



ThinkEdge SE350 V2 User Guide



Machine Type: 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/

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

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

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

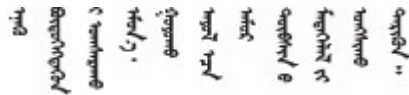
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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



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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

ཐོན་ཐུང་འདི་བདེ་སྤྱད་མ་བྱས་གོང་། སྐྱོར་གྱི་ཡིད་གཟབ་
བྱ་འདྲ་མིན་ཡོད་པའི་འོད་སྤེར་བལྟ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

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canjbinj soengq cungj vahgangj ancien siusik.

Safety inspection checklist

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

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.

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



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.

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.

Security advisories

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

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

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

Specifications

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

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

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

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"> • One Intel® Xeon® processor D-2700 product family • Single processor <p>For a list of supported processors, see https://serverproven.lenovo.com.</p>

Memory

Memory
<p>See “Memory module installation rules and order” on page 41 for detailed information about memory configuration and setup.</p> <ul style="list-style-type: none">• Slots: 4 DIMM slots• Memory module types:<ul style="list-style-type: none">– Double-data-rate 4 (TruDDR4) error correcting code (ECC) 3200 MHz registered DIMM (RDIMM) <p>Note: Memory operates at up to 2933 MHz, depending on the processor selected.</p> <ul style="list-style-type: none">• Capacity:<ul style="list-style-type: none">– 16 GB (2Rx8)– 32 GB (2Rx4, 2Rx8)– 64 GB (2Rx4)• Total capacity<ul style="list-style-type: none">– Minimum: 16 GB– Maximum: 256 GB <p>For a list of supported memory modules, see: https://serverproven.lenovo.com.</p>

M.2 Boot Drives

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

Storage expansion

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

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">• 10/25GbE I/O module board<ul style="list-style-type: none">– Four 10/25GbE SFP28 connectors<p>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.</p><ul style="list-style-type: none">– Two 2.5GbE RJ-45 connectors– One XCC system management port (1GbE RJ-45)• 1GbE I/O module board<ul style="list-style-type: none">– Four 1GbE RJ-45 connectors– Two 2.5GbE RJ-45 connectors– One XCC system management port (1GbE RJ-45)

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>Note: Depending on the selected electrical input, SE350 V2 supports different mounting options. See “Configuration guide” on page 45 for more information.</p> <ul style="list-style-type: none"> The models with DC/DC power module board (Output 12V): one of the following <ul style="list-style-type: none"> Dual 12-48V variable DC power source input Up to two 300W (230V/115V) external power adapters <p>Notes:</p> <ul style="list-style-type: none"> 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"> Desktop mount at lower than 40°C Rack mount with ThinkEdge SE350 V2 1U2N Enclosure at lower than 30°C Rack mount with ThinkEdge SE350 V2 2U2N Enclosure at lower than 40°C The models with internal power supply: <ul style="list-style-type: none"> Single 500W (230V/115V) AC power source input Supported external power adapters: <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"> ThinkEdge 300W 230V/115V External Power Supply 		
<p><i>Table 1. ThinkEdge 300W 230V/115V External Power Supply</i></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 [Deploy the operating system](#).

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">• Keep the ambient temperature to 45°C or lower when one or more NVMe drives are installed. If the ambient temperature is over 45°C, the server will have performance degradation.• Keep the ambient temperature to 40°C or lower when AC adapters are installed.• Keep the ambient temperature to 30°C 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 27°C when AC adapters are installed.

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 30°C ambient temperature. ThinkEdge SE350 V2 is supported in the following environment: <ul style="list-style-type: none">• Air temperature:<ul style="list-style-type: none">– Operating<ul style="list-style-type: none">– ASHRAE Class 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).– 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).– 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).– 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).– 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">• No AC adapter installed• NVMe drives may have performance degradation– Server off: 0°C to 55°C (32°F to 131°F)– Shipping/storage: -40°C to 65°C (-40°F to 149°F)• Maximum altitude: 3,050 m (10,000 ft)• Relative Humidity (non-condensing):<ul style="list-style-type: none">– Operating: 8% to 90%, maximum dew point : 24°C (75.2°F)– Shipment/storage: 8% to 90%, maximum dew point : 27°C (80.6°F)– Non-operating (unpacked) storage can pass the following condition: 5% to 95% at 38.7°C (101.7°F) maximum dry-bulb temperature for 48 hrs.• Particulate contamination<ul style="list-style-type: none">– 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. <p>Attention: Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server. For information about the limits for particulates and gases, see “Particulate contamination” on page 12.</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)
Desktop mount (standing alone)	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
Rack mount (1U2N and 2U2N)	Half-sine wave, 15G 3ms	<ul style="list-style-type: none"> Free-fall drop height: 100mm Equivalent shock: 70 inch/sec, 2-3 ms 	5-500 Hz, 0.21 Grms, 15mins	2-200Hz, 0.8 Grms, 15mins
DIN-rail mount	Half-sine wave, 15G 11ms	Not applicable	5-100 Hz, 0.15 Grms, 30 mins	Not applicable
Wall mount	<ul style="list-style-type: none"> All configurations: <ul style="list-style-type: none"> Half-sine wave, 40G 6ms Half-sine wave, 30G 11ms Configurations with 7mm drives: <ul style="list-style-type: none"> Half-sine wave, 30G 18ms 	Not applicable	<ul style="list-style-type: none"> 1.91 Grms, 10-500z, 30 mins 1.04 Grms, 10-500z, 1 hr 	Not applicable
Ceiling mount	Not applicable	Not applicable	<ul style="list-style-type: none"> 1.91 Grms, 10-500z, 30 mins 1.04 Grms, 10-500z, 1 hr 	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 71.04-1985¹:</p> <ul style="list-style-type: none"> • The copper reactivity level shall be less than 200 Angstroms per month ($\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour}$ weight gain).² • The silver reactivity level shall be less than 200 Angstroms per month ($\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour}$ weight gain).³ • The reactive monitoring of gaseous corrosivity must be conducted approximately 5 cm (2 in.) in front of the rack on the air inlet side at one-quarter and three-quarter frame height off the floor or where the air velocity is much higher.
Airborne particulates	<p>Data centers must meet the cleanliness level of ISO 14644-1 class 8.</p> <p>For data centers without airside economizer, the ISO 14644-1 class 8 cleanliness might be met by choosing one of the following filtration methods:</p> <ul style="list-style-type: none"> • The room air might be continuously filtered with MERV 8 filters. • Air entering a data center might be filtered with MERV 11 or preferably MERV 13 filters. <p>For data centers with airside economizers, the choice of filters to achieve ISO class 8 cleanliness depends on the specific conditions present at that data center.</p> <ul style="list-style-type: none"> • The deliquescent relative humidity of the particulate contamination should be more than 60% RH.⁴ • Data centers must be free of zinc whiskers.⁵
<p>¹ ANSI/ISA-71.04-1985. <i>Environmental conditions for process measurement and control systems: Airborne contaminants</i>. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.</p> <p>² The derivation of the equivalence between the rate of copper corrosion growth in the thickness of the corrosion product in $\text{\AA}/\text{month}$ and the rate of weight gain assumes that Cu_2S and Cu_2O grow in equal proportions.</p> <p>³ The derivation of the equivalence between the rate of silver corrosion growth in the thickness of the corrosion product in $\text{\AA}/\text{month}$ and the rate of weight gain assumes that Ag_2S is the only corrosion product.</p> <p>⁴ The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.</p> <p>⁵ Surface debris is randomly collected from 10 areas of the data center on a 1.5 cm diameter disk of sticky electrically conductive tape on a metal stub. If examination of the sticky tape in a scanning electron microscope reveals no zinc whiskers, the data center is considered free of zinc whiskers.</p>	

Management options

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

Overview

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

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

Functions

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

Notes:

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

Chapter 2. Server components

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

Front view

This section contains information about the controls, LEDs, and connectors 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

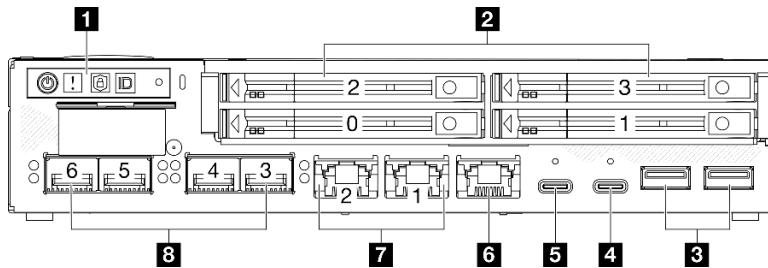


Figure 2. Front view of SE350 V2, 7mm drives with 10/25GbE I/O module

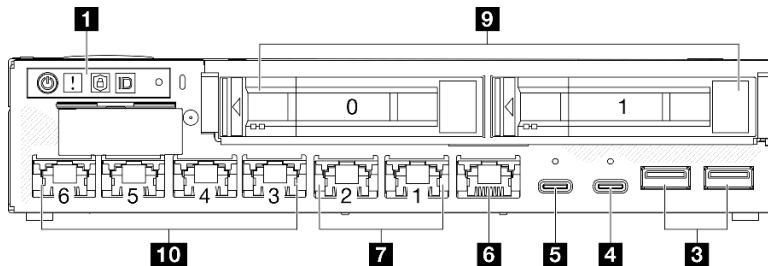


Figure 3. Front view of SE350 V2, 15mm drives with 1GbE I/O module

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

1 Front operator panel buttons and LEDs	6 “XCC system management port (1GbE RJ-45)” on page 19
2 7mm 2.5-inch drive bays (bays 0 to 3)	7 “2.5GbE RJ-45 connectors” on page 20
3 “USB 3.2 Gen 1 Type-A connectors” on page 19	8 “10/25GbE SFP28 connectors” on page 20
4 “USB 3.2 Gen 1 Type-C connector (supporting display)” on page 19	9 15mm 2.5-inch drive bays (bays 0 to 1)
5 “USB 2.0 Gen 1 Type-C connector with Lenovo XClarity Controller (XCC) management” on page 19	10 “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” on page 225.

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 hot-swap drive” on page 112).
- For more information about the drive LEDs, see “Drive LEDs” on page 225.

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” on page 227.

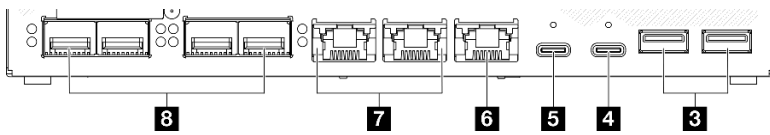


Figure 4. Front I/O of 10/25GbE I/O module

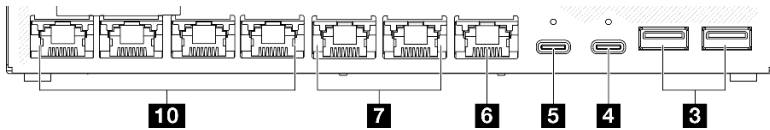


Figure 5. Front I/O of 1GbE I/O module

Table 5. Components in the front I/O module

3 “USB 3.2 Gen 1 Type-A connectors” on page 19	7 “2.5GbE RJ-45 connectors” on page 20
4 “USB 3.2 Gen 1 Type-C connector (supporting display)” on page 19	8 “10/25GbE SFP28 connectors” on page 20

Table 5. Components in the front I/O module (continued)

<p>5 “USB 2.0 Gen 1 Type-C connector with Lenovo XClarity Controller (XCC) management” on page 19</p>	<p>10 “1GbE RJ-45 connectors” on page 20</p>
<p>6 “XCC system management port (1GbE RJ-45)” on page 19</p>	

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 209](#)

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 209](#)
- [“XCC system management port LEDs” on page 232](#)

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” on page 227](#).

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.

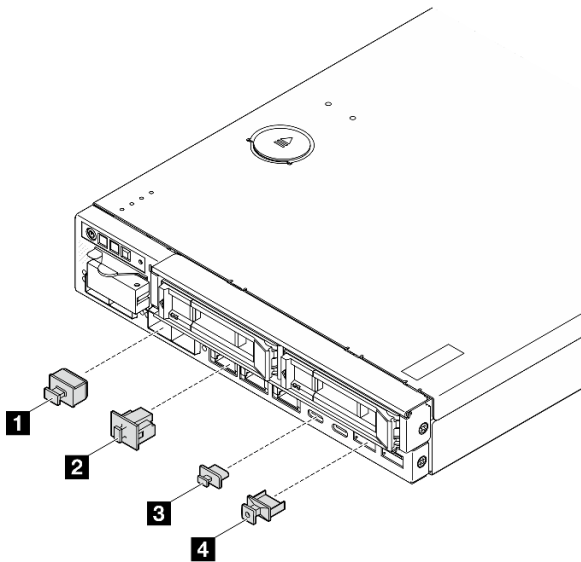


Figure 6. Front I/O fillers

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

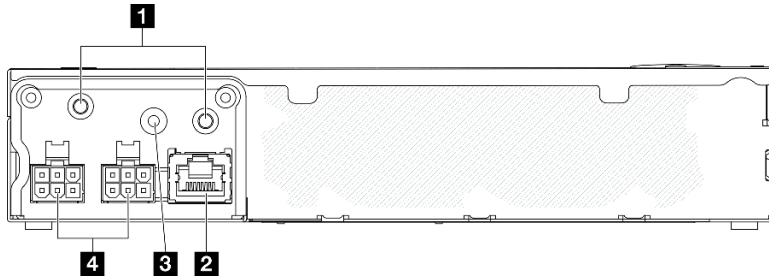


Figure 7. Rear view of ThinkEdge SE350 V2, DC power input

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

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

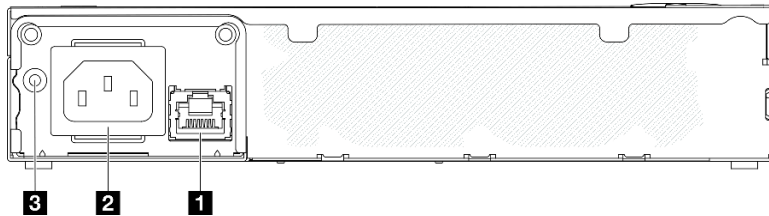


Figure 8. Rear view of ThinkEdge SE350 V2, AC power input

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

1 RJ-45 RS-232 serial console connector	3 PMB status LED
2 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” on page 88](#).

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 229](#).

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.

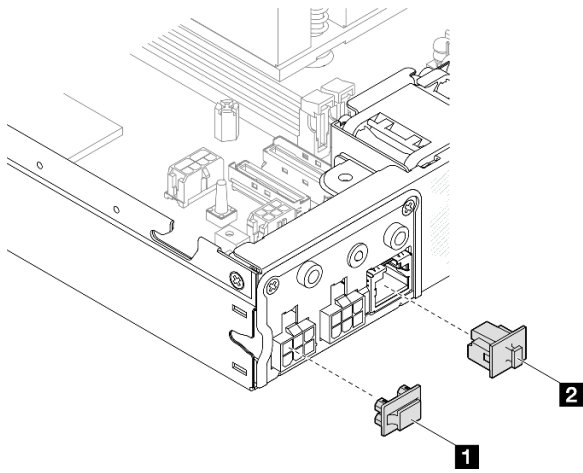


Figure 9. Rear I/O fillers

1 Power-connector filler (x2)	2 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

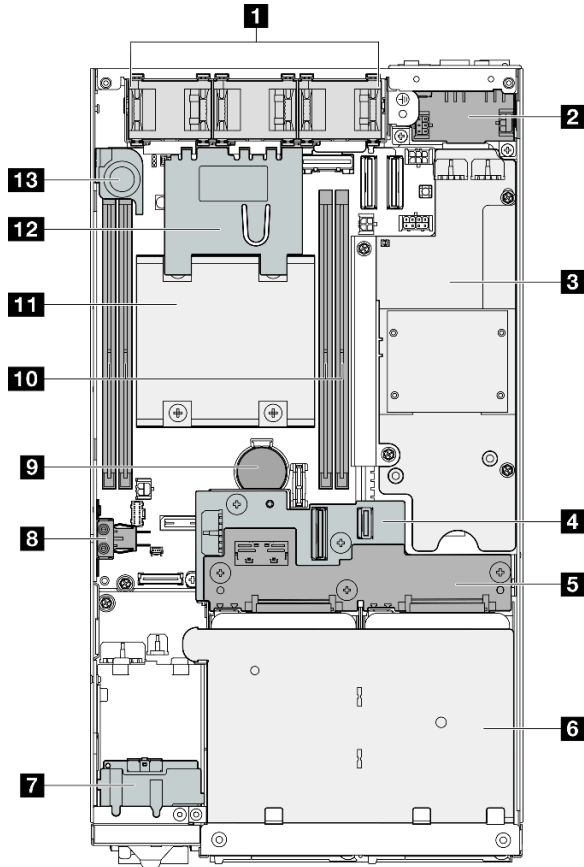


Figure 10. Top view of SE350 V2

Table 8. Components in the top view of SE350 V2

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

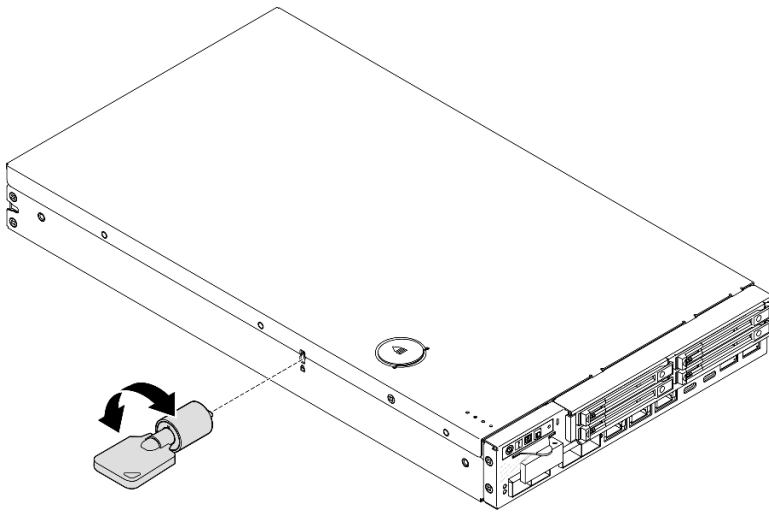


Figure 11. Kensington lock securing the node and top cover

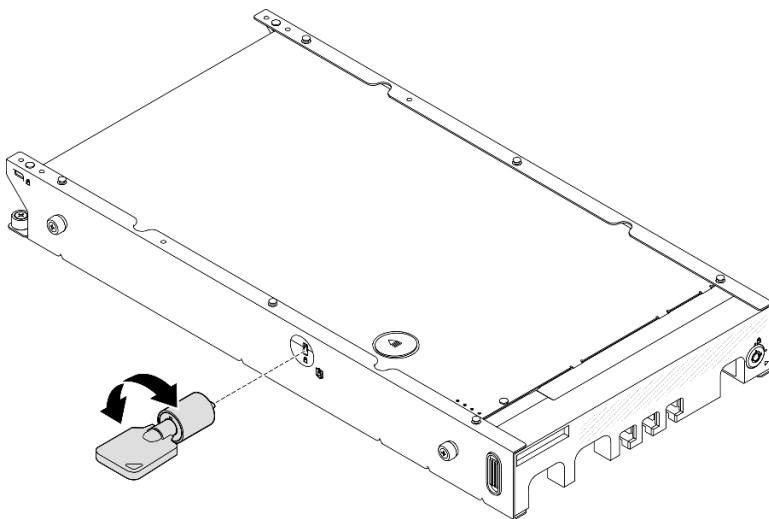


Figure 12. Kensington lock securing the node, the top cover, and the node sleeve

- 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”](#) on page 127.

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”](#) on page 45.

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 230.

System-board connectors

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

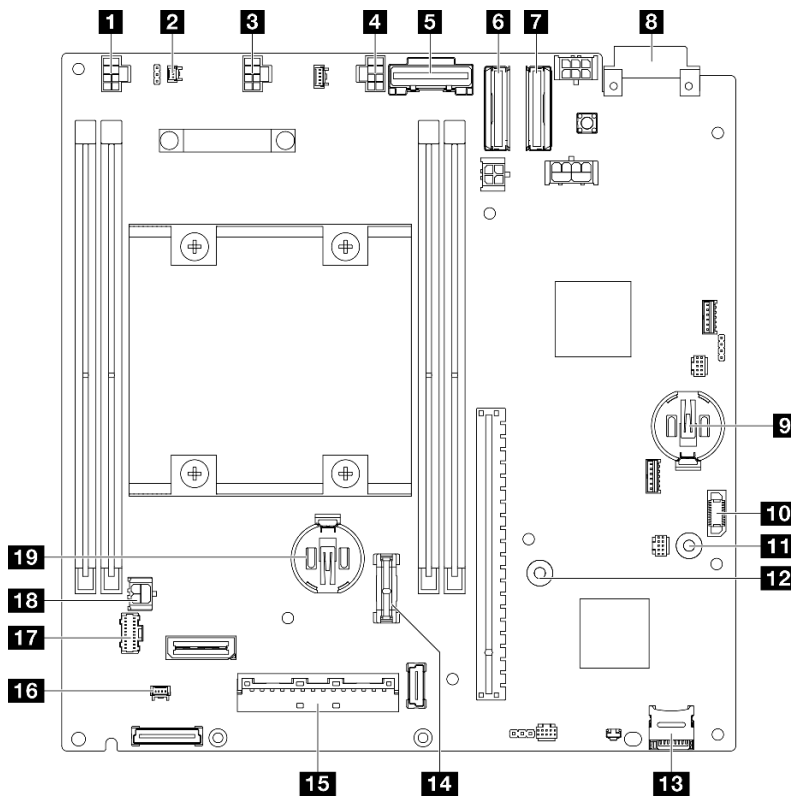


Figure 13. System-board connectors

Table 9. System-board connectors

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

Table 9. System-board connectors (continued)

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

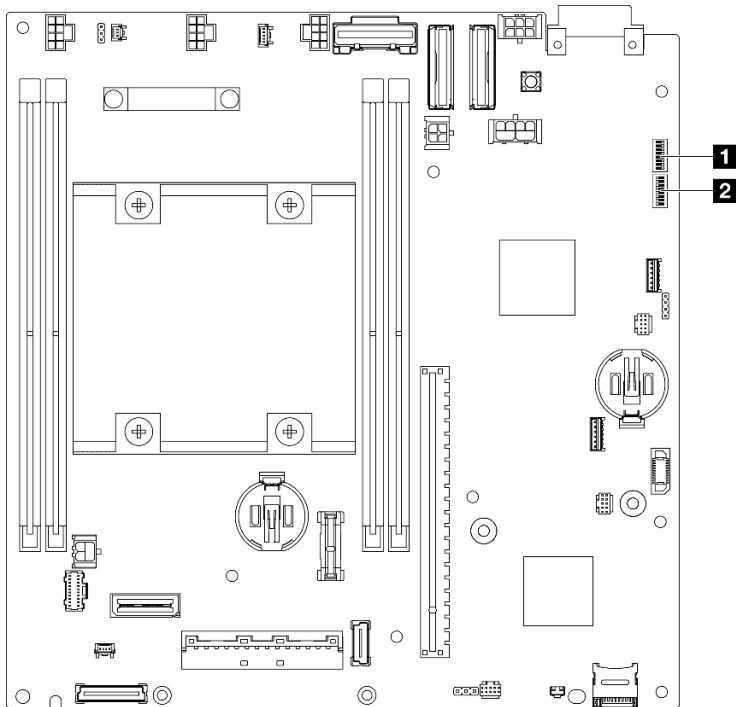


Figure 14. System-board switches

Table 10. System-board switches

1 Switch block (SW1)	2 Switch block (SW18)
-----------------------------	------------------------------

Important:

1. Before changing any switch settings or move any jumpers, turn off the server; then, disconnect all power cords and external cables. Review the following information:

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

- [“Installation Guidelines” on page 37](#)
 - [“Handling static-sensitive devices” on page 39](#)
 - [“Power off the server” on page 44](#)
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 225](#).

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

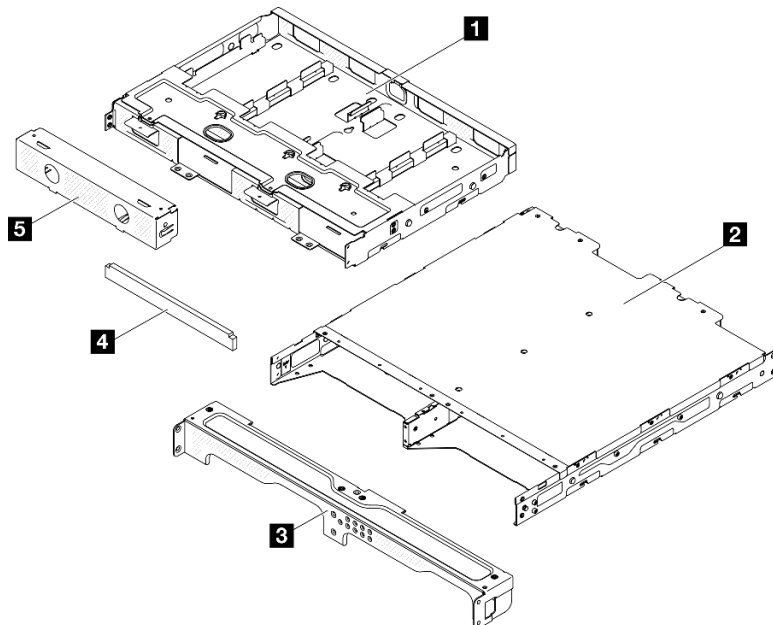


Figure 15. Enclosure components

Table 12. Enclosure parts listing

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

Node components

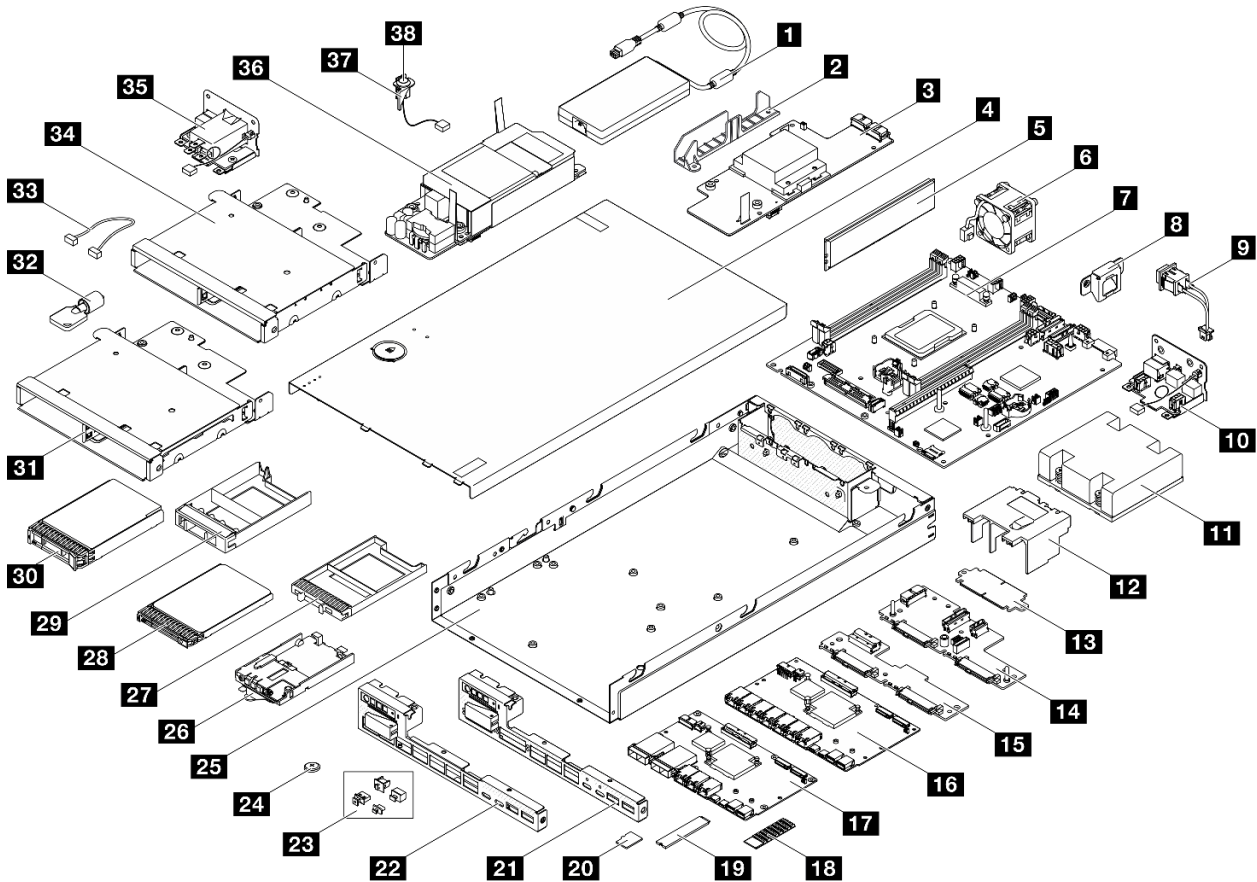


Figure 16. Server components

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

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

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 35](#) 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.

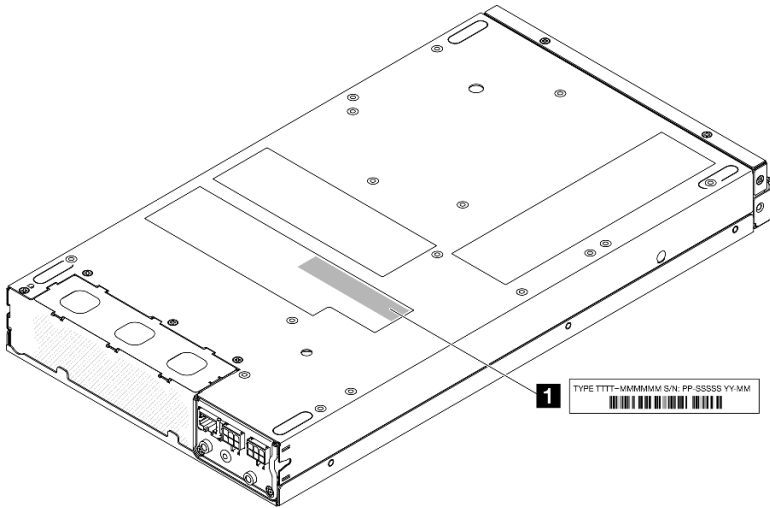


Figure 17. Location of the ID label

Table 13. ID label

<p>1 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.

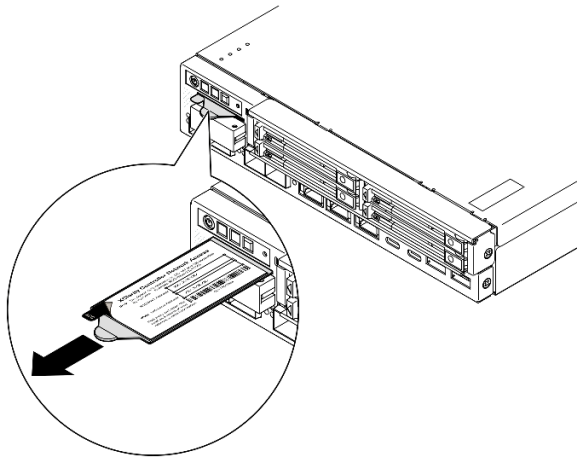


Figure 18. Lenovo XClarity Controller network access label on the pull-out information tab

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” on page 192](#)). 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.

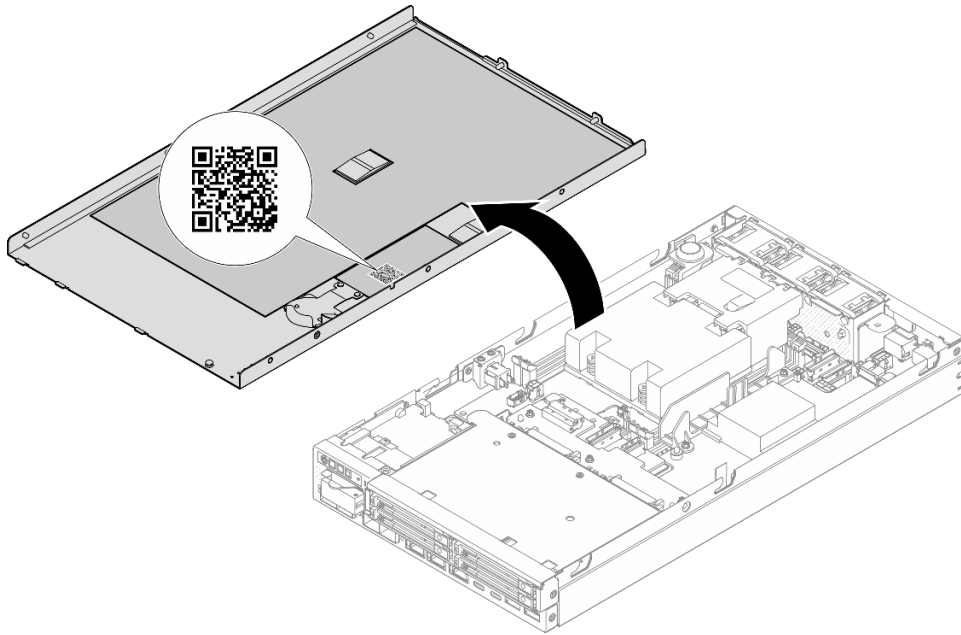


Figure 19. Service Label and QR code

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 33](#)).
2. Install any required hardware or server options (see the related topics in [Chapter 5 “Hardware replacement procedures” on page 37](#)).
3. If necessary, mount the server or install the server to an enclosure. See [“Configuration guide” on page 45](#)
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 214](#).
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 225](#)

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 7 “System configuration” on page 209](#).

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 213](#).

Chapter 5. Hardware replacement procedures

This section provides installation and removal procedures for all serviceable system components. Each component replacement procedure references any tasks that need to be performed to gain access to the component being replaced.

Installation Guidelines

Before installing components in the server, read the installation guidelines.

Before installing optional devices, read the following notices carefully:

Attention: Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.

- Read the safety information and guidelines to ensure safety at work:
 - A complete list of safety information for all products is available at:
https://pubs.lenovo.com/safety_documentation/
 - The following guidelines are available as well: “[Handling static-sensitive devices](#)” on page 39.
- Make sure that the components to be installed are supported by the server.
 - For a list of supported optional components for the server, see <https://serverproven.lenovo.com>.
 - For the option package contents, see <https://serveroption.lenovo.com/>.
- For more information about ordering parts:
 1. Go to <http://datacentersupport.lenovo.com> and navigate to the support page for the specific server.
 2. Click **Parts**.
 3. Enter the serial number to view a listing of parts for the specific server.
- When you install a new server, download and apply the latest firmware. This will help ensure that any known issues are addressed, and that your server is ready to work with optimal performance. Go to <https://datacentersupport.lenovo.com/products/servers/thinkedge/se350v2/7da9/downloads/driver-list> to download firmware updates for your server.

Important: Some cluster solutions require specific code levels or coordinated code updates. If the component is part of a cluster solution, verify the latest Best Recipe code level menu for cluster supported firmware and driver before you update the code.

- If you replace a part, such as an adapter, that contains firmware, you might also need to update the firmware for that part. For more information about updating firmware, see “[Update the firmware](#)” on page 209.
- Make sure that the server is working correctly before installing an optional component.
- Keep the working area clean, and place removed components on a flat and smooth surface that does not shake or tilt.
- Do not attempt to lift an object that might be too heavy for you. If you have to lift a heavy object, read the following precautions carefully:
 - Make sure that you can stand steadily without slipping.
 - Distribute the weight of the object equally between your feet.
 - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
 - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.
- Back up all important data before making any change related to the disk drives.
- Have a small flat-blade screwdriver, a small Phillips screwdriver, and a T8 torx screwdriver available.

- To view the error LEDs on the system board and internal components, leave the power on.
- You do not have to turn off the server to remove or install hot-plug USB devices. However, you must turn off the server and disconnect the power source from the server before performing any steps that involve removing or installing internal cables.
- Blue on a component indicates touch points, where you can grip to remove a component from or install it in the server, open or close a latch, and so on.
- Orange on a component or an orange on or near a component indicates that the component can be hot-swapped if the server and operating system support hot-swap capability, which means that you can remove or install the component while the server is still running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- The Red strip on the drives, adjacent to the release latch, indicates that the drive can be hot-swapped if the server and operating system support hot-swap capability. This means that the drive can be removed or installed while the server is still running.

Note: See the system specific instructions for removing or installing a hot-swap drive for any additional procedures that you might need to perform before removing or installing the drive.

- After finishing working on the server, make sure to reinstall all safety shields, guards, labels, and ground wires.

Safety inspection checklist

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

Note: 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.

System reliability guidelines

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

Make sure the following requirements are met:

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

Handling static-sensitive devices

Review these guidelines before you handle static-sensitive devices to reduce the possibility of damage from electrostatic discharge.

Attention: Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.

- Limit your movement to prevent building up static electricity around you.
- Take additional care when handling devices during cold weather, for heating would reduce indoor humidity and increase static electricity.
- Always use an electrostatic-discharge wrist strap or other grounding system, particularly when working inside the server with the power on.
- While the device is still in its static-protective package, touch it to an unpainted metal surface on the outside of the server for at least two seconds. This drains static electricity from the package and from your body.
- Remove the device from the package and install it directly into the server without putting it down. If it is necessary to put the device down, put it back into the static-protective package. Never place the device on the server or on any metal surface.

- When handling a device, carefully hold it by the edges or the frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Keep the device from others' reach to prevent possible damages.

Memory module installation rules and order

Memory modules must be installed in a specific order based on the memory configuration implement in the server and the number of processors and memory modules installed in the server.

Supported memory types

For information on the types of memory module supported by this server, see “Memory” section in “Technical specifications” on page 4.

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

Shown below is the specific information about the installation rules and order of memory modules required in ThinkEdge SE350 V2 based on the system configuration and memory mode.

Layout of the processor and memory module connectors

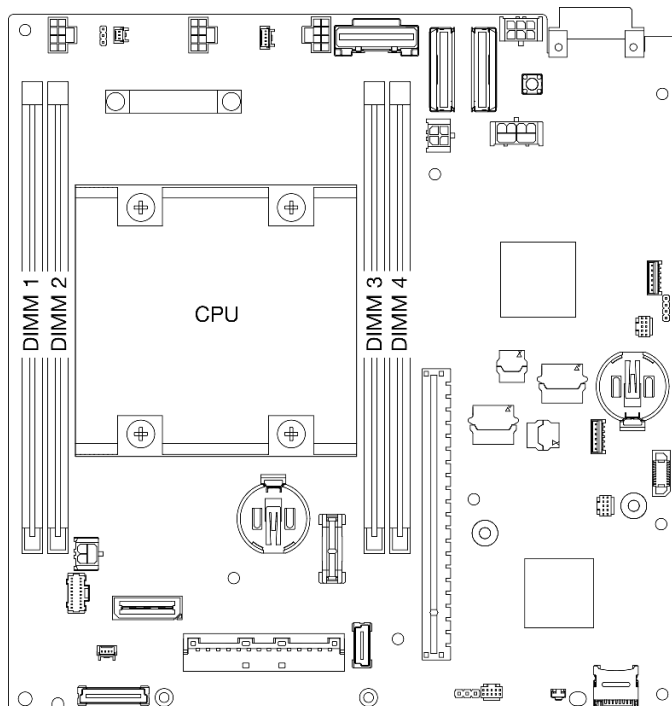


Figure 20. Layout of the processor and memory module connectors

Memory module installation guideline

- ThinkEdge SE350 V2 supports the following memory configurations and population sequences:
 - “DRAM DIMMs installation order” on page 43 (DDR4-3200 RDIMMs)
- A label on each DIMM identifies the DIMM type. This information is in the format **xxxxx nRxxx PC4-xxxx-xx-xx-xxx**, where **n** indicates if the DIMM is single-rank (n=1) or dual-rank (n=2).

- When a DIMM is replaced, the server provides automatic DIMM enablement capability without requiring you to use the Setup Utility to enable the new DIMM manually.

Attention:

- Mixing DIMMs of different capacities with same configuration is allowed but not recommended. For example, 16GB 2Rx8 DIMMs can be mixed with 32GB 2Rx8 DIMMs, or 32GB 2Rx4 DIMMs with 64GB 2Rx4 DIMMs.
- Mixing DIMMs of different types (x4/x8) is **NOT** supported. Each DIMM type is mutually exclusive in ThinkEdge SE350 V2.

DRAM DIMMs installation order

This section contains information of how to install DRAM DIMMs properly.

Independent memory mode installation order

In independent memory mode, memory channels can be populated with DIMMs in any order and you can populate all channels for each processor in any order with no matching requirements. Independent memory mode provides the highest level of memory performance, but lacks failover protection. The DIMM installation order for independent memory mode varies based on the number of processors and memory modules installed in the server.

Independent memory mode guidelines:

- Individual memory channels can run at different DIMM timings, but all channels must run at the same interface frequency.

Independent mode memory population sequence

The following table shows the DIMM population sequence for the independent memory mode.

Total DIMMs installed	DIMM slot 1	DIMM slot 2	DIMM slot 3	DIMM slot 4
1	√			
2	√			√
4†	√	√	√	√

Attention:

- Installation sequence: **1, 4, 2, 3**.
- ThinkEdge SE350 V2 only supports the above-listed numbers of DIMMs installed in the node.

Note: ‡DIMM configurations that support Software Guard Extensions (SGX), see [“Enable Software Guard Extensions \(SGX\)” on page 219](#) to enable this feature.

Power on and power off the server

Follow instructions in this section to power on and power off the server.

Power on the server

After the server performs a short self-test (power status LED flashes quickly) when connected to input power, it enters a standby state (power status LED flashes once per second).

Power button location and power LED are specified in:

- [Chapter 2 “Server components” on page 17](#)
- [“Troubleshooting by system LEDs” on page 225](#)

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

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

For information about powering off the server, see [“Power off the server” on page 44](#).

Power off the server

The server remains in a standby state when it is connected to a power source, allowing the Lenovo XClarity Controller to respond to remote power-on requests. To remove all power from the server (power status LED off), you must disconnect all power cables.

Power button location and power LED are specified in:

- [Chapter 2 “Server components” on page 17](#)
- [“Troubleshooting by system LEDs” on page 225](#)

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

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

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

When in a standby state, the server can respond to remote power-on requests sent to the Lenovo XClarity Controller. For information about powering on the server, see [“Power on the server” on page 43](#).

Configuration guide

Follow instructions in this section to remove or install the enclosure, node sleeve, and node from and to the related mounting options.

Notes: ThinkEdge SE350 V2 is designed to be used with various mounting options.

- **Desktop mount:** the node is oriented horizontally with rubber feet mounted to its underside.
- **Rack mount:** up to two nodes (with no top cover) can be mounted in an **enclosure**, and the enclosure is installed in the rack.

For information about removing or installing a node from or to the rack mount, see [“Rack mount configuration” on page 45](#).

For details of the rail options for the rack installation, see [“Rail Installation Guides” on page 253](#).

- **DIN-rail mount** or **Wall mount/ceiling mount:** the node is mounted in a node sleeve.

For information about removing or installing the node sleeve from or to the DIN-rail mount or wall mount/ceiling mount, see [“DIN-rail mount configuration” on page 61](#) or [“Wall mount/ceiling mount configuration” on page 69](#).

Important: The mounting options of SE350 V2 support different system configuration. For proper operation, see the following table for the supported configurations:

Table 14. Supported configurations of SE350 V2 mounting options

	Desktop mount	Rack mount with 1U2N enclosure	Rack mount with 2U2N enclosure	Wall mount/ceiling mount	DIN-rail mount
DC power source input	√	√		√	√
300W external power adapter *	√	√	√		
AC power source input	√	√		√	√

*When 300W external power adapter is installed, one of the following mounting options is supported with proper ambient temperature:

- Desktop mount at lower than 40°C
- Rack mount with ThinkEdge SE350 V2 1U2N Enclosure at lower than 30°C
- Rack mount with ThinkEdge SE350 V2 2U2N Enclosure at lower than 40°C

Rack mount configuration

Follow instructions in this section to remove or install the node from or to an enclosure, as well as the enclosure from or to a rack.

Notes:

- For details of the rail options for the rack installation, see [“Rail Installation Guides” on page 253](#).

- If the node is to be installed in an enclosure, change the machine type for proper operation.

If the node is removed from and not to be reinstalled into an enclosure, change the machine type to the default mode for proper operation.

- See [“Change the machine type for operating in an enclosure” on page 191](#)

Remove a node from a rack

Follow instructions in this section to remove a node from a rack.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **R006**



CAUTION:

Do not place any object on top of a rack-mounted device unless that rack-mounted device is intended for use as a shelf.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- To remove a node from the rack:
 1. [“Remove the shipping bracket from the enclosure” on page 46](#)
 2. [“Remove the enclosure from the rack” on page 47](#)
 3. [“Remove a node from the enclosure” on page 51](#)

Remove the shipping bracket from the enclosure

Follow instructions in this section to remove the shipping bracket from the enclosure.

Notes:

- Depending on the specific configuration, the node, enclosure, or rails might look different from the illustrations in this section.

- For details of the rail options for the rack installation, see [“Rail Installation Guides” on page 253](#).

Procedure

Step 1. Remove the seven screws of the shipping bracket as shown.

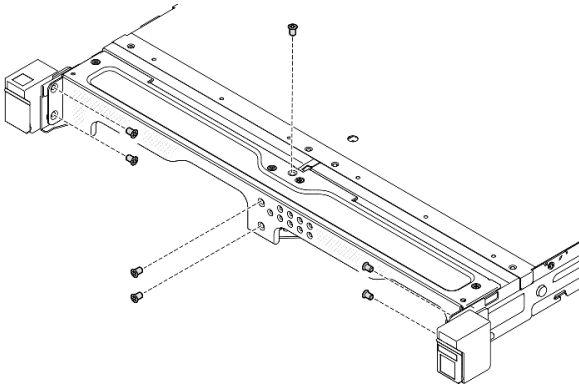


Figure 21. Removal of the shipping bracket screws

Step 2. Pull the shipping bracket away from the enclosure.

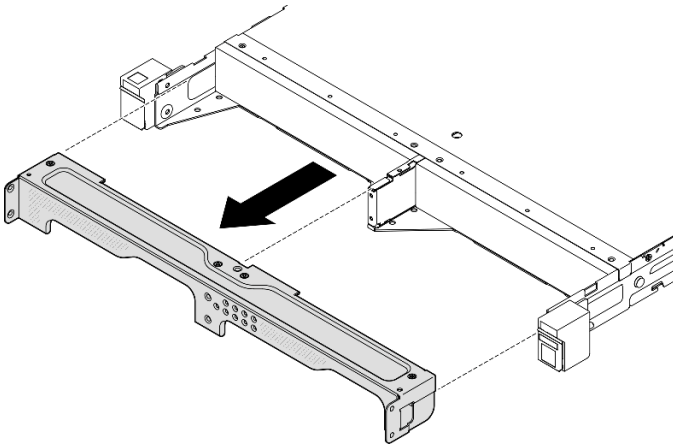


Figure 22. Removal of the shipping bracket

Notes:

- When a 1U2N enclosure is installed with ThinkSystem Toolless Slide Rail Kit without 1U CMA, a node can be directly removed from the enclosure on the rack. If necessary, proceed to [“Remove a node from the enclosure” on page 51](#) for the procedure.
- When the enclosure is installed with rail kit except for ThinkSystem Toolless Slide Rail Kit without 1U CMA, remove the enclosure with node(s) from the rack; then, remove the node(s) from the enclosure.

Remove the enclosure from the rack

Notes:

- Depending on the specific configuration, the node, enclosure, or rails might look different from the illustrations in this section.
- For details of the rail options for the rack installation, see [“Rail Installation Guides” on page 253](#).

Attention:

- Make sure to have enough help and use safe practices when lifting the enclosure.

Procedure

Step 1. Make preparations for this task.

- Power off the node (see [“Power off the server” on page 44](#)).
- Disconnect the power cords and all external cables.

Step 2. If applicable, open the rack release latches and remove the screws that secure the enclosure to the rails.

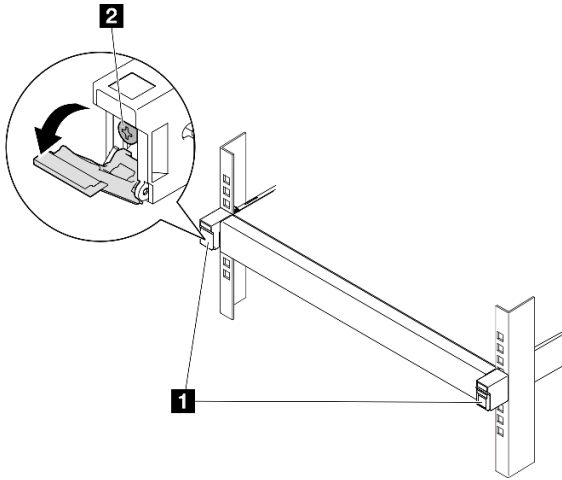


Figure 23. Removal of screws from rack release latches

1 Rack release latches	2 Front screw
-------------------------------	----------------------

Step 3. Depending on the specific configuration, the procedure of removing the enclosure from the rails can be one of the following.

- [Rail kit except for ThinkSystem Toolless Slide Rail Kit without 1U CMA](#)
- [ThinkSystem Toolless Slide Rail Kit without 1U CMA](#)

Rail kit except for ThinkSystem Toolless Slide Rail Kit without 1U CMA

- Slide the enclosure out of the rails.
 - **1** Open the rack release latches in the front of the enclosure; then, slowly slide out the enclosure until it stops.
 - **2** Press the release latches on the rail.
 - **3** Carefully lift the enclosure away from the rack.

