Lenovo

ThinkSystem SN550 Compute Node Maintenance Manual

Machine Type: 7X16

Note

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

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

Twenty-third Edition (April 2024)

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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 přečtěте 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.

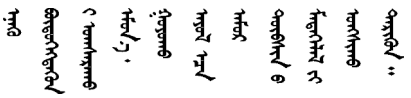
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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.

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Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

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

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

مەزكۇر مەھسۇلاتنى ئورنىتىشتىن بۇرۇن بىخەتەرلىك ئۇچۇرلىرىنى ئوقۇپ چىقىڭ.

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

Safety inspection checklist

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

Notes:

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

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

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

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

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

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Chapter 1. Introduction

Each ThinkSystem SN550 compute node supports up to two 2.5-inch hot-swap Serial Attached SCSI (SAS), Serial ATA (SATA) or Non-Volatile Memory express (NVMe) hard disk drives.

When you receive your Lenovo ThinkSystem SN550 Type 7X16 compute node, refer to the *Setup Guide* to set up the compute node, install optional devices, and perform the initial configuration of the compute node. Meanwhile, the *Maintenance Manual* contains information to help you solve problems that might occur in your Lenovo ThinkSystem SN550 Type 7X16 compute node. It describes the diagnostic tools that come with the compute node, error codes and suggested actions, and instructions for replacing failing components.

The compute node 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

Notes:

1. The first generation Chassis Management Module (CMM1; 68Y7030) is not supported by the ThinkSystem SN550 compute node.
2. The second generation Chassis Management Module (CMM2; 00FJ669) must be at firmware level 1.6.1 or above to support the ThinkSystem SN550 compute node. This applies to both CMMs that are installed in the chassis.
3. The illustrations in this document might differ slightly from your model.

Identifying your compute node

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

Record information about the compute node in the following table.

Table 1. Record of the system information

Product name	Machine Type (s)	Model number	Serial number
Lenovo ThinkSystem SN550 Type 7X16	7X16		

The model number and serial number are on the ID label on the front of the compute node and the chassis, as shown in the following illustration.

Note: The illustrations in this document might differ slightly from your hardware.

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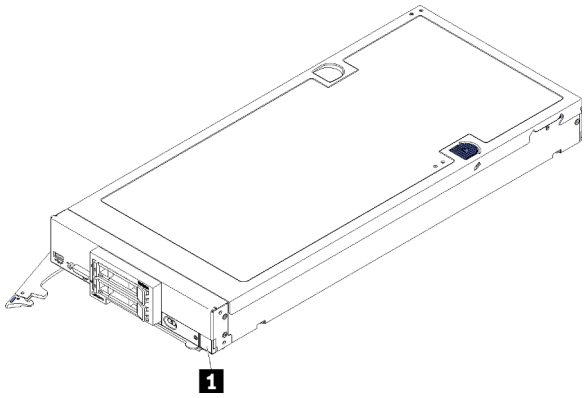

Figure 1. ID label on the front of the node

Table 2. ID label on the front of the node

1 ID label

Customer information tabs

The customer information tabs contain system-related information such as firmware level, administrator accounts and so forth.

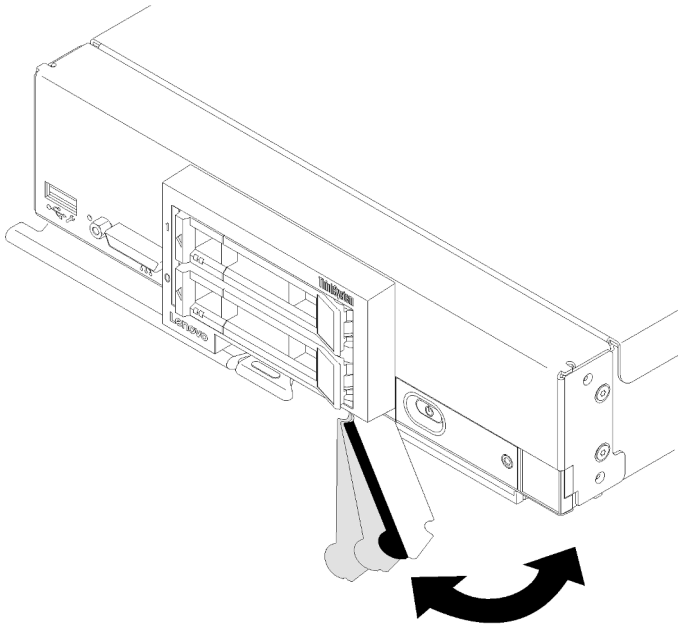

Figure 2. Location of customer information tabs

Specifications

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

Table 3. Specifications

Specification	Description
Size	• Height: 55.5 mm (2.2 in) • Depth: 492.7 mm (19.4 in) • Width: 215.5 mm (8.5 in)
Weight	Approximately 4.7 kg (10.4 lb) to 7.0 kg (15.5 lb), depending on your configuration.
Processor (depending on the model)	Processor: Up to two multi-core Intel Xeon processors. **Notes:** • Use the Setup utility to determine the type and speed of the processors in the compute node. • When using Intel Xeon Gold 6126T 12C 125W 2.6 GHz Processor, Intel Xeon Gold 6144 8C 150W 3.5 GHz Processor, Intel Xeon Gold 6146 12C 165W 3.2 GHz Processor, Intel Xeon Platinum 8160T 24C 150W 2.1 GHz Processor, or Intel Xeon Platinum 6244 8C 150W 3.6 GHz Processor, please note the following: – The ambient temperature should be less than 30°C. – When operating above 30°C or in the event of a fan failure, the server will continue to function as long as all the component's temperature requirements are met. However, the performance may be reduced. – The noise level will be significantly higher than the base models. For a list of supported processors, see: https://serverproven.lenovo.com/
Memory	See "Memory module installation order" in *Setup Guide* for detailed information about memory configuration and setup. • Minimum: 8 GB • Maximum: – 6.9 TB with DC Persistent Memory Module (DCPMM) • Type: – Error correcting code (ECC), Low-profile (LP) double-data rate (DDR4) RDIMM, LRDIMM, and 3DS RDIMM (mixing is not supported) – DC Persistent Memory Module (DCPMM) • Supports (depending on the model): – 8 GB, 16 GB, 32 GB, and 64 GB RDIMM – 64 GB LRDIMM – 128 GB 3DS RDIMM – 128 GB, 256 GB, and 512 GB DCPMM • Slots: 24 dual inline memory module (DIMM) connectors that support up to: – 24 DRAM DIMMs – 12 DRAM DIMMs and 12 DCPMMs For a list of supported DIMMs, see: https://serverproven.lenovo.com/ **Note:** List of supported memory module is different for 1st generation (Skylake) and 2nd generation (Cascade Lake) Intel Xeon processors. Make sure to install compatible memory modules to avoid system error.
2.5-inch drive/backplane	• Supports up to two small form factor (SFF) drive bays. Drive bay can be either SATA only, SAS/SATA, or NVMe/SATA, depending on the model. • Supported 2.5-inch drives: – Serial Attached SCSI (SAS)/Serial Advanced Technology Attachment (SATA) hot-swap hard disk drives/solid-state drives – Non-Volatile Memory Express (NVMe) solid-state drives

Table 3. Specifications (continued)

Specification	Description
M.2 drive/backplane	ThinkSystem M.2 with Mirroring Enablement Kit contains dual M.2 backplane supports up to two identical M.2 drives. Supports 3 different physical sizes of M.2 drives: • 42 mm (2242) • 60 mm (2260) • 80 mm (2280) **Note:** ThinkSystem M.2 Enablement Kit contains single M.2 backplane is only supported in pre-configured models.
RAID adapter	• RAID 530-4i adapter • RAID 930-4i-2GB adapter
Integrated functions	• One baseboard management controller (BMC) with integrated VGA controller (XClarity Controller or XCC) • Light path diagnostics • Automatic server restart (ASR) • Additional RAID levels supported when an optional RAID controller is installed • One external USB 3.2 Gen 1 port • Serial over LAN (SOL) • Wake on LAN (WOL) when an optional I/O adapter with WOL capability is installed.
Minimum configuration for debugging	• One processor in processor socket 1 • One memory DIMM in slot 5
Predictive failure analysis (PFA) alerts	• Processors • Memory • Drives
Security	Fully compliant with NIST 800-131A. The security cryptography mode set by the managing device (CMM or Lenovo XClarity Administrator) determines the security mode in which the compute node operates.

Table 3. Specifications (continued)

Specification	Description
Environment	The ThinkSystem SN550 compute node complies with ASHRAE Class A2 specifications. Depending on the hardware configuration, some models comply with ASHRAE Class A3 specifications. System performance may be impacted when operating temperature is outside ASHRAE A2 specification or fan failed condition. The Lenovo ThinkSystem SN550 compute node is supported in the following environment: • Air temperature: – Operating: – ASHRAE Class A2: 10°C - 35°C (50°F - 95°F); decrease the maximum ambient temperature by 1°C for every 300 m (984 ft) increase in altitude above 900 m (2,953 ft) – ASHRAE Class A3: 5°C - 40°C (41°F - 104°F); decrease the maximum ambient temperature by 1°C for every 175 m (574 ft) increase in altitude above 900 m (2,953 ft) – Compute node off: 5°C to 45°C (41°F to 113°F) – Shipment/Storage: -40°C to 60°C (-40°F to 140°F) • Maximum altitude: 3,050 m (10,000 ft) • Relative Humidity (non-condensing): – Operating: – ASHRAE Class A2: 8% - 80%, maximum dew point: 21°C (70°F) – ASHRAE Class A3: 8% - 85%, maximum dew point: 24°C (75°F) – Shipment/Storage: 8% - 90% • Particulate contamination **Attention:** Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server. For information about the limits for particulates and gases, see “Particulate contamination” on page 5. **Note:** The server is designed for standard data center environment and recommended to be placed in industrial data center.
Operating systems	Supported and certified operating systems: • Microsoft Windows Server • VMware ESXi • Red Hat Enterprise Linux • SUSE Linux Enterprise Server References: • Complete list of available operating systems: https://lenovopress.lenovo.com/osig. • OS deployment instructions: “Deploy the operating system” in *Setup Guide*.
Acoustical noise emissions	**Notes:** • The declared acoustic noise level are based on specified configurations and they may change depending on configuration/condition changes. • The declared acoustic noise levels may increase greatly, if high-power components are installed such as high-power NICs, high-power processors and GPUs.

Particulate contamination

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

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

Table 4. Limits for particulates and gases

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

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

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

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

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

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

Firmware updates

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

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

- Best practices related to updating firmware is available at the following site:
  - http://lenovopress.com/LP0656
- The latest firmware can be found at the following site:
  - http://datacentersupport.lenovo.com/products/servers/thinksystem/sn550/7X16/downloads
- You can subscribe to product notification to stay up to date on firmware updates:
  - https://datacentersupport.lenovo.com/tw/en/solutions/ht509500

UpdateXpress System Packs (UXSPs)

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

Update method terminology

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

Firmware updating tools

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

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

Tool	Update Methods Supported	Core System Firmware Updates	I/O Devices Firmware Updates	Graphical user interface	Command line interface	Supports UXSPs
Lenovo XClarity Essentials OneCLI (OneCLI)	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√	√
Lenovo XClarity Essentials UpdateXpress (LXCE)	In-band Out-of-band On-Target Off-Target	√	All I/O devices	√		√
Lenovo XClarity Essentials Bootable Media Creator (BoMC)	In-band Out-of-band Off-Target	√	All I/O devices	√ (BoMC application)	√ (BoMC application)	√
Lenovo XClarity Administrator (LXCA)	In-band[1] Out-of-band[2] Off-Target	√	All I/O devices	√		√
Lenovo XClarity Integrator (LXCI) for VMware vCenter	Out-of-band Off-Target	√	Selected I/O devices	√		
Lenovo XClarity Integrator (LXCI) for Microsoft Windows Admin Center	In-band Out-of-band On-Target Off-Target	√	All I/O devices	√		√
Lenovo XClarity Integrator (LXCI) for Microsoft System Center Configuration Manager	In-band On-Target	√	All I/O devices	√		√

Notes:

1. For I/O firmware updates.
2. For BMC and UEFI firmware updates.

- **Lenovo XClarity Provisioning Manager**

  From Lenovo XClarity Provisioning Manager, you can update the Lenovo XClarity Controller firmware, the UEFI firmware, and the Lenovo XClarity Provisioning Manager software.

Note: By default, the Lenovo XClarity Provisioning Manager Graphical User Interface is displayed when you start the server and press the key specified in the on-screen instructions. If you have changed that default to be the text-based system setup, you can bring up the Graphical User Interface from the text-based system setup interface.

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

"Firmware Update" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/

Important: Lenovo XClarity Provisioning Manager (LXPM) supported version varies by product. All versions of Lenovo XClarity Provisioning Manager are referred to as Lenovo XClarity Provisioning Manager and LXPM in this document, unless specified otherwise. To see the LXPM version supported by your server, go to https://pubs.lenovo.com/lxpm-overview/.

- **Lenovo XClarity Controller**

  If you need to install a specific update, you can use the Lenovo XClarity Controller interface for a specific server.

  Notes:

  – To perform an in-band update through Windows or Linux, the operating system driver must be installed and the Ethernet-over-USB (sometimes called LAN over USB) interface must be enabled.

    For additional information about configuring Ethernet over USB, see:

    "Configuring Ethernet over USB" section in the XCC documentation version compatible with your server at https://pubs.lenovo.com/lxcc-overview/

  – If you update firmware through the Lenovo XClarity Controller, make sure that you have downloaded and installed the latest device drivers for the operating system that is running on the server.

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

  "Updating Server Firmware" section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/

  Important: Lenovo XClarity Controller (XCC) supported version varies by product. All versions of Lenovo XClarity Controller are referred to as Lenovo XClarity Controller and XCC in this document, unless specified otherwise. To see the XCC version supported by your server, go to https://pubs.lenovo.com/lxcc-overview/.

- **Lenovo XClarity Essentials OneCLI**

  Lenovo XClarity Essentials OneCLI is a collection of command line applications that can be used to manage Lenovo servers. Its update application can be used to update firmware and device drivers for your servers. The update can be performed within the host operating system of the server (in-band) or remotely through the BMC of the server (out-of-band).

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

  https://pubs.lenovo.com/lxce-onecli/onecli_c_update

- **Lenovo XClarity Essentials UpdateXpress**

  Lenovo XClarity Essentials UpdateXpress provides most of OneCLI update functions through a graphical user interface (GUI). It can be used to acquire and deploy 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 firmware updates, VPD updates, inventory and FFDC collection, advanced system configuration, FoD Keys management, secure erase, RAID configuration, and diagnostics on supported servers.

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

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

- **Lenovo XClarity Administrator**

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

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

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

- **Lenovo XClarity Integrator offerings**

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

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

  https://pubs.lenovo.com/lxci-overview/

Tech Tips

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

To find the Tech Tips available for your server:

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

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

Security advisories

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

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

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

Power on the compute node

Use this information for details about power on the compute node.

After you connect the compute node to power through the Lenovo Flex System chassis, the compute node can be started in any of the following ways.

Important: If an Attention label is on the front panel of the compute node above the power button, read it; then, remove the label and discard it before turning on the compute node.

- You can press the power button on the front of the compute node to start the compute node. The power button works only if local power control is enabled for the compute node. Local power control is enabled and disabled through the CMM **power** command and the CMM web interface.
  - For more information about the CMM **power** command, see the *Flex System Chassis Management Module: Command-Line Interface Reference Guide* at https://pubs.lenovo.com/cmm2/cli_command_power.
  - From the CMM web interface, select **Compute Nodes** from the **Chassis Management** menu. For more information, see the "Flex System Chassis Management Module: User's Guide" at https://pubs.lenovo.com/cmm2/cmm_user_guide. All fields and options are described in the CMM web interface online help.

  Notes:

  1. Wait until the power LED on the compute node flashes slowly before you press the power button. While the Lenovo XClarity Controller in the compute node is initializing and synchronizing with the Chassis Management Module, the power LED flashes rapidly, and the power button on the compute node does not respond. The time required for a compute node to initialize varies by system configuration; however, the power LED blink rate slows when the compute node is ready to be turned on.
  2. While the compute node is starting, the power LED on the front of the compute node is lit and does not flash.
- If a power failure occurs, the Lenovo Flex System chassis and the compute node can be configured through the CMM **power** command and the CMM web interface to start automatically when power is restored.
  - For more information about the CMM **power** command, see the *Flex System Chassis Management Module: Command-Line Interface Reference Guide* at https://pubs.lenovo.com/cmm2/cli_command_power.
  - From the CMM web interface, select **Compute Nodes** from the **Chassis Management** menu. For more information, see the "Flex System Chassis Management Module: User's Guide" at https://pubs.lenovo.com/cmm2/cmm_user_guide. All fields and options are described in the CMM web interface online help.
- You can turn on the compute node through the CMM **power** command, the CMM web interface and the Lenovo XClarity Administrator application (if installed).
  - For more information about the CMM **power** command, see the *Flex System Chassis Management Module: Command-Line Interface Reference Guide* at https://pubs.lenovo.com/cmm2/cli_command_power.
  - From the CMM web interface, select **Compute Nodes** from the **Chassis Management** menu. For more information, see the "Flex System Chassis Management Module: User's Guide" at https://pubs.lenovo.com/cmm2/cmm_user_guide. All fields and options are described in the CMM web interface online help.
  - For more information about the Lenovo XClarity Administrator application, see https://datacentersupport.lenovo.com/products/solutions-and-software/software/lenovo-xclarity/solutions/ht115665.
- You can turn on the compute node through the Wake on LAN (WOL) feature when an optional I/O adapter with WOL capability is installed. The compute node must be connected to power (the power LED is

flashing slowly) and must be communicating with the Chassis Management Module. The operating system must support the Wake on LAN feature, and the Wake on LAN feature must be enabled through the Chassis Management Module interface.

Power off the compute node

Use this information for details about turning off the compute node.

When you turn off the compute node, it is still connected to power through the Lenovo Flex System chassis. The compute node can respond to requests from the XClarity Controller, such as a remote request to turn on the compute node. To remove all power from the compute node, you must remove it from the Lenovo Flex System chassis.

Before you turn off the compute node, shut down the operating system. See the operating-system documentation for information about shutting down the operating system.

The compute node can be turned off in any of the following ways:

- You can press the power button on the compute node. This starts an orderly shutdown of the operating system, if this feature is supported by the operating system.
- If the operating system stops functioning, you can press and hold the power button for more than four seconds to turn off the compute node.

  Attention: Pressing the power button for 4 seconds forces the operating system to shut down immediately. Data loss is possible.
- You can turn off the compute node through the CMM **power** command, the CMM web interface and the Lenovo XClarity Administrator application (if installed).
  - For more information about the CMM **power** command, see the *Flex System Chassis Management Module: Command-Line Interface Reference Guide* at https://pubs.lenovo.com/cmm2/cli_command_power.
  - From the CMM web interface, select **Compute Nodes** from the **Chassis Management** menu. For more information, see the "Flex System Chassis Management Module: User's Guide" at https://pubs.lenovo.com/cmm2/cmm_user_guide. All fields and options are described in the CMM web interface online help.
  - For more information about the Lenovo XClarity Administrator application, see https://datacentersupport.lenovo.com/products/solutions-and-software/software/lenovo-xclarity/solutions/ht115665.

Chapter 2. Compute node components

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

Front view

Use this information to view the power features and functions of the controls and indicators on the front of the compute node.

Compute node controls, connectors, and LEDs

Use this information for details about the controls, connectors, and LEDs.

The following illustration identifies the buttons, connectors, and LEDs on the control panel.

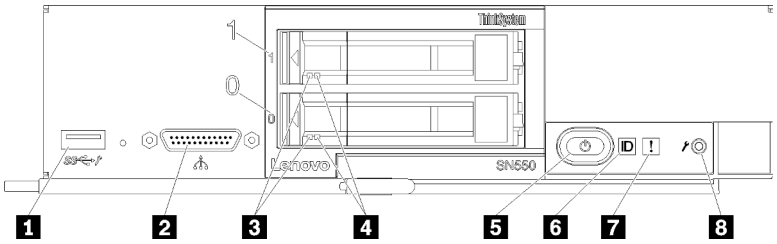

Figure 3. Compute node control panel buttons, connectors, and LEDs

Table 5. Compute node control panel buttons, connectors, and LEDs

1 USB 3.2 Gen 1 connector	5 Power button/LED (green)
2 KVM connector	6 Identification LED
3 Drive activity LED (green)	7 Fault LED (yellow)
4 Drive status LED (yellow)	8 USB management button

1 USB 3.2 Gen 1 connector

Connect a USB device to this USB 3.2 Gen 1 connector.

Note: It is best practice to connect a USB device to the front of only one compute node at a time in each Lenovo Flex System chassis.

2 KVM connector

Connect the console breakout cable to this connector (see “KVM cable” on page 19 for more information).

Attention: Use only the console breakout cable that comes with the chassis. Attempting to connect other console breakout cable types might damage the console breakout cable and the compute node.

Note: It is best practice to connect the console breakout cable to only one compute node at a time in each Lenovo Flex System chassis.

3 Drive activity LED (green)

Green LEDs are on all hot swap drives. When this green LED is lit, it indicates that there is activity on the associated hard disk drive or solid-state drive.

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- When this LED is flashing, it indicates that the drive is actively reading or writing data.
- For SAS and SATA drives, this LED is off when the drive is powered but not active.
- For NVMe (PCIe) SSDs, this LED is on solid when the drive is powered but not active.

