

Lenovo

ThinkSystem SE350 and ThinkSystem SE350 Enclosures Maintenance Manual



Machine Types: 7Z46, 7D1X, 7D27, and 7D1R

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:

http://thinksystem.lenovofiles.com/help/topic/safety_documentation/pdf_files.html

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

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

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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



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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

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

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

مەزكۇر مەھسۇلاتنى ئورنىتىشتىن بۇرۇن بىخەتەرلىك ئۇچۇرلىرىنى ئوقۇپ چىقىڭ.

Youq mwngz yungh canjbinj neix gaxgonq, itdingh aeu doeg aen
canjbinj soengq cungj vahgangj ancien siusik.

Safety inspection checklist

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

Notes:

1. The product is not suitable for use at visual display workplaces according to §2 of the Workplace Regulations.
2. The set-up of the server is made in the server room only.

CAUTION:

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

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

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

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

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

- a. Go to:

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

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

Chapter 1. Introduction

The ThinkSystem SE350 server is a new edge server offering. It is specifically designed to meet the needs at IoT and edge locations. The ThinkSystem SE350 is a 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 it is designed for the non-datacenter environment, ideal for remote locations such as retail, manufacturing and factory locations.

Note: SE350 with Security Pack is also known simply as SE350 prior to July 2021.

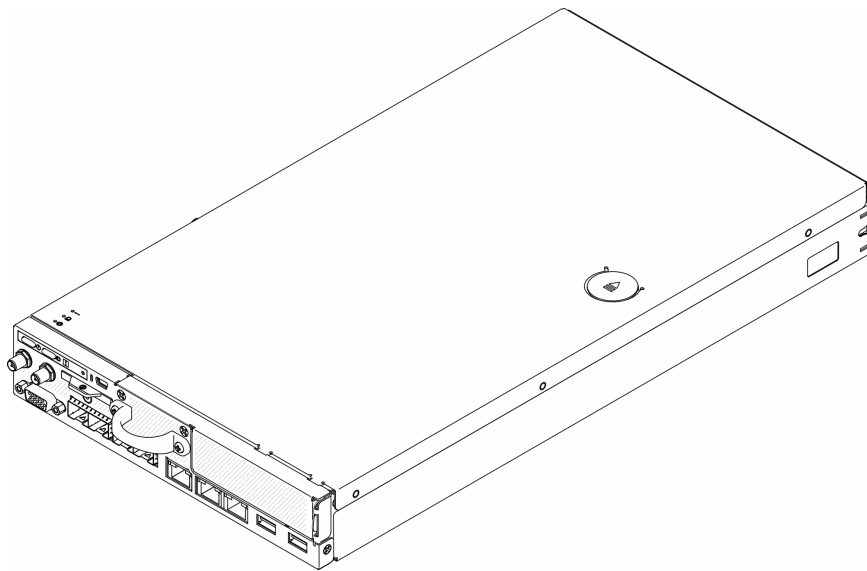


Figure 1. ThinkSystem SE350

The server comes with a limited warranty. For details about the warranty, see: <https://support.lenovo.com/us/en/solutions/ht503310>

For details about your specific warranty, see: <http://datacentersupport.lenovo.com/warrantylookup>

Specifications

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

Table 1. Server Specifications

Specification	Description
Security option (depending on the model)	<ul style="list-style-type: none"> • SE350 with Security Pack <ul style="list-style-type: none"> – SE350 automatic data protection, including intrusion sensor and motion sensor, can be enabled. – SED data access can be locked up at tamper events. – The system will need to be claimed and activated in order to unlock and access data. – Requires activation to boot up and fully functional. • SE350 Standard (Security Pack disabled) <ul style="list-style-type: none"> – SE350 automatic data protection, including intrusion sensor and motion sensor, is disabled. – Data access will never be locked up. SED management is disabled. Tamper setting is disabled. – No activation is required. – Claiming the system is optional. Secure Activation Code is needed for claiming. <p>Notes:</p> <ul style="list-style-type: none"> • <i>SE350 with Security Pack</i> is also known simply as <i>SE350</i> prior to July 2021. • You can check whether your system is SE350 with Security Pack or SE350 Standard in Lenovo XClarity Controller.
Size	<p>Node</p> <ul style="list-style-type: none"> • Height: 43.2 mm (1.7 inches) • Width: 209 mm (8.2 inches) • Depth: 376.1 mm (14.8 inches) <p>E1 Enclosure (1U 2-node):</p> <ul style="list-style-type: none"> • Height: 43 mm (1.69 inches) • Width: 439.2 mm (17.29 inches, from EIA bracket to EIA bracket) • Depth: 773.12 mm (30.44 inches) • Weight: 10 kg (with 1 node and 2 power adapters), 15 kg (with 4 power adapters) <p>E2 Enclosure (2U 2-node):</p> <ul style="list-style-type: none"> • Height: 86.9 mm (3.42 inches) • Width: 439.2 mm (17.29 inches, from EIA bracket to EIA bracket) • Depth: 476.12 mm (18.74 inches) • Weight: 10 kg (with 1 node and 2 power adapters), 15 kg (with 4 power adapters)
Weight	<p>Node</p> <ul style="list-style-type: none"> • Maximum: 3.6 kg (7.9 lbs)
Processor (depending on the model)	<p>One Intel® Xeon® processor D-2100 product family</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. Use the Setup utility to determine the type and speed of the processors in the node. 2. For a list of supported processors, see https://serverproven.lenovo.com/server/se350.

Table 1. Server Specifications (continued)

Specification	Description
Memory	<p>See “Memory module installation order” in <i>Setup Guide</i> for detailed information about memory configuration and setup.</p> <ul style="list-style-type: none"> • Slots: 4 DIMM slots • Minimum: 8 GB (1 x 8GB RDIMM) • Maximum: 256 GB (4 x 64GB LRDIMM) • Type: <ul style="list-style-type: none"> – PC4-21300 (single-rank, dual-rank), 2666 MT/s, error correcting code (ECC), double-data-rate 4 (DDR4) registered DIMM (RDIMM) – PC4-21300 (quad-rank), 2666 MT/s, error correcting code (ECC), double-data-rate 4 (DDR4) load reduced DIMM (LRDIMM) <p>Note: For a list of supported processors, see https://serverproven.lenovo.com/server/se350.</p>
M.2 drive	<p>M.2 boot adapter</p> <ul style="list-style-type: none"> • Supports up to two identical M.2 SATA drives • Supports three different physical sizes of M.2 drives: <ul style="list-style-type: none"> – 42 mm (2242) – 60 mm (2260) – 80 mm (2280) <p>M.2 data adapter</p> <ul style="list-style-type: none"> • PCIe and M.2 riser assembly: <ul style="list-style-type: none"> – Supports up to four M.2 SATA/NVMe drives • M.2 riser assembly <ul style="list-style-type: none"> – Supports up to eight M.2 NVMe drives – Supports up to four NVMe and four SATA drives • Supports four different physical sizes of M.2 drives: <ul style="list-style-type: none"> – 42 mm (2242) – 60 mm (2260) – 80 mm (2280) – 110 mm (22110) <p>Notes:</p> <ul style="list-style-type: none"> • M.2 drives installed on boot adapter and on data adapter are not swappable. • M.2 connector type: socket 3 (M key) • Mixing SATA drives and NVMe drives in the same M.2 SATA/NVMe 4-bay data adapter is not supported.
PCIe riser assembly	<p>PCIe and M.2 riser assembly:</p> <ul style="list-style-type: none"> • Slot 6: PCI Express 3.0 x16, (supports <75W, low profile, half-height, half-length PCIe adapter)

Table 1. Server Specifications (continued)

Specification	Description
WLAN	<ul style="list-style-type: none"> • WLAN: IEEE 802.11 a/b/g/n/ac • MIMO: 2x2 MIMO • Interfaces: WLAN: PCIe x1 • Antenna configuration: 2xIPEX (MHF4) connector • Form factor: M.2 2230 • Maximum number of concurrent user connection (AP mode): eight • Security: <ul style="list-style-type: none"> – AP mode supports WPA2 Personal – Station mode supports both WPA2 Enterprise and Personal • Working Band: <ul style="list-style-type: none"> – AP Mode: 2.4GHz – Station Mode: 2.4GHz/5GHz <p>Notes:</p> <ul style="list-style-type: none"> • WLAN performance may vary depending on your configuration and environment. • Wireless signal quality may be affected when installed in a rack or cabinet.
LTE	<ul style="list-style-type: none"> • 3GPP Release 11 • Category: Cat9 • Region: Global • Operating mode: FDD/TDD • Data transmission: up to 450Mbps DL/50Mbps UL • Function interface: USB 3.0 • Antenna configuration: 2xIPEX (MHF4) connector • Form factor: M.2 3042 <p>Notes:</p> <ul style="list-style-type: none"> • LTE performance may vary depending on your configuration and environment. • Wireless signal quality may be affected when installed in a rack or cabinet.

Table 1. Server Specifications (continued)

Specification	Description
Integrated functions	<ul style="list-style-type: none"> • Lenovo XClarity Controller, which provides service processor control and monitoring functions, video controller, and remote keyboard, video, mouse, and remote drive capabilities. • Front operator panel • LOM module connector (front of server): <ul style="list-style-type: none"> – 10G SFP+ LOM Package <ul style="list-style-type: none"> – Two USB 3.1 Gen 1 connectors – Two 1Gb Ethernet connectors – Two Lenovo XClarity Controller network connectors – Two 10Gb SFP+ connectors – One VGA connector – Wireless enabled LOM Package <ul style="list-style-type: none"> – Two USB 3.1 Gen 1 connectors – Two 1Gb Ethernet connectors – One Lenovo XClarity Controller network connector – Two 1Gb SFP connectors – Two 10Gb SFP+ connectors – One VGA connector – 10G BASE-T LOM Package <ul style="list-style-type: none"> – Two Lenovo XClarity Controller network connector – Two 10Gb BASE-T RJ45 connectors – Two 1Gb Ethernet connectors – Two USB 3.1 Gen 1 connectors – One VGA connector • Rear I/O connectors (rear of server): <ul style="list-style-type: none"> – Two WLAN Antenna connectors – One RS-232 port (RJ-45) – Two LTE Antenna connectors – Two USB 2.0 connectors – Two types of power distribution module: <ul style="list-style-type: none"> – 12V power distribution module (PDM) with two power connectors – -48V power distribution module (PDM) with one power connector
RAID controllers	<p>Software RAID: A software RAID controller is integrated on the system board, supporting RAID levels 0, 1, 5, and 10.</p> <ul style="list-style-type: none"> • Supports standard Intel SATA software RAID, RSTe • Supports Intel VROC NVMe RAID <ul style="list-style-type: none"> – VROC Intel-SSD-Only supports RAID levels 0, 1, 5, and 10 with Intel NVMe drives. – VROC Premium requires an activation key and supports RAID levels 0, 1, 5, and 10 with non-Intel NVMe drives. For more information about acquiring and installing the activation key, see https://fod.lenovo.com/lkms.

Table 1. Server Specifications (continued)

Specification	Description
	Hardware RAID: An M.2 hardware RAID module is needed for hardware RAID storage, supporting RAID levels 0 and 1.
Video controller (integrated into Lenovo XClarity Controller)	<p>Matrox G200</p> <ul style="list-style-type: none"> • ASPEED • SVGA compatible video controller • Avocent Digital Video Compression • 16 MB of video memory (not expandable) <p>Note: Maximum video resolution is 1920 x 1200 at 60 Hz.</p>
Fans	Three 40 mm system fans
Power adapters	<p>External power adapters:</p> <p>Sine-wave input (50–60 Hz) required</p> <ul style="list-style-type: none"> • 240W external power adapter 100-127 V ac / 200-240 V ac, 3.2/1.6 A <p>Notes:</p> <ul style="list-style-type: none"> • Power adapters is supported only by 12V PDM <p>CAUTION:</p> <ul style="list-style-type: none"> – Power adapters to the node must be with the same brand, power rating, wattage or efficiency level. – To distinguish the power adapters, check the size, the position of connector, and the label of the power adapters. • When GPU is installed, system must be installed with two power adapters <p>EU ErP (EcoDesign) Directive (2009/125/EC) Implementing Measure (COMMISSION REGULATION (EU) 2019/1782 of 1 October 2019) requires manufacturers to provide the energy efficiency and rating information. Lenovo products are designed to work with a range of compatible chargers and different chargers may be shipped in box or purchased subsequently. A list of suitable chargers can be found on the EU Declaration of Conformity (DoC) accessible here (https://www.lenovo.com/us/en/compliance/eu-doc). In order to access the applicable energy efficiency information for your charger, please access the following web page, search for your product using the full model number and select the applicable user guide or power supply data sheet. https://support.lenovo.com/</p>

Table 1. Server Specifications (continued)

Specification	Description
Acoustical noise emissions (base configuration)	<ul style="list-style-type: none"> • Operation: <ul style="list-style-type: none"> – Minimum: 5.3 bels – Typical: 5.4 bels – Maximum: 5.7 bels • Idle <ul style="list-style-type: none"> – Minimum: 4.9 bels – Typical: 5.0 bels – Maximum: 5.4 bels <p>Notes:</p> <ol style="list-style-type: none"> 1. These sound power levels are measured in controlled acoustical environments according to procedures specified by ISO 7779 and are reported in accordance with ISO 9296. 2. The declared acoustic noise levels are based on specified configurations, which may change slightly depending on configurations/conditions. 3. The options supported in this server vary in function, power consumption, and required cooling. Any increase in cooling required by these options will increase the fan speed and generated sound level. The actual sound pressure levels measured 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 of other equipment; the room ambient temperature and barometric pressure; and the location of employees in relation to the equipment.
Heat output	<p>Approximate heat output:</p> <ul style="list-style-type: none"> • Minimum configuration: 287.46 BTU per hour (84.25 watts) • Maximum configuration : 783.02 BTU per hour (229.49 watts)
Electrical input	<p>Power distribution module: 12V PDM</p> <ul style="list-style-type: none"> • Supports 12.2V/20A per power adapter • Each node supports up to two power adapters <p>Power distribution module: -48V PDM</p> <ul style="list-style-type: none"> • -48V - -60V DC / 8.4 A max direct -48V input <p>Notes:</p> <ul style="list-style-type: none"> • Power redundancy is in dual power mode when system power consumption is under 210W. • System operates in capping/throttling mode when power resource is insufficient. • Install two power adapters when system power consumption is higher than 210W.

Table 1. Server Specifications (continued)

Specification	Description
<p>Cautions and regulatory compliance statements for NEBS</p>	<p>Follow NEBS GR-1089-CORE cautions, regulatory compliance statements, and requirements.</p> <ul style="list-style-type: none"> • Supports Common Bonding Network (CBN) installation. • System can be installed in network telecommunication facilities where the National Electric Code applies. • It is required to turn ON UEFI “Power Restore Policy” when set the test condition in “MIN OPERATING VOLTAGE ” • The 1Gb Ethernet and SFP+ cables evaluated by NEBS measurement are required shielded. • The typical system boot up time under NEBS section 4 evaluation is 4 minutes and 55 seconds. • WARNING: The intra-building port(s) (1Gb Ethernet and SFP+ ports) of the equipment or subassembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly MUST NOT be metalically connected to interfaces that connect to the OSP or its wiring for more than 6 meters (approximately 20 feet). These interfaces are designed for use as intra-building interfaces only (Type 2 port as described in GR-1089) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metalically to an OSP wiring system.
<p>Environment</p>	<p>The ThinkSystem SE350 complies with ASHRAE class A4 specifications. System performance may be impacted when operating temperature is outside ASHRAE A4 Specification or fan failed condition outside A2 Specification.</p> <p>The ThinkSystem SE350 is supported in the following environment:</p> <ul style="list-style-type: none"> • Standard: <ul style="list-style-type: none"> – Server on: 0°C to 45°C (32°F to 113°F) – Server off: 0°C to 45°C (32°F to 113°F) • ASHRAE Class A4 <ul style="list-style-type: none"> – Server on: 5°C to 45°C (41°F to 113°F); decrease the maximum ambient temperature by 1°C for every 125 m (410 ft) increase in altitude above 900 m (2,953 ft). – Server off: 5°C to 45°C (41°F to 113°F) • Extended operation temperature (with limited configuration): <ul style="list-style-type: none"> – Server on: 0°C to 55°C (32°F to 131°F) – Server off: 0°C to 55°C (32°F to 131 °F) <p>Notes: Limited configuration₁:</p> <ul style="list-style-type: none"> – No GPU – No Micron/LITE-ON M.2 – Only Lenovo certified PCIe cards, for example: <ul style="list-style-type: none"> • ThinkSystem Broadcom NX-E PCIe 10Gb 2-Port Base-T Ethernet Adapter • ThinkSystem Mellanox ConnectX-4 Lx 10/25GbE SFP28 2-port PCIe Ethernet Adapter <ul style="list-style-type: none"> • Shipping/storage: -40 to 60°C (-40 to 140°F) • Maximum altitude: 3050 m (10 000 ft)

Table 1. Server Specifications (continued)

Specification	Description
	<ul style="list-style-type: none"> • Relative Humidity (non-condensing): <ul style="list-style-type: none"> – Operating: 8% to 90%, maximum dew point : 24°C (75.2°F) – Shipment/storage: 8% to 90%, maximum dew point : 27°C (80.6°F) • Non-operating (unpacked) storage can pass the following condition: 5% to 95% at 38.7°C (101.7°F) maximum dry-bulb temperature for 48 hrs. • Particulate contamination <p>Attention: Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server. For information about the limits for particulates and gases, see “Particulate contamination” on page 10.</p>
Operating systems	<p>Supported and certified operating systems:</p> <ul style="list-style-type: none"> • Microsoft Windows Server • VMware ESXi • Red Hat Enterprise Linux • SUSE Linux Enterprise Server <p>References:</p> <ul style="list-style-type: none"> • Complete list of available operating systems: https://lenovopress.com/osig. • OS deployment instructions: See “Deploy the operating system” in <i>Setup Guide</i>..

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.

SE350 system configuration		Vibration (when server is in operation)	Shock (when server is in operation)	Environmental vibration criteria		
Left wing	Right wing			IEC Stationary 0.15Grms, 30mins15G, 11ms	3.06 Grms, 15mins 30G, 11ms	3.06 Grms, 60mins 30G, 11ms
Four M.2 SATA drives	None	3.06Grms, 3-500 Hz, 60 min/axis	30G, 11ms, half-sine, $\pm X$, $\pm Y$, $\pm Z$	✓	✓	✓
Four M.2 SATA drives	NVIDIA T4 GPU	3.06Grms, 3-500 Hz, 15 min/axis	30G, 11ms, half-sine, $\pm X$, $\pm Y$, $\pm Z$	✓	✓	
Four M.2 NVMe drives (with heatsink)	Four M.2 NVMe drives (with heatsink)	0.21Grms, 5- 500 Hz, 15 min/axis	15G, 3ms, half-sine, $\pm X$, $\pm Y$, $\pm Z$	✓		
Four M.2 NVMe drives (with heatsink)	NVIDIA T4 GPU	0.21Grms, 5-500 Hz, 15 min/axis	15G, 3ms, half-sine, $\pm X$, $\pm Y$, $\pm Z$	✓		

Particulate contamination

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

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

Table 2. Limits for particulates and gases

Contaminant	Limits
Reactive gases	<p>Severity level G1 as per ANSI/ISA 71.04-1985¹:</p> <ul style="list-style-type: none"> The copper reactivity level shall be less than 300 Angstroms per month ($\text{\AA}/\text{month} \approx 0.0039 \mu\text{g}/\text{cm}^2\text{-hour}$ weight gain).² The silver reactivity level shall be less than 200 $\text{\AA}/\text{month}$ ($\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour}$ weight gain).³ The reactive monitoring of gaseous corrosivity must be conducted approximately 5 cm (2 in.) in front of the rack on the air inlet side at one-quarter and three-quarter frame height off the floor or where the air velocity is much higher.
Airborne particulates	<p>Data centers must meet the cleanliness level of ISO 14644-1 class 8.</p> <p>For data centers without airside economizer, the ISO 14644-1 class 8 cleanliness might be met by choosing one of the following filtration methods:</p> <ul style="list-style-type: none"> The room air might be continuously filtered with MERV 8 filters. Air entering a data center might be filtered with MERV 11 or preferably MERV 13 filters. <p>For data centers with airside economizers, the choice of filters to achieve ISO class 8 cleanliness depends on the specific conditions present at that data center.</p> <ul style="list-style-type: none"> The deliquescent relative humidity of the particulate contamination should be more than 60% RH.⁴ Data centers must be free of zinc whiskers.⁵

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 $\text{\AA}/\text{month}$ 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 $\text{\AA}/\text{month}$ 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.

Firmware updates

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

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

- Best practices related to updating firmware is available at the following site:
 - <http://lenovopress.com/LP0656>
- The latest firmware can be found at the following site:
 - <https://datacentersupport.lenovo.com/products/servers/thinksystem/se350/downloads>
- You can subscribe to product notification to stay up to date on firmware updates:
 - <https://datacentersupport.lenovo.com/tw/en/solutions/ht509500>

UpdateXpress System Packs (UXSPs)

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

Update method terminology

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

Firmware updating tools

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

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

Tool	Update Methods Supported	Core System Firmware Updates	I/O Devices Firmware Updates	Graphical user interface	Command line interface	Supports UXSPs
Lenovo XClarity Essentials UpdateXpress (LXCE)	In-band Out-of-band On-Target Off-Target	√	All I/O devices	√		√
Lenovo XClarity Essentials Bootable Media Creator³ (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.						

- **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://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html

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://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.

- **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://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html

- 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://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html

Important: Lenovo XClarity Controller (XCC) supported version varies by product. All versions of Lenovo XClarity Controller are referred to as Lenovo XClarity Controller and XCC in this document, unless specified otherwise. To see the XCC version supported by your server, go to https://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html.

- **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:

http://sysmgt.lenovofiles.com/help/topic/toolstr_cli_lenovo/onecli_c_update.html

- **Lenovo XClarity Essentials UpdateXpress**

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

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

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

- **Lenovo XClarity Essentials Bootable Media Creator**

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

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

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

- **Lenovo XClarity Administrator**

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

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

http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/update_fw.html

- **Lenovo XClarity Integrator offerings**

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

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

https://sysmgt.lenovofiles.com/help/topic/lxci/lxci_product_page.html

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

Power on the server

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

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

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

For information about powering off the server, see [“Power off the server” on page 16](#).

Power off the server

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

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

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

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

When in a standby state, the server can respond to remote power-on requests sent to the Lenovo XClarity Controller. For information about powering on the server, see [“Power on the server” on page 16](#).

Chapter 2. Server components

Use the information in this section to learn about each of the components associated with your server.

Important product information

This section provides information to help you locate the following:

- **Machine type and model information:** 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 model number and serial number are on the ID label. The following illustration shows the location of the ID label containing the machine type, model, and serial number.
- **FCC ID and IC Certification information:** The FCC and IC Certification information is identified by a label located on the edge server as shown in the following illustration.

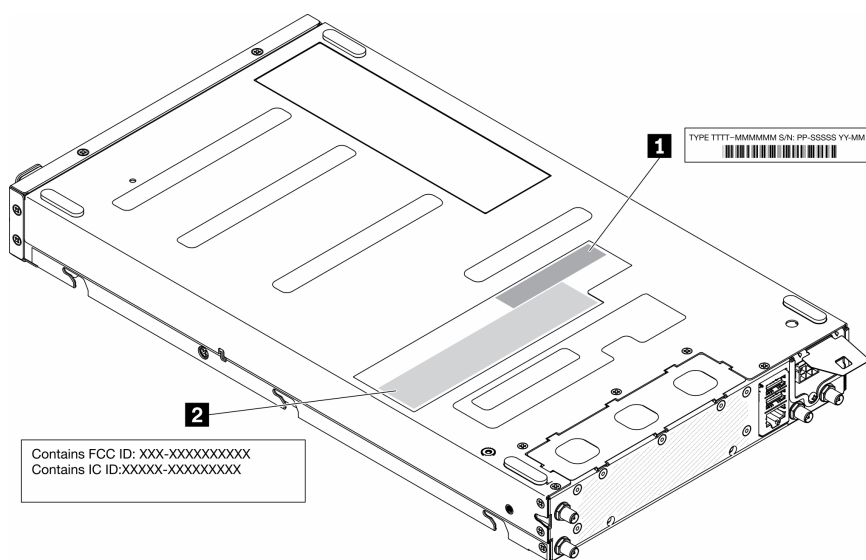


Figure 2. Location of the ID label and FCC ID/IC label

Table 3. ID label and FCC ID/IC label

1 ID label (machine type and model information)	2 FCC ID and IC Certification label
--	--

For a preinstalled wireless module, this label identifies the actual FCC ID and IC certification number for the wireless module installed by Lenovo.

Note: Do not remove or replace a preinstalled wireless module by yourself. For module replacement, you must contact Lenovo service first. Lenovo is not responsible for any damage caused by unauthorized replacement.

Network access tag

The network access tag can be found on the front of the server. You can pull way the network access tag to paste your own label for recording some information such as the hostname, the system name and the inventory bar code. Please keep the network access tag for future reference.

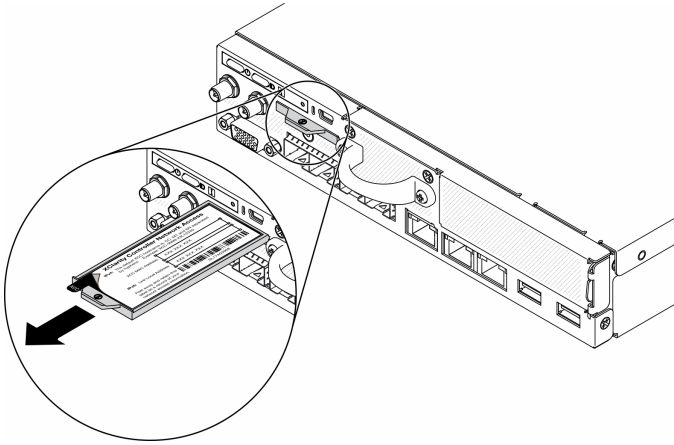


Figure 3. Location of the network access tag

QR code

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



Figure 4. SE350 QR code

Front view

The front view of the server varies by the model.

Front view of the server

- 10G SFP+ LOM Package

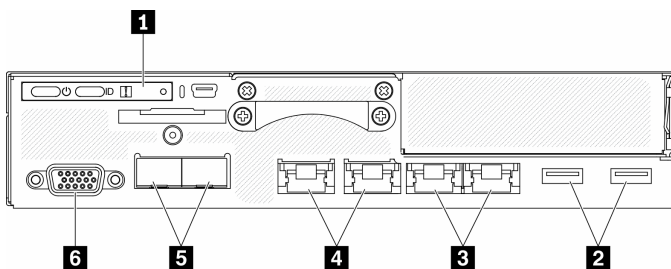



Figure 5. 10G SFP+ LOM Package front view

Table 4. Components on the 10G SFP+ LOM Package front view

<p>1 Front operator panel</p>	<p>4 Shared XClarity Controller (XCC) network connectors</p>  <p>The wrench icon on the connector indicates that this connector can be set to connect to Lenovo XClarity Controller.</p> <p>Attention: Only one network IP can be used.</p> <p>2x RJ45 ports to support daisy-chain connection. The dual-port provide the ability to daisy-chain the Ethernet management connections thereby reducing the number of ports in the management switches and reducing the overall cable density needed for systems management. With this feature, user can connect the first XCC management port to the management network and the second XCC management port to the next server system.</p>
<p>2 USB 3.1 Gen 1 connectors</p>	<p>5 10Gb SFP+ Ethernet connectors</p>
<p>3 1Gb Ethernet connectors</p>	<p>6 VGA connector</p>

- Wireless enabled LOM Package

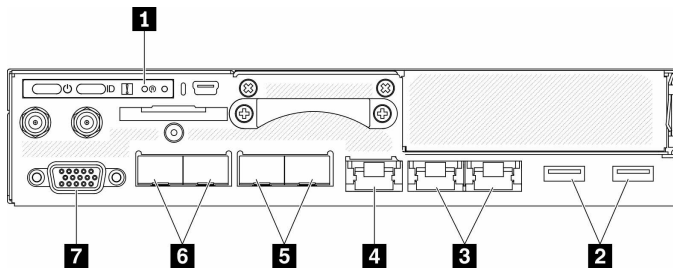



Figure 6. Wireless enabled LOM Package front view

Table 5. Components on the Wireless enabled LOM Package front view

<p>1 Front operator panel</p>	<p>5 1Gb SFP connectors</p>
<p>2 USB 3.1 Gen 1 connectors</p>	<p>6 10Gb SFP+ Ethernet connectors</p>
<p>3 1Gb Ethernet connectors</p>	<p>7 VGA connector</p>
<p>4 XClarity Controller (XCC) network connector</p>  <p>The wrench icon on the connector indicates that this connector can be set to connect to Lenovo XClarity Controller.</p>	

Install fillers

Install the fillers when the connectors are not used. The connectors could be damaged without proper protection of the fillers.

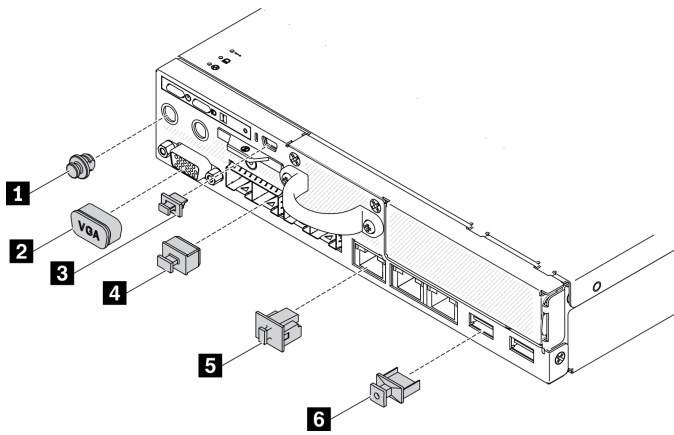


Figure 7. Fillers

Table 6. Fillers

1 Antenna port filler (x2 or not available, depending on the model)	4 SFP Ethernet connector filler (x2 or x4, depending on the model)
2 VGA filler	5 Ethernet connector filler (x3 or x4, depending on the model)
3 Mini USB filler	6 USB filler x2

Front operator panel

The front operation information panel of the server provides controls, connectors, and LEDs. The front operator panel varies by model.

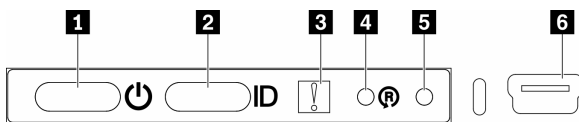


Figure 8. Front operator panel

Table 7. Front operator panel controls and indicators

1 Power button/LED (green)	4 Wireless enabled LOM package reset button
2 Identification button/LED (blue)	5 NMI button
3 System-error LED (yellow)	6 XClarity Controller mini USB connector

1 Power button/LED (green): Press this button to turn the server on and off manually. The states of the power LED are as follows:

Off: Power is not present or the power adapter, or the LED itself has failed.

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

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

On: The server is turned on.

2 Identification button/LED (blue): Use this blue LED to visually locate the server among other servers. This LED is also used as a presence detection button. You can use Lenovo XClarity Administrator to light this LED remotely. The states of the identification LED are as follows:

Off: Presence detection off.

Flashing rapidly (4 times per second): (on XCC firmware version 3.10 or later) The server is not activated yet and has no power permission. See *Activation guide* to activate the system.

Flashing slowly (once per second): Presence detection on.

On: Presence detection on.

3 System-error LED (yellow): When this yellow LED is lit, it indicates that a system error has occurred.

4 Wireless enabled LOM module reset button: The reset pin for the wireless enabled LOM module.

5 NMI button: Press this button to force a nonmaskable interrupt (NMI) to the processor. By this way, you can blue screen the server and take a memory dump. You might have to use a pen or the end of a straightened paper clip to press the button.

6 XClarity Controller mini USB connector: Used to attach a mini USB to manage the system using XClarity Controller.

Rear view

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

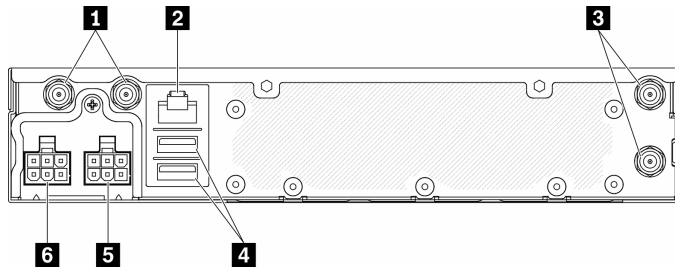


Figure 9. Rear view - 12V power distribution module (PDM)

Table 8. Rear view - 12V power adapter model

1 WLAN Antenna connectors (available only when M.2 WLAN module is installed)	4 USB 2.0 connectors
2 RS-232 port (RJ-45)	5 Power connector 1
3 LTE Antenna connectors (available only when M.2 LTE module is installed)	6 Power connector 2

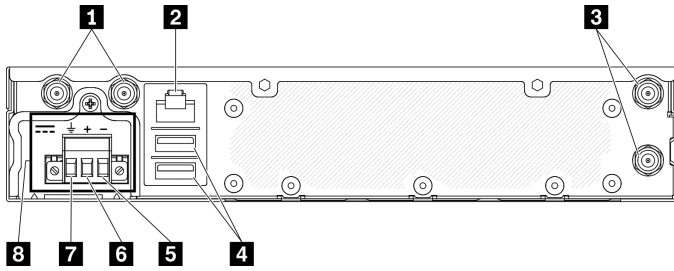


Figure 10. Rear view - -48V power distribution module (PDM)

Table 9. Rear view - -48V power adapter model

1 WLAN Antenna connectors (available only when M.2 WLAN module is installed)	5 Vin- terminal
2 RS-232 port (RJ-45)	6 Vin+ terminal
3 LTE Antenna connectors (available only when M.2 LTE module is installed)	7 GND terminal
4 USB 2.0 connectors	8 Power connector

Install covers

Install the covers, or connectors could be damaged without proper protection of the covers.

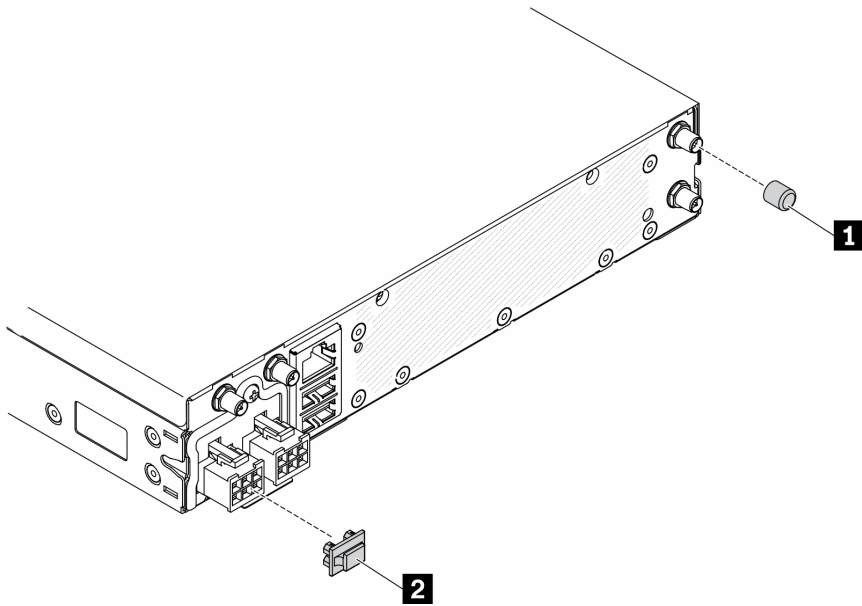


Figure 11. Covers

Table 10. Covers

1 Antenna cover x4 (if no antennas are installed, use antenna port filler, see “Front view” on page 18)	2 Power adapter cover
--	------------------------------

System-board switches, jumpers, and buttons

The illustrations in this section provide information about the switches, jumpers, and buttons 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 23](#).

System-board LEDs

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

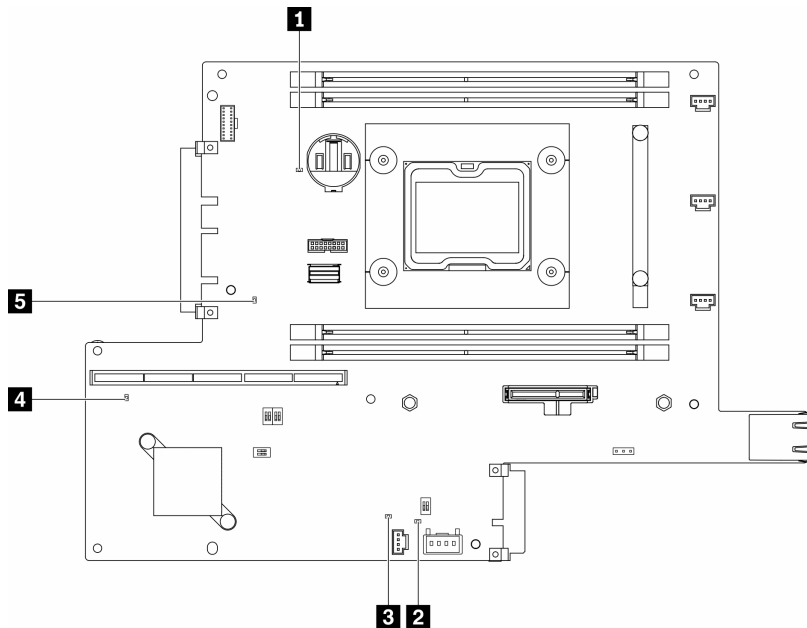


Figure 12. System-board LEDs

Table 11. System-board LEDs

1 Battery error LED	4 XClarity Controller heartbeat LED
2 Field-Programmable Gate Array (FPGA) Heartbeat LED	5 ME Heartbeat LED
3 Field-Programmable Gate Array (FPGA) error LED	

System-board connectors

The following illustrations show the connectors on the system board.

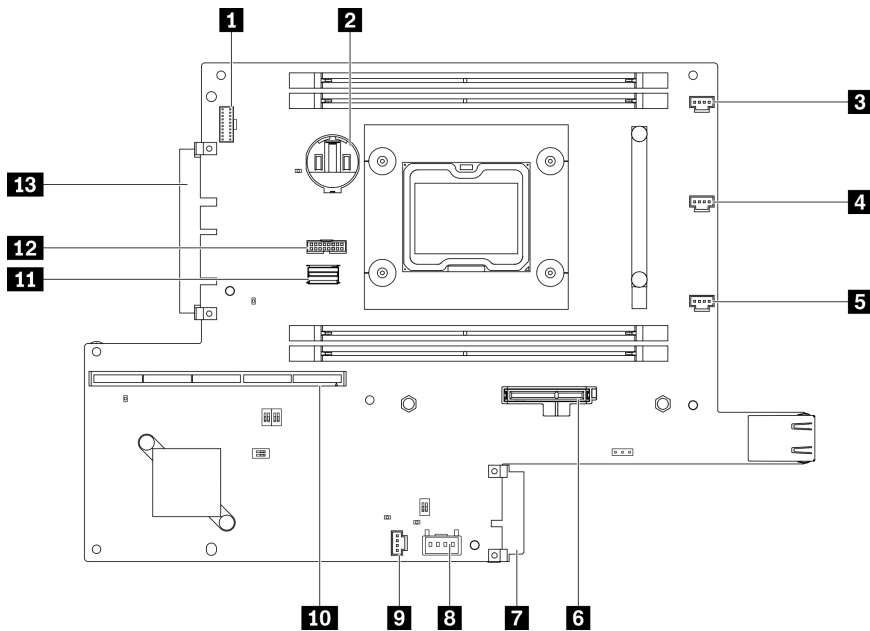


Figure 13. System-board connectors

Table 12. System-board connectors

1 Front operator panel connector	8 Lock switch connector
2 3V Battery (CR2032)	9 Intrusion switch connector
3 Fan 1 connector	10 Riser connector
4 Fan 2 connector	11 SATA Cable connector
5 Fan 3 connector	12 TPM connector
6 M.2 boot adapter connector	13 LOM module connector
7 Power distribution module connector	

LOM packages

The following illustrations show the wireless enabled LOM package, 10G SFP+ LOM package, and 10G BASE-T LOM Package.

Depending on the server configuration, connect one of the LOM packages to the LOM module connector on the system board (see [“System-board connectors”](#) on page 23).

Wireless enabled LOM package

Wireless enabled LOM package enables the wireless function of the server. The connector on the package is designed for M.2 WLAN/LTE wireless adapter. There are two types of the wireless adapter, both are installed in the same method. For more information, see [“Install the M.2 WLAN/LTE wireless adapter”](#) on page 42.

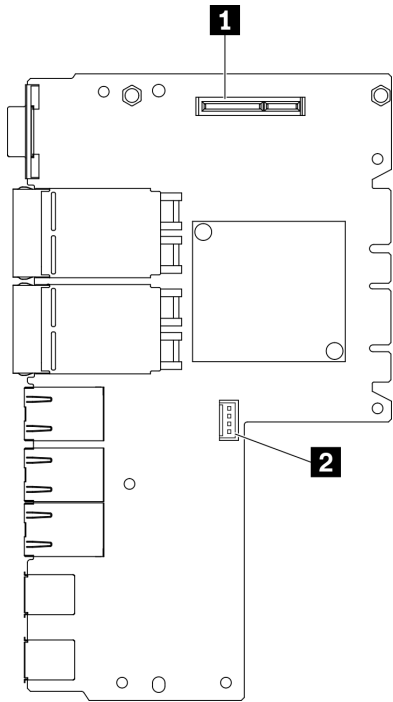


Figure 14. Wireless enabled LOM package

Table 13. Wireless enabled LOM package

1 M.2 WLAN/LTE wireless connector	2 Service-only connector
--	---------------------------------

Note: The service-only connector is available on some models and reserved for service only.