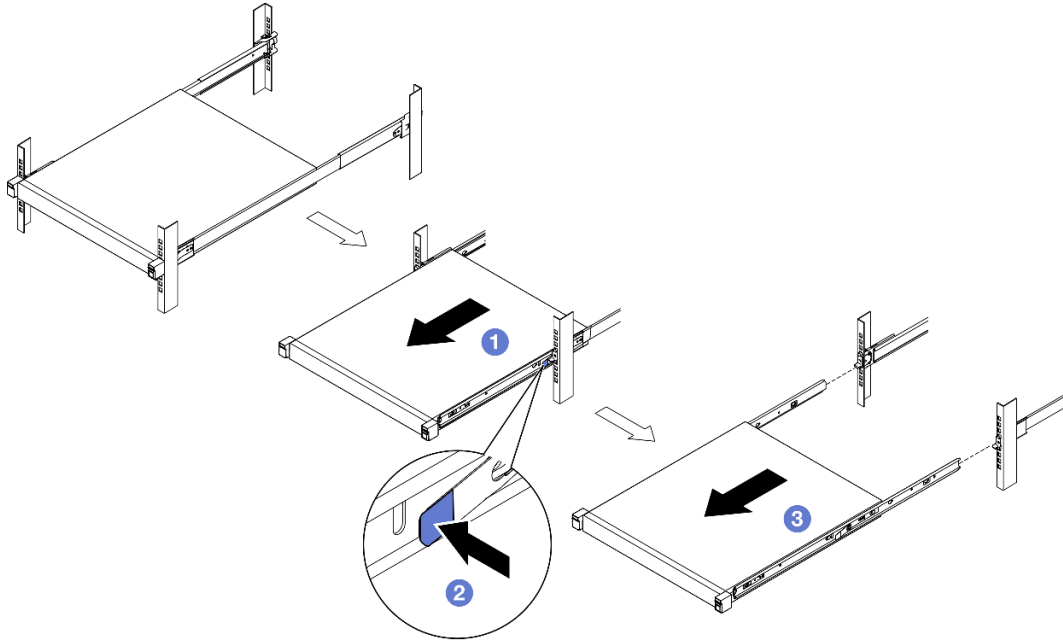


Figure 24. Removal of the enclosure from the rack by sliding

2. (Optional) If necessary, remove the inner rails from the enclosure.
 - If applicable, remove the screws that secure the inner rails on the enclosure.

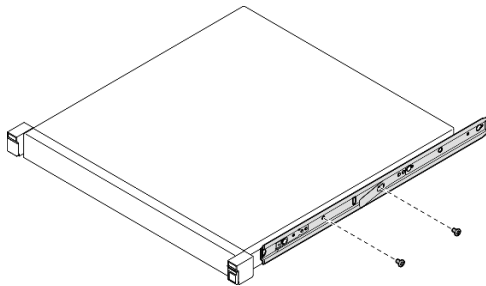


Figure 25. Removal of the screws from inner rails

- ① Push the inner rails as shown to disengage the inner rails from the mounting pins on the enclosure.
- ② Remove the inner rails from the enclosure when the mounting holes on the inner rails are aligned with the corresponding rail mounting pins on the enclosure.

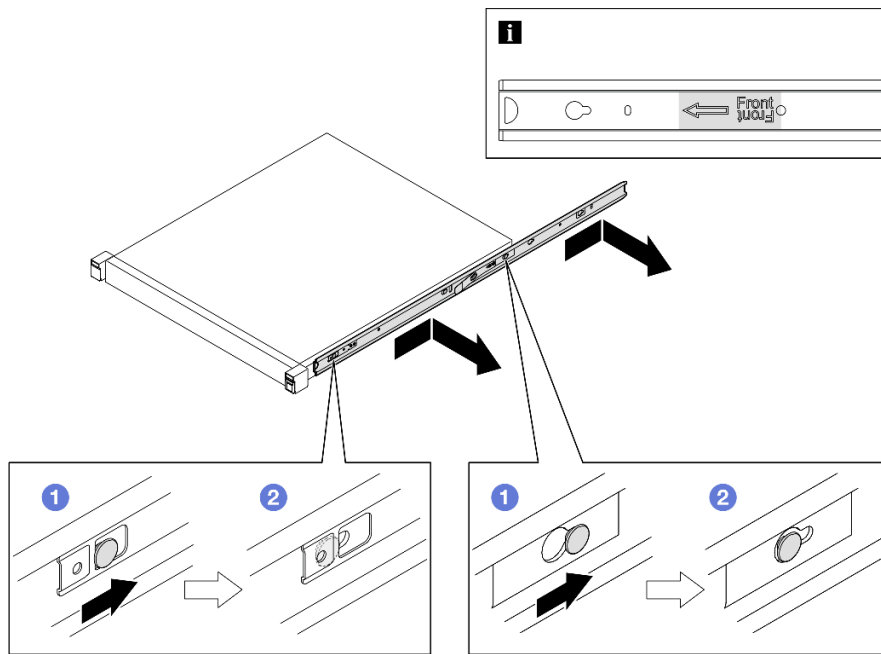


Figure 26. Removal of the inner rails

ThinkSystem Toolless Slide Rail Kit without 1U CMA

1. ① Press the blue touch points at the front of both the inner rails.
2. ② Carefully rotate the enclosure upward as shown.
3. ③ Lift the enclosure out of the rails.

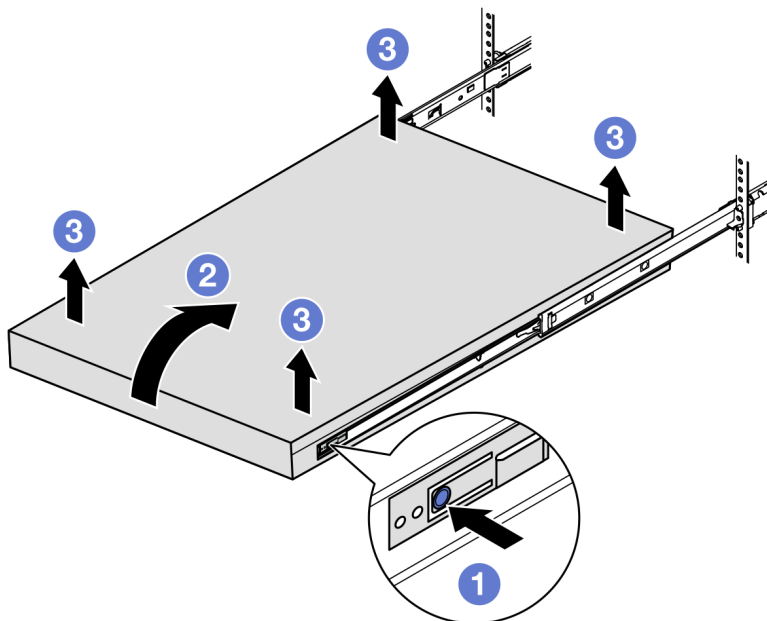
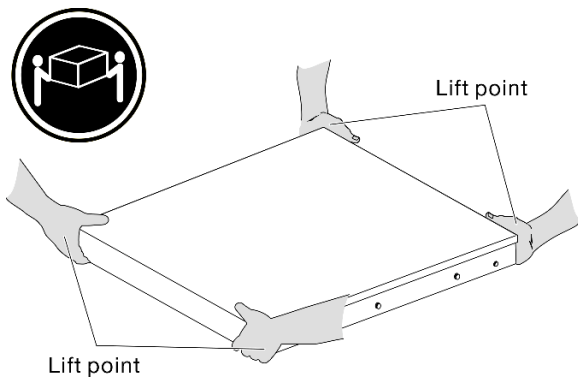


Figure 27. Removal of the enclosure from the rack by lifting

Attention:

- Make sure that two people are lifting the enclosure together, and that the hands must be positioned as illustrated.



After this task is completed

- Carefully lay the enclosure on a flat, static-protective surface.

Remove a node from the enclosure

Notes:

- For a node installed in an enclosure, the node is with no top cover.
- Depending on the specific configuration, the node, enclosure, or rails might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- a. For 1U2N enclosure, remove the power cable cover (see [“Remove a power adapter from the enclosure” on page 86](#)).
- b. If applicable, power off the node and disconnect all power cords from the node (see [“Power off the server” on page 44](#)).
- c. Disconnect all external cables from the node.

Step 2. Remove the node from the enclosure.

- a. ① Press the release button on the rear of the enclosure.
- b. ② Slide the node out of the enclosure.
 - 1U2N enclosure

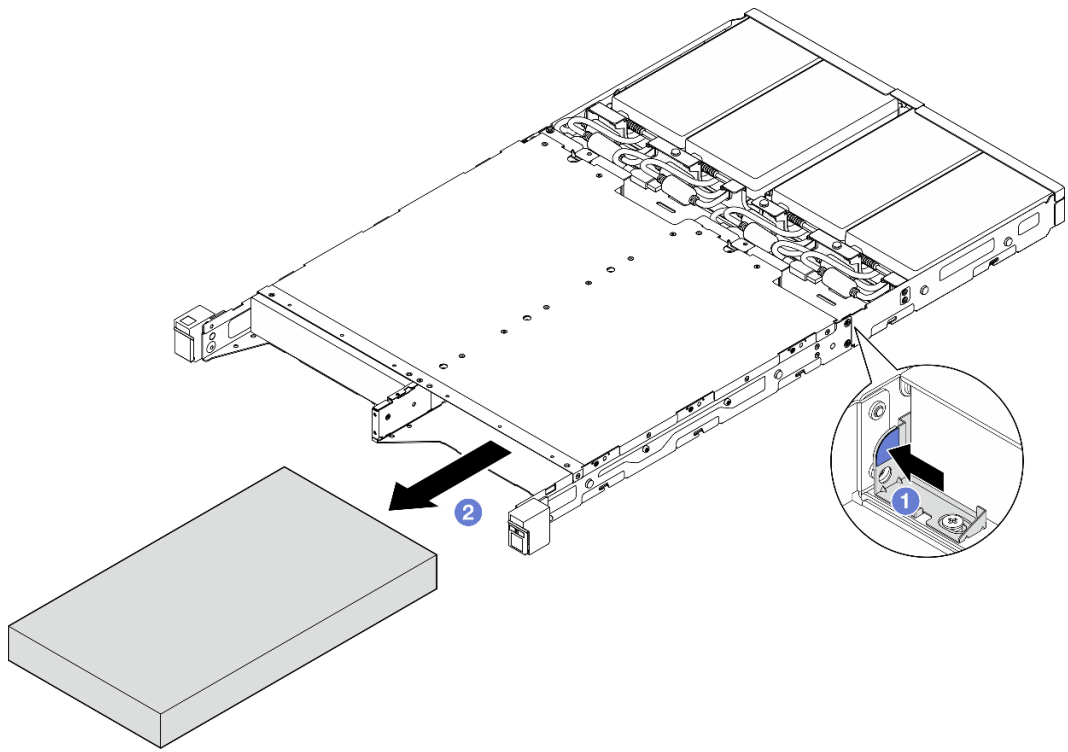


Figure 28. Removal of a node from a 1U2N enclosure

- 2U2N enclosure

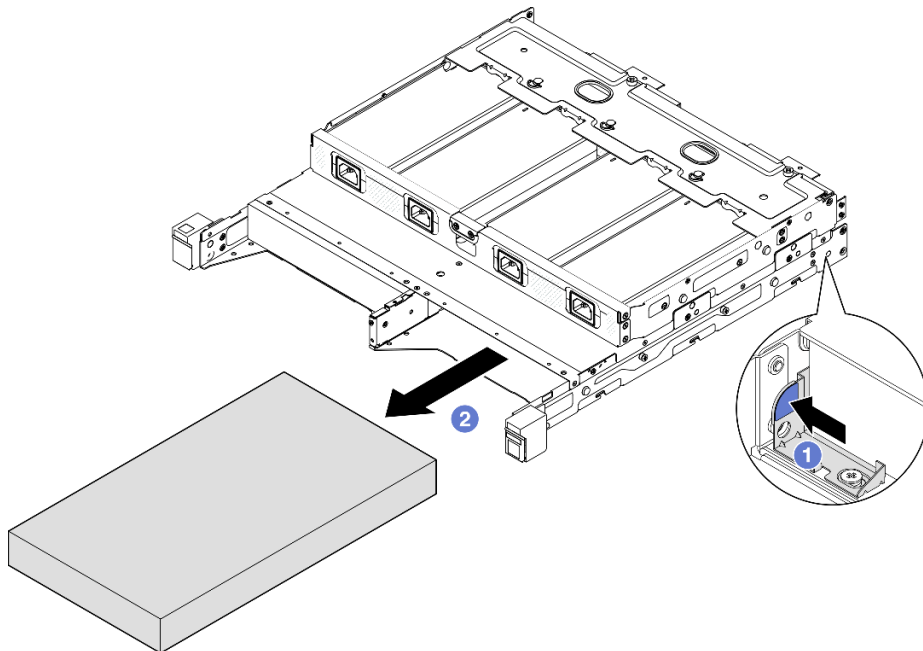


Figure 29. Removal of a node from a 2U2N enclosure

After this task is completed

- Carefully lay the node on a flat, static-protective surface.
- Install a replacement node (see [“Install a node to the rack” on page 53](#)) or node dummy filler to the node bay of the enclosure.
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Install a node to the rack

Follow instructions in this section to install a node to the rack.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **R006**



CAUTION:

Do not place any object on top of a rack-mounted device unless that rack-mounted device is intended for use as a shelf.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Make sure that all components and cables are installed and seated correctly inside the node, except for the power cords and external cables, and that no loose tools or parts are left inside the node.
- For a node installed in an enclosure, the node is with no top cover.
- To **install a node to the rack**:
 1. [“Install a node into an enclosure” on page 54](#)
 2. [“Install an enclosure to the rack” on page 55](#)
 3. [“Install a shipping bracket to the enclosure” on page 59](#)

Notes:

- For details of the rail options for the rack installation, see [“Rail Installation Guides” on page 253](#).

Install a node into an enclosure

Procedure

Note: When a 1U2N enclosure is installed with ThinkSystem Toolless Slide Rail Kit without 1U CMA, the node can be directly installed to the enclosure on the rack.

Step 1. Make preparations for this task.

- a. Make sure that the node is with no top cover (see [“Remove the top cover”](#) on page 192).
- b. For configurations with 300W external power adapter, make sure that the power adapter is installed properly (see [“Install a power adapter”](#) on page 88).

Step 2. Insert the node into the node bay until it stops.

- 1U2N enclosure

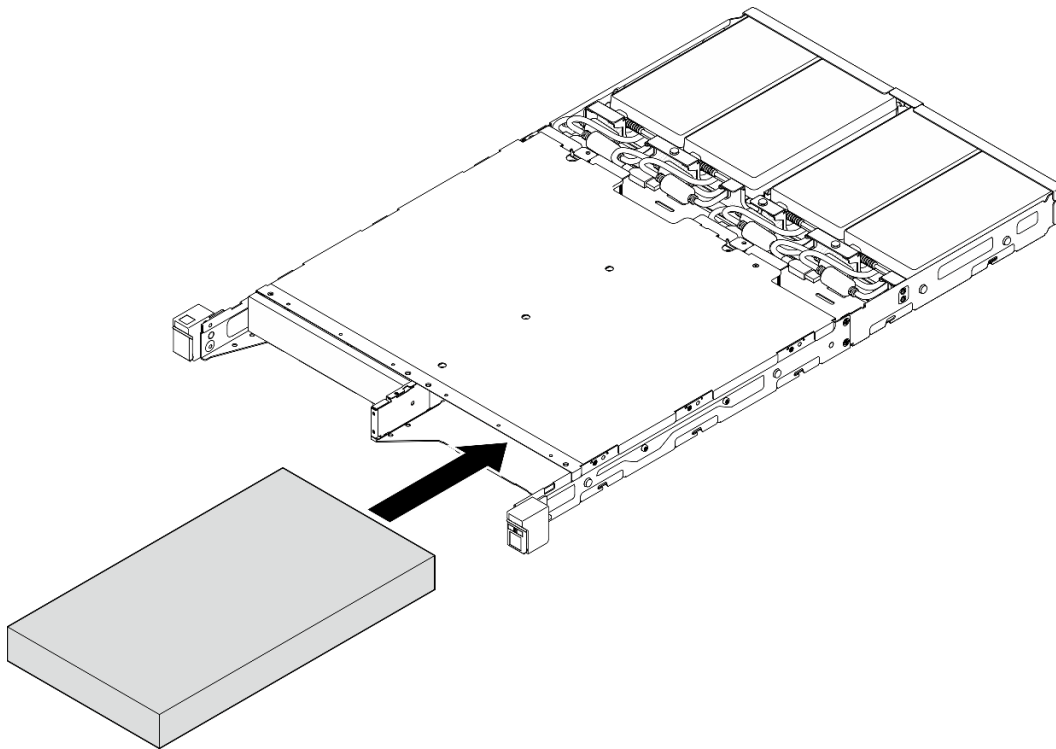


Figure 30. Installation of a node into a 1U2N enclosure

- 2U2N enclosure

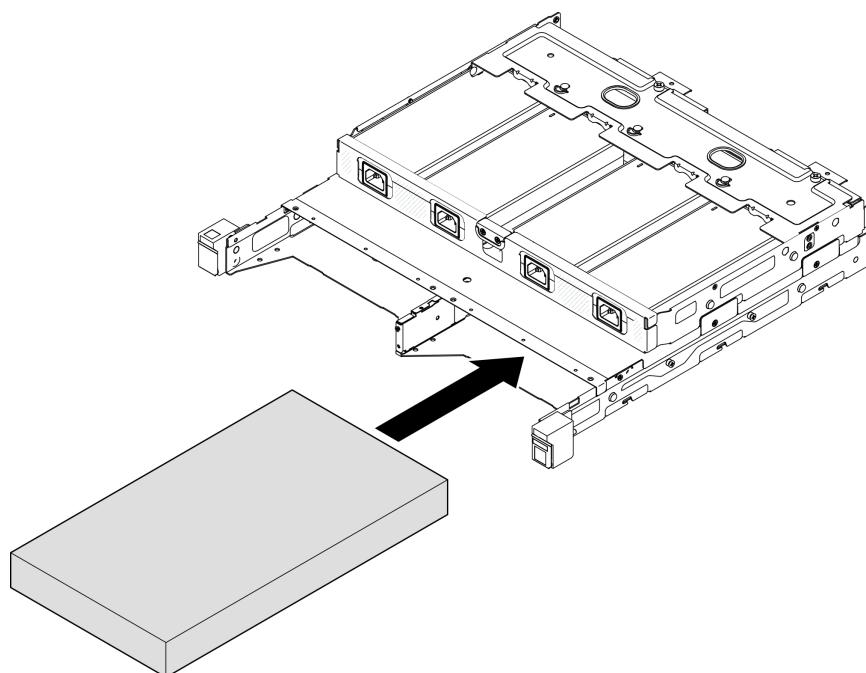


Figure 31. Installation of a node into a 2U2N enclosure

Step 3. Connect the power cables to the node.

Step 4. For 1U2N enclosure, install the power cable cover (see [“Install a power adapter to the enclosure” on page 89](#)).

Note: If the node is installed in an enclosure on the rack, proceed to [“Install a shipping bracket to the enclosure” on page 59](#) if necessary.

Install the enclosure to the rack

Attention:

- Make sure to have enough help and use safe practices when lifting the enclosure.

Important: Make sure to use the rail kit that supports the selected configuration.

	1U2N enclosure			2U2N enclosure
	DC power source input	300W external power adapter	AC power source input	300W external power adapter
ThinkSystem Enclosure Universal Short Rack Rail Kit	√	Not supported	√	√

ThinkSystem Friction 2-Post Screw-in Rail Kit	✓	Not supported	✓	✓
ThinkSystem Toolless Slide Rail Kit without 1U CMA	✓	✓	✓	Not supported

Procedure

Step 1. Depending on the configuration, the procedure of installing the enclosure to the rack can be one of the following.

- [Rail kit except for ThinkSystem Toolless Slide Rail Kit without 1U CMA](#)
- [ThinkSystem Toolless Slide Rail Kit without 1U CMA](#)

Rail kit except for ThinkSystem Toolless Slide Rail Kit without 1U CMA

1. If applicable, install the inner rails onto the enclosure.
 - ① Align the mounting holes on the inner rails with the corresponding rail-mounting pins on the side of the enclosure.
 - ② Push the inner rails as shown until the mounting pins on the enclosure lock into place with the inner rails.

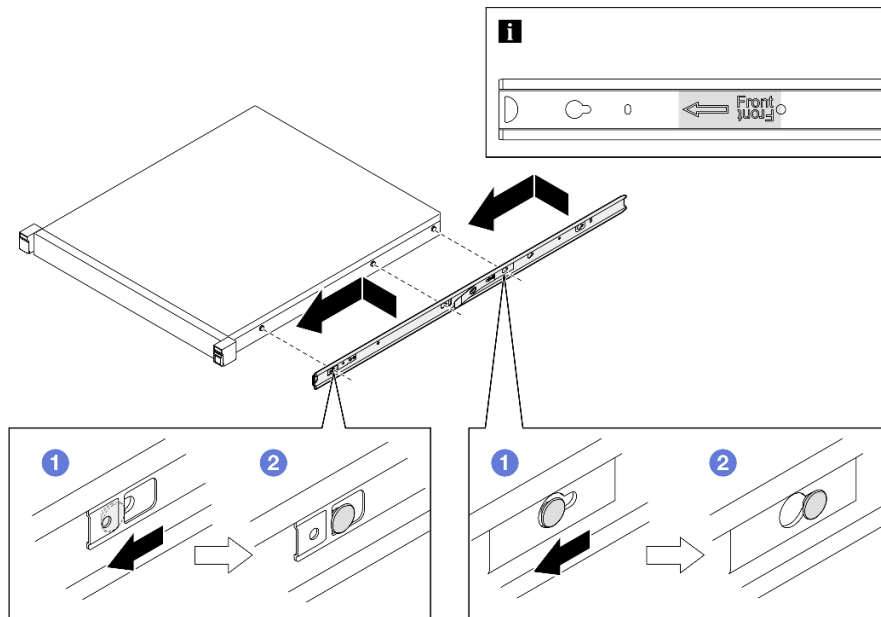


Figure 32. Installation of the inner rails

- If applicable, tighten the screws to secure the inner rails on the enclosure.

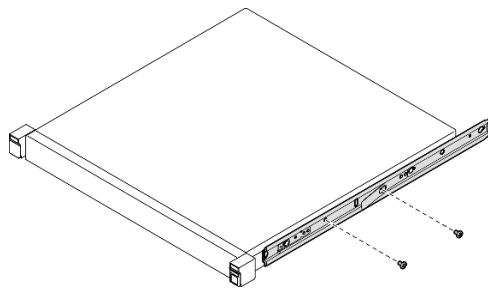


Figure 33. Installation of inner-rail screws

2. Lift and slide the enclosure into the rails.

- ① Carefully lift the enclosure and align the enclosure with the rails on the rack; then, position the enclosure as shown and push it into the rack.
- ② Press the release latches.
- ③ Push the enclosure all the way into the rack until the enclosure locks into place with a click.

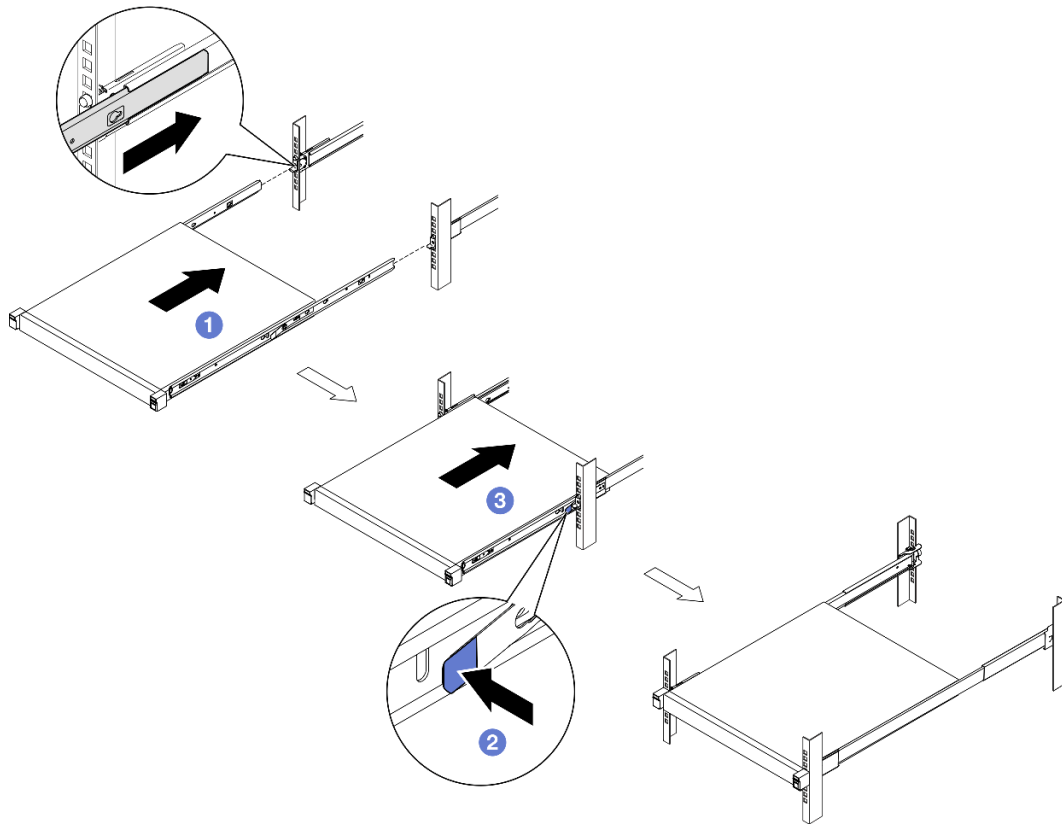


Figure 34. Installation of the enclosure into the rack by sliding

ThinkSystem Toolless Slide Rail Kit without 1U CMA

1. Place the enclosure down into the rails.

- ① Pull the rails forward until the inner rails click two times into place.
- ② Carefully lift the enclosure and tilt it into position over the rails so that the mounting studs on the enclosure line up with the mounting holes of the inner rails.

- ③ Slowly lower the enclosure down until the rear mounting studs slide into the rear mounting holes; then, the front mounting studs go into the corresponding mounting holes of the rails. Make sure that the mounting studs are locked into position so the enclosure is firmly secured.

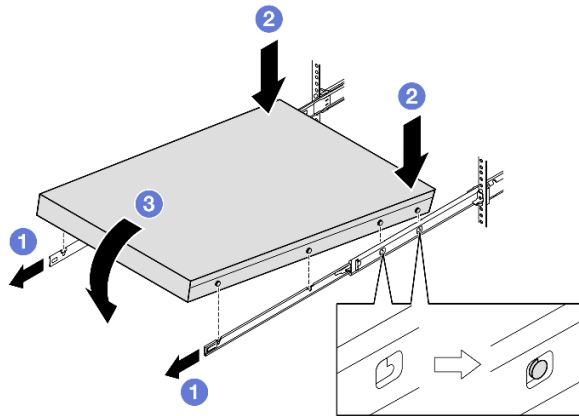
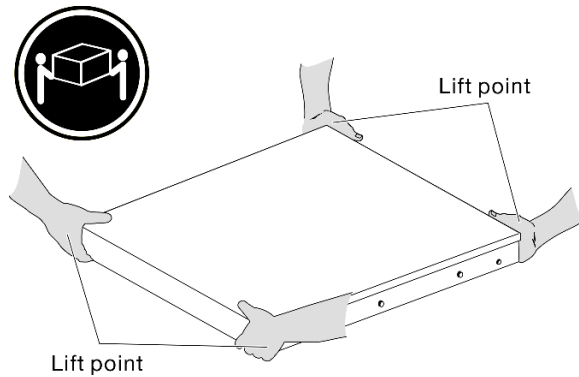


Figure 35. Installation of the enclosure into the rack by rotating

Attention:

- Make sure that two people are lifting the enclosure together, and that the hands must be positioned as illustrated.



2. Slide the enclosure into the rack.

- ① Lift the locking levers on both sides of the rails.
- ② Push the enclosure all the way into the rack until it clicks into place.

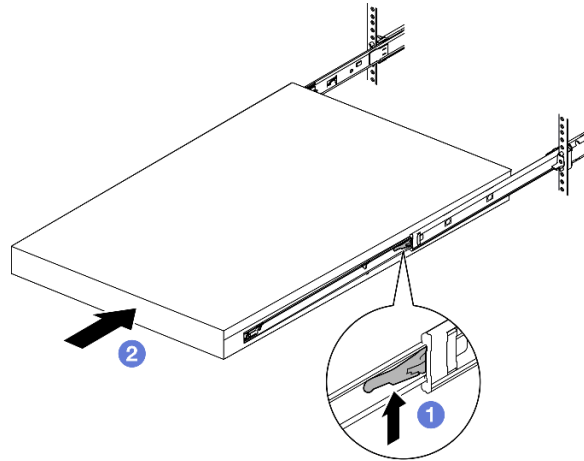


Figure 36. Installation of the enclosure into the rack by rotating

Step 2. (Optional) If necessary, open the rack release latches and tighten the screws to firmly secure the enclosure to the rack.

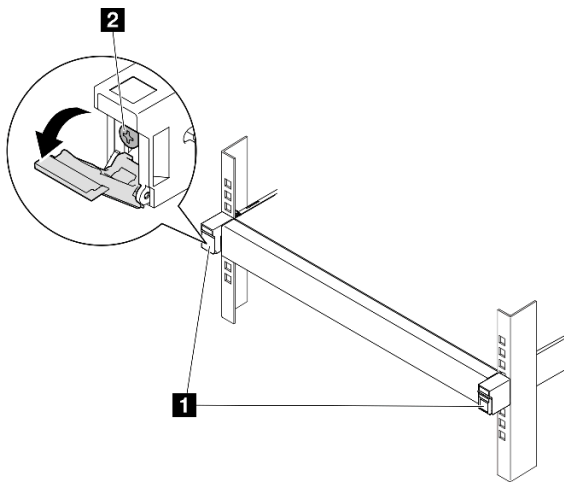


Figure 37. Installation of screws to the rack release latches

1 Rack release latches	2 Front screw
-------------------------------	----------------------

Install a shipping bracket to the enclosure

Procedure

- Step 1. When the front shipping bracket is installed, the front operator panel is not accessible. Make sure to complete the following procedure before installing the front shipping bracket:
- Connect the power cords and power on the server (see [“Power on the server” on page 43](#)).
 - Connect all necessary external cables to the node.
- Step 2. If applicable, install the dust filter holder to the shipping bracket; then, secure the dust filter holder with two screws.

Note: Repeat this step to install the other dust filter holder.

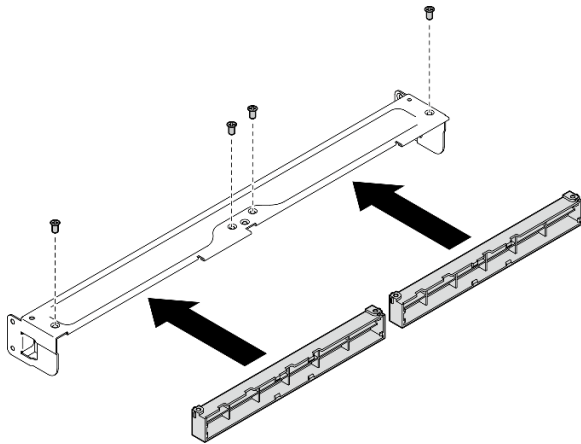


Figure 38. Installation of the dust filter holders

Step 3. Insert the shipping bracket to the front of the enclosure.

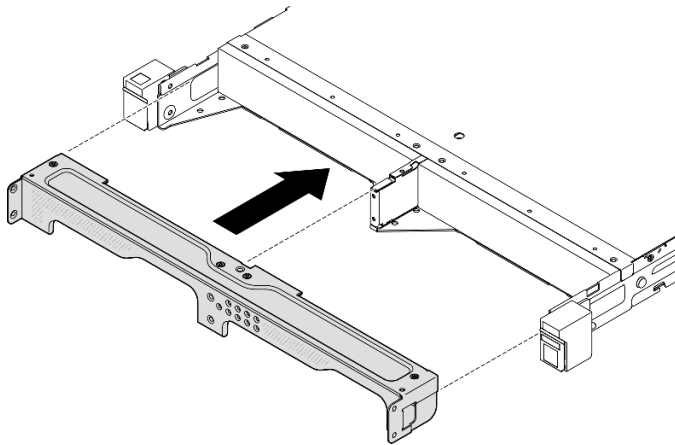


Figure 39. Installation of an shipping bracket

Step 4. Tighten the seven screws as shown to secure the shipping bracket.

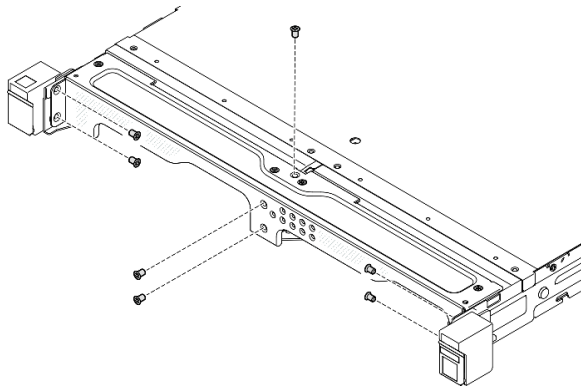


Figure 40. Installation of the shipping bracket screws

After this task is completed

- Proceed to complete the parts replacement (see [“Complete the parts replacement” on page 195](#)).

DIN-rail mount configuration

Follow instructions in this section to remove or install a node from or to a node sleeve, or a node sleeve from or to the DIN rail.

Remove the node from the DIN rail

Follow instructions in this section to remove the node from the node sleeve and the node sleeve from the DIN rail.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Reserve **500 mm** of clearance in front of the node for the procedures of removal or installation.
- This section includes the following procedures:
 - [“Remove the node from the node sleeve” on page 61](#)
 - [“Remove the node sleeve from the DIN rail” on page 63](#)

Remove the node from the node sleeve

Notes:

- If applicable, unlock any locking device that secures the node to the node sleeve, such as a Kensington lock.
- Depending on the specific configuration, the node or security bezel might look different from the illustrations in this section.

Procedure

- Step 1. If applicable, remove the security bezel from the node sleeve.
- 1 Use the key to unlock the security bezel.
 - 2 Press the release tab and pivot the security bezel and pivot the security bezel outward.
 - 3 Remove the security bezel from the node sleeve

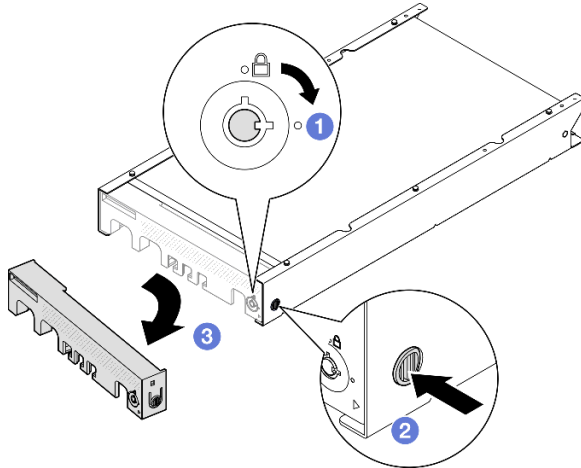


Figure 41. Removal of the security bezel from a node sleeve

- Step 2. **Power off the server and disconnect all external cables and power cords** (see [“Power off the server”](#) on page 44).
- Step 3. Remove the node from the node sleeve.
- 1 Loosen the two thumbscrews on the side of the node sleeve.
 - 2 Slide the node out of the node sleeve.

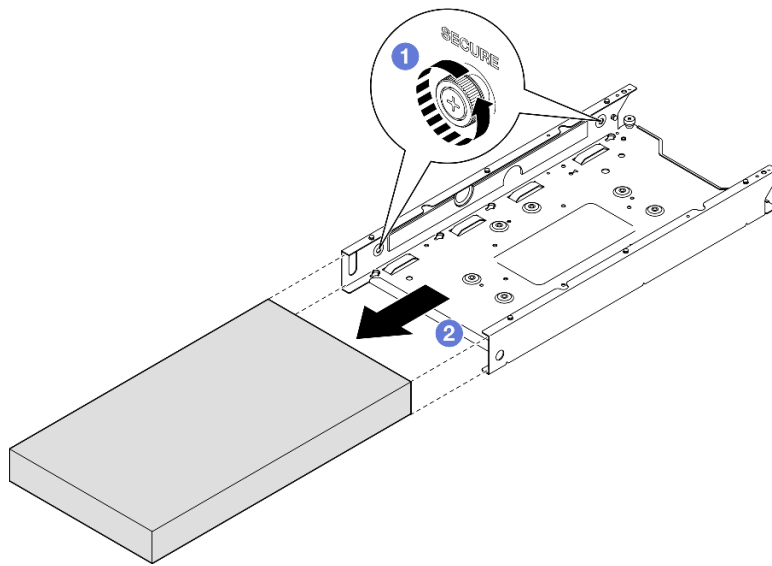


Figure 42. Removal of a node from a node sleeve

After this task is completed

- Carefully lay the node on a flat, static-protective surface.

Remove the node sleeve from the DIN rail

Procedure

Step 1. Remove the node sleeve from the DIN rail.

- a. ① Pull the node sleeve upward to disengage the two DIN-rail clips on the back of the node sleeve from the DIN rail.
- b. ② Pull the node sleeve away from the DIN rail..

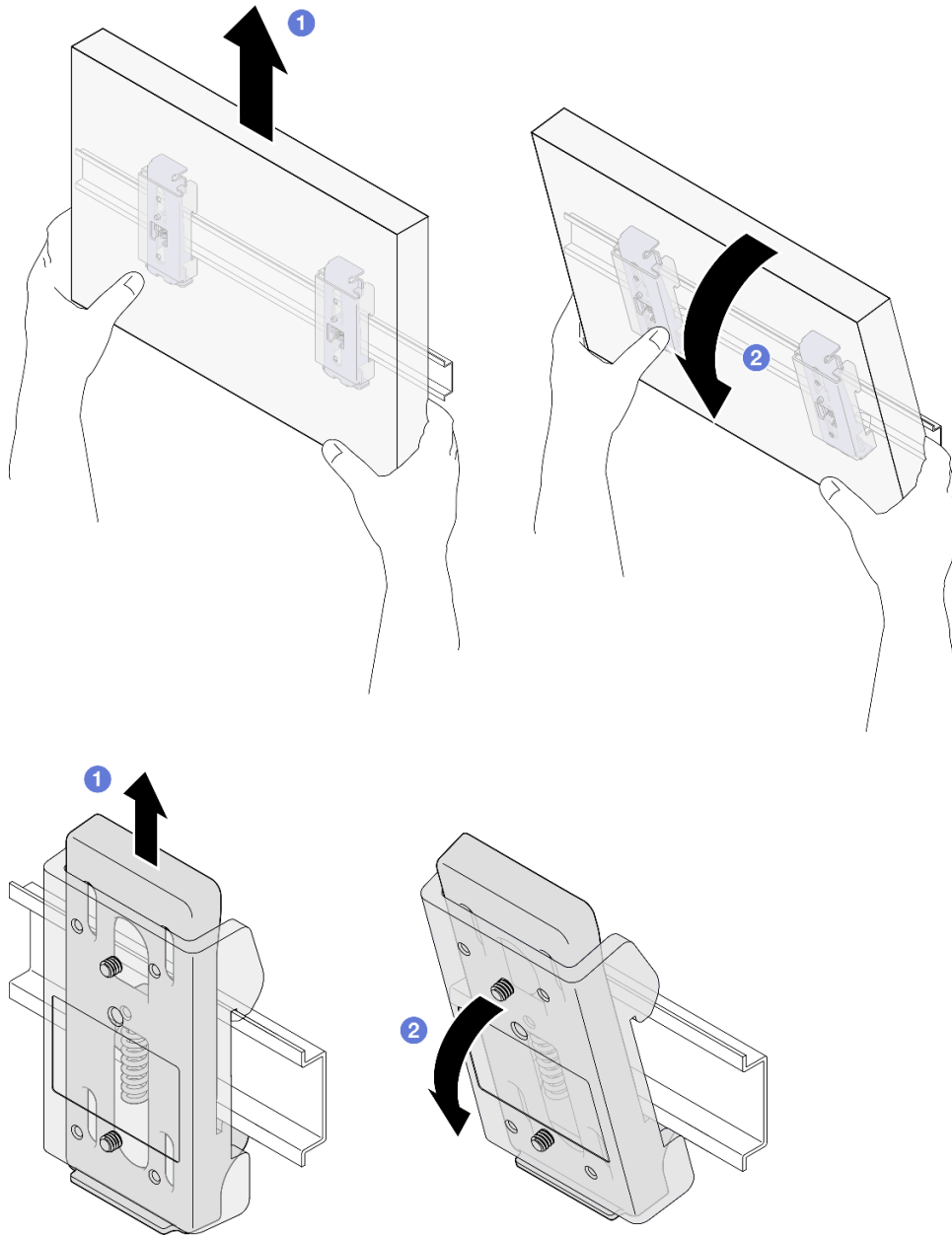


Figure 43. Removal of the node sleeve directly from the DIN rail

Step 2. Remove the four screws as shown to remove the two DIN-rail clips from the node sleeve.

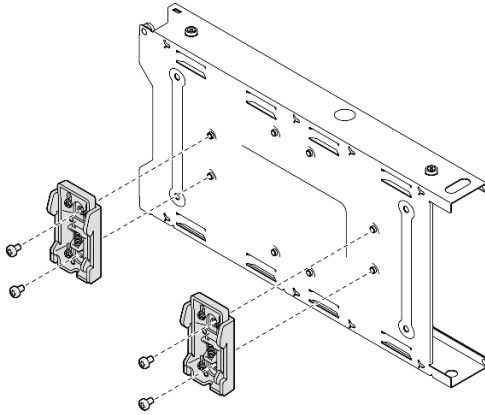


Figure 44. Removal of the DIN-rail clips from the node sleeve

After this task is completed

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

Install a node to the DIN rail

Follow instructions in this section to install a node into a node sleeve, as well as install a node sleeve to the DIN-rail.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Make sure that all components and cables are installed and seated correctly inside the node, except for the power cords and external cables, and that no loose tools or parts are left inside the node.
- Reserve **500 mm** of clearance in front of the node for the procedures of removal or installation.
- This section includes the following procedures:
 - [“Install the node sleeve to the DIN rail” on page 66](#)

- “Install a node into the node sleeve” on page 67

Install the node sleeve to the DIN rail

Procedure

Step 1. Make preparations for this task.

- Make sure that the node is not installed in the node sleeve.

Step 2. Install the two DIN-rail clips onto the node sleeve.

- Align the two DIN-rail clips to the node sleeve.
- Insert and tighten the four screws as shown.

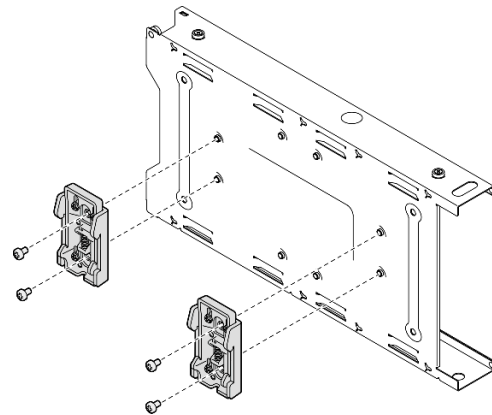


Figure 45. Installation of the DIN-rail clips to the node sleeve

Step 3. Install the node sleeve onto the DIN rail.

- Hook the DIN-rail clips on the back of the node sleeve onto the DIN rail at an angle as shown.

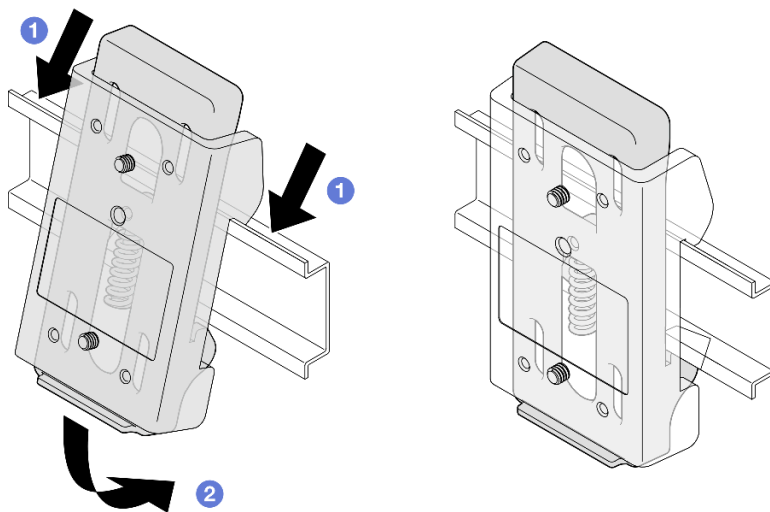


Figure 46. Installation of the DIN-rail clips to the DIN rail

- b. Push down the node sleeve at an angle as shown to ensure that the DIN-rail clips on the back of the node sleeve are securely seated.

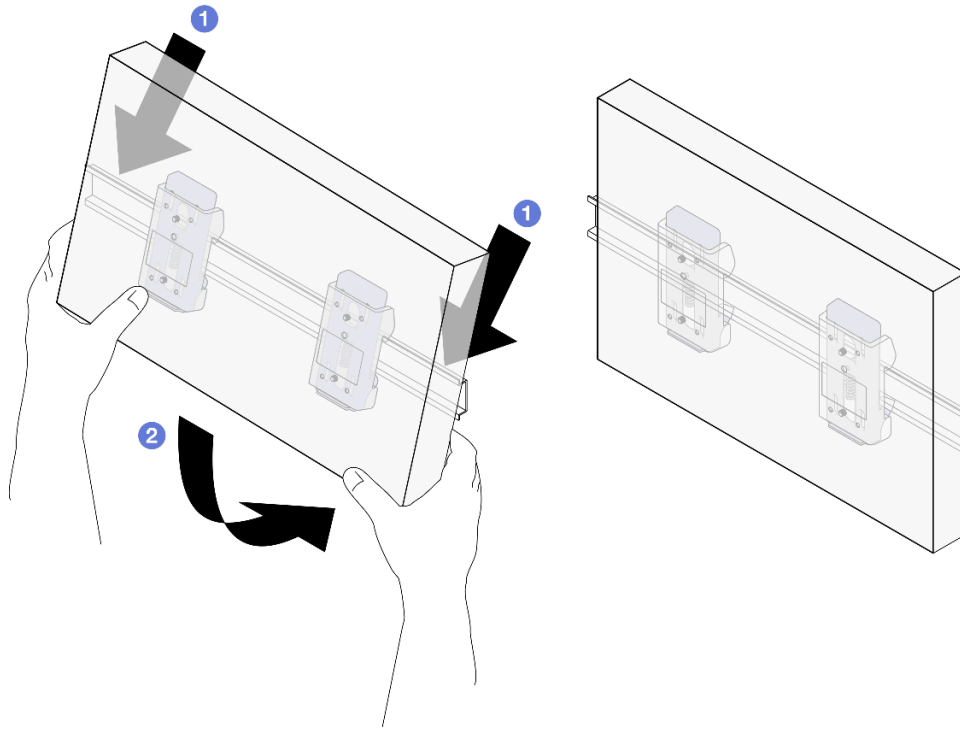


Figure 47. Installation of the node sleeve to the DIN rail

After this task is completed

- If necessary, proceed to install a node into the node sleeve (see [“Install a node into the node sleeve” on page 67](#)).

Install a node into the node sleeve

Note: Depending on the specific configuration, the node or security bezel might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- Make sure that the top cover is installed securely to the node (see [“Install the top cover” on page 194](#)).

Step 2. Install the node into the node sleeve.

- a. ① Align the node with the node sleeve; then, insert and slide the node into place.
- b. ② Tighten the two thumbscrews on the side of the node sleeve.

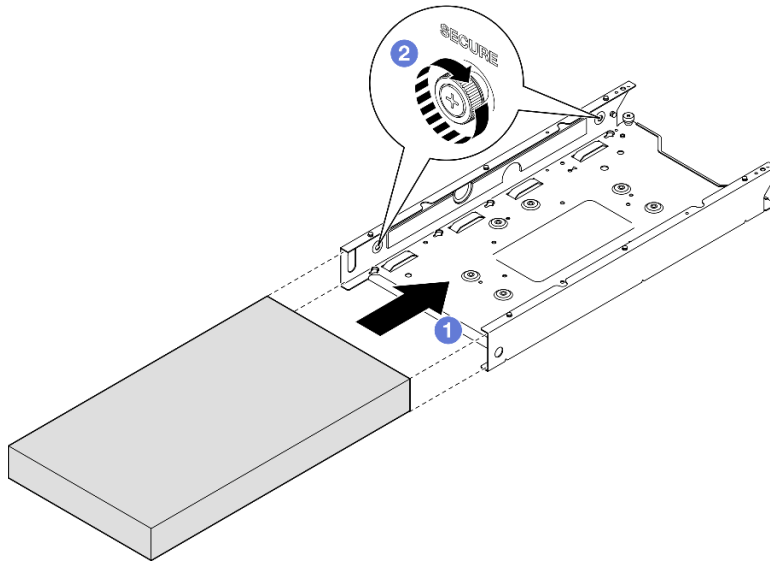


Figure 48. Installation of a node into a node sleeve

Step 3. (Optional) If necessary, install a security bezel to the node sleeve.

Notes:

- If necessary, do the following **BEFORE installing the security bezel:**
 - Connect the power cords and power on the server (see [“Power on the server”](#) on page 43).
 - Connect all the external cables.
 - When the security bezel is installed, the front operator panel and the USB Type-C connectors are not accessible.
- a. ① Insert the tab on the security bezel into the slot; then, pivot the security bezel inward until the other side of the bezel clicks into place.
 - b. ② Use the key to lock the security bezel.

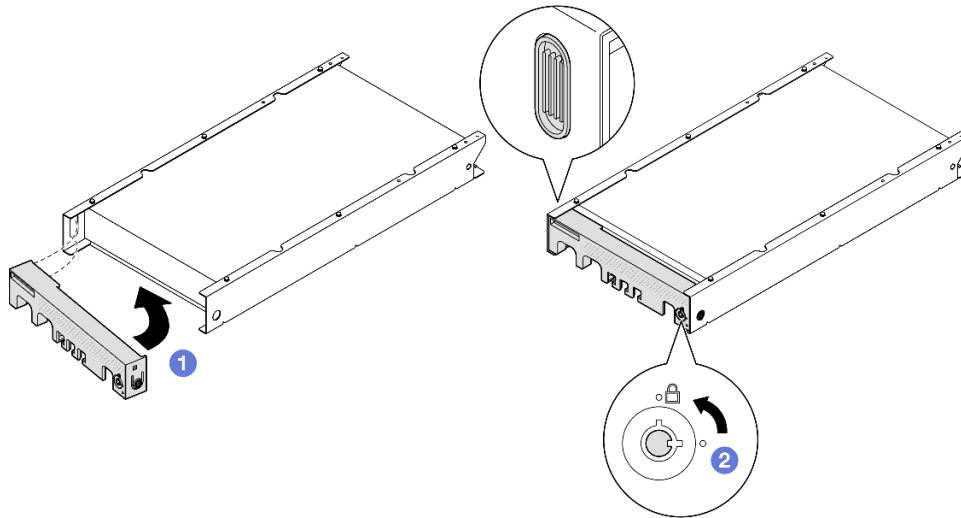


Figure 49. Installation of a security bezel onto a node sleeve

Step 4. (Optional) If necessary, install and lock any locking device that secures the node with the node sleeve, such as a Kensington lock.

After this task is completed

- Proceed to complete the parts replacement (see [“Complete the parts replacement” on page 195](#)).

Wall mount/ceiling mount configuration

Follow instructions in this section to remove or install a node from or to a node sleeve, or a node sleeve from or to the wall mount/ceiling mount.