Note: The drive activity LED might be in a different location on the front of the drive, depending on the drive type that is installed.

4 Drive status LED (yellow)

The state of this yellow LED indicates an error condition or the RAID status of the associated hard disk drive or solid-state drive:

- When the yellow LED is lit continuously, it indicates that an error has occurred with the associated drive. The LED turns off only after the error is corrected. You can check the CMM event log to determine the source of the condition.
- When the yellow LED flashes slowly, it indicates that the associated drive is being rebuilt.
- When the yellow LED flashes rapidly, it indicates that the associated drive is being located.

Note: The hard disk drive status LED might be in a different location on the front of the hard disk drive, depending on the drive type that is installed.

5 Power button/LED (green)

When the compute node is connected to power through the Lenovo Flex System chassis, press this button to turn on or turn off the compute node.

Note: The power button works only if local power control is enabled for the compute node. Local power control is enabled and disabled through the CMM **power** command and the CMM web interface.

- For more information about the CMM **power** command, see the *Flex System Chassis Management Module: Command-Line Interface Reference Guide* at https://pubs.lenovo.com/cmm2/cli_command_power.
- From the CMM web interface, select **Compute Nodes** from the **Chassis Management** menu. For more information, see the "Flex System Chassis Management Module: User's Guide" at https://pubs.lenovo.com/cmm2/cmm_user_guide. All fields and options are described in the CMM web interface online help.

After the compute node is removed from the chassis, press and hold this button to activate the system-board LEDs (light path diagnostics). See “Viewing the light path diagnostics LEDs” on page 103 for more information.

This button is also the power LED. This green LED indicates the power status of the compute node:

- **Flashing rapidly (Four times per second)**: The LED flashes rapidly for one of the following reasons:
  - The compute node has been installed in a powered chassis. When you install the compute node, the LED flashes rapidly while the XClarity Controller in the compute node is initializing and synchronizing with the Chassis Management Module. The time required for a compute node to initialize varies by system configuration.
  - Power permissions have not been assigned to the compute node through the Chassis Management Module.
  - The Lenovo Flex System chassis does not have enough power to turn on the compute node.
  - The XClarity Controller in the compute node is not communicating with the Chassis Management Module.

  The power LED blink rate slows when the compute node is ready to be turned on.
- **Flashing slowly (One time per second)**: The compute node is connected to power through the Lenovo Flex System chassis and is ready to be turned on.

- **Lit continuously**: The compute node is connected to power through the Lenovo Flex System chassis and is turned on.

When the compute node is on, pressing this button causes an orderly shutdown of the compute node so that it can be removed safely from the chassis. This includes shutting down the operating system (if possible) and removing power from the compute node.

Attention: If an operating system is running, you might have to press the button for approximately 4 seconds to initiate the shutdown. This forces the operating system to shut down immediately. Data loss is possible.

6 Identification LED (blue)

The system administrator can remotely light this blue LED to aid in visually locating the compute node. When this LED is lit, the identification LED on the Lenovo Flex System chassis is also lit. The identification LED can be lit and turned off through the CMM **led** command, the CMM web interface and the Lenovo XClarity Administrator application (if installed).

- There are four states of identification LED:

Table 6. Identification LED state

LED state	Operation required for this state	Description
Off	This is the default state, no operation required	Compute node is in the normal state.
Solid On	– Press USB management button – Use CMM or Lenovo XClarity Controller	Compute node is in locally manual operation status. To return LED to Off state, press USB management button again or change state through CMM or Lenovo XClarity Controller.
Blinking (blink one time per second)	Use CMM or Lenovo XClarity Controller	Compute node is in the locally manual operation status (same as solid On state). To return LED to Off state, press USB management button again or change state through CMM or Lenovo XClarity Controller.
Slow blinking (blink one time every two seconds)	– Press USB management button for 3 seconds – Use CMM or Lenovo XClarity Controller	Compute node is in the status, where USB port is connected to the Lenovo XClarity Controller. In this state, you can access the Lenovo XClarity Controller directly via a mobile device connected to the USB connector of the compute node. To return LED to Off state, press USB management button again or change state through CMM or Lenovo XClarity Controller.

- For more information about the CMM **led** command, see the *Flex System Chassis Management Module: Command-Line Interface Reference Guide* at https://pubs.lenovo.com/cmm2/cli_command_led.
- From the CMM web interface, select **Compute Nodes** from the **Chassis Management** menu. For more information, see the "Flex System Chassis Management Module: User's Guide" at https://pubs.lenovo.com/cmm2/cmm_user_guide. All fields and options are described in the CMM web interface online help.
- For more information about the Lenovo XClarity Administrator application, see https://datacentersupport.lenovo.com/products/solutions-and-software/software/lenovo-xclarity/solutions/ht115665.

7 Fault LED (yellow)

When this yellow LED is lit, it indicates that a system error has occurred in the compute node. In addition, the fault LED on the chassis system LED panel is lit. You can check the CMM event log and the light path diagnostics LEDs to determine the source of the condition. See “Light path diagnostics LEDs” on page 105 for more information about the LEDs on the compute node.

The fault LED turns off only after the error is corrected.

Note: When the fault LED turns off, you should also clear the XClarity Controller event log. Use the Setup utility to clear the XClarity Controller event log.

8 USB management button

Press the button and held for 3 seconds to switch the USB 3.2 Gen 1 port between default mode and Lenovo XClarity Controller management mode.

Notes:

- It is best practice to connect a USB device to the front of only one compute node at a time in each Lenovo Flex System chassis.
- When enabling the USB port for system management, do not insert USB 3.2 Gen 1 devices.

System-board layout

Use this information to locate the connectors, LEDs, and switches on the system board.

System-board connectors

Use this information to locate compute node system-board components and connectors for optional devices.

The following illustration shows the system-board components, including connectors for user-installable optional devices, in the compute node.

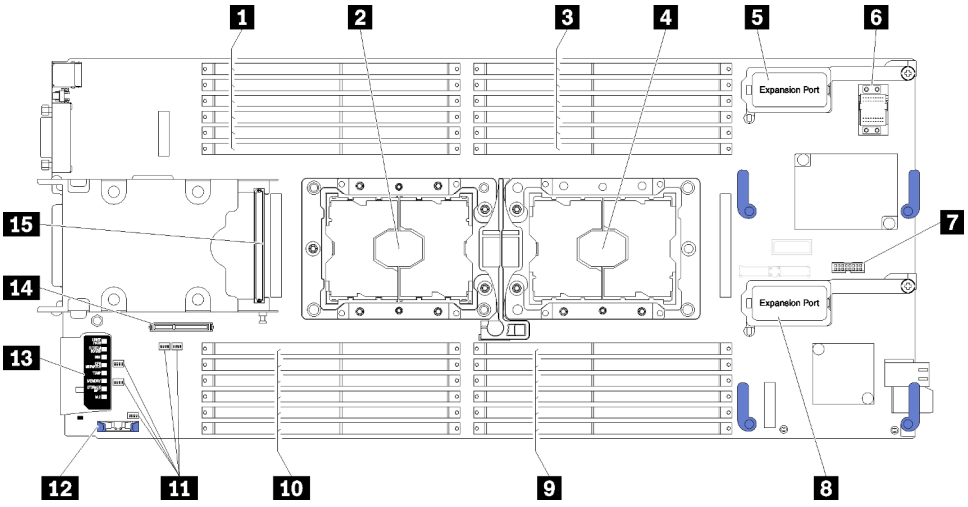

Figure 4. System-board connectors

Table 7. System-board connectors

1 DIMM slots 13–18	9 DIMM slots 7–12
2 Processor socket 2	10 DIMM slots 19–24
3 DIMM slots 1–6	11 Switch blocks

Table 7. System-board connectors (continued)

4 Processor socket 1	12 CMOS battery - CR2032
5 I/O expansion 1 connector	13 Light path diagnostics
6 Fabric connector socket	14 M.2 backplane connector
7 Trusted Cryptographic Module (TCM) connector	15 2.5-inch drive backplane connector
8 I/O expansion 2 connector	

System-board switches

Use this information to locate the system-board switches.

The following illustration shows the location of the switch blocks on the system board.

Important:

1. Before you change any switch settings or move any jumpers, turn off the compute node; then, disconnect all power cords and external cables. Review the information in https://pubs.lenovo.com/safety_documentation/, "Installation Guidelines" on page 23, "Handling static-sensitive devices" on page 26, and "Power on the compute node" on page 11.
2. Any system-board switch or jumper block that is not shown in the illustrations in this document are reserved.

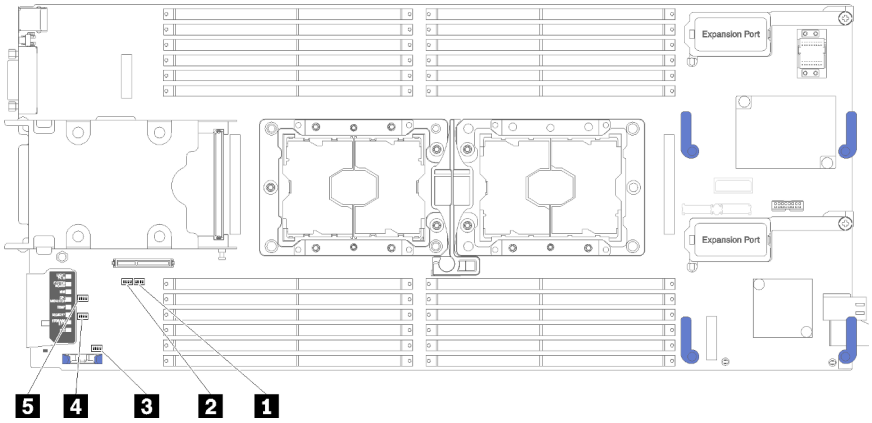

Figure 5. System board switches

Table 8. System board switches

1 SW5 switch block	4 SW3 switch block
2 SW8 switch block	5 SW2 switch block
3 SW1 switch block	

Note: Any system-board switches or jumpers that are not described in this section are reserved.

Switch and jumper functions are as follows:

- All jumpers on the system board are reserved and should be removed.
- The following table describes the functions of the switches on switch block SW5.

Table 9. System-board switch block SW1

Switch number	Description	Definition
SW1-1	ME recovery	ME boots to recovery
SW1-2	ME firmware security override	For debug only.
SW1-3	Power permission	Changing this switch to the on position enables Power On
SW1-4	BMC reset	Changing this switch to the on position forces the compute node to reset the BMC.

- The following table describes the functions of the switches on switch block SW5.

Table 10. System-board switch block SW5

Switch number	Description	Definition
SW5-1	Password override	The default position is Off. Changing this switch to the On position overrides the power-on password.
SW5-2	Trusted Platform Module (TPM) physical presence	The default position is Off. Changing this switch to the On position indicates a physical presence to the TPM.
SW5-3	Real time clock (RTC) reset	The default position is Off. Changing this switch to the On position resets the RTC. A momentary toggle is all that is required. To avoid excessive CMOS battery drain, do not leave this switch in the On position.
SW5-4	Serial select	The default position is Off (send the serial input output (SIO) to the front serial port). Changing this switch to the On position sends the BMC to the serial port.

- The following table describes the functions of the switches on switch block SW8.

Table 11. System-board switch block SW8

Switch number	Description	Definition
SW8-1	Boot backup XClarity Controller	When the switch is in the default Off position, the compute node will boot by using the primary XClarity Controller firmware. When the switch is in the On position, the compute node will boot by using a backup of the XClarity Controller firmware.
SW8-2	Boot backup UEFI	The default position is Off. Changing this switch to the On position forces the compute node to boot from the backup UEFI image.

Table 11. System-board switch block SW8 (continued)

Switch number	Description	Definition
SW8-3	iBMC force update	The default position is Off. Changing this switch to the On position bypasses the operational firmware image and performs a BMC firmware update, if the normal firmware update procedure results in an inoperative BMC. **Note:** Use this switch only if the normal firmware update procedure fails and the operational firmware image is corrupted. Use of this switch disables normal baseboard management controller operation.
SW8-4	Wake on LAN (WOL) disable	Changing this switch to the On position disables WOL.

KVM cable

Use this information for details about the KVM cable.

Use the KVM cable to connect external I/O devices to the compute node. The KVM cable connects through the KVM connector (see “Compute node controls, connectors, and LEDs” on page 13). The console breakout cable has connectors for a display device (video), two USB 2.0 connectors for a USB keyboard and mouse, and a serial interface connector.

The following illustration identifies the connectors and components on the KVM cable.

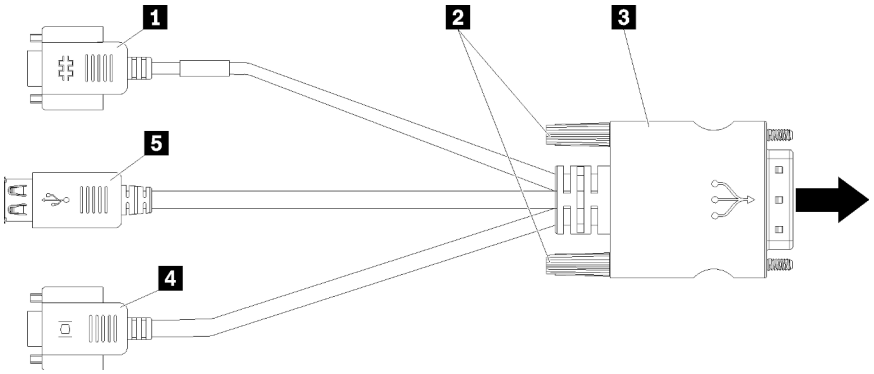

Figure 6. Connectors and components on the KVM cable

Table 12. Connectors and components on the KVM cable

1 Serial connector	4 Video connector (blue)
2 Captive screws	5 USB 2.0 ports (2)
3 to KVM connector	

Parts list

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

For more information about ordering the parts shown in Figure 7 “Compute node components” on page 20:

https://datacentersupport.lenovo.com/products/servers/thinksystem/sn550/7x16/parts

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

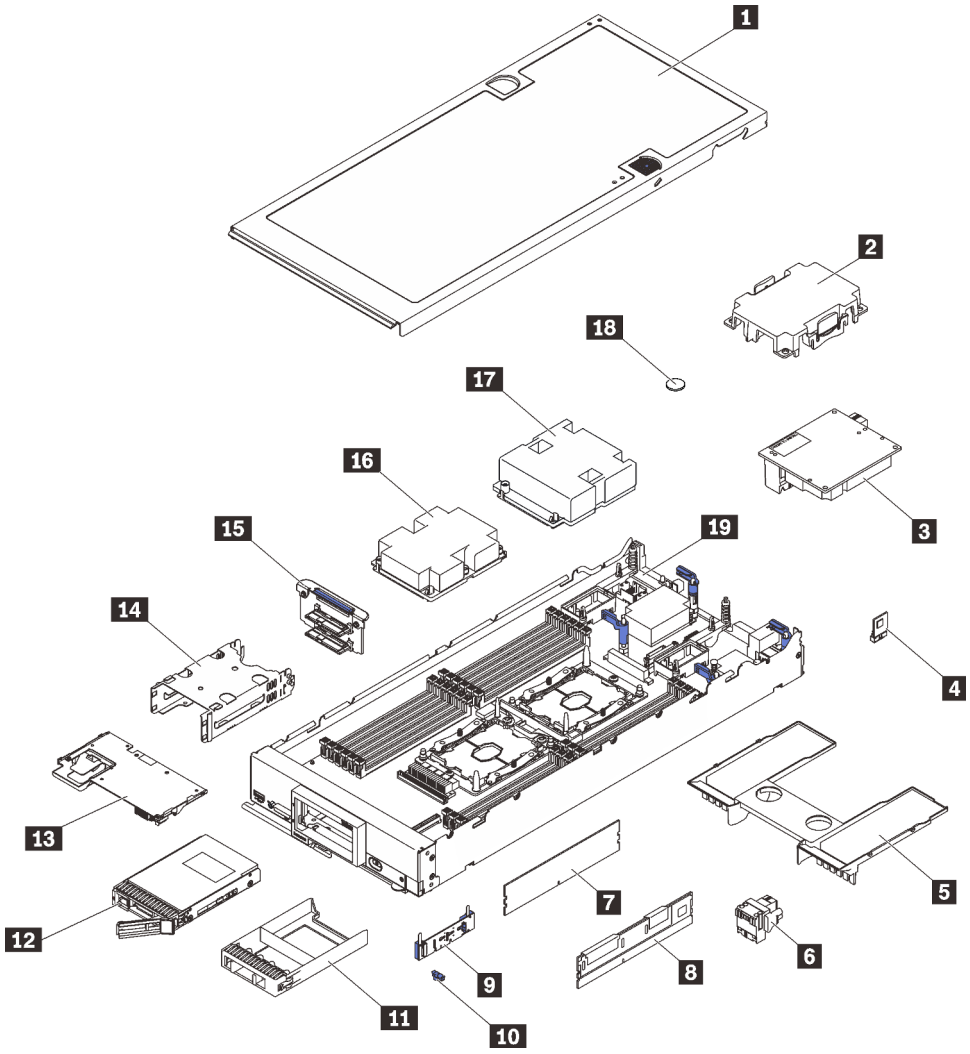

Figure 7. Compute node components

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

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

Table 13. Parts list

Index	Description	Consumable and Structural part	Tier 1 CRU	Tier 2 CRU	FRU
For more information about ordering the parts shown in Figure 7 “Compute node components” on page 20: https://datacentersupport.lenovo.com/products/servers/thinksystem/sn550/7x16/parts It is highly recommended that you check the power summary data for your server using Lenovo Capacity Planner before purchasing any new parts.					
1	Compute node cover	√			
2	Processor heat sink filler	√			
3	I/O expansion adapter		√		
4	Trusted Cryptographic Module				√
5	Air baffle	√			
6	Fabric connector		√		
7	DRAM DIMM		√		
8	DC Persistent Memory Module (DCPMM)		√		
9	M.2 backplane		√		
10	M.2 retainer clip		√		
11	Drive bay filler	√			
12	2.5-inch drive		√		
13	RAID adapter		√		
14	Storage cage	√			
15	2.5-inch drive backplane		√		
16	Processor 2, heat sink, and clip assembly				√
17	Processor 1, heat sink, and clip assembly				√
18	CMOS battery (CR2032)	√			
19	System board				√

Chapter 3. Hardware replacement procedures

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

For more information about ordering parts:

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

Note: If you replace a part, such as an adapter, that contains firmware, you might also need to update the firmware for that part. For more information about updating firmware, see “Firmware updates” on page 6.

Installation Guidelines

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

Before installing optional devices, read the following notices carefully:

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

- Read the safety information and guidelines to ensure your safety at work:
  - A complete list of safety information for all products is available at:

    https://pubs.lenovo.com/safety_documentation/
  - The following guidelines are available as well: “Handling static-sensitive devices” on page 26 and “Working inside the server with the power on” on page 25.
- Make sure the components you are installing are supported by the server. For a list of supported optional components for the server, see https://serverproven.lenovo.com/.
- 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 SN550 Drivers and Software to download firmware updates for your server.

  Important: Some cluster solutions require specific code levels or coordinated code updates. If the component is part of a cluster solution, verify the latest Best Recipe code level menu for cluster supported firmware and driver before you update the code.
- Before you remove a compute node from the Flex System chassis, you must shut down the operating system and turn off the compute node. You do not have to shut down the chassis itself.
- 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.

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  - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
  - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.
- Back up all important data before you make changes related to the disk drives.
- Have a small flat-blade screwdriver, a small Phillips screwdriver, and a T8 torx screwdriver available.
- To view the error LEDs on the system board and internal components, leave the power on.
- You do not have to turn off the server to remove or install hot-swap power supplies, hot-swap fans, or hot-plug USB devices. However, you must turn off the server before you perform any steps that involve removing or installing adapter cables, and you must disconnect the power source from the server before you perform any steps that involve removing or installing a riser card.
- Blue on a component indicates touch points, where you can grip to remove a component from or install it in the server, open or close a latch, and so on.
- Terra-cotta on a component or a terra-cotta label on or near a component indicates that the component can be hot-swapped if the server and operating system support hot-swap capability, which means that you can remove or install the component while the server is still running. (Terra-cotta can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- The Red strip on the drives, adjacent to the release latch, indicates that the drive can be hot-swapped if the server and operating system support hot-swap capability. This means that you can remove or install the drive while the server is still running.

  Note: See the system specific instructions for removing or installing a hot-swap drive for any additional procedures that you might need to perform before you remove or install the drive.
- After finishing working on the server, make sure you reinstall all safety shields, guards, labels, and ground wires.

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.

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

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

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

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

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

a. Go to:

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

b. 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.

System reliability guidelines

The system reliability guidelines to ensure proper system cooling.

To help ensure proper system cooling and system reliability, make sure that the following requirements are met:

- Each of the drive bays has a drive or a filler panel and electromagnetic compatibility (EMC) shield installed in it.
- Each of the power-supply bays has a power supply or a filler installed in it.
- If the server has redundant power, each of the power-supply bays has a power supply installed in it.
- There is adequate space around the server to allow the 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 objects in front of the fans. For proper cooling and airflow, replace the server cover before you turn on the server. Operating the server for extended periods of time (more than 30 minutes) with the server cover removed might damage server components.
- You do not operate the server without the air baffle installed. Operating the server without the air baffle might cause the processor to overheat.
- Processor socket 2 always contains either a socket cover or a processor and heat sink.
- You have installed the fifth and sixth fans when you installed the second processor option.

