Lenovo

ThinkEdge SE100
User Guide

Machine Type: 7DGR

Note

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

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

First Edition (May 2025)

Contents

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

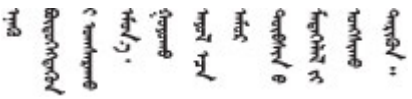
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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



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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

ཐོན་རྫས་འདི་བདེ་སྐྱོང་མ་བྱས་གོང་། ·སྐོར་གྱི་ཡིད་གཟབ· བྱ་འདྲ་མིན་ཡོད་པའི་འོད་སྣེར་བལྟ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

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Safety inspection checklist

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

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

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

Important:

- Electrical grounding of the server is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.
- Do not remove the black coating on the surface of the server. The black coating on the surface is insulating for electro-static discharge protection

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

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

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

a. Go to:

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

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

c. Enter the machine type and model for your server to display the configurator page.

d. Click **Power → Power Cables** to see all line cords.

- Make sure that the insulation is not frayed or worn.

3. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
4. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
5. Check for worn, frayed, or pinched cables.
6. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Chapter 1. Introduction

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

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

Figure 1. ThinkEdge SE100

Features

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

Your server implements the following features and technologies:

- **Lenovo XClarity Controller (XCC)**

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

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

- **UEFI-compliant server firmware**

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

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

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

- **Large system-memory capacity**

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

- **Integrated network support**

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

- **Large data-storage capacity**

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

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

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

- **Active Energy Manager**

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

- **Redundant networking connection**

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

- **Redundant cooling**

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

- **Optional power capabilities**

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

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

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

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

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

- **Lenovo XClarity Controllers System Lockdown Mode**

  System lockdown will be enforced under specific circumstances to protect the server from information breach, particularly when the server detects physical movements of the node or enclosure covers. See “System Lockdown Mode” on page 228 for details.

- **Kensington–style cable lock**

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

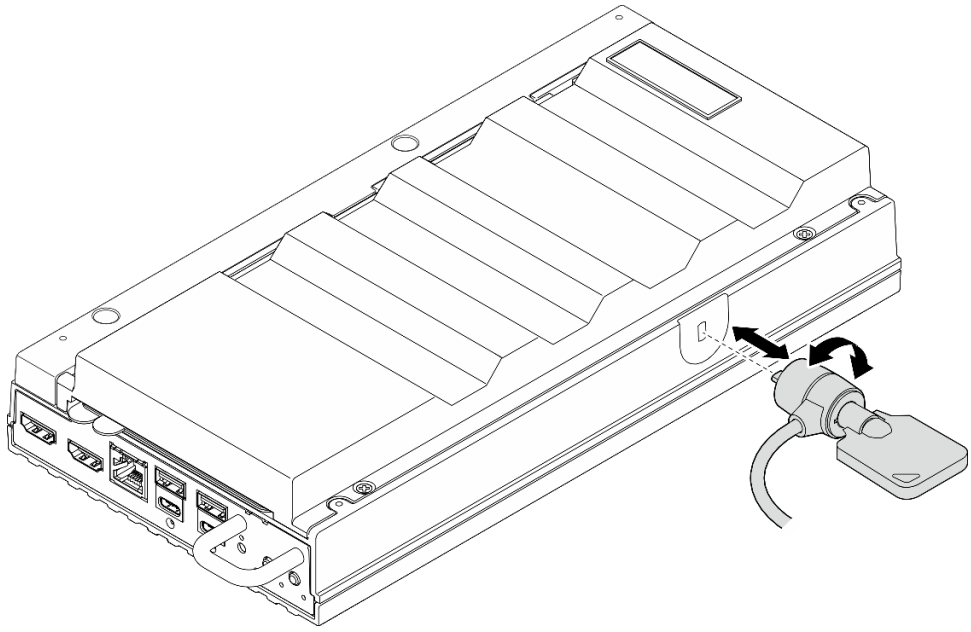


Figure 2. Kensington–style cable lock

Tech Tips

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

To find the Tech Tips available for your server:

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

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

Security advisories

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

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

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

Specifications

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

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

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

Technical specifications

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

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

Memory

See “Memory module installation rules and order” on page 47 for detailed information about memory configuration and setup.

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

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

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

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

M.2 Drive

M.2 boot drive:

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

M.2 storage drives:

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

Notes:

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

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

Expansion slots

One PCIe slot supports up to 75W:

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

Graphics processing unit (GPU)

The server supports the following GPU configuration:

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

Integrated functions and I/O connectors

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

Network

Ethernet connectors

- Two 1GbE RJ-45 connectors

Ethernet adapters

- Support one low-profile PCIe Ethernet adapter

System fan

Supported fans vary by configuration.

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

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

Electrical input

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

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

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

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

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

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

ThinkEdge 140W 230V/115V External Power Supply

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

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

Minimal configuration for debugging

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

Operating systems

Supported and certified operating systems:

- Microsoft Windows
- Canonical Ubuntu

Notes:

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

References:

- Complete list of available operating systems: https://lenovopress.lenovo.com/osig.
- OS deployment instructions, see “Deploy the operating system” on page 232.

Mechanical specifications

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

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

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

Environmental specifications

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

Acoustical noise emissions

The server has the following acoustic noise emissions declaration:

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

Notes:

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

Acoustical noise emissions

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

Ambient temperature management

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

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

Environment

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

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

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

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

Shock and vibration specifications

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

Table 1. Shock and vibration specifications

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

Particulate contamination

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

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

Table 2. Limits for particulates and gases

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

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

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

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

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

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

Management options

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

Overview

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

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

Functions

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

Notes:

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

Chapter 2. Server components

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

Front view

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

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

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

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

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

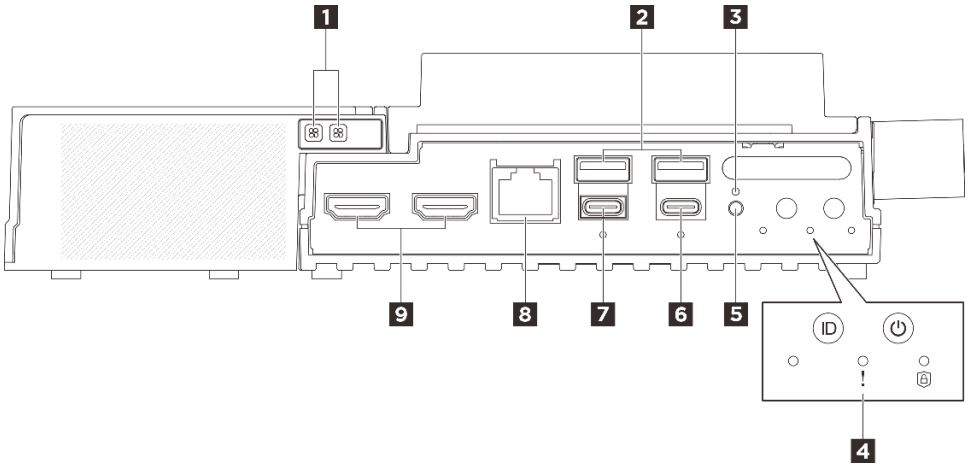


Figure 3. Front view

Table 3. Components on the front view

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

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

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

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

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

3 Locked button

After pressing this button, the server will be in System Lockdown Mode for security and the security LED of the server will start blinking. See “Front LEDs” on page 237 to identify the security LED status. The lockdown button will not respond if the button is pressed after the system has already entered BIOS Setup menu or OS.

4 System buttons and LEDs

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

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

See “Front LEDs” on page 237 for more information.

5 UART switch button

Press this button to switch the UART output between XCC log (Lenovo service technicians only) or CPU log. After powering on the server, the output is CPU log by default. See “Front LEDs” on page 237 to determine the status of the UART output.

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

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

Notes:

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

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

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

Notes:

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

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

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

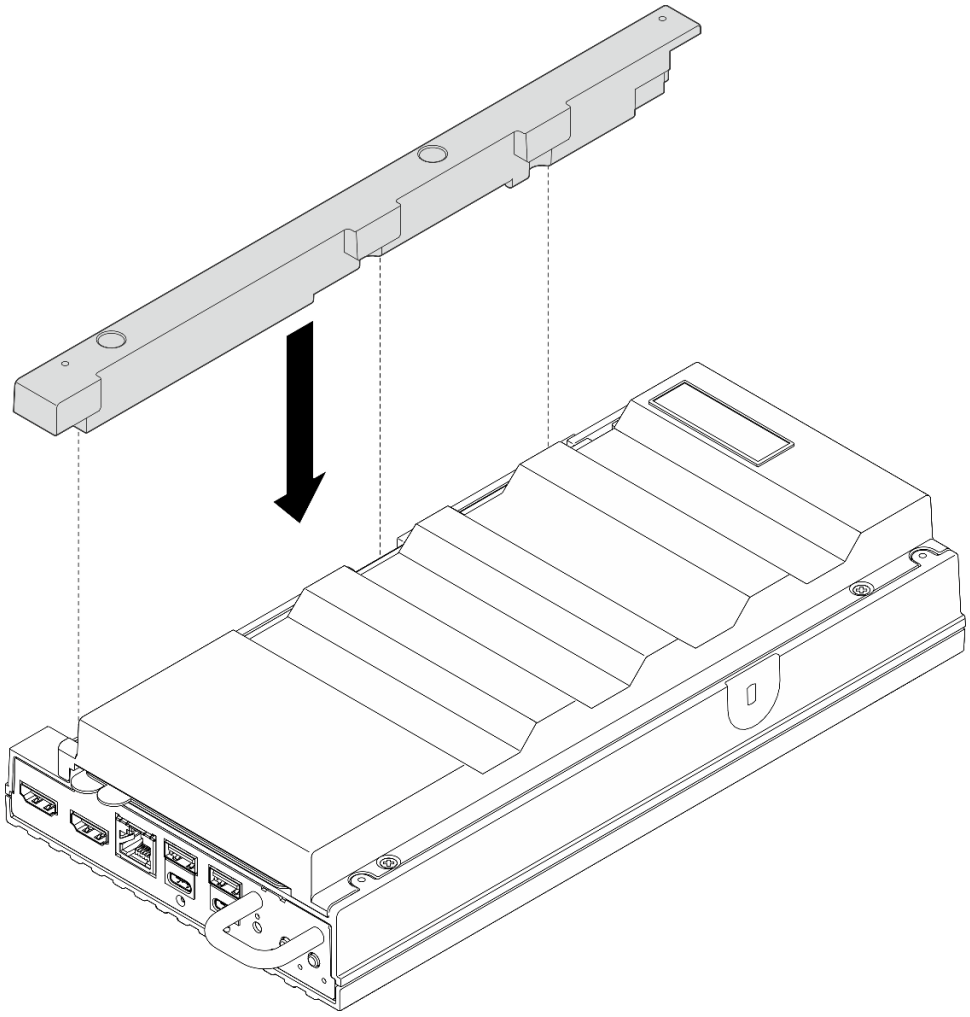
9 HDMI 2.0 connectors

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

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

Expansion filler

Install the expansion filler when the node is not installed with a expansion kit. See “Install the expansion filler” on page 113 for more information.



Front I/O fillers

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

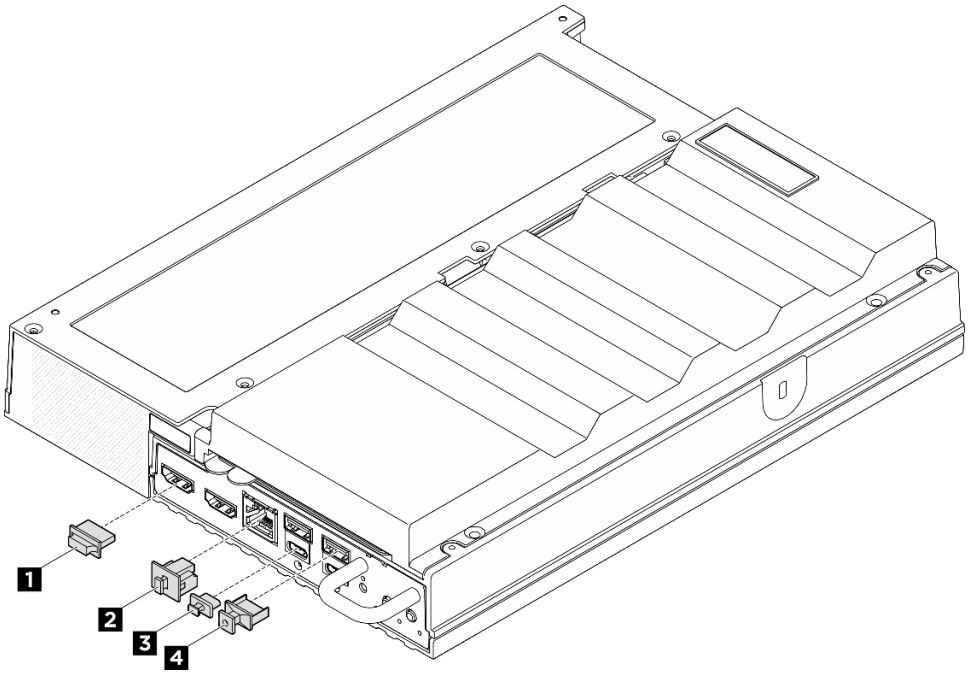


Figure 4. Front I/O fillers

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

Rear view

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

Notes:

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

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

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

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

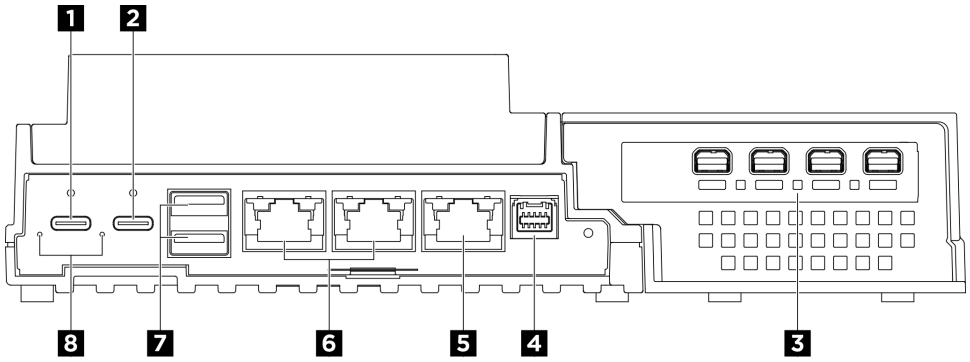


Figure 5. Rear view

Table 4. Components on the rear view

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

1 2 USB Type-C power connectors

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

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

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

Only one mode is supported:

- **BMC only mode**

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

3 PCIe slot (expansion kit)

Install a PCIe adapter into this slot. See “Install the PCIe adapter” on page 218 for more information.

4 Fan control board connector

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

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

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

See the following for more information:

- Set the network connection for the Lenovo XClarity Controller
- "XCC system management port (10/100/1000 Mbps RJ-45) and LAN port LEDs" on page 242

6 1GbE RJ-45 connectors

Connect an Ethernet cable to either of these connectors for LAN connection. See "XCC system management port (10/100/1000 Mbps RJ-45) and LAN port LEDs" on page 242 for more information.

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

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

8 Power input LEDs (green/yellow)

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

Rear I/O fillers

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

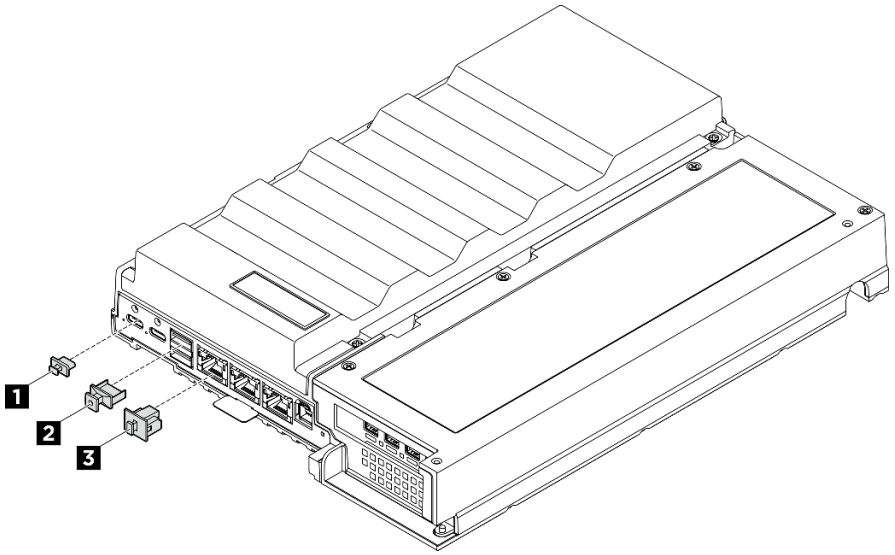


Figure 6. Rear I/O fillers

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

Top view

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

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

Top view: top layer

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

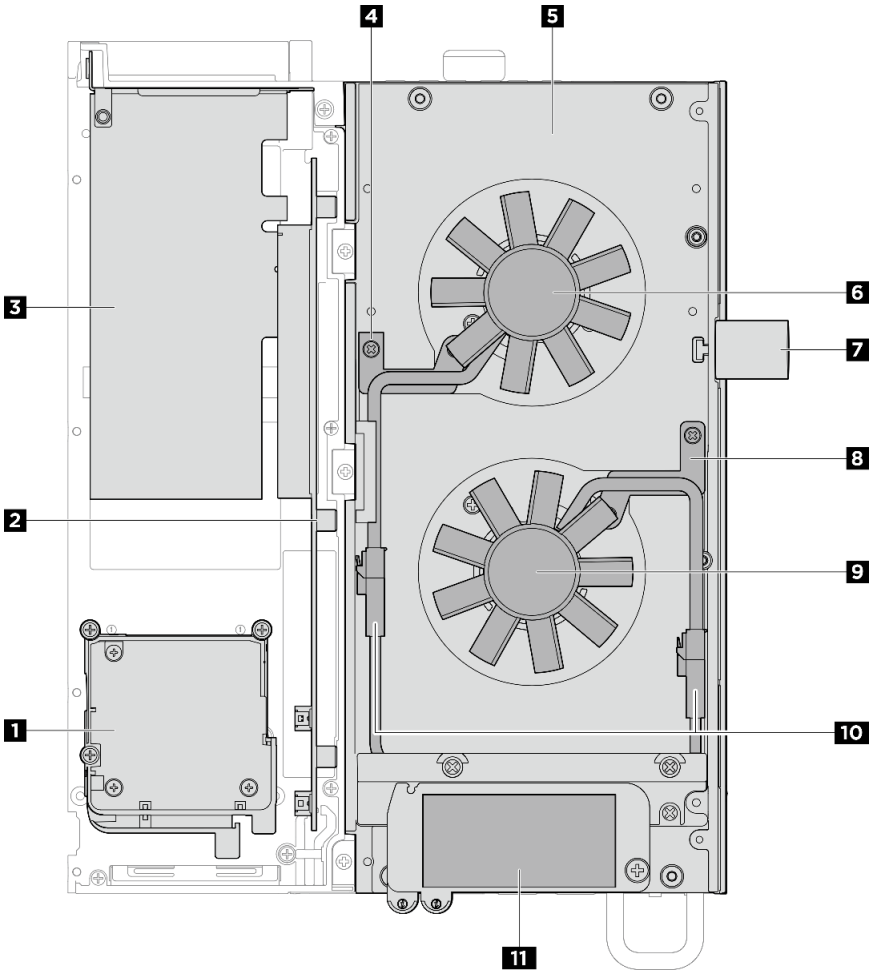


Figure 7. Top view: top layer

Table 5. Top view: top layer

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

Top view: bottom layer

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

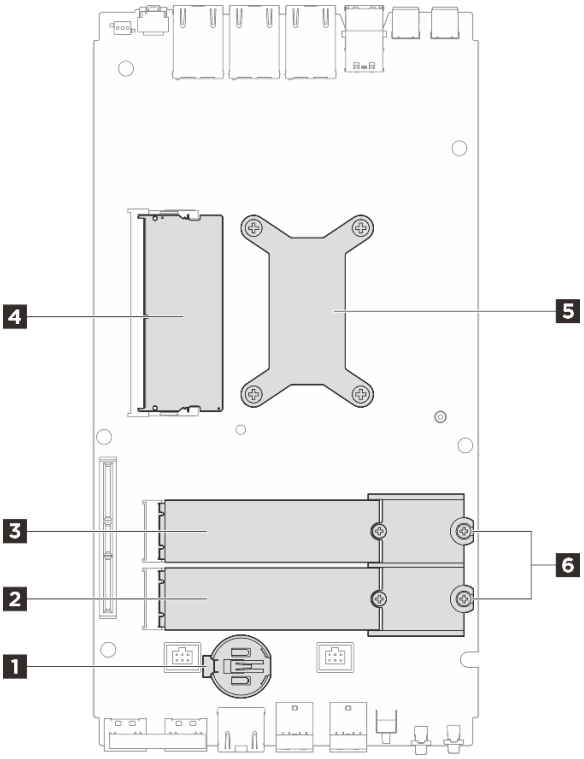


Figure 8. Top view: bottom layer

Table 6. Top view: bottom layer

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

Bottom view

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

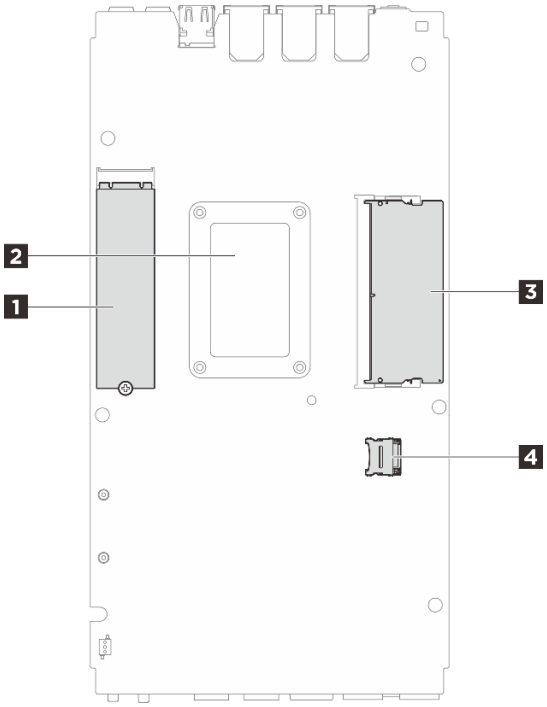


Figure 9. Bottom view

Table 7. Bottom view

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

System-board layout

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

For more information about the LEDs that are available on the system board, see “System-board LEDs” on page 240.

System-board connectors

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

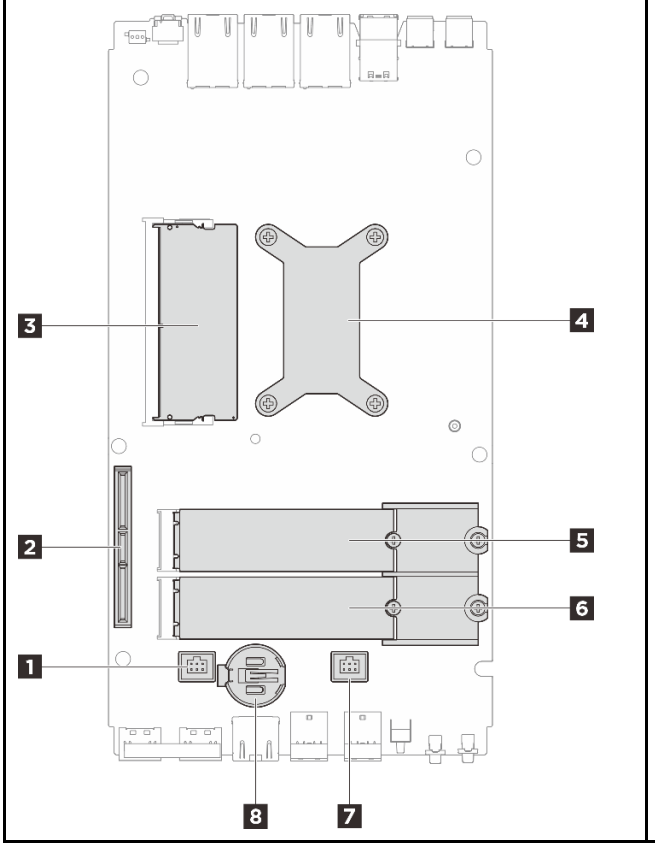
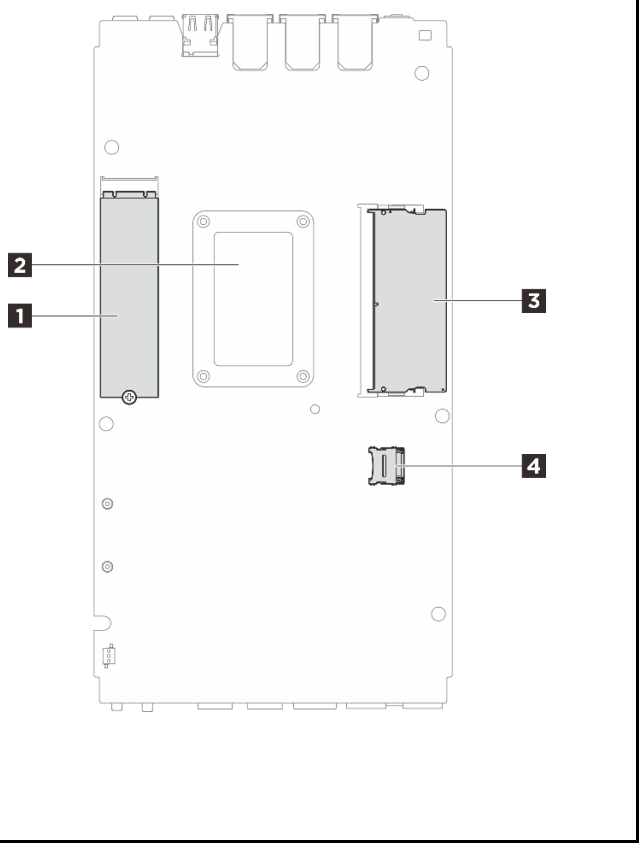
Top side	Bottom side
	

Figure 10. System-board connectors

Table 8. System-board connectors

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

System-board switches

The following illustrations show the location of the switches, jumpers, and buttons on the server.

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

Important:

1. Before you change any switch settings or move any jumpers, turn off the server; then, disconnect all power cords and external cables. Review the following information:
   - https://pubs.lenovo.com/safety_documentation/
   - “Installation Guidelines” on page 43
   - “Handling static-sensitive devices” on page 46
   - “Power off the server” on page 53
2. Any system-board switch or jumper block that is not shown in the illustrations in this document are reserved.

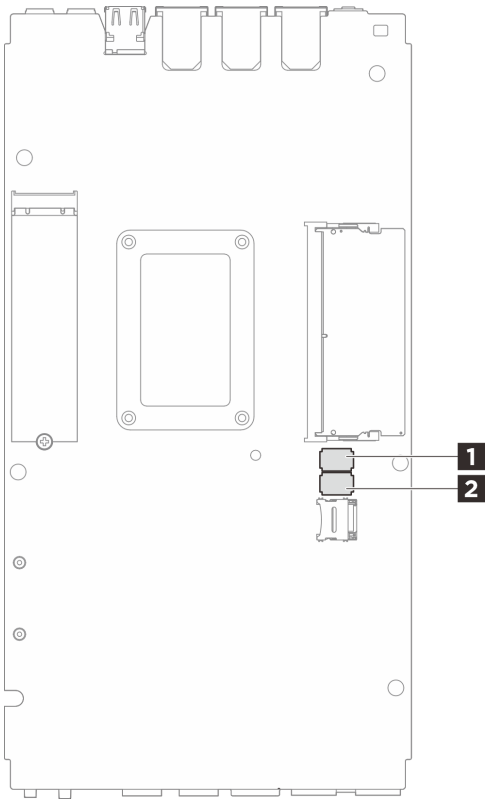


Figure 11. System-board switches (System board bottom side)

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

Table 9. System-board switches

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

Table 9. System-board switches (continued)

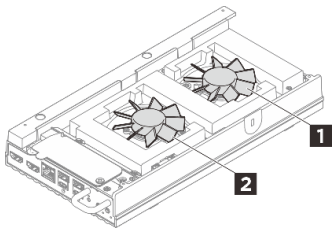
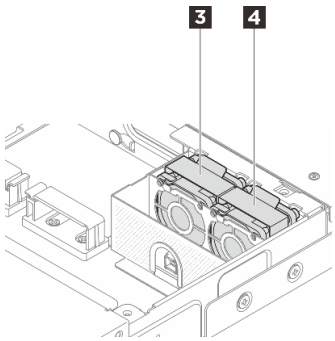
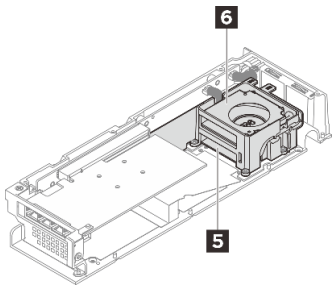
Switches block	Switch number	Switch name	Usage description	
			On	Off
	6	Machine Engine (ME) recovery override	ME boots to recovery	Normal (default)
	7	(Reserved)	(Reserved)	Normal (default)
	8	(Reserved)	(Reserved)	Normal (default)
2 SW2	1	Machine Engine (ME) firmware security override	Enables ME update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

System fan numbering

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

Fan support matrix

Table 10. Fan support matrix

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

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

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

System LEDs

See the following section for information on available system LEDs.

For more information, refer to “Troubleshooting by system LEDs” on page 237.

Chapter 3. Parts list

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

For more information about ordering parts:

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

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

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

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

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

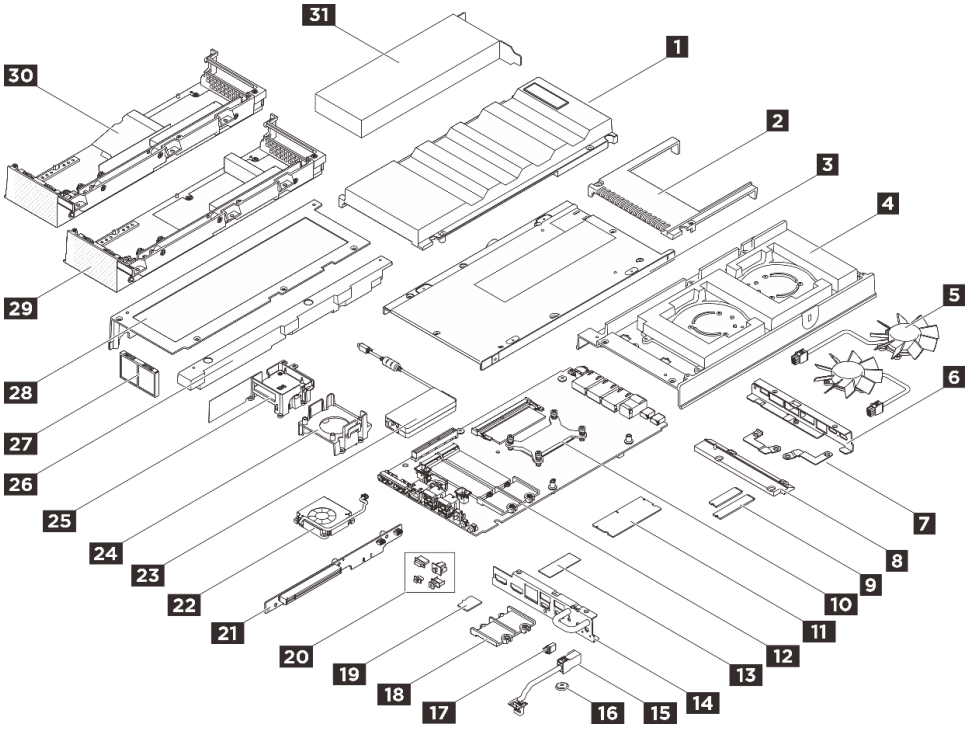


Figure 12. Server components

Table 11. Parts list

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

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

- GPU adapter: T2
- Ethernet adapter: T1

Power cords

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

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

1. Go to:

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

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

Notes:

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

Chapter 4. Unboxing and setup

Information in this section assists you on unboxing and setting up the server. When unboxing the server, check if the items in the package are correct, and learn where to find information of server serial number and Lenovo XClarity Controller access. Make sure to follow the instructions in “Server setup checklist” on page 39 when setting up the server.

Server package contents

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

The server package includes the following items:

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

Notes:

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

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

Identify the server and access the Lenovo XClarity Controller

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

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

Identifying your server

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

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

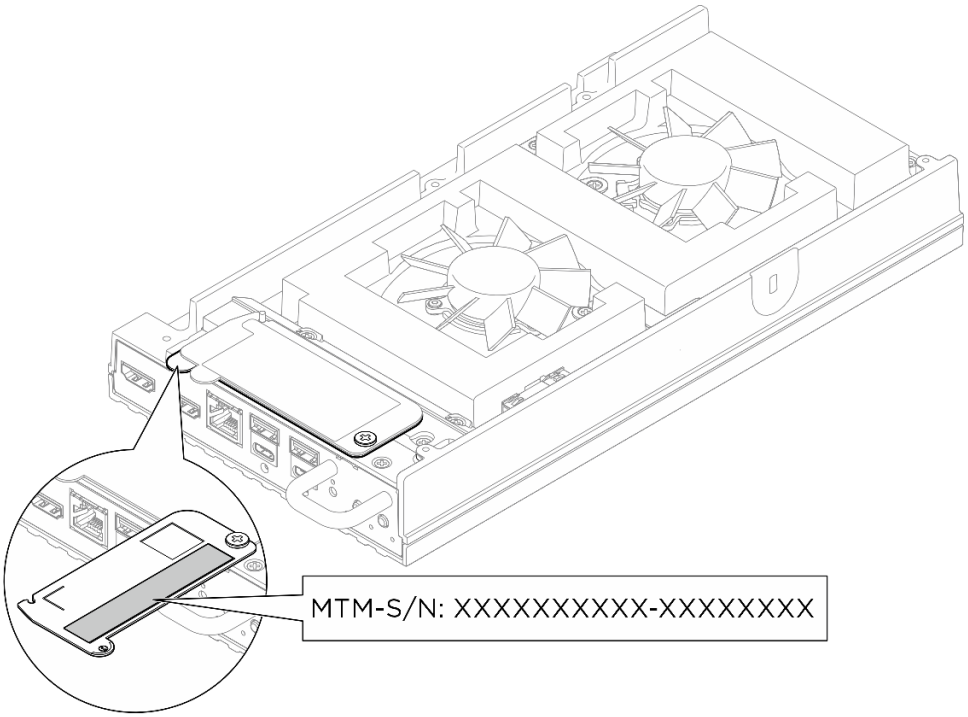


Figure 13. ID label on the pull-out information tab

Lenovo XClarity Controller network access label

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

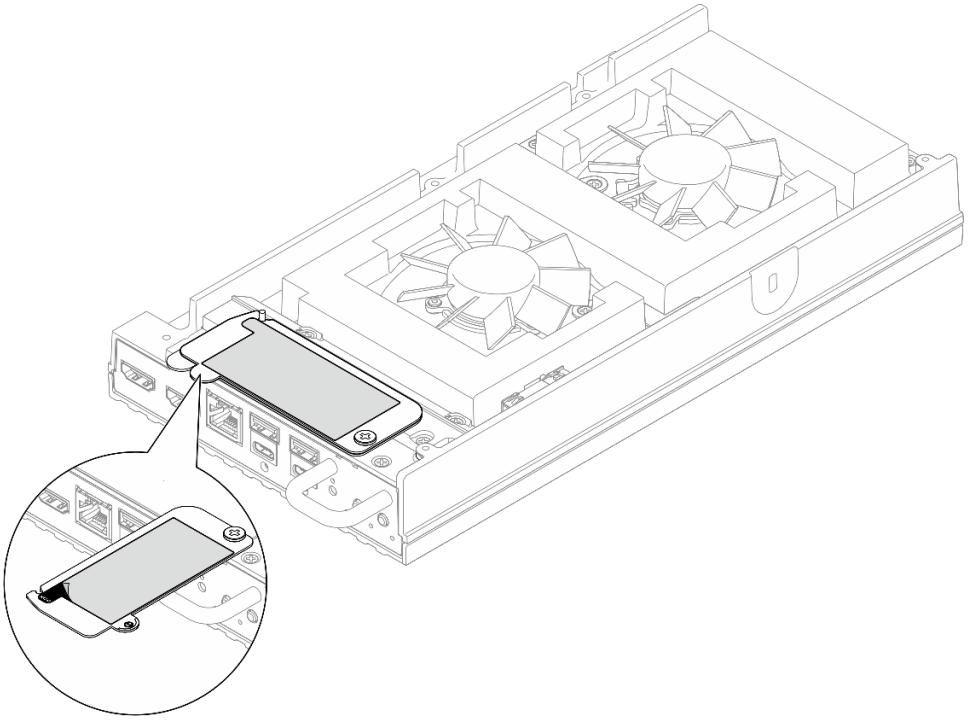


Figure 14. Lenovo XClarity Controller network access label on the pull-out information tab

Service information QR code

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

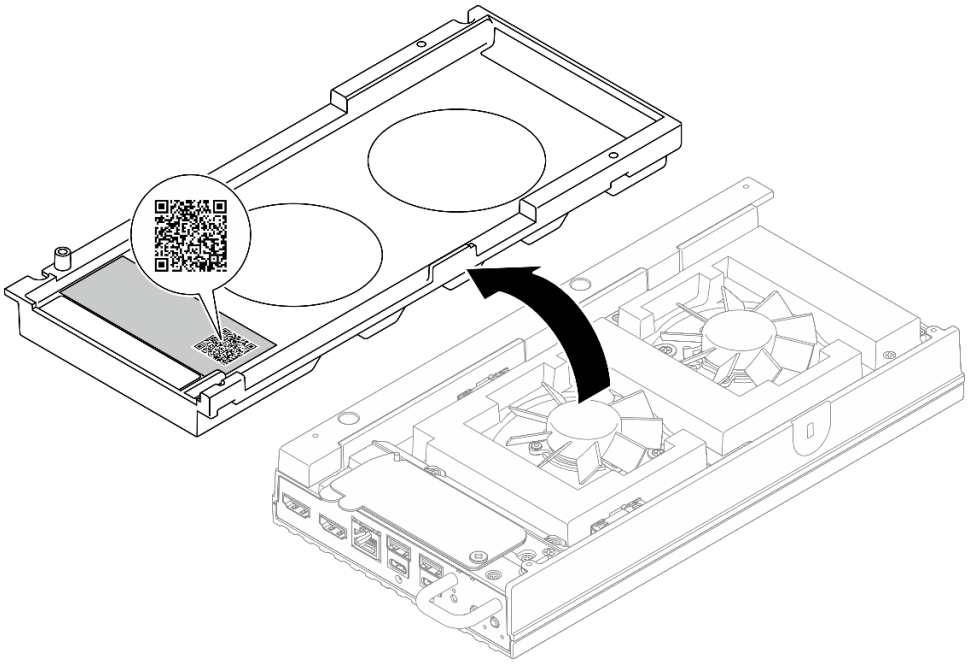


Figure 15. Service information QR code on the desktop mount fan shroud

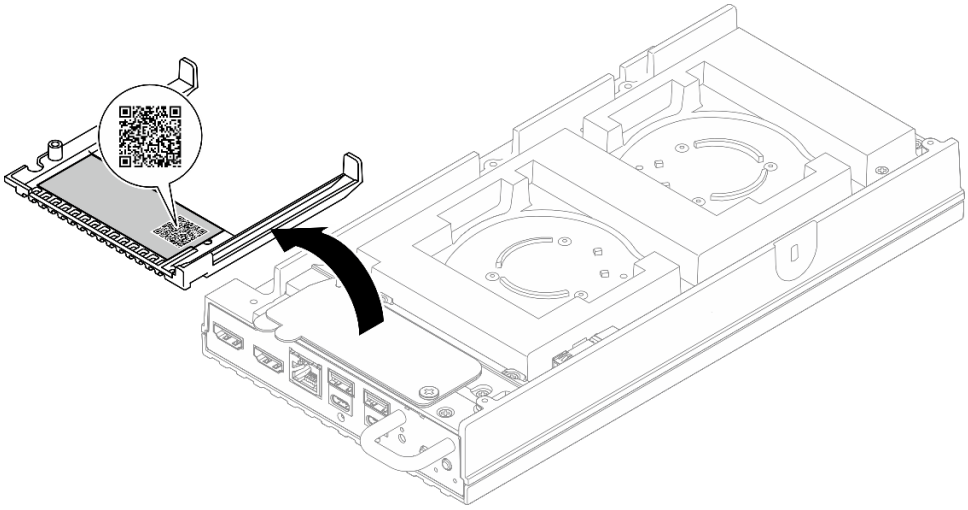


Figure 16. Service information QR code on the rack mount fan shroud

Server setup checklist

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

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

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

Setup the server hardware

Complete the following procedures to setup the server hardware.

1. Unpack the server package. See “Server package contents” on page 37.
2. Install any required hardware or server options. See the related topics in Chapter 5 “Hardware replacement procedures” on page 43.
3. If necessary, mount the server or install the server to an enclosure. Follow the instruction in “Configuration guide” on page 53.
4. Connect all external cables to the server. See Chapter 2 “Server components” on page 17 for connectors locations.

   Typically, you will need to connect the following cables:

   - Connect server to the power source
   - Connect server to the data network
   - Connect the server to the storage device
   - Connect the server to the management network
5. Install the I/O fillers when the connectors are not used. The connectors could be dust-covered without proper protection of the fillers. The I/O fillers are in the material box. See “Front I/O fillers” on page 20 and “Rear I/O fillers” on page 23 to distinguish the I/O fillers.
6. If the security LED of the server is blinking, the server is in System Lockdown Mode. Activate or unlock the system for operation. See “Activate or unlock the system” on page 226.
7. 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 237

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

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

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

   See “Troubleshooting by system LEDs” on page 237 for more information on the LED indications.

Configure the system

Complete the following procedures to configure the system. For detailed instructions, refer to Chapter 6 “System configuration” on page 221.

1. Set the network connection for the Lenovo XClarity Controller to the management network.
2. Update the firmware for the server, if necessary.
3. Configure the firmware for the server.
4. Install the operating system.
5. Back up the server configuration.
6. Install the applications and programs for which the server is intended to be used.
7. Configure ThinkEdge security features. See “Activate/unlock the system and configure ThinkEdge security features” on page 225.

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 your 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 your safety at work:
  - A complete list of safety information for all products is available at:

    https://pubs.lenovo.com/safety_documentation/
  - The following guidelines are available as well: “Working inside the server with the power on” on page 45 and “Handling static-sensitive devices” on page 46.
- Make sure the components you are installing are supported by your server.
  - For a list of supported optional components for the server, see https://serverproven.lenovo.com.
  - 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 your server.
  2. Click **Parts**.
  3. Enter the serial number to view a listing of parts for your 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/tw/en/products/servers/thinkedge/se100/7dgr/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 221.
- It is good practice to make sure that the server is working correctly before you install an optional component.
- Keep the working area clean, and place removed components on a flat and smooth surface that does not shake or tilt.
- Do not attempt to lift an object that might be too heavy for you. If you have to lift a heavy object, read the following precautions carefully:
  - Make sure that you can stand steadily without slipping.
  - Distribute the weight of the object equally between your feet.

  - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
  - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.
- Back up all important data before you make changes related to the disk drives.
- Have a small flat-blade screwdriver, a small Phillips screwdriver, and a T8 torx screwdriver available.
- To view the error LEDs on the system board (system board assembly) and internal components, leave the power on.
- You do not have to turn off the server to remove or install hot-swap power supplies, or hot-plug USB devices. However, you must turn off the server before you perform any steps that involve removing or installing adapter cables, and you must disconnect the power source from the server before you perform any steps that involve removing or installing a riser card.
- When replacing power supply units or fans, make sure to refer to redundancy rules for these components.
- 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.
- Except PSU, orange on a component or an orange label on or near a component indicates that the component can be hot-swapped if the server and operating system support hot-swap capability, which means that you can remove or install the component while the server is still running. (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.
- After finishing working on the server, make sure you 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: The product is not suitable for use at visual display workplaces according to §2 of the Workplace Regulations.

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

Important:

- Electrical grounding of the server is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.
- Do not remove the black coating on the surface of the server. The black coating on the surface is insulating for electro-static discharge protection

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

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

- Make sure that the power cord is the correct type.

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

  a. Go to:

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

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

  c. Enter the machine type and model for your server to display the configurator page.

  d. Click **Power → Power Cables** to see all line cords.
- Make sure that the insulation is not frayed or worn.

3. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
4. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
5. Check for worn, frayed, or pinched cables.
6. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

System reliability guidelines

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

Make sure the following requirements are met:

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

Working inside the server with the power on

You might need to keep the power on with the server cover removed to look at system information on the display panel or to replace hot-swap components. Review these guidelines before doing so.

Attention: The server might stop and data loss might occur when internal server components are exposed to static electricity. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding systems when working inside the server with the power on.

- Avoid loose-fitting clothing, particularly around your forearms. Button or roll up long sleeves before working inside the server.
- Prevent your necktie, scarf, badge rope, or hair from dangling into the server.
- Remove jewelry, such as bracelets, necklaces, rings, cuff links, and wrist watches.

- Remove items from your shirt pocket, such as pens and pencils, in case they fall into the server as you lean over it.
- Avoid dropping any metallic objects, such as paper clips, hairpins, and screws, into the server.

Handling static-sensitive devices

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 that you implement 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

Specific information about the required installation order of memory modules in your server based on the system configuration and memory mode that you are implementing is shown below.

Memory modules and processor layout

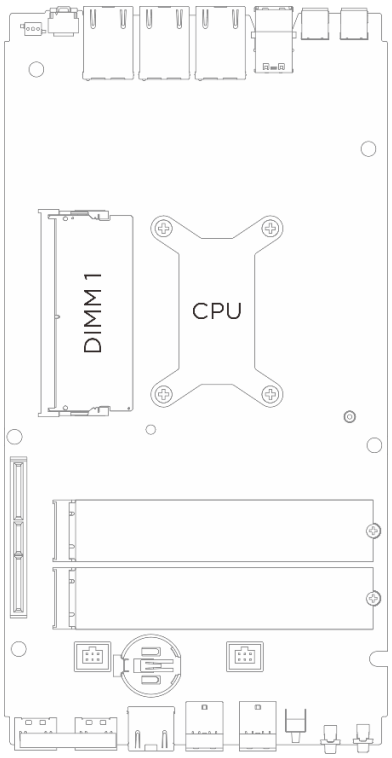
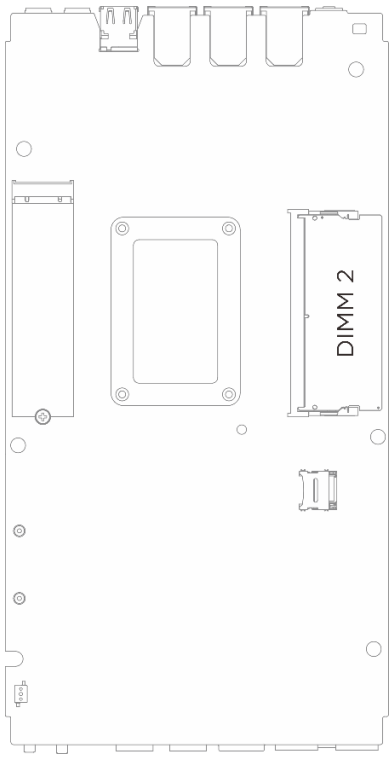
Top side	Bottom side
	

Figure 17. Memory modules and processor layout

Memory module installation guideline

- This server supports “Independent mode” on page 49.
- This server supports the following type of memory modules:
  - Double-data-rate 5 (TruDDR5) error correcting code (ECC) 6400 MHz clocked small outline DIMM (CSODIMM)
  - Double-data-rate 5 (TruDDR5) 5600 MHz small outline DIMM (SODIMM)
- At least one DIMM is required for the processor. Install at least one DIMM per processor for good performance.
- When you replace a DIMM, the server provides automatic DIMM enablement capability without requiring you to use the Setup Utility to enable the new DIMM manually.

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.

Follow the rules below when installing memory modules in independent mode:

- There should be at least one DDR5 DIMM per processor.
- Populate memory channel 0 first.
- In each memory channel, populate slot 0 first.
- Memory modules from different vendors are supported
- All memory modules to be installed must be the same capacity and same speed.

Table 12. Memory population in independent mode

Number of Memory Modules	**Memory Module Slot Number**	
	1 (Top side of system board)	**2** (Bottom side of system board)
1	√	
2	√	√

Thermal pad installation guidelines

Follow the information in this section to identify the shape, location, orientation and instruction of the thermal pads used in SE100.

Notes:

- If a thermal pad is in any of the following conditions, replace the thermal pad with a new one.
  - The thermal pad is damaged or detached from the surface.
  - The new part to be installed is of different brand or form factor from the replaced one; the new part might cause thermal pads to be deformed or damaged.
- Before replacing the thermal pad, gently clean the interface plate and the hardware surface with an alcohol cleaning pad.
- Hold the thermal pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the thermal pad.
- Do not use expired thermal pads. Check the manufacturing date on the thermal pad package and make sure it does not exceed 1 year. If the thermal pads are expired, order new thermal pads for proper replacement.

Thermal pad identification and location

See the following for the thermal pads used in SE100:

- Top cover thermal pad kits
- Bottom cover thermal pad kits

- System board thermal pad kits

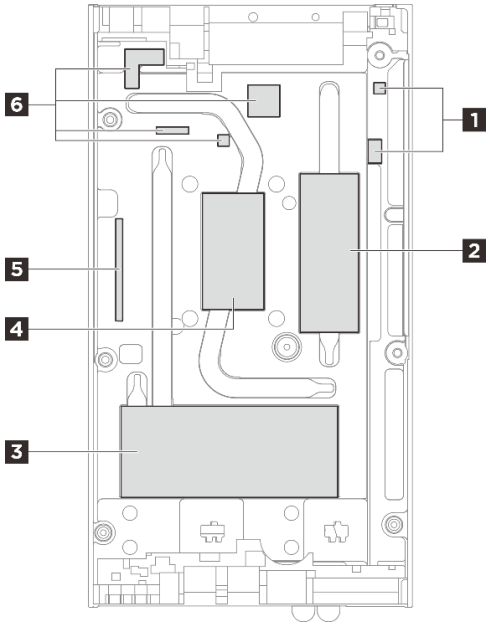


Figure 18. Thermal pad identification and location: Top cover

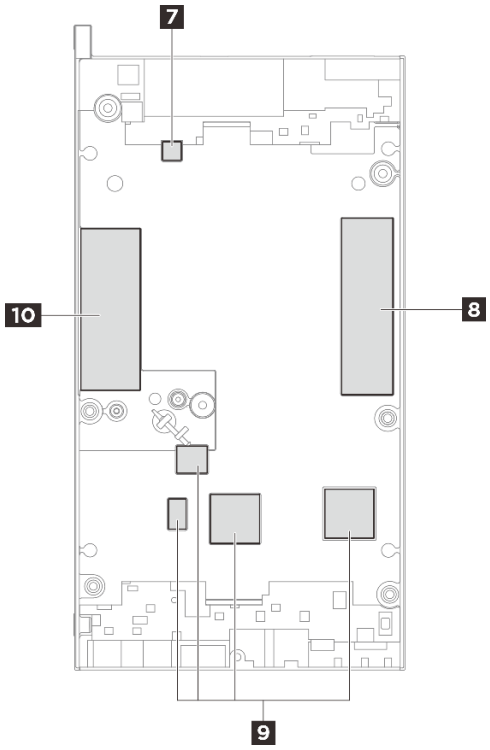


Figure 19. Thermal pad identification and location: Bottom cover

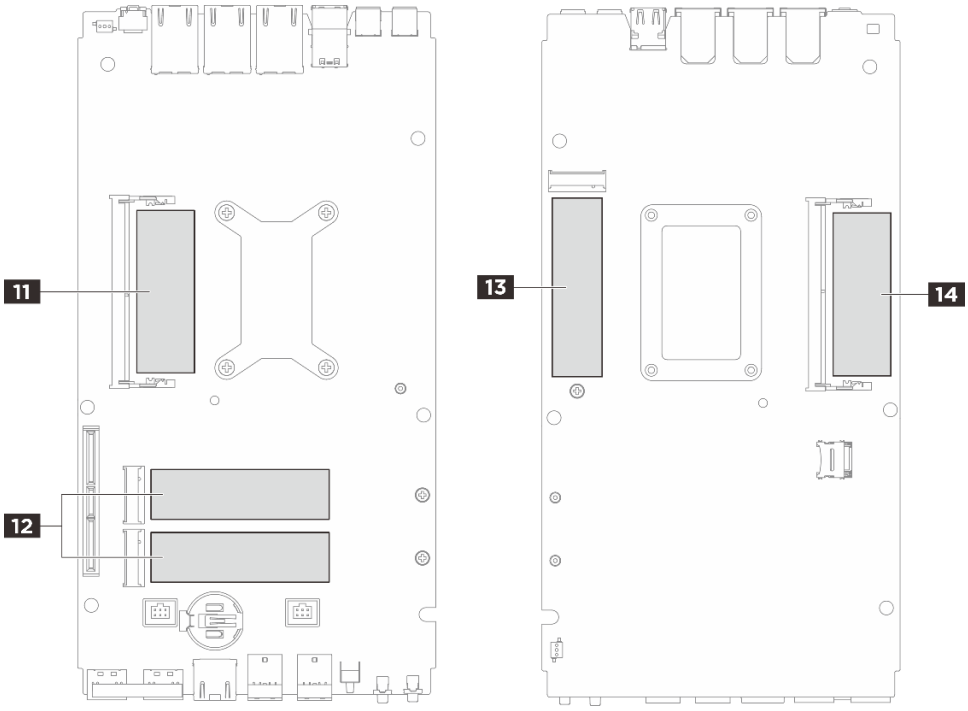


Figure 20. Thermal pad identification and location: System board

Table 13. Thermal pad identification and location

Component installation requiring the pads	Pad number	Pad orientation	Pad replacement procedure
• Top cover • System board • Processor heat sink	1 5 6	Pink side facing outward.	1. Peel off the transparent plastic film on the gray side of the pad, and attach this side to the top cover. 2. After the pad is attached to the top cover, remove the other plastic film from the pad.
	2 3		Keep the pink side facing up, peel off the plastic film from the bottom side; then attach the pad to the top cover.
	4	Glossy side facing outward.	Peel off the plastic film of the pad, and attach the pad to the top cover.
• Bottom cover • System board • Processor heat sink	7 8 10	Pink side facing outward.	Keep the pink side facing up, peel off the plastic film from the bottom side; then attach the pad to the bottom cover.

Table 13. Thermal pad identification and location (continued)

Component installation requiring the pads	Pad number	Pad orientation	Pad replacement procedure
	9	Pink side facing outward.	1. Peel off the transparent plastic film on the gray side of the pad, and attach this side to the top cover. 2. After the pad is attached to the top cover, remove the other plastic film from the pad.
Memory module slot 1	• 2 Top cover side • 11 System board side	Pink side facing outward.	• **Top / Bottom cover side:** – Keep the pink side facing up, peel off the plastic film from the bottom side; then attach the pad to the top /bottom cover. • **System board side:** 1. Keep the pink side of the thermal pad facing up. Peel off the plastic film from the bottom side; align the thermal pad to the marking on the system board; then, stick the thermal pad to the system board. 2. Remove the liner from the adhesive on the back of the ESD absorbent pad, align the ESD absorbent pad with the thermal pad; then, stick the ESD absorbent pad to the thermal pad.
Memory module slot 2	• 10 Bottom cover side • 14 System board side		
M.2 drive slot 1	• 8 Bottom cover side • 13 System board side	Pink side facing outward.	Keep the pink side facing up, peel off the plastic film from the bottom side; then attach the pad to the cover / system board.
M.2 drive slot 2 & 3	• 3 Top cover side • 12 System board side		

Power on and power off the server

Follow the 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 237

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 53.

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 237

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 53.

Configuration guide

Follow instructions in this section to remove and install supporting mounting configurations.

ThinkEdge SE100 node is designed to support the following mounting options:

- **Desktop mount:** The node is oriented horizontally with rubber feet installed at the bottom side. For the locations and replacement of rubber feet, see “Rubber feet replacement” on page 89.
- **Rack mount**: Up to three nodes can be installed to an 1U3N enclosure, and up to two nodes with expansion kit can be installed to an 1U2N enclosure. The enclosure can be installed to the rack. See “Rack mount configuration” on page 54.
- **Wall mount/ceiling mount:** With node sleeve, the node can be mounted on the wall or the ceiling. See “Wall mount/ceiling mount configuration” on page 65.

- **DIN-rail mount:** With node sleeve and DIN rail clips, the node can be mounted on a DIN rail. See “DIN rail configuration” on page 79.

Important: The mounting options of SE100 support different system configuration. For proper operation, see the following table for the supported configurations:

Table 14. Supported configurations of SE100 mounting options

	Desktop mount	Rack mount with 1U2N enclosure	Rack mount with 1U3N enclosure	Wall mount/ ceiling mount	DIN-rail mount
• Expansion kit	√	√		√	√
Electrical input					
• 140W external power adapter*	√			√	√
• 300W external power adapter**		√	√		
System fan* **					
• Node fan module	√			√	√
• Ethernet adapter blower fan	√	√		√	√
• Enclosure fan module		√	√		

* When one or two 140W external power adapter are installed, keep ambient temperature lower than 45°C.

**When one or two 300W external power adapter are installed, keep ambient temperature lower than 35°C.

***Depending on the configuration, the server supports different kinds of system fans. Refer to “System fan numbering” on page 30 for more information.

Rack mount configuration

Follow instructions in this section to remove and install the rack mount configuration.

Remove a node from the rack

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

About this task

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 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.

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

Remove the shipping bracket

Procedure

Step 1. Loosen the four captive screws on both sides of the shipping bracket.

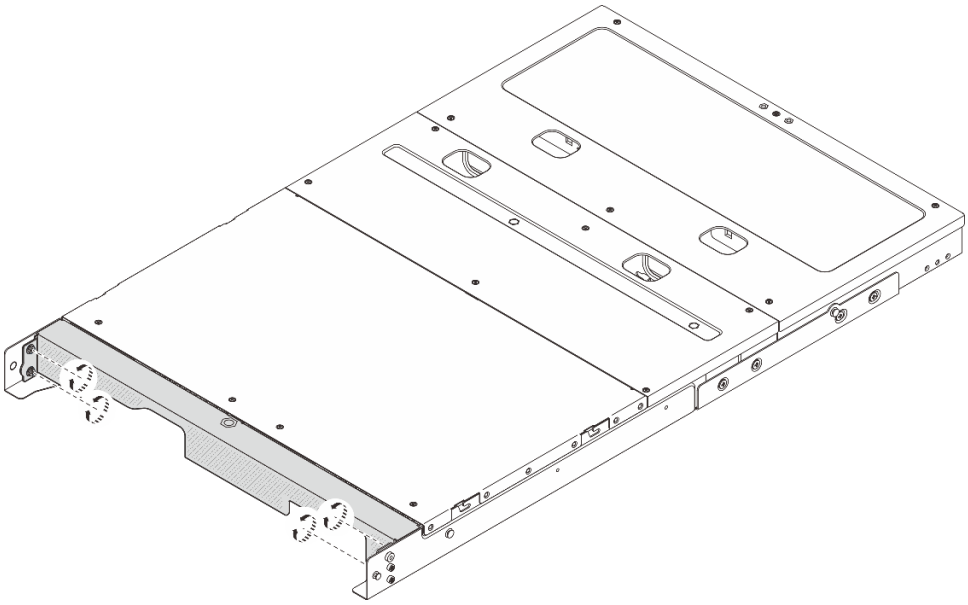


Figure 21. Loosening the screws

Step 2. Pull the shipping bracket to remove it from the enclosure.

