operates under the assumption that the security perimeter includes only the internals of the CPU package, and leaves the DRAM untrusted.

Complete the following steps to enable SGX.

- Step 1. **Make sure** to refer to “Memory module installation rules and order” section in the *User Guide* or *Hardware Maintenance Guide*, which specifies whether your server supports SGX and lists the memory module population sequence for SGX configuration. (DIMM configuration must be 4 DIMMs to support SGX.)
- Step 2. Restart the system. Before the operating system starts up, press the key specified in the on-screen instructions to enter the Setup Utility. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.)
- Step 3. Go to **System settings** → **Processors** → **Total Memory Encryption (TME)** and **enable** the option.
- Step 4. Go to **System settings** → **Devices and I/O Ports** → **Intel VT for Directed I/O (VT-d)** and **disable** the option.
- Step 5. For LCC and HCC processors, go to **System settings** → **Memory** → **Patrol Scrub** and **disable** the option.
- Step 6. Save the changes, then go to **System settings** → **Processors** → **SW Guard Extension (SGX)** and **enable** the option.

---

## RAID configuration

Using a Redundant Array of Independent Disks (RAID) to store data remains one of the most common and cost-efficient methods to increase server's storage performance, availability, and capacity.

RAID increases performance by allowing multiple drives to process I/O requests simultaneously. RAID can also prevent data loss in case of a drive failure by reconstructing (or rebuilding) the missing data from the failed drive using the data from the remaining drives.

RAID array (also known as RAID drive group) is a group of multiple physical drives that uses a certain common method to distribute data across the drives. A virtual drive (also known as virtual disk or logical drive) is a partition in the drive group that is made up of contiguous data segments on the drives. Virtual drive is presented up to the host operating system as a physical disk that can be partitioned to create OS logical drives or volumes.

An introduction to RAID is available at the following Lenovo Press website:

<https://lenovopress.lenovo.com/lp0578-lenovo-raid-introduction>

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

<https://lenovopress.lenovo.com/lp0579-lenovo-raid-management-tools-and-resources>

## Intel VROC

### Enabling Intel VROC

Before setting up RAID for NVMe drives, follow the below steps to enable VROC:

1. Restart the system. Before the operating system starts up, press the key specified in the on-screen instructions to enter the Setup Utility. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.)
2. Go to **System settings** → **Devices and I/O Ports** → **Intel® VMD technology** → **Enable/Disable Intel® VMD** and enable the option.
3. Save the changes and reboot the system.

#### Notes:

- Supported RAID levels varies by model. For the RAID level supported by SE350 V2, see [Technical specifications](#).
- For more information about acquiring and installing the activation key, see <https://fod.lenovo.com/lkms>.

---

## Deploy the operating system

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

### Available operating systems

- Microsoft Windows Server
- VMware ESXi
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server

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

### Tool-based deployment

- **Multi-server**

Available tools:

- Lenovo XClarity Administrator

[https://pubs.lenovo.com/lxca/compute\\_node\\_image\\_deployment](https://pubs.lenovo.com/lxca/compute_node_image_deployment)

- Lenovo XClarity Essentials OneCLI

[https://pubs.lenovo.com/lxce-onecli/onecli\\_r\\_uxspi\\_proxy\\_tool](https://pubs.lenovo.com/lxce-onecli/onecli_r_uxspi_proxy_tool)

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

[https://pubs.lenovo.com/lxci-deploypack-sccm/dpsccm\\_c\\_endtoend\\_deploy\\_scenario](https://pubs.lenovo.com/lxci-deploypack-sccm/dpsccm_c_endtoend_deploy_scenario)

- **Single-server**

Available tools:

- Lenovo XClarity Provisioning Manager

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

- Lenovo XClarity Essentials OneCLI

[https://pubs.lenovo.com/lxce-onecli/onecli\\_r\\_uxspi\\_proxy\\_tool](https://pubs.lenovo.com/lxce-onecli/onecli_r_uxspi_proxy_tool)

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

[https://pubs.lenovo.com/lxci-deploypack-sccm/dpsccm\\_c\\_endtoend\\_deploy\\_scenario](https://pubs.lenovo.com/lxci-deploypack-sccm/dpsccm_c_endtoend_deploy_scenario)

## Manual deployment

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

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

---

## Back up the server configuration

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

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

- **Management processor**

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

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

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

[https://pubs.lenovo.com/lxce-onecli/onecli\\_r\\_save\\_command](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.