Working inside the server with the power on

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

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

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

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

Handling static-sensitive devices

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

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

- Limit your movement to prevent building up static electricity around you.
- Take additional care when handling devices during cold weather, for heating would reduce indoor humidity and increase static electricity.
- Always use an electrostatic-discharge wrist strap or other grounding system, particularly when working inside the server with the power on.
- While the device is still in its static-protective package, touch it to an unpainted metal surface on the outside of the server for at least two seconds. This drains static electricity from the package and from your body.
- Remove the device from the package and install it directly into the server without putting it down. If it is necessary to put the device down, put it back into the static-protective package. Never place the device on the server or on any metal surface.
- When handling a device, carefully hold it by the edges or the frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Keep the device from others' reach to prevent possible damages.

Returning a device or component

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

Updating the compute node configuration

Use this information to update the compute node configuration.

When the compute node starts for the first time after you add or remove an internal device, you might receive a message that the configuration has changed. See the *Lenovo ThinkSystem SN550 Type 7X16 Setup Guide* for more information.

Some devices have device drivers that you must install. See the documentation that comes with each device for information about installing device drivers.

The compute node operates as a symmetric multiprocessing (SMP) compute node, regardless of how many processors are installed. For optimum performance, you must upgrade the operating system to support SMP. See your operating-system documentation for additional information.

Compute node replacement

Use the following procedures to remove and install the compute node from a chassis.

S021

CAUTION:
Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

Remove the compute node from the chassis

Use this information to remove the compute node from the Lenovo Flex System chassis.

Before you remove the compute node:

1. Read "Installation Guidelines" on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Record the serial number for each node bay.

To remove the compute node from the chassis, complete the following steps:

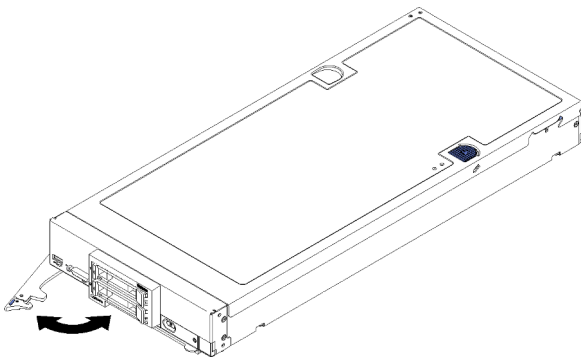

Figure 8. Compute node removal from chassis

Step 1. Pull the front handle as shown in the illustration. The compute node moves out of the node bay approximately 0.6 cm (0.25 inch).

Attention:

- To maintain proper system cooling, do not operate the Lenovo Flex System chassis without a compute node or node bay filler installed in each node bay.
- When you remove the compute node, note the node bay number. Reinstalling a compute node into a different node bay from the one it was removed from can have unintended consequences. Some configuration information and update options are established according to the node bay number. If you reinstall the compute node into a different node bay, you might have to reconfigure the compute node.

Step 2. Pull the compute node out of the node bay using both hands.

Step 3. Install either a node bay filler or another compute node in the node bay within 1 minute.

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

Demo video

Watch the procedure on YouTube

Install the compute node in the chassis

Use this information to install the compute node in the chassis.

Before you install the compute node in the chassis, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To install the compute node in a chassis, complete the following steps:

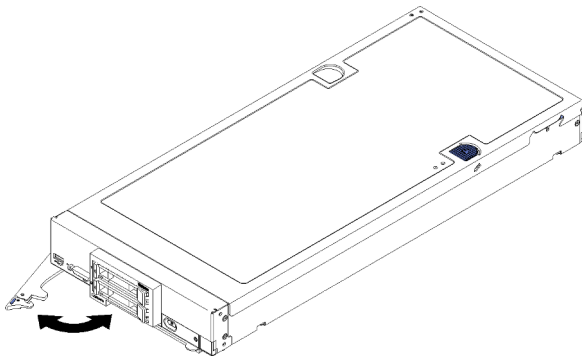

Figure 9. Compute node installation in chassis

Step 1. Select the node bay.

Notes:

1. If you are reinstalling a compute node that you removed, you must install it in the same node bay from which you removed it. Some compute node configuration information and update options are established according to node bay number. Reinstalling a compute node into a different node bay can have unintended consequences. If you reinstall the compute node into a different node bay, you might have to reconfigure the compute node.
2. To maintain proper system cooling, do not operate the Lenovo Flex System chassis without a compute node, or node bay filler in each node bay.

Step 2. Make sure that the front handle on the compute node is in the fully open position.

Step 3. Slide the compute node into the node bay until it stops.

Step 4. Push the front handle on the front of the compute node to the closed position.

Note: After the compute node is installed, the Lenovo XClarity Controller in the compute node initializes and synchronizes with the Chassis Management Module. The time required for a compute node to initialize varies by system configuration. The power LED flashes rapidly; the power button on the compute node does not respond until the power LED flashes slowly, indicating that the initialization process is complete.

Step 5. Turn on the compute node.

Important: If an Attention label is on the front panel of the compute node above the power button, read it; then, remove the label and discard it before turning on the compute node.

Step 6. Make sure that the power LED on the compute node control panel is lit continuously, indicating that the compute node is receiving power and is turned on.

Step 7. If you have other compute nodes to install, do so now.

If this is the initial installation of the compute node in the chassis, you must configure the compute node through the Setup utility and install the compute node operating system. See the *Setup Guide* of the Lenovo ThinkSystem SN550 Type 7X16 compute node for details.

If you have changed the configuration of the compute node or if you are installing a different compute node from the one that you removed, you must configure the compute node through the Setup utility, and you might have to install the compute node operating system. See the *Setup Guide* of the Lenovo ThinkSystem SN550 Type 7X16 compute node for details..

- For instructions related to the Flex System Enterprise chassis, see https://pubs.lenovo.com/enterprise-chassis/installing_components.
- For instructions related to the Flex System Carrier-Grade chassis, see https://pubs.lenovo.com/carrier-grade-chassis/installing_components.

Demo video

Watch the procedure on YouTube

2.5-inch hot-swap drive replacement

Use the following information to remove and install a 2.5-inch hot-swap drive.

Remove a 2.5-inch hot-swap drive

Use this information to remove a 2.5-inch hot-swap drive.

Before you remove a 2.5-inch hot-swap drive, complete the following steps:

1. Back up all important data before you make changes to the drives.
2. Read “Installation Guidelines” on page 23 to ensure that you work safely.
3. If one or more NVMe solid-state drives are to be removed, it is recommended to disable them beforehand via the operating system.

To remove a 2.5-inch hot-swap drive, complete the following steps:

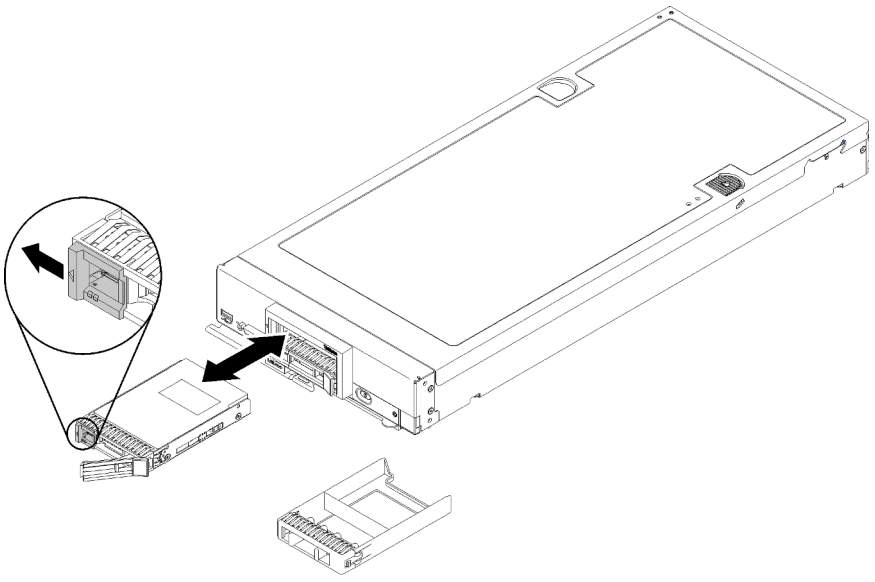

Figure 10. 2.5-inch hot-swap drive removal

Step 1. Press the release latch on the drive to release the drive handle.

Step 2. Pull the release handle to remove the drive from the bay.

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

Demo video

Watch the procedure on YouTube

Install a 2.5-inch hot-swap drive

Use this information to install a 2.5-inch hot-swap drive.

Before you install a 2.5-inch hot-swap drive, complete the following steps:

1. Read "Installation Guidelines" on page 23 to ensure that you work safely.

The compute node has two 2.5-inch drive bays for installing hot-swap drives. One drive might already be installed in the compute node. If the compute node is equipped with one drive, you can install an additional drive. RAID level-0 (striping) can be configured on a compute node with a single drive installed. A minimum of two disk drives of the same interface type must be installed to implement and manage RAID level-1 (mirroring) arrays. See the *Lenovo ThinkSystem SN550 Type 7X16 Setup Guide* for more information.

To install a 2.5-inch hot-swap drive, complete the following steps:

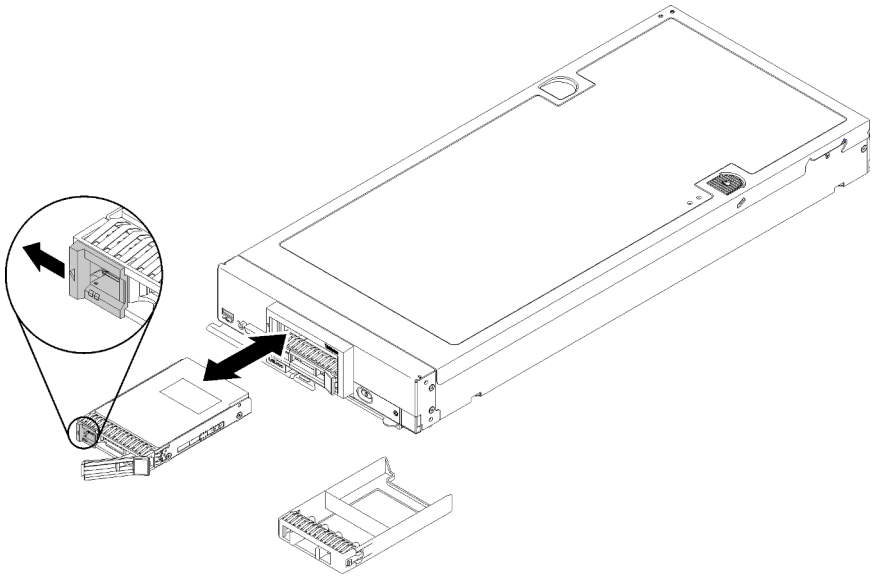

Figure 11. 2.5-inch hot-swap drive installation

Step 1. Identify the drive bay in which you plan to install the hot-swap drive.

Step 2. If a drive bay filler is installed, remove it from the compute node by pulling the release lever and sliding the filler away from the compute node.

Step 3. Touch the static-protective package that contains the hot-swap drive to any *unpainted* metal surface on the Lenovo Flex System chassis or any *unpainted* metal surface on any other grounded rack component; then, remove the drive from the package.

Step 4. Open the release lever on the hot-swap drive and slide the drive into the bay until the lever catches on the bezel, then rotate the handle to fully seat the drive.

Step 5. Lock the drive into place by closing the release lever.

Step 6. Check the drive status LEDs to make sure that the drive is operating correctly.

Demo video

Watch the procedure on YouTube

2.5-inch drive backplane replacement

Use the following information to remove and install a 2.5-inch drive backplane.

Remove the 2.5-inch drive backplane

Use this information to remove the 2.5-inch drive backplane.

Before you remove the 2.5-inch drive backplane, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).

Notes:

- Several different types of 2.5-inch drive backplanes can be installed in the compute node. For example, some 2.5-inch drive backplanes come with a lever, while others don’t (refer to the illustrations below). All are removed and installed in a similar manner.
- See the documentation that comes with an optional drive backplane for device-specific information and information about removing other components that might be included as part of the option.
- If necessary, remove the RAID adapter to more easily access the drive backplane. (see “Remove a RAID adapter” on page 83).

To remove the 2.5-inch drive backplane, complete the following steps:

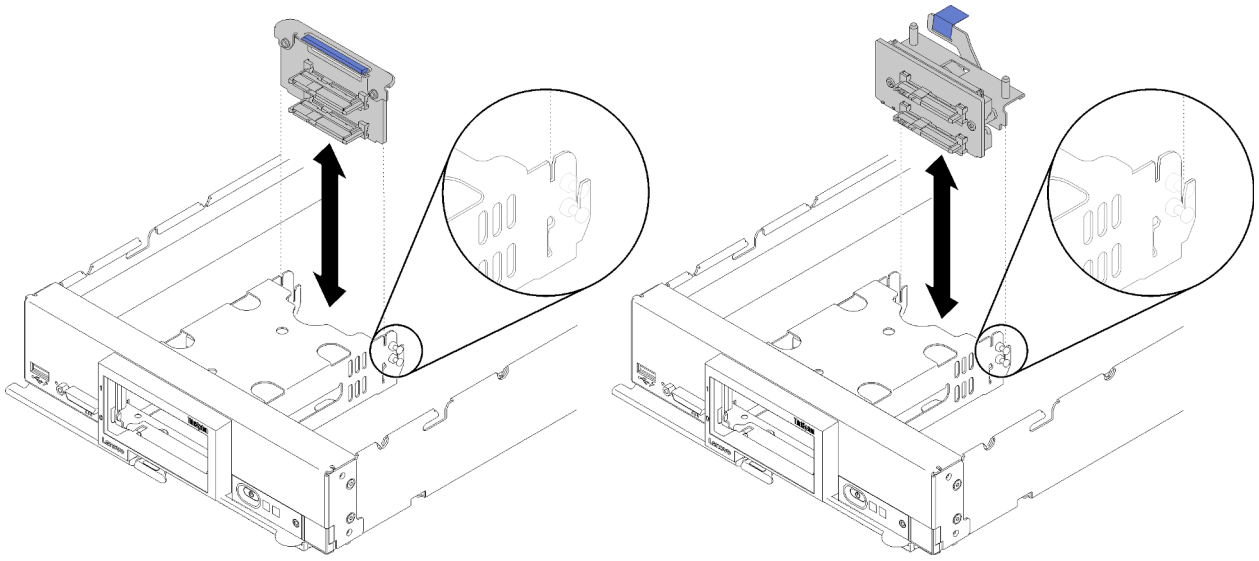

Figure 12. 2.5-inch drive backplane removal

Step 1. Remove any drive bay fillers; then, pull the drives out slightly from the bays to disengage them from the backplane.

Step 2. Lift out the 2.5-inch drive backplane.

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

Demo video

Watch the procedure on YouTube

Install a 2.5-inch drive backplane

Use this information to install a 2.5-inch drive backplane.

Before you install a 2.5-inch drive backplane:

1. Read "Installation Guidelines" on page 23 to ensure that you work safely.

Notes:

- Several different types of 2.5-inch drive backplanes can be installed in the compute node. For example, some 2.5-inch drive backplanes come with a lever, while others don't (refer to the illustrations below). All are removed and installed in a similar manner.
- See the documentation that comes with an optional 2.5-inch drive backplane for device-specific information and information about installing other components that might be included as part of the option or about other components or modules that must be installed to use the option. For example, some optional 2.5-inch drive backplanes might require installation of a second processor.

To install a 2.5-inch drive backplane, complete the following steps:

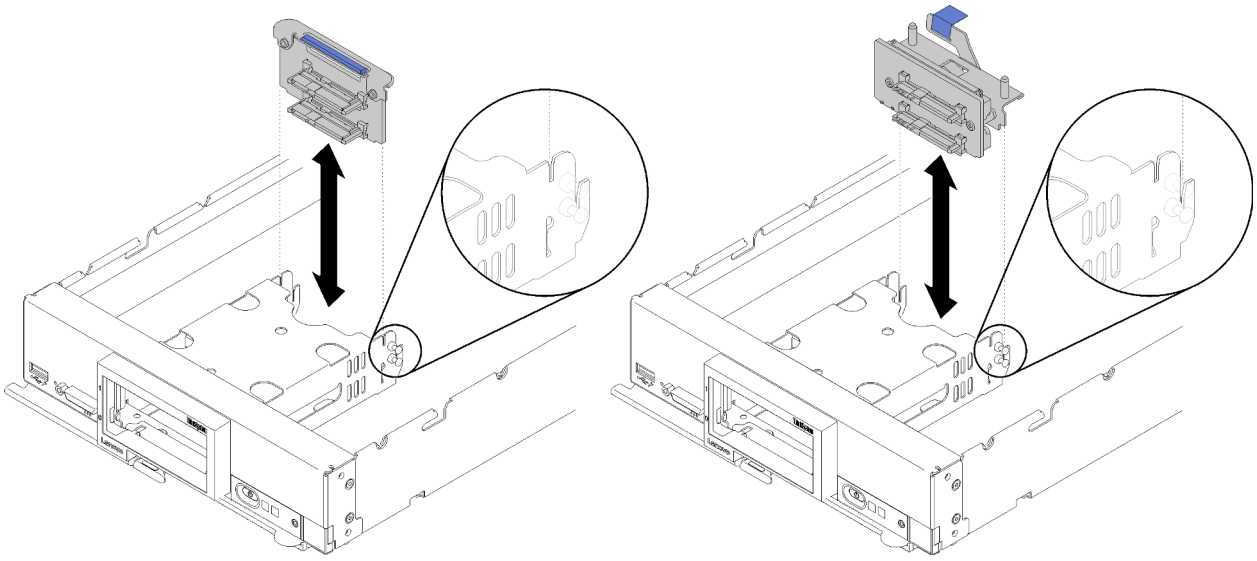

Figure 13. 2.5-inch drive backplane installation

Step 1. Align the backplane with the storage cage and the connector on the system board and press the backplane into position until it is fully seated in the connector.

Note: All 2.5-inch drive backplanes use the same connector on the system board; however, there are two alignment slots in the storage cage to accommodate different backplane types. Make sure that you align the backplane and system board connectors when inserting the backplane in the storage cage.

After you install the 2.5-inch drive backplane, complete the following steps:

1. If the RAID adapter was removed, install it now. (see “Install a RAID adapter” on page 84).
2. Install any removed storage drives and drive bay fillers (see “Install a 2.5-inch hot-swap drive” on page 30).

   Note: Install any storage drives in the same bay locations as from which they were removed.
3. Install the compute node cover (see “Install the compute node cover” on page 47).
4. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
5. Power on the compute node.

Demo video

Watch the procedure on YouTube

Air baffle replacement

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

S012

CAUTION:
Hot surface nearby.

Remove the air baffle

Use this information to remove the air baffle.

Before removing the air baffle:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).

To remove the air baffle, complete the following steps:

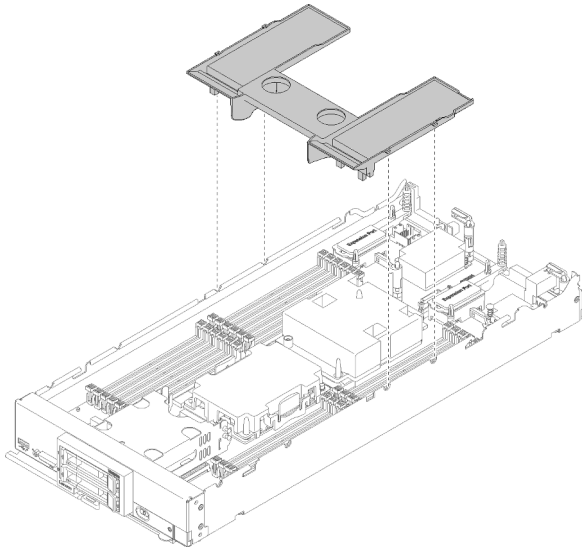

Figure 14. Air baffle removal

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 compute node. Operating the compute node with the air baffle removed might damage compute node components.

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

Demo video

Watch the procedure on YouTube

Install the air baffle

Use this information to install the air baffle.

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

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To install the air baffle, complete the following steps:

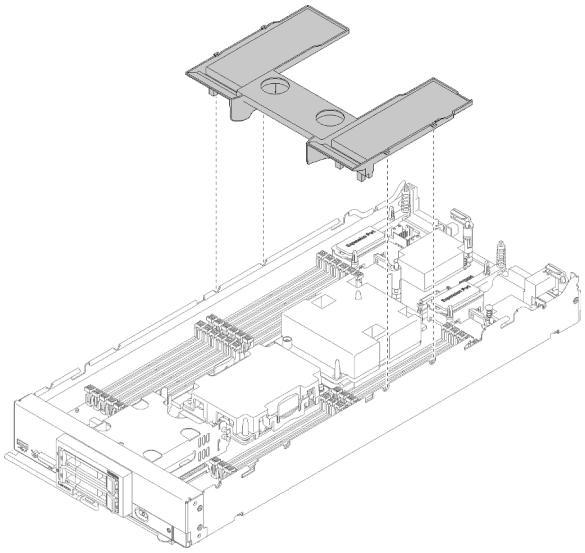

Figure 15. Air baffle installation

Step 1. Align the air baffle pins with the pin holes on both sides of the chassis; then, lower the air baffle into the compute node. Press the air baffle down until it is securely seated.

Note: Close the retaining clip on each end of the DIMM connector before installing the air baffle.