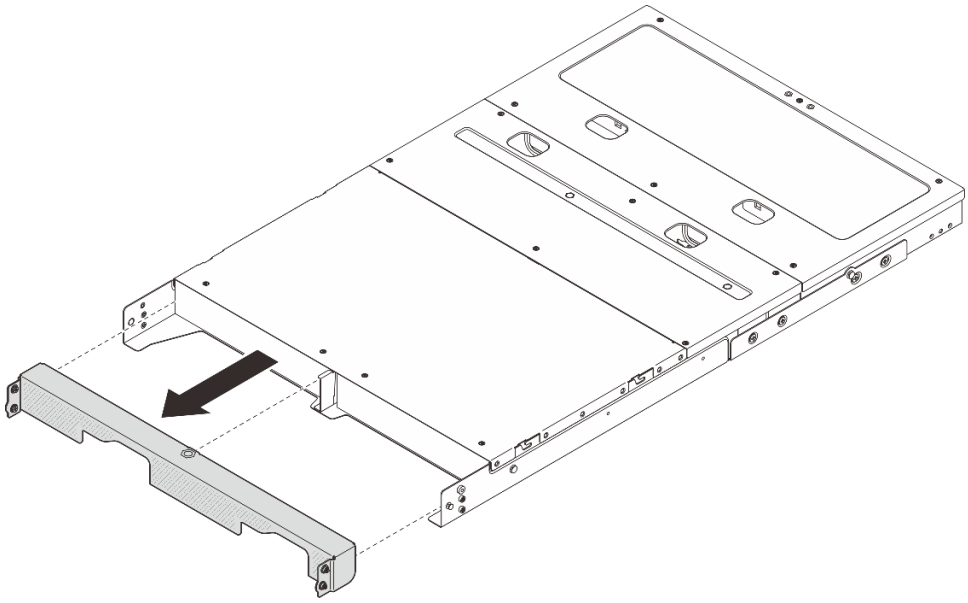


Figure 22. Removing the shipping bracket

Remove the node from the enclosure

Procedure

Step 1. Make preparation for this task.

a. Remove the middle top cover. See ***https://pubs.lenovo.com/se100-enclosure/remove_encl_middle_cover***.

b. Remove the air baffle. See ***https://pubs.lenovo.com/se100-enclosure/remove_air_baffle_encl***.

c. Disconnect all the cables from the node. To remove the power adapter cable, proceed to the step 3 in “Remove a power adapter (Rack mount)” on page 100 section.

Step 2. The fan control board connector on the rear of the node is with a protective dust cap attached. Make sure to cover the connector with the cap after disconnecting the cable.

Step 3. Press the release button on the rear of the node to disengage the node from the enclosure, and pull the node out of the enclosure at the same time.

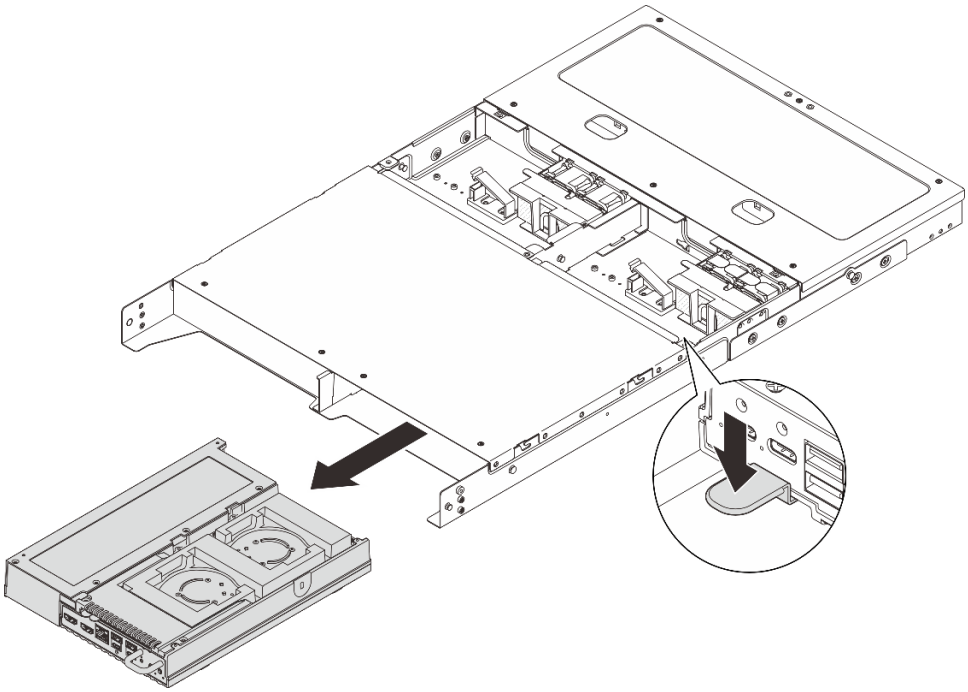


Figure 23. Removing the node

Note: A node bay should be installed with a node or a node filler. To install a node filler, insert the filler into the node bay; then, secure the filler with two screws.

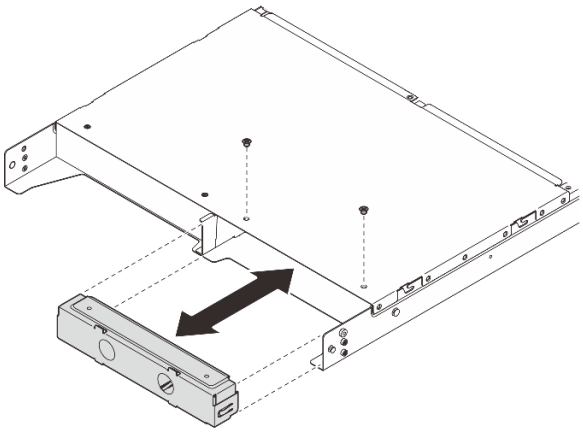


Figure 24. Installing the node filler

Step 4. (Optional) If the node is not to be reinstalled to the enclosure, do the following:

1. Change the machine type for proper operation. See “Change the machine type for operating in an enclosure (trained technician only)” on page 193.
2. Remove a rack mount fan shroud. See “Remove a fan shroud” on page 122.
3. Install the fan modules to the node. See Install a fan module.
4. Install a desktop mount fan shroud. See ***https://pubs.lenovo.com/se100/install_fan_shroud***.

- Change the machine type for proper operation. See “Change the machine type for operating in an enclosure (trained technician only)” on page 193.

- Proceed to the following replacement sections for proper cooling and airflow.
  - Remove a rack mount fan shroud. See “Remove a fan shroud” on page 122.
  - Install the fan modules to the node. See Install a fan module.
  - Install a desktop mount fan shroud. See “Remove a fan shroud” on page 122.

Remove the enclosure from the rack

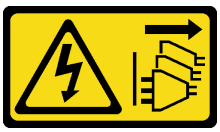
To remove the node from a rack, follow the instructions that are provided in the Rail Installation Kit for the rails on which the server will be installed. See ThinkSystem Toolless Stab-in Slide Rail Kit V3 with 1U CMA.

Install a node to the rack

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

About this task

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 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.

Note: To install a node to an enclosure which is already on the rack, start from “Install the node to the enclosure” on page 61.

Install the enclosure to the rack

Procedure

Step 1. Remove the inner rails from the intermediate rails.

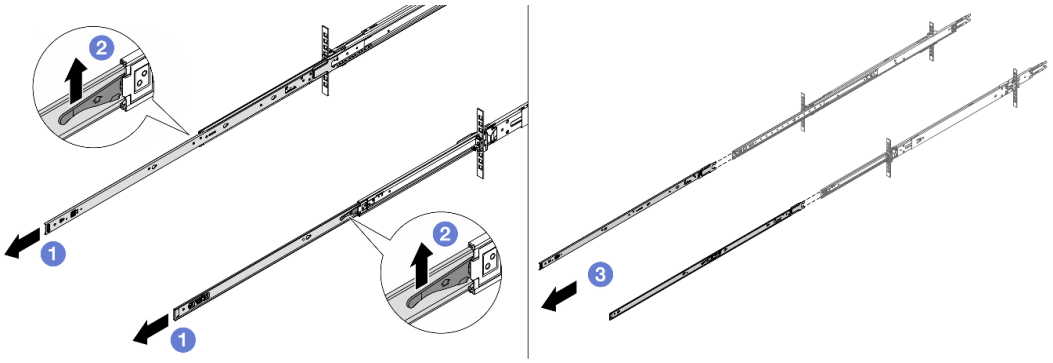


Figure 25. Removing the inner rails

a. 1 Extend the inner rails.
b. 2 Push up the latches to disengage inner rails from the intermediate ones.
c. 3 Remove the inner rails.

Step 2. Align the slots on the inner rail with the corresponding T-pins on the side of the enclosure; then, slide the inner rail forwards until the T-pins lock into place.

Notes:

1. Make sure that the stamp “Front” always face toward the front when assembling the inner rails to the enclosure.
2. “L” and “R” stamps indicate the left and right sides of the rails.

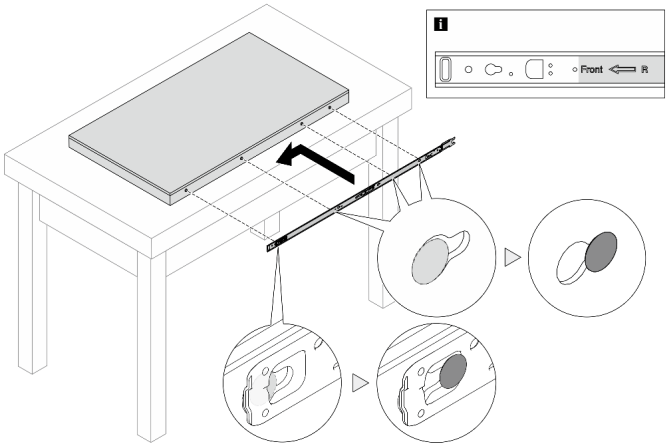


Figure 26. Installing an inner rail to the server

Step 3. Repeat the previous step to the other rail.

Step 4. Carefully lift up the enclosure with three people.

CAUTION:
Make sure three people are lifting the enclosure by holding the lift points.

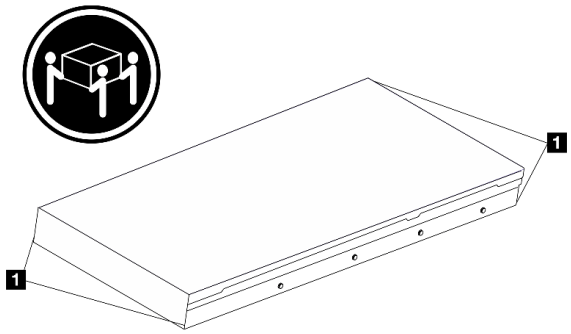


Figure 27. Lifting up the server

Step 5. Install the enclosure to the rack. Align both rear ends of the inner rails with the openings in the intermediate rails, and make sure that the two pairs of rails mate correctly.

Note: Before installing the inner rails to the intermediate ones, make sure that the ball retainers on both sides reach the outmost position. If the retainers are not in good position, slide them to the front until they stop.

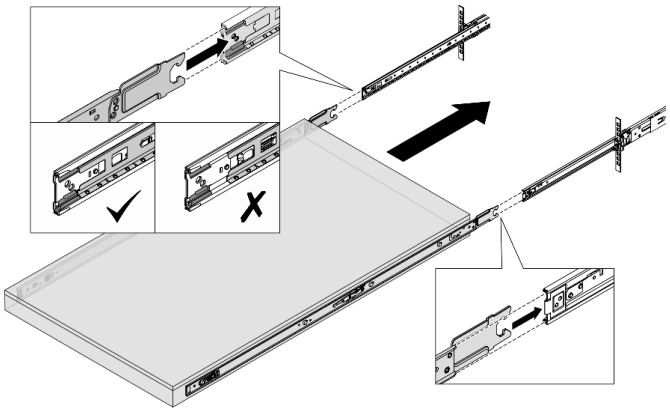


Figure 28. Installing the server

Step 6. Lift the lock latches to proceed to slide the enclosure in.

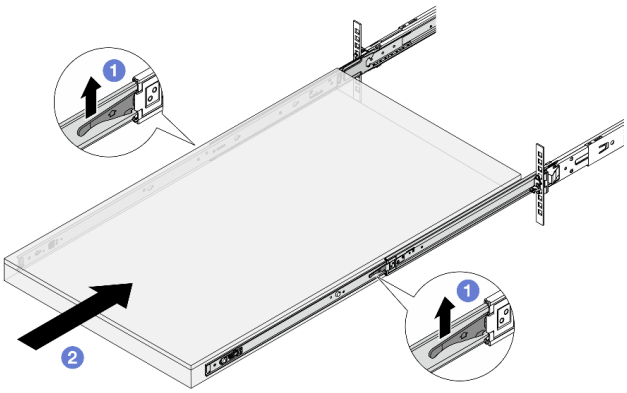


Figure 29. Locking latches

a. (1) Lift the lock latches on both sides.

b. (2) Push the server all the way into the rack until both latches lock into position with a click.

Step 7. Secure the enclosure to the rack.

a. Secure the enclosure to the front of the rack. Fasten the two screws located on the rack latches.

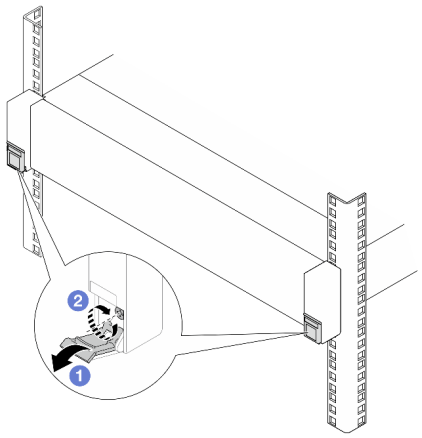


Figure 30. Securing the enclosure to the front of the rack

(1) Flip down the covers on the rack latches.

(2) Tighten the screws to secure the enclosure.

b. (Optional) If the rack is shipped with enclosures or placed in a vibration-prone area, install one M6 screw to each of the rails to secure the enclosure to the rear of the rack.

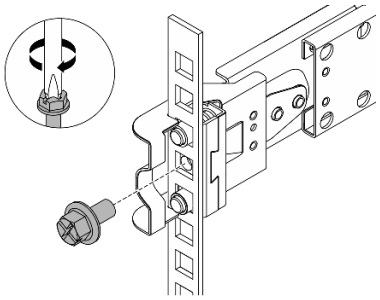


Figure 31. Securing the enclosure to the rear of the rack

Install the node to the enclosure

Procedure

Step 1. Make preparation for this task.

a. Make sure the power adapters are properly installed in the enclosure. To install the power adapters, see Install a power adapter (Rack mount).

b. If the node was not installed in enclosure previously, before installing the node to the enclosure, complete the following steps:

1. Remove the desktop mount fan shroud from the node. See ***https://pubs.lenovo.com/se100/remove_fan_shroud***.
2. Remove the fan modules from the node. See ***https://pubs.lenovo.com/se100/remove_fan***. Otherwise, it might be interfered with the top of the enclosure.

3. Install the rack mount fan shroud to the node. See “Install the fan shroud” on page 126.
4. Change the machine type for proper operation. See “Change the machine type for operating in an enclosure (trained technician only)” on page 193.

Step 2. If a node filler is installed in the node bay, remove it first.

a. Loosen the two screws that secure the node filler.

b. Remove the node filler from the node bay. Keep the node filler in a safe place for future use.

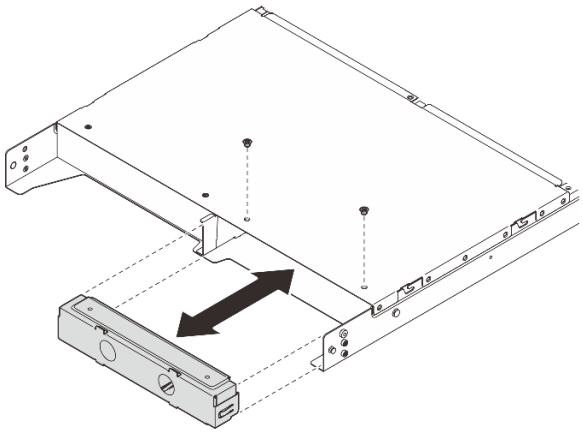


Figure 32. Removing the node filler

Step 3. Slide the node into the node bay until it clicks into place.

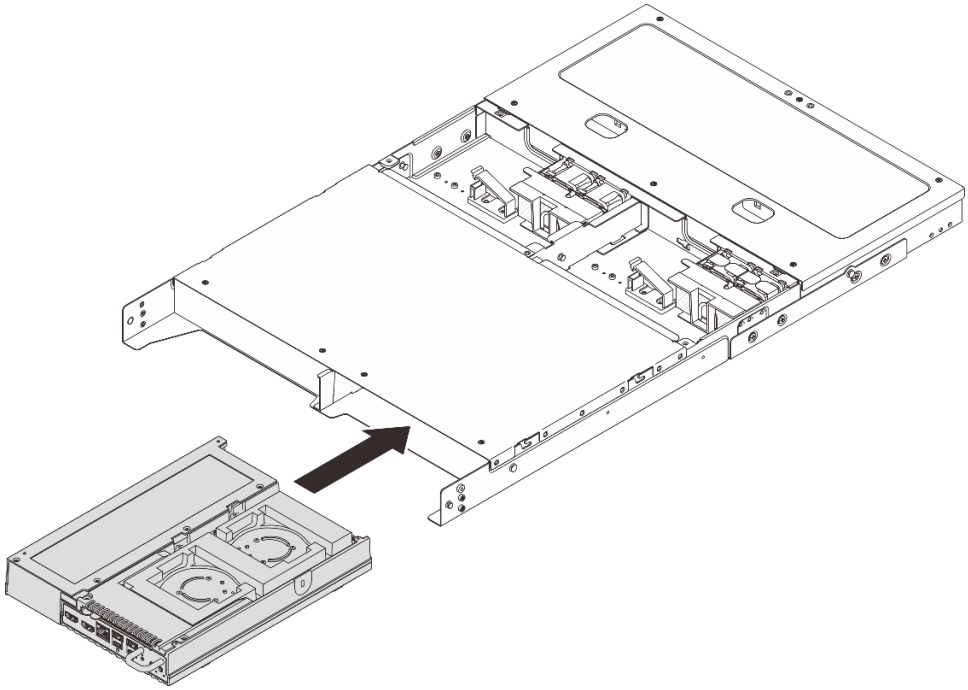


Figure 33. Installing the node

Step 4. (Optional) If the enclosure is with only one node installed, install a node filler into the vacant node bay.

a. Insert the node filler into the node bay.

b. Secure the node filler with two screws.

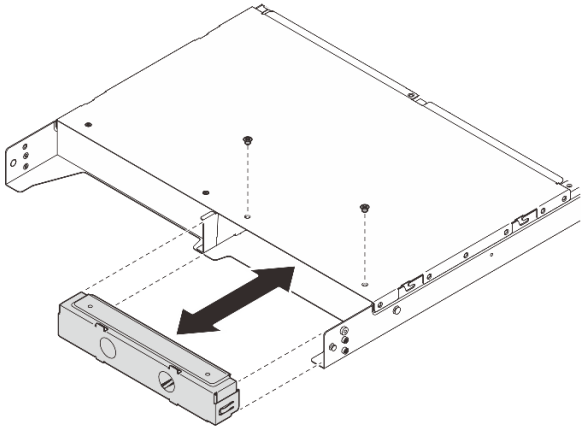


Figure 34. Installing the node filler

Step 5. Connect all the cables to the node. To connect the power cable from power adapter, complete the following steps:

a. ❶ Align the screw holes and install the power cable to the node.

b. ❷ Tighten the screw and make sure the power cable is securely locked.

Note: To connect the power adapter to the node, 1U2N enclosure needs 2 USB-C output power cables for one power adapter, and 1U3N enclosure needs 3 USB-C output power cables for one power adapter. Plug in the additional power cable to the power adapter installed in an 1U3N enclosure. For more details about cable routing, see ***https://pubs.lenovo.com/se100-enclosure/se100_enclosure_internal_cable_routing_guide.pdf***.

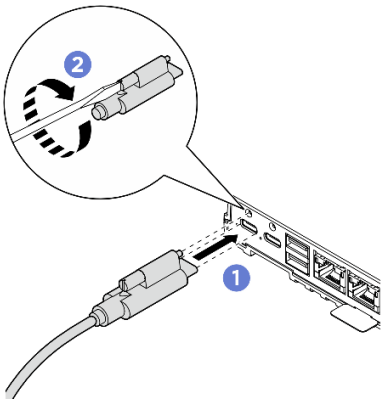


Figure 35. Installing the power cable

After you finish

1. Install the air baffle. See ***https://pubs.lenovo.com/se100-enclosure/install_air_baffle_encl***.
2. Install the middle top cover. See ***https://pubs.lenovo.com/se100-enclosure/install_encl_middle_cover***.
3. If applicable, install the crossbar to the enclosure.
   a. ❶ Align the crossbar with the screw holes on the enclosure; then lower the crossbar onto the enclosure. Make sure all the cables are routed properly under the crossbar.

b. ❷ Tighten the two captive screws to secure the crossbar.

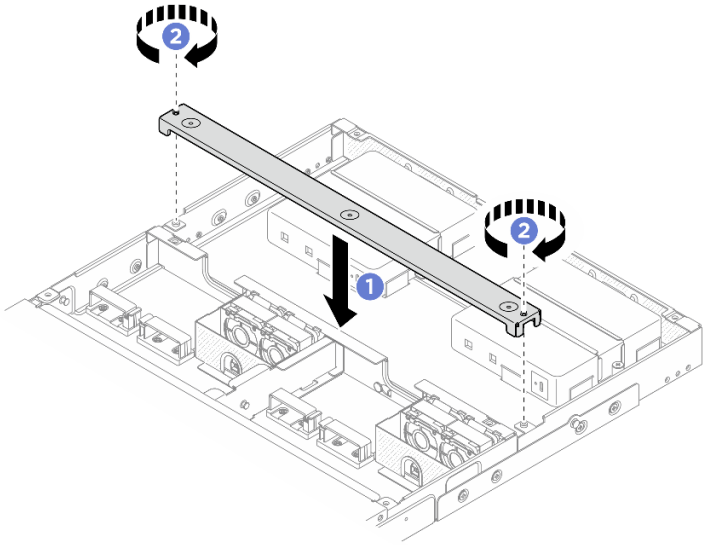


Figure 36. Installing the crossbar

4. If applicable, install the rear top cover. See ***https://pubs.lenovo.com/se100-enclosure/install_encl_rear_cover***..
5. Complete the parts replacement. See "Complete the parts replacement" on page 219.

Install the shipping bracket to the enclosure

Attention: When the shipping bracket is installed, the connectors on the front of the server are not accessible. Make sure to complete the following procedure before installing the shipping bracket:

1. Connect all necessary external cables to the node.
2. Power on the server and any peripheral devices. See "Power on the server" on page 53.

Procedure

Step 1. Press the captive screws on the side of the shipping bracket as illustrated; then, push the shipping bracket toward the enclosure until it is firmly seated.

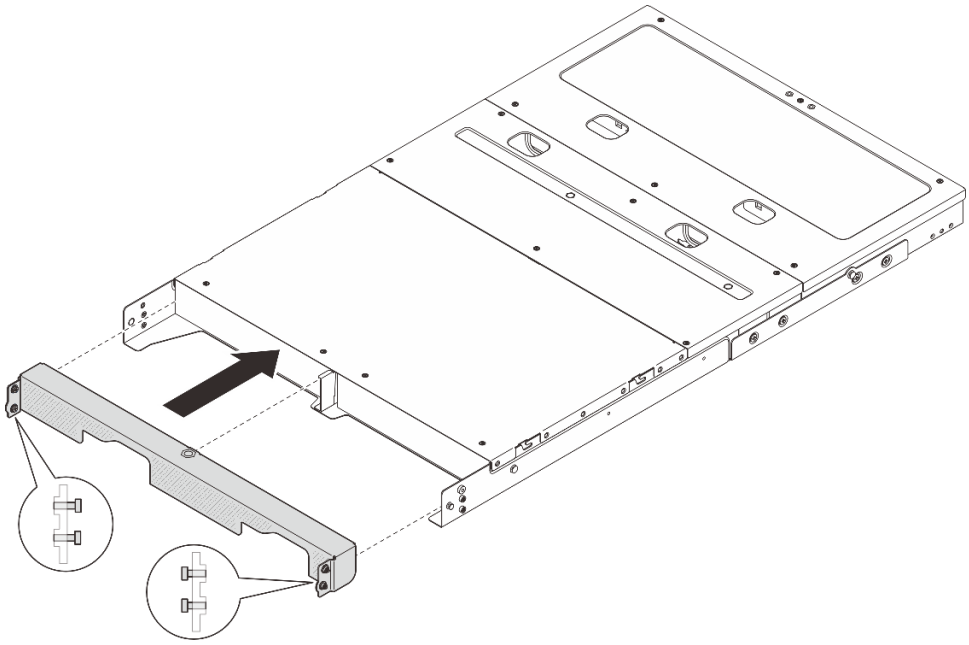


Figure 37. Installing the shipping bracket

Step 2. Secure the four captive screws on both sides of the shipping bracket.

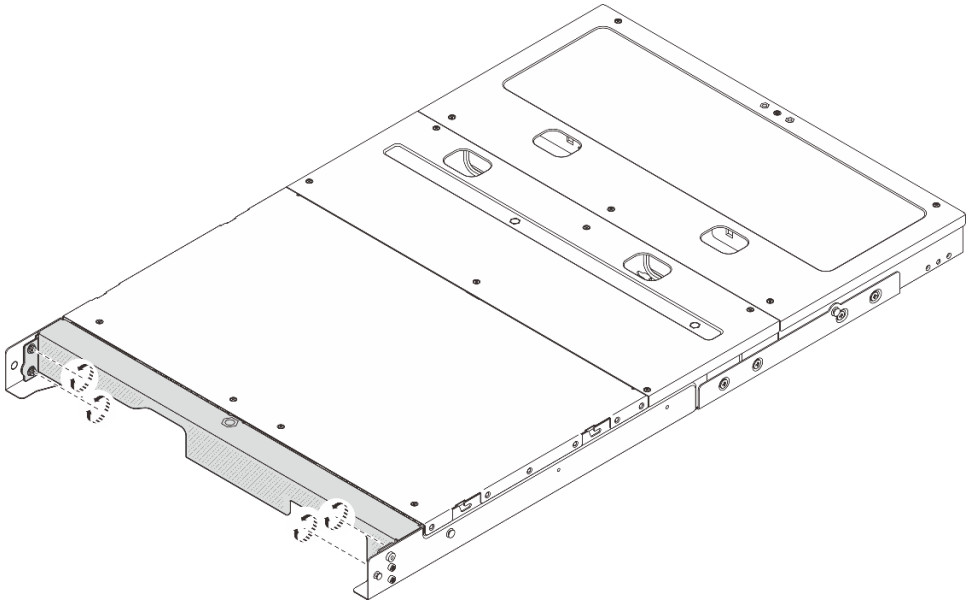


Figure 38. Fastening the screws

Wall mount/ceiling mount configuration

Follow instructions in this section to remove and install the wall mount/ceiling mount configuration.

Remove a node from the wall or the ceiling

Follow instructions in this section to remove a node from the wall or the ceiling.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Reserve 500 mm of clearance in front of the node for installation/removal procedure.

Important: This task must be operated by trained technicians.

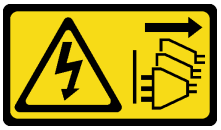
Note: Depending on the model, your server might look slightly different from the illustration.

Remove a node from the node sleeve

Procedure

Step 1. Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.

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.

Step 2. Remove the node from the node sleeve.

a. ❶ Loosen the four thumbscrews on the side of the node sleeve.

b. ❷ Slide the node out of the node sleeve.

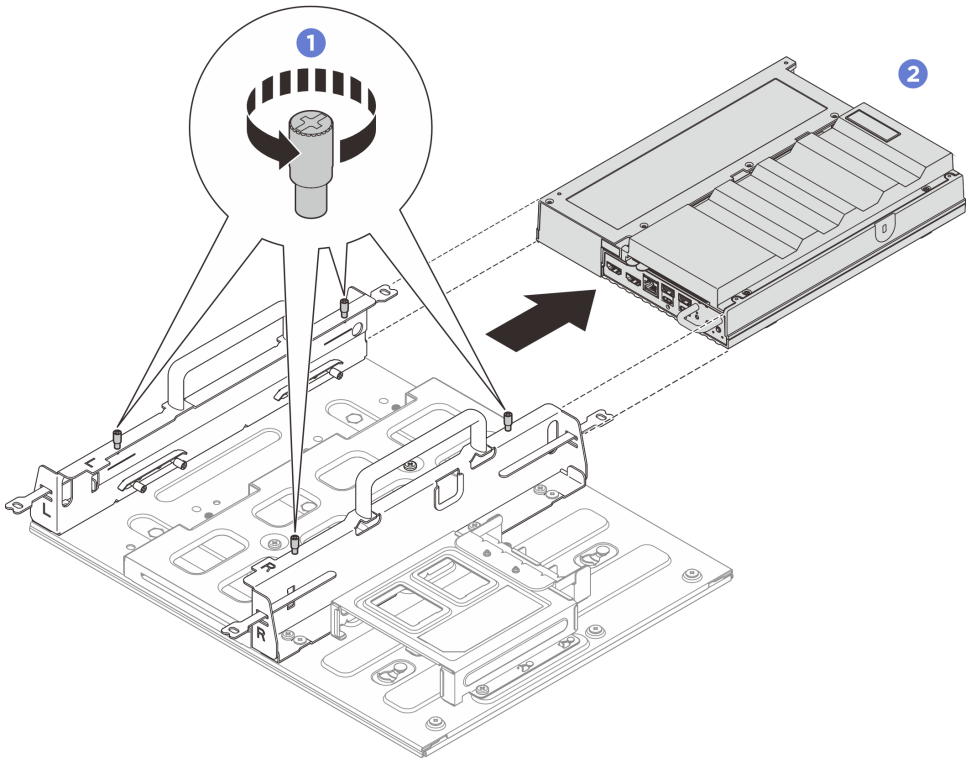


Figure 39. Removal of node from a node sleeve

Remove the node sleeve assembly from the wall

Procedure

Step 1. Make preparation for this task.

a. Remove the node from the node sleeve. See “Remove a node from the node sleeve” on page 66.

b. Remove the power adapter from the power adapter cage. See the step 1 and step 2 in “Remove a power adapter (wall/ceiling/DIN rail mount)” on page 95.

Step 2. Remove the node sleeve from the mount plate.

a. Remove the eleven screws that secure the node sleeve.

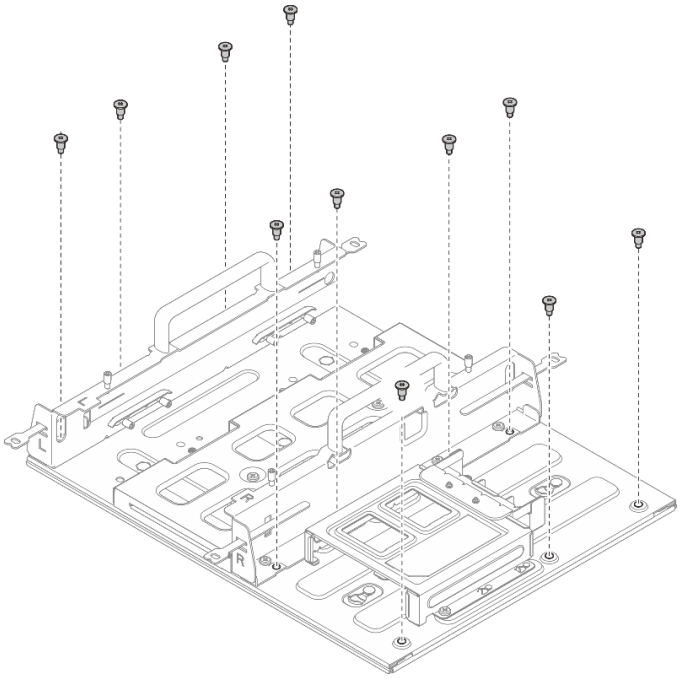


Figure 40. Removing the node sleeve with expansion kit

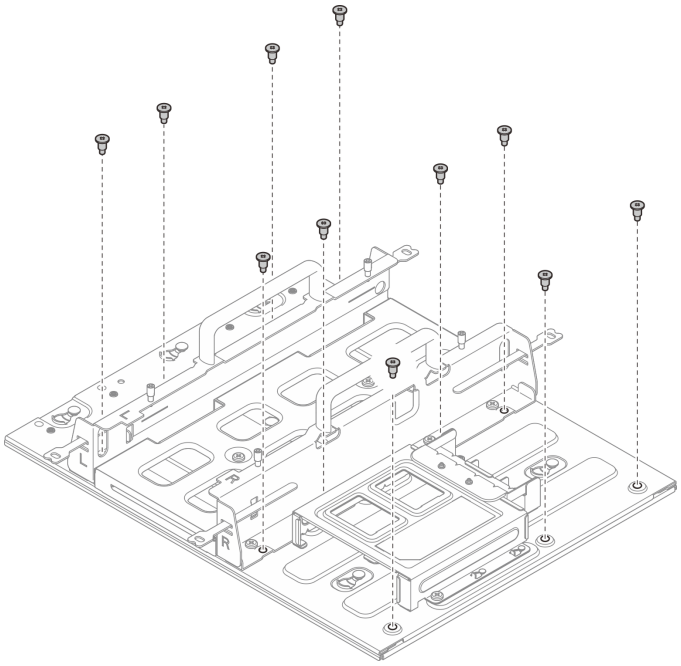


Figure 41. Removing the node sleeve without expansion kit

b. Slide the node sleeve until the guide pins on the wall-mount plate are seated in the large opening of the keyhole; then, remove the node sleeve from the mount plate.

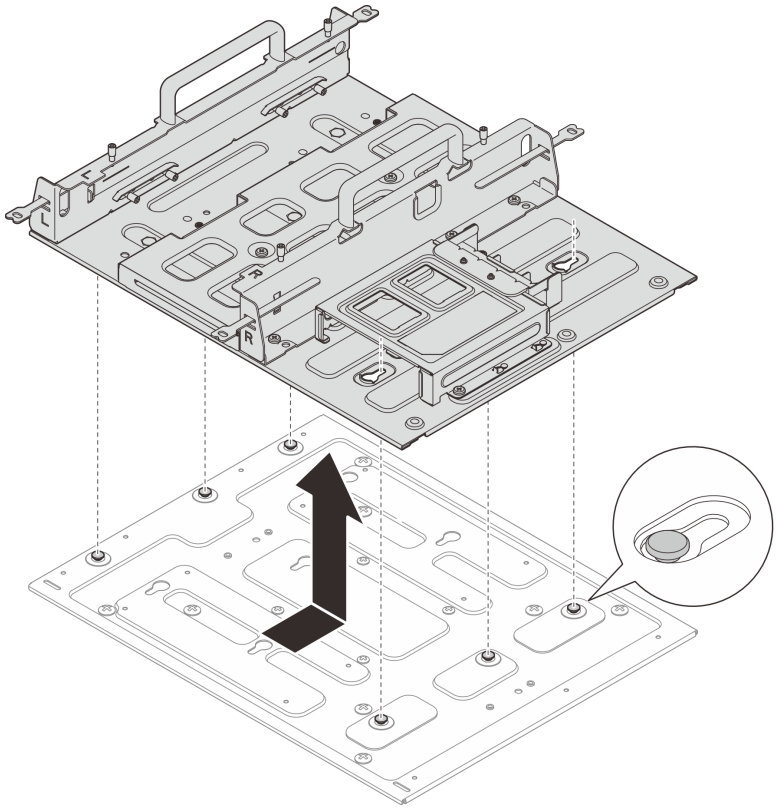


Figure 42. Removing the node sleeve

Step 3. Loosen the four M4 screws and eight M6 screws that secure the mount plate; then, remove the mount plate from the wall.

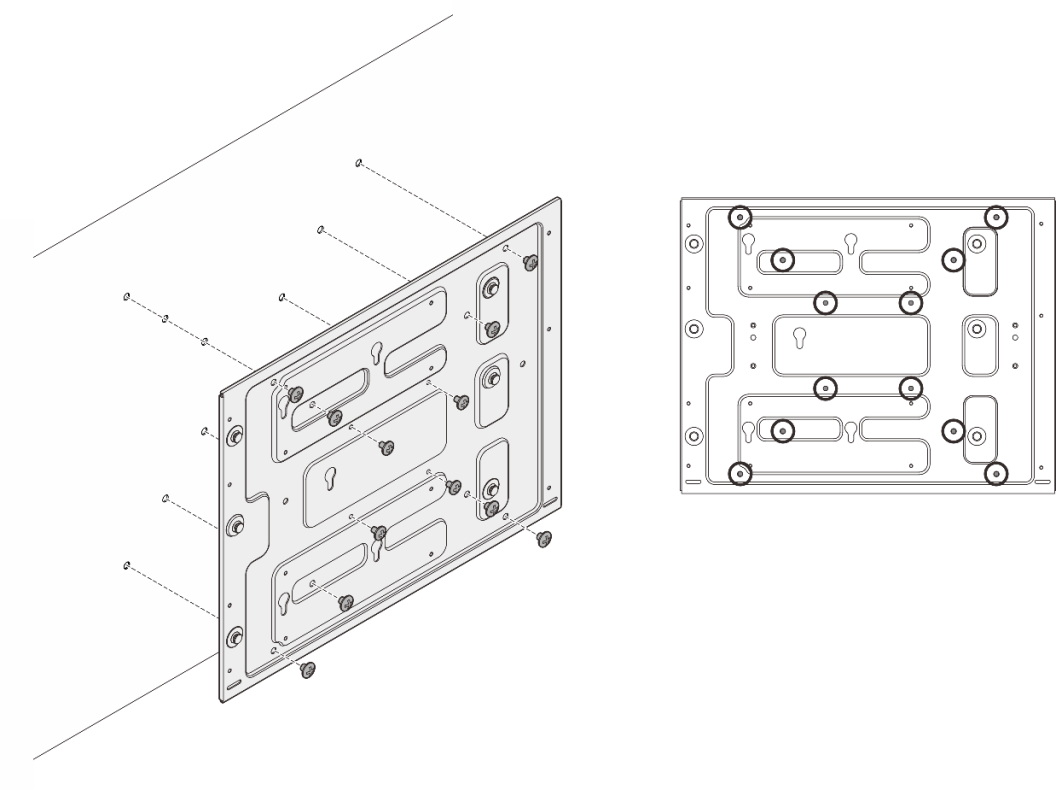


Figure 43. Removing the mount plate

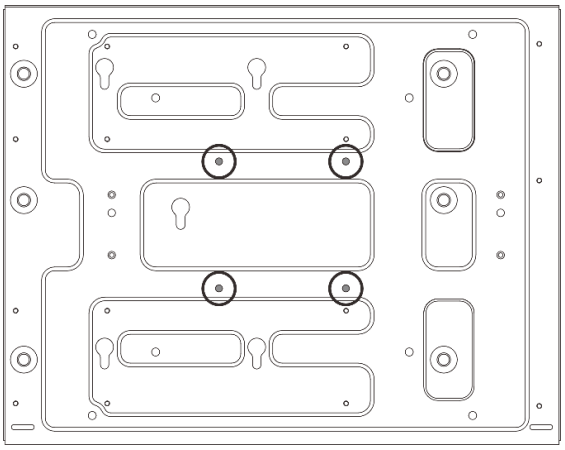


Figure 44. Locations of M4 screws

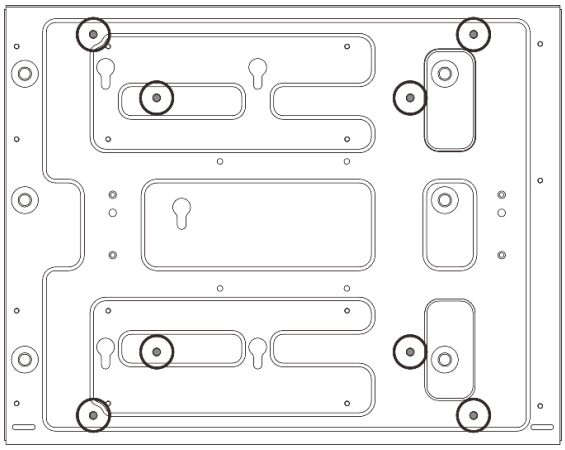


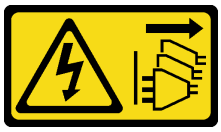
Figure 45. Locations of M6 screws

Install a node to the wall or the ceiling

Follow instructions in this section to install a node to the wall or the ceiling.

About this task

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 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 53.
- Reserve 500 mm of clearance in front of the node for installation/removal procedure.
- For safe installation, the wall to mount the node must be able to support 5 times of the weight. If not, the surface must be reinforced to meet this standard.

	Maximal weight	5 times of maximal weight
SE100 node with node sleeve	**7.3 KG (16 lbs)**	**36.5 KG (80 lbs)**
SE100 node and expansion kit with node sleeve	**7.9 KG (17.4 lbs)**	**39.5 KG (87 lbs)**

- Avoid existing in-wall utilities, for example, plumbing, natural gas, or electrical input.

Important: This task must be operated by trained technicians.

Notes:

- If the node sleeve is already installed on the wall, start from "Install the node into the node sleeve" on page 78
- Depending on the model, your server might look slightly different from the illustration.

Install the node sleeve assembly to the wall

Procedure

Step 1. The wall mount configuration requires four M4 screws and eight M6 screws. Prepare screws and related parts for this task.

Note: The appropriate length of the screw base should be assessed by qualified professionals.

Table 15. Max screw size for the inner four M4 screws

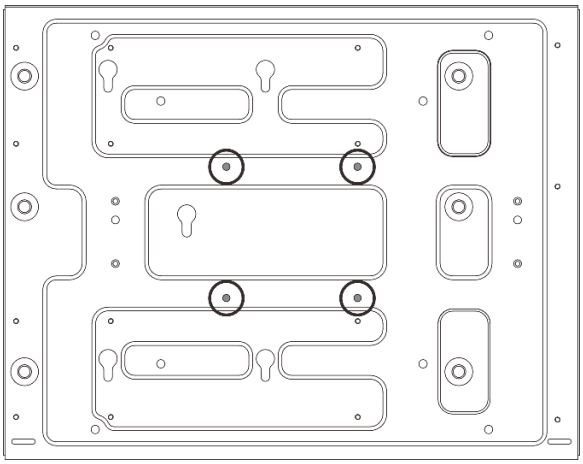
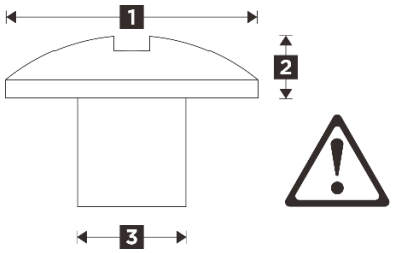
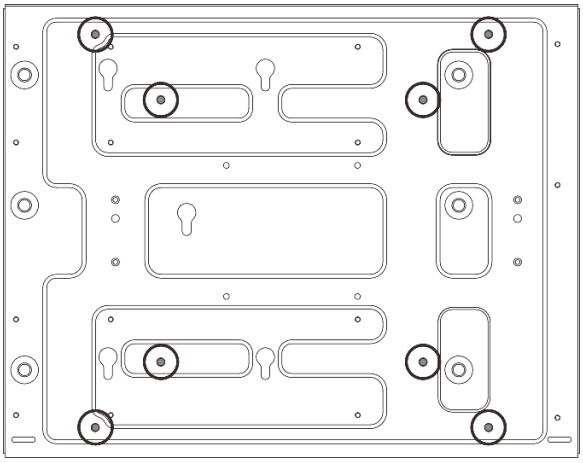
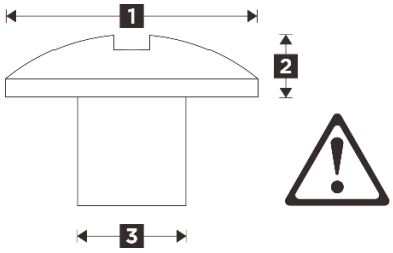
			
	1 8.5-10.5 mm (0.334-0.413 inch)	2 3-3.4 mm (0.118-0.133 inch)	3 M4 (#7-19T)

Table 16. Max screw size for the outer eight M6 screws

			
	1 12.5-14.5 mm (0.492-0.570 inch)	2 3-3.4 mm (0.118-0.133 inch)	3 M6 (#14-14T)

Step 2. Remove the node sleeve from the mount plate.

a. Remove the eleven screws that secure the node sleeve.

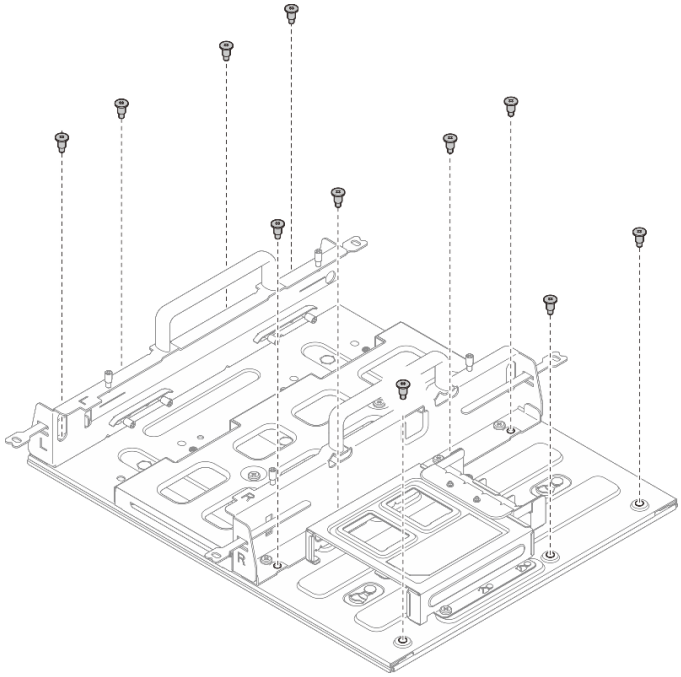


Figure 46. Removing the node sleeve with expansion kit

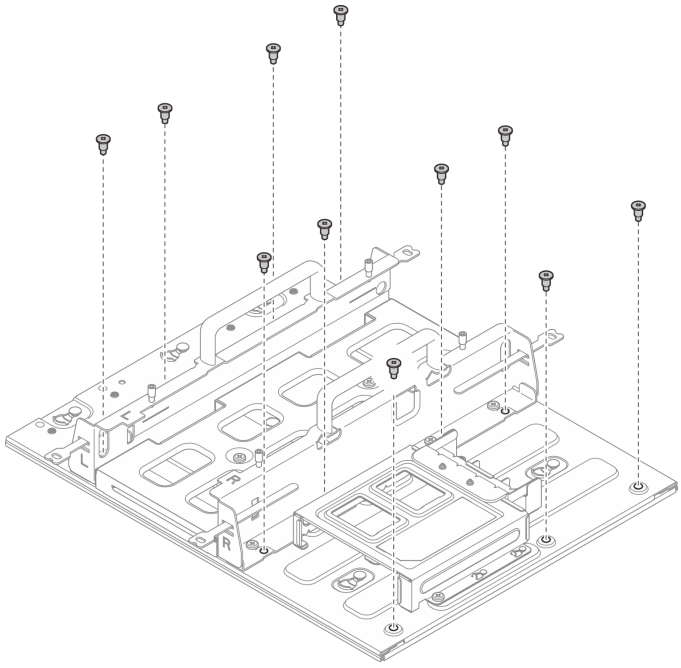


Figure 47. Removing the node sleeve without expansion kit

b. Slide the node sleeve until the guide pins on the wall-mount plate are seated in the large opening of the keyhole; then, remove the node sleeve from the mount plate.

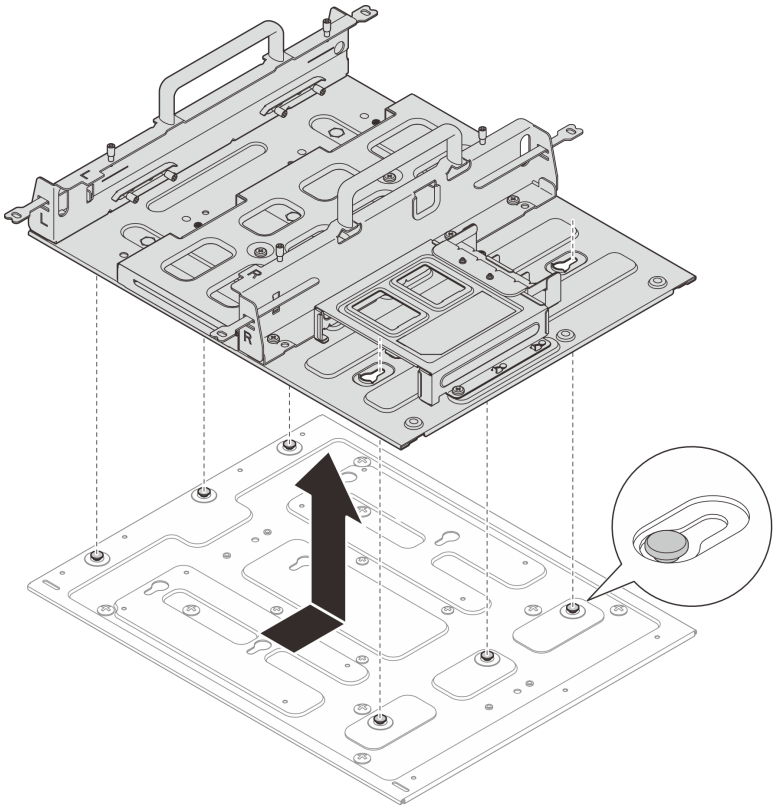


Figure 48. Removing the node sleeve

Step 3. (Optional) To mount the mount plate on a flat wall with no screw holes, drill twelve screw holes on the wall if necessary.

a. Press the mount plate against the mounting location.

b. Mark the locations of screw holes with a pencil.

c. Drill twelve screw holes as marked.

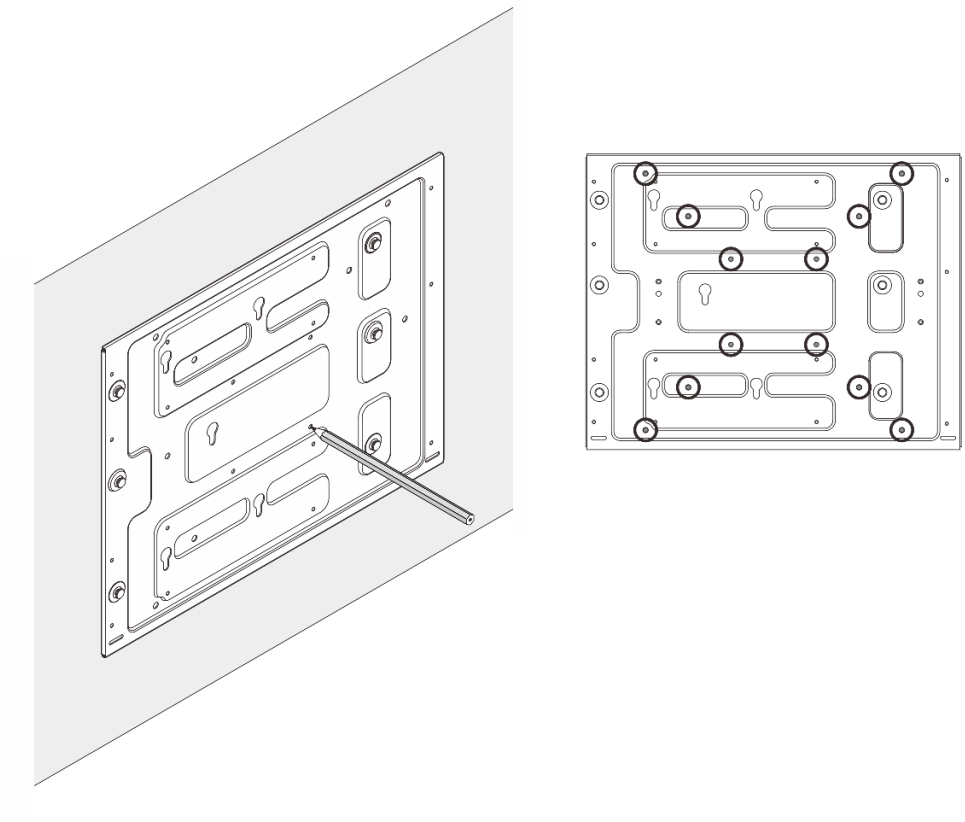


Figure 49. Locations of screw holes

Step 4. Secure the mount plate to the wall with four M4 screws and eight M6 screws.

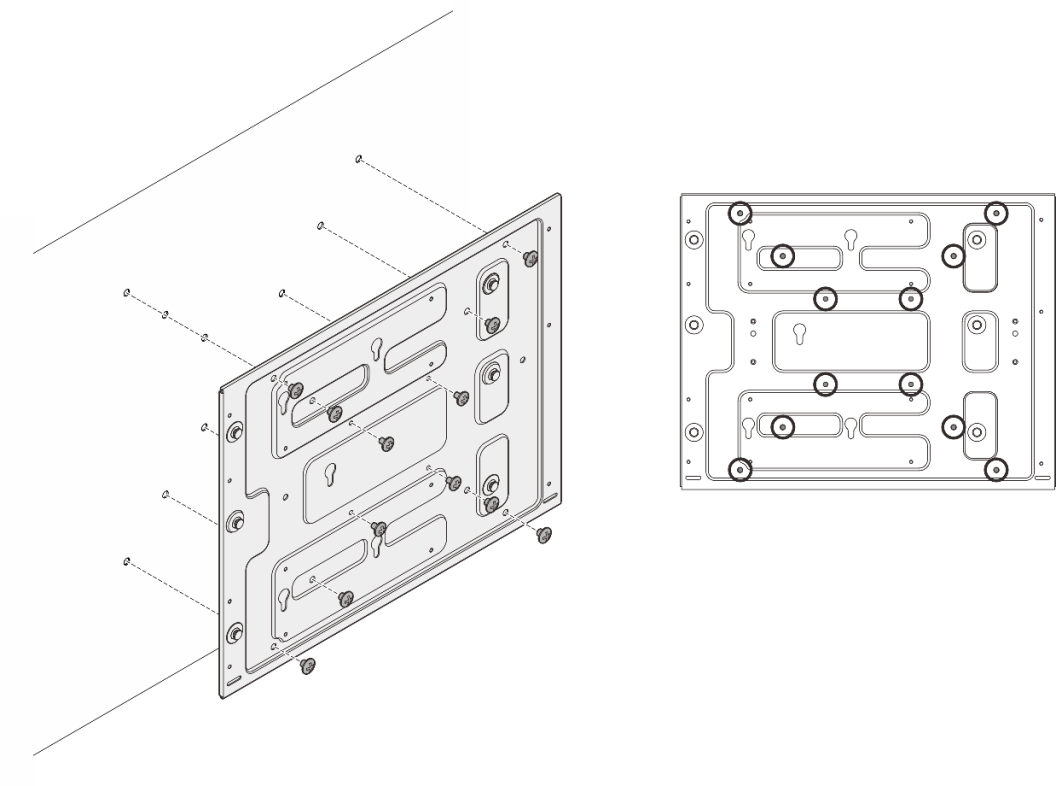


Figure 50. Installing the mount plate

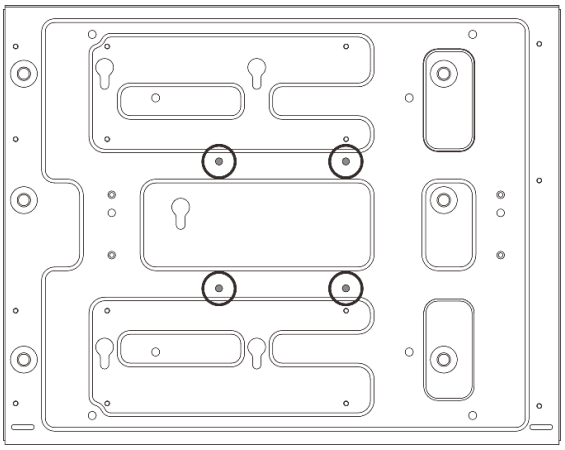


Figure 51. Locations of M4 screws

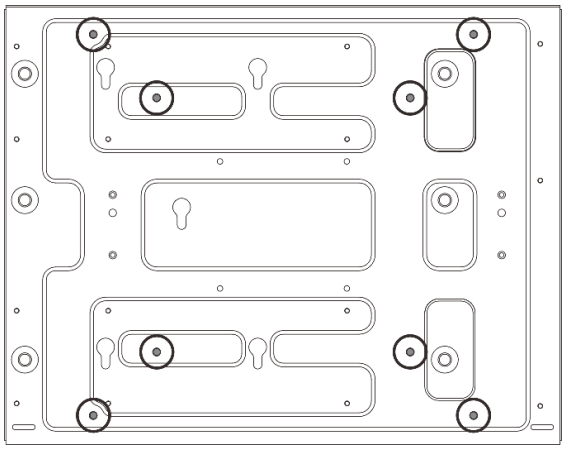


Figure 52. Locations of M6 screws

Step 5. Install the node sleeve to the mount plate.

a. Align the node sleeve with the guide pins on the wall-mount plate.

b. Push the node sleeve onto the mount plate; then, slide the node sleeve until the guide pins are seated in the small opening of keyholes.

Note: There are “L” and “R” logos marked on the front of node sleeve holder which represents the left hand and right hand of the user (viewed from the front of the node). Make sure to install the node sleeve with correct orientation shown in the illustration.

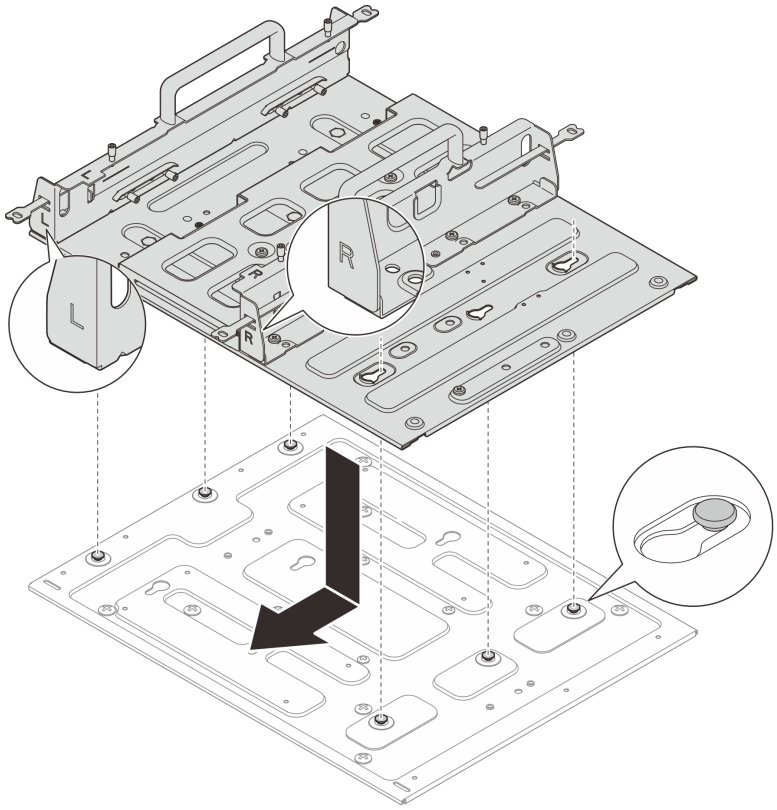


Figure 53. Installing the node sleeve

c. Secure the node sleeve with eleven screws.