Important:

- The maximal weight of the server and wall mount assembly is approximately 7.82 KG (17.25 lbs). For safe installation, the wall to mount the assembly must be able to support **4 times** of the assembly weight, 31.28 KG (68.97 lbs). If not, the surface must be reinforced to meet this standard.
- Avoid existing in-wall utilities, for example, plumbing, natural gas, or electrical input.

Remove the node from the wall or the ceiling

Follow instructions in this section to remove the node from the node sleeve, as well as the node sleeve from the wall mount/ceiling mount.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Reserve **500 mm** of clearance in front of the node for the procedures of removal or installation.
- This section includes the following procedures:
 - [“Remove the node from the node sleeve” on page 70](#)
 - [“Remove the node sleeve from the wall” on page 71](#)

Remove the node from the node sleeve**Notes:**

- If applicable, unlock any locking device that secures the node to the node sleeve, such as a Kensington lock.
- Depending on the specific configuration, the node or security bezel might look different from the illustrations in this section.

Procedure

- Step 1. If applicable, remove the security bezel from the node sleeve.
- 1 Use the key to unlock the security bezel.
 - 2 Press the release tab and pivot the security bezel and pivot the security bezel outward.
 - 3 Remove the security bezel from the node sleeve

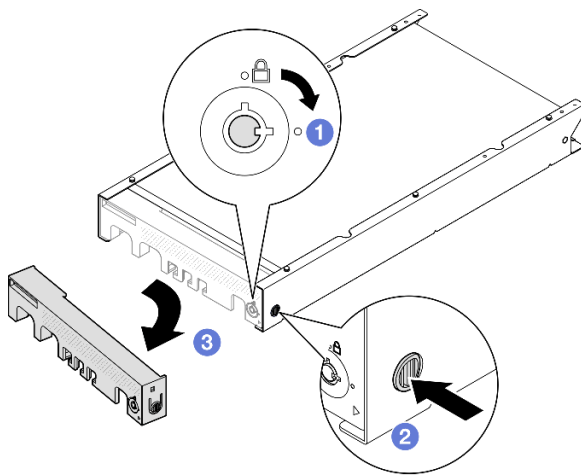


Figure 50. Removal of the security bezel from a node sleeve

- Step 2. **Power off the server and disconnect all external cables and power cords** (see [“Power off the server” on page 44](#)).

- Step 3. Remove the node from the node sleeve.
- a. ① Loosen the two thumbscrews on the side of the node sleeve.
 - b. ② Slide the node out of the node sleeve.

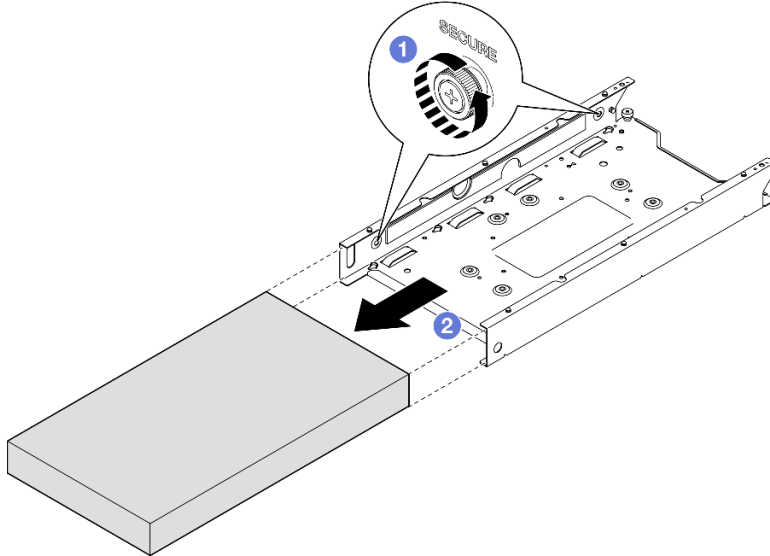


Figure 51. Removal of a node from a node sleeve

After this task is completed

- Carefully lay the node on a flat, static-protective surface.

Remove the node sleeve from the wall

Procedure

- Step 1. Remove the four screws as shown; then, remove the node sleeve from the wall.

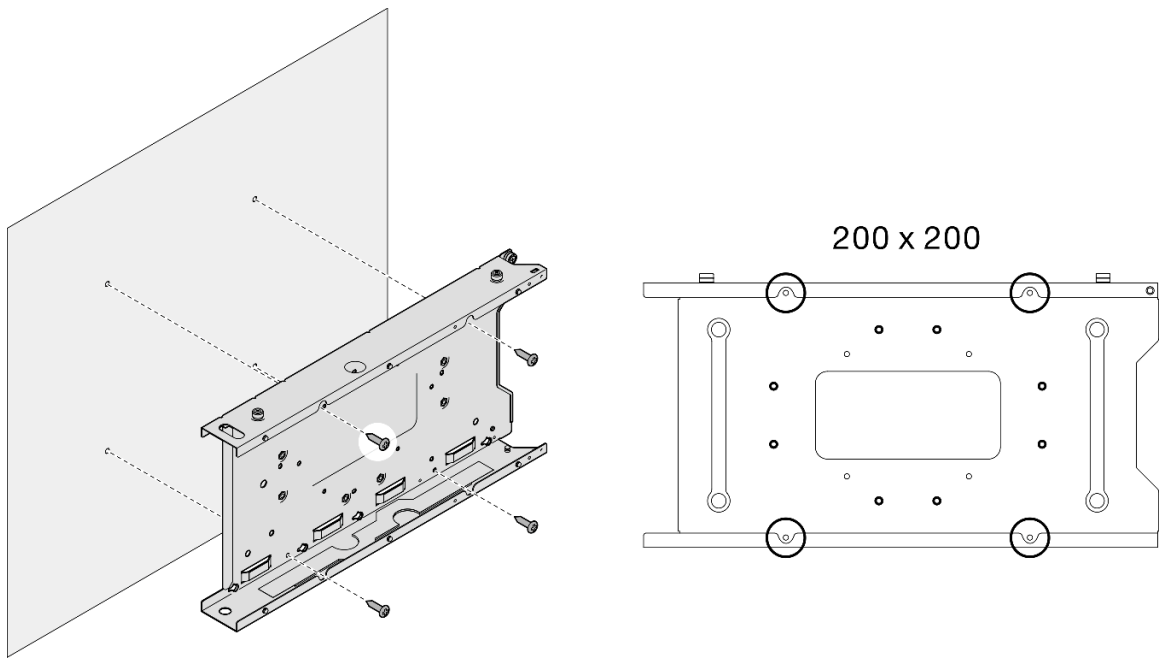


Figure 52. Removal of node sleeve directly from the wall

Step 2. (Optional) If necessary, remove the wall anchors from the wall.

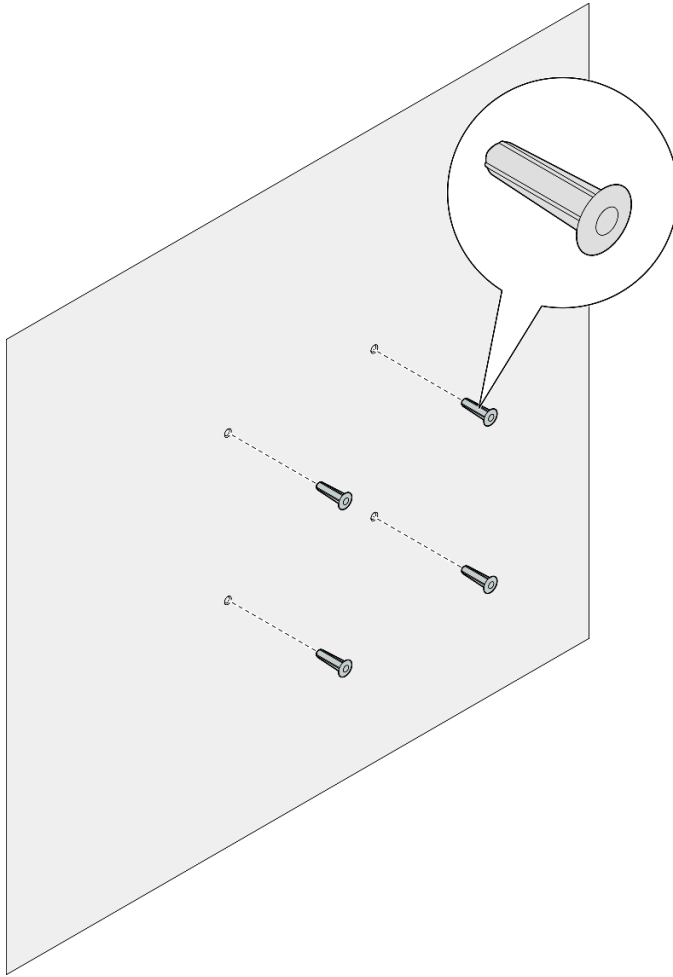


Figure 53. Removal of the wall anchors

After this task is completed

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

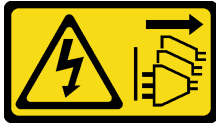
Install a node to the wall or the ceiling

Follow instructions in this section to install a node sleeve to the wall mount/ceiling mount, as well as install a node into a node sleeve.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Make sure that all components and cables are installed and seated correctly inside the node, except for the power cords and external cables, and that no loose tools or parts are left inside the node.
- Reserve **500 mm** of clearance in front of the node for the procedures of removal or installation.
- This section includes the following procedures:
 - [“Install the node sleeve to the wall” on page 74](#)
 - [“Install a node into the node sleeve” on page 77](#)

Install the node sleeve to the wall

Procedure

Step 1. Make preparations for this task.

- Make sure that the node is not installed in the node sleeve.

Step 2. Drill four holes on the wall for the node sleeve.

- a. Place the node sleeve on the wall to determine the location; then, use a pencil to mark the screw positions.
- b. Drill the four holes as marked.

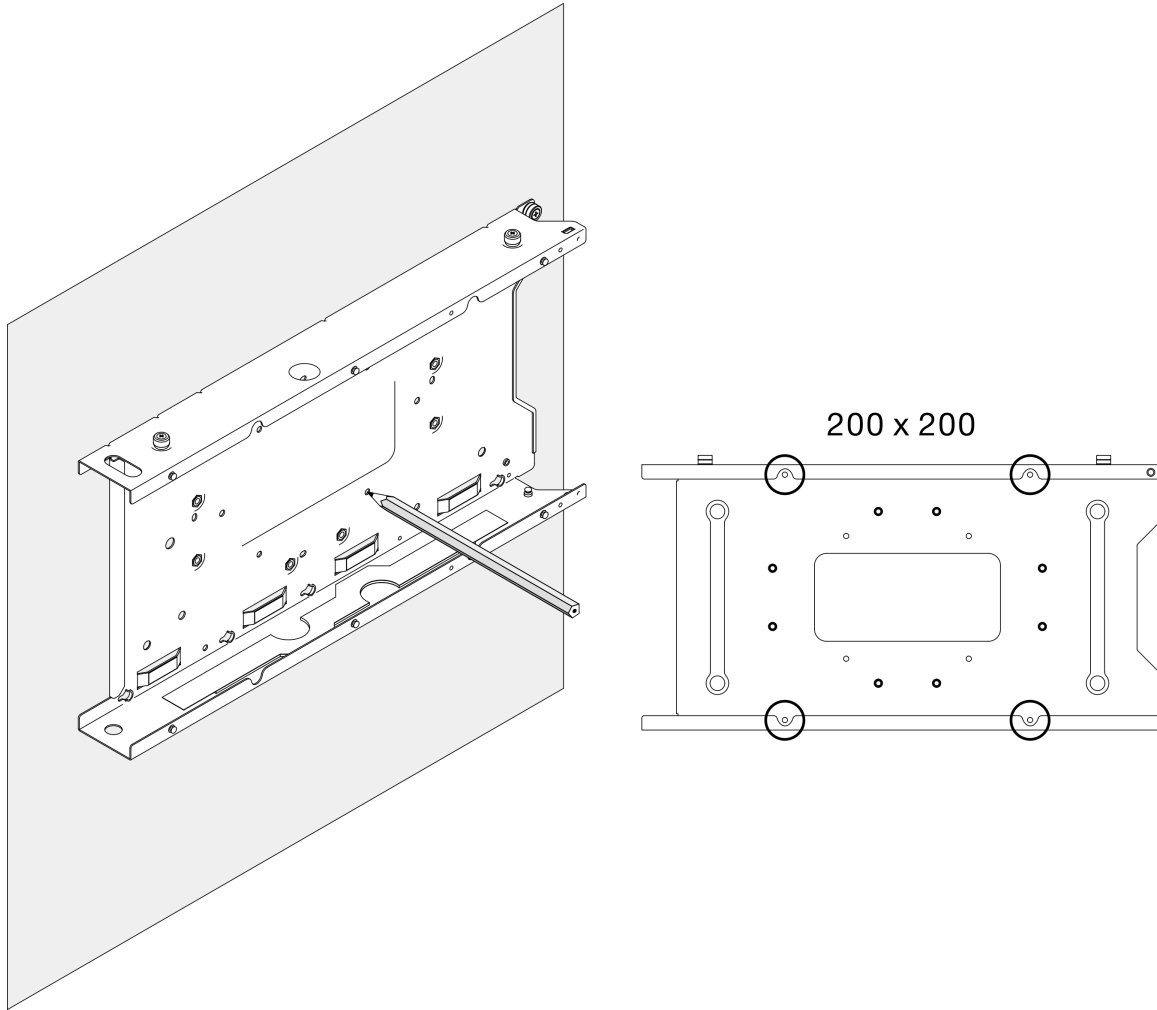


Figure 54. Drilling holes for the node sleeve

Step 3. If necessary, insert four wall anchors to the four drilled holes on the wall .

Notes:

- If the wall anchors are not needed in the configuration, skip this step and tighten the required screws in the holes.

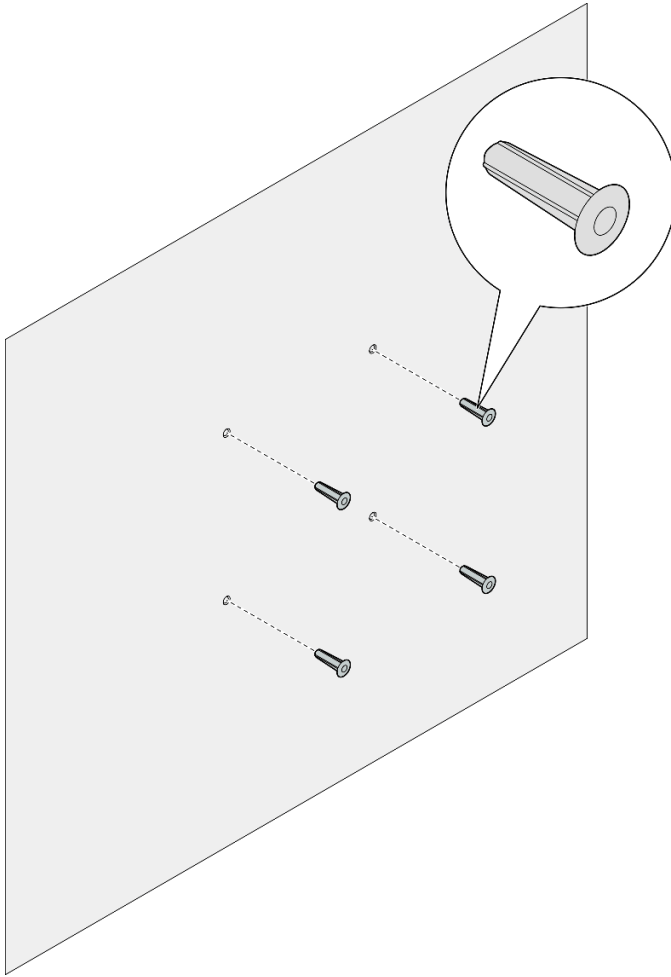


Figure 55. Installation of the wall anchors

- Step 4. Install the node sleeve onto the wall.
- a. Align the node sleeve with the **wall anchors** on the wall or **screw holes** on the wall.
 - b. Insert and tighten the four screws into the **wall anchors** or **screw holes** on the wall.

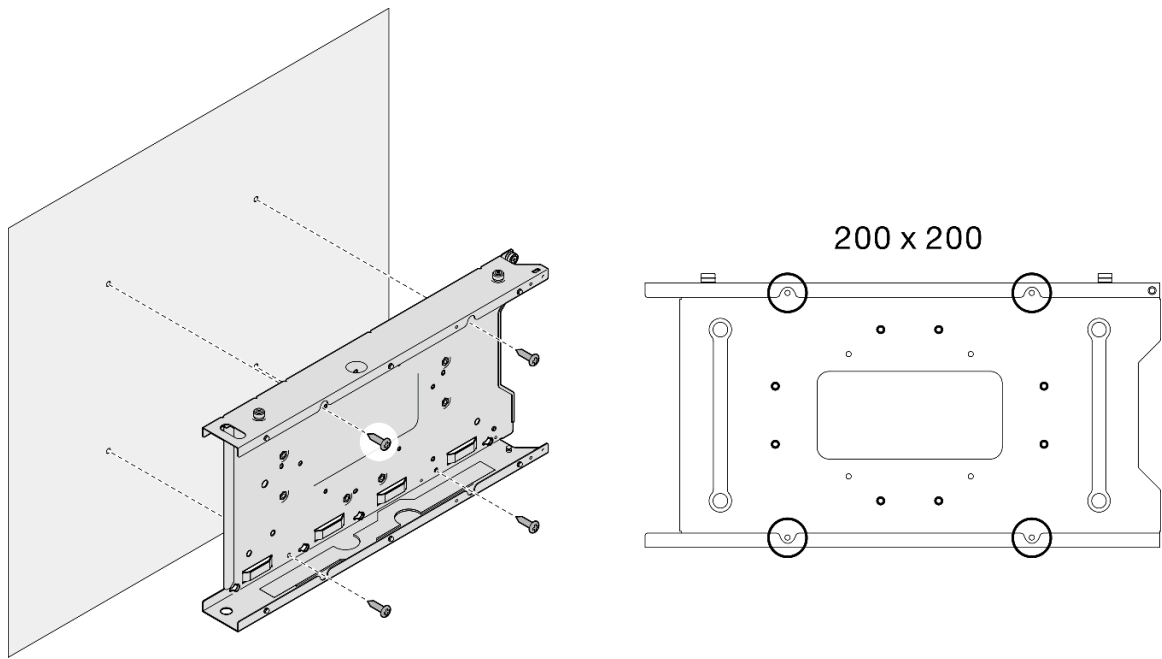


Figure 56. Installation of the node sleeve onto the wall

After this task is completed

- If necessary, proceed to install a node into the node sleeve (see [“Install a node into the node sleeve”](#) on page 77).

Install a node into the node sleeve

Note: Depending on the specific configuration, the node or security bezel might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- Make sure that the top cover is installed securely to the node (see [“Install the top cover”](#) on page 194).

Step 2. Install the node into the node sleeve.

- 1 Align the node with the node sleeve; then, insert and slide the node into place.
- 2 Tighten the two thumbscrews on the side of the node sleeve.

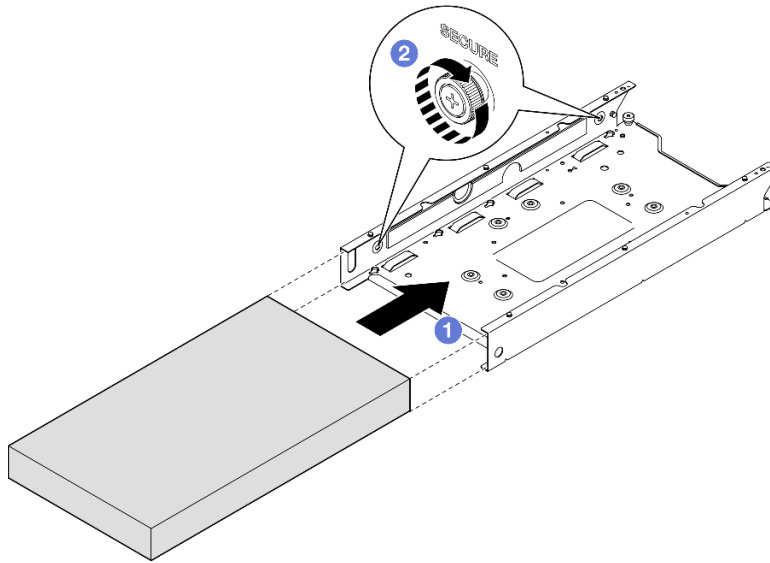


Figure 57. Installation of a node into a node sleeve

Step 3. (Optional) If necessary, install a security bezel to the node sleeve.

Notes:

- If necessary, do the following **BEFORE installing the security bezel:**
 - Connect the power cords and power on the server (see [“Power on the server”](#) on page 43).
 - Connect all the external cables.
 - When the security bezel is installed, the front operator panel and the USB Type-C connectors are not accessible.
- a. ① Insert the tab on the security bezel into the slot; then, pivot the security bezel inward until the other side of the bezel clicks into place.
 - b. ② Use the key to lock the security bezel.

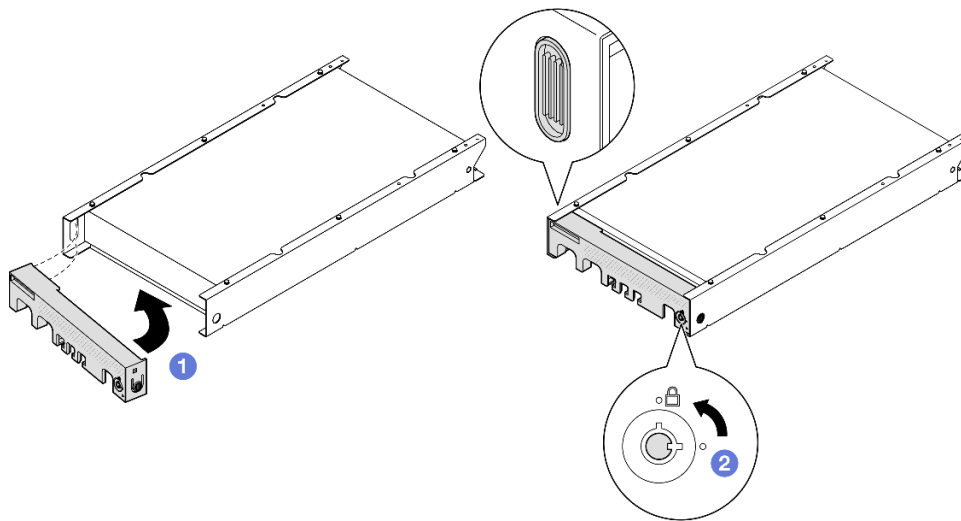


Figure 58. Installation of a security bezel onto a node sleeve

Step 4. (Optional) If necessary, install and lock any locking device that secures the node with the node sleeve, such as a Kensington lock.

Dust filter replacement

Follow instructions in this section to remove or install a dust filter. The server might or might not come with this component.

Notes: Depending on the mounting option, the node can stand alone in desktop mount or be installed in an enclosure or a node sleeve.

- For an enclosure, the dust filter is located in the **shipping bracket**.
- For a node sleeve, the dust filter is located in the **security bezel**, if applicable.
- For the removal or installation of a **shipping bracket** or **security bezel** from or to an enclosure or node sleeve, see [“Configuration guide” on page 45](#).

Important:

- Depending on the environment, check the status of the dust filter at least every 3 months to make sure it is functional.
- It is recommended to have a dust filter installed when the server is in operation.

Remove the dust filter

Follow instructions in this section to remove the dust filter from the shipping bracket of an enclosure or the security bezel of a node sleeve.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.

- Depending on the mounting option, the node can stand alone in desktop mount or be installed in an **enclosure** or a **node sleeve**.
 - For an enclosure, the dust filter is located in the **shipping bracket**.
 - See [“Remove the dust filter from the shipping bracket of an enclosure”](#) on page 80.
 - For a node sleeve, the dust filter is located in the **security bezel**, if applicable.
 - See [“Remove the dust filter from the security bezel of a node sleeve”](#) on page 81.
 - For the removal or installation of a **shipping bracket** or **security bezel** from or to an enclosure or node sleeve, see [“Configuration guide”](#) on page 45.

Important:

- Depending on the environment, check the status of the dust filter at least every 3 months to make sure it is functional.
- It is recommended to have a dust filter installed when the server is in operation.

Remove the dust filter from the shipping bracket of an enclosure

Notes:

- Depending on the specific configuration, the node, enclosure, or rails might look different from the illustrations in this section.
- For details of the rail options for the rack installation, see [“Rail Installation Guides”](#) on page 253.

Procedure

- Step 1. Make preparations for this task.
- a. Remove the shipping bracket from the enclosure (see [“Remove a node from a rack”](#) on page 46).
- Step 2. Remove the dust filter from the shipping bracket.

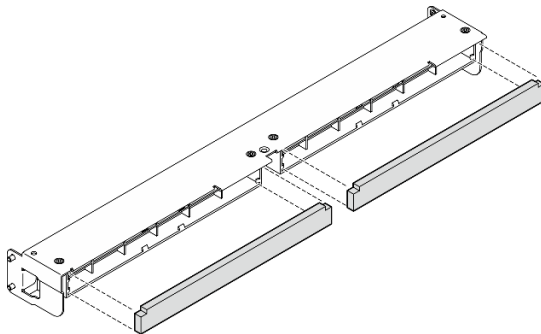


Figure 59. Removal of the dust filter from the shipping bracket

After this task is completed

- Install a replacement unit (see [“Install a dust filter”](#) on page 82).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Remove the dust filter from the security bezel of a node sleeve

Notes:

- Depending on the specific configuration, the node or security bezel might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- a. Remove the security bezel from the node sleeve (see [“Remove the node from the DIN rail”](#) on page 61 or [“Remove the node from the wall or the ceiling”](#) on page 69).

Step 2. Press the latch of the dust filter holder as shown; then, remove the dust filter holder from the security bezel.

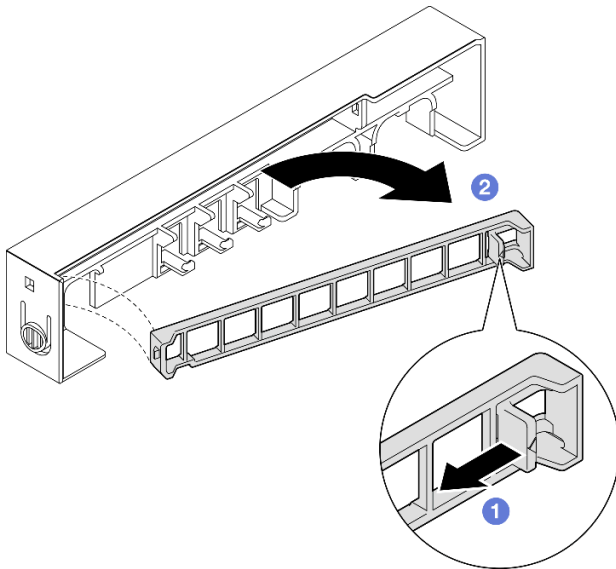


Figure 60. Removal of the dust filter holder

Step 3. Remove the dust filter from the security bezel.

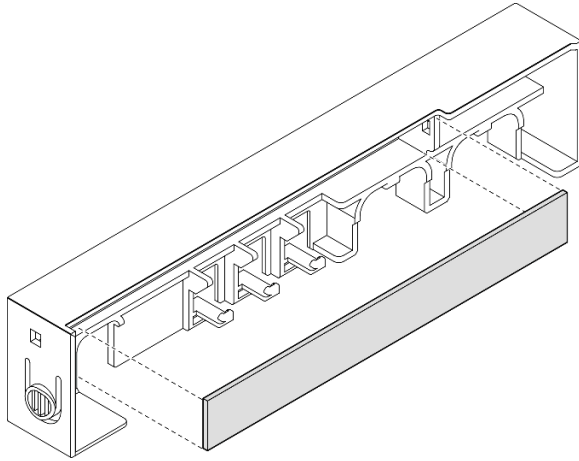


Figure 61. Removal of the dust filter from the security bezel

After this task is completed

- Install a replacement unit (see [“Install a dust filter” on page 82](#)).
- For information about removing or installing the node sleeve from or to the DIN-rail mount or wall mount/ceiling mount, see [“DIN-rail mount configuration” on page 61](#) or [“Wall mount/ceiling mount configuration” on page 69](#).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Install a dust filter

Follow instructions in this section to install a dust filter into the shipping bracket of an enclosure or the security bezel of a node sleeve.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.
- Depending on the mounting option, the node can stand alone in desktop mount or be installed in an **enclosure** or a **node sleeve**.
 - For an enclosure, the dust filter is located in the **shipping bracket**.
 - See [“Install a dust filter into the shipping bracket of an enclosure” on page 83](#).
 - For a node sleeve, the dust filter is located in the **security bezel**, if applicable.
 - See [“Install a dust filter into the security bezel of a node sleeve” on page 83](#).
 - For the removal or installation of a **shipping bracket** or **security bezel** from or to an enclosure or node sleeve, see [“Configuration guide” on page 45](#).

Important:

- Depending on the environment, check the status of the dust filter at least every 3 months to make sure it is functional.
- It is recommended to have a dust filter installed when the server is in operation.

Install a dust filter into the shipping bracket of an enclosure**Notes:**

- Depending on the specific configuration, the node, enclosure, or rails might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- a. Remove the shipping bracket from the enclosure (see [“Remove a node from a rack” on page 46](#)).

Step 2. Align the dust filter with the slot in the shipping bracket; then, insert the dust filter into place.

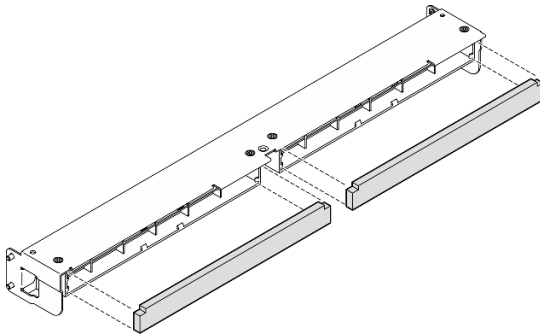


Figure 62. Installation of the dust filter into the shipping bracket

After this task is completed

- Install the shipping bracket back to the enclosure (see [“Install a node to the rack” on page 53](#)).

Install a dust filter into the security bezel of a node sleeve**Notes:**

- Depending on the specific configuration, the node or security bezel might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- a. Remove the security bezel from the node sleeve (see [“Remove the node from the DIN rail” on page 61](#) or [“Remove the node from the wall or the ceiling” on page 69](#)).

Step 2. Align the dust filter with the slot in the security bezel; then, insert the filter into place.

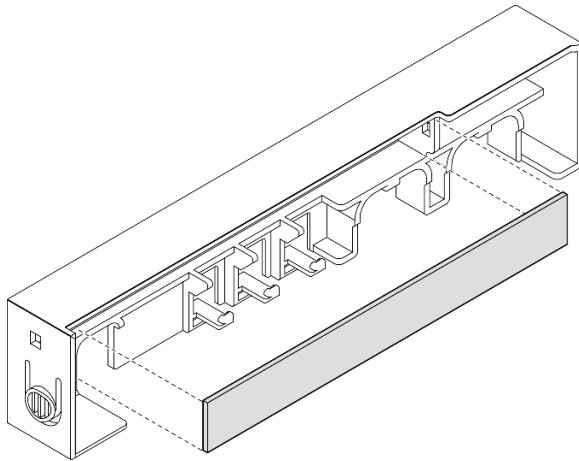


Figure 63. Installation of a dust filter to the security bezel

- Step 3. Install the dust filter holder onto the security bezel.
- a. 1 Insert one side of the dust filter holder into the slot.
 - b. 2 Pivot the dust filter holder inward and press the other side of the holder into place.

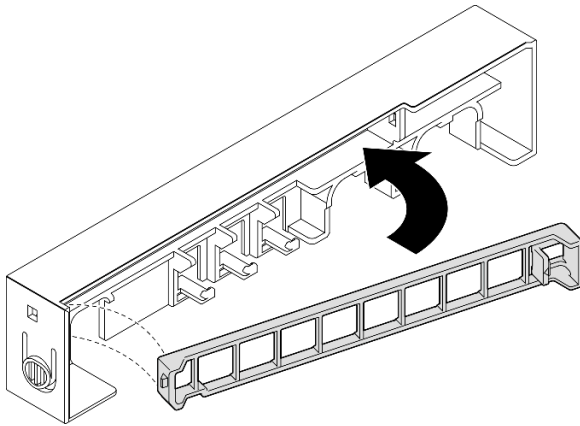


Figure 64. Installation of a dust filter holder

After this task is completed

- Install the security bezel back onto the node sleeve (see [“Install a node to the DIN rail” on page 65](#) or [“Install a node to the wall or the ceiling” on page 73](#)).

Power adapter replacement

Follow instructions in this section to remove or install power adapter(s). The server might or might not come with this component.

Notes: 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**.

When 300W external power adapter is installed, one of the following mounting options is supported with proper ambient temperature:

- Desktop mount at lower than 40°C
- Rack mount with ThinkEdge SE350 V2 1U2N Enclosure at lower than 30°C
- Rack mount with ThinkEdge SE350 V2 2U2N Enclosure at lower than 40°C

Remove a power adapter

Follow instructions in this section to remove power adapter(s).

About this task

To avoid potential danger, make sure to read and follow the safety information.

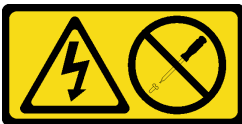
- **S002**



CAUTION:

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

- **S035**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).

Remove a power adapter from the enclosure

Procedure

Step 1. Remove the power cable cover from the power adapter support bracket of the enclosure.

- a. Remove the two screws from the power cable cover.
- b. Disengage and remove the cover from the enclosure.
 - For a **1U2N enclosure**: push the power cable cover slightly toward the front of the node; then, remove the cover.

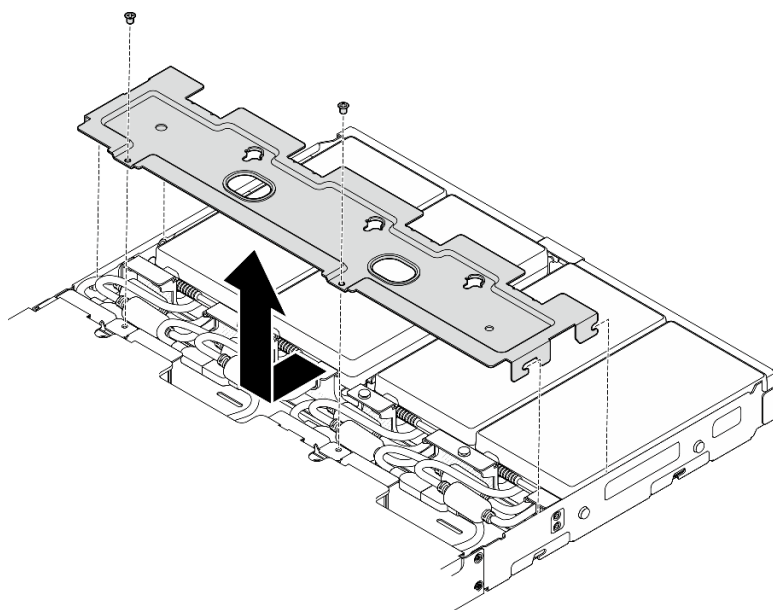


Figure 65. Removal of the power cable cover, 1U2N enclosure

- For an **2U2N enclosure**: enclosure: push the power cable cover slightly toward the rear of the node; then, remove the cover.

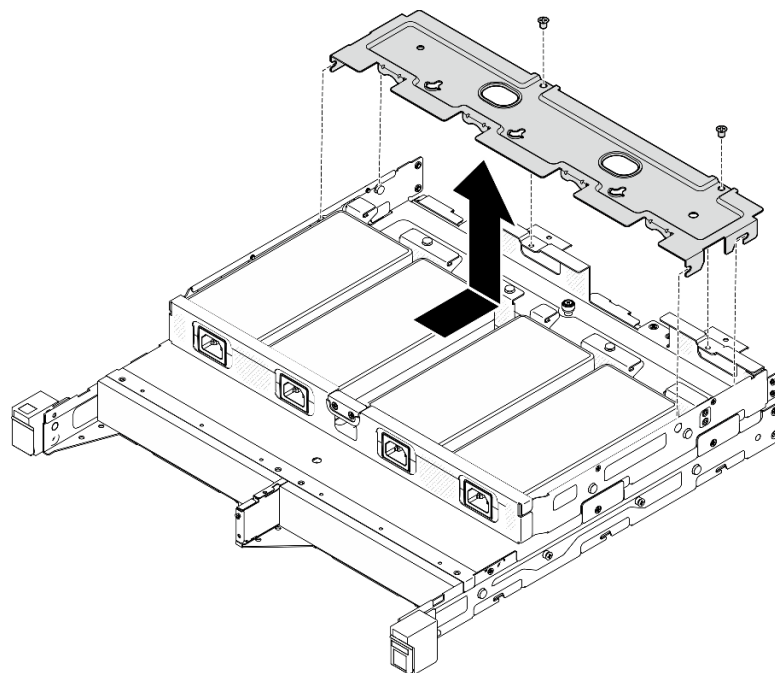


Figure 66. Removal of the power cable cover, 2U2N enclosure

Step 2. Carefully tilt the power adapter up and remove it from the enclosure.

1U2N enclosure

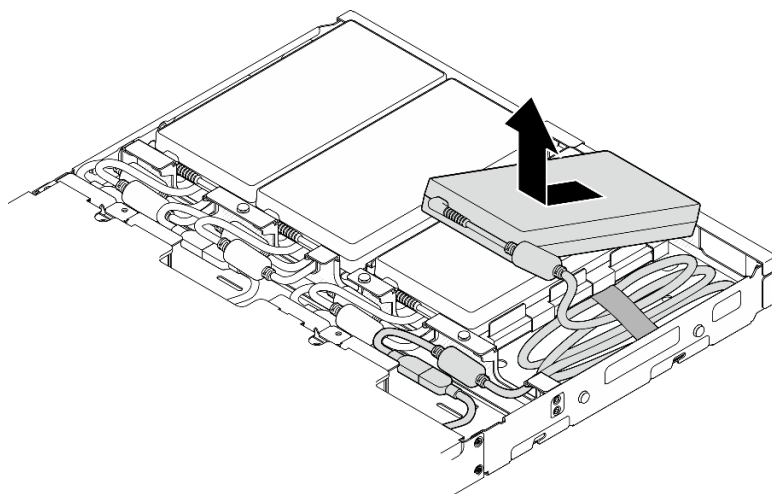


Figure 67. Removal of the power adapter, 1U2N enclosure

2U2N enclosure

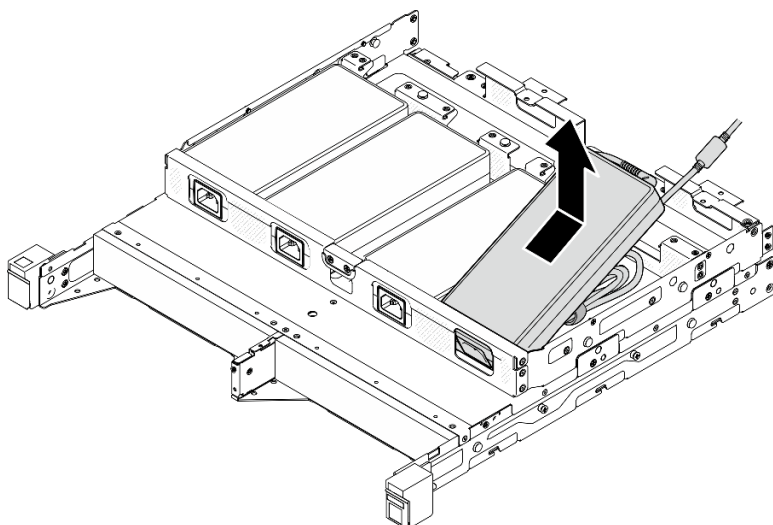


Figure 68. Removal of the power adapter, 2U2N enclosure

Step 3. Disconnect the power adapter cable from the bridge cable that connects the adapter and the node.

After this task is completed

- Install a replacement unit (see [“Install a power adapter” on page 88](#)).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Install a power adapter

Follow instructions in this section to install power adapter(s).

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.

Table 15. ThinkEdge 300W 230V/115V External Power Supply

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	%

Table 15. ThinkEdge 300W 230V/115V External Power Supply (continued)

Information published	Value and precision	Unit
Efficiency at low load (10 %)	88.07	%
No-load power consumption	0.15	W

CAUTION:

Power adapters to the node must be of the same brand, power rating, wattage or efficiency level.

Install a power adapter

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **S035**



CAUTION:

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

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Install a power adapter to the enclosure

Procedure

- Step 1. Connect the power adapter cable to the bridge cable that connects the adapter and the node.
- Step 2. Install the power adapter to the power adapter support bracket of the enclosure.

- a. ① Coil the power adapter cord until length is suitable; then, bundle the cord with the pre-attached velcro strap and place the bundle in the bracket.
- b. ② Insert the power adapter into the power adapter support bracket of the enclosure.

Important: To contain both the cord and adapter in the bracket, keep the cord bundle flat and loose.

- 1U2N enclosure

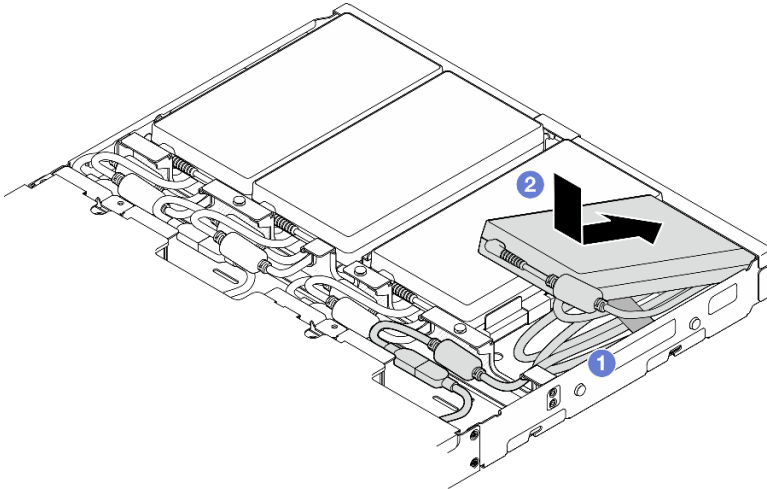


Figure 69. Installation of a power adapter into the support bracket, 1U2N enclosure

- 2U2N enclosure

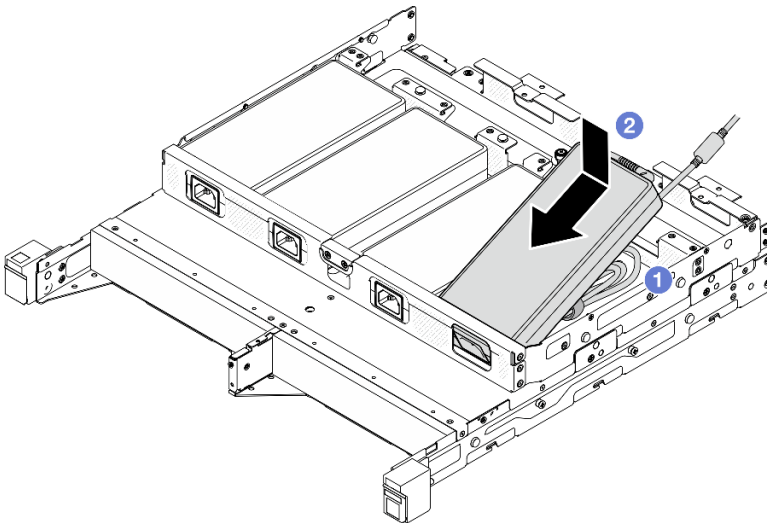


Figure 70. Installation of a power adapter into the support bracket, 2U2N enclosure

Step 3. Connect the power adapter cable to the node.

Step 4. Install the power cable cover onto the power adapter support bracket.

- a. For a **1U2N enclosure**: align the power cable cover with the slot; then, push the cover slightly toward the rear of the node until it clicks into place.

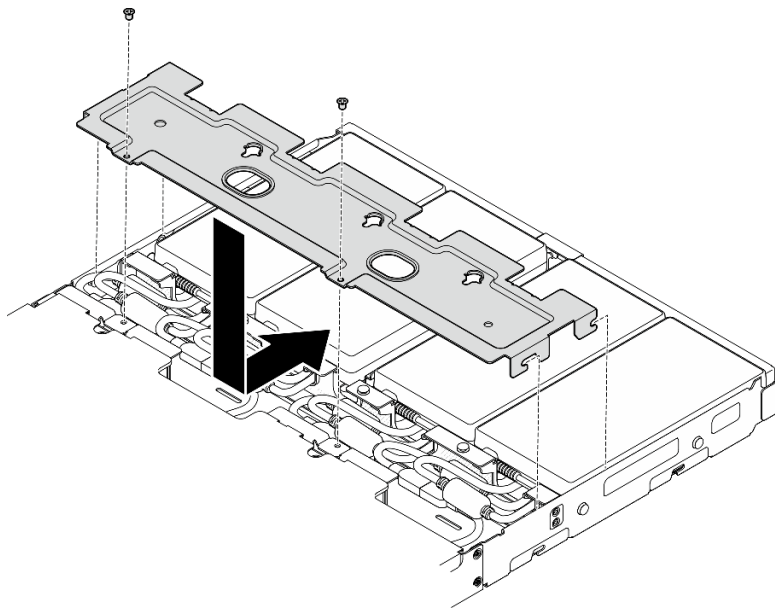


Figure 71. Installation of a power cable cover, 2U2N enclosure

- b. For a **2U2N enclosure**: align the power cable cover with the slot; then, push the cover slightly toward the front of the node until it clicks into place.

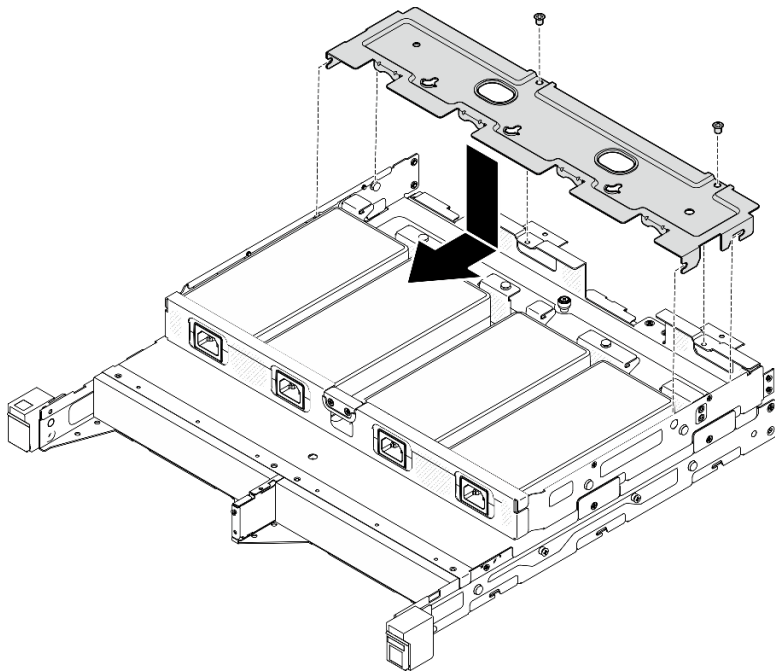


Figure 72. Installation of a power cable cover, 2U2N enclosure

- c. Tighten the two screws to secure the power cable cover.

After this task is completed

- Reconnect all power cords and all external cables.
- Connect the power cords and power on the server (see [“Power on the server”](#) on page 43).

- For the removal or installation of the enclosure from or to the rack, see [“Rack mount configuration” on page 45](#)).
- For details of the rail options for the rack installation, see [“Rail Installation Guides” on page 253](#).

Node component replacement

Follow instructions in this section to remove or install components from or to the node.

Air baffle replacement

Follow instructions in this section to remove or install an air baffle.

Remove the air baffle

Follow instructions in this section to remove the air baffle.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **S012**



CAUTION:

Hot surface nearby.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.

Procedure

Step 1. Make preparations for this task.

- a. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see [“Remove the top cover” on page 192](#)).

Step 2. Remove the air baffle.

CAUTION:

Hazardous moving parts. Keep fingers and other body parts away.



- a. **1** Pinch both sides of the air baffle; then, disengage the air baffle from its slot.
- b. **2** Lift up the air baffle to remove it from the node.

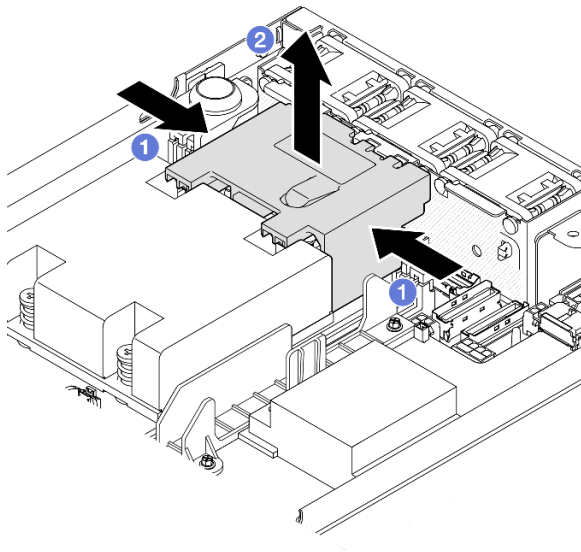


Figure 73. Removal of the air baffle

Attention: For proper cooling and airflow, reinstall the air baffle before you turn on the server. Operating the server without the air baffle might damage server components.

After this task is completed

- Make sure to install the air baffle back after finishing component replacement (see [“Install an air baffle” on page 94](#)).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=BDKGbi4RC8w>

Install an air baffle

Follow instructions in this section to install an air baffle.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **S012**



CAUTION:

Hot surface nearby.

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Align the air baffle with its slot between the fan module and processor-heat-sink module.

CAUTION:

Hazardous moving parts. Keep fingers and other body parts away.