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

1. Install the compute node cover (see “Install the compute node cover” on page 47).
2. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
3. Power on the compute node.

Demo video

Watch the procedure on YouTube

Adapter-retention assembly replacement

Use the folowing information to remove and install the adapter-retention assembly.

Remove the adapter-retention assembly

Use this information to remove the adapter-retention assembly.

Before you remove the adapter-retention assembly, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).

4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).

The adapter-retention assembly consists of 12 separate parts. You can replace only the parts that you choose and save the unused parts for future use.

To remove the adapter-retention assembly, complete the following steps:

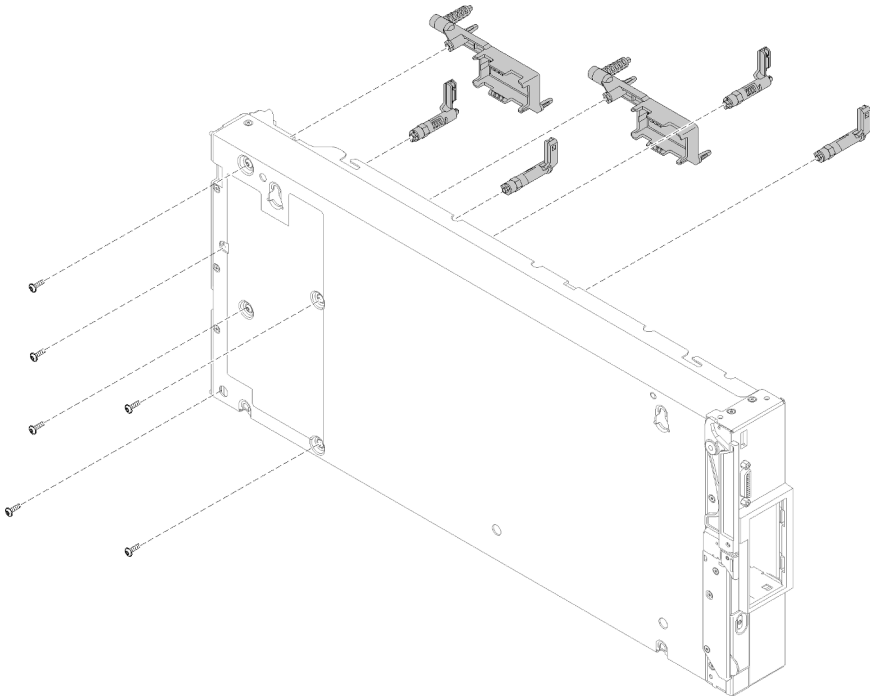

Figure 16. Adapter-retention assembly removal

Step 1. Remove the air baffle (see “Remove the air baffle” on page 34).

Step 2. If necessary, remove the I/O expansion adapters (see “Remove an I/O expansion adapter” on page 57).

Step 3. Carefully place the compute node on its side, making sure the protruding part of the handle is at the top.

Attention: If you place the compute node on its side, with the protruding part of the handle at the bottom, the compute node will not be stable and might fall over.

Step 4. Using a T10 Torx screwdriver, remove the screws that secure each part of the adapter-retention assembly that you are removing.

Note: All adapter-attention assembly parts are shown. Replace the parts that are needed and save the unused parts for future use.

Step 5. Lift each part of the adapter-retention assembly that you are removing from the system board.

Step 6. Carefully return the node to the bottom-side-down orientation.

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

Demo video

Watch the procedure on YouTube

Install the adapter-retention assembly

Use this information to install the adapter-retention assembly.

Before you install the adapter-retention assembly, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

The adapter-retention assembly consists of 12 separate parts. You can replace only the parts that you choose and save the unused parts for future use.

To install the adapter-retention assembly, complete the following steps:

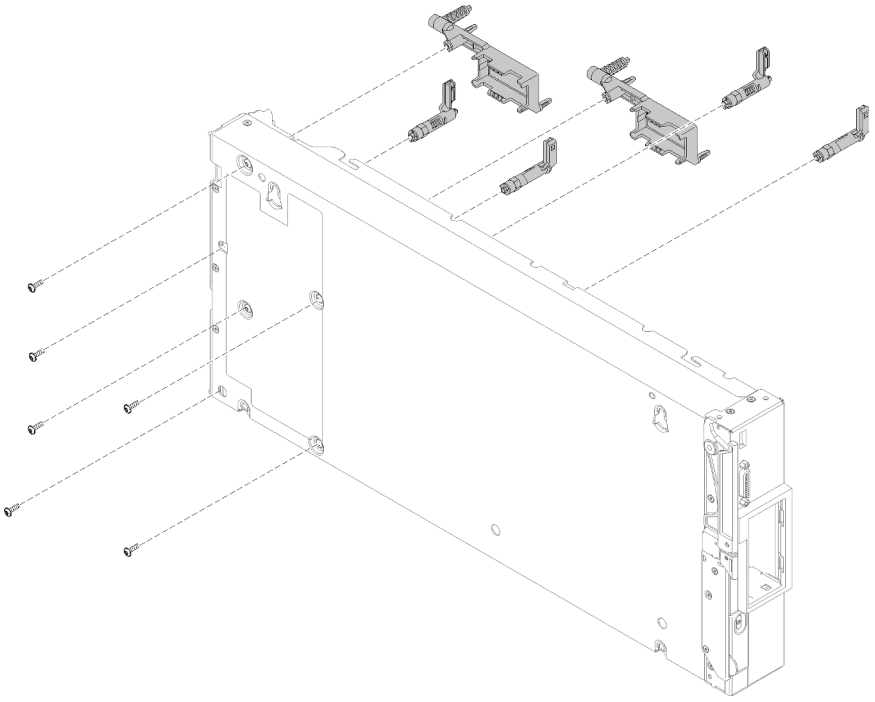

Figure 17. Adapter-retention assembly installation

Step 1. Carefully place the compute node on its side, making sure the protruding part of the handle is at the top.

Attention: If you place the compute node on its side, with the protruding part of the handle at the bottom, the compute node will not be stable and might fall over.

Step 2. Align each part of the adapter-retention assembly on the system board.

Note: All adapter-attention assembly parts are shown. Replace the parts that are needed and save the unused parts for future use.

Step 3. Using a T10 Torx screwdriver, install the screws that secure each part of the adapter-retention assembly that you are installing.

Step 4. Carefully return the compute node to the bottom-side-down orientation.

After you install the adapter-retention assembly, complete the following steps:

1. Install the I/O expansion adapters, if you removed them (see “Install an I/O expansion adapter” on page 58).
2. Install the air baffle (see “Install the air baffle” on page 34).
3. Install the compute node cover (see “Install the compute node cover” on page 47).
4. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
5. Power on the compute node.

Demo video

Watch the procedure on YouTube

Bezel replacement

Use the following information to remove and install the bezel.

Remove the bezel

Use this information to remove the bezel.

Before you remove the bezel, read safety information and guidelines to ensure that you work safely.

- Read “Installation Guidelines” on page 23 to ensure that you work safely.
- Power off the corresponding compute node that you are going to perform the task on.

Note: Several different types of bezel can be installed in the compute node: all are removed and installed in a similar manner. The bezel shown in the illustrations might differ slightly from the bezel installed in your compute node.

To remove the bezel, complete the following steps:

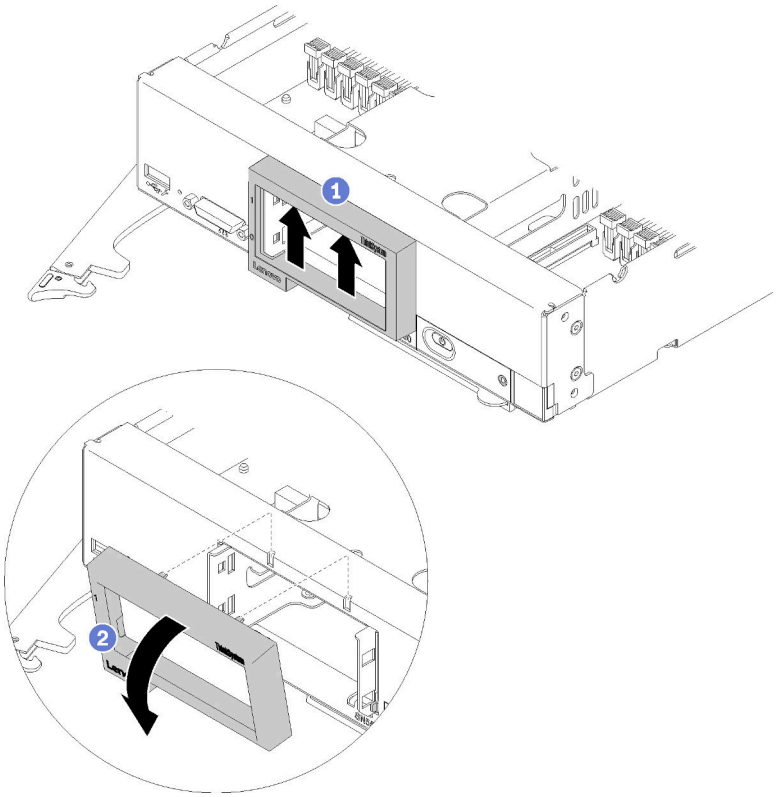

Figure 18. Bezel removal

Step 1. If any storage drives or hard disk drive bay fillers are installed, remove them (see "Remove a 2.5-inch hot-swap drive" on page 29).

Note: When removing the storage drives, make note of the drive bay from which the drive was removed so that you can install the drive back in to the same drive bay.

Step 2. Pull the front handle as shown in the illustration.

Step 3. Press up on the inside top of the bezel; then, rotate the top edge of the bezel away from the compute node.

Step 4. Lift the bezel from the compute node.

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

Demo video

Watch the procedure on YouTube

Install the bezel

Use this information to install the bezel.

Before you install the bezel, read the safety information and guidelines to ensure that you work safely.

- Read "Installation Guidelines" on page 23 to ensure that you work safely.

Note: Several different types of bezel can be installed in the compute node: all are removed and installed in a similar manner. The bezel shown in the illustrations might differ slightly from the bezel installed in your compute node.

To install the bezel, complete the following steps:

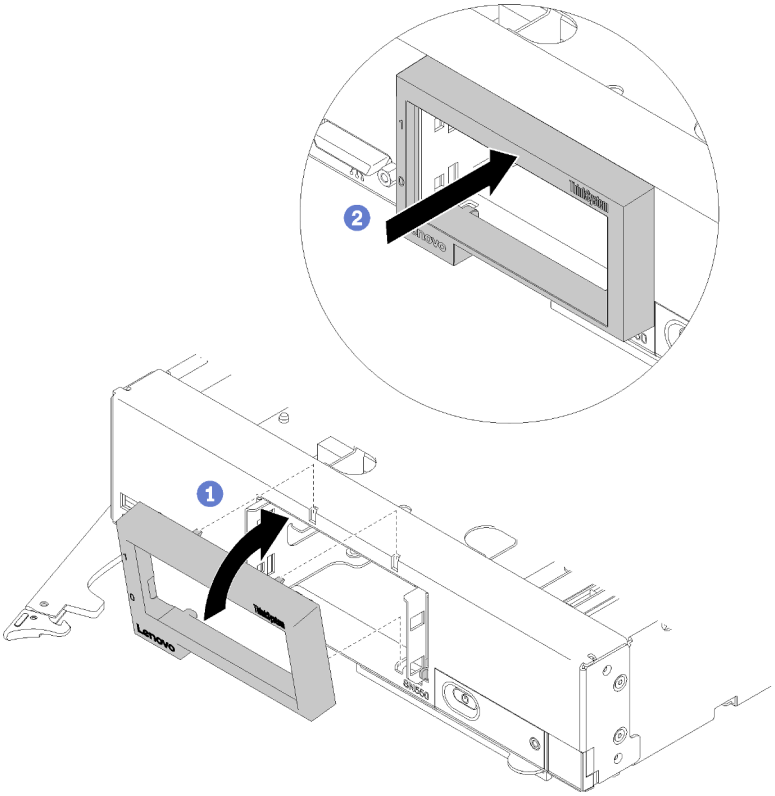

Figure 19. Bezel installation

Step 1. Position the bezel on the front of the compute node.

Step 2. Hook the bottom edge of the bezel on the front of the compute node; then, rotate the top of the bezel toward the compute node.

Step 3. Press the bezel securely against the compute node to snap it in place.

Note: Make sure that the bezel is pressed flat against the chassis. Lifting up slightly on the top edge of the bezel as you press it might make it easier to seat the clips.

Step 4. Install any removed storage drives or hard disk drive bay fillers (see “Install a 2.5-inch hot-swap drive” on page 30).

Step 5. Close the front handle.

Demo video

Watch the procedure on YouTube

Chassis bulkhead replacement

Use the following information to remove and install the chassis bulkhead.

Remove the bulkhead

Use this information to remove the bulkhead.

Before you remove the bulkhead, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).

To remove the bulkhead, complete the following steps:

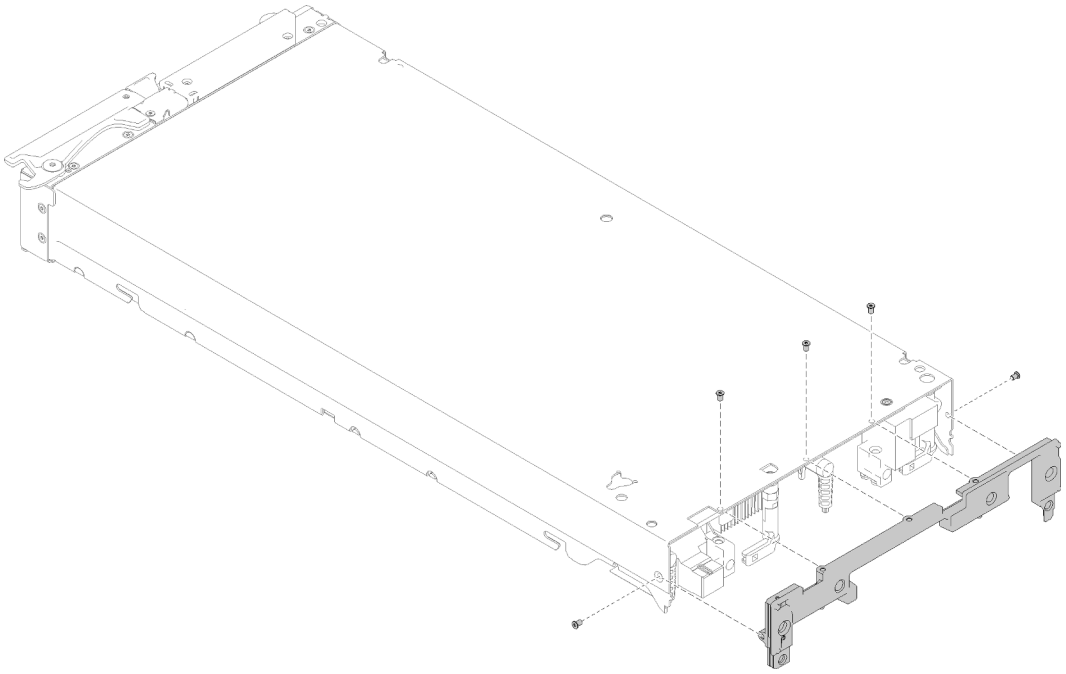

Figure 20. Bulkhead removal

Step 1. Remove the air baffle (see “Remove the air baffle” on page 34).

Step 2. Remove the fabric connector (see “Remove a fabric connector” on page 49).

Step 3. Remove the I/O expansion adapters (see “Remove an I/O expansion adapter” on page 57).

Step 4. Carefully place the compute node to the up-side-down orientation.

Step 5. Using a T8 Torx screwdriver, remove the screws that secure the bulkhead from the bottom of the compute node.

Step 6. Using a T8 Torx screwdriver, remove the screws that secure the bulkhead from the sides of the compute node.

Step 7. Carefully return the compute node to the bottom-side-down orientation.

Step 8. Lift the bulkhead from the compute node.

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

Demo video

Watch the procedure on YouTube

Install the bulkhead

Use this information to install the bulkhead.

Before you install the bulkhead:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To install the bulkhead, complete the following steps:

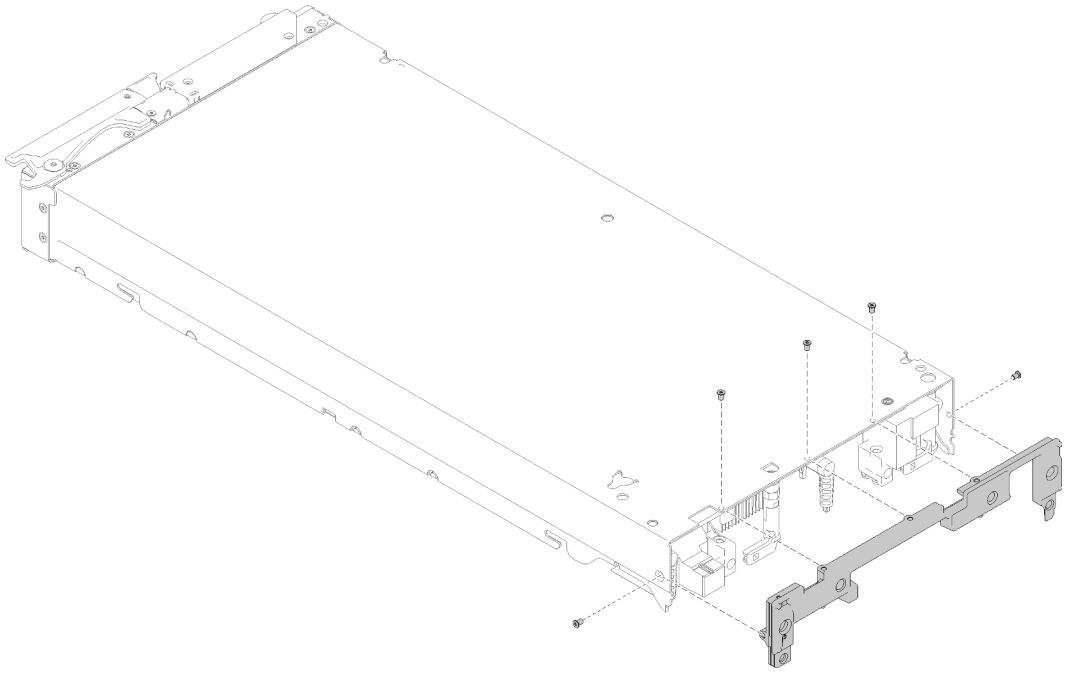

Figure 21. Bulkhead installation

Step 1. Carefully place the compute node to the up-side-down orientation.

Step 2. Align the bulkhead to the rear end of the compute node.

Step 3. Using a T8 Torx screwdriver, install the screws that secure the bulkhead to the bottom of the compute node.

Step 4. Using a T8 Torx screwdriver, install the screws that secure the bulkhead to the sides of the compute node.

Step 5. Carefully return the node to the bottom-side-down orientation.

After you install the bulkhead, complete the following steps:

1. Install the I/O expansion adapters (see “Install an I/O expansion adapter” on page 58
2. Install the fabric connector (see “Install a fabric connector” on page 50).
3. Install the air baffle (see “Install the air baffle” on page 34).

4. Install the compute node cover (see “Install the compute node cover” on page 47).
5. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
6. Power on the compute node.

Demo video

Watch the procedure on YouTube

CMOS battery - CR2032 replacement

Use the following information to remove and install the CMOS battery - CR2032.

Remove the CMOS battery - CR2032

Use this information to remove the CMOS battery - CR2032.

Before you remove the CMOS battery - CR2032, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).

The following notes describe information that you must consider when you are replacing the CMOS battery - CR2032 in the compute node:

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

S004

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

Do not:

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

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

To remove the CMOS battery - CR2032, complete the following steps:

Step 1. Locate the CMOS battery - CR2032 socket on the system board (see “System-board connectors” on page 16).

Step 2. If a cover is over the CMOS battery - CR2032, remove the cover.

Step 3. Pivot the CMOS battery - CR2032 toward the middle of the compute node.

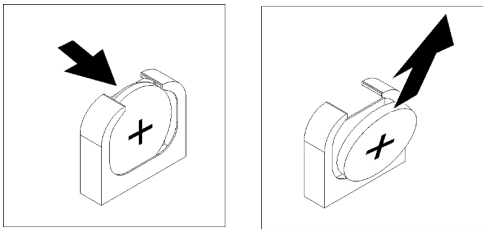

Figure 22. CMOS battery - CR2032 removal

Step 4. Lift the CMOS battery - CR2032 from the socket.

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

Demo video

Watch the procedure on YouTube

Install the CMOS battery - CR2032

Use this information to install the CMOS battery - CR2032.

Before you install the CMOS battery - CR2032, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

The following notes describe information that you must consider when you are replacing the CMOS battery - CR2032 in the compute node:

- You must replace the CMOS battery - CR2032 with a lithium CMOS battery - CR2032 of the same type.
- To order replacement batteries, call 1-800-426-7378 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your Lenovo marketing representative or authorized reseller.
- After you replace the CMOS battery - CR2032, you must reconfigure the compute node and reset the system date and time.
- To avoid possible danger, read and follow the following safety statement.

Attention: Touching the CMOS battery - CR2032 on a metal surface, such as the side of the compute node, when you replace the CMOS battery - CR2032 can cause it to fail.

Step 1. Follow any special handling and installation instructions that come with the CMOS battery - CR2032.

Step 2. Locate the CMOS battery - CR2032 socket on the system board (see “System-board connectors” on page 16).