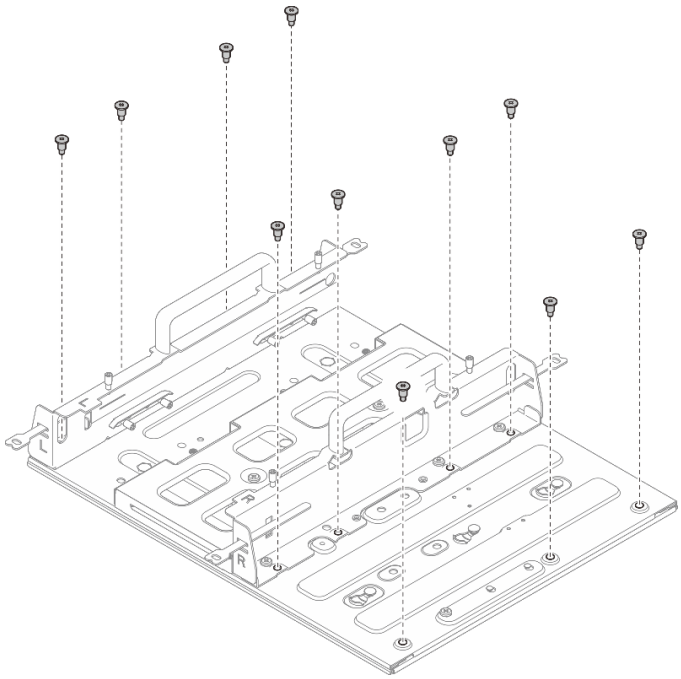


Figure 54. Installing the node sleeve with expansion kit

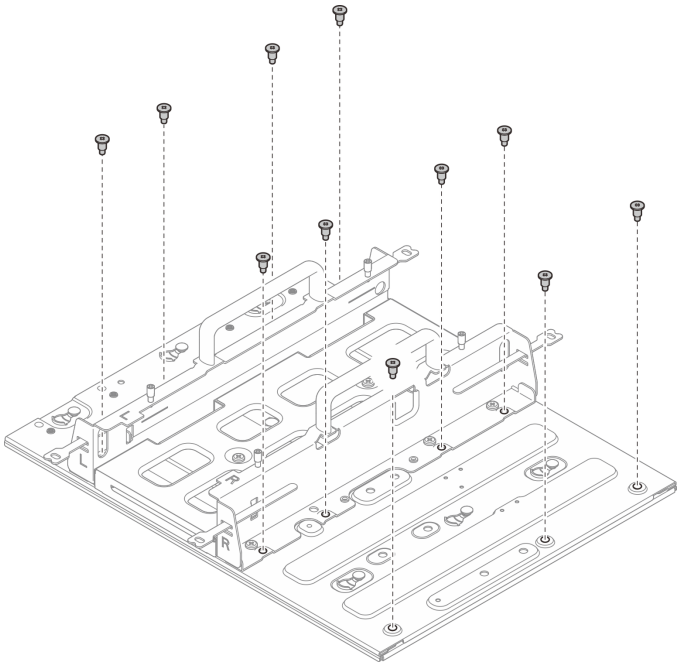


Figure 55. Installing the node sleeve without expansion kit

Install the node into the node sleeve

Procedure

Step 1. Install the node into the node sleeve.

a. ❶ Align the node with the node sleeve; then, insert and slide the node into the node sleeve until it stops.

b. ❷ Tighten the four thumbscrews on the side of the node sleeve.

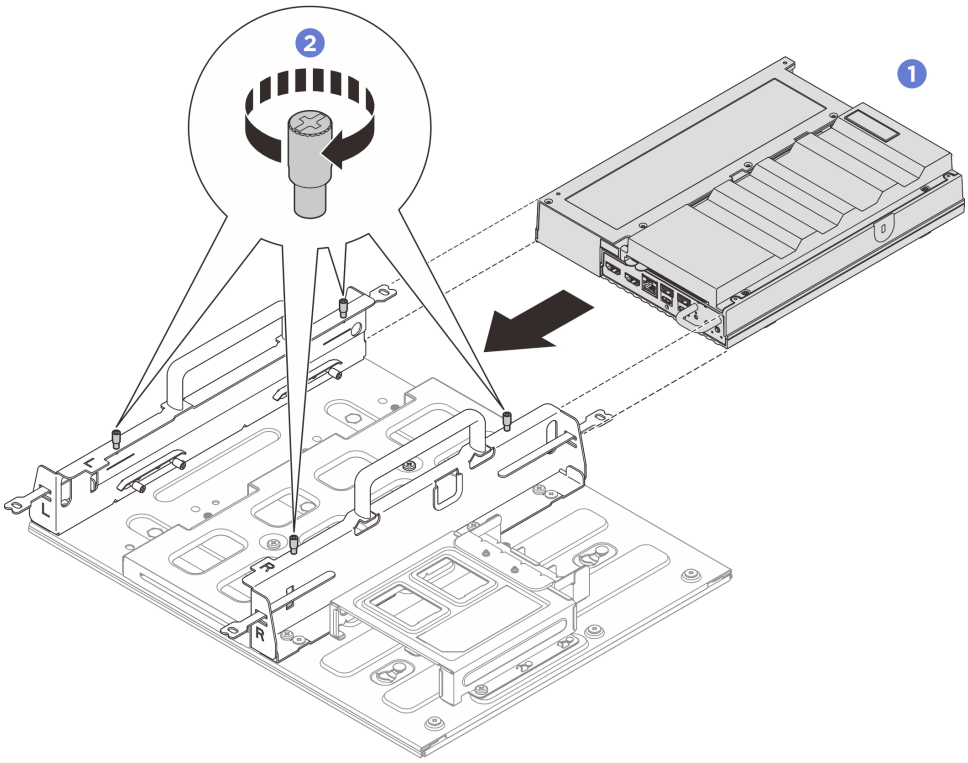


Figure 56. Installing a node into a node sleeve

After you finish

- Install the power adapter and power adapter cage. See "Install a power adapter (wall/ceiling/DIN rail mount)" on page 97.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

DIN rail configuration

Follow instructions in this section to remove and install the DIN rail configuration.

Remove a node from the DIN rail

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

About this task

Attention:

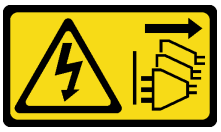
- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- Reserve 500 mm of clearance in front of the node for installation/removal procedure.

Remove a node from the node sleeve

Procedure

Step 1. Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 53.

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.

Step 2. Remove the node from the node sleeve.

a. ❶ Loosen the four thumbscrews on the side of the node sleeve.

b. ❷ Slide the node out of the node sleeve.

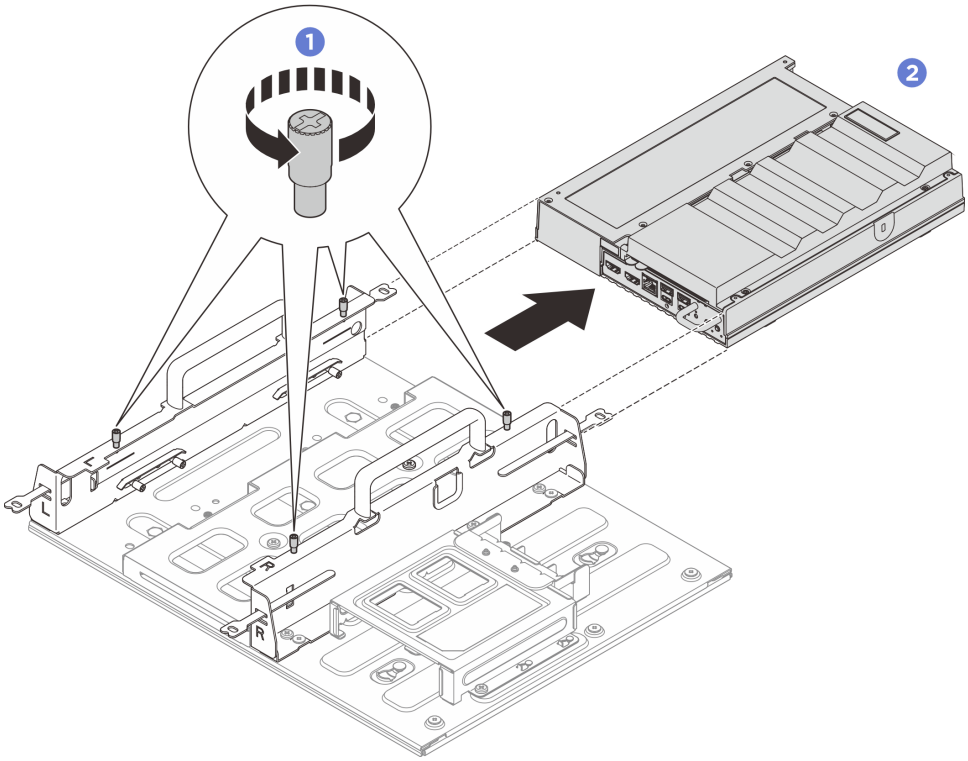


Figure 57. Removal of node from a node sleeve

Remove the node sleeve assembly from the DIN rail

Procedure

Step 1. Make preparation for this task.

a. Remove the node from the node sleeve. See “Remove a node from the node sleeve” on page 66.

b. Remove the power adapter from the power adapter cage. See the step 1 and step 2 in “Remove a power adapter (wall/ceiling/DIN rail mount)” on page 95.

Step 2. Remove the node sleeve from the mount plate.

a. Remove the eleven screws that secure the node sleeve.

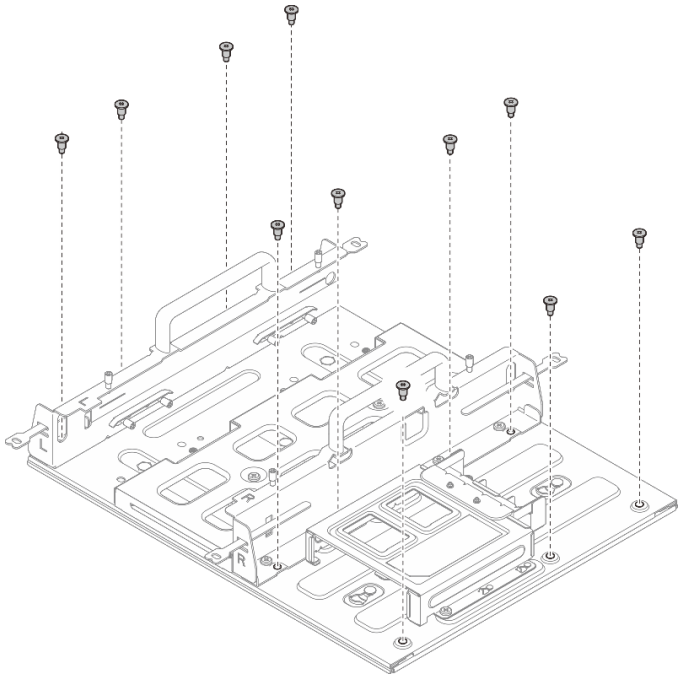


Figure 58. Removing the node sleeve with expansion kit

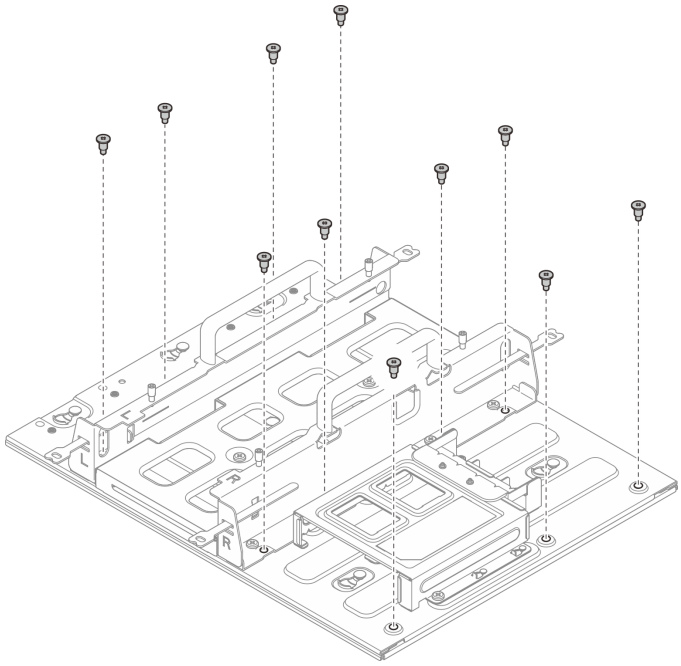


Figure 59. Removing the node sleeve without expansion kit

b. Slide the node sleeve until the guide pins on the DIN rail-mount plate are seated in the large opening of the keyhole; then, remove the node sleeve from the mount plate.

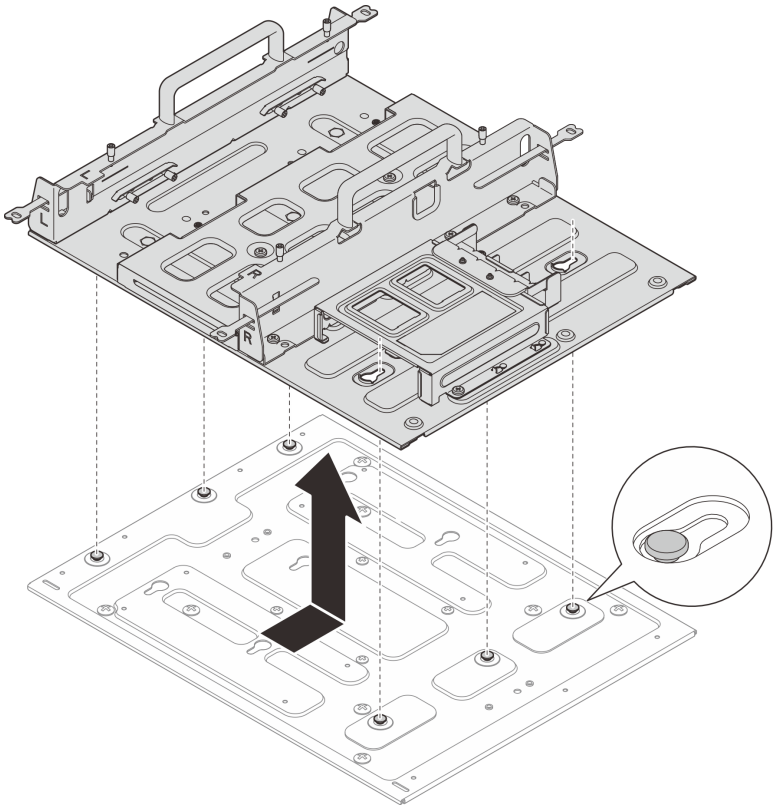


Figure 60. Removing the node sleeve

Step 3. Remove the mount plate from the DIN rail.

a. ❶ Loosen the two M3.5 screws on the front of the mount plate.

b. ❷ Lift the mount plate slightly upward until the top side of DIN rail clips disengage from the rail.

c. ❸ Pivot the mount plate outward to remove it from the rail.

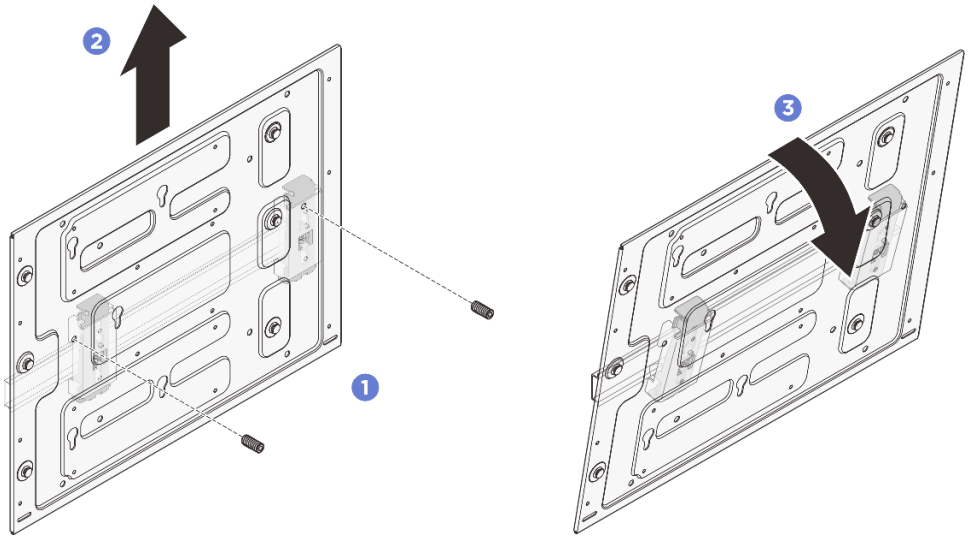


Figure 61. Removing the mount plate

Step 4. Loosen the four screws that secure the two DIN rail clips; then, remove the clips from the mount plate.

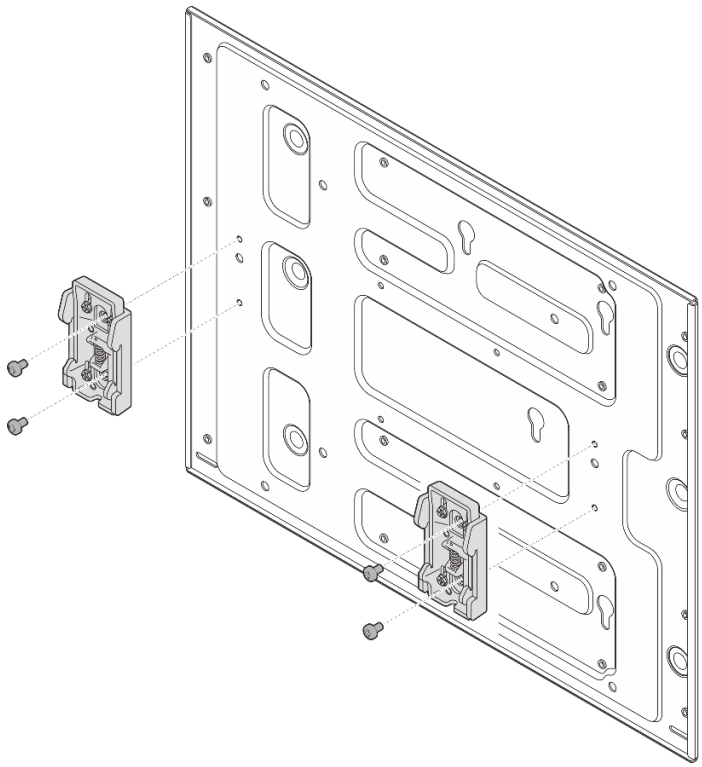


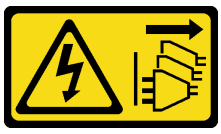
Figure 62. Removing the DIN rail clips

Install a node to the DIN rail

Follow instructions in this section to install a node to the DIN rail.

About this task

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 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- Reserve 500 mm of clearance in front of the node for installation/removal procedure.

Note: If the node sleeve is already installed on the DIN rail, start from “Install the node into node sleeve” on page 88.

Install the node sleeve assembly to the DIN-rail

Procedure

Step 1. Remove the node sleeve from the mount plate.

a. Remove the eleven screws that secure the node sleeve.

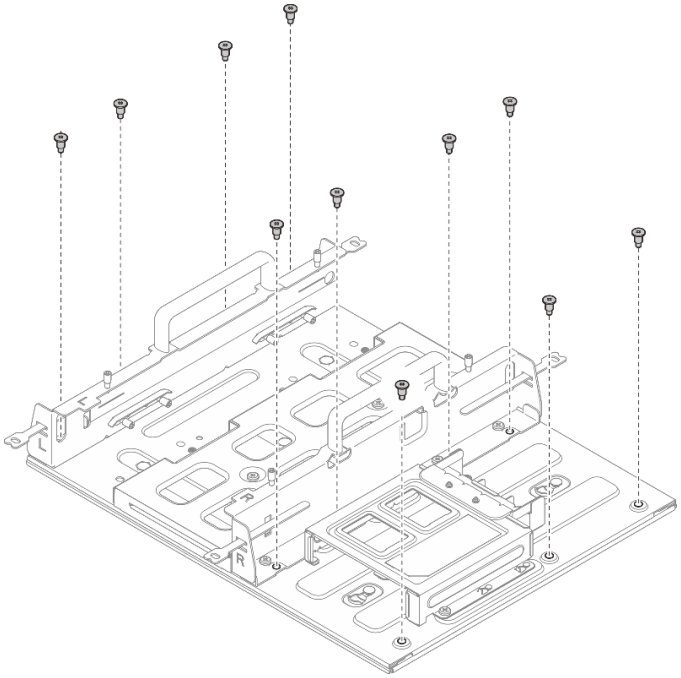


Figure 63. Removing the node sleeve with expansion kit

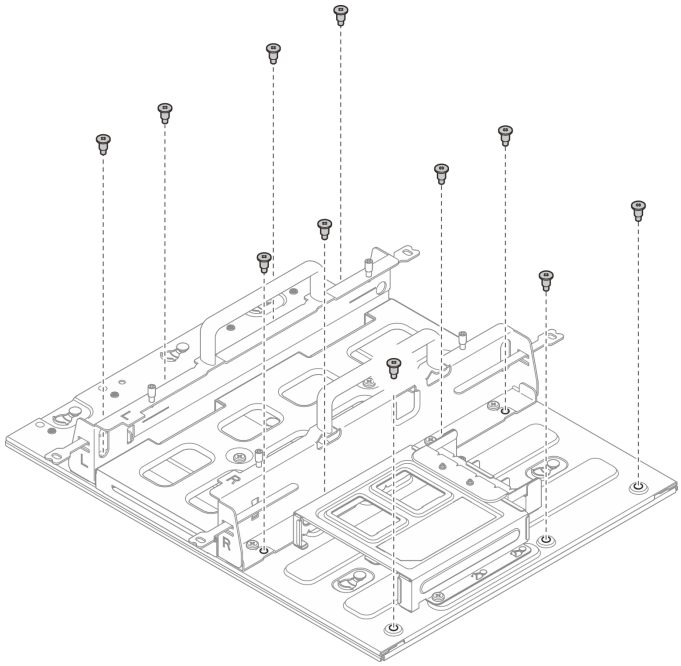


Figure 64. Removing the node sleeve without expansion kit

b. Slide the node sleeve until the guide pins on the DIN rail-mount plate are seated in the large opening of the keyhole; then, remove the node sleeve from the mount plate.

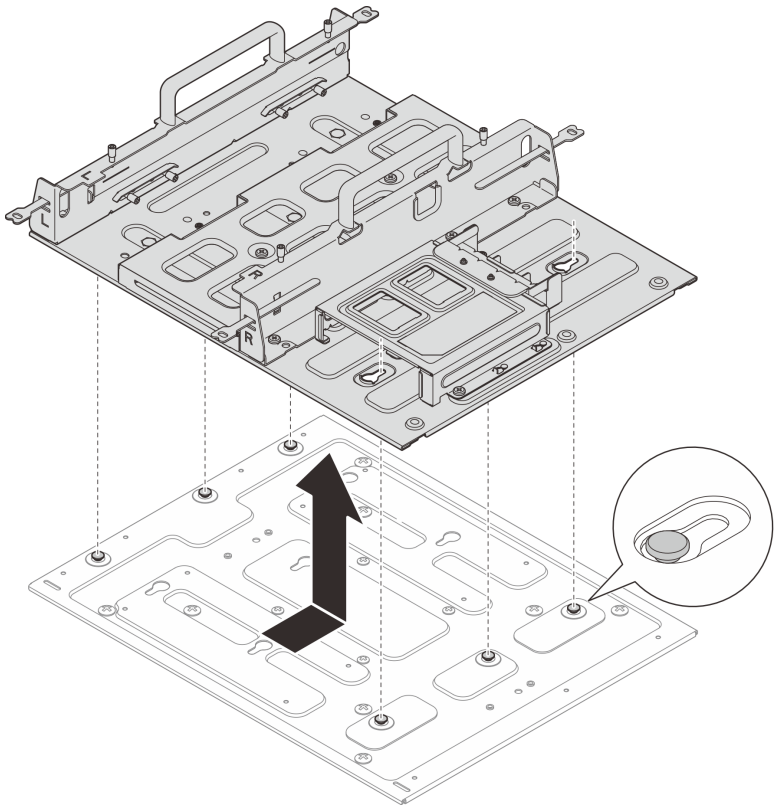


Figure 65. Removing the node sleeve

Step 2. Secure the DIN rail clips to the mount plate with two screws for each clip.

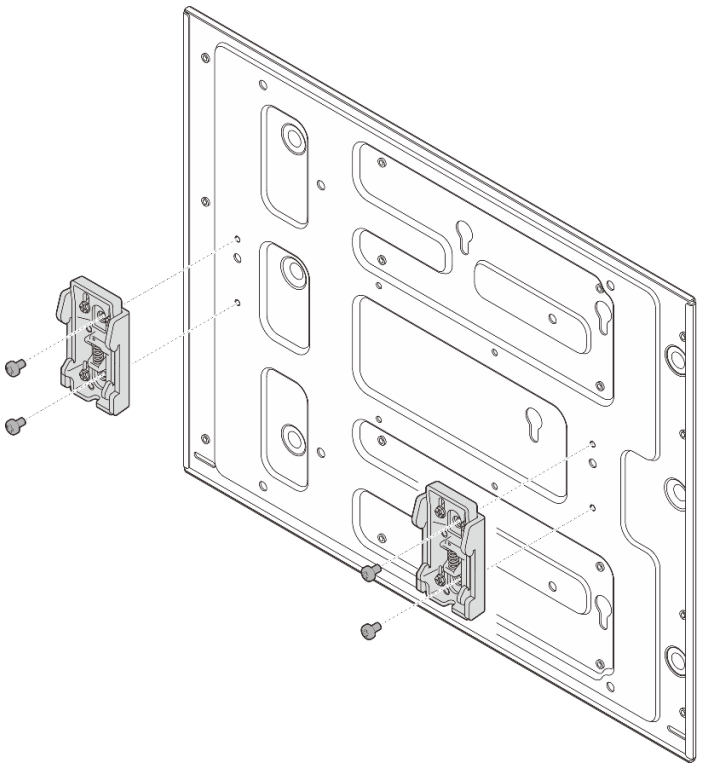


Figure 66. Installing the DIN rail clips

Step 3. Mount the mount plate to the DIN rail.

a. ❶ Hook the top side of DIN rail clips onto the rail at an angle.

b. ❷ Pivot the mount plate toward the DIN rail, and ensure the DIN rail clips are securely seated.

c. ❸ Tighten two M3.5 screws to fully secure the mount plate.

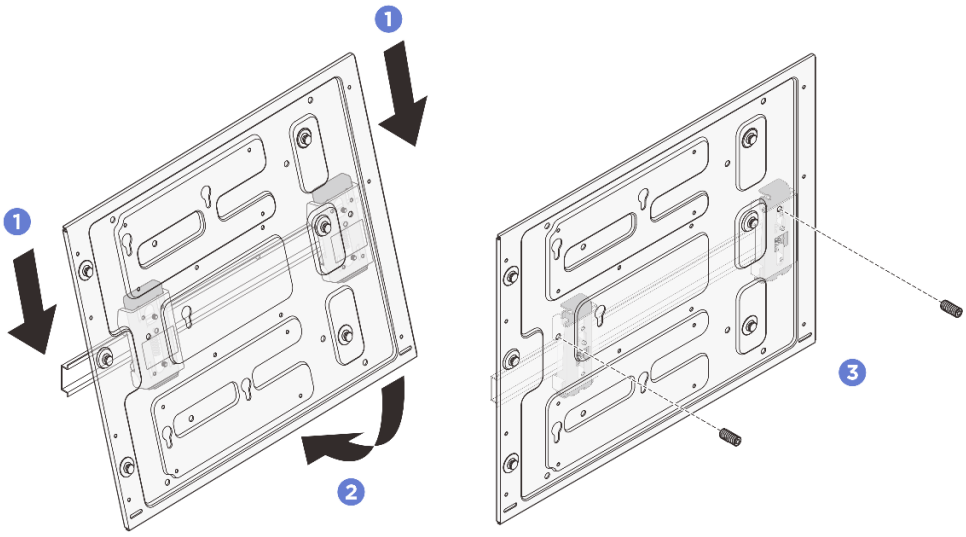


Figure 67. Installing the mount plate

Step 4. Install the node sleeve to the DIN-rail mount plate.

a. Align the node sleeve with the guide pins on the DIN-rail mount plate.

b. Push the node sleeve onto the mount plate; then, slide the node sleeve until the guide pins are seated in the small opening of keyholes.

Note: There are “L” and “R” logos marked on the front of node sleeve holder which represents the left hand and right hand of the user (viewed from the front of the node). Make sure to install the node sleeve with correct orientation shown in the illustration.

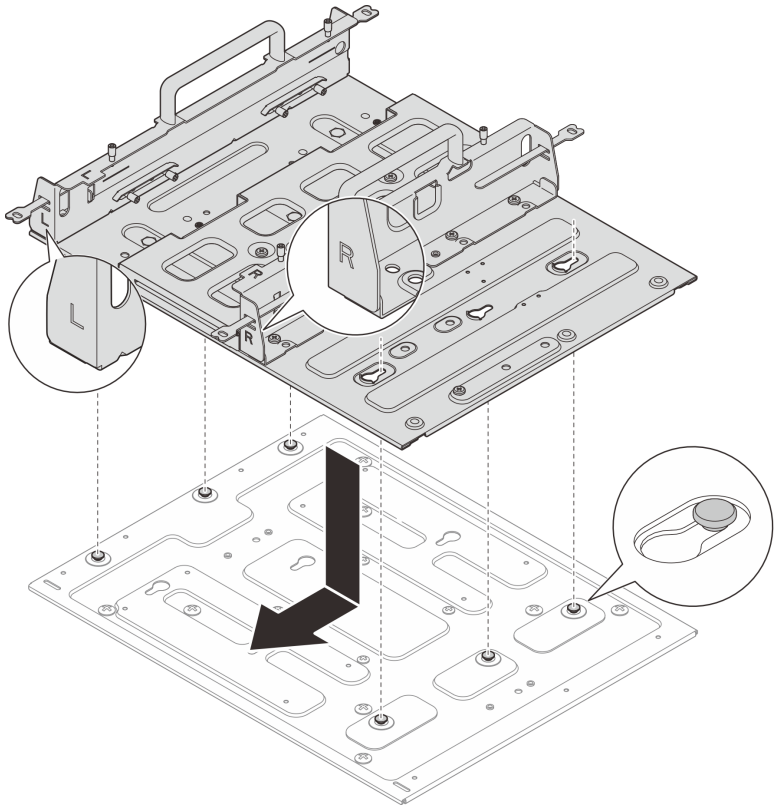


Figure 68. Installing the node sleeve

c. Secure the node sleeve with eleven screws.

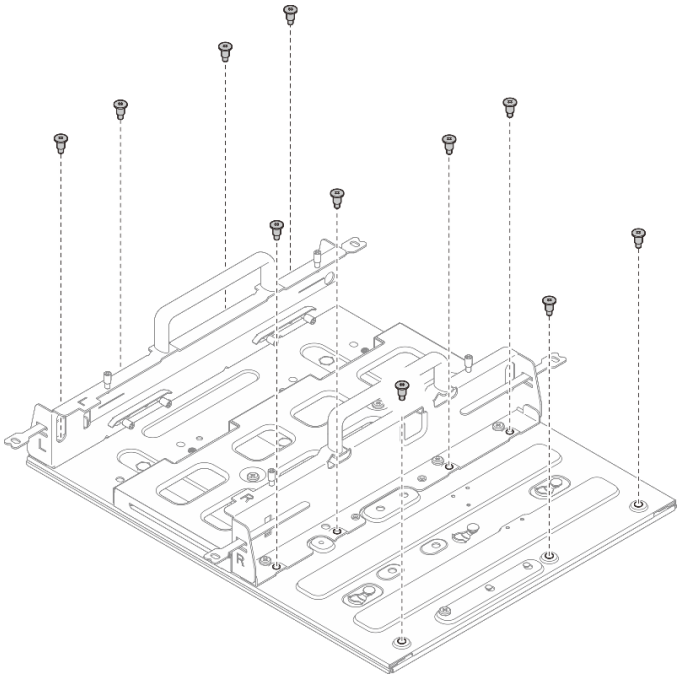


Figure 69. Installing the node sleeve with expansion kit

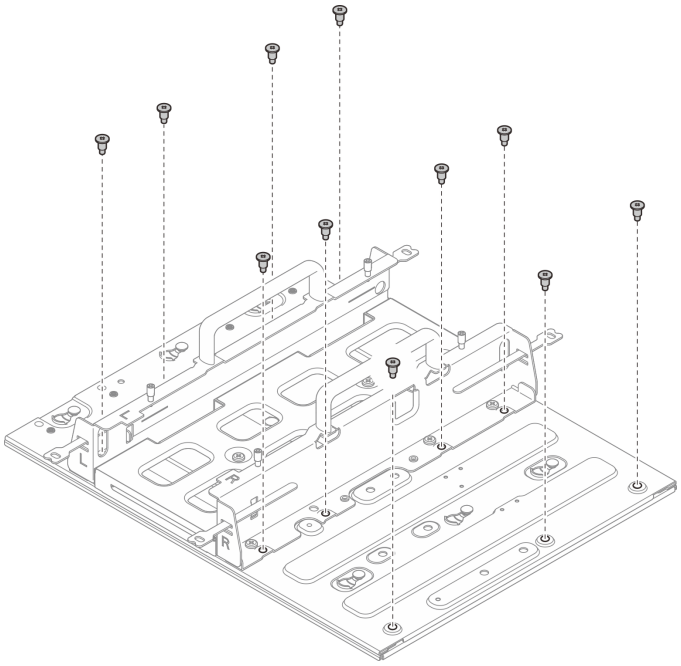


Figure 70. Installing the node sleeve without expansion kit

Install the node into the node sleeve

Procedure

Step 1. Install the node into the node sleeve.

a. ❶ Align the node with the node sleeve; then, insert and slide the node into the node sleeve until it stops.

b. ❷ Tighten the four thumbscrews on the side of the node sleeve.

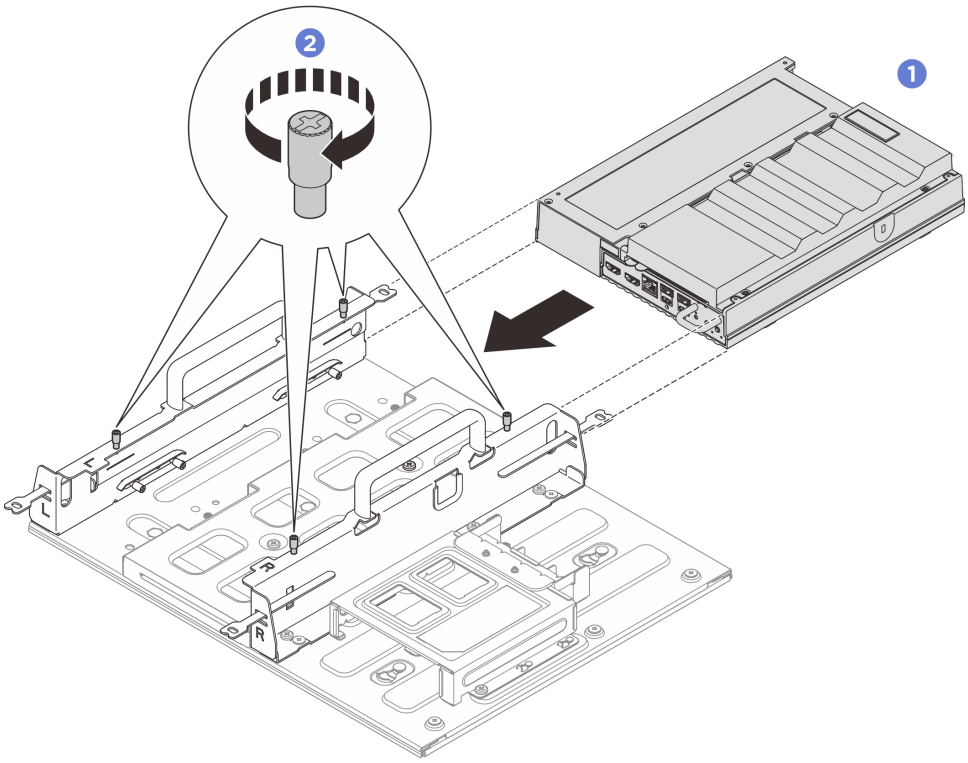


Figure 71. Installing a node into a node sleeve

After you finish

- Install the power adapter and power adapter cage. See "Install a power adapter (wall/ceiling/DIN rail mount)" on page 97.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Rubber feet replacement

Follow instructions in this section to remove and install the rubber feet.

Remove the rubber feet

Follow instructions in this section to remove the rubber feet.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.

Procedure

Step 1. Let the bottom side of the node facing up.

Step 2. Pull the rubber feet to remove it.

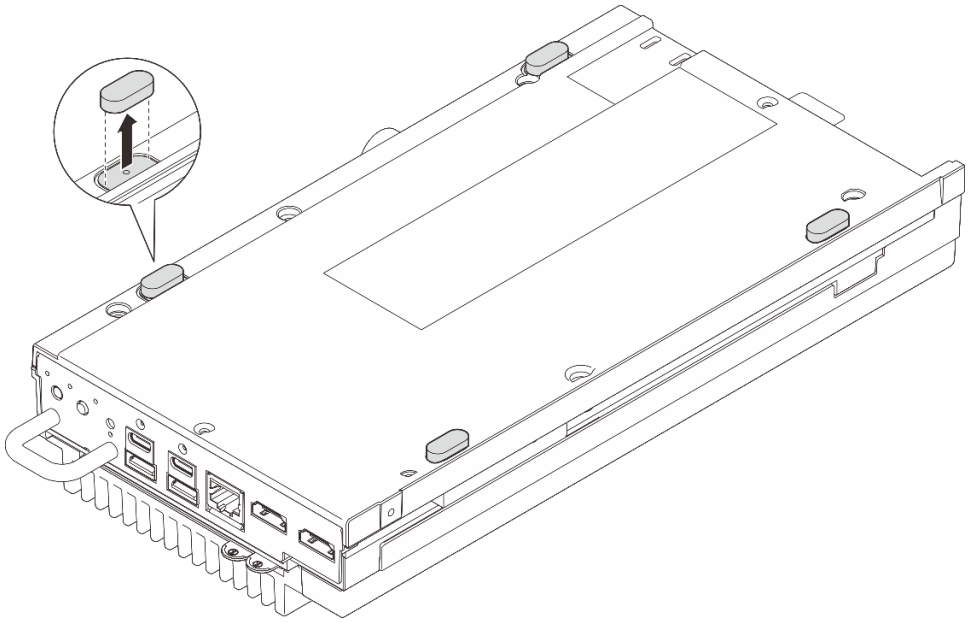


Figure 72. Removing the rubber feet from the node

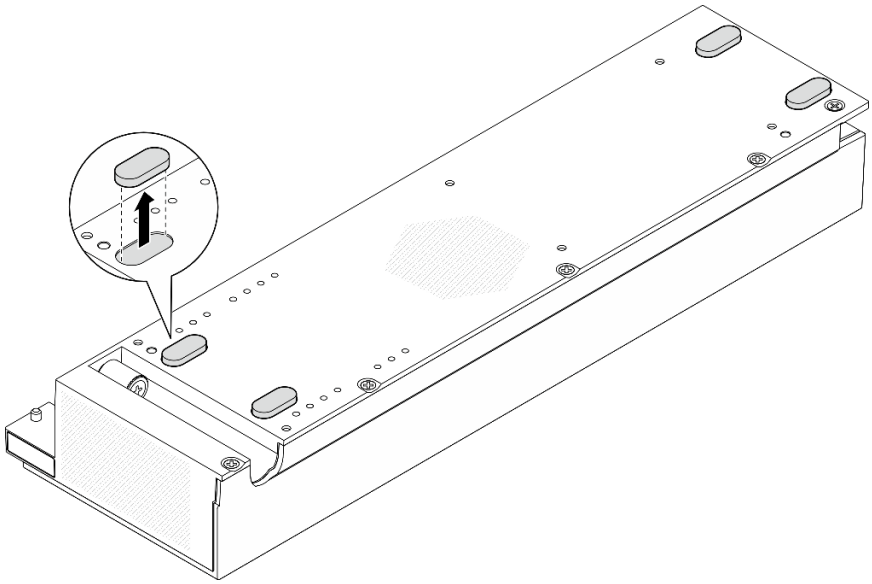


Figure 73. Removing the rubber feet from the expansion kit

After you finish

- Install a replacement unit. See "Install the rubber feet" on page 90.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the rubber feet

Follow instructions in this section to install the rubber feet.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.

Procedure

Step 1. Let the bottom side of the node facing up

Step 2. Remove the film on the rubber feet.

Step 3. Stick the rubber feet to the node or the PCIe expansion kit as shown.

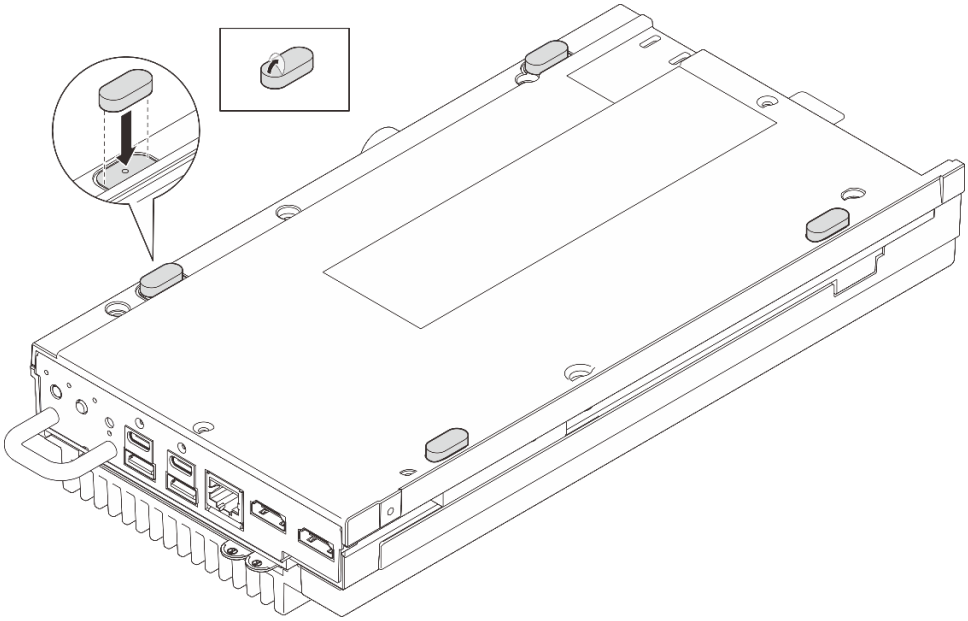


Figure 74. Installing the rubber feet to the node

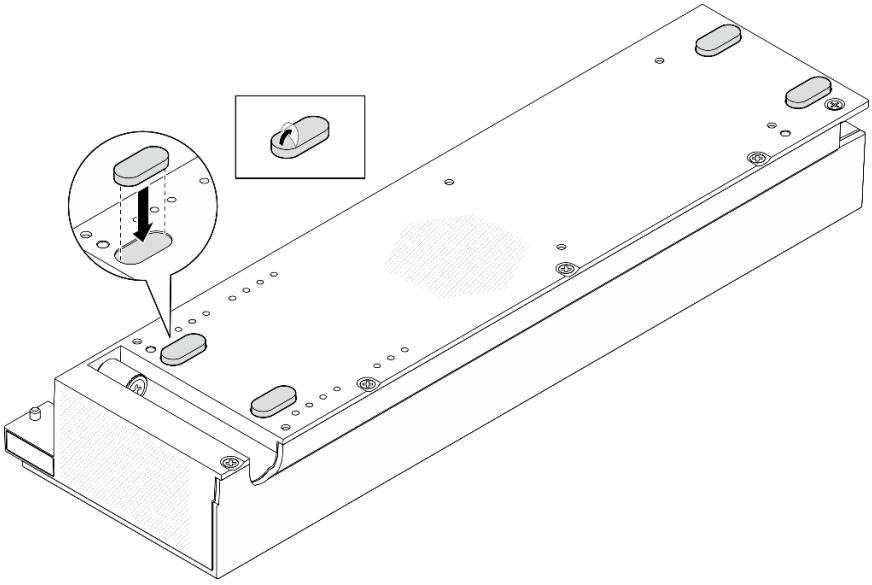


Figure 75. Installing the rubber feet to the expansion kit

After you finish

Complete the parts replacement. See “Complete the parts replacement” on page 219.

Power adapter replacement

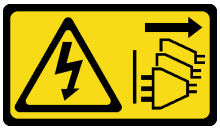
Follow instructions in this section to remove and install the power adapters.

Remove a power adapter (Desktop mount)

Follow instructions in this section to remove power adapters.

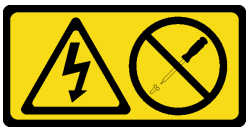
About this task

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 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.

Procedure

Step 1. Disconnect the power adapter from the server.

a. ❶ Use a flat-blade screwdriver to loosen the screw that lock the power cable.

b. ❷ Disengage the power cable from the server to remove the power adapter.

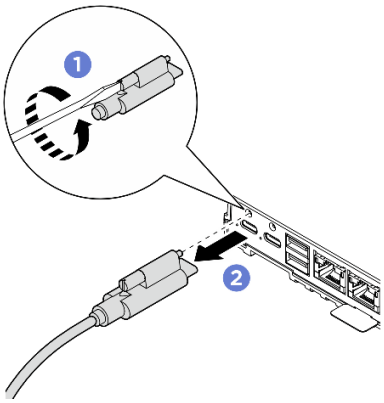


Figure 76. Disconnecting the power adapter

After you finish

- Install a replacement unit. See "Install a power adapter (Desktop mount)" on page 93.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a power adapter (Desktop mount)

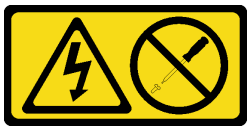
Follow instructions in this section to install power adapter(s).

About this task

- **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 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.

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

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

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

ThinkEdge 140W 230V/115V External Power Supply		
Information published	**Value and precision**	**Unit**
Manufacturer's name	Lenovo	-
Model identifier	Adapter	-
Input voltage	100-240	V
Input AC frequency	50-60	Hz
Output voltage	28.0	V
Output current	5.0	A
Output power	140.0	W
Average active efficiency	• FSP: 91.0 / 91.0 • Delta: 92.1 / 91.6	%
Efficiency at low load (10 %)	• FSP: 88.5 / 87.5 • Delta: 77.4 / 77.4	%
No-load power consumption	• FSP: 0.065 / 0.08 • Delta: 0.078 / 0.047	W

Procedure

Note: ThinkEdge SE100 node only supports 140W power adapter. If only one power adapter is to be installed, it is recommended to connect the power adapter to power connector 1.

Step 1. Connect the power cable to the node.

a. ❶ Align the screw holes and install the power cable to the node.

b. ❷ Tighten the screw and make sure the power cable is securely locked.

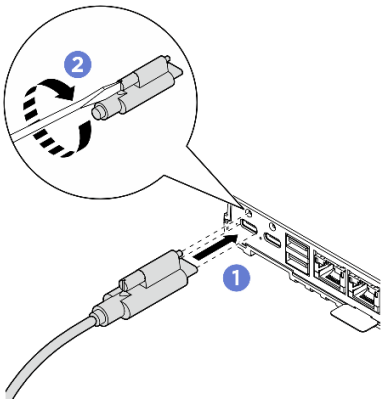


Figure 77. Installing the power cable

After you finish

1. Complete the parts replacement. See "Complete the parts replacement" on page 219.

Remove a power adapter (wall/ceiling/DIN rail mount)

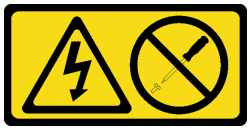
Follow instructions in this section to remove power adapters.

About this task

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 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.

- Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 53.

Procedure

Step 1. Remove the power cable.

a. ❶ Use a flat-blade screwdriver to loosen the screw that lock the power cable.

b. ❷ Disengage the power cable from the node.

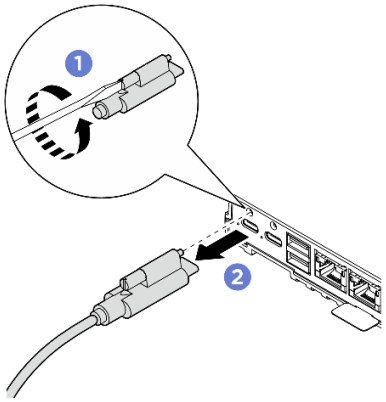


Figure 78. Removing the power cable

Step 2. Remove the power adapter.

a. ❶ Loosen the two thumbscrews; then, lift the tab to remove it from the power adapter bracket.

b. ❷ Slide the power adapter out of the power adapter bracket.

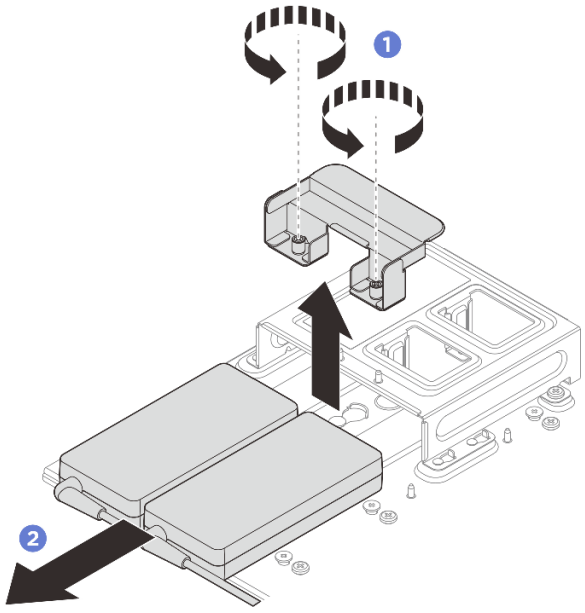


Figure 79. Removing the power adapter

Step 3. If necessary, remove the power adapter bracket.

a. ❸ Loosen the two screws located on both sides.

b. 4 Slide the power adapter bracket until the guide pins are seated on the large opening of the keyholes; then lift the power adapter bracket to remove it.

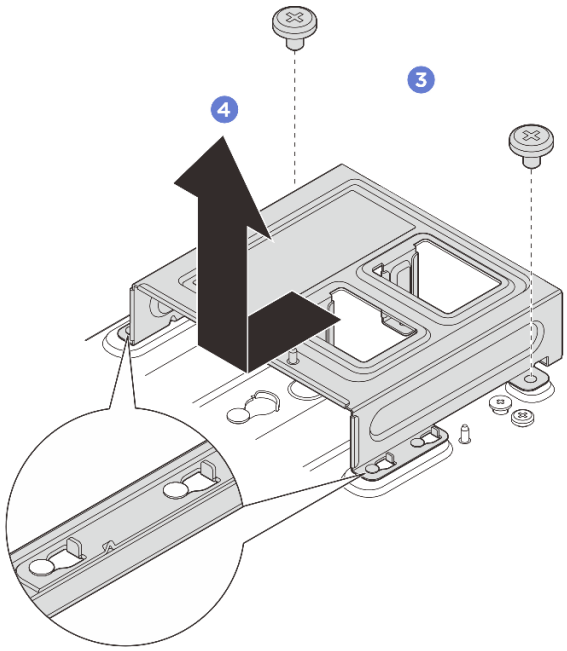


Figure 80. Removing the power adapter bracket

After you finish

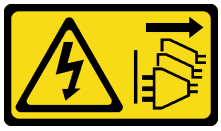
- Install a replacement unit. See "Install a power adapter (wall/ceiling/DIN rail mount)" on page 97.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a power adapter (wall/ceiling/DIN rail mount)

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

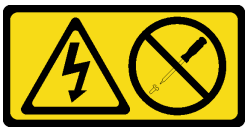
About this task

- **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 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

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

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

ThinkEdge 140W 230V/115V External Power Supply		
Information published	**Value and precision**	**Unit**
Manufacturer’s name	Lenovo	-
Model identifier	Adapter	-
Input voltage	100-240	V
Input AC frequency	50-60	Hz
Output voltage	28.0	V
Output current	5.0	A
Output power	140.0	W
Average active efficiency	• FSP: 91.0 / 91.0 • Delta: 92.1 / 91.6	%
Efficiency at low load (10 %)	• FSP: 88.5 / 87.5 • Delta: 77.4 / 77.4	%
No-load power consumption	• FSP: 0.065 / 0.08 • Delta: 0.078 / 0.047	W

Step 1. If applicable, install the power adapter bracket.

a. ❶ Align the power adapter bracket with the node sleeve and slightly slide the power adapter bracket until the guide pins on the node sleeve are seated on the small opening of the keyholes.

b. ❷ Tighten two screws to secure the power adapter bracket.

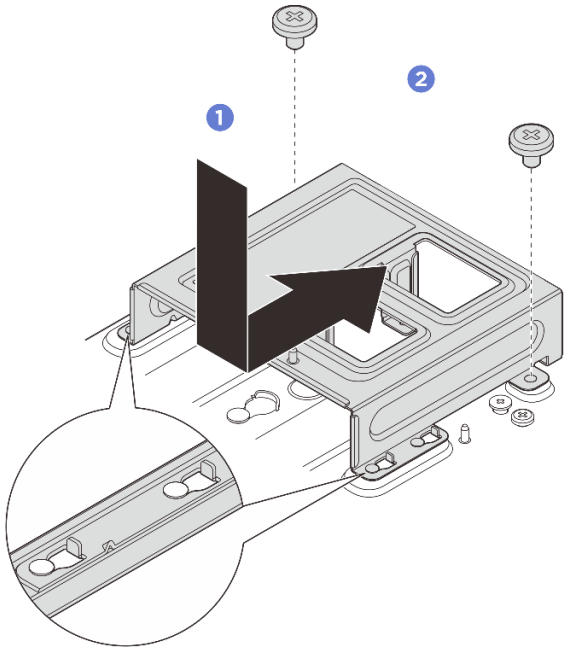


Figure 81. Installing the power adapter bracket

Step 2. Install the power adapters.

Note: Use the information below to locate the power adapter slot numbering. If there is only one power adapter to be installed, install the power adapter to slot 1.

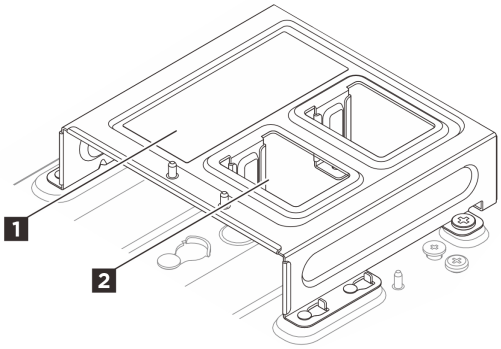


Figure 82. Power adapter slot numbering

1 Power adapter slot 1	**1 Power adapter slot 2**

a. 3 Align the power adapters with the power adapter cage; then, slide the power adapters in place.

b. 4 Align the two screw holes on the tab with the power adapter bracket; then fully tighten the two thumbscrews to secure the tab.

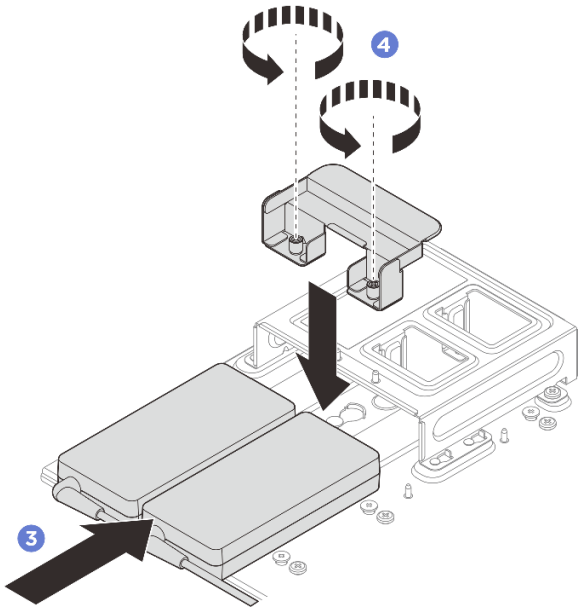


Figure 83. Installing the power adapter

Step 3. Connect the power cable to the node.

a. ❶ Align the screw holes and install the power cable to the node.

b. ❷ Tighten the screw and make sure the power cable is securely locked.

Note: Make sure to connect the power adapter in slot 1 to power connector 1, and connect power adapter in slot 2 to power connector 2.

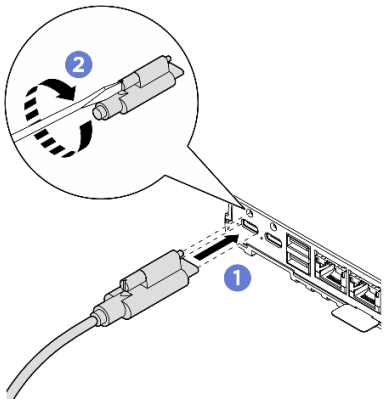


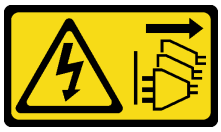
Figure 84. Connecting the power cable

Remove a power adapter (Rack mount)

Follow instructions in this section to remove power adapters from the enclosure.

About this task

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 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 53.
- If the server is installed in a rack, slide the server out on its rack slide rails to gain access to the top cover, or remove the server from the rack. See "Remove a node from the rack" on page 54.

Procedure

Step 1. Make preparation for this task.

a. Remove the middle top cover. See ***https://pubs.lenovo.com/se100-enclosure/remove_encl_middle_cover***.

b. Remove the rear top cover. See ***https://pubs.lenovo.com/se100-enclosure/remove_encl_rear_cover***.

c. Remove the air baffle. See ***https://pubs.lenovo.com/se100-enclosure/remove_air_baffle_encl***.

Step 2. Remove the crossbar.

a. ❶ Loosen the two captive screws that secure the crossbar.

b. ❷ Hold the crossbar and remove it from the enclosure.

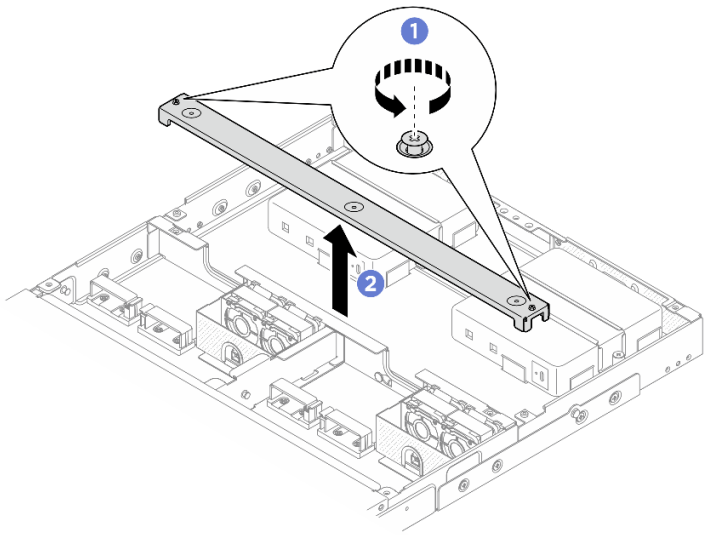


Figure 85. Removing the crossbar

Step 3. Remove the power cable.

a. ❶ Use a flat-blade screwdriver to loosen the screw that lock the power cable.

b. ❷ Disengage the power cable from the node.

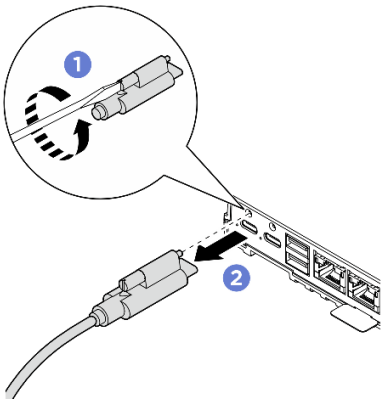


Figure 86. Removing the power cable

Step 4. Remove the power adapter.

a. ❶ Loosen the two captive screws on the both sides of the power adapter bracket with a screw driver.

b. ❷ Lift the power adapter bracket out of the enclosure.

c. ❸ Carefully lift the power adapter and remove it from the enclosure.