10G SFP+ LOM package

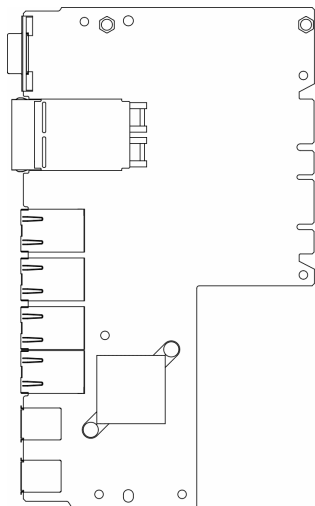


Figure 15. 10G SFP+ LOM package

10G BASE-T LOM Package

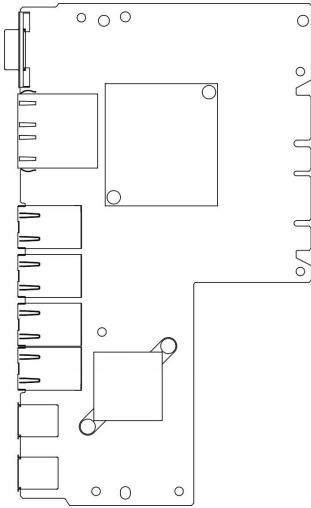


Figure 16. 10G BASE-T LOM Package

System-board switches and jumpers

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

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

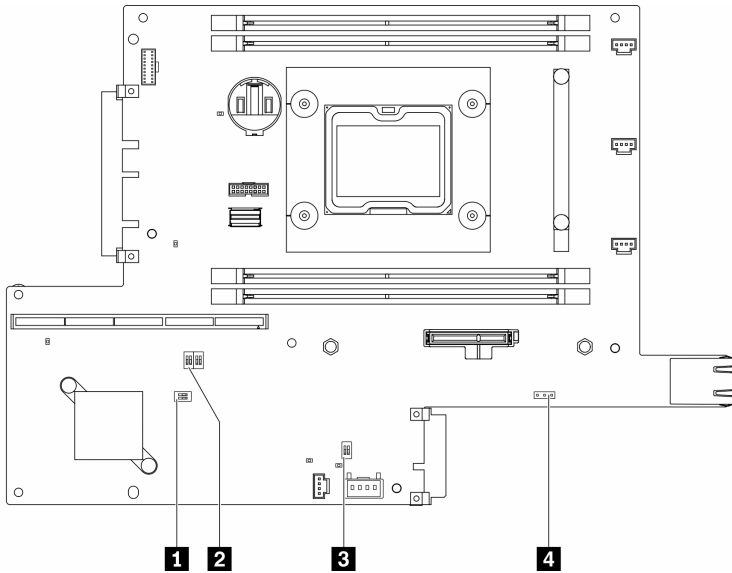


Figure 17. System-board switches

The following table describes the switches on the system board.

Table 14. System-board jumpers

Switches block	Switch number	Switch name	Usage description	
			On	off
1 SW2	1	Machine Engine (ME) firmware security override	ME update mode	Normal (default)
	2	N/A	Accessed by technician only	Normal (default)
2 SW8	1	Password override	Overrides the power-on password	Normal (default)
	2	XClarity Controller force update	Enables XClarity Controller force update	Normal (default)
	3	XClarity Controller boot backup	The node will boot by using a backup of the XClarity Controller firmware	Normal (default)
	4	Low security	Enable low security	Normal (default)
3 SW1	1	TPM physical presence	Indicates a physical presence to the system TPM	Normal (default)
	2	CMOS clear	Clears the real-time clock (RTC) registry	Normal (default)

The following table describes the jumper on the system board.

Table 15. System-board jumpers

Jumper name	Jumper setting
4 Serial select jumper	<ul style="list-style-type: none"> • Pins 1 and 2: Send UEFI debug message to serial port (default) • Pins 2 and 3: Sends the XCC to the serial port.

Important:

1. Before you change any switch settings or move any jumpers, turn off the server; then, disconnect all power cords and external cables. Review the information in http://thinksystem.lenovofiles.com/help/topic/safety_documentation/pdf_files.html, “Installation Guidelines” on page 37, “Handling static-sensitive devices” on page 39, and “Power off the server” on page 16.
2. Any system-board switch or jumper block that is not shown in the illustrations in this document are reserved.

PCIe riser assembly

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

PCIe and M.2 riser assembly

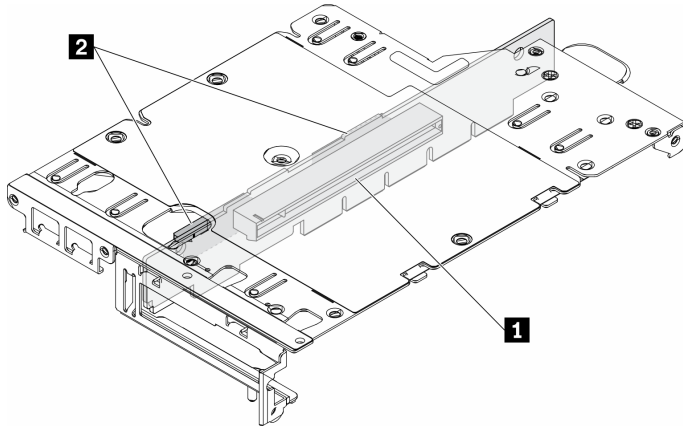


Figure 18. PCIe and M.2 riser assembly

Table 16. PCIe and M.2 riser assembly

1 Slot 6: PCIe 3.0 x16, (supports <75W, low profile, half-height, half-length PCIe adapter)	2 Drives (Slot) 2-5, M.2 data adapters
--	---

M.2 riser assembly

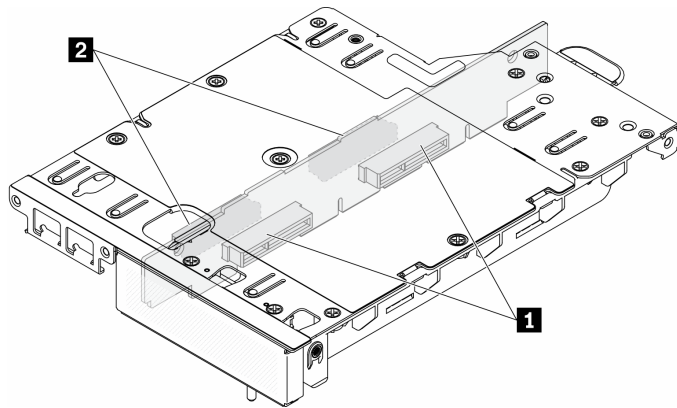


Figure 19. M.2 riser assembly

Table 17. M.2 riser assembly

1 Drives (Slot) 6-9, M.2 data adapters	2 Drives (Slot) 2-5, M.2 data adapters
---	---

M.2 drive and slot numbering

Use this information to locate the M.2 drive and slot numbering

M.2 boot adapter

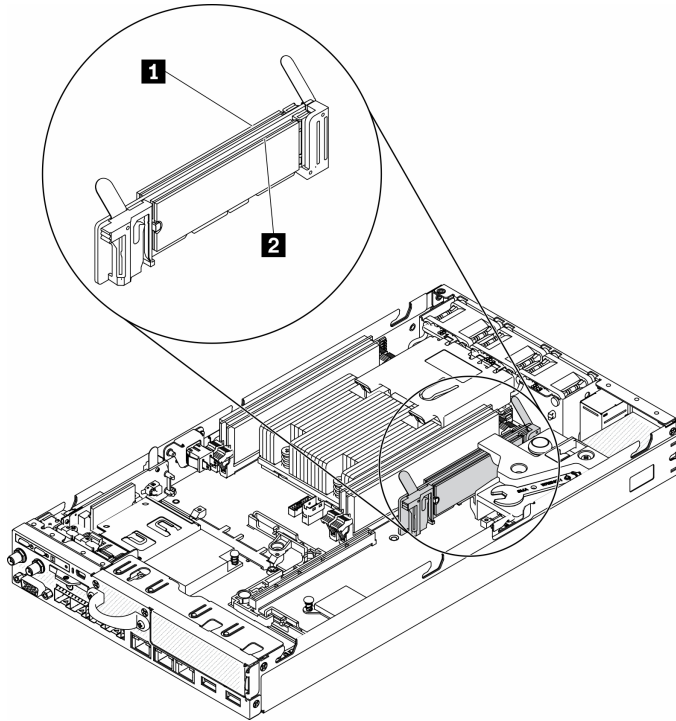


Figure 20. M.2 boot adapter

Table 18. M.2 boot adapter slot numbering

1 Drive 0	2 Drive 1
------------------	------------------

M.2 data adapter

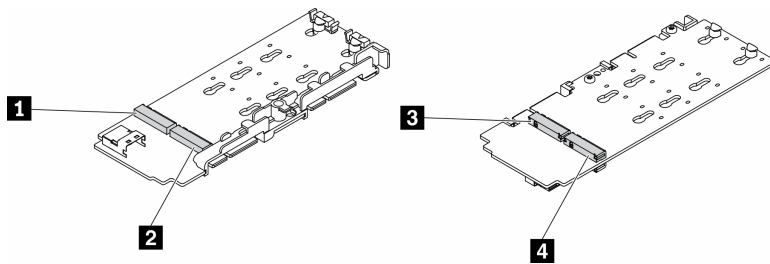


Figure 21. M.2 data adapter

Table 19. M.2 data adapter

1 Drive 2 or 9	3 Drive 5 or 6
2 Drive 4 or 7	4 Drive 3 or 8

The following tables demonstrate the M.2 drive and slot numbering.

- PCIe and M.2 riser assembly

Left-wing (M.2 data adapter)		Right-wing (PCIe adapter)	
The drive numbering on the adapter	The slot numbering in the UEFI Setup Menu	The drive numbering on the adapter	The slot numbering in the UEFI Setup Menu
Drive 2	Slot 2	PCIe adapter	Slot 6
Drive 3	Slot 3		
Drive 4	Slot 4		
Drive 5	Slot 5		

Left-wing (M.2 data adapter with hardware RAID)		Right-wing (PCIe adapter)	
The drive numbering on the adapter	The slot numbering in the UEFI Setup Menu	The drive numbering on the adapter	The slot numbering in the UEFI Setup Menu
Drive 2	Slot 2/3	PCIe adapter	Slot 6
Drive 3			
Drive 4	Slot 4/5		
Drive 5			

- M.2 riser assembly with two M.2 data adapters

Left-wing (M.2 data adapter)		Right-wing (M.2 data adapter)	
The drive numbering on the adapter	The slot numbering in the UEFI Setup Menu	The drive numbering on the adapter	The slot numbering in the UEFI Setup Menu
Drive 2	Slot 2	Drive 9	Slot 9
Drive 3	Slot 3	Drive 8	Slot 8
Drive 4	Slot 4	Drive 7	Slot 7
Drive 5	Slot 5	Drive 6	Slot 6

Left-wing (M.2 data adapter with hardware RAID)		Right-wing (M.2 data adapter with hardware RAID)	
The drive numbering on the adapter	The slot numbering in the UEFI Setup Menu	The drive numbering on the adapter	The slot numbering in the UEFI Setup Menu
Drive 2	Slot 2/3	Drive 9	Slot 8/9
Drive 3		Drive 8	
Drive 4	Slot 4/5	Drive 7	Slot 6/7
Drive 5		Drive 6	

Parts list

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

For more information about ordering the parts shown in the [Figure 22 “Server components ” on page 32:](#)

<https://datacentersupport.lenovo.com/products/servers/thinksystem/se350/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:

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

Server components

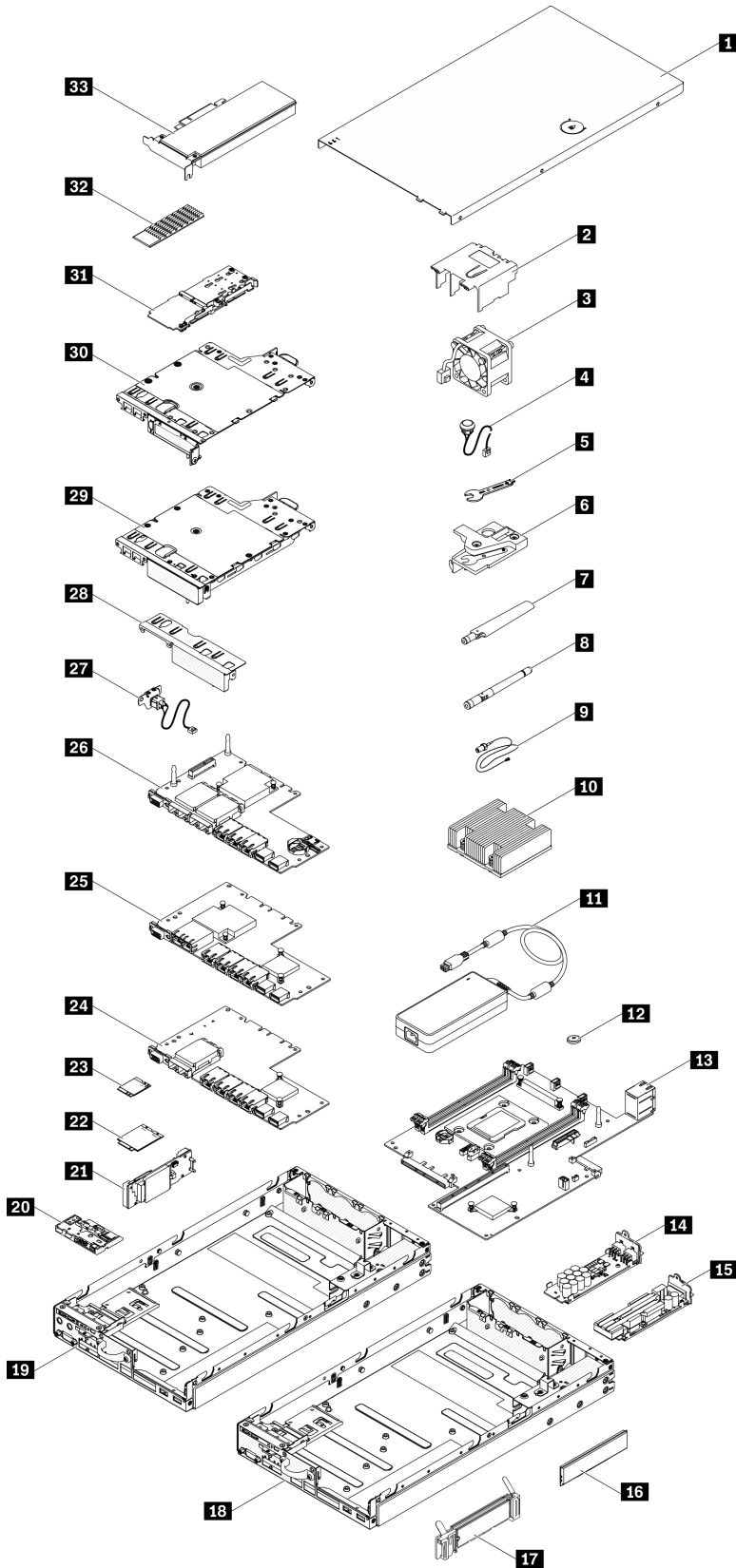


Figure 22. Server components

Table 20. Parts listing

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
For more information about ordering the parts shown in Figure 22 “Server components ” on page 32: https://datacentersupport.lenovo.com/products/servers/thinksystem/se350/parts					
1	Top cover				√
2	Air baffle				√
3	Fan	√			
4	Intrusion switch cable	√			
5	Screwdriver in Misc kit				√
6	Intrusion switch	√			
7	LTE Antenna	√			
8	WLAN Antenna	√			
9	M.2 WLAN/LTE module cable			√	
10	Processor heat sink			√	
11	Power adapter	√			
12	CMOS battery (CR2032)				√
13	System board			√	
14	12 V power distribution module		√		
15	-48 V power distribution module		√		
16	DIMM	√			
17	M.2 boot adapter		√		
18	10G SFP+ LOM package chassis				√
19	Wireless enabled LOM package chassis				√
20	Front operator panel				√
21	M.2 WLAN/LTE wireless adapter			√	
22	M.2 LTE module			√	
23	M.2 WLAN module			√	
24	10G SFP+ LOM package				√
25	10G BASE-T LOM Package				√
26	Wireless enabled LOM package				√
27	Locking cable	√			
28	Front filler				√
29	M.2 riser assembly		√		

Table 20. Parts listing (continued)

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
30	PCIe and M.2 riser assembly		√		
31	M.2 SATA/NVMe data adapter		√		
32	M.2 SATA/NVMe heat sink				√
33	PCIe adapter		√		

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 3. 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.

For more information about ordering parts:

<https://datacentersupport.lenovo.com/products/servers/thinksystem/se350/parts>

Note: 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 [“Firmware updates” on page 11](#).

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 that you work safely.
 - A complete list of safety information for all products is available at:
http://thinksystem.lenovofiles.com/help/topic/safety_documentation/pdf_files.html
 - The following guidelines are available as well: [“Handling static-sensitive devices” on page 39](#) and [“Working inside the server with the power on” on page 39](#).
- Make sure the components you are installing are supported by the server. For a list of supported optional components for the server, see <https://serverproven.lenovo.com/server/se350>.
- When you install a new server, download and apply the latest firmware. This will help ensure that any known issues are addressed, and that your server is ready to work with optimal performance. Go to [ThinkSystem SE350 Drivers and Software](#) to download firmware updates for your server.

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

- It is good practice to make sure that the server is working correctly before you install an optional component.
- Keep the working area clean, and place removed components on a flat and smooth surface that does not shake or tilt.
- Do not attempt to lift an object that might be too heavy for you. If you have to lift a heavy object, read the following precautions carefully:
 - Make sure that you can stand steadily without slipping.
 - Distribute the weight of the object equally between your feet.
 - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
 - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.

- Make sure that you have an adequate number of properly grounded electrical outlets for the server, monitor, and other devices.
- Back up all important data before you make changes related to the disk drives.
- Have a small flat-blade screwdriver, a small Phillips screwdriver, and a T8 torx screwdriver available.
- To view the error LEDs on the system board and internal components, leave the power on.
- You do not have to turn off the server to remove or install hot-swap power supplies, hot-swap fans, 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.
- Blue on a component indicates touch points, where you can grip to remove a component from or install it in the server, open or close a latch, and so on.
- Terra-cotta on a component or an terra-cotta label on or near a component indicates that the component can be hot-swapped if the server and operating system support hot-swap capability, which means that you can remove or install the component while the server is still running. (Terra-cotta can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- The Red strip on the drives, adjacent to the release latch, indicates that the drive can be hot-swapped if the server and operating system support hot-swap capability. This means that you can remove or install the drive while the server is still running.

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

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

System reliability guidelines

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

Make sure the following requirements are met:

- When the server comes with redundant power, a power adapter must be installed in each power-adapter 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 since malfunction.
- A removed hot-swap fan must be replaced within 30 seconds after removal.
- A removed hot-swap drive must be replaced within two minutes after removal.
- A removed hot-swap power adapter must be replaced within two minutes after removal.
- Every air baffle that comes with the server must be installed when the server starts (some servers might come with more than one air baffle). Operating the server with a missing air baffle might damage the processor.
- All processor sockets must contain either a socket cover or a processor with heat sink.
- When more than one processor is installed, fan population rules for each server must be strictly followed.

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 loss of data 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 long 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.

Adapter replacement

Use the following information to remove and install an adapter.

Remove the M.2 boot adapter

Use this information to remove the M.2 boot adapter.

Before you remove the M.2 boot adapter, complete the following steps:

1. Read the following sections to ensure that you work safely.

- “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
 3. Remove the node from the enclosure if needed (see “Remove a node” on page 98).
 4. Remove the intrusion switch (see “Remove the intrusion switch cable” on page 72).

To remove the M.2 boot adapter, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Grasp the M.2 boot adapter at both ends and pull it straight up to remove it from the system board.

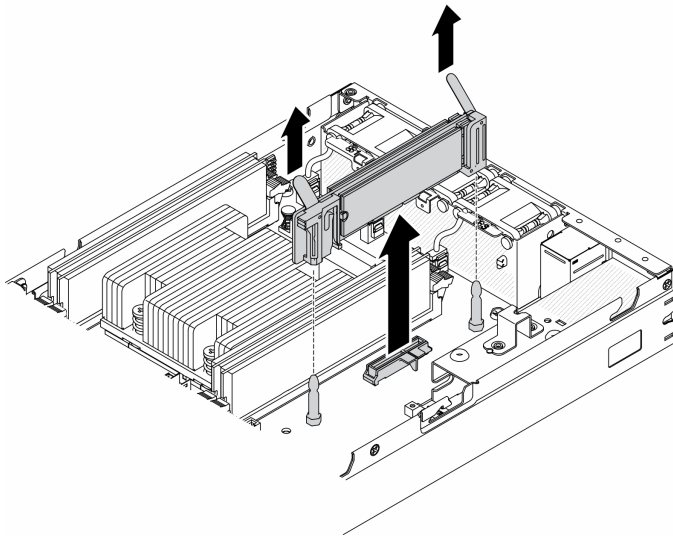


Figure 23. M.2 boot adapter removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the M.2 boot adapter

Use this information to install the M.2 boot adapter.

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

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To install the M.2 boot adapter, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

For more information about the M.2 adapter, see <https://lenovopress.com/lp0769-thinksystem-m2-drives-adapters>.

Step 1. Align the M.2 boot adapter with the connector on the system board, and press the adapter straight into the connector.

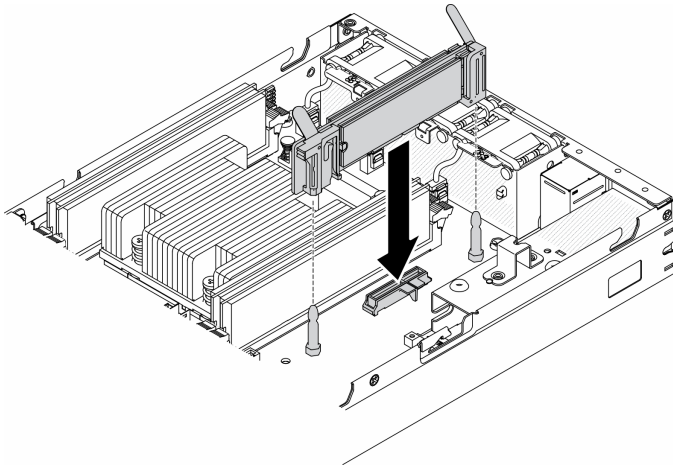


Figure 24. M.2 boot adapter installation

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

1. Install the intrusion switch (see [“Install the intrusion switch cable” on page 73](#)).
2. Install the node if needed (see [“Install a node” on page 101](#)).
3. Reconnect power cords and all external cables.

Remove the M.2 WLAN/LTE wireless adapter

Use this information to remove the M.2 WLAN/LTE wireless adapter.

Before you remove the M.2 WLAN/LTE wireless adapter, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).
3. Remove the node from the enclosure if needed (see [“Remove a node” on page 98](#)).
4. Remove the lock position switch if installed (see [“Remove the lock position switch” on page 75](#)).

To remove the M.2 WLAN/LTE wireless adapter, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Grasp the M.2 wireless adapter at both ends and pull it straight up to remove it from the system board.

Note: Carefully remove the adapter to avoid cable disconnected inappropriately from the adapter.

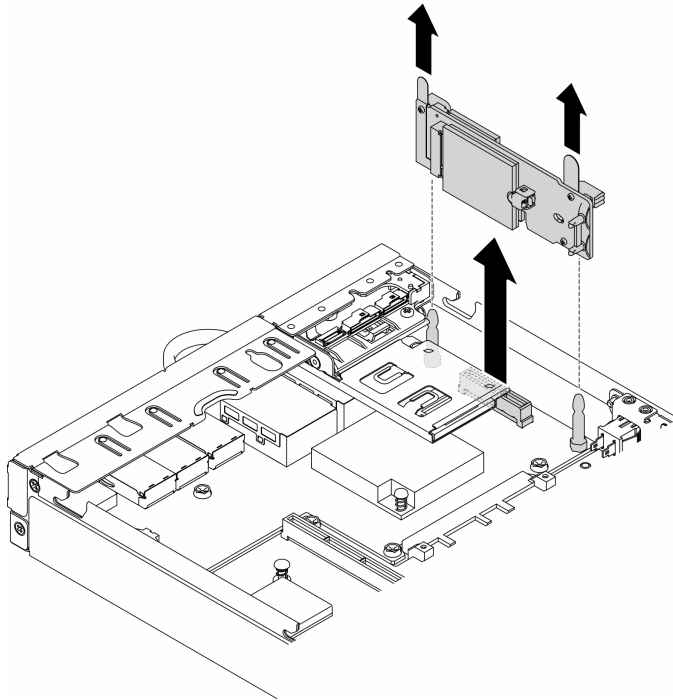


Figure 25. M.2 WLAN/LTE wireless adapter removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the M.2 WLAN/LTE wireless adapter

Use this information to install the M.2 WLAN/LTE wireless adapter.

Before you install the M.2 WLAN/LTE wireless adapter, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To install the M.2 WLAN/LTE wireless adapter, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6VRzUE>.

Notes:

- LTE and WLAN performance may vary depending on your configurations and environments.

- There are two types of the wireless adapter for the server, only one can be used at a time. Both are installed in the same method:
 - M.2 WLAN/LTE wireless adapter that comes with both WLAN and 4G LTE modules.
 - M.2 WLAN wireless adapter comes only with WLAN module
- The absence, removal, or the defectiveness of the WLAN/LTE modules could cause a system error event.

If the WLAN/LTE configuration error event occurred, follow the steps below:

1. Ensure the system firmware (UEFI, XCC, etc.) and switch board firmware are up-to-date.
2. Power off the system and check if the WLAN/LTE module is installed properly, re-seat it if necessary. WLAN/LTE module is required for server operation.
3. Replace the module if the message persists after proper reinstallation. The module may be defective in this situation.

Step 1. Align the M.2 wireless adapter with the connector on the system board, and press the adapter straight into the connector.

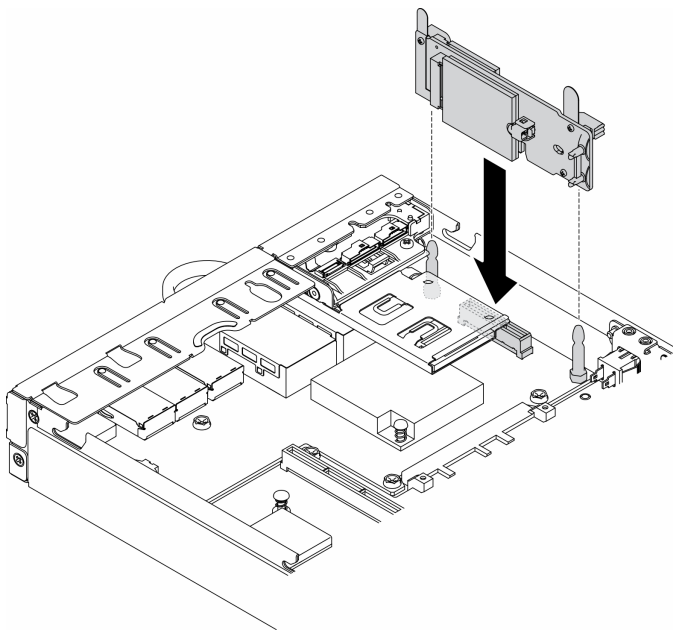


Figure 26. M.2 WLAN/LTE wireless adapter installation

After you install the M.2 WLAN/LTE wireless adapter, complete the following steps:

1. Install the lock position switch if removed (see [“Install the lock position switch” on page 77](#)).
2. Install the node if needed (see [“Install a node” on page 101](#)).
3. Reconnect power cords and all external cables.

Remove a M.2 data adapter

Use this information to remove a M.2 data adapter.

Before you remove a M.2 data adapter, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)

- “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
 3. Remove the node from the enclosure if needed (see “Remove a node” on page 98).
 4. Remove the PCIe riser assembly (see “Remove the PCIe riser assembly” on page 103 for instructions).

To remove a M.2 data adapter, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Remove the screws on the both side to remove the bezels from the riser assembly.

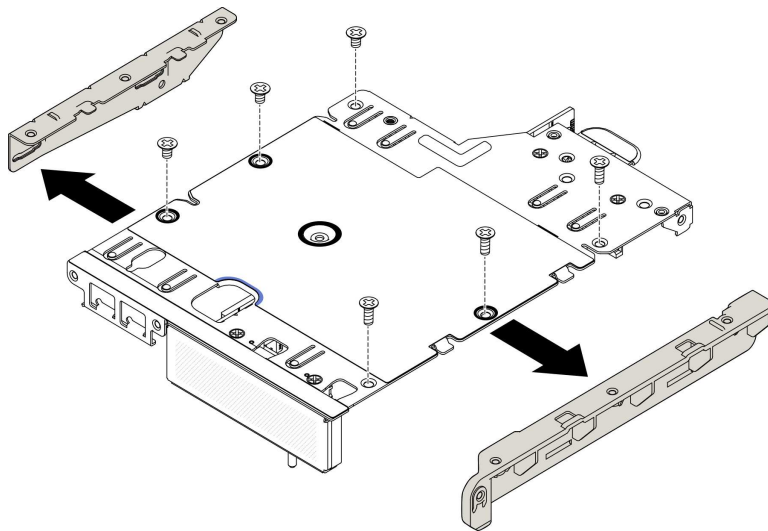


Figure 27. M.2 data adapter removal

- Step 2. Remove the screws.
- Step 3. Grasp the M.2 data adapter by its edges and carefully pull it out of the slot.
 - M.2 riser assembly

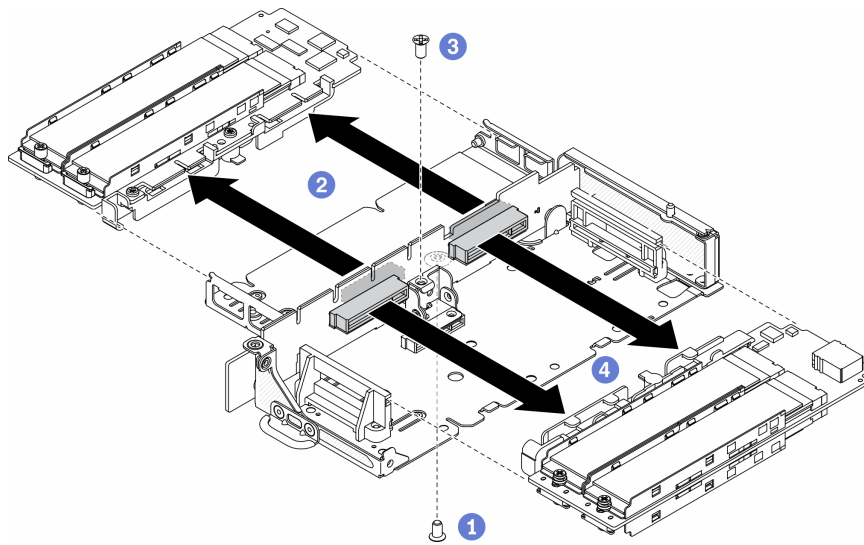


Figure 28. M.2 data adapter removal

- PCIe and M.2 riser assembly

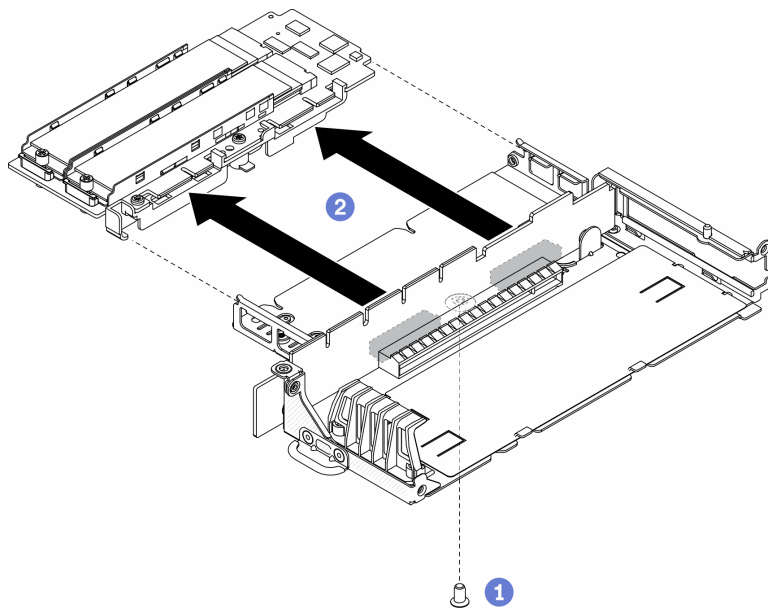


Figure 29. M.2 data adapter removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install a M.2 data adapter

Use this information to install a M.2 data adapter.

Before you install a M.2 data adapter, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)

- “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To install a M.2 data adapter, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Align the M.2 data adapter with the slot on the riser card; then, carefully press the M.2 data adapter straight into the slot until it is securely seated.

Step 2. Install the screw.

- M.2 riser assembly

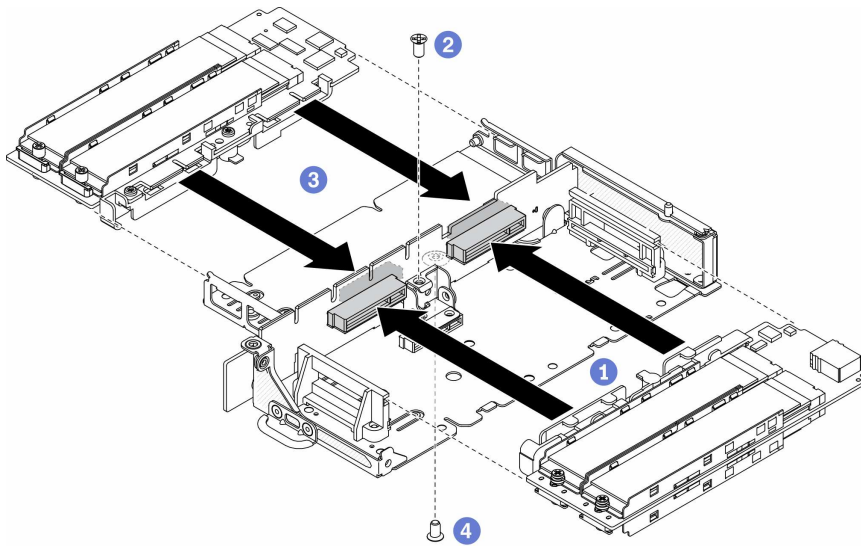


Figure 30. M.2 data adapter installation

- PCIe and M.2 riser assembly

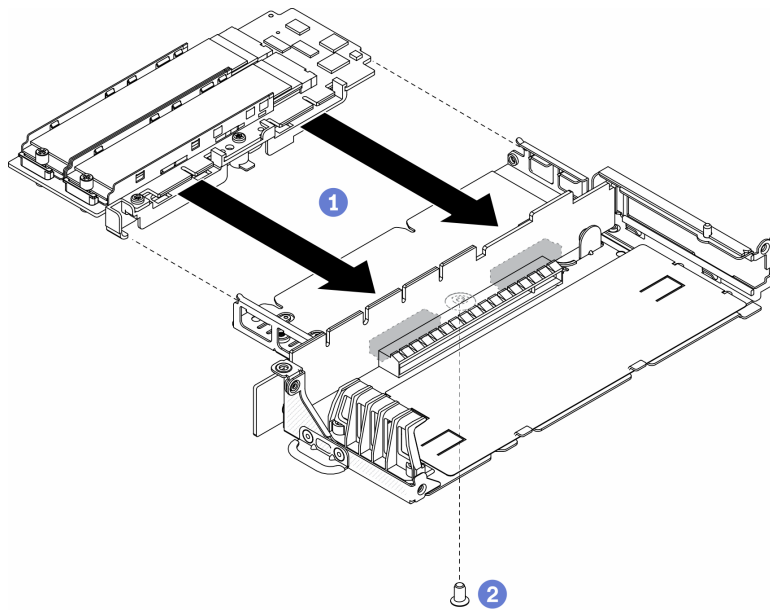


Figure 31. M.2 data adapter installation

Step 3. Insert the bezels to the riser assembly on the both sides and install the six screws as shown.

Note: The color and the size of the screws on each side are different, make sure to install the short ones on the left and long ones on the right.

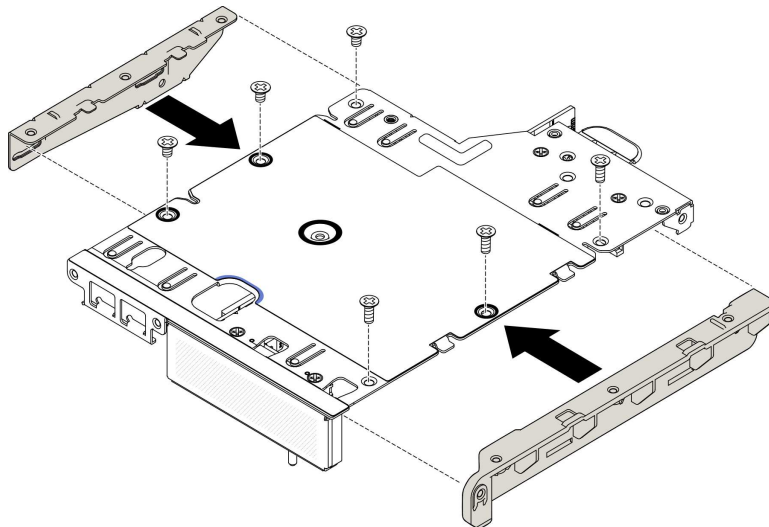


Figure 32. M.2 data adapter installation

After you install a M.2 data adapter, complete the following steps:

1. Install the PCIe riser assembly (see [“Install the PCIe riser assembly”](#) on page 106 for instructions).
2. Install the node if needed (see [“Install a node”](#) on page 101).
3. Reconnect power cords and all external cables.

Remove the PCIe adapter

Use this information to remove the PCIe adapter.

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

- **S012**



CAUTION:
Hot surface nearby.

Before you remove the PCIe adapter, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Remove the node from the enclosure if needed (see “Remove a node” on page 98).
4. Remove the PCIe riser assembly (see “Remove the PCIe riser assembly” on page 103 for instructions).

To remove the PCIe adapter, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Remove the screws of the adapter retainer and remove the retainer.

Step 1. Remove the screw of the adapter.

Step 2. Grasp the PCIe adapter by its edges and carefully pull it out of the slot.

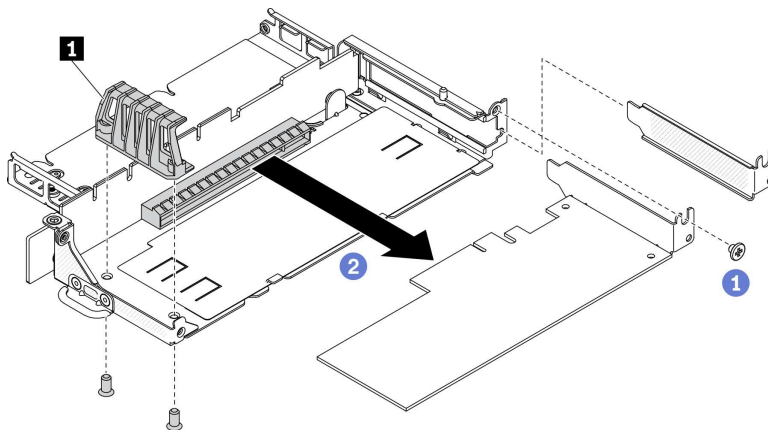


Figure 33. PCIe adapter removal

Table 21. PCIe adapter installation

1 Adapter retainer

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the PCIe adapter

Use this information to install the PCIe adapter.

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

- **S012**



CAUTION:
Hot surface nearby.

Before you install the PCIe adapter, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To install the PCIe adapter, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Remove the filler on the rear side of the riser assembly. Remove the screws of the adapter retainer and remove the adapter.

- Step 1. Align the adapter with the slot on the riser card; then, carefully press the adapter straight into the slot until it is securely seated.
- Step 2. Install the screw of the adapter.
- Step 3. Install the screws of the adapter retainer.

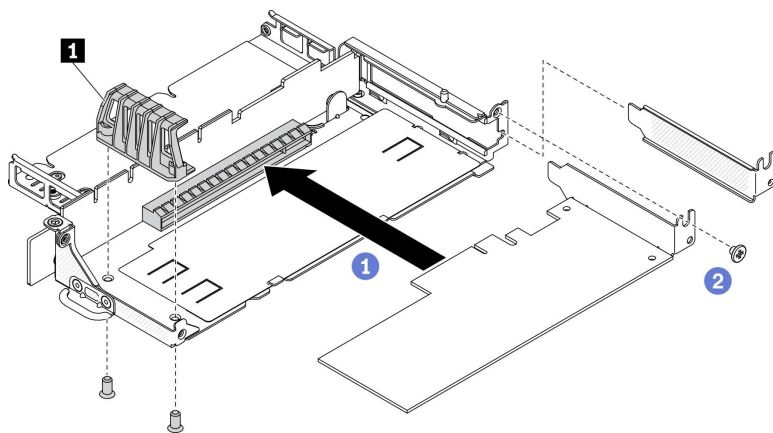


Figure 34. PCIe adapter installation

Table 22. PCIe adapter installation

1 Adapter retainer

After you install the PCIe adapter, complete the following steps:

1. Install the PCIe riser assembly (see [“Install the PCIe riser assembly” on page 106](#) for instructions).
2. Install the node if needed (see [“Install a node” on page 101](#)).
3. Reconnect power cords and all external cables.

Air baffle replacement

Use the following information to remove and install the air baffle.

Remove the air baffle

Use this information to remove the air baffle.

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

- **S012**



CAUTION:
Hot surface nearby.