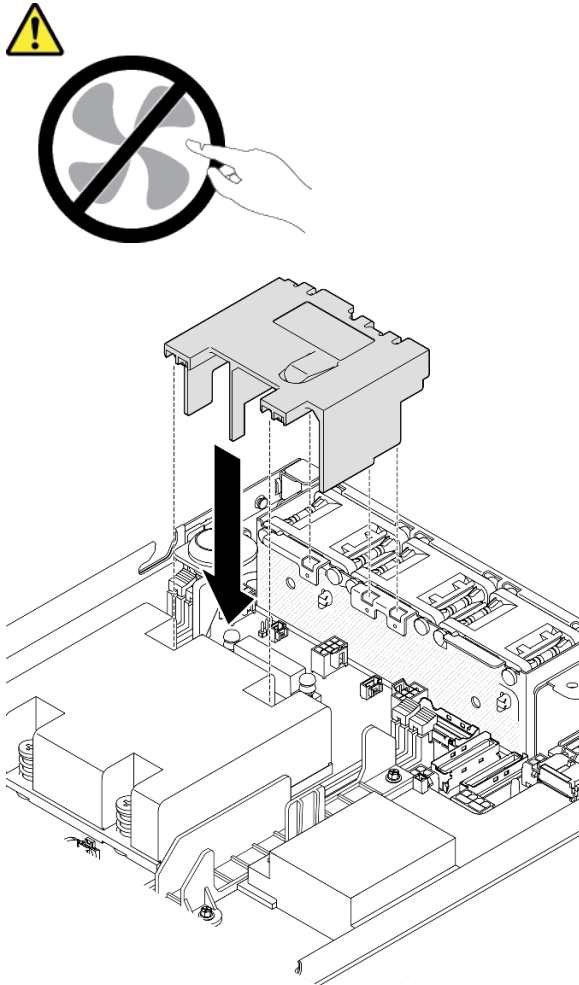


Figure 74. Installation of an air baffle

Step 2. Lower the air baffle down into the slot; then, press down the air baffle until it is securely seated.

After this task is completed

- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).

Demo video

https://www.youtube.com/watch?v=e_FvSSUt2R8

CMOS battery (CR2032) replacement

Follow instructions in this section to remove or install a CMOS battery.

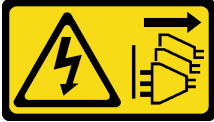
Remove a CMOS battery (CR2032)

Follow instructions in this section to remove a CMOS battery.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **S004**



CAUTION:

When replacing the lithium battery, use only Lenovo specified part number or an equivalent type of battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

- **S005**



CAUTION:

The battery is a lithium ion battery. To avoid possible explosion, do not burn the battery. Exchange it only with the approved part. Recycle or discard the battery as instructed by local regulations.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.

- Remove the shipping bracket or security bezel, if applicable (see “[Configuration guide](#)” on page 45); then, **power off the server** and disconnect the power cords (see “[Power off the server](#)” on page 44).
- Remove the node from the enclosure or node sleeve, if applicable (see “[Configuration guide](#)” on page 45); then, carefully lay the node on a flat, static-protective surface.
- Consider the following information when replacing a CMOS battery:
 - Lenovo has designed this product with user safety in mind. The lithium battery must be handled correctly to avoid potential danger. Make sure to follow instructions in this topic while replacing the battery.
 - The CMOS battery must be replaced with another unit of the same type (CR2032).
 - For high temperature operation environment, it is recommended to use CR2032HR instead.
 - After replacement is completed, it is required to reconfigure the server and reset the system date and time.
 - Dispose of the battery as required by local ordinances or regulations.

Procedure

Step 1. Make preparations for this task.

- If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see “[Remove the top cover](#)” on page 192).
- Locate the CMOS battery slots on the system board and identify the battery to be removed.

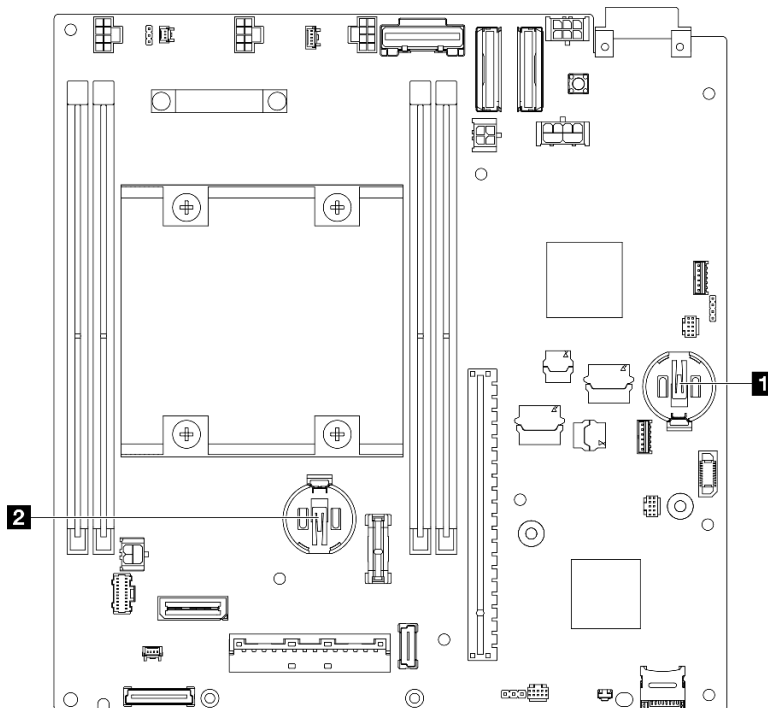


Figure 75. Locations of CMOS battery slots

1 3V system battery

2 3V security battery

Note:

If the Security battery for ThinkShield is replaced, ThinkEdge SE350 V2 with Security Pack will enter lockdown mode. Reactivation is required to unlock the system (see “[Activate or unlock the system](#)” in the *User Guide* or *System Configuration Guide*).

- To remove the CMOS battery from Slot 1, first remove the power module board (see “[Remove the power module board \(PMB\)](#)” on page 154).
- To remove the CMOS battery from Slot 2, first disconnect the drive cables and remove the drive cage (see “[Remove the drive cage](#)” on page 103).

Step 2. Remove the CMOS battery from the socket.

- 1 Gently press the clip in the direction as shown.
- 2 Carefully tilt and lift the CMOS battery out of the socket.

Attention:

- Avoid excessive force on the CMOS battery, as it might damage the socket on the system board and result in system board replacement.



Figure 76. Removal of a CMOS battery

After this task is completed

- Install a replacement unit (see “[Install a CMOS battery \(CR2032\)](#)” on page 98).
- Dispose of the CMOS battery as required by local ordinances or regulations.

Demo video

<https://www.youtube.com/watch?v=ZhxvfROI9BU>

Install a CMOS battery (CR2032)

Follow instructions in this section to install a CMOS battery (CR2032).

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **S004**



CAUTION:

When replacing the lithium battery, use only Lenovo specified part number or an equivalent type of battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

- **S005**



CAUTION:

The battery is a lithium ion battery. To avoid possible explosion, do not burn the battery. Exchange it only with the approved part. Recycle or discard the battery as instructed by local regulations.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.
- To avoid potential damage, **do not** let the CMOS battery contact any metal surface.
- Make sure that all server power cords are disconnected from their power sources before performing this procedure.
- Consider the following information when replacing a CMOS battery:
 - Lenovo has designed this product with user safety in mind. The lithium battery must be handled correctly to avoid potential danger. Make sure to follow instructions in this topic while replacing the battery.
 - The CMOS battery must be replaced with another unit of the same type (CR2032).
 - For high temperature operation environment, it is recommended to use CR2032HR instead.
 - After replacement is completed, it is required to reconfigure the server and reset the system date and time.
 - Dispose of the battery as required by local ordinances or regulations.

Procedure

Step 1. Make preparations for this task.

- a. Locate the CMOS battery slots on the system board and identify the slot to be installed with a battery.

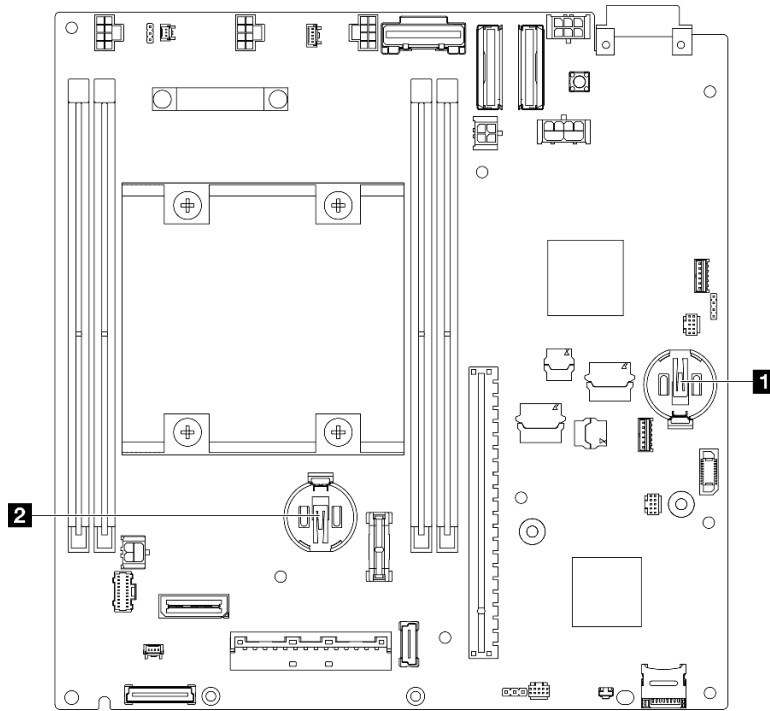


Figure 77. Locations of CMOS battery slots

1 3V system battery

2 3V security battery

Note:

If the Security battery for ThinkShield is replaced, ThinkEdge SE350 V2 with Security Pack will enter lockdown mode. Reactivation is required to unlock the system (see “Activate or unlock the system” in the *User Guide* or *System Configuration Guide*).

Step 2. Install a CMOS battery into the socket.

Note: Make sure that the positive (+) side of the CMOS battery faces upward.

- a. **1** Pivot the CMOS battery to insert it into the socket. Make sure that the battery goes tight to the metal clip.
- b. **2** Gently press the battery straight down until it clicks in place.

Attention:

- Avoid excessive force on the CMOS battery, as it might damage the socket on the system board and result in system board replacement.

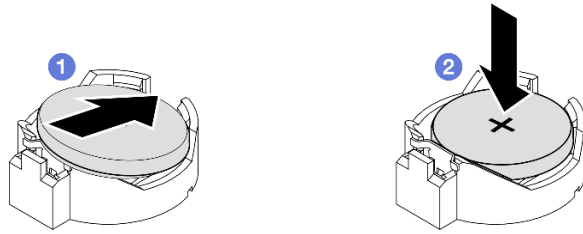


Figure 78. Installation of a CMOS battery

After this task is completed

- If necessary, reinstall the drive cage or power module board into the node and reconnect the cables (see “Install a drive cage” on page 110 or “Install a power module board (PMB)” on page 155).
- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).
- If the Security battery for ThinkShield is replaced, ThinkEdge SE350 V2 with Security Pack will enter lockdown mode. Reactivation is required to unlock the system (see “Activate or unlock the system” in the *User Guide* or *System Configuration Guide*).
- Power on the server; then, reset date, time, and all the passwords.

Demo video

<https://www.youtube.com/watch?v=08Vn5VDmpYE>

Drive and backplane replacement

Follow instructions in this section to remove or install the components of a drive assembly, including the hot-swap drives, drive cage, and drive backplane(s).

Notes:

- ThinkEdge SE350 V2 supports two types of drive assemblies:
 - **7mm drive assembly:**
 - This assembly includes up to four 7mm 2.5-inch hot-swap SATA or NVMe drives or drive bay fillers, one 7mm drive cage, and two backplanes.
 - **15mm drive assembly:**
 - This assembly includes up to two 15mm hot-swap NVMe 2.5-inch drives or drive bay fillers, one 15mm drive cage, and one backplane.
- Information in this section includes the removal and installation of a 2.5-inch hot-swap drive from and into a drive bay; removal and installation of the backplane(s) from and onto the drive cage; and, removal and installation of the drive cage from and to the node.

Remove a hot-swap drive

Follow instructions in this section to remove a hot-swap drive.

About this task

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- To make sure that there is adequate system cooling, do not operate the server for more than two minutes without either a drive or a filler installed in each bay.
- If one or more NVMe solid-state drives are to be removed, it is recommended to disable them beforehand via the operating system.
- Before removing or making changes to drives, drive controllers (including controllers that are integrated on the system board), drive backplanes or drive cables, make sure to back up all important data that is stored on drives.
- Make sure to have the drive bay fillers available if some drive bays will be left empty after the removal.

Notes:

- Depending on the specific configuration, the drives, drive bay fillers, or drive cage might look different from the illustrations in this section.

Important:

- To avoid damage to the drive connectors when removing or installing a hot-swap drive, make sure that
 - **the node is securely placed within an enclosure**; or that
 - **the top cover is in place and fully closed**, when the node is not installed in an enclosure.

Procedure

Step 1. Make preparations for this task.

- a. If applicable, remove the shipping bracket from the enclosure or security bezel from the node sleeve (see [“Configuration guide” on page 45](#)).
- b. Identify the drive to be removed.

Step 2. Remove the drive from the drive bay.

- a. ① Slide the latch to unlock the drive handle.
- b. ② Pull the handle to open it.
- c. ③ Slide the drive out of the drive bay.

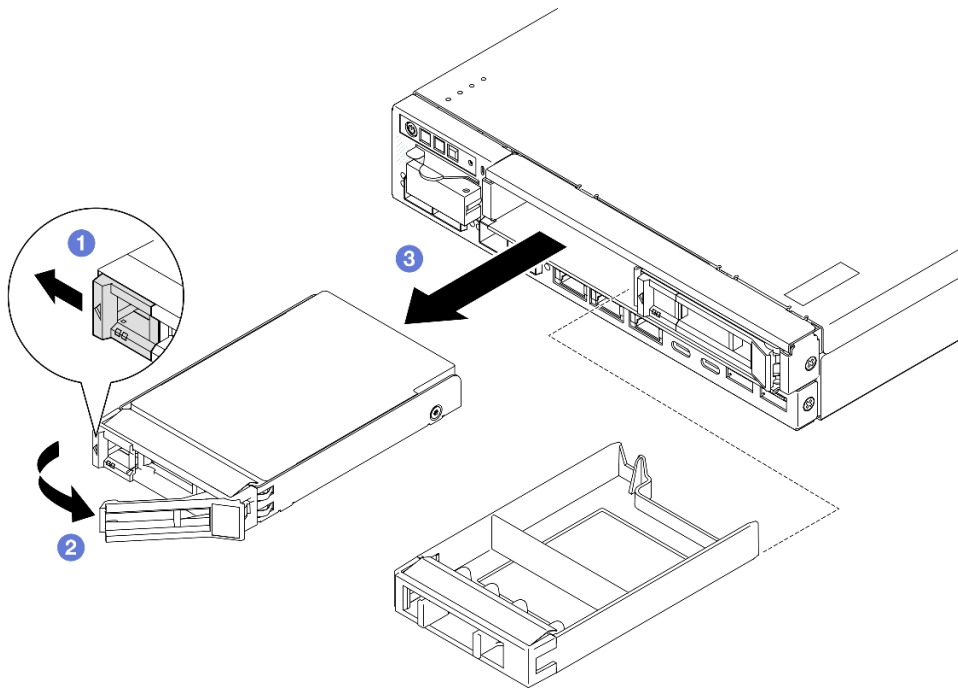


Figure 79. Removal of a hot-swap drive

After this task is completed

- Install either a replacement drive (see “[Install a hot-swap drive](#)” on page 112) or a drive bay filler into the drive bay.
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=huDZmqU6pHQ>

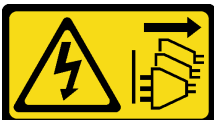
Remove the drive cage

Follow instructions in this section to remove the drive cage from the node.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.

Note: Depending on the specific configuration, the drives, drive bay fillers, or drive cage might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- a. Remove all drives and drive bay fillers (see [“Remove a hot-swap drive” on page 101](#)) and disconnect all cables.
- b. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see [“Remove the top cover” on page 192](#)).
- c. Disconnect all the cables from the drive backplane(s) (see [“Cable routing for the hot-swap drives” on page 199](#)).

Step 2. Disengage and remove the drive cage.

- a. Remove the four screws as shown to disengage the drive cage.

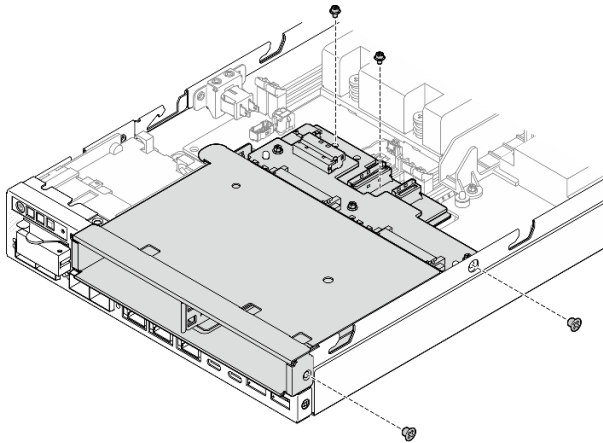


Figure 80. Removal of the drive cage screws

- b. Lift up the drive cage to remove it from the node.

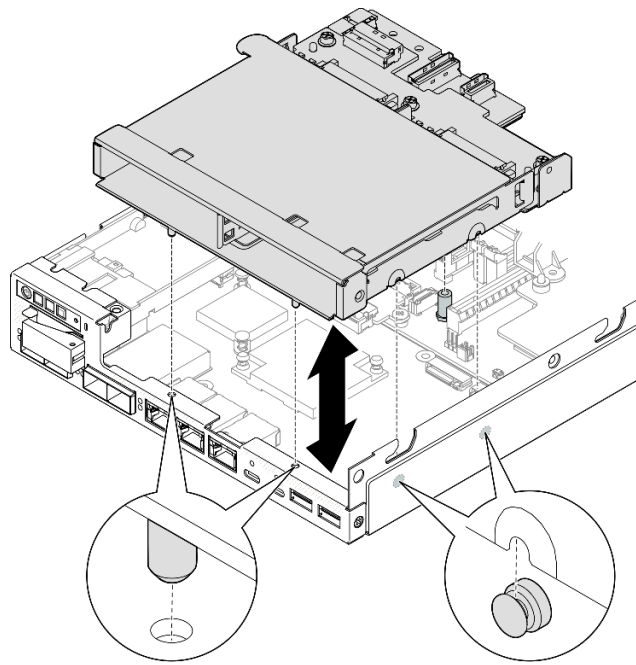


Figure 81. Removal of the drive cage

After this task is completed

- Lay the drive cage on a flat, static-protective surface.
- Install a replacement unit (see “Install a drive cage” on page 110).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=zHUIbXBqW7s>

Remove a drive backplane

Follow instructions in this section to remove a drive backplane from the drive cage.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.

Notes:

- Depending on the specific configuration, there may be one or two backplanes for the drives:
 - For a 7mm drive assembly, there are two backplanes. Drive backplane 2 (upper) must be removed before Drive backplane 1 (lower) (see [Step 2 Drive backplane 2 \(upper\) on page 106](#)).
 - For a 15mm drive assembly, there is only one backplane (Drive backplane 1 (lower); see [Step 3 Drive backplane 1 \(lower\) on page 107](#)).
- Depending on the specific configuration, the drives, drive bay fillers, or drive cage might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- a. Remove all the installed hot-swap drives and drive bay fillers from the drive cage; then, set them aside on a static-protective surface (see [“Remove a hot-swap drive” on page 101](#)).
- b. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see [“Remove the top cover” on page 192](#)).
- c. Disconnect all the cables from the drive backplane(s); then, remove the drive cage from the node (see [“Remove the drive cage” on page 103](#)).
- d. Lay the drive cage on a flat, static-protective surface.

Step 2. Remove Drive backplane 2 (upper).

- a. Remove the 3 screws that secure Drive-backplane 2.
- b. Disengage and remove Drive-backplane 2.

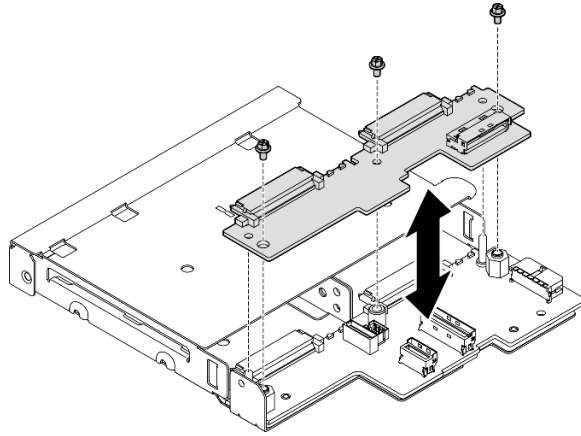


Figure 82. Removal of Drive backplane 2 (upper)

- Step 3. Remove Drive backplane 1 (lower) from the drive cage.
- Remove the two hex standoffs that secure Drive-backplane 1.
 - Disengage and remove Drive-backplane 1.

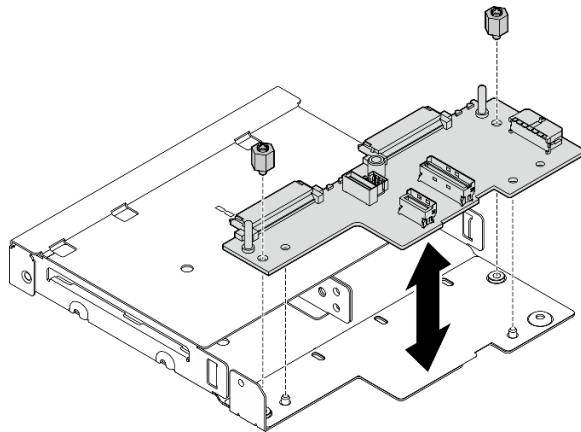


Figure 83. Removal of the Drive backplane 1 (lower)

Note: The hex standoffs are designed to be used with a common Phillips screwdriver or flat-head screwdriver.

After this task is completed

- Install a replacement unit (see “Install a drive backplane” on page 108).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=zHUIbXBqW7s>

Install a drive backplane

Follow instructions in this section to install a drive backplane to the drive cage.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Notes:

- Depending on the specific configuration, there may be one or two backplanes for the drives:
 - For a 7mm drive assembly, there are two backplanes. Drive backplane 1 (lower) must be installed before Drive backplane 2 (upper).
 - For a 15mm drive assembly, there is only one backplane to install (Drive backplane 1 (lower)).
- Depending on the specific configuration, the drives, drive bay fillers, or drive cage might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- a. Lay the drive cage on a flat, static-protective surface.

Step 2. Install Drive backplane 1 (lower) onto the drive cage.

- a. Align Drive backplane 1 (lower) with the guide pins, screw holes, and edges of the drive cage; then, place the backplane down and engage it into place.
- b. Tighten the two hex standoffs to secure Backplane 1 to the drive cage.

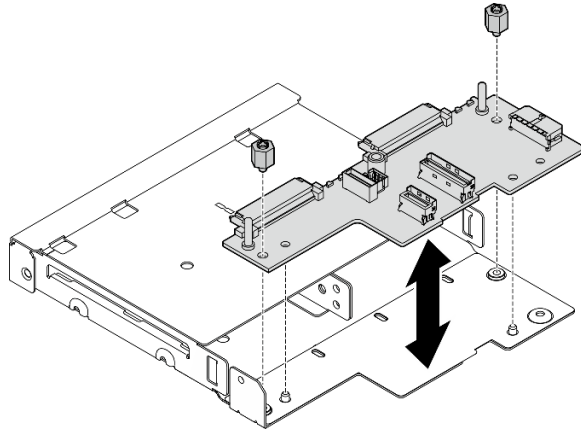


Figure 84. Installation of Drive-backplane 1

Note: The hex standoffs are designed to be used with a common Phillips screwdriver or flat-head screwdriver.

Step 3. Install Drive backplane 2 (upper).

- a. Align Drive backplane 2 (upper) with the screw holes and edges of Drive backplane 1 (lower) and the drive cage.
- b. Place the backplane down and engage it in position.
- c. Tighten the three screws to secure Drive-backplane 2 to Drive-backplane 1.

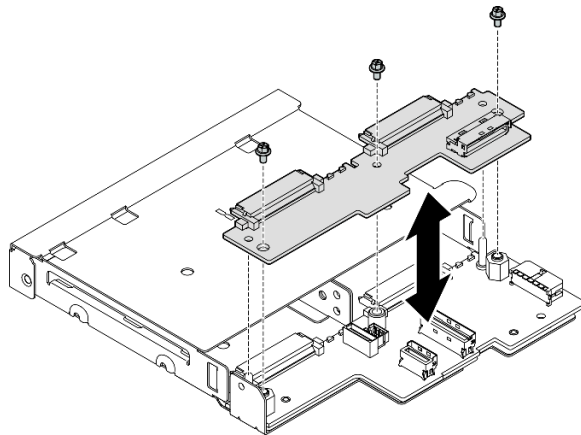


Figure 85. Installation of Drive-backplane 2

After this task is completed

- Proceed to install the drive cage into the node (see [“Install a drive cage” on page 110](#)).
- Connect all necessary cables to the drive backplane(s) (see [“Cable routing for the hot-swap drives” on page 199](#)).

Attention: Before connecting the drive-backplane cables, make sure that the power input board module and the power module board are installed in place.

- Reinstall all the drives and drive bay fillers (if any) into the drive cage when the drive cage is in place (see [“Install a hot-swap drive” on page 112](#)).
- Proceed to complete the parts replacement (see [“Complete the parts replacement” on page 195](#)).

Demo video

<https://www.youtube.com/watch?v=jb-2eoB6ZIk>

Install a drive cage

Follow instructions in this section to install a drive cage to the node.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Note: Depending on the specific configuration, the drives, drive bay fillers, or drive cage might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- Make sure that the backplane(s) have been installed onto the drive cage (see [“Install a drive backplane” on page 108](#)).

Step 2. Align the drive cage with the node; then, lower the drive cage down into place.

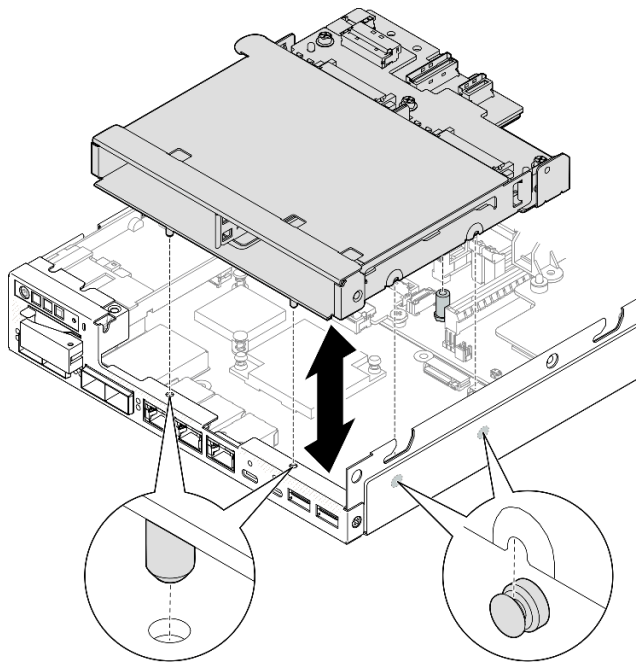


Figure 86. Installation of the drive cage

Step 3. Tighten the four screws as illustrated.

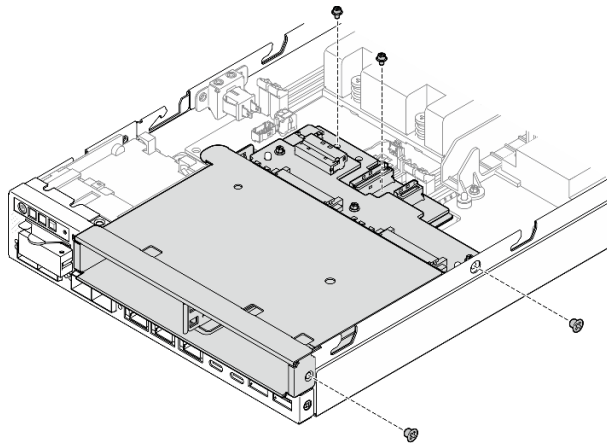


Figure 87. Installation of the drive cage screws

After this task is completed

- Connect all necessary cables to the drive backplane(s) (see [“Cable routing for the hot-swap drives” on page 199](#)).

Attention: Before connecting the drive-backplane cables, make sure that the power input board module and the power module board are installed in place.

- Install the top cover to the node (see [“Install the top cover” on page 194](#)) or install the node into an enclosure (see [“Install a node to the rack” on page 53](#)).

Important: To avoid damage to the drive connectors when removing or installing a hot-swap drive, make sure that

- **the node is securely placed within an enclosure;** or that
- **the top cover is in place and fully closed,** when the node is not installed in an enclosure.
- Reinstall all the required drives and drive bay fillers into the drive cage (see “[Install a hot-swap drive](#)” on page 112).
- Proceed to complete the parts replacement (see “[Complete the parts replacement](#)” on page 195).

Demo video

<https://www.youtube.com/watch?v=jb-2eoB6ZIk>

Install a hot-swap drive

Follow instructions in this section to install a hot-swap drive into a drive bay.

About this task

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.
- To make sure that there is adequate system cooling, do not operate the server for more than two minutes without either a drive or a drive bay filler installed in each bay.
- Locate the documentation that comes with the drive and follow those instructions in addition to the instructions in this chapter.
- For a complete list of supported optional devices for the server, see <https://serverproven.lenovo.com>.
- The drive bays are numbered to indicate the installation order (starting from number “0”). Follow the installation order.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/products/servers/thinkedge/se350v2/7da9/downloads/driver-list> to see the latest firmware and driver updates for your server.
- Go to “[Update the firmware](#)” on page 209 for more information on firmware updating tools.

Note: Depending on the specific configuration, the drives, drive bay fillers, or drive cage might look different from the illustrations in this section.

Important: To avoid damage to the drive connectors when removing or installing a hot-swap drive, make sure that

- **the node is securely placed within an enclosure;** or that
- **the top cover is in place and fully closed,** when the node is not installed in an enclosure.

Procedure

Step 1. Make preparations for this task.

- a. Locate the drive bay to install a drive.
- b. If a drive bay filler is installed in this drive bay, remove it first. Keep the drive bay filler in a safe place for future use.
- c. Make sure that the tray handle is in the open (unlocked) position.

Step 2. Install a drive into a drive bay.

- a. ① Align the drive with the guide rails in the bay; then, gently push the drive into the bay until the drive stops.
- b. ② Pivot the tray handle to the closed (lock) position with a click.

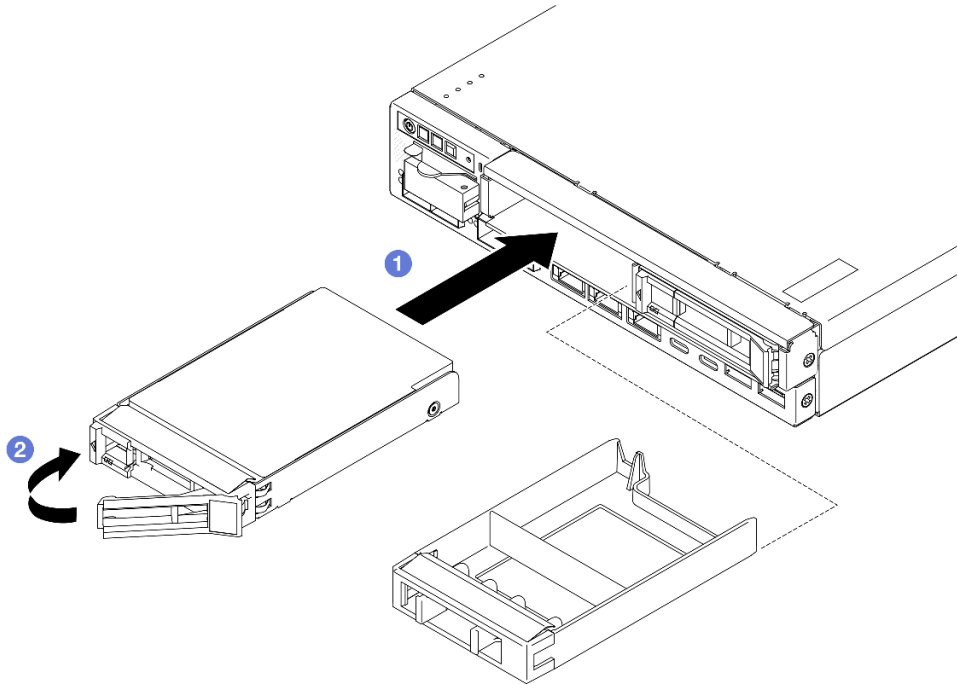


Figure 88. Installation of a hot-swap drive

Step 3. If there are plans of installing additional drives, proceed to install all of them.

After this task is completed

- If SED encryption is enabled on the system, reboot the system.

Note: 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.

- Check the drive status LED to verify that the drive is operating correctly.
 - If the yellow drive status LED of a drive is lit continuously, that drive is faulty and must be replaced.
 - If the green drive activity LED is flashing, the drive is being accessed.

Note: For more details about the drive LEDs, see [“Drive LEDs” on page 225](#).

- If necessary, install the enclosure bracket to the enclosure or the security bezel to the node sleeve (see [“Configuration guide” on page 45](#)).

Demo video

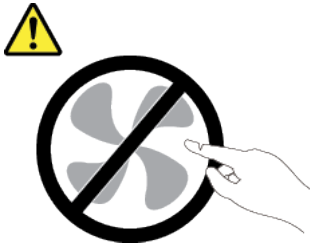
<https://www.youtube.com/watch?v=pz8BsnyjvQ>

Fan module replacement

Follow instructions in this section to remove or install a fan module .

CAUTION:

Hazardous moving parts. Keep fingers and other body parts away.



Remove a fan module

Follow instructions in this section to remove a fan module .

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **S017**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.

Procedure

Step 1. Make preparations for this task.

- If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see [“Remove the top cover” on page 192](#)).
- Remove the air baffle (see [“Remove the air baffle” on page 92](#)).
- If necessary, remove the intrusion switch (see [“Remove the intrusion switch with cable” on page 123](#)).

Step 2. Remove the fan module.

- ① Disconnect the fan cable from the connector on the system board.
- ② Locate the hole under the fan slot; then, disengage the fan module by pushing it through this hole from the underside of the node.
- ③ Lift the fan module up to remove it from the node.

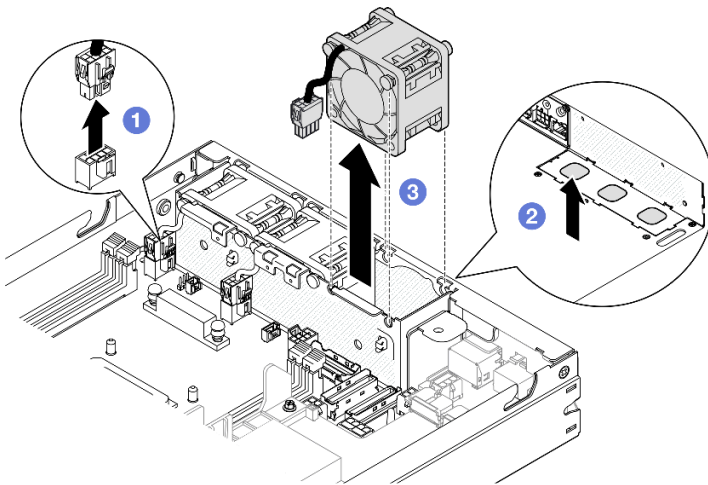


Figure 89. Disconnection of a fan cable and removal of a fan module

After this task is completed

- Install a replacement fan (see [“Install a fan module” on page 116](#)).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

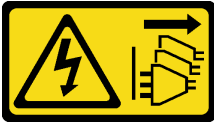
Install a fan module

Follow instructions in this section to install a fan module.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **S017**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Align the fan module with the slot in the fan cage and make sure that the **fan cable** is on the same side of the **connector** of this fan slot.

Step 2. Install the fan module into the fan cage.

- a. ① Place the fan module into the slot; then, press it down into place.
- b. ② Connect the fan cable to the connector on the system board.

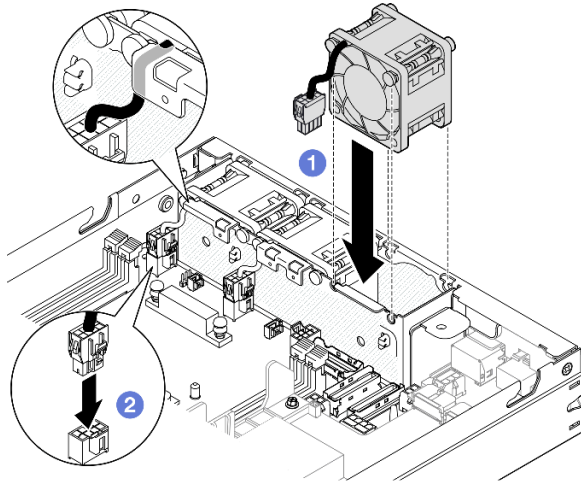


Figure 90. Installation of a fan module

After this task is completed

- If applicable, reinstall the intrusion switch (see “Install an intrusion switch with cable” on page 125).
- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).

Demo video

<https://www.youtube.com/watch?v=ygqsqNfmKYs>

Front operator assembly replacement

Follow instructions in this section to remove or install a front operator assembly.

Remove the front operator assembly

Follow instructions in this section to remove the front operator assembly.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

The power-control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord.

To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

Attention:

- Read “Installation Guidelines” on page 37 and “Safety inspection checklist” on page 38 to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see “Configuration guide” on page 45); then, **power off the server** and disconnect the power cords (see “Power off the server” on page 44).
- Remove the node from the enclosure or node sleeve, if applicable (see “Configuration guide” on page 45); then, carefully lay the node on a flat, static-protective surface.

Procedure

- Step 1. Make preparations for this task.
- a. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see “Remove the top cover” on page 192).
 - b. Disconnect the cable from the front operator assembly (see “Cable routing for the front operator assembly” on page 204).
- Step 2. ① Remove the three screws that secure the front operator assembly to the node.
- Step 3. ② Disengage and remove the front operator assembly from its slot.

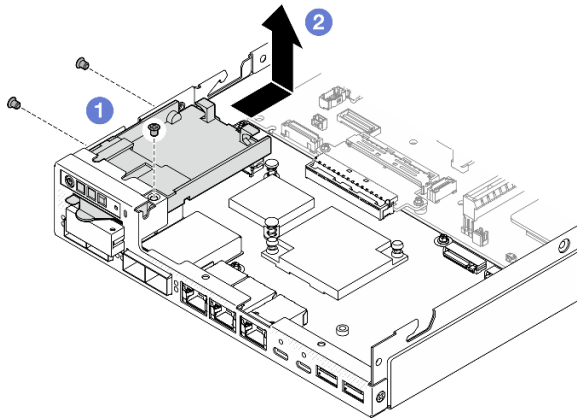


Figure 91. Removal of the front operator assembly

After this task is completed

- Install a replacement unit (see “Install a front operator assembly” on page 119).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=okPLbdDgflo>

Install a front operator assembly

Follow instructions in this section to install a front operator assembly.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Procedure

- Step 1. ① Align the front operator assembly with the front and side edges of the node; then, place the front operator assembly into its slot in the node.
- Step 2. ② Tighten the three screws to secure the front operator assembly to the node.

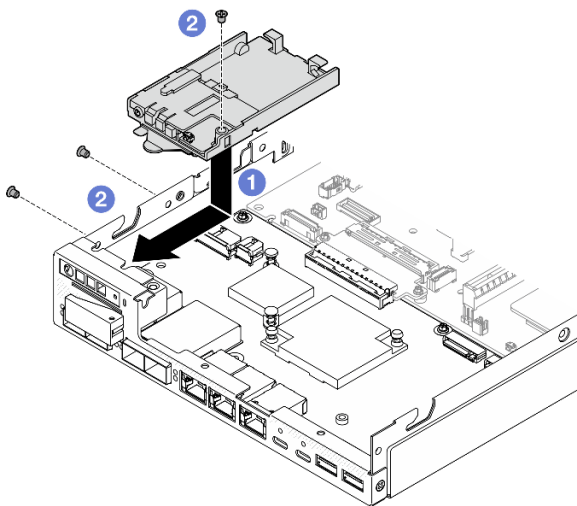


Figure 92. Installation of the front operator assembly

After this task is completed

- Connect the cable to the front operator assembly (see [“Cable routing for the front operator assembly”](#) on page 204).
- Proceed to complete the parts replacement (see [“Complete the parts replacement”](#) on page 195).

Demo video

<https://www.youtube.com/watch?v=kl13Tgl3PI8>

Internal power supply unit (AC PMB) replacement

Follow instructions in this section to remove or install a ThinkEdge 500W 230V/115V Non-Hot Swap Power Supply (internal power supply unit, also called AC PMB).

Remove the internal power supply unit (AC PMB)

Follow instructions in this section to remove the internal power supply unit (AC PMB).

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines”](#) on page 37 and [“Safety inspection checklist”](#) on page 38 to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide”](#) on page 45); then, **power off the server** and disconnect the power cords (see [“Power off the server”](#) on page 44).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide”](#) on page 45); then, carefully lay the node on a flat, static-protective surface.

Procedure

Step 1. Make preparations for this task.

- a. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see [“Remove the top cover”](#) on page 192).
- b. Disconnect all the drive cables from the system board; then, remove the drive cage from the node (see [“Remove the drive cage”](#) on page 103).

Step 2. Remove the cable wall and the internal power supply unit.

- a. ① Remove the two screws that secure cable wall; then, remove the cable wall.
- b. ② Remove the other two screws from the internal power supply unit; then, pull the two pull tapes as well as tilt the internal power supply unit from the corner with the blue touch point to remove the internal power supply unit from the system board.

Important: To prevent damage to the parts, make sure to carefully pull both pull tapes with equal strength at the same time.

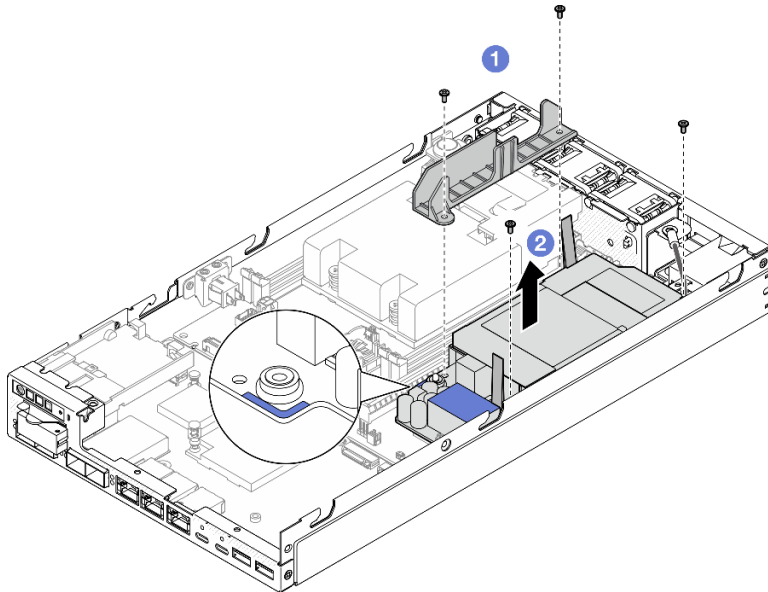


Figure 93. Removal of the cable wall and the internal power supply

- Step 3. Disconnect the cables from the internal power supply unit (see “[Cable routing for the power module board and power input board module](#)” on page 206).

Attention: Remove the internal power supply unit **BEFORE** disconnecting the cables between the internal power supply unit and power input board module.

After this task is completed

- Install a replacement unit (see “[Install an internal power supply unit \(AC PMB\)](#)” on page 121).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

https://www.youtube.com/watch?v=m-TO_JSJb7w

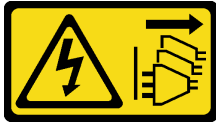
Install an internal power supply unit (AC PMB)

Follow instructions in this section to install an internal power supply unit (AC PMB).

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Make preparations for this task.

- a. Make sure that the power input board module is already installed in place (see [“Install a power input board \(PIB\) module” on page 150](#)).

Step 2. Connect the cables between the internal power supply unit and power input board (see [“Cable routing for the power module board and power input board module” on page 206](#)).

Attention: For a smooth installation, connect the cables between the power module board and power input board module BEFORE installing the power module board.

Step 3. Install the internal power supply unit and the cable wall.

- a. ① Align the internal power supply unit with the guide pins, lower and insert the internal power supply unit into place, and slightly press the touch point until it is securely seated; then, tighten the two screws by the sidewall of the node.
- b. ② Lower the cable wall into place on the internal power supply unit; then, tighten the two screws.

Important:

- Make sure to place the pull tape of the power module board beneath the cable wall away from the DIMM slots. Otherwise, it may interfere with the memory modules and cause system failure.
- Make sure that the busbars are seated in the holes of the power module board as shown in the illustration.

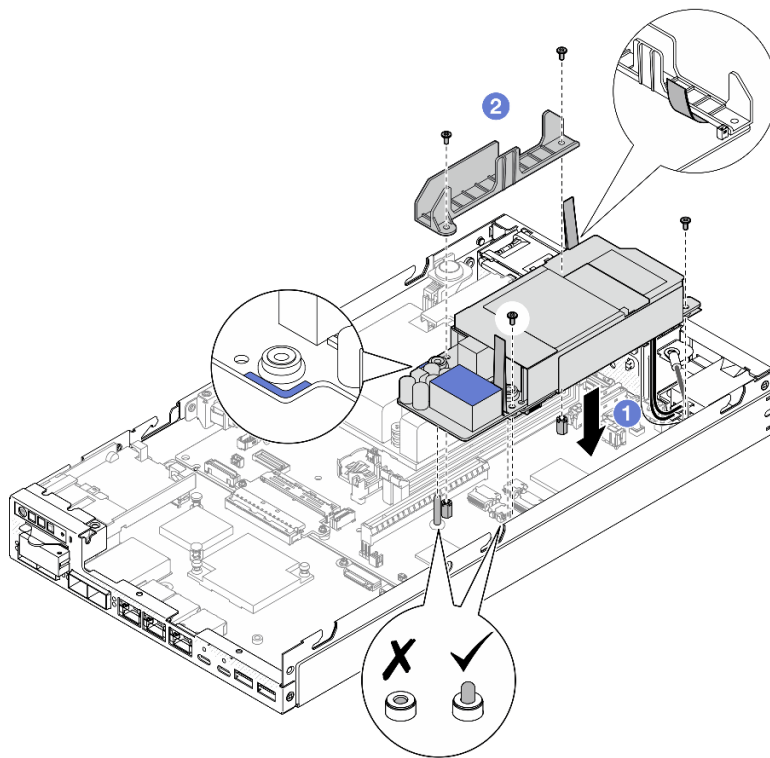


Figure 94. Installation of the cable wall and the internal power supply unit

After this task is completed

- Reinstall the drive cage and reconnect the required drive cables (see “Install a drive cage” on page 110 and “Cable routing for the hot-swap drives” on page 199).
- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).

Demo video

<https://www.youtube.com/watch?v=zHg0tcinLXo>

Intrusion switch with cable replacement

Follow instructions in this section to remove or install an intrusion switch with cable.

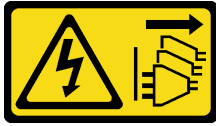
Remove the intrusion switch with cable

Follow instructions in this section to remove the intrusion switch with cable.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see “[Configuration guide](#)” on page 45); then, **power off the server** and disconnect the power cords (see “[Power off the server](#)” on page 44).
- Remove the node from the enclosure or node sleeve, if applicable (see “[Configuration guide](#)” on page 45); then, carefully lay the node on a flat, static-protective surface.

Procedure

Step 1. Make preparations for this task.

- a. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see “[Remove the top cover](#)” on page 192).
- b. Remove the air baffle (see “[Remove the air baffle](#)” on page 92).

Step 2. Remove the intrusion switch with cable from the node

- a. ① Remove the screw that secures the intrusion switch to the sidewall of the node.
- b. ② Tilt the intrusion switch and remove it from the node.
- c. ③ Disconnect the intrusion switch cable from the connector on the system board.

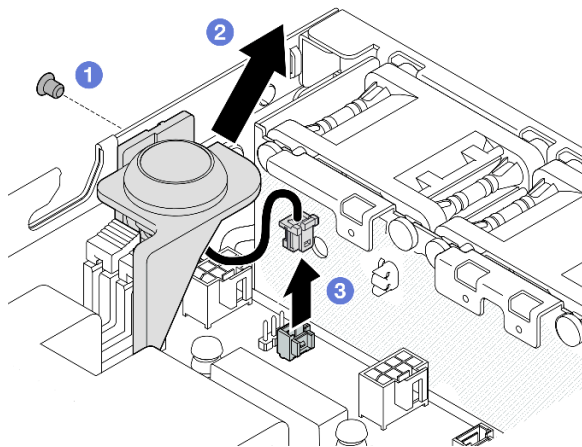


Figure 95. Removal of the intrusion switch with cable from the node

Step 3. (Optional) If necessary, remove the intrusion switch with cable from the intrusion switch holder.

- a. ① Press the latches of the intrusion switch to release it from the holder.
- b. ② Separate the intrusion switch with cable from the holder.

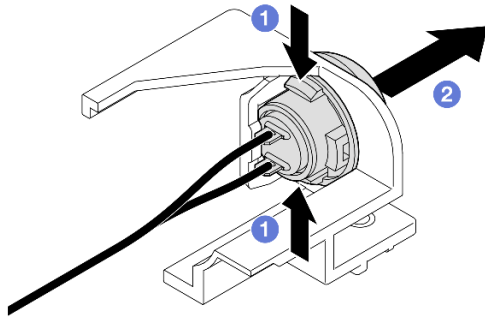


Figure 96. Separation of the intrusion switch from the holder

After this task is completed

- Install a replacement unit (see “[Install an intrusion switch with cable](#)” on page 125).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=HOftO3W017E>

Install an intrusion switch with cable

Follow instructions in this section to install an intrusion switch with cable.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. If applicable, install the intrusion switch with cable to the intrusion switch holder.

Attention: Make sure to install the O-ring together with the switch onto the plastic holder.

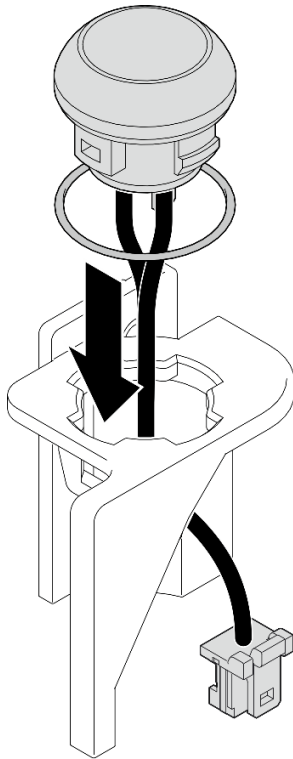


Figure 97. Installation of the intrusion switch with cable to the switch holder

Step 2. Install the intrusion switch with cable to the node.

- a. ① Connect the intrusion switch cable to the connector on the system board.
- b. ② Align the intrusion switch with its slot at an angle; then, insert and tilt the intrusion switch into place.
- c. ③ Tighten the screw to secure the intrusion switch to the node.