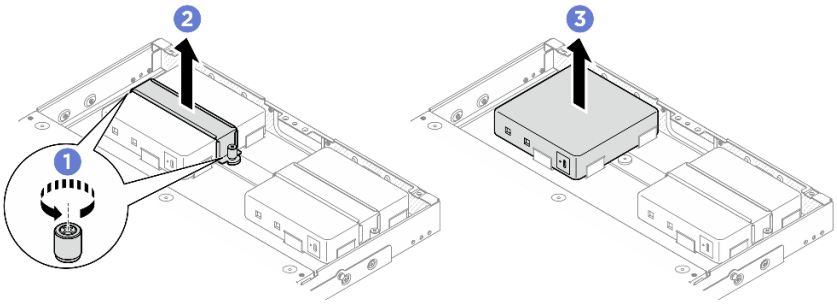


Figure 87. Removing the power adapter

After you finish

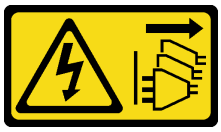
- Install a replacement unit. See "Install a power adapter (Rack mount)" on page 102.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a power adapter (Rack mount)

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

About this task

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 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

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

Notes:

- Depending on the model, the enclosure might look slightly different from the illustrations in this section.
- ThinkEdge SE100 1U2N and 1U3N Enclosure only support 300W power adapters.

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

ThinkEdge 300W 230V/115V External Power Supply		
Information published	**Value and precision**	**Unit**
Manufacturer’s name	Lenovo	-
Model identifier	Adapter	-
Input voltage	100-240	V
Input AC frequency	50-60	Hz
Output voltage	28.0	V
Output current	• 3 ports: 3.57 • 2 ports: 5.0	A
Output power	• 3 ports: 300.0 • 2 ports: 280.0	W

ThinkEdge 300W 230V/115V External Power Supply		
Average active efficiency	• FSP: – 3 ports: 90.0 / 91.0 – 2 ports: 88.5 / 89.5 • Delta: – 3 ports: 91.5 / 90.7 – 2 ports: 91.8 / 91.1	%
Efficiency at low load (10 %)	• FSP: – 3 ports: 78.0 / 80.0 – 2 ports: 77.0 / 79.0 • Delta: – 3 ports: 78.9 / 78.3 – 2 ports: 80.9 / 81.6	%
No-load power consumption	• FSP: 0.20 / 0.28 • Delta: 0.25 / 0.16	W

Procedure

Step 1. Make preparation for this task.

a. Remove the middle top cover. See ***https://pubs.lenovo.com/se100-enclosure/remove_encl_middle_cover***.

b. Remove the rear top cover. See ***https://pubs.lenovo.com/se100-enclosure/remove_encl_rear_cover***.

c. Remove the air baffle. See ***https://pubs.lenovo.com/se100-enclosure/remove_air_baffle_encl***.

d. Remove the crossbar.

1. ❶ Loosen the two captive screws that secure the crossbar.
2. ❷ Hold the crossbar and remove it from the enclosure.

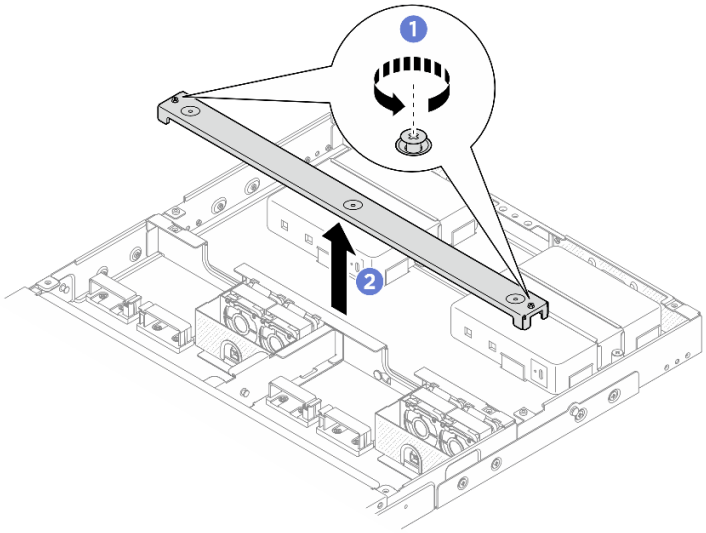


Figure 88. Removing the crossbar

Step 2. Install the power adapter.

a. ❶ Install the power adapter into the enclosure.

b. ❷ Lower the power adapter bracket onto the top of the power adapter.

c. ❸ Tighten the two captive screws on both sides of the power adapter bracket to secure the power adapter.

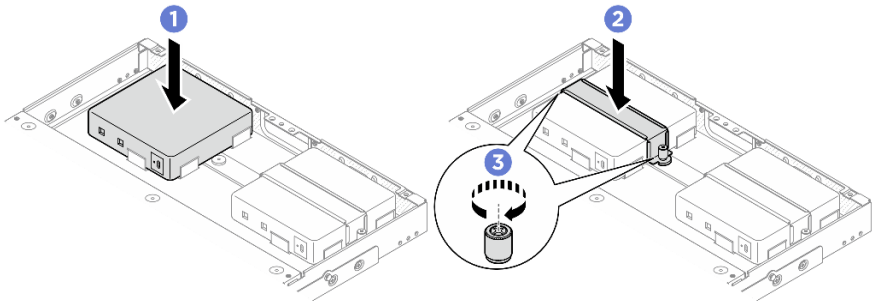


Figure 89. Installing the power adapter

Step 3. Connect the power cable to the node.

a. ❶ Align the screw holes and install the power cable to the node.

b. ❷ Tighten the screw and make sure the power cable is securely locked.

Note: To connect the power adapter to the node, 1U2N enclosure needs 2 USB-C output power cables for one power adapter, and 1U3N enclosure needs 3 USB-C output power cables for one power adapter. Plug in the additional power cable to the power adapter installed in an 1U3N enclosure. For more details about cable routing, see ***https://pubs.lenovo.com/se100-enclosure/se100_enclosure_internal_cable_routing_guide.pdf***.

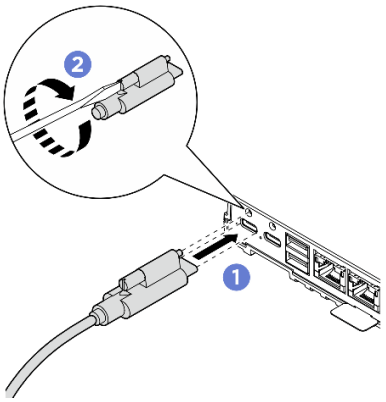


Figure 90. Installing the power cable

Step 4. Install the crossbar.

a. ❶ Align the crossbar with the screw holes on the enclosure; then lower the crossbar onto the enclosure. Make sure all the cables are routed properly under the crossbar.

b. ❷ Tighten the two captive screws to secure the crossbar.

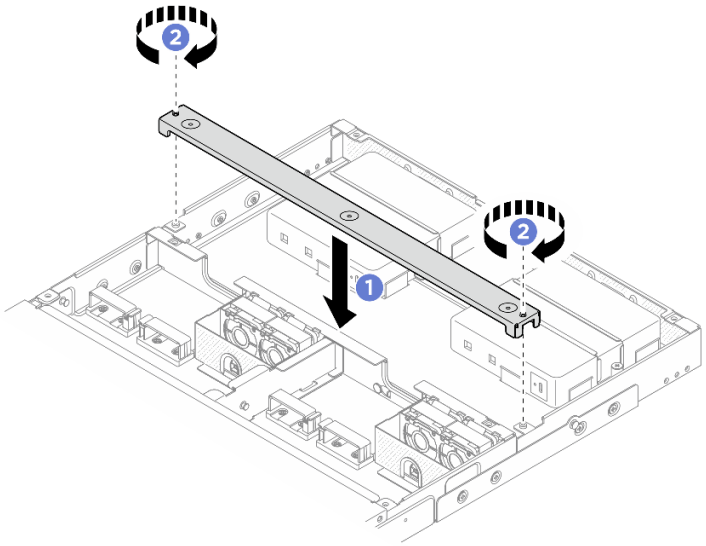


Figure 91. Installing the crossbar

After you finish

1. Install the air baffle. See ***https://pubs.lenovo.com/se100-enclosure/install_air_baffle_encl***.
2. Install the rear top cover. See ***https://pubs.lenovo.com/se100-enclosure/install_encl_rear_cover***.
3. Install the middle top cover. See ***https://pubs.lenovo.com/se100-enclosure/install_encl_middle_cover***.
4. Reinstall the enclosure to the rack. See "Rack mount configuration" on page 54.
5. Complete the parts replacement. See "Complete the parts replacement" on page 219.

Replace components in the node

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

CMOS battery (CR2032) replacement

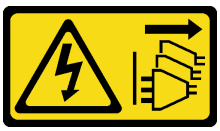
Follow instructions in this section to remove and install a CMOS battery (CR2032).

Remove the CMOS battery (CR2032)

Follow instructions in this section to remove the CMOS battery (CR2032).

About this task

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.

Consider the following when replacing the CMOS battery.

- Lenovo has designed this product with user safety in mind. The lithium battery must be handled properly 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 CMOS battery as required by local ordinances or regulations.

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See “Configuration guide” on page 53.

Procedure

Step 1. Make preparation for this task.

a. Remove the fan shroud. See “Remove a fan shroud” on page 122.
b. If applicable, remove the expansion filler. See “Remove the expansion filler” on page 112.
c. If applicable, remove the expansion kit. See “Remove the expansion kit” on page 200.
d. Remove the top cover. See “Remove the top cover” on page 155.

Step 2. Locate the battery socket on the system board.

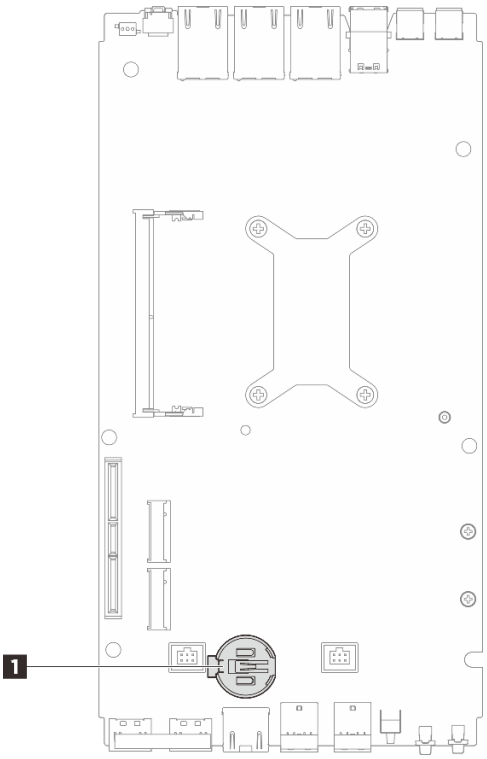


Figure 92. CMOS battery location

1 CMOS battery

Note: If the CMOS battery is replaced, the system enters System Lockdown Mode and needs to be activated or unlocked. See “Activate or unlock the system” on page 226.

Step 3. Remove the CMOS battery.

a. ❶ Gently press on the nub on the side of the CMOS battery as illustrated.
b. ❷ Pivot the battery away from the seat to remove it.

Attention:

- Avoid excessive force on the CMOS battery, as it might damage the socket on the system board and result in system board replacement.
- If the CMOS battery is replaced, the system enters System Lockdown Mode and needs to be activated or unlocked. See “Activate or unlock the system” on page 226.

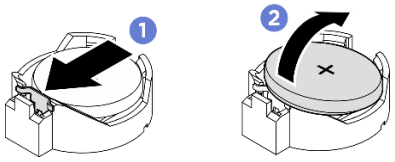


Figure 93. Removing the CMOS battery

After you finish

1. Dispose of the CMOS battery as required by local ordinances or regulations.
2. Install a replacement unit. See "Install the CMOS battery (CR2032)" on page 109.

Install the CMOS battery (CR2032)

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

About this task

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.

Consider the following when replacing the CMOS battery.

- Lenovo has designed this product with user safety in mind. The lithium battery must be handled properly 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 CMOS battery as required by local ordinances or regulations.

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- To avoid potential damage, **do not** let the CMOS battery contact any metal surface.
- Make sure that all the server power cords are disconnected from power source before performing this procedure.

Procedure

Step 1. Follow any special handling and installation instructions that come with the CMOS battery.

Step 2. Locate the battery socket on the system board.

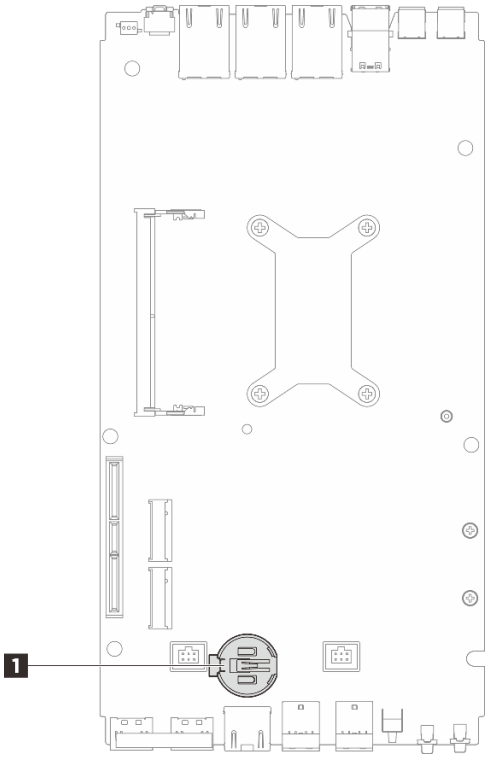


Figure 94. CMOS battery location

1 CMOS battery

Note: If the CMOS battery is replaced, the system enters System Lockdown Mode and needs to be activated or unlocked. See "Activate or unlock the system" on page 226.

Step 3. Install the CMOS battery.

a. 1 Place the CMOS battery on top of the socket with the positive (+) symbol facing up.

b. 2 Press the battery into the seat until it clicks in place.

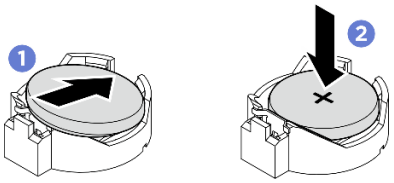


Figure 95. Installing the CMOS battery

After you finish

1. Install the top cover. See "Install the top cover" on page 158.
2. If applicable, install the expansion kit. See "Install the expansion kit" on page 200.
3. If applicable, install the expansion filler. See "Install the expansion filler" on page 113.
4. Install the fan shroud. See "Install the fan shroud" on page 126.
5. Complete the parts replacement. See "Complete the parts replacement" on page 219.

6. If the CMOS battery is replaced, the system enters System Lockdown Mode and needs to be activated or unlocked. See “Activate or unlock the system” on page 226.
7. Power on the server; then, reset date, time, and all the passwords.

Expansion filler replacement

Follow instructions in this section to remove and install the expansion filler.

Remove the expansion filler

Follow instructions in this section to remove the expansion filler.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See “Configuration guide” on page 53.

Procedure

Step 1. Remove the expansion filler.

a. ❶ Loosen the two screws that secure the expansion filler to the node.

b. ❷ Carefully hold the expansion filler by its edges and remove it from the node.

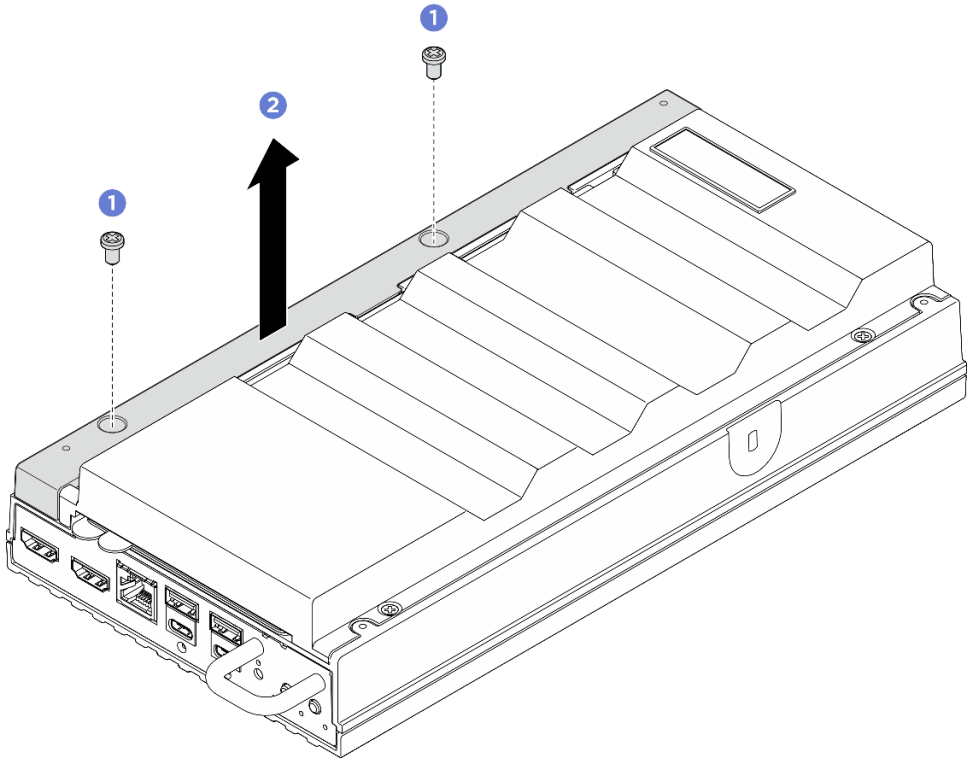


Figure 96. Removing the expansion filler

After you finish

- Install a replacement unit or an expansion kit into the empty slot.
  - To install a replacement unit, see “Install the expansion filler” on page 113.
  - To install a expansion filler, see “Install the expansion kit” on page 200.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the expansion filler

Follow instructions in this section to install the expansion filler.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.

Procedure

Step 1. Make preparation for this task.

a. If there is an expansion kit installed, remove it. See “Remove the expansion kit” on page 200.

Step 2. Align the expansion filler slots with the alignment pins and lower the expansion filler onto the node.

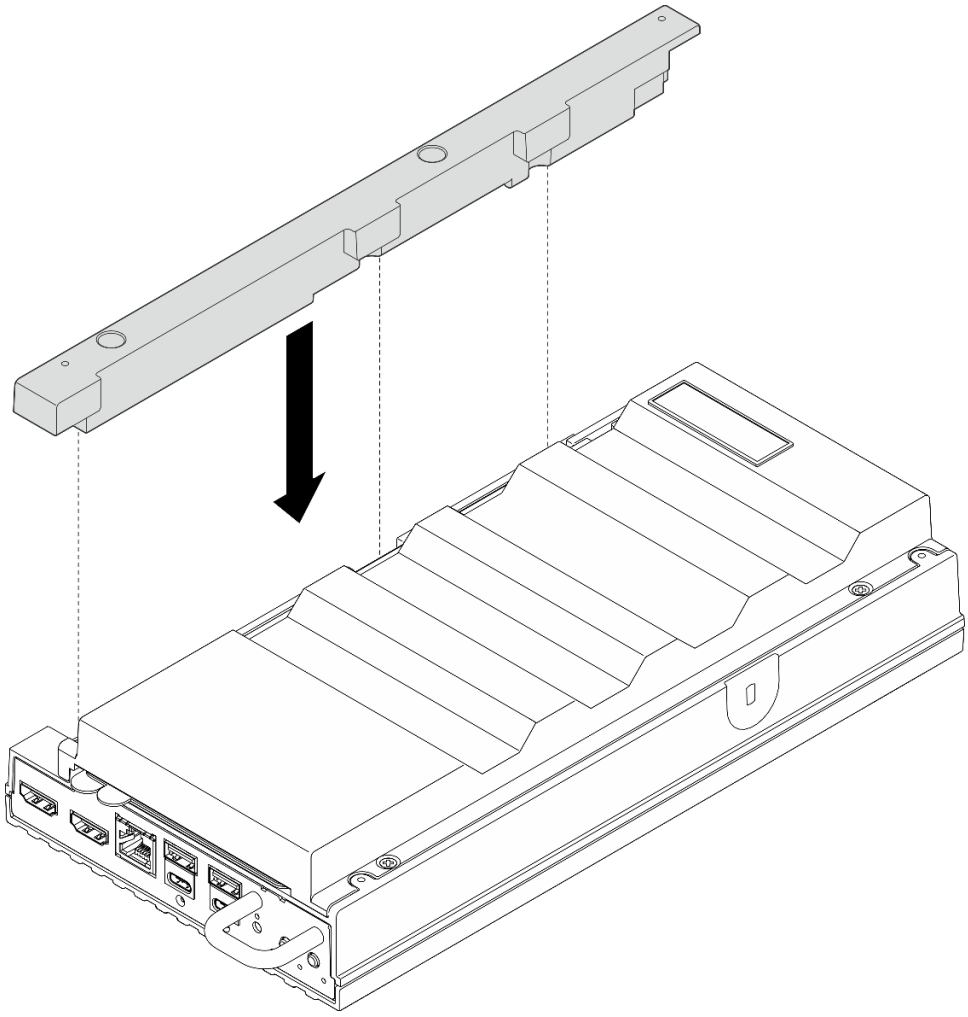


Figure 97. Installing the expansion filler

Step 3. Tighten two screws to secure the expansion filler to the node.

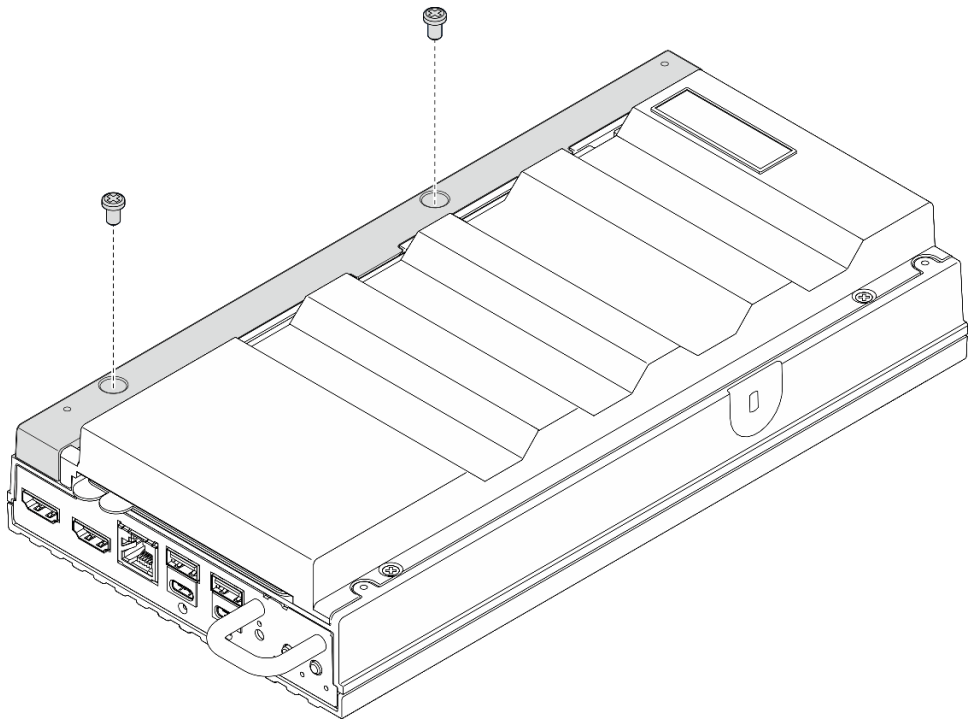


Figure 98. Securing the expansion filler

After you finish

- Complete the parts replacement. See “Complete the parts replacement” on page 219.

Fan bridge cable replacement (trained technician only)

Follow instructions in this section to remove and install a fan bridge cable.

Remove a fan bridge cable

Follow instructions in this section to remove a fan bridge cable.

About this task

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.

S033

CAUTION:
Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in spattered metal, burns, or both.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See "Configuration guide" on page 53.

Procedure

Step 1. Make preparation for this task.

a. Remove the fan shroud. See "Remove a fan shroud" on page 122.

b. If applicable, remove the expansion filler. See "Remove the expansion filler" on page 112.

c. If applicable, remove the expansion kit. See "Remove the expansion kit" on page 200.

d. Remove the top cover. See "Remove the top cover" on page 155.

Step 2. Remove the fan bridge cable cover.

a. ❶ Slide the pull-out information tabs outward from the node.

b. ❷ Remove the four screws that secure the fan bridge cable cover; then lift up the fan bridge cable cover to remove it from the node.

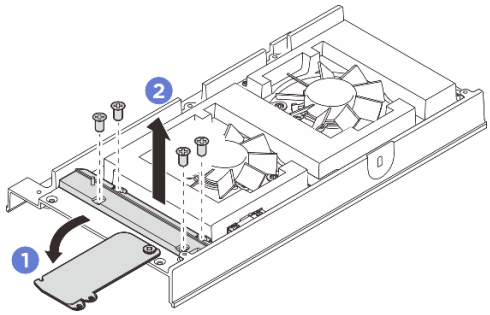


Figure 99. Removing the fan bridge cable cover

Step 3. Disconnect the fan bridge cable from the fan module.

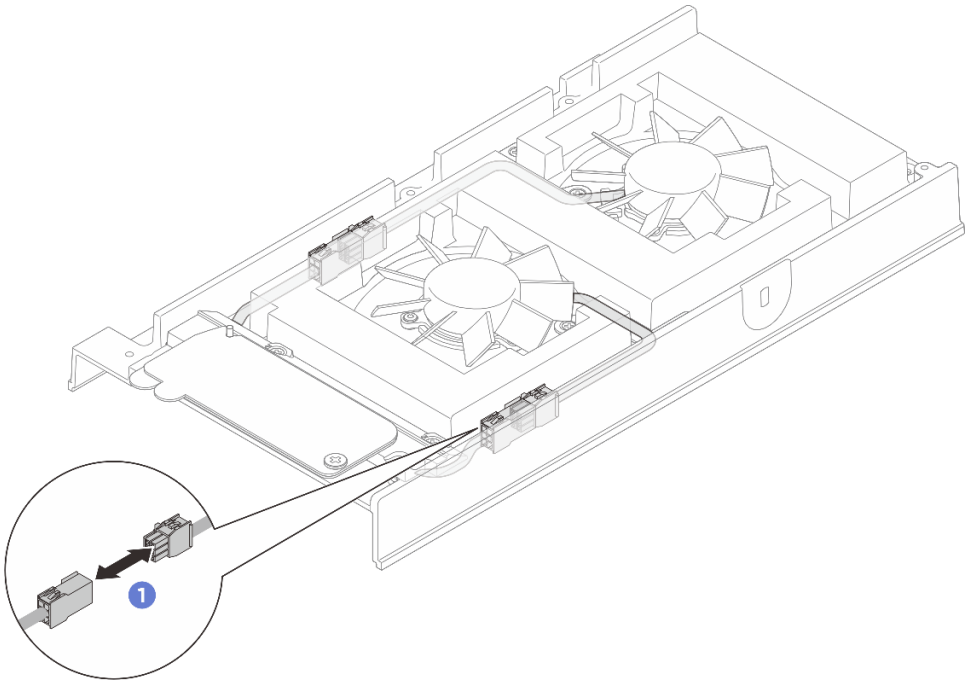


Figure 100. Disconnecting the fan bridge cable

Step 4. Push the fan bridge cable to the left (viewed from the front of the node); then, pull and remove the fan bridge cable from the node.

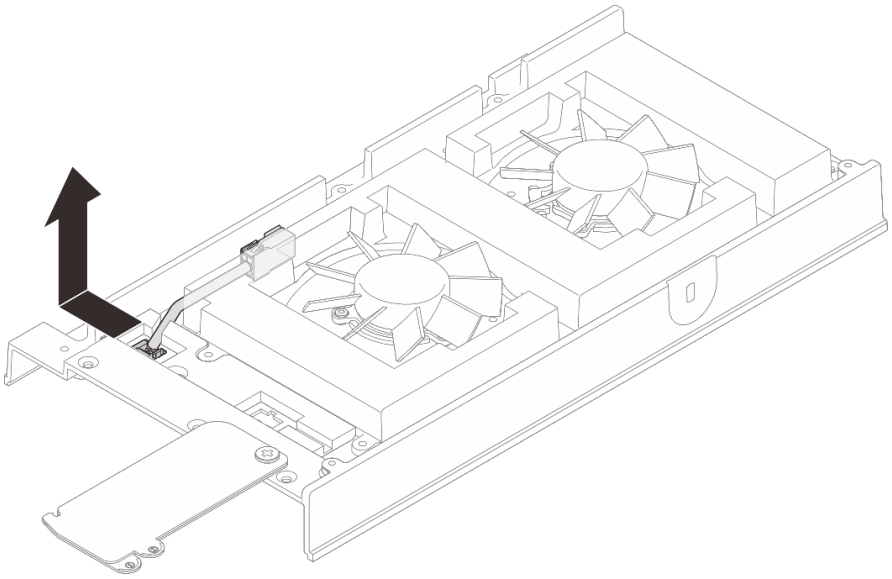


Figure 101. Removing the fan bridge cable

After you finish

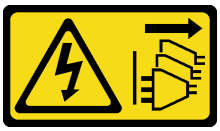
1. Install a replacement unit. See “Install the fan bridge cable” on page 118.
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the fan bridge cable

Follow instructions in this section to install a fan bridge cable.

About this task

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

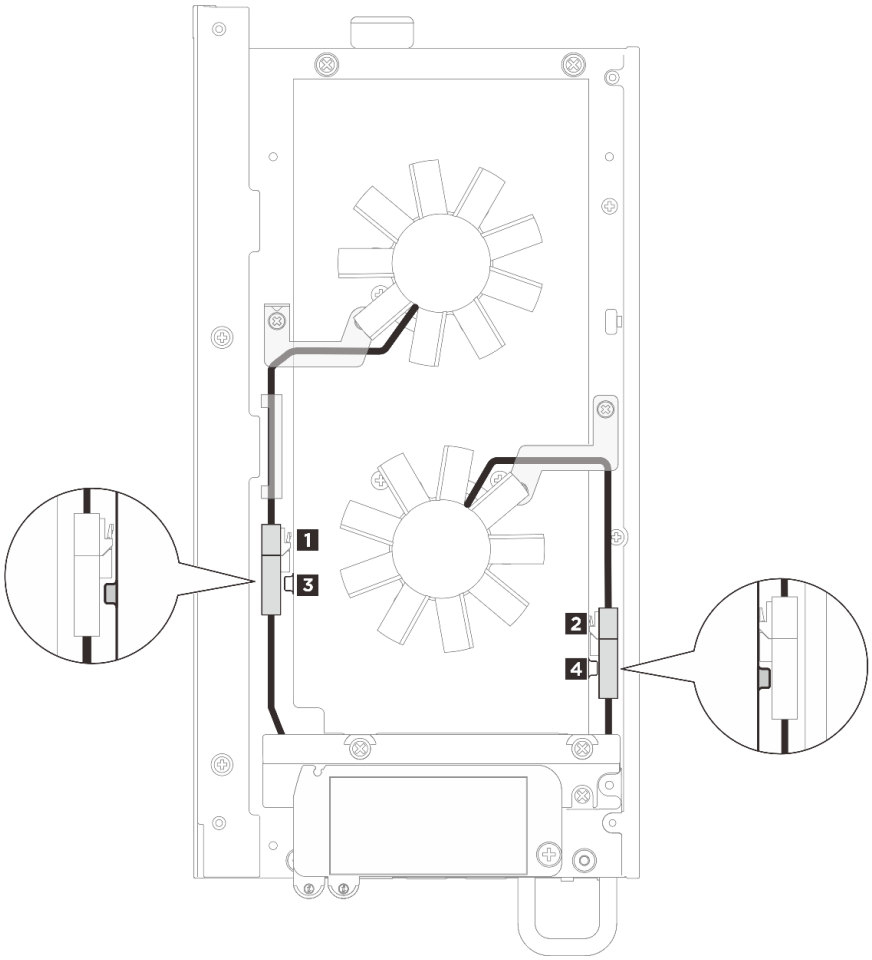
CAUTION:
Hazardous moving fan blades nearby. Keep fingers and other body parts away.

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Locate the fan bridge cable to be installed.



1 Cable of Fan module 1	2 Cable of Fan module 2
3 Fan bridge cable 1	3 Fan bridge cable 2

Step 2. Install the fan bridge cable to the node.

a. Align the fan bridge cable with the connector hole on the node.

b. Insert the fan bridge cable to the connector hole; then push the fan bridge cable to the right (viewed from the front of the node) until it locks into place.

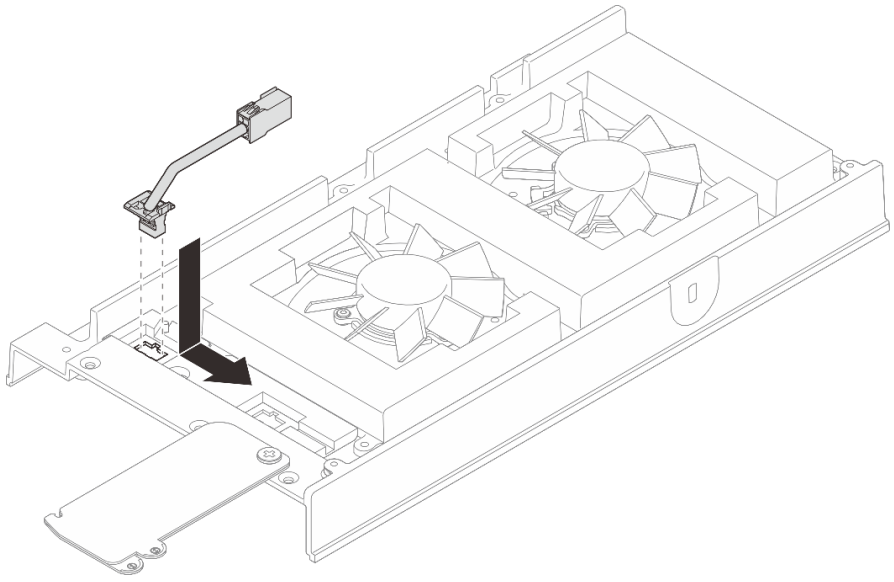


Figure 102. Installing the fan bridge cable

Step 3. Route the cable through the pre-cut slot on the node.

Note: There are labels attached on the fan cables. Roll the label around the cable for easier cable routing.

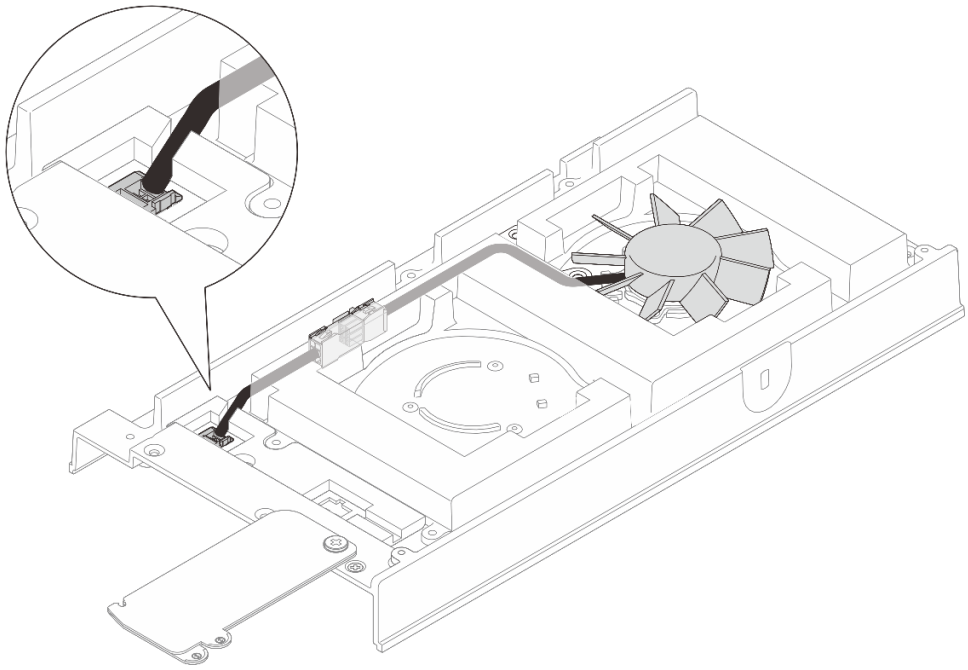


Figure 103. Cable routing for fan connector 1

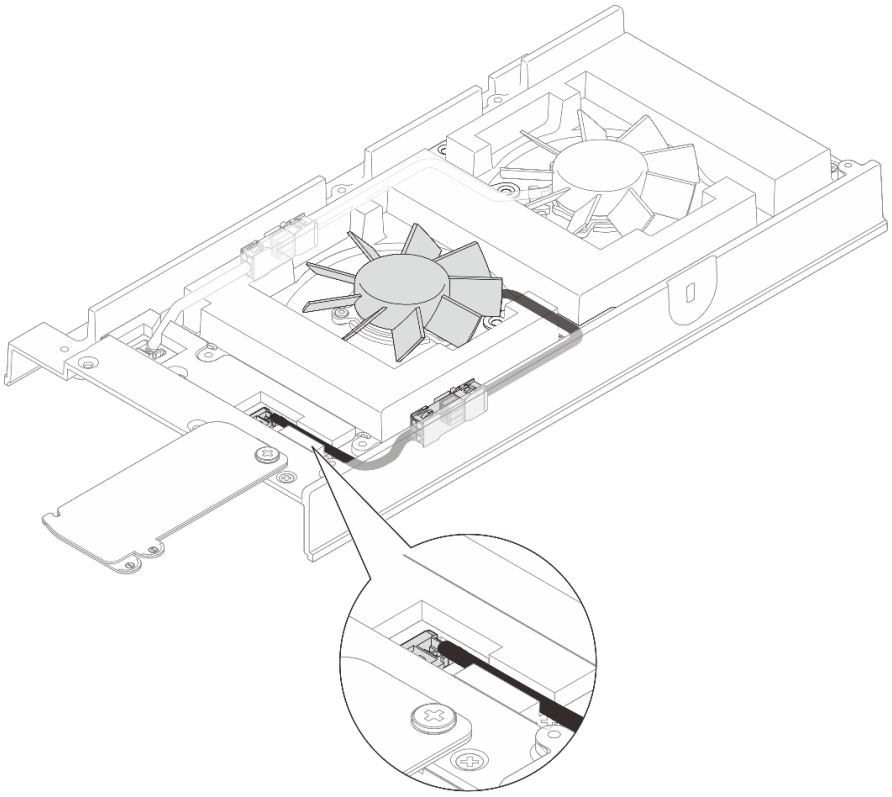


Figure 104. Cable routing for fan connector 2

Step 4. Install the fan bridge cable cover.

a. ❶ Align the fan bridge cable cover with the screw slots on the node; then, tighten four screws to secure the fan bridge cable cover.

b. ❷ Slide the pull-out information tabs towards the node.

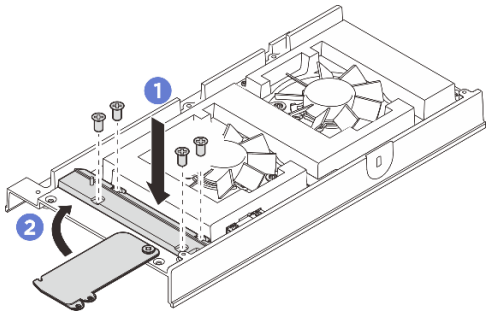


Figure 105. Installing the fan bridge cable cover

Step 5. Reconnect the fan bridge cable to the fan module cable. Route the cable properly through the cable slot on the top cover as illustrated to avoid interfering the fan shroud. For more information about cable routing, see ***SE100 Internal Cable Routing Guide***.

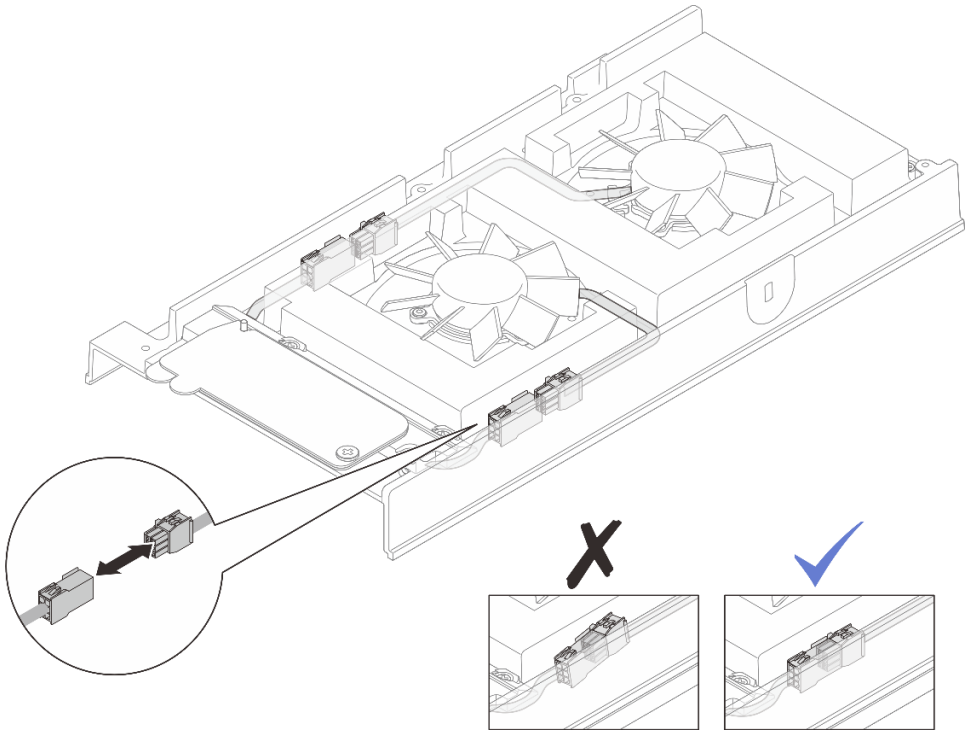


Figure 106. Reconnecting the fan bridge cable

After you finish

1. Install the top cover. See “Install the top cover” on page 158.
2. If applicable, install the expansion filler. See “Install the expansion filler” on page 113.
3. If applicable, install the expansion kit. See “Install the expansion kit” on page 200.
4. Install the fan shroud. See “Install the fan shroud” on page 126.
5. Complete the parts replacement. See “Complete the parts replacement” on page 219.

Fan shroud replacement

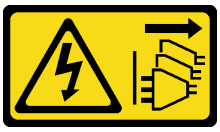
Follow instructions in this section to remove and install a fan shroud.

Remove a fan shroud

Follow instructions in this section to remove a fan shroud.

About this task

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.

S033

CAUTION:
Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in spattered metal, burns, or both.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See "Configuration guide" on page 53.

Proceed to the section corresponding to the fan shroud to be removed:

- "Remove a desktop mount fan shroud" on page 123.
- "Remove a rack mount fan shroud" on page 125.

Remove a desktop mount fan shroud

Procedure

Step 1. Let the top side of the node facing up.

Step 2. Remove the fan shroud.

a. Remove the four screws that secure the fan shroud to the node.

b. Lift up the fan shroud from the node, and place it on a flat clean surface.

Attention: Service label is located on the inside of the fan shroud.

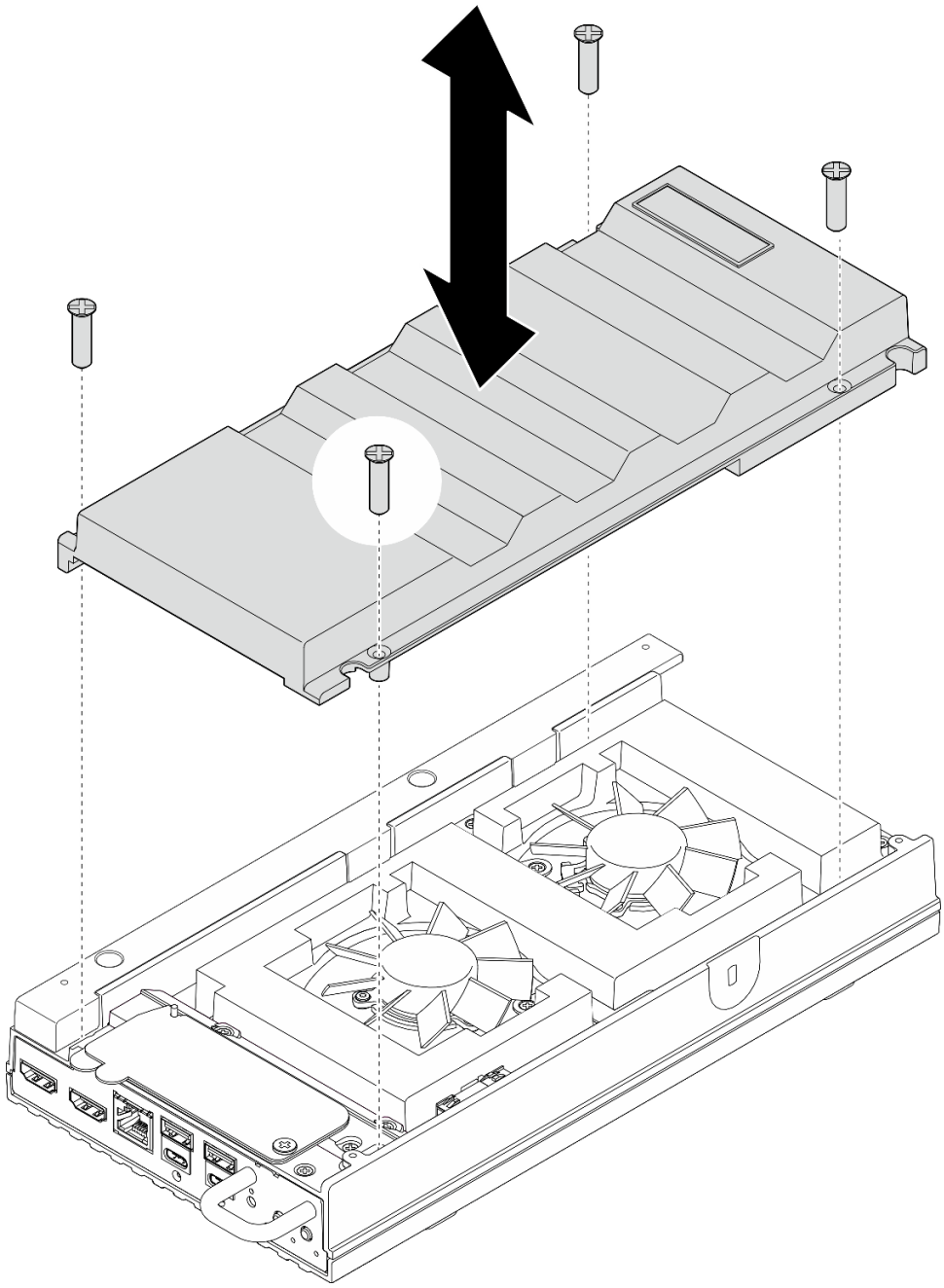


Figure 107. Removing the fan shroud

After you finish

- Install a replacement unit or a rack mount fan shroud before installing the node into the enclosure.
  - To install a replacement unit. See “Install the desktop mount fan shroud” on page 127.
  - If the node is to be installed in an enclosure, install a rack mount fan shroud. See “Install the rack mount fan shroud” on page 128.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Remove a rack mount fan shroud

Procedure

Step 1. Let the top side of the node facing up.

Step 2. Remove the fan shroud.

a. Remove the two screws that secure the fan shroud to the node.

b. Lift up the fan shroud from the node, and place it on a flat clean surface.

Attention: Service label is located on the inside of the fan shroud.

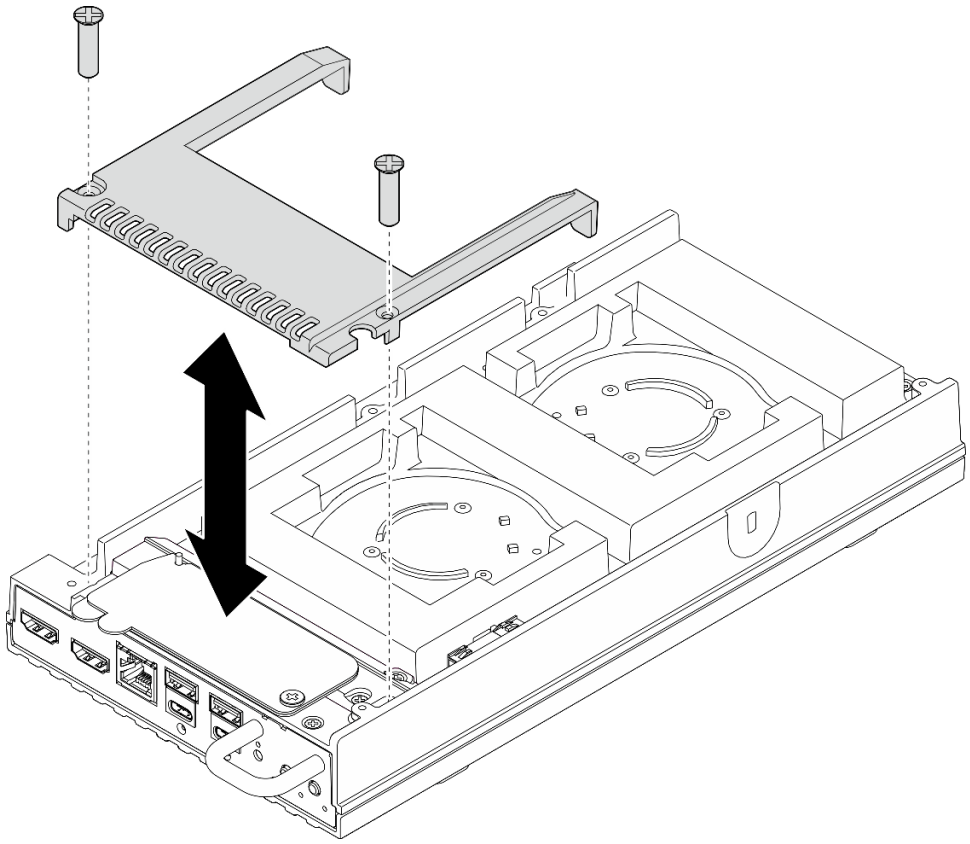


Figure 108. Removing the fan shroud

After you finish

1. Install a replacement unit or proceed to the steps below if the node is not to be installed to the enclosure.
   - To install a replacement unit, see "Install the rack mount fan shroud" on page 128.
   - If the node is not to be installed in a enclosure, complete the following steps:
     a. Remove the fan bridge cable dusts cover from the fan bridge cables.

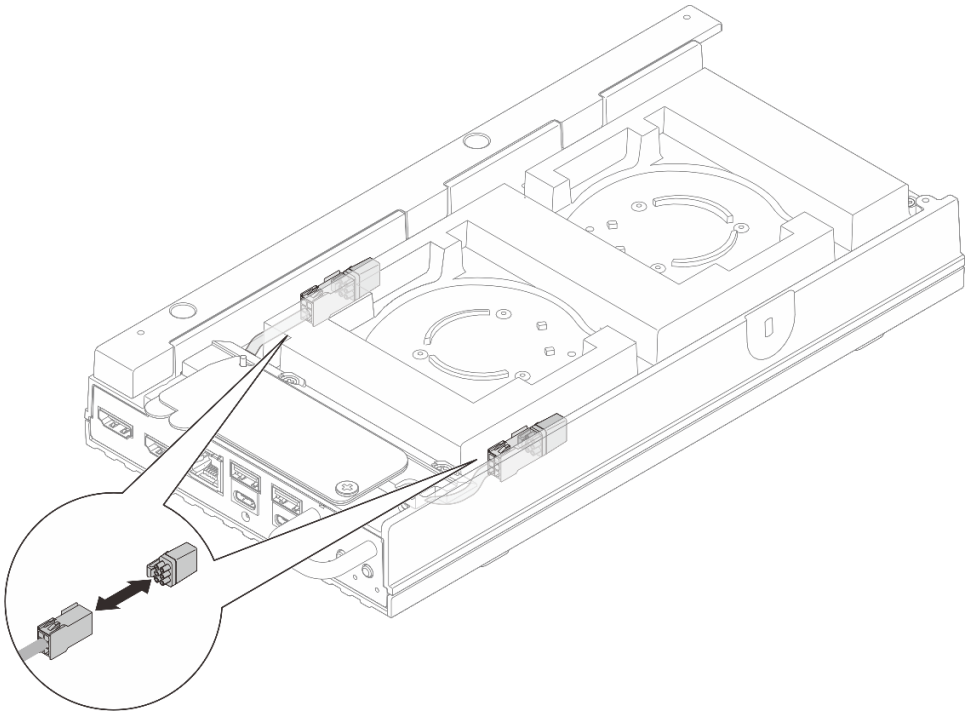


Figure 109. Removing the fan bridge cable dust covers

b. Install the fan modules. See “Install a fan module” on page 134.

c. Install the desktop mount fan shroud. See “Install the desktop mount fan shroud” on page 127.

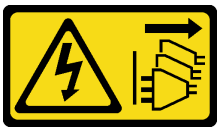
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the fan shroud

Follow instructions in this section to install the fan shroud.

About this task

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.

Proceed to the section corresponding to the fan shroud to be installed:

- “Install the desktop mount fan shroud” on page 127.
- “Install the rack mount fan shroud” on page 128.

Install the desktop mount fan shroud

Procedure

Step 1. Make preparation for this task.

a. If the node was installed in an enclosure, complete the following steps before installing the desktop mount fan shroud.

1. Remove the rack mount fan shroud. See “Remove a rack mount fan shroud” on page 125.
2. Remove the fan bridge cable dust covers from the fan bridge cables.

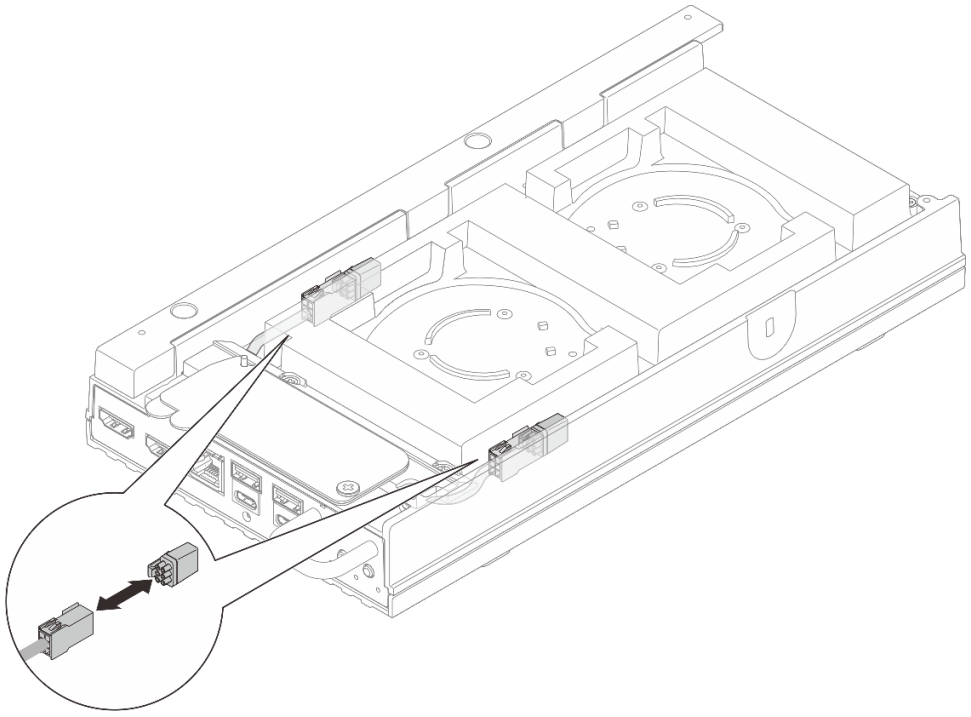


Figure 110. Removing the fan bridge cable dust covers

3. Install the fan modules. See “Install a fan module” on page 134.

Step 2. Install the fan shroud.

a. Align the fan shroud with the screw holes on the node; then lower the fan shroud onto the node.

b. Tighten four screws to secure the fan shroud to the node.

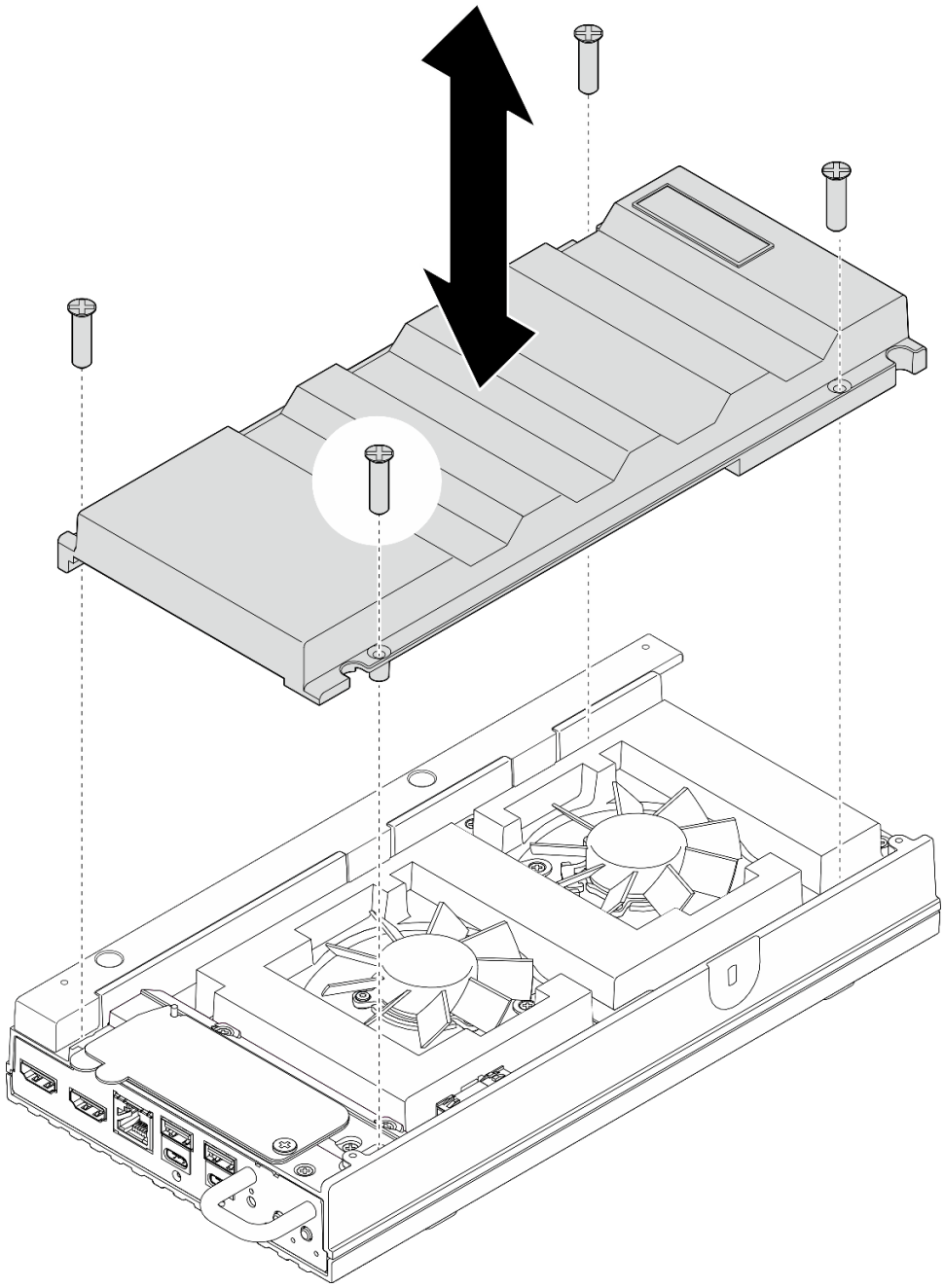


Figure 111. Installing the fan shroud

After you finish

- Complete the parts replacement. See “Complete the parts replacement” on page 219.