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

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).
3. Remove the node from the enclosure if needed (see [“Remove a node” on page 98](#)).

To remove the air baffle, complete the following steps:

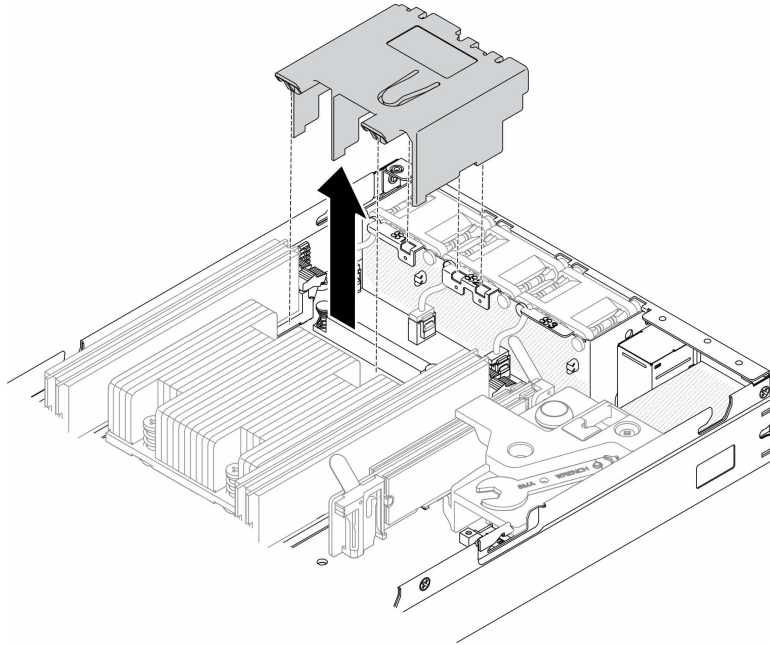


Figure 35. Air baffle removal

Step 1. Lift the air baffle up and set it aside.

Attention: For proper cooling and airflow, reinstall the air baffle before you turn on the server. Operating the server with the air baffle removed might damage server components.

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the air baffle

Use this information to install the air baffle.

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

- **S012**



CAUTION:
Hot surface nearby.

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

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)

2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To install the air baffle, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

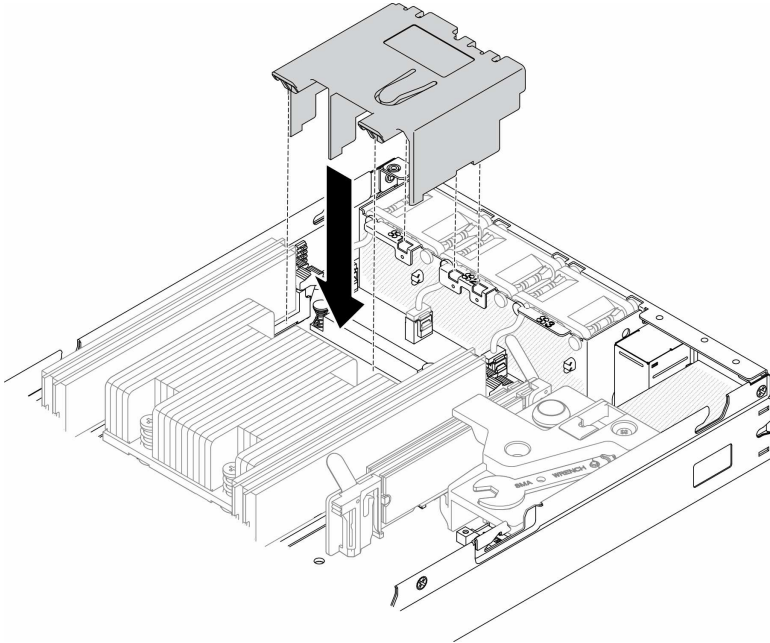


Figure 36. Air baffle installation

- Step 1. Align the tabs on both sides of the air baffle with the corresponding slots; then, lower the air baffle into the chassis and press the air baffle down until it is securely seated.

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

1. Install the node if needed (see “Install a node” on page 101).
2. Reconnect power cords and all external cables.

CMOS battery (CR2032) replacement

Use the following information to remove and install the CMOS battery.

Remove the CMOS battery (CR2032)

Use this information to remove the CMOS battery.

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

S002



CAUTION:

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

S004



CAUTION:

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

Do not:

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

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

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

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Remove the node from the enclosure if needed (see [“Remove a node” on page 98](#)).
3. Locate the CMOS battery on the system board.

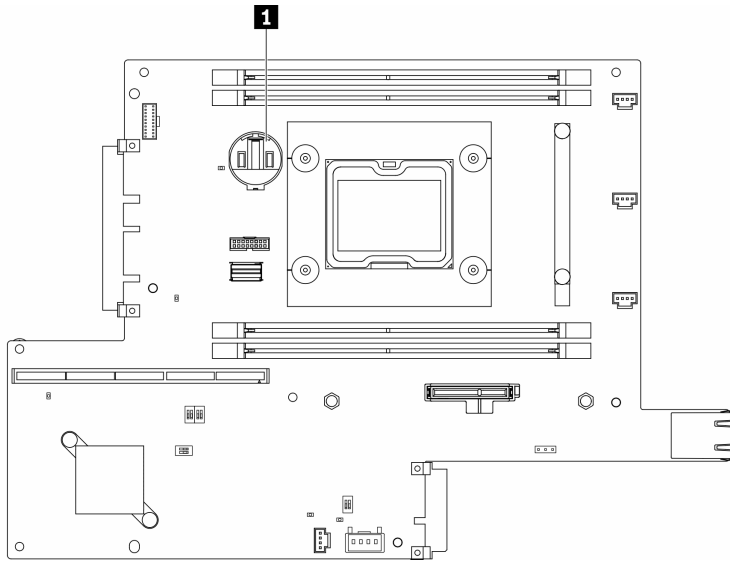


Figure 37. CMOS battery location

1 CMOS battery

The following notes describe information that you must consider when replacing the battery.

- Remove the CMOS battery will cause system lockdown. To unlock the system, contact Lenovo Support for more information.
- Lenovo has designed this product with your safety in mind. The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.
- If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.
- After you replace the battery, you must reconfigure the solution and reset the system date and time.

To remove the CMOS battery, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

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

Attention: Do not use excessive force to tilt or push the battery, it might damage the socket.



Figure 38. CMOS battery removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the CMOS battery (CR2032)

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

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

S002



CAUTION:

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

S004



CAUTION:

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

Do not:

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

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

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

1. Read the following sections to ensure that you work safely.

- “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
 3. Locate the CMOS battery on the system board.

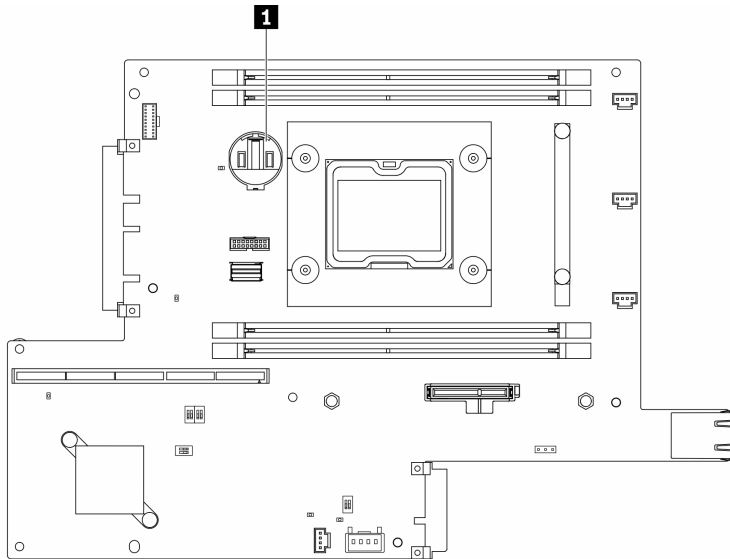


Figure 39. CMOS battery location

1 CMOS battery

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

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

- You must replace the CMOS battery with a lithium CMOS battery of the same type (CR2032).
- To operate the system in high temperature environment, it is recommended to use CMOS (CR2032HR).
- After you replace the CMOS battery, you must reconfigure the server and reset the system date and time.
- Dispose of the battery as required by local ordinances or regulations.

Attention:

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

To install the CMOS battery, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6VRzUE>.

- Step 1. Pivot the CMOS battery to insert it into the socket, with positive (+) side faces up.
- Step 2. Press the battery straight down until it clicks in place.

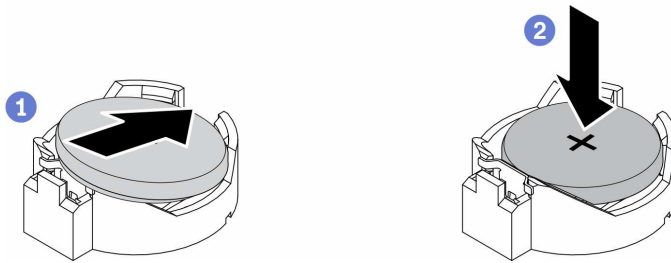


Figure 40. CMOS battery installation

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

1. Install the node if needed (see [“Install a node” on page 101](#)).
2. Reconnect power cords and all external cables.

DIMM replacement

Use the following information to remove and install a DIMM.

Remove a DIMM

Use this information to remove a DIMM.

Attention: Memory modules are sensitive to static discharge and require special handling. In addition to the standard guidelines for [“Handling static-sensitive devices” on page 39](#):

- Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
- Never hold two or more memory modules together so that they touch. Do not stack memory modules directly on top of each other during storage.
- Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory-module connector housing.
- Handle memory modules with care: never bend, twist, or drop a memory module.

Before you remove a DIMM, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).
3. Remove the node from the enclosure if needed (see [“Remove a node” on page 98](#)).
4. Locate the DIMM connectors. Determine which DIMM you want to remove from the server.

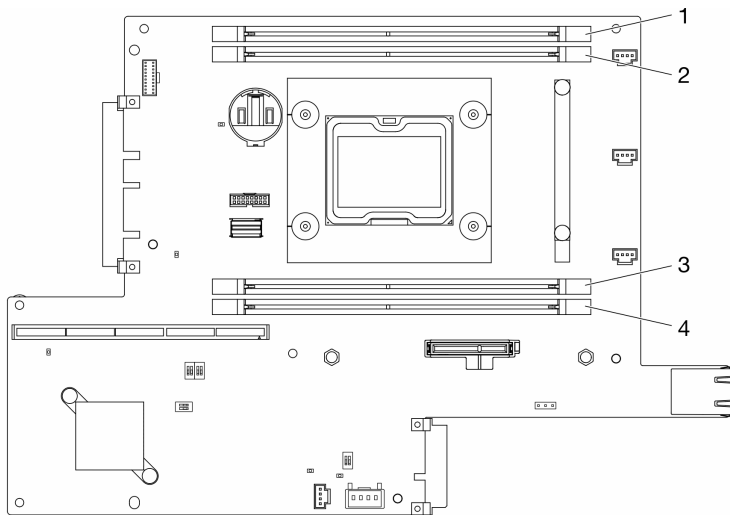


Figure 41. DIMM connectors

To remove a DIMM, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

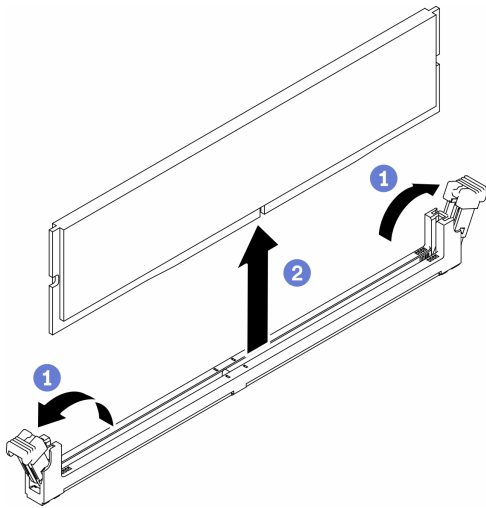


Figure 42. DIMM removal

Note: To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.

Step 1. Carefully open the retaining clips on each end of the DIMM connector.

Step 2. Make sure that both retaining clips are in the fully-open position; then, pull the DIMM out of the connector.

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install a DIMM

Use this information to install a DIMM.

See “Memory module installation order” in *Setup Guide* for detailed information about memory configuration and setup.

Before you install a DIMM, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.

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

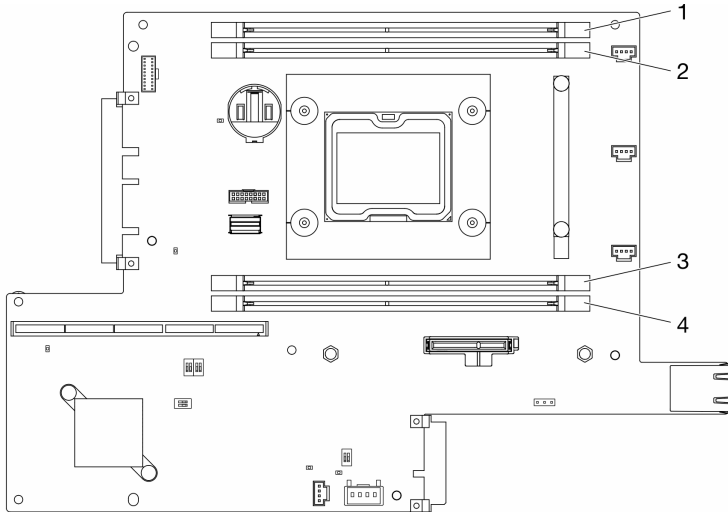


Figure 43. DIMM connectors

To install a DIMM, complete the following steps:

Attention: Memory modules are sensitive to static discharge and require special handling. In addition to the standard guidelines for “Handling static-sensitive devices” on page 39:

- Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
- Never hold two or more memory modules together so that they touch. Do not stack memory modules directly on top of each other during storage.
- Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory-module connector housing.
- Handle memory modules with care: never bend, twist, or drop a memory module.

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

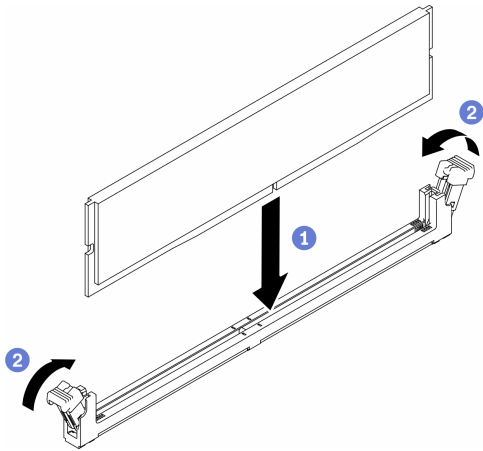


Figure 44. DIMM installation

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

After you install the DIMM, complete the following steps:

1. Reinstall the air baffle if it is removed (see [“Install the air baffle” on page 51](#)).
2. Install the node if needed (see [“Install a node” on page 101](#)).
3. Reconnect power cords and all external cables.

Dust filter replacement

Use this procedure to remove or install the dust filter.

Remove the dust filter in locking bezel

Use this information to remove the dust filter in locking bezel.

Before you remove the dust filter in locking bezel, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).
3. Remove the node from the enclosure if needed (see [“Remove a node” on page 98](#)).
4. It is required to have dust filter when server is in operation.

To remove the dust filter in locking bezel, complete the following steps:

- Step 1. Open the latch to remove the dust filter holder out of the locking bezel.

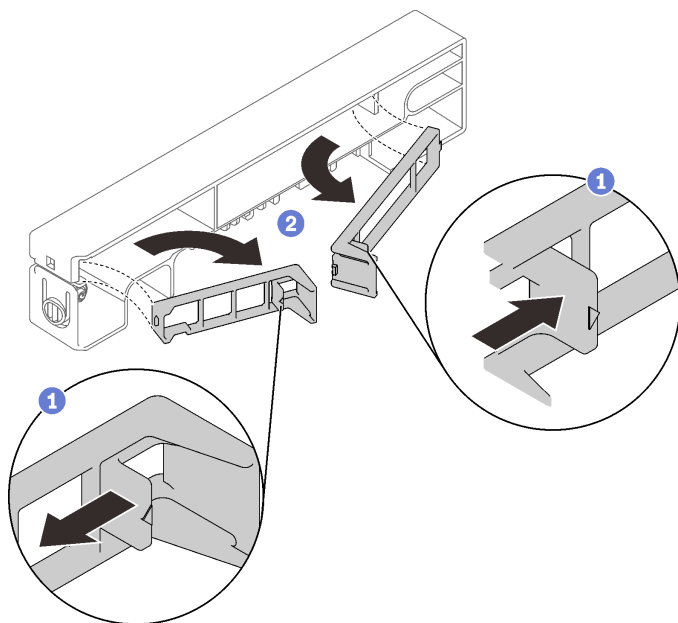


Figure 45. Dust filter removal

Step 2. Remove the dust filter out of the locking bezel.

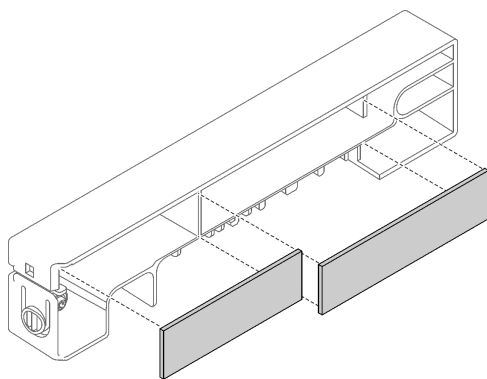


Figure 46. Dust filter removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the dust filter in locking bezel

Use this information to install the dust filter in locking bezel.

Before you install the dust filter in locking bezel, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).

3. Depends on the environment of the server, check the status of the dust filter every 3 months to make sure it is functional.

To install the dust filter in locking bezel, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

- Step 1. Align the dust filter with the slot in locking bezel, and place the filter into the slot.

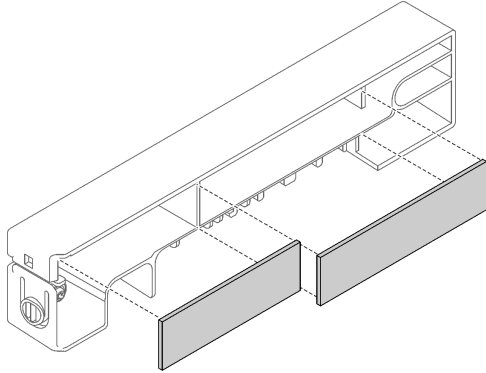


Figure 47. Dust filter installation

- Step 2. Rotate the dust filter holder into the slot until it clicks.

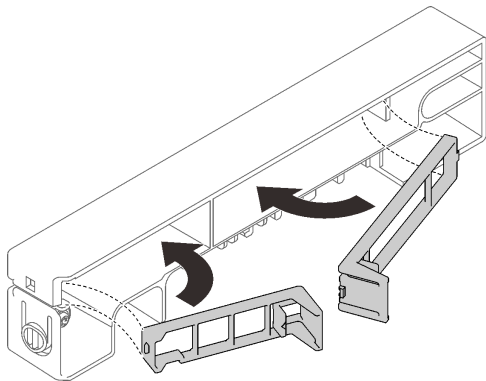


Figure 48. Dust filter installation

After you install the dust filter in locking bezel, complete the following steps:

1. Install the node if needed (see [“Install a node”](#) on page 101).
2. Reconnect power cords and all external cables.

Remove the dust filter in E1 enclosure bracket

Use this information to remove the dust filter in E1 enclosure bracket.

Before you remove the dust filter in E1 enclosure bracket, complete the following steps:

1. Read the following sections to ensure that you work safely.

- “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
 3. Remove the node from the enclosure if needed (see “Remove a node” on page 98).
 4. It is required to have dust filter when server is in operation.

To remove the dust filter in E1 enclosure bracket, complete the following steps:

Step 1. Remove the dust filter out of the bracket.

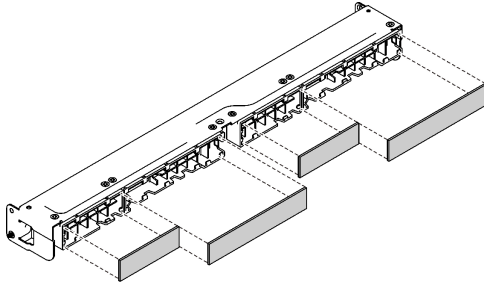


Figure 49. Dust filter removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the dust filter in E1 enclosure bracket

Use this information to install the dust filter in E1 enclosure bracket.

Before you install the dust filter in E1 enclosure bracket, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Depends on the environment of the server, check the status of the dust filter every 3 months to make sure it is functional.

To install the dust filter in E1 enclosure bracket, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Align the dust filter with the slot in locking bezel, and place the filter into the slot.

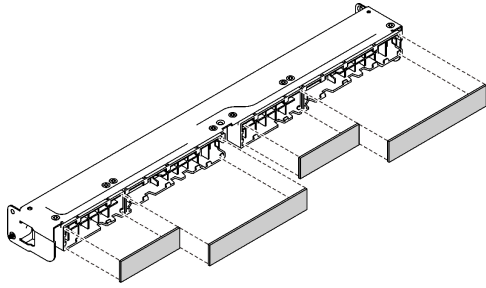


Figure 50. Dust filter installation

After you install the dust filter, complete the following steps:

1. Install the node if needed (see [“Install a node” on page 101](#)).
2. Reconnect power cords and all external cables.

Fan replacement

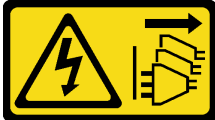
Use the following information to remove and install the fan.

Remove a fan

Use this information to remove a fan.

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

S002



CAUTION:

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

S009



CAUTION:

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

Before you remove a fan, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)

2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Remove the node from the enclosure if needed (see “Remove a node” on page 98).
4. Remove the air baffle (see “Remove the air baffle” on page 50).

To remove a fan, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

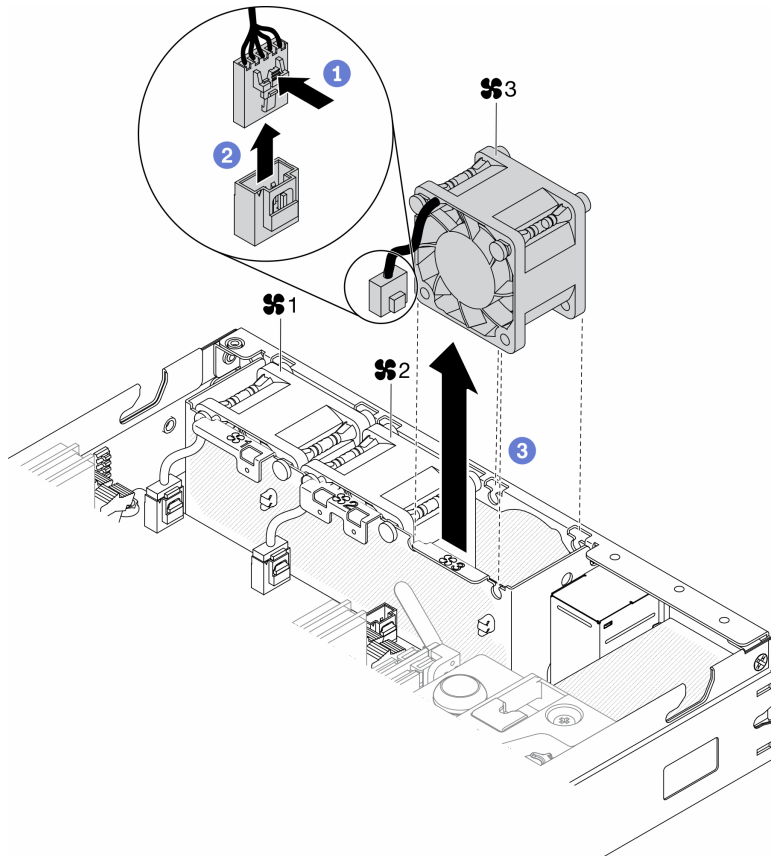


Figure 51. Fan removal

- Step 1. Press and hold the fan cable latch.
- Step 2. Disconnect the cable from the connector.
- Step 3. Push the fan up from the bottom of the node and lift it out of the fan cage.

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install a fan

Use this information to install a fan.

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

S002



CAUTION:

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

S009



CAUTION:

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

Before you install a fan, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To install a fan, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

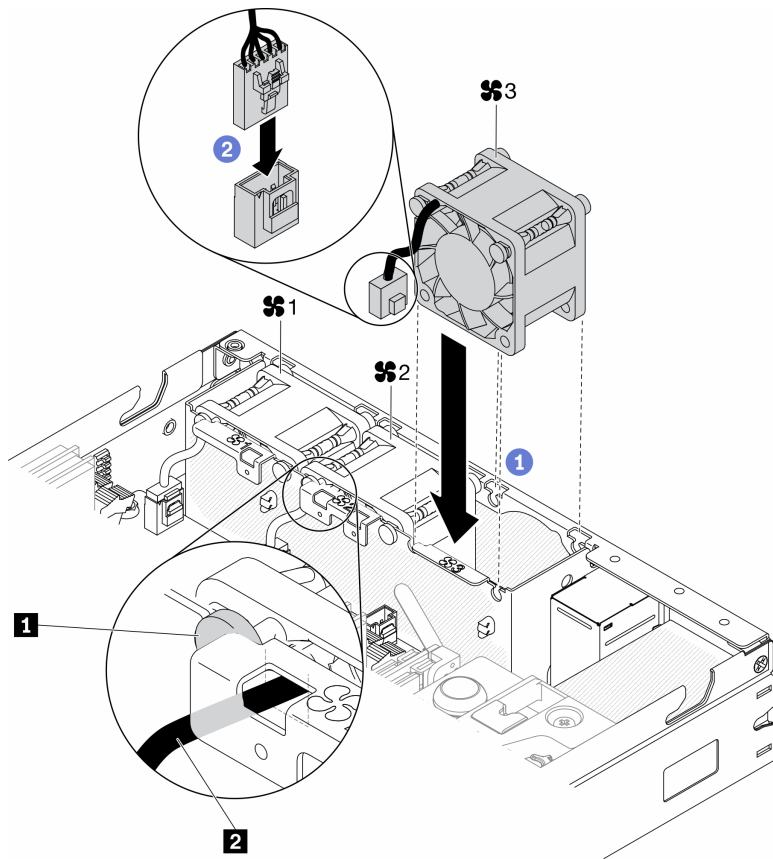


Figure 52. Fan installation

Table 23. Fan installation

1 Round pin	2 Fan cable
--------------------	--------------------

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

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

After you install a fan, complete the following steps:

1. Reinstall the air baffle if it was removed (see [“Install the air baffle” on page 51](#)).
2. Install the node if needed (see [“Install a node” on page 101](#)).
3. Reconnect power cords and all external cables.

Front operator panel replacement

Use this procedure to remove or install the front operator panel.

Remove the front operator panel

Use this information to remove the front operator panel .

Before you remove the front operator panel , complete the following steps:

1. Read the following sections to ensure that you work safely.

- “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
 3. Remove the node from the enclosure if needed (see “Remove a node” on page 98).
 4. Remove the M.2 WLAN/LTE wireless adapter if installed (see “Remove the M.2 WLAN/LTE wireless adapter” on page 41).
 5. Remove the lock position switch if installed (see “Remove the lock position switch” on page 75).

To remove the front operator panel, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

- Step 1. Carefully remove the cable from the metal pull tab holder.
- Step 2. Carefully press the cable latches and disconnect the two Y-cable connectors.
- Step 3. Remove the screw.
- Step 4. Pull the release tab.
- Step 5. Slide the front operator panel out of the server.

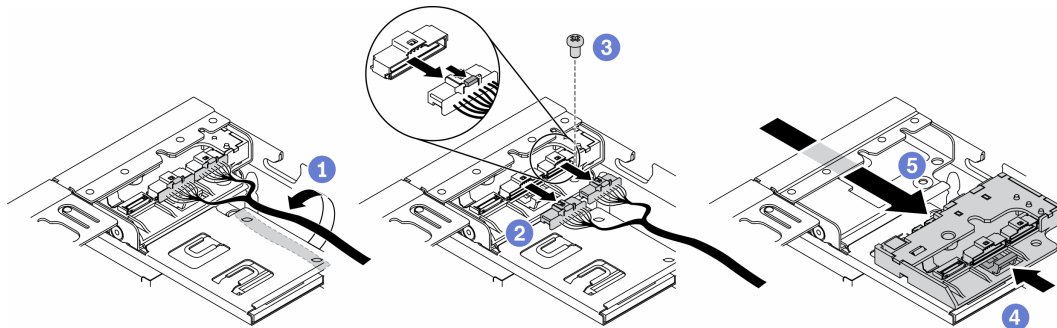


Figure 53. Front operator panel removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the front operator panel

Use this information to install the front operator panel.

Before you install the front operator panel, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To install the front operator panel, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

- Step 1. Slide the front operator panel into the assembly bay.
- Step 2. Install the screw to secure the front operator panel.
- Step 3. Carefully connect the two Y-cable connectors.
- Step 4. Carefully route the cable underneath the metal pull tab holder.

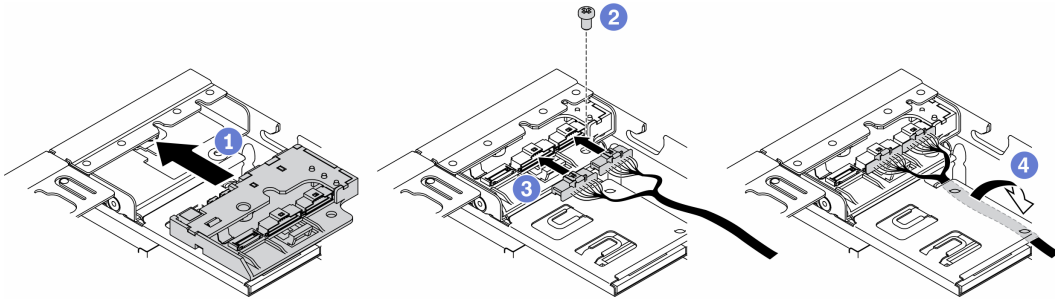


Figure 54. Front operator panel installation

After you install the front operator panel, complete the following steps:

- 1.
2. Install the M.2 WLAN/LTE wireless adapter if removed (see “Install the M.2 WLAN/LTE wireless adapter” on page 42).
3. Install the lock position switch if removed (see “Install the lock position switch” on page 77).
4. Install the node if needed (see “Install a node” on page 101).
5. Reconnect power cords and all external cables.

Heat sink replacement

Follow this procedure to remove and install the heat sink.

Remove the heat sink

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

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

- **S012**



CAUTION:
Hot surface nearby.

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

1. Read the following sections to ensure that you work safely.

- “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
 3. Remove the node from the enclosure if needed (see “Remove a node” on page 98).

To remove the heat sink, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

- Step 1. Fully loosen the Torx T30 captive fasteners on the processor-heat-sink module in the *removal sequence shown* on the heat-sink label.
- Step 2. Lift evenly and remove the heat sink from the server.

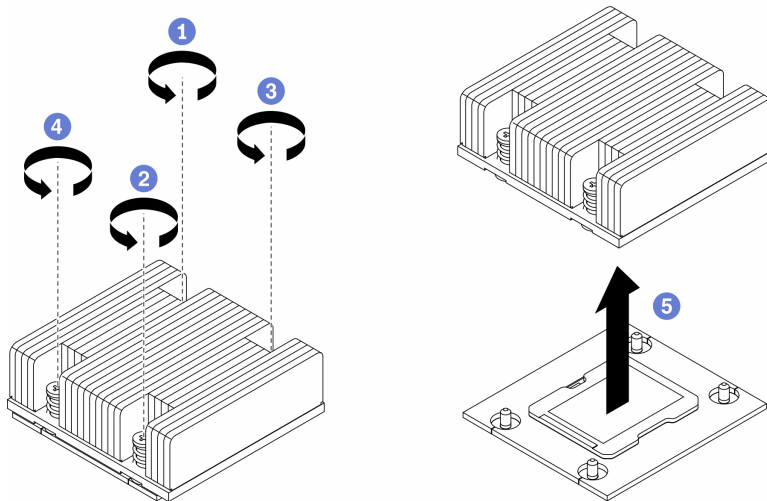


Figure 55. Heat sink removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the heat sink

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

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

- **S012**



CAUTION:
Hot surface nearby.

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

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. 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.

4. 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 and apply the new grease onto it for optimal thermal performance.
5. Apply the thermal grease on the top of the processor with syringe by forming four uniformly spaced dots, while each dot consists of about 0.1 ml of thermal grease.

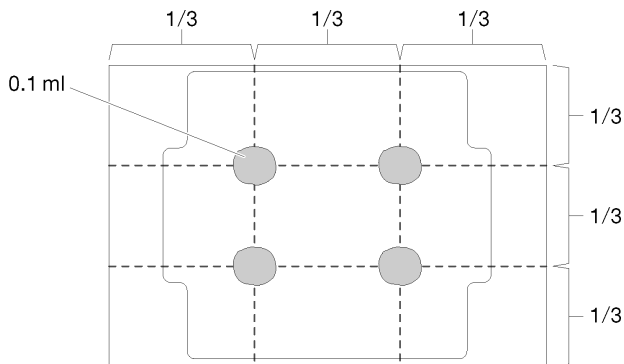


Figure 56. Proper shape of the thermal grease

To install the heat sink, complete the following steps:

- Step 1. Align the triangular marks and guide pins on the processor socket with the heat sink; then, insert the heat sink into the processor socket.

Attention: To prevent damage to components, make sure that you follow the indicated tightening sequence.

Step 2. Fully tighten the screws in the installation sequence shown on the heat-sink label. Tighten the screws until they stop; then, visually inspect to make sure that there is no gap between the screw shoulder beneath the heat sink and the processor socket. (For reference, the torque required for the nuts to fully tighten is 1.4-1.6 newton-meters, 12-14 inch-pounds).

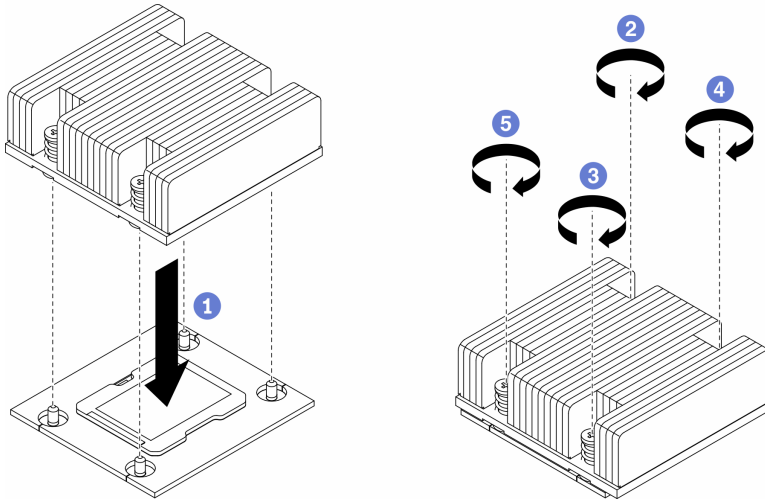


Figure 57. Heat sink installation

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

1. Install the node if needed (see [“Install a node” on page 101](#)).
2. Reconnect power cords and all external cables.

Intrusion switch cable replacement

Follow this procedure to remove and install the intrusion switch cable.

Remove the intrusion switch cable

Use this information to remove the intrusion switch cable.

Before you remove the intrusion switch cable, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).
3. Remove the node from the enclosure if needed (see [“Remove a node” on page 98](#)).

To remove the intrusion switch cable, complete the following steps:

- Step 1. Loosen the two screws.
- Step 2. Press and hold the cable latch.

- Step 3. Disconnect the cable from the connector.
- Step 4. Carefully lift the intrusion switch carrier out of the server.

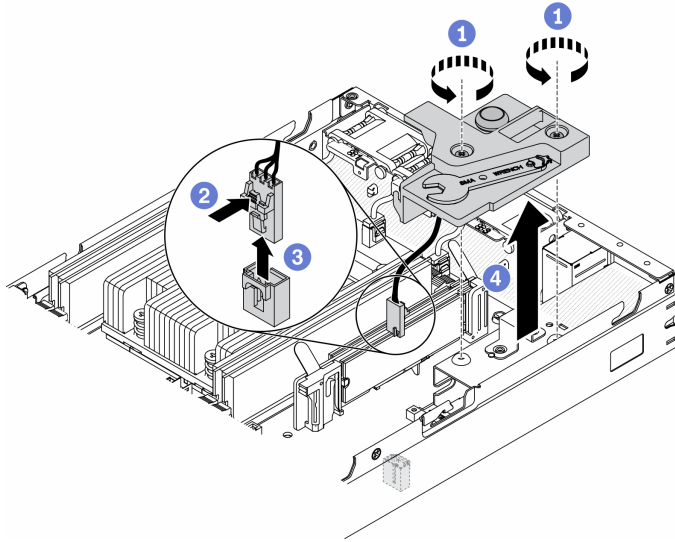


Figure 58. Intrusion switch cable removal

- Step 5. Press and hold the latches on the both side of the cable.
- Step 6. Remove the intrusion switch cable from the carrier.

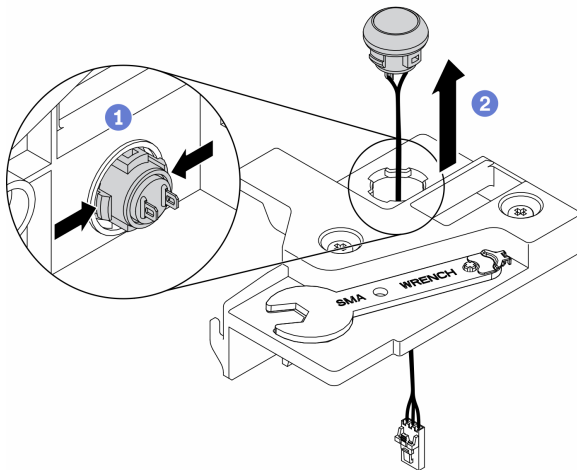


Figure 59. Intrusion switch cable removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the intrusion switch cable

Use this information to install the intrusion switch cable.

Before you install the intrusion switch cable, complete the following steps:

- 1. Read the following sections to ensure that you work safely.

- “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To install the intrusion switch cable, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Insert the intrusion switch cable through the hole on the carrier.

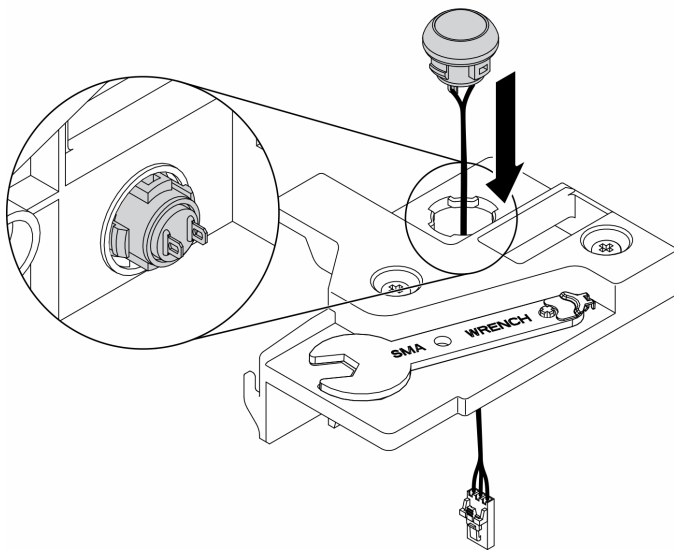


Figure 60. Intrusion switch cable installation

- Step 1. Lower the intrusion switch carrier into the chassis and press the intrusion switch carrier down until it is securely seated.
- Step 2. Fasten the two screws.
- Step 3. Connect the cable to the connector and press it down until it clicks.

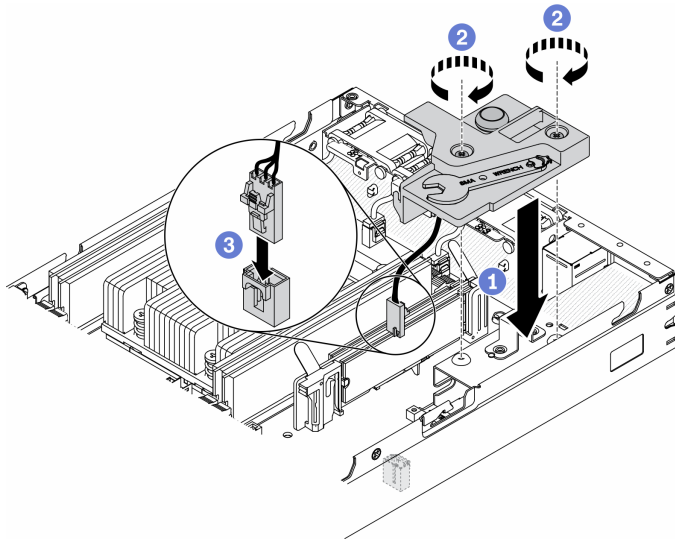


Figure 61. Intrusion switch installation

After you install the intrusion switch, complete the following steps:

1. Install the node if needed (see [“Install a node” on page 101](#)).
2. Reconnect power cords and all external cables.

Lock position switch replacement

Use the following information to remove and install the lock position switch.

Remove the lock position switch

Use this information to remove the lock position switch.

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

S002



CAUTION:

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

S009



CAUTION:

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

Before you remove the lock position switch, complete the following steps: Before you install the lock position switch, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Remove the node from the enclosure if needed (see “Remove a node” on page 98).
4. Remove the PCIe riser cage (see “Remove the PCIe riser assembly” on page 103).

To remove the lock position switch, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6VRzUE>.

Step 1. Disconnect the cable.