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## 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.

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### 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/products/servers/thinkedge/se350v2/7da9/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](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 41.
- 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.

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## Collecting service data

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

Service data can be collected through the following tools:

- **Lenovo XClarity Provisioning Manager**

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

- **Lenovo XClarity Controller**

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

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

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

- **Lenovo XClarity Administrator**

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

You can find more information about setting up automatic problem notification within the Lenovo XClarity Administrator at [https://pubs.lenovo.com/lxca/admin\\_setupcallhome](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](https://pubs.lenovo.com/lxce-onecli/onecli_r_getinfor_command).

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## 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/supportphonenumber> for your region support details.





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## Appendix B. Documents and supports

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

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### Documents download

This section provides introduction and download links for handy documents.

#### Documents

Download the following product documentations at:

[https://pubs.lenovo.com/se350-v2/pdf\\_files](https://pubs.lenovo.com/se350-v2/pdf_files)

- **Rail Installation Guides**
  - Rail installation in a rack
- **Activation Guide**
  - Activation process and activation code
- **User Guide**
  - Complete overview, system configuration, hardware components replacing, and troubleshooting.  
Selected chapters from *User Guide*:
    - **System Configuration Guide** : Server overview, components identification, system LEDs and diagnostics display, product unboxing, setting up and configuring the server.
    - **Hardware Maintenance Guide** : Installing hardware components, cable routing, and troubleshooting.
- **Messages and Codes Reference**
  - XClarity Controller, LXPM, and uEFI events
- **UEFI Manual**
  - UEFI setting introduction

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### Support websites

This section provides driver and firmware downloads and support resources.

#### Support and downloads

- Drivers and Software download website for ThinkEdge SE350 V2
  - <https://datacentersupport.lenovo.com/products/servers/thinkedge/se350v2/7da9/downloads/driver-list>
- Lenovo Data Center Forum
  - [https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv\\_eg](https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg)
- Lenovo Data Center Support for ThinkEdge SE350 V2
  - <https://datacentersupport.lenovo.com/products/servers/thinkedge/se350v2/7da9>
- Lenovo License Information Documents
  - <https://datacentersupport.lenovo.com/documents/Invo-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](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>

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## Appendix C. Notices

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Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

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## Important notes

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

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

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

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

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

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

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

Lenovo makes no representations or warranties with respect to non-Lenovo products. Support (if any) for the non-Lenovo products is provided by the third party, not Lenovo.

Some software might differ from its retail version (if available) and might not include user manuals or all program functionality.

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## Electronic emission notices

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

Additional electronic emissions notices are available at:

[https://pubs.lenovo.com/important\\_notices/](https://pubs.lenovo.com/important_notices/)

## Taiwan Region BSMI RoHS declaration

單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr <sup>6+</sup> )	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機架	○	○	○	○	○	○
外部蓋板	○	○	○	○	○	○
機械組零件	-	○	○	○	○	○
空氣傳動設備	-	○	○	○	○	○
冷卻組零件	-	○	○	○	○	○
內存模組	-	○	○	○	○	○
處理器模組	-	○	○	○	○	○
電纜組零件	-	○	○	○	○	○
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 import and export contact information

Contacts are available for Taiwan import and export information.

委製商/進口商名稱: 台灣聯想環球科技股份有限公司  
 進口商地址: 台北市南港區三重路 66 號 8 樓  
 進口商電話: 0800-000-702





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