Lenovo

ThinkSystem SE350 and ThinkSystem SE350 Enclosures
Setup Guide

Machine Type: 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

Third Edition (September 2019)

Contents

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

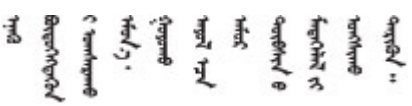
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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



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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

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Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

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Safety inspection checklist

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

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.

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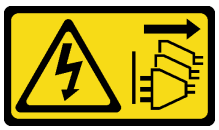
CAUTION:

- **This equipment must be installed or serviced by trained personnel, as defined by IEC 60950-1 and IEC 62368-1, the Standard for Safety of audio/video, information and communication technology equipment.**
- **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.**



Make sure all power cords are disconnected from the system when reading the following step in this manual: *Turn off the server. Disconnect the power cords and all external cables*.

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. In the Customize a Model pane:

     1) Click **Select Options/Parts for a Model**.
     2) Enter the machine type and model for your server.

  c. Click the Power tab 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 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.

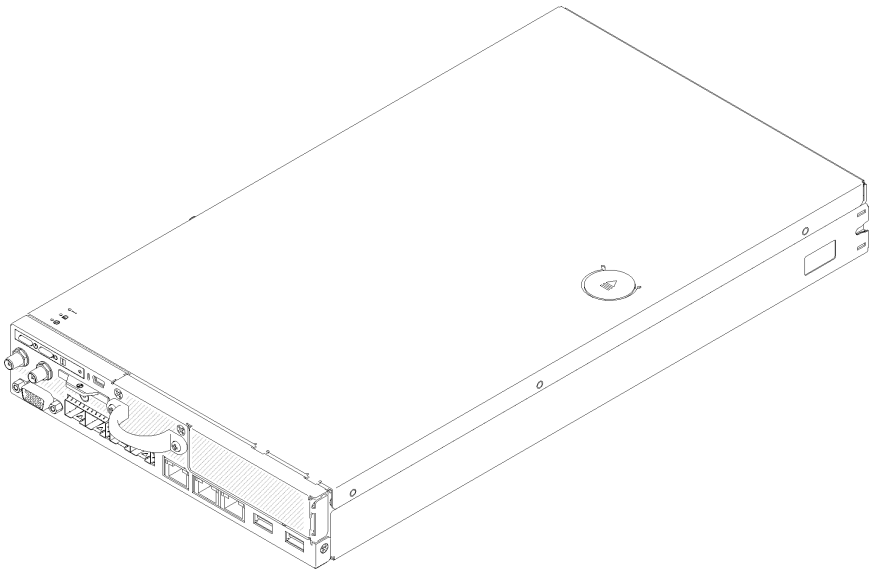


Figure 1. ThinkSystem SE350

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

Server package contents

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

The server package includes the following items:

Note: Some of the items listed are available on select models only.

- Server
- Rail installation kit (optional). Detailed instructions for installing the rail installation kit are provided in the package with the rail installation kit.
- Material box, including items such as power cords, rack installation template, and accessory kit.

Features

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

Your server implements the following features and technologies:

- **Lenovo XClarity Controller (XCC)**

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

  Some of the features that are unique to the Lenovo XClarity Controller are enhanced performance, higher-resolution remote video, and expanded security options. For additional information about the Lenovo XClarity Controller, see:

  http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/product_page.html

- **UEFI-compliant server firmware**

  Lenovo ThinkSystem firmware is Unified Extensible Firmware Interface (UEFI) 2.5 compliant. UEFI replaces BIOS and defines a standard interface between the operating system, platform firmware, and external devices.

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

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

- **Large system-memory capacity**

  The server supports synchronous dynamic random-access memory (SDRAM) registered dual inline memory modules (DIMMs) with error correcting code (ECC). For more information about the specific types and maximum amount of memory, see “Specifications” on page 3.

- **Integrated network support**

  There two optional packages for the server: 10G SFP+ LOM Package or Wireless enabled LOM Package. You can utilize 10Gb SFP+ connectors, 10/100MB/1Gb conductors and WLAN function depending on the package you choose.

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

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

  For more information on TPM configurations, see “Enable TPM” in the *Maintenance Manual*.

  Note: For customers in the People’s Republic of China, a Lenovo-qualified TPM 2.0 adapter or a TPM card may be pre-installed.

- **Large data-storage capacity**

  The server supports up to eight M.2 NVMe drives.

- **Front operator panel**

  Front operator panel provides LEDs to help you diagnose problems. For more information about the front operator panel, see “Front operator panel” on page 20.

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

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

- **Active Energy Manager**

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

- **Redundant cooling and optional power capabilities**

  The server supports a maximum of two 240-watt hot-swap power adapters and three internal fans, which provide redundancy for a typical configuration. The redundant cooling by the fans in the server enables continued operation if one of the fans fails.

- **ThinkSystem RAID support**

  The ThinkSystem RAID adapter provides hardware redundant array of independent disks (RAID) support to create configurations. The software RAID controller supports RAID levels 0, 1, 5, and 10.

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
Size	Node • Height: 43.2 mm (1.7 inches) • Width: 209 mm (8.2 inches) • Depth: 376.1 mm (14.8 inches) Chassis: • Height: 43.2 mm (1.7 inches) • Width: 434.4 mm (17.1 inches, from EIA bracket to EIA bracket) • Depth: 735.8 mm (29.0 inches)
Weight	Node • Maximum: 3.6 kg (7.9 lbs)
Processor (depending on the model)	One Intel® Xeon® processor D-2100 product family **Notes:** 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 http://www.lenovo.com/us/en/serverproven/.

Table 1. Server Specifications (continued)

Specification	Description
Memory	• Slots: 4 DIMM slots • Minimum: 8 GB (1 x 8GB RDIMM) • Maximum: 256 GB (4 x 64GB LRDIMM) • Type: – 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) **Note:** For a list of supported processors, see http://www.lenovo.com/us/en/serverproven/.
M.2 drive	M.2 boot adapter • Supports up to two identical M.2 SATA drives • Supports three different physical sizes of M.2 drives: – 42 mm (2242) – 60 mm (2260) – 80 mm (2280) M.2 data adapter • PCIe and M.2 riser assembly: – Supports up to four M.2 SATA/NVMe drives • M.2 riser assembly – 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: – 42 mm (2242) – 60 mm (2260) – 80 mm (2280) – 110 mm (22110) **Notes:** • M.2 drives installed on boot adapter and on data adapter are not swappable. • M.2 connector type: socket 3 (M key)
PCIe riser assembly	PCIe and M.2 riser assembly: • Slot 6: PCI Express 3.0 x16, (supports <75W, low profile, half-height, half-length PCIe adapter)
WLAN	• 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

Table 1. Server Specifications (continued)

Specification	Description
LTE	• 3GPP Release 11 • Category: Cat9 • Region: Global • Operating mode: FDD/TDD • Data transmission: 450Mbps DL/50Mbps UL • Function interface: USB 3.0 • Antenna configuration: 2xIPEX (MHF4) connector • Form factor: M.2 3024
Integrated functions	• 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): – 10G SFP+ LOM Package – 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 – 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 • Rear I/O connectors (rear of server): – 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: – 12V power distribution module (PDM) with two power connectors – -48V power distribution module (PDM) with one power connector
RAID controllers	Software RAID: A software RAID controller is integrated on the system board. The software RAID controller supports RAID levels 0, 1, 5, and 10. **Notes:** • SED is not supported • Software RAID: standard Intel SATA software RAID, RSTe

Table 1. Server Specifications (continued)

Specification	Description
Video controller (integrated into Lenovo XClarity Controller)	Matrox G200 • ASPEED • SVGA compatible video controller • Avocent Digital Video Compression • 16 MB of video memory (not expandable) **Note:** Maximum video resolution is 1920 x 1200 at 60 Hz.
Fans	Three 40mm system fans
Power adapters	External power adapters: Sine-wave input (50–60 Hz) required • 240W external power adapter 100-127 V ac / 200-240 V ac, 3.2/1.6 A **Notes:** • Power adapters is supported only by 12V PDM • It is best practice to use identical power adapters.
Acoustical noise emissions (base configuration)	• Operation: – Minimum: 5.3 bels – Typical: 5.4 bels – Maximum: 5.7 bels • Idle – Minimum: 4.9 bels – Typical: 5.0 bels – Maximum: 5.4 bels **Notes:** 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	Approximate heat output: • Minimum configuration: 287.46 BTU per hour (84.25 watts) • Maximum configuration : 783.02 BTU per hour (229.49 watts)

Table 1. Server Specifications (continued)

Specification	Description
Electrical input	Power distribution module: 12V PDM • Supports 12.2V/20A per power adapter • Each node supports up to two power adapters Power distribution module: -48V PDM • -48V - -60V DC / 8.4 A max direct -48V input **Notes:** • 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.
Environment	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. The ThinkSystem SE350 is supported in the following environment: • Air temperature: – Server on: – 0°C to 45°C (32°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). **Note:** For the 1U 2-node model, the temperature limitation is 0°C to 35°C (32°F to 95°F). – Sever off: 0°C to 45°C (32°F to 113°F) – Shipping/storage: -40 to 60°C (-40 to 140°F) – Extended operation temperature (with limited configuration):: – Server on: 0°C to 55°C (32°F to 131 °F) – Server off: 0°C to 55°C (32°F to 131 °F) **Note:** Limited configuration: no GPU, no Micron/LiteON M.2 SSD drive, only Lenovo certified PCIe Cards. • Maximum altitude: 3050 m (10,000 ft) • Relative Humidity (non-condensing): – 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. • Extended operation temperature : 0°C to 55°C (on limited configuration) – No GPU – No Micron/LITE-ON M.2 – Only Lenovo certified PCIe cards • Particulate contamination: 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 solution. For information about the limits for particulates and gases, see *Particulate contamination* .

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, ±X, ±Y, ±Z	√	√	√
Four M.2 SATA drives	NVIDIA T4 GPU	3.06Grms, 3-500 Hz, 15 min/axis	30G, 11ms, half-sine, ±X, ±Y, ±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, ±X, ±Y, ±Z	√		
Four M.2 NVMe drives (with heatsink)	NVIDIA T4 GPU	0.21Grms, 5-500 Hz, 15 min/axis	15G, 3ms, half-sine, ±X, ±Y, ±Z	√		

Management options

Several management interfaces are available for managing your server. The management options described in this section are provided to support the direct management of Lenovo servers.

Function	**Lenovo XClarity Administrator**	**Lenovo XClarity Integrator**	**Lenovo XClarity Energy Manager**	**Lenovo XClarity Provisioning Manager**	**Lenovo XClarity Essentials[1]**	**Lenovo XClarity Controller**	**Lenovo Capacity Planner**	**Lenovo Business Vantage**
Multiple systems management	√	√	√		√			
Operating system deployment	√			√				
Firmware updates[2]	√[4]	√		√[3]	√[4]	√		
System configuration	√	√		√	√	√		
Events / alerts	√	√	√			√		
Inventory / Log	√[5]	√		√[6]	√[5]	√[5]		
Power management		√[7]	√					

Function	Lenovo XClarity Administrator	Lenovo XClarity Integrator	Lenovo XClarity Energy Manager	Lenovo XClarity Provisioning Manager	Lenovo XClarity Essentials[1]	Lenovo XClarity Controller	Lenovo Capacity Planner	Lenovo Business Vantage
Data center planning							√	
Security management								√[8]

Notes:

1. Lenovo XClarity Essentials includes Lenovo XClarity Essentials OneCLI, Lenovo XClarity Essentials Bootable Media Creator, and Lenovo XClarity Essentials UpdateXpress.
2. Most options can be updated through the Lenovo tools. Some options, such as GPU firmware or Omni-Path firmware require the use of vendor tools.
3. Firmware updates are limited to Lenovo XClarity Provisioning Manager, Lenovo XClarity Controller firmware, and UEFI updates only. Firmware updates for optional devices, such as adapters, are not supported.
4. The server UEFI settings for option ROM must be set to **Auto** or **UEFI** to update firmware using Lenovo XClarity Administrator or Lenovo XClarity Essentials.
5. The server UEFI settings for option ROM must be set to **Auto** or **UEFI** for detailed adapter card information, such as model name and firmware levels, to be displayed in Lenovo XClarity Administrator, Lenovo XClarity Controller, or Lenovo XClarity Essentials.
6. Limited inventory.
7. Power management function is supported by Lenovo XClarity Integrator for VMware vCenter.
8. Available only in the People's Republic of China.

Lenovo XClarity Administrator

Lenovo XClarity Administrator is a centralized, resource-management solution that simplifies infrastructure management, speeds responses, and enhances the availability of Lenovo server systems and solutions. It runs as a virtual appliance that automates discovery, inventory, tracking, monitoring, and provisioning for server, network, and storage hardware in a secure environment.

Lenovo XClarity Administrator provides a central interface to perform the following functions for all managed endpoints:

- **Manage and monitor hardware**. Lenovo XClarity Administrator provides agent-free hardware management. It can automatically discover manageable endpoints, including server, network, and storage hardware. Inventory data is collected for managed endpoints for an at-a-glance view of the managed hardware inventory and status.
- **Configuration management**. You can quickly provision and pre-provision all of your servers using a consistent configuration. Configuration settings (such as local storage, I/O adapters, boot settings, firmware, ports, and Lenovo XClarity Controller and UEFI settings) are saved as a server pattern that can be applied to one or more managed servers. When the server patterns are updated, the changes are automatically deployed to the applied servers.
- **Firmware compliance and updates**. 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.

  When an endpoint is out of compliance, you can use Lenovo XClarity Administrator to apply and activate firmware updates for all devices in that endpoint from a repository of firmware updates that you manage.

- **Operating System deployment**. You can use Lenovo XClarity Administrator to manage a repository of operating-system images and to deploy operating-system images to up to 28 managed servers concurrently.
- **Service and support**. Lenovo XClarity Administrator can be set up to collect and send diagnostic files automatically to your preferred service provider 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.

Lenovo XClarity Administrator can be integrated into external, higher-level management and automation platforms through open REST application programming interfaces (APIs). Using the REST APIs, Lenovo XClarity Administrator can easily integrate with your existing management infrastructure. In addition, you can automate tasks using the PowerShell toolkit or the Python toolkit.

To obtain the latest version of the Lenovo XClarity Administrator, see:

https://datacentersupport.lenovo.com/documents/LNVO-LXCAUPD

Documentation for Lenovo XClarity Administrator is available at:

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

Lenovo XClarity Integrator

Lenovo also provides the following integrators that you can use to manage Lenovo servers from higher-level management tools:
- Lenovo XClarity Integrator for VMware vCenter
- Lenovo XClarity Integrator Microsoft System Center

For more information about Lenovo XClarity Integrator, see:

http://www3.lenovo.com/us/en/data-center/software/systems-management/xclarity-integrators

Lenovo XClarity Energy Manager

Lenovo XClarity Energy Manager is a web-based power and temperature management solution designed for data center administrators. It monitors and manages the power consumption and temperature of servers, such as Converged, NeXtScale, System x, ThinkServer, and ThinkSystem servers, using the out-of-band method. Lenovo XClarity Energy Manager models data center physical hierarchy and monitors power and temperature at the server/group level. By analyzing monitored power and temperature data, Lenovo XClarity Energy Manager greatly improves business continuity and energy efficiency.

With Lenovo XClarity Energy Manager, administrators can take control of power usage through improved data analysis and lower the TCO (total cost of ownership). The tool optimizes data center efficiency by allowing administrators to:

- Monitor energy consumption, estimate power need, and re-allocate power to servers as needed via IPMI or Redfish.
- Track platform power consumption, inlet temperature, and component-level power consumption, such as CPU and memory power consumption.
- Visually check the layout of room, row and rack via 2D thermal map.
- Show events and send e-mail or SNMP trap notifications when certain faults occur or certain thresholds are reached.
- Limit the consumed amount of energy of an endpoint by setting up policies.

- Optimize energy efficiency by identifying hotspot or over-cooling servers to optimize cooling efficiency and identifying low-usage servers to save energy.
- Reduce the power consumption to the minimum level to prolong service time during emergency power event (such as a data-center power failure).

For more information about downloading, installation, and usage, see:

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

Lenovo XClarity Provisioning Manager

Lenovo XClarity Provisioning Manager is embedded software that provides a graphic user interface (GUI) for configuring the system with support for 11 languages. It simplifies the process of configuring Basic Input Output System (BIOS) settings and configuring Redundant Array of Independent Disks (RAID) in an GUI wizard. It also provides functions for updating applications and firmware, performing system diagnostics, and automating the process of installing the supported Windows, Linux, or VMware ESXi operating systems and associated device drivers.

Note: When you start a server and press F1, the Lenovo XClarity Provisioning Manager interface is displayed by default. However, the text-based interface to system configuration (the Setup Utility) is also available. From Lenovo XClarity Provisioning Manager, you can choose to restart the server and access the text-based interface. In addition, you can choose to make the text-based interface the default interface that is displayed when you press F1.

Lenovo XClarity Provisioning Manager provides a system summary of all installed devices and includes the following functions:

- **UEFI setup**. Use this function to configure UEFI system settings, such as processor configuration, start options, and user security. You can also view POST events and the System Event Log (SEL).
- **Firmware update**. Use this function to update the firmware for Lenovo XClarity Controller, Unified Extensible Firmware Interface (UEFI), Lenovo XClarity Provisioning Manager, and operating system device drivers.
- **RAID setup**. Use this function to configure RAID for the server. It provides an easy-to-use graphical wizard that supports a unified process for performing RAID setup for a variety of RAID adapters. You can also perform advanced RAID configuration from the UEFI Setup.
- **OS installation**. Use this function to deploy an operating system for the server with an easy-to-use Guided Install mode. Operating systems can be installed using unattended mode after you choose the Operating System version and basic settings; the device drivers are installed automatically.