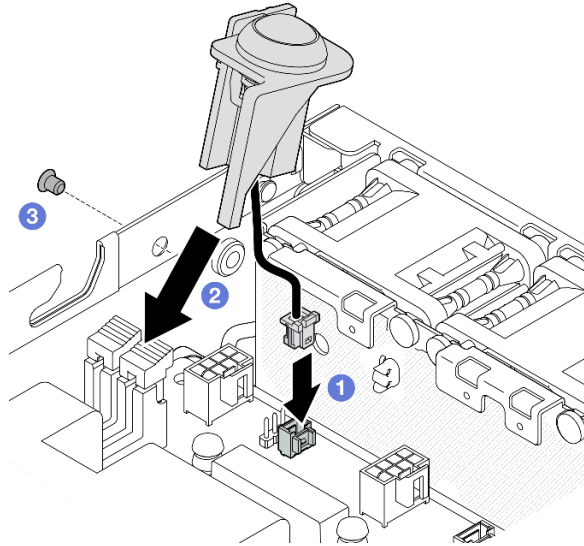


Figure 98. Installation of the intrusion switch with cable to the node

After this task is completed

- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).

Demo video

<https://www.youtube.com/watch?v=uwiU7IHLRkk>

Keylock switch with cable replacement

Follow instructions in this section to remove or install an anti-tampering keylock switch with cable.

Remove the keylock switch with cable

Follow instructions in this section to remove the keylock switch with cable.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

The power-control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord.

To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.

Procedure

Step 1. Make preparations for this task.

- a. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see [“Remove the top cover” on page 192](#)).
- b. Disconnect the drive-backplane power cable from the I/O module board (see [“Cable routing for the hot-swap drives” on page 199](#)).

Step 2. Remove the keylock switch with cable from the node.

- a. ① Disconnect the keylock switch cable from the connector on the system board.
- b. ② Remove the screw that secures the keylock switch to the sidewall of the node.
- c. ③ Slightly push the keylock switch rightward; then, remove it from the node.

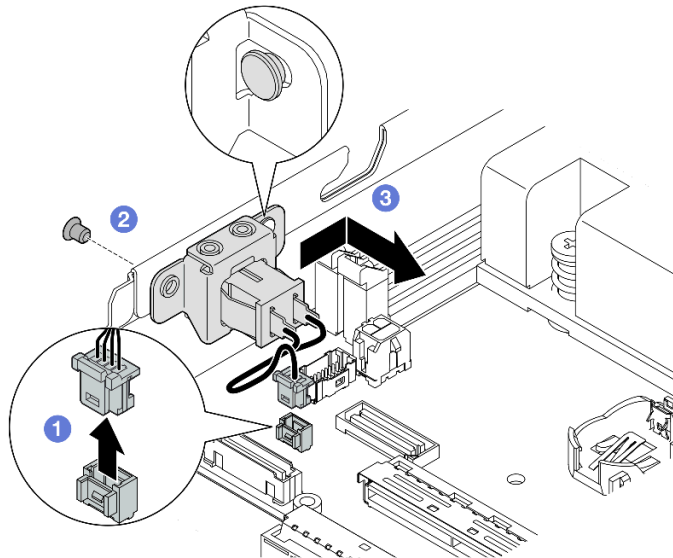


Figure 99. Removal of the keylock switch with cable

Step 3. (Optional) If necessary, remove the keylock switch cable from the bracket.

- a. ① Press and hold on the latches on both sides of the keylock switch.
- b. ② Meanwhile, pull the switch with cable away from the bracket as illustrated.

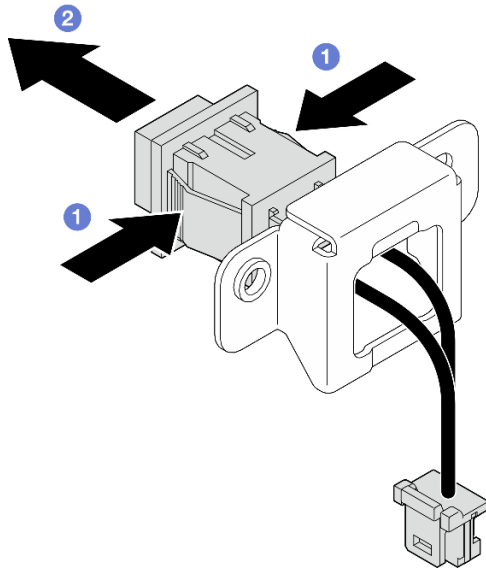


Figure 100. Removal of the keylock switch with cable from the bracket

After this task is completed

- If necessary, install a replacement unit (see “Install a keylock switch with cable” on page 129).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=JR9-9OXIdRY>

Install a keylock switch with cable

Follow instructions in this section to install a keylock switch with cable.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- S002



CAUTION:

The power-control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord.

To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Make preparations for this task.

- a. If necessary, install the keylock switch cable to the bracket.
 1. Insert the keylock switch with cable into the bracket until it clicks into place.

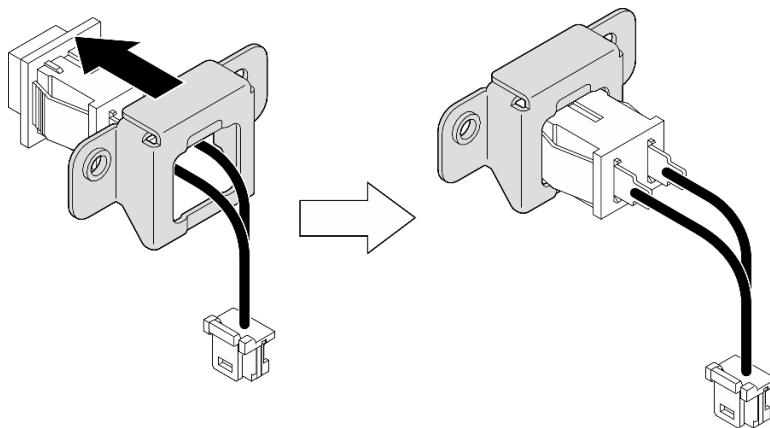


Figure 101. Installation of the keylock switch with cable onto the bracket

Step 2. Install the keylock switch with cable to the node.

- a. ① Hook the keylock switch onto the pin on the sidewall of the node; then, slightly push it leftward.
- b. ② Tighten the screw to secure the keylock switch.
- c. ③ Connect the keylock switch cable to the system board.

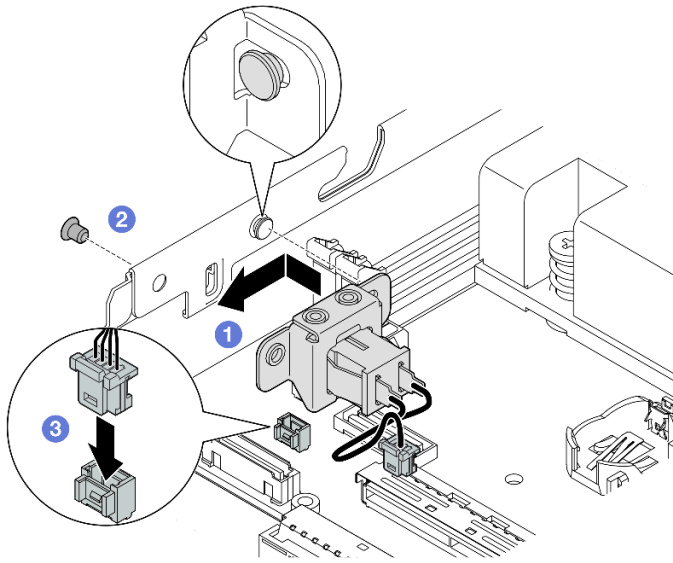


Figure 102. Installation of a keylock switch with cable

After this task is completed

- Reconnect the drive-backplane power cable to the I/O module board (see “Cable routing for the hot-swap drives” on page 199).
- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).

Demo video

https://www.youtube.com/watch?v=zSpM_ujglyI

M.2 boot drive replacement

Follow instructions in this section to remove or install an M.2 boot drive from or to the I/O module board.

Remove an M.2 boot drive

Follow instructions in this section to remove an M.2 boot drive from the I/O module board.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.

Note: Depending on the specific configuration, the I/O module board might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see [“Remove the top cover” on page 192](#)).
- Disconnect all the drive cables from the system board; then, remove the drive cage from the node (see [“Remove the drive cage” on page 103](#)).

Step 2. Remove the M.2 boot drive from the I/O module board.

- a. ① Remove the screw that secures the M.2 drive.
- b. ② Lift up the screw side of the M.2 drive at an angle.
- c. ③ Pull the M.2 drive away from the connector to remove it.

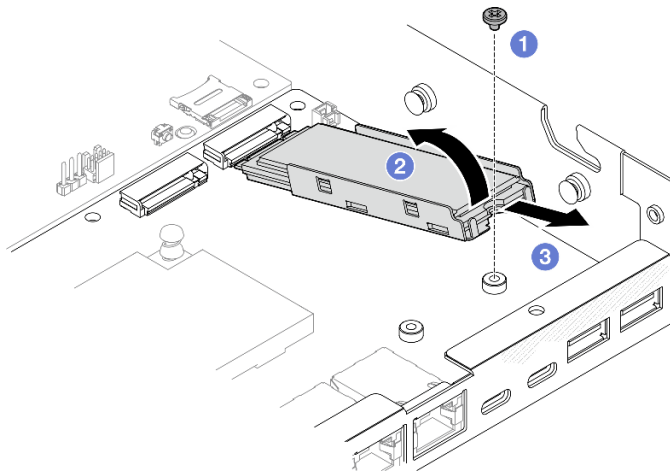


Figure 103. Removal of an M.2 boot drive

Step 3. (Optional) If necessary, remove the M.2 heat sink and the M.2 drive from the tray.

- a. ① Press the tabs on the M.2 and heat sink tray to disengage the heat sink.

Note: If necessary, press the tabs with a flat-head screwdriver.

- b. ② Lift the M.2 heat sink out of the tray.
- c. ③ Slide the M.2 drive outward and remove it from the tray.

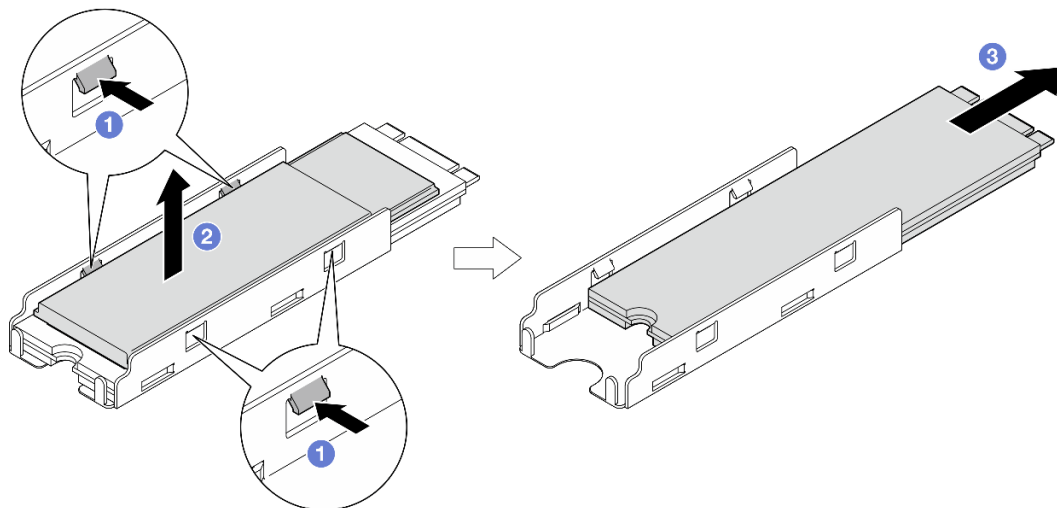


Figure 104. Removal of the M.2 heat sink

After this task is completed

- If necessary, peel off the thermal pad from the M.2 drive or M.2 heat sink.
- Install a replacement unit (see “Install an M.2 boot drive” on page 133).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

https://www.youtube.com/watch?v=evmb2_k5RIs

Install an M.2 boot drive

Follow instructions in this section to install an M.2 boot drive to the I/O module board.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read “Installation Guidelines” on page 37 and “Safety inspection checklist” on page 38 to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Notes:

- Depending on the specific configuration, the I/O module board might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- a. Locate the slots for M.2 boot drives.

Attention: If there is only one M.2 boot drive to be installed to the I/O module board, the M.2 drive should be installed in **slot 1**.

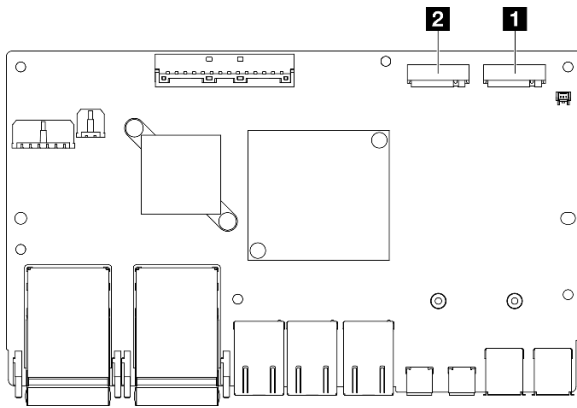


Figure 105. Boot M.2 slots

1 Boot M.2 slot 1	2 Boot M.2 slot 2
--------------------------	--------------------------

Step 2. (Optional) If necessary, install the M.2 drive into the M.2 tray.

- a. **1** Peel off the plastic liner from the thermal pad in the tray.
- b. **2** Slide the M.2 drive all the way into the tray, the side with the most chips facing up. Make sure that the **screw cutout** of the drive is aligned with the cutout of the tray.

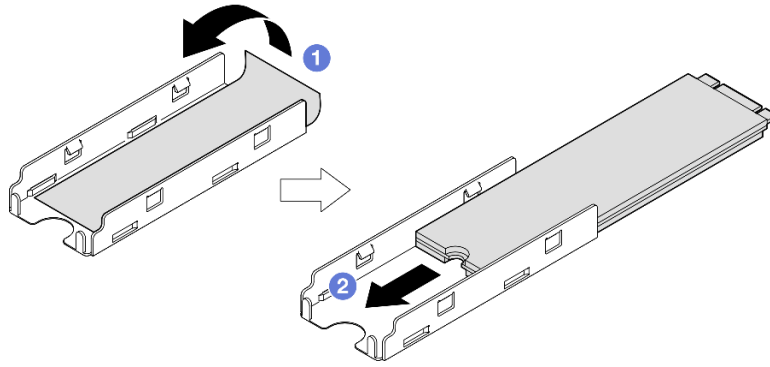


Figure 106. Installation of a thermal pad and M.2 drive to the tray

Step 3. (Optional) If applicable, install the M.2 heat sink into tray.

- a. 1 Peel off the plastic liner from the thermal pad at the bottom side of the heat sink.
- b. 2 Align the heat sink with the four clips of the tray; then, insert and press down the heat sink until it clicks into place.

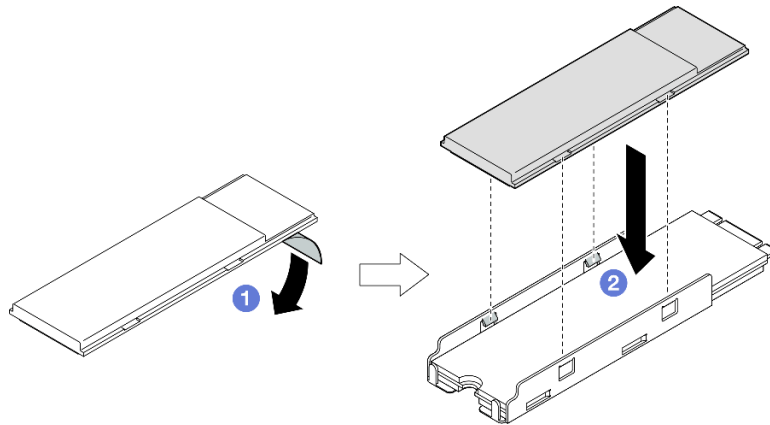


Figure 107. Installation of an M.2 heat sink to the M.2 tray

Step 4. Install the M.2 drive with heat sink onto the I/O module board.

- a. 1 Insert the M.2 drive at an angle to the connector.
- b. 2 Lower down the other side of the M.2 drive; then, gently press the M.2 drive down into place.
- c. 3 Tighten the screw.

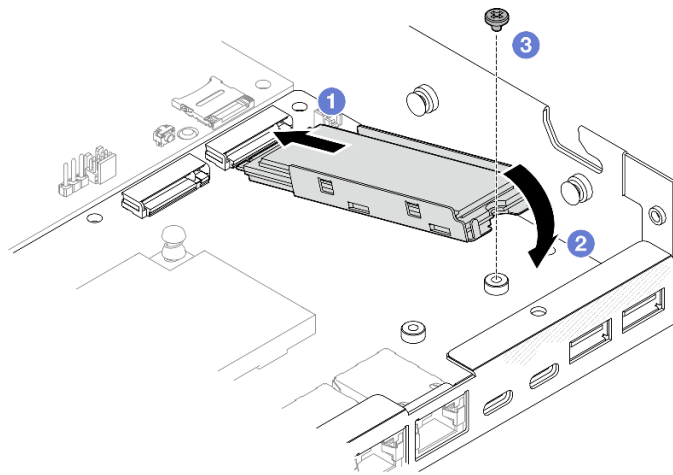


Figure 108. Installation of an M.2 boot drive

After this task is completed

- Install the drive cage and connect all the cables (see “Install a drive cage” on page 110).
- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).

Demo video

<https://www.youtube.com/watch?v=ewzFpHEFV7M>

Memory module replacement

Follow instructions in this section to remove or install a memory module.

Remove a memory module

Follow instructions in this section to remove a memory module.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.
- Memory modules are sensitive to static discharge and require special handling. Refer to the standard guidelines for [“Handling static-sensitive devices” on page 39](#).
 - Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
 - Never hold two or more memory modules together so that they do not touch each other. Do not stack memory modules directly on top of each other during storage.
 - Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory module connector housing.
 - Handle memory modules with care: never bend, twist, or drop a memory module.
 - Do not use any metal tools (such as jigs or clamps) to handle the memory modules, because the rigid metals may damage the memory modules.
 - Do not insert memory modules while holding packages or passive components, which can cause package cracks or detachment of passive components by the high insertion force.

Procedure

Step 1. Make preparations for this task.

- a. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see [“Remove the top cover” on page 192](#)).
- b. If necessary, remove the intrusion switch (see [“Remove the intrusion switch with cable” on page 123](#)).
- c. Locate the memory module slots and identify which memory module is to be removed.

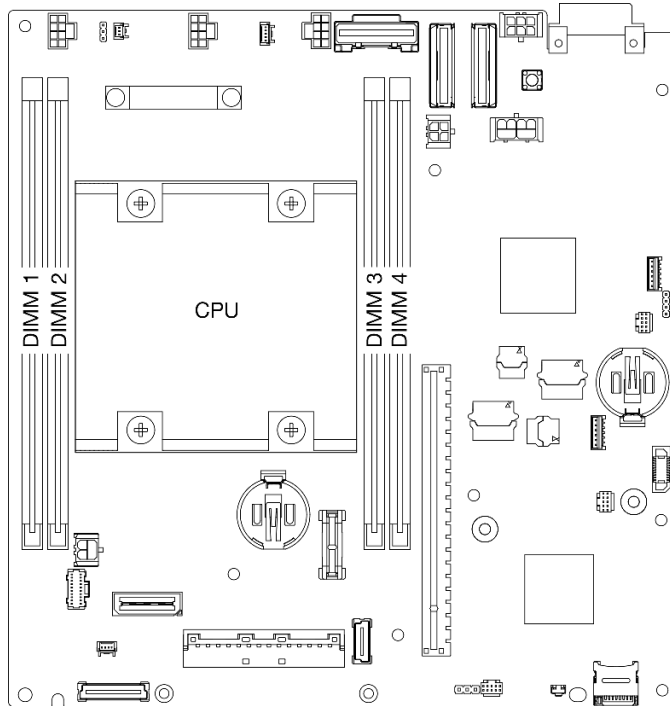


Figure 109. Location of the memory module slots on the system board

Step 2. Remove the memory module from the slot.

- a. ① Carefully Open the retaining clip to disengage the memory module. One end of the module will be slightly higher than the other.
- b. ② Grasp the memory module on both ends; then, carefully lift it vertically to remove it out of the slot.

Attention:

- To avoid breaking the retaining clips or damaging the memory module slots, handle the clips gently.
- If necessary, due to space constraints, you can use a pointed tool to open the retaining clips. Place the tip of the tool in the recess on the top of the retaining clip; then, carefully rotate the retaining clip away from the memory module slot. Make sure you use firm and solid pointed tool to open the latch. Do not use pencils or other fragile tools.

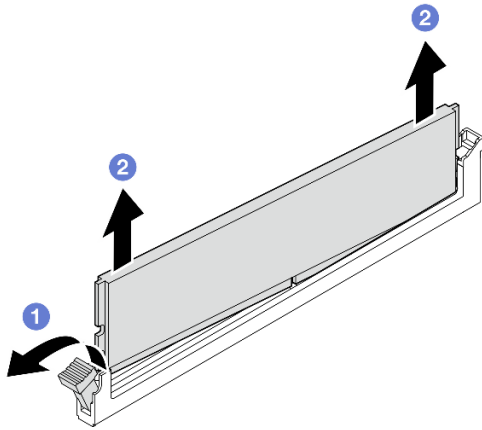


Figure 110. Removal of a memory module

After this task is completed

- If necessary, install a replacement memory module to the empty slot (see “[Install a memory module](#)” on page 139).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=5rGMVURgZXQ>

Install a memory module

Follow instructions in this section to install a memory module.

About this task

See “[Memory module installation rules and order](#)” on page 41 for detailed information about memory configuration and setup.

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Make sure to adopt one of the supported configurations listed in [“Memory module installation rules and order” on page 41](#).
- Memory modules are sensitive to static discharge and require special handling. Refer to the standard guidelines at [“Handling static-sensitive devices” on page 39](#):
 - Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
 - Never hold two or more memory modules together so that they do not touch each other. Do not stack memory modules directly on top of each other during storage.
 - Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory module connector housing.
 - Handle memory modules with care: never bend, twist, or drop a memory module.
 - Do not use any metal tools (such as jigs or clamps) to handle the memory modules, because the rigid metals may damage the memory modules.
 - Do not insert memory modules while holding packages or passive components, which can cause package cracks or detachment of passive components by the high insertion force.
- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/products/servers/thinkedge/se350v2/7da9/downloads/driver-list> to see the latest firmware and driver updates for your server.
- Go to [“Update the firmware” on page 209](#) for more information on firmware updating tools.

Procedure

Step 1. Make preparations for this task.

- a. In the case of altering memory configuration, refer to [“Memory module installation rules and order” on page 41](#) to ensure a valid configuration is planned.
- b. Locate the slot to install the memory module.

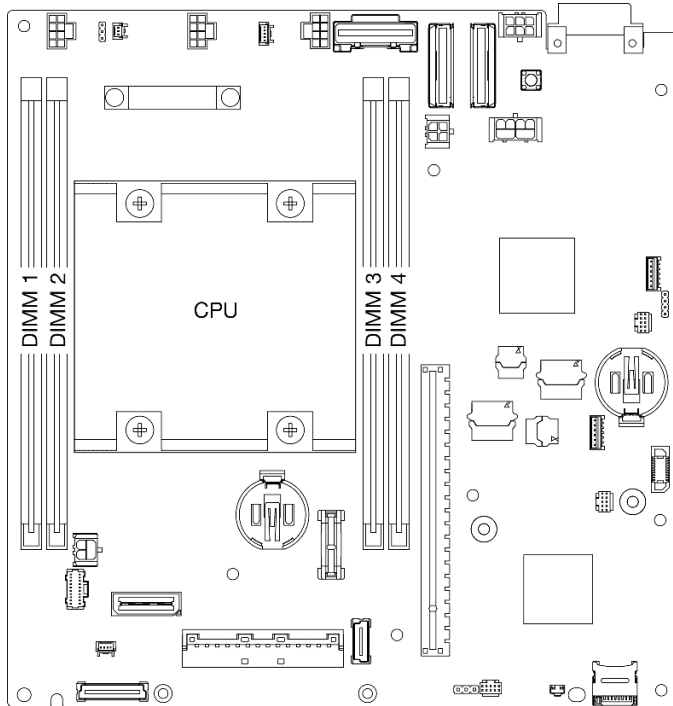


Figure 111. Location of the memory module slots on the system board

Step 2. Install a memory module into the slot.

Attention:

- To avoid breaking the retaining clips or damaging the memory module slots, open and close the clips gently.
- If there is a gap between the memory module and the retaining clips, the memory module has not been correctly inserted. In this case, open the retaining clips, remove the memory module, and then reinsert it.

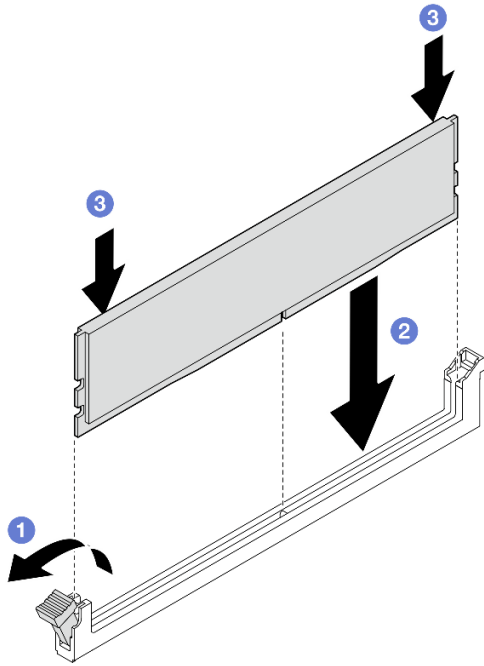


Figure 112. Installation of a memory module

- a. ① Carefully press to open the retaining clip.
- b. ② Align the memory module with the slot.
- c. ③ Firmly press both ends of the memory module straight down into the slot until the retaining clip snaps into the locked position.

Step 3. If there are plans of installing additional memory modules, proceed to install all of them.

After this task is completed

- If applicable, reinstall the intrusion switch (see “Install an intrusion switch with cable” on page 125).
- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).

Demo video

<https://www.youtube.com/watch?v=LZDO0ecEJso>

MicroSD card replacement

Follow instructions in this section to remove or install a MicroSD card from or to the system board.

Remove the MicroSD card

Follow instructions in this section to remove the MicroSD card.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.

Note: Depending on the specific configuration, the node or security bezel might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- a. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see [“Remove the top cover” on page 192](#)).
- b. Disconnect all the drive cables from the system board; then, remove the drive cage from the node (see [“Remove the drive cage” on page 103](#)).
- c. Locate the MicroSD card socket on the system board (see [“System-board connectors” on page 25](#)).

Step 2. Remove the MicroSD card.

- a. ① Slide the socket lid to the open position.
- b. ② Lift open the socket lid.
- c. ③ Remove the MicroSD card from the socket.

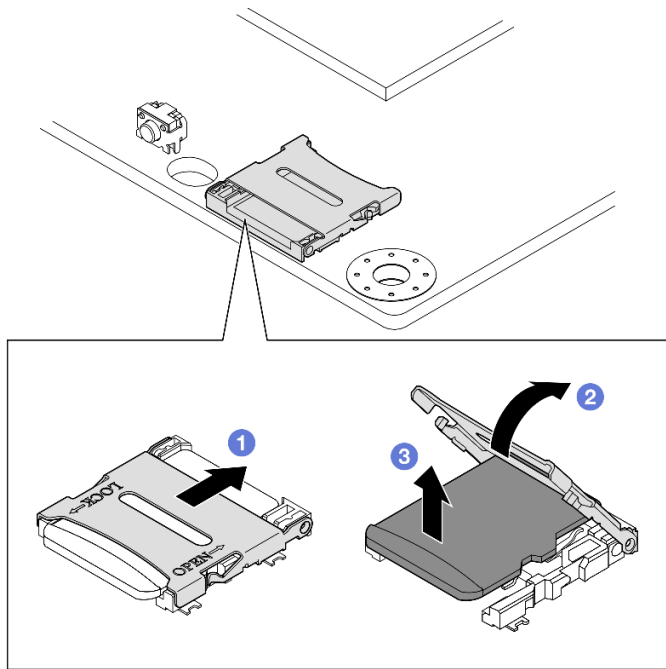


Figure 113. Removal of a MicroSD card

After this task is completed

- Install a replacement unit (see “Install a MicroSD card” on page 144).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=jPBiHboLv6c>

Install a MicroSD card

Follow instructions in this section to install a MicroSD card.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Notes:

- Depending on the specific configuration, the node or security bezel might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- a. Make sure that the drive cage has not been installed yet.
- b. Locate the MicroSD card socket on the system board (see “[System-board connectors](#)” on page 25).

Step 2. Install the MicroSD card.

- a. ① Place the MicroSD card into the socket.
- b. ② Close the socket lid.
- c. ③ Slide the socket lid to the lock position.

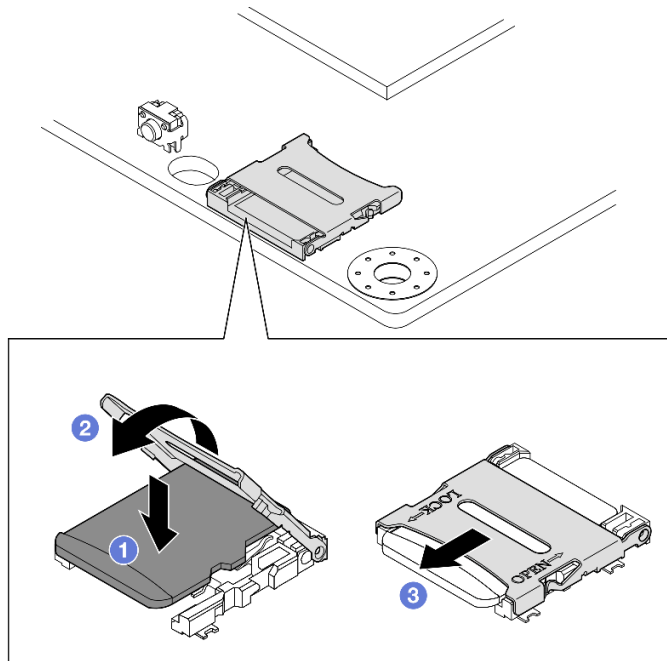


Figure 114. Installation of a MicroSD card

After this task is completed

- Install a drive cage (see [“Install a drive cage” on page 110](#)).
- Proceed to complete the parts replacement (see [“Complete the parts replacement” on page 195](#)).

Demo video

<https://www.youtube.com/watch?v=6H3mBi8JTgA>

Power input board (PIB) module replacement

Follow instructions in this section to remove or install a power input board (PIB) module.

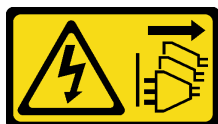
Remove the power input board (PIB) module

Follow instructions in this section to remove the power input board module.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.
- Depending on the specific configuration, proceed to the corresponding section for the procedure of the DC PIB module or AC PIB module.
 - [“Procedure of removing a DC PIB module” on page 146](#)
 - [“Procedure of removing an AC PIB module” on page 148](#)

Remove a DC PIB module

Procedure

Step 1. Make preparations for this task.

- a. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see “Remove the top cover” on page 192).
- b. Disconnect all the drive cables from the system board; then, remove the drive cage from the node (see “Remove the drive cage” on page 103).
- c. Remove the power module board and disconnect the cables between the power module board and power input board module (see “Remove the power module board (PMB)” on page 154 and “Cable routing for the power module board and power input board module” on page 206).

Step 2. Remove the power input board module.

- a. ① Remove the four screws that secure the power input board module.
- b. ② Carefully slide the power input board module out of the rear of the node.

Note: Use the interior side and rear-top side of the power input board module as the touch points.

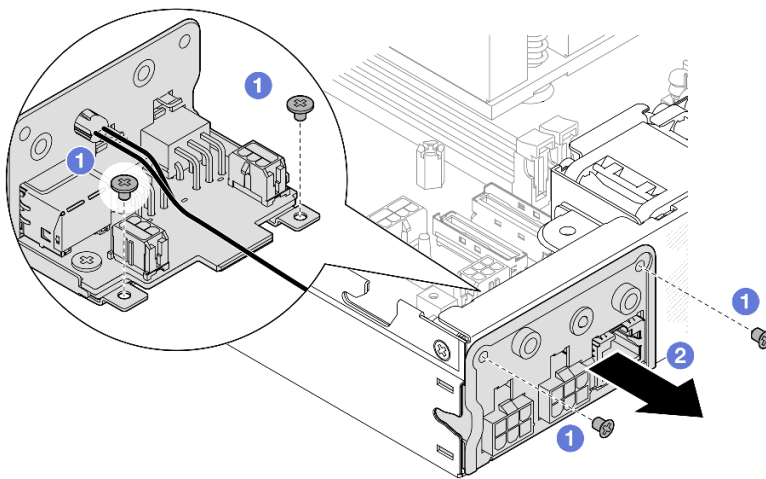


Figure 115. Removal of the power input board module

Step 3. (Optional) If necessary, remove the PMB status LED cable from the PIB module.

Attention: The LED latch is fragile; removing the PMB status LED cable from the PIB module is highly likely to break the latch. Remove this cable from the PIB module only when it is absolutely necessary.

- a. ① Press the LED latches with a tool, such as a flat-head screwdriver.
- b. ② Remove the LED cable from the PIB module.

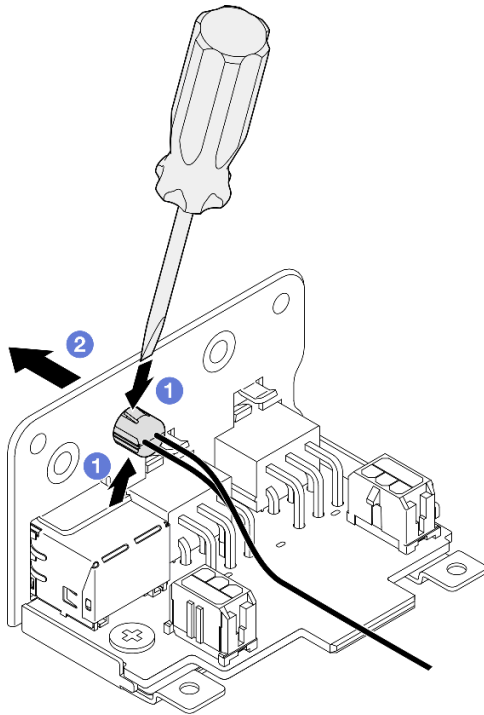


Figure 116. Removal of the PMB status LED cable from the DC PIB module

After this task is completed

- Install a replacement unit (see “[Install a power input board \(PIB\) module](#)” on page 150).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=tkbGEznMEuA>

Remove an AC PIB module

Procedure

- Step 1. Make preparations for this task.
- a. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see “[Remove the top cover](#)” on page 192).
 - b. Disconnect all the drive cables from the system board; then, remove the drive cage from the node (see “[Remove the drive cage](#)” on page 103).
 - c. Remove the internal power supply unit, and disconnect the cables between internal power supply unit and AC PIB module (see “[Remove the internal power supply unit \(AC PMB\)](#)” on page 120 and “[Cable routing for the power module board and power input board module](#)” on page 206).

Step 2. Remove the power input board module.

- a. ① Remove the screw of the PIB ground wire; then, lift the PIB ground wire away from the rear edge of the node.
- b. ② Lift the X-cap away from the side of the PIB module.
- c. ③ Remove the four screws that secure the power input board module.
- d. ④ Carefully slide the power input board module out of the rear of the node.

Note: Use the interior side and rear-top side of the power input board module as the touch points.

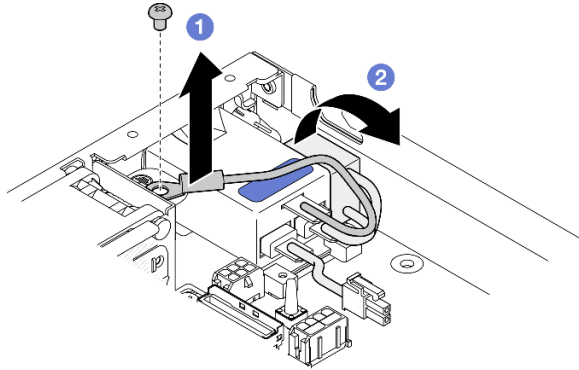
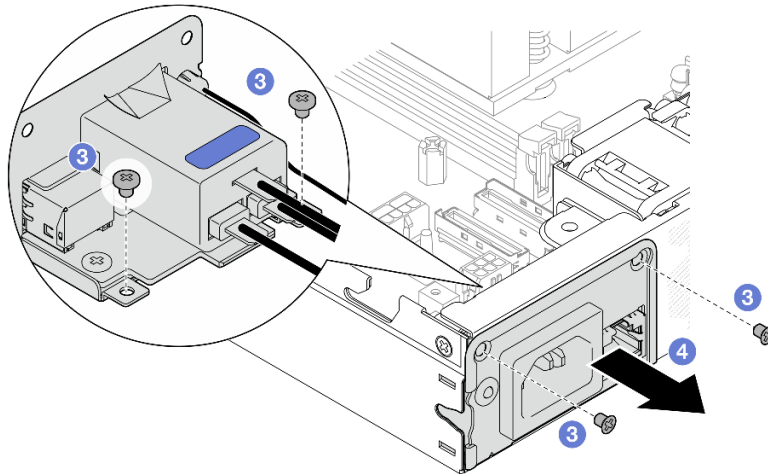


Figure 117. Removal of the power input board module



Step 3. (Optional) If necessary, remove the PMB status LED cable from the PIB module.

Attention: The LED latch is fragile; removing the PMB status LED cable from the PIB module is highly likely to break the latch. Remove this cable from the PIB module only when it is absolutely necessary.

- a. ① Press the LED latches with a tool, such as a flat-head screwdriver.
- b. ② Remove the LED cable from the PIB module.

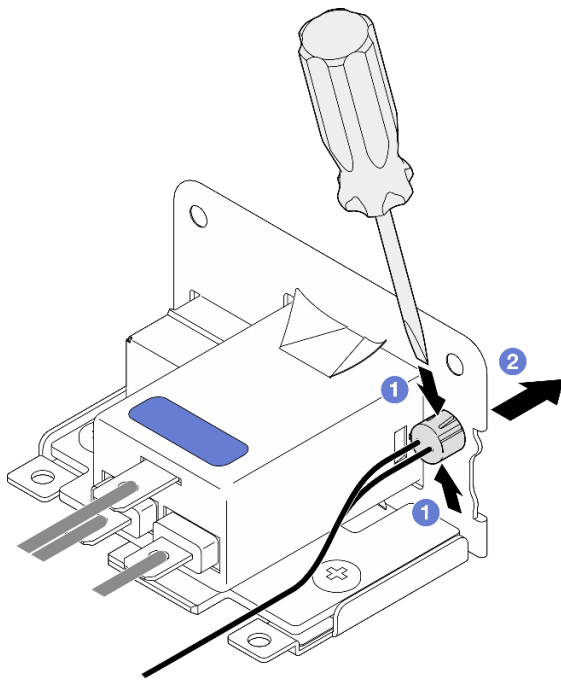


Figure 118. Removal of the PMB status LED cable from the AC PIB module

After this task is completed

- Install a replacement unit (see “Install a power input board (PIB) module” on page 150).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=GAZsWpoA2Wc>

Install a power input board (PIB) module

Follow instructions in this section to install a power input board (PIB) module.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.
- Depending on the specific configuration, proceed to the corresponding section for the procedure of the DC PIB module or AC PIB module.
 - [“Procedure of installing a DC PIB module” on page 151](#)
 - [“Procedure of installing an AC PIB module” on page 152](#)

Install a DC PIB module

Procedure

Step 1. Make preparations for this task.

- a. If applicable, install the PMB status LED cable to the power input board module.

Attention: The LED latch is fragile; removing the PMB status LED cable from the PIB module is highly likely to break the latch. Remove this cable from the PIB module only when it is absolutely necessary.

Step 2. Install the PIB module to the node.

- a. ① Align the power input board module with its slot; then, carefully insert the power input board module into place.

Notes:

- Use the exterior side and rear-top side of the power input board module as the touch points.
 - When inserting the power input board module into place, make sure to connect it to the connector on the system board.
- b. ② Tighten the four screws as shown.

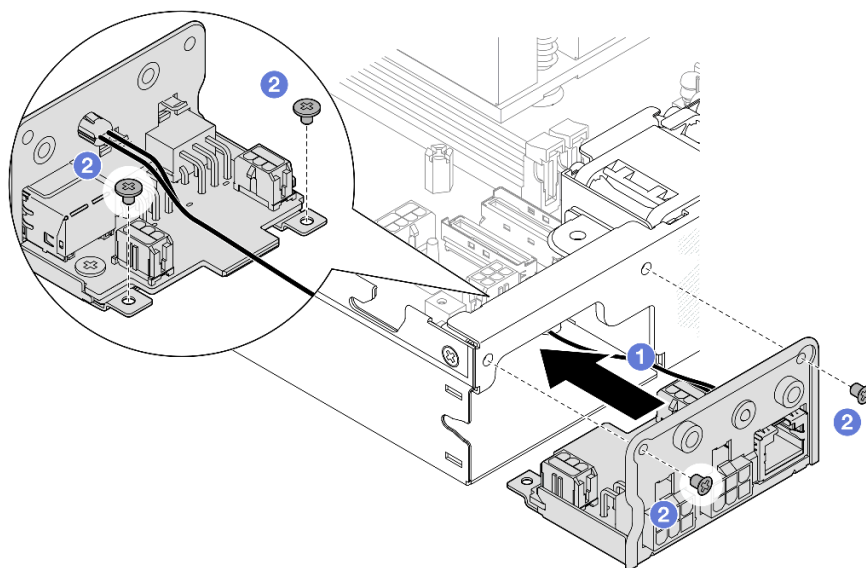


Figure 119. Installation of the DC PIB module

After this task is completed

- Proceed to connect the cable(s) between the power input board module and the power module board; then, install the power module board (see “Install a power module board (PMB)” on page 155 and “Cable routing for the power module board and power input board module” on page 206).
- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).

Demo video

<https://www.youtube.com/watch?v=p9dnp4qjaEo>

Install an AC PIB module

Procedure

Step 1. Make preparations for this task.

- If applicable, install the PMB status LED cable to the power input board module.

Attention: The LED latch is fragile; removing the PMB status LED cable from the PIB module is highly likely to break the latch. Remove this cable from the PIB module only when it is absolutely necessary.

Step 2. Install the PIB module to the node.

- 1 Align the power input board module with its slot; then, carefully insert the power input board module into place.

Notes:

- When inserting the power input board module into place, make sure to connect it to the connector on the system board.

- b. 2 Tighten the four screws as shown.

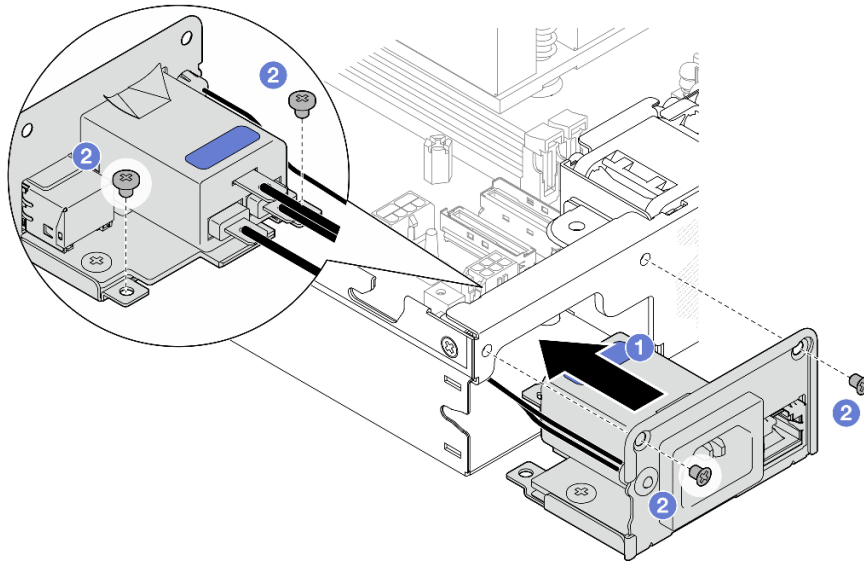


Figure 120. Installation of the AC PIB module

- c. 3 Place the PIB ground wire onto the screw hole on the rear edge of the node; then, tighten the screw to secure the ground wire.
- d. 4 Insert the X-cap between the PIB module and the node sidewall.

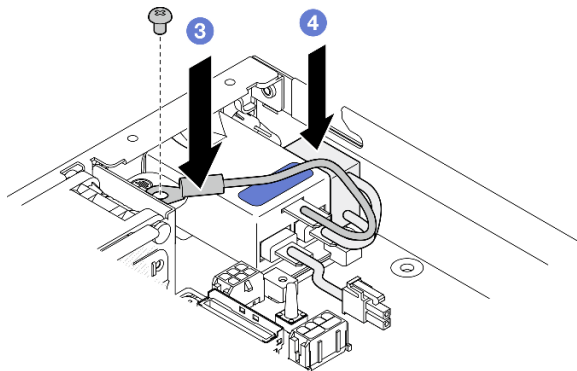


Figure 121. Installation of the AC PIB ground wire and X-cap

After this task is completed

- Proceed to connect the cables between AC PIB module and the internal power supply unit; then, install the internal power supply unit (see [“Install an internal power supply unit \(AC PMB\)”](#) on page 121 and [“Cable routing for the power module board and power input board module”](#) on page 206).
- Proceed to complete the parts replacement (see [“Complete the parts replacement”](#) on page 195).

Demo video

Power module board (PMB) replacement

Follow instructions in this section to remove or install a power module board (PMB).

Remove the power module board (PMB)

Follow instructions in this section to remove the power module board.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.

Procedure

Step 1. Make preparations for this task.

- a. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see [“Remove the top cover” on page 192](#)).
- b. Disconnect all the drive cables from the system board; then, remove the drive cage from the node (see [“Remove the drive cage” on page 103](#)).

Step 2. Remove the cable wall and the power module board.

- a. ① Remove the two screws that secure cable wall; then, remove the cable wall.
- b. ② Remove the other two screws from the power module board; then, pull the two **pull tapes** on the power module board to remove it from the system board.

Important: To prevent damage to the parts, make sure to carefully pull both pull tapes with equal strength at the same time.

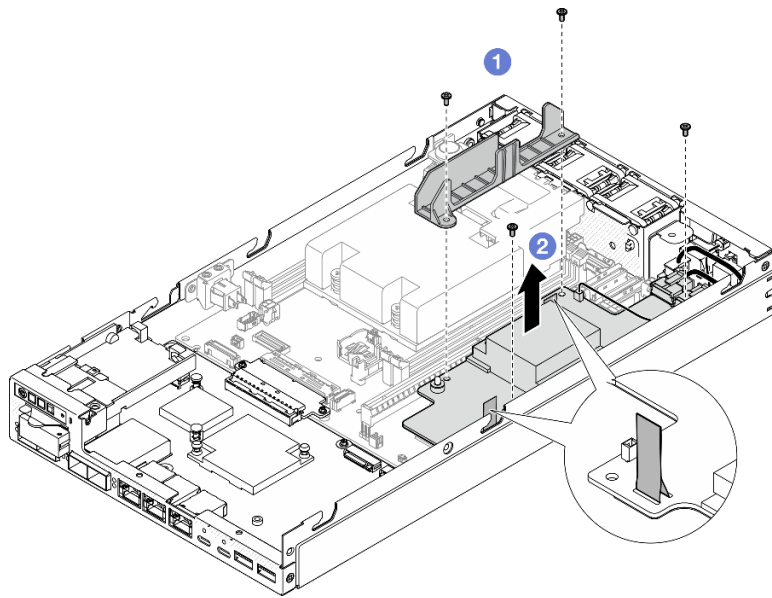


Figure 122. Removal of the cable wall from power module board

Step 3. Disconnect the cables from the power module board (see “Cable routing for the power module board and power input board module” on page 206).

Attention: Remove the power module board **BEFORE** disconnecting the cables between the power module board and power input board module.

After this task is completed

- Install a replacement unit (see “Install a power module board (PMB)” on page 155).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=nphQYjhGWZ8>

Install a power module board (PMB)

Follow instructions in this section to install a power module board.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**

**CAUTION:**

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Make preparations for this task.

- a. Make sure that the power input board module is already installed in place (see [“Install a power input board \(PIB\) module” on page 150](#)).

Step 2. Connect the cables between the power module board and power input board (see [“Cable routing for the power module board and power input board module” on page 206](#)).

Attention: For a smooth installation, connect the cables between the power module board and power input board module BEFORE installing the power module board.

Step 3. Install the power module board and the cable wall.

- a. ① Align the power module board with the guide pins; then, place the power module board into place and tighten the two screws by the sidewall of the node.
- b. ② Place the cable wall into its position on the power module board; then, tighten the two screws.

Important:

- Make sure to place the pull tape of the power module board beneath the cable wall away from the DIMM slots. Otherwise, it may interfere with the memory modules and cause system failure.
- Make sure that the busbars are seated in the holes of the power module board as shown in the illustration.

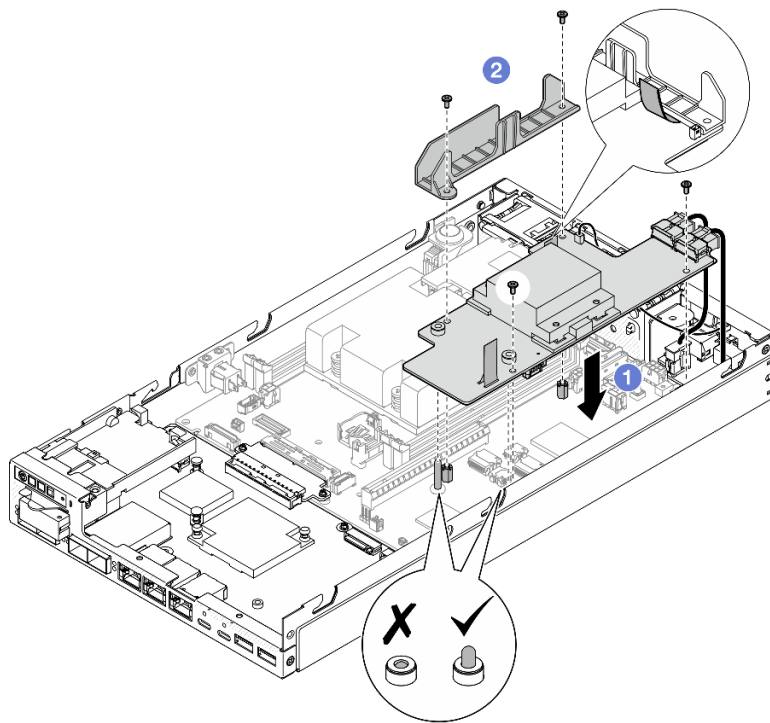


Figure 123. Installation of the power module board

After this task is completed

- Reinstall the drive cage and reconnect the required drive cables (see “Install a drive cage” on page 110 and “Cable routing for the hot-swap drives” on page 199).
- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).