Step 3. Orient the CMOS battery - CR2032 so that the positive (+) side faces in toward the center of the compute node.

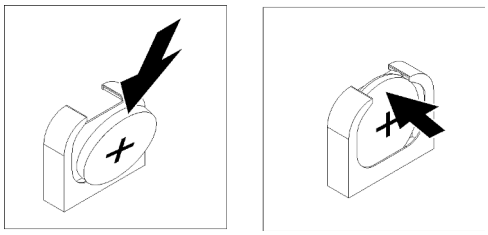

Figure 23. CMOS battery - CR2032 installation

Step 4. Pivot the CMOS battery - CR2032 so that you can insert it into the bottom of the socket.

Step 5. As you slide the CMOS battery - CR2032 into place, press the top of the CMOS battery - CR2032 into the socket.

Step 6. If you removed a cover from the battery, install the cover.

After you install the CMOS battery - CR2032, complete the following steps:

1. Install the compute node cover (see “Install the compute node cover” on page 47).
2. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
3. Power on the compute node.

Demo video

Watch the procedure on YouTube

Compute node cover replacement

Use the following information to remove and install the compute node cover.

S012

CAUTION:
Hot surface nearby.

S014

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

S021

CAUTION:
Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

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.

Remove the compute node cover

Use this information to remove the cover from the compute node.

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

- **S014**

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

- **S033**

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

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

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.

To remove the compute node cover, complete the following steps:

Step 1. Press on the release button and the push point at the same time and slide the cover toward the rear of the compute node.

Step 2. Lift the cover away from the compute node.

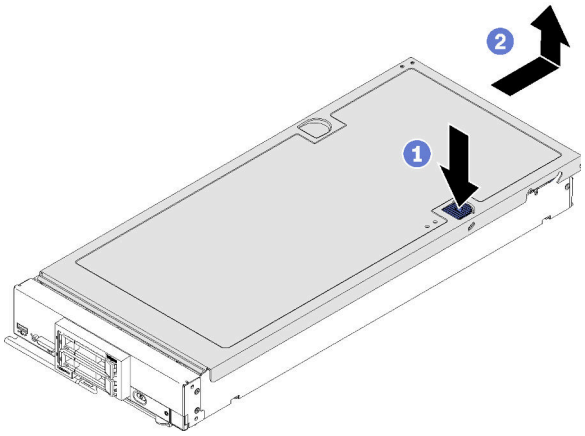

Figure 24. Compute node cover removal

Step 3. Lay the cover flat or store it for future use.

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

Demo video

Watch the procedure on YouTube

Install the compute node cover

Use this information to install the compute node cover.

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

- **S014**

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

- **S033**

CAUTION:

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

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. If you are replacing the cover, make sure that you have the system service label kit on hand for use during the replacement procedure (see “Parts list” on page 19 for more information).

Attention: You cannot insert the compute node into the Lenovo Flex System chassis until the cover is installed and closed. Do not attempt to override this protection.

Step 1. Orient the cover so that the posts on the inside of the cover slide into the slots on the compute node.

Note: Before you close the cover, make sure that the air baffle and all components are installed and seated correctly and that you have not left loose tools or parts inside the compute node. Retention clips that secure the I/O expansion adapters must be in the closed position to install the cover.

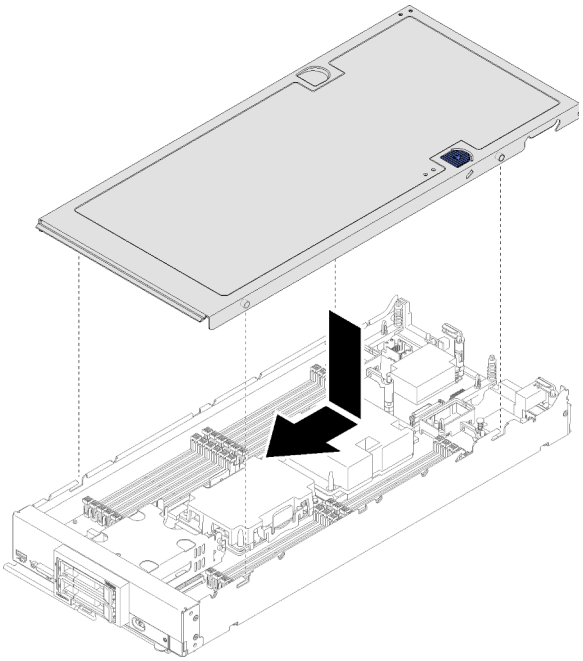

Figure 25. Compute node cover installation

Step 2. Hold the front of the compute node and slide the cover forward to the closed position, until it clicks into place.

After you install the compute node cover, complete the following steps:

1. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
2. Power on the compute node.

Demo video

Watch the procedure on YouTube

Fabric connector replacement

Use the following information to remove and install a fabric connector.

Remove a fabric connector

Use this information to remove a fabric connector.

Before you remove the fabric connector, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).
6. Obtain a long shank #1 Phillips screwdriver.

When you remove the fabric connector, the UEFI firmware holds the Ethernet controller in reset and displays a warning message, if an I/O expansion adapter is not installed in the I/O expansion connector 1 to provide connectivity to the chassis.

To remove a fabric connector, complete the following steps:

Watch the procedure. A video of the installation process is available:
- YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-B4_LYuT9X1MRWBU6UzX9gO

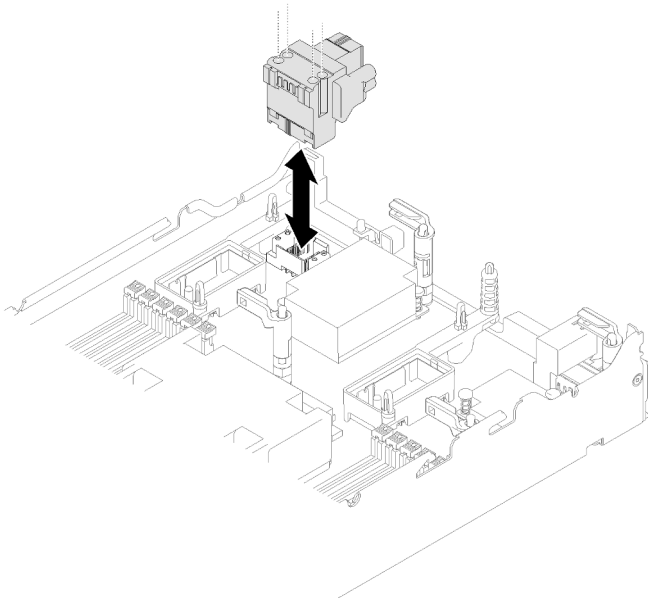

Figure 26. Fabric connector removal

Step 1. Locate the fabric connector on the system board (see “System-board connectors” on page 16).

Step 2. Using a long shank #1 Phillips screwdriver, loosen the four captive screws that secure the fabric connector.

Step 3. Lift the fabric connector from the system board and store it in a safe place.

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

If you have removed the fabric connector to install an I/O expansion adapter in I/O expansion connector 1, keep the fabric connector in a safe place for future use.

Demo video

Watch the procedure on YouTube

Install a fabric connector

Use this information to install a fabric connector.

Before you install a fabric connector, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Obtain a long shank #1 Phillips screwdriver.

To install a fabric connector, complete the following steps:

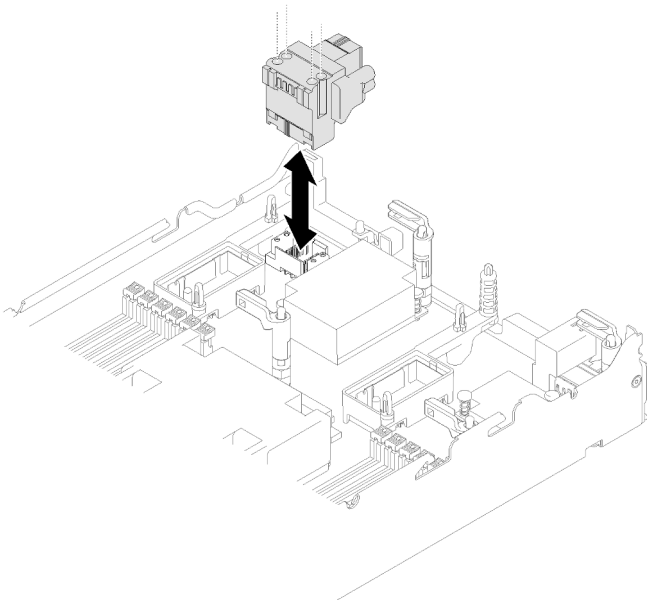

Figure 27. Fabric connector installation

Step 1. Locate the connector on the system board (see “System-board connectors” on page 16).

Step 2. Carefully insert the fabric connector into the connector.

Step 3. Using a long shank #1 Phillips screwdriver, tighten the four captive screws to secure the fabric connector.

Attention: Make sure that the fabric connector is secure, but do not overtighten the screws to avoid damaging the connector.

After you install the fabric connector, complete the following steps:

1. Install the compute node cover (see “Install the compute node cover” on page 47).

2. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
3. Power on the compute node.

Demo video

Watch the procedure on YouTube

Flash power module replacement

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

Remove the flash power module

Use this information to remove the flash power module.

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

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).

Note: This section only applies to RAID adapters that come with a flash power module.

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

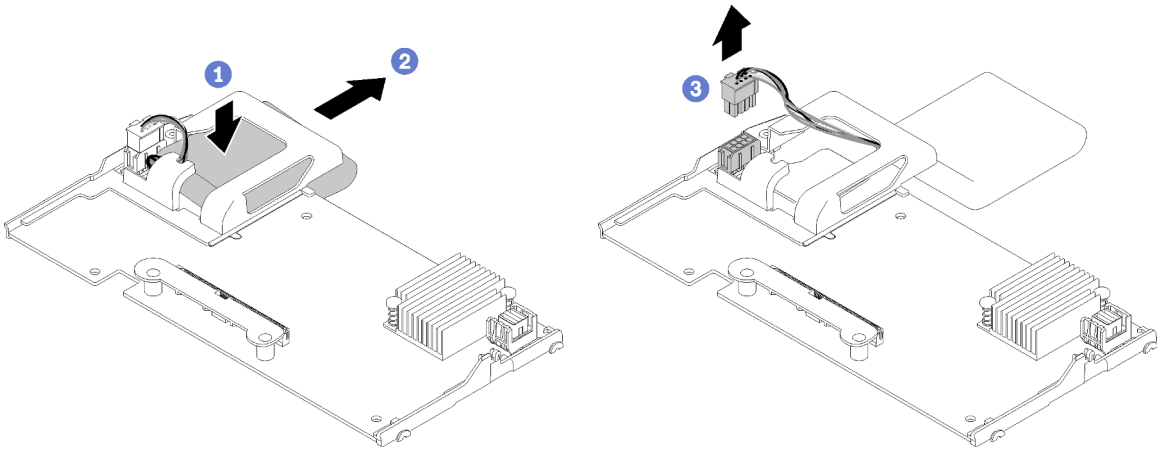

Figure 28. Flash power module removal

Step 1. Remove the RAID adapter (see “Remove a RAID adapter” on page 83).

Step 2. Carefully turn the RAID adapter over in your hand to access the underside. Press down on the rear of the flash power module; then, slide the flash power module out of its holder on the RAID adapter.

Step 3. Disconnect the flash power module cable from the RAID adapter.

Attention: To prevent any damage to the flash power module cable or connector, it is important to first slide out the flash power module. This provides more space for your fingers to better grip the flash power module cable and remove it from the connector.

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

Demo video

Watch the procedure on YouTube

Install the flash power module

Use this information to install the flash power module.

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

1. Read "Installation Guidelines" on page 23 to ensure that you work safely.

Note: This section only applies to RAID adapters that come with a flash power module.

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

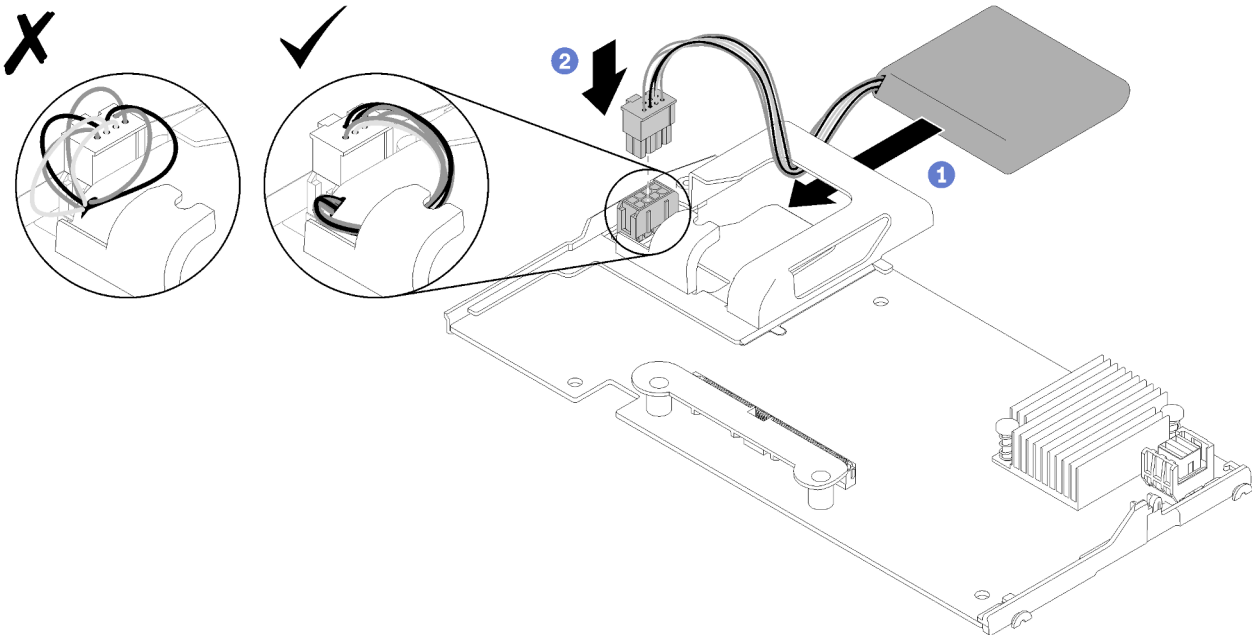

Figure 29. Flash power module installation

Step 1. Orient the flash power module with the cable side facing the retaining clip on the RAID adapter; then, feed the cable up through the flash power module holder.

Step 2. Slide the flash power module into the holder.

Step 3. Connect the flash power module cable to its connector on the RAID adapter. The connector is keyed. Press the cable into the connector until the connector retaining clip snaps in place.

Step 4. Route the flash power module cable through the notch in the holder; then, press the flash power module forward to seat it in the holder.

Attention: It is important to route the flash power module cable through the notch in holder to prevent the cable from catching on the DIMM connector latches when the RAID adapter is installed in a ThinkSystem node.

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

1. Install the RAID adapter in the compute node. (see “Install a RAID adapter” on page 84)
2. Install the compute node cover (see “Install the compute node cover” on page 47).
3. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
4. Power on the compute node.

Demo video

Watch the procedure on YouTube

Front handle replacement

Use the following information to remove and install the front handle.

Remove the front handle

Use this information to remove the front handle.

Before you remove the front handle, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface with the cover side down, orienting the compute node with the bezel pointing toward you.

To remove the front handle, complete the following steps:

Step 1. Locate the screw that attaches the handle to the compute node.

Step 2. Using a T15 Torx screwdriver, remove the screw from the front handle.

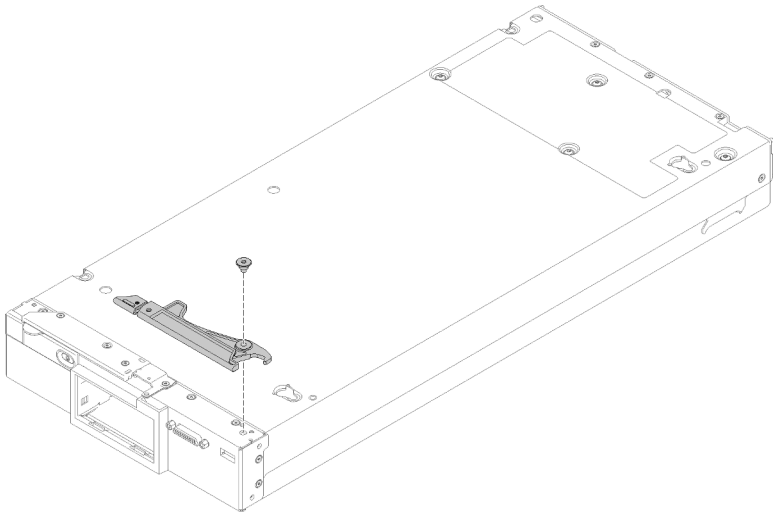

Figure 30. Front handle removal

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

Demo video

Watch the procedure on YouTube

Install the front handle

Use this information to install the front handle.

Before you install the front handle:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To install the front handle, complete the following steps:

Step 1. Orient the front handle so that the release latch is toward the middle of the compute node.

Step 2. Align the hole in the handle with the hole on the compute node where the handle is installed.

Step 3. Using a T15 Torx screwdriver, install a new screw to secure the handle.

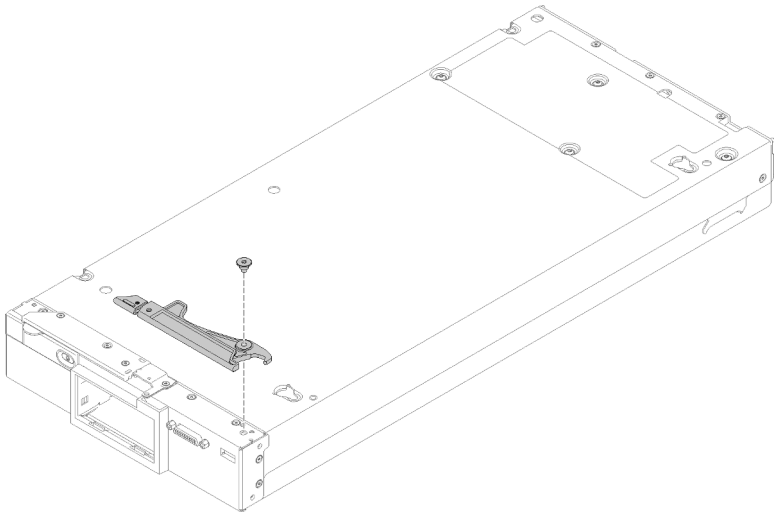

Figure 31. Front handle installation

After you install the front handle, complete the following steps:

1. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
2. Power on the compute node.

Demo video

Watch the procedure on YouTube

ID label plate replacement

Use the following information to remove and install the ID label plate.

Remove the ID label plate

Use this information to remove the identification (ID) label plate from the front panel.

Before you remove the ID label plate, read

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To remove the ID label plate, complete the following steps:

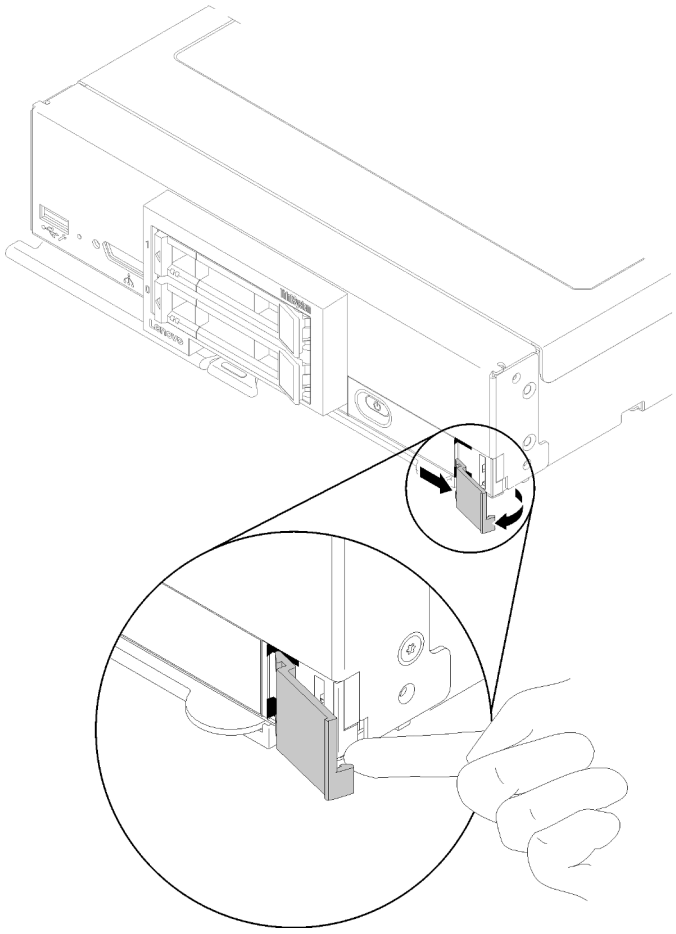

Figure 32. ID label plate removal

Step 1. Using your finger nail or a flat-blade screwdriver, push the outer edge of the ID label plate away from the compute node front panel.

Step 2. Rotate the ID label plate away from the front panel; then, remove the ID label plate.

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

Demo video

Watch the procedure on YouTube

Install the ID label plate

Use this information to install the identification (ID) label plate on the front panel.