  A Manual Install mode is also available. You can export the drivers from system, manually install the operating systems, and then install the drivers. This way, you do not need to go to the web to download device drivers.

  Note: In Guided Install mode, you can export the operating system installation settings to a response file during operating system installation. Then, you can use the Import function under the Cloning menu to apply the operating system installation settings to the target server.
- **Cloning**. Use this function to clone settings in one server to other similarly configured Lenovo servers.
  - **Export**: Export UEFI, RAID, and BMC settings for the current server to files respectively and save the files to a USB storage drive or a shared network folder.
  - **Import**: Apply UEFI, RAID, BMC, and operating system installation settings to the target server by using the files you have saved.
- **Diagnostics**. Use this function to view the overall health of devices installed in the server and to perform diagnostics for hard disk drives and memory. You can also collect service data that can be saved to a USB device and sent to Lenovo Support.

Note: The service data collected by Lenovo XClarity Provisioning Manager does not include the operating system logs. To collect the operating system logs and the hardware service data, use Lenovo XClarity Essentials OneCLI.

Documentation for Lenovo XClarity Provisioning Manager is available at:

http://sysmgt.lenovofiles.com/help/topic/LXPM/LXPM_introduction.html

Lenovo XClarity Essentials

Lenovo XClarity Essentials (LXCE) is a collection of server management utilities that provides a less complicated method to enable customers to manage Lenovo ThinkSystem, System x, and Thinkserver servers more efficiently and cost-effectively.

Lenovo XClarity Essentials includes the following utilities:

- Lenovo XClarity Essentials OneCLI is a collection of several command line applications, which can be used to:
  - Configure the server.
  - Collect service data for the server. If you run Lenovo XClarity Essentials OneCLI from the server operating system (in-band), you can collect operating system logs as well. You can also choose to view the service data that has been collected or to send the service data to Lenovo Support.
  - Update firmware and device drivers for the server. Lenovo XClarity Essentials OneCLI can help to download UpdateXpress System Packs (UXSPs) for your server and update all the firmware and device drivers payloads within the UXSP.
  - Perform miscellaneous functions, such as rebooting the server or rebooting the BMC.

  To learn more about Lenovo XClarity Essentials OneCLI, see:

  https://datacentersupport.lenovo.com/documents/LNVO-CENTER

  Documentation for Lenovo XClarity Essentials OneCLI is available at:

  http://sysmgt.lenovofiles.com/help/topic/xclarity_essentials/overview.html
- Lenovo XClarity Essentials Bootable Media Creator (BoMC) is a software application that applies UpdateXpress System Packs and individual updates to your system.

  Using Lenovo XClarity Essentials Bootable Media Creator, you can:
  - Update the server using an ISO image or CD.
  - Update the server using a USB key.
  - Update the server using the Preboot Execution Environment (PXE) interface.
  - Update the server in unattendance mode.
  - Update the server in Serial Over LAN (SOL) mode.

  To learn more about Lenovo XClarity Essentials Bootable Media Creator, see:

  https://datacentersupport.lenovo.com/solutions/lnvo-bomc
- Lenovo XClarity Essentials UpdateXpress is a software application that applies UpdateXpress System Packs and individual updates to your system.

  Using Lenovo XClarity Essentials UpdateXpress, you can:
  - Update the local server.
  - Update a remove server.
  - Create a repository of updates.

To learn more about Lenovo XClarity Essentials UpdateXpress, see:

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

Lenovo XClarity Controller

Lenovo XClarity Controller is the management processor for the server. It is the third generation of the Integrated Management Module (IMM) service processor that consolidates the service processor functionality, super I/O, video controller, and remote presence capabilities into a single chip on the server system board.

There are two ways to access the management processor:

- **Web-based interface**. To access the web-based interface, point your browser to the IP address for the management processor.
- **Command-line interface**. To access the CLI interface, use SSH or Telnet to log in to the management processor.

Whenever power is applied to a server, the management processor is available. From the management processor interface, you can perform the following functions:

- Monitor all hardware devices installed in the server.
- Power the server on and off.
- View the system event log and system audit log for the server.
- Use the Remote management function to log in to the server itself.

Documentation for Lenovo XClarity Controller is available at:

http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/product_page.html

Lenovo Capacity Planner

Lenovo Capacity Planner is a power consumption evaluation tool that enhances data center planning by enabling IT administrators and pre-sales to understand important parameters of different type of racks, servers, and other devices. Lenovo Capacity Planner can dynamically calculate the power consumption, current, British Thermal Unit (BTU), and volt-ampere (VA) rating at the rack level, and therefore improves the efficiency of large scale deployments.

Lenovo Capacity Planner provides the following functions:

- Power and thermal evaluation of servers and network devices; generating evaluation reports.
- Customizable server configuration, workload, CPU turbo model, and fan speed for different user scenarios.
- Chassis-level and node-level customizable configuration for Flex System and High-Density servers.
- Visual memory configuration guidance for best memory performance.

More information about Lenovo Capacity Planner is available at:

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

Lenovo Business Vantage

Lenovo Business Vantage is a security software tool suite designed to work with the TPM plug card for enhanced security, to keep user data safe, and to erase confidential data completely from a hard disk drive.

Lenovo Business Vantage provides the following functions:

- **Data Safe**. Encrypt files to ensure data safety by using the TPM plug card.
- **Sure Erase**. Erase confidential data from a hard disk. This tool follows the industry standard method to do the erasing and allows the user to select different erasing levels.
- **Smart USB Protection**. Prohibit unauthorized access to the USB port of devices.
- **USB Data Safe**. Encrypt files to ensure data security on a USB storage device.

Note: This tool is available in the People's Republic of China only.

More information about Lenovo Business Vantage is available at:

http://support.lenovo.com.cn/lenovo/wsi/es/es.html

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 helps 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.

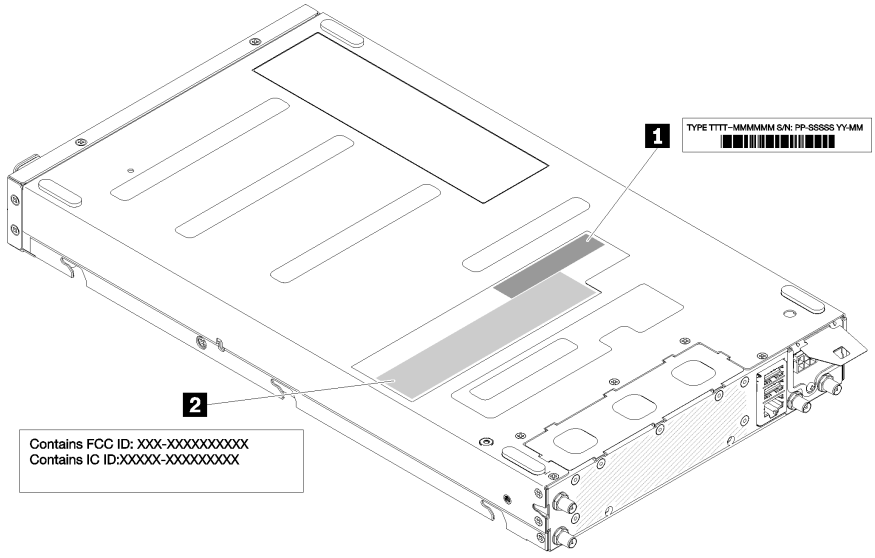


Figure 2. Location of the ID label and FCC ID/IC label

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.

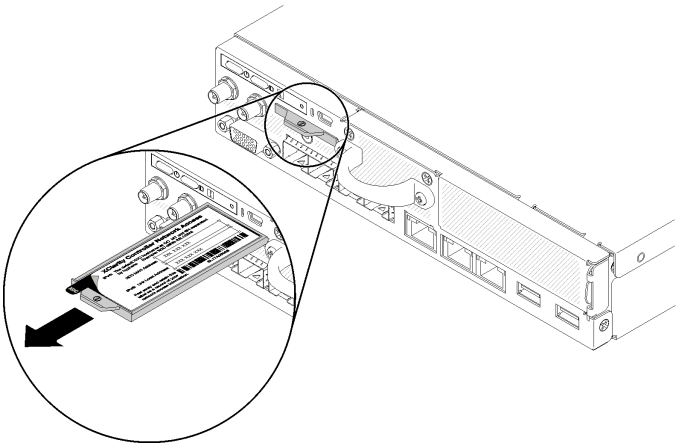


Figure 3. Location of the network access tag

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

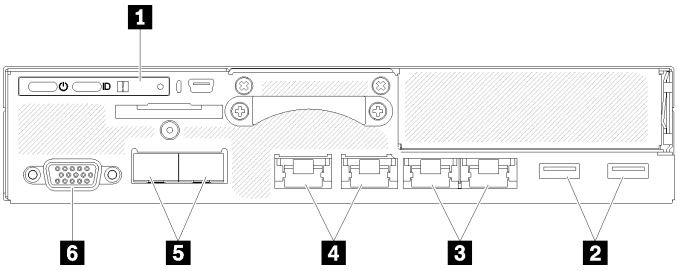


Figure 5. 10G SFP+ LOM Package front view

Table 2. Components on the 10G SFP+ LOM Package front view

1 Front operator panel	4 Shared XClarity Controller (XCC) network connectors **Attention:** Only one network IP can be used. 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.
2 USB 3.1 Gen 1 connectors	5 10Gb SFP+ Ethernet connectors
3 1Gb Ethernet connectors	6 VGA connector

- Wireless enabled LOM Package

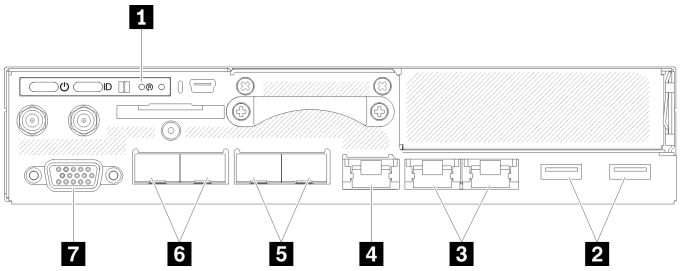


Figure 6. Wireless enabled LOM Package front view

Table 3. Components on the Wireless enabled LOM Package front view

1 Front operator panel	5 1Gb SFP connectors
2 USB 3.1 Gen 1 connectors	6 10Gb SFP+ Ethernet connectors
3 1Gb Ethernet connectors	7 VGA connector
4 XClarity Controller (XCC) network connector	

Install fillers

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

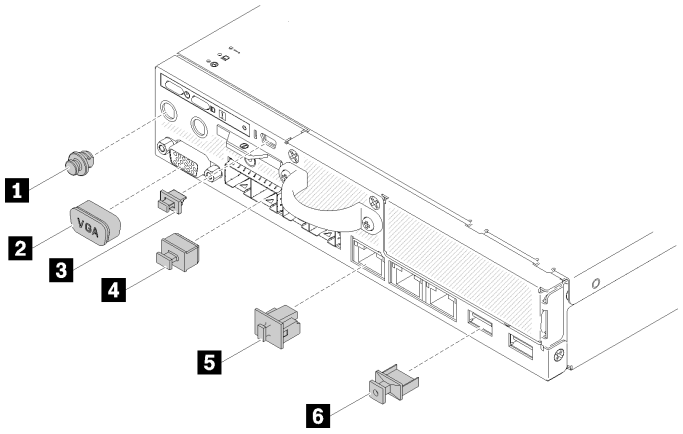


Figure 7. Fillers

Table 4. 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.

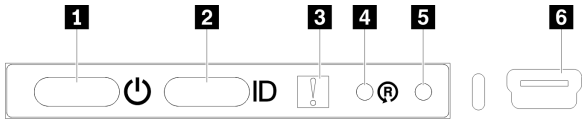


Figure 8. Front operator panel

Table 5. 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.

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.

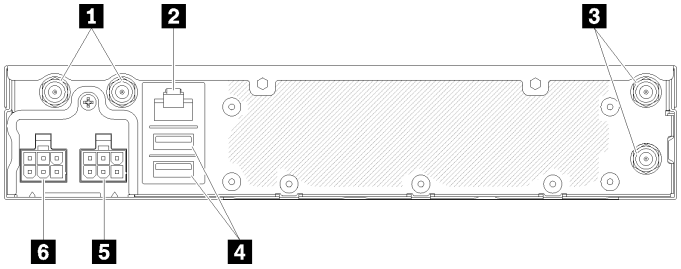


Figure 9. Rear view - 12V power distribution module (PDM)

Table 6. 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

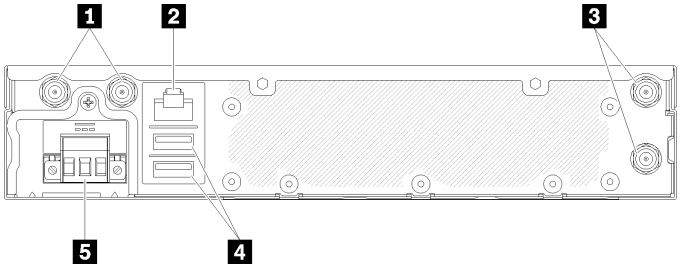


Figure 10. Rear view - -48V power distribution module (PDM)

Table 7. Rear view - -48V 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
3 LTE Antenna connectors (available only when M.2 LTE module is installed)	

Install covers

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

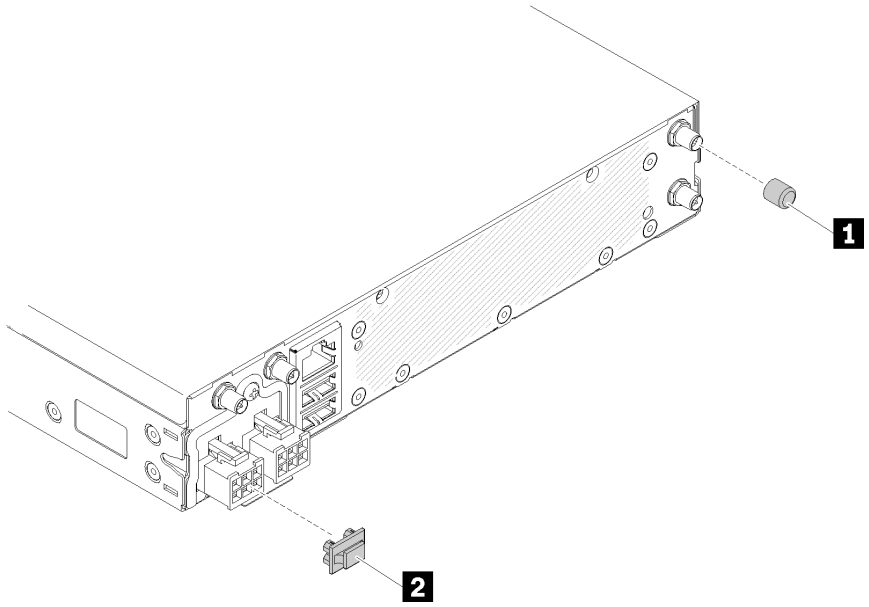


Figure 11. Covers

Table 8. 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 connectors

The following illustrations show the connectors on the system board.

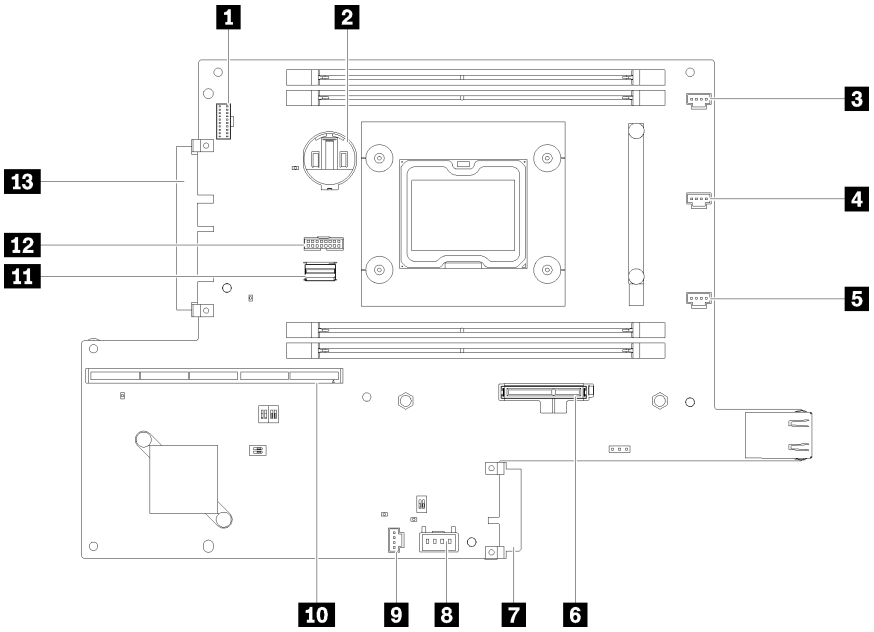


Figure 12. System-board connectors

Table 9. 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	

Wireless enabled LOM package and 10G SFP+ LOM package

The following illustrations show the wireless enabled LOM package and 10G SFP+ LOM package.

Depending on the server configuration, connect wireless enabled LOM package or 10G SFP+ LOM package to the LOM module connector on the system board (see “System-board connectors” on page 22).