Demo video

<https://www.youtube.com/watch?v=xmIPfGNjfOM>

Processor heat sink replacement (trained technician only)

Follow instructions in this section to remove or install a processor heat sink. This procedure must be executed by a trained technician.

CAUTION:



The heat sinks and processors might be very hot. Turn off the server and wait several minutes to let the server cool before removing the server cover.

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

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

Remove the processor heat sink (trained technician only)

Follow instructions in this section to remove the processor heat sink. This procedure must be executed by a trained technician.

About this task

Important: Removing and installing this component requires trained technicians. **Do not** attempt to remove or install the part without proper training.

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **S012**



CAUTION:

Hot surface nearby.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.

Procedure

Step 1. Make preparations for this task.

- a. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see [“Remove the top cover”](#) on page 192).
- b. Remove the air baffle (see [“Remove the air baffle”](#) on page 92).
- c. Remove all the memory modules (see [“Remove a memory module”](#) on page 136).

Step 2. Remove the processor heat sink.

Attention:

- Avoid touching the processor socket or processor contacts. Processor-socket contacts are very fragile and easily damaged. Contaminants on the processor contacts, such as oil from your skin, can cause connection failures.
 - Prevent the thermal grease on the processor or heat sink from coming in contact with anything. Contact with any surface can compromise the thermal grease, rendering it ineffective. Thermal grease can damage components, such as the electrical connectors in the processor socket.
- a. ①②③④ Use a Phillips screwdriver to fully loosen the captive screws from the heat sink in the *removal sequence shown* on the heat-sink label as well as indicated in the illustration below.
 - b. ⑤ Lift the heat sink up evenly to remove it from the node.

Important: To prevent damage to the processor, make sure to follow the loosening sequence indicated in the illustration.

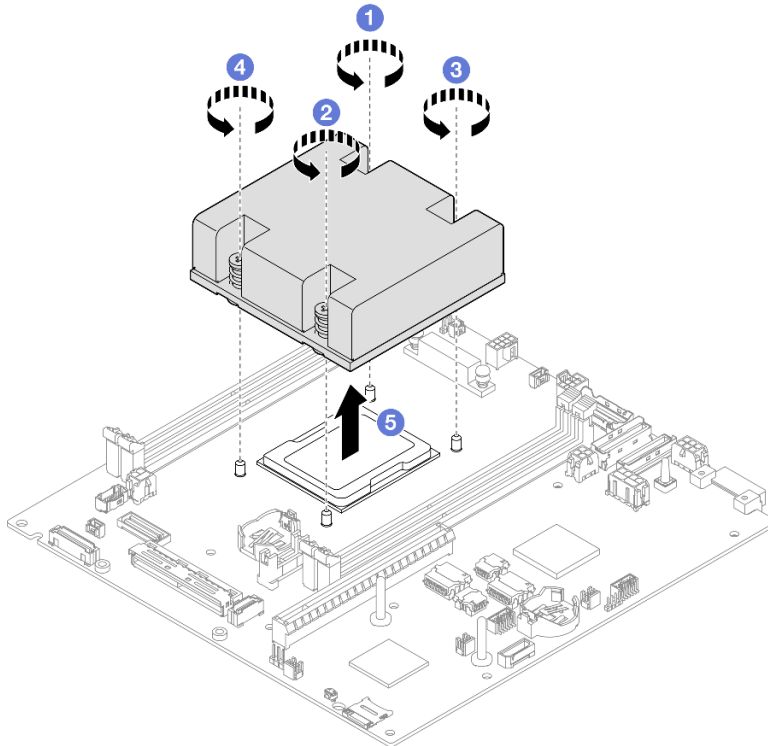


Figure 124. Removal of the processor heat sink

After this task is completed

- Install a replacement unit (see [“Install a processor heat sink \(trained technician only\)”](#) on page 160).

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

Demo video

<https://www.youtube.com/watch?v=f1xtQidCp4w>

Install a processor heat sink (trained technician only)

Follow instructions in this section to install a heat sink. This procedure must be executed by a trained technician.

About this task

Important: Removing and installing this component requires trained technicians. **Do not** attempt to remove or install the part without proper training.

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **S012**



CAUTION:

Hot surface nearby.

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.
- Avoid touching the processor socket or processor contacts. Processor-socket contacts are very fragile and easily damaged. Contaminants on the processor contacts, such as oil from your skin, can cause connection failures.

- Prevent the thermal grease on the processor or heat sink from coming in contact with anything. Contact with any surface can compromise the thermal grease, rendering it ineffective. Thermal grease can damage components, such as the electrical connectors in the processor socket.

Procedure

Step 1. Make preparations for this task.

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

Attention:

- If there is any old thermal grease on the processor, gently clean the top of the processor using an alcohol cleaning pad. Dispose of the cleaning pad after all of the thermal grease is removed.
- Before applying thermal grease on the top of the processor, make sure that the alcohol has fully evaporated.
- To ensure the best performance, check the manufacturing date on the new heat sink and make sure that it does not exceed two years.

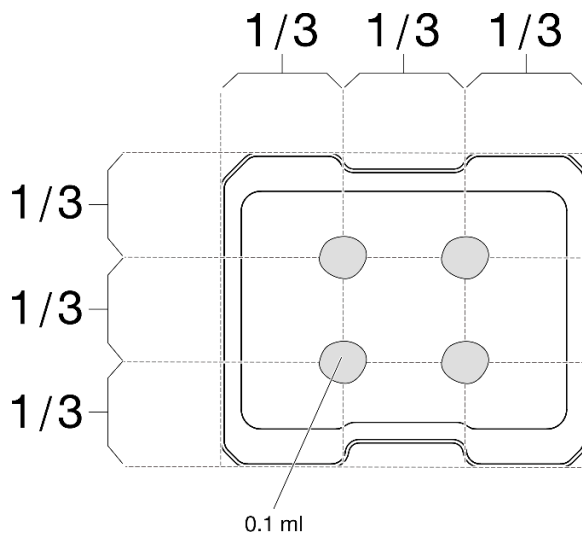


Figure 125. Application of the thermal grease

Step 2. Install the processor heat sink.

- ① Align the heat sink with the guide pins on the processor socket; then, insert the heat sink into the processor socket.
- ②③④⑤ Use a Phillips screwdriver to fully tighten the captive screws in the installation sequence shown on the heat-sink label. Tighten the screws until they stop; then, visually inspect to make sure that there is no gap between the screw shoulder beneath the heat sink and the processor socket. (For reference, the torque required for the nuts to fully tighten is 1.4-1.6 newton-meters, 12-14 inch-pounds.)

Important:

- To prevent damage to the processor, make sure to follow the tightening sequence indicated in the illustration.

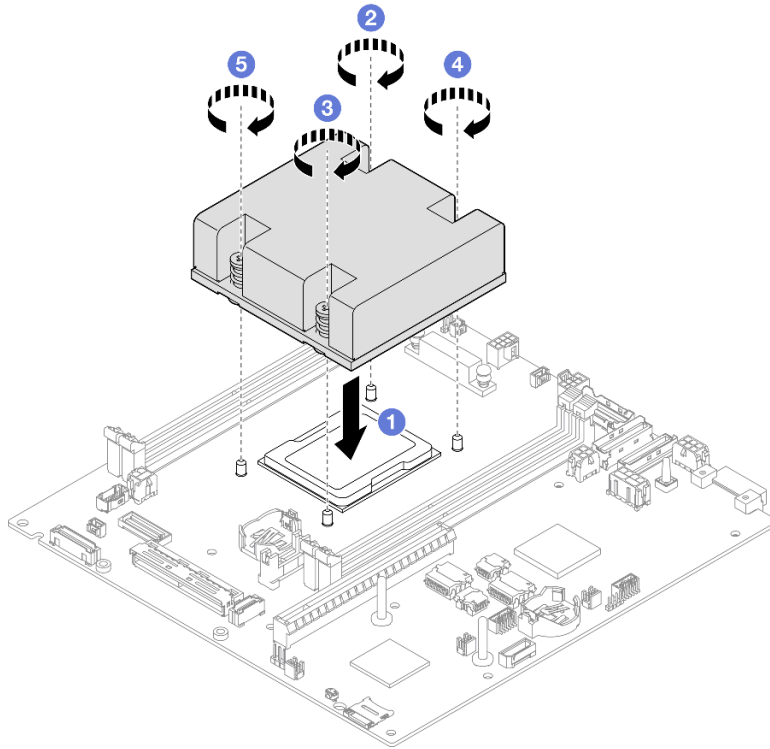


Figure 126. Installation of a processor heat sink

After this task is completed

- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).

Demo video

<https://www.youtube.com/watch?v=67oVnQqaM5E>

Rubber feet replacement

Follow instructions in this section to remove or install the rubber feet (4 rubber pads).

Remove the rubber feet

Follow instructions in this section to remove the rubber feet (four rubber pads) from a node or node sleeve.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Lay the node or node sleeve on a flat, static-protective surface.

Note: For the removal of a node from an enclosure or a node sleeve, or the removal of a node sleeve from a DIN rail or wall mount, see [“Configuration guide” on page 45](#).

Procedure

- Step 1. Carefully place the node or node sleeve upside down.
- Step 2. Remove a rubber pad by pulling it from the node or node sleeve.

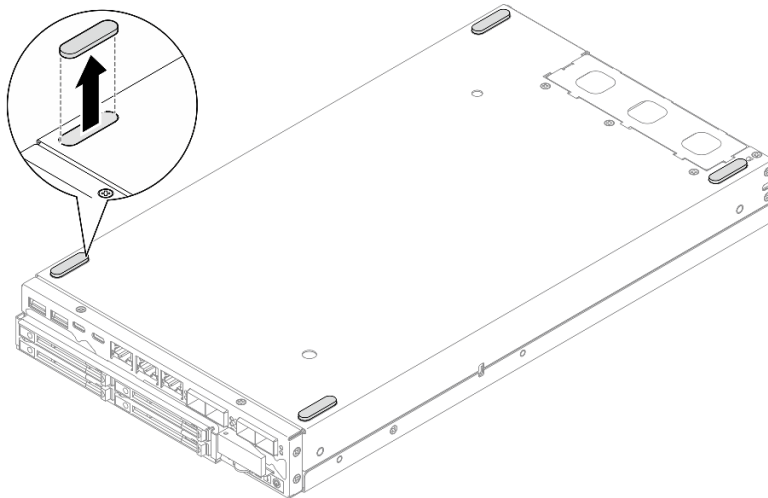


Figure 127. Removal of a rubber pad

- Step 3. (Optional) If necessary, repeat the same step for the other three rubber feet.

After this task is completed

- If necessary, install a replacement unit (see [“Install the rubber feet” on page 164](#)).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=M1eiYOIW18k>

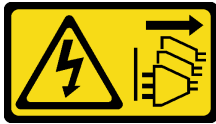
Install the rubber feet

Follow instructions in this section to install the rubber feet (four rubber pads) to a node or node sleeve.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.

Procedure

- Step 1. Carefully place the node or node sleeve upside down.
- Step 2. Remove the film on the rubber pad; then, stick the rubber pad onto the corner of the underside of the node or node sleeve .

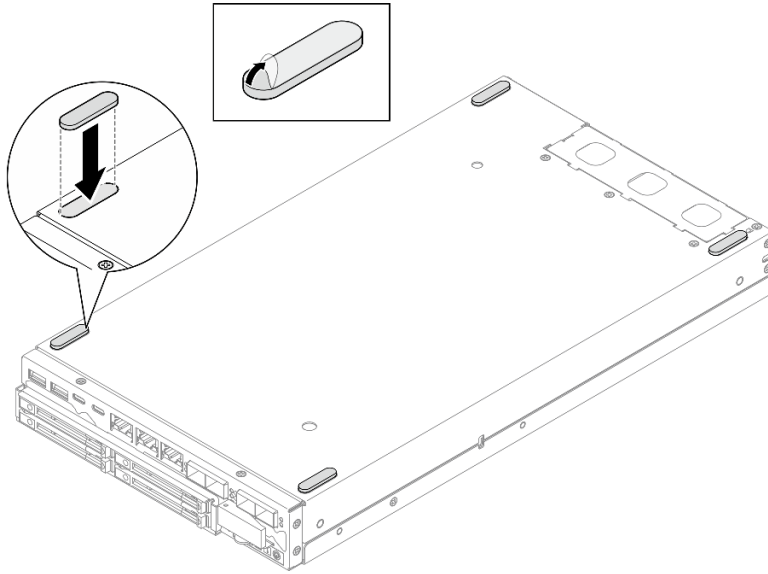


Figure 128. Installation of a rubber pad

Step 3. (Optional) If necessary, repeat the same step for the other three rubber feet.

After this task is completed

- Carefully place the node or node sleeve topside up.
- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).

Demo video

<https://www.youtube.com/watch?v=aKhFYfylusI>

System-board assembly replacement (trained technician only)

Follow instructions in this section to remove or install the system-board assembly, including the system board, bridge board, I/O module board (aka. LOM package), and front I/O bezel. This procedure must be executed by a trained technician.

Important: Removing and installing this component requires trained technicians. **Do not** attempt to remove or install the part without proper training.

CAUTION:

Hazardous moving parts. Keep fingers and other body parts away.



CAUTION:



The heat sinks and processors might be very hot. Turn off the server and wait several minutes to let the server cool before removing the server cover.

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 214](#) 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+**.

Remove the front I/O bezel

Follow instructions in this section to remove a front I/O bezel.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.

Note: Depending on the specific configuration, the front I/O bezel and I/O module board might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- a. If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see [“Remove the top cover” on page 192](#)).
- b. Disconnect all the drive cables from the system board; then, remove the drive cage from the node (see [“Remove the drive cage” on page 103](#)).
- c. Remove the drive cage (see [“Remove the drive cage” on page 103](#)).
- d. Remove the front operator assembly from the node and disconnect the cable from the system board(see [“Remove the front operator assembly” on page 117](#)).

Step 2. Remove the five screws that secure the front I/O bezel.

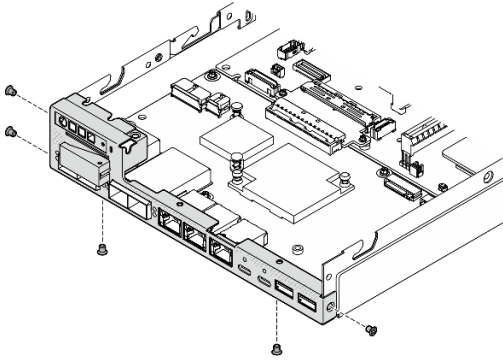


Figure 129. Removal of the front I/O bezel screws

Step 3. Remove the front I/O bezel by pulling it away from the node.

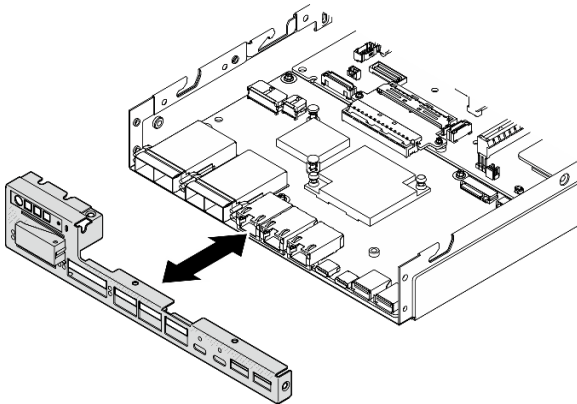


Figure 130. Removal of the front I/O bezel

After this task is completed

- Install a replacement unit (see [“Install a front I/O bezel” on page 186](#)).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=mc-SIkDvMT8>

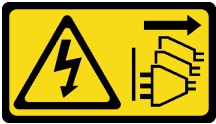
Remove the I/O module board

Follow instructions in this section to remove the I/O module board from the node.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see “[Configuration guide](#)” on page 45); then, **power off the server** and disconnect the power cords (see “[Power off the server](#)” on page 44).
- Remove the node from the enclosure or node sleeve, if applicable (see “[Configuration guide](#)” on page 45); then, carefully lay the node on a flat, static-protective surface.

Note: Depending on the specific configuration, the front I/O bezel and I/O module board might look different from the illustrations in this section.

Procedure

Step 1. Make preparations for this task.

- If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see “[Remove the top cover](#)” on page 192).
- Disconnect all the drive cables from the system board; then, remove the drive cage from the node (see “[Remove the drive cage](#)” on page 103).
- Remove the front operator assembly from the node and disconnect the cable from the system board (see “[Remove the front operator assembly](#)” on page 117).
- Remove the front I/O bezel (see “[Remove the front I/O bezel](#)” on page 167).
- Disconnect the I/O module board power cable (see “[Cable routing for the I/O module board](#)” on page 205).

Step 2. Remove the six screws that secure the I/O module board .

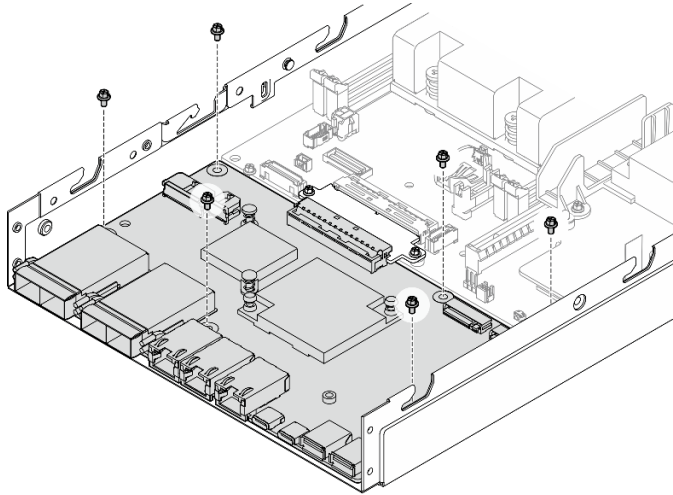


Figure 131. Removal of the screws from the I/O module board

Step 3. Slightly pivot the I/O module board at an angle to disengage it; then, pull the I/O module board toward the front of the node to remove it.

Attention: When disengaging and removing the I/O module board, make sure to:

- pivot the I/O module board at a small angle to avoid interfering with the studs on the chassis sidewalls; and
- keep the I/O module board under these studs.

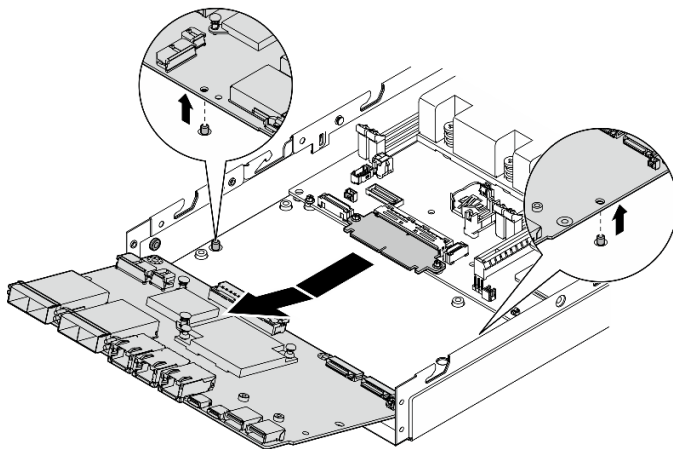


Figure 132. Removal of the I/O module board

After this task is completed

- Install a replacement unit (see [“Install an I/O module board”](#) on page 183).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.
- If any M.2 boot drives are installed on the I/O module board, remove them before returning or recycling the I/O module board (see [“Remove an M.2 boot drive”](#) on page 131).

Demo video

<https://www.youtube.com/watch?v=mc-SiKDvMT8>

Remove the bridge board

Follow instructions in this section to remove the bridge board.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to make sure that you work safely.
- Remove the shipping bracket or security bezel, if applicable (see “[Configuration guide](#)” on page 45); then, **power off the server** and disconnect the power cords (see “[Power off the server](#)” on page 44).
- Remove the node from the enclosure or node sleeve, if applicable (see “[Configuration guide](#)” on page 45); then, carefully lay the node on a flat, static-protective surface.

Procedure

Step 1. Make preparations for this task.

- If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see “[Remove the top cover](#)” on page 192).
- Disconnect all the drive cables from the system board; then, remove the drive cage from the node (see “[Remove the drive cage](#)” on page 103).
- Remove the front operator assembly from the node and disconnect the cable from the system board (see “[Remove the front operator assembly](#)” on page 117).
- Remove the front I/O bezel (see “[Remove the front I/O bezel](#)” on page 167).
- Remove the I/O module board and disconnect the cable from the system board (see “[Remove the I/O module board](#)” on page 169).

Step 2. Remove the two screws that secure the bridge board.

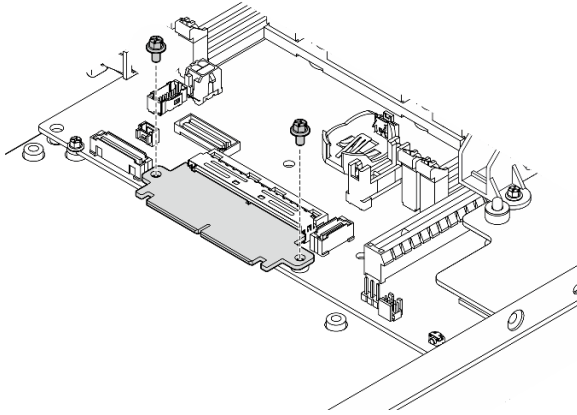


Figure 133. Removal of the bridge board screws

Step 3. Slightly pull the bridge board toward the front of the node to remove it.

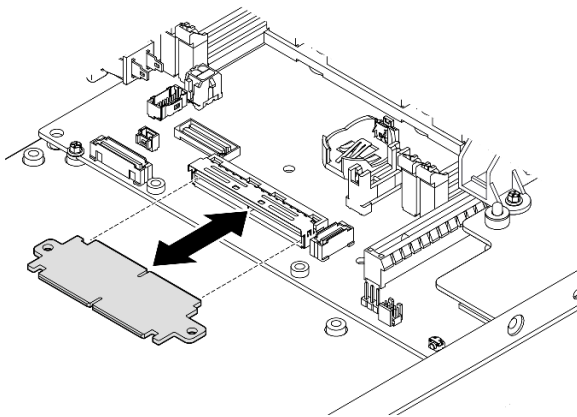


Figure 134. Removal of the bridge board

After this task is completed

- Install a replacement unit (see “[Install a bridge board](#)” on page 181).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=wcFw7YtLDI8>

Remove the system board (trained technician only)

Follow instructions in this section to remove the system board. This procedure must be executed by a trained technician.

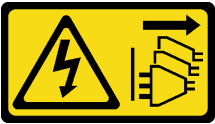
About this task

Important:

- Removing and installing this component requires trained technicians. **Do not** attempt to remove or install the part without proper training.
- When replacing the system board, always update the server with the latest firmware or restore the pre-existing firmware. Make sure that you have the latest firmware or a copy of the pre-existing firmware before you proceed.
- When removing the memory modules, label the slot number on each memory module, remove all the memory modules from the system board, and set them aside on a static-protective surface for reinstallation.
- When disconnecting cables, make a list of each cable and record the connectors the cable is connected to, and use the record as a cabling checklist after installing the new system board.

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **S012**



CAUTION:

Hot surface nearby.

Attention:

- Do the following before removing the system board to backup important data:
 1. Record all system configuration information, such as Lenovo XClarity Controller IP addresses, vital product data, and the machine type, model number, serial number, Universally Unique Identifier, and asset tag of the server.
 2. If the server has SED installed, maintain a backup of SED AK. See [“Manage the Self Encryption Drive Authentication Key \(SED AK\)” on page 166](#) for more details.
 3. Use the Lenovo XClarity Essentials OneCLI to save the system configuration to external media.
 4. Log on XCC Web GUI and backup config to external media.
 5. Download the XCC Service Data to external media.
- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.

- Remove the shipping bracket or security bezel, if applicable (see “[Configuration guide](#)” on page 45); then, **power off the server** and disconnect the power cords (see “[Power off the server](#)” on page 44).
- Remove the node from the enclosure or node sleeve, if applicable (see “[Configuration guide](#)” on page 45); then, carefully lay the node on a flat, static-protective surface.

Procedure

Step 1. Make preparations for this task.

- Record all system configuration information, such as Lenovo XClarity Controller IP addresses, vital product data, and the machine type, model number, serial number, Universally Unique Identifier, and asset tag of the server.
- If SED encryption is enabled, maintain a backup of SED AK. See “[Manage the Self Encryption Drive Authentication Key \(SED AK\)](#)” on page 166.
- If applicable, export Lenovo Features on Demand activation key. See the “License Management” section in the XCC documentation compatible with the server at <https://pubs.lenovo.com/lxcc-overview/>.
- Save the system configuration to an external device with Lenovo XClarity Essentials.
- Save the system event log to external media.
- If applicable, unlock or remove any locking device that secures the top cover, such as a Kensington lock; then, remove the top cover (see “[Remove the top cover](#)” on page 192).
- Disconnect all cables from the system board and remove the components listed below:
 - Disconnect all the drive cables from the system board; then, remove the drive cage from the node (see “[Remove the drive cage](#)” on page 103).
 - Remove the front operator assembly from the node and disconnect the cable from the system board (see “[Remove the front operator assembly](#)” on page 117).
 - Remove the front I/O bezel (see “[Remove the front I/O bezel](#)” on page 167).
 - Remove the I/O module board and disconnect the cable from the system board (see “[Remove the I/O module board](#)” on page 169).
 - Remove the bridge board (see “[Remove the bridge board](#)” on page 171).
 - Remove the MicroSD card (see “[Remove the MicroSD card](#)” on page 142).
 - Remove the air baffle (see “[Remove the air baffle](#)” on page 92).
 - Depending on the configuration, remove the power module board or internal power supply unit (see “[Remove the power input board \(PIB\) module](#)” on page 146 or “[Remove the internal power supply unit \(AC PMB\)](#)” on page 120).
 - Remove the power input board module (see “[Remove the power input board \(PIB\) module](#)” on page 146).
 - Remove the intrusion switch with cable (see “[Remove the intrusion switch with cable](#)” on page 123).
 - Remove all the memory modules (see “[Remove a memory module](#)” on page 136).

Note: When removing the memory modules, label the slot number on each memory module, remove all the memory modules from the system board, and set them aside on a static-protective surface for reinstallation.
 - Remove the keylock switch with cable (see “[Remove the keylock switch with cable](#)” on page 127).

Step 2. Remove the three screws and six hex standoffs that secure the system board.

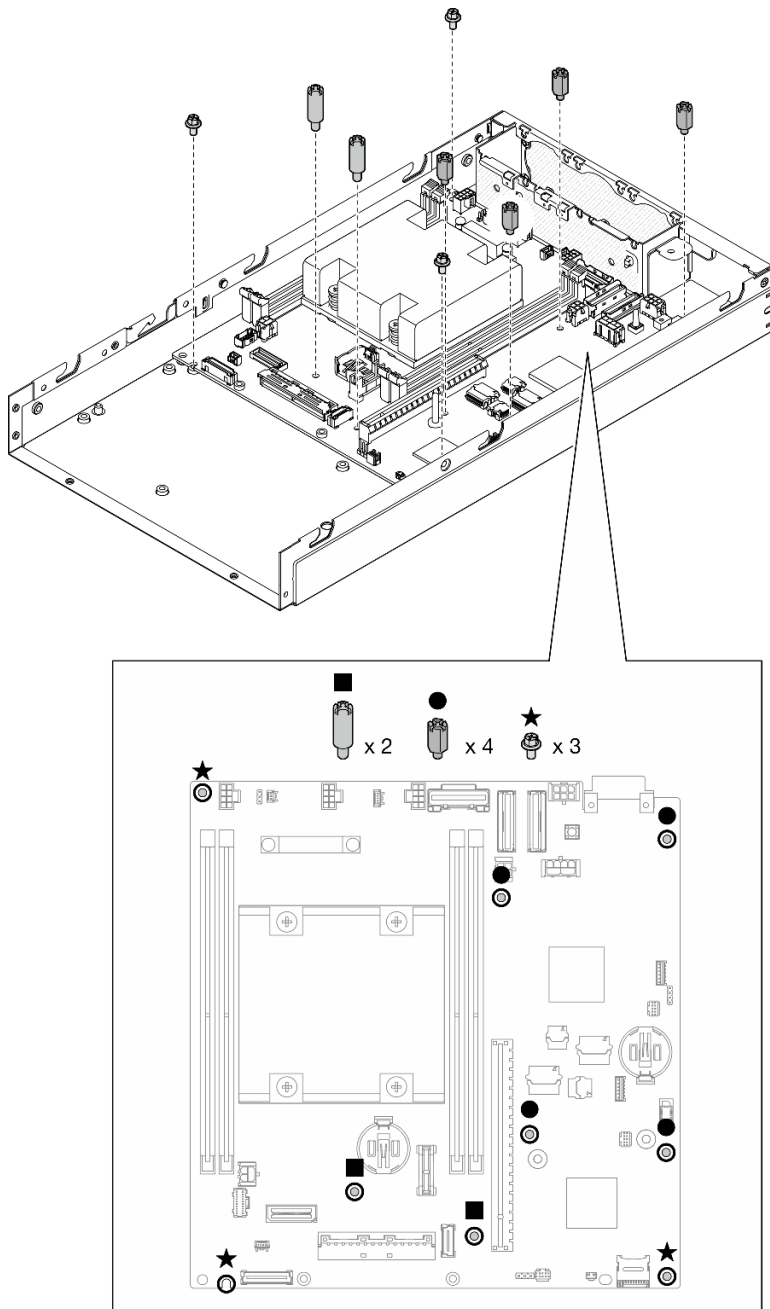


Figure 135. Removal of the system board screws and standoffs

Note: The hex standoffs are designed to be used with a common Phillips screwdriver or flat-head screwdriver.

- Step 3. Carefully lift up the system board to disengage it from the chassis pins; then, pull the system board toward the front of the node.

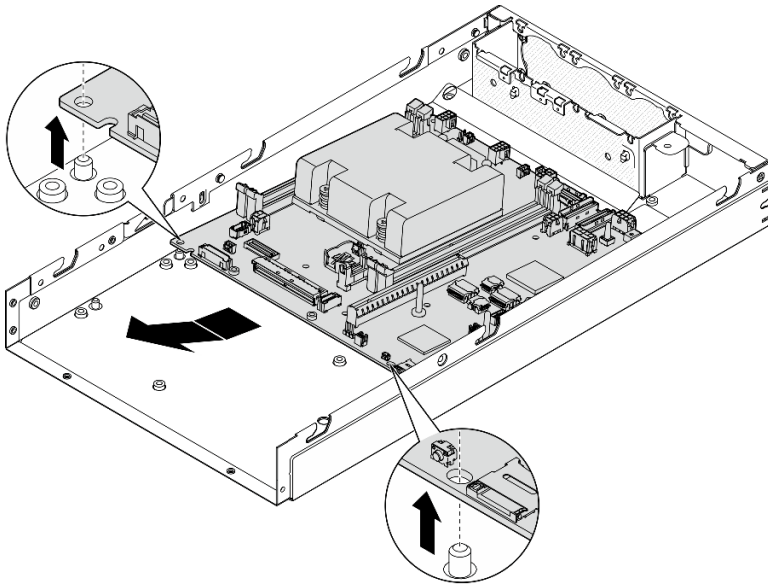


Figure 136. Removal of the system board

Step 4. Pivot the system board at an angle; then, fully remove it from the chassis.

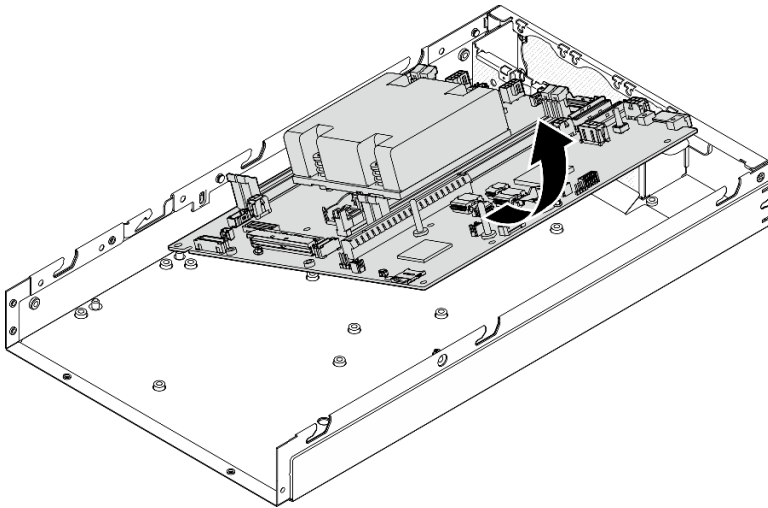


Figure 137. Removal of the system board

After this task is completed

- Install a replacement unit (see “[Install a system board \(trained technician only\)](#)” on page 177).
- If you are instructed to return the component, follow all of the packaging instructions and use any packaging materials for shipping that are supplied to you.

Demo video

<https://www.youtube.com/watch?v=AxjLjm1CUE>

Install a system board (trained technician only)

Follow instructions in this section to install a system board. This procedure must be executed by a trained technician.

About this task

Important:

- Removing and installing this component requires trained technicians. **Do not** attempt to remove or install the part without proper training.
- When replacing the system board, always update the server with the latest firmware or restore the pre-existing firmware. Make sure that you have the latest firmware or a copy of the pre-existing firmware before you proceed.
- When removing the memory modules, label the slot number on each memory module, remove all the memory modules from the system board, and set them aside on a static-protective surface for reinstallation.
- When disconnecting cables, make a list of each cable and record the connectors the cable is connected to, and use the record as a cabling checklist after installing the new system board.

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

- **S012**



CAUTION:

Hot surface nearby.

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/products/servers/thinkedge/se350v2/7da9/downloads/driver-list> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 209 for more information on firmware updating tools.

Procedure

Step 1. Make preparations for this task.

- a. Carefully lay the node on a flat, static-protective surface.

Step 2. Insert the system board into the node at an angle as illustrated.

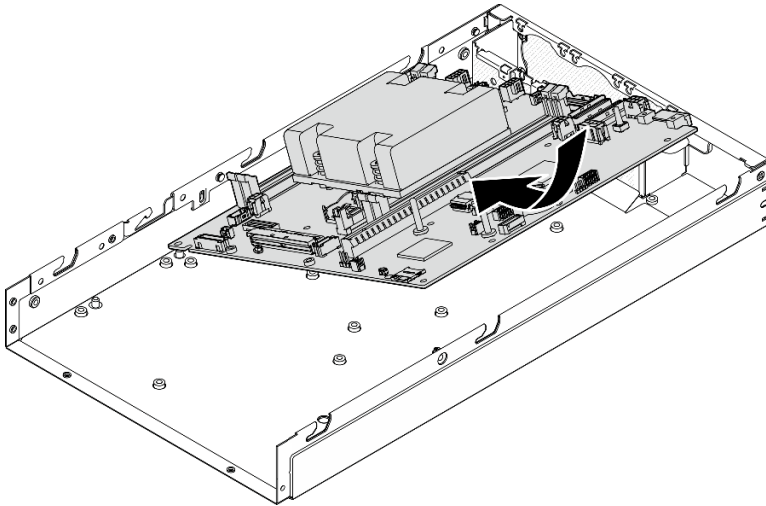


Figure 138. Installation of a system board

Step 3. Carefully slide the system board toward the rear of the node; then, seat the system board onto the guide pins of the chassis.

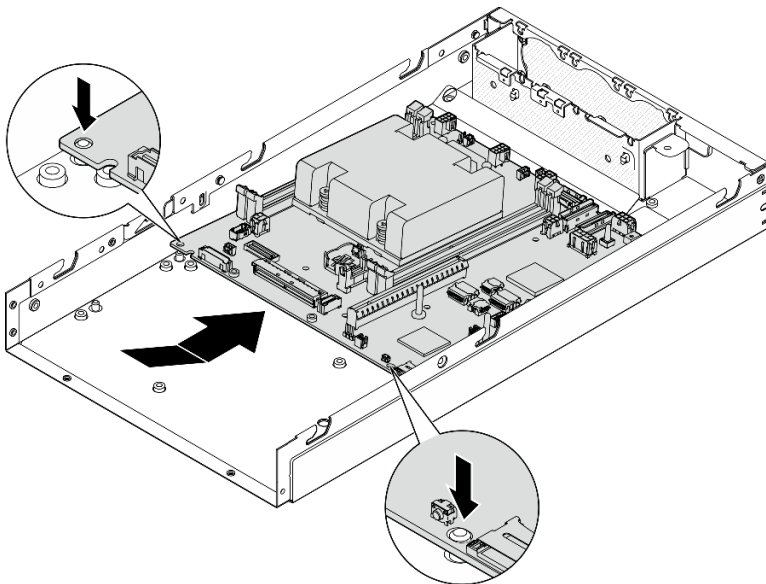


Figure 139. Installation of a system board

Step 4. Tighten the screws and standoffs as illustrated to secure the system board.

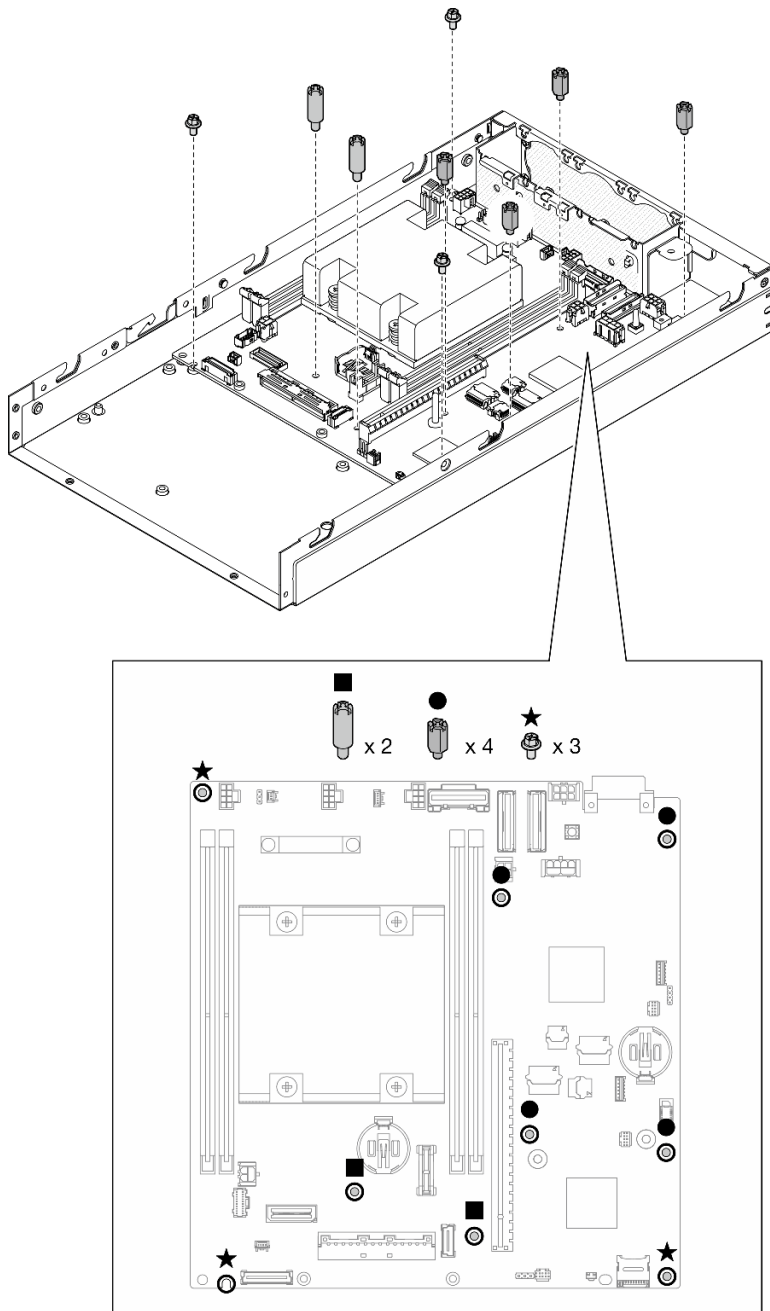


Figure 140. System board screws

Note: The hex standoffs are designed to be used with a common Phillips screwdriver or flat-head screwdriver.

- Step 5. Peel away the Lenovo XClarity Controller network access label on the process heat sink; then, attach this label to the network access tag on the front of the node.

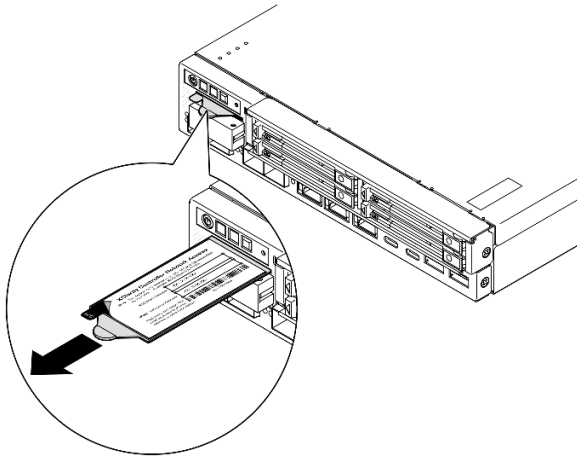


Figure 141. Lenovo XClarity Controller network access label on the pull-out information tab

After this task is completed

1. Proceed to install the other components of the system-board assembly.
 - Install a bridge board (see [“Install a bridge board” on page 181](#)).
 - Install an I/O module board (see [“Install an I/O module board” on page 183](#)).
 - Install a front I/O bezel (see [“Install a front I/O bezel” on page 186](#)).
2. Reinstall any components that have been removed from the system board and connect all required cables (see related topics in [Chapter 5 “Hardware replacement procedures” on page 37](#) and [Chapter 6 “Internal cable routing” on page 197](#)), such as the following.
 - a. Reinstall the power input board module and the power main board and connect the required cables between these two components (see [“Install a power input board \(PIB\) module” on page 150](#), [“Install a power module board \(PMB\)” on page 155](#), and [“Cable routing for the power module board and power input board module” on page 206](#)).
 - b. Reinstall all the required memory modules (see [“Install a memory module” on page 139](#)).
 - c. If applicable, reinstall the intrusion switch with cable and connect the cable to the system board (see [“Install an intrusion switch with cable” on page 125](#)).
 - d. Reinstall the front operator assembly and connect the cable to the system board (see [“Install a front operator assembly” on page 119](#)).
 - e. Reinstall the MicroSD card (see [“Install a MicroSD card” on page 144](#)).
 - f. Reinstall the keylock switch with cable and connect the cable to the system board (see [“Install a keylock switch with cable” on page 129](#)).
 - g. Reinstall the drive cage and connect the required cables to the system board and the I/O module board (see [“Install a drive cage” on page 110](#) and [“Cable routing for the hot-swap drives” on page 199](#)).
 - h. Connect and route all the required cables into place (see [Chapter 6 “Internal cable routing” on page 197](#)).
3. Proceed to complete the parts replacement (see [“Complete the parts replacement” on page 195](#)).
4. Reconnect the power cords and any cables that you removed.
5. Reset the system date and time.

6. Update the machine type and serial number with the new vital product data (VPD) using the Lenovo XClarity Provisioning Manager (see “[Update the Vital Product Data \(VPD\)](#)” on page 187).

Notes:

- The machine type needs to be updated if the node is to be installed in an enclosure, or is removed from and not to be reinstalled to an enclosure (see “[Change the machine type for operating in an enclosure](#)” on page 191).
 - Machine type number and serial number can be found on the ID label (see “[Identify the server and access the Lenovo XClarity Controller](#)” on page 33).
7. Update the UEFI, XCC and LXPM firmware to the specific version supported by the server. See “[Update the firmware](#)” on page 209.
 8. If applicable, install Lenovo Features on Demand activation key. See the “License Management” section in the XCC documentation compatible with the server at <https://pubs.lenovo.com/lxcc-overview/>.
 9. Update the public key. See the “Update Device Key” section of https://download.lenovo.com/servers_pdf/thinkshield-web-application-user-guide-v2.pdf for more details.

Notes:

- The role of Lenovo ID should be **Maintenance User** to update the public key in ThinkShield Key Vault Portal web interface or ThinkShield mobile app.
 - (Lenovo Service only) See https://glosse4lenovo.lenovo.com/wiki/glosse4lenovo/view/How%20To/System%20related/ThinkEdge/HowTo_update_PublicKey_after_board_replacement/ for the details.
10. Set the TPM policy (see “[Set the TPM policy](#)” on page 189).
 11. Optionally, enable Secure Boot (see [Enable UEFI Secure Boot](#)).
 12. Reconfigure the following ThinkEdge security features if necessary.
 - a. Change System Lockdown Mode Control status to ThinkShield Portal. See “[Activate or unlock the system](#)” on page 214
 - b. Enable SED encryption. See “[Manage the Self Encryption Drive Authentication Key \(SED AK\)](#)” on page 166.
 - c. Recover SED AK. See “[Manage the Self Encryption Drive Authentication Key \(SED AK\)](#)” on page 166.
 - d. Enable security features. See “[System Lockdown Mode](#)” on page 216.

Demo video

<https://www.youtube.com/watch?v=RYT8glyqKCc>

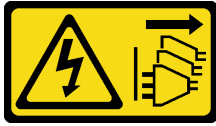
Install a bridge board

Follow instructions in this section to install a bridge board.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Make preparations for this task.

- a. Make sure the system board is installed (see “[Install a system board \(trained technician only\)](#)” on page 177).

Step 2. Align the bridge board with the connector on the system board; then, carefully insert the bridge board into the connector until it clicks into place.

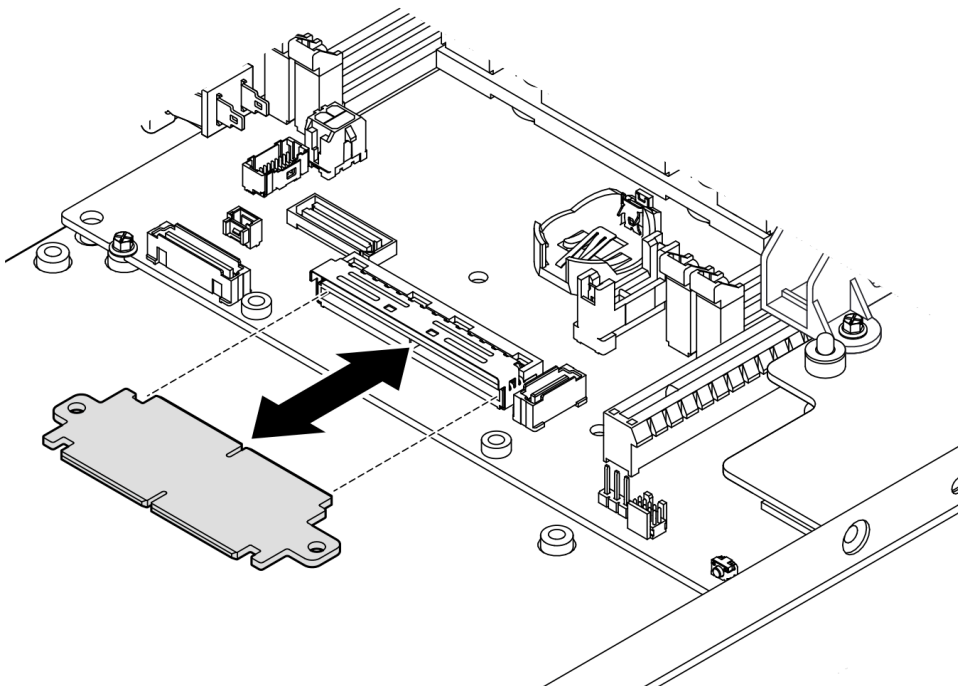


Figure 142. Installation of the bridge board

Step 3. Tighten the two screws to secure the bridge board.

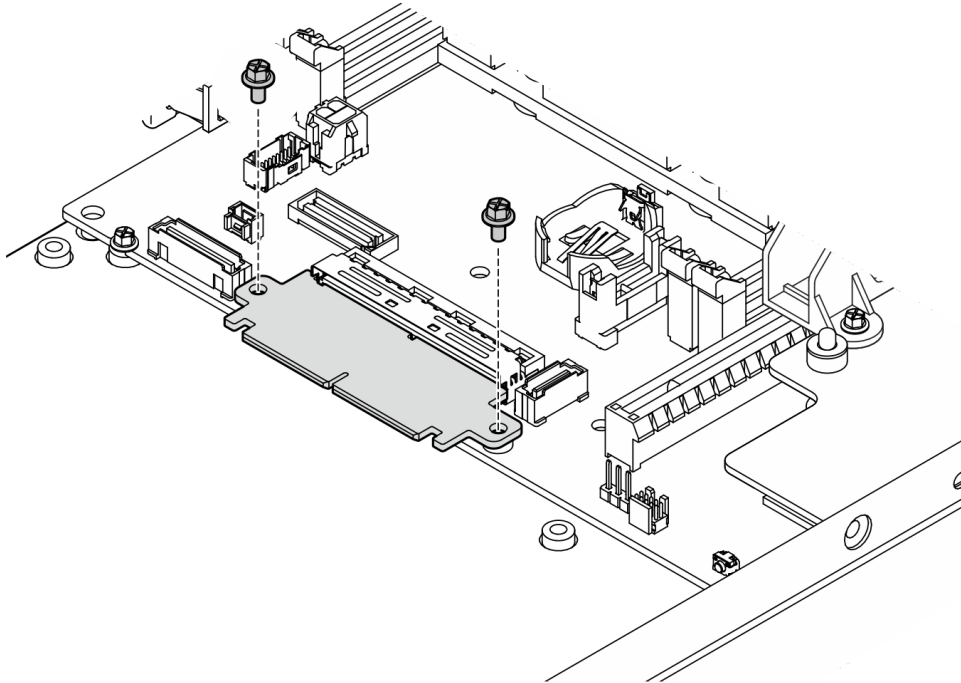


Figure 143. Installation of the bridge board screws

After this task is completed

- Install an I/O module board (see “[Install an I/O module board](#)” on page 183).
- Install a front I/O bezel (see “[Install a front I/O bezel](#)” on page 186).
- Install a front operator assembly (see “[Install a front operator assembly](#)” on page 119).
- Install a drive cage (see “[Install a drive cage](#)” on page 110).
- Proceed to complete the parts replacement (see “[Complete the parts replacement](#)” on page 195).

Demo video

<https://www.youtube.com/watch?v=uqauMSsqioc>

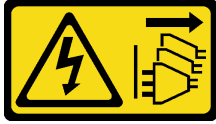
Install an I/O module board

Follow instructions in this section to install an I/O module board.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read “[Installation Guidelines](#)” on page 37 and “[Safety inspection checklist](#)” on page 38 to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/products/servers/thinkedge/se350v2/7da9/downloads/driver-list> to see the latest firmware and driver updates for your server.
- Go to “[Update the firmware](#)” on page 209 for more information on firmware updating tools.