Before you install the ID label plate, read

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To install the ID label plate, complete the following steps:

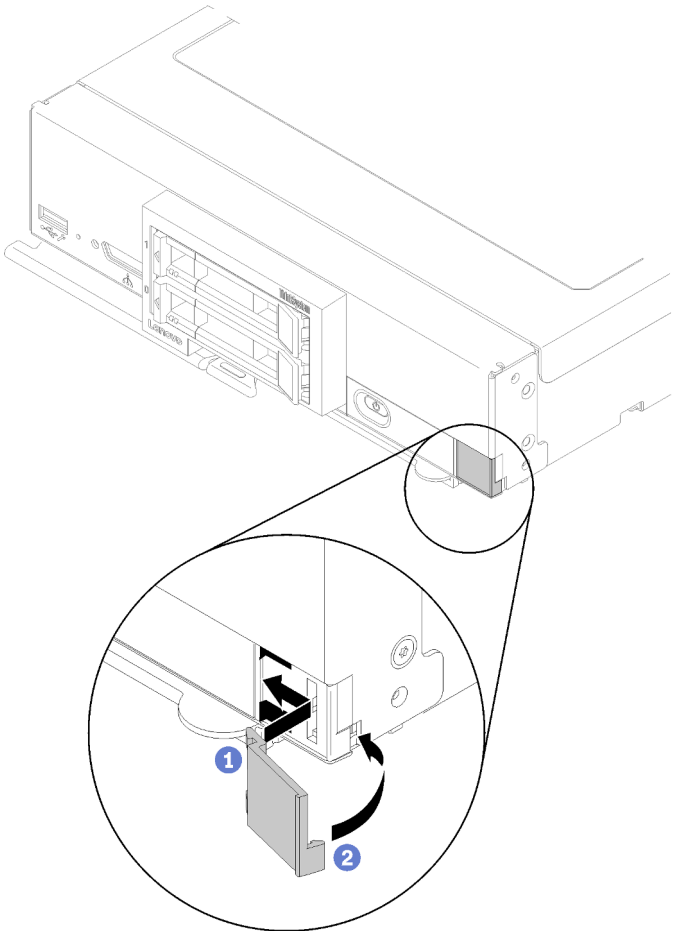

Figure 33. ID label plate installation

Step 1. Place the clips on the ID label plate into the slots on the compute node front panel.

Step 2. Rotate the outer edge of the ID label plate toward the compute node front panel; then, press the ID label plate securely against the front panel.

Demo video

Watch the procedure on YouTube

I/O expansion adapter replacement

Use the following information to remove and install an I/O expansion adapter.

Remove an I/O expansion adapter

Use this information to remove an I/O expansion adapter.

Before you remove the I/O expansion adapter, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).

4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).

To remove an I/O expansion adapter, complete the following steps:

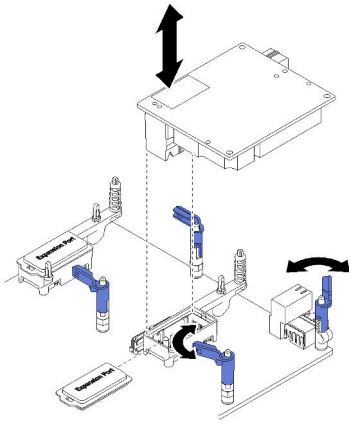

Figure 34. I/O expansion adapter removal

Step 1. Locate the I/O expansion adapter connectors (see “System-board connectors” on page 16).

Step 2. Rotate the retention clips outward.

Step 3. Lift the I/O expansion adapter from the connector and remove the I/O expansion adapter from the compute node. You might find it helpful to rock the adapter back and forth, from front to rear, to disengage the adapter.

Important: Rocking the adapter from side to side might damage the I/O expansion adapter connector.

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

Demo video

Watch the procedure on YouTube

Install an I/O expansion adapter

Use this information to install an I/O expansion adapter.

Before you install an I/O expansion adapter, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

This component can be installed as an optional device or as a CRU. The installation procedure is the same for the optional device and the CRU.

The optional Flex System PCIe Expansion Node supports additional PCIe adapters and I/O expansion adapters to provide a cost-effective way for you to increase and customize the capabilities of the compute node. For additional information, see "PCIe Expansion Node" at https://pubs.lenovo.com/flexsystem-pcie-expansion-node/.

Attention: When installing an I/O adapter in one of the I/O expansion connectors, make sure the numbers in the Hexagon and Pentagon on the I/O expansion connector (see the service labeling on top of the compute node cover for details) corresponds to the particular shape and numbering of the I/O module bay on the Flex chassis (see the service labeling at the top on the rear of the chassis for details). If the correlation is incorrect, communication with the chassis may fail.

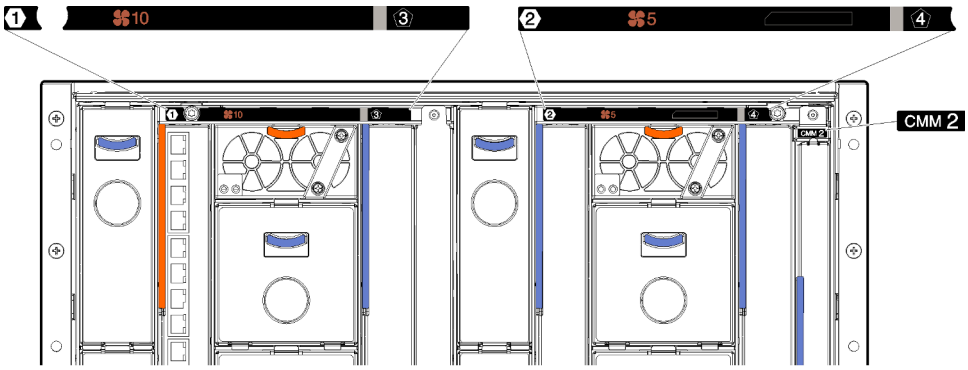

Figure 35. Service labeling on the rear of the chassis

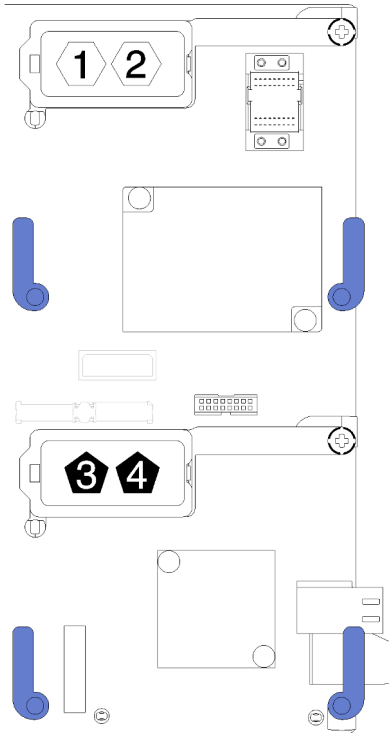

Figure 36. Hexagon and Pentagon number location on the I/O expansion connector

To install an I/O expansion adapter, complete the following steps:

Watch the procedure. A video of the installation process is available:
- YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-B4_LYuT9X1MRWBU6UzX9gO

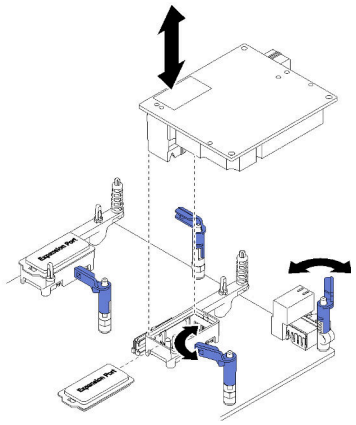

Figure 37. I/O expansion adapter installation

Step 1. Locate the I/O expansion connectors.

Step 2. Remove the expansion cover from the connector, if one is present.

Step 3. Touch the static-protective package that contains the expansion adapter to any *unpainted* metal surface on the Lenovo Flex System chassis or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion adapter from the package.

Step 4. Rotate the retention clips outward.

Step 5. Orient the connector on the expansion adapter with the I/O expansion connector and alignment pins on the system board; then, press the adapter into the I/O expansion connector.

Step 6. Firmly press on the indicated locations to seat the expansion adapter in the connector and over the alignment pins.

Step 7. Close the retention clips to secure the adapter.

After you install the I/O expansion adapter, complete the following steps:

1. Install the compute node cover (see “Install the compute node cover” on page 47).
2. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
3. Power on the compute node.
4. See the documentation that comes with the expansion adapter for device-driver and configuration information to complete the installation.

Demo video

Watch the procedure on YouTube

M.2 backplane replacement

Use the following information to remove and install the M.2 backplane.

Remove the M.2 backplane

Use this information to remove the M.2 backplane.

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

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.

3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).

To remove the M.2 backplane, complete the following steps:

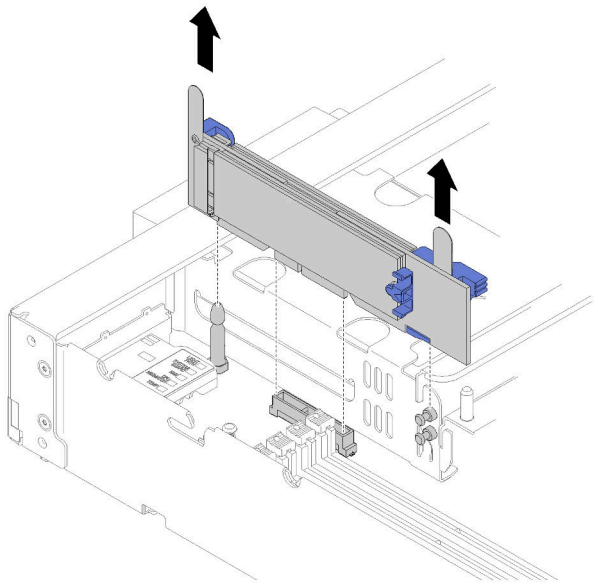

Figure 38. M.2 backplane removal

Step 1. Remove the M.2 backplane from the system board by pulling up on both ends of the backplane at the same time.

Note: Pull the M.2 backplane straight up when removing it from the system board.

To remove an M.2 drive from the M.2 backplane, see “Remove an M.2 drive” on page 62 .

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

Demo video

Watch the procedure on YouTube

Install the M.2 backplane

Use this information to install the M.2 backplane.

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

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To install the M.2 backplane, complete the following steps:

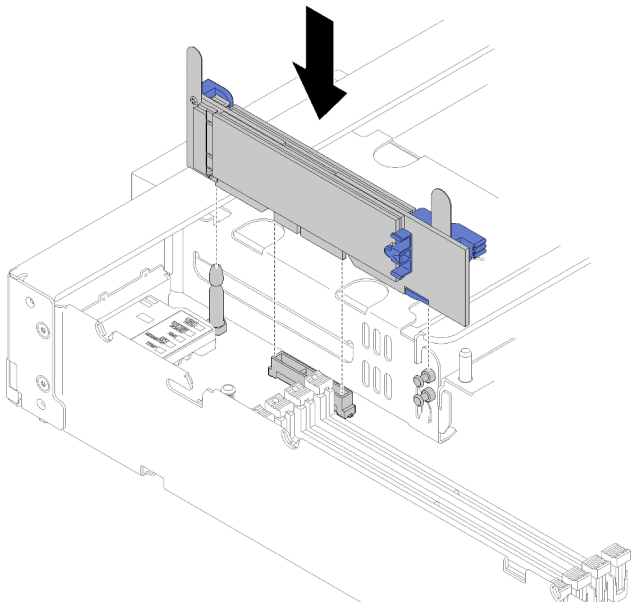

Figure 39. M.2 backplane installation

Step 1. Align the openings located at the bottom of the blue plastic supports at each end of the M.2 backplane with the guide pin on the system board and T-head pins on the hard drive cage; then, insert the backplane in the system board connector. Press down on the M.2 backplane to fully seat it.

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

1. Install the compute node cover (see “Install the compute node cover” on page 47).
2. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
3. Power on the compute node.
4. See the documentation that comes with the M.2 backplane for device-driver and configuration information to complete the installation.

Demo video

Watch the procedure on YouTube

M.2 drive replacement

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

Remove an M.2 drive

Use this information to remove an M.2 drive from the M.2 backplane.

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

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. If necessary, remove the M.2 backplane from your system (see “Remove the M.2 backplane” on page 60).

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

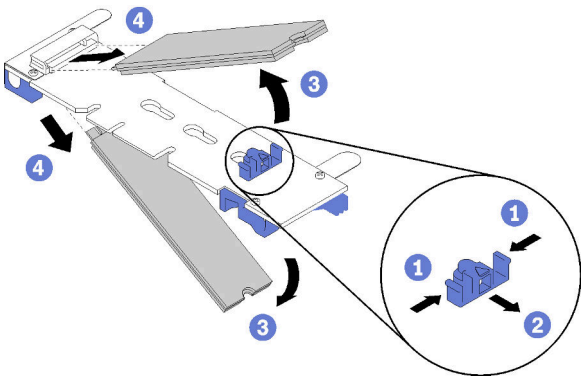

Figure 40. M.2 drive removal

Step 1. Press both sides of the retainer and slide it backward to loosen the M.2 drive from the M.2 backplane.

Note: If your M.2 backplane has two M.2 drives, they will both release outward when you slide the retainer backward.

Step 2. Remove the M.2 drive by rotating it away from the M.2 backplane and pulling away from the connector at an angle (approximately 30 degrees).

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

Demo video

Watch the procedure on YouTube

Adjust the position of the retainer on the M.2 backplane

Use this information to adjust the position of the retainer on the M.2 backplane.

Before you adjust the position of the retainer on the M.2 backplane, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To adjust the position of the retainer on the M.2 backplane, complete the following steps:

Step 1. Locate the correct keyhole that the retainer should be installed into to accommodate the particular size of the M.2 drive you wish to install.

Step 2. Press both sides of the retainer and move it forward until it is in the large opening of the keyhole; then, remove it from the backplane.

Step 3. Insert the retainer into the correct keyhole and slide it backwards until the nubs are in the holes.

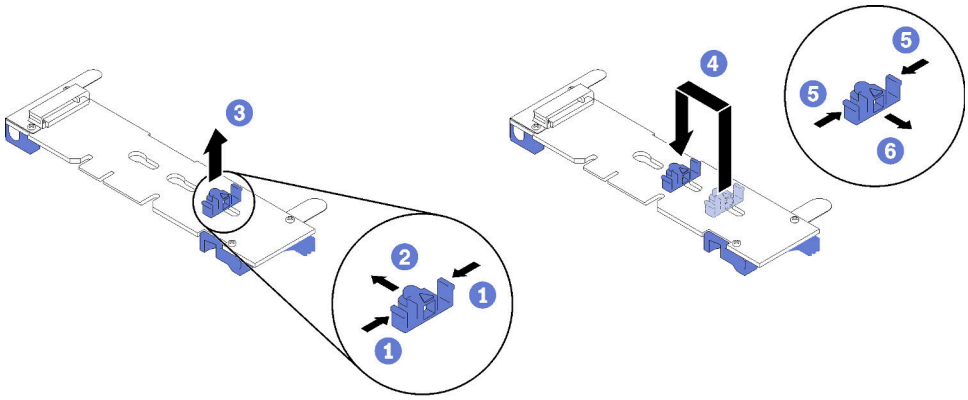

Figure 41. M.2 retainer adjustment

Demo video

Watch the procedure on YouTube

Install an M.2 drive

Use this information to install an M.2 drive in the M.2 backplane.

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

1. Read "Installation Guidelines" on page 23 to ensure that you work safely.
2. Touch the static-protective package that contains the M.2 drive to any *unpainted* metal surface on the chassis or any *unpainted* metal surface on any other grounded rack component; then, remove the M.2 drive from the package.
3. Make sure the retainer on the M.2 backplane is in the correct keyhole to accommodate the particular size of the M.2 drive you wish to install (see "Adjust the position of the retainer on the M.2 backplane" on page 63).

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

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

Notes:

- Some M.2 backplanes 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.
- Install the M.2 drive in slot 0 first.

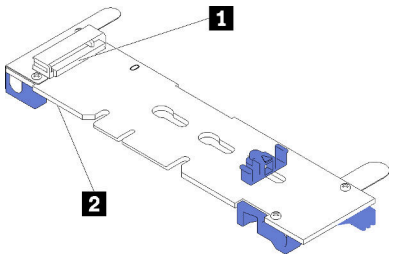

Figure 42. M.2 drive slot

Table 14. M.2 drive slot

1 Slot 0	2 Slot 1

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 the M.2 backplane.

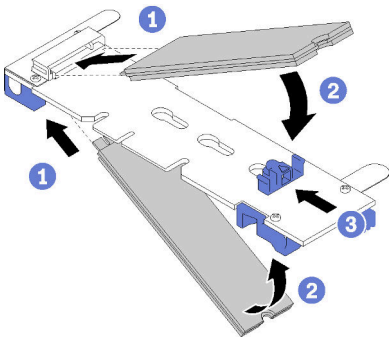

Figure 43. M.2 drive installation

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

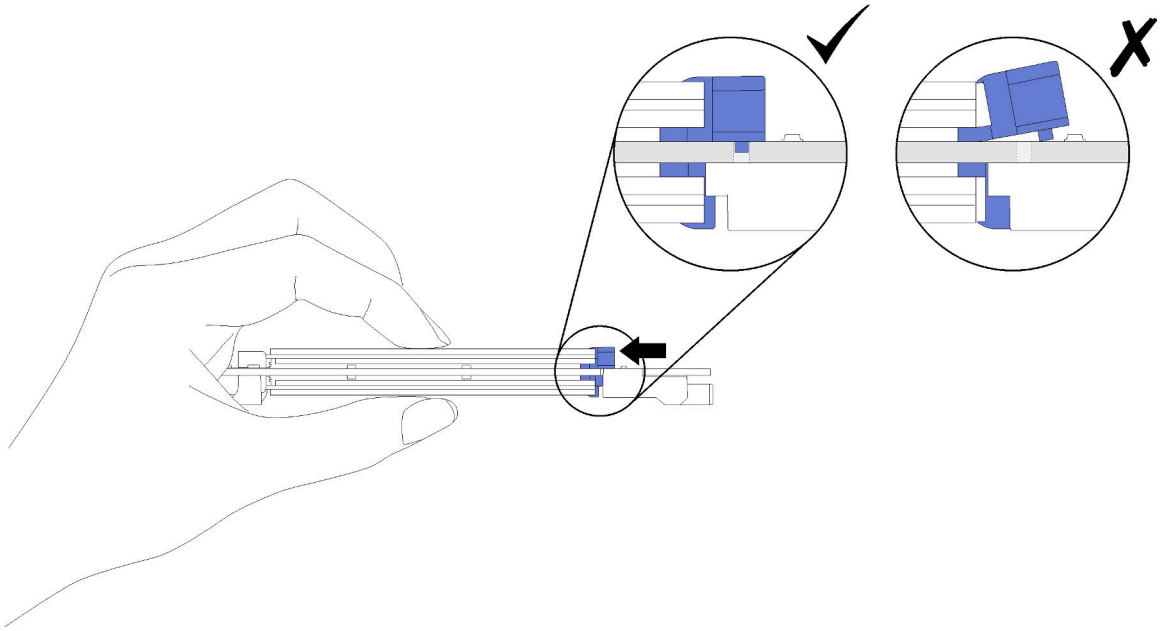

Figure 44. M.2 drive installation

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

1. Install the M.2 backplane (see “Install the M.2 backplane” on page 61).
2. Install the compute node cover (see “Install the compute node cover” on page 47).
3. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
4. Power on the compute node.

Demo video

Watch the procedure on YouTube

Memory module replacement

Use the following information to remove and install a memory module.

Remove a memory module

Use this information to remove a memory module.

Before you remove a memory module, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).

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

- 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.
- Do not use any metal tools (such as jigs or clamps) to handle the memory modules, because the rigid metals may damage the memory modules.
- Do not insert memory modules while holding packages or passive components, which can cause package cracks or detachment of passive components by the high insertion force.

After you install or remove a memory module, you must change and save the new configuration information by using the Setup utility. When you turn on the compute node, a message indicates that the memory configuration has changed. Start the Setup utility and select **Save Settings** (see the *Lenovo ThinkSystem SN550 Type 7X16 Setup Guide* for more information) to save changes.

To remove a memory module, complete the following steps:

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

Step 1. Remove the air baffle (see “Remove the air baffle” on page 34 for instructions).

Step 2. Locate the memory module connectors (see “System-board connectors” on page 16). Determine which memory module you want to remove from the compute node.

Attention: To avoid breaking the retaining clips or damaging the memory module connectors, handle the clips gently.

Note: The retaining clips for adjacent memory module connectors of processor one and processor two can not be open at the same time. Remove or install the memory modules for each processor one at a time and close the retaining clips after removing a memory module.

Step 3. Carefully open the retaining clips on each end of the memory module connector.