Wireless enabled LOM package

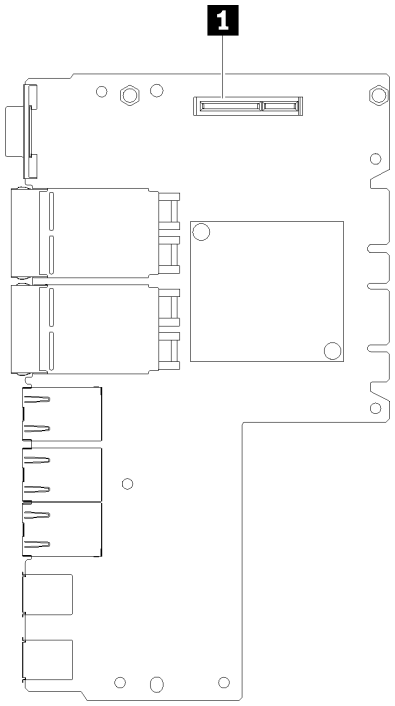


Figure 13. Wireless enabled LOM package

Table 10. Wireless enabled LOM package

1 M.2 WLAN/LTE wireless connector

10G SFP+ LOM package

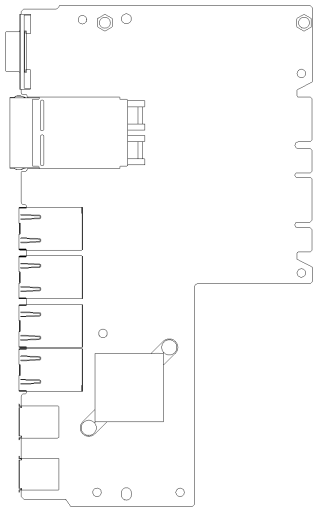


Figure 14. 10G SFP+ LOM package

PCIe riser assembly

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

PCIe and M.2 riser assembly

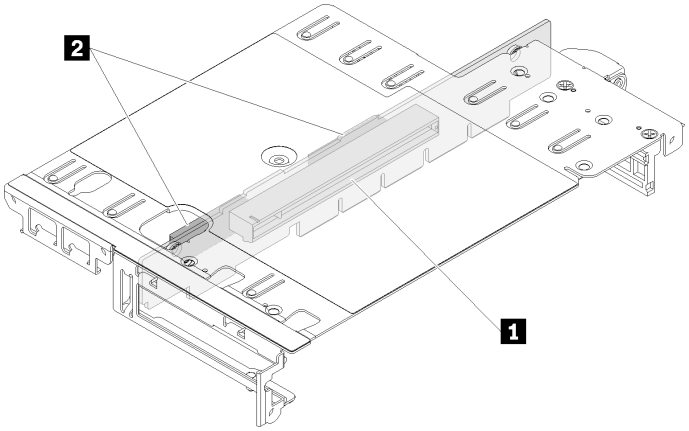


Figure 15. PCIe and M.2 riser assembly

Table 11. 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

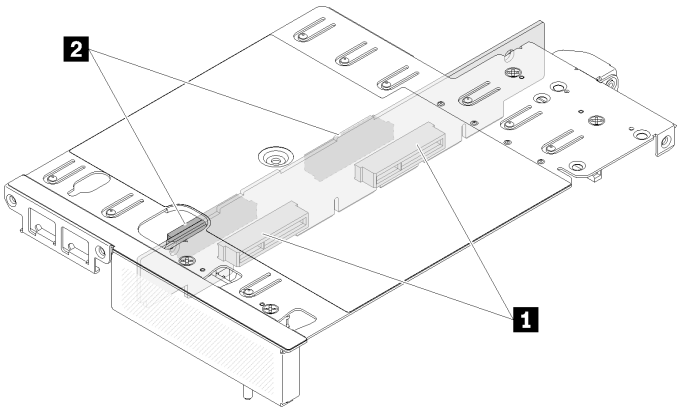


Figure 16. M.2 riser assembly

Table 12. 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

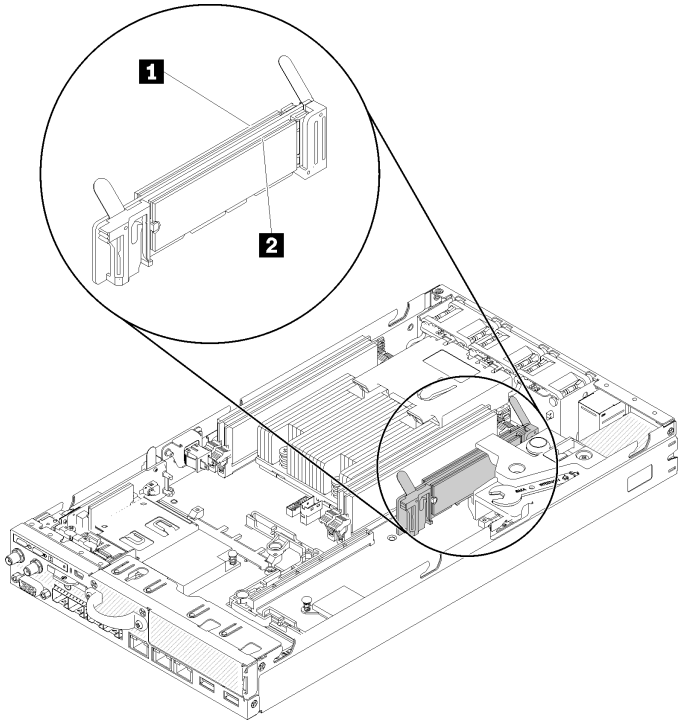


Figure 17. M.2 boot adapter

Table 13. M.2 boot adapter slot numbering

1 Drive 0	2 Drive 1

M.2 data adapter

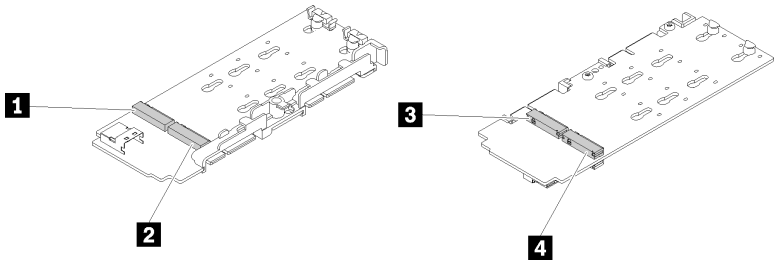


Figure 18. M.2 data adapter

Table 14. M.2 data adapter

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

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

- PCIe and M.2 riser assembly

Left-wing (M.2 data adapters)		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 2/9	Slot 2	PCIe adapter	Slot 6
Drive 3/8	Slot 3		
Drive 4/7	Slot 4		
Drive 5/6	Slot 5		

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

Left-wing (M.2 data adapters)		Right-wing (M.2 data adapters)	
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 2/9	Slot 2	Drive 2/9	Slot 9
Drive 3/8	Slot 3	Drive 3/8	Slot 8
Drive 4/7	Slot 4	Drive 4/7	Slot 7
Drive 5/6	Slot 5	Drive 5/6	Slot 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 19 “Server components ” on page 28:

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:** 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

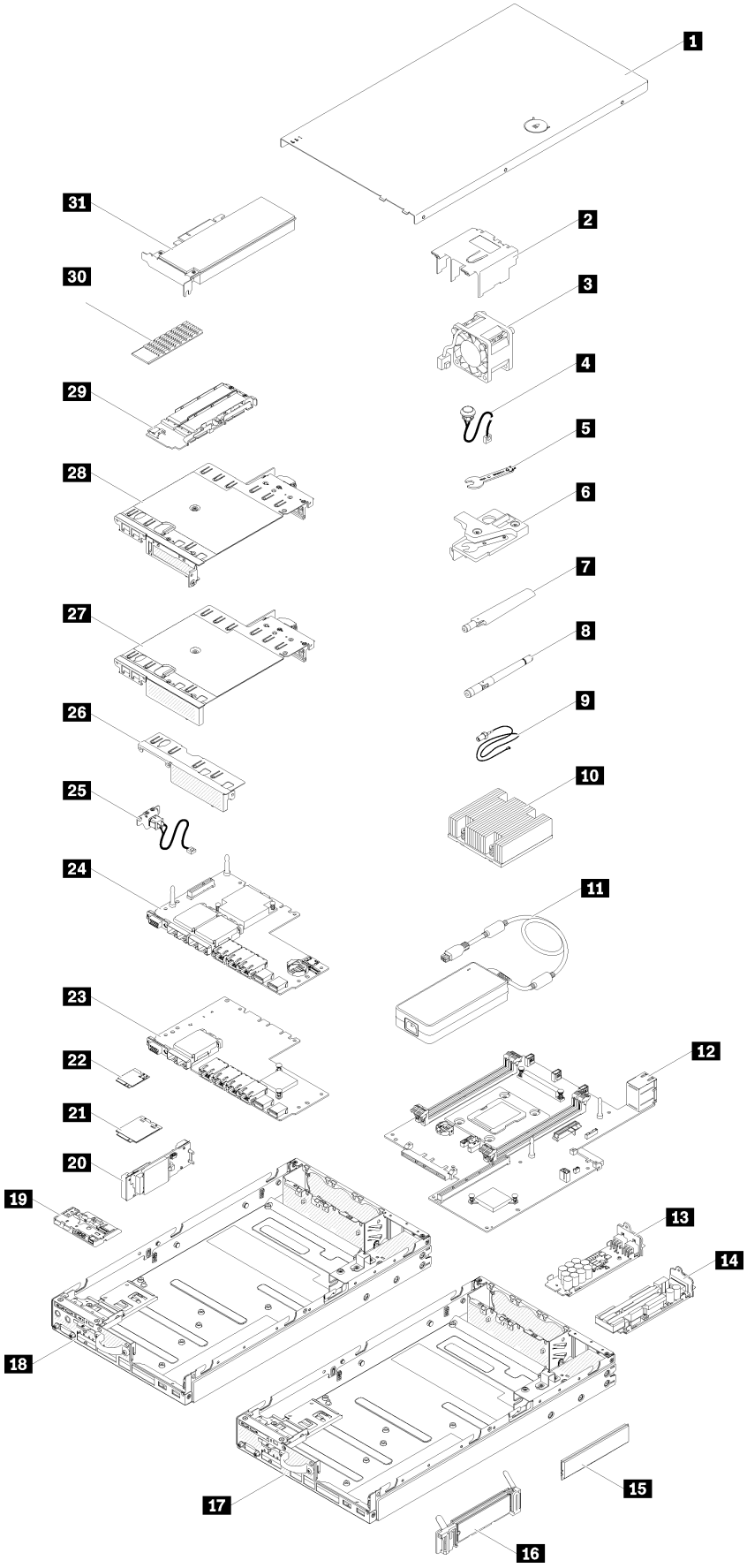


Figure 19. Server components

Table 15. 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 19 “Server components ” on page 28: 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	System board				√
13	12 V power distribution module		√		
14	-48 V power distribution module		√		
15	DIMM	√			
16	M.2 boot adapter		√		
17	10G SFP+ LOM package chassis				√
18	Wireless enabled LOM package chassis				√
19	Front operator panel				√
20	M.2 WLAN/LTE wireless adapter			√	
21	M.2 LTE module				√
22	M.2 WLAN module				√
23	10G SFP+ LOM package				√
24	Wireless enabled LOM package				√
25	Locking cable	√			
26	Front filler				√
27	M.2 riser assembly		√		
28	PCIe and M.2 riser assembly		√		
29	M.2 SATA/NVMe data adapter		√		

Table 15. Parts listing (continued)

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
30	M.2 SATA/NVMe heat sink				√
31	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. Server hardware setup

To set up the server, install any options that have been purchased, cable the server, configure and update the firmware, and install the operating system.

Server setup checklist

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

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

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

1. Unpack the server package. See “Server package contents” on page 1.
2. Set up the server hardware.
   a. Install any required hardware or server options. See the related topics in “Install server hardware options” on page 36.
   b. If necessary, install the server into a standard rack cabinet by using the rail kit shipped with the server. See the *Rack Installation Instructions* that comes with optional rail kit.
   c. Connect the Ethernet cables and power cords to the server. See “Rear view” on page 21 to locate the connectors. See “Cable the server” on page 69 for cabling best practices.
   d. Power on the server. See “Power on the server” on page 69.

      Note: You can access the management processor interface to configure the system without powering on the server. Whenever the server is connected to power, the management processor interface is available. For details about accessing the management server processor, see:

      http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/dw1lm_c_chapter2_openingandusing.html
   e. Validate that the server hardware was set up successfully. See Validate server setup.
3. Configure the system.
   a. Follow the steps in “Activate the system” on page 71 to activate the system.
   b. Connect the Lenovo XClarity Controller to the management network. See Set the network connection for the Lenovo XClarity Controller.
   c. Update the firmware for the server, if necessary. See “Update the firmware” on page 75.
   d. Configure the firmware for the server. See “Configure the firmware” on page 78.

      The following information is available for RAID configuration:

      - https://lenovopress.com/lp0578-lenovo-raid-introduction
      - https://lenovopress.com/lp0579-lenovo-raid-management-tools-and-resources
   e. Install the operating system. See “Install the operating system” on page 82.
   f. Back up the server configuration. See “Back up the server configuration” on page 82.
   g. Install the applications and programs for which the server is intended to be used.

Installation Guidelines

Use the installation guidelines to install components in your server.

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 36 and “Working inside the server with the power on” on page 35.
- Make sure the components you are installing are supported by the server. For a list of supported optional components for the server, see http://www.lenovo.com/us/en/serverproven/.
- 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 that the latest level of code is supported for the cluster solution 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.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped if the server and operating system support hot-swap capability, which means that you can remove or install the component while the server is still running. (Orange can also indicate touch points on

hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.

- 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

Guidelines to work inside the server with the power on.

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

Use this information to handle static-sensitive devices.

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.

Install server hardware options

This section includes instructions for performing initial installation of optional hardware. Each component installation procedure references any tasks that need to be performed to gain access to the component being replaced.

Installation procedures are presented in the optimum sequence to minimize work.

Attention: To ensure the components you install work correctly without problems, read the following precautions carefully.

- Make sure the components you are installing are supported by the server. For a list of supported optional components for the server, see http://www.lenovo.com/us/en/serverproven/.
- Always 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.
- It is good practice to make sure that the server is working correctly before you install an optional component.
- Follow the installation procedures in this section and use appropriate tools. Incorrectly installed components can cause system failure from damaged pins, damaged connectors, loose cabling, or loose components.

Remove a compute node

Use this information to remove a compute node.

Before you remove a compute node, complete the following steps:

1. Read the following sections to ensure that you work safely.
   - "Installation Guidelines" on page 34

2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).

To remove a compute node, complete the following steps:

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

Step 1. Remove the five screws, and loosen the two thumb screws of the locking bezel.

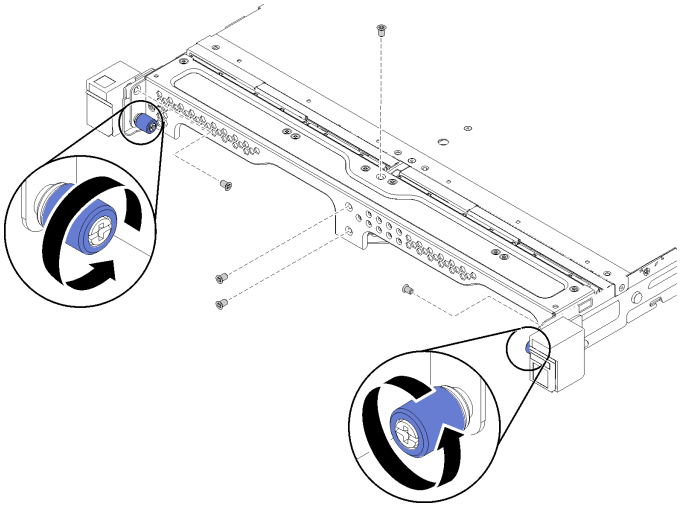


Figure 20. Node removal

Step 2. Remove the locking bezel from the server.

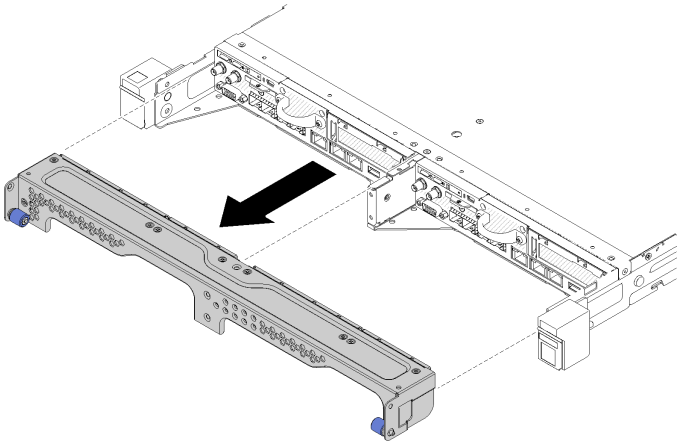


Figure 21. Node removal

Step 3. Remove the node.

- If the node is installed in the enclosure, complete the following steps.

  Note: If a node is installed in an enclosure, the node has no cover.