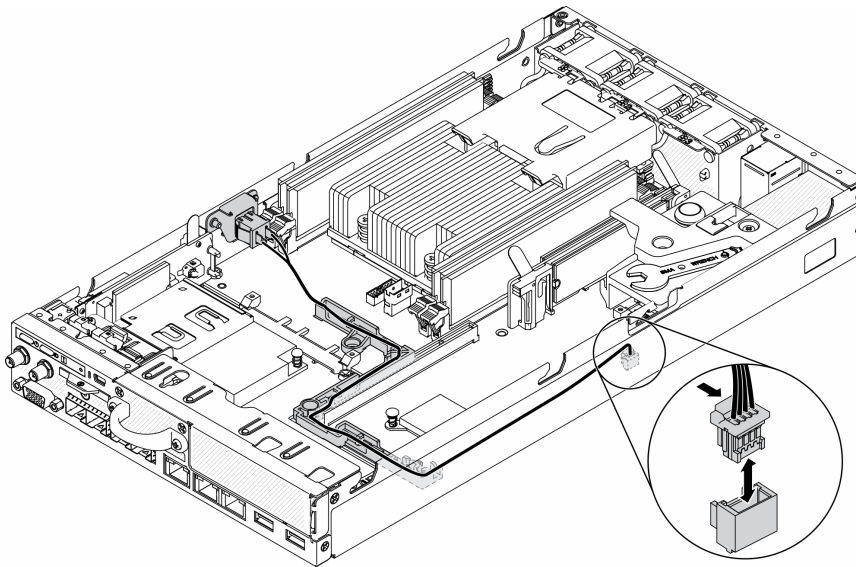


Figure 62. Lock position switch cable

Step 2. Remove the screw.

Step 3. Slightly push the lock position switch rightward and remove it from the server.

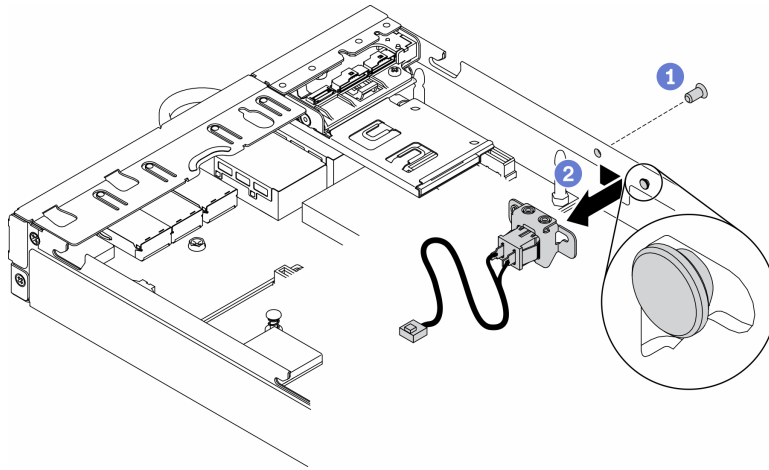


Figure 63. Lock position switch removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the lock position switch

Use this information to install the lock position switch.

Before you install the lock position switch, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To install the lock position switch, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Hook the lock position switch onto the pin; then, slightly push it leftward.

Step 2. Install and fasten the screw.

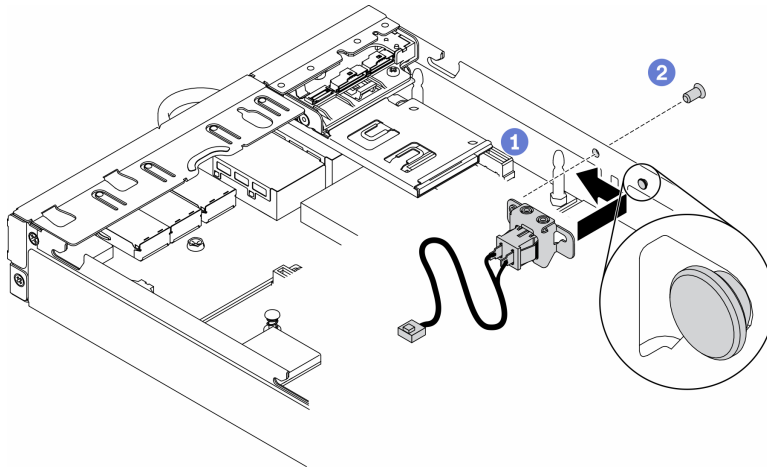


Figure 64. Lock position switch installation

Step 3. Carefully route the cables as the following illustration and connect the connector.

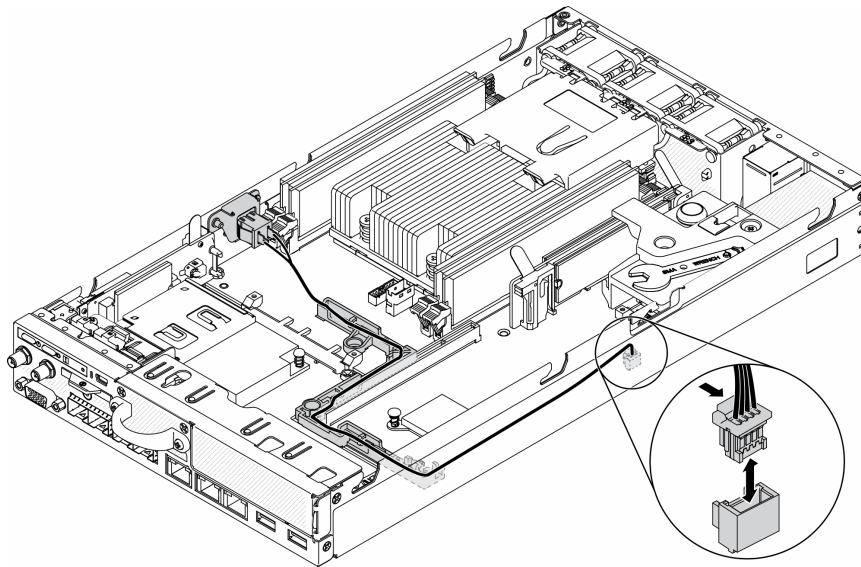


Figure 65. Lock position switch cable

After you install the lock position switch, complete the following steps:

1. Reinstall the PCIe riser cage (see [“Install the PCIe riser assembly”](#) on page 106).
2. Install the node if needed (see [“Install a node”](#) on page 101).
3. Reconnect power cords and all external cables.

LTE/WLAN Antenna replacement

Follow this procedure to remove and install a LTE/WLAN Antenna.

Remove a LTE/WLAN Antenna

Use this information to remove a LTE/WLAN Antenna.

Before you remove a LTE/WLAN Antenna, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Remove the node from the enclosure if needed (see “Remove a node” on page 98).

To remove a LTE/WLAN Antenna, complete the following steps:

Step 1. Rotate the Antenna counterclockwise to remove it from the server.

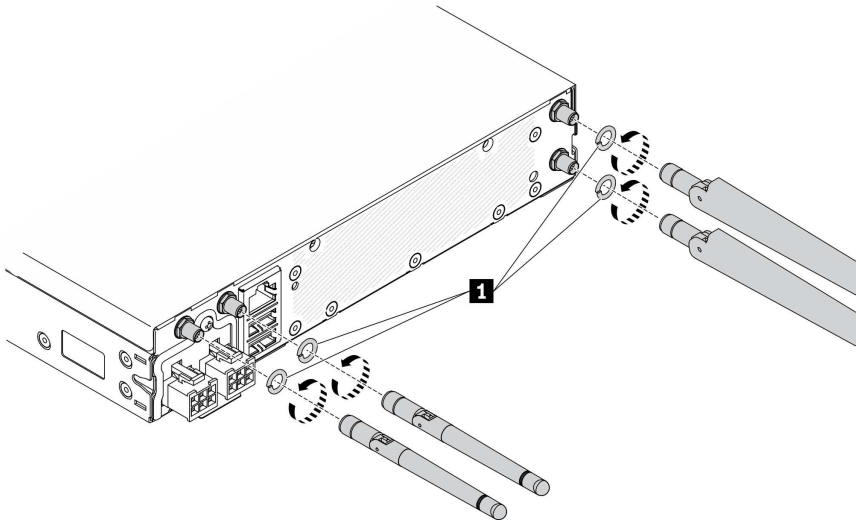


Figure 66. LTE/WLAN Antenna removal

Table 24. LTE/WLAN Antenna

1 Washers

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install a LTE/WLAN Antenna

Use this information to install a LTE/WLAN Antenna.

Before you install a LTE/WLAN Antenna, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To install a LTE/WLAN Antenna, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. With washers between the antenna and the server, rotate the antenna clockwise to install it to the server.

Note: The suggested fastening torque is 3.5 Kgf-cm.

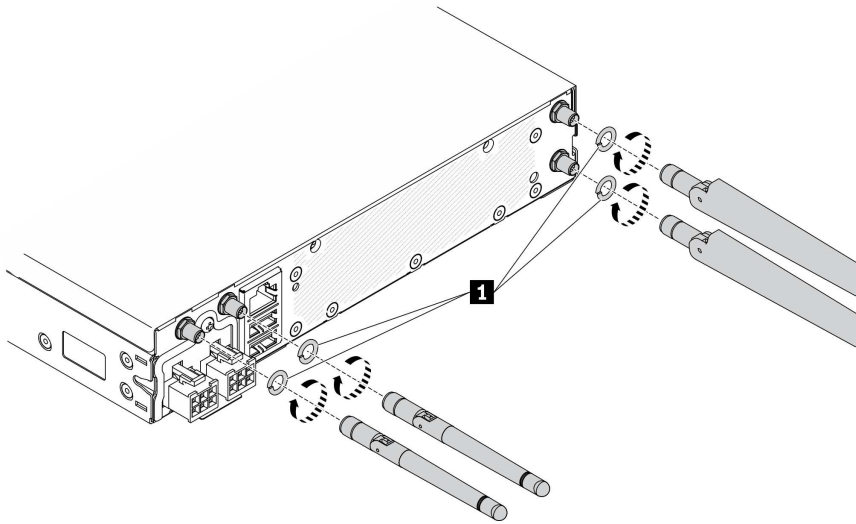


Figure 67. LTE/WLAN Antenna installation

Table 25. LTE/WLAN Antenna

1 Washers

After you install a LTE/WLAN Antenna, complete the following steps:

1. Install the node if needed (see [“Install a node” on page 101](#)).
2. Reconnect power cords and all external cables.

M.2 drive on an M.2 data adapter replacement

Use the following information to remove and install an M.2 drive on an M.2 data adapter.

Remove an M.2 drive from an M.2 data adapter

Use this information to remove an M.2 drive from an M.2 data adapter.

Before you remove an M.2 drive from an M.2 data adapter, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).
3. Remove the node from the enclosure if needed (see [“Remove a node” on page 98](#)).

4. Remove a M.2 data adapter (see “Remove a M.2 data adapter” on page 43).

To remove an M.2 drive from an M.2 data adapter, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

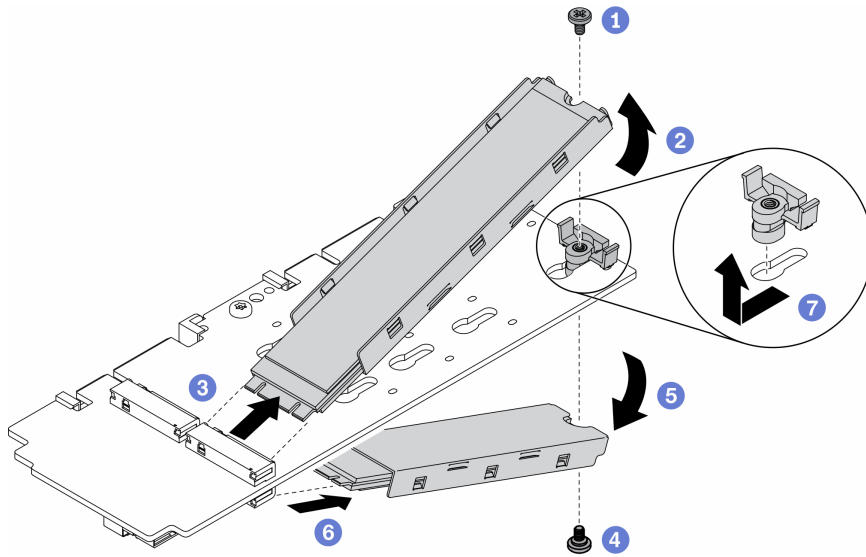


Figure 68. M.2 drive removal

Note: In the removal process, carefully proceed the steps to prevent the drives from dropping.

- Step 1. Remove the screw on the top of the adapter.
- Step 2. Rotate the M.2 drive on the top upward.
- Step 3. Pull out the M.2 drive on the top from the M.2 data adapter.
- Step 4. Remove the screw on the bottom of the adapter.
- Step 5. Rotate the M.2 drive on the bottom downward.
- Step 6. Pull out the M.2 drive on the bottom from the M.2 data adapter.
- Step 7. (Optional) Remove the retainer by pulling it backward and lifting it up.

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

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install an M.2 drive on an M.2 data adapter

Use this information to install M.2 drive on an M.2 data adapter.

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

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37

2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

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

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

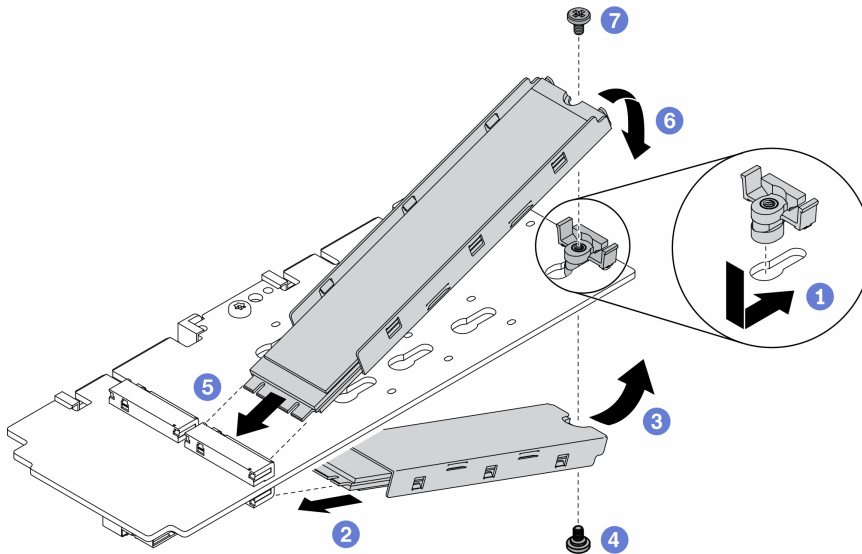


Figure 69. M.2 drive on an M.2 data adapter installation

Note: In the process of installation, carefully proceed the steps to prevent the drives from dropping.

- Step 1. Insert the retainer into the slot and push it forward to firmly seat it into the slot.
- Step 2. Insert the M.2 drive on the bottom into the slot with an angle as shown.
- Step 3. Rotate the M.2 drive on the bottom upward and hold it to against the adapter.
- Step 4. Install the screw to secure the M.2 drive to the adapter.
- Step 5. Insert the M.2 drive on the top into the slot with an angle as shown.
- Step 6. Rotate the M.2 drive on the top downward and hold it to against the adapter.
- Step 7. Install the screw to secure the M.2 drive to the adapter.

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

1. Install the node if needed (see “Install a node” on page 101).
2. Reconnect power cords and all external cables.

M.2 LTE module replacement

Use this procedure to remove or install the M.2 LTE module.

Remove the M.2 LTE module

Use this information to remove the M.2 LTE module.

Before you remove the M.2 LTE module, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Remove the node from the enclosure if needed (see “Remove a node” on page 98).
4. Remove a LTE/WLAN Antenna (see “Remove a LTE/WLAN Antenna” on page 78).
5. Remove the M.2 WLAN/LTE wireless adapter (see “Remove the M.2 WLAN/LTE wireless adapter” on page 41).

To remove the M.2 LTE module, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

- Step 1. Remove the M.2 LTE module cables from the cable clip.

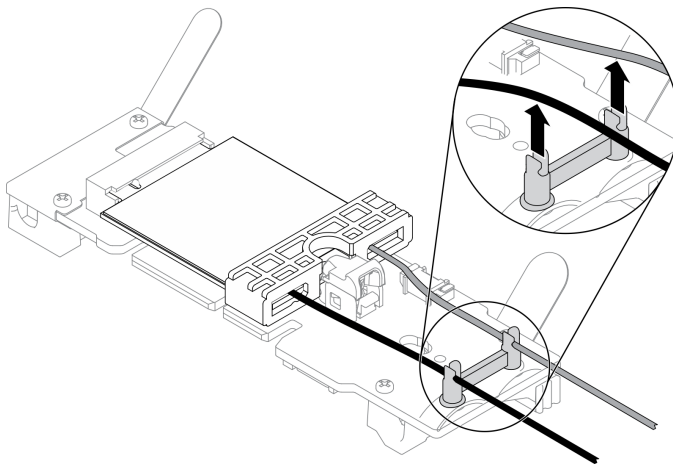


Figure 70. M.2 LTE module removal

- Step 2. Press the module latch. Rotate the M.2 LTE module up and pull it out from the adapter.

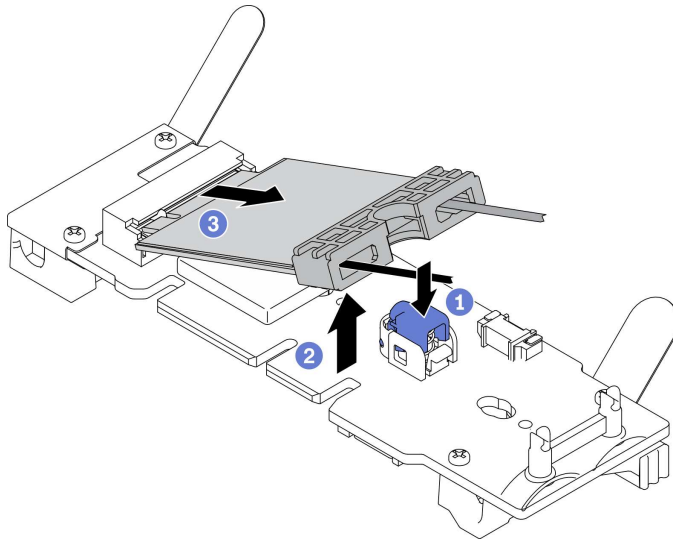


Figure 71. M.2 LTE module removal

Step 3. Slide the cable holder out from the M.2 LTE module.

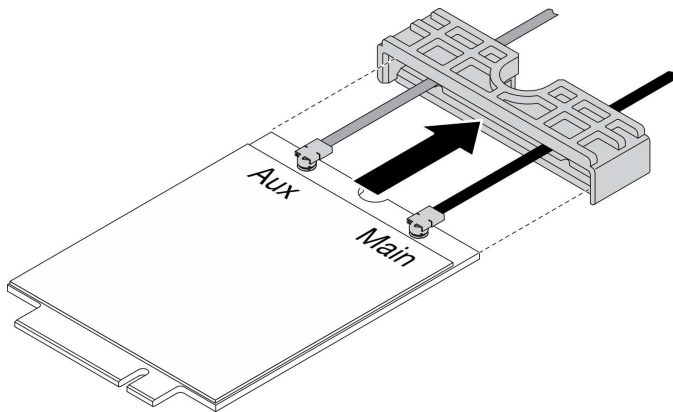


Figure 72. M.2 LTE module removal

Step 4. Use the screwdriver in the Misc kit to hook the cable as shown, and remove the cable from the M.2 LTE module. Apply the same method to the main cable and the AUX cable.

Note: Carefully to remove the cables, make sure the cable is removed vertically without excessive force.

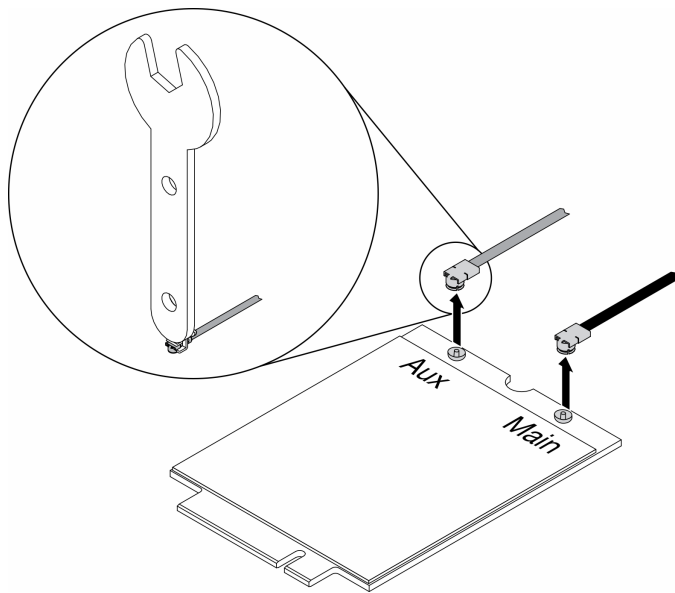


Figure 73. M.2 LTE module removal

Step 5. Use screwdriver in the Misc kit to counterclockwise remove the nut and the washer on the rear of the server.

Note: Apply the same method to remove both main and AUX cable.

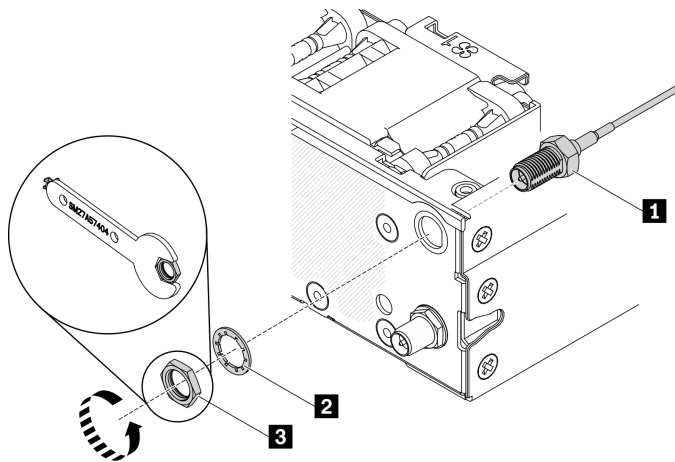


Figure 74. M.2 LTE module removal

Table 26. M.2 LTE module removal

1 M.2 LTE module cable	3 Nut
2 Washer	

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the M.2 LTE module

Use this information to install the M.2 LTE module.

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

- **S012**



CAUTION:
Hot surface nearby.

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

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Locate the M.2 LTE module adapter connector on the adapter.

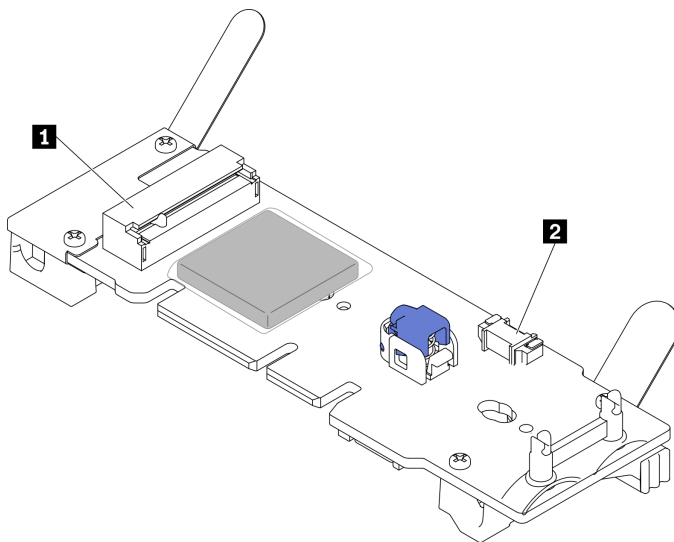


Figure 75. M.2 LTE module adapter connectors

1 M.2 LTE module connector	2 Service-only connector
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Note: The service-only connector is available on some models and reserved for service only.

To install the M.2 LTE module, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

- Step 1. Remove the protection cover first; then, insert the cables through the M.2 LTE cable holder as shown.

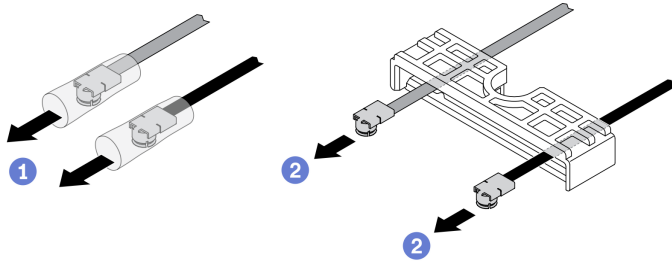


Figure 76. M.2 LTE module installation

Step 2. Connect the cables to the connectors on the M.2 LTE module as shown. Press the cable down until it clicks.

Notes:

- Make sure the cables are connected to the right connector. Black cable connected to “Main” connector, gray cable connected to “Aux” connector.
- Carefully perform the step without excessive force to prevent the connector from damage.
- Make sure the cables are connected to the connectors properly, you should be able to rotate the cable horizontally without it detached easily.

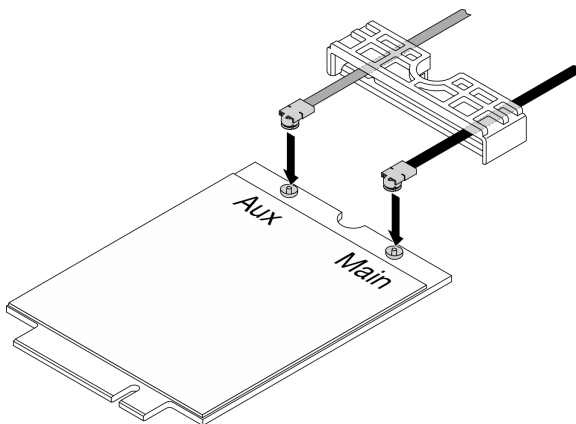


Figure 77. M.2 LTE module installation

Step 3. Slide the cable holder onto the M.2 LTE module.

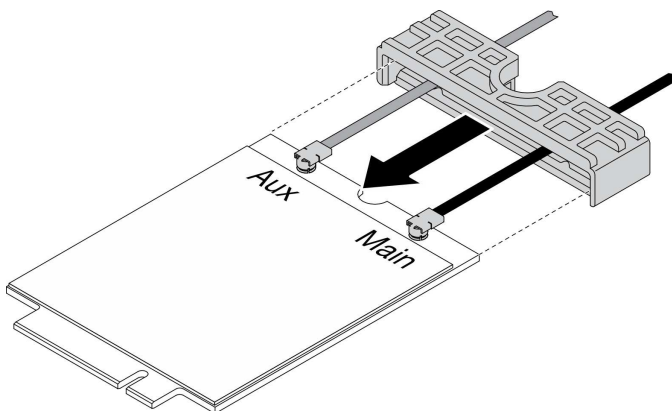


Figure 78. M.2 LTE module installation

Step 4. Press the cover latch; then, rotate the cover up and pull it out from the adapter.

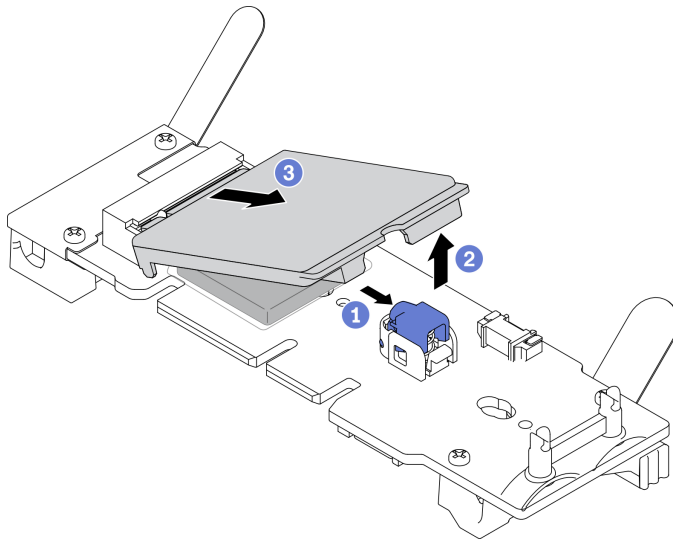


Figure 79. M.2 LTE module installation

Step 5. Remove the film on the heat sink pad.

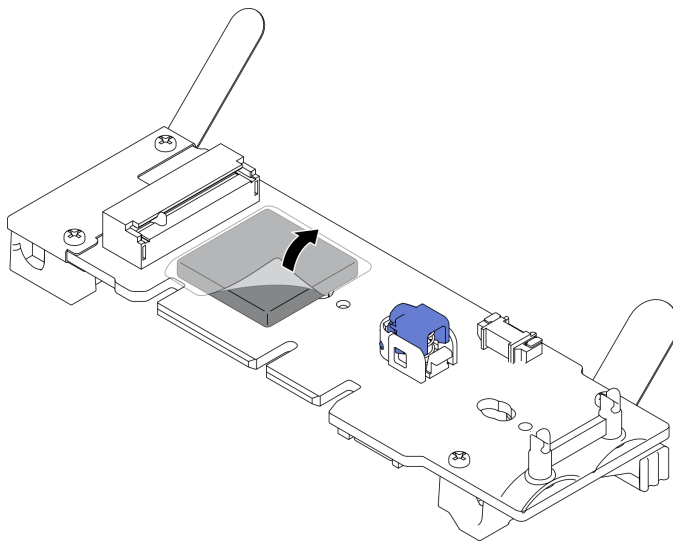


Figure 80. M.2 LTE module installation

Step 6. Insert the M.2 LTE module into the connector and press it down until it clicks into the place.

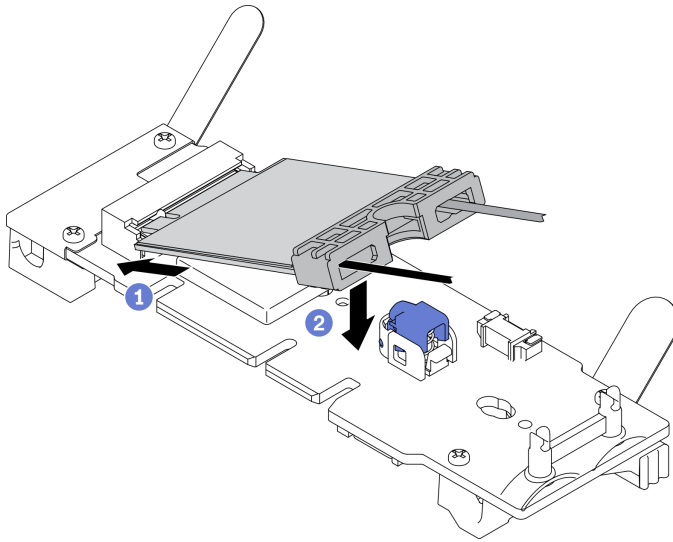


Figure 81. M.2 LTE module installation

Step 7. Route the cables in the clips as shown.

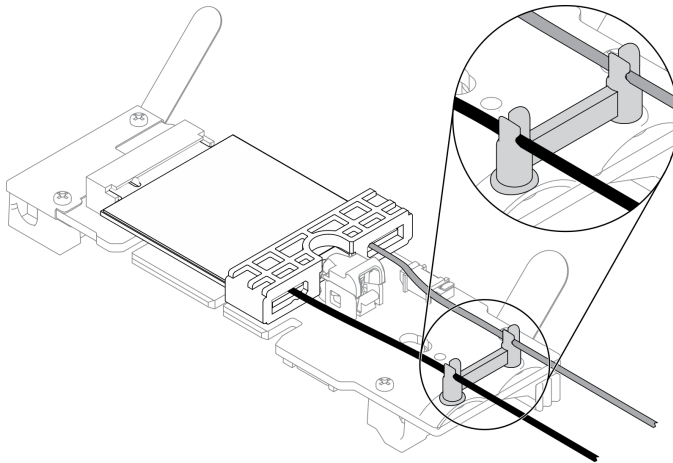


Figure 82. M.2 LTE module installation

Step 8. Route the cables to the rear of the server, make sure to route the cable respectively into the right hole as shown. Be careful of the difference between the cable colors.

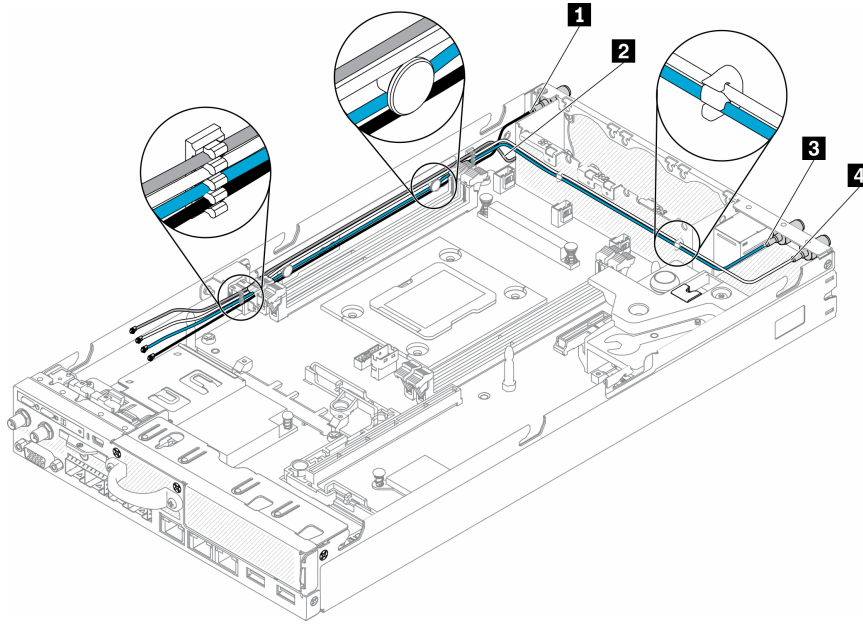


Figure 83. M.2 LTE module installation

Table 27. M.2 LTE module installation

<p>1 M.2 LTE module main cable (black cable, on the top)</p>	<p>3 M.2 WLAN module main cable (blue cable)</p>
<p>2 M.2 LTE module AUX cable (gray cable, on the bottom)</p>	<p>4 M.2 WLAN module AUX cable (white cable)</p>

Step 9. Use screwdriver in the Misc kit to clockwise install the nut, the washer, and the M.2 LTE module cable on the rear of the server.

Note: Apply the same method to install both main and AUX cable.

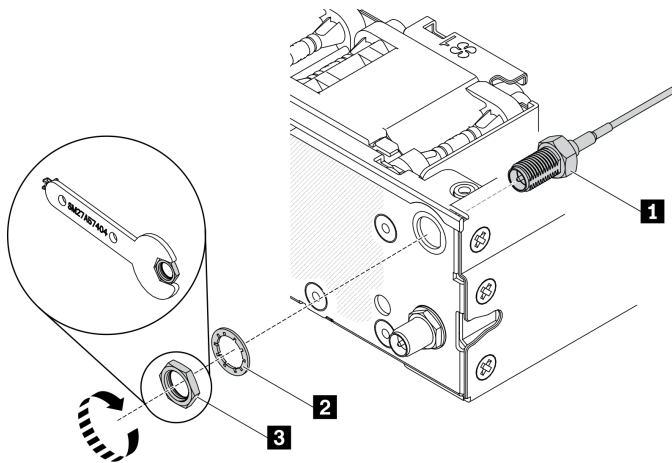


Figure 84. M.2 LTE module installation

Table 28. M.2 LTE module installation

1 M.2 LTE module cable	3 Nut
2 Washer	

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

1. Install the node if needed (see [“Install a node” on page 101](#)).
2. Reconnect power cords and all external cables.

M.2 WLAN module replacement

Use this procedure to remove or install the M.2 WLAN module.

Remove the M.2 WLAN module

Use this information to remove the M.2 WLAN module.

Before you remove the M.2 WLAN module, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).
3. Remove the node from the enclosure if needed (see [“Remove a node” on page 98](#)).
4. Remove a LTE/WLAN Antenna (see [“Remove a LTE/WLAN Antenna” on page 78](#)).
5. Remove the M.2 WLAN/LTE wireless adapter (see [“Remove the M.2 WLAN/LTE wireless adapter” on page 41](#)).

To remove the M.2 WLAN module, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Remove the M.2 WLAN module cables from the cable clip.

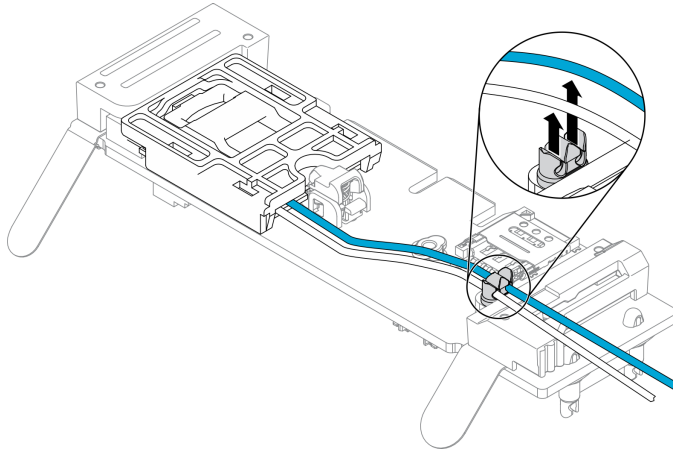


Figure 85. M.2 WLAN module removal

Step 2. Press the module latch. Rotate the M.2 WLAN module up and pull it out from the adapter.

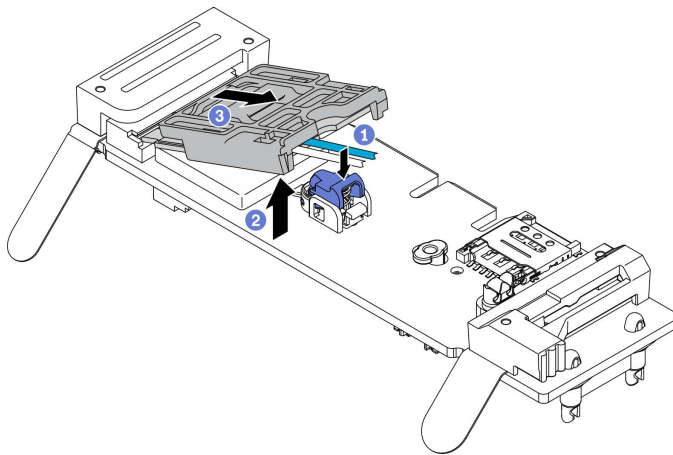


Figure 86. M.2 WLAN module removal

Step 3. Slide the cable holder out from the M.2 WLAN module.

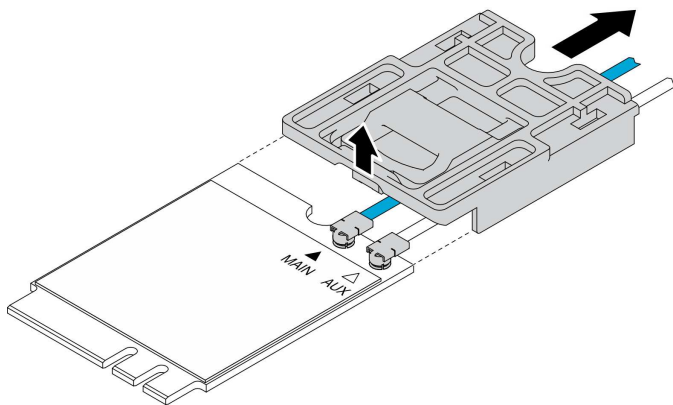


Figure 87. M.2 WLAN module removal

Step 4. Use the screwdriver in the Misc kit to hook the cable as shown, and remove the cable from the M.2 WLAN module. Apply the same method to the main cable and the AUX cable.

Note: Carefully to remove the cables, make sure the cable is removed vertically without excessive force.

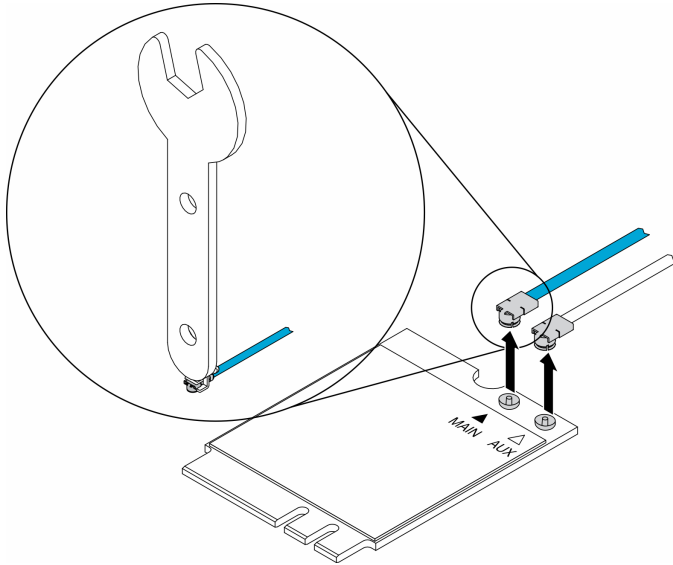


Figure 88. M.2 WLAN module removal

Step 5. Use screwdriver in the Misc kit to counterclockwise remove the nut and the washer on the rear of the server.

Note: Apply the same method to remove both main and AUX cable.

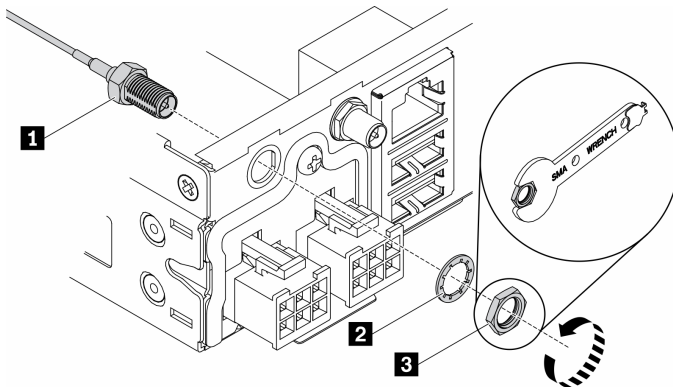


Figure 89. M.2 WLAN module removal

Table 29. M.2 WLAN module removal

1 M.2 WLAN module cable	3 Nut
2 Washer	

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the M.2 WLAN module

Use this information to install the M.2 WLAN module.