Install the rack mount fan shroud

Procedure

Step 1. Make preparation for this task.

a. If the node was not installed in an enclosure, complete the following steps before installing the rack mount fan shroud.

1. Remove the desktop mount fan shroud. See “Remove a desktop mount fan shroud” on page 123.
2. Remove the fan modules. See “Remove a fan module” on page 130.
3. Install the fan bridge cable dust covers to the fan bridge cables.

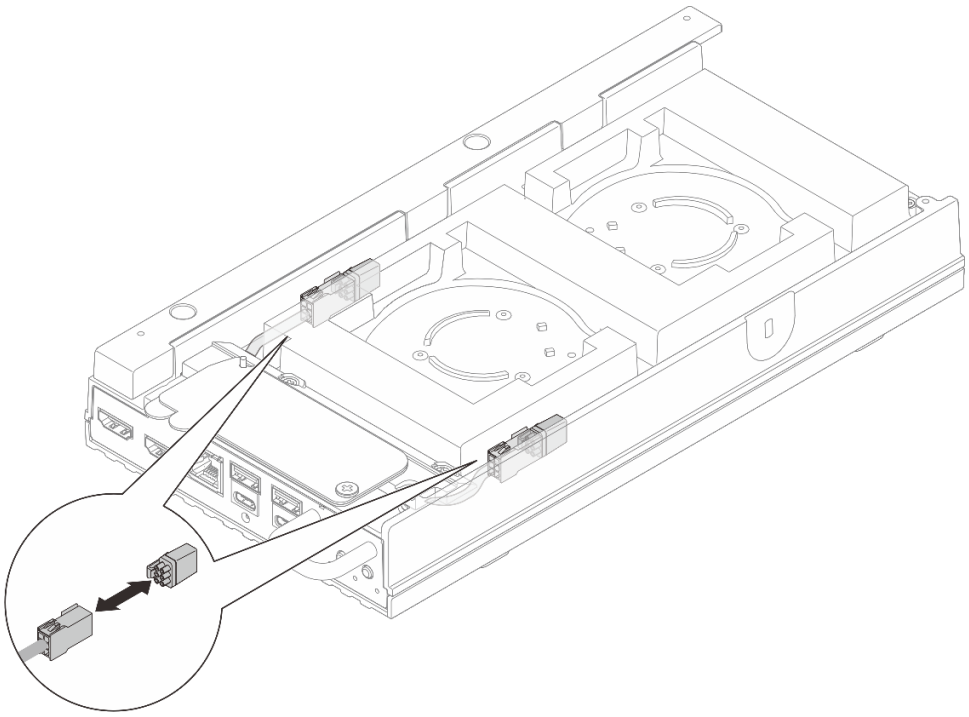


Figure 112. Installing the fan bridge cable dust covers

Step 2. Install the fan shroud.

a. Align the fan shroud with the screw holes on the node; then lower the fan shroud onto the node.

b. Tighten two screws to secure the fan shroud to the node.

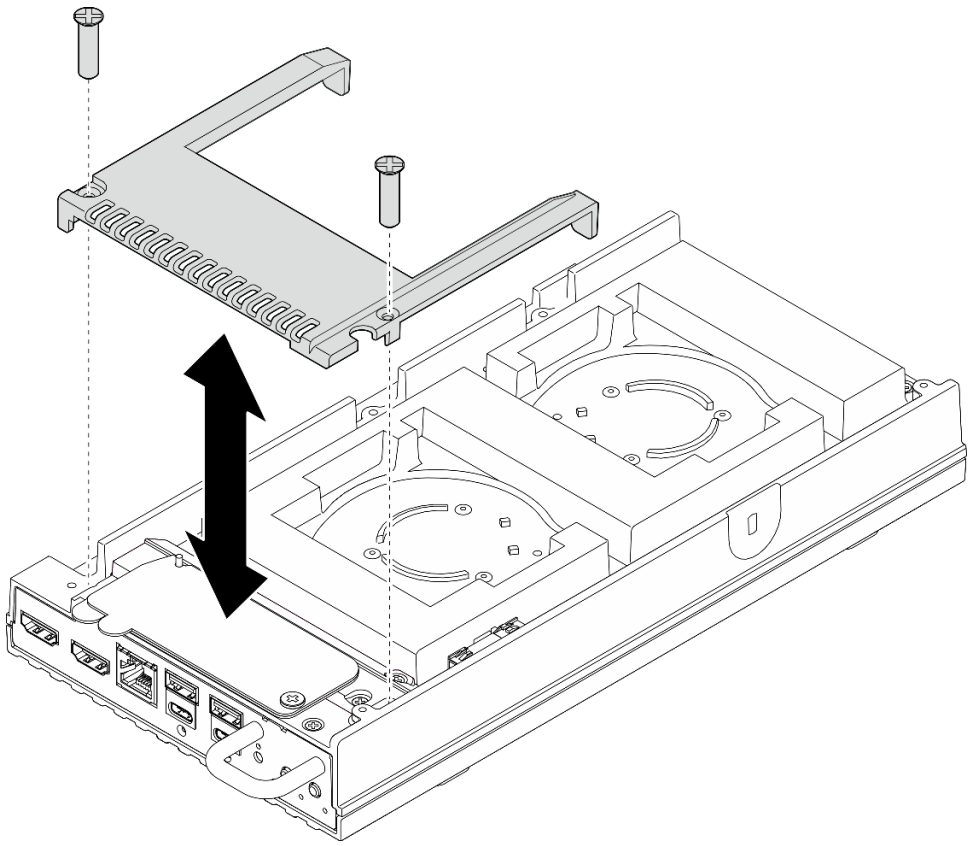


Figure 113. Installing the fan shroud

After you finish

- Proceed to "Install a node to the rack" on page 58.
- Complete the parts replacement. See "Complete the parts replacement" on page 219.

Fan module replacement

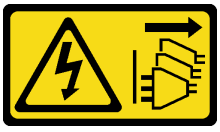
Follow instructions in this section to remove and install a fan module.

Remove a fan module

Follow instructions in this section to remove a fan module.

About this task

S002



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

S009

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

S017

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

S033

CAUTION:
Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in spattered metal, burns, or both.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See "Configuration guide" on page 53.

Procedure

Step 1. Make preparation for this task.

a. Remove the desktop mount fan shroud. See "Remove a fan shroud" on page 122.

Step 2. Locate the fan module to be removed. See "System fan numbering" on page 30.

Step 3. Remove the fan module.

a. ❶ Disconnect the fan module cable from the fan bridge cable.

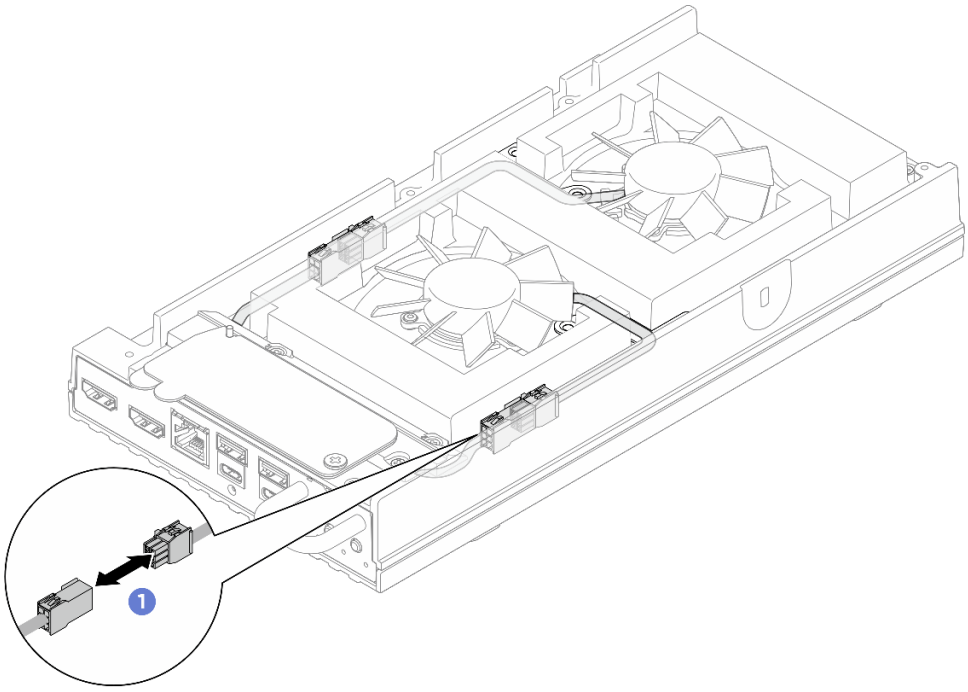


Figure 114. Disconnecting the fan bridge cable

b. 2 Remove the two screws that secure the fan module cable bracket; then, remove the fan module cable bracket from the server.

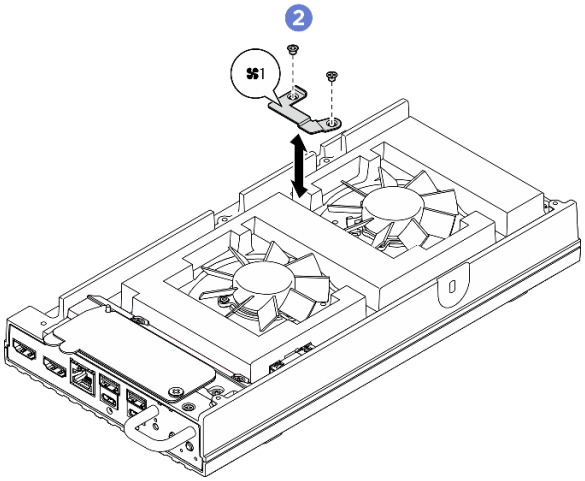


Figure 115. Fan module 1 cable bracket

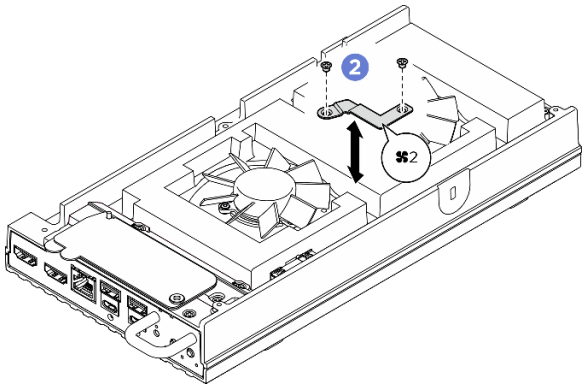


Figure 116. Fan module 2 cable bracket

c. 3 Remove the three screws that secure the fan module to the top cover; then gently lift the fan module.

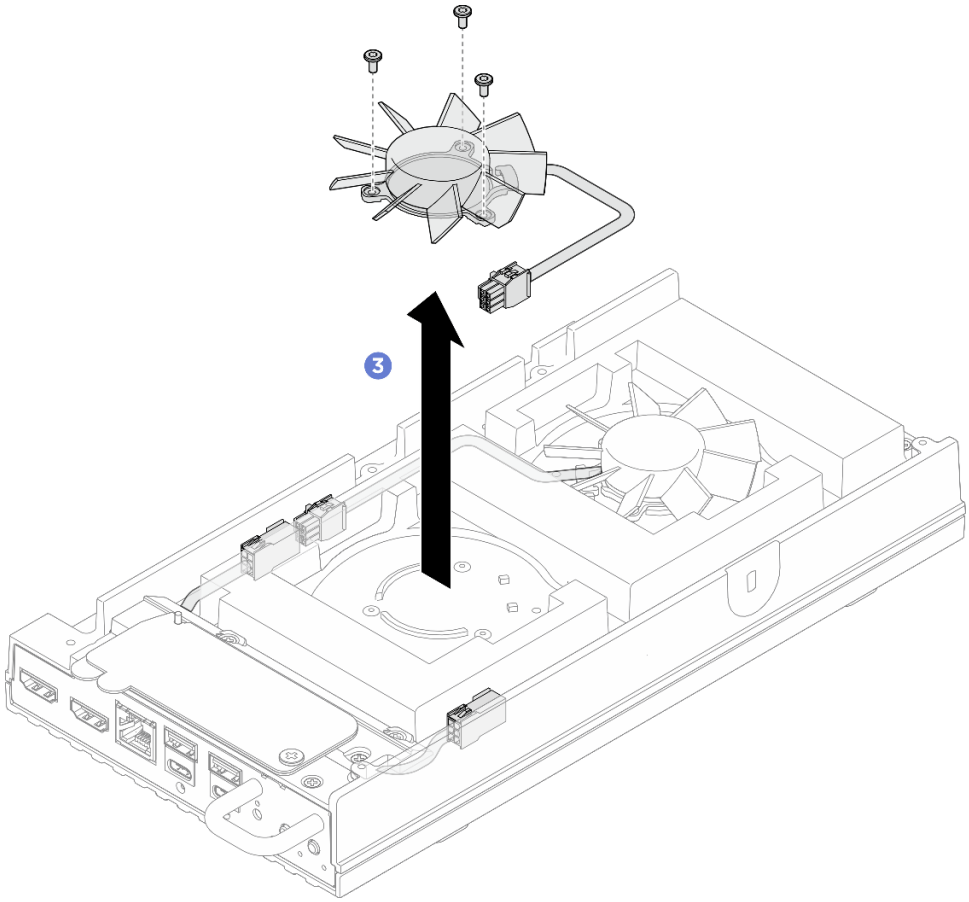


Figure 117. Removing the fan module

Note: If necessary, repeat the procedure to remove the other fan module.

After you finish

1. If necessary, install a replacement unit. See “Install a fan module” on page 134.

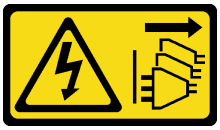
2. If the node is to be installed in an enclosure, install a rack mount fan shroud. See “Install the rack mount fan shroud” on page 128.
3. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a fan module

Follow instructions in this section to install a fan module.

About this task

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 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Make preparation for this task.

a. If the node was installed in an enclosure, remove the rack mount fan shroud. See “Remove a rack mount fan shroud” on page 125.

Step 2. Locate the fan slot on the top cover to install the fan module. See “System fan numbering” on page 30.

Step 3. Install the fan module.

a. ❶ Align the fan module with the fan slot on the top cover; then, tighten three screws to secure the fan module.

Note: Make sure to route the fan module cable through the guide slot as illustrated.

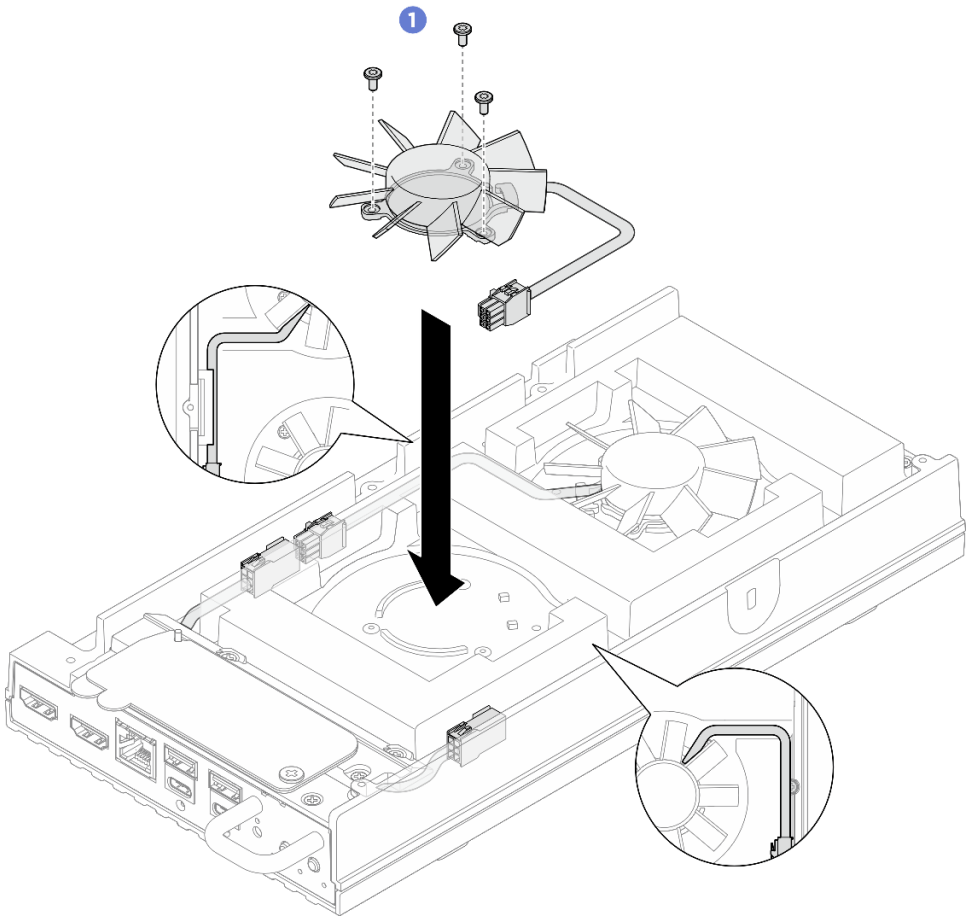


Figure 118. Installing the fan module

b. 2 Align the fan module cable bracket with the slot on the top cover; then, tighten two screws to secure the fan module cable bracket.

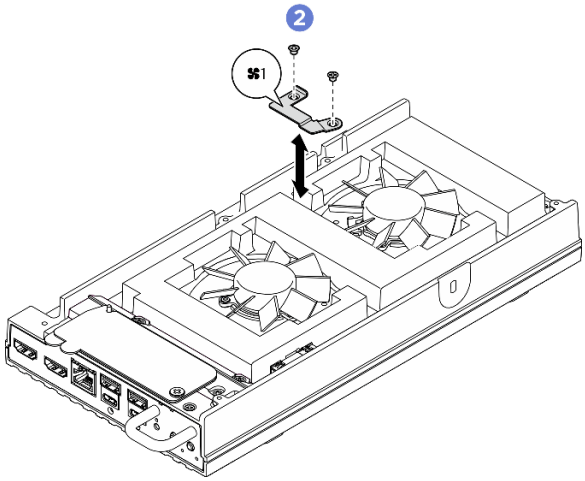


Figure 119. Fan module 1 cable bracket

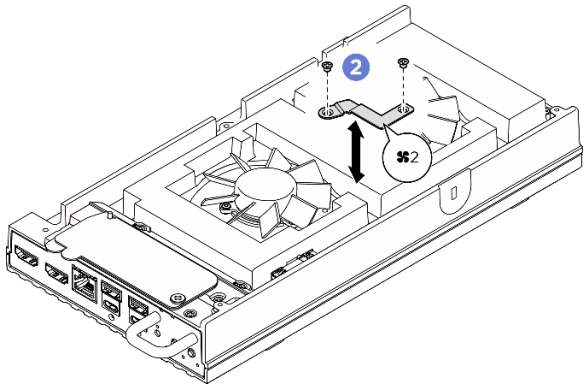


Figure 120. Fan module 2 cable bracket

c. 2 Connect the fan module cable to its connector. Route the cable properly through the cable slot on the top cover as illustrated to avoid interfering the fan shroud. For more information about cable routing, see ***SE100 Internal Cable Routing Guide***.

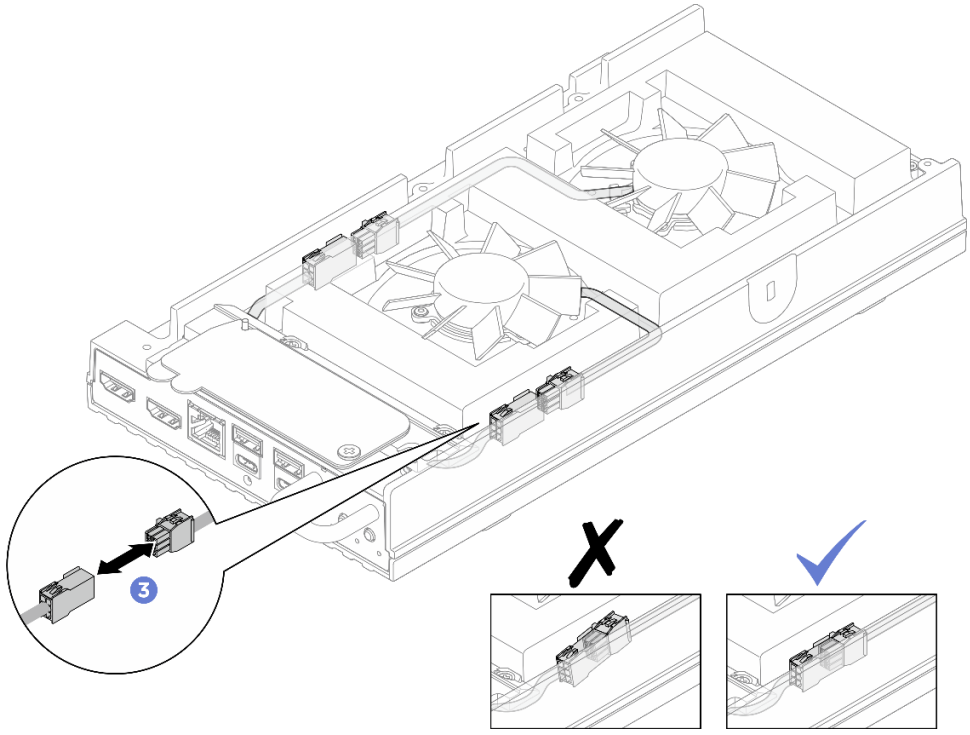


Figure 121. Connecting the fan bridge cable

Note: If necessary, repeat the procedure to install the other fan module.

After you finish

1. Install the desktop mount fan shroud. See “Install the desktop mount fan shroud” on page 127.
2. Complete the parts replacement. See “Complete the parts replacement” on page 219.

M.2 drive replacement (trained technician only)

Follow instructions in this section to remove or install an M.2 drive.

Remove an M.2 drive

Follow instructions in this section to remove an M.2 drive from the system board.

About this task

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 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See "Configuration guide" on page 53.

Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Prepare corresponding thermal pad kits for replacing the M.2 drive installed in specific slot:
  - M.2 drive in slot 1:
    - System board thermal pad kit
    - Bottom cover thermal pad kit
  - M.2 drive in slot 2 or slot 3:
    - System board thermal pad kit
    - Top cover thermal pad kit

  See "Thermal pad installation guidelines" on page 49 for details of thermal pad replacement.

Procedure

Step 1. Make preparation for this task.

a. Remove the fan shroud. See "Remove a fan shroud" on page 122.

b. If applicable, remove the expansion filler. See "Remove the expansion filler" on page 112.

c. If applicable, remove the expansion kit. See "Remove the expansion kit" on page 200.

d. Locate the M.2 drive to be removed, and remove the corresponding node cover.

1. To remove the M.2 drive from slot 1, remove the bottom cover. See "Remove the bottom cover" on page 162.
2. To remove the M.2 drive from slot 2 or slot 3, remove the top cover. See "Remove the top cover" on page 155.

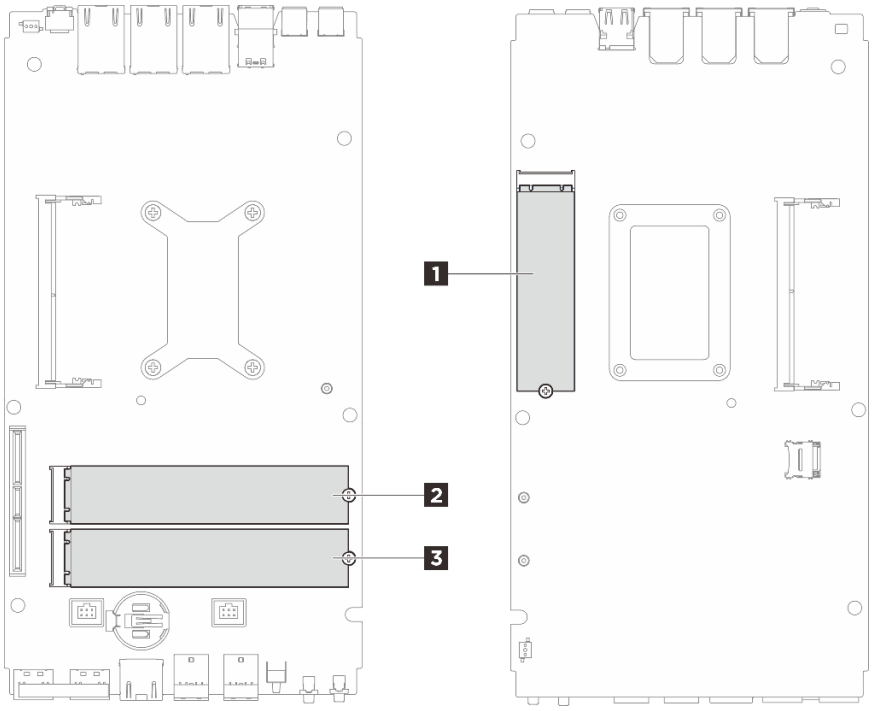


Figure 122. M.2 drive slot numbering

1 Slot 1 / M.2 drive 0	2 Slot 2 / M.2 drive 1
3 Slot 3 / M.2 drive 2	

Step 2. Proceed to the section corresponding to the M.2 drive to be removed:

- “Remove an M.2 drive from slot 1” on page 138
- “Remove an M.2 drive from slot 2 or slot 3” on page 139

Remove an M.2 drive from slot 1

Step 1. Remove the M.2 drive.

a. (1) Loosen the screw that secures the M.2 drive.

b. (2) Pivot the rear side of the M.2 drive away from the system board.

c. (3) Remove the M.2 drive from the slot.

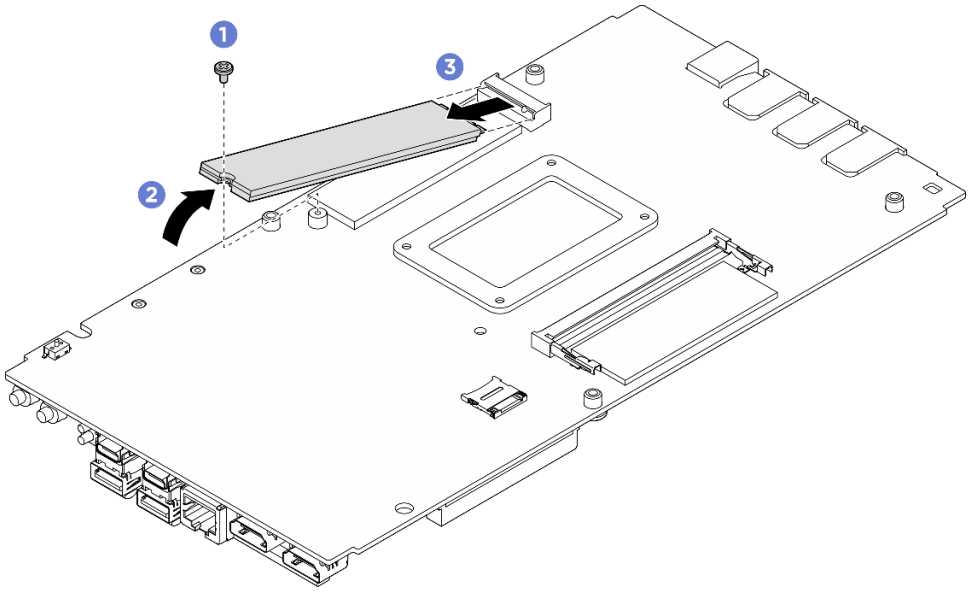


Figure 123. Removing the M.2 drive

After you finish

1. Install a replacement unit. See “Install an M.2 drive” on page 140.
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Remove an M.2 drive from slot 2 or slot 3

Step 1. Remove the M.2 drive.

a. 1 Loosen the screw that secures the M.2 drive.

b. 2 Pivot the rear side of the M.2 drive away from the system board.

c. 3 Remove the M.2 drive from the slot.

Note: If necessary, repeat this procedure to the other M.2 drive to be removed.

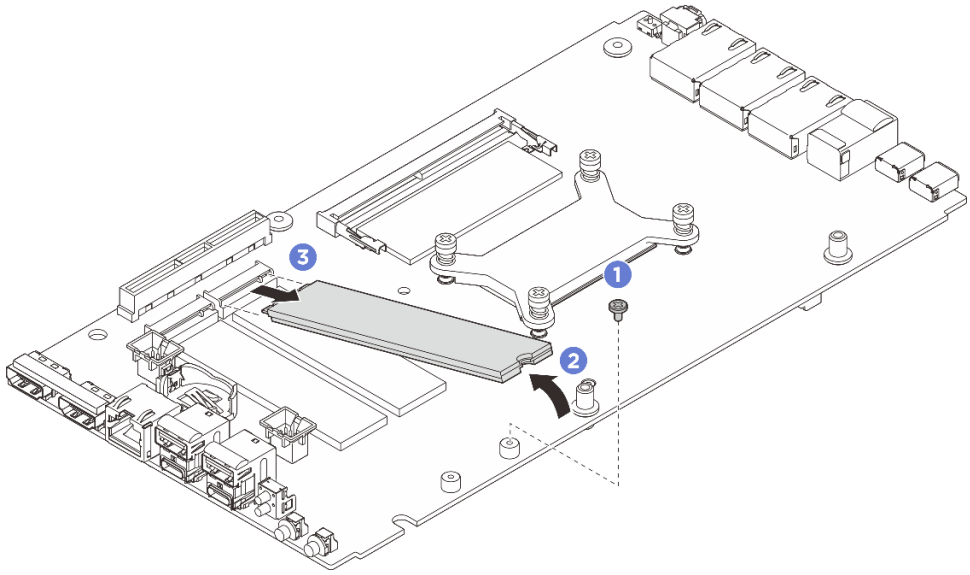


Figure 124. Removing the M.2 drive (22110 form factor)

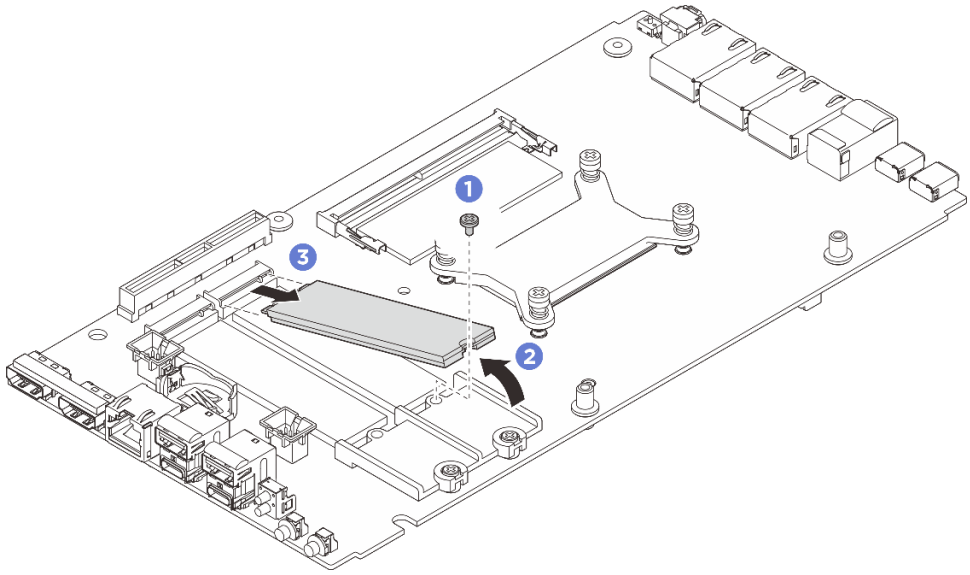


Figure 125. Removing the M.2 drive (2280 form factor)

After you finish

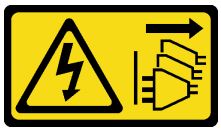
1. Install a replacement unit. See “Install an M.2 drive” on page 140.
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install an M.2 drive

Follow instructions in this section to install an M.2 drive to the system board.

About this task

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 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Prepare corresponding thermal pad kits for replacing the M.2 drive installed in specific slot:
  - M.2 drive in slot 1:
    - System board thermal pad kit
    - Bottom cover thermal pad kit
  - M.2 drive in slot 2 or slot 3:
    - System board thermal pad kit
    - Top cover thermal pad kit

  See “Thermal pad installation guidelines” on page 49 for details of thermal pad replacement.

Procedure

Step 1. Make preparation for this task.

a. Locate the slot to install the M.2 drive.

Attention: If there is only one M.2 drive to be installed to the system board, the M.2 drive should be installed in slot 1.

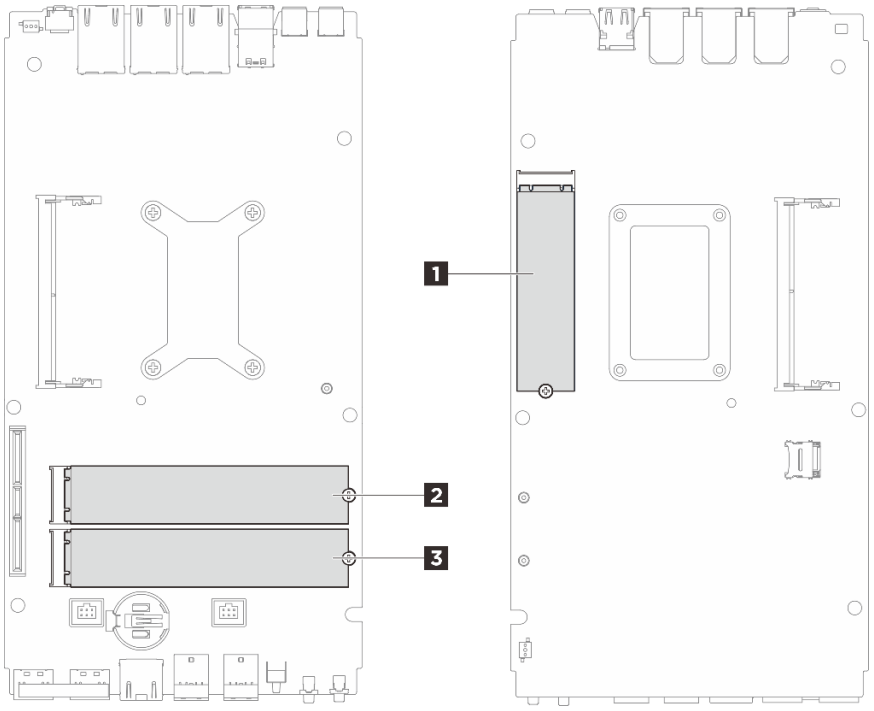


Figure 126. M.2 drive slot numbering

1 Slot 1 / M.2 drive 0	2 Slot 2 / M.2 drive 1
3 Slot 3 / M.2 drive 2	

Step 2. Proceed to the section corresponding to the M.2 drive to be installed:

- "Install the M.2 drive to slot 1" on page 142
- "Install the M.2 drive to slot 2 & slot 3" on page 143

Install the M.2 drive to slot 1

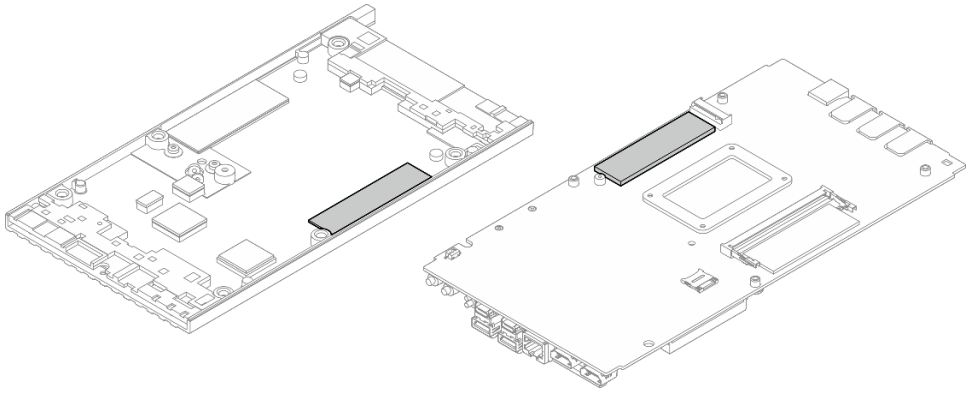
Procedure

Step 1. Make preparation for this task.

a. If a thermal pad is in any of the following conditions, replace the thermal pad with a new one. Make sure to follow "Thermal pad installation guidelines" on page 49.

- The thermal pad is damaged or detached from the surface.
- The new part to be installed is of different brand or form factor from the replaced one; the new part might cause thermal pads to be deformed or damaged.

Figure 127. M.2 drive slot 1 thermal pads (Bottom cover & system board side)



Step 2. Install the M.2 drive.

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

b. ❷ Lower the rear side of the M.2 drive down to the system board.

c. ❸ Secure the M.2 drive with one screw.

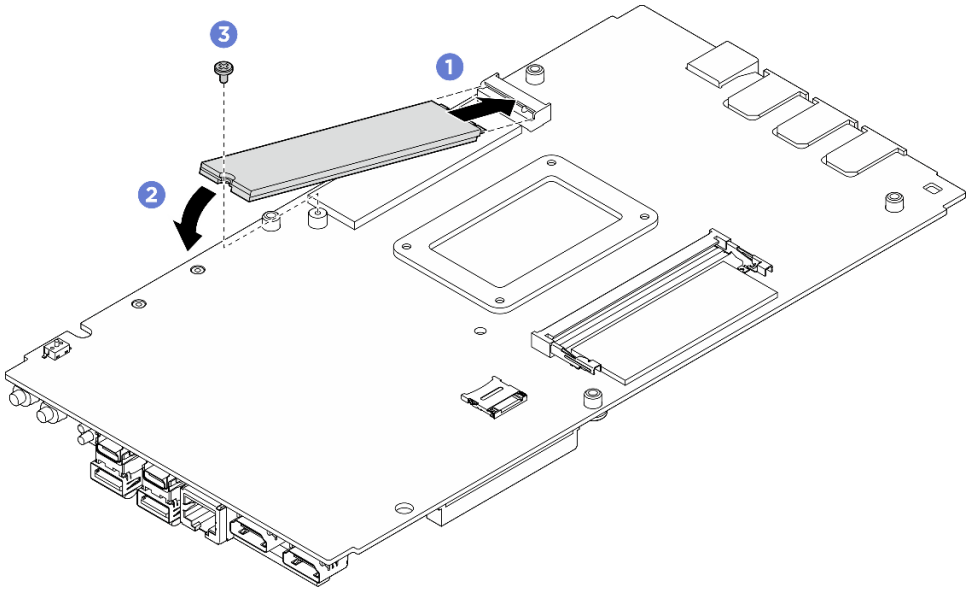


Figure 128. Installing the M.2 drive

After you finish

1. Install the bottom cover. See “Install the bottom cover” on page 165.
2. If applicable, install the expansion kit. See “Install the expansion kit” on page 200.
3. If applicable, install the expansion filler. See “Install the expansion filler” on page 113.
4. Install the fan shroud. See “Install the fan shroud” on page 126.
5. Complete the parts replacement. See “Complete the parts replacement” on page 219.

Install the M.2 drive to slot 2 & slot 3

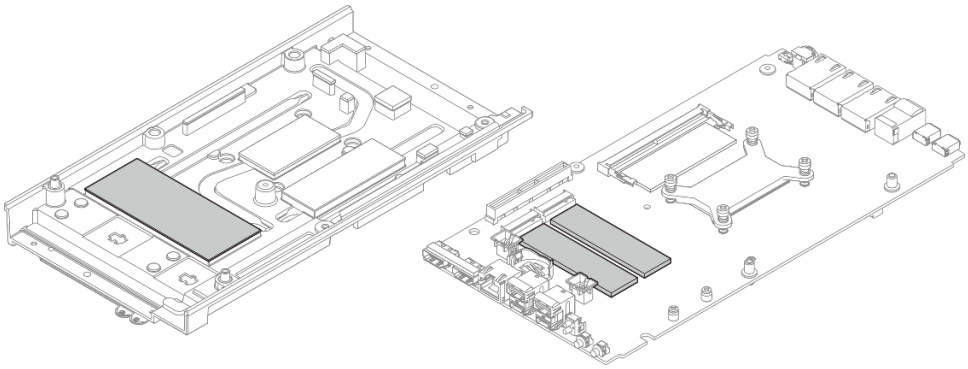
Procedure

Step 1. Make preparation for this task.

a. If a thermal pad is in any of the following conditions, replace the thermal pad with a new one. Make sure to follow “Thermal pad installation guidelines” on page 49.

- The thermal pad is damaged or detached from the surface.
- The new part to be installed is of different brand or form factor from the replaced one; the new part might cause thermal pads to be deformed or damaged.

Figure 129. M.2 drive slot 2 & slot 3 thermal pads (Top cover & system board side)



Step 2. Slot 2 and slot 3 support M.2 22110 drives and M.2 2280 drives. Depending on the form factor, the installation procedure varies.

a. Step 3 Install an M.2 22110 drive on page 144

b. Step 4 Install an M.2 2280 drive on page 145

Step 3. Follow the procedure below to install an M.2 22110 drive.

a. If applicable, remove the M.2 holder.

1. Remove the two screws that secure the M.2 holder.
2. Lift the M.2 holder from the system board.

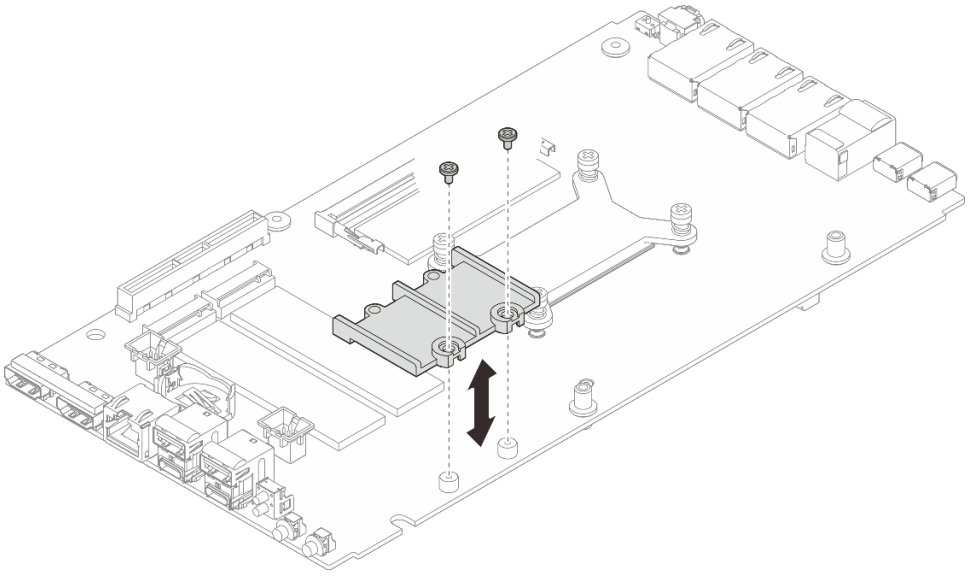


Figure 130. Removing the M.2 holder

b. Install the M.2 drive.

1. ❶ Hold the M.2 drive at an angle, and insert the drive into the M.2 slot.
2. ❷ Lower the rear side of the M.2 drive down to the system board.
3. ❸ Secure the M.2 drive with one screw.

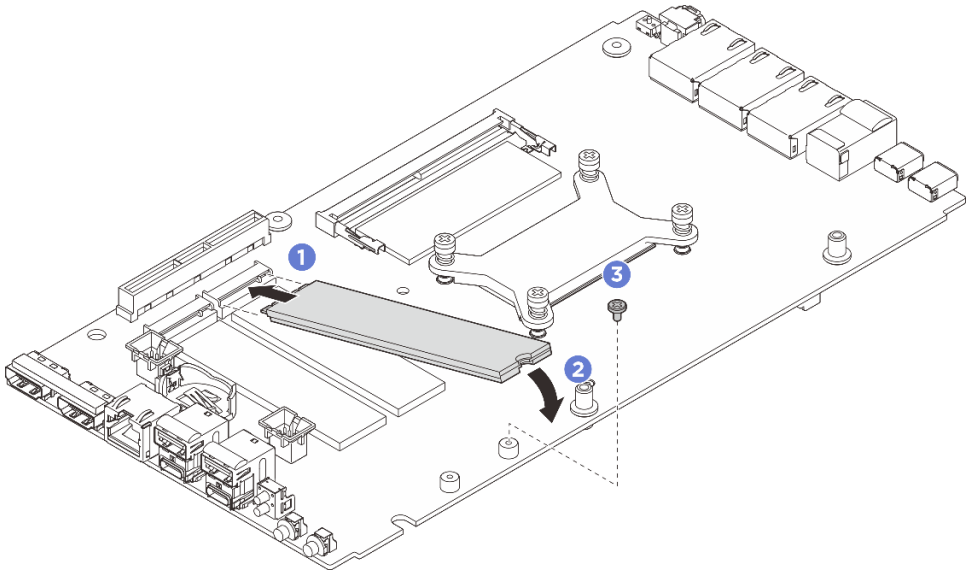


Figure 131. Installing an M.2 22110 drive

Step 4. Follow the procedure below to install an M.2 2280 drive.

a. Make sure the M.2 holder is properly installed.
   1. Align the M.2 holder with the guide pins; then place the M.2 holder on the system board.
   2. Secure the M.2 holder with two screws.

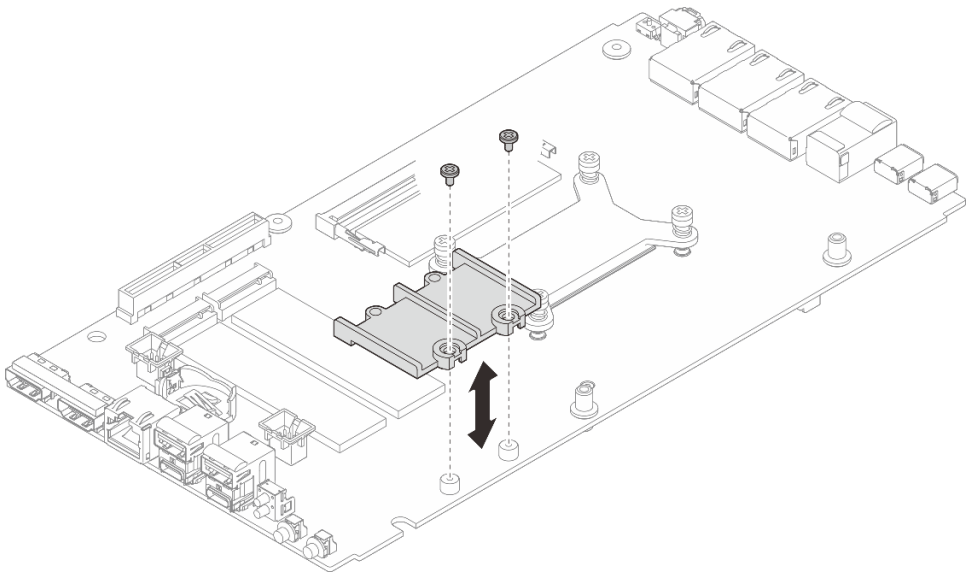


Figure 132. Installing the M.2 holder

b. Install the M.2 drive.
   1. ❶ Hold the M.2 drive at an angle, and insert the drive into the M.2 slot.

2. ❷ Lower the rear side of the M.2 drive down to the system board.
3. ❸ Secure the M.2 drive with one screw.

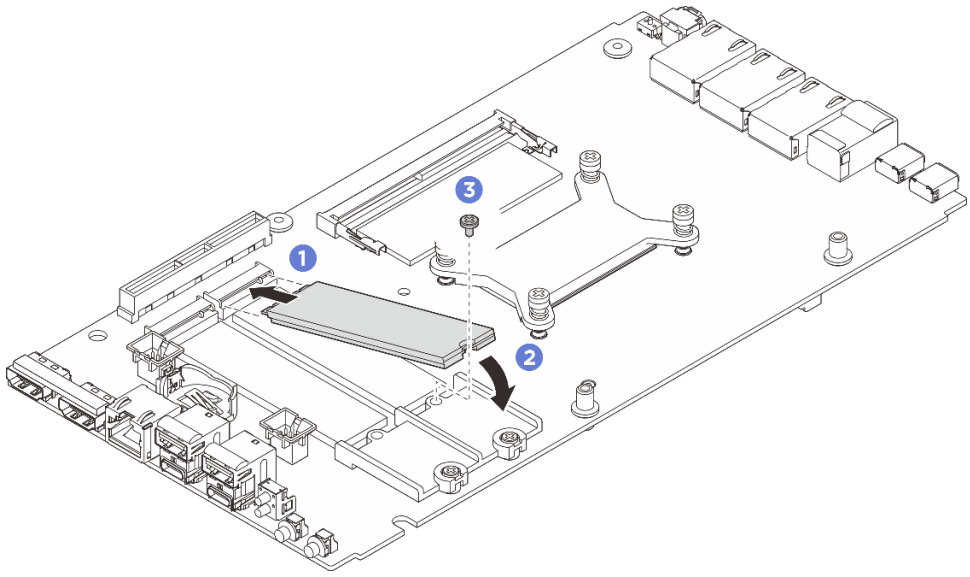


Figure 133. Installing an M.2 2280 drive

After you finish

1. Install the top cover. See “Install the top cover” on page 158.
2. Install the expansion kit or the expansion filler. See “Install the expansion kit” on page 200 or “Install the expansion filler” on page 113.
3. Install the fan shroud. See “Install the fan shroud” on page 126.
4. Complete the parts replacement. See “Complete the parts replacement” on page 219.

Memory module replacement (trained technician only)

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

Remove a memory module

Follow instructions in this section to remove a memory module.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See “Configuration guide” on page 53.

- If you are not installing a replacement memory module to the same slot, make sure you have memory module filler available.
- Memory modules are sensitive to static discharge and require special handling. Refer to the standard guidelines for “Handling static-sensitive devices” on page 46.
  - 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.

Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Prepare corresponding thermal pad kits for replacing the memory module installed in specific slot:
  - Memory module in slot 1:
    - System board thermal pad kit
    - Top cover thermal pad kit
  - Memory module in slot 2:
    - System board thermal pad kit
    - Top cover thermal pad kit

  See “Thermal pad installation guidelines” on page 49 for details of thermal pad replacement.

Procedure

Step 1. Make preparation for this task.

a. Remove the fan shroud. See “Remove a fan shroud” on page 122.

b. If applicable, remove the expansion filler. See “Remove the expansion filler” on page 112.

c. If applicable, remove the expansion kit. See “Remove the expansion kit” on page 200.

d. Locate the memory module to be removed on the system board, and remove the corresponding node cover.

1. To remove the memory module from slot 1, remove the top cover. See “Remove the top cover” on page 155.
2. To remove the memory module from slot 2, remove the bottom cover. See “Remove the bottom cover” on page 162.

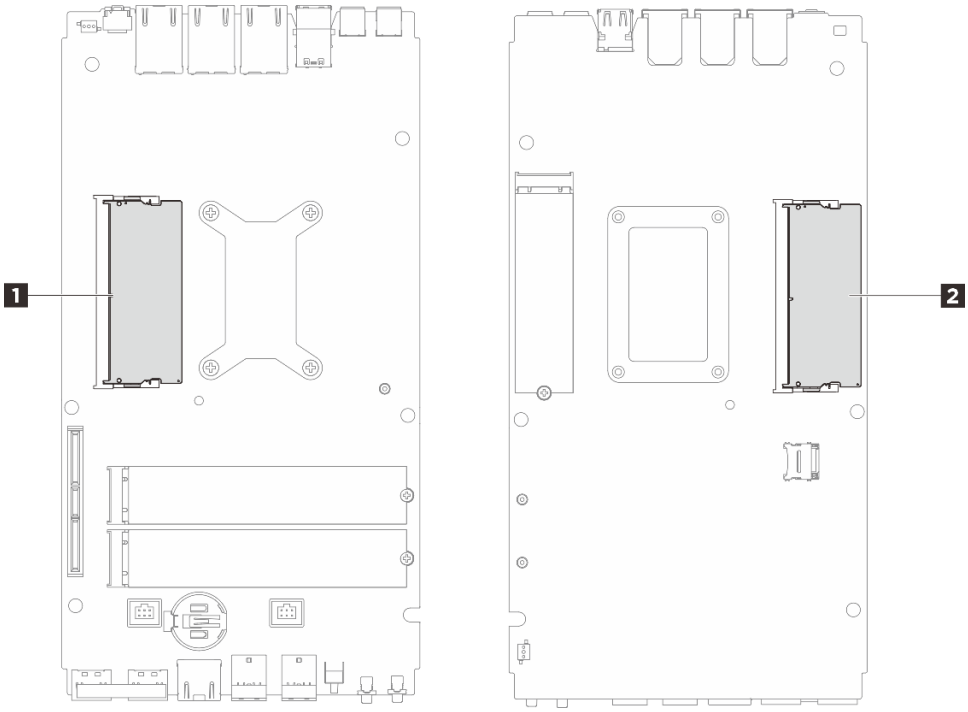


Figure 134. Memory modules and processor layout

Table 17. Location of memory modules

1 DIMM slot 1 (top side)	2 DIMM slot 2 (bottom side)

Step 2. Remove the memory module from the slot.

a. ❶ Carefully spread apart the securing clips on each end of the memory module slot until the memory module pops up.

b. ❷ Remove the memory module from the memory module slot.

Attention: To avoid breaking the securing clips or damaging the memory module slots, handle the clips gently.

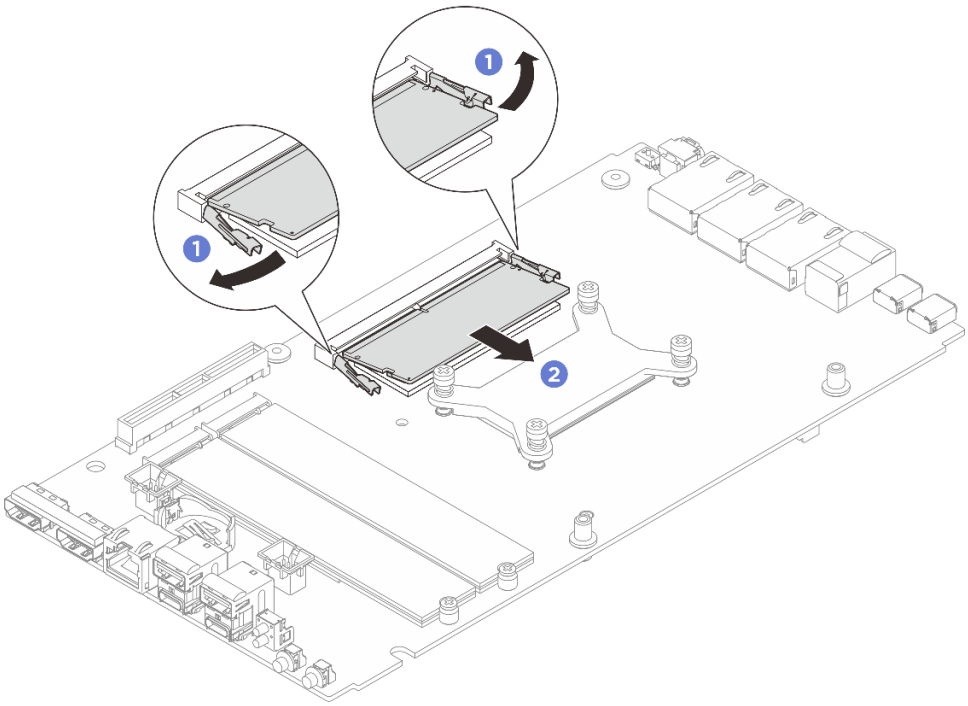


Figure 135. Removing the memory module

After you finish

1. Install a replacement unit. See “Install a memory module” on page 149.
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a memory module

Follow instructions in this section to install a memory module.

About this task

See “Memory module installation rules and order” on page 47 for detailed information about memory configuration and setup.

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.
- Make sure to adopt one of the supported configurations listed in “Memory module installation rules and order” on page 47.
- Memory modules are sensitive to static discharge and require special handling. Refer to the standard guidelines at “Handling static-sensitive devices” on page 46:
  - 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.

Important: Remove or install memory modules for one processor at a time.

Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

-
  - Prepare corresponding thermal pad kits for replacing the memory module installed in specific slot:
    - Memory module in slot 1:
      - System board thermal pad kit
      - Top cover thermal pad kit
    - Memory module in slot 2:
      - System board thermal pad kit
      - Top cover thermal pad kit

    See “Thermal pad installation guidelines” on page 49 for details of thermal pad replacement.

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

- Go to https://datacentersupport.lenovo.com/tw/en/products/servers/thinkedge/se100/7dgr/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 221 for more information on firmware updating tools.

Procedure

Step 1. Make preparation for this task.

a. Locate the memory module slot on the system board.

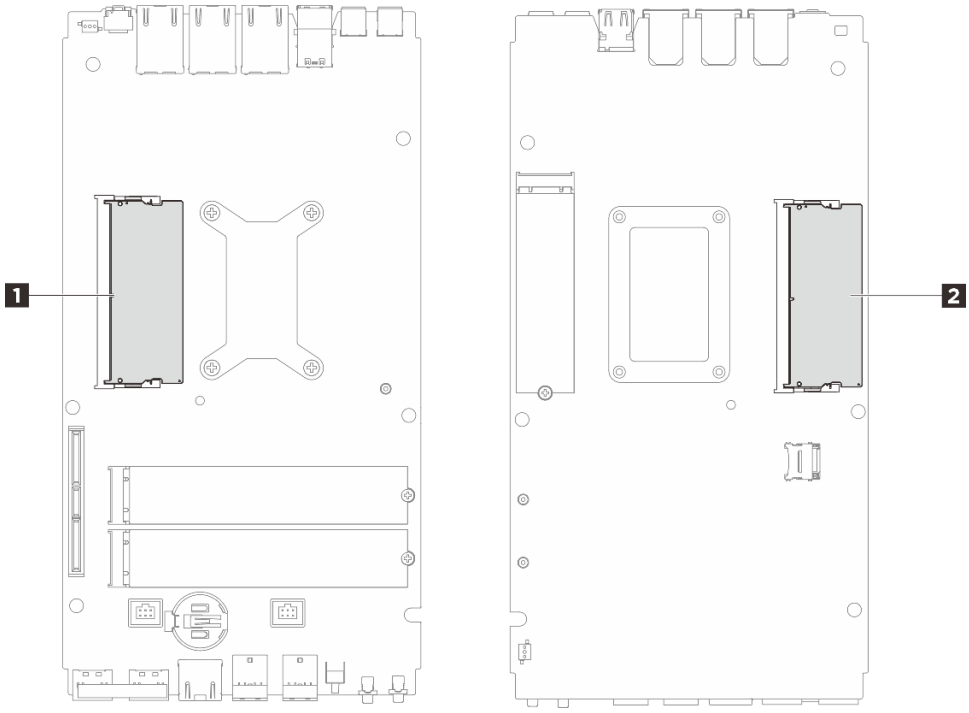


Figure 136. Memory modules and processor layout

Table 18. Location of memory modules

1 DIMM slot 1 (top side)	2 DIMM slot 2 (bottom side)

b. Replace the thermal pad and the ESD absorbent pads if the thermal pad is in any of the following conditions. Make sure to follow "Thermal pad installation guidelines" on page 49.

- The thermal pad is damaged or detached from the surface.
- The new part to be installed is of different brand or form factor from the replaced one; the new part might cause thermal pads to be deformed or damaged.