  1. Press on the release button and slide the node out of the enclosure.

– 1U 2-node

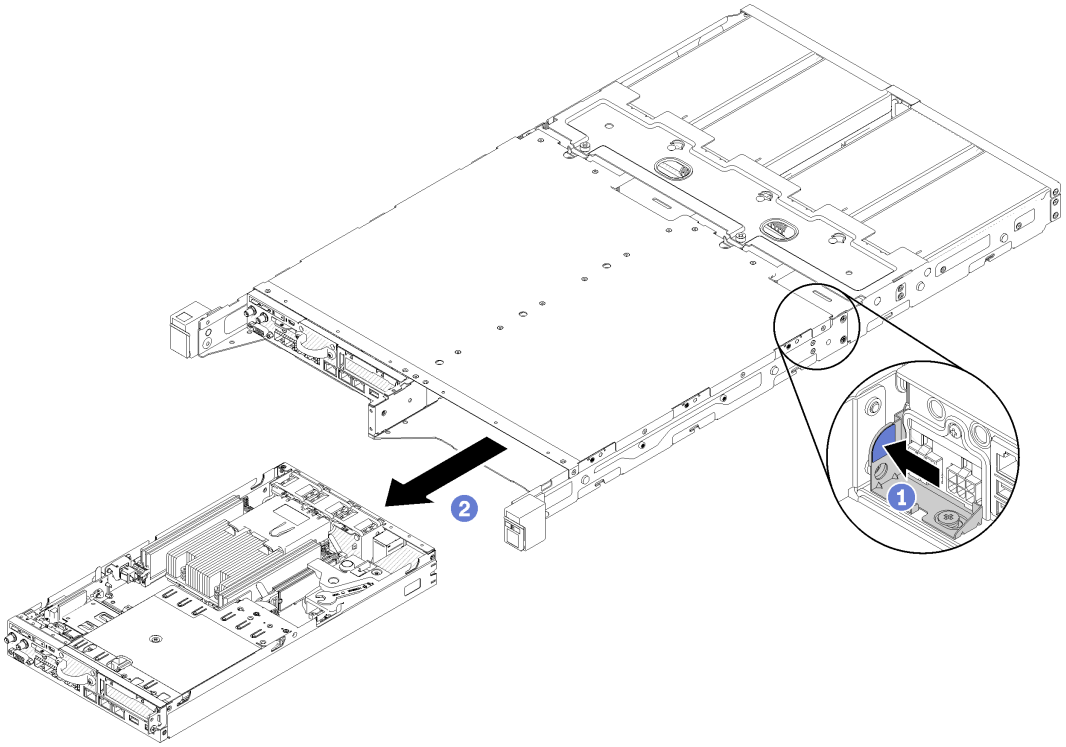


Figure 22. Node removal

– 2U 2-node

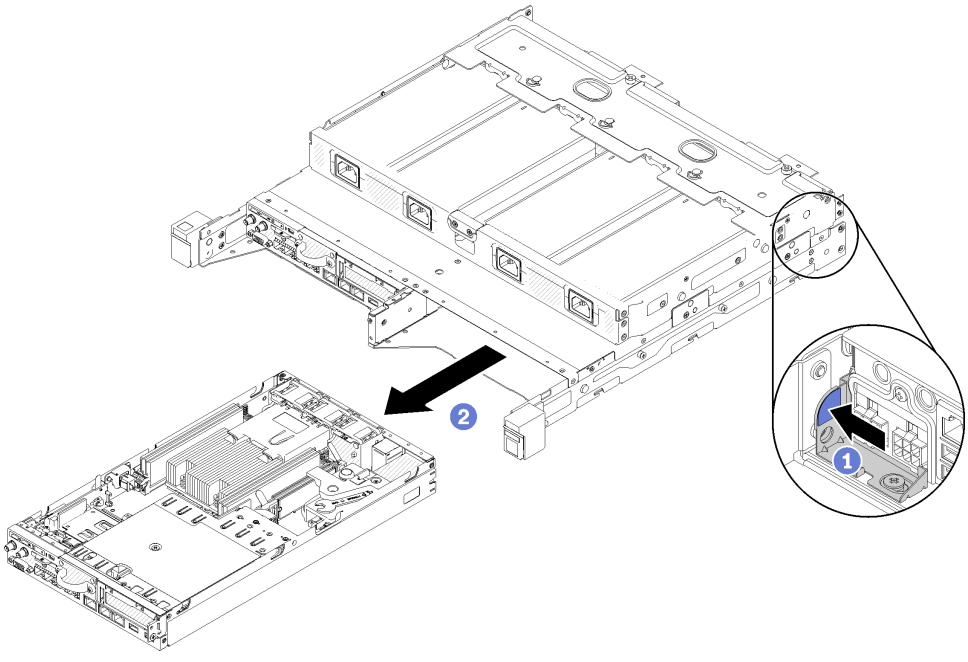


Figure 23. Node removal

- If the node is installed in the node sleeve, complete the following steps.

1. Loosen the two thumbscrews and slide the node of the node sleeve.

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

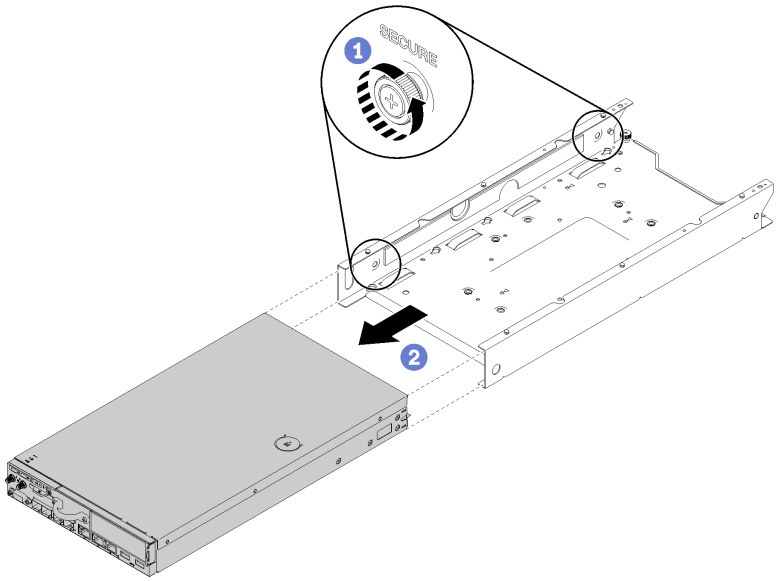


Figure 24. Node removal

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.

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 following 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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).

To remove the top cover, complete the following steps:

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

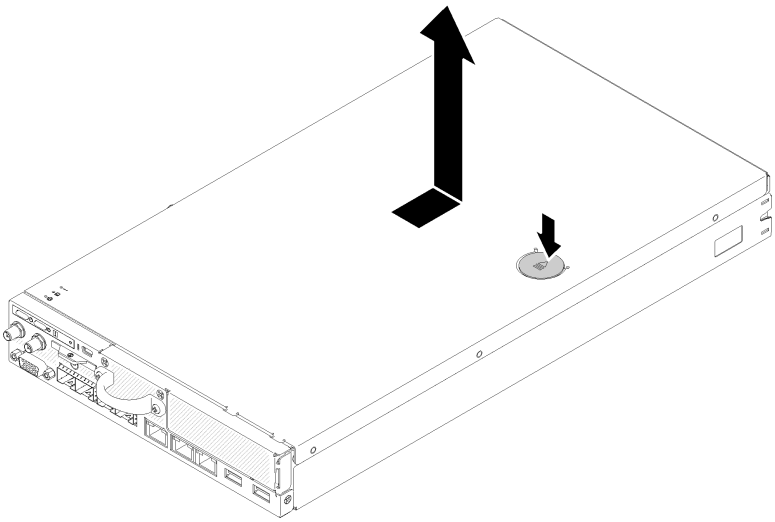


Figure 25. Top cover removal

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.

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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).
3. Remove the node from the enclosure if needed (see “Remove a compute node” on page 36).

To remove the air baffle, complete the following steps:

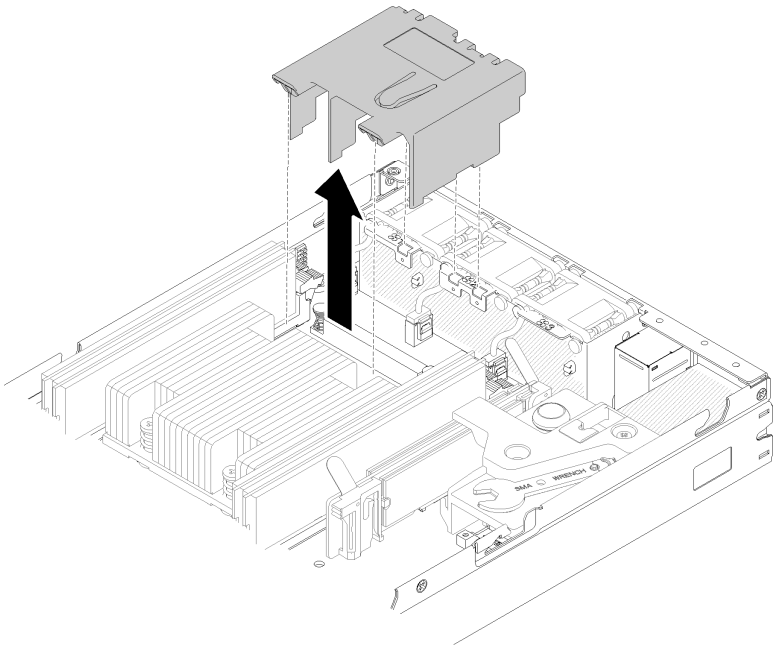


Figure 26. Air baffle removal

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.

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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).
3. Remove the node from the enclosure if needed (see “Remove a compute node” on page 36).

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

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

Step 1. Remove the four screws.

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.

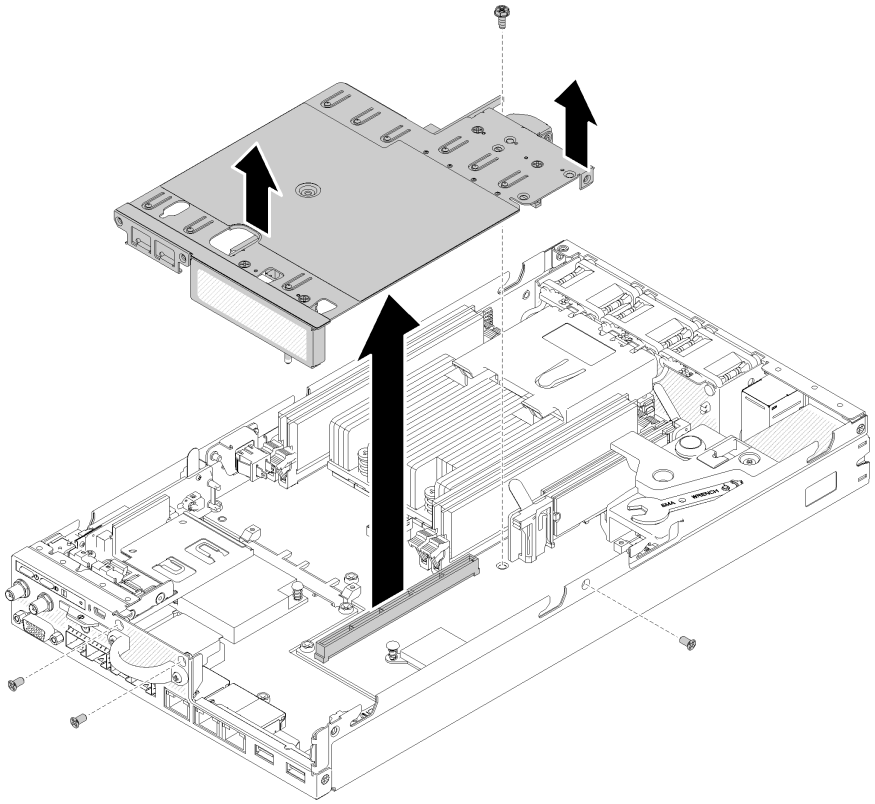


Figure 27. PCIe riser assembly removal

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

1. Install the filler and fasten the three screws.

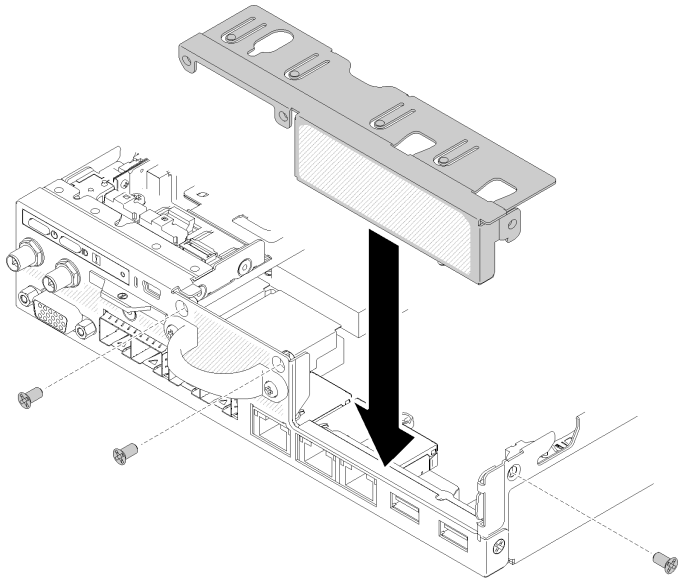


Figure 28. Filler installation

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.

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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).
3. Remove the node from the enclosure if needed (see “Remove a compute node” on page 36).
4. Remove the M.2 WLAN/LTE wireless adapter if needed.
5.
6. Remove the lock position switch if installed (see “Remove the lock position switch” on page 44).

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

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

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.

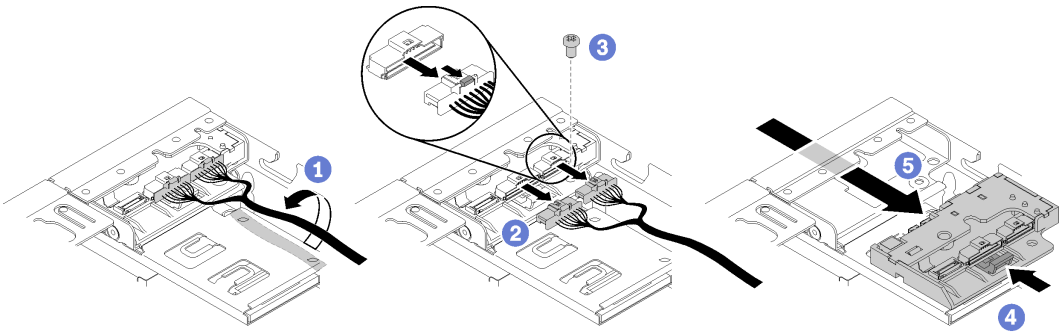


Figure 29. Front operator panel removal

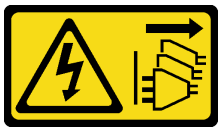
If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

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 adapter do not turn off the electrical current that is 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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).
3. Remove the node from the enclosure if needed (see “Remove a compute node” on page 36).
4. Remove the PCIe riser cage (see “Remove the PCIe riser assembly” on page 42).

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

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

Step 1. Disconnect the cable.

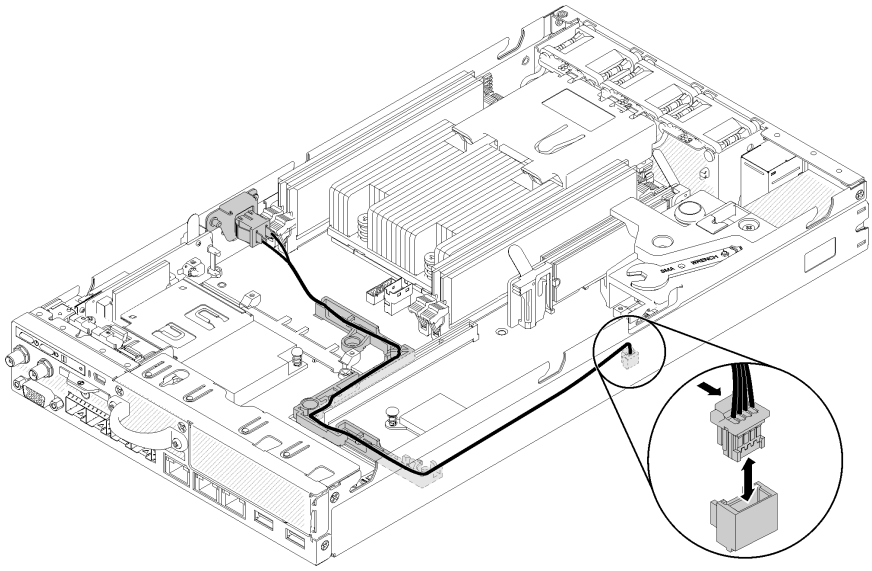


Figure 30. Lock position switch cable

Step 2. Remove the screw.

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

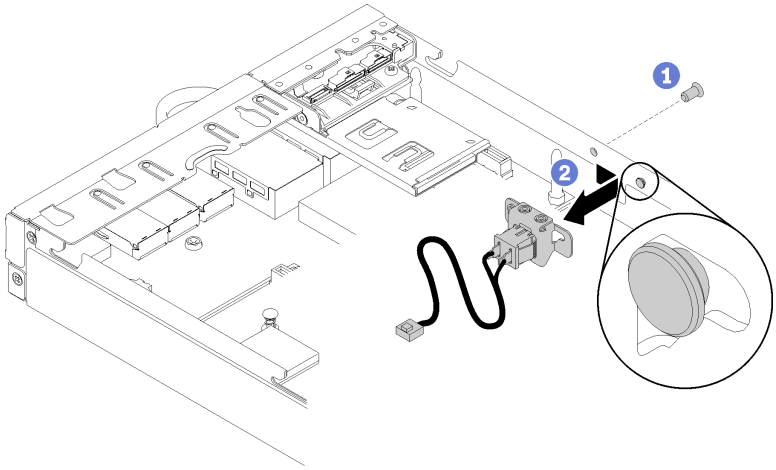


Figure 31. Lock position switch removal

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.

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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).

3. Remove the node from the enclosure if needed (see “Remove a compute node” on page 36).

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.