Note: Depending on the specific configuration, the front I/O bezel and I/O module board might look different from the illustrations in this section.

Procedure

- Step 1. Make preparations for this task.
 - a. Make sure that the system board and bridge board are installed (see “[Install a system board \(trained technician only\)](#)” on page 177 and “[Install a bridge board](#)” on page 181).
- Step 2. Align the connector on the I/O module board with the bridge board; then, align the I/O module board with the guide pins in the node.
- Step 3. Lower and pivot the I/O module board at an angle to insert it into place; then, make sure the I/O module board is connected with the bridge board.

Attention: When sliding and inserting the I/O module board into place, make sure to:

- keep the I/O module board **under the studs** on both sidewalls of the chassis; and
- align and engage the I/O module board with the guide pins on the bottom of the chassis.

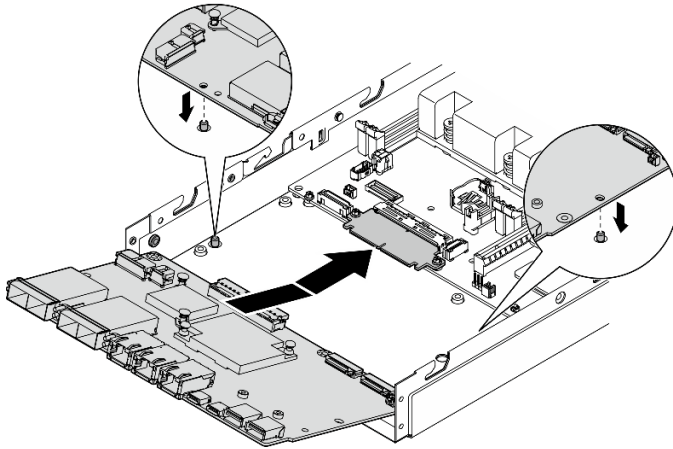


Figure 144. Installation of the I/O module board

Step 4. Tighten the six screws as shown to secure the I/O module board.

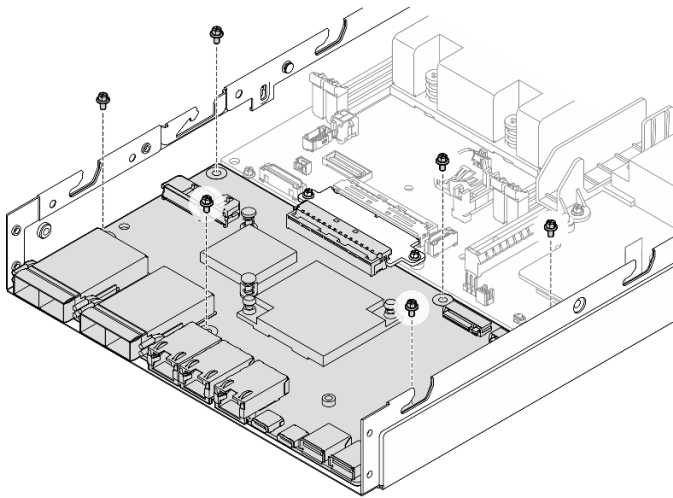


Figure 145. Installation of the I/O module board screws

After this task is completed

- Connect the I/O-module-board power cable (see [“Cable routing for the I/O module board”](#) on page 205).
- Install a front I/O bezel (see [“Install a front I/O bezel”](#) on page 186).
- Install a front operator assembly (see [“Install a front operator assembly”](#) on page 119).
- Install a drive cage (see [“Install a drive cage”](#) on page 110).
- If necessary, install one or both M.2 boot drives onto the I/O module board (see [“Install an M.2 boot drive”](#) on page 133).
- Proceed to complete the parts replacement (see [“Complete the parts replacement”](#) on page 195).

Demo video

<https://www.youtube.com/watch?v=uC3SFsq4HiM>

Install a front I/O bezel

Follow instructions in this section to install a front I/O bezel.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.

Note: Depending on the specific configuration, the front I/O bezel and I/O module board might look different from the illustrations in this section.

Procedure

- Step 1. Make preparations for this task.
 - a. Make sure that the system board, bridge board, and I/O module board have been installed (see [“Install a system board \(trained technician only\)” on page 177](#), [“Install a bridge board” on page 181](#), and [“Install an I/O module board” on page 183](#)).
- Step 2. Align the front I/O bezel with its slot on the front of the node; then, insert the front I/O bezel into place.

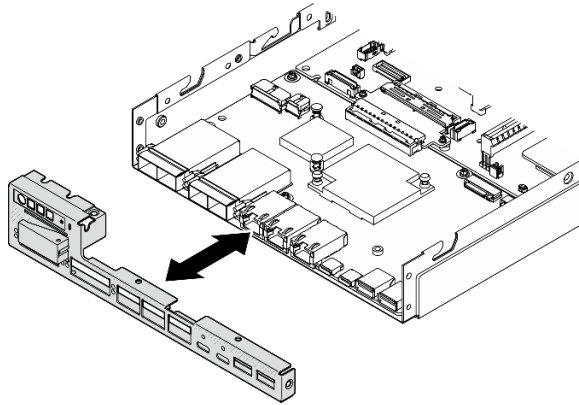


Figure 146. Installation of the front I/O bezel

Step 3. Tighten the five screws that secure the front I/O bezel.

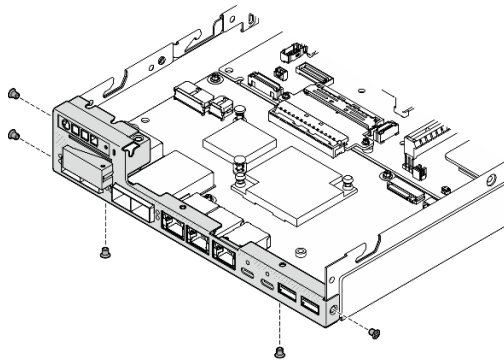


Figure 147. Installation of the front I/O bezel screws

After this task is completed

- Proceed to complete the parts replacement (see [“Complete the parts replacement”](#) on page 195).

Demo video

<https://www.youtube.com/watch?v=uC3SFsq4HiM>

Update the Vital Product Data (VPD)

Use this topic to update the Vital Product Data (VPD).

- **(Required)** Machine type
- **(Required)** Serial number
- **(Required)** System model
- (Optional) Asset tag


- (Optional) UUID

Recommended tools:

- Lenovo XClarity Provisioning Manager
- Lenovo XClarity Essentials OneCLI commands

Using Lenovo XClarity Provisioning Manager

Steps:

1. Start the server and press the key according to the on-screen instructions. The Lenovo XClarity Provisioning Manager interface is displayed by default.
2. Click  on the top right corner of the Lenovo XClarity Provisioning Manager main interface.
3. Click **Update VPD**; then, follow on-screen instructions to update the VPD.

Using Lenovo XClarity Essentials OneCLI commands

- **Updating machine type**
onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model> [access_method]
- **Updating serial number**
onecli config set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n> [access_method]
- **Updating system model**
onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifier <system model> [access_method]
onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifierEx <system model> --override [access_method]
- **Updating asset tag**
onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag> [access_method]
- **Updating UUID**
onecli config createuuid SYSTEM_PROD_DATA.SysInfoUUID [access_method]

Variable	Description
<m/t_model>	The server machine type and model number. Type xxxxyyy, where xxxx is the machine type and yyy is the server model number.
<s/n>	The serial number on the server. Type zzzzzzz, where zzzzzzz is the serial number.
<system model>	The system model on the server. Type system yyyyyyyy, where yyyyyyyy is the product identifier.

<asset_tag>	<p>The server asset tag number.</p> <p>Type aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa, where aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa is the asset tag number.</p>
[access_method]	<p>The access method that you select to access the target server.</p> <ul style="list-style-type: none"> • Online KCS (unauthenticated and user restricted): You can directly delete [access_method] from the command. • Online authenticated LAN: In this case, specify below LAN account information at the end of the OneCLI command: --bmc-username <user_id> --bmc-password <password> • Remote WAN/LAN: In this case, specify below XCC account information and IP address at the end of the OneCLI command: --bmc <bmc_user_id>:<bmc_password>@<bmc_external_IP> <p>Notes:</p> <ul style="list-style-type: none"> - <bmc_user_id> The BMC account name (1 of 12 accounts). The default value is USERID. - <bmc_password> The BMC account password (1 of 12 accounts).


Set the TPM policy

By default, a replacement system board is shipped with the TPM policy set to **undefined**. You must modify this setting to match the setting that was in place for the system board that is being replaced.

There are two methods available to set the TPM policy:

- From Lenovo XClarity Provisioning Manager

To set the TPM policy from Lenovo XClarity Provisioning Manager:

1. Start the server and press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.)
2. If the power-on Administrator password is required, enter the password.
3. Click  on the top right corner of the LXPM main interface; then click **Update VPD**.
4. Set the policy to one of the following settings.
 - **NationZ TPM 2.0 enabled - China only**. Customers in the Chinese Mainland should choose this setting if a NationZ TPM 2.0 adapter is installed.
 - **TPM enabled - ROW**. Customers outside of the Chinese Mainland should choose this setting.
 - **Permanently disabled**. Customers in the Chinese Mainland should use this setting if no TPM adapter is installed.

Note: Although the setting **undefined** is available as a policy setting, it should not be used.

- From Lenovo XClarity Essentials OneCLI

Note: Please note that a Local IPMI user and password must be setup in Lenovo XClarity Controller for remote accessing to the target system.

To set the TPM policy from Lenovo XClarity Essentials OneCLI:

1. Read TpmTcmPolicyLock to check whether the TPM_TCM_POLICY has been locked:
OneCli.exe config show imm.TpmTcmPolicyLock --override --imm <userid>:<password>@<ip_address>

Note: The imm.TpmTcmPolicyLock value must be 'Disabled', which means TPM_TCM_POLICY is NOT locked and changes to the TPM_TCM_POLICY are permitted. If the return code is 'Enabled' then no changes to the policy are permitted. The planar may still be used if the desired setting is correct for the system being replaced.

2. Configure the TPM_TCM_POLICY into XCC:

- For customers in Chinese Mainland with no TPM, or customers that require to disable TPM:
`OneCli.exe config set imm.TpmTcmPolicy "NeitherTpmNorTcm" --override --imm <userid>:<password>@<ip_address>`
- For customers in Chinese Mainland that require to enable TPM:
`OneCli.exe config set imm.TpmTcmPolicy "NationZTPM20Only" --override --imm <userid>:<password>@<ip_address>`
- For customers outside Chinese Mainland that require to enable TPM:
`OneCli.exe config set imm.TpmTcmPolicy "TpmOnly" --override --imm <userid>:<password>@<ip_address>`

3. Issue reset command to reset system:

`OneCli.exe misc ospower reboot --imm <userid>:<password>@<ip_address>`

4. Read back the value to check whether the change has been accepted:

`OneCli.exe config show imm.TpmTcmPolicy --override --imm <userid>:<password>@<ip_address>`

Notes:

- If the read back value is matched it means the TPM_TCM_POLICY has been set correctly.

imm.TpmTcmPolicy is defined as below:

- Value 0 use string "Undefined", which means UNDEFINED policy.
- Value 1 use string "NeitherTpmNorTcm", which means TPM_PERM_DISABLED.
- Value 2 use string "TpmOnly", which means TPM_ALLOWED.
- Value 4 use string "NationZTPM20Only", which means NationZ_TPM20_ALLOWED.
- Below 4 steps must also be used to 'lock' the TPM_TCM_POLICY when using OneCli/ASU commands:

5. Read TpmTcmPolicyLock to check whether the TPM_TCM_POLICY has been locked, command as below:

`OneCli.exe config show imm.TpmTcmPolicyLock --override --imm <userid>:<password>@<ip_address>`

The value must be 'Disabled', it means TPM_TCM_POLICY is NOT locked and must be set.

6. Lock the TPM_TCM_POLICY:

`OneCli.exe config set imm.TpmTcmPolicyLock "Enabled" --override --imm <userid>:<password>@<ip_address>`

7. Issue reset command to reset system, command as below:

`OneCli.exe misc ospower reboot --imm <userid>:<password>@<ip_address>`

During the reset, UEFI will read the value from imm.TpmTcmPolicyLock, if the value is 'Enabled' and the imm.TpmTcmPolicy value is valid, UEFI will lock the TPM_TCM_POLICY setting.

Note: The valid values for imm.TpmTcmPolicy include 'NeitherTpmNorTcm', 'TpmOnly', and 'NationZTPM20Only'.

If the imm.TpmTcmPolicyLock is set as 'Enabled' but imm.TpmTcmPolicy value is invalid, UEFI will reject the 'lock' request and change imm.TpmTcmPolicyLock back to 'Disabled'.

8. Read back the value to check whether the 'Lock' is accepted or rejected. Command as below:

`OneCli.exe config show imm.TpmTcmPolicy --override --imm <userid>:<password>@<ip_address>`

Note: If the read back value is changed from 'Disabled' to 'Enabled' that means the TPM_TCM_POLICY has been locked successfully. There is no method to unlock a policy once it has been set other than replacing system board.

imm.TpmTcmPolicyLock is defined as below:

Value 1 uses string "Enabled" , which means lock the policy. Other values are not accepted.

Enable UEFI Secure Boot

Optionally, you can enable UEFI Secure Boot.

There are two methods available to enable UEFI Secure Boot:

- From Lenovo XClarity Provisioning Manager

To enable UEFI Secure Boot from Lenovo XClarity Provisioning Manager:

1. Start the server and press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.)
2. If the power-on Administrator password is required, enter the password.
3. From the UEFI Setup page, click **System Settings** → **Security** → **Secure Boot**.
4. Enable Secure Boot and save the settings.

Note: If disabling UEFI secure boot is needed, select Disable in step 4.

- From Lenovo XClarity Essentials OneCLI

To enable UEFI Secure Boot from Lenovo XClarity Essentials OneCLI:

1. Download and install Lenovo XClarity Essentials OneCLI.

To download Lenovo XClarity Essentials OneCLI, go to the following site:

<https://datacentersupport.lenovo.com/solutions/HT116433>

2. Run the following command to enable Secure Boot:

```
OneCli.exe config set SecureBootConfiguration.SecureBootSetting Enabled --bmc <userid>:<password>@<ip_
address>
```

where:

- <userid>:<password> are the credentials used to access the BMC (Lenovo XClarity Controller interface) of your server. The default user ID is USERID, and the default password is PASSWORD (zero, not an uppercase o)
- <ip_address> is the IP address of the BMC.

For more information about the Lenovo XClarity Essentials OneCLI `set` command, see:

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

Note: If disabling UEFI secure boot is needed, run the following command:

```
OneCli.exe config set SecureBootConfiguration.SecureBootSetting Disabled --bmc <userid>:<password>@<ip_
address>
```

Change the machine type for operating in an enclosure

Use the following information to change the machine type information in the vital product data (VPD) for different configurations.

Important: This task must be operated by trained technicians.

Node to be installed in an enclosure

If the node is to be installed in an enclosure, change the machine type for proper operation.

- **1U2N enclosure:**

1. Enable IPMI on Lenovo XClarity Controller web interface or Lenovo XClarity Essentials OneCLI.
2. Implement the following IPMI commands:

```
ipmitool raw 0x3a 0x0c 0xE9 0x01 0x10 0x37 0x44 0x42 0x4B 0x43 0x54 0x4F 0x31 0x57 0x57
```

3. For data security purpose, make sure to disable IPMI again on Lenovo XClarity Controller web interface or Lenovo XClarity Essentials OneCLI.

- **2U2N enclosure:**

1. Enable IPMI on Lenovo XClarity Controller web interface or Lenovo XClarity Essentials OneCLI.
2. Implement the following IPMI commands:

```
ipmitool raw 0x3a 0x0c 0xE9 0x01 0x10 0x37 0x44 0x42 0x4B 0x43 0x54 0x4F 0x32 0x57 0x57
```

3. For data security purpose, make sure to disable IPMI again on Lenovo XClarity Controller web interface or Lenovo XClarity Essentials OneCLI.

Node not to be reinstalled into an enclosure

If the node is removed from and not to be reinstalled into an enclosure, change the machine type to the default mode for proper operation.

1. Enable IPMI on Lenovo XClarity Controller web interface or Lenovo XClarity Essentials OneCLI.
2. Implement the following IPMI commands:

```
ipmitool raw 0x3a 0x0c 0xE9 0x01 0x10 0x37 0x44 0x41 0x39 0x43 0x54 0x4F 0x31 0x57 0x57
```

3. For data security purpose, make sure to disable IPMI again on Lenovo XClarity Controller web interface or Lenovo XClarity Essentials OneCLI.

Top cover replacement

Follow instructions in this section to remove or install the top cover.

Remove the top cover

Follow instructions in this section to remove the top cover.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read [“Installation Guidelines” on page 37](#) and [“Safety inspection checklist” on page 38](#) to make sure that you work safely.

- Remove the shipping bracket or security bezel, if applicable (see [“Configuration guide” on page 45](#)); then, **power off the server** and disconnect the power cords (see [“Power off the server” on page 44](#)).
- Remove the node from the enclosure or node sleeve, if applicable (see [“Configuration guide” on page 45](#)); then, carefully lay the node on a flat, static-protective surface.

Procedure

Step 1. Make preparations for this task.

- a. If applicable, remove any locking device that secures the top cover, such as a Kensington lock.

Step 2. Remove the top cover.

- a. ① Remove the screw that secures the top cover on the side.
- b. ② Press and hold the release button on the top cover; then, slide the cover toward the rear of the node to remove it.

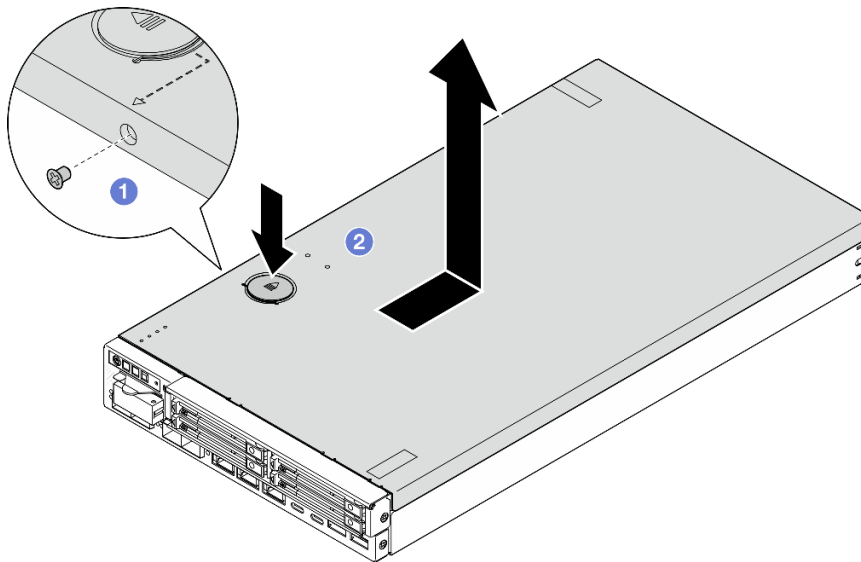


Figure 148. Removal of the top cover

Step 3. Place the top cover on a flat and clean surface.

Attention:

- The service label is located on the inside of the top cover.
- For proper cooling and air flow, either install the top cover onto the node or install the node into an enclosure before you power on the server. Operating the node without an installed top cover might damage the components.

After this task is completed

- If necessary, install a replacement unit (see [“Install the top cover” on page 194](#)).

Important: For safety, make sure to tighten the top cover safety screw (provided in the accessory kit) after installing the top cover.

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

Demo video

<https://www.youtube.com/watch?v=THcuXEVJEUQ>

Install the top cover

Follow instructions in this section to install the top cover.

About this task

To avoid potential danger, make sure to read and follow the safety information.

- **S002**



CAUTION:

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

Attention:

- Read “Installation Guidelines” on page 37 and “Safety inspection checklist” on page 38 to make sure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the node; then, remove it from the package and place it on a static-protective surface.
- Make sure that all components and cables are installed and seated correctly inside the node, except for the power cords and external cables, and that no loose tools or parts are left inside the node.

Procedure

Step 1. Make preparations for this task.

- a. Carefully lay the node on a flat, static-protective surface.

Step 2. Install the top cover.

- a. ① Align the posts inside the top cover with the slots on the node; then, slide the top cover towards the front of the node until it clicks into place.
- b. ② Tighten the safety screw on the side to secure the top cover to the node.

Important: For safety, make sure to tighten the top cover safety screw (provided in the accessory kit) after installing the top cover.

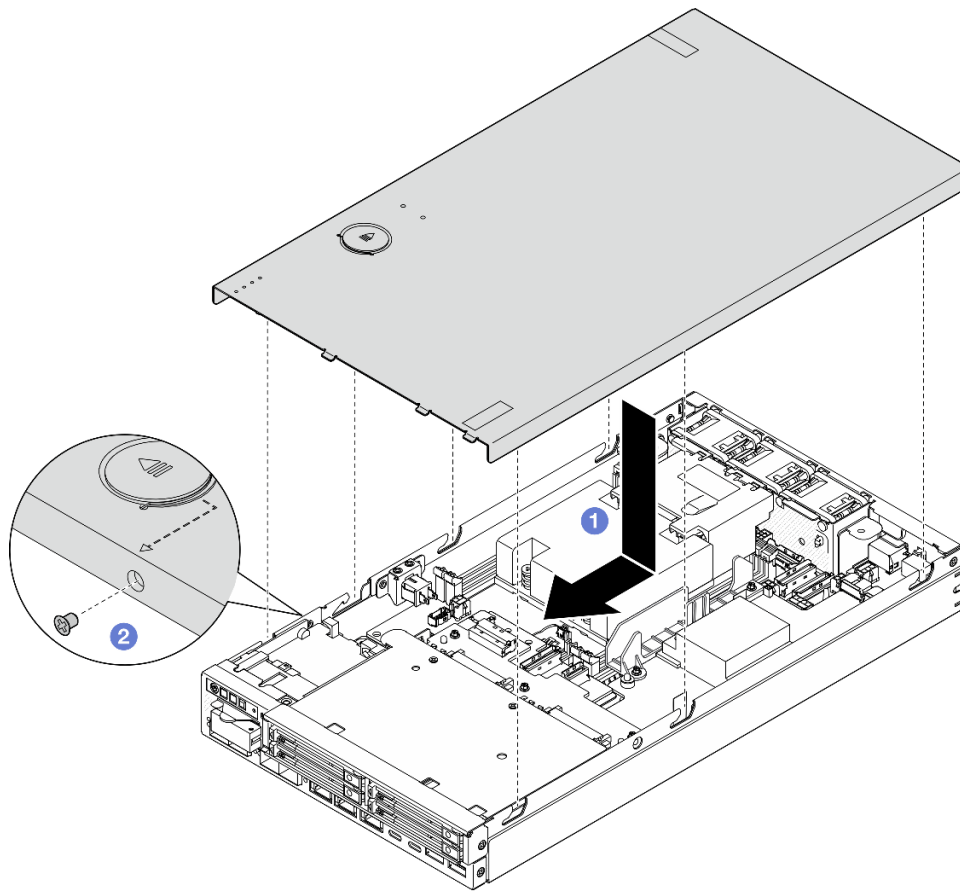


Figure 149. Installation of the top cover

After this task is completed

- If necessary, install any locking device that secures the top cover, such as a Kensington lock.
- Proceed to complete the parts replacement (see “Complete the parts replacement” on page 195).

Demo video

<https://www.youtube.com/watch?v=zHg0tcinLXo>

Complete the parts replacement

Go through the checklist to complete parts replacement.

To complete the parts replacement, do the following:

1. Make sure that all components have been reassembled correctly and that no tools or loose screws are left inside the node.

2. Properly route and secure the cables in the node. Refer to the cable connecting and routing information for each component (see [Chapter 6 “Internal cable routing” on page 197](#)).
3. If applicable, reinstall the air baffle (see [“Install an air baffle” on page 94](#)).
4. If applicable, install the top cover onto the node (see [“Install the top cover” on page 194](#)).
5. If necessary, reinstall the node back into an enclosure or node sleeve (see [“Configuration guide” on page 45](#)).
6. If necessary, install any locking devices that secure the top cover, such as a Kensington lock.
7. After checking and making sure that all necessary items are in place, reconnect all external cables and then the power cords to the server.

Attention: To avoid component damage, connect all the other cables before connecting the power cords.

8. If the security LED of the server is blinking, activate or unlock the system. See [“Activate or unlock the system” on page 214](#).
9. Power on the server (see [“Power on the server” on page 43](#)).
10. If necessary, reinstall the security bezel or shipping bracket back into place (see [“Configuration guide” on page 45](#)).
11. Update the server configuration.
 - Download and install the latest device drivers: <http://datacentersupport.lenovo.com>.
 - Update the system firmware (see [“Update the firmware” on page 209](#)).
 - Update the UEFI configuration. See <https://pubs.lenovo.com/uefi-overview/>.
 - Reconfigure the disk arrays if you have installed or removed a hot-swap drive. See <https://pubs.lenovo.com/lxpm-overview/> for the LXPM documentation compatible with your server.

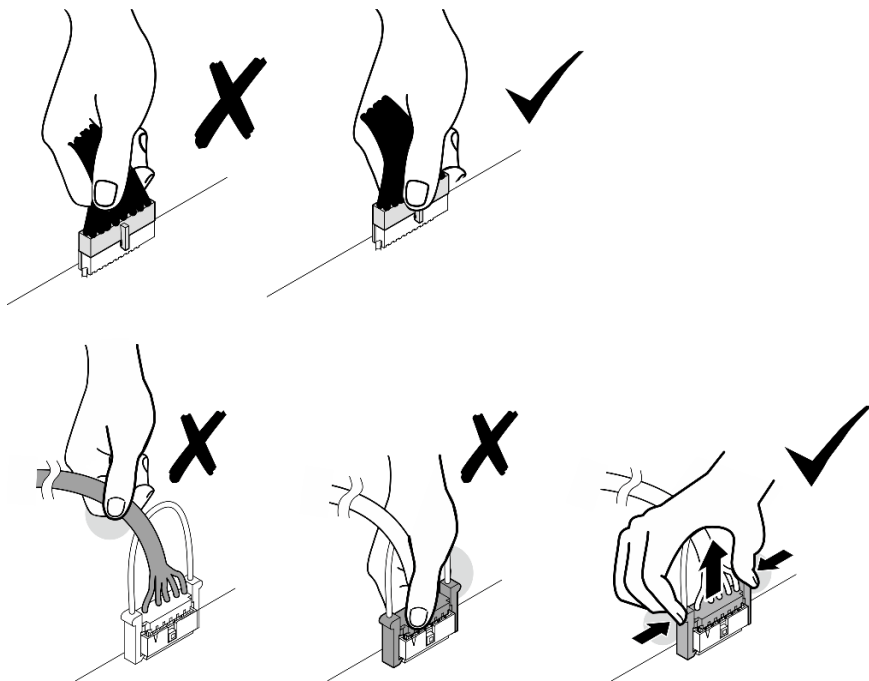
Chapter 6. Internal cable routing

See this section to do cable routing for specific components.

Before connecting the cables, read the following guidelines carefully:

- Turn off the server before connecting or disconnecting any internal cables.
- Refer to the documentation that comes with any external devices for additional cabling instructions.
- Make use of the identifiers printed on the cables to locate the proper connectors.
- Make sure that the cable is not pinched and does not cover any connectors or obstruct any components on the system board.

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



Identifying connectors

See this section to locate and identify the connectors on the electric boards.

System-board connectors for cable routing

The following illustration shows the internal connectors on the system board that are used for internal cable routing.

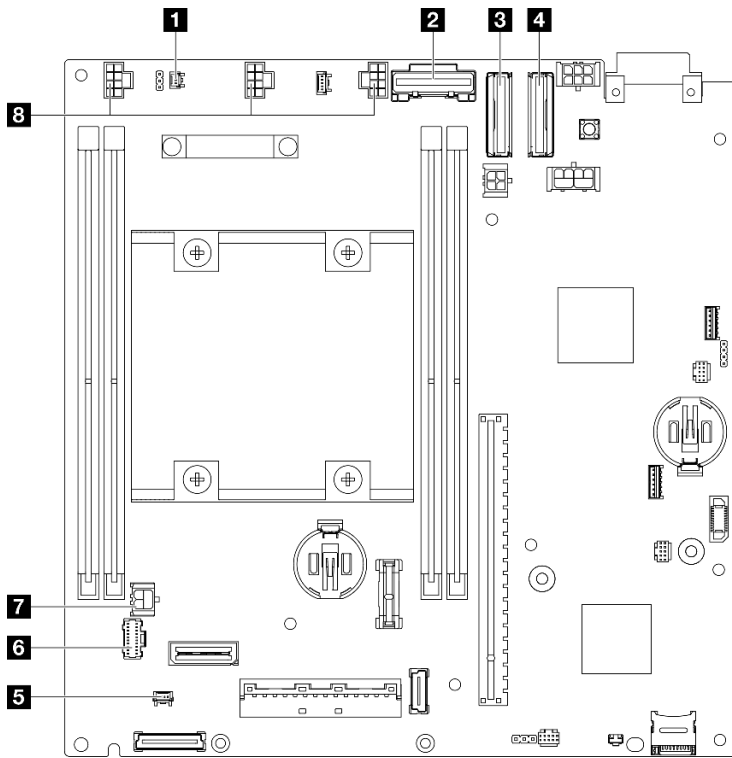


Figure 150. System-board connectors for cable routing

Table 16. System-board connectors for cable routing

1 Connector for the intrusion switch cable*	5 Connector for the lock position switch cable*
2 SATA connector for Drive backplane 1 (lower)	6 Connector for the front operator assembly
3 MCIO connector 1 for Drive backplane 1 (lower)	7 Power connector for the I/O module board
4 MCIO connector 2 for Drive backplane 2 (upper)	8 Connectors for fan cables*

Notes:

- * For the installation or removal of the intrusion switch with cable, see [“Intrusion switch with cable replacement” on page 123](#).
- * For the installation or removal of the lock position switch with cable, see [“Keylock switch with cable replacement” on page 127](#).
- * For the installation or removal of the fan cables, see [“Fan module replacement” on page 114](#).

I/O-module-board connectors for cable routing

The following illustration shows the internal connectors on the I/O module board that are used for internal cable routing.

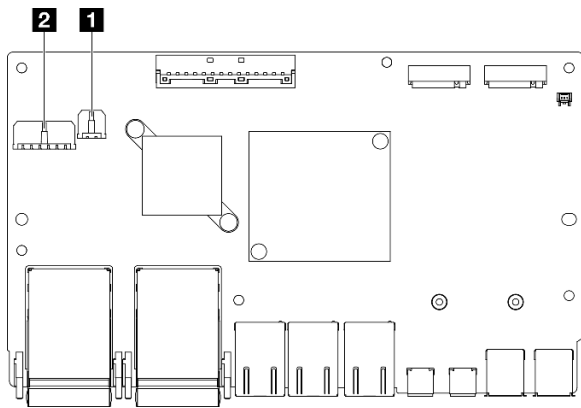


Figure 151. I/O-module-board connectors for cable routing

Notes:

- Depending on the specific configuration, the I/O module board might look different from the illustrations in this section.

Table 17. I/O-module-board connectors for cable routing

1 I/O-module-board power connector	2 Power connector for Drive Backplane 1 (lower)
---	--

Cable routing for the hot-swap drives

Follow instructions in this section to learn how to do cable routing for the 15mm and 7mm 2.5-inch hot-swap drives.

Identifying connectors on the drive backplanes

The following illustration shows the connectors on the drive backplanes that are used for internal cable routing.

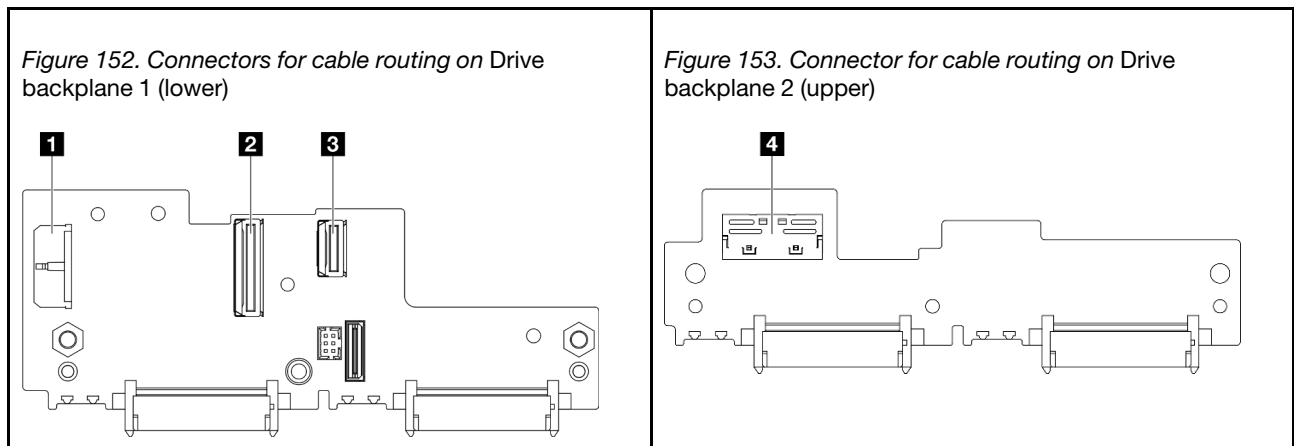


Table 18. Backplane connectors for cable routing

1 Drive-backplane 1 power connector	3 Drive-backplane 1 MCIOx4 connector for SATA
2 Drive-backplane 1 MCIO connector for NVMe	4 Drive-backplane 2 MCIO connector for NVMe

- [“15mm NVMe drives” on page 200](#)

- “7mm SATA drives” on page 201
- “7mm NVMe drives” on page 202

15mm NVMe drives

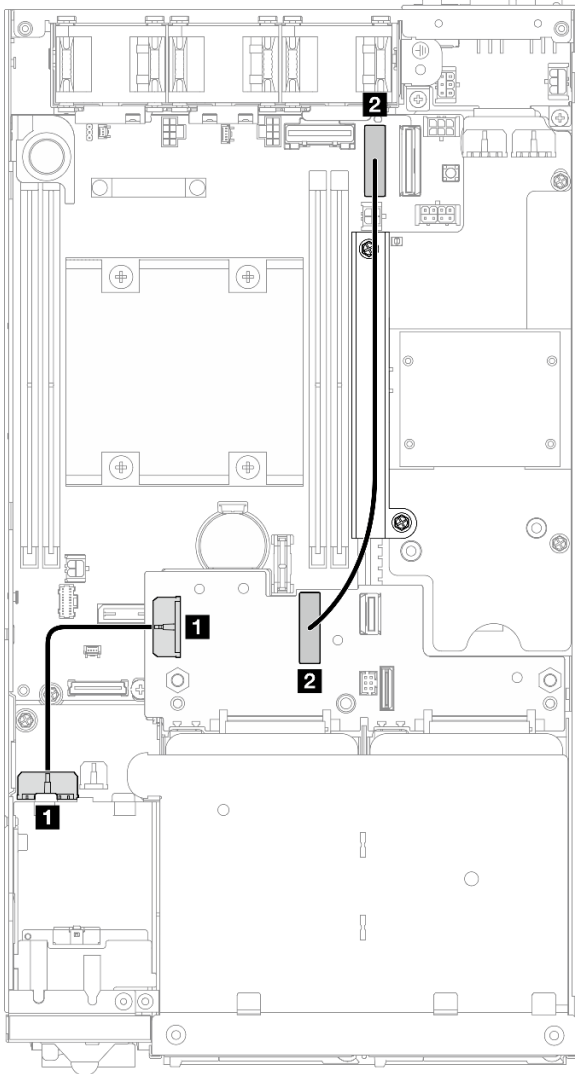


Figure 154. Backplane power cable and Gen 4 high-speed cable for the 15mm drives; Drive backplane 1 (lower)

From	To	Cable length
1 Drive-backplane 1 power connector	1 Power connector for drive backplane on the I/O module board	85 mm
2 Drive-backplane 1 MCIO connector for NVMe	2 MCIO connector 1 on the system board	250 mm

Attention:

- Make sure that all cables between the drive backplane(s) and the system-board connectors go through the cable wall on the power module board.

- For a better result of cable routing, install the cable of the keylock switch before connecting the drive-backplane power cable **(1)** (see “Install a keylock switch with cable” on page 129).

7mm SATA drives

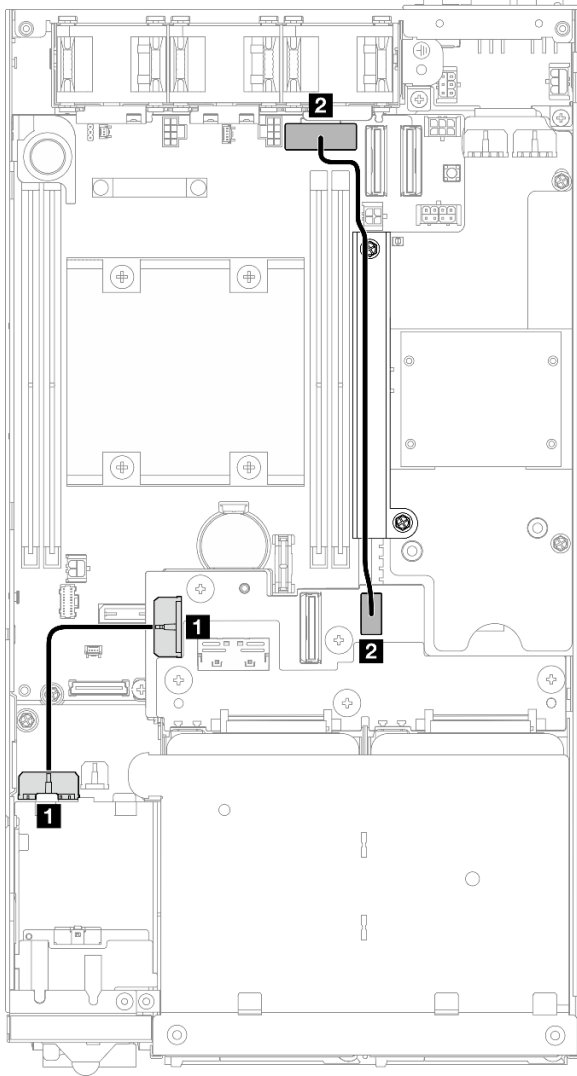


Figure 155. Backplane power cable and SATA cable for the 7mm drives; Drive backplane 1 (lower)

From	To	Cable length
1 Drive-backplane 1 power connector	1 Power connector for drive backplane on the I/O module board	85 mm
2 Drive-backplane 1 MCIOx4 connector for SATA	2 SATA connector on the system board	220 mm

Attention:

- Make sure that all cables between the drive backplane(s) and the system-board connectors go through the cable wall on the power module board.

- For a better result of cable routing, install the cable of the keylock switch before connecting the drive-backplane power cable (1) (see “Install a keylock switch with cable” on page 129).

7mm NVMe drives

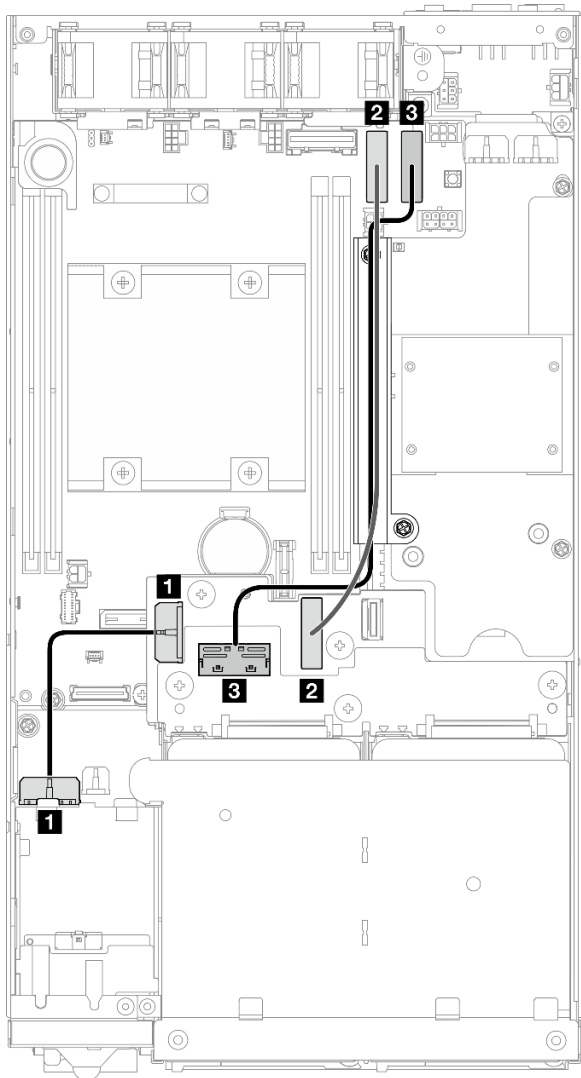


Figure 156. Backplane power cable and Gen 4 high-speed cables for the 7mm drives; Drive backplane 1 (lower) and Drive backplane 2 (upper)

From	To	Cable length
1 Drive-backplane 1 power connector	1 Power connector for drive backplane on the I/O module board	85 mm
2 Drive-backplane 1 MCIO connector for NVMe	2 MCIO connector 1 on the system board	250 mm
3 Drive-backplane 2 MCIO connector for NVMe	3 MCIO connector 2 on the system board	300 mm

Attention:

- Make sure that all cables between the drive backplane(s) and the system-board connectors go through the cable wall on the power module board.
- For a better result of cable routing, install the cable of the keylock switch before connecting the drive-backplane power cable **(1)** (see [“Install a keylock switch with cable” on page 129](#)).

Cable routing for the front operator assembly

Follow instructions in this section to learn how to do cable routing for the front operator assembly.

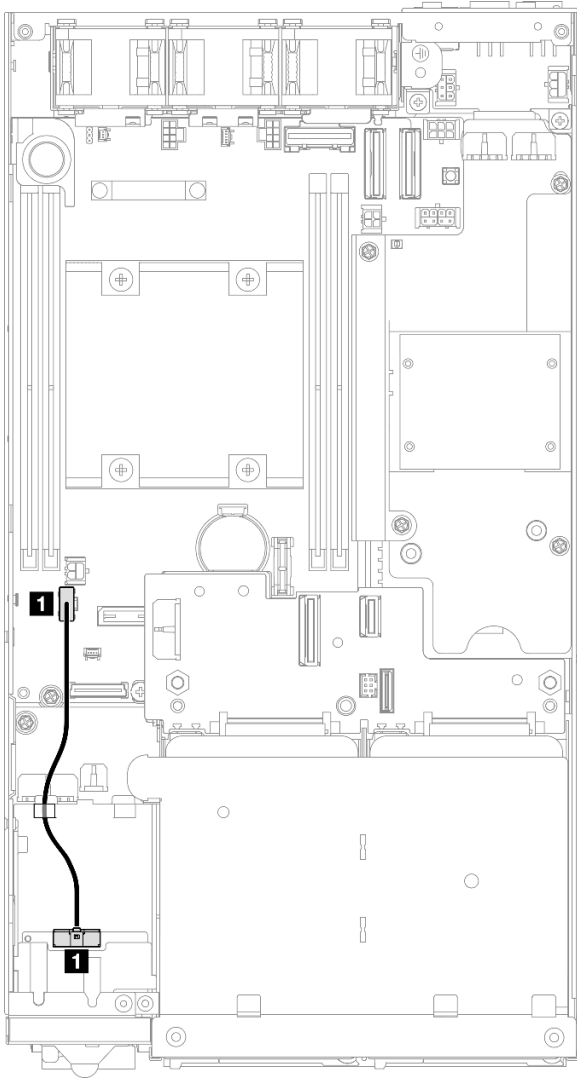


Figure 157. Cable routing for the front operator assembly

Note: Make sure to route the cable through the cable guide on the top of the front operator assembly as shown in the illustration.

Cable	From	To
1	Connector on the front operator board assembly	OP panel connector on the system board

Cable routing for the I/O module board

Follow instructions in this section to learn how to do cable routing for the I/O module board.

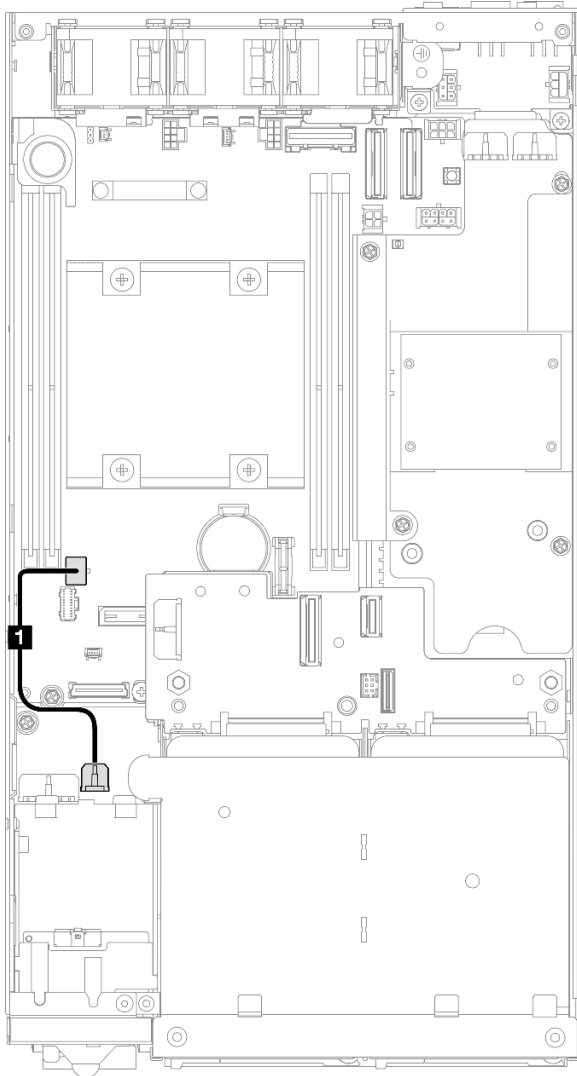


Figure 158. Cable routing for the I/O module board

Cable	From	To
1	Power connector on the I/O module board	I/O-module-board power connector on the system board

Cable routing for the power module board and power input board module

Follow instructions in this section to learn how to do cable routing for the power input board (PIB) module and power module board (PMB).

Attention:

- For a smooth installation, connect the cables between the power module board and power input board module **BEFORE** installing the power module board.
- Depending on the specific configuration, the components in the node might be one of the following. The appearances are different but the procedure is almost the same.
 - DC PMB and DC PIB
 - Internal power supply (AC PMB) and AC PIB

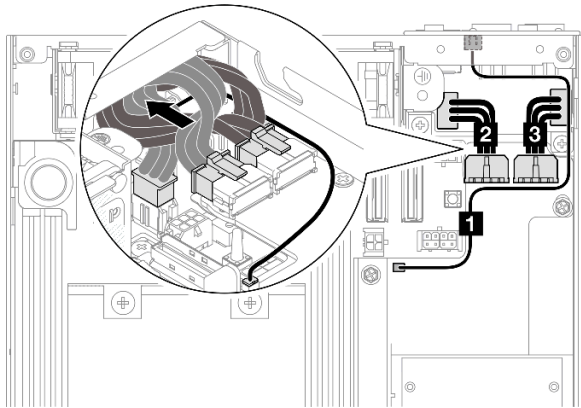


Figure 159. Cable routing for the DC PIB and DC PMB

Table 19. Cable routing for the DC PIB and DC PMB

Cable	From (Power module board)	To (Power input board)
1	LED connector	PMB status LED
2 & 3	Two power connectors Important: <ul style="list-style-type: none"> • When connecting these power cables, make sure to distinguish cables 2 and 3 and connect them correctly to their respective connectors. Switching these cables will cause failure. 	Two power connectors

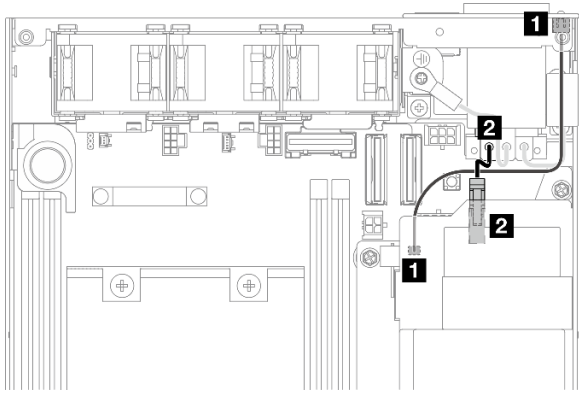


Figure 160. Cable routing for the AC PIB and AC PMB

Table 20. Cable routing for the AC PIB and AC PMB

Cable	From (AC PMB)	To (AC PIB)
1	LED connector	PMB status LED
2	Power connector	Attached power cable

Procedure of installing the PMB-PIB cables

Step 1. Make preparations for this task.

- Install the power input board module with PMB status LED cable (see [“Install a power input board \(PIB\) module” on page 150](#)).

Step 2. Depending on the configuration, connect and organize the two or three cables (**1**, **2**, **3**) for the power input board module and power module board.

- 1 Connect the **PMB status LED cable (1)** to the power module board.
- b. Depending on the specific configuration, do one of the following.
 1. For configurations with DC PIB and PMB:
 - a. Connect the **power cables 2** and **3** to the two connectors on the PIB module and the two connectors on the PMB.

Important:

- When connecting these power cables, make sure to distinguish cables **2** and **3** and connect them correctly to their respective connectors. Switching these cables will cause failure.
- b. Carefully twist and fold the power cables together.
 - c. Carefully move the folded power cables toward the rear of node; then, place the folded cables under the rear edge of the node chassis.
2. For configurations with AC PIB and PMB:
 - a. Connect the **power cable 2** from the PIB to the PMB connector.
 - c. Place the LED cable toward the chassis sidewall as shown.

Step 3. Install the power module board (see [“Install a power module board \(PMB\)” on page 155](#)).

Notes:

- To disconnect the power cable(s), first remove the power module board (see [“Remove the power module board \(PMB\)” on page 154](#)).

- The LED latch is fragile; removing the PMB status LED cable from the PIB module is highly likely to break the latch. Remove this cable from the PIB module only when it is absolutely necessary.

Chapter 7. System configuration

Complete these procedures to configure your system.