Figure 137. Memory module slot 1 thermal pads (Top cover & system board side)

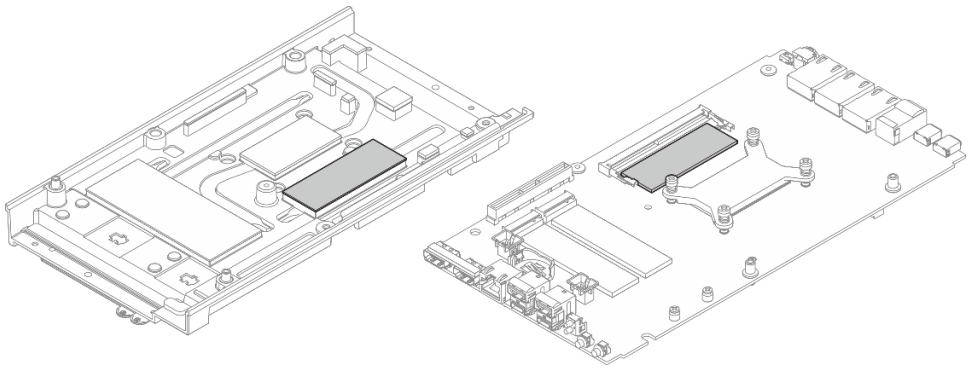
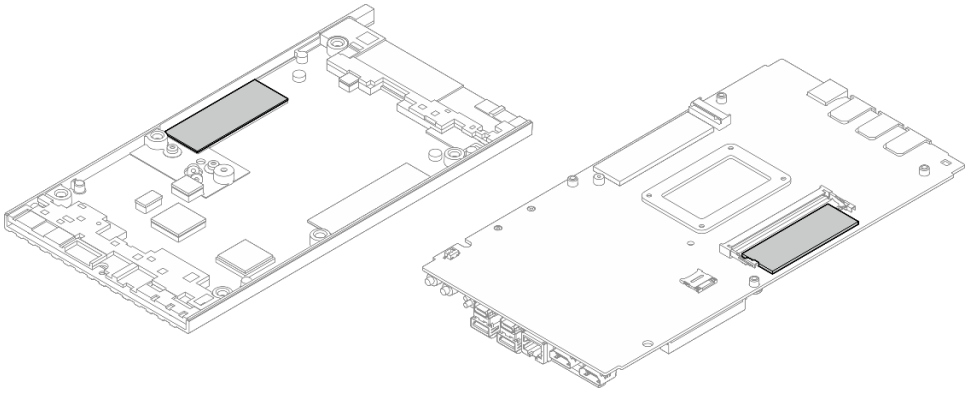


Figure 138. Memory module slot 2 thermal pads (Bottom cover & system board side)



Step 2. Touch the static-protective package that contains the memory module to any unpainted surface on the outside of the server. Then, take the memory module out of the package and place it on a static-protective surface.

Step 3. Install the memory module into the slot.

a. ❶ Align the notch on the memory module with the tab on the memory module slot; then insert the memory module at an angle of approximately 30 degrees into the slot.

b. ❷ Press the memory module down until it clicks into place.

Note: Make sure the securing pins are fully locked and the gold finger is fully inserted into the slot as illustrated.

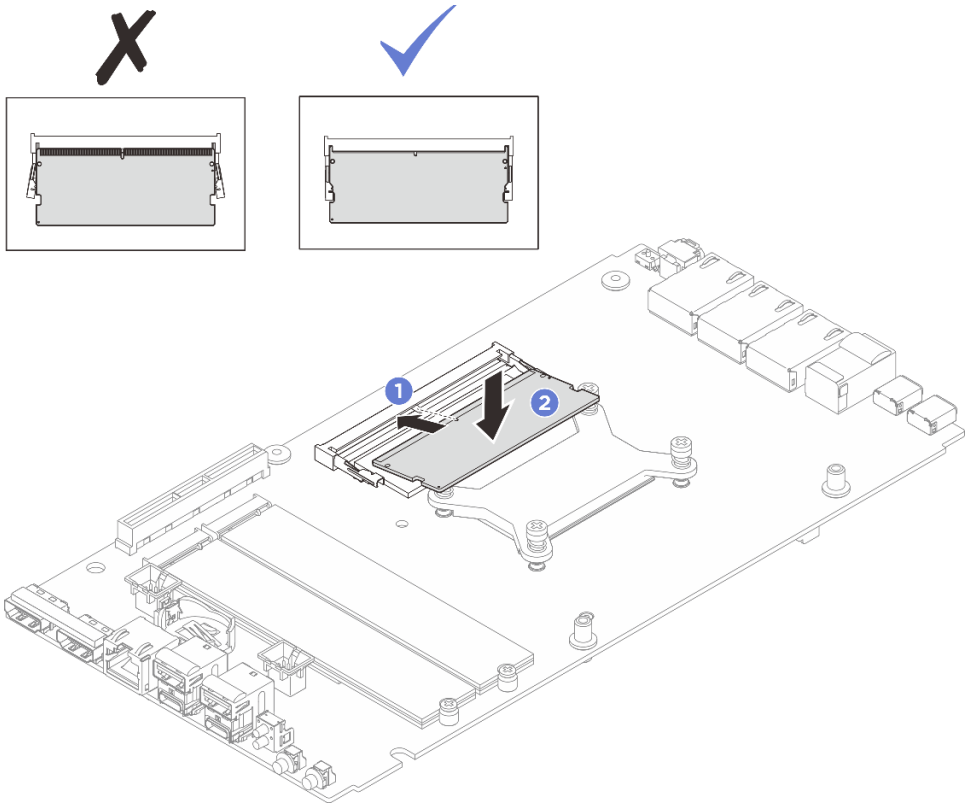


Figure 139. Memory module installation

After you finish

1. If applicable, install the top cover. See “Install the top cover” on page 158.
2. If applicable, install the bottom cover. See “Install the bottom cover” on page 165.
3. Install the expansion kit or the expansion filler. See “Install the expansion kit” on page 200 or “Install the expansion filler” on page 113.
4. Install the fan shroud. See “Install the fan shroud” on page 126.
5. Complete the parts replacement. See “Complete the parts replacement” on page 219.

MicroSD card replacement

Follow instructions in this section to remove and install the MicroSD card.

Remove the MicroSD card

Follow instructions in this section to remove the MicroSD card.

About this task

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 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See “Configuration guide” on page 53.

Procedure

Step 1. Make preparation for this task.
   a. Remove the fan shroud. See “Remove a fan shroud” on page 122.
   b. If applicable, remove the expansion filler. See “Remove the expansion filler” on page 112.
   c. If applicable, remove the expansion kit. See “Remove the expansion kit” on page 200.
   d. Remove the bottom cover. See “Remove the bottom cover” on page 162.

Step 2. Locate the MicroSD socket on the system board. See “System-board connectors” on page 27.

Step 3. Remove the MicroSD card.
   a. ❶ Slide the socket lid to the open position.
   b. ❷ Lift open the socket lid.

c. ❸ Remove the MicroSD card from the socket.

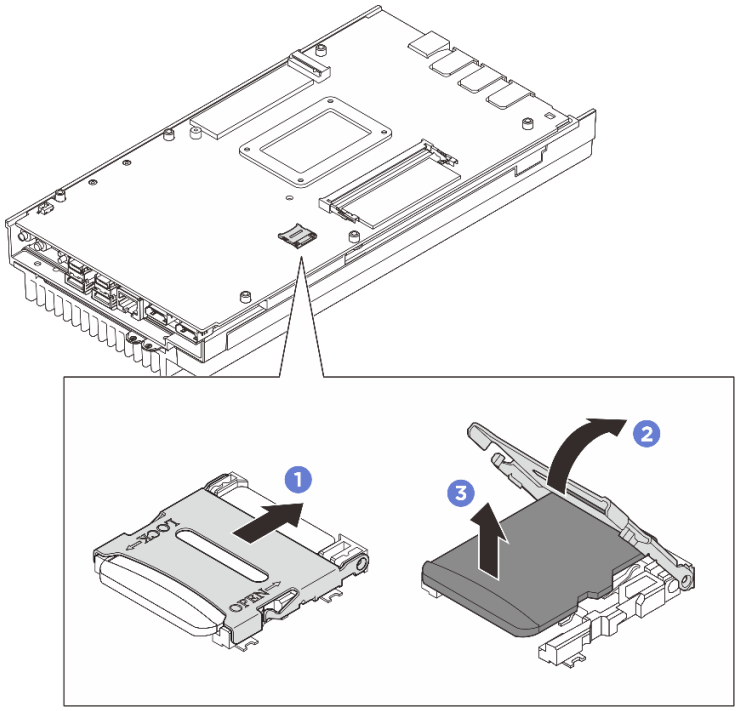


Figure 140. Removing the MicroSD card

After you finish

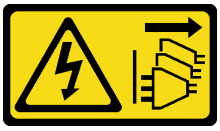
- Install a replacement unit. See "Install the MicroSD card" on page 154.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the MicroSD card

Follow instructions in this section to install the MicroSD card.

About this task

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 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.

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

Procedure

Step 1. Locate the MicroSD socket on the system board. See “System-board connectors” on page 27.

Step 2. Install the MicroSD card.

a. ❶ Place the MicroSD card into the socket.

b. ❷ Close the socket lid.

c. ❸ Slide the socket lid to the lock position.

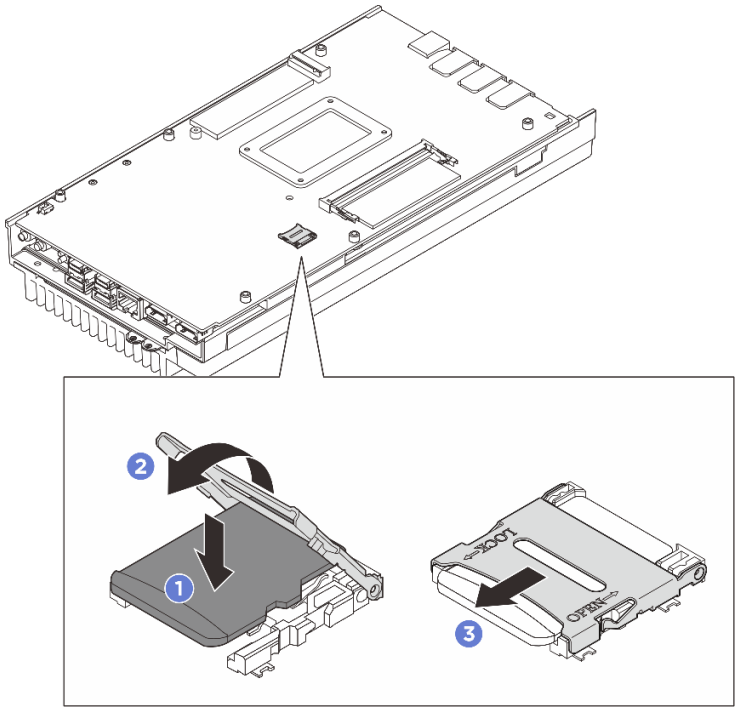


Figure 141. Installing the MicroSD card

After you finish

1. Install the bottom cover. See “Install the bottom cover” on page 165.
2. Install the expansion kit or the expansion filler. See “Install the expansion kit” on page 200 or “Install the expansion filler” on page 113.
3. Install the fan shroud. See “Install the fan shroud” on page 126.
4. Complete the parts replacement. See “Complete the parts replacement” on page 219.

Node cover replacement (trained technician only)

Follow instructions in this section to remove and install the node covers.

Remove the top cover

Follow instructions in this section to remove the top cover.

About this task

S014

CAUTION:
Hazardous voltage, current, and energy levels might be present. Only a qualified service technician is authorized to remove the covers where the label is attached.

S033

CAUTION:
Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in spattered metal, burns, or both.

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See "Configuration guide" on page 53.

Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Prepare a top cover thermal pad kit. See "Thermal pad installation guidelines" on page 49 for details of thermal pad replacement.
- Prepare the following screwdrivers:
  - Phillips #1 head screwdriver
  - Phillips #2 head screwdriver

Procedure

Step 1. Make preparation for this task.

a. Remove the fan shroud. See "Remove a fan shroud" on page 122.

b. If applicable, remove the expansion filler. See "Remove the expansion filler" on page 112.

c. If applicable, remove the expansion kit. See "Remove the expansion kit" on page 200.

Step 2. Remove the screws from the top cover.

a. ❶ Slide the pull-out information tabs outward from the node.

b. ❷ Remove the four Phillips #1 screws located on the short side of the top cover.

Note: Make sure to slide the pull-out information tabs back once the screw underneath is fully removed.

c. 3 Remove the four Phillips #2 screws located on the long side of the top cover; then, reverse the node to let the bottom side of the node facing up.

Notes:

- The screws to be removed might be covered by fan cables. Carefully pull the fan cable out a little bit to remove the screw underneath, and put the cable back after removing the screw.

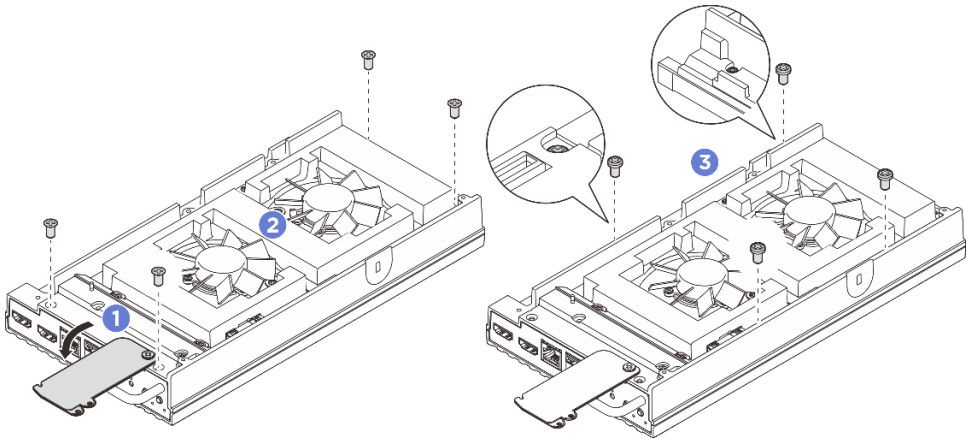


Figure 142. Removing screws from the top cover

Step 3. Remove the front and rear I/O brackets.

a. 1 Loosen the two Phillips #1 screws located on the short side of the bottom cover.

b. 2 Loosen the two Phillips #2 screws located on the long side of the bottom cover.

c. 3 Hold the blue touch points on the rear side of the node and the I/O bracket handle on the front side of the node; then pull the front and rear I/O brackets from the node.

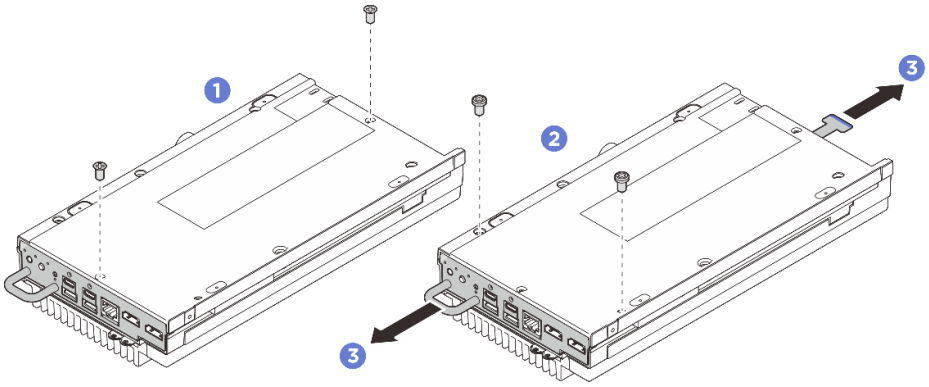


Figure 143. Removing the front and rear I/O brackets

Step 4. Let the top side of the node facing up.

Step 5. Remove the top cover.

a. 1 Locate the right thumb on the rear side of the node tab and hold the front side of the node by its edge with your left hand. While pressing the node tab with your right thumb, pulling up the rear side of the top cover at the same time until the rear side of the top cover pops up.

Note: To separate the top cover from the node more easily, insert your left hand fingers into the hole on the front of the node as illustrated.

b. 2 Gently lift up the front side of the top cover until the cover is fully separated from the node.

c. 3 Remove the top cover from the node and place the top cover on a flat clean surface.

Attention: To make sure that there is adequate system cooling, install both top cover and bottom cover before powering on the server. Operating the server with the covers removed might damage server components.

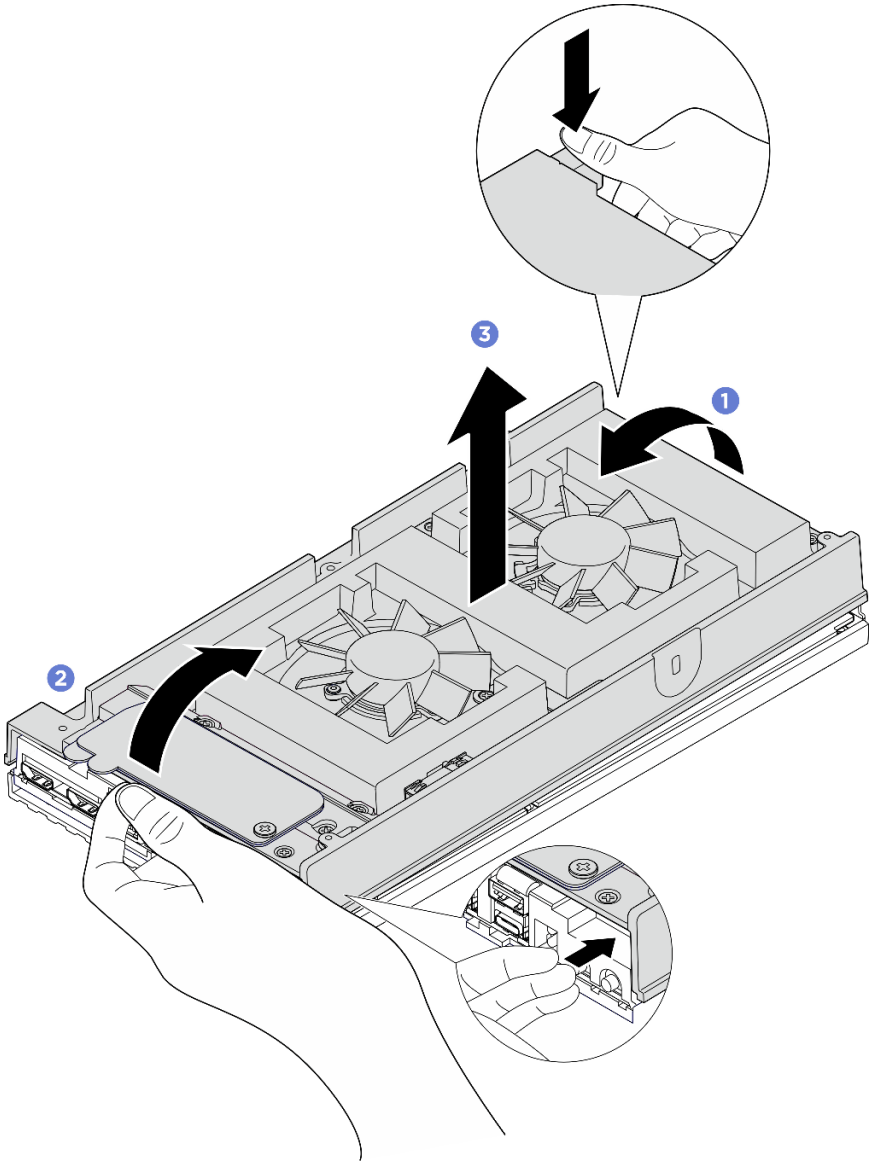


Figure 144. Removing the top cover

After you finish

1. Install a replacement unit. See "Install the top cover" on page 158.
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the top cover

Follow instructions in this section to install the top cover.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your server.

Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Prepare a top cover thermal pad kit. See “Thermal pad installation guidelines” on page 49 for details of thermal pad replacement.
- Prepare the following screwdrivers:
  - Phillips #1 head screwdriver
  - Phillips #2 head screwdriver

Important: If you are installing a new top cover, make sure to attach new thermal pads to the top cover first. Follow the rules and identify the location of the thermal pads in “Thermal pad installation guidelines” on page 49.

Procedure

Step 1. Make preparation for this task.

a. Check the thermal pads on the top cover. If a thermal pad is damaged or detached from the cover, replace it with a new one. Make sure to follow “Thermal pad installation guidelines” on page 49.

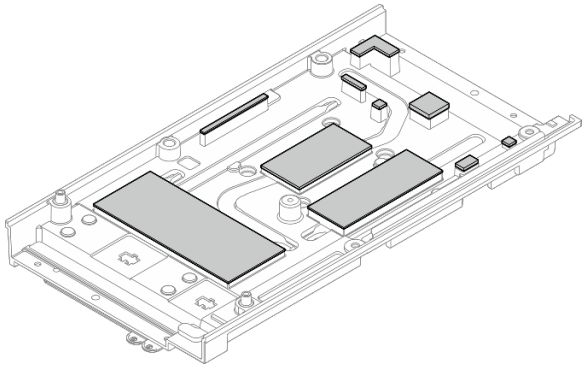


Figure 145. Top cover thermal pads

Step 2. Install the top cover.

a. ❶ Align the top cover with the guiding slots on both sides of the node; then, lower the top cover onto the node.

b. ❷ Insert the front and rear I/O brackets into the node until they are seated in place.

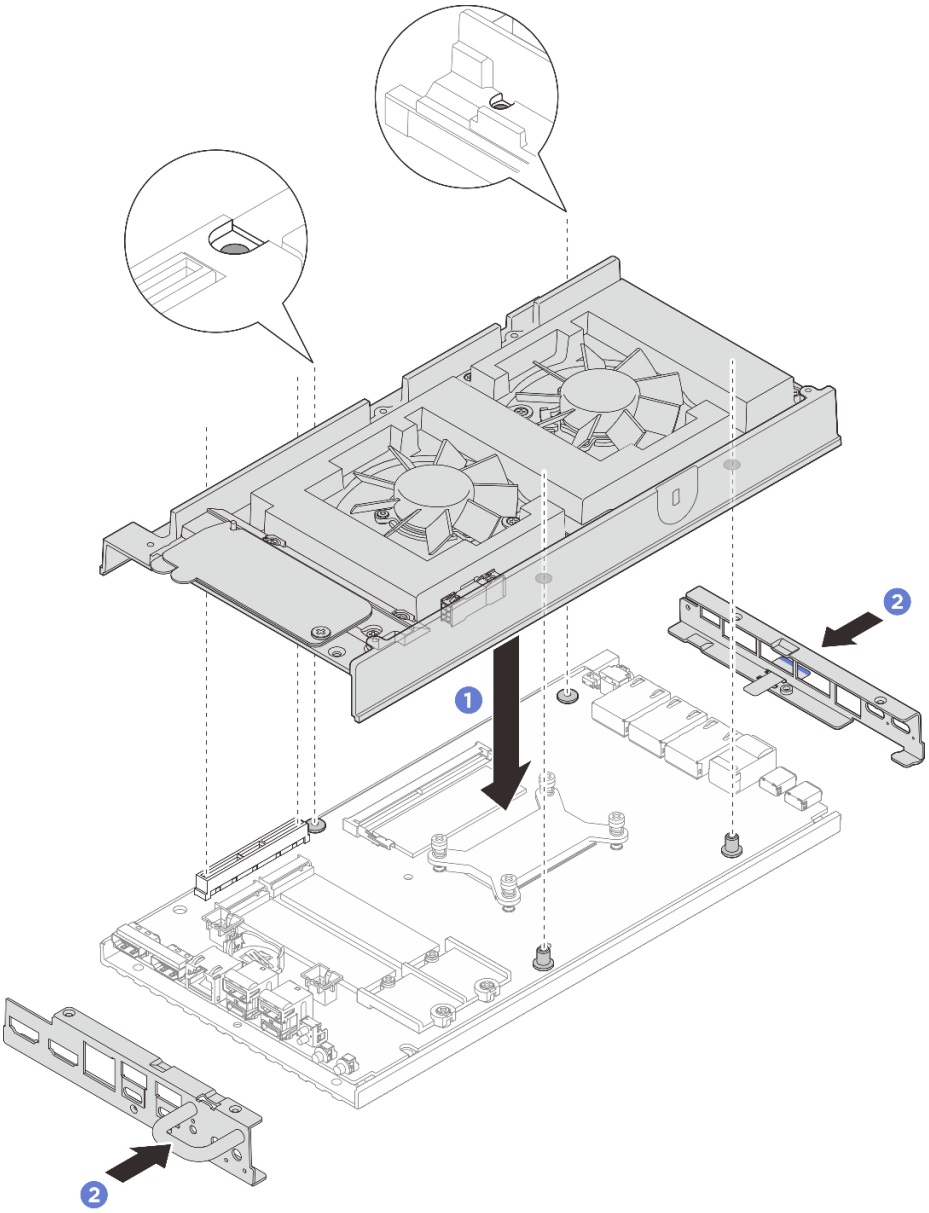


Figure 146. Installing the top cover

Step 3. Tighten screws to secure the cover.

a. ❶ Tighten four Phillips #2 screws to the long sides of the top cover.

Note: The screw holes might be covered by fan cables. Carefully pull the fan cable out a little bit to install the screw, and put the cable back after installing the screw.

b. ❷ Slide the pull-out information tabs outward from the node.

c. ❸ Tighten the four Phillips #1 screws with pre-applied white threadlocking adhesive to the short sides of the top cover; then let the bottom side of the node facing up.

Note: Make sure to slide the pull-out information tabs back once the screw underneath is fully installed.

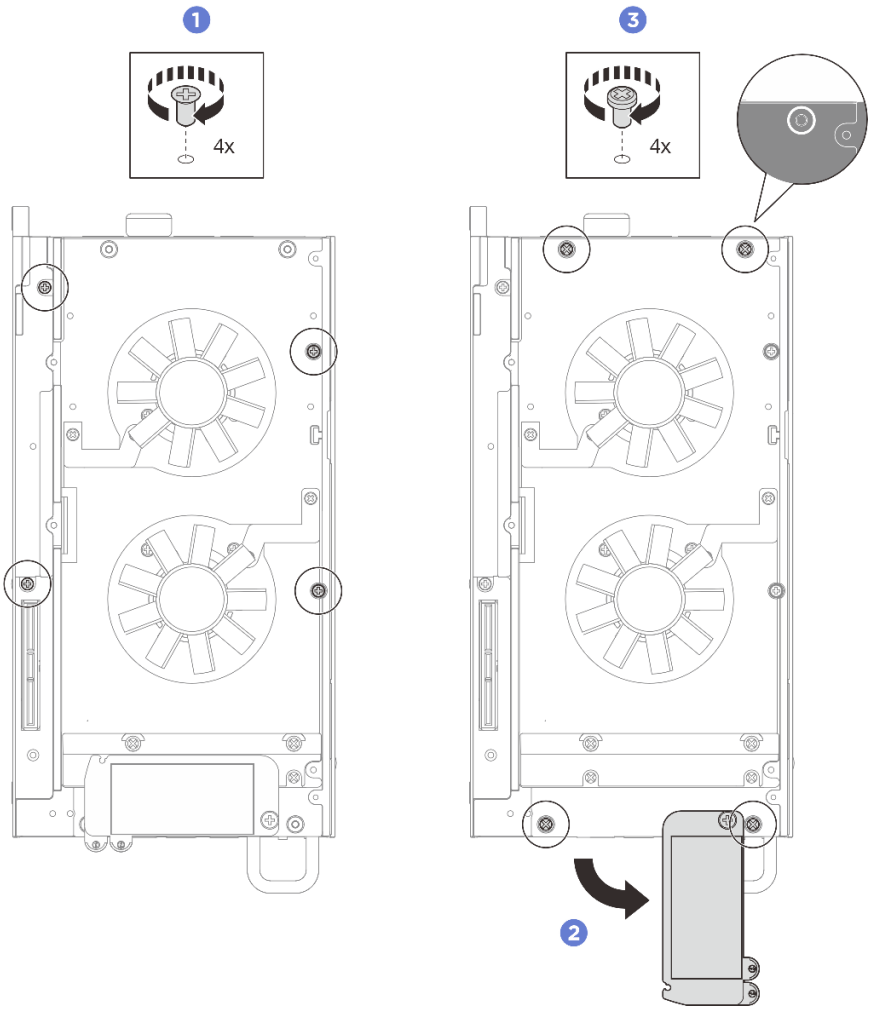


Figure 147. Installing the screws

Step 4. Tighten screws to the bottom cover.

a. 1 Tighten two Phillips #1 screws with pre-applied white threadlocking adhesive to secure the front and rear I/O brackets.

b. 2 Tighten the two Phillips #2 screws to the bottom cover as illustrated.

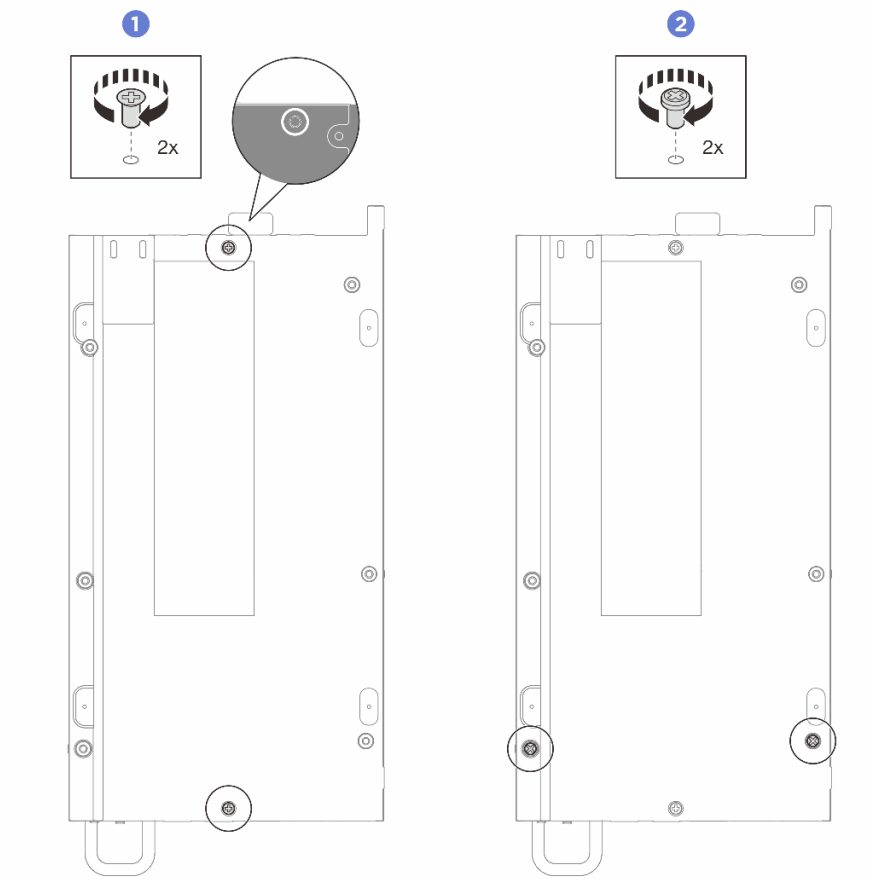


Figure 148. Installing the screws

After you finish

1. Install the expansion kit or the expansion filler. See “Install the expansion kit” on page 200 or “Install the expansion filler” on page 113.
2. Install the fan shroud. See “Install the fan shroud” on page 126.
3. Complete the parts replacement. See “Complete the parts replacement” on page 219.

Remove the bottom cover

Follow instructions in this section to remove the bottom cover.

About this task

S014

CAUTION:
Hazardous voltage, current, and energy levels might be present. Only a qualified service technician is authorized to remove the covers where the label is attached.

S033

CAUTION:
Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in spattered metal, burns, or both.

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See “Configuration guide” on page 53.

Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Prepare a bottom cover thermal pad kit. See “Thermal pad installation guidelines” on page 49 for details of thermal pad replacement.
- Prepare the following screwdrivers:
  - Phillips #1 head screwdriver
  - Phillips #2 head screwdriver

Procedure

Step 1. Make preparation for this task.

a. Remove the fan shroud. See “Remove a fan shroud” on page 122.

b. If applicable, remove the expansion filler. See “Remove the expansion filler” on page 112.

c. If applicable, remove the expansion kit. See “Remove the expansion kit” on page 200.

Step 2. Remove the screws from the top cover.

a. ❶ Slide the pull-out information tabs outward from the node.

b. ❷ Remove the four Phillips #1 screws located on the top cover; then reverse the node to let the bottom side facing up.

Note: Make sure to slide the pull-out information tabs back once the screw underneath is fully removed.

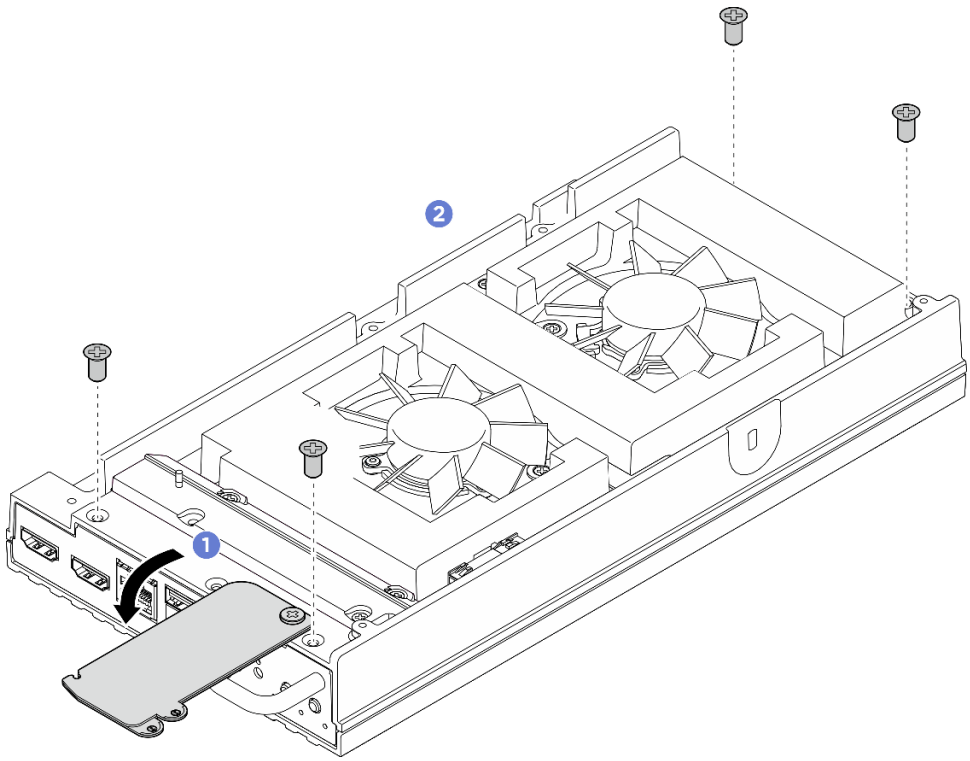


Figure 149. Removing the screws from the top cover

Step 3. Remove the bottom cover.

a. ❶ Remove the two Phillips #1 screws located on the short side of the bottom cover.

b. ❷ Remove the six Phillips #2 screws from the long side of the bottom cover.

c. ❸ Hold the blue touch points on the rear side of the node and the I/O bracket handle on the front side of the node; then pull the front and rear I/O brackets from the node.

d. ❹ Lift up the bottom cover from the node, and place it on a flat clean surface.

Attention: To make sure that there is adequate system cooling, install both top cover and bottom cover before powering on the server. Operating the server with the covers removed might damage server components.

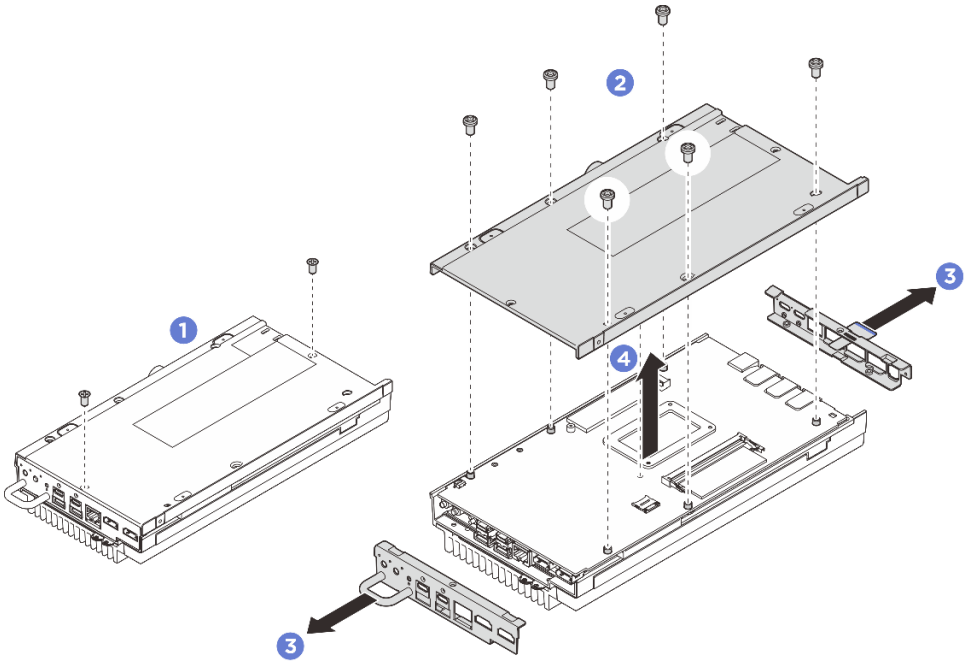


Figure 150. Removing the bottom cover

After you finish

1. Install a replacement unit. See "Install the bottom cover" on page 165.
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the bottom cover

Follow instructions in this section to install the bottom cover.

About this task

S014

CAUTION:
Hazardous voltage, current, and energy levels might be present. Only a qualified service technician is authorized to remove the covers where the label is attached.

S033

CAUTION:
Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in spattered metal, burns, or both.

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your server.

Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Prepare a bottom cover thermal pad kit. See “Thermal pad installation guidelines” on page 49 for details of thermal pad replacement.
- Prepare the following screwdrivers:
  - Phillips #1 head screwdriver
  - Phillips #2 head screwdriver

Important: If you are installing a new bottom cover to the server, make sure to attach the new thermal pads to the bottom cover first. Follow the rules and identify the location of the thermal pads in “Thermal pad installation guidelines” on page 49.

Procedure

Step 1. Make preparation for this task.

a. Check the thermal pads on the bottom cover. If a thermal pad is damaged or detached from the cover, replace it with a new one. Make sure to follow “Thermal pad installation guidelines” on page 49.

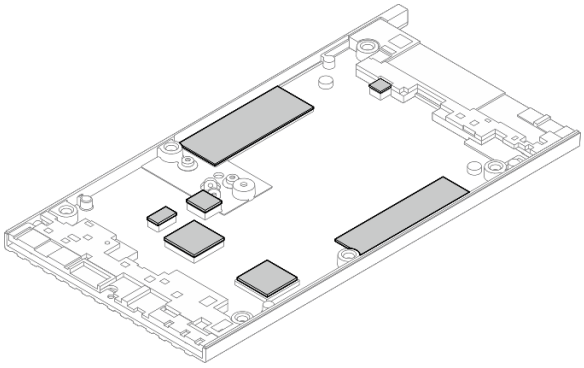


Figure 151. Bottom cover thermal pads

Step 2. Install the bottom cover.

a. ❶ Align the bottom cover with the guiding slots on both sides of the node; then, lower the bottom cover onto the node.

b. ❷ Insert the front and rear I/O brackets into the node until they are seated in place.

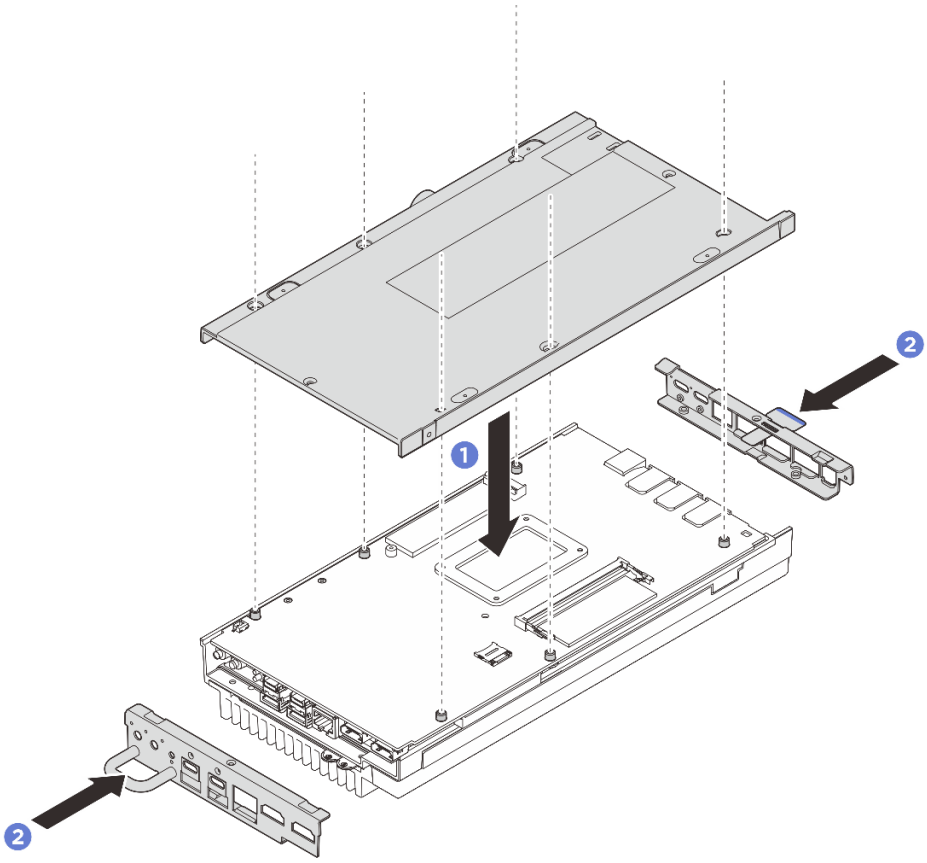


Figure 152. Installing the bottom cover

Step 3. Tighten screws to secure the cover.

a. ❶ Tighten two Phillips #1 screws with pre-applied white threadlocking adhesive to the short sides of the bottom cover.

b. ❷ Tighten six Phillips #2 screws to the long sides of the bottom cover as illustrated; then reverse the node to let the top side facing up.

c. ❸ Slide the pull-out information tabs outward from the node.

d. ❹ Tighten four Phillips #1 screws with pre-applied white threadlocking adhesive to the short sides of the top cover.

Note: Make sure to slide the pull-out information tabs back once the screw underneath is fully installed.

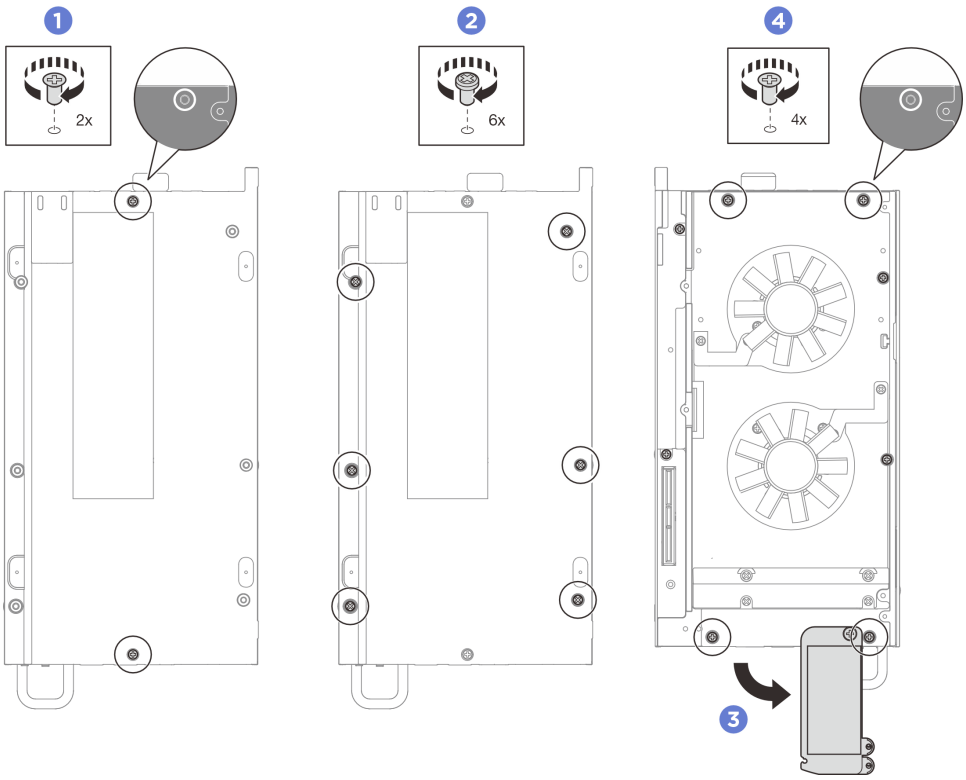


Figure 153. Installing the screws

After you finish

1. Install the fan shroud. See “Install the fan shroud” on page 126.
2. Install the expansion kit or the expansion filler. See “Install the expansion kit” on page 200 or “Install the expansion filler” on page 113.
3. Complete the parts replacement. See “Complete the parts replacement” on page 219.

Processor heat sink replacement

Follow instructions in this section to remove and install the processor heat sink.

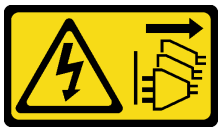
Important: The processor in your server can throttle in response to thermal conditions, temporarily lowering its speed to reduce heat output. In instances where a few processor cores are throttled for an extremely short time period (100 ms or less), the only indication might be an entry in the operating 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

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

About this task

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 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See "Power off the server" on page 53.
- 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.
- Do not allow the thermal grease on the processor or heat sink to come 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.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See "Configuration guide" on page 53.

Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Prepare the following thermal pad kits:
  - Top cover thermal pad kit
  - Bottom cover thermal pad kit

  See "Thermal pad installation guidelines" on page 49 for details of thermal pad replacement.

Procedure

Step 1. Make preparation for this task.
  a. Remove the fan shroud. See "Remove a fan shroud" on page 122.
  b. If applicable, remove the expansion filler. See "Remove the expansion filler" on page 112.
  c. If applicable, remove the expansion kit. See "Remove the expansion kit" on page 200.

Step 2. Remove the screws from the top cover.

a. ❶ Slide the pull-out information tabs outward from the node.

b. ❷ Remove the four Phillips #1 screws located on the short side of the top cover.

Note: Make sure to slide the pull-out information tabs back once the screw underneath is fully removed.

c. ❸ Remove the four Phillips #2 screws located on the long side of the top cover; then, reverse the node to let the bottom side of the node facing up.

Notes:

- The screws to be removed might be covered by fan cables. Carefully pull the fan cable out a little bit to remove the screw underneath, and put the cable back after removing the screw.

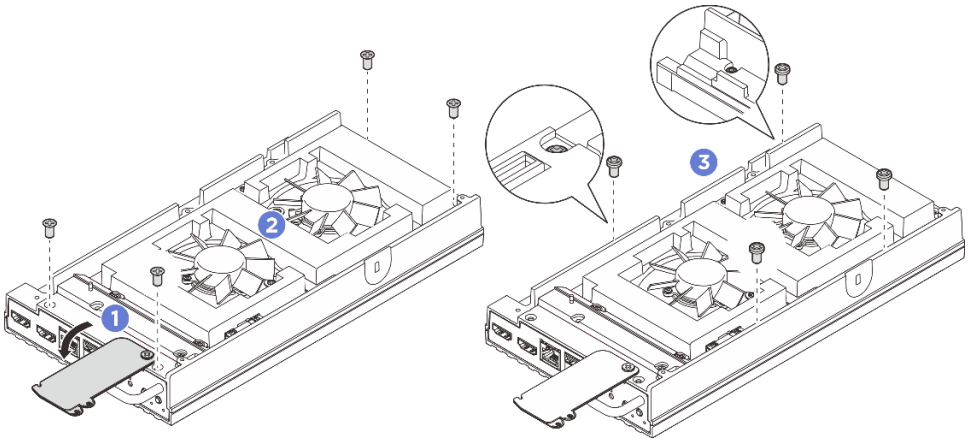


Figure 154. Removing screws from the top cover

Step 3. Remove the bottom cover.

a. ❶ Remove the two Phillips #1 screws located on the short side of the bottom cover.

b. ❷ Remove the six Phillips #2 screws from the long side of the bottom cover.

c. ❸ Hold the blue touch points on the rear side of the node and the I/O bracket handle on the front side of the node; then pull the front and rear I/O brackets from the node.

d. ❹ Lift up the bottom cover from the node, and place it on a flat clean surface.

Attention: To make sure that there is adequate system cooling, install both top cover and bottom cover before powering on the server. Operating the server with the covers removed might damage server components.

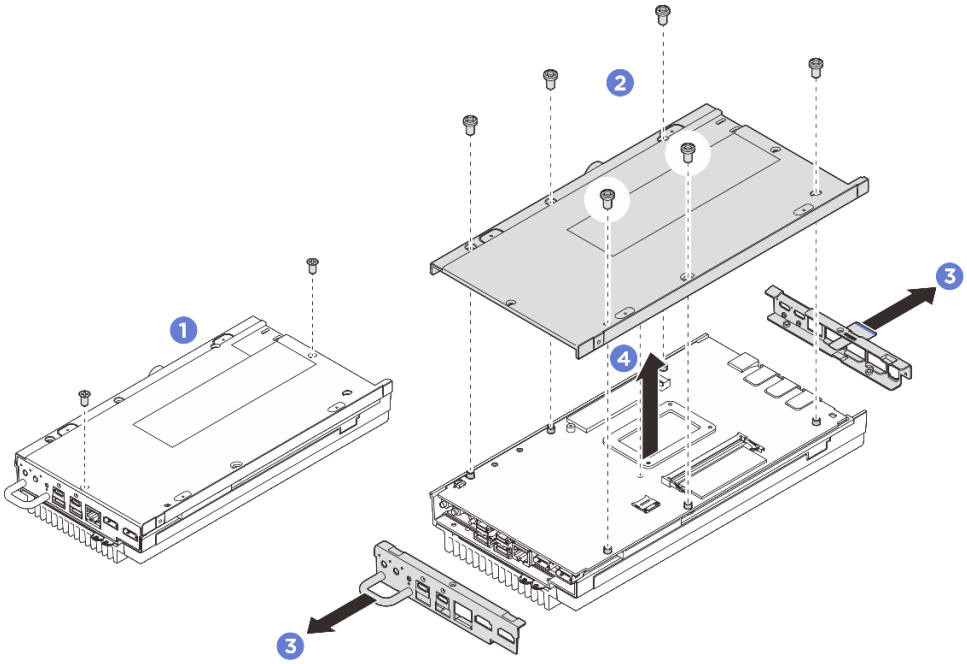


Figure 155. Removing the bottom cover

Step 4. Separate the system board from the top cover.

a. 1 Carefully separate the system board with the top cover from the edge of the front I/O connectors.

b. 2 Gently lift up the rear I/O side of the system board until the system board is fully separated from the top cover.

c. 3 Lift up the system board to remove it from the top cover. Hold both sides of the system board and turn it over to let the top side of the system board facing up; then place it on a static-protective surface.

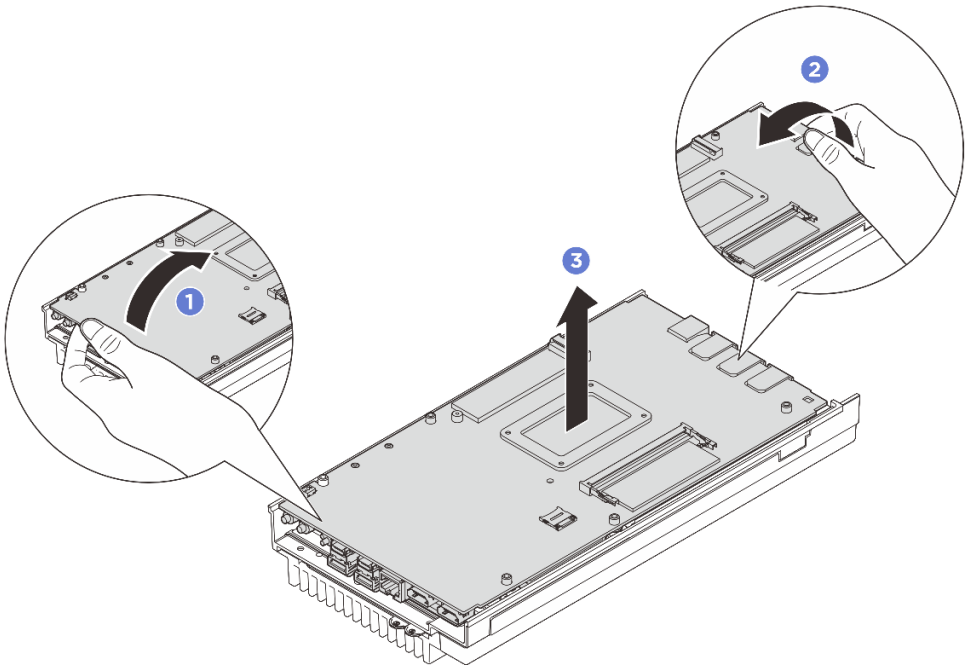


Figure 156. Removing the system board

Step 5. Remove the processor heat sink.

a. Follow the screw sequence 1 to 4 shown in the illustration to partially loosen the screws that secure heat sink; then, follow the same sequence to fully loosen the screws.

b. Lift the heat sink evenly to remove it from the server.

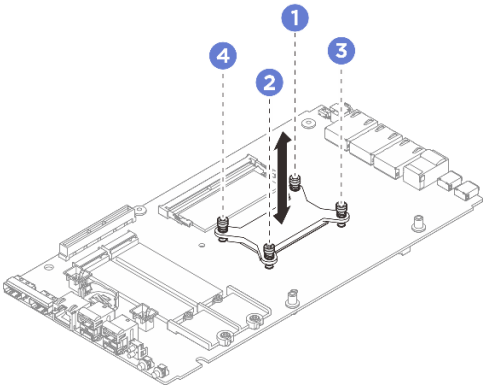


Figure 157. Removing the processor heat sink

After you finish

- Install a replacement unit. See "Install the processor heat sink" on page 172.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the processor heat sink

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

About this task

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.

Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Prepare the following thermal pad kits:
  - Top cover thermal pad kit
  - Bottom cover thermal pad kit

  See “Thermal pad installation guidelines” on page 49 for details of thermal pad replacement.

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- 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.
- Do not allow the thermal grease on the processor or heat sink to come 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 preparation for this task.

a. If there is any old thermal grease on the processor, gently clean the top of the processor using an alcohol cleaning pad. Dispose of the cleaning pad after all of the thermal grease is removed.

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

b. To ensure the best performance, check the manufacturing date on the new heat sink and make sure it does not exceed 2 years. Otherwise, wipe off the existing thermal grease on the heat sink; then, apply the new grease on the top of the processor with syringe by forming four uniformly spaced dots, while each dot consists of about 0.1 ml of thermal grease for optimal thermal performance.

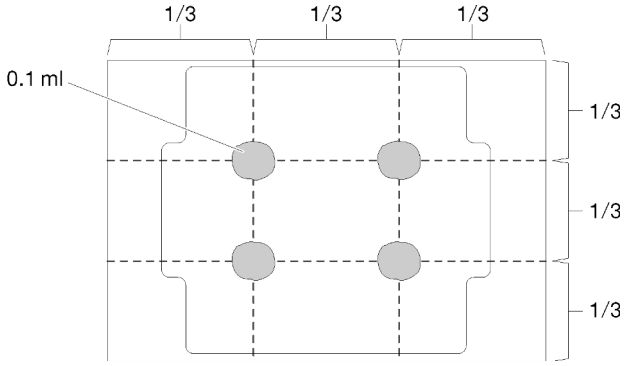


Figure 158. Proper shape of the thermal grease

c. Check the thermal pads on node covers. If a thermal pad is in any of the following conditions, replace the thermal pad with a new one. Make sure to follow "Thermal pad installation guidelines" on page 49.

- The thermal pad is damaged or detached from the surface.
- The new part to be installed is of different brand or form factor from the replaced one; the new part might cause thermal pads to be deformed or damaged.

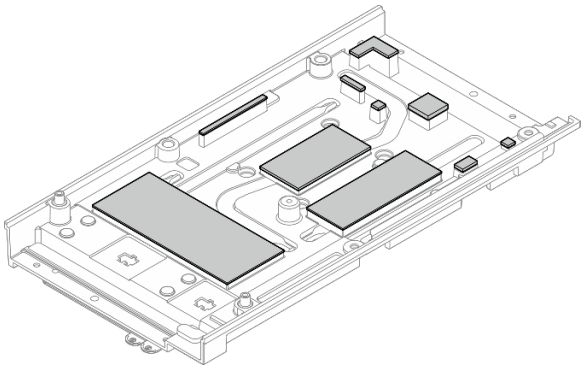


Figure 159. Top cover thermal pads

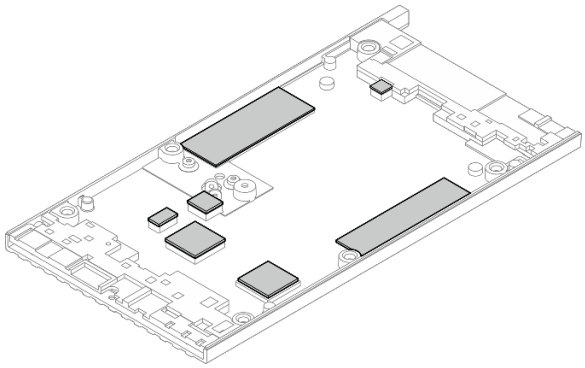


Figure 160. Bottom cover thermal pads

Step 2. Install the processor backplate.

a. ❶ Align the processor backplate with the screw holes on the bottom side of the system board; then lower the processor backplate down to the system board.

b. ❷ Hold the processor backplate together with the system board; then turn the system board over to let the top side facing up.

Note: Make sure not to drop the processor backplate when turning the system board over since the processor backplate is not yet secured to the system board.

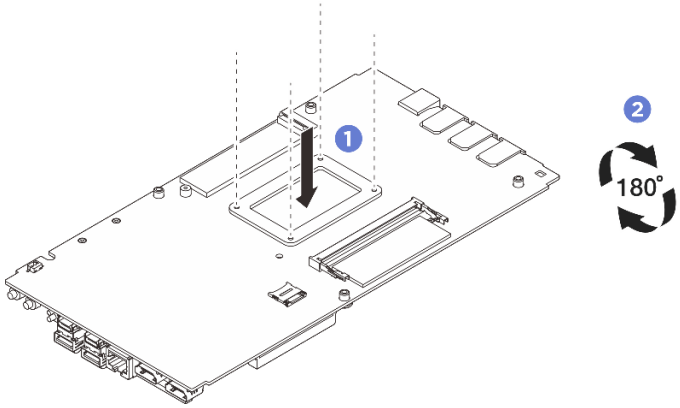


Figure 161. Installing the processor backplate

Step 3. Install the processor heat sink.

a. Align the processor heat sink with the screw holes on the system board; then lower the heat sink down to the system board.

b. Follow the screw sequence ❶ to ❹ shown in the illustration to partially tighten the screws; then, follow the same sequence to fully tighten the screws to secure the processor heat sink with the processor backplate on the bottom side of the system board.

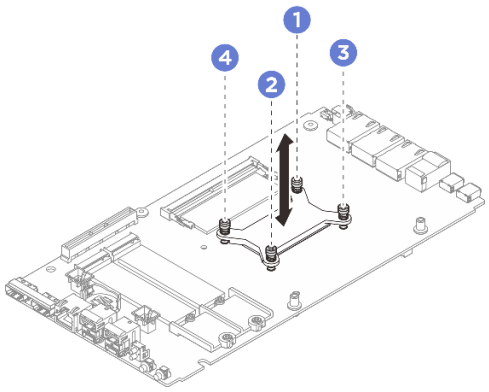


Figure 162. Installing the processor heat sink

Step 4. Hold the system board by its edge, and carefully turn the system board over to let the bottom side of the system board facing up; then lower the system board onto the top cover.