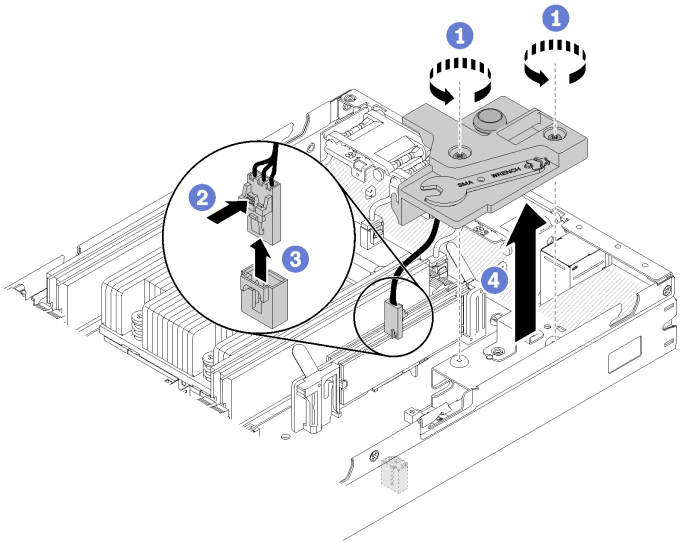


Figure 32. Intrusion switch cable removal

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

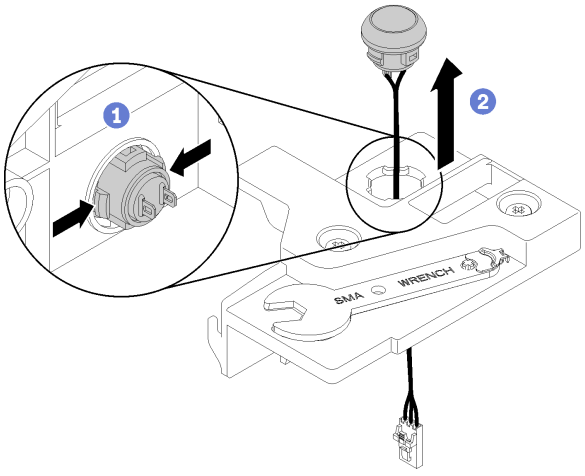


Figure 33. Intrusion switch cable removal

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 a power adapter

Use this information to install a power adapter.

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

1. Read the following sections to ensure that you work safely.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).
3. Remove the node from the enclosure if needed (see “Remove a compute node” on page 36).

To install a power adapter, complete the following steps:

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

Note: It is best practice to use identical power adapters.

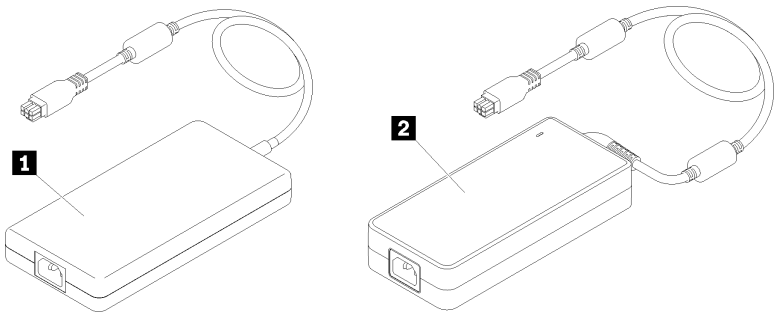


Table 16. Power adapters

1 240W FSP power adapter	2 240W Greatwall AC adapter

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 34. Power adapters

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.
     - 1U 2-node

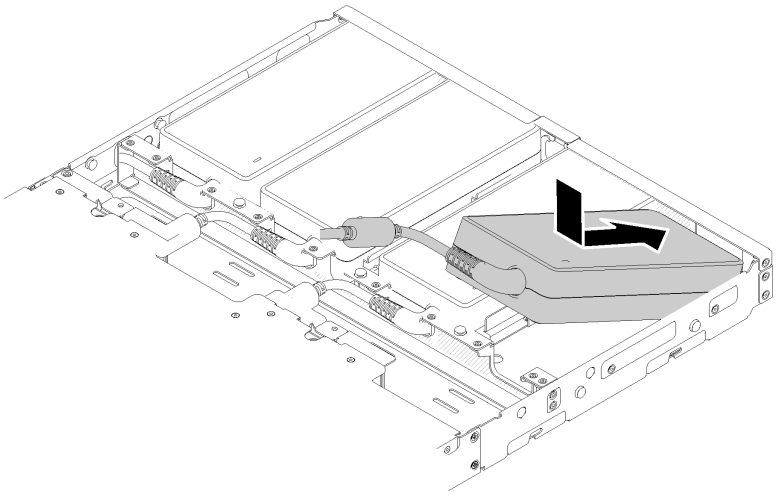


Figure 35. Power adapter installation

2. Slightly push the bracket backward and to install the bracket.
3. Install the two screws.
   - 1U 2-node

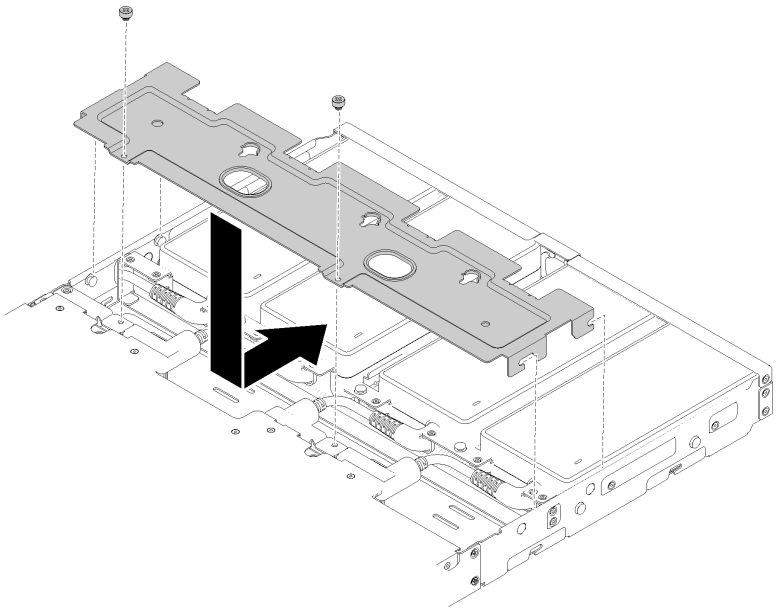


Figure 36. Bracket installation

- 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.

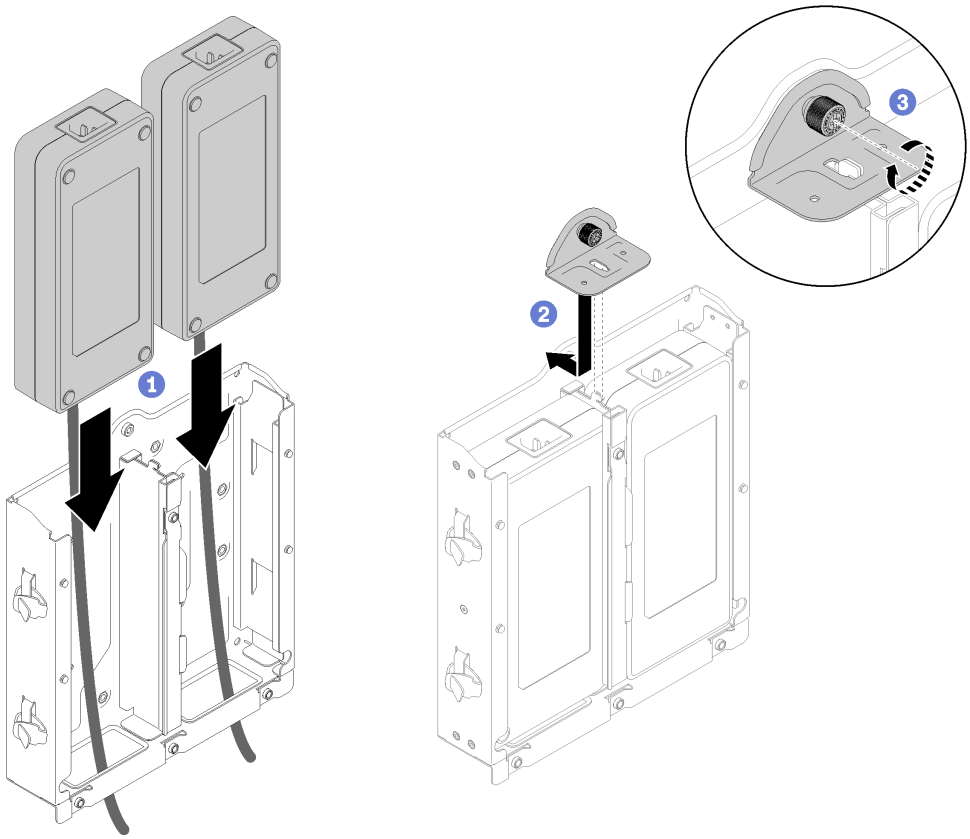


Figure 37. Power adapter installation

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 69).

Install an M.2 drive into an M.2 adapter

Use this information to install an M.2 drive in an M.2 adapter.

Before you install an M.2 drive into an M.2 adapter:

1. Read the following sections to ensure that you work safely.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).

Complete the following steps to install an M.2 drive in an M.2 adapter.

Step 1. Locate the connector on each side of an M.2 adapter.

Notes:

- Some M.2 adapters support two identical M.2 drives. When two drives are installed, align and support both drives when sliding the retainer forward to secure the drives.

Step 2. Insert the M.2 drive at an angle (approximately 30 degrees) into the connector and rotate it until the notch catches on the lip of the retainer; then, slide the retainer forward (toward the connector) to secure the M.2 drive in an M.2 adapter.

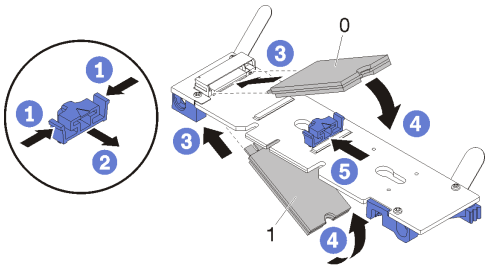


Figure 38. M.2 drive installation

Attention: When sliding the retainer forward, make sure the two nubs on the retainer enter the small holes on an M.2 adapter. Once they enter the holes, you will hear a soft “click” sound.

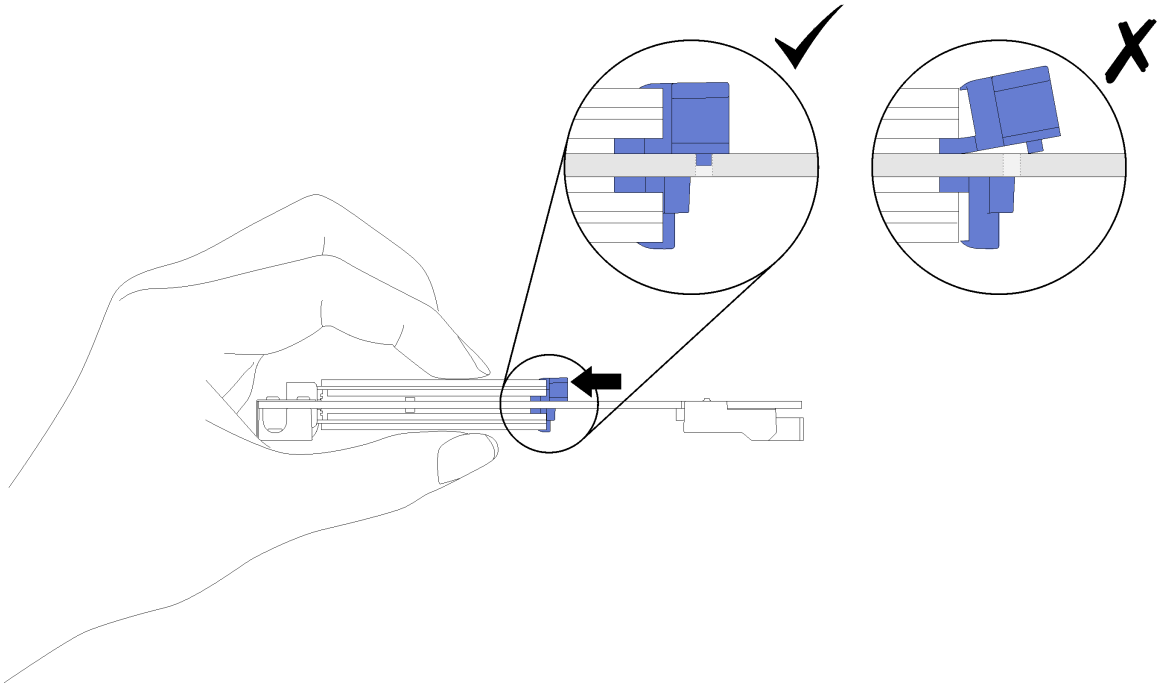


Figure 39. M.2 drive installation

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

1. Reinstall an M.2 boot adapter or an M.2 data adapter (see “Install the M.2 boot adapter” on page 51 or “Install a M.2 data adapter” on page 52).
2. Install the node if needed (see “Install a compute node” on page 65).
3. Reconnect power cords and all external cables.

Install the M.2 boot adapter

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

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

1. Read the following sections to ensure that you work safely.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).

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

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

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

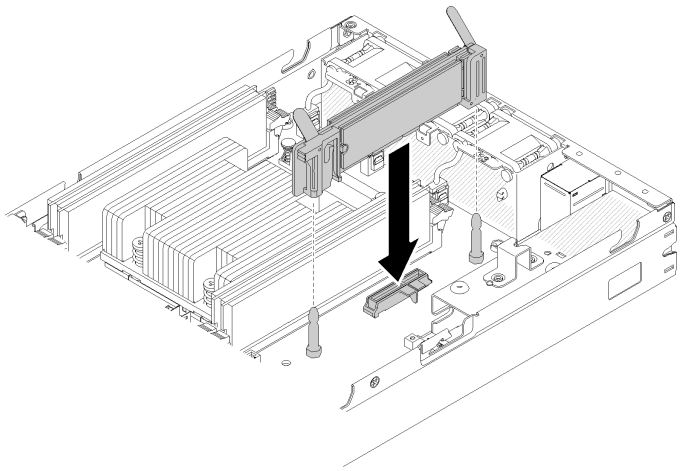


Figure 40. M.2 boot adapter installation

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 57).
2. Install the node if needed (see “Install a compute node” on page 65).
3. Reconnect power cords and all external cables.

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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).

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

Watch the procedure. A video of the process is available:

- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

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

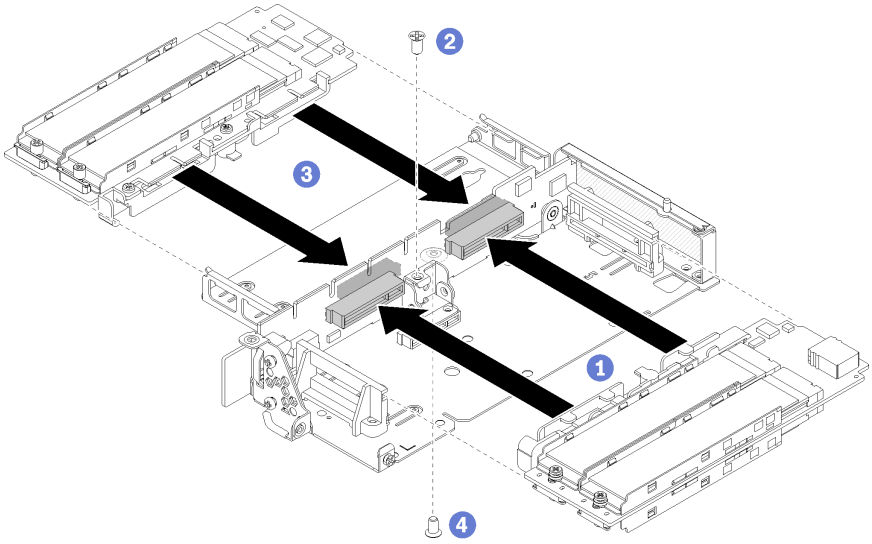


Figure 41. M.2 data adapter installation

- PCIe and M.2 riser assembly

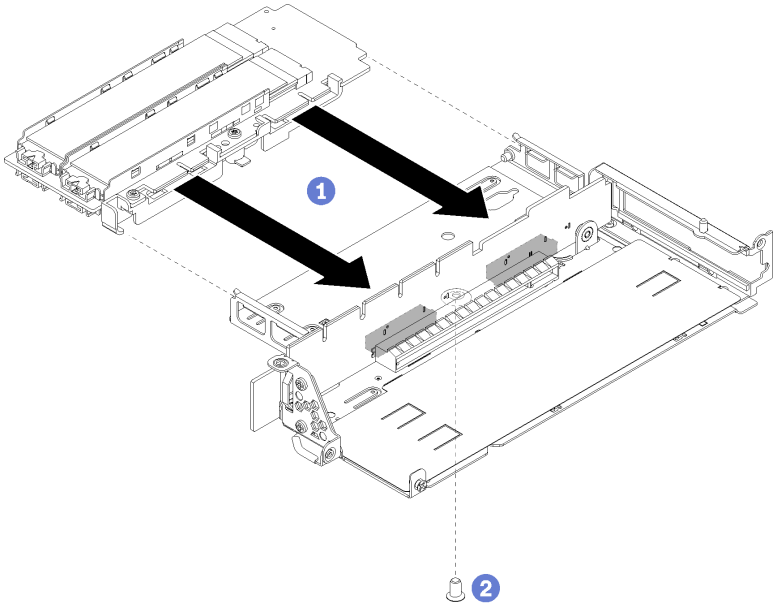


Figure 42. M.2 data adapter installation

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 56 for instructions).
2. Install the node if needed (see “Install a compute node” on page 65).
3. Reconnect power cords and all external cables.

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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).