Set the network connection for the Lenovo XClarity Controller

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

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

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

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

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

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

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)
Lenovo XClarity Provisioning Manager (LXPM)	In-band ² On-Target	√			√		
Lenovo XClarity Controller (XCC)	In-band ⁴ Out-of-band Off-Target	√	Selected I/O devices	√ ³	√		√
Lenovo XClarity Essentials OneCLI (OneCLI)	In-band Out-of-band On-Target Off-Target	√	All I/O devices	√ ³		√	√

Tool	Update Methods Supported	Core System Firmware Updates	I/O Devices Firmware Updates	Drive Firmware Updates	Graphical user interface	Command line interface	Supports Update Bundles (Service Packs)
Lenovo XClarity Essentials UpdateXpress (LXCE)	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√		√
Lenovo XClarity Essentials Bootable Media Creator (BoMC)	In-band Out-of-band Off-Target	√	All I/O devices		√ (BoMC application)	√ (BoMC application)	√
Lenovo XClarity Administrator (LXCA)	In-band ¹ Out-of-band ² Off-Target	√	All I/O devices		√		√
Lenovo XClarity Integrator (LXCI) for VMware vCenter	Out-of-band Off-Target	√	Selected I/O devices		√		
Lenovo XClarity Integrator (LXCI) for Microsoft Windows Admin Center	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√		√
Lenovo XClarity Integrator (LXCI) for Microsoft System Center Configuration Manager	In-band On-Target	√	All I/O devices		√		√

Notes:

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

- **Lenovo XClarity Provisioning Manager**

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

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

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

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

- **Lenovo XClarity Controller**

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

Notes:

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

For additional information about configuring Ethernet over USB, see:

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

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

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

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

- **Lenovo XClarity Essentials OneCLI**

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

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

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

- **Lenovo XClarity Essentials UpdateXpress**

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

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

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

- **Lenovo XClarity Essentials Bootable Media Creator**

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

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

<https://datacentersupport.lenovo.com/solutions/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

- **Lenovo XClarity Integrator offerings**

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

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

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

Activate/unlock the system and configure ThinkEdge security features

ThinkEdge 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 214](#).
2. Maintain backup of SED AK. See [“Manage the Self Encryption Drive Authentication Key \(SED AK\)” on page 217](#).
3. Configure the security features in Lenovo XClarity Controller. See [“System Lockdown Mode” on page 216](#) 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 217](#).
 - 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 225](#) 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 214](#) to activate the system.
- **XClarity Controller:** The system can be unlocked through Lenovo XClarity Controller. See [“Unlock the system” on page 216](#) 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 214](#) 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 216](#) 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 214](#) 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

- **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

- **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

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](#)” on page 41, 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

- Lenovo XClarity Essentials OneCLI

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

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

https://pubs.lenovo.com/lxci-deploypack-sccm/dpsccm_c_endtoend_deploy_scenario

- **Single-server**

Available tools:

- Lenovo XClarity Provisioning Manager

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

- Lenovo XClarity Essentials OneCLI

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

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

https://pubs.lenovo.com/lxci-deploypack-sccm/dpsccm_c_endtoend_deploy_scenario

Manual deployment

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

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

Back up the server configuration

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

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

- **Management processor**

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

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

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

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

- **Operating system**

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

Chapter 8. Problem determination

Use the information in this section to isolate and resolve issues that you might encounter while using your server.

Lenovo servers can be configured to automatically notify Lenovo Support if certain events are generated. You can configure automatic notification, also known as Call Home, from management applications, such as the Lenovo XClarity Administrator. If you configure automatic problem notification, Lenovo Support is automatically alerted whenever a server encounters a potentially significant event.

To isolate a problem, you should typically begin with the event log of the application that is managing the server:

- If you are managing the server from the Lenovo XClarity Administrator, begin with the Lenovo XClarity Administrator event log.
- If you are using some other management application, begin with the Lenovo XClarity Controller event log.

Web resources

- **Tech tips**

Lenovo continually updates the support website with the latest tips and techniques that 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.

- **Lenovo Data Center Forum**

- Check https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg to see if someone else has encountered a similar problem.

Event logs

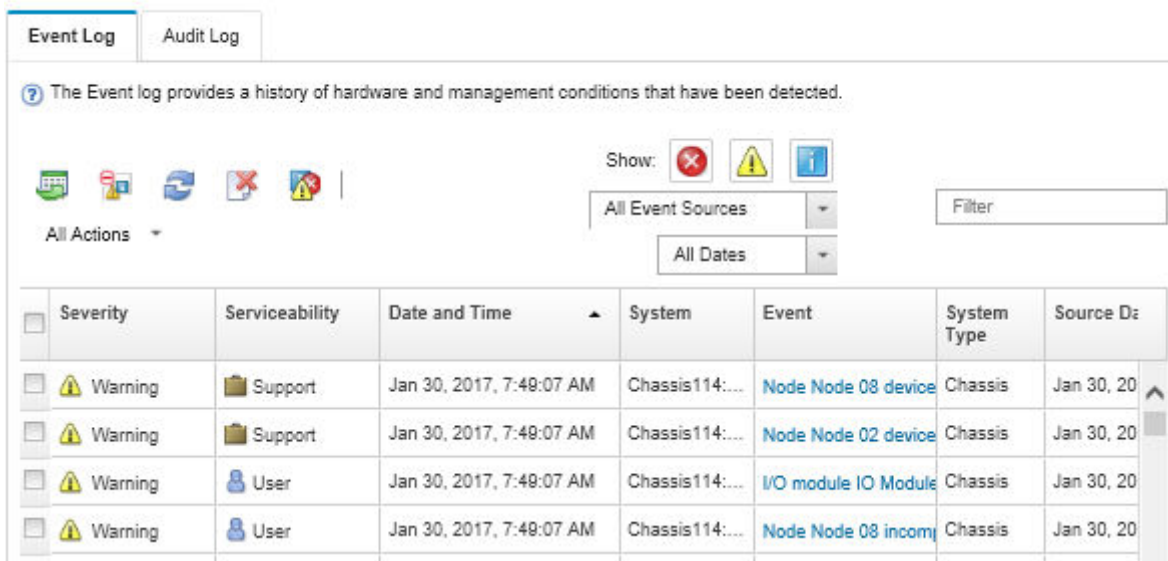
An *alert* is a message or other indication that signals an event or an impending event. Alerts are generated by the Lenovo XClarity Controller or by UEFI in the servers. These alerts are stored in the Lenovo XClarity Controller Event Log. If the server is managed by the Chassis Management Module 2 or by the Lenovo XClarity Administrator, alerts are automatically forwarded to those management applications.

Note: For a listing of events, including user actions that might need to be performed to recover from an event, see the *Messages and Codes Reference*, which is available at https://pubs.lenovo.com/se350-v2/pdf_files.

Lenovo XClarity Administrator event log

If you are using Lenovo XClarity Administrator to manage server, network, and storage hardware, you can view the events from all managed devices through the XClarity Administrator.

Logs



The Event log provides a history of hardware and management conditions that have been detected.

Show:

All Event Sources

All Dates

Severity	Serviceability	Date and Time	System	Event	System Type	Source ID
Warning	Support	Jan 30, 2017, 7:48:07 AM	Chassis114:...	Node Node 08 device	Chassis	Jan 30, 20
Warning	Support	Jan 30, 2017, 7:48:07 AM	Chassis114:...	Node Node 02 device	Chassis	Jan 30, 20
Warning	User	Jan 30, 2017, 7:48:07 AM	Chassis114:...	I/O module IO Module	Chassis	Jan 30, 20
Warning	User	Jan 30, 2017, 7:48:07 AM	Chassis114:...	Node Node 08 incom	Chassis	Jan 30, 20

Figure 161. Lenovo XClarity Administrator event log

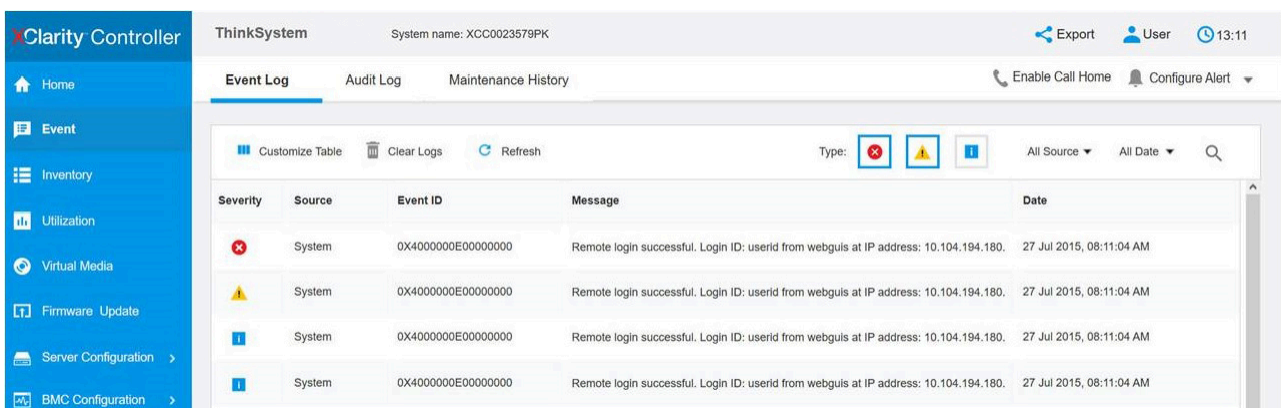
For more information about working with events from XClarity Administrator, see:

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

Lenovo XClarity Controller event log

The Lenovo XClarity Controller monitors the physical state of the server and its components using sensors that measure internal physical variables such as temperature, power-supply voltages, fan speeds, and component status. The Lenovo XClarity Controller provides various interfaces to systems management software and to system administrators and users to enable remote management and control of a server.

The Lenovo XClarity Controller monitors all components of the server and posts events in the Lenovo XClarity Controller event log.



ThinkSystem System name: XCC0023579PK

Event Log Audit Log Maintenance History

Customize Table Clear Logs Refresh

Type: All Source All Date

Severity	Source	Event ID	Message	Date
	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM
	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM
	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM
	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM

Figure 162. Lenovo XClarity Controller event log

For more information about accessing the Lenovo XClarity Controller event log, see:

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

Troubleshooting by system LEDs

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.

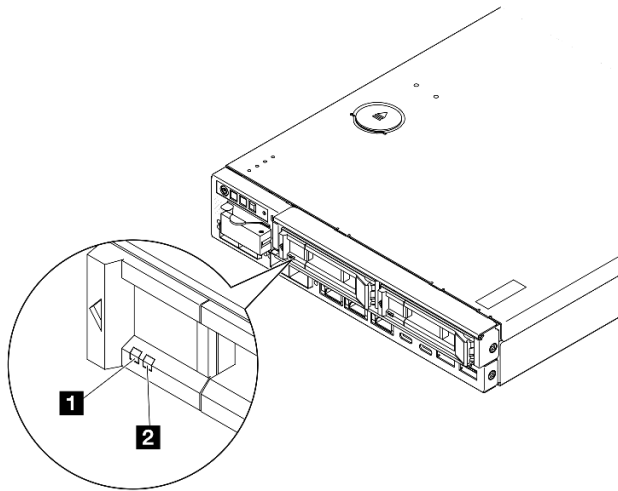


Figure 163. Drive LEDs

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

Front operator panel LEDs

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

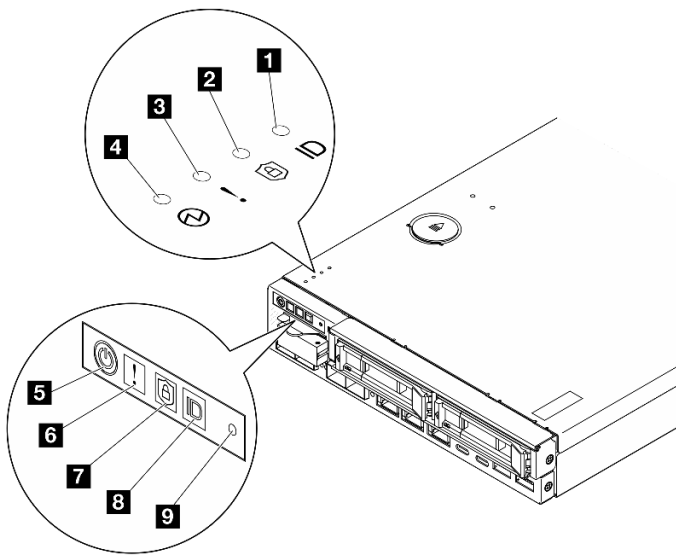


Figure 164. Front operator panel LEDs

Table 21. Front operator panel LEDs

1 & 8 “System ID button with system ID LED (blue)” on page 226	4 & 5 “Power button with power status LED (green)” on page 227
2 & 7 “Security LED (green)” on page 226	9 “NMI button” on page 227
3 & 6 “System Error LED (yellow)” on page 226	

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 214.](#)

Off: No security feature is enabled on the server.

See to activate the system. 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"> The temperature of the server has reached a non-critical temperature threshold. The voltage of the server has reached a non-critical voltage threshold. A fan has been detected to be running at low speed. A critical error has occurred to the power supply. The power supply is not connected. 	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.

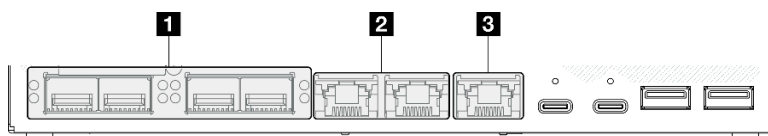


Figure 165. LAN port LEDs of the 10/25GbE I/O module

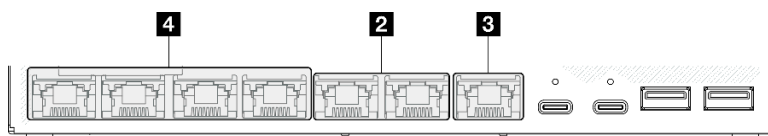


Figure 166. LAN port LEDs of the 1GbE I/O module

Table 22. LAN port LEDs

1 “10/25GbE SFP28 connectors” on page 228	3 “XCC system management port link LED and activity LED (green)” on page 228
2 “2.5GbE RJ-45 connectors” on page 228	4 “1GbE RJ-45 connectors” on page 229

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

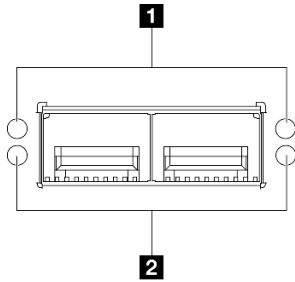


Figure 167. LEDs of 10/25GbE SFP28 connectors

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

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

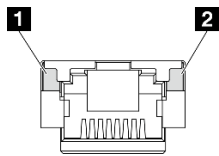


Figure 168. LEDs of 2.5GbE RJ-45 connectors

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

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

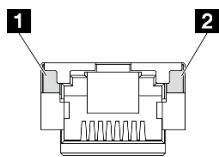


Figure 169. LEDs of XCC system management port (1GbE RJ-45)

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

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

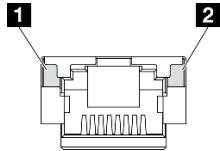


Figure 170. LEDs of 1GbE RJ-45 connectors

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

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

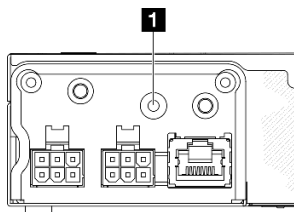


Figure 171. PMB status LED, DC power input

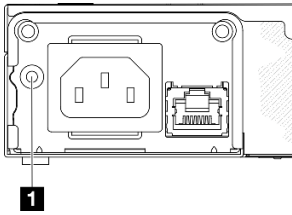


Figure 172. PMB status LED, AC power input

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"> • The DC power source may not be connected or working properly. • The 300-watt power adapter is not working properly. <p>To resolve the issue:</p> <ul style="list-style-type: none"> • Check to see if the external power cords are correctly connected to the server and to a working electrical output. • 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” on page 206). • Replace the power input board module or the power module board (DC PMB) or internal power supply (AC PMB)(see “Power input board (PIB) module replacement” on page 146 or “Power module board (PMB) replacement” on page 154 or Internal power supply unit (AC PMB) replacement).
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.

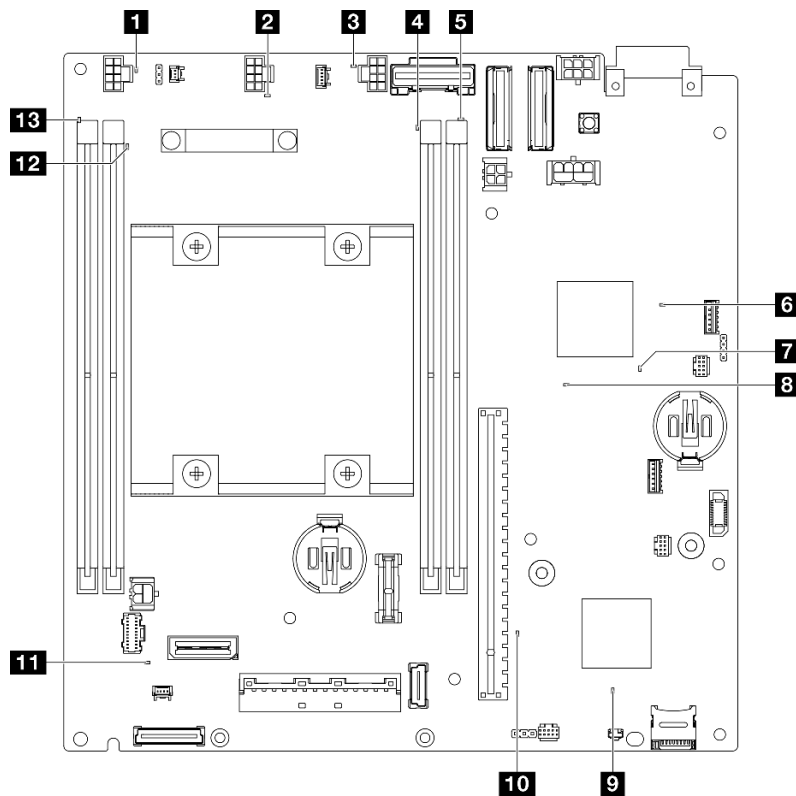


Figure 173. System-board LEDs

Table 23. Description and actions for the system-board LEDs

LED	Description and actions
1 2 3 Fans 1-3 error LED	LED on: an error has occurred to the fan the LED represents.
4 5 12 13 DIMMs 1-4 error LED (amber)	LED on: an error has occurred to the DIMM the LED represents.
6 FPGA power status LED (green)	The FPGA power LED helps to identify different FPGA errors. <ul style="list-style-type: none"> • LED blinking rapidly (four times per second): The FPGA permission is delayed. • LED blinking slowly (once per second): the FPGA is read to power on. • LED on: The FPGA power is on.
7 FPGA heartbeat LED (green)	This LED indicates power-on and power-off sequencing. <ul style="list-style-type: none"> • LED blinking: the system is functioning properly, and no action is necessary. • LED not blinking: replace the system board (trained technician only). See “System-board assembly replacement (trained technician only)” on page 165.

Table 23. Description and actions for the system-board LEDs (continued)

LED	Description and actions
8 System power LED	<p>The states of the system power LED are as follows:</p> <ul style="list-style-type: none"> • Off: No power supply is properly installed, or the LED itself has failed. • Flashing rapidly (four times per second): The server is turned off and is not ready to be turned on. The power-control button is disabled. This will last approximately 5 to 10 seconds. • Flashing slowly (once per second): The server is turned off and is ready to be turned on. Press the power-control button to turn on the server. • On: The server is turned on.
9 XCC status LED	<p>The states of the XCC status LED are as follows:</p> <ul style="list-style-type: none"> • On: The XCC is alive. • Off: 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.
10 XCC heartbeat LED (green)	<p>This LED indicates the XCC heartbeat and boot process:</p> <ul style="list-style-type: none"> • LED blinking rapidly: XCC code is in the loading process. • LED going off momentarily and then starts blinking slowly: XCC is fully operational. You can now press the power-control button to power on the server.
11 System error LED (yellow)	<p>LED on: an error has occurred. Complete the following steps:</p> <ul style="list-style-type: none"> • Check the identification LED and check log LED and follow the instructions. • Check the Lenovo XClarity Controller event log and the system error log for information about the error. • Save the log if necessary, and clear the log afterwards.

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 225](#), [“Front operator panel LEDs” on page 225](#), and [“LAN port LEDs” on page 227](#).

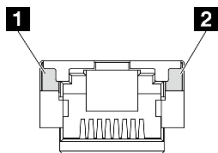


Figure 174. XCC system management port LEDs

LED	Description
1 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"> • Off: The network link is disconnected. • Green: The network link is established.
2 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"> • Blinking: Network link is transmitting and receiving actions. • Off: Normal.

General problem determination procedures

Use the information in this section to resolve problems if the event log does not contain specific errors or the server is inoperative.

If you are not sure about the cause of a problem and the power source is connected correctly, complete the following steps to attempt to resolve the problem:

1. Power off the server.
2. Make sure that the server is cabled correctly.
3. Remove or disconnect the following devices if applicable, one at a time, until you find the failure. Power on and configure the server each time you remove or disconnect a device.
 - Any external devices.
 - Surge-suppressor device (on the server).
 - Printer, mouse, and non-Lenovo devices.
 - Hard disk drives.
 - Memory modules until you reach the minimal configuration for debugging that is supported for the server.

To determine the minimal configuration for your server, see “Minimal configuration for debugging” in [“Technical specifications” on page 4](#).

4. Power on the server.

If the problem appears to be a networking problem and the server passes all system tests, suspect a network cabling problem that is external to the server.

Resolving suspected power problems

Power problems can be difficult to solve. For example, a short circuit can exist anywhere on any of the power distribution buses. Usually, a short circuit will cause the power subsystem to shut down because of an overcurrent condition.

Complete the following steps to diagnose and resolve a suspected power problem.

Step 1. Check the event log and resolve any errors related to the power.

Note: Start with the event log of the application that is managing the server. For more information about event logs, see [“Event logs” on page 223](#).

Step 2. Check for short circuits, for example, if a loose screw is causing a short circuit on a circuit board.

Step 3. Remove the adapters and disconnect the cables and power cords to all internal and external devices until the server is at the minimal configuration for debugging that is required for the server to start. To determine the minimal configuration for your server, see “Minimal configuration for debugging” in [“Technical specifications” on page 4](#).

Step 4. Reconnect all power cords and turn on the server. If the server starts successfully, reseal the adapters and devices one at a time until the problem is isolated.

If the server does not start from the minimal configuration, replace the components in the minimal configuration one at a time until the problem is isolated.

Resolving suspected Ethernet controller problems

The method that you use to test the Ethernet controller depends on which operating system you are using. See the operating-system documentation for information about Ethernet controllers, and see the Ethernet controller device-driver readme file.

Complete the following steps to attempt to resolve suspected problems with the Ethernet controller.

Step 1. Make sure that the correct device drivers, which come with the server are installed and that they are at the latest level.

Step 2. Make sure that the Ethernet cable is installed correctly.

- The cable must be securely attached at all connections. If the cable is attached but the problem remains, try a different cable.
- If you set the Ethernet controller to operate at 100 Mbps or 1000 Mbps, you must use Category 5 cabling.

Step 3. Determine whether the hub supports auto-negotiation. If it does not, try configuring the integrated Ethernet controller manually to match the speed and duplex mode of the hub.

Step 4. Check the Ethernet controller LEDs on the server. These LEDs indicate whether there is a problem with the connector, cable, or hub.

Ethernet controller LED locations are specified in [“Troubleshooting by system LEDs” on page 225](#).

- The Ethernet link status LED is lit when the Ethernet controller receives a link pulse from the hub. If the LED is off, there might be a defective connector or cable or a problem with the hub.
- The Ethernet transmit/receive activity LED is lit when the Ethernet controller sends or receives data over the Ethernet network. If the Ethernet transmit/receive activity is off, make sure that the hub and network are operating and that the correct device drivers are installed.

Step 5. Check the Network activity LED on the server. The Network activity LED is lit when data is active on the Ethernet network. If the Network activity LED is off, make sure that the hub and network are operating and that the correct device drivers are installed.

Network activity LED location is specified in [“Troubleshooting by system LEDs” on page 225](#).

Step 6. Check for operating-system-specific causes of the problem, and also make sure that the operating system drivers are installed correctly.

Step 7. Make sure that the device drivers on the client and server are using the same protocol.

If the Ethernet controller still cannot connect to the network but the hardware appears to be working, the network administrator must investigate other possible causes of the error.

Troubleshooting by symptom

Use this information to find solutions to problems that have identifiable symptoms.

To use the symptom-based troubleshooting information in this section, complete the following steps:

1. Check the event log of the application that is managing the server and follow the suggested actions to resolve any event codes.

- If you are managing the server from the Lenovo XClarity Administrator, begin with the Lenovo XClarity Administrator event log.
- If you are using some other management application, begin with the Lenovo XClarity Controller event log.

For more information about event logs (see “Event logs” on page 223).

2. Review this section to find the symptoms that you are experiencing and follow the suggested actions to resolve the issue.
3. If the problem persists, contact support (see “Contacting Support” on page 251).

Intermittent problems

Use this information to solve intermittent problems.

- “Intermittent external device problems” on page 235
- “Intermittent KVM problems” on page 235
- “Intermittent unexpected reboots” on page 236

Intermittent external device problems

Complete the following steps until the problem is solved.

1. Update the UEFI and XCC firmware to the latest versions.
2. Make sure that the correct device drivers are installed. See the manufacturer's website for documentation.
3. For a USB device:
 - a. Make sure that the device is configured correctly.

Restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Then, click **System Settings** → **Devices and I/O Ports** → **USB Configuration**.

- b. Connect the device to another port. If using a USB hub, remove the hub and connect the device directly to the node. Make sure that the device is configured correctly for the port.

Intermittent KVM problems

Complete the following steps until the problem is solved.

Video problems:

1. Make sure that all cables and the console breakout cable are properly connected and secure.
2. Make sure that the monitor is working properly by testing it on another node.
3. Test the console breakout cable on a working node to ensure that it is operating properly. Replace the console breakout cable if it is defective.

Keyboard problems:

Make sure that all cables and the console breakout cable are properly connected and secure.

Mouse problems:

Make sure that all cables and the console breakout cable are properly connected and secure.

Intermittent unexpected reboots

Note: Some correctable errors require that the server reboot so that it can disable a device, such as a memory DIMM or a processor to allow the machine to boot up properly.

1. If the reset occurs during POST and the POST watchdog timer is enabled, make sure that sufficient time is allowed in the watchdog timeout value (POST Watchdog Timer).

To check the POST watchdog time, restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Then, click **BMC Settings → POST Watchdog Timer**.

2. If the reset occurs after the operating system starts, enter the operating system when the system operates normally and set up operating system kernel dump process (Windows and Linux base operating systems will be using different method). Enter the UEFI setup menus and disable the feature, or disable it with the following OneCli command.

```
OneCli.exe config set SystemRecovery.RebootSystemOnNMI Disable --bmcxcc_userid PASSWORD@xcc_ipaddress
```

3. See the management controller event log to check for an event code that indicates a reboot. See “[Event logs](#)” on page 223 for information about viewing the event log. If you are using Linux base operating system, then capture all logs back to Lenovo support for further investigation.

Keyboard, mouse, KVM switch, or USB-device problems

Use this information to solve problems related to a keyboard, mouse, KVM switch or USB-device problems.

- “[All or some keys on the keyboard do not work](#)” on page 236
- “[Mouse does not work](#)” on page 236
- “[KVM switch problems](#)” on page 237
- “[USB-device does not work](#)” on page 237

All or some keys on the keyboard do not work

1. Make sure that:
 - The keyboard cable is securely connected.
 - The server and the monitor are turned on.
2. If you are using a USB keyboard, run the Setup utility and enable keyboardless operation.
3. If you are using a USB keyboard and it is connected to a USB hub, disconnect the keyboard from the hub and connect it directly to the server.
4. Replace the keyboard.

Mouse does not work

1. Make sure that:
 - The mouse cable is securely connected to the server.
 - The mouse device drivers are installed correctly.
 - The server and the monitor are turned on.
 - The mouse option is enabled in the Setup utility.
2. If you are using a USB mouse and it is connected to a USB hub, disconnect the mouse from the hub and connect it directly to the server.
3. Replace the mouse.

KVM switch problems

1. Make sure that the KVM switch is supported by your server.
2. Make sure that the KVM switch is powered on correctly.
3. If the keyboard, mouse or monitor can be operated normally with direct connection to the server, then replace the KVM switch.

USB-device does not work

1. Make sure that:
 - The correct USB device driver is installed.
 - The operating system supports USB devices.
2. Make sure that the USB configuration options are set correctly in system setup.

Restart the server and press key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Then, click **System Settings → Devices and I/O Ports → USB Configuration**.

3. If you are using a USB hub, disconnect the USB device from the hub and connect it directly to the server.

Memory problems

Use this information to resolve issues related to memory.

Common memory problems

- “Displayed system memory less than installed physical memory” on page 237
- “Invalid memory population detected” on page 238

Displayed system memory less than installed physical memory

Complete the following procedure to solve the problem.

Note: Each time you install or remove a memory module, you must disconnect the server from the power source; then, wait 10 seconds before restarting the server.

1. Make sure that:
 - No error LEDs are lit. See “Troubleshooting by system LEDs” on page 225.
 - No memory module error LEDs are lit on the system board.
 - Memory mirrored channel does not account for the discrepancy.
 - The memory modules are seated correctly.
 - You have installed the correct type of memory module (see “Memory module installation rules and order” on page 41 for requirements).
 - After changing or replacing a memory module, memory configuration is updated accordingly in the Setup Utility.
 - All banks of memory are enabled. The server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.
 - There is no memory mismatch when the server is at the minimum memory configuration.
2. Reseat the memory modules, and then restart the server.
3. Check the POST error log:
 - If a memory module was disabled by a systems-management interrupt (SMI), replace the memory module.

- If a memory module was disabled by the user or by POST, reseat the memory module; then, run the Setup Utility and enable the memory module.
4. Run memory diagnostics. When you start a solution and press the key according to the on-screen instructions, the LXPM interface is displayed by default. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) You can perform memory diagnostics with this interface. From the Diagnostic page, go to **Run Diagnostic** → **Memory test**.
 5. Reverse the modules between the channels (of the same processor), and then restart the server. If the problem is related to a memory module, replace the failing memory module.
 6. Re-enable all memory modules using the Setup Utility, and then restart the server.
 7. (Trained technician only) Replace the system board.

Invalid memory population detected

If this warning message appears, complete the following steps:

Invalid memory population (unsupported DIMM population) detected. Please verify memory configuration is valid.

1. See “[Memory module installation rules and order](#)” on page 41 to make sure the present memory module population sequence is supported.
2. If the present sequence is indeed supported, see if any of the modules is displayed as “disabled” in Setup Utility.
3. Reseat the module that is displayed as “disabled,” and reboot the system.
4. If the problem persists, replace the memory module.

Monitor and video problems

Use this information to solve problems related to a monitor or video.

- “[Incorrect characters are displayed](#)” on page 238
- “[Screen is blank](#)” on page 238
- “[Screen goes blank when you start some application programs](#)” on page 239
- “[The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted](#)” on page 239
- “[The wrong characters appear on the screen](#)” on page 239

Incorrect characters are displayed

Complete the following steps:

1. Verify that the language and locality settings are correct for the keyboard and operating system.
2. If the wrong language is displayed, update the server firmware to the latest level. See “[Update the firmware](#)” on page 209.

Screen is blank

Note: Make sure that the expected boot mode has not been changed from the UEFI to Legacy or vice versa.

1. If the server is attached to a KVM switch, bypass the KVM switch to eliminate it as a possible cause of the problem: connect the monitor cable directly to the correct connector on the server.
2. The management controller remote presence function is disabled if you install an optional video adapter. To use the management controller remote presence function, remove the optional video adapter.
3. Make sure that:
 - The server is turned on and there is power supplied to the server.
 - The monitor cables are connected correctly.
 - The monitor is turned on and the brightness and contrast controls are adjusted correctly.

4. Make sure that the correct server is controlling the monitor, if applicable.
5. Make sure that the video output is not affected by corrupted server firmware. See [“Update the firmware” on page 209](#).
6. If the problem remains, contact Lenovo Support.

Screen goes blank when you start some application programs

1. Make sure that:
 - The application program is not setting a display mode that is higher than the capability of the monitor.
 - The necessary device drivers have been installed for the application.

The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted

1. If the monitor self-tests show that the monitor is working correctly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescents, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor.

Attention: Moving a color monitor while it is turned on might cause screen discoloration.

Move the device and the monitor at least 305 mm (12 in.) apart, and turn on the monitor.

Notes:

- a. To prevent diskette drive read/write errors, make sure that the distance between the monitor and any external diskette drive is at least 76 mm (3 in.).
- b. Non-Lenovo monitor cables might cause unpredictable problems.
2. Reseat the monitor cable.
3. Replace the following components one at a time, in the order shown, restarting the server each time:
 - a. Monitor cable
 - b. Monitor
 - c. (Trained technician only) System board.

The wrong characters appear on the screen

Complete the following steps until the problem is solved:

1. Verify that the language and locality settings are correct for the keyboard and operating system.
2. If the wrong language is displayed, update the server firmware to the latest level. See [“Update the firmware” on page 209](#).

Network problems

Use this information to resolve issues related to networking.

- [“Cannot wake server using Wake on LAN” on page 239](#)
- [“Could not log in using LDAP account with SSL enabled” on page 240](#)

Cannot wake server using Wake on LAN

Complete the following steps until the problem is solved.

1. Check the system event log and resolve any related problems. To view the system event log, go to **Setup Utility** and select **Security → System Event Log → View System Event Log**.

2. Change the Wake on LAN setting. Go to **Setup Utility** and select **Power → Automatic Power On → Wake on LAN**. The default setting is automatic. Change it to primary.
3. Remove and reinstall the I/O module board.
4. Turn off the server and disconnect it from the power source; then, wait 10 seconds before restarting the server.
5. If the problem recurs, replace the I/O module board.

Could not log in using LDAP account with SSL enabled

Complete the following steps until the problem is resolved:

1. Make sure that the license key is valid.
2. Generate a new license key and log in again.

Observable problems

Use this information to solve observable problems.

- [“Server hangs during the UEFI boot process” on page 240](#)
- [“The server immediately displays the POST Event Viewer when it is turned on” on page 240](#)
- [“Server is unresponsive \(POST is complete and operating system is running\)” on page 240](#)
- [“Server is unresponsive \(POST failed and cannot start System Setup\)” on page 241](#)
- [“Voltage planar fault is displayed in the event log” on page 241](#)
- [“Unusual smell” on page 242](#)
- [“Server seems to be running hot” on page 242](#)
- [“Cannot enter legacy mode after installing a new adapter” on page 242](#)
- [“Cracked parts or cracked chassis” on page 242](#)

Server hangs during the UEFI boot process

If the system hangs during the UEFI boot process with the message UEFI: DXE INIT on the display, make sure that Option ROMs were not configured with a setting of **Legacy**. You can remotely view the current settings for Option ROMs by running the following command using the Lenovo XClarity Essentials OneCLI:

```
onecli config show EnableDisableAdapterOptionROMSupport --bmc xcc_userid:xcc_password@xcc_ipaddress
```

To recover a system that hangs during the boot process with Legacy Option ROM settings, see the following Tech Tip:

<https://datacentersupport.lenovo.com/solutions/ht506118>

If legacy Option ROMs must be used, do not set slot Option ROMs to **Legacy** on the Devices and I/O Ports menu. Instead, set slot Option ROMs to **Auto** (the default setting), and set the System Boot Mode to **Legacy Mode**. Legacy option ROMs will be invoked shortly before the system boots.

The server immediately displays the POST Event Viewer when it is turned on

Complete the following steps until the problem is solved.

1. Correct any errors that are indicated by the system LEDs and diagnostics display.
2. (Trained technician only) Replace the system board; then, restart the server.

Server is unresponsive (POST is complete and operating system is running)

Complete the following steps until the problem is solved.

- If you are in the same location as the server, complete the following steps:
 1. If you are using a KVM connection, make sure that the connection is operating correctly. Otherwise, make sure that the keyboard and mouse are operating correctly.
 2. If possible, log in to the server and verify that all applications are running (no applications are hung).
 3. Restart the server.
 4. If the problem remains, make sure that any new software has been installed and configured correctly.
 5. Contact your place of purchase of the software or your software provider.
- If you are accessing the server from a remote location, complete the following steps:
 1. Make sure that all applications are running (no applications are hung).
 2. Attempt to log out of the system and log back in.
 3. Validate the network access by pinging or running a trace route to the compute node from a command line.
 - a. If you are unable to get a response during a ping test, attempt to ping another compute node in the enclosure to determine whether it is a connection problem or compute node problem.
 - b. Run a trace route to determine where the connection breaks down. Attempt to resolve a connection issue with either the VPN or the point at which the connection breaks down.
 4. Restart the compute node remotely through the management interface.
 5. If the problem remains, verify that any new software has been installed and configured correctly.
 6. Contact your place of purchase of the software or your software provider.

Server is unresponsive (POST failed and cannot start System Setup)

Configuration changes, such as added devices or adapter firmware updates, and firmware or application code problems can cause the server to fail POST (the power-on self-test).

If this occurs, the server responds in either of the following ways:

- The server restarts automatically and attempts POST again.
- The server hangs, and you must manually restart the server for the server to attempt POST again.

After a specified number of consecutive attempts (automatic or manual), the server reverts to the default UEFI configuration and starts System Setup so that you can make the necessary corrections to the configuration and restart the server. If the server is unable to successfully complete POST with the default configuration, there might be a problem with the system board.

You can specify the number of consecutive restart attempts in System Setup. Restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Then, click **System Settings → Recovery and RAS → POST Attempts → POST Attempts Limit**. Available options are 3, 6, 9, and disable.

Voltage planar fault is displayed in the event log

Complete the following steps until the problem is solved.

1. Revert the system to the minimum configuration. See “Specifications” on page 4 for the minimally required number of processors and DIMMs.
2. Restart the system.
 - If the system restarts, add each of the removed items one at a time and restart the system each time until the error occurs. Replace the item for which the error occurs.
 - If the system does not restart, suspect the system board.

Unusual smell

Complete the following steps until the problem is solved.

1. An unusual smell might be coming from newly installed equipment.
2. If the problem remains, contact Lenovo Support.

Server seems to be running hot

Complete the following steps until the problem is solved.

Multiple compute nodes or chassis:

1. Make sure that the room temperature is within the specified range (see [“Specifications” on page 4](#)).
2. Make sure that the fans are installed correctly.
3. Update the UEFI and XCC to the latest versions.
4. Make sure that the fillers in the server are installed correctly (see [Chapter 5 “Hardware replacement procedures” on page 37](#) for detailed installation procedures).
5. Use the IPMI command to ramp up the fan speed to the full fan speed to see whether the issue can be resolved.

Note: The IPMI raw command should only be used by trained technician and the each system has its own specific PMI raw command.

6. Check the management processor event log for rising temperature events. If there are no events, the compute node is running within normal operating temperatures. Note that you can expect some variation in temperature.

Cannot enter legacy mode after installing a new adapter

Complete the following procedure to solve the problem.

1. Go to **UEFI Setup → Devices and I/O Ports → Set Option ROM Execution Order**.
2. Move the operation system installed to the top of the list.
3. Select **Save**.
4. Reboot the system and auto boot to operation system.

Cracked parts or cracked chassis

Contact Lenovo Support.

Optional-device problems

Use this information to solve problems related to optional devices.

- [“External USB device is not recognized” on page 242](#)
- [“A Lenovo optional device that worked previously does not work now” on page 243](#)
- [“A Lenovo optional device that was just installed does not work.” on page 243](#)
- [“A Lenovo optional device that worked previously does not work now” on page 243](#)

External USB device is not recognized

Complete the following steps until the problem is resolved:

1. Update the UEFI firmware to the latest version.
2. Make sure that the proper drivers are installed on the compute node. See the product documentation for the USB device for information about device drivers.

3. Use the Setup utility to make sure that the device is configured correctly.
4. If the USB device is plugged into a hub or the console breakout cable, unplug the device and plug it directly into the USB port on the front of the node.

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

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

A Lenovo optional device that worked previously does not work now

1. Make sure that all of the cable connections for the device are secure.
2. If the device comes with test instructions, use those instructions to test the device.
3. Reseat the cable connection and check if any physical parts have been damaged.
4. Replace the cable.
5. Reseat the failing device.
6. Replace the failing device.

Performance problems

Use this information to solve performance problems.

- “[Network performance](#)” on page 243
- “[Operating system performance](#)” on page 243

Network performance

Complete the following steps until the problem is solved:

1. Isolate which network is operating slowly (such as storage, data, and management). You might find it helpful to use ping tools or operating-system tools such as task manager or resource manager.
2. Check for traffic congestion on the network.
3. Update the NIC device driver, or the storage device controller device driver.
4. Use the traffic-diagnostic tools that are provided by the IO-module manufacturer.

Operating system performance

Complete the following steps until the problem is solved:

1. If you have recently made changes to the node (for example updated device drivers or installed software applications) remove the changes.
2. Check for any networking issues.

3. Check the operating system logs for performance related errors.
4. Check for events related to high temperatures and power issues as the node might be throttled to help with cooling. If it is throttled, reduce the workload on the node to help improve performance.
5. Check for events related to disabled DIMMs. If you do not have enough memory for the application workload, your operating system will have poor performance.
6. Ensure that the workload is not too high for the configuration.

Power on and power off problems

Use this information to resolve issues when powering on or powering off the server.

- [“The power button does not work \(server does not start\)” on page 244](#)
- [“Server does not power on” on page 244](#)

The power button does not work (server does not start)

Note: The power button will not function until approximately 1 to 3 minutes after the server has been connected to power source to allow time for BMC to initialize.

Complete the following steps until the problem is resolved:

1. Make sure that the power button on the server is working correctly:
 - a. Disconnect the server power cords.
 - b. Reconnect the server power cords.
 - c. Reseat the front operator panel cable, and then repeat steps a and b.
 - If the server starts, reseat the front operator panel.
 - If the problem remains, replace the front operator panel.
2. Make sure that:
 - The power cords are correctly connected to the server and to a working electrical outlet.
 - The PMB status LED on the rear side of the sever does not indicate a problem.
 - The Power button LED is lit on and is flashing slowly.
 - The push force is enough and with button force response.
3. If the power button LED is not lit on or is not flashing correctly, reseat all power source, PMB/PIB, and cables in between; then, check the power button LED again.
4. If you have just installed an optional device, remove it, and restart the server.
5. If the issue is still observed or without power button LED lit on, implement the minimum configuration to check whether any specific components lock the power permission. Replace another power source or external power adapter; then, check the power button LED again.
6. If everything is still done and the issue cannot be resolved, collect the failure information with system logs captured to Lenovo support.

Server does not power on

Complete the following steps until the problem is resolved:

1. Check the event log for any events related to the server not powering on.
2. Check for any LEDs that are flashing amber.
3. Check the power LED on the system board.
4. Check if the PMB status LED on the rear side of the server is lit on.
5. AC cycle the system.

6. Remove the CMOS battery for at least ten seconds, then, reinstall the CMOS battery.
7. Try to power on the system by IPMI command through XCC or by the power button.
8. Implement the minimum configuration (see [“Technical specifications” on page 4](#)).
9. Reseat all power source, PMB/PIB, and cables in between; then, check the power button LED again.
10. If the issue cannot be resolved by above actions, call service to review the issue symptom and see whether the system board (system board assembly) replacement is necessary.

Serial-device problems

Use this information to solve problems with serial ports or devices.

- [“Serial device does not work” on page 245](#)

Serial device does not work

1. Make sure that:
 - The device is compatible with the server.
 - The serial port is enabled and is assigned a unique address.
 - The device is connected to the correct connector (see [“Rear view” on page 21](#)).
2. Reseat the following components:
 - a. Failing serial device.
 - b. Serial cable.
3. Replace the following components:
 - a. Failing serial device.
 - b. Serial cable.
4. (Trained technician only) Replace the system board.

Software problems

Use this information to solve software problems.

1. To determine whether the problem is caused by the software, make sure that:
 - The server has the minimum memory that is needed to use the software. For memory requirements, see the information that comes with the software.

Note: If you have just installed a memory, the server might have a memory-address conflict.
 - The software is designed to operate on the server.
 - Other software works on the server.
 - The software works on another server.
2. If you receive any error messages while you use the software, see the information that comes with the software for a description of the messages and suggested solutions to the problem.
3. Contact your place of purchase of the software.

Storage drive problems

Use this information to resolve issues related to the storage drives.

- [“Server cannot recognize a drive” on page 246](#)
- [“Multiple drives fail” on page 247](#)
- [“Multiple drives are offline” on page 247](#)

- “A replacement drive does not rebuild” on page 247
- “Green drive activity LED does not represent actual state of associated drive” on page 247
- “Yellow drive status LED does not represent actual state of associated drive” on page 247

Server cannot recognize a drive

Note: 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.

Complete the following steps until the problem is solved.

1. Observe the associated yellow drive status LED. If the LED is lit, it indicates a drive fault.
2. If the status LED is lit, remove the drive from the bay, wait 45 seconds, and reinsert the drive, making sure that the drive assembly connects to the drive backplane.
3. Observe the associated green drive activity LED and the yellow status LED and perform corresponding operations in different situations:
 - If the green activity LED is flashing and the yellow status LED is not lit, the drive is recognized by the controller and is working correctly. Run the diagnostics tests for the drives. When you start a server and press the key according to the on-screen instructions, the LXPM is displayed by default. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) You can perform drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → Disk Drive Test**.
 - If the green activity LED is flashing and the yellow status LED is flashing slowly, the drive is recognized by the controller and is rebuilding.
 - If neither LED is lit or flashing, check whether the drive backplane is correctly seated. For details, go to step 4.
 - If the green activity LED is flashing and the yellow status LED is lit, replace the drive.
4. Make sure that the drive backplane is correctly seated. When it is correctly seated, the drive assemblies correctly connect to the backplane without bowing or causing movement of the backplane.
5. Reseat the backplane power cable and repeat steps 1 through 3.
6. Reseat the backplane signal cable and repeat steps 1 through 3.
7. Suspect the backplane signal cable or the backplane:
 - Replace the affected backplane signal cable.
 - Replace the affected backplane.
8. Run the diagnostics tests for the drives. When you start a server and press the key according to the on-screen instructions, the LXPM is displayed by default. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) You can perform drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → Disk Drive Test**.

Based on those tests:

- If the backplane passes the test but the drives are not recognized, replace the backplane signal cable and run the tests again.
- Replace the backplane.
- If the adapter fails the test, disconnect the backplane signal cable from the adapter and run the tests again.
- If the adapter fails the test, replace the adapter.

Multiple drives fail

Complete the following steps until the problem is solved:

- View the Lenovo XClarity Controller event log for events related to power supplies or vibration issues and resolve those events.
- Make sure that the device drivers and firmware for the drive and server are at the latest level.

Important: Some cluster solutions require specific code levels or coordinated code updates. If the device is part of a cluster solution, verify that the latest level of code is supported for the cluster solution before you update the code.

Multiple drives are offline

Complete the following steps until the problem is solved:

- View the Lenovo XClarity Controller event log for events related to power supplies or vibration issues and resolve those events.
- View the storage subsystem log for events related to the storage subsystem and resolve those events.

A replacement drive does not rebuild

Complete the following steps until the problem is solved:

1. Make sure that the drive is recognized by the adapter (the green drive activity LED is flashing).
2. Review the SAS/SATA RAID adapter documentation to determine the correct configuration parameters and settings.

Green drive activity LED does not represent actual state of associated drive

Complete the following steps until the problem is solved:

1. If the green drive activity LED does not flash when the drive is in use, run the diagnostics tests for the drives. When you start a server and press the key according to the on-screen instructions, the LXPM is displayed by default. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) You can perform drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → Disk Drive Test**
2. If the drive passes the test, replace the backplane.
3. If the drive fails the test, replace the drive.

Yellow drive status LED does not represent actual state of associated drive

Complete the following steps until the problem is solved:

1. Turn off the server.
2. Reseat the SAS/SATA adapter.
3. Reseat the backplane signal cable and backplane power cable.
4. Reseat the drive.
5. Power on the server and observe the activity of the drive LEDs.

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about Lenovo products, you will find a wide variety of sources available from Lenovo to assist you.

On the World Wide Web, up-to-date information about Lenovo systems, optional devices, services, and support are available at:

<http://datacentersupport.lenovo.com>

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

Before you call

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

Attempt to resolve the problem yourself

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

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

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

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Check for updated software, firmware, and operating-system device drivers for your Lenovo product. (See the following links) The Lenovo Warranty terms and conditions state that you, the owner of the Lenovo product, are responsible for maintaining and updating all software and firmware for the product (unless it is covered by an additional maintenance contract). Your service technician will request that you upgrade your software and firmware if the problem has a documented solution within a software upgrade.
 - Drivers and software downloads
 - <https://datacentersupport.lenovo.com/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 [Chapter 8 “Problem determination” on page 223](#) for instructions on isolating and solving issues.
- Go to <http://datacentersupport.lenovo.com> and check for information to help you solve the problem.

To find the Tech Tips available for your server:

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

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

- Check Lenovo Data Center Forum at https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg to see if someone else has encountered a similar problem.

Gathering information needed to call Support

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

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

- Hardware and Software Maintenance agreement contract numbers, if applicable
- Machine type number (Lenovo 4-digit machine identifier). Machine type number can be found on the ID label, see “[Identify the server and access the Lenovo XClarity Controller](#)” on page 33.
- Model number
- Serial number
- Current system UEFI and firmware levels
- Other pertinent information such as error messages and logs

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

Collecting service data

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

Service data can be collected through the following tools:

- **Lenovo XClarity Provisioning Manager**

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

- **Lenovo XClarity Controller**

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

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

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

- **Lenovo XClarity Administrator**

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

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

- **Lenovo XClarity Essentials OneCLI**

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

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

Contacting Support

You can contact Support to obtain help for your issue.

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

Appendix B. Documents and supports

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

Documents download

This section provides introduction and download links for handy documents.

Documents

Download the following product documentations at:

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

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
- 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
- Lenovo Product Warranty Plans
 - <http://datacentersupport.lenovo.com/warrantylookup>
- Lenovo Server Operating Systems Support Center website
 - <https://datacentersupport.lenovo.com/solutions/server-os>
- Lenovo ServerProven website (Options compatibility lookup)
 - <https://serverproven.lenovo.com>
- Operating System Installation Instructions
 - <https://pubs.lenovo.com/thinkedge#os-installation>
- Submit an eTicket (service request)
 - <https://support.lenovo.com/servicerequest>
- Subscribe to Lenovo Data Center Group product notifications (Stay up to date on firmware updates)
 - <https://datacentersupport.lenovo.com/solutions/ht509500>

Appendix C. Notices

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

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Morrisville, NC 27560
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Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk.

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.

Electronic emission notices

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

Additional electronic emissions notices are available at:

https://pubs.lenovo.com/important_notices/

Taiwan Region BSMI RoHS declaration

單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁶⁺)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機架	○	○	○	○	○	○
外部蓋板	○	○	○	○	○	○
機械組零件	-	○	○	○	○	○
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.

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