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

- **S012**



CAUTION:
Hot surface nearby.

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

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To install the M.2 WLAN module, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

- Step 1. Remove the protection cover first; then, carefully connect the cables to the connectors on the M.2 WLAN module as shown. Press the cable down until it clicks.

Notes:

- Make sure the cables are connected to the right connector. Blue cable connected to “Main” connector, white cable connected to “Aux” connector.
- Carefully perform the step without excessive force to prevent the connector from damage.
- Make sure the cables are connected to the connectors properly, you should be able to rotate the cable horizontally without it detached easily.

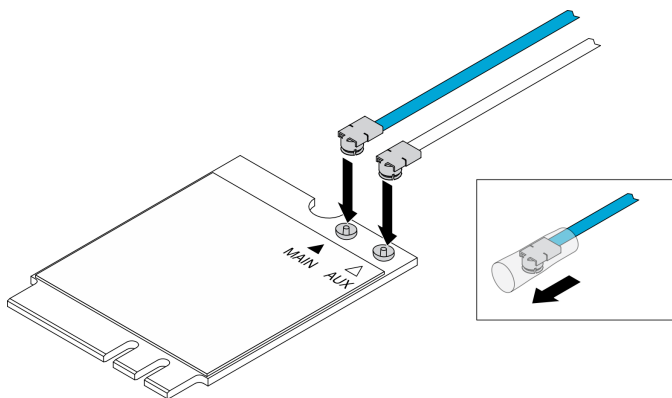


Figure 90. M.2 WLAN module installation

Step 2. Align the retainer with the WLAN module; then, slide the cable holder onto the module until it clicks.

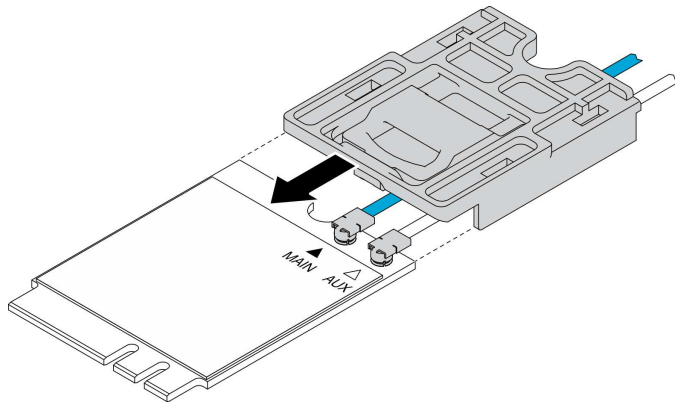


Figure 91. M.2 WLAN module installation

Step 3. Press the cover latch; then, rotate the cover up and pull it out from the adapter.

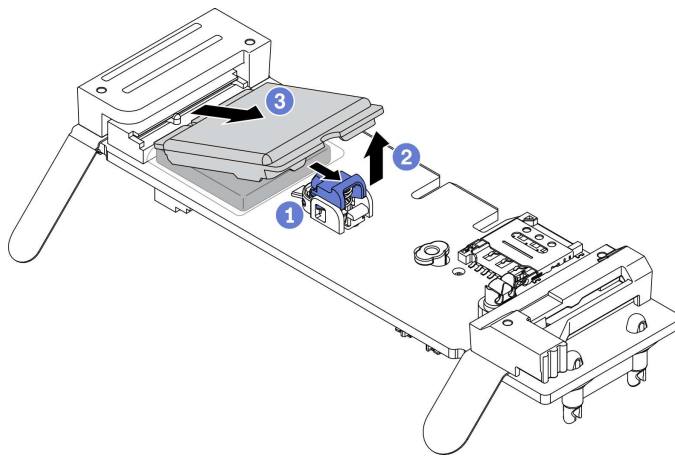


Figure 92. M.2 WLAN module installation

Step 4. Remove the film on the heat sink pad.

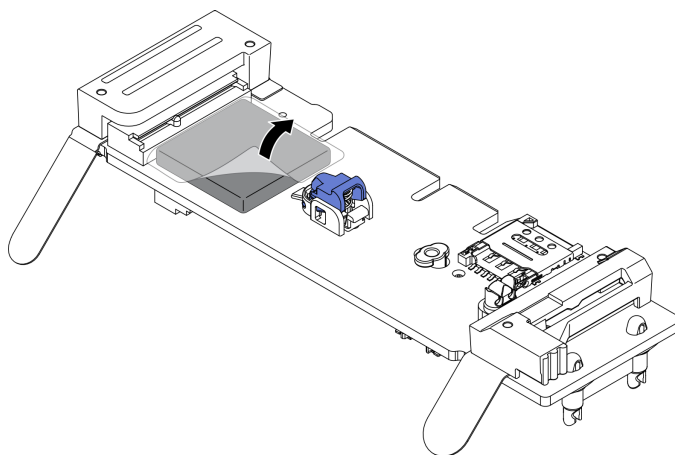


Figure 93. M.2 WLAN module installation

Step 5. Insert the M.2 WLAN module into the connector and press it down until it clicks into the place.

Note: Make sure the module is firmly seated on the adapter.

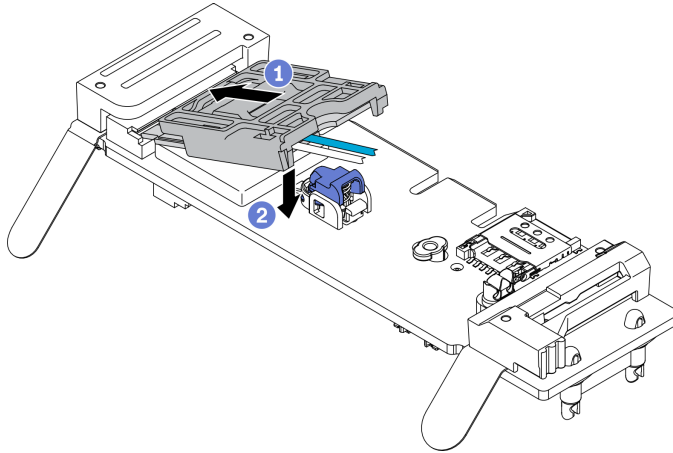


Figure 94. M.2 WLAN module installation

Step 6. Route the cables in the clips as shown.

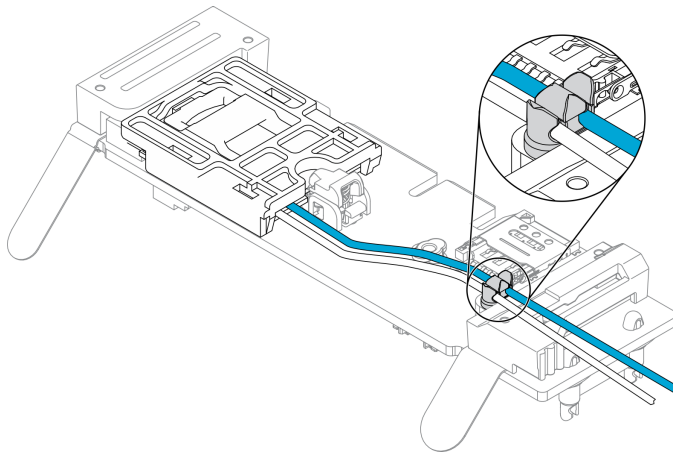


Figure 95. M.2 WLAN module installation

Step 7. Route the cables to the rear of the server, make sure to route the cable respectively into the right hole as shown. Be careful of the difference between the cable colors.

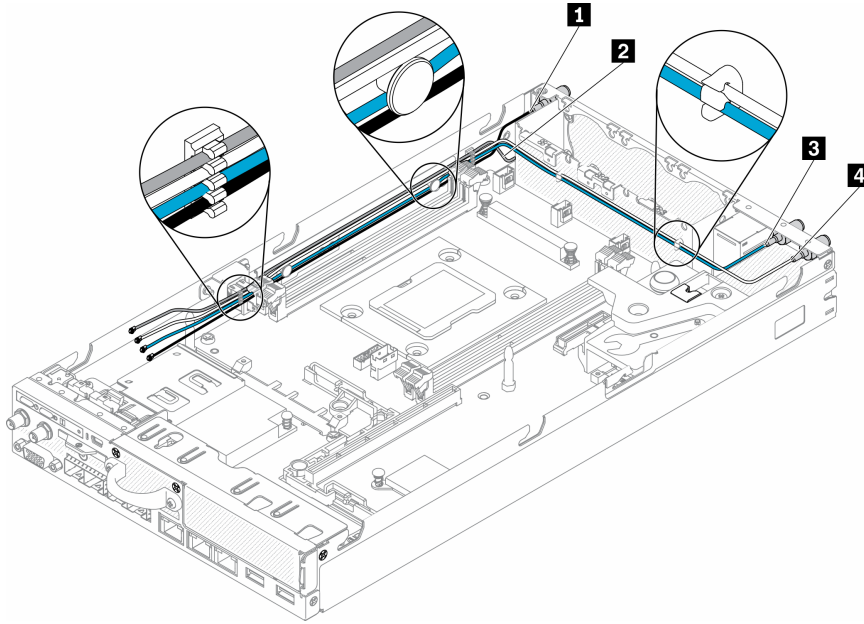


Figure 96. M.2 WLAN module installation

Table 30. M.2 WLAN module installation

1 M.2 LTE module main cable (black cable, on the top)	3 M.2 WLAN module main cable (blue cable)
2 M.2 LTE module AUX cable (gray cable, on the bottom)	4 M.2 WLAN module AUX cable (white cable)

Step 8. Use screwdriver in the Misc kit to clockwise install the nut, the washer, and the M.2 WLAN module cable on the rear of the server.

Note: Apply the same method to install both main and AUX cables.

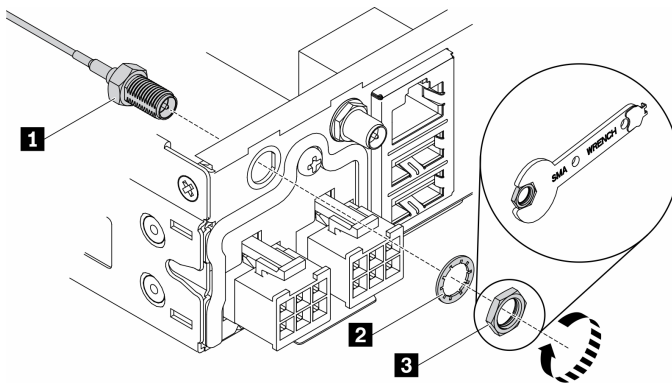


Figure 97. M.2 WLAN module installation

Table 31. M.2 WLAN module installation

1 M.2 WLAN module cable	3 Nut
2 Washer	

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

1. Install the node if needed (see [“Install a node” on page 101](#)).
2. Reconnect power cords and all external cables.

Node replacement

Use this information to remove and install a node.

Remove a node

Use this information to remove a node.

Before you remove a node, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

To remove a node, complete the following steps:

Step 1. To remove the node from the enclosure, complete the following steps.

- a. Remove the five screws, and loosen the two thumb screws of the shipping bracket.

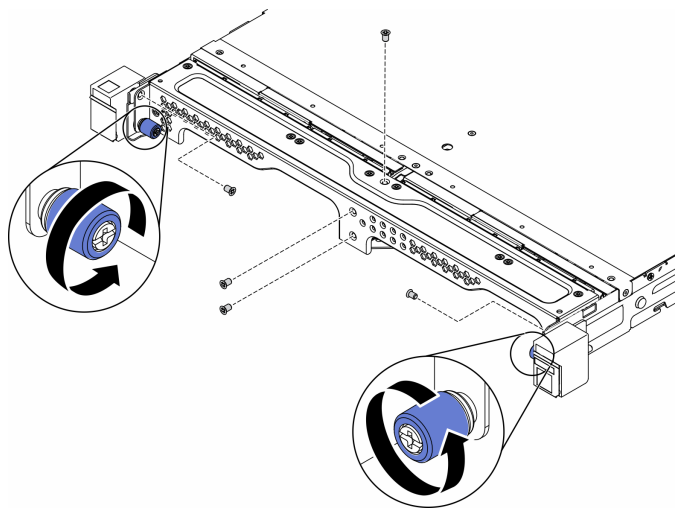


Figure 98. Node removal

- b. Remove the shipping bracket from the enclosure.

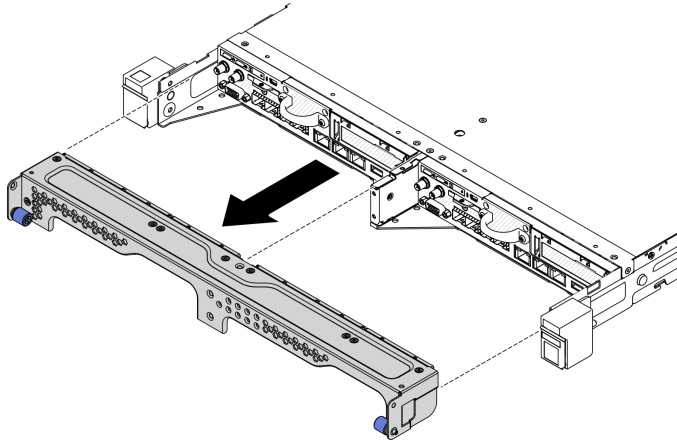


Figure 99. Node removal

- c. Press on the release button and slide the node out of the enclosure.
 - E1 Enclosure (1U 2-node)

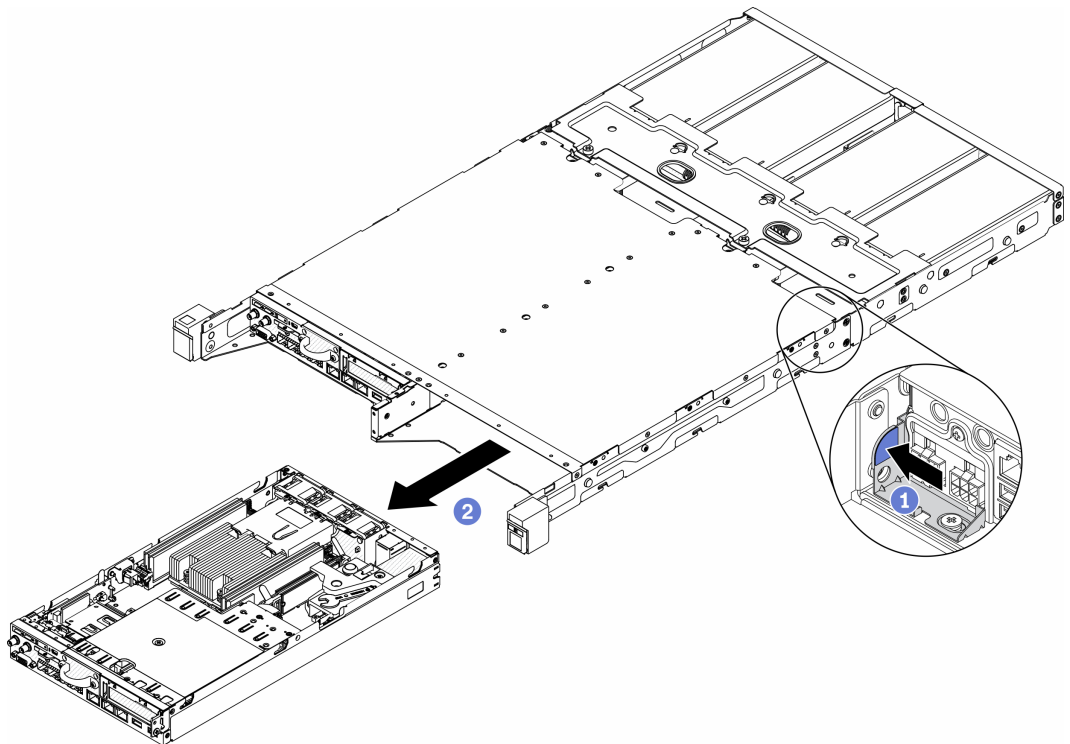


Figure 100. Node removal

- E2 Enclosure (2U 2-node)

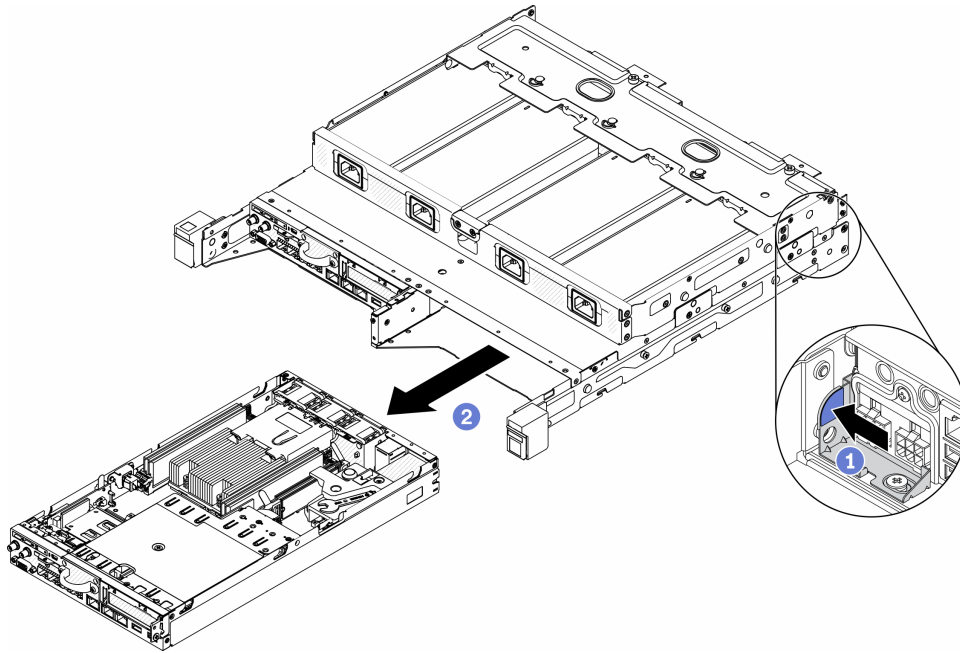


Figure 101. Node removal

Notes:

- The node removed from the enclosure is without top cover. If the node is not to be reinstalled to an enclosure, make sure to install the top cover. See [“Install the top cover” on page 141](#).
- If the node is removed from an E1 Enclosure (1U 2-node) and is not to be reinstalled to the E1 Enclosure, change the vital product data (VPD) to the default mode for proper operation. See [“Change the VPD for E1 Enclosure configuration \(trained technician only\)” on page 139](#).

- Step 2. To remove the node from the node sleeve, complete the following steps.
- a. Loosen the two thumbscrews and slide the node of the node sleeve.

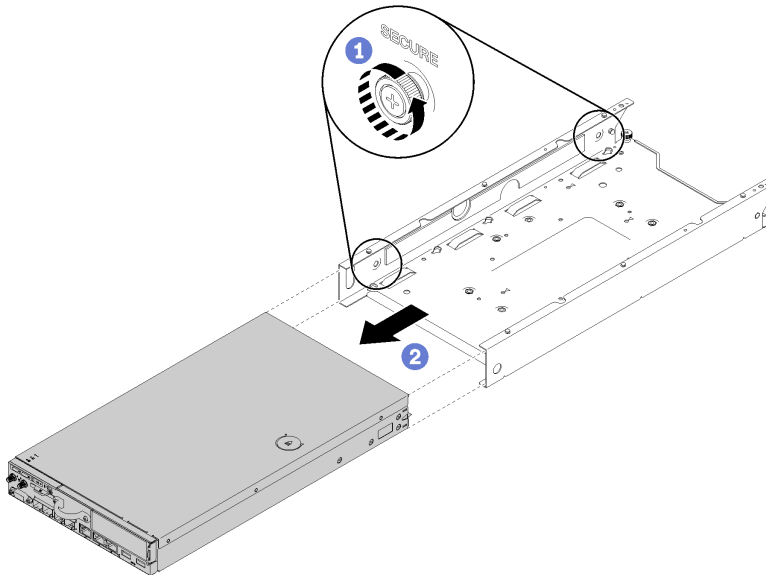


Figure 102. Node removal

Note: See *Configuration Installation Guide* for the bookshelf configuration, DIN rail configuration and wall-mounted configuration installation details if necessary.

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install a node

Use this information to install a node.

Before you install a node, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Make sure all the removed components are installed, and all the disconnected cables inside the server are reconnected.

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

To install a node, complete the following steps:

- Step 1. To install the node into the node sleeve, complete the following steps.
 - a. Align the node with the node sleeve and slide the node into place.
 - b. Fasten the two thumbscrews.

Note: See *Configuration Installation Guide* for the bookshelf configuration, DIN rail configuration and wall-mounted configuration installation details if necessary.

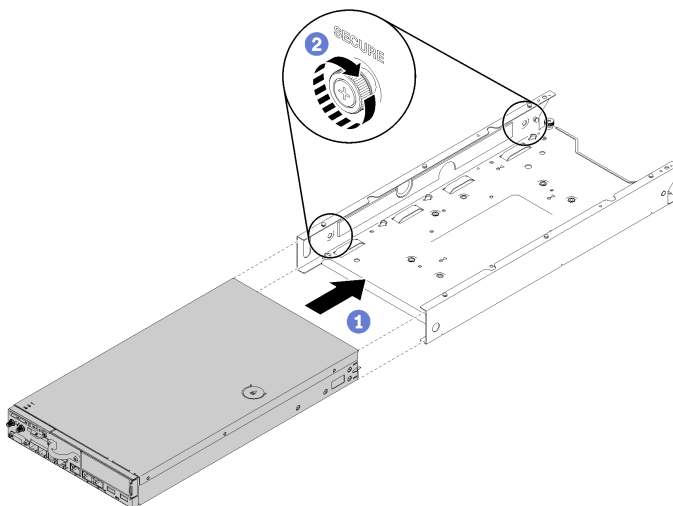


Figure 103. Node installation

- Step 2. To install the node into the enclosure, complete the following steps.

Attention: If the node is to be installed in an E1 Enclosure (1U 2-node), change the vital product data (VPD) for proper operation. See [“Change the VPD for E1 Enclosure configuration \(trained technician only\)”](#) on page 139.

- a. Determine the node bay to install the node.
- b. Insert the node into the node bay until it stops.
 - E1 Enclosure (1U 2-node)

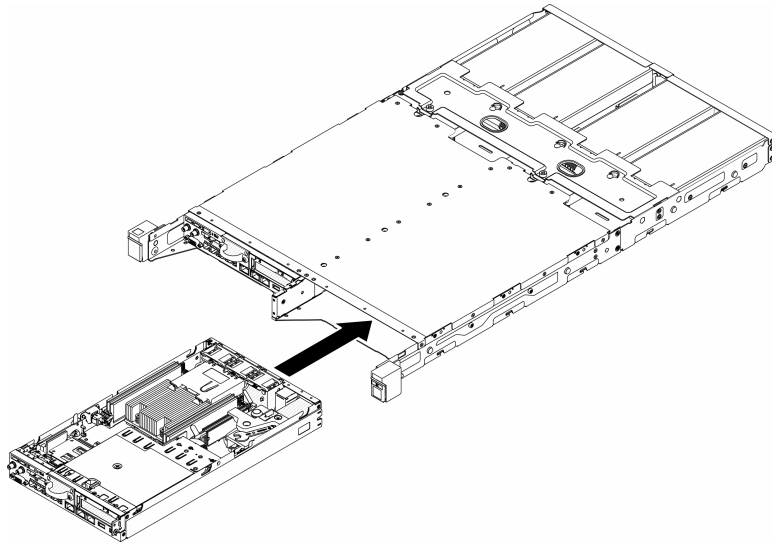


Figure 104. Node installation

- E2 Enclosure (2U 2-node)

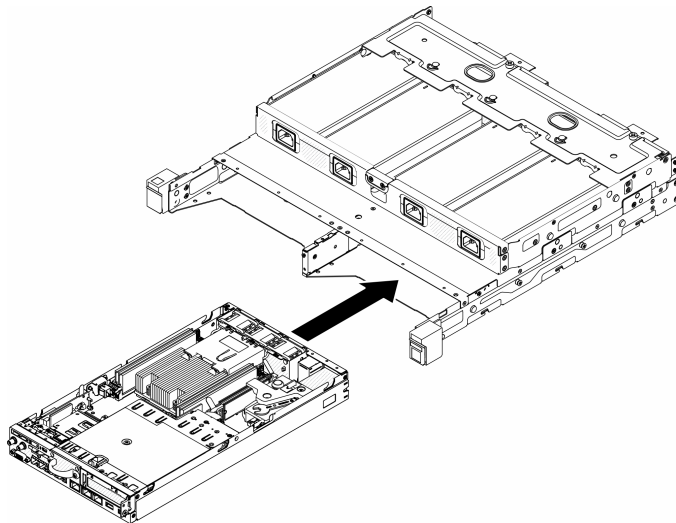


Figure 105. Node installation

- c. Align and insert the shipping bracket onto the front of the enclosure.

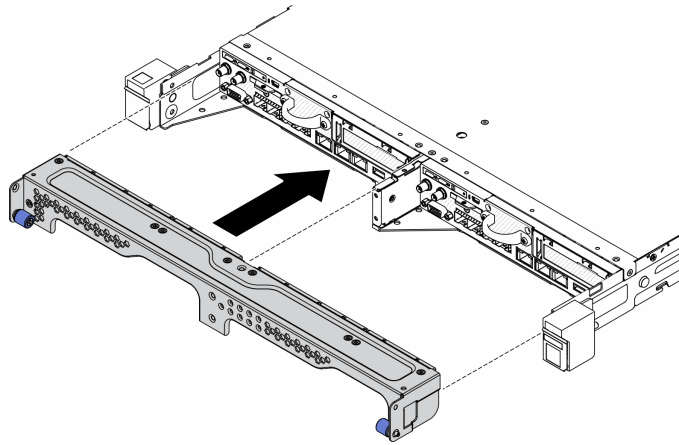


Figure 106. Node installation

- d. Install the five screws and fasten the two thumb screws to secure the shipping bracket.

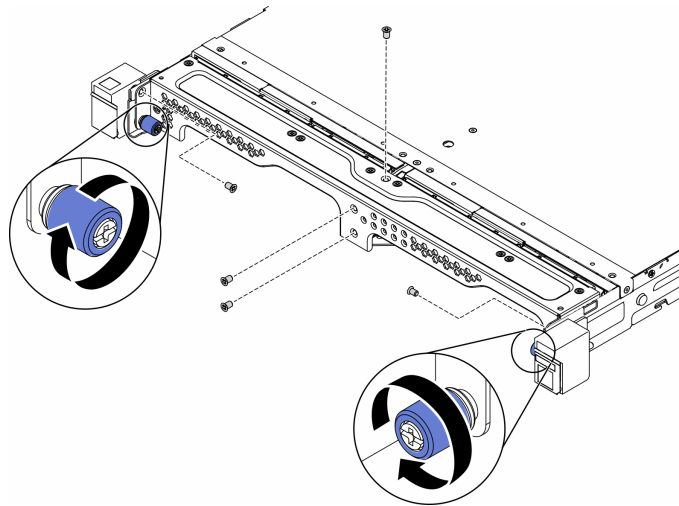


Figure 107. Node installation

After you install a node, complete the following steps:

1. Install the enclosure into rack if necessary.
2. Reconnect power cords and all external cables.
3. Turn on the server (see [“Power on the server”](#) on page 16).

PCIe riser assembly replacement

Use this procedure to remove or install the PCIe riser assembly.

Remove the PCIe riser assembly

Use this information to remove the PCIe riser assembly .

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

- **S012**



CAUTION:
Hot surface nearby.

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

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Remove the node from the enclosure if needed (see “Remove a node” on page 98).

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

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Remove the seven screws as shown.

Step 2. Grasp the PCIe riser assembly by its edge and the blue tab; then, carefully lift it out of the server.

Notes:

1. The following illustration might differ slightly from your hardware.
2. Carefully lift the PCIe riser assembly straight up. Avoid tilting the PCIe riser assembly at a large angle, tilting might cause damage to the connector.

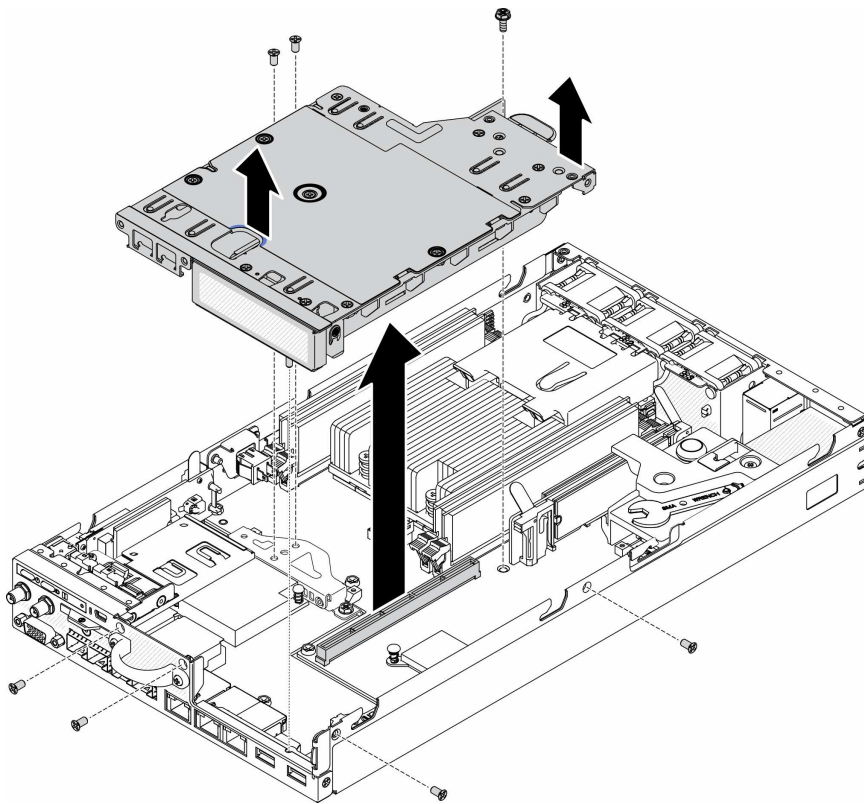


Figure 108. PCIe riser assembly removal

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

1. Install the filler and fasten the three screws.

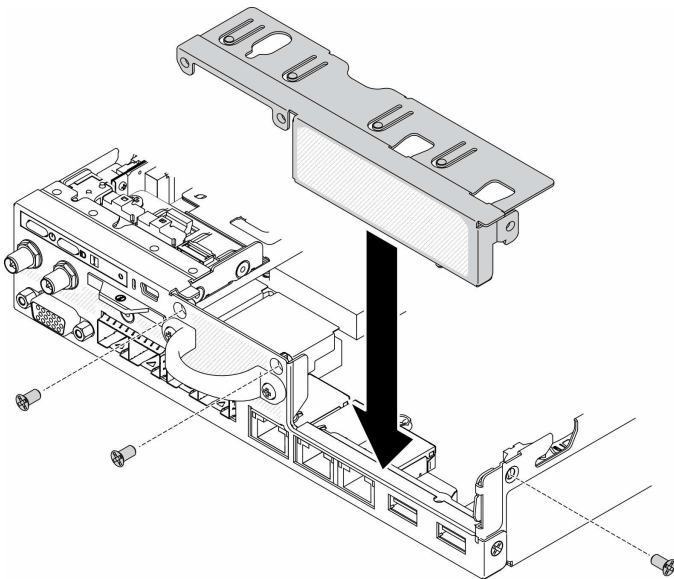


Figure 109. Filler installation

2. If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the PCIe riser assembly

Use this information to install the PCIe riser assembly.

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

- **S012**



CAUTION:
Hot surface nearby.

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

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Install the required adapters.
4. Remove the filler if it is installed.
 - a. Remove the three screws.
 - b. Grasp the filler by its edges and carefully lift it out of the server.

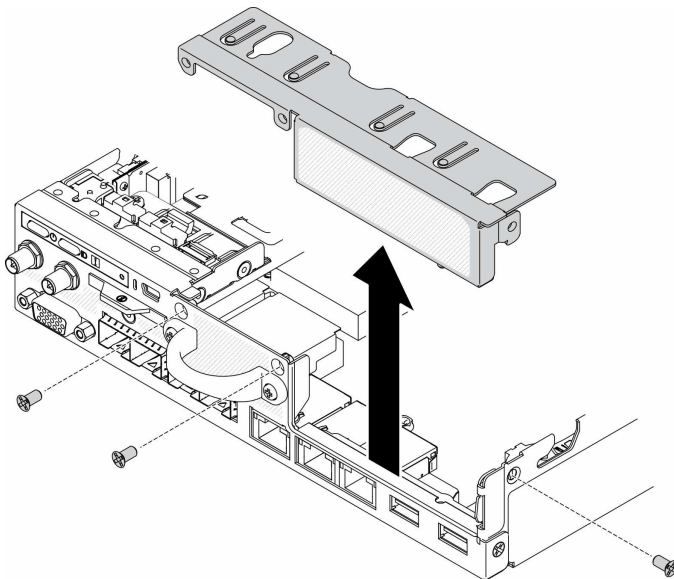


Figure 110. Filler removal

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

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. If the adapter bracket is not installed, install it by fastening the two screws as shown.

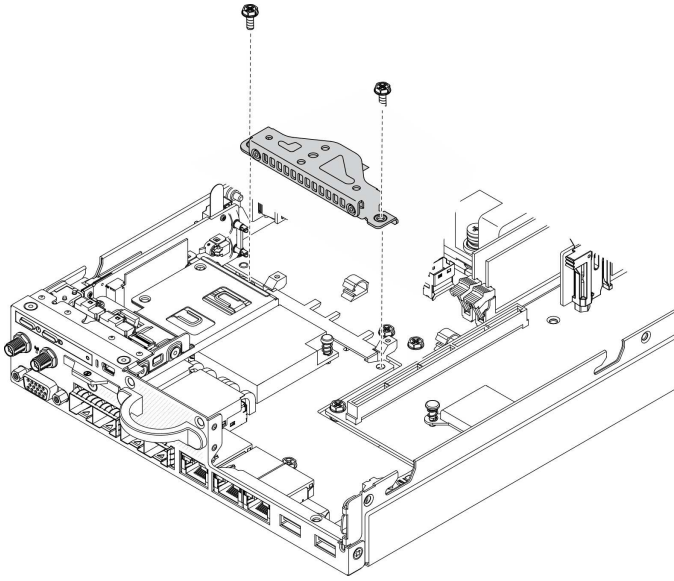


Figure 111. PCIe riser assembly installation

Step 2. Lower the PCIe riser assembly into the chassis and press the PCIe riser assembly down until it is securely seated.

Step 3. Install the seven screws.

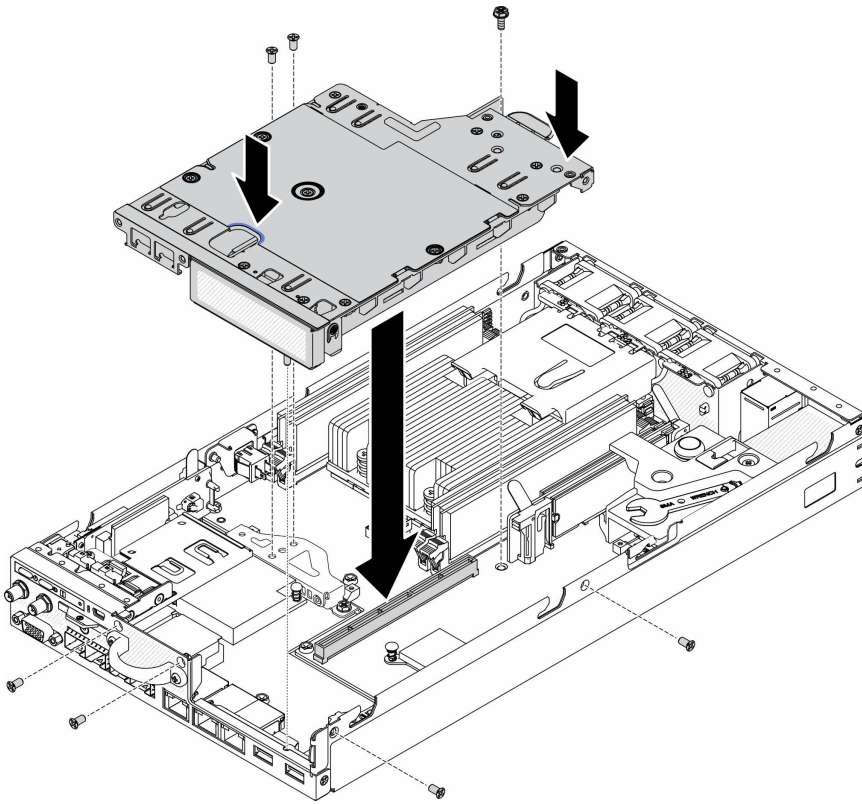


Figure 112. PCIe riser assembly installation

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

1. Install the node if needed (see “[Install a node](#)” on page 101).
2. Reconnect power cords and all external cables.

Power distribution module replacement

Use the following information to remove and install the power distribution module.

Remove the power distribution module

Use this information to remove the power distribution module.

Before you remove the power distribution module, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “[Safety](#)” on page iii
 - “[Installation Guidelines](#)” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “[Power off the server](#)” on page 16).
3. Remove the node from the enclosure if needed (see “[Remove a node](#)” on page 98).

To remove the power distribution module, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

- Step 1. Remove the screw on the bottom of the server.
- Step 2. Remove the screw on the rear of the server.
- Step 3. Carefully hold the tab and pull the power distribution module out of the server.

- 12 V power distribution module removal

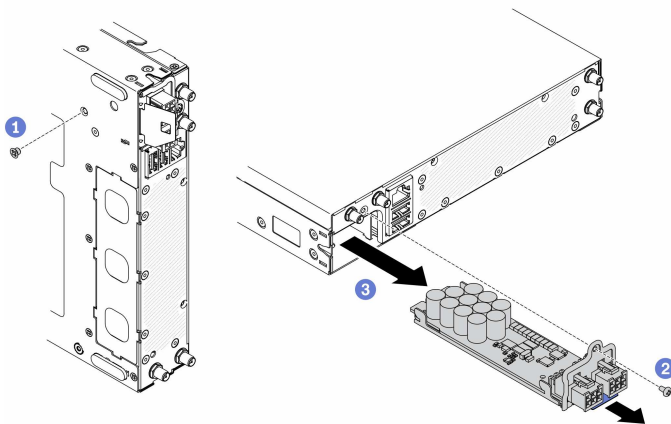


Figure 113. 12 V power distribution module removal

- -48 V power distribution module removal

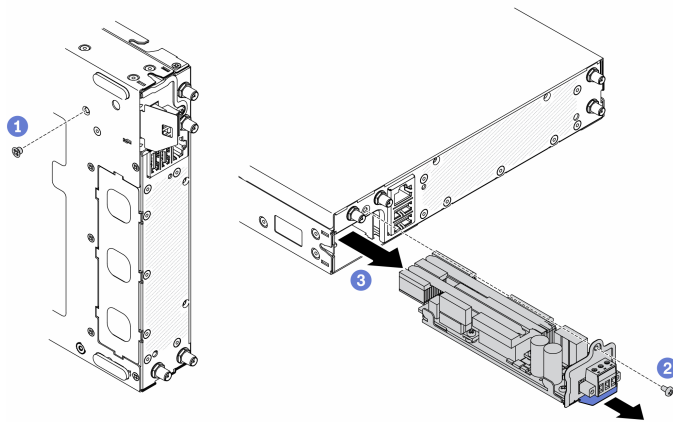


Figure 114. -48 V power distribution module removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the power distribution module

Use this information to install the power distribution module.

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

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

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

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

- Step 1. Hold the tab and slide the power distribution module into the server.
- Step 2. Fasten the screw on the rear of the server.
- Step 3. Fasten the screw on the bottom of the server.
 - 12 V power distribution module installation

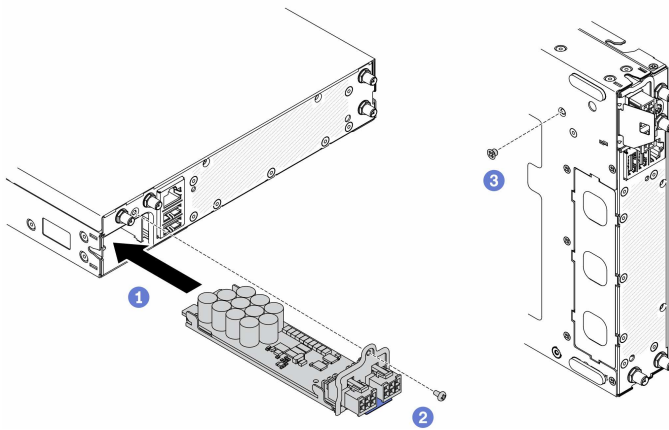


Figure 115. 12 V power distribution module installation

- -48 V power distribution module installation

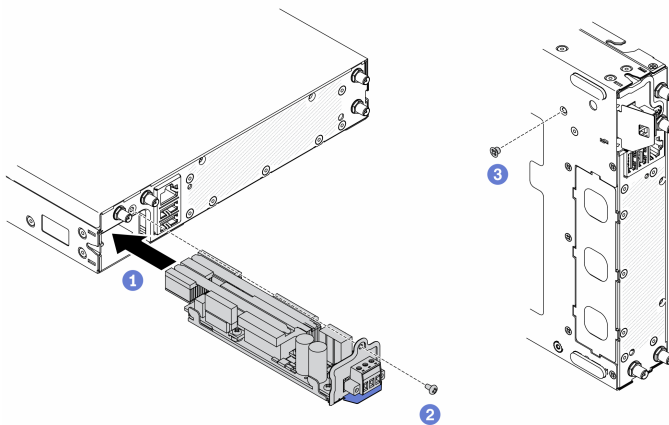


Figure 116. -48 V power distribution module installation

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

1. Install the node if needed (see [“Install a node” on page 101](#)).
2. Reconnect power cords and all external cables.
3. If necessary, configure the RAID array using the Setup utility configuration.