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

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

Note: LTE and WLAN performance might be fluctuated depending on your configurations and working environments.

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

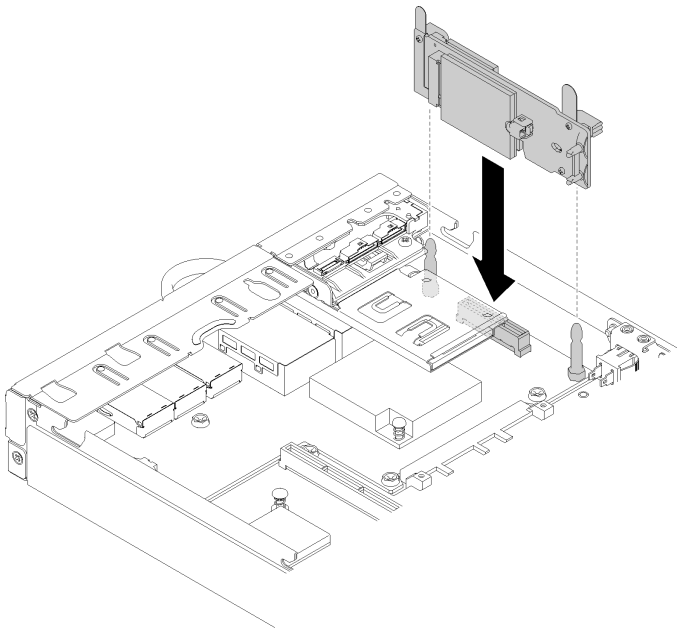


Figure 43. M.2 WLAN/LTE wireless adapter installation

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 61).

2. Install the node if needed (see “Install a compute node” on page 65).
3. Reconnect power cords and all external cables.

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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).

To install the PCIe adapter, complete the following steps:

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

Remove the filler on the rear side of the riser assembly.

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.

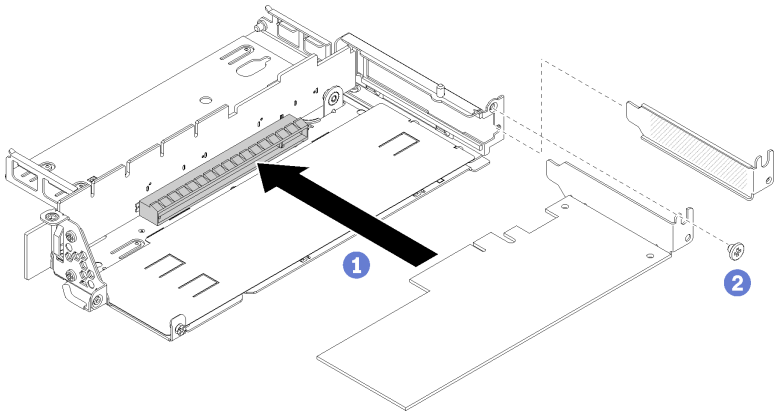


Figure 44. PCIe adapter installation

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

1. Install the PCIe riser assembly (see “Install the PCIe riser assembly” on page 56 for instructions).
2. Install the node if needed (see “Install a compute node” on page 65).
3. Reconnect power cords and all external cables.

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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).
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.

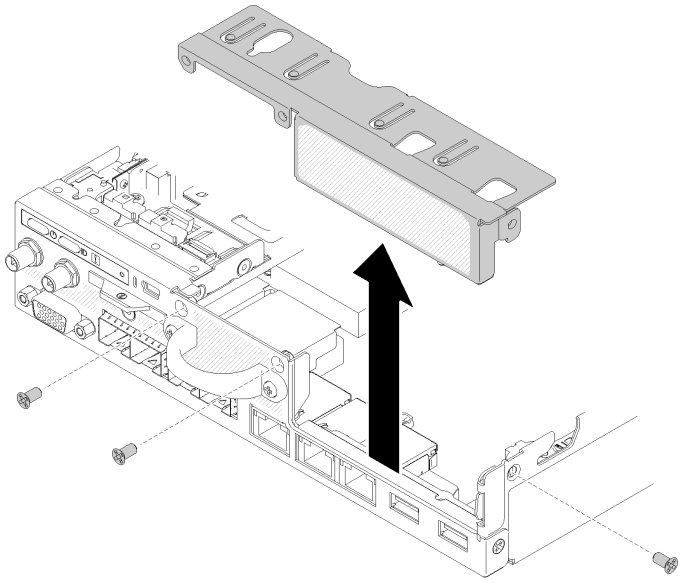


Figure 45. Filler removal

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

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

Step 1. Lower the PCIe riser assembly into the chassis and press the PCIe riser assembly down until it is securely seated.

Step 2. Fasten the four screws.

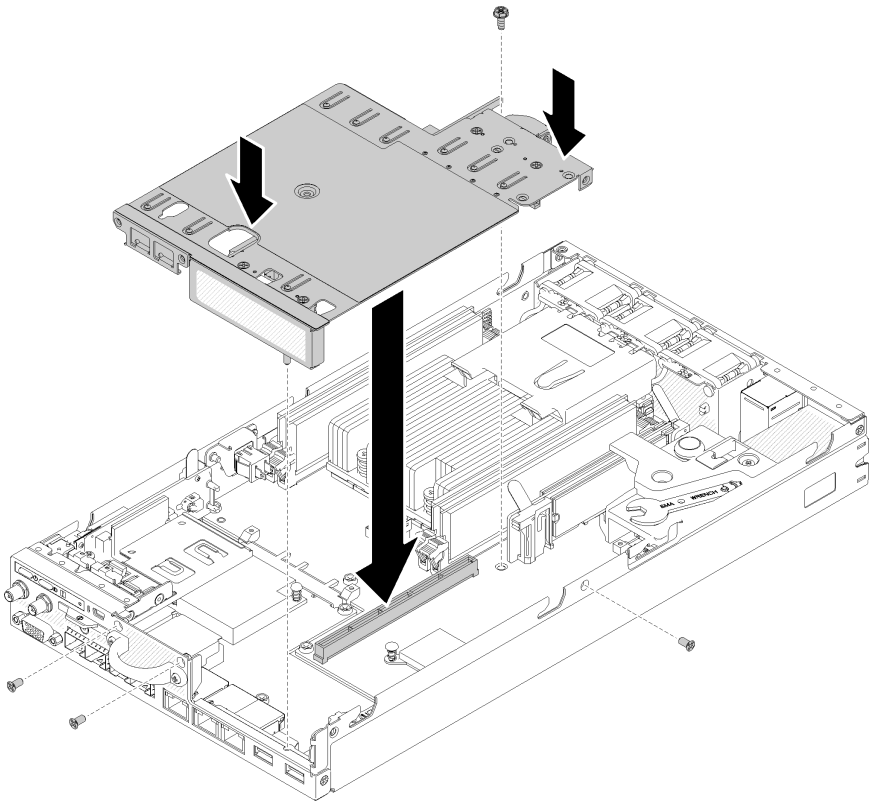


Figure 46. PCIe riser assembly installation

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

1. Install the node if needed (see “Install a compute node” on page 65).
2. Reconnect power cords and all external cables.

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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).

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

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

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

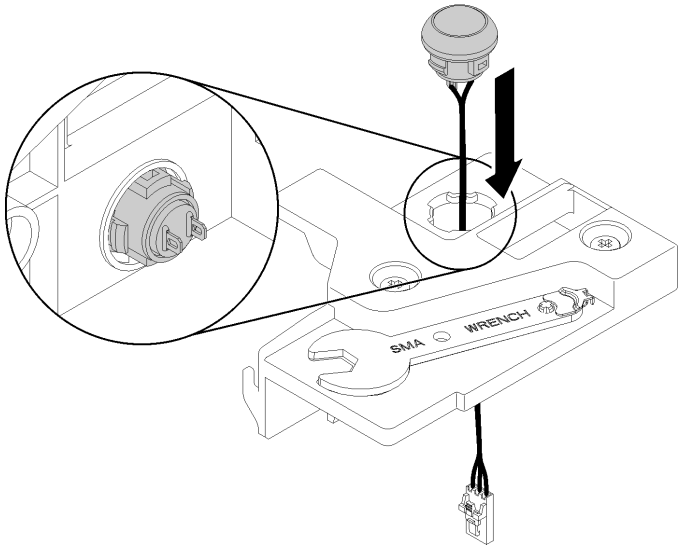


Figure 47. Intrusion switch cable installation

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.

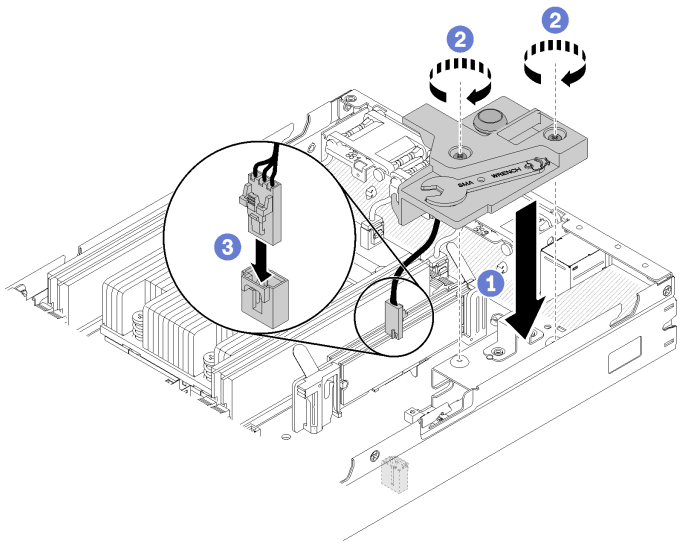


Figure 48. Intrusion switch installation

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

1. Install the node if needed (see “Install a compute node” on page 65).
2. Reconnect power cords and all external cables.

Install a DIMM

Use this information to install a DIMM.

Before you install a DIMM, complete the following steps:

1. Read the following sections to ensure that you work safely.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).
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.

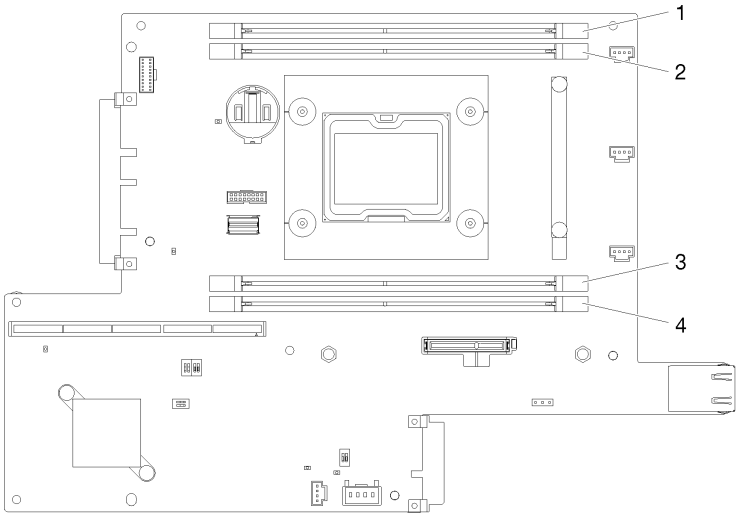


Figure 49. DIMM connectors

The following table show the sequence of DIMM installation

Table 17. DIMM installation sequence

Total DIMM installed	DIMM 1	DIMM 2	DIMM 3	DIMM 4
1	√			
2	√			√
3	√	√		√
4	√	√	√	√

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 36:

- 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 the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

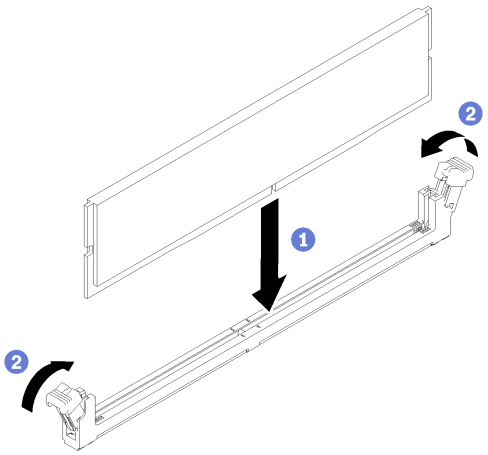


Figure 50. DIMM installation

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 62).
2. Install the node if needed (see “Install a compute node” on page 65).
3. Reconnect power cords and all external cables.

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.
   - “Installation Guidelines” on page 34

2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).

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

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

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.

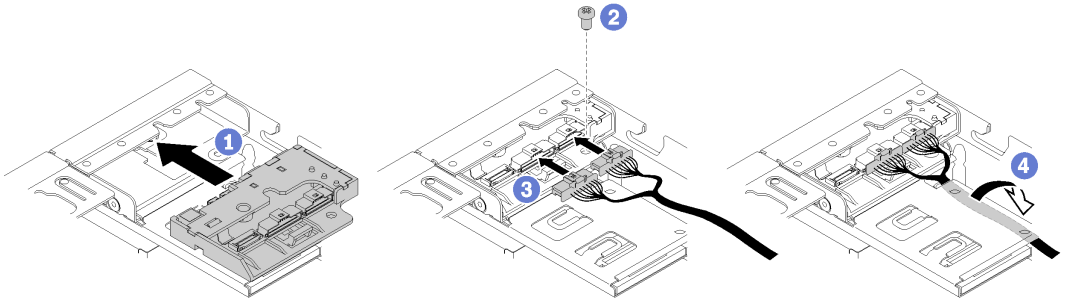


Figure 51. Front operator panel installation

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

1. Install the M.2 WLAN/LTE wireless adapter if needed.
2.
3. Install the lock position switch if removed (see “Install the lock position switch” on page 61).
4. Install the node if needed (see “Install a compute node” on page 65).
5. Reconnect power cords and all external cables.

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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).

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

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

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

Step 2. Install and fasten the screw.

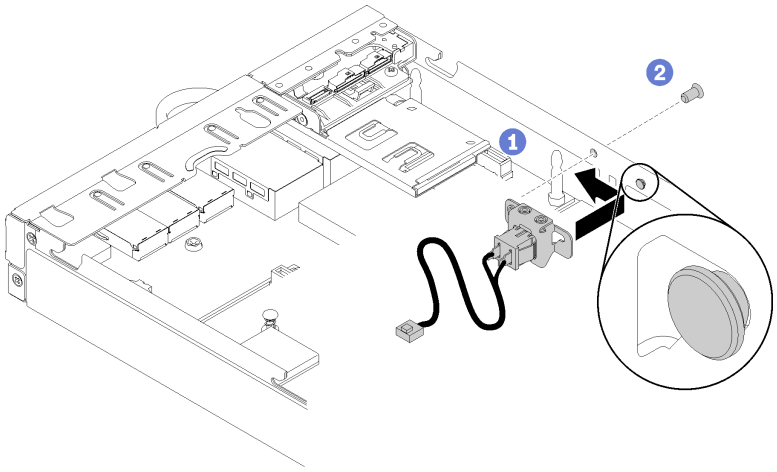


Figure 52. Lock position switch installation

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

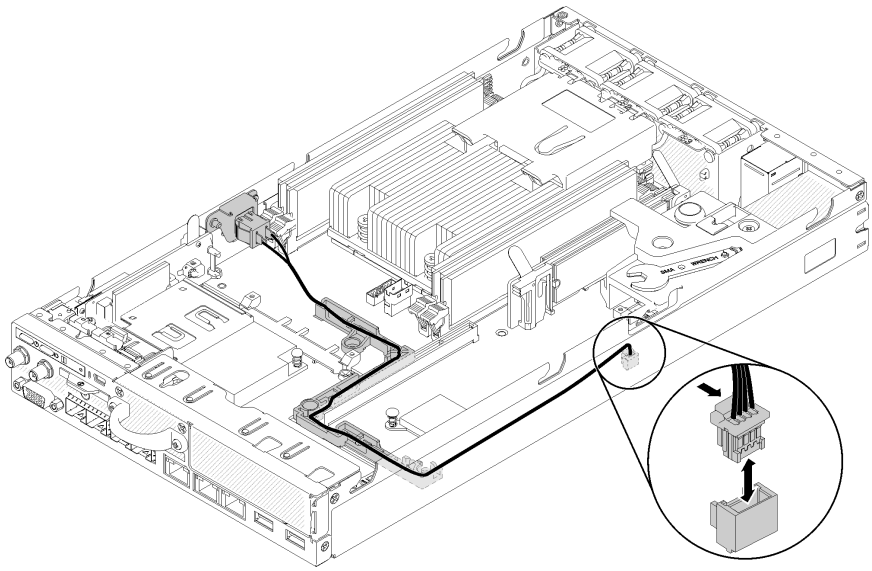


Figure 53. Lock position switch cable

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 56).
2. Install the node if needed (see “Install a compute node” on page 65).
3. Reconnect power cords and all external cables.

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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).

To install the air baffle, complete the following steps:

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

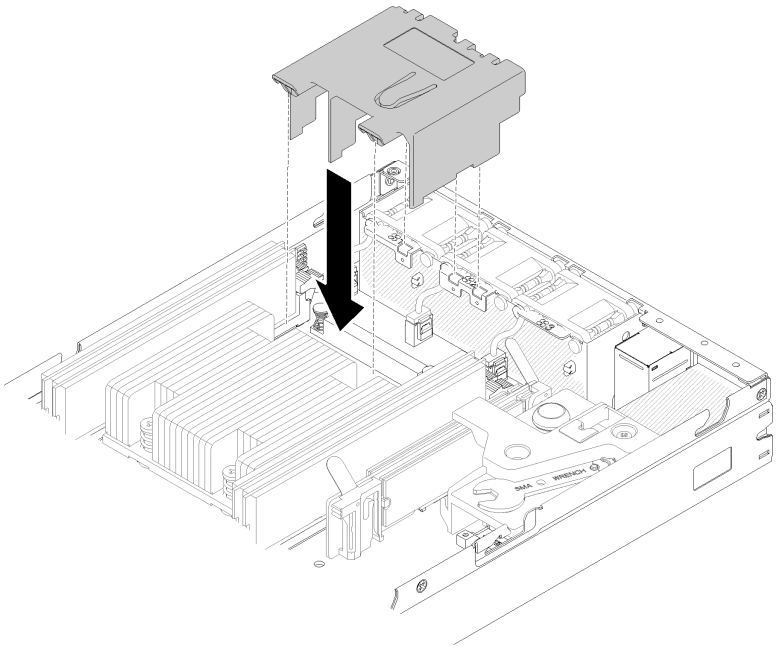


Figure 54. Air baffle installation

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 compute node” on page 65).
2. Reconnect power cords and all external cables.