Note: Make sure not to let the system board touch the rubber on the edge of the top cover when installing the system board.

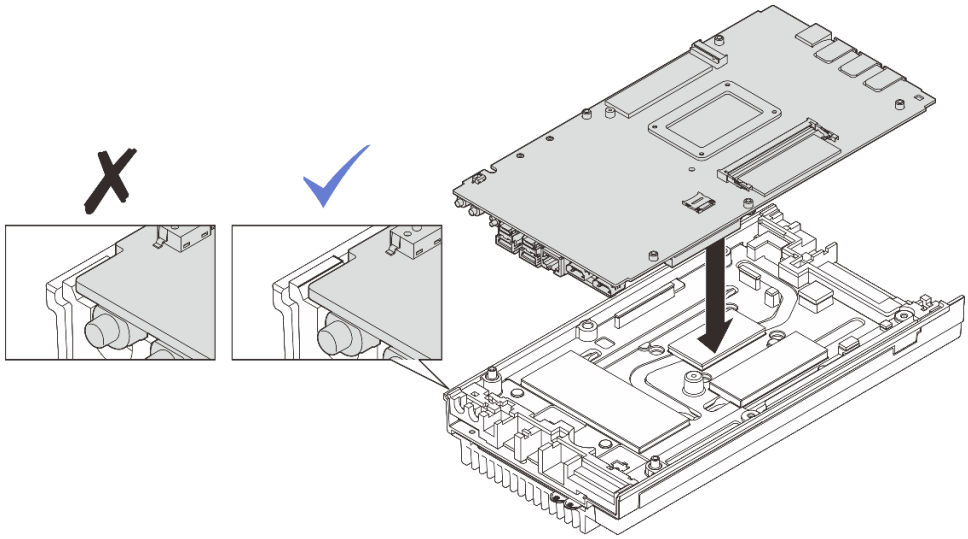


Figure 163. Installing the system board

Step 5. Install the bottom cover.

a. ❶ Align the bottom cover with the guiding slots on both sides of the node; then, lower the bottom cover onto the node.

b. ❷ Insert the front and rear I/O brackets into the node until they are seated in place.

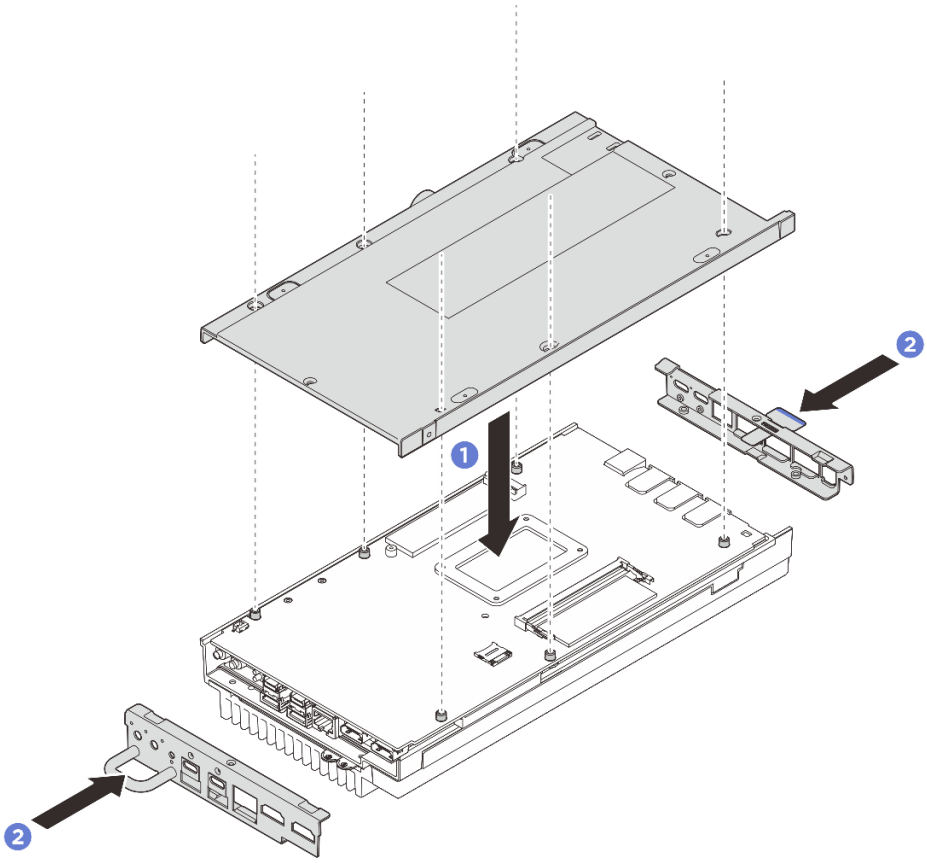


Figure 164. Installing the bottom cover

Step 6. Tighten screws to the bottom cover.

a. ❶ Tighten two Phillips #1 screws with pre-applied white threadlocking adhesive to the short sides of the bottom cover.

b. ❷ Tighten six Phillips #2 screws to the long sides of the bottom cover as illustrated; then reverse the node to let the top side facing up.

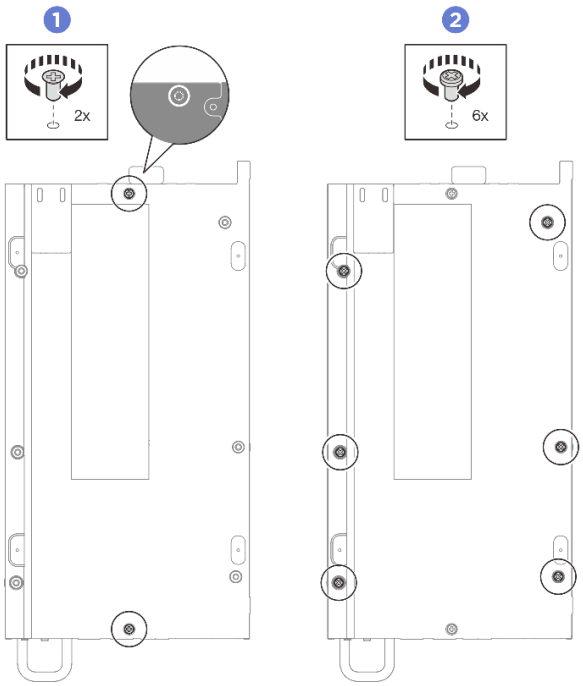


Figure 165. Installing the screws

Step 7. Tighten screws to secure the cover.

a. 1 Tighten four Phillips #2 screws to the long sides of the top cover.

Note: The screw holes might be covered by fan cables. Carefully pull the fan cable out a little bit to install the screw, and put the cable back after installing the screw.

b. 2 Slide the pull-out information tabs outward from the node.

c. 3 Tighten the four Phillips #1 screws with pre-applied white threadlocking adhesive to the short sides of the top cover; then let the bottom side of the node facing up.

Note: Make sure to slide the pull-out information tabs back once the screw underneath is fully installed.

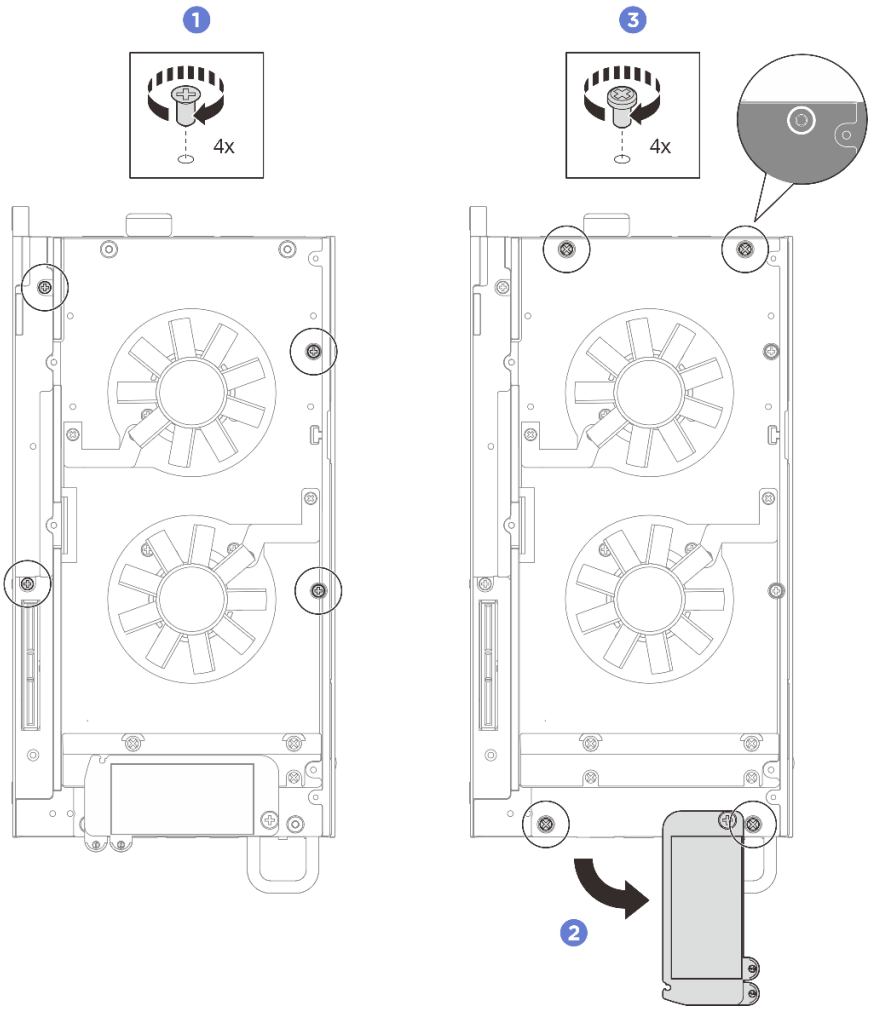


Figure 166. Installing the screws

After you finish

1. Install the expansion kit or the expansion filler. See “Install the expansion kit” on page 200 or “Install the expansion filler” on page 113.
2. Install the fan shroud. See “Install the fan shroud” on page 126.
3. Complete the parts replacement. See “Complete the parts replacement” on page 219.

System board replacement (trained technician only)

Follow instructions in this section to remove and install the system board.

Important: This task must be operated by trained technicians.

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

SED Authentication Key (AK) Manager

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

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

- System Lockdown Mode is in **Active** state. SED AK is locked until the system is activated or unlocked. See "Activate or unlock the system" on page 226 to activate or unlock the system.
- Current user does not have the authority to manage SED AK.
  - To generate, backup, and recover the SED AK with passphrase or backup file, the role of XCC user should be **Administrator**.
  - To recover the SED AK from automatic backup, the role of XCC user should be **Administrator+**.

SED encryption

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

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

Attention:

- Once SED encryptoin is Enabled, it cannot be changed back to Disabled.
- When SED encryption is enabled, if emergency XCC password reset is performed, the SED AK stored in the server will be cleared as the default action. Data stored on the SED will no longer be accessible unless the SED AK is restored. Backing up the SED AK is strongly advised to reduce the risk of data loss. See "Emergency XCC Password Reset" on page 230.

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 system board

Follow instructions in this section to remove the system board.

About this task

Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Prepare the following thermal pad kits:
  - Top cover thermal pad kit
  - Bottom cover thermal pad kit

  See “Thermal pad installation guidelines” on page 49 for details of thermal pad replacement.

Important:

- Removing and installing this component requires trained technicians. **Do not** attempt to remove or install it 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.

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.

- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See “Configuration guide” on page 53.

Procedure

Step 1. Make preparation for this task.

a. 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.

b. Save the system configuration to an external device with Lenovo XClarity Essentials.

c. Save the system event log to external media.

d. Remove the fan shroud. See “Remove a fan shroud” on page 122.

e. If applicable, remove the expansion filler. See “Remove the expansion filler” on page 112.

f. If applicable, remove the expansion kit. See “Remove the expansion kit” on page 200.

Step 2. Remove the screws from the top cover.

a. ❶ Slide the pull-out information tabs outward from the node.

b. ❷ Remove the four Phillips #1 screws located on the short side of the top cover.

Note: Make sure to slide the pull-out information tabs back once the screw underneath is fully removed.

c. ❸ Remove the four Phillips #2 screws located on the long side of the top cover; then, reverse the node to let the bottom side of the node facing up.

Notes:

- The screws to be removed might be covered by fan cables. Carefully pull the fan cable out a little bit to remove the screw underneath, and put the cable back after removing the screw.

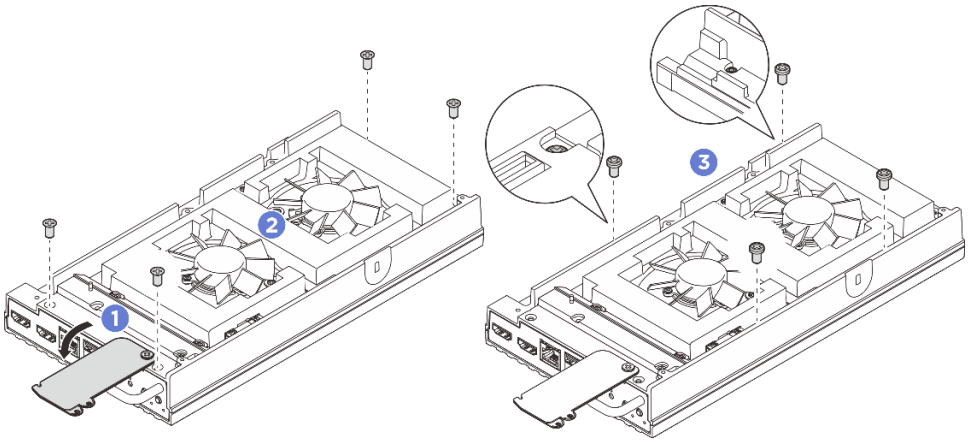


Figure 167. Removing screws from the top cover

Step 3. Remove the bottom cover.

a. ❶ Remove the two Phillips #1 screws located on the short side of the bottom cover.

b. ❷ Remove the six Phillips #2 screws from the long side of the bottom cover.

c. 3 Hold the blue touch points on the rear side of the node and the I/O bracket handle on the front side of the node; then pull the front and rear I/O brackets from the node.

d. 4 Lift up the bottom cover from the node, and place it on a flat clean surface.

Attention: To make sure that there is adequate system cooling, install both top cover and bottom cover before powering on the server. Operating the server with the covers removed might damage server components.

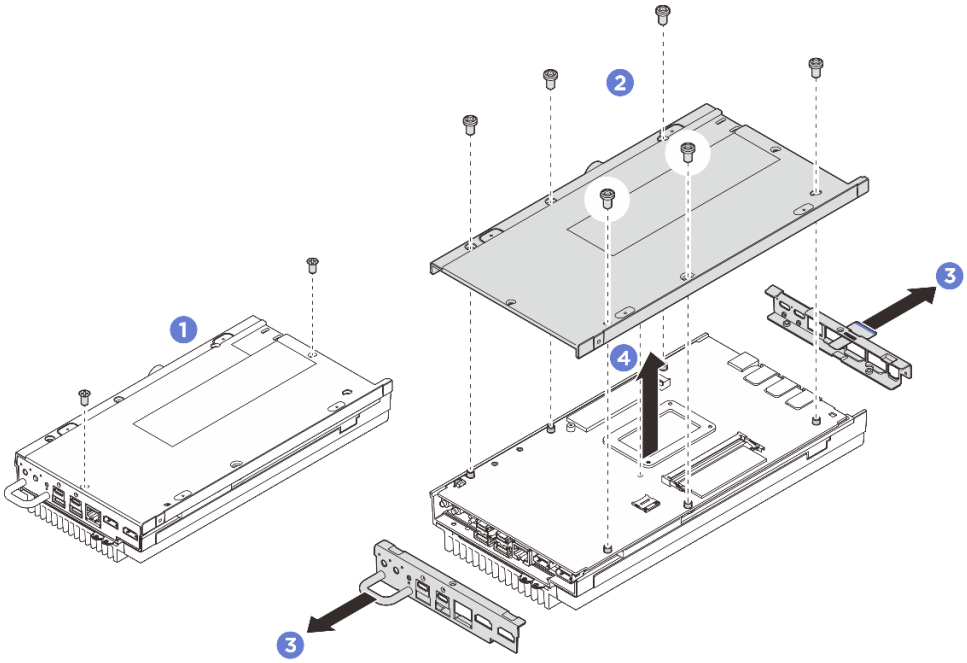


Figure 168. Removing the bottom cover

Step 4. Remove the following components on the bottom side of the system board in the sequence below:

a. Remove the M.2 drive from slot 1. See “Remove an M.2 drive from slot 1” on page 138.

b. Remove the memory module. See “Remove a memory module” on page 146.

Step 5. Separate the system board from the top cover.

a. 1 Carefully separate the system board with the top cover from the edge of the front I/O connectors.

b. 2 Gently lift up the rear I/O side of the system board until the system board is fully separated from the top cover.

c. 3 Lift up the system board to remove it from the top cover. Hold both sides of the system board and turn it over to let the top side of the system board facing up; then place it on a static-protective surface.

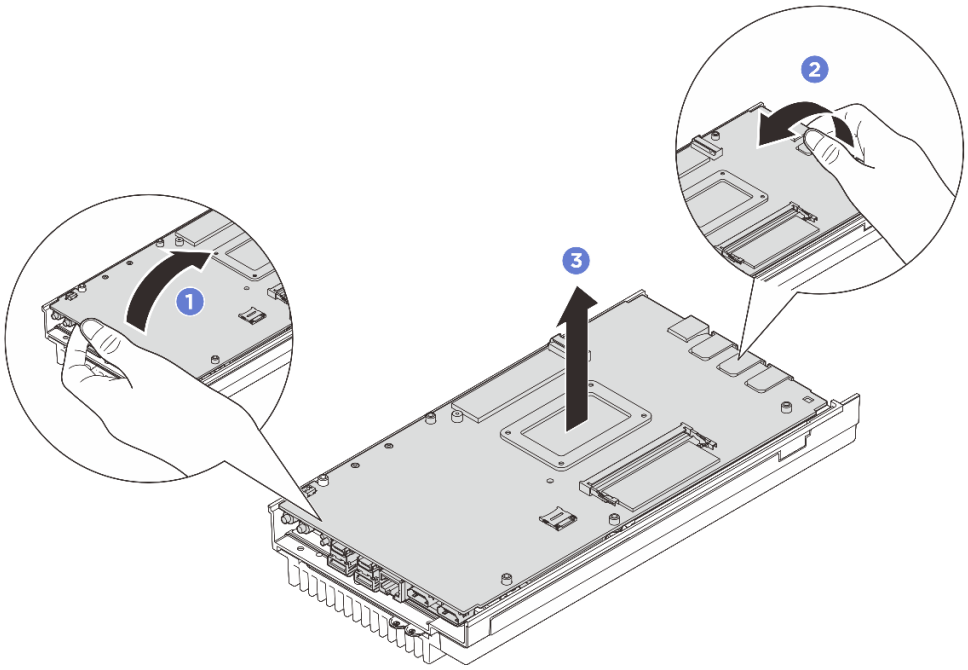


Figure 169. Removing the system board

Step 6. Remove the following components on the top side of the system board in the sequence below:

a. Remove the memory module. See "Remove a memory module" on page 146.

b. Remove the M.2 drives from slot 2 and slot 3. See "Remove an M.2 drive from slot 2 or slot 3" on page 139.

After you finish

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

Install the system board

Follow instructions in this section to install the system board.

About this task

Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Prepare the following thermal pad kits:
  - Top cover thermal pad kit
  - Bottom cover thermal pad kit

  See "Thermal pad installation guidelines" on page 49 for details of thermal pad replacement.

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

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Touch the static-protective package that contains the drive to any unpainted metal surface on the server; then, remove the drive from the package and place it on a static-protective surface.

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

- Go to https://datacentersupport.lenovo.com/tw/en/products/servers/thinkedge/se100/7dgr/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 221 for more information on firmware updating tools.

Procedure

Step 1. Make preparation for this task.

a. Check the thermal pads on node covers. If a thermal pad is in any of the following conditions, replace the thermal pad with a new one. Make sure to follow “Thermal pad installation guidelines” on page 49.

- The thermal pad is damaged or detached from the surface.
- The new part to be installed is of different brand or form factor from the replaced one; the new part might cause thermal pads to be deformed or damaged.

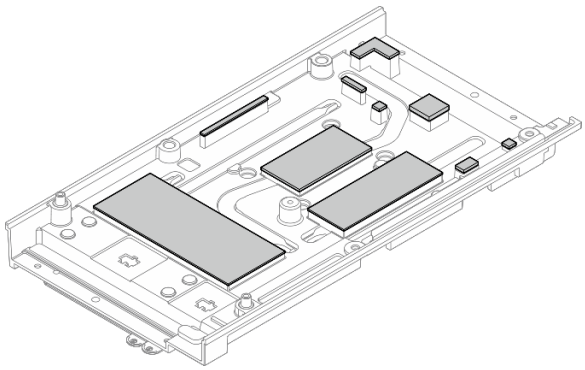


Figure 170. Top cover thermal pads

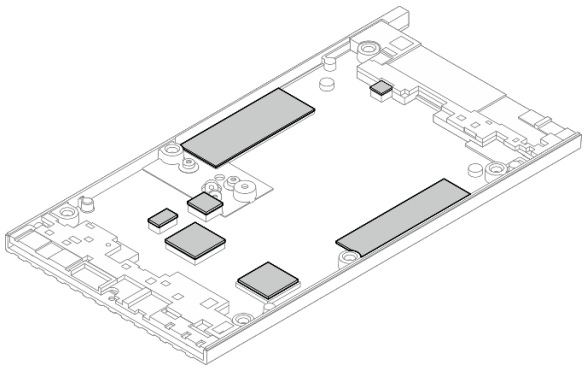


Figure 171. Bottom cover thermal pads

Step 2. Peel away the XClarity Controller network access label on the processer heat sink of the system board and attach it to the pull-out information tab on the top cover.

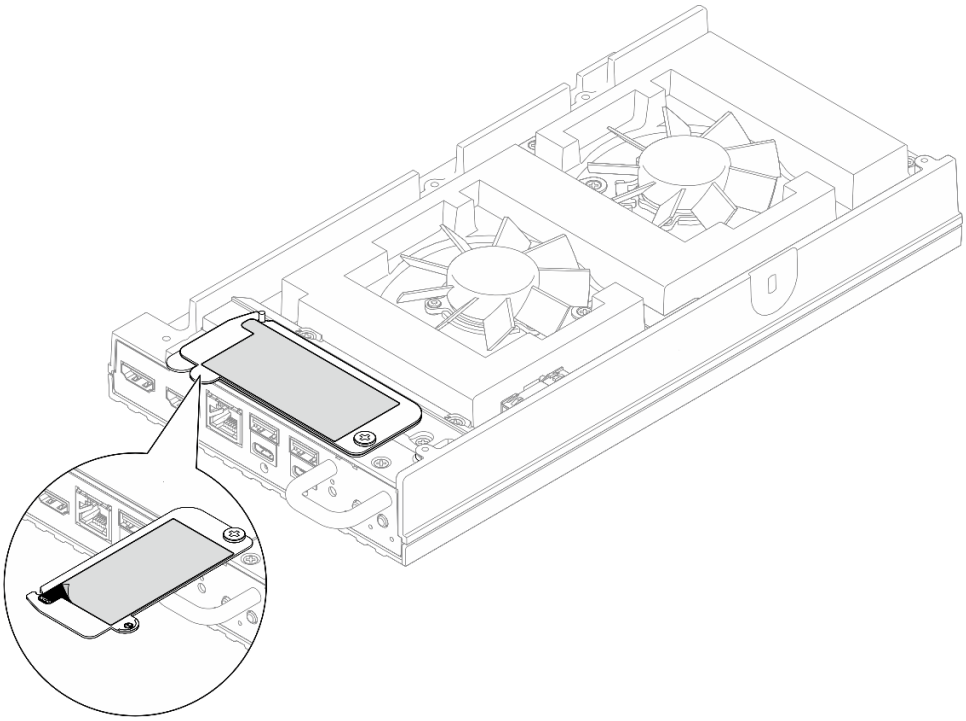


Figure 172. Lenovo XClarity Controller network access label on the pull-out information tab

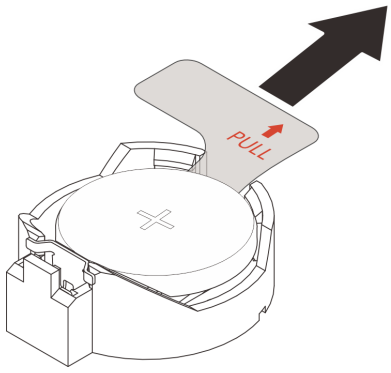
Step 3. Place the system board on the static-protective clean surface with the top side facing up, and then install the following components to the system board:

a. If necessary, install M.2 drives to slot 2 and slot 3. See "Install the M.2 drive to slot 2 & slot 3" on page 143.

b. Install a memory module to DIMM slot 1. See "Install a memory module" on page 149.

c. If an insulating pull tab is under the CMOS battery on the system board, remove it.

Figure 173. Removing the insulating pull tab



Step 4. Hold the system board by its edge, and carefully turn the system board over to let the bottom side of the system board facing up; then lower the system board onto the top cover.

Note: Make sure not to let the system board touch the rubber on the edge of the top cover when installing the system board.

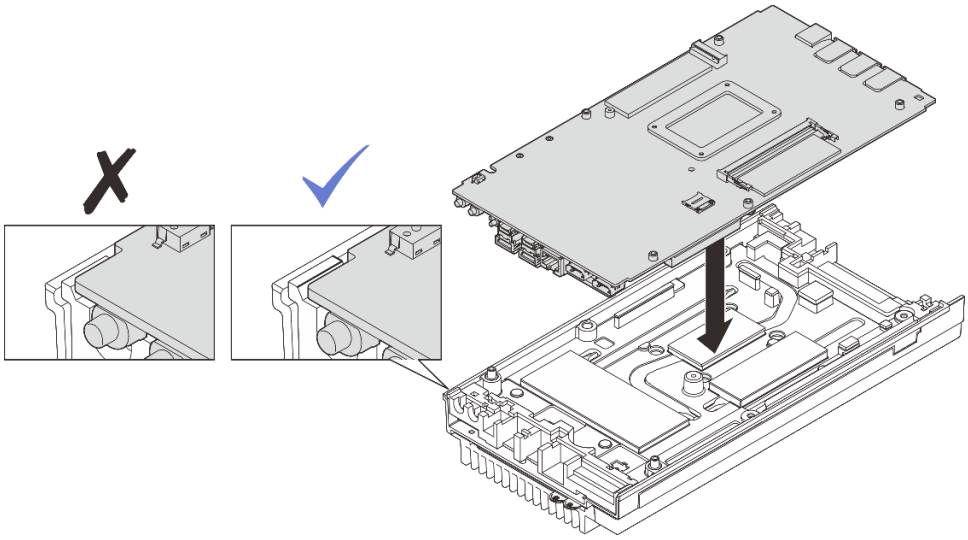


Figure 174. Installing the system board

Step 5. Install the following components to the bottom side of the system board:

a. If necessary, install a memory module to DIMM slot 2. See “Install a memory module” on page 149.

b. If necessary, install an M.2 drive to slot 1. See “Install the M.2 drive to slot 1” on page 142.

Step 6. Install the bottom cover.

a. ❶ Align the bottom cover with the guiding slots on both sides of the node; then, lower the bottom cover onto the node.

b. ❷ Insert the front and rear I/O brackets into the node until they are seated in place.

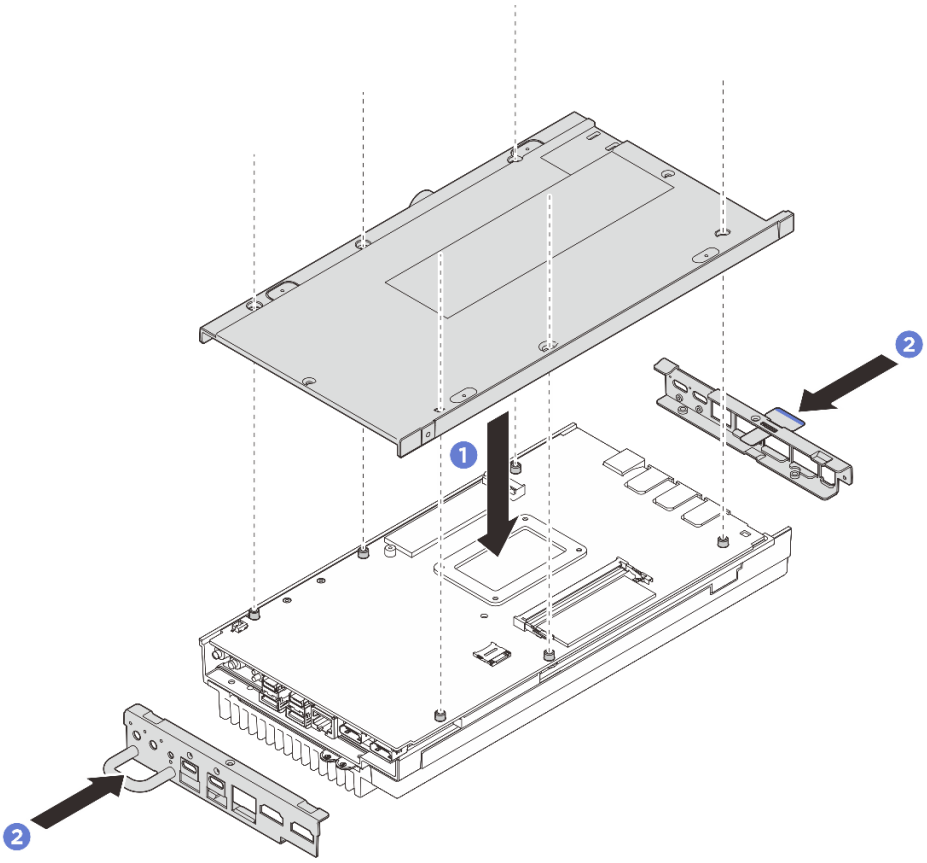


Figure 175. Installing the bottom cover

Step 7. Tighten screws to the bottom cover.

a. ❶ Tighten two Phillips #1 screws with pre-applied white threadlocking adhesive to the short sides of the bottom cover.

b. ❷ Tighten six Phillips #2 screws to the long sides of the bottom cover as illustrated; then reverse the node to let the top side facing up.

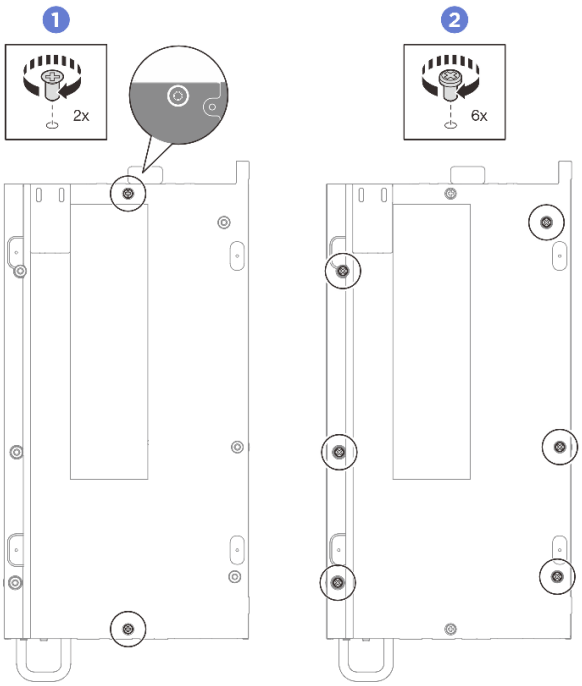


Figure 176. Installing the screws

Step 8. Tighten screws to secure the cover.

a. 1 Tighten four Phillips #2 screws to the long sides of the top cover.

Note: The screw holes might be covered by fan cables. Carefully pull the fan cable out a little bit to install the screw, and put the cable back after installing the screw.

b. 2 Slide the pull-out information tabs outward from the node.

c. 3 Tighten the four Phillips #1 screws with pre-applied white threadlocking adhesive to the short sides of the top cover; then let the bottom side of the node facing up.

Note: Make sure to slide the pull-out information tabs back once the screw underneath is fully installed.

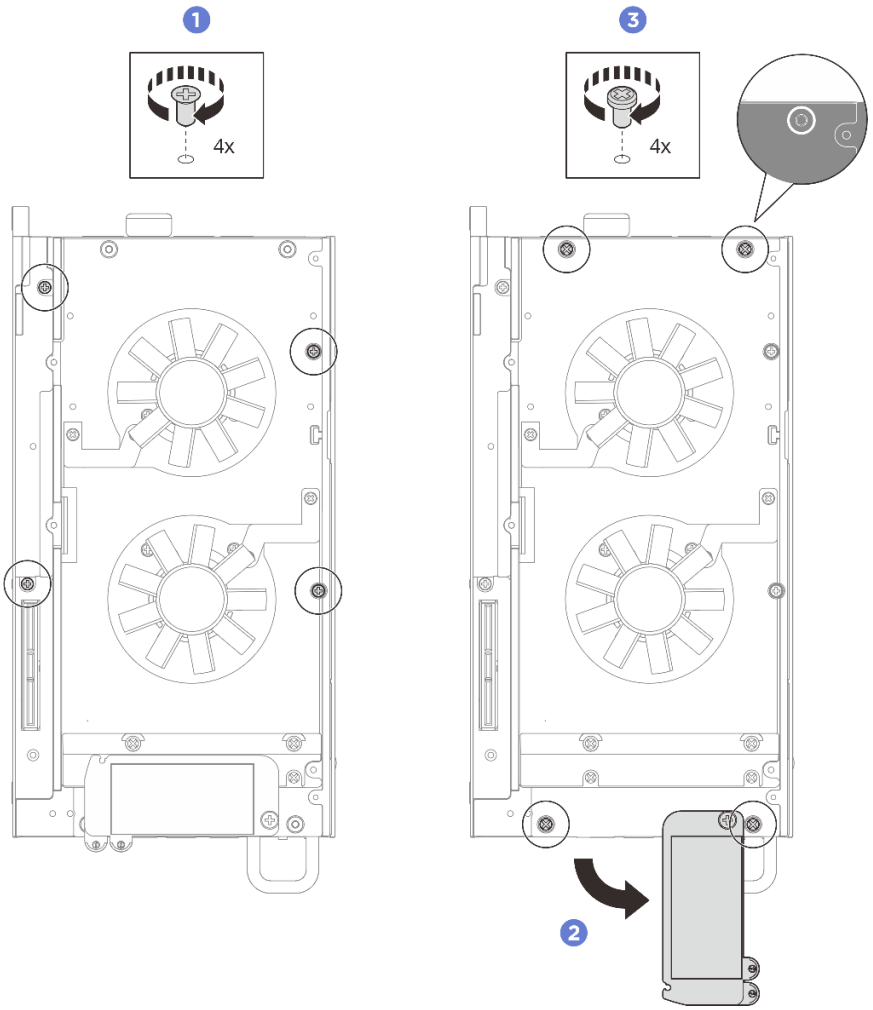


Figure 177. Installing the screws

After you finish

1. Install the expansion kit or the expansion filler. See “Install the expansion kit” on page 200 or “Install the expansion filler” on page 113.
2. Install the fan shroud. See “Install the fan shroud” on page 126.
3. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your server.
4. If necessary, reinstall the node to the enclosure or mount. See “Configuration guide” on page 53.
5. Reconnect the power cords and any cables that you removed.
6. Power on the server and any peripheral devices. See “Power on the server” on page 53.
7. Reset the system date and time.
8. Update the machine type and serial number with new vital product data (VPD). Use the Lenovo XClarity Provisioning Manager to update the machine type and serial number. See “Update the Vital Product Data (VPD)” on page 191.

   Notes:

- If the node is installed in a ThinkEdge SE100 1U2N or ThinkEdge SE100 1U3N Enclosure, change the machine type for proper operation. See “Change the machine type for operating in an enclosure (trained technician only)” on page 193.
- 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 37.

9. Update the UEFI, XCC and LXPM firmware to the specific version supported by the server. See Update the firmware.
10. 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/.
11. 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 technician only) See https://glosse4lenovo.lenovo.com/wiki/glosse4lenovo/view/How%20To/System%20related/ThinkEdge/HowTo_update_PublicKey_after_board_replacement/ for the details.
12. If hiding TPM is needed, see “Hide/observe TPM” on page 195.
13. Set the TPM policy. See “Set the TPM policy” on page 193.
14. Optionally, enable UEFI Secure Boot. See “Enable UEFI Secure Boot” on page 196.
15. 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 226.
    b. Enable SED encryption. See “Manage the Self Encryption Drive Authentication Key (SED AK) ” on page 180.
    c. Recover SED AK. See “Manage the Self Encryption Drive Authentication Key (SED AK) ” on page 180.
    d. Enable security features. See “System Lockdown Mode” on page 228.
    e. Change the emergency XCC password reset settings. See “Emergency XCC Password Reset” on page 230.

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 VPD.SysInfoProdName1O <m/t_model> [access_method]`
- Updating **serial number**
  `onecli config set VPD.SysInfoSerialNum1O <s/n> [access_method]`
- Updating **system model**

  `onecli config set VPD.SysInfoProdIdentifier <system model> [access_method]`
- Updating **asset tag**
  `onecli config set VPD.SysEncloseAssetTag <asset_tag> [access_method]`
- Updating **UUID**
  `onecli config createuuid VPD.SysInfoUUID [access_method]`

Variable	Description
<m/t_model>	The server machine type and model number. Type `xxxxyyyyyy`, where `xxxx` is the machine type and `yyyyyy` is the server model number.
<s/n>	The serial number on the server. Type `zzzzzzzz` (length 8-10 characters), where `zzzzzzzz` is the serial number.
<system model>	The system model on the server. Type `system yyyyyyyy`, where *yyyyyyyy* is the product identifier.
<asset_tag>	The server asset tag number. Type `aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa`, where `aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa` is the asset tag number.

[access_method]	The access method that you select to access the target server.
	• 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>`
	
	Notes:
	– *<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).

Change the machine type for operating in an enclosure (trained technician only)

Use the following information to change the machine type for operating in an enclosure.

- "For a node to be installed into an enclosure" on page 193
- "For a node not to be reinstalled into an enclosure" on page 193

Important: This task must be operated by trained technicians.

Node to be installed into an enclosure

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

To change the machine type for operating in a 1U2N Enclosure configuration, complete the following steps:

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 0x47 0x56 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.

To change the machine type for operating in a 1U3N Enclosure configuration, complete the following steps:

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 0x47 0x56 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.

Node not to be reinstalled into an enclosure

If the node is removed from a 1U2N or 1U3N Enclosure and is not to be reinstalled to the enclosure, change the machine type to the default mode for proper operation.

To change the machine type to the default mode, complete the following steps:

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 0x47 0x52 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.

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 according to the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface.

2. If the power-on Administrator password is required, enter the password.
3. From the System Summary page, click **Update VPD**.
4. Set the policy to one of the following settings.
   - **TPM enabled - ROW**. Customers outside of the Chinese Mainland should choose this setting.
   - **Permanently disabled**. Customers in the Chinese Mainland should use this setting.

   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, or customers that require to disable TPM:

       ```
       OneCli.exe config set imm.TpmTcmPolicy "NeitherTpmNorTcm" --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.
     - 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', and 'TpmOnly'.

   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.

Hide/observe TPM

TPM is enabled by default to encrypt data transfer for system operation. Optionally, you can disable TPM using Unified Extensible Firmware Interface (UEFI) or Lenovo XClarity Essentials OneCLI.

Using UEFI

For details, see “TPM Device” in *UEFI User Guide* at https://pubs.lenovo.com/uefi-overview/.

Using Lenovo XClarity Essentials OneCLI

To disable TPM, do the following:

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:
   `OneCli.exe config set UEFI.TrustedComputingGroup_TPMDevice "Disabled" --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 PASSW0RD (zero, not an uppercase o)
   - *<ip_address>* is the IP address of the BMC.

   Example:

   ```
   D:\onecli>OneCli.exe config set UEFI.TrustedComputingGroup_TPMDevice "Disabled" --bmc USERID:PASSWORD@10.245.38.64
   [1s]Certificate check finished [100%][==========================================================================>]
   Start to connect BMC at 10.245.38.64 to apply config set
   Invoking SET command ...
   UEFI.TrustedComputingGroup_TPMDevice=Disabled
   Changes completed successfully, but these changes will not take effect until next reboot.
   Succeed.
   ```

3. Reboot the system.

If you want to enable TPM again, run the following command and reboot the system:
`OneCli.exe config set UEFI.TrustedComputingGroup_TPMDevice "Enabled" --bmc <userid>:<password>@<ip_address>`

Example:

```
D:\onecli>OneCli.exe config set UEFI.TrustedComputingGroup_TPMDevice "Enabled" --bmc USERID:PASSWORD@10.245.38.64
[1s]Certificate check finished [100%][=======================================================================>]
Start to connect BMC at 10.245.38.64 to apply config set
Invoking SET command ...
UEFI.TrustedComputingGroup_TPMDevice=Enabled
Changes completed successfully, but these changes will not take effect until next reboot.
Succeed.
```

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 Configuration → Secure Boot Setting**.
  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 UEFI.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 PASSW0RD (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 UEFI.SecureBootConfiguration_SecureBootSetting Disabled --bmc <userid>:<password>@<ip_address>`

Replace components in the expansion kit

Follow instructions in this section to remove and install the expansion kit components.

ThinkEdge SE100 expansion kit is designed to support the following configurations:

- **SW GPU adapter:** To install the single-width GPU adapter to the expansion kit, see "Install the PCIe adapter" on page 218.
- **Ethernet adapter:** For proper air flow, the expansion kit with the Ethernet adapter must installed with an expansion kit fan module. See "Install an expansion kit fan module" on page 206.

Important: The expansion kit of SE100 support different system configuration, see the following table for the supported configurations:

Table 19. Supported configurations of SE100 expansion kit

	SW GPU adapter	Ethernet adapter
Fan holder		
• Blower fan		√
• Support holder	√	
Dust filter		
• Rear dust filter	√	√

Dust filter replacement

Follow instructions in this section to remove and install the dust filters.

Remove the rear dust filter

Follow instructions in this section to remove the rear dust filter.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See "Configuration guide" on page 53.

Procedure

Step 1. Make preparation for this task.

a. Remove the expansion top cover. See "Remove the expansion top cover" on page 201.

Step 2. Slide the dust filter holder out from the expansion kit.

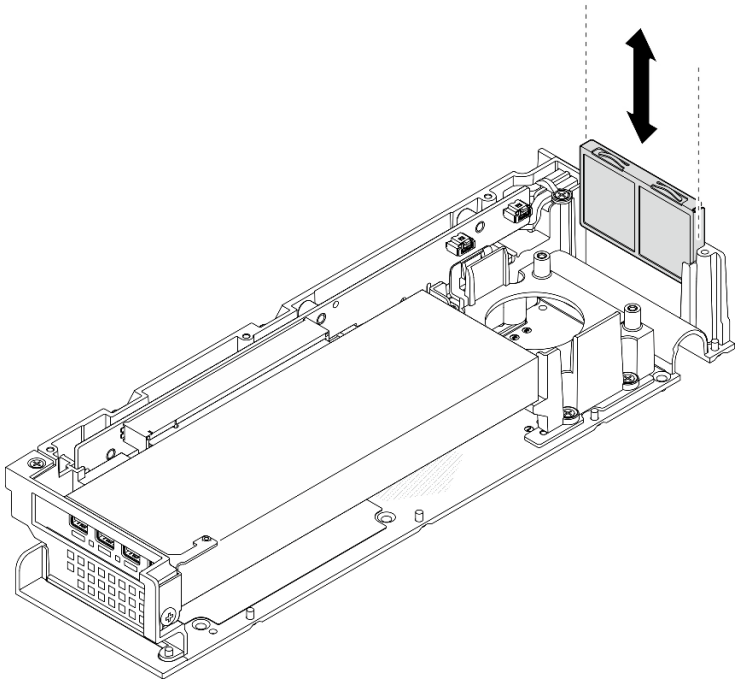


Figure 178. Removing the dust filter holder

Step 3. Remove the dust filter from the dust filter holder.

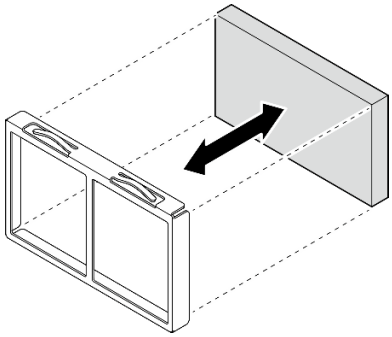


Figure 179. Removing the dust filter

After you finish

- Install a replacement unit. See “Install the rear dust filter” on page 198.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the rear dust filter

Follow instructions in this section to install the rear dust filter.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.

- Depends on the operating environment, check the status of the dust filter at least every 3 months to make sure it is functional.

SE100 supports a dust filter installed at rear of the expansion kit. 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.

Procedure

Step 1. Place the dust filter into the dust filter holder.

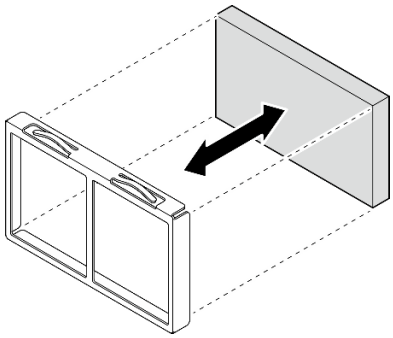


Figure 180. Installing the dust filter

Step 2. Align the dust filter holder with the slot on the rear side of the expansion kit; then slide the dust filter holder into the slot until the holder stops.

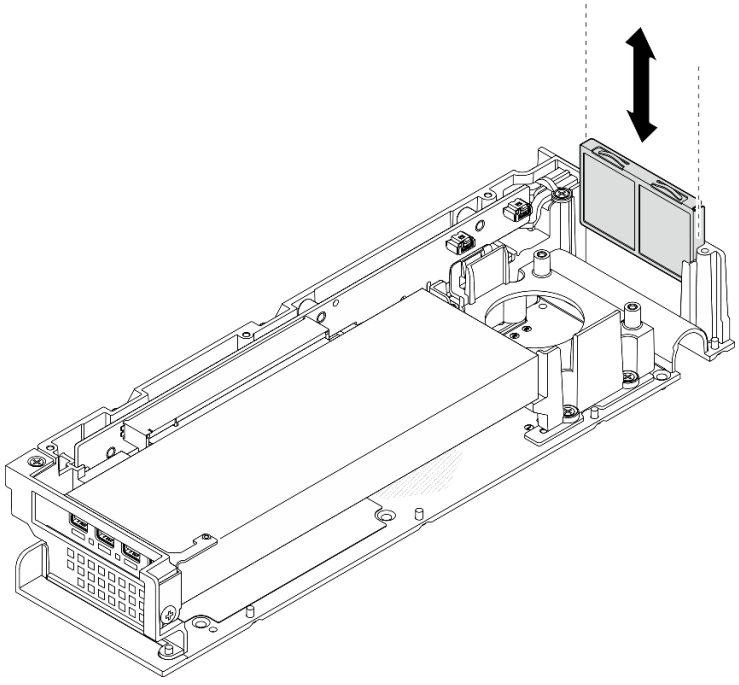


Figure 181. Installing the dust filter holder

After you finish

1. Install the expansion top cover. See “Install the expansion top cover” on page 203.
2. Complete the parts replacement. See “Complete the parts replacement” on page 219.

Expansion kit replacement

Follow instructions in this section to remove and install the expansion kit.

Remove the expansion kit

Follow instructions in this section to remove the expansion kit.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See “Configuration guide” on page 53.

Procedure

Step 1. Remove the expansion kit.

a. ❶ Remove the three screws that secure the expansion kit to the node.

b. ❷ Loosen the captive screw located on the rear of the server with the screw driver.

c. ❸ Lift up the expansion kit and remove it from the node.

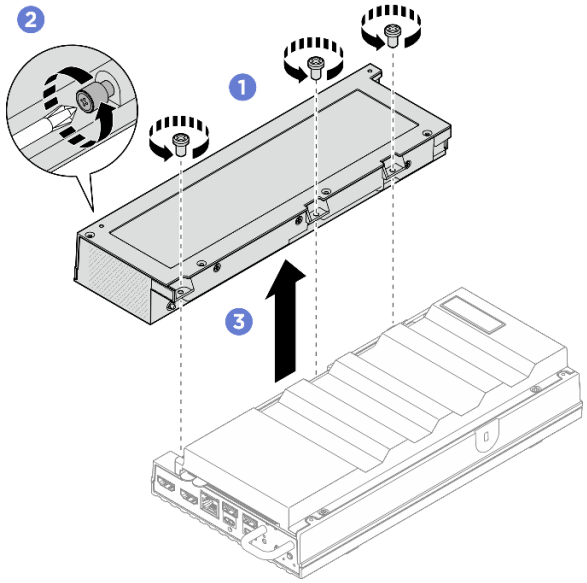


Figure 182. Removing the expansion kit

After you finish

1. Install a replacement unit or an expansion filler into the empty slot.
   a. To install a replacement unit, see “Install the expansion kit” on page 200.
   b. To install a expansion filler, see “Install the expansion filler” on page 113.
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the expansion kit

Follow instructions in this section to install the expansion kit.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.

Procedure

Step 1. Make preparation for this task.

a. If there is a expansion filler installed, remove it. See “Remove the expansion filler” on page 112.

Step 2. Install the expansion kit.

a. ❶ Align the expansion kit with the alignment pins and lower the expansion kit onto the node.

b. ❷ Tighten the captive screw located on the rear of the expansion kit with a screw driver.

c. ❸ Tighten the three screws to secure the expansion kit to the node.

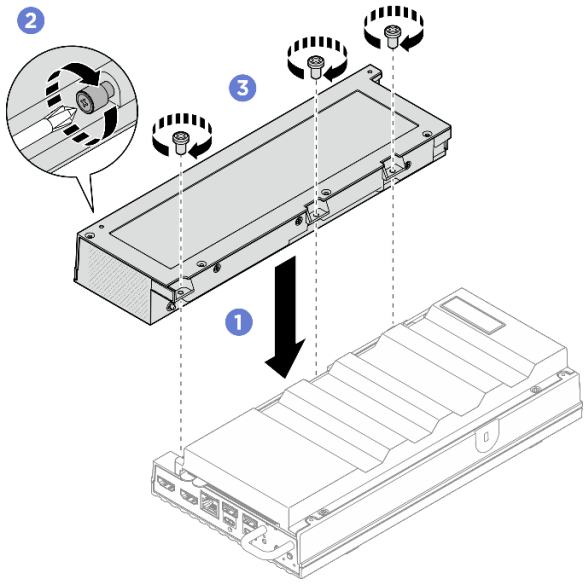


Figure 183. Installing the expansion kit

After you finish

- Complete the parts replacement. See “Complete the parts replacement” on page 219.

Expansion top cover replacement

Follow instructions in this section to remove and install the expansion top cover.

Remove the expansion top cover

Follow instructions in this section to remove the expansion kit top cover.

S014

CAUTION:
Hazardous voltage, current, and energy levels might be present. Only a qualified service technician is authorized to remove the covers where the label is attached.

S033

CAUTION:
Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in spattered metal, burns, or both.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See “Configuration guide” on page 53.

Procedure

Step 1. Make preparation for this task.

a. Remove the expansion kit from the node. See “Remove the expansion kit” on page 200.

Step 2. Remove the expansion top cover.

a. ❶ Remove the four screws located on the top side of the expansion top cover; then let the bottom side of the expansion kit facing up.

b. ❷ Remove the four screws located on the bottom side of the expansion kit; then carefully turn the expansion kit over again to let the top side facing up.

c. ❸ Lift up the top cover from the expansion kit, and place it on a flat clean surface.

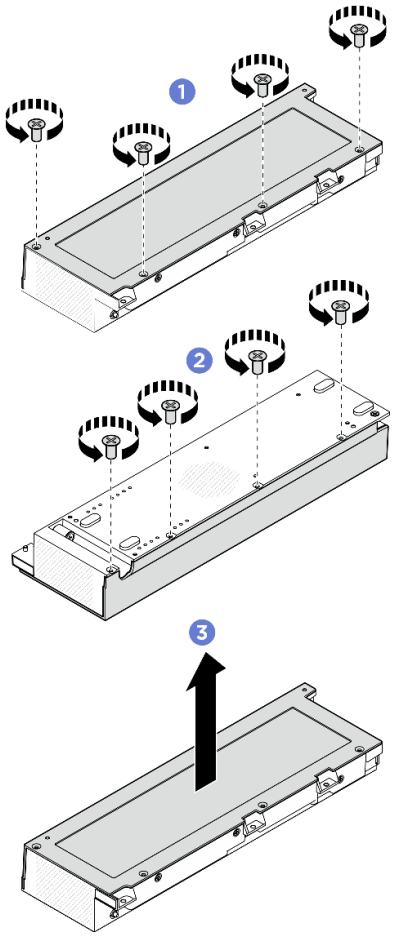


Figure 184. Removing the expansion top cover

After you finish

1. Install a replacement unit. See "Install the expansion top cover" on page 203.
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the expansion top cover

Follow instructions in this section to install the expansion top cover.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your server.
- Make sure that all internal cables are correctly routed. See ***SE100 Internal Cable Routing Guide***.

Procedure

Step 1. Install the expansion top cover.

a. ❶ Align the four screws slots on the expansion top cover with the expansion kit; then fasten the screws to secure the top cover to the expansion kit.

b. ❷ Let the bottom side of the node facing up; then fasten the four screws located on the bottom side of the expansion kit.

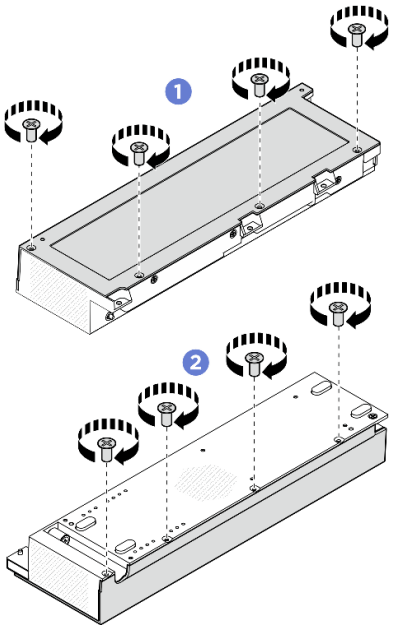


Figure 185. Installing the expansion top cover

After you finish

1. Install the expansion kit to the node. See “Install the expansion kit” on page 200.
2. Complete the parts replacement. See “Complete the parts replacement” on page 219.

Expansion kit fan module replacement

Follow instructions in this section to remove and install the expansion kit fan module.

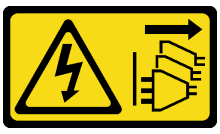
Remove an expansion kit fan module

Follow instructions in this section to remove a fan module.

About this task

Note: This section only applies to the expansion kit that is installed with an Ethernet adapter.

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 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See “Configuration guide” on page 53.

Procedure

Step 1. Make preparation for this task.

a. Remove the expansion kit from the node. See “Remove the expansion kit” on page 200.

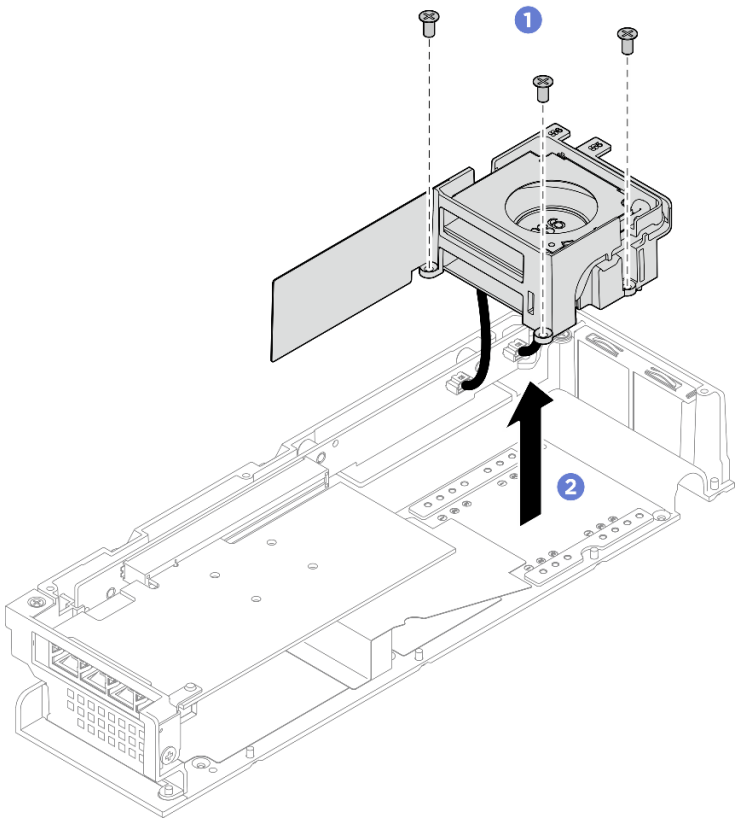
b. Remove the expansion top cover. See “Remove the expansion top cover” on page 201.

Step 2. Remove the fan module.

a. ❶ Remove the three screws that secure the fan module to the expansion kit.

b. ❷ Lift the fan module to remove it from the expansion kit.

Figure 186. Removing the fan module



Step 3. Disconnect all the fan power cables from the PCIe riser card.

After you finish

- Disassemble the fan module. See “Disassemble an expansion kit fan module” on page 207.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

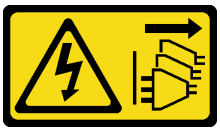
Install an expansion kit fan module

Follow instructions in this section to install a fan module.

About this task

Note: This section only applies to the expansion kit that is installed with an Ethernet adapter.

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 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Connect the fan power cable to the PCIe riser card. Make sure to connect fan power cable 5 to the connector first. See ***SE100 Internal Cable Routing Guide***.

Step 2. Install the fan module.

a. ❶ Align the fan module with the screw holes on the expansion kit.

b. ❷ Tighten the three screws to secure the fan module to the expansion kit.

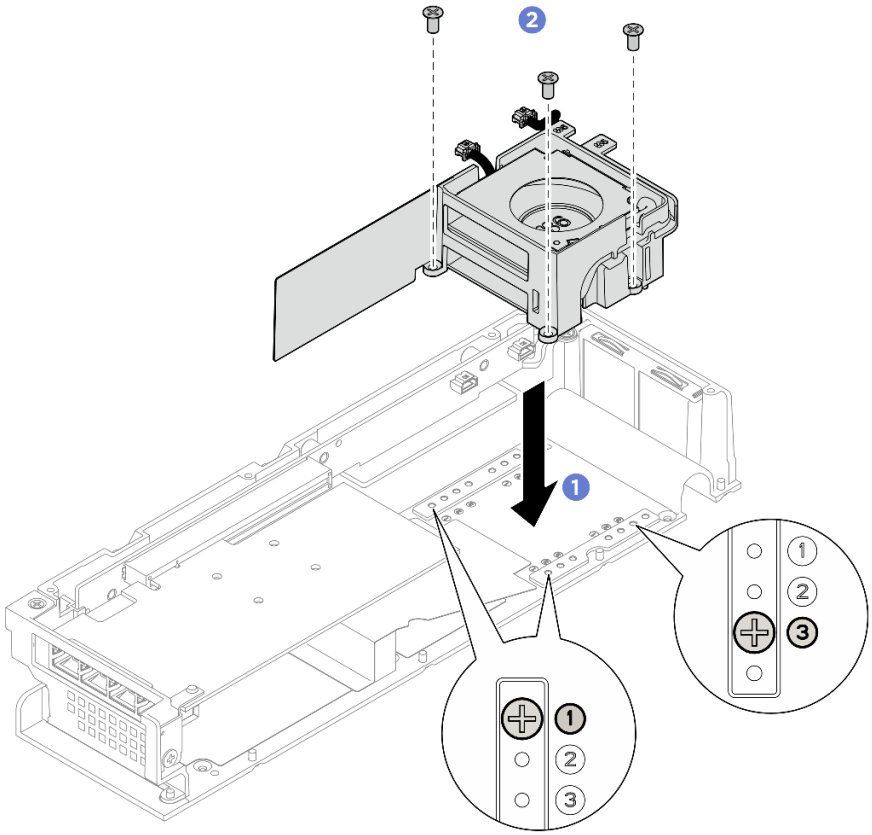


Figure 187. Installing the fan module

After you finish

1. Install the expansion top cover. See “Install the expansion top cover” on page 203.
2. Install the expansion kit to the node. See “Install the expansion kit” on page 200.
3. Complete the parts replacement. See “Complete the parts replacement” on page 219.