Power adapter replacement

Use this information to remove and install a power adapter.

Remove a power adapter

Use this information to remove a power adapter.

Before you remove a power adapter, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)

2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Remove the enclosure from the rack if necessary.

To remove a power adapter, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Remove the power adapter.

- If you are removing a power adapter while a node is installed in an enclosure, complete the following steps.
 1. Remove the two screws.
 2. Slightly push the bracket frontward and remove it from the enclosure.
 - E1 Enclosure (1U 2-node)

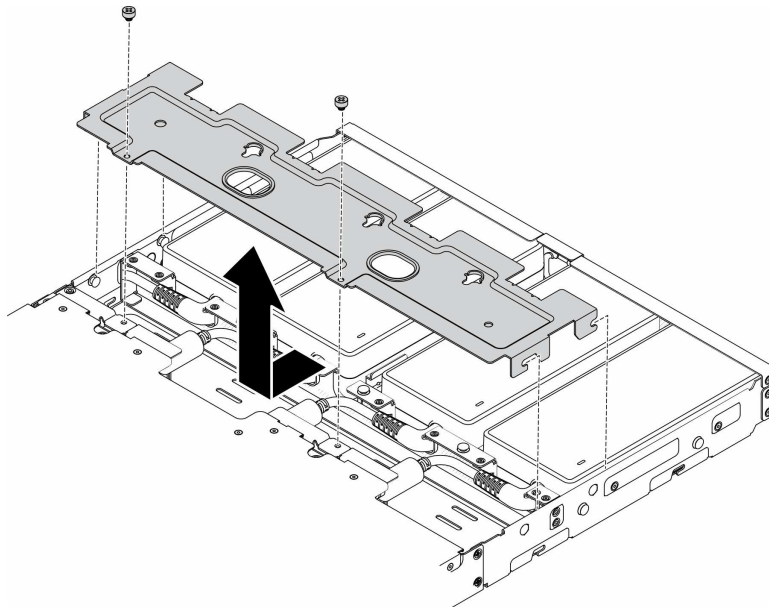


Figure 117. Bracket removal

- E2 Enclosure (2U 2-node)

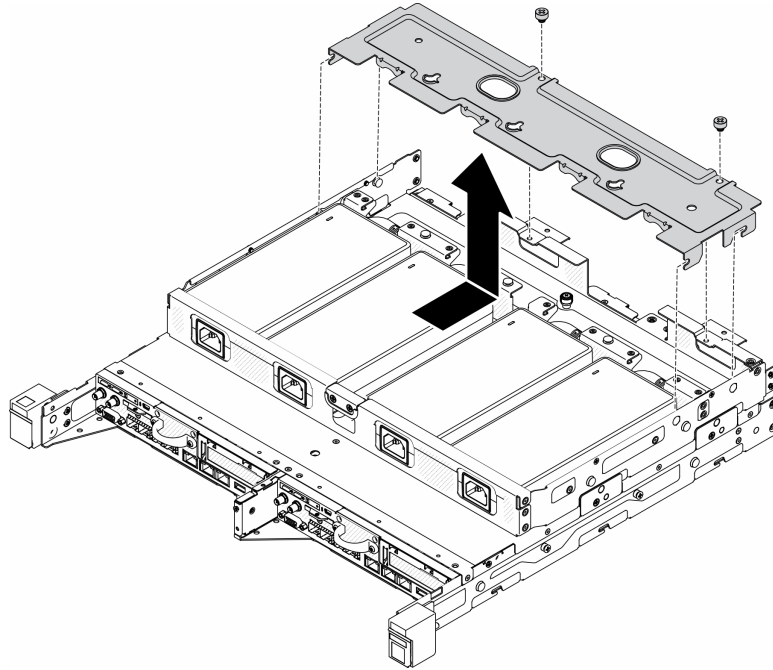


Figure 118. Bracket removal

3. Carefully tilt the power adapter up and remove it from the cage.
 - E1 Enclosure (1U 2-node)

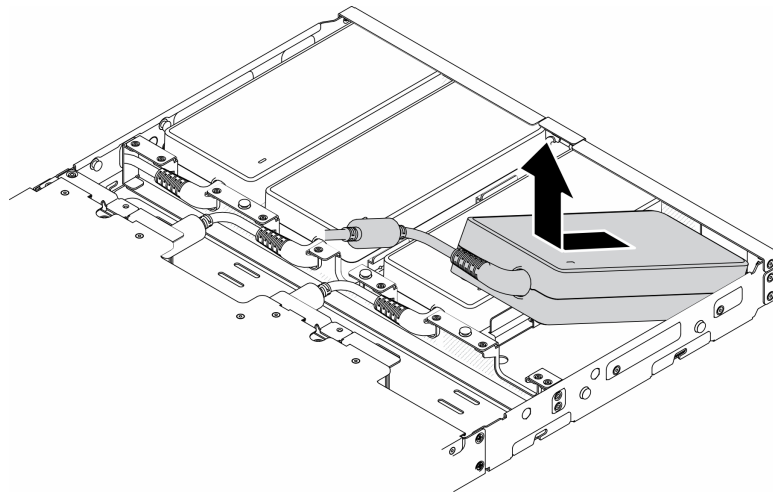


Figure 119. Power adapter removal

- E2 Enclosure (2U 2-node)

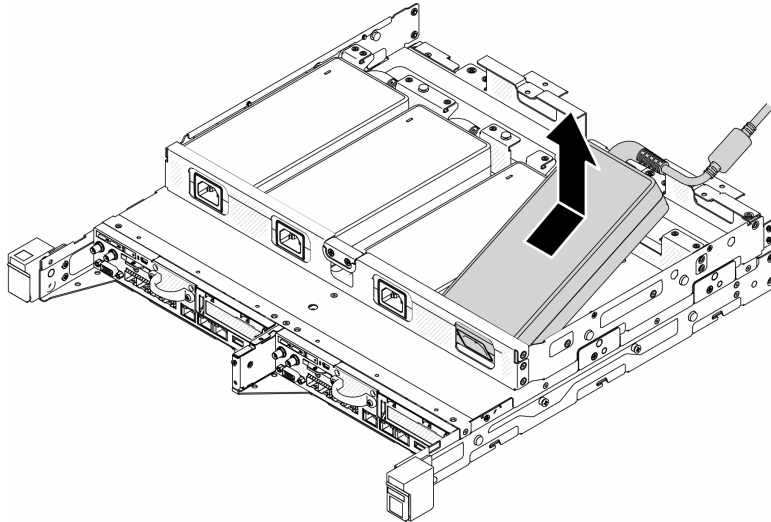


Figure 120. Power adapter removal

- If you are removing a power adapter installed in a power adapter bracket, complete the following steps.
 1. Loosen the thumbscrew.
 2. Remove the tab from the power adapter bracket.
 3. Slide the power adapter out of the power adapter bracket.

Note: See *Configuration Installation Guide* for the DIN rail configuration and wall-mounted configuration installation details if necessary.

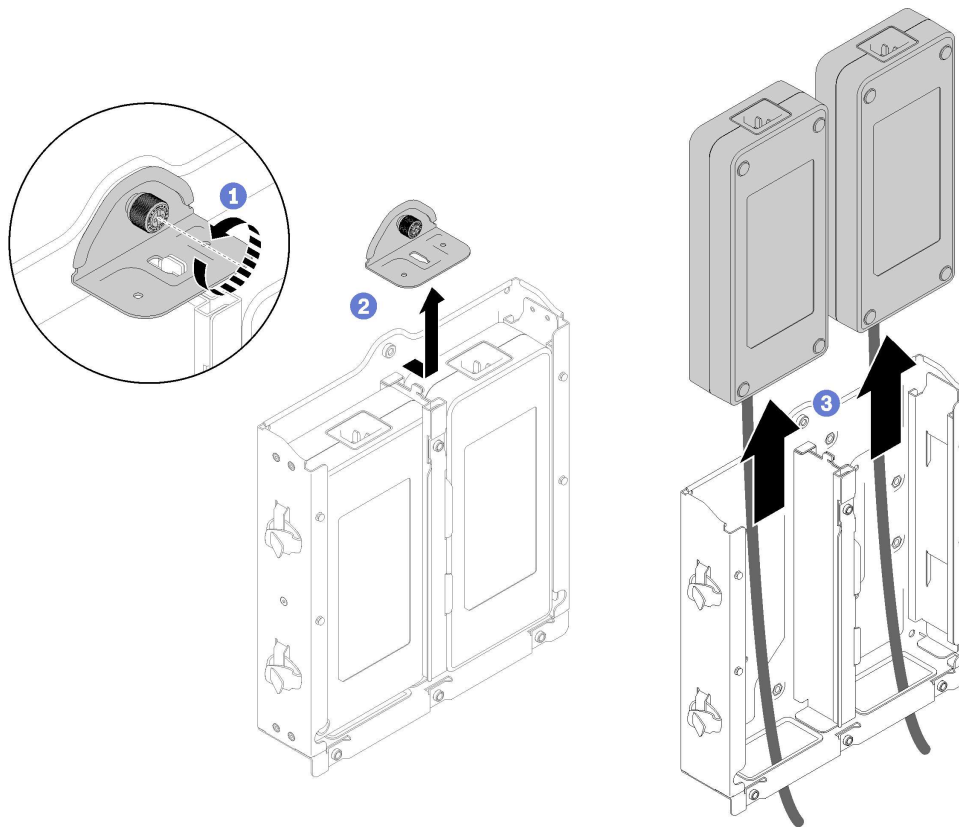


Figure 121. Power adapter removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install a power adapter

Use this information to install a power adapter.

As required by COMMISSION REGULATION (EU) 2019/1782 of 1 October 2019 laying down ecodesign requirements for external power supplies pursuant to Directive 2009/125/EC of the European Parliament and of the Council and repealing Commission Regulation (EC) No 278/2009 (ErP Lot7) for the external power supply of the product.

Table 32. ThinkEdge 240W 230V/115V External Power Supply

Information published	Value and precision	Unit
Manufacturer's name	Lenovo	-
Model identifier	FSP240-A12C14	-
Input voltage	100-240	V
Input AC frequency	50-60	Hz
Output voltage	12.2	V
Output current	20.0	A
Output power	240.0	W
Average active efficiency	92.73	%

Table 32. ThinkEdge 240W 230V/115V External Power Supply (continued)

Information published	Value and precision	Unit
Efficiency at low load (10 %)	87.35	%
No-load power consumption	0.13	W

Table 33. ThinkEdge 240W 230V/115V External Power Supply v2

Information published	Value and precision	Unit
Manufacturer's name	Lenovo	-
Model identifier	GA240SD1-12020000	-
Input voltage	100-240	V
Input AC frequency	50-60	Hz
Output voltage	12.2	V
Output current	20.0	A
Output power	240.0	W
Average active efficiency	93.21	%
Efficiency at low load (10 %)	79.0	%
No-load power consumption	0.097	W

Before you install a power adapter, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).
3. Remove the node from the enclosure if needed (see [“Remove a node” on page 98](#)).

CAUTION:

- **Power adapters to the node must be with the same brand, power rating, wattage or efficiency level.**
- **To distinguish the power adapters, check the size, the position of connector, and the label of the power adapters.**

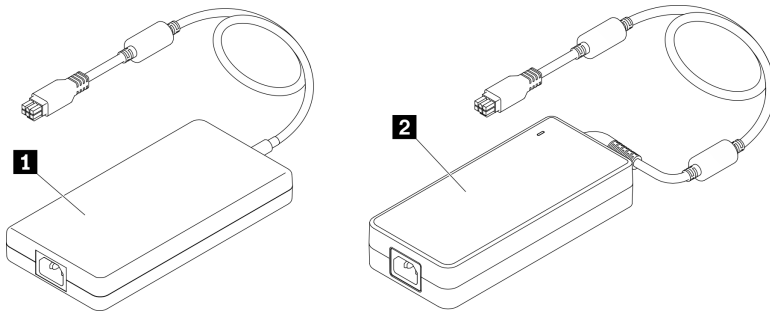


Table 34. Power adapters

1 ThinkEdge 240W 230V/115V External Power Supply	2 ThinkEdge 240W 230V/115V External Power Supply v2
--	---

Note: To tell the difference between the power adapters, you can check the physical size, the label and the connector position of the power connectors.

Figure 122. Power adapters

To install a power adapter, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Install the power adapter.

- If you are installing a power adapter while a node is installed in an enclosure, complete the following steps.
 1. Insert the power adapter into the cage.
 - E1 Enclosure (1U 2-node)

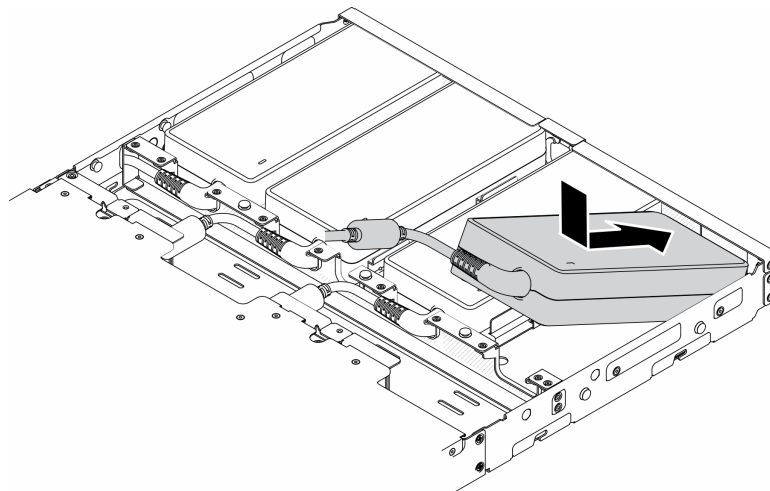


Figure 123. Power adapter installation

- E2 Enclosure (2U 2-node)

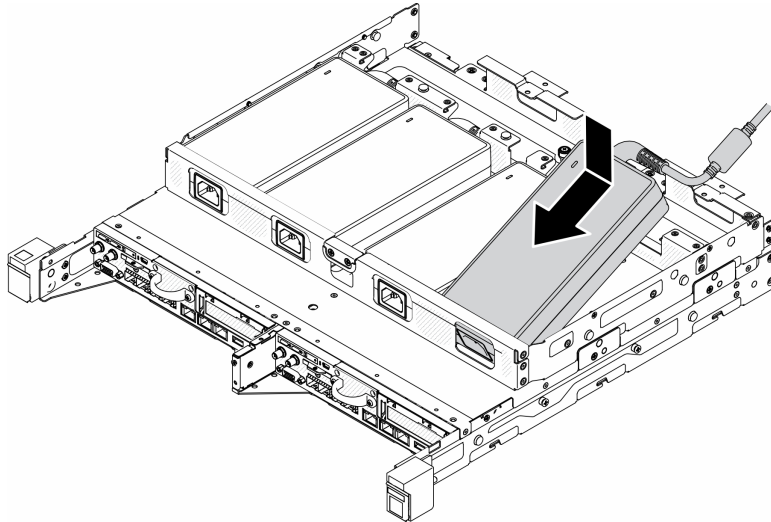


Figure 124. Power adapter installation

2. Slightly push the bracket backward and install the bracket.
3. Install the two screws.
 - E1 Enclosure (1U 2-node)

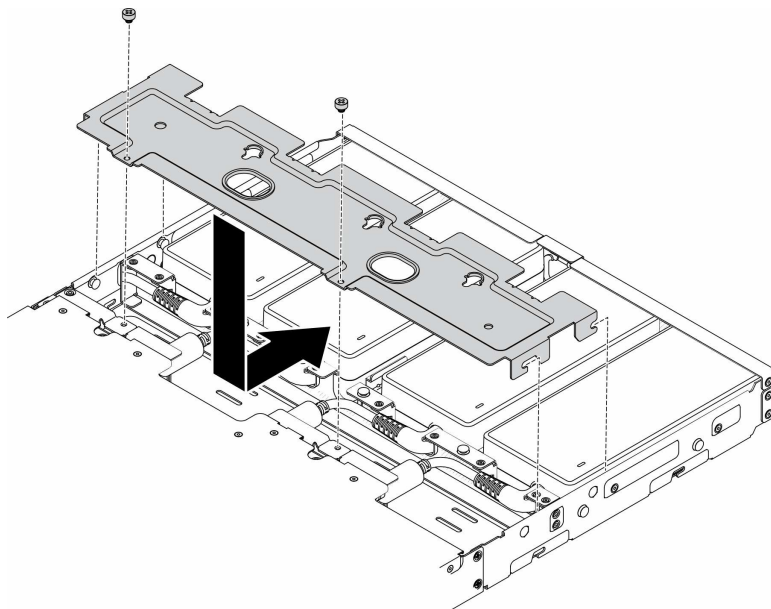


Figure 125. Bracket installation

- E2 Enclosure (2U 2-node)

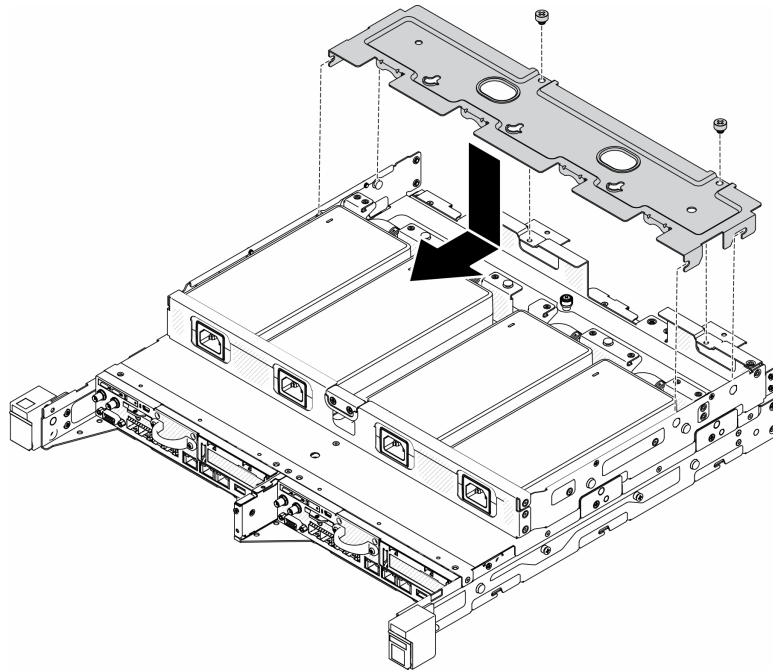


Figure 126. Bracket installation

- If you are installing a power adapter into a power adapter bracket, complete the following steps.
 1. Align the power adapter with the power adapter bracket; then, slide the power adapter into place.
 2. Align the tab with the slot and carefully hook the tab into place.
 3. Fasten the thumbscrew.

Note: See *Configuration Installation Guide* for the DIN rail configuration and wall-mounted configuration installation details if necessary.

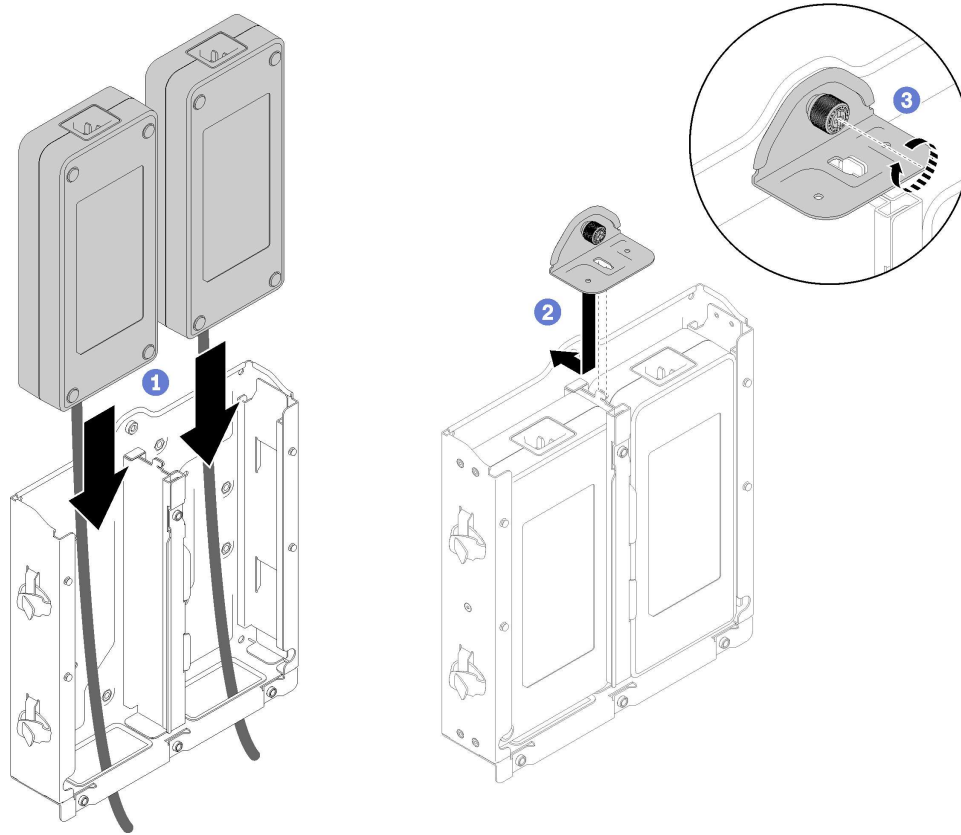


Figure 127. Power adapter installation

1. Install the enclosure into rack if necessary.
2. Refer to *Configuration Installation Guide* for the DIN rail configuration and wall-mounted configuration installation details if necessary.
3. Reconnect power cords and all external cables.
4. Turn on the server (see [“Power on the server” on page 16](#)).

Rubber feet replacement

Use this procedure to remove or install the rubber feet.

Remove the rubber feet

Use this information to remove the rubber feet.

Before you remove the rubber feet, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).
3. Remove the node from the enclosure if needed (see [“Remove a node” on page 98](#)).

To remove the rubber feet, complete the following steps:

Step 1. Remove the rubber feet by pulling it out of the server, be careful when server is placed upside down.

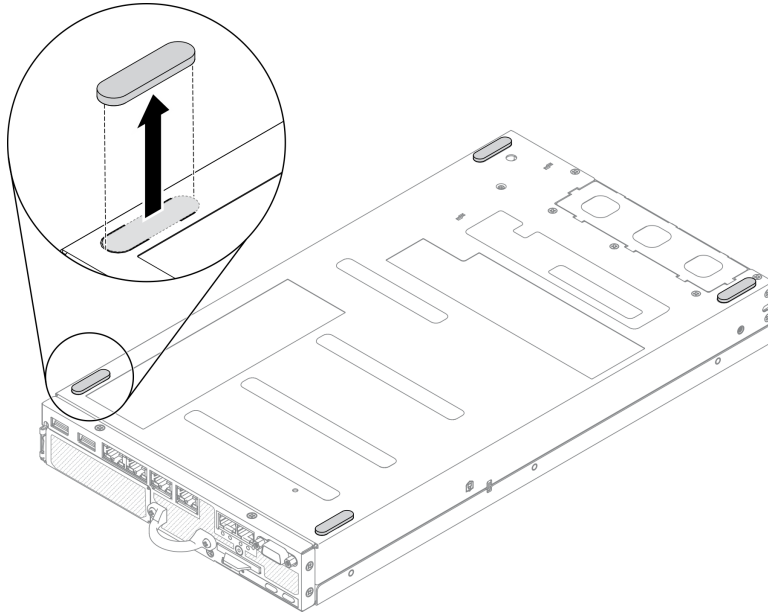


Figure 128. Rubber feet removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the rubber feet

Use this information to install the rubber feet.

Before you install the rubber feet, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To install the rubber feet, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

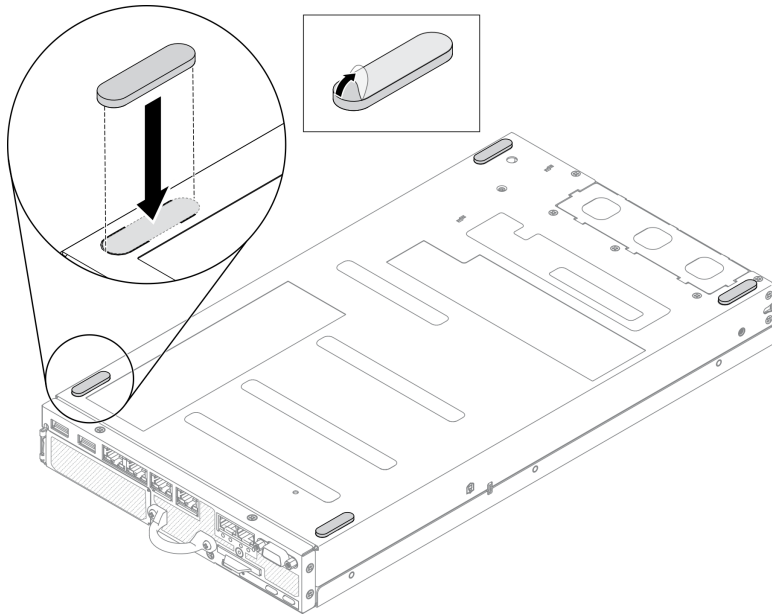


Figure 129. Rubber feet installation

Step 1. Remove the film on the rubber feet, and stick it onto the corner of the server downside as shown.

After you install the rubber feet, complete the following steps:

1. Install the node if needed (see [“Install a node” on page 101](#)).
2. Reconnect power cords and all external cables.

SIM card replacement

Use the following information to remove and install the SIM card.

Remove the SIM card

Use this information to remove the SIM card.

Before you remove the SIM card, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).
3. Remove the node from the enclosure if needed (see [“Remove a node” on page 98](#)).
4. Remove the M.2 WLAN/LTE wireless adapter (see [“Remove the M.2 WLAN/LTE wireless adapter” on page 41](#)).

To remove the SIM card, complete the following steps:

- Step 1. Locate the SIM card position on the M.2 WLAN/LTE wireless adapter.
- Step 2. Slide the retainer cover backward and rotate it up.
- Step 3. Remove the SIM card from the slot.

Step 4. Rotate the retainer cover down and slide it forward to secure the SIM card.

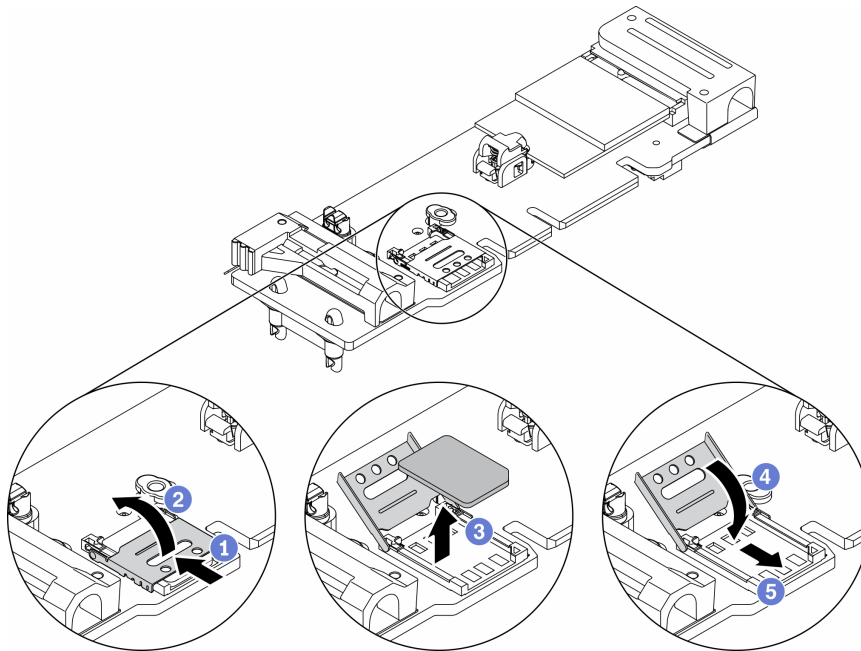


Figure 130. SIM card removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the SIM card

Use this information to install the SIM card.

Before you install the SIM card, complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

Note: To enable LTE, SIM card installation is required. LTE service is provided by authorized mobile service carriers in respective countries or regions. Server must have a cellular plan from a service carrier to connect to the LTE network.

To install the SIM card, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Locate the SIM card position on the M.2 WLAN/LTE wireless adapter.

Step 2. Slide the retainer cover backward and rotate it up.

Step 3. Carefully place the SIM card on the slot.

Step 4. Rotate the retainer cover down and slide it forward.

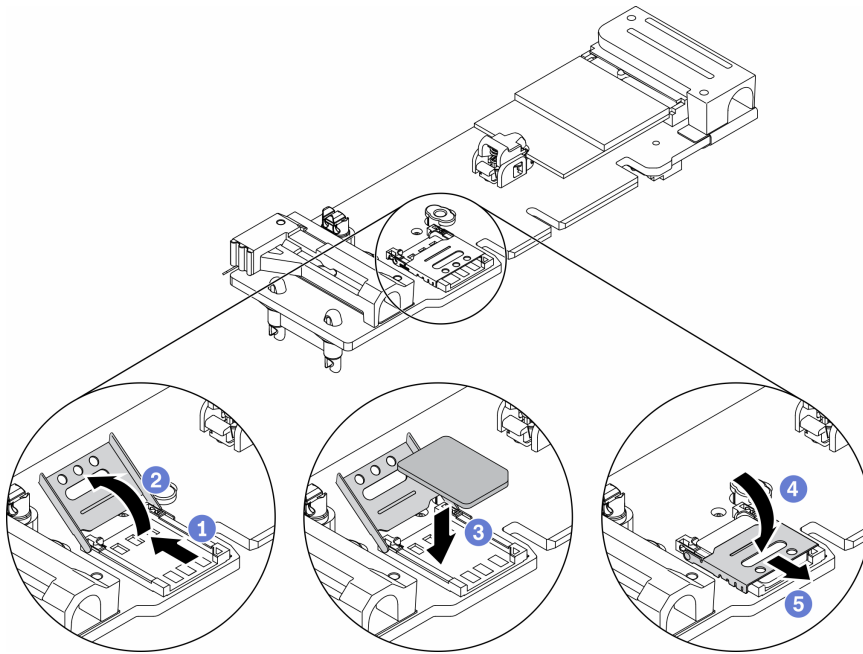


Figure 131. SIM card installation

After you install the SIM card, complete the following steps:

1. Install the M.2 WLAN/LTE wireless adapter (see [“Install the M.2 WLAN/LTE wireless adapter”](#) on page 42).
2. Install the node if needed (see [“Install a node”](#) on page 101).
3. Reconnect power cords and all external cables.
4. Follow the setup process to enable SIM card:

Note: Obtain the PIN code, APN, and other settings from your carrier or SIM provider and keep it in a safe place.

- PIN code:

- When the PIN code of the SIM card is required, use the following command lines (using 1234 as an example of PIN code):

```
sudo uci set network.lte_wan.pincode='1234'  
sudo uci commit network  
sudo /etc/init.d/network restart
```

- When the PIN code of the SIM card is not required, use the following command lines:

```
sudo uci del network.lte_wan.pincode  
sudo uci del network.lte_wan.auth  
sudo uci del network.lte_wan.username  
sudo uci commit network
```

```
sudo reboot
```

- APN:

- When APN setting is required, use the following command lines (using 1234 as an example of APN):

```
sudo uci set network.lte_wan.apn='1234'
```

```
sudo uci commit network
```

```
sudo reboot
```

- When the APN setting is not required, use the following command lines:

```
sudo uci set network.lte_wan.apn='internet'
```

```
sudo uci commit network
```

```
sudo reboot
```

Note: For more information about configuring the LTE settings, see **Configure LTE setting** under the “Embedded switch CLI for wireless LOM Package configuration” section in the *ThinkSystem SE350 Setup Guide*.

System board replacement

Use this procedure to remove or install the system board.

Remove the system board assembly

Use this information to remove the system board assembly.

Attention: Removing and installing this component requires trained technicians. Do not attempt to remove or install it without proper training.

Before removing the system board assembly:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)
2. 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.
3. If the server has SED installed, maintain a backup of SED AK. See *Backup the Self Encryption Drive Authentication Key (SED AK)* in *Setup Guide* for more details.
4. Use the Lenovo XClarity Essentials OneCLI to save the system configuration to external media.
5. Log on XCC Web GUI and backup config to external media.
6. Download the XCC Service Data to external media.
7. Turn off the server. Disconnect the power cords and all external cables (see [“Power off the server” on page 16](#)).
8. Remove the node from the enclosure if needed (see [“Remove a node” on page 98](#)).
9. Remove the top cover (see [“Remove the top cover” on page 140](#)).

To remove the system board assembly, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Remove the following components that are installed on the system board assembly and put them in a safe, static-protective place.

- Disconnect the fan cables (see “Remove a fan” on page 64).
- Remove the air baffle (see “Remove the air baffle” on page 50).
- Remove the PCIe riser assembly (see “Remove the PCIe riser assembly” on page 103).
- Remove the intrusion switch cable (see “Remove the intrusion switch cable” on page 72).
- Remove the M.2 boot adapter (see “Remove the M.2 boot adapter” on page 39).
- Remove the lock position switch if installed (see “Remove the lock position switch” on page 75).
- Remove M.2 WLAN/LTE wireless adapter (see “Remove the M.2 WLAN/LTE wireless adapter” on page 41).
- Disconnect the front operator panel cables (see “Remove the front operator panel” on page 67).
- Remove the TPM card if installed (see “Remove the TPM card (for Chinese Mainland only)” on page 143).
- Remove the power distribution module (see “Remove the power distribution module” on page 108).
- Remove the DIMMs (see “Remove a DIMM” on page 57).

Step 2. Remove the two screws on the bottom of the server.

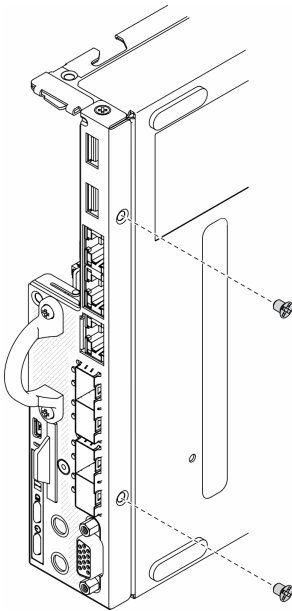


Figure 132. Screws removal

Step 3. Remove the three screws on the sides of the server, and remove the two screws that secure VGA connector.

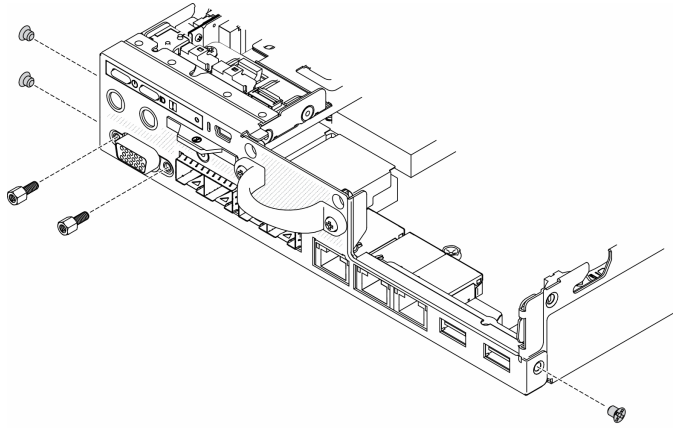


Figure 133. Screws removal

Step 4. Remove the front operator panel by pulling it out from the server.

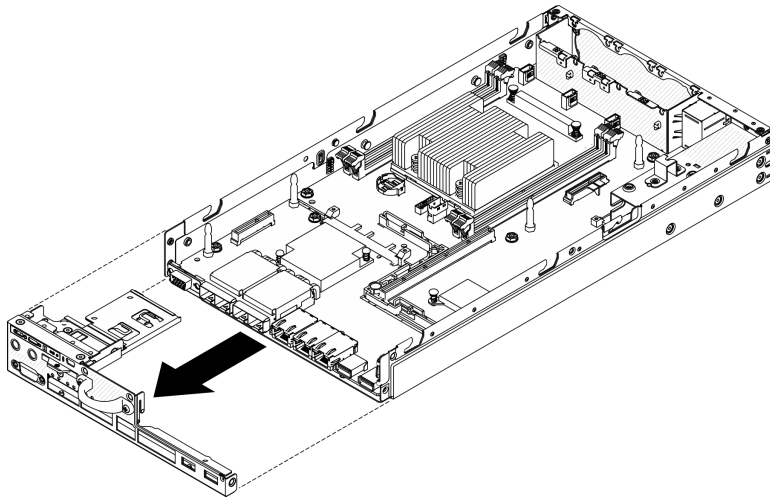


Figure 134. Front operator panel removal

Step 5. Remove the six screws that secure the LOM package.

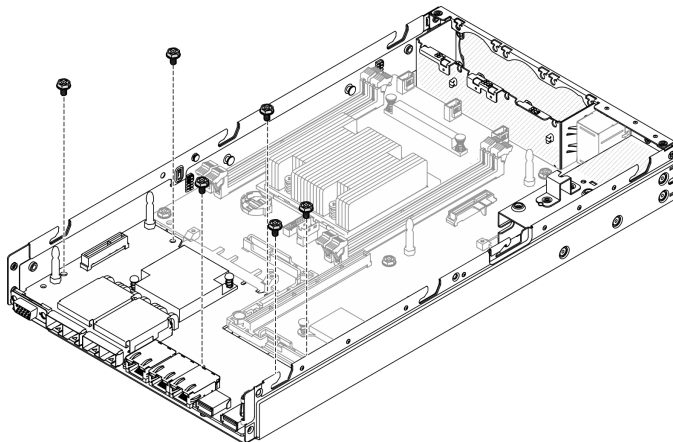


Figure 135. LOM package removal

Step 6. Slightly pull the LOM package forward, and lift it up at an angle as shown to remove it from the server.

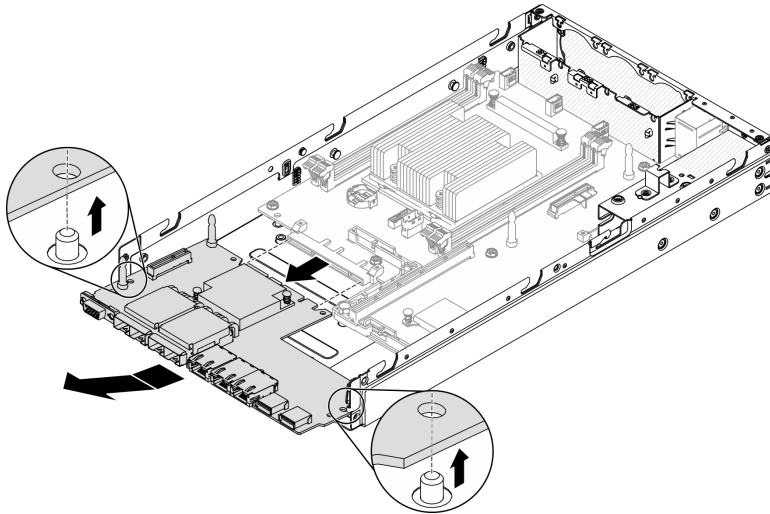


Figure 136. LOM package removal

Note: Wireless enabled LOM package and 10G SFP+ LOM package are removed with the same method.

Step 7. Remove the eight screws that secure the system board.

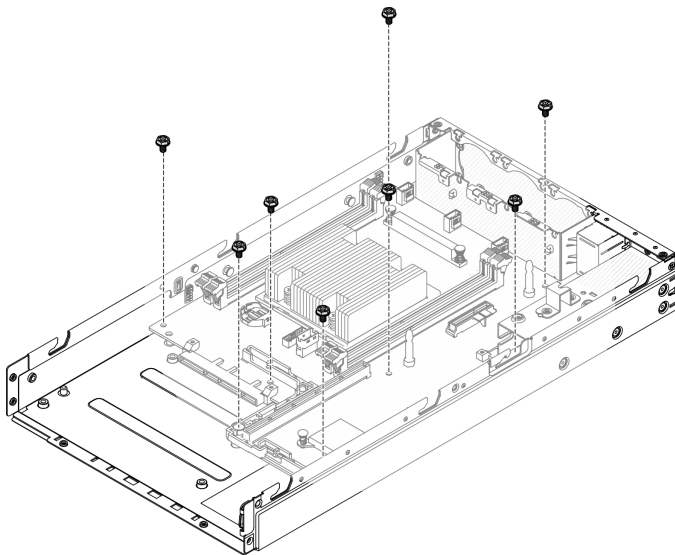


Figure 137. System board removal

Step 8. Pull the system board forward and lift it up slightly to remove it from the guide pins.

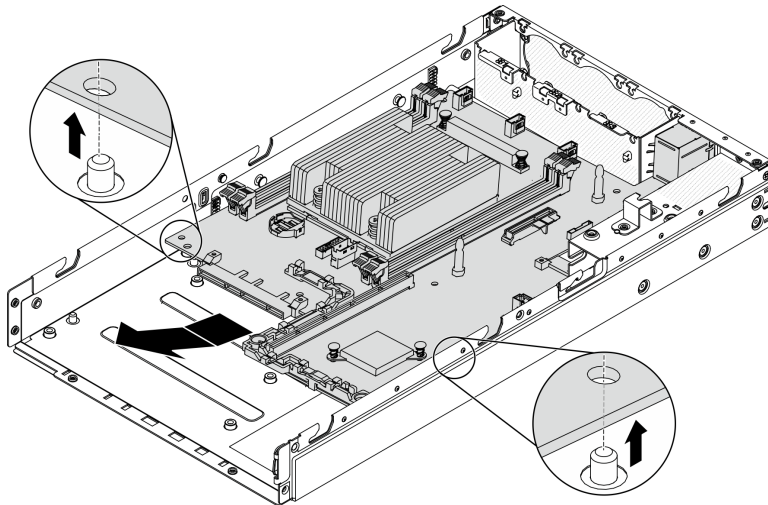


Figure 138. System board removal

Step 9. Lift the system board toward the side of the server as shown to remove it from the server.