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 following 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.
   - “Installation Guidelines” on page 34
2. Turn off the server. Disconnect the power cords and all external cables (see “Power off the server” on page 69).
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 the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

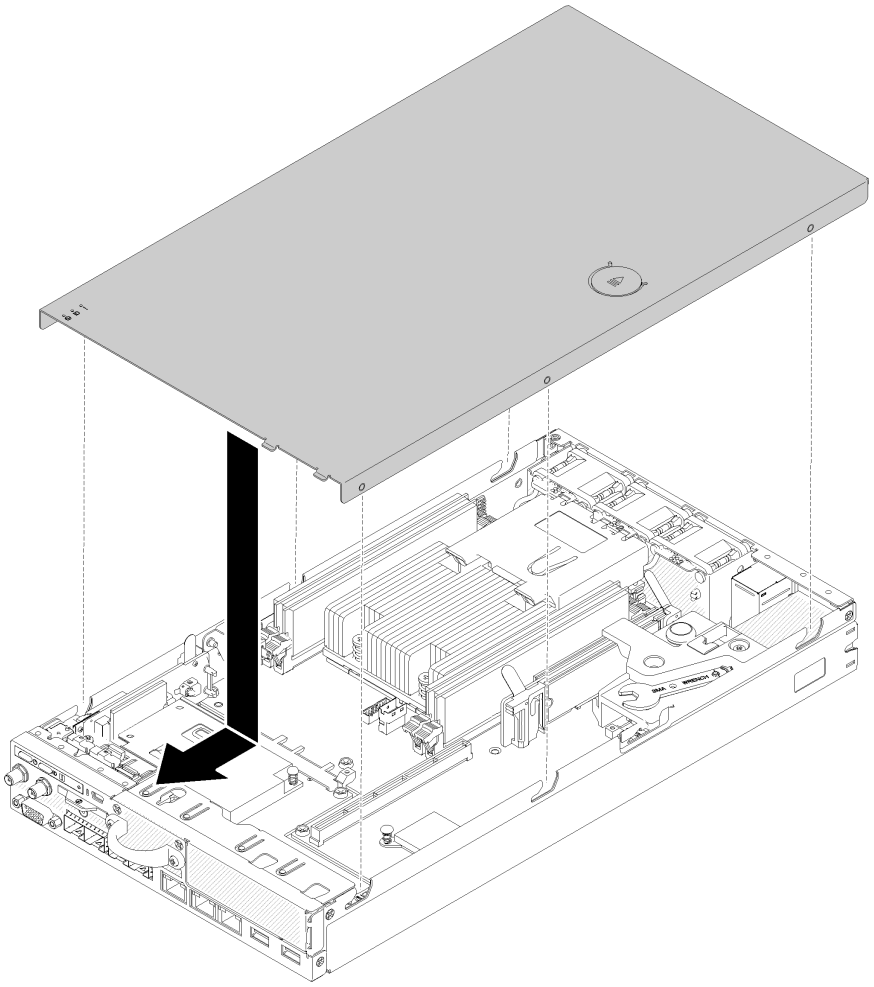


Figure 55. Top cover installation

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 69).

Install a compute node

Use this information to install a compute node.

Before you install a compute node, complete the following steps:

1. Read the following sections to ensure that you work safely.
   - “Installation Guidelines” on page 34
2. Make sure all the removed components are installed, and all the disconnected cables inside the server are reconnected.

To install a compute node, complete the following steps:

Watch the procedure. A video of the process is available:
- Youtube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-DkEpH4SzvKZck4f6rVRzUE&playnext=1&index=1
- Youku: http://list.youku.com/albumlist/show/id_52211641.html

Step 1. Install the node.

- If you are installing the node into the enclosure, complete the following steps.
  1. Select the node bay.
  2. Insert the node into the node bay until it stops.
     - 1U 2-node

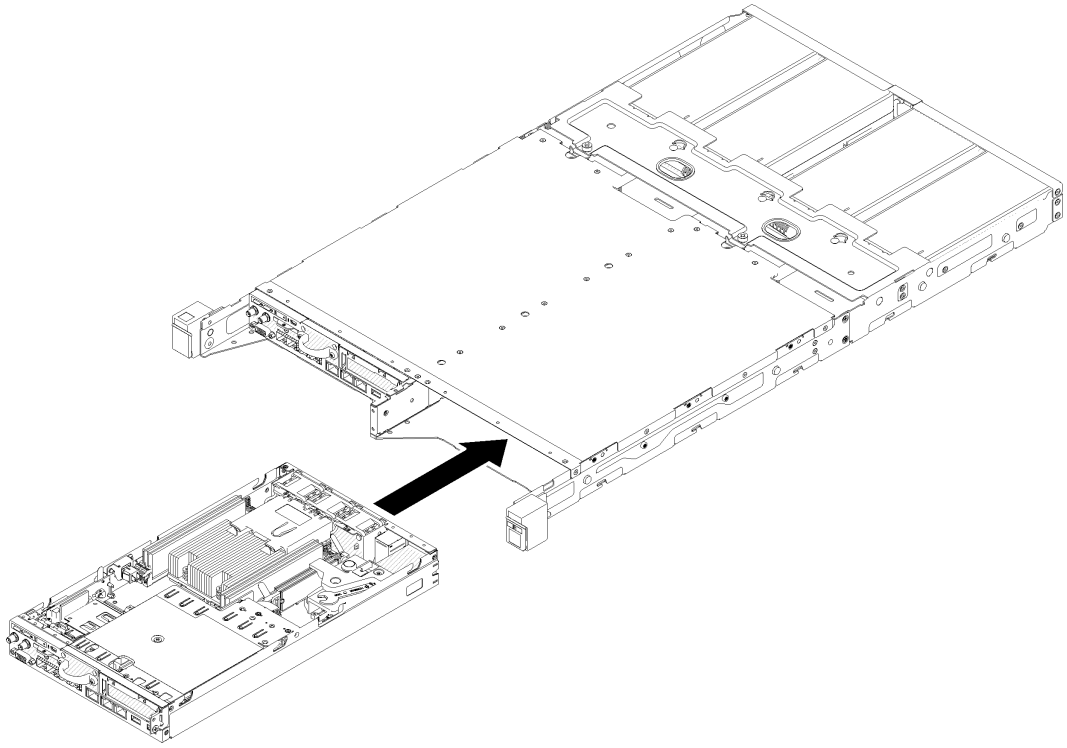


Figure 56. Node installation

     - 2U 2-node

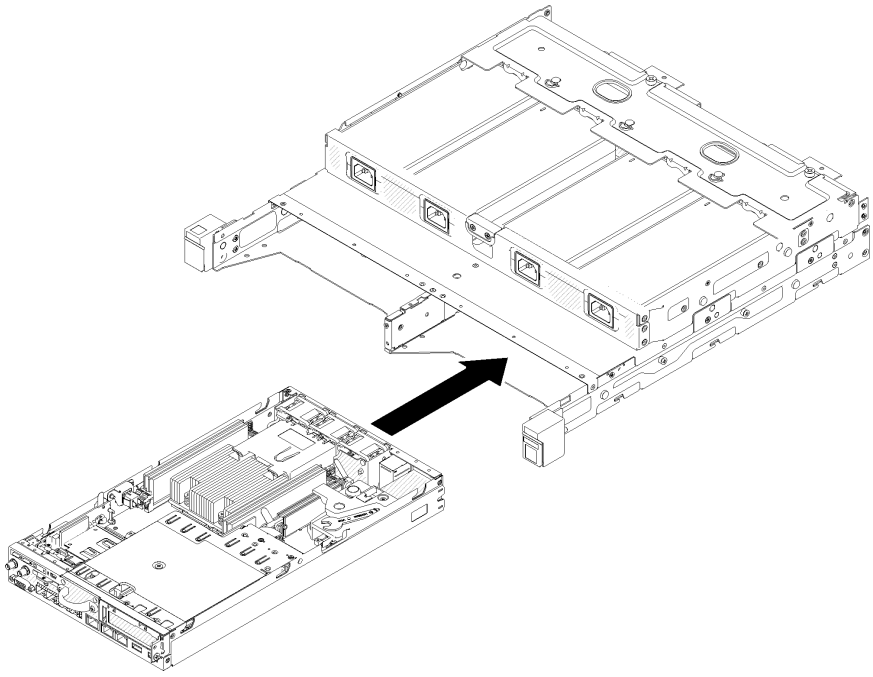


Figure 57. Node installation

- If you are installing the node into the node sleeve, complete the following steps.
  1. Align the node with the node sleeve and slide the node into place.
  2. Fasten the two thumbscrews.

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

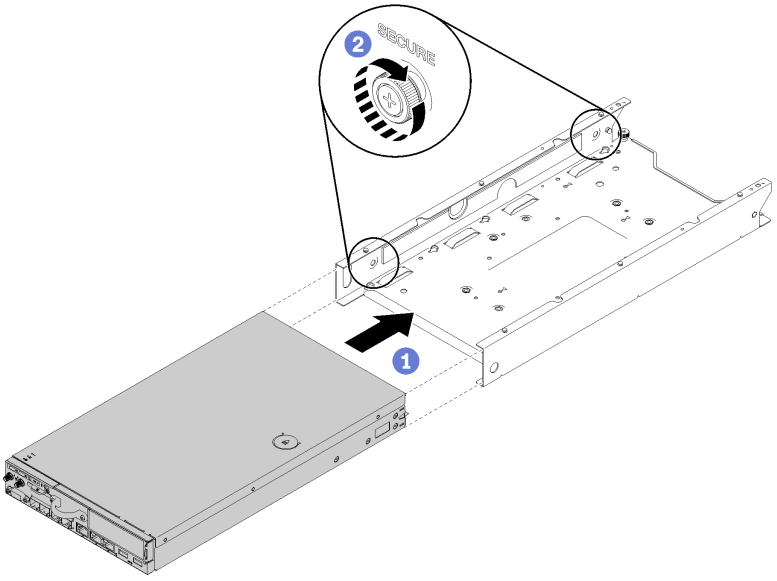


Figure 58. Node installation

Step 2. Align and insert the bezel onto the front of the server.

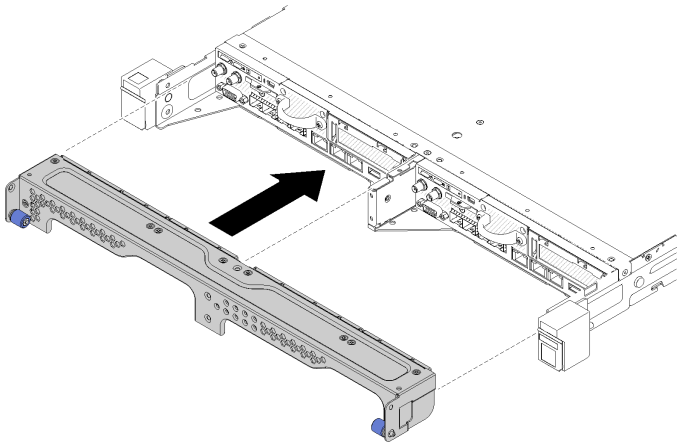


Figure 59. Node installation

Step 3. Install the five screws and fasten the two thumb screws to secure the locking bezel.

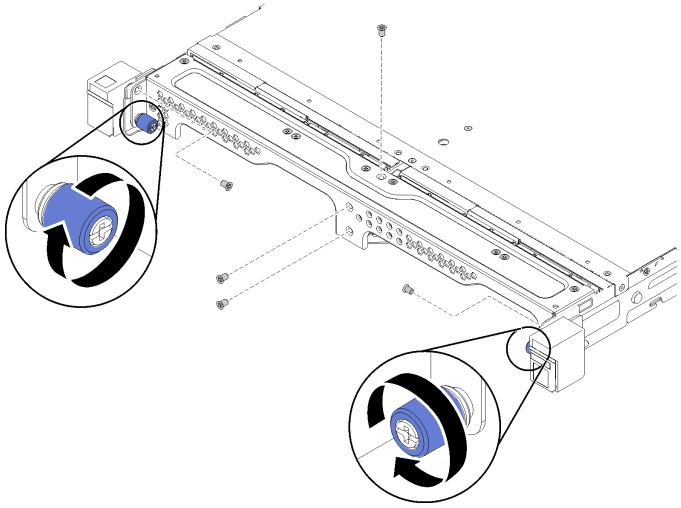


Figure 60. Node installation

After you install a compute 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 69).

Install the server in a rack

To install the server in a rack, follow the instructions that are provided below.

To install the server in a rack, follow the instructions that are provided in the Rail Installation Kit for the rails on which the server will be installed.

Cable the server

Attach all external cables to the server. Typically, you will need to connect the server to a power source, to the data network, and to storage. In addition, you will need to connect the server to the management network.

Connect to power

Connect the server to power.

Connect to the network

Connect the server to the network.

Connect to storage

Connect the server to any storage devices.

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 69.

Validate server setup

After powering up the server, make sure that the LEDs are lit and that they are green.

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 69.

Chapter 4. System configuration

Complete these procedures to configure your system.

Activate the system

ThinkSystem SE350 server is shipped in locked state for security. Before operation, server needs to be activated to be fully functional. Follow the detailed steps below to activate the system.

For more information, see activation guides in https://datacentersupport.lenovo.com/tw/en/products/servers/thinksystem/se350/documentation.

Claim the device

Server needs to be claimed to the organization before activation. Use existing Lenovo ID or create a new one to log in the ThinkSystem Key Vault Portal or ThinkShield mobile APP.

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

Complete the following steps to claim the device to the organization, these steps should be performed by IT department of the organization :

1. Log in to the Lenovo ThinkSystem Key Vault Portal, and accept the **Terms and Conditions**.
2. Accept the **Privacy Policy**.
3. Click **Devices +** or **+ Claim device** to start the claiming process.
4. Input serial number, machine type, and activation code of the server. These three columns are required.

   Notes:

   - Device name is optional. ThinkSystem Key Vault Portal will generate an unique device name if no information is input.
   - Each device name must be unique within the organization.
5. Click **Claim** to complete the process.
6. Server will be displaying in the device list page.

Activation methods

After successful claiming, there are three different methods to active the server. Depending on the environment of the server, decide the most suitable way to activate the server.

1. **Mobile App connection**

   After downloading the mobile App for ThinkSystem SE350, connect mobile phone with the server and activate the server through the App. For the detailed steps, see “Mobile App connection” on page 72.
2. **Internet connection**

   If the server has access to the internet, it can be activated through Lenovo XClarity Controller. For the detailed steps, see “Internet connection” on page 72.
3. **Web manual activation**

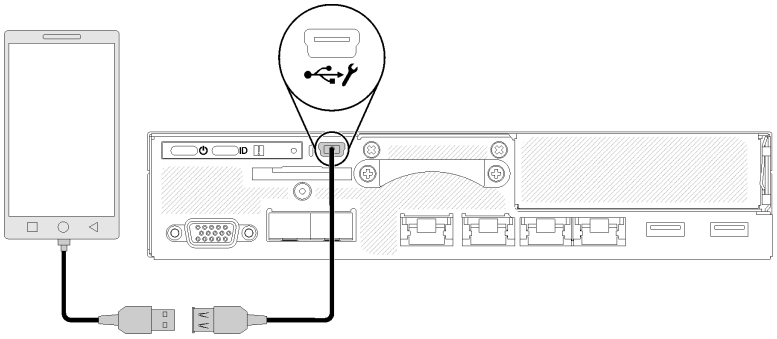
   If the server has no access to the internet, it can be activated through the manual process on ThinkSystem Key Vault Portal. For the detailed steps, see “Web manual activation (server has no access to internet)” on page 72.

Mobile App connection

1. Download the Android or iOS App ThinkShield at https://apps.thinkshield.lenovo.com.

   Notes:

   - ThinkShield supports Android mobile devices with Android operation system 5.0 - 9.0.
   - ThinkShield supports iOS mobile devices with iOS 12 or above.
2. Use Lenovo ID to login to the App ThinkShield.
3. Power on the server.
4. Click the **Activate Device** in the App ThinkShield.
5. Connect the mobile phone to the server as shown, using your own mobile phone cable and the cable shipped with the system.



6. Enable tethering on your phone:
   - For Android phone, click the **Go to settings** on the screen to tethering setting and enable tethering.
     - For more information, see https://support.google.com/android/answer/9059108.
   - For iOS phone, go to Settings and enable **Personal Hotspot** (tethering).
     - For more information, see https://support.apple.com/HT204023.
7. App start the automatic activation process.
   a. Wait for App to establish connection to the server.
   b. Wait for App to establish connection to cloud.
8. **Device Activated** message will be shown after the device is successfully activated.

Internet connection

1. Select the server you plan to activate on the Lenovo ThinkSystem Key Vault Portal and click **Activate**.
2. The status of the server will change to **Ready**.
3. Perform an AC cycle and power on the server.
4. Connect server XCC port to Internet, see XCC port location on “Front view” on page 18.
5. Server will be activated within 15 minutes and power on automatically.
6. After successful activation, the status of the server will change to **Activate** on the Key Vault Portal.