Disassemble an expansion kit fan module

Follow instructions in this section to disassemble a fan module.

About this task

Note: This section only applies to the expansion kit that is installed with an Ethernet adapter.

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 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.

Procedure

Step 1. Make preparation for this task.

a. Remove the expansion kit from the node. See “Remove the expansion kit” on page 200.

b. Remove the expansion top cover. See “Remove the expansion top cover” on page 201.

c. Remove an expansion kit fan module. See “Remove an expansion kit fan module” on page 204.

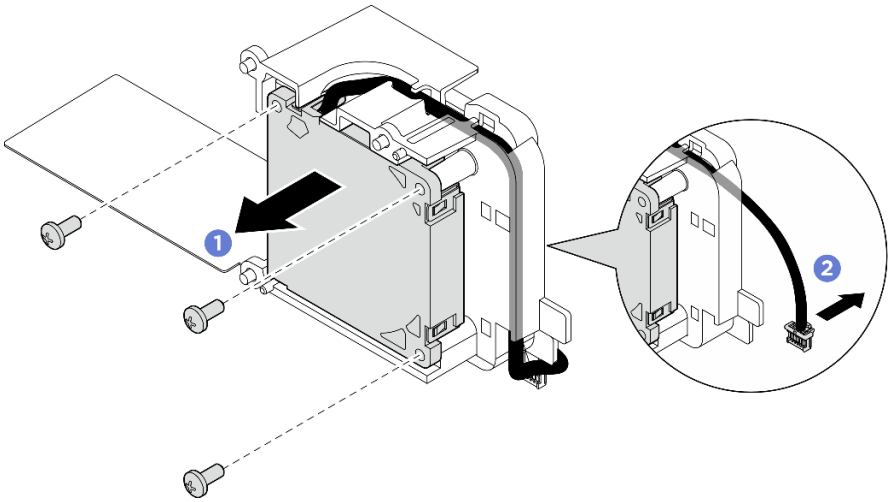
Step 2. Disassemble the fan module.

Remove the fan 5 from the fan holder.

a. ❶ Remove the three screws that secure the fan; then, remove the fan out of the fan holder.

b. ❷ Release the fan power cable from the pre-cut slots on the fan holder.

Figure 188. Removing the fan 5

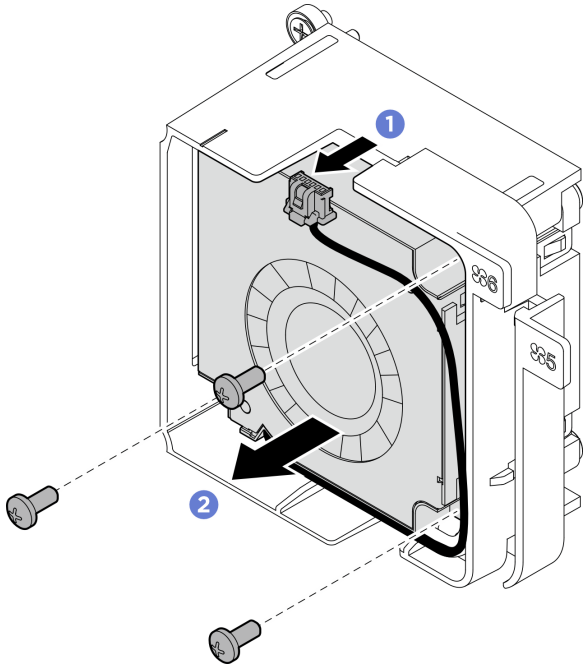


Remove the fan 6 from the fan holder.

a. ❶ Release the fan power cable from the pre-cut slots on the fan holder.

b. ❷ Remove the three screws that secure the fan; then, remove the fan out of the fan holder.

Figure 189. Removing the fan 6



After you finish

- Install a replacement unit. See "Assemble an expansion kit fan module" on page 209.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Assemble an expansion kit fan module

Follow instructions in this section to assemble a fan module.

About this task

Note: This section only applies to the expansion kit that is installed with an Ethernet adapter.

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 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.

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

Procedure

Step 1. Install the fan to the fan holder.

a. ❶ Align the screw holes on the fan with the fan slot; then, tighten the three screws to secure the fan.

b. ❷ Route the fan power cable through the pre-cut slot on the fan holder.

Important:

- For the fan 6, ensure that the fan power cable is fixed at the end of the pre-cut slot as illustrated. Otherwise, the cable might slide out from the fan holder, and might damage the cable.
- The fan installed direction will be different depends on the fan numbering. Refer to the following illustration for the fan direction.

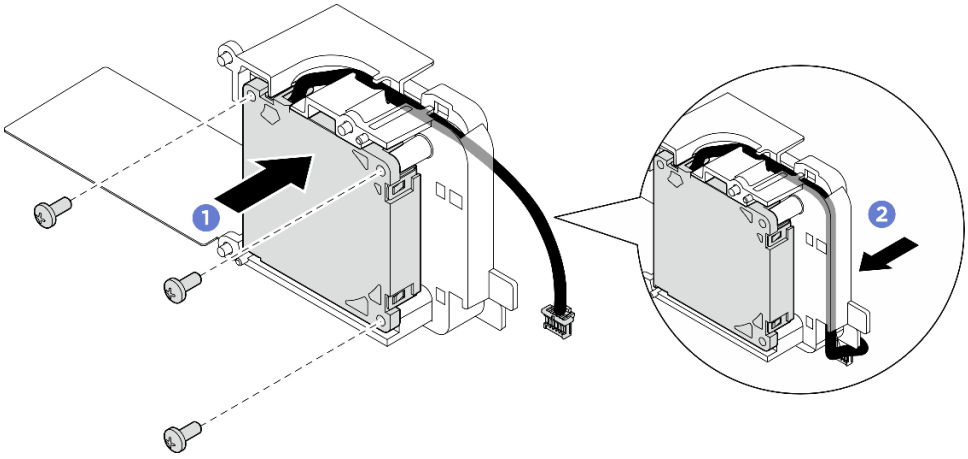


Figure 190. Installing the fan 5

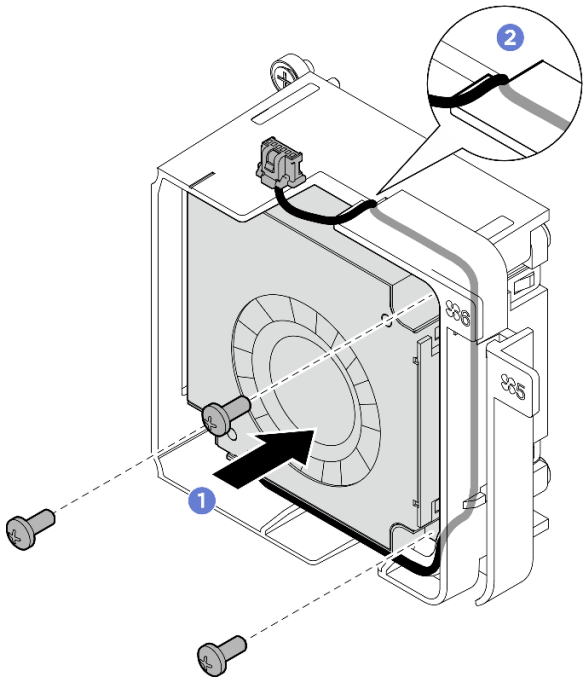


Figure 191. Installing the fan 6

After you finish

1. Install the expansion kit fan module to the expansion kit. See “Install an expansion kit fan module” on page 206

Support baffle replacement

Follow instructions in this section to remove and install the support baffle.

Remove the support baffle

Follow instructions in this section to remove the support baffle.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See “Configuration guide” on page 53.

Procedure

Step 1. Make preparation for this task.

a. Remove the expansion kit from the node. See “Remove the expansion kit” on page 200.

b. Remove the expansion top cover. See “Remove the expansion top cover” on page 201.

Step 2. Remove the four screws that secure the support baffle; then gently lift the support baffle up from the expansion kit. If necessary, tilt the support baffle a little bit when removing it for easier operation.

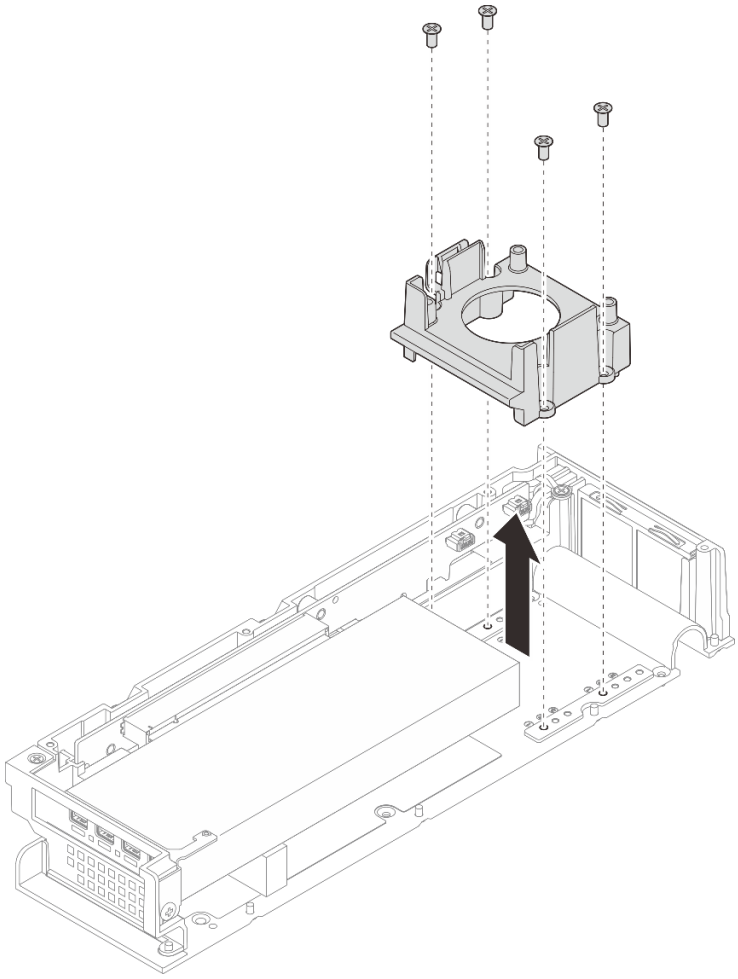


Figure 192. Removing the support baffle

After you finish

1. Install a replacement unit. See “Install the support baffle” on page 212.
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the support baffle

Follow instructions in this section to install the support baffle.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.

Procedure

Step 1. Install the support baffle.

a. Tilt the support baffle and align the support baffle to the edge of the PCIe adapter.

b. Push the support baffle toward the PCIe adapter until the pins on the support baffle are inserted into the corresponding holes on the expansion kit.

Note: Depending on the configuration, the location of the pin hole to insert might be different. Make sure to push the support baffle toward the PCIe adapter until the support baffle touches the edge of the PCIe adapter.

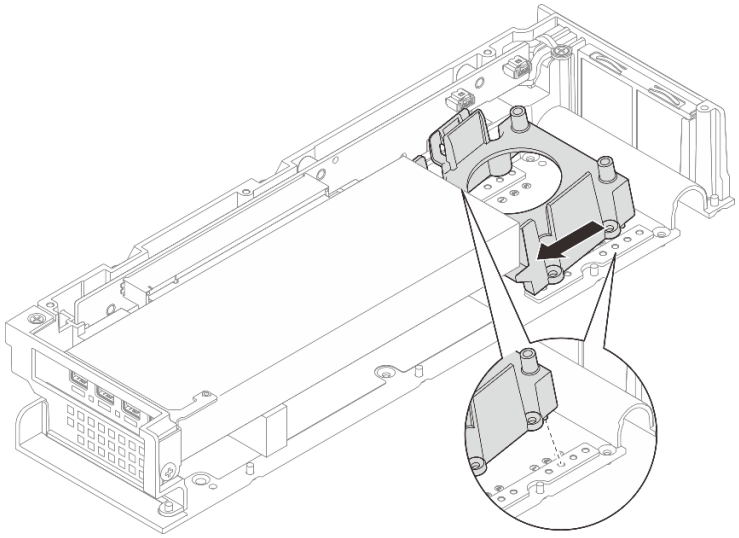


Figure 193. Installing the support baffle

c. Tighten the four screws and make sure the support baffle is fully secured.

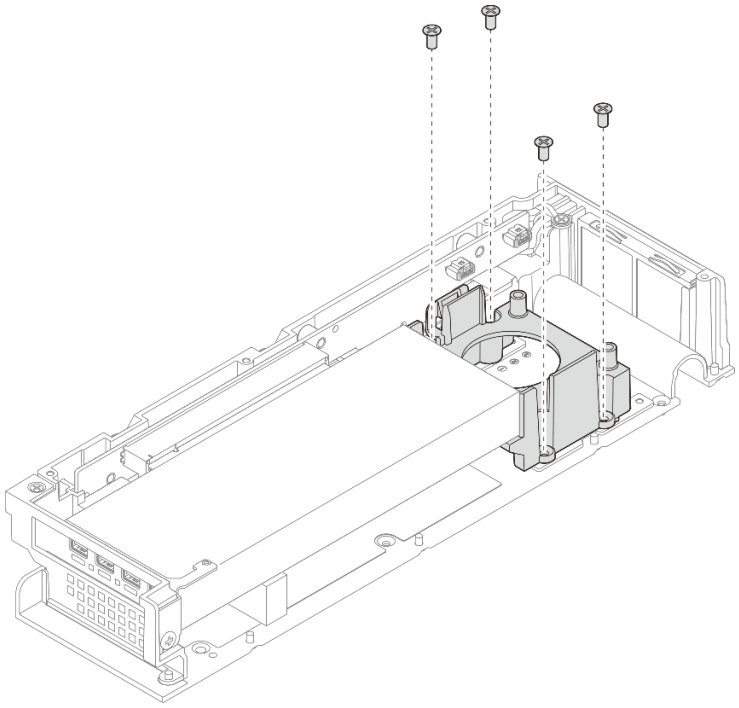


Figure 194. Installing the support baffle

After you finish

1. Install the expansion top cover. See “Install the expansion top cover” on page 203.
2. Install the expansion kit to the node. See “Install the expansion kit” on page 200.
3. Complete the parts replacement. See “Complete the parts replacement” on page 219.

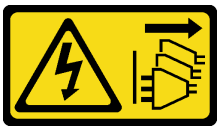
PCIe riser card replacement (trained technician only)

Follow instructions in this section to remove and install the PCIe riser card.

Remove the PCIe riser card

Follow the instructions in this section to remove the PCIe riser card.

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.

About this task

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See “Configuration guide” on page 53.

Procedure

Step 1. Make preparation for this task.

a. Remove the expansion kit from the node. See “Remove the expansion kit” on page 200.

b. Remove the expansion top cover. See “Remove the expansion top cover” on page 201.

c. Remove the PCIe adapter from the PCIe slot. See “Remove a PCIe adapter” on page 216.

Step 2. If applicable, disconnect all the cables from the riser card.

Note: This procedure is only applicable for the PCIe expansion kit installed with the Ethernet adapter.

Step 3. Remove the PCIe riser card.

a. ❶ Remove the three screws located on the side of the PCIe expansion kit.

b. ❷ Hold the riser card by its edge and remove it from the PCIe expansion kit.

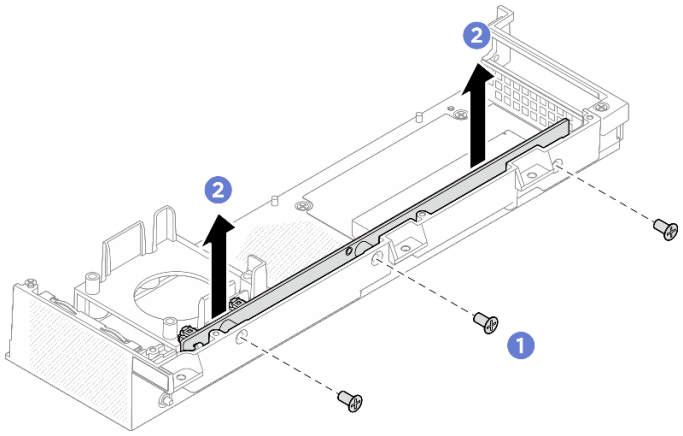


Figure 195. Removing the PCIe riser card

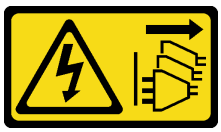
After you finish

- Install a replacement unit. See "Install the PCIe riser card" on page 215.
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the PCIe riser card

Follow the instructions in this section to install the PCIe riser card.

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.

About this task

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

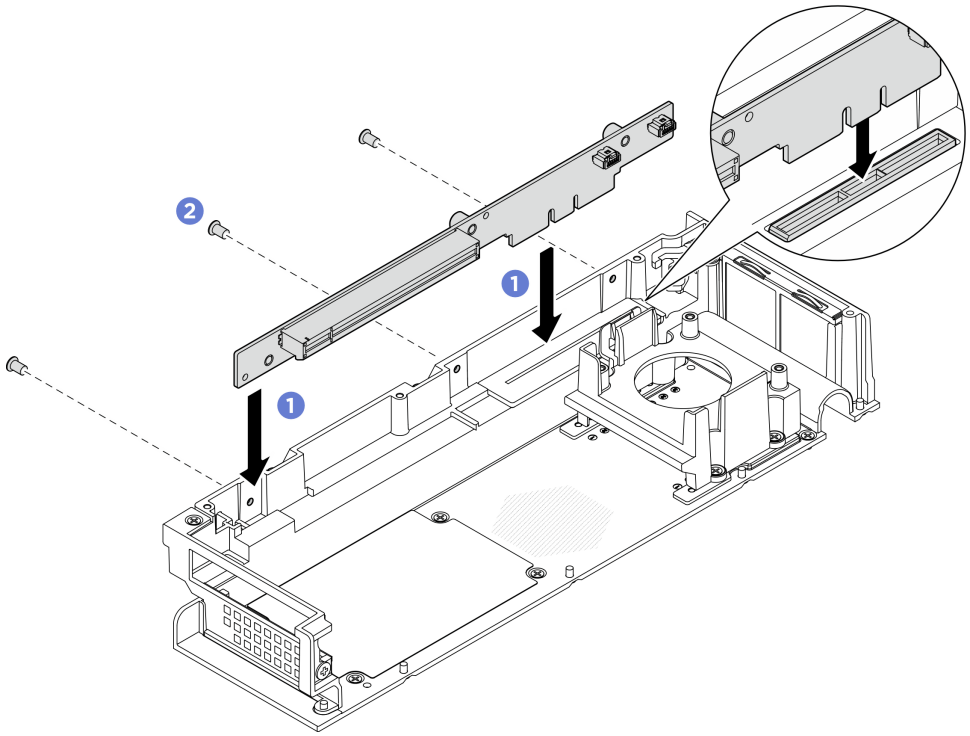
Procedure

Step 1. Install the PCIe riser card.

a. (1) Align the PCIe riser card with the connector on the expansion kit; then, carefully press the PCIe riser card straight into the slot until it is securely seated.

b. (2) Tighten the three screws to secure the PCIe riser card.

Figure 196. Installing the PCIe riser card



After you finish

1. Install the PCIe adapter to the PCIe slot. See “Install the PCIe adapter” on page 218.
2. Install the expansion top cover. See “Install the expansion top cover” on page 203.
3. Install the expansion kit to the node. See “Install the expansion kit” on page 200.
4. Complete the parts replacement. See “Complete the parts replacement” on page 219.

PCIe adapter replacement

Follow instructions in this section to remove and install a PCIe adapter.

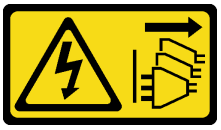
Remove a PCIe adapter

Follow the instructions in this section to remove a PCIe adapter.

About this task

To avoid potential danger, read and follow the following safety statements.

- **S002**



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

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

Attention:

- Read “Installation Guidelines” on page 43 and “Safety inspection checklist” on page 44 to ensure that you work safely.
- Power off the server and peripheral devices and disconnect the power cords and all external cables. See “Power off the server” on page 53.
- If the node is installed in an enclosure or mounted, remove the node from the enclosure or mount. See “Configuration guide” on page 53.

Notes:

- Depending on the specific type, your PCIe adapter and expansion kit components might look different from the illustration in this section.
- Use any documentation that comes with the PCIe adapter and follow those instructions in addition to the instructions in this section.

Procedure

Step 1. Make preparation for this task.

a. Remove the expansion kit from the node. See “Remove the expansion kit” on page 200.

b. Remove the expansion top cover. See “Remove the expansion top cover” on page 201.

Step 2. Remove a PCIe adapter.

a. ❶ Remove the screws that secure the PCIe adapter bracket to the expansion kit.

b. ❷ Hold the PCIe adapter by its edges, and carefully pull it out of the slot.

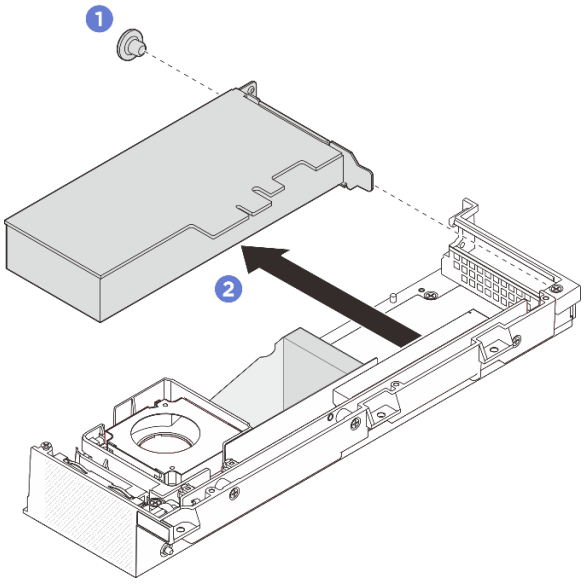


Figure 197. Removing a PCIe adapter

After you finish

1. Install the PCIe adapter to the PCIe slot. See “Install the PCIe adapter” on page 218.
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

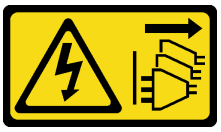
Install the PCIe adapter

Follow instructions in this section to install a PCIe adapter.

About this task

To avoid potential danger, read and follow the following safety statements.

- **S002**



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

Attention:

- Read "Installation Guidelines" on page 43 and "Safety inspection checklist" on page 44 to ensure that you work safely.
- Use any documentation that comes with the PCIe adapter and follow those instructions in addition to the instructions in this section.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

Note: Depending on the specific type, your PCIe adapter and expansion kit components might look different from the illustration in this section.

Procedure

Step 1. Make preparation for this task.

a. (Optional) If the PCIe adapter to be installed is with different type, make sure the support baffle is removed from the PCIe adapter. See "Remove the support baffle" on page 211.

Step 2. The system only supports low-profile bracket. Install the low-profile bracket to the PCIe adapter.

Step 3. Install a PCIe adapter.

a. ❶ Insert the PCIe adapter into the PCIe riser card.

b. ❷ Tighten the screw to secure the PCIe adapter to the PCIe riser card.

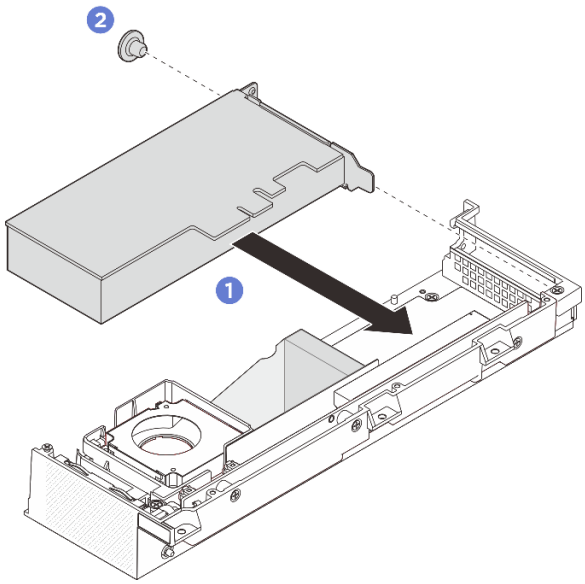


Figure 198. Installing a PCIe adapter

After you finish

1. (Optional) Install the support baffle. See “Install the support baffle” on page 212.
2. Install the expansion top cover. See “Install the expansion top cover” on page 203.
3. Install the expansion kit to the node. See “Install the expansion kit” on page 200.
4. Complete the parts replacement. See “Complete the parts replacement” on page 219.

Complete the parts replacement

Go through the checklist to complete parts replacement

To complete the parts replacement, do the following:

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your server.
2. Properly route and secure the cables in the server. Refer to the cable connecting and routing information for each component.
3. If applicable, reinstall the expansion filler or expansion kit.
   - Install the expansion filler, see “Install the expansion filler” on page 113.
   - Install the expansion kit, see “Install the expansion kit” on page 200.
4. If applicable, reinstall the desktop mount fan shroud. See “Install the desktop mount fan shroud” on page 127.
5. If necessary, reinstall the node to the enclosure or mount. See “Configuration guide” on page 53.
6. Reconnect the power cords and any cables that you removed.

   Note: To connect the power cords, see the “Power adapter replacement” on page 92.
7. Install the I/O fillers when the connectors are not used. The connectors could be dust-covered without proper protection of the fillers. See “Front I/O fillers” on page 20 and “Rear I/O fillers” on page 23.
8. If the Security LED of the server is blinking, activate or unlock the system. See “Activate or unlock the system” on page 226.

9. Power on the server and any peripheral devices. See “Power on the server” on page 53.
10. 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 221.
    - Update the UEFI configuration. See https://pubs.lenovo.com/uefi-overview/.

Chapter 6. System configuration

Complete these procedures to configure your system.

Set the network connection for the Lenovo XClarity Controller

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

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

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

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

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

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

Update the firmware

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

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

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

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

Update Bundles (Service Packs)

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

Update method terminology

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

Firmware updating tools

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

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

Tool	Update Methods Supported	Core System Firmware Updates	I/O Devices Firmware Updates	Drive Firmware Updates	Graphical user interface	Command line interface	Supports Update Bundles (Service Packs)
Lenovo XClarity Essentials UpdateXpress (LXCE)	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√		√
Lenovo XClarity Essentials Bootable Media Creator (BoMC)	In-band Out-of-band Off-Target	√	All I/O devices		√ (BoMC application)	√ (BoMC application)	√
Lenovo XClarity Administrator (LXCA)	In-band[1] Out-of-band[2] Off-Target	√	All I/O devices		√		√
Lenovo XClarity Integrator (LXCI) for VMware vCenter	Out-of-band Off-Target	√	Selected I/O devices		√		
Lenovo XClarity Integrator (LXCI) for Microsoft Windows Admin Center	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√		√
Lenovo XClarity Integrator (LXCI) for Microsoft System Center Configuration Manager	In-band On-Target	√	All I/O devices		√		√

Notes:

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

- **Lenovo XClarity Provisioning Manager**

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

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

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

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

- **Lenovo XClarity Controller**

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

  Notes:

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

    For additional information about configuring Ethernet over USB, see:

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

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

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

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

- **Lenovo XClarity Essentials OneCLI**

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

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

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

- **Lenovo XClarity Essentials UpdateXpress**

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

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

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

- **Lenovo XClarity Essentials Bootable Media Creator**

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

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

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

- **Lenovo XClarity Administrator**

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

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

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

- **Lenovo XClarity Integrator offerings**

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

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

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

Activate/unlock the system and configure ThinkEdge security features

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

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

Setup the security features

Complete the following steps to setup the security features:

1. If the security LED of the server is blinking, the server is in System Lockdown Mode. Activate or unlock the system for operation. See “Activate or unlock the system” on page 226.
2. Maintain backup of SED AK. See “Manage the Self Encryption Drive Authentication Key (SED AK) ” on page 228.
3. Configure the security features in Lenovo XClarity Controller. See “System Lockdown Mode” on page 228 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 228.
  - Set and remember the password of SED AK backup file to restore SED AK in the future.

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

Activate or unlock the system

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

If the security LED of the server is blinking, the server is in System Lockdown Mode. Activate or unlock the system for operation. See “Activate or unlock the system” on page 226. See ***https://pubs.lenovo.com/se100/server_front_leds*** to locate the security LED.

System Lockdown Mode Control

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

- **ThinkShield Portal:** The system can be activated through ThinkShield Key Vault Portal. See “Activate the system” on page 226 to activate the system.
- **XClarity Controller:** The system can be unlocked through Lenovo XClarity Controller. See “Unlock the system” on page 228 to unlock the system.

Important:

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

Activate the system

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

Have a Lenovo ID with proper permission

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

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

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

Activation methods

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

- **Mobile App activation**

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

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

  Connection with the USB cable that came with the smart phone

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

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

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

- **Portal automatic activation**

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

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

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

  Notes:

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

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

Unlock the system

Important:

- When System Lockdown Mode Control status is XClarity Controller, if XClarity Controller is reset to defaults, the default credentials can be used to login to XClarity Controller and unlock the system. It is important to use security controls such as an UEFI PAP to prevent unauthorized users from executing an XClarity Controller reset to defaults. For the highest level of security, it is recommended to set System Lockdown Mode Control to ThinkShield Portal. See "System Lockdown Mode Control" on page 226 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 228 for more information.

Chassis Intrusion Detection

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

Manage the Self Encryption Drive Authentication Key (SED AK)

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

SED Authentication Key (AK) Manager

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

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

- System Lockdown Mode is in **Active** state. SED AK is locked until the system is activated or unlocked. See "Activate or unlock the system" on page 226 to activate or unlock the system.
- Current user does not have the authority to manage SED AK.
  - To generate, backup, and recover the SED AK with passphrase or backup file, the role of XCC user should be **Administrator**.
  - To recover the SED AK from automatic backup, the role of XCC user should be **Administrator+**.

SED encryption

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

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

Attention:

- Once SED encryptoin is Enabled, it cannot be changed back to Disabled.
- When SED encryption is enabled, if emergency XCC password reset is performed, the SED AK stored in the server will be cleared as the default action. Data stored on the SED will no longer be accessible unless the SED AK is restored. Backing up the SED AK is strongly advised to reduce the risk of data loss. See "Emergency XCC Password Reset" on page 230.

Change the SED AK

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

Backup the SED AK

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

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

Recover the SED AK

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

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

Emergency XCC Password Reset

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

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

Emergency XCC password reset

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

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

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

See "Activate or unlock the system" on page 226 for the details of System Lockdown Mode and mobile app settings.

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

Clear SED AK as part of Emergency XCC Password Reset

When SED encryption is enabled, if emergency XCC password reset is performed, the SED AK stored in the server will be cleared as the default action. Data stored on the SED will no longer be accessible unless the SED AK is restored. Backing up the SED AK is strongly advised to reduce the risk of data loss. See "Manage the Self Encryption Drive Authentication Key (SED AK) " on page 228 for more information.

The clearing SED AK action can be changed in XCC.

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

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

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

Configure the firmware

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

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

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

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

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

See the following documentations for more information:

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

- **Lenovo XClarity Essentials OneCLI**

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

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

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

- **Lenovo XClarity Administrator**

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

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

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

- **Lenovo XClarity Controller**

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

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

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

Memory module configuration

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

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

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

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

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

Deploy the operating system

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

Available operating systems

- Microsoft Windows
- Canonical Ubuntu

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

Tool-based deployment

- **Multi-server**

  Available tools:

  – Lenovo XClarity Administrator

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

  – Lenovo XClarity Essentials OneCLI

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

- **Single-server**

  Available tools:

  – Lenovo XClarity Provisioning Manager

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

  – Lenovo XClarity Essentials OneCLI

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

Manual deployment

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

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

Back up the server configuration

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

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

- **Management processor**

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

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

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

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

- **Operating system**

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

Chapter 7. 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 you can use to solve issues that your server might encounter. These Tech Tips (also called retain tips or service bulletins) provide procedures to work around issues or solve problems related to the operation of your server.

  To find the Tech Tips available for your server:

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

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

- **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/se100/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.

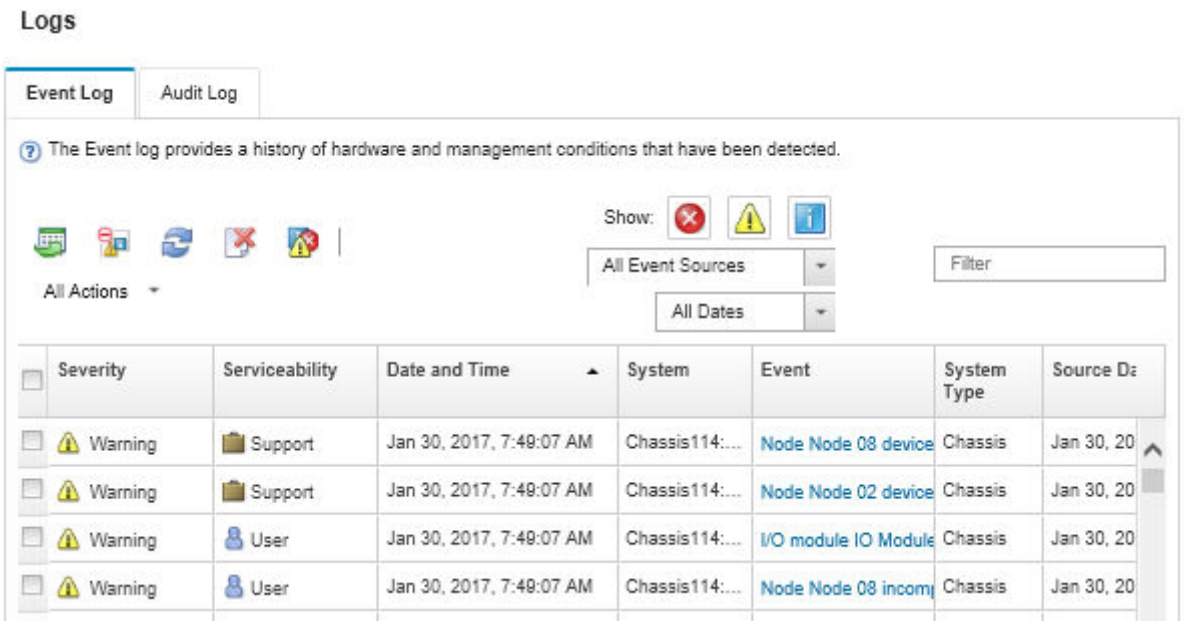


Figure 199. Lenovo XClarity Administrator event log

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.

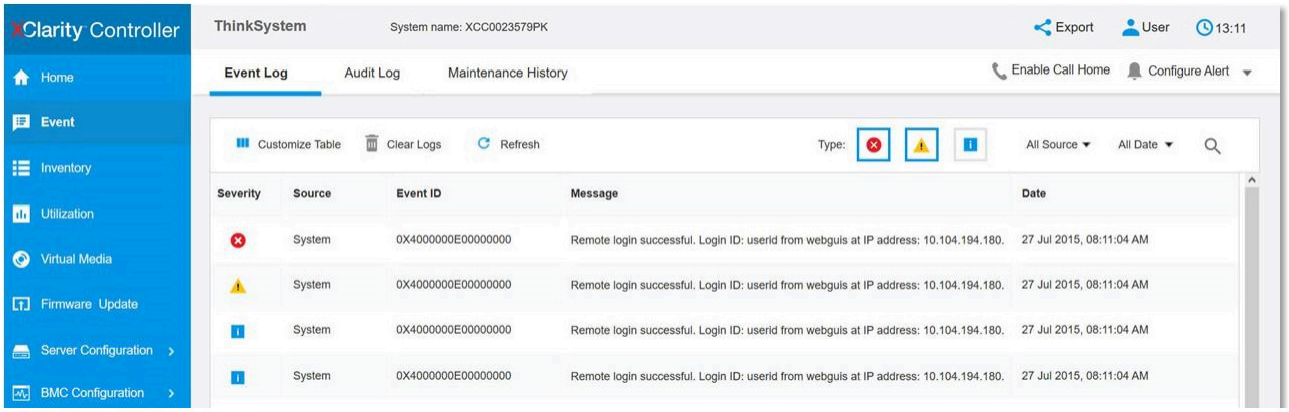


Figure 200. Lenovo XClarity Controller event log

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 section for information on available system LEDs.

Ethernet adapter expansion kit LEDs

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

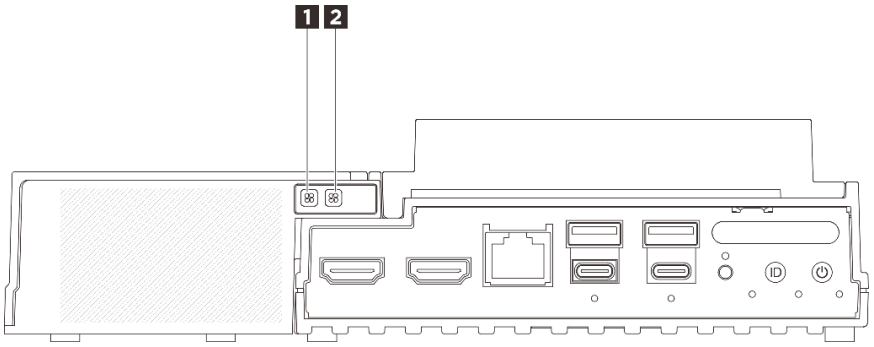


Figure 201. Ethernet adapter expansion kit LEDs

Table 20. Ethernet adapter expansion kit LEDs

1 Fan 5 error LED	2 Fan 6 error LED

1 2 Fan error LEDs

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

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

Front LEDs

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

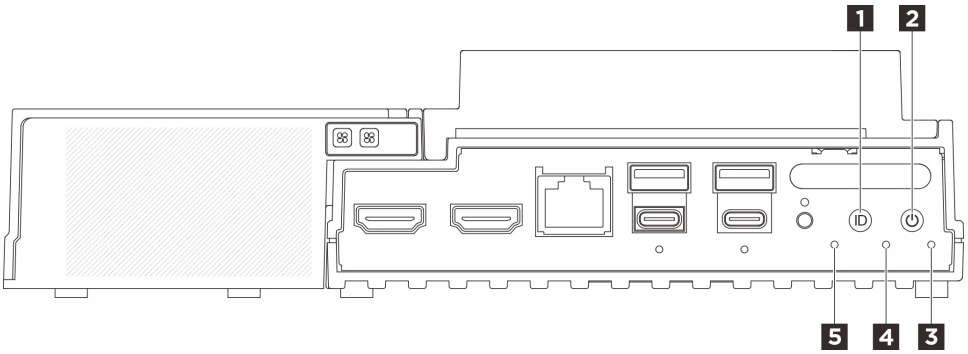


Figure 202. Front LEDs

Table 21. Front LEDs

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

1 UID button with LED (blue)

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

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

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

2 Power button with power status LED (green)

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

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

3 Security LED (green)

The states of Security LED are as following:

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

Blinking: The server is in System Lockdown Mode. Activate or unlock the system for operation. See "Activate or unlock the system" on page 226.

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

4 System Error LED (yellow)

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

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

5 UART status LED (white)

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

Rear LEDs

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

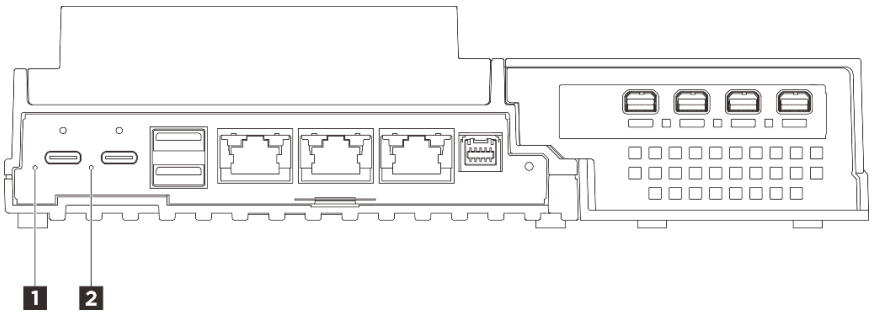


Figure 203. Rear LEDs

Table 22. Rear LEDs

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

1 2 Power input LED (green/yellow)

LED	Status	Description
Power input LED	On (green)	The server is connected to the power adapter and working normally.

	On (yellow)	The server is connected to the power adapter but can not be powered on since the power capability is unable to support the system requirement.
	Off	The power adapter is disconnected or a power problem occurs.

System-board LEDs

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

Top side

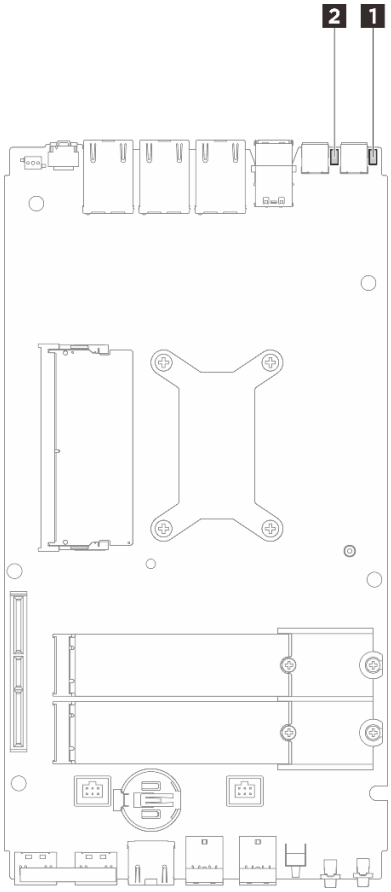


Figure 204. System board LEDs on top side

Bottom side

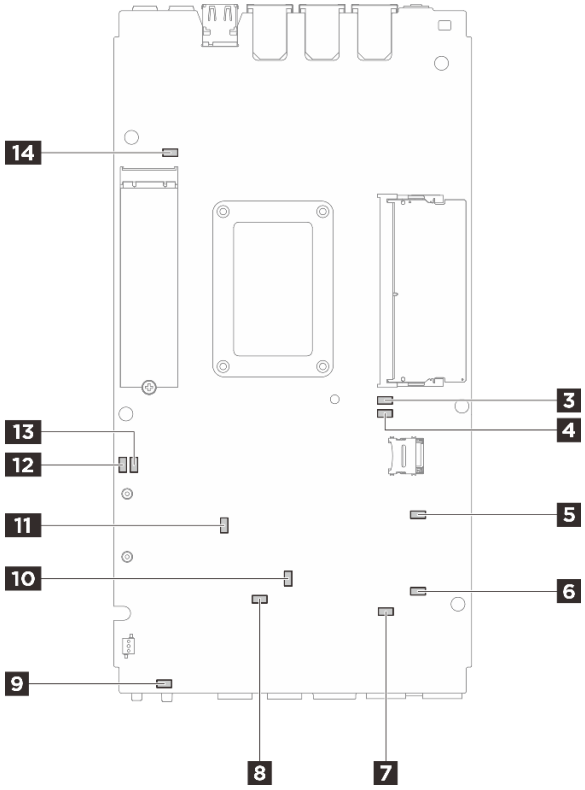


Figure 205. System board LEDs on bottom side

Figure 206. System-board LEDs

Table 23. System board LEDs description and actions

LED	Description and actions
1 Adapter 1 status LED 2 Adapter 2 status LED	The states of the adapter LED are as follows: • **On (green):** The server is connected to the power adapter and working normally. • **On (yellow):** The server is connected to the power adapter but can not be powered on since the power capability is unable to support the system requirement. • **Off:** The power adapter is disconnected or a power problem occurs.
3 DIMM 1 error LED 4 DIMM 2 error LED	**LED on:** an error has occurred to the DIMM the LED represents.
5 M.2 slot 2 status LED 6 M.2 slot 3 status LED 14 M.2 slot 1 status LED	The states of the M.2 LED are as follows: • **LED on/flashing :** M.2 drive is operating normally. • **LED off:** an error has occurred to the M.2 the LED represents or the M.2 drive is not powered.
7 Fan 1 error LED 8 Fan 2 error LED	**LED on:** an error has occurred to the fan the LED represents.
9 System error LED (yellow)	**LED on:** an error has occurred. Complete the following steps: • Check the identification LED and check log LED and follow the instructions. • Check the Lenovo XClarity Controller event log and the system error log for information about the error. • Save the log if necessary, and clear the log afterwards.
10 XCC status LED	The states of the XCC status LED are as follows: • **On:** XCC is alive. • **Off:** XCC is not ready or not alive. The LED is in this state when the server is first connected to the power source. It does not turn on until the SSP (Synchronous Serial Port) is ready.
11 XCC heartbeat LED (green)	This LED indicates the XCC heartbeat and boot process: • **LED blinking rapidly:** XCC code is in the loading process. • **LED going off momentarily and then starts blinking slowly:** XCC is fully operational. You can now press the power-control button to power on the server.
12 FPGA power status LED (green)	The FPGA power LED helps to identify different FPGA errors. • **LED blinking rapidly (four times per second):** The FPGA permission is delayed. • **LED blinking slowly (once per second):** The FPGA is ready to power on. • **LED on:** The FPGA power is on.
13 FPGA heartbeat LED (green)	This LED indicates power-on and power-off sequencing. • **LED blinking:** the system is functioning properly, and no action is necessary. • **LED not blinking:** replace the system board (trained technician only). See "System board replacement (trained technician only)" on page 179.

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

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

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

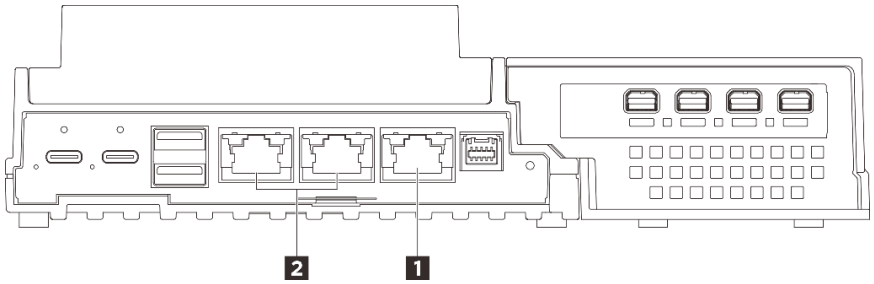


Figure 207. XCC system management port (10/100/1000 Mbps RJ-45) LEDs and LAN port LEDs

1 "XCC system management port (10/100/1000 Mbps RJ-45)" on page 242	2 "1GbE RJ-45 LAN port link and activity LEDs" on page 242 (LAN 1 to 2)

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

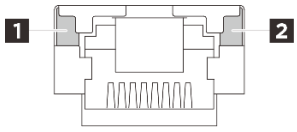


Figure 208. XCC system management port (10/100/1000 Mbps RJ-45) LED

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

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

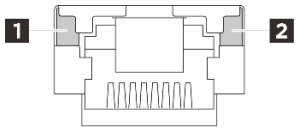


Figure 209. 1GbE RJ-45 LAN port link and activity LEDs

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

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 supplies are working 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.
   - Each adapter.
   - 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 235.

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 AC power cords and turn on the server. If the server starts successfully, reseat 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.
- Make sure that the cable rating is applicable for the network speed selected. For example, an SFP+ cable is only suitable for 10G operation. An SFP25 cable is needed for 25G operation. Likewise for Base-T operation, a CAT5 cable is required for 1G Base-T operation while a CAT6 cable is required for 10G Base-T operation.

Step 3. Set both the adapter port and the switch port to auto-negotiation. If auto-negotiation is not supported on one of the ports, try configuring both ports manually to match each other.

Step 4. Check the Ethernet controller LEDs on the adapter and server. These LEDs indicate whether there is a problem with the connector, cable, or hub.

Although some adapters may vary, when installed vertically the adapter link LED is typically on the left of the port and the activity LED is typically on the right.

The server front panel LED is described in "System LEDs" on page 31.

- The Ethernet link status LED is lit when the Ethernet controller receives a link indication from the switch. If the LED is off, there might be a defective connector or cable or a problem with the switch.
- 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 237.

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 235).

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 259).

Intermittent problems

Use this information to solve intermittent problems.

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 server. 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 server.
3. Test the console breakout cable on a working server 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 uncorrectable 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 **System Settings → Recovery and RAS → System Recovery → POST Watchdog Timer**.

2. If the reset occurs after the operating system starts, do one of the followings:
   - 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 --bmc XCC_USER:XCC_PASSWORD@XCC_IPAddress`
   - Disable any automatic server restart (ASR) utilities, such as the Automatic Server Restart IPMI Application for Windows, or any ASR devices that are installed.
3. See the management controller event log to check for an event code that indicates a reboot. See “Event logs” on page 235 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

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.

Mouse cursor is duplicated on external monitor

This problem may be caused by accessing the system through the remote console functionality of XCC when a monitor is connected to USB port 4 (with display support) or HDMI connector. Complete the following steps until the problem is solved.

1. Change the display setting:
   a. Right-click on the desktop and choose **Display Setting**.
   b. Change the display setting from “Extend these displays” to “Duplicate these displays”.

      Note: Depending on the Operating System, it might show “Mirror display” in the display setting.

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 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**.
3. If you are using a USB hub, disconnect the USB device from the hub and connect it directly to the server.

Monitor and video problems

Use this information to solve problems related to a monitor or video.

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 221.

Blank screen issue or screen flickering

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 rear of 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. If the server is installed with the graphical adapters while turning on the server, the Lenovo logo is displayed on the screen after approximately 3 minutes. This is normal operation while the system loads.
4. If the USB port 4 (with display support) on the front of the server is connected to a gaming monitor with Adaptive Sync support, perform one of the following steps listed below until the problem is solved. If you can not solve the problem after performing all steps, contact the monitor manufacturer for support.
   a. Change the display refresh rate on the monitor. For example, the refresh rate of Window O/S is set as 60 Hz by default, proceed to the following steps to change the refresh rate higher or lower:
      1) Right-click on the desktop and choose **Display Setting**.
      2) Click on **Related settings → Advanced display → Choose a refresh rate**.
   b. Disable the Adaptive Sync feature.
5. If the system is installed with the operating system Ubuntu 24.04.2, to configure the system in multi-monitor environment, check if the following steps is followed until the problem is solved:
   a. The display ports on the server can be separated into two types of groups. To avoid causing any problem to the display function of the connector, it is only allowed to connect the monitors to the connectors in either group A or group B. See Chapter 2 “Server components” on page 17 to locate the connectors.

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

   b. Make sure the display mode is set as “Mirror Display”.
6. 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.
7. Make sure that the correct server is controlling the monitor, if applicable.
8. Make sure that the video output is not affected by corrupted server firmware; See “Update the firmware” on page 221.
9. 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.
   - You installed the necessary device drivers 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 components listed in step 2 one at a time, in the order shown, restarting the server each time:
   a. Monitor cable
   b. Video adapter (if one is installed)
   c. Monitor
   d. (Trained technician only) System board (system board assembly)

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 221.

Network problems

Use this information to resolve issues related to networking.

Cannot wake server using Wake on LAN

Complete the following steps until the problem is resolved:

1. If you are using the dual-port network adapter and the server is connected to the network using Ethernet 5 connector, check the system-error log or IMM2 system event log (see "Event logs" on page 235), make sure:
   a. Fan 3 is running in standby mode, if Emulex dual port 10GBase-T embedded adapter is installed.
   b. The room temperature is not too high (see "Specifications" on page 4).
   c. The air vents are not blocked.
   d. The air baffle is installed securely.
2. Reseat the dual-port network adapter.
3. Turn off the server and disconnect it from the power source; then, wait 10 seconds before restarting the server.
4. If the problem still remains, replace the dual-port network adapter.

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.

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 compute node, 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 compute node and verify that all applications are running (no applications are hung).
  3. Restart the compute node.
  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 compute node 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 (system board assembly).

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 (system board assembly).

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 and thermal pads for processor, memory modules and M.2 drives in the server are installed correctly (see Chapter 5 “Hardware replacement procedures” on page 43 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 each system has its own specific IPMI 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.

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

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 compute node.

PCIe adapter is not recognized or is not functioning

Complete the following steps until the problem is resolved:

1. Update the UEFI firmware to the latest version.
2. Check the event log and resolve any issues related to the device.
3. Validate that the device is supported for the server (see https://serverproven.lenovo.com). Make sure that the firmware level on the device is at the latest supported level and update the firmware if applicable.
4. Make sure that the adapter is installed properly.
5. Make sure that the proper device drivers are installed for the device.
6. Check http://datacentersupport.lenovo.com for any tech tips (also known as retain tips or service bulletins) that might be related to the adapter.
7. Ensure any adapter external connections are correct and that the connectors are not physically damaged.
8. Make sure that the PCIe adapter is installed with the supported operating system.

Insufficient PCIe resources are detected.

If you see an error message stating "Insufficient PCI Resources Detected," complete the following steps until the problem is resolved:

1. Press Enter to access System Setup Utility.
2. Select **System Settings → Devices and I/O Ports → MM Config Base**; then, modify the setting to increase the device resources. For example, modify 3 GB to 2 GB or modify 2 GB to 1 GB.
3. Save the settings and restart the system.

4. If the error recurs with the highest device resource setting (1GB), shutdown the system and remove some PCIe devices; then, power on the system.
5. If the reboot failed, repeat step 1 to step 4.
6. If the error recurs, press Enter to access System Setup Utility.
7. Select **System Settings → Devices and I/O Ports → PCI 64–Bit Resource Allocation**, then; modify the setting from **Auto** to **Enable**.
8. DC cycle the system and ensure the system is enter UEFI boot menu or the operating system; then, capture the FFDC log.
9. Contact Lenovo technical support.

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 damage, 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 253
- "Operating system performance" on page 254

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 and firmware, 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 compute 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 compute node might be throttled to help with cooling. If it is throttled, reduce the workload on the compute 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 254
- "Server does not power on" on page 255

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 ac power 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 rear I/O power cable, and then repeat steps 1a and 2b.
      - If the problem remains, replace the system board.
2. Make sure that:
   - The power cords are correctly connected to the server and to a working electrical outlet.
   - The LEDs on the power supply do 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 the power supplies and make sure AC LED on PSU rear side are lit on.
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 the each power supply and check the power button function after installing the each one.
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 (system board assembly).
4. Check if the power status LEDs at the rear of the server are 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 adapters and make sure if the power status LEDs at the rear of the server are lit on.
10. Replace the each power adapter and check the power button function after installing the each one.
11. If the issue cannot be resolved by above actions, call service to review the issue symptom and see whether the system board (system board assembly) replacement is necessary.

Power problems

Use this information to resolve issues related to power.

Power input LED is on and event log "Power supply has lost input" is displayed

To resolve the problem, ensure that:

1. The power supply is properly connected to a power cord.
2. Make sure that the power supply AC source is stable within the supported range.
3. Swap the power supply to see if the issue follows the power supply, if it follows the power supply, then replace the failing one.
4. Review the event log and see how the problem it is to follow the event log actions to resolved the problems.

Serial-device problems

Use this information to solve problems with serial ports or devices.

Number of displayed serial ports is less than the number of installed serial ports

Complete the following steps until the problem is solved.

1. Make sure that:
   - Each port is assigned a unique address in the Setup utility and none of the serial ports is disabled.
   - The serial-port adapter (if one is present) is seated correctly.
2. Reseat the serial port adapter.
3. Replace the serial port adapter.

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 “Front view” on page 17).

2. To enable the serial port module on Linux or Microsoft Windows, do one of the followings according to the installed operating system:

   Note: If the Serial over LAN (SOL) or Emergency Management Services (EMS) feature is enabled, the serial port will be hidden on Linux and Microsoft Windows. Therefore, it is required to disable SOL and EMS to use the serial port on operating systems for serial devices.

   - For Linux:

     Open the ipmitool and enter the following command to disable the Serial over LAN (SOL) feature:

     ```
     -I lanplus -H IP -U USERID -P PASSWORD sol deactivate
     ```

   - For Microsoft Windows:
     a. Open the ipmitool and enter the following command to disable the SOL feature:

        ```
        -I lanplus -H IP -U USERID -P PASSWORD sol deactivate
        ```

     b. Open Windows PowerShell and enter the following command to disable the Emergency Management Services (EMS) feature:

        ```
        Bcdedit /ems off
        ```

     c. Restart the server to ensure that the EMS setting takes effect.

3. Reseat the following components:
   a. Failing serial device.
   b. Serial cable.
4. Replace the following components:
   a. Failing serial device.
   b. Serial cable.
5. (Trained technician only) Replace the system board (system board assembly).

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 an adapter or 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.

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about Lenovo products, you will find a wide variety of sources available from Lenovo to assist you.

On the World Wide Web, up-to-date information about Lenovo systems, optional devices, services, and support are available at:

http://datacentersupport.lenovo.com

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

Before you call

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

Attempt to resolve the problem yourself

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

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

https://pubs.lenovo.com/

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Check for updated software, firmware, and operating-system device drivers for your Lenovo product. (See the following links) The Lenovo Warranty terms and conditions state that you, the owner of the Lenovo product, are responsible for maintaining and updating all software and firmware for the product (unless it is covered by an additional maintenance contract). Your service technician will request that you upgrade your software and firmware if the problem has a documented solution within a software upgrade.
  - Drivers and software downloads
    - https://datacentersupport.lenovo.com/tw/en/products/servers/thinkedge/se100/7dgr/downloads/driver-list/
  - Operating system support center
    - https://datacentersupport.lenovo.com/solutions/server-os
  - Operating system installing instructions
    - https://pubs.lenovo.com/thinkedge#os-installation
- If you have installed new hardware or software in your environment, check https://serverproven.lenovo.com to make sure that the hardware and software are supported by your product.
- Refer to Chapter 7 “Problem determination” on page 235 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 37.
- Model number
- Serial number
- Current system UEFI and firmware levels
- Other pertinent information such as error messages and logs

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

Collecting service data

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

Service data can be collected through the following tools:

- **Lenovo XClarity Provisioning Manager**

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

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

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

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

- **Lenovo XClarity Administrator**

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

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

- **Lenovo XClarity Essentials OneCLI**

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

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

Contacting Support

You can contact Support to obtain help for your issue.

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

Appendix B. Documents and supports

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

Documents download

This section provides introduction and download link for handy documents.

Documents

Download the following product documentations at:

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

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

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

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

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

Support websites

This section provides driver and firmware downloads and support resources.

Support and downloads

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

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

Appendix C. Notices

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

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Important notes

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

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

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

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

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

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

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

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

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

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	○	○	○	○	○	○
機械組合件	–	○	○	○	○	○
空氣傳動設備	–	○	○	○	○	○
冷卻組合件	–	○	○	○	○	○
內存模組	–	○	○	○	○	○
處理器模組	–	○	○	○	○	○
電纜組合件	–	○	○	○	○	○
電源供應器	–	○	○	○	○	○
儲備設備	–	○	○	○	○	○
印刷電路板	–	○	○	○	○	○

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

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

備考2. 〝○〞係指該項限用物質之百分比含量未超出百分比含量基準值。

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

備考3. 〝-〞係指該項限用物質為排除項目。

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

Taiwan Region import and export contact information

Contacts are available for Taiwan Region import and export information.

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