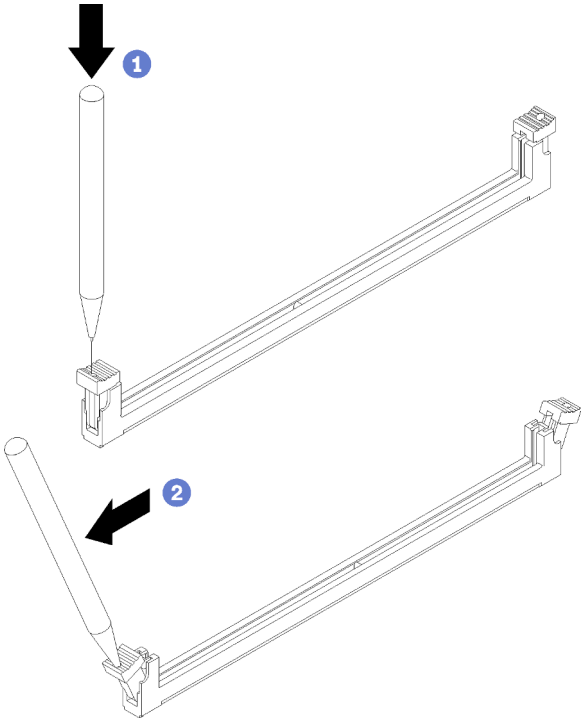

Figure 45. Opening retaining clip

Attention: If necessary, due to space constraints, you can use a pointed tool to open the retaining clips. Place the tip of the tool in the recess on the top of the retaining clip; then, carefully rotate the retaining clip away from the memory module connector. Pencils are not recommended, as they may not be strong enough.

Step 4. Make sure that both retaining clips on the memory module connector from which you are removing the memory module are in the fully-open position; then, pull the memory module out of the connector with both hands.

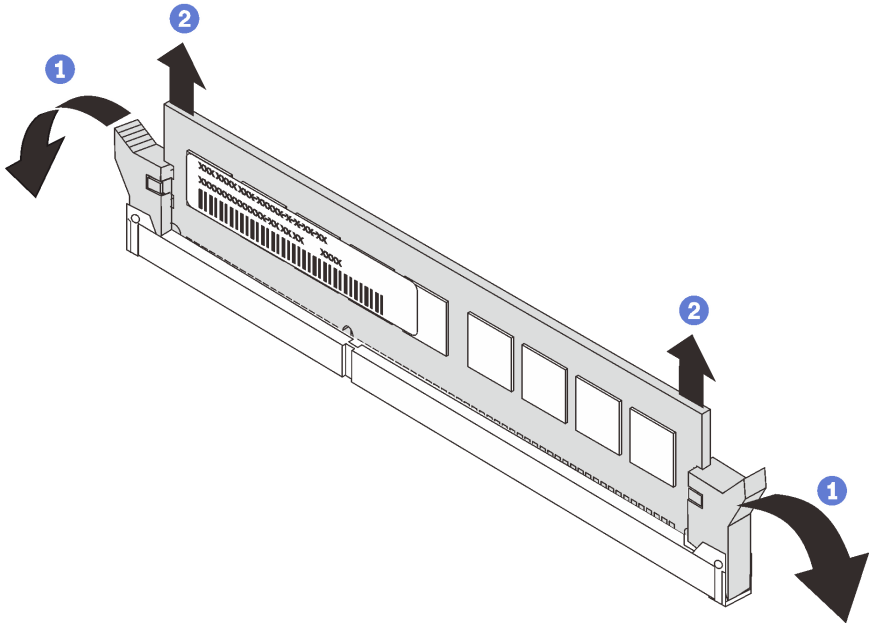

Figure 46. memory module removal

Attention: To maintain proper system cooling, do not operate the compute node without an air baffle installed over the memory module connectors.

Notes:

- If you are not immediately replacing the memory module, install the air baffle (see “Install the air baffle” on page 34).
- Retaining clips on the memory module connectors must be in the closed position to install the air baffle.

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

Demo video

Watch the procedure on YouTube

Install a memory module

Use this information to install a memory module.

Before you install a memory module, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. See “Memory module installation order” in *Setup Guide* for detailed information about memory configuration and setup.
3. If you are installing DCPMMs for the first time, follow the instructions in “DC Persistent Memory Module (DCPMM) setup” in *Setup Guide*.

The compute node has a total of 24 dual inline DIMM connectors. The compute node supports low-profile (LP) DDR4 DIMMs with error-correcting code (ECC).

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

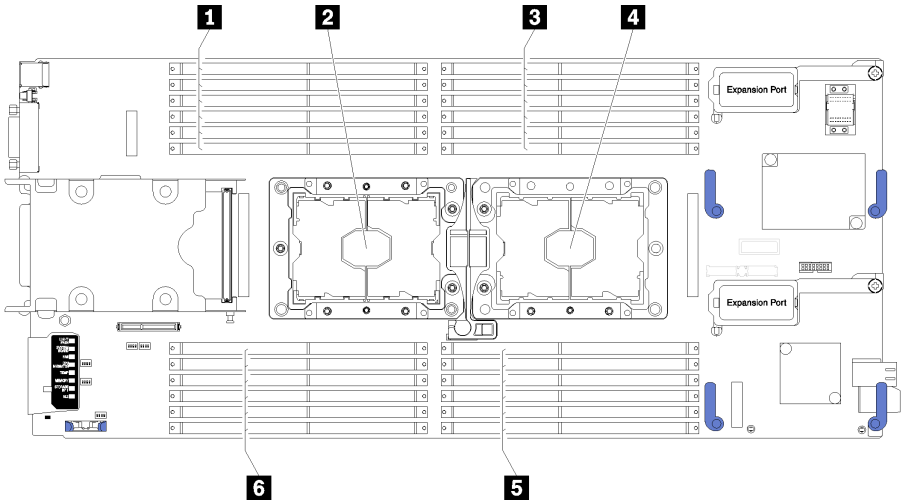

Figure 47. Memory module and processor location

Table 15. Memory module and processor location

1 Memory module connectors 13–18	4 Processor socket 1
2 Processor socket 2	5 Memory module connectors 7–12
3 Memory module connectors 1–6	6 Memory module connectors 19–24

To install a memory module, 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:

- 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.
- Do not use any metal tools (such as jigs or clamps) to handle the memory modules, because the rigid metals may damage the memory modules.
- Do not insert memory modules while holding packages or passive components, which can cause package cracks or detachment of passive components by the high insertion force.

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

Step 1. Locate the memory module connectors. Determine which memory module connector you want to install the memory module.

Step 2. Touch the static-protective package that contains the memory module to any *unpainted* metal surface on the Lenovo Flex System chassis or any *unpainted* metal surface on any other grounded rack component in the rack in which you are installing the memory module for at least 2 seconds; then, remove the memory module from its package.

Step 3. Make sure that both retaining clips on the memory module connector are in the open position.

Attention:

- memory modules are static-sensitive devices. The package must be grounded before it is opened.
- To avoid breaking the retaining clips or damaging the memory module connector, handle the clips gently.

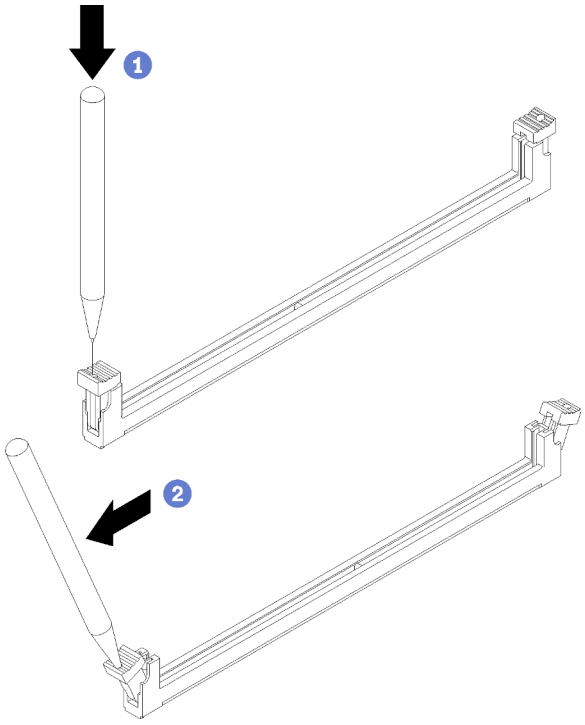

Figure 48. Opening retaining clip

Notes:

- If necessary, due to space constraints, you can use a pointed tool to open the retaining clips. Place the tip of the tool in the recess on the top of the retaining clip; then, carefully rotate the retaining clip away from the memory module connector.
- The retaining clips for adjacent memory module connectors of processor one and processor two can not be open at the same time. Remove or install the memory modules for each processor one at a time.

Step 4. Turn the memory module so that the memory module keys align correctly with the memory module connector on the system board, and gently place the memory module on the connector with both hands.

Step 5. Firmly press both ends of the memory module straight down into the memory module connector until the retaining clips snap into the locked position.

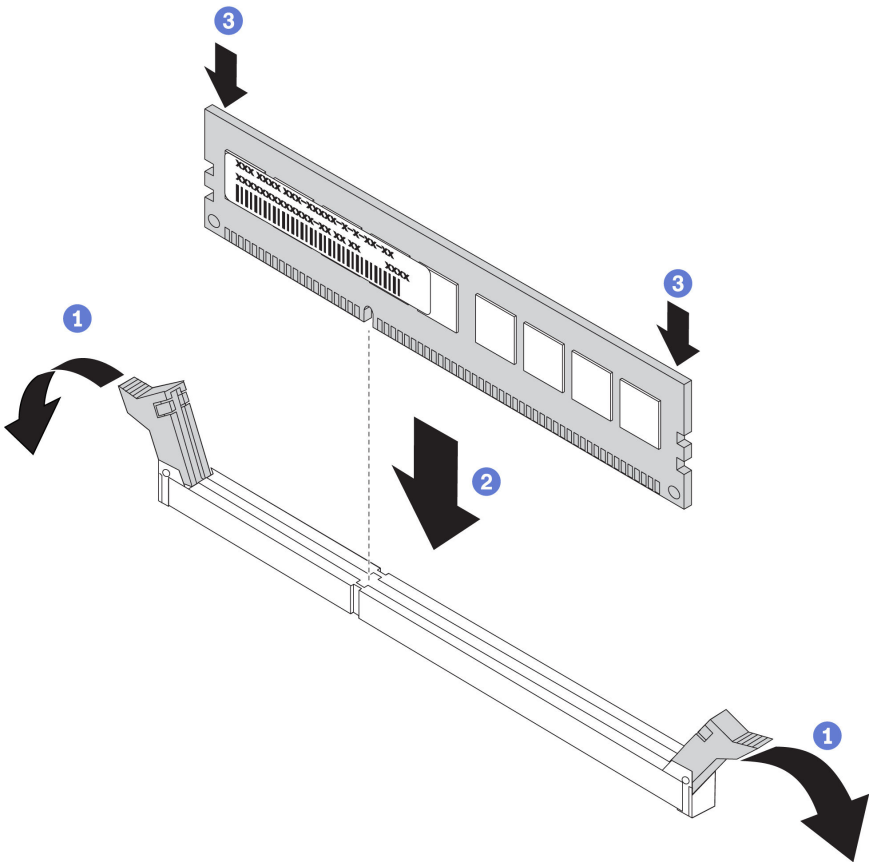

Figure 49. Memory module installation

Step 6. Make sure that the small tabs on the retaining clips engage the notches on the memory module. If there is a gap between the memory module and the retaining clips, the memory module has not been correctly installed. Press the memory module firmly into the connector, and then press the retaining clips toward the memory module until the tabs are fully seated.

Note: Retaining clips on the memory module connectors must be in the closed position to install the air baffle.

After you install the memory module, complete the following steps:

1. Install the air baffle (see “Install the air baffle” on page 34).

   Attention: To maintain proper system cooling, do not operate the compute node without an air baffle installed over the memory module connectors.
2. Install the compute node cover (see “Install the compute node cover” on page 47).
3. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
4. Power on the compute node.

Demo video

Watch the procedure on YouTube

Processor and heat sink replacement

Use the following procedures to replace an assembled processor and heat sink, known as a processor-heat-sink module (PHM), a processor, or a heat sink.

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

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

Remove a processor and heat sink

This task has instructions for removing an assembled processor and heat sink, known as a processor-heat-sink module (PHM), a processor, and a heat sink. All of these tasks require a Torx T30 driver.

Attention:

- Each processor socket must always contain a PHM or a cover and heat sink baffle. When removing or installing a PHM, protect empty processor sockets with a cover.
- Do not touch the processor socket or processor contacts. Processor-socket contacts are very fragile and easily damaged. Contaminants on the processor contacts, such as oil from your skin, can cause connection failures.
- Remove and install only one PHM at a time. If the system board supports multiple processors, install the PHMs starting with the first processor socket.
- Do not allow the thermal grease on the processor or heat sink to come in contact with anything. Contact with any surface can compromise the thermal grease, rendering it ineffective. Thermal grease can damage components, such as electrical connectors in the processor socket. Do not remove the grease cover from a heat sink until you are instructed to do so.
- To ensure the best performance, check the manufacturing date on the new heat sink and make sure it does not exceed two years. Otherwise, wipe off the existing thermal grease and apply the new grease onto it for optimal thermal performance.

Before you remove a PHM:

Note: The heat sink, processor, and processor retainer for your system might be different than those shown in the illustrations.

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).
6. Remove the air baffle (see “Remove the air baffle” on page 34).
7. Locate the processor that is to be removed.

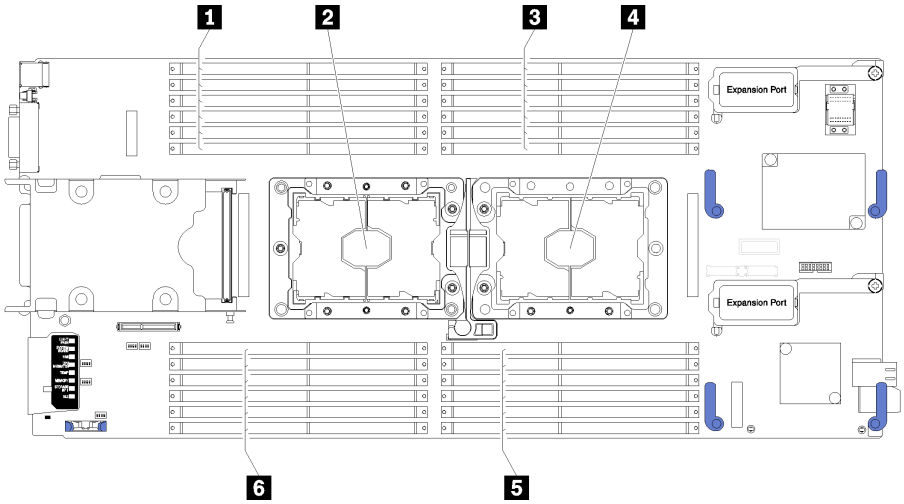

Figure 50. DIMM and processor location

Table 16. DIMM and processor location

1 DIMM connectors 13–18	4 Processor socket 1
2 Processor socket 2	5 DIMM connectors 7–12
3 DIMM connectors 1–6	6 DIMM connectors 19–24

Complete the following steps to remove a PHM.

Step 1. Remove the PHM from the system board

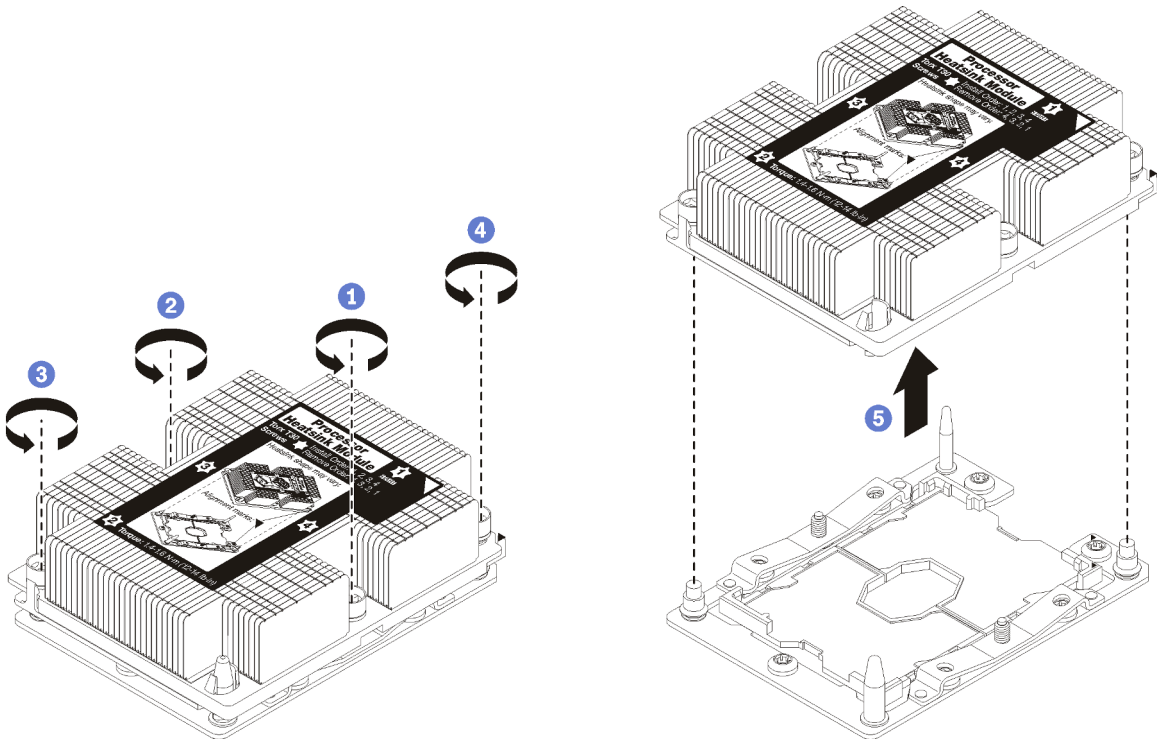

Figure 51. Removing a PHM

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

a. Fully loosen the Torx T30 captive fasteners on the processor-heat-sink module *in the removal sequence shown* on the heat-sink label.

b. Lift the processor-heat-sink module from the processor socket.

After you remove a PHM:

- If you are removing the PHM as part of a system board replacement, set the PHM aside.
- If you are replacing the processor or heat sink, separate the processor and its retainer from the heat sink.

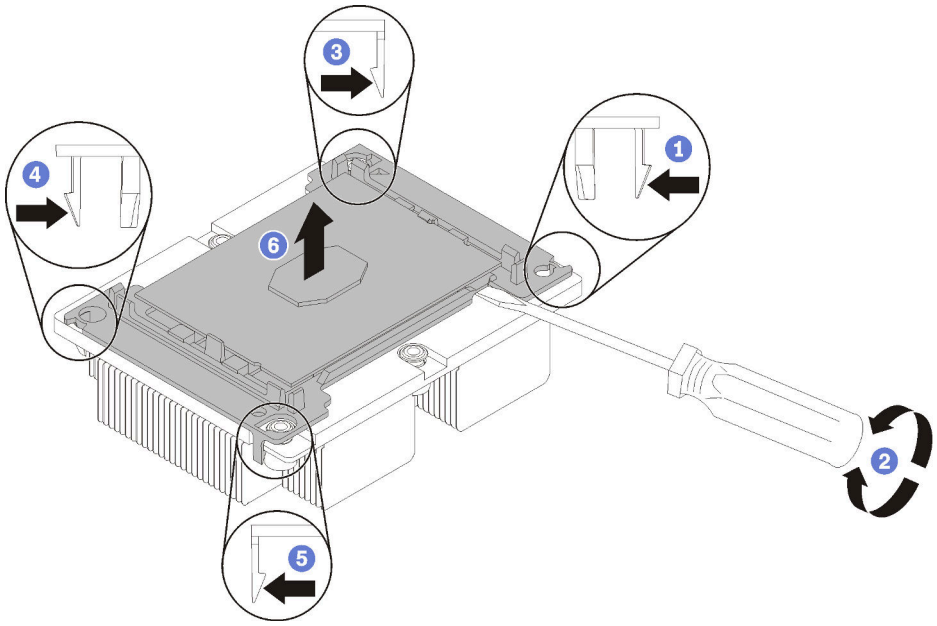

Figure 52. Separating a heat sink from a processor

1. Press the retaining clip at the corner of the processor retainer closest to the pry point; then, gently pry this corner of the retainer away from the heat sink with a flat-bladed screwdriver, using a twisting motion to break the processor-to-heat-sink seal.
2. Release the remaining retaining clips and lift the processor and retainer from the heat sink.
3. After separating the processor and retainer from the heat sink, hold the processor and retainer with the thermal-grease side down and the processor-contact side up to prevent the processor from falling out of the retainer.

   Note: The processor retainer will be removed and discarded in a later step and replaced with a new one.

- If you are replacing the processor, you will be reusing the heat sink. Wipe the thermal grease from the bottom of the heat sink using an alcohol cleaning pad.
- If you are replacing the heat sink, you will be reusing the processor. Wipe the thermal grease from the top of the processor using an alcohol cleaning pad.

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

Demo video

Watch the procedure on YouTube

Install a processor and heat sink

This task has instructions for installing an assembled processor and heat sink, known as a processor-heat-sink module (PHM), a processor, and a heat sink. All of these tasks require a Torx T30 driver.

Attention:

- Each processor socket must always contain a PHM or a cover and heat sink baffle. When removing or installing a PHM, protect empty processor sockets with a cover.
- Do not touch the processor socket or processor contacts. Processor-socket contacts are very fragile and easily damaged. Contaminants on the processor contacts, such as oil from your skin, can cause connection failures.
- Remove and install only one PHM at a time. If the system board supports multiple processors, install the PHMs starting with the first processor socket.
- Do not allow the thermal grease on the processor or heat sink to come in contact with anything. Contact with any surface can compromise the thermal grease, rendering it ineffective. Thermal grease can damage components, such as electrical connectors in the processor socket. Do not remove the grease cover from a heat sink until you are instructed to do so.
- To ensure the best performance, check the manufacturing date on the new heat sink and make sure it does not exceed two years. Otherwise, wipe off the existing thermal grease and apply the new grease onto it for optimal thermal performance.