Note: If the server is not activated successfully in 2 hours after power cable plug in, perform an AC cycle and power on the server again.

Web manual activation (server has no access to internet)

In web manual activation, the process requires to switch between two websites (Lenovo XClarity Controller and Lenovo ThinkSystem Key Vault Portal) for information input and exchange. See the instruction below:

1. Perform an AC cycle and power on the server.
2. Login into the XCC portal on web browser.
   - Select **BMC configuration → Security → System Lockdown Mode**
   - Configure the state of the server from **Asserted** to **De-asserted**.
   - **Challenge text** shows on the Key Vault Activation pop-up window.
   -
3. Log into Lenovo ThinkSystem Key Vault Portal.
   - Select the server you plan to activate and click **Manually Activate**.
   - Input the **Challenge text** and click **Generate Response**, the portal shows **Challenge Response** in return.
4. Go back to XCC portal and input **Challenge Response** on the Key Vault Activation pop-up window.
   - Click **OK**.
   - **System Lockdown Mode** changes to **De-asserted state**.
5. Go back to Lenovo ThinkSystem Key Vault Portal and click **Activate**. The sever changes its status to **Manually Activated**.

Customer's responsibility:

- Keep Secure Activation Code (provided in flyer).
- Maintain a back up of SED AK, see “Backup the Self Encryption Drive Authentication Key (SED AK) ” on page 73.
- Move SE350 system to a safe working place for service.
- Prepare the cable of mobile phone.
- Engage IT department so they can help to claim or activate device when required.
- Confirm if the SE350 system is claimed. If not, work with IT department to claim the device.
- Restore SED AK from the back up file and set the password.
- Place SE350 system back to the working place after service.
- Confirm the wireless (network) connectivity is working. Service technician cannot help examine the connection of the device to network.

Backup the Self Encryption Drive Authentication Key (SED AK)

After setting up the server or making changes to the configuration, backing up the Self Encryption Drive Authentication Key (SED AK) is a must operation to prevent data loss in the hardware failure case.

SED Authentication Key (AK) Manager

Find SED Authentication Key (AK) Manager in Lenovo XClarity Controller to change, backup, or recover the SED AK of the server. See https://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/dw1lm_c_ch1_introduction.html for more information.

Change the SED AK

- **Generate SED AK from Passphrase:** Set the password and reenter it for the confirmation. Click **Re-generate** to get the new SED AK.
- **Generate a Random SED AK:** Click Re-generate to get a Random SED AK.

  Note: If System Lockdown Mode is enabled, generating SED AK function is not available.

Backup the SED AK

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

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

Recover the SED AK

- **Recover SED AK using Passphrase:** Use the password that set in **Generate SED AK from Passphrase** mode to recover the SED AK.
- **Recover SED AK from Backup file:** Upload the backup file generated in **Backup the SED AK** mode and enter the corresponding backup file password to recover the SED AK.

Set the network connection for the Lenovo XClarity Controller

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

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

- If a monitor is attached to the server, you can use Lenovo XClarity Controller to set the network connection.
- If no monitor attached to the server, you can set the network connection through the Lenovo XClarity Controller interface. Connect an Ethernet cable from your laptop to Lenovo XClarity Controller connector, which is located at the front of the server. For the location of the Lenovo XClarity Controller connector, see “Front view” on page 18.

  Note: Make sure that you modify the IP settings on the laptop so that it is on the same network as the server default settings.

  The default IPv4 address and the IPv6 Link Local Address (LLA) is provided on the Lenovo XClarity Controller Network Access label that is affixed to the Pull Out Information Tab.
- If you are using the Lenovo XClarity Administrator Mobile app from a mobile device, you can connect to the Lenovo XClarity Controller through the Lenovo XClarity Controller USB connector on the front of the server. For the location of the Lenovo XClarity Controller USB connector, see “Front view” on page 18.

  Note: The Lenovo XClarity Controller USB connector mode must be set to manage the Lenovo XClarity Controller (instead of normal USB mode). To switch from normal mode to Lenovo XClarity Controller management mode, hold the blue ID button on the front operator panel for at least 3 seconds until its LED flashes slowly (once every couple of seconds).

  To connect using the Lenovo XClarity Administrator Mobile app:

  1. Connect the USB cable of your mobile device to the Lenovo XClarity Administrator USB connector on the front operator panel.
  2. On your mobile device, enable USB tethering.
  3. On your mobile device, launch the Lenovo XClarity Administrator mobile app.
  4. If automatic discovery is disabled, click **Discovery** on the USB Discovery page to connect to the Lenovo XClarity Controller.

  For more information about using the Lenovo XClarity Administrator Mobile app, see:

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

Important: The Lenovo XClarity Controller is set initially with a user name of USERID and password of PASSW0RD (with a zero, not the letter O). This default user setting has Supervisor access. Change this user name and password during your initial configuration for enhanced security.

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

Step 1. Start the server.

Step 2. When you see <F1> Setup, press F1.

Step 3. Specify how the Lenovo XClarity Controller will connect to the network.

- If you choose a static IP connection, make sure that you specify an IPv4 or IPv6 address that is available on the network.
- If you choose a DHCP connection, make sure that the MAC address for the server has been configured in the DHCP server.

Step 4. Click **OK** to continue starting the server.

Update the firmware

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

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

Notes:

- 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.
- IPMI over KCS Access is disabled by default in ThinkSystem SE350. To enable the function, go to Lenovo XClarity Controller **BMC Configuration → Security → IPMI over KCS Access** to enable the function.

Best practices related to updating firmware is available at the following location:

http://lenovopress.com/LP0656

Important 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 Operating System executing on the server's operating system.
- **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.

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

Note: The server UEFI settings for option ROM must be set to **Auto** or **UEFI** to update firmware using Lenovo XClarity Administrator or Lenovo XClarity Essentials. For more information, see the following Tech Tip:

https://datacentersupport.lenovo.com/us/en/solutions/ht506118

Tool	In-band update	Out-of-band update	On-target update	Off-target update	Graphical user interface	Command-line interface	Supports UXSPs
Lenovo XClarity Provisioning Manager Limited to core system firmware only.	√			√	√		√
Lenovo XClarity Controller Supports core system firmware and most advanced I/O option firmware updates		√		√	√	√	
Lenovo XClarity Essentials OneCLI Supports all core system firmware, I/O firmware, and installed operating system driver updates	√	√				√	√
Lenovo XClarity Essentials UpdateXpress Supports all core system firmware, I/O firmware, and installed operating system driver updates	√	√			√		√
Lenovo XClarity Essentials Bootable Media Creator Supports core system firmware and I/O firmware updates. You can update the Microsoft Windows operating system, but device drivers are not included on the bootable image	√				√	√	√
Lenovo XClarity Administrator Supports core system firmware and I/O firmware updates	√	√		√	√		

The latest firmware can be found at the following site:

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

- **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 press F1. 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.

  Additional information about using Lenovo XClarity Provisioning Manager to update firmware is available at:

  http://sysmgt.lenovofiles.com/help/topic/LXPM/platform_update.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.

    Additional information about configuring Ethernet over USB is available at:

    http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/NN1ia_c_configuringUSB.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.

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

  http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/NN1ia_c_manageserverfirmware.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).

  Specific details about updating firmware using Lenovo XClarity Essentials OneCLI is available at:

  http://sysmgt.lenovofiles.com/help/topic/toolsctr_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/lnvo-xpress

- **Lenovo XClarity Essentials Bootable Media Creator**

You can use Lenovo XClarity Essentials Bootable Media Creator to create bootable media that is suitable for applying firmware updates, running preboot diagnostics, and deploying Microsoft Windows operating systems.

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

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

- **Lenovo XClarity Administrator**

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

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

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

Configure the firmware

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

Important: Do not configure option ROMs to be set to **Legacy** unless directed to do so by Lenovo Support. This setting prevents UEFI drivers for the slot devices from loading, which can cause negative side effects for Lenovo software, such as Lenovo XClarity Administrator and Lenovo XClarity Essentials OneCLI, and to the Lenovo XClarity Controller. The side effects include the inability to determine adapter card details, such as model name and firmware levels. When adapter card information is not available, generic information for the model name, such as "Adapter 06:00:00" instead of the actually model name, such as "ThinkSystem RAID 930-16i 4GB Flash." In some cases, the UEFI boot process might also hang.

- **Lenovo XClarity Provisioning Manager**

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

  Note: The Lenovo XClarity Provisioning Manager provides a Graphical User Interface to configure a server. The text-based interface to system configuration (the Setup Utility) is also available. From Lenovo XClarity Provisioning Manager, you can choose to restart the server and access the text-based interface. In addition, you can choose to make the text-based interface the default interface that is displayed when you press F1.

- **Lenovo XClarity Essentials OneCLI**

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

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

  http://sysmgt.lenovofiles.com/help/topic/toolsctr_cli_lenovo/onecli_c_settings_info_commands.html

- **Lenovo XClarity Administrator**

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

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

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

- **Lenovo XClarity Controller**

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

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

  http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/NN1ia_c_manageserverfirmware.html

Memory configuration

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

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

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

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

http://1config.lenovo.com/#/memory_configuration

For specific information about the required installation order of memory modules in your server based on the system configuration and memory mode that you are implementing, see the *ThinkSystem SE350 Memory Population Reference*.

RAID configuration

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

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

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

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

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

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

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

Wireless Enabled LOM Package Configuration

Use this information to set configuration of wireless enabled LOM package.

Setting up the network topology

A network topology is an arrangement of network in which all nodes connect with each other using network links. System reset the network settings of ports to default after users change network topology.

Note: LTE/WLAN and IPMI over KCS Accessare disabled by default, it is required to enable them through XCC.

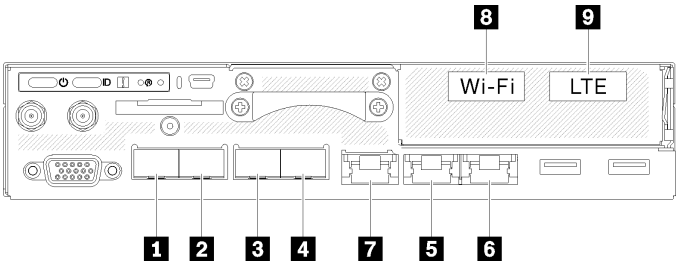


Figure 61. Ports on the front of the server

There are five types of network topology that are available for chosen. See the information below for the different usage of ports in each configuration.

Table 18. Configuration 1 - maximum access links to IOT gateway (default configuration)

Function	Port
Host port	1 and 2 Two 10Gb Ethernet SFP+
XCC Management port	7 1Gb Ethernet RJ45
Uplink port (cloud port)	6 1Gb Ethernet RJ45 9 LTE (an adapter inside the node, not a physical port, default is disabled)
Downlink port (edge port)	3 and 4 Two 1Gb Ethernet SFP 5 1Gb Ethernet RJ45 8 WLAN AP (an adapter inside the node, not a physical port, default is disabled)

Table 19. Configuration 2 - Two ThinkSystem SE350 are connected as redundancy in cluster mode

Function	Port
Host port	1 and 2 Two 10Gb Ethernet SFP+
XCC Management port	7 1Gb Ethernet RJ45
Uplink port (cloud port)	6 1Gb Ethernet RJ45 9 LTE (an adapter inside the node, not a physical port, default is disabled)
Cluster port (inter-switch port)	3 1Gb Ethernet SFP
Downlink port (edge port)	4 1Gb Ethernet SFP 5 1Gb Ethernet RJ45 8 WLAN AP (an adapter inside the node, not a physical port, default is disabled)

Table 20. Configuration 3 - Three ThinkSystem SE350 are connected as redundancy in cluster mode

Function	Port
Host port	1 and 2 Two 10Gb Ethernet SFP+
XCC Management port	7 1Gb Ethernet RJ45
Uplink port (cloud port)	6 1Gb Ethernet RJ45 9 LTE (an adapter inside the node, not a physical port, default is disabled)
Cluster port (inter-switch port)	3 and 4 Two 1Gb Ethernet SFP
Downlink port (edge port)	5 1Gb Ethernet RJ45 8 WLAN AP (an adapter inside the node, not a physical port, default is disabled)

Table 21. Configuration 4 - WLAN port work as a uplink fail-over

Function	Port
Host port	1 and 2 Two 10Gb Ethernet SFP+
XCC Management port	7 1Gb Ethernet RJ45
Uplink port (cloud port)	6 1Gb Ethernet RJ45 8 WLAN client (an adapter inside the node, not a physical port, default is disabled) 9 LTE (an adapter inside the node, not a physical port, default is disabled)
Downlink port (edge port)	3 and 4 2x GbE SFP 5 1Gb Ethernet RJ45

Table 22. Configuration 5- Extra WLAN client as a uplink fail-over

Function	Port
Host port	1 and 2 Two 10Gb Ethernet SFP+
XCC Management port	7 1Gb Ethernet RJ45
Uplink port (cloud port)	9 LTE (an adapter inside the node, not a physical port, default is disabled)
Downlink port (edge port)	3 and 4 Two 1Gb Ethernet SFP 5 and 6 Two 1Gb Ethernet RJ45 8 WLAN AP (an adapter inside the node, not a physical port, default is disabled)

BMC network bridge

BMC network bridge is an configuration to select the outbound interface to access to BMC management port. There are four options as shown below. The default is “None”, which means only dedicated RJ45 can access XCC interface.

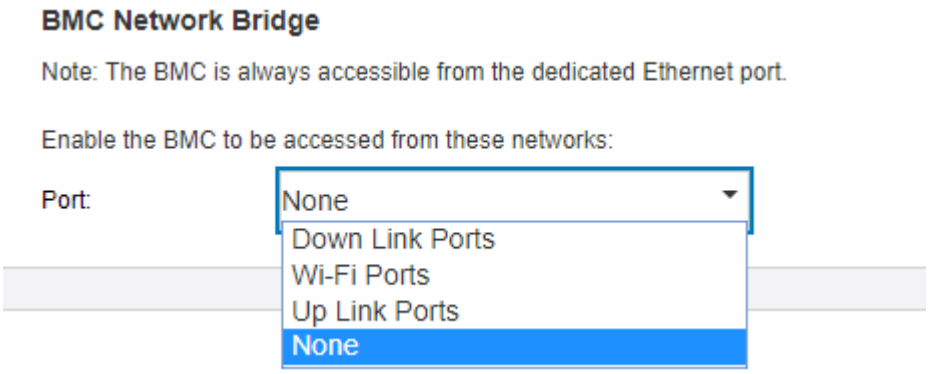


Figure 62. BMC network bridge

Install the operating system

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

- **Lenovo XClarity Administrator**

  If you are managing your server using Lenovo XClarity Administrator, you can use it to deploy operating-system images to up to 28 managed servers concurrently. For more information about using Lenovo XClarity Administrator to deploy operating system images, see:

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

- **Lenovo XClarity Provisioning Manager**

  Lenovo XClarity Provisioning Manager is used to install operating system of single server. You can complete operating system installation by following the instructions in Lenovo XClarity Provisioning Manager OS Installation function.

- **Install the operating system manually**

  If you cannot install the operating system through Lenovo XClarity Administrator or Lenovo XClarity Provisioning Manager, you can install the operating system manually. For more information about installing a specific operating system:

  1. Go to http://datacentersupport.lenovo.com and navigate to the support page for your server.
  2. Click **How-tos & Solutions**.
  3. Select an operating system and the installation instructions will be displayed.

Back up the server configuration

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

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

- **Management processor**

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

  http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/NN1ia_c_backupthexcc.html

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

http://sysmgt.lenovofiles.com/help/topic/toolsctr_cli_lenovo/onecli_r_save_command.html

- **Operating system**

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

Chapter 5. Resolving installation issues

Use this information to resolve issues that you might have when setting up your system.

Use the information in this section to diagnose and resolve problems that you might encounter during the initial installation and setup of your server.

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.

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. View processor details from system setup.
3. (Trained technician only) Make sure that system board is seated correctly
4. If error still occur, replace the system board and restart the server.

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 http://www.lenovo.com/us/en/serverproven/ 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 the XClarity Controller product documentation:

   http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/dw1lm_c_chapter2_openingandusing.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.

Displayed system memory less than installed physical memory

Complete the following steps until the problem is resolved:

Note: Each time you install or remove a DIMM, you must disconnect the server from the power source; then, wait 10 seconds before restarting the server.

1. Make sure that:
   - The memory modules are seated correctly.
   - You have installed the correct type of memory.
   - If you changed the memory, you updated the memory configuration 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 DIMMs, and then restart the server.
3. Run memory diagnostics. When you start a server and press F1, the Lenovo XClarity Provisioning Manager interface is displayed by default. You can perform memory diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → Memory test**.
4. Check the POST error log:
   - If a DIMM was disabled by a systems-management interrupt (SMI), replace the DIMM.
   - If a DIMM was disabled by the user or by POST, reseat the DIMM; then, run the Setup utility and enable the DIMM.
5. Reseat the DIMM.
6. Restart the server.

A Lenovo optional device that was just installed does not work.

1. Make sure that:
   - The device is supported for the server (see http://www.lenovo.com/us/en/serverproven/).
   - 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 F1 to display the system setup interface. 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.

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 3 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.

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: This section includes references to IBM web sites and information about obtaining service. 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 http://www.lenovo.com/us/en/serverproven/ 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://www-947.ibm.com/support/servicerequest/Home.action 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 http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/NN1ia_c_servicesandsupport.html.
  - For more information about using the CLI to collect service data, see http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/nn1ia_r_ffdccommand.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/toolsctr_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/supportphonelist for your region support details.

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