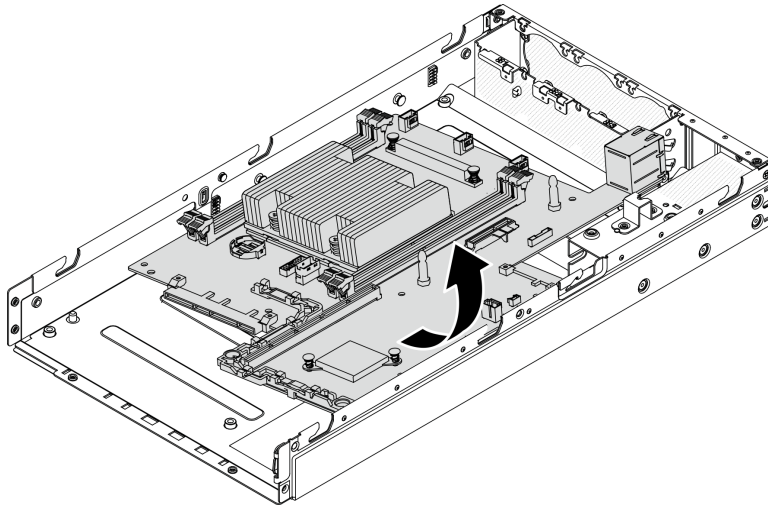


Figure 139. System board removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the system board assembly

Use this information to install the system board assembly.

Attention: Removing and installing this component requires trained technicians. Do not attempt to remove or install it without proper training.

Before you install a system board, complete the following steps:

1. Read the following sections to ensure that you work safely.

- [“Safety” on page iii](#)
- [“Installation Guidelines” on page 37](#)

2. Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
3. If an insulating pull tab is under the CMOS battery on the replacement system board, remove it.

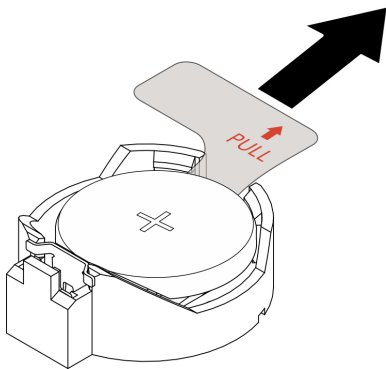


Figure 140. Insulating pull tab removal

To install the system board, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

- Step 1. Insert the system board into the chassis with an angle as shown.

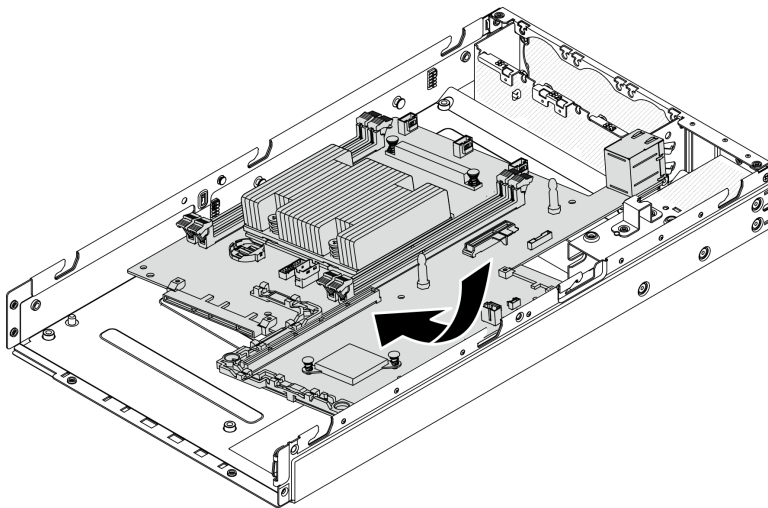


Figure 141. System board installation

- Step 2. Push the system board into the server and seat the system board onto the guide pins.

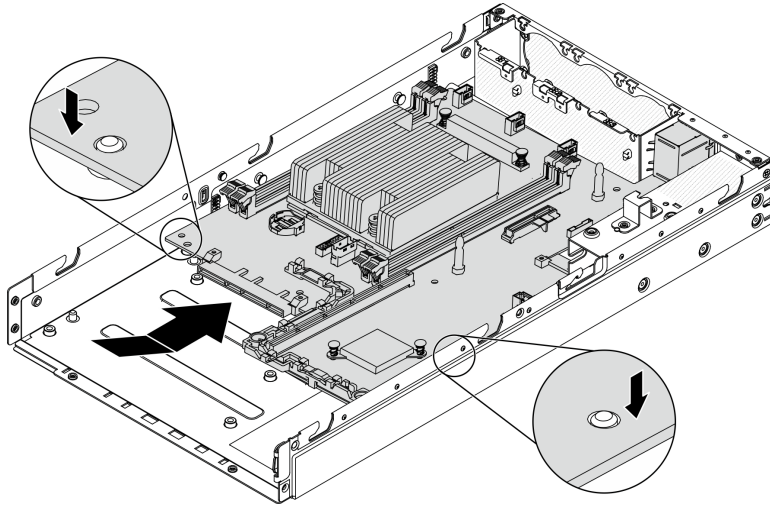


Figure 142. System board installation

Step 3. Install the eight screws to secure the system board.

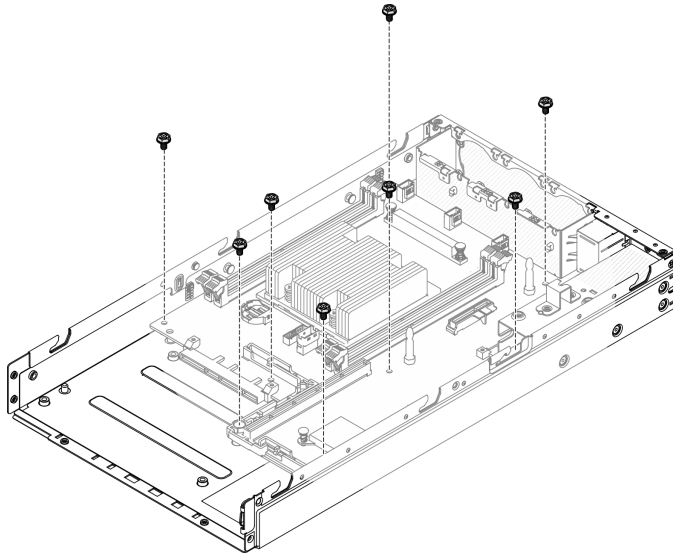


Figure 143. System board installation

Step 4. Insert the LOM package into the server at an angle as shown; then, seat the LOM package onto the guide pins.

Note: Wireless enabled LOM package and 10G SFP+ LOM package are installed with the same method.

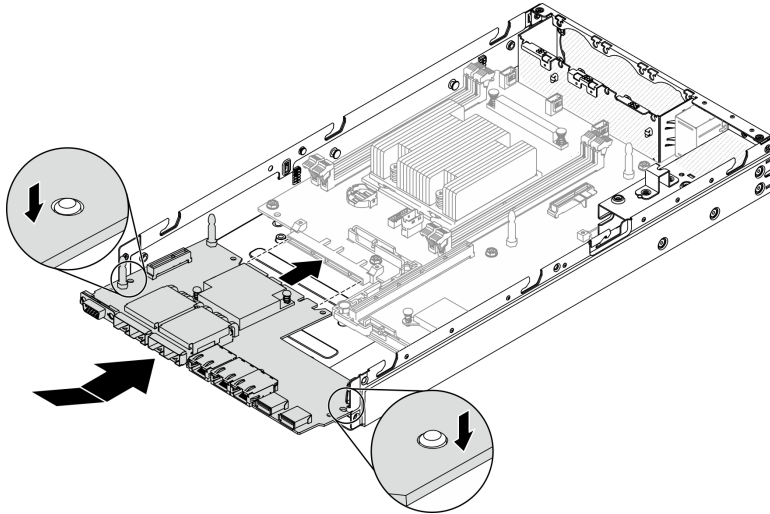


Figure 144. LOM package installation

Step 5. Install the six screws to secure the LOM package.

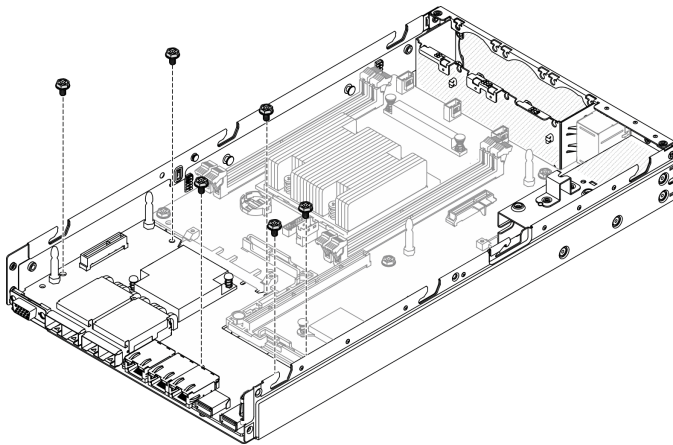


Figure 145. LOM package installation

Step 6. Align the front operator panel with the chassis and insert the panel onto the front of the server.

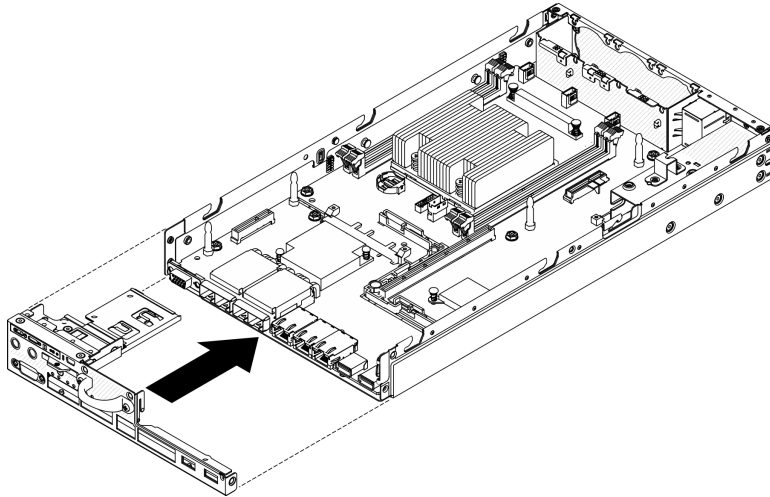


Figure 146. Front operator panel installation

Step 7. Install the two screws that secure VGA connector, and install the three screws on the sides of the server.

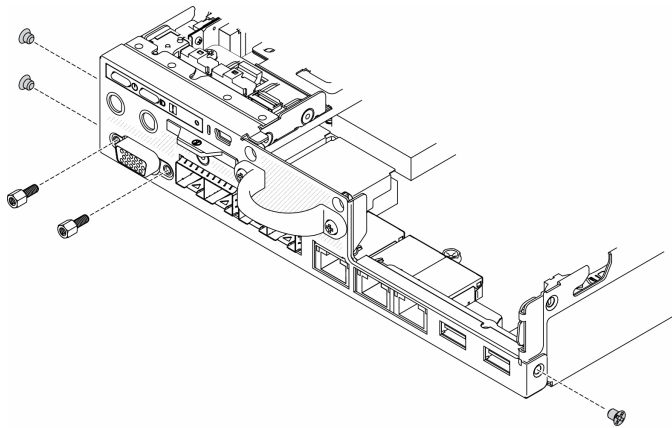


Figure 147. Screws installation

Step 8. Install the two screws on the bottom of the server.

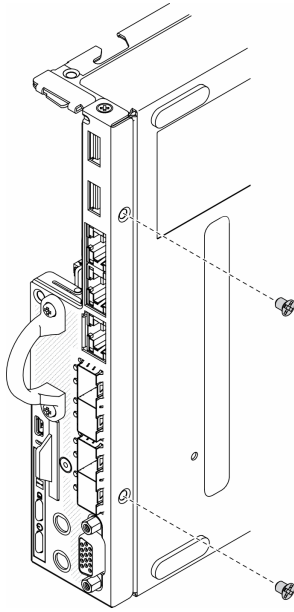


Figure 148. Screws installation

- Step 9. Peel away the XClarity Controller network access label on the processor heat sink and attach it to the network access tag on the front of the server.

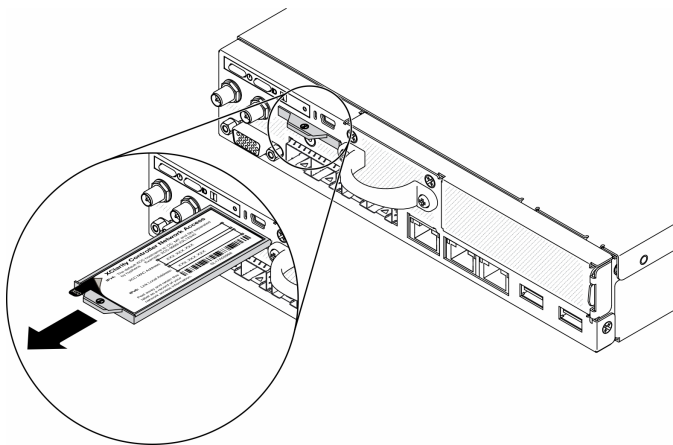


Figure 149. Location of the network access tag

- Step 10. Install the following components:

- Install the DIMMs (see [“Install a DIMM” on page 59](#)).
- Install the TPM card (for Chinese Mainland only) if necessary (see [“Install the TPM card \(for Chinese Mainland only\)” on page 144](#)).
- Install the PCIe riser assembly if necessary (see [“Install the PCIe riser assembly” on page 106](#)).
- Install an M.2 adapter if necessary (see [“Install a M.2 data adapter” on page 45](#) and [“Install the M.2 boot adapter” on page 40](#) and [“Install the M.2 WLAN/LTE wireless adapter” on page 42](#)).
- Install the power distribution module (see [“Install the power distribution module” on page 109](#)).
- Connect front operator panel or the front I/O assembly cables (see [“Install the front operator panel” on page 68](#)).

- Install the air baffle (see [“Install the air baffle” on page 51](#)).
- Connect the fan cables (see [“Install a fan” on page 65](#)).

After you install the system board, complete the following steps:

1. Install the top cover onto the server (see [“Install the top cover” on page 141](#)).
2. Install the node if needed (see [“Install a node” on page 101](#)).
3. Reconnect power cords and all external cables.
4. Reconfigure the server and reset the system date and time.
5. 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 machine type and serial number” on page 134](#).

Note: If the node is to be installed in an E1 Enclosure (1U 2-node), change the vital product data (VPD) for proper operation. See [“Change the VPD for E1 Enclosure configuration \(trained technician only\)” on page 139](#).

6. If the server has SED installed, recover the SED AK. See *Backup the Self Encryption Drive Authentication Key (SED AK)* in *Setup Guide* for more details.
7. Recover the FoD key if needed.
8. Update the public key. See the *Update Key* section of https://download.lenovo.com/servers_pdf/thinkshield_mobile_application_user_guide.pdf for more details.
9. For ThinkSystem SE350 with Security Pack, re-activate the system. See “Activate the system” in the *ThinkSystem SE350 Setup Guide* for more information.
10. Enable TPM. See [“Enable TPM” on page 136](#).
11. Optionally, enable Secure Boot. See [“Enable UEFI Secure Boot” on page 138](#).

Update the machine type and serial number

After the system board is replaced by trained service technicians, the machine type and serial number must be updated.

There are two methods available to update the machine type and serial number:

- From Lenovo XClarity Provisioning Manager

To update the machine type and serial number 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. Update the machine type and serial number.

- From Lenovo XClarity Essentials OneCLI

Lenovo XClarity Essentials OneCLI sets the machine type and serial number in the Lenovo XClarity Controller. Select one of the following methods to access the Lenovo XClarity Controller and set the machine type and serial number:

- Operate from the target system, such as LAN or keyboard console style (KCS) access
- Remote access to the target system (TCP/IP based)

To update the machine type and serial number from Lenovo XClarity Essentials OneCLI:

1. Download and install Lenovo XClarity Essentials OneCLI.

To download Lenovo XClarity Essentials OneCLI, go to the following site:

<https://datacentersupport.lenovo.com/solutions/HT116433>

2. Copy and unpack the OneCLI package, which also includes other required files, to the server. Make sure that you unpack the OneCLI and the required files to the same directory.
3. After you have Lenovo XClarity Essentials OneCLI in place, type the following commands to set the machine type and serial number:

```
onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model> [access_method]
```

```
onecli config set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n> [access_method]
```

Where:

<m/t_model>

The server machine type and model number. Type *m t m xxxxyyy*, where *xxxx* is the machine type and *yyy* is the server model number.

<s/n>

The serial number on the server. Type *sn zzzzzzz*, where *zzzzzzz* is the serial number.

[access_method]

The access method that you select to use from the following methods:

- Online authenticated LAN access, type the command:

```
[--bmc-username xcc_user_id --bmc-password xcc_password]
```

Where:

xcc_user_id

The BMC/IMM/XCC account name (1 of 12 accounts). The default value is USERID.

xcc_password

The BMC/IMM/XCC account password (1 of 12 accounts).

Example commands are as follows:

```
onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model> --bmc-username xcc_user_id  
--bmc-password xcc_password
```

```
onecli config set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n> --bmc-username xcc_user_id  
--bmc-password xcc_password
```

- Online KCS access (unauthenticated and user restricted):

You do not need to specify a value for *access_method* when you use this access method.

Example commands are as follows:

```
onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model>  
onecli config set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n>
```

Note: The KCS access method uses the IPMI/KCS interface, which requires that the IPMI driver be installed.

- Remote LAN access, type the command:

```
[--bmc xcc_user_id:xcc_password@xcc_external_ip]
```

Where:

xcc_external_ip

The BMC/IMM/XCC IP address. There is no default value. This parameter is required.

xcc_user_id

The BMC/IMM/XCC account (1 of 12 accounts). The default value is USERID.

xcc_password

The BMC/IMM/XCC account password (1 of 12 accounts).

Note: BMC, IMM, or XCC internal LAN/USB IP address, account name, and password are all valid for this command.

Example commands are as follows:

```
onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model>
--bmc xcc_user_id:xcc_password@xcc_external_ip
onecli config set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n>
--bmc xcc_user_id:xcc_password@xcc_external_ip
```

4. Reset the Lenovo XClarity Controller to the factory defaults. See “Resetting the BMC to Factory Default” section in the XCC documentation compatible with your server at https://systemt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html.

Enable TPM

The server supports Trusted Platform Module (TPM) Version 2.0

Note: For customers in Chinese Mainland, integrated TPM is not supported. However, customers in Chinese Mainland can install a TPM card.

When a system board is replaced, you must make sure that the TPM policy is set correctly.

CAUTION:

Take special care when setting the TPM policy. If it is not set correctly, the system board can become unusable.

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.
 - **NationZ TPM 2.0 enabled - China only**. Customers in the Chinese Mainland should choose this setting if a NationZ TPM 2.0 adapter is installed.
 - **TPM enabled - ROW**. Customers outside of the Chinese Mainland should choose this setting.
 - **Permanently disabled**. Customers in the Chinese Mainland should use this setting if no TPM adapter is installed.

Note: Although the setting **undefined** is available as a policy setting, it should not be used.

- From Lenovo XClarity Essentials OneCLI

Note: Please note that a Local IPMI user and password must be setup in Lenovo XClarity Controller for remote accessing to the target system.

To set the TPM policy from Lenovo XClarity Essentials OneCLI:

1. Read TpmTcmPolicyLock to check whether the TPM_TCM_POLICY has been locked:

```
OneCli.exe config show imm.TpmTcmPolicyLock --override --imm <userid>:<password>@<ip_address>
```

Note: The imm.TpmTcmPolicyLock value must be 'Disabled', which means TPM_TCM_POLICY is NOT locked and changes to the TPM_TCM_POLICY are permitted. If the return code is 'Enabled' then no changes to the policy are permitted. The planar may still be used if the desired setting is correct for the system being replaced.

2. Configure the TPM_TCM_POLICY into XCC:

- For customers in Chinese Mainland with no TPM, or customers that require to disable TPM:

```
OneCli.exe config set imm.TpmTcmPolicy "NeitherTpmNorTcm" --override --imm <userid>:<password>@<ip_address>
```

- For customers in Chinese Mainland that require to enable TPM:

```
OneCli.exe config set imm.TpmTcmPolicy "NationZTPM20Only" --override --imm <userid>:<password>@<ip_address>
```

- For customers outside Chinese Mainland that require to enable TPM:

```
OneCli.exe config set imm.TpmTcmPolicy "TpmOnly" --override --imm <userid>:<password>@<ip_address>
```

3. Issue reset command to reset system:

```
OneCli.exe misc ospower reboot --imm <userid>:<password>@<ip_address>
```

4. Read back the value to check whether the change has been accepted:

```
OneCli.exe config show imm.TpmTcmPolicy --override --imm <userid>:<password>@<ip_address>
```

Notes:

- If the read back value is matched it means the TPM_TCM_POLICY has been set correctly.

imm.TpmTcmPolicy is defined as below:

- Value 0 use string "Undefined", which means UNDEFINED policy.
- Value 1 use string "NeitherTpmNorTcm", which means TPM_PERM_DISABLED.
- Value 2 use string "TpmOnly", which means TPM_ALLOWED.
- Value 4 use string "NationZTPM20Only", which means NationZ_TPM20_ALLOWED.
- Below 4 steps must also be used to 'lock' the TPM_TCM_POLICY when using OneCli/ASU commands:

5. Read TpmTcmPolicyLock to check whether the TPM_TCM_POLICY has been locked, command as below:

```
OneCli.exe config show imm.TpmTcmPolicyLock --override --imm <userid>:<password>@<ip_address>
```

The value must be 'Disabled', it means TPM_TCM_POLICY is NOT locked and must be set.

6. Lock the TPM_TCM_POLICY:

```
OneCli.exe config set imm.TpmTcmPolicyLock "Enabled" --override --imm <userid>:<password>@<ip_address>
```

7. Issue reset command to reset system, command as below:

```
OneCli.exe misc ospower reboot --imm <userid>:<password>@<ip_address>
```

During the reset, UEFI will read the value from `imm.TpmTcmPolicyLock`, if the value is 'Enabled' and the `imm.TpmTcmPolicy` value is valid, UEFI will lock the `TPM_TCM_POLICY` setting.

Note: The valid values for `imm.TpmTcmPolicy` include 'NeitherTpmNorTcm', 'TpmOnly', and 'NationZTPM20Only'.

If the `imm.TpmTcmPolicyLock` is set as 'Enabled' but `imm.TpmTcmPolicy` value is invalid, UEFI will reject the 'lock' request and change `imm.TpmTcmPolicyLock` back to 'Disabled'.

8. Read back the value to check whether the 'Lock' is accepted or rejected. Command as below:

```
OneCli.exe config show imm.TpmTcmPolicy --override --imm <userid>:<password>@<ip_address>
```

Note: If the read back value is changed from 'Disabled' to 'Enabled' that means the `TPM_TCM_POLICY` has been locked successfully. There is no method to unlock a policy once it has been set other than replacing system board.

`imm.TpmTcmPolicyLock` is defined as below:

Value 1 uses string "Enabled" , which means lock the policy. Other values are not accepted.

Assert Physical Presence

Before you can assert Physical Presence, the Physical Presence Policy must be enabled. By default, the Physical Presence Policy is enabled with a timeout of 30 minutes.

There are two ways to assert the Physical Presence:

1. If the Physical Presence Policy is enabled, you can assert Physical Presence through the Lenovo XClarity Provisioning Manager or through the Lenovo XClarity Controller.
2. Switch the hardware jumpers on the system board.

Notes: If the Physical Presence Policy has been disabled:

1. Set the hardware Physical Presence jumper on the system board to assert Physical Presence.
2. Enable the Physical Presence Policy using either F1 (UEFI Settings) or Lenovo XClarity Essentials OneCLI.

Assert Physical Presence through the Lenovo XClarity Controller

Complete the following steps to assert Physical Presence through the Lenovo XClarity Controller:

1. Log in to the Lenovo XClarity Controller interface.

For information about logging in to the Lenovo XClarity Controller, see the "Opening and Using the XClarity Controller Web Interface" section in the XCC documentation version compatible with your server at https://sysmgmt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html.

2. Click **BMC Configuration** → **Security** and verify that Physical Presence is set to **assert**.

Assert Physical Presence through the hardware

You can also assert hardware Physical Presence through the use of a jumper on the system board. For more information about asserting hardware Physical Presence through the use of a jumper, see:

["System board jumpers and switches" on page 26](#)

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://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.)
2. If the power-on Administrator password is required, enter the password.
3. From the UEFI Setup page, click **System Settings** → **Security** → **Secure Boot**.
4. Enable Secure Boot and save the settings.

- From Lenovo XClarity Essentials OneCLI

To enable UEFI Secure Boot from Lenovo XClarity Essentials OneCLI:

1. Download and install Lenovo XClarity Essentials OneCLI.

To download Lenovo XClarity Essentials OneCLI, go to the following site:

<https://datacentersupport.lenovo.com/solutions/HT116433>

2. Run the following command to enable Secure Boot:

```
OneCli.exe config set SecureBootConfiguration.SecureBootSetting Enabled
```

```
--bmc <userid>:<password>@<ip_address>
```

where:

- *<userid>:<password>* are the credentials used to access the BMC (Lenovo XClarity Controller interface) of your server. The default user ID is USERID, and the default password is PASSWORD (zero, not an uppercase o)
- *<ip_address>* is the IP address of the BMC.

For more information about the Lenovo XClarity Essentials OneCLI `set` command, see:

http://sysmgt.lenovofiles.com/help/topic/toolstr_cli_lenovo/onecli_r_set_command.html

Change the VPD for E1 Enclosure configuration (trained technician only)

Use the following information to change the vital product data (VPD) for E1 Enclosure configuration.

If the node is to be installed in an E1 Enclosure (1U 2-node), change the vital product data (VPD) for proper operation.

Important: This task must be operated by trained technicians.

To change the VPD for E1 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 0x0E 0x01 0x10 0x54 0x68 0x69 0x6e 0x6b 0x53 0x79 0x73 0x74 0x65 0x6d 0x20
0x53 0x45 0x33 0x35 0x30 0x20 0x28 0x31 0x55 0x32 0x4e 0x29 0x20 0x20 0x20 0x20 0x20 0x20
0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20
```

3. For data security purpose, make sure to disable IPMI again on Lenovo XClarity Controller web interface or Lenovo XClarity Essentials OneCLI.

If the node is removed from an E1 Enclosure (1U 2-node) and is not to be reinstalled to the E1 Enclosure, change the vital product data (VPD) to the default mode for proper operation.

To change the VPD 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 0x0E 0x01 0x10 0x54 0x68 0x69 0x6e 0x6b 0x53 0x79 0x73 0x74 0x65 0x6d 0x20  
0x53 0x45 0x33 0x35 0x30 0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20
```

3. For data security purpose, make sure to disable IPMI again on Lenovo XClarity Controller web interface or Lenovo XClarity Essentials OneCLI.

Top cover replacement

Use the following information to remove and install the top cover.

Remove the top cover

Use this information to remove the top cover.

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

S012



CAUTION:
Hot surface nearby.

S014



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

S033



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

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

1. Read the following sections to ensure that you work safely.

- “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).

To remove the top cover, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

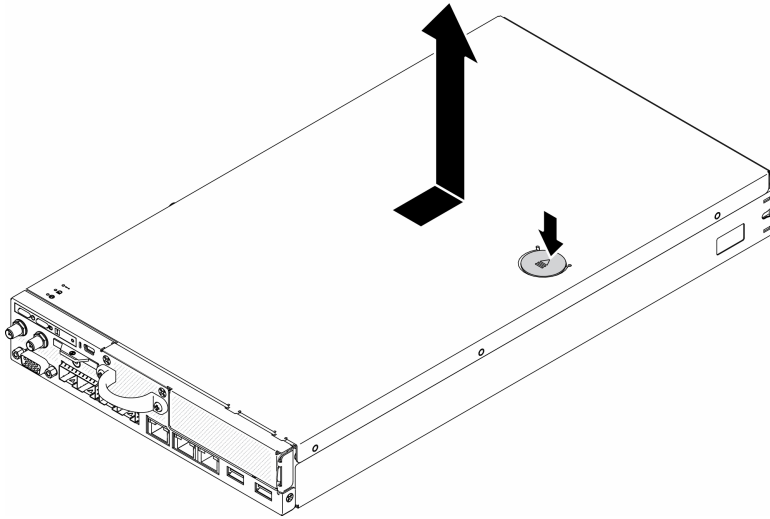


Figure 150. Top cover removal

- Step 1. Press on the release button and the push point at the same time; then, slide the cover toward the rear of the server.
- Step 2. Lift the top cover away from the server.

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the top cover

Use this information to install the top cover.

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

S012



CAUTION:
Hot surface nearby.

S014



CAUTION:

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

S033



CAUTION:

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

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

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Make sure all the removed components are installed, and all the disconnected cables inside the server are reconnected.

To install the top cover, complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

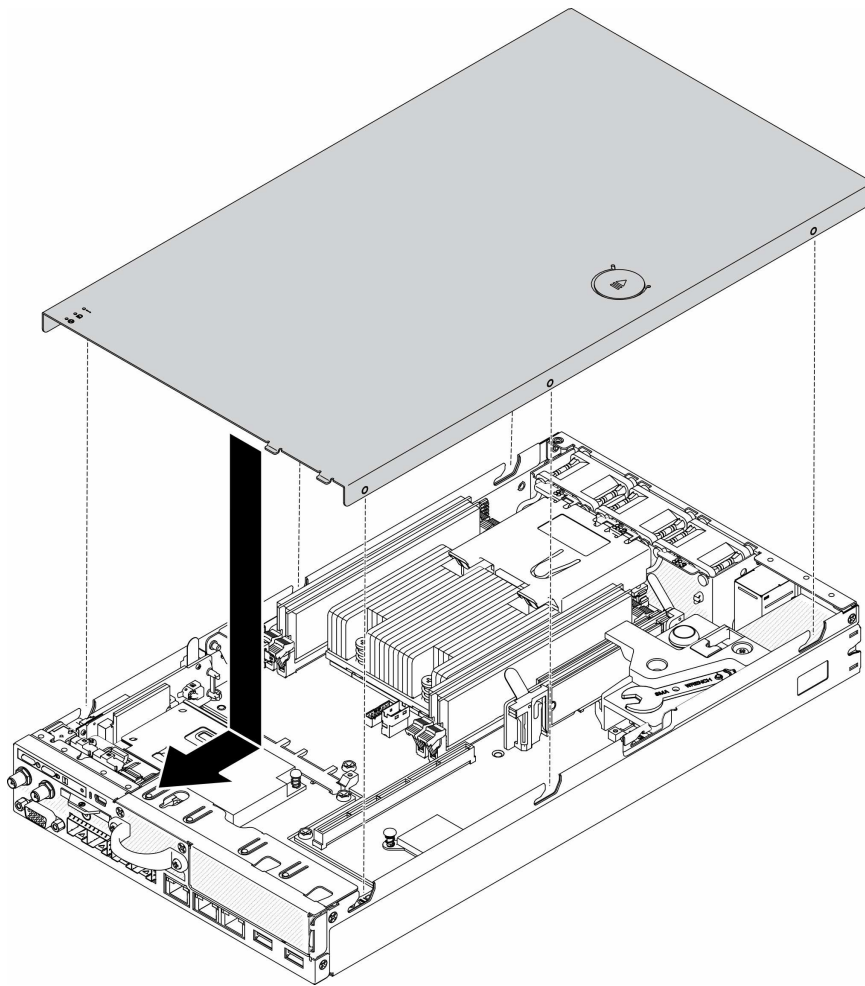


Figure 151. Top cover installation

Step 1. Align the posts inside the top cover with the slots on the chassis.

Step 2. Hold the front of the server and slide the top cover towards the front server until it clicks into place.

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

1. Reconnect power cords and all external cables.
2. Turn on the server (see [“Power on the server” on page 16](#)).

TPM card (for Chinese Mainland only) replacement

Use this information to remove and install the TPM card (for Chinese Mainland only).

Remove the TPM card (for Chinese Mainland only)

Use this information to remove the TPM card (for Chinese Mainland only) .

Before you remove the the TPM card (for Chinese Mainland only) , complete the following steps:

1. Read the following sections to ensure that you work safely.
 - [“Safety” on page iii](#)
 - [“Installation Guidelines” on page 37](#)

2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Remove the node from the enclosure if needed (see “Remove a node” on page 98).

To remove the TPM card (for Chinese Mainland only), complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6VRzUE>.

- Step 1. Press and hold the release latch.
- Step 2. Lift the TPM card (for Chinese Mainland only) out of the server.

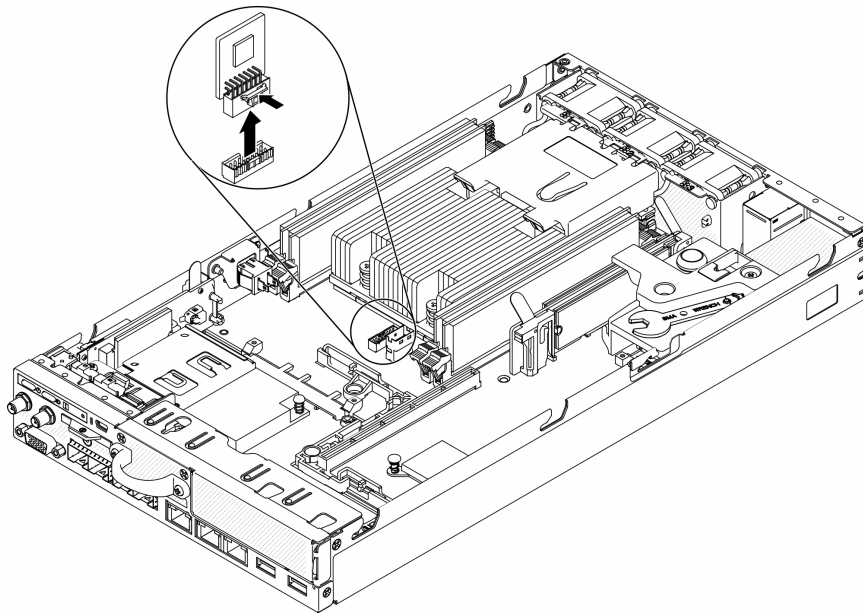


Figure 152. TPM card (for Chinese Mainland only) removal

If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Install the TPM card (for Chinese Mainland only)

Use this information to install the TPM card (for Chinese Mainland only).

Before you install the TPM card (for Chinese Mainland only), complete the following steps:

1. Read the following sections to ensure that you work safely.
 - “Safety” on page iii
 - “Installation Guidelines” on page 37
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 16).
3. Touch the static-protective package that contains the new TPM card to any unpainted surface on the outside of the server. Then, take the new TPM card out of the package and place it on a static-protective surface.

To install the TPM card (for Chinese Mainland only), complete the following steps:

Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE>.

Step 1. Insert the TPM card into the TPM card connector on the system board.

Notes:

- Carefully handle the TPM card by its edges.
- Your TPM card might look slightly different from the illustration.

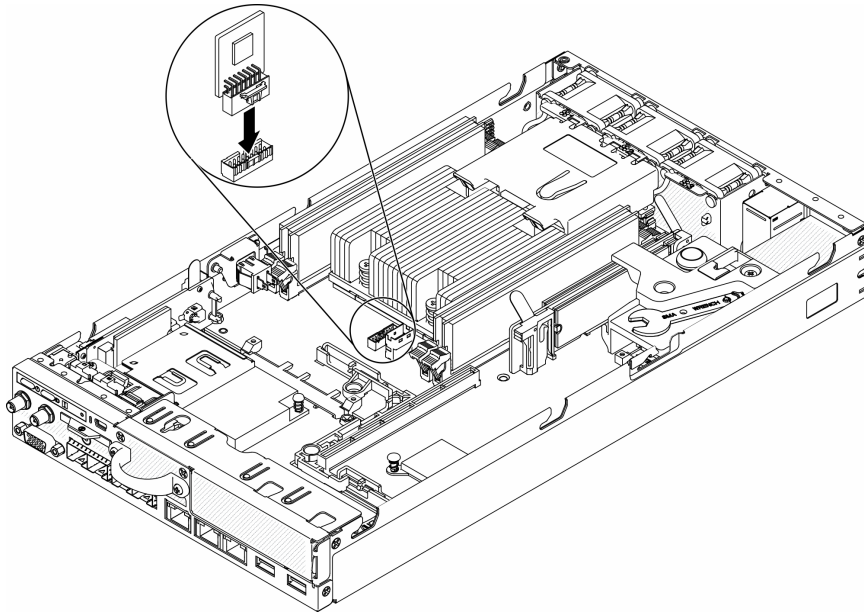


Figure 153. TPM card (for Chinese Mainland only) installation

After you install the TPM card (for Chinese Mainland only), complete the following steps:

1. Install the node if needed (see [“Install a node” on page 101](#)).
2. Reconnect power cords and all external cables.

Complete the parts replacement

Use this information to complete the 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 you have removed the server cover, reinstall it. See [“Install the top cover” on page 141](#).
4. Reconnect external cables and power cords to the server.

Attention: To avoid component damage, connect the power cords last.

5. Update the server configuration.

- Download and install the latest device drivers: <http://datacentersupport.lenovo.com>
- Update the system firmware. See “Firmware updates” on page 11.
- Update the UEFI configuration.
- Reconfigure the disk arrays if you have installed or removed a hot-swap drive or a RAID adapter. See the Lenovo XClarity Provisioning Manager User Guide, which is available for download at: <http://datacentersupport.lenovo.com>

Chapter 4. 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.

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://thinksystem.lenovofiles.com/help/topic/SE350/pdf_files.html

Lenovo XClarity Administrator event log

If you are using Lenovo XClarity Administrator to manage server, network, and storage hardware, you can view the events from all managed devices through the XClarity Administrator.

Logs

Severity	Serviceability	Date and Time	System	Event	System Type	Source Date
Warning	Support	Jan 30, 2017, 7:48:07 AM	Chassis114:...	Node Node 08 device	Chassis	Jan 30, 2017
Warning	Support	Jan 30, 2017, 7:48:07 AM	Chassis114:...	Node Node 02 device	Chassis	Jan 30, 2017
Warning	User	Jan 30, 2017, 7:48:07 AM	Chassis114:...	I/O module IO Module	Chassis	Jan 30, 2017
Warning	User	Jan 30, 2017, 7:48:07 AM	Chassis114:...	Node Node 08 incom	Chassis	Jan 30, 2017

Figure 154. Lenovo XClarity Administrator event log

For more information about working with events from XClarity Administrator, see:

http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/events_vieweventlog.html

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-adaptor 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.

Severity	Source	Event ID	Message	Date
Warning	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM
Warning	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM
Info	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM
Info	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM

Figure 155. 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://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html

The front operator panel and error LEDs

The front operator panel is a system of LEDs on various external and internal components of the server that leads you to the failed component. When an error occurs, LEDs are lit on the front operator panel on the front of the server, then on the failed component. By viewing the LEDs in a particular order, you can often identify the source of the error.

The following illustration shows the error LEDs for the server, which are located on the front operator panel.

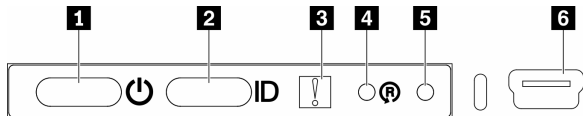


Figure 156. Front operator panel

Table 35. Front operator panel controls and indicators

1 Power button/LED (green)	4 Wireless enabled LOM package reset button
2 Identification button/LED (blue)	5 NMI button
3 System-error LED (yellow)	6 XClarity Controller mini USB connector

1 Power button/LED (green): Press this button to turn the server on and off manually. The states of the Power button/LED are as follows:

Off: Power is not present or the power adapter, or the LED itself has failed.

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

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

On: The server is turned on.

2 Identification button/LED (blue): Use this blue LED to visually locate the server among other servers. This LED is also used as a presence detection button. You can use Lenovo XClarity Administrator to light this LED remotely.

3 System-error LED (yellow): When this yellow LED is lit, it indicates that a system error has occurred. A system-error LED is also on the rear of the server. Messages on the LCD system information display panel and LEDs on other server components might also be lit to help isolate the error. This LED is controlled by the Lenovo XClarity Controller.

4 Wireless enabled LOM package reset button: Press this pinhole to reset the network SoC (use this button only when directed by the service support). You have to use the end of a straightened paper clip to press the pinhole.

5 NMI button: Press this pinhole to force a non-maskable interrupt to the processor. It allows you to blue screen the solution and take a memory dump (use this button only when directed by the service support). You have to use the end of a straightened paper clip to press the pinhole.

6 XClarity Controller mini USB connector: The connector provides direct access to Lenovo XClarity Controller management.

System-board LEDs

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

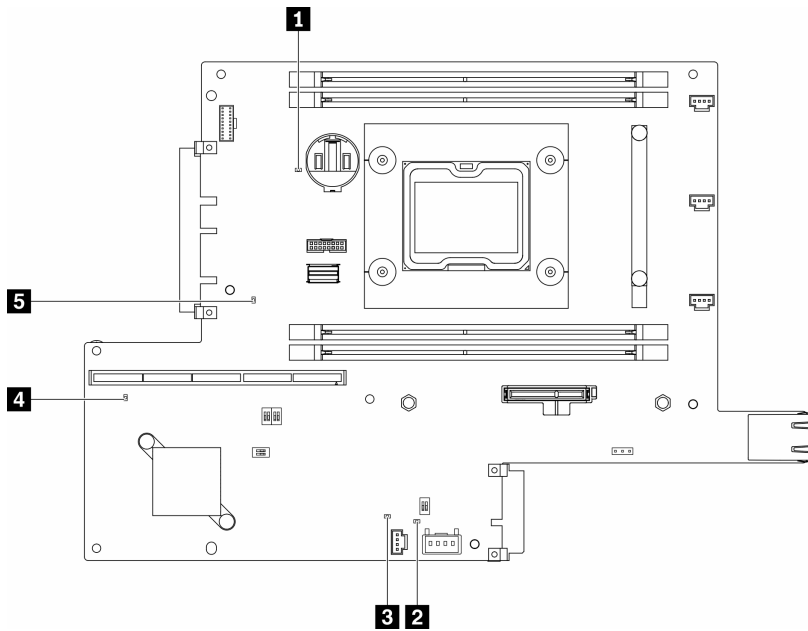


Figure 157. System-board LEDs

Table 36. System-board LEDs

1 Battery error LED	4 XClarity Controller heartbeat LED
2 Field-Programmable Gate Array (FPGA) Heartbeat LED	5 ME Heartbeat LED
3 Field-Programmable Gate Array (FPGA) error LED	

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 minimum configuration that is supported for the server.

See [“Specifications” on page 1](#) to determine the minimum configuration for your server.

4. Power on the server.

If the problem is solved when you remove an adapter from the server, but the problem recurs when you install the same adapter again, suspect the adapter. If the problem recurs when you replace the adapter with a different one, try a different PCIe slot.

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 147](#)

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 minimum configuration that is required for the server to start. See [“Specifications” on page 1](#) to determine the minimum configuration for your server.

Step 4. Reconnect all ac power cords and turn on the server. If the server starts successfully, reseal the adapters and devices one at a time until the problem is isolated.

If the server does not start from the minimum configuration, replace the components in the minimum configuration one at a time until the problem is isolated.

Resolving suspected Ethernet controller problems

The method that you use to test the Ethernet controller depends on which operating system you are using. See the operating-system documentation for information about Ethernet controllers, and see the Ethernet controller device-driver readme file.

Complete the following steps to attempt to resolve suspected problems with the Ethernet controller.

Step 1. Make sure that the correct device drivers, which come with the server are installed and that they are at the latest level.

Step 2. Make sure that the Ethernet cable is installed correctly.

- The cable must be securely attached at all connections. If the cable is attached but the problem remains, try a different cable.
- If you set the Ethernet controller to operate at 100 Mbps or 1000 Mbps, you must use Category 5 cabling.

Step 3. Determine whether the hub supports auto-negotiation. If it does not, try configuring the integrated Ethernet controller manually to match the speed and duplex mode of the hub.

Step 4. Check the Ethernet controller LEDs on the rear panel of the server. These LEDs indicate whether there is a problem with the connector, cable, or hub.

- The Ethernet link status LED is lit when the Ethernet controller receives a link pulse from the hub. If the LED is off, there might be a defective connector or cable or a problem with the hub.
- The Ethernet transmit/receive activity LED is lit when the Ethernet controller sends or receives data over the Ethernet network. If the Ethernet transmit/receive activity is off, make sure that the hub and network are operating and that the correct device drivers are installed.

- Step 5. Check the Network activity LED on the rear of 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.
- 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 147](#)

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 177](#)).

Power on and power off problems

Use this information to resolve issues when powering on or powering off the server.

- [“Embedded hypervisor is not in the boot list” on page 152](#)
- [“The power button does not work \(server does not start\)” on page 153](#)
- [“Server does not power on” on page 153](#)
- [“Server does not power off” on page 153](#)

Embedded hypervisor is not in the boot list

Complete the following steps until the problem is solved.

1. If the server has been installed, moved, or serviced recently, or if this is the first time the embedded hypervisor is being used, make sure that the device is connected properly and that there is no physical damage to the connectors.
2. See the documentation that comes with the optional embedded hypervisor flash device for setup and configuration information.
3. Check <https://serverproven.lenovo.com/server/se350> to validate that the embedded hypervisor device is supported for the server.
4. Make sure that the embedded hypervisor device is listed in the list of available boot options. From the management controller user interface, click **Server Configuration → Boot Options**.

For information about accessing the management controller user interface, see “Opening and Using the XClarity Controller Web Interface” section in the XCC documentation compatible with your server at:

https://sysmgt.lenovofiles.com/help/topic/lxccc_frontend/lxccc_overview.html

5. Check <http://datacentersupport.lenovo.com> for any tech tips (service bulletins) related to the embedded hypervisor and the server.
6. Make sure that other software works on the server to ensure that it is working properly.

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 operation information panel cable, and then repeat steps 3a and 3b.
 - If the server starts, reseal the operation information panel.
 - If the problem remains, replace the operation information panel.
2. Make sure that:
 - The power cords are correctly connected to the server and to a working electrical outlet.
 - The LEDs on the power adapter do not indicate a problem.
 - The Power button LED is lit on and flash slowly.
 - The push force is enough and with button force response.
3. If the power button LED didn't lit on or flash correctly, please reseal all the power supplies.
4. If you just installed an optional device, remove it, and restart the server. If the server starts, you might have installed more devices than the power adapter supports.
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 adapter and check the power button function after installing the each one.
6. If everything is still done and the issue cannot be resolved, please collect the failure information with system logs captured to Lenovo support.

Server does not power on

Complete the following steps until the problem is resolved:

1. Check the event log for any events related to the server not powering on.
2. Check for any LEDs that are flashing amber.
3. Check the power LED on the system board.
4. Reseat the power adapter.
5. Replace the power adapter and check the power button function after installing each one.
6. If the issue cannot be resolved by above actions, please call service to review the issue symptom and see whether the system board replacement is necessary.

Server does not power off

Complete the following steps until the problem is resolved:

1. Determine whether you are using an Advanced Configuration and Power Interface (ACPI) or a non-ACPI operating system. If you are using a non-ACPI operating system, complete the following steps:
 - a. Press Ctrl+Alt+Delete.

- b. Turn off the server by pressing the power button and holding it down for 5 seconds.
 - c. Restart the server.
 - d. If the server fails POST and the power button does not work, disconnect the power cord for 20 seconds; then, reconnect the power cord and restart the server.
2. If the problem remains or if you are using an ACPI-aware operating system, suspect the system board.

Memory problems

Use this information to resolve issues related to memory.

- [“Multiple memory modules in a channel identified as failing” on page 154](#)
- [“Displayed system memory less than installed physical memory” on page 154](#)

Multiple memory modules in a channel identified as failing

Note: Each time you install or remove a memory module, you must disconnect the server from the power source; then, wait 10 seconds before restarting the server.

Complete the following procedure to solve the problem.

1. Reseat the memory modules; then, restart the server.
2. Remove the highest-numbered memory module of those that are identified and replace it with an identical known good memory module; then, restart the server. Repeat as necessary. If the failures continue after all identified memory modules are replaced, go to step 4.
3. Return the removed memory modules, one at a time, to their original connectors, restarting the server after each memory module, until a memory module fails. Replace each failing memory module with an identical known good memory module, restarting the server after each memory module replacement. Repeat step 3 until you have tested all removed memory modules.
4. Replace the highest-numbered memory module of those identified; then, restart the server. Repeat as necessary.
5. Reverse the memory modules between the channels (of the same processor), and then restart the server. If the problem is related to a memory module, replace the failing memory module.
6. (Trained technician only) Install the failing memory module into a memory module connector for processor 2 (if installed) to verify that the problem is not the processor or the memory module connector.
7. (Trained technician only) Replace the system board.

Displayed system memory less than installed physical memory

Complete the following procedure to solve the problem.

Note: Each time you install or remove a memory module, you must disconnect the server from the power source; then, wait 10 seconds before restarting the server.

1. Make sure that:
 - No error LEDs are lit on the operator information panel.
 - No memory module error LEDs are lit on the system board.
 - Memory mirrored channel does not account for the discrepancy.
 - The memory modules are seated correctly.
 - You have installed the correct type of memory module (see [“Specifications” on page 1](#) for requirements).
 - After changing or replacing a memory module, memory configuration is updated accordingly in the Setup Utility.

- All banks of memory are enabled. The server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.
 - There is no memory mismatch when the server is at the minimum memory configuration.
2. Reseat the memory modules, and then restart the server.
 3. Check the POST error log:
 - If a memory module was disabled by a systems-management interrupt (SMI), replace the memory module.
 - If a memory module was disabled by the user or by POST, reseat the memory module; then, run the Setup Utility and enable the memory module.
 4. Run memory diagnostics. When you start a solution and press the key according to the on-screen instructions, the LXPM interface is displayed by default. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at https://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.) You can perform memory diagnostics with this interface. From the Diagnostic page, go to **Run Diagnostic → Memory test**.
 5. Re-enable all memory modules using the Setup Utility, and then restart the server.
 6. (Trained technician only) Replace the system board.

Monitor and video problems

Use this information to solve problems related to a monitor or video.

- [“Incorrect characters are displayed” on page 155](#)
- [“Screen is blank” on page 155](#)
- [“Screen goes blank when you start some application programs” on page 156](#)
- [“The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.” on page 156](#)
- [“The wrong characters appear on the screen” on page 156](#)
- [“Management controller remote presence cannot work” on page 156](#)

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 [“Firmware updates” on page 11](#).

Screen is blank

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. If the server installed with the graphical adapters while turning on the server, the Lenovo logo displays on the screen after approximately 3 minutes. This is normal operation while the system loads.
3. Make sure that:
 - The server is turned on and there is power supplied to the server.
 - The monitor cables are connected correctly.
 - The monitor is turned on and the brightness and contrast controls are adjusted correctly.
4. Make sure that the correct server is controlling the monitor, if applicable.
5. Make sure that the video output is not affected by corrupted server firmware; see [“Firmware updates” on page 11](#).
6. If the problem remains, contact Lenovo Support.

Screen goes blank when you start some application programs

1. Make sure that:
 - The application program is not setting a display mode that is higher than the capability of the monitor.
 - 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.

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 [“Firmware updates” on page 11](#).

Management controller remote presence cannot work

The management controller remote presence function is unable to display the system screen when an optional video adapter is present. To use the management controller remote presence function, remove the optional video adapter or use the onboard VGA as the display device.

Keyboard, mouse, KVM switch or USB-device problems

Use this information to solve problems related to a keyboard, mouse, KVM switch or USB-device problems.

- [“All or some keys on the keyboard do not work” on page 156](#)
- [“Mouse does not work” on page 157](#)
- [“KVM switch problems” on page 157](#)
- [“USB-device does not work” on page 157](#)

All or some keys on the keyboard do not work

1. Make sure that:

- The keyboard cable is securely connected.
 - The server and the monitor are turned on.
2. If you are using a USB keyboard, run the Setup utility and enable keyboardless operation.
 3. If you are using a USB keyboard and it is connected to a USB hub, disconnect the keyboard from the hub and connect it directly to the server.
 4. Replace the keyboard.

Mouse does not work

1. Make sure that:
 - The mouse cable is securely connected to the server.
 - The mouse device drivers are installed correctly.
 - The server and the monitor are turned on.
 - The mouse option is enabled in the Setup utility.
2. If you are using a USB mouse and it is connected to a USB hub, disconnect the mouse from the hub and connect it directly to the server.
3. Replace the mouse.

KVM switch problems

1. Make sure that the KVM switch is supported by your server.
2. Make sure that the KVM switch is powered on correctly.
3. If the keyboard, mouse or monitor can be operated normally with direct connection to the server, then replace the KVM switch.

USB-device does not work

1. Make sure that:
 - The correct USB device driver is installed.
 - The operating system supports USB devices.
2. Make sure that the USB configuration options are set correctly in system setup.

Restart the server and press 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://sysmgmt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.) 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.

Optional-device problems

Use this information to solve problems related to optional devices.

- [“External USB device is not recognized” on page 157](#)
- [“PCIe adapter is not recognized or is not functioning” on page 158](#)
- [“Insufficient PCIe resources are detected.” on page 158](#)
- [“A Lenovo optional device that was just installed does not work.” on page 158](#)
- [“A Lenovo optional device that worked previously does not work now.” on page 159](#)

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 server. 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 server.

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/server/se350>). 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 in a correct slot.
5. Make sure that the proper device drivers are installed for the device.
6. Resolve any resource conflicts if running legacy mode (UEFI). Check legacy ROM boot orders and modify the UEFI setting for MM config base.

Note: Ensure that you modify the ROM boot order associated with the PCIe adapter to the first execution order.

7. Check <http://datacentersupport.lenovo.com> for any tech tips (also known as retain tips or service bulletins) that might be related to the adapter.
8. Ensure any adapter external connections are correct and that the connectors are not physically damaged.
9. 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. If the Boot Device does not support MMIO above 4GB for Legacy Boot, use UEFI Boot Mode or remove/disable some PCIe devices.
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/server/se350>).

- 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://sysmgmt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.) Whenever memory or any other device is changed, you must update the configuration.
2. Reseat the device that you just installed.
 3. Replace the device that you just installed.
 4. Reseat the cable connection and check there is no physical damage to the cable.
 5. If there is any cable damages, then replace the cable.

A Lenovo optional device that worked previously does not work now.

1. Make sure that all of the cable connections for the device are secure.
2. If the device comes with test instructions, use those instructions to test the device.
3. Reseat the cable connection and check if any physical parts have been damaged, .
4. Replace the cable.
5. Reseat the failing device.
6. Replace the failing device.

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” on page 159](#)
- [“Serial device does not work” on page 159](#)

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.
2. Reseat the following components:
 - a. Failing serial device.
 - b. Serial cable.
3. Replace the following components:
 - a. Failing serial device.

- b. Serial cable.
4. (Trained technician only) Replace the system board.

Intermittent problems

Use this information to solve intermittent problems.

- “Intermittent external device problems” on page 160
- “Intermittent KVM problems” on page 160
- “Intermittent unexpected reboots” on page 160

Intermittent external device problems

Complete the following steps until the problem is solved.

1. Make sure that the correct device drivers are installed. See the manufacturer's website for documentation.
2. 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://sysmgmt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.) 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://sysmgmt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.) Then, click **BMC Settings → 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 147](#) 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.

Power problems

Use this information to resolve issues related to power.

System error LED is on and event log "Power supply has lost input" is displayed

To resolve the problem, ensure that:

1. The power adapter is properly connected to a power cord.
2. The power cord is connected to a properly grounded electrical outlet for the server.
3. Make sure that the power supply AC source is stable within the supported range.
4. Swap the power supply to see if the issue follows the power supply; if it follows the power supply, then replace the failing one.
5. Review the event log and see how the problem it is to follow the event log actions to resolved the problems.

Network problems

Use this information to resolve issues related to networking.

- [“Cannot wake server using Wake on LAN” on page 161](#)
- [“Could not log in using LDAP account with SSL enabled” on page 162](#)
- [“Server could not connect to the Wi-Fi” on page 162](#)
- [“Sever could not be set as WLAN AP mode” on page 163](#)
- [“LTE connection failed” on page 164](#)
- [“Config LTE in Linux” on page 164](#)
- [“LTE setup checklist for Lenovo service ” on page 165](#)
- [“Register network with selected APN” on page 166](#)
- [“Log file” on page 166](#)
- [“LTE connection is unstable” on page 167](#)
- [“WLAN connection is unstable ” on page 167](#)

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 147), make sure:
 - a. Fan 3 is running in standby mode, if Emulex dual port 10G Base-T embedded adapter is installed.
 - b. The room temperature is not too high (see “Specifications” on page 1).
 - 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.

Server could not connect to the Wi-Fi

Complete the following steps until the problem is resolved:

1. Log into Lenovo XClarity Controller (change password for the first-time log in). Enable **Wi-Fi Connectivity** and input the information of the existing Wi-Fi.

Note: Server supports WPA2 only.

The screenshot shows the 'Wi-Fi Connectivity' configuration page. At the top right, there is an 'Enabled' toggle switch which is currently turned on. Below this is a table with the following data:

Hardware Level	Driver Version	Board Serial Number	IPv4 Address
rtl88x2be	v5.2.21.5_30361.20181019	105BAD0847CF	192.168.1.9

Below the table, there are configuration fields:

- Method: Client (dropdown menu)
- SSID: [] (text input field with a green checkmark icon)
- Encryption: WPA2 (dropdown menu)
- Password: [] (password input field with a green checkmark icon)

Figure 158. Network setting

2. If the server still cannot connect to the Wi-Fi, repeat step one or check if WLAN module is enabled by using the command through OpenWRT:

```
dmesg | grep RTW
```

See example:

```
oper@OpenWrt:/etc/config$ dmesg | grep RTW
RTW: module init start
RTW: rtl88x2be v5.2.21.5_30361.20181019
RTW: build time: May 30 2019 04:00:44
RTW: rtl88x2be BT-Coex version = COEX20180824-6666
RTW: rtw_inetaddr_notifier_register
```

```

RTW: Memory mapped space start: 0x4040000000 len:00010000 flags:00140204, after map:0xffff00000e2d0000
RTW: CHIP TYPE: RTL8822BE
RTW: Bus master is enabled. usPciCommand=7
RTW: PCIe Header Offset =70
RTW: PCIe Capability =2
Link Control Register =40
RTW: Clock Request =0

```

Server could not be set as WLAN AP mode

Complete the following steps until the problem is resolved:

1. Log into Lenovo XClarity Controller (change password for the first-time log in). Enable **Wi-Fi Connectivity** and input the information of AP mode.

Note: Server supports WPA2 only.

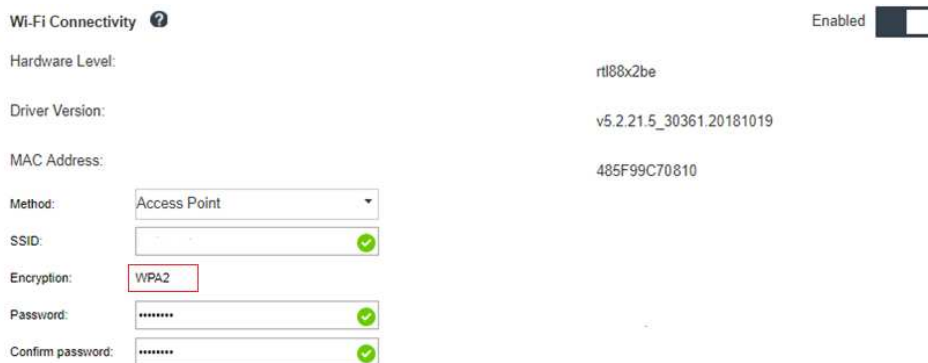


Figure 159. Network setting

2. If the server still cannot work in AP mode, repeat step one or check the AP mode status by using the command through OpenWRT:`sudo uci show wireless`

For example:

```

oper@OpenWrt:/tmp$ sudo uci show wireless
wireless.radio0=wifi-device
wireless.radio0.type='mac80211'
wireless.radio0.channel='11'
wireless.radio0.hwmode='11n'
wireless.radio0.path='/soc/3400000.pcie/pci0000:00/0000:00:00.0/0000:01:00.0'
wireless.radio0.disabled='0'
wireless.radio0.htmode='HT40'
wireless.radio0.country='TW'
wireless.default_radio0=wifi-iface
wireless.default_radio0.device='radio0'
wireless.default_radio0.network='wifi_lan_ap'
wireless.default_radio0.mode='ap'
wireless.default_radio0.ssid='SE350_ap3'
wireless.default_radio0.encryption='psk2'

```

```
wireless.default_radio0.key='password'
wireless.default_radio0.maxassoc='8'
oper@OpenWrt:/tmp$
```

LTE connection failed

Complete the following steps until the problem is resolved:

1. Log into Lenovo XClarity Controller (change password for the first-time log in). Enable **LTE Connectivity** and apply the change.

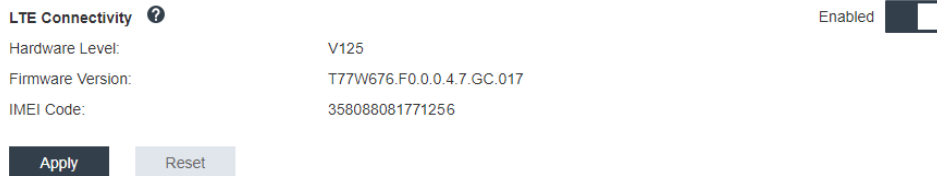


Figure 160. Network setting

2. To check if LTE module is successfully enabled, connect the server to OpenWRT via SSH (default = 192.168.70.254) and use the command below:

```
oper@OpenWrt:/tmp$ sudo ifconfig
```

It shows **wwan0** if LTE module is successfully enabled. For example:

```
oper@OpenWrt:/tmp$ sudo ifconfig
...
wwan0 Link encap:UNSPEC HWaddr 00-00-00-00-00-00-00-00-00-00-00-00-00-00-00-00
inet addr:10.0.148.227 P-t-P:10.0.148.227 Mask:255.255.255.248
inet6 addr: fe80::244a:5b3e:11a9:ae7/64 Scope:Link
UP POINTOPOINT RUNNING NOARP MULTICAST MTU:1500 Metric:1
RX packets:110700 errors:0 dropped:0 overruns:0 frame:0
TX packets:45977 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:160842733 (153.3 MiB) TX bytes:2001645 (1.9 MiB)
```

Config LTE in Linux

Complete the following steps until the problem is resolved:

1. QMI mode is required for LTE mode in Linux. Connect the server to OpenWRT via SSH (default = 192.168.70.254) and use the command below:

```
sudo usbmode_switch_telit_openwrt.sh
```

For example:

```
oper@OpenWrt:/tmp$ sudo usbmode_switch_telit_openwrt.sh
/sys/bus/usb/devices/2-1
LN940 at MBIM mode, change to QMI mode.
oper@OpenWrt:/tmp$ sudo reboot
```

LTE setup checklist for Lenovo service

Complete the checklist below until the problem is resolved:

1.

Section	Check item and detail
Hardware	LTE antennas are installed properly at correct locations.
	Antenna cable are well connected on the LTE module.
	SE350 support only 4G (LTE); 3G and 5G are not supported.
	<p>USIM is installed properly into SIM holder of wireless adaptor card.</p> <p>Make sure to remove ac power adaptor from SE350 system before any installation or removal.</p>
Firmware	XCC, UEFI and Switch board firmware are updated to the latest version.
SIM card	<p>SIM Card Selection</p> <p>Use the below recommended “terms” while checking with your carrier.</p> <ol style="list-style-type: none"> Carrier’s SIM card should support at least one of the following LTE band: 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 21, 25, 26, 28, 29, 30, 38, 39, 40, 41, 66. SIM card supports 4G (LTE). SE350 only supports USIM with Nano-SIM form factor. The SIM card can be used on “Laptop or Pad” with support for “data” transfer (no voice and SMS). In general, IOT SIM & MVNO SIM are not suitable for SE350’s LTE application, but it depends on carriers. <p>Note: Verizon SIM is compatible on SE350 with switch firmware 1.03 (build version HYL408E) or above.</p>
	<p>SIM Card Activation</p> <p>Check the SIM card activation requirements with the carrier; then, bring the SE350 IMEI number to the carrier retail store and request for SIM activation (depends on carrier policy, some policy might not need it).</p> <ol style="list-style-type: none"> Check the details with the carrier retail store. Activate the SIM card to connect to telecom services with a phone (or through SIM activation website).

Section	Check item and detail
	<p>APN Setting</p> <p>Collect information from the SIM card user manual. Generally, it includes information as below, but some might have more.</p> <p>NAME, APN, PIN code, USERNAME, PASSWORD and Authentication method (CHAP or PAP).</p> <p>For example:</p> <ul style="list-style-type: none"> • Name: SB • APN: plus.4g • Username: plus • Password: 4g • Authentication method: CHAP or PAP <p>SE350 contains the most common APN settings by default. By enabling LTE into XCC_GUI or CLI WWAN, SE350 can connect to telecom services.</p> <p>The default PDP type is “IPV4”, this is also the most common setting. For some carriers that change the PDP type to IPV4V6 or IPV6, check the PDP type requirement with the carrier; then, change to IPV4V6 or IPV6 using the command below:</p> <pre>sudo uci set network.lte_wan.pdptype='IPV4V6' sudo uci commit network sudo /etc/init.d/network restart sudo at_command.sh 'at+reset'</pre>
Log files	For more details, see “Log file” on page 166

Register network with selected APN

For some special cases, it is possible to be unregistered from the telecom operator. Register again with your selected “APN” to the network using the command below:

```
AT+COPS=2
AT+CGDCONT=1,"IPV4V6", "<APN>"
AT+COPS=0
```

Log file

Log files are collected by CLI commands below for SIM working status and Network Registration Status.

```
sudo at_command.sh 'at+cpin?' /** Is SIM well-installed? Is PIN-CODE setting correct? **/
sudo at_command.sh 'AT+CIMI' /** read IMSI **/
sudo uci show network |grep lte /** check APN, username, password, auth, PDP type **/
```

Check Network Registration status:

```
'AT+CSQ' /** search max RF signal quality between ‘device” and all “carriers “ around the device **/
'AT+COPS?' /** return wwan’s registered carrier and 4G tech if it’s successful to register to carrier **/
```

```
'AT+CREG?' /** report CS network registration status -2G/3G/4G ** /  
'AT+CEREG?' /** report EPS network registration status - 4G ** /
```

LTE connection is unstable

The LTE signal strength might be obstructed when the SE350 is placed at the “corner of a building/ department” or in a “WLAN noisy” environment.

To improve the signal strength:

- Install the two LTE antennas in the correct positions. It is recommended to keep one antenna in a vertical position and the other in a horizontal position.

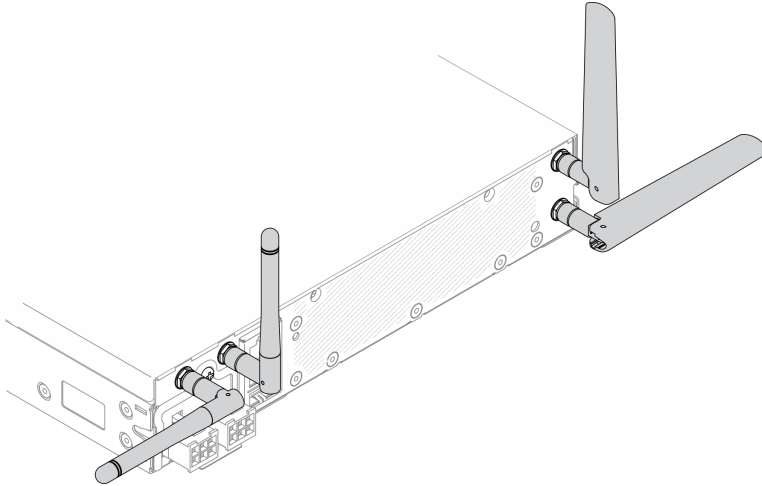


Figure 161. Antenna position

- Move the SE350 to an area with less RF noise or a location without shields (metal parts).

Check the status with these useful commands:

```
ifconfig /** check if LTE "wwan0" is ready ** //  
sudo at_command.sh 'ATI' /** get IMEI code ** //  
sudo uci show network | grep lte /** show all LTE parameters setting ** //  
sudo uqmi -d /dev/cdc-wdm0 --uim-get-card-status" /** check SIM is installed well ** //  
sudo at_command.sh 'AT+COPS?' /** check Carrier Network registration and configuration** //  
sudo ping -I wwan0 8.8.8.8 /** check if SE350's LTE network ping ** //  
sudo at_command.sh 'AT+CSQ' /** check signal strength of LTE modem ** //
```

WLAN connection is unstable

The WLAN signal strength might be obstructed when the SE350 is placed at the “corner of a building/ department” or in a “WLAN noisy” environment.

To improve the signal strength:

- Install the two Wi-Fi antennas in the correct positions. It is recommended to keep one antenna in a vertical position and the other in a horizontal position.

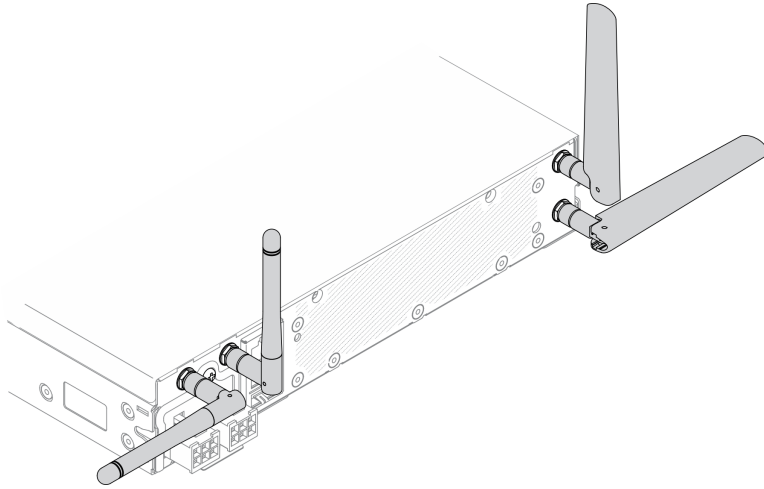


Figure 162. Antenna position

- Move the SE350 to an area with less RF noise or a location without shields (metal parts).
- Move the SE350 closer to the WLAN AP router.
- Adjust the Wi-Fi router's frequency to a channel with less RF noise.
- Adjust the direction of the router's antennas with some positioned vertically and some positioned horizontally.
- Wi-Fi networking performance will be affected when multiple devices are connected to the same channel at the same time. Change the frequency and channel of the Wi-Fi router, use a Wi-Fi extender to help spread out the signal, or use a router with a more powerful signal.

Check the status with these useful commands:

```
ifconfig /** check if WLAN is ready, "wlan0" shows up **//  
sudo uci show network | grep wifi /** show related to WLAN parameters setting **//  
sudo uci show wireless /** confirm setting **//  
sudo ping -I wlan0 8.8.8.8 /** check WLAN network function successfully **//  
sudo iw dev wlan0 link /** Check WLAN Signal Strength**//
```

Observable problems

Use this information to solve observable problems.

- [“Server hangs during the UEFI boot process” on page 169](#)
- [“The server immediately displays the POST Event Viewer when it is turned on” on page 169](#)
- [“Server is unresponsive \(POST is complete and operating system is running\)” on page 169](#)
- [“Server is unresponsive \(POST failed and cannot start System Setup\)” on page 170](#)
- [“Voltage planar fault is displayed in the event log” on page 170](#)
- [“Unusual smell” on page 170](#)
- [“Server seems to be running hot” on page 170](#)
- [“Cracked parts or cracked chassis” on page 171](#)

Server hangs during the UEFI boot process

If the system hangs during the UEFI boot process with the message UEFI: DXE INIT on the display, make sure that Option ROMs were not configured with a setting of **Legacy**. You can remotely view the current settings for Option ROMs by running the following command using the Lenovo XClarity Essentials OneCLI:

```
onecli config show EnableDisableAdapterOptionROMSupport --bmc xcc_userid:xcc_password@xcc_ipaddress
```

To recover a system that hangs during the boot process with Legacy Option ROM settings, see the following Tech Tip:

<https://datacentersupport.lenovo.com/us/en/solutions/ht506118>

If legacy Option ROMs must be used, do not set slot Option ROMs to **Legacy** on the Devices and I/O Ports menu. Instead, set slot Option ROMs to **Auto** (the default setting), and set the System Boot Mode to **Legacy Mode**. Legacy option ROMs will be invoked shortly before the system boots.

The server immediately displays the POST Event Viewer when it is turned on

Complete the following steps until the problem is solved.

1. Correct any errors that are indicated by the front operator panel and error LEDs.
2. Make sure that the server supports the processor and that the processor matches in speed and cache size.

You can view processor details from system setup.

To determine if the processor is supported for the server, see <https://serverproven.lenovo.com/server/se350>.

3. (Trained technician only) Make sure that system board is seated correctly
4. (Trained technician only) Make sure that processor is seated correctly
5. Replace the following components one at a time, in the order shown, restarting the server each time:
 - a. (Trained technician only) Processor
 - b. (Trained technician only) System board

Server is unresponsive (POST is complete and operating system is running)

Complete the following steps until the problem is solved.

- If you are in the same location as the server, complete the following steps:
 1. If you are using a KVM connection, make sure that the connection is operating correctly. Otherwise, make sure that the keyboard and mouse are operating correctly.
 2. If possible, log in to the server and verify that all applications are running (no applications are hung).
 3. Restart the server.
 4. If the problem remains, make sure that any new software has been installed and configured correctly.
 5. Contact your place of purchase of the software or your software provider.
- If you are accessing the server from a remote location, complete the following steps:
 1. Make sure that all applications are running (no applications are hung).
 2. Attempt to log out of the system and log back in.
 3. Validate the network access by pinging or running a trace route to the server from a command line.
 - a. If you are unable to get a response during a ping test, attempt to ping another server in the enclosure to determine whether it is a connection problem or server 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 server remotely through the management interface.
5. If the problem remains, verify that any new software has been installed and configured correctly.
6. Contact your place of purchase of the software or your software provider.

Server is unresponsive (POST failed and cannot start System Setup)

Configuration changes, such as added devices or adapter firmware updates, and firmware or application code problems can cause the server to fail POST (the power-on self-test).

If this occurs, the server responds in either of the following ways:

- The server restarts automatically and attempts POST again.
- The server hangs, and you must manually restart the server for the server to attempt POST again.

After a specified number of consecutive attempts (automatic or manual), the server reverts to the default UEFI configuration and starts System Setup so that you can make the necessary corrections to the configuration and restart the server. If the server is unable to successfully complete POST with the default configuration, there might be a problem with the system board.

You can specify the number of consecutive restart attempts in System Setup. Restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at https://sysmgt.lenovofiles.com/help/topic/lxpm_frontend/lxpm_product_page.html.) 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 1 for the minimally required number of processors and DIMMs.
2. Restart the system.
 - If the system restarts, add each of the items that you removed one at a time, restarting the system each time, until the error occurs. Replace the item for which the error occurs.
 - If the system does not restart, suspect the system board.

Unusual smell

Complete the following steps until the problem is solved.

1. An unusual smell might be coming from newly installed equipment.
2. If the problem remains, contact Lenovo Support.

Server seems to be running hot

Complete the following steps until the problem is solved.

Multiple servers or chassis:

1. Make sure that the room temperature is within the specified range (see “Specifications” on page 1).
2. Make sure that the fans are installed correctly.
3. Update the UEFI and XCC to the latest versions.
4. Make sure that the fillers in the server are installed correctly (see *Maintenance Manual* for detailed installation procedures).

5. Use the IPMI command to ramp up the fan speed to the full fan speed to see whether the issue can be resolved.

Note: The IPMI raw command should only be used by trained technician and the each system has its own specific PMI raw command.

6. Check the management processor event log for rising temperature events. If there are no events, the server is running within normal operating temperatures. Note that you can expect some variation in temperature.

Cracked parts or cracked chassis

Contact Lenovo Support.

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.

SIM selection and APN settings (Japan)

Use this section to understand how to select the SIM plan and configure the APN settings.

The following tips describe the type of SIM card that the server supports and other information that you must consider when you buy or install a SIM card:

- SE350 only supports Nano-SIM card form-factor. Standard SIM and Micro-SIM are not supported.
- SE350 only supports 4G (LTE). 2G, 3G, and 5G are not supported.
- SE350 only supports native SIM. IOT and MVNO SIM are not supported.
- SE350 only supports USIM. ISIM is not supported.
- Make sure the SIM card includes a Data Plan service.
- Obtain the APN, User name, Password, and Authentication Protocol information from your carrier or SIM provider.
- Perform a factory reset to the wireless enabled LOM package before configuring the APN settings. Login to the XCC web UI, then navigate to “Edge Network” -> “Reset to Factory Default”.

Note: Wireless enabled LOM package with firmware versions earlier than 1.01 (hyl404p) requires adding specific commands for the SIMs in Japan. Please contact Lenovo for details.

Table 37. SIM information of major carriers in Japan

Carrier	Native SIM	SIM feature	Monthly / Prepaid SIM	How to get SIM
NTT DoCoMo	Native SIM	Voice + SMS + Data	Monthly SIM	Shop / Consumer SIM
au KDDI	Native SIM	Voice + SMS + Data	Monthly SIM	Shop / Consumer SIM
SoftBank	Native SIM	Voice + SMS + Data	Monthly SIM	Shop / Consumer SIM

SIM card availability and APN settings are different for different carriers:

- “NTT DoCoMo SIM card” on page 172
- “au KDDI SIM card” on page 172
- “SoftBank SIM Card ” on page 172

NTT DoCoMo SIM card

For a list of NTT DoCoMo shops, see https://www.nttdocomo.co.jp/support/shop/index.html?icid=CRP_SUP_Inquiry_to_CRP_SUP_shop.

For APN settings for the NTT DoCoMo SIM card, see https://www.nttdocomo.co.jp/support/for_simfree/index.html.

Table 38. APN Settings for NTT DoCoMo SIM card

APN	spmode.ne.jp
User name	-
Password	-
Authentication type	-

au KDDI SIM card

For a list of au KDDI shops, see <https://www.au.com/aushop/>.

For APN settings for the au KDDI SIM card, see <https://www.au.com/mobile/charge/internet-connection/lte-net/>.

Table 39. APN Settings for au KDDI SIM card

APN	uno.au-net.ne.jp
User name	685840734641020@uno.au-net.ne.jp
Password	KpyrR6BP
Authentication type	CHAP

SoftBank SIM Card

For a list of SoftBank shops, see <https://www.softbank.jp/shop/>.

For APN settings for the SoftBank SIM card, see https://www.softbank.jp/mobile/support/usim/portout_procedure/.

Table 40. APN Settings for NTT DoCoMo SIM card

APN	plus.4g
User name	plus
Password	4g
Authentication type	PAP

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 Lenovo product documentation also describes the diagnostic tests that you can perform. The documentation for most systems, operating systems, and programs contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

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

<http://thinksystem.lenovofiles.com/help/index.jsp>

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Check for updated software, firmware, and operating-system device drivers for your Lenovo product. The Lenovo Warranty terms and conditions state that you, the owner of the Lenovo product, are responsible for maintaining and updating all software and firmware for the product (unless it is covered by an additional maintenance contract). Your service technician will request that you upgrade your software and firmware if the problem has a documented solution within a software upgrade.
- If you have installed new hardware or software in your environment, check <https://serverproven.lenovo.com/server/se350> to make sure that the hardware and software is supported by your product.
- Go to <http://datacentersupport.lenovo.com> and check for information to help you solve the problem.
 - Check the Lenovo forums at https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg to see if someone else has encountered a similar problem.

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

messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

Gathering information needed to call Support

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

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

- Hardware and Software Maintenance agreement contract numbers, if applicable
- Machine type number (Lenovo 4-digit machine identifier)
- Model number
- Serial number
- Current system UEFI and firmware levels
- Other pertinent information such as error messages and logs

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

Collecting service data

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

Service data can be collected through the following tools:

- **Lenovo XClarity Provisioning Manager**

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

- **Lenovo XClarity Controller**

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

- For more information about using the web interface to collect service data, see the “Downloading service data” section in the XCC documentation version compatible with your server at https://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html.
- For more information about using the CLI to collect service data, see the “ffdc command” section in the XCC documentation version compatible with your server at https://sysmgt.lenovofiles.com/help/topic/lxcc_frontend/lxcc_overview.html.

- **Lenovo XClarity Administrator**

Lenovo XClarity Administrator can be set up to collect and send diagnostic files automatically to Lenovo Support when certain serviceable events occur in Lenovo XClarity Administrator and the managed endpoints. You can choose to send diagnostic files to Lenovo Support using Call Home or to another

service provider using SFTP. You can also manually collect diagnostic files, open a problem record, and send diagnostic files to the Lenovo Support Center.

You can find more information about setting up automatic problem notification within the Lenovo XClarity Administrator at http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/admin_setupcallhome.html.

- **Lenovo XClarity Essentials OneCLI**

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

To obtain service data, you can run the `getinfor` command. For more information about running the `getinfor`, see http://sysmgt.lenovofiles.com/help/topic/toolstr_cli_lenovo/onecli_r_getinfor_command.html.

Contacting Support

You can contact Support to obtain help for your issue.

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

Appendix B. Notices

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

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Important notes

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

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

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

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

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

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

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

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

Telecommunication regulatory statement

This product may not be certified in your country for connection by any means whatsoever to interfaces of public telecommunications networks. Further certification may be required by law prior to making any such connection. Contact a Lenovo representative or reseller for any questions.

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:

<http://thinksystem.lenovofiles.com/help/index.jsp>

Taiwan Region BSMI RoHS declaration

單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (PB)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁶⁺)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機架	○	○	○	○	○	○
外部蓋板	○	○	○	○	○	○
機械組零件	-	○	○	○	○	○
空氣傳動設備	-	○	○	○	○	○
冷卻組零件	-	○	○	○	○	○
內存模組	-	○	○	○	○	○
處理器模組	-	○	○	○	○	○
電纜組零件	-	○	○	○	○	○
電源供應器	-	○	○	○	○	○
儲備設備	-	○	○	○	○	○
印刷電路板	-	○	○	○	○	○

備考1. “超出0.1 wt%”及“超出0.01 wt%”係指限用物質之百分比含量超出百分比含量基準值。
 Note1: “exceeding 0.1wt%” and “exceeding 0.01 wt%” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考2. “○”係指該項限用物質之百分比含量未超出百分比含量基準值。
 Note2: “○”indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考3. “-”係指該項限用物質為排除項目。
 Note3: The “-” indicates that the restricted substance corresponds to the exemption.

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Figure 163. Taiwan Region BSMI RoHS declaration

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

Manufacturer:

USA company name: Lenovo Global Technology (United States) Inc.

USA company address: 7001 Development Dr. Building 7, Morrisville, NC 27560, USA

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