Notes:

- PHMs are keyed for the socket where they can be installed and for their orientation in the socket.
- See https://serverproven.lenovo.com/ for a list of processors supported for your compute node. All processors on the system board must have the same speed, number of cores, and frequency.
- Before you install a new PHM or replacement processor, update your system firmware to the latest level. See “Update the firmware” in the *ThinkSystem SN550 Setup Guide*.
- Installing an additional PHM can change the memory requirements for your system. See “Install a DIMM” in the *ThinkSystem SN550 Setup Guide* for a list of processor-to-memory relationships.
- The maximal capacity the system supports varies with the processor(s) installed:
  - L processors (model name ending with L): 4.5 TB
  - M processors (model name ending with M): 2 TB
  - Other processors that support PMM: 1 TB
- When using Intel Xeon Gold 6126T 12C 125W 2.6 GHz Processor, Intel Xeon Gold 6144 8C 150W 3.5 GHz Processor, Intel Xeon Gold 6146 12C 165W 3.2 GHz Processor, Intel Xeon Platinum 8160T 24C 150W 2.1 GHz Processor, or Intel Xeon Platinum 6244 8C 150W 3.6 GHz Processor, please note the following:
  - The ambient temperature should be less than 30°C.
  - When operating above 30°C or in the event of a fan failure, the server will continue to function as long as all the component’s temperature requirements are met. However, the performance may be reduced.
  - The noise level will be significantly higher than the base models.

Before you install a PHM:

Note: The heat sink, processor, and processor retainer for your system might be different than those shown in the illustrations.

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.

3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).
6. Remove the existing PHM, if one is installed. See “Remove a processor and heat sink” on page 72.

   Note: Replacement processors come with both rectangular and square processor retainers. A rectangular retainer comes attached to the processor. The square retainer can be discarded.
7. If you are replacing a heat sink, replace the processor retainer. *Processor retainers should not be reused.*
   a. Remove the old processor retainer.

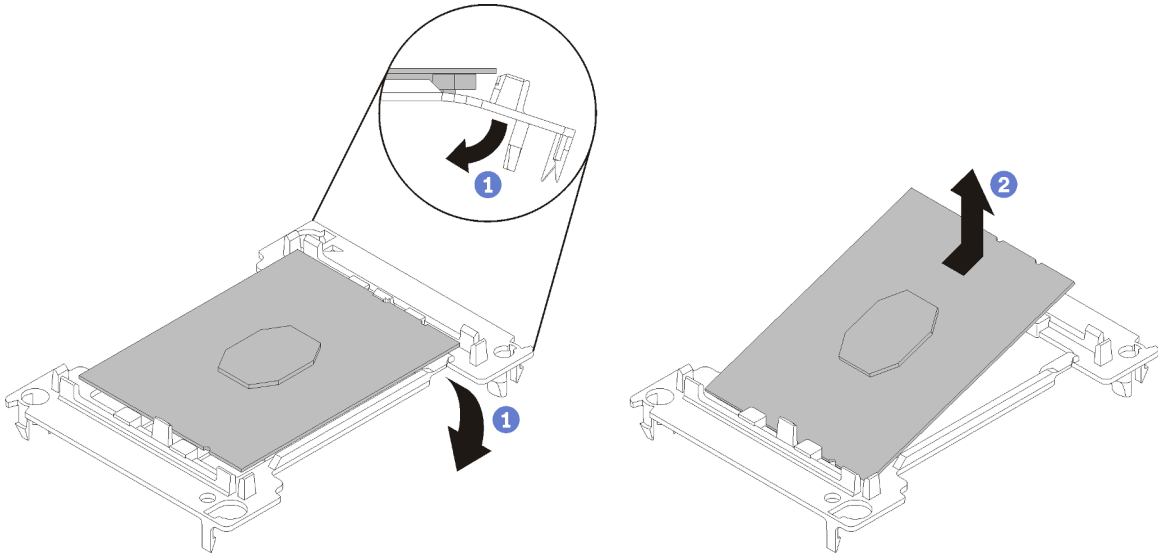

Figure 53. Removing a processor retainer

Note: When the processor is out of its retainer, hold the processor by the long edges to prevent touching the contacts or the thermal grease, if it is applied.

With the processor-contact side up, flex the ends of the retainer down and away from the processor to release the retaining clips; then, remove the processor from the retainer. Discard the old retainer.

   b. Install a new processor retainer.

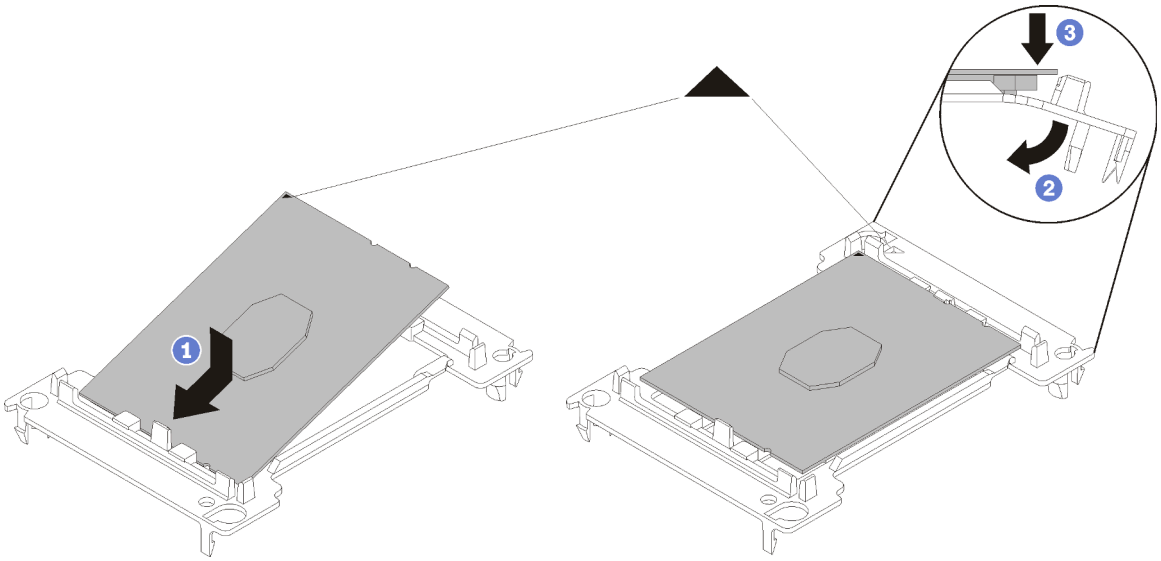

Figure 54. Installing a processor retainer

1) Position the processor on the new retainer so that the triangular marks align; then, insert the unmarked end of the processor into the retainer.
2) Holding the inserted end of the processor in place, flex the opposite end of the retainer down and away from the processor until you can press the processor under the clip on the retainer.

   To prevent the processor from falling out of the retainer after it is inserted, keep the processor-contact side up and hold the processor-retainer assembly by the sides of the retainer.
3) If there is any old thermal grease on the processor, gently clean the top of the processor using an alcohol cleaning pad.

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

8. If you are replacing a processor:
   a. Remove the processor identification label from the heat sink and replace it with the new label that comes with the replacement processor.
   b. Apply the thermal grease on the top of the processor with syringe by forming four uniformly spaced dots, while each dot consists of about 0.1 ml of thermal grease.

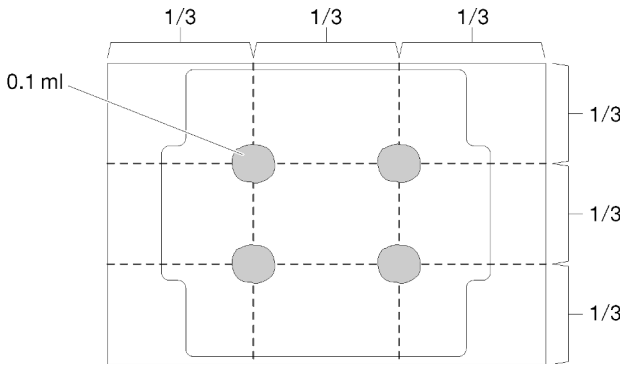

Figure 55. Proper shape of the thermal grease

1) Carefully place the processor and retainer on a flat surface with the processor-contact side down.
2) Apply half a syringe of thermal grease, approximately 0.65 g, to the center of the processor top.

9. If you are replacing a heat sink, remove the processor identification label from the old heat sink and place it on the new heat sink in the same location. The label is on the side of the heat sink closet to the triangular alignment mark.

   If you are unable to remove the label and place it on the new heat sink, or if the label is damaged during transfer, write the processor serial number from the processor identification label on the new heat sink in the same location as the label would be placed using a permanent marker.

10. Assemble the processor and heat sink, if these components are separate.

    Notes:

    - If you are replacing a processor, install the heat sink onto the processor and retainer while the processor and retainer are in the shipping tray.
    - If you are replacing a heat sink, remove the heat sink from its shipping tray and place the processor and retainer in the opposite half of the heat sink shipping tray with the processor-contact side down. To prevent the processor from falling out of the retainer, hold the processor-retainer assembly by its sides with the processor-contact side up until you turn it over to fit in the shipping tray.

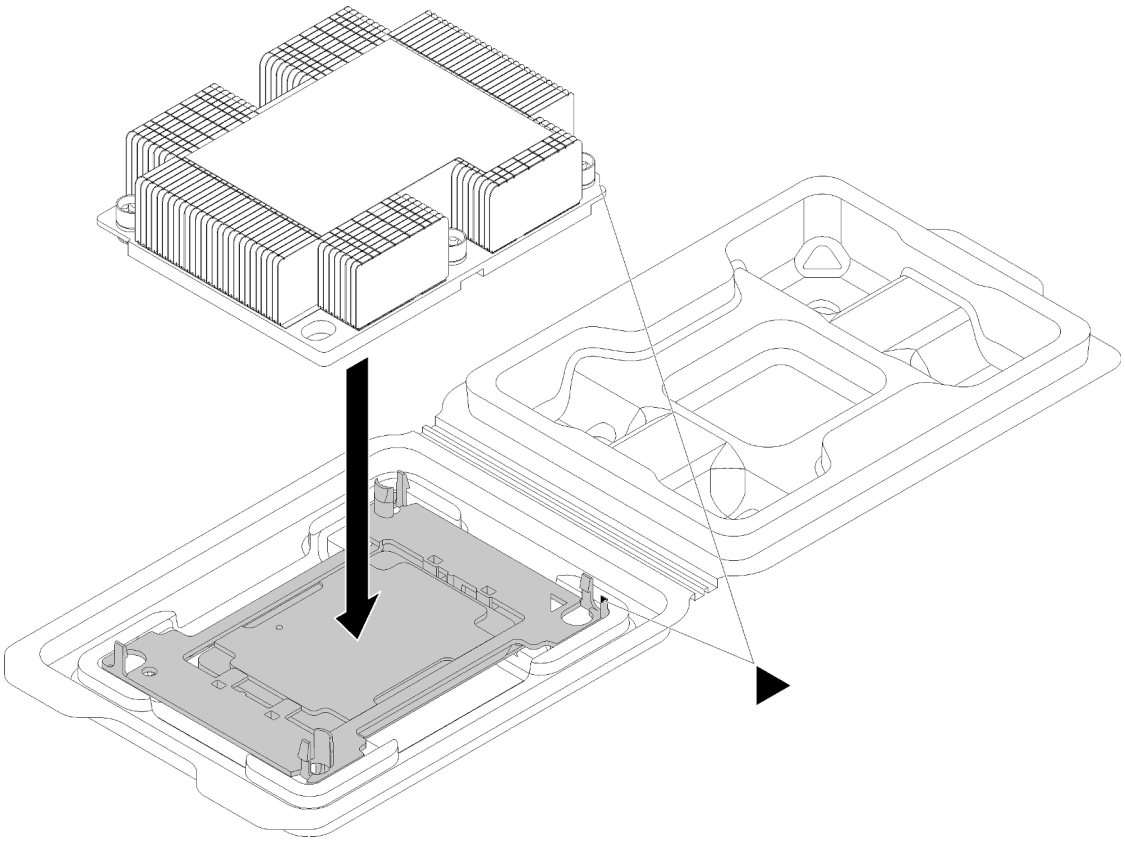

Figure 56. Assembling a PHM in the shipping tray

    a. Align the triangular marks on the processor retainer and the heat sink or align the triangular mark on the processor retainer with the notched corner of the heat sink.
    b. Insert the processor-retainer clips into the holes on the heat sink.
    c. Press the retainer into place until the clips at all four corners engage.

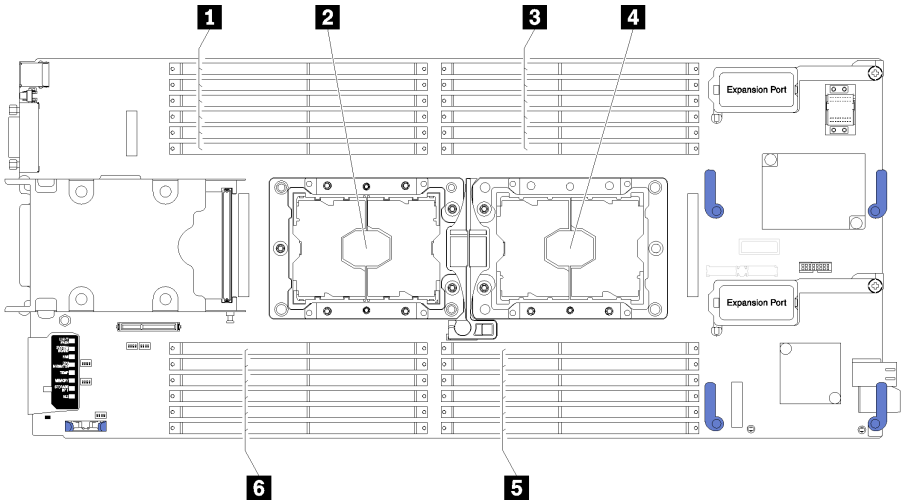

Figure 57. DIMM and processor location

Table 17. DIMM and processor location

1 DIMM connectors 13-18	4 Processor socket 1
2 Processor socket 2	5 DIMM connectors 7-12
3 DIMM connectors 1-6	6 DIMM connectors 19-24

Complete the following steps to install a PHM.

Step 1. Remove the processor socket cover, if one is installed on the processor socket, by placing your fingers in the half-circles at each end of the cover and lifting it from the system board.

Step 2. Install the processor-heat-sink module on the system board.

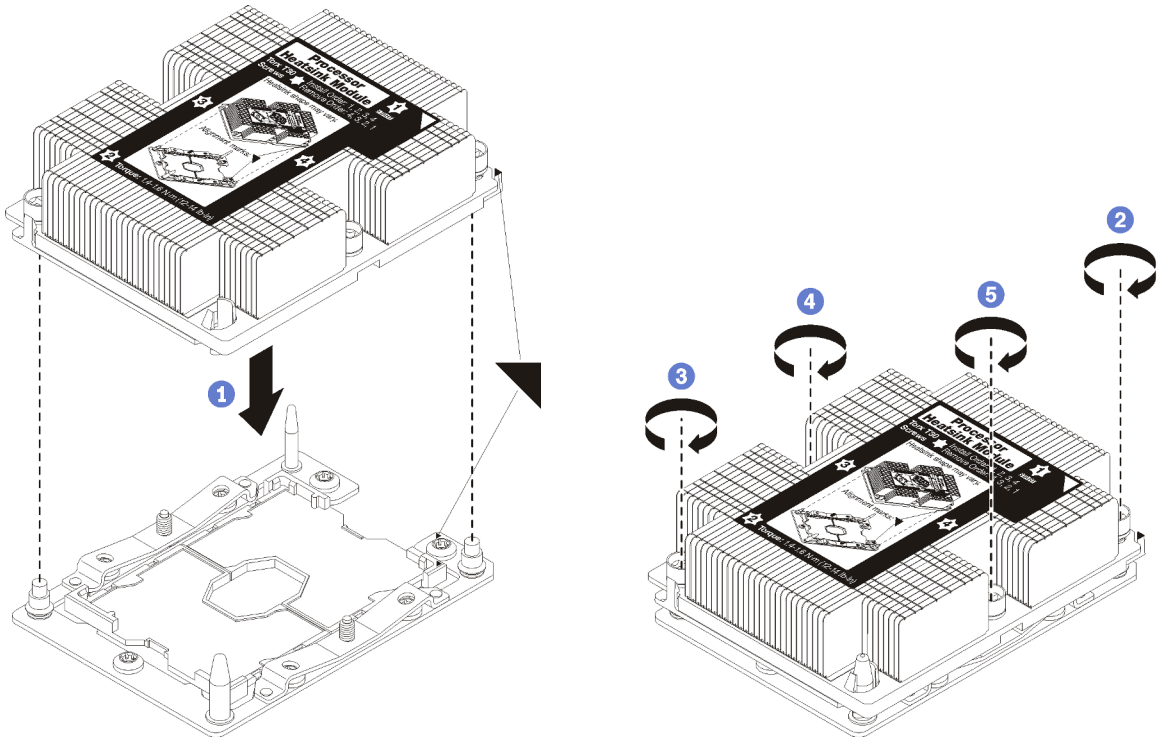

Figure 58. Installing a PHM

a. Align the triangular marks and guide pins on the processor socket with the PHM; then, insert the PHM into the processor socket.

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

b. Fully tighten the Torx T30 captive fasteners *in the installation sequence shown* on the heat-sink label. Tighten the screws until they stop; then, visually inspect to make sure that there is no gap between the screw shoulder beneath the heat sink and the processor socket. (For reference, the torque required for the nuts to fully tighten is 1.4-1.6 newton-meters, 12-14 inch-pounds).

After you install a PHM:

1. Install the air baffle (see “Install the air baffle” on page 34).
2. Install the compute node cover (see “Install the compute node cover” on page 47).
3. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
4. Power on the compute node.

Demo video

Watch the procedure on YouTube

RFID tag replacement

Use the following information to remove and install the RFID tag.

Remove the RFID tag

Use this information to remove the RFID tag from the front panel.

Before you remove the RFID tag, read

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To remove the RFID tag, complete the following steps:

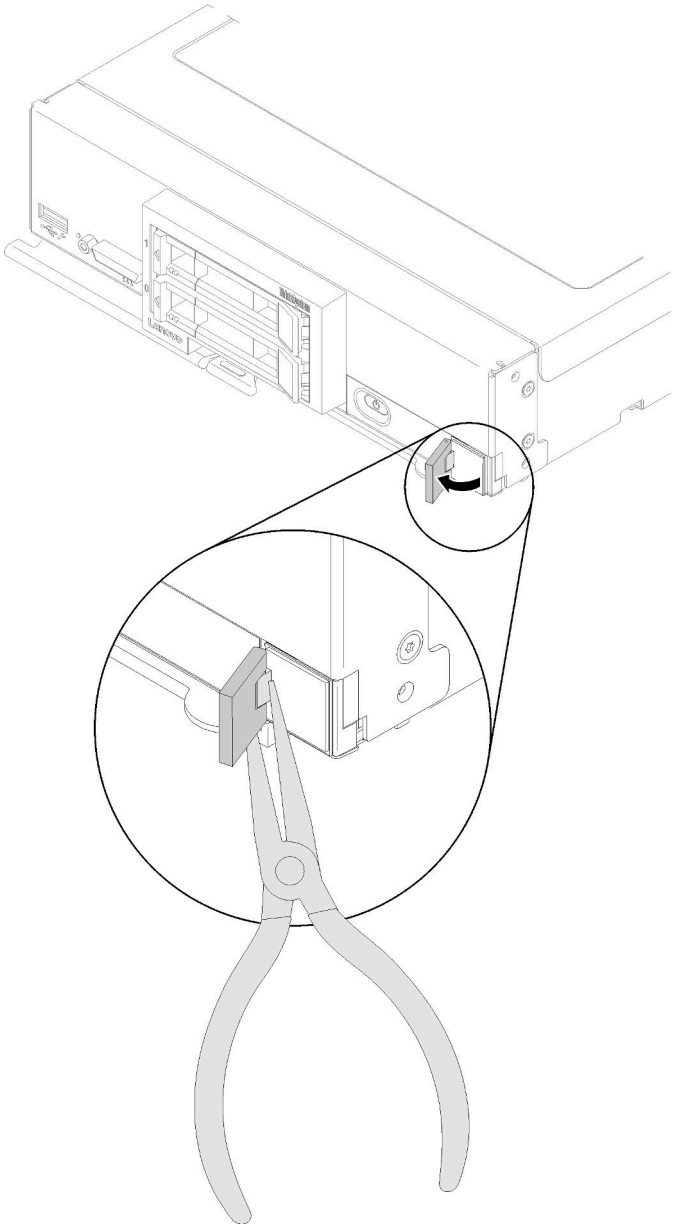

Figure 59. RFID tag removal

Step 1. If the RFID tag is still attached to its hinge, open the RFID tag.

Important: Use care when removing the RFID tag to avoid damaging the ID label plate.

Step 2. Use pliers to carefully grip the RFID hinge and gently pull and twist the base of the RFID tag from the ID label plate on the front panel of the compute node. Hold the ID label plate in place on the compute node front panel while removing the RFID tag.

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

Demo video

Watch the procedure on YouTube

Install the RFID tag

Use this information to install the RFID tag on the front panel.

Before you install the RFID tag, read

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To install the RFID tag, complete the following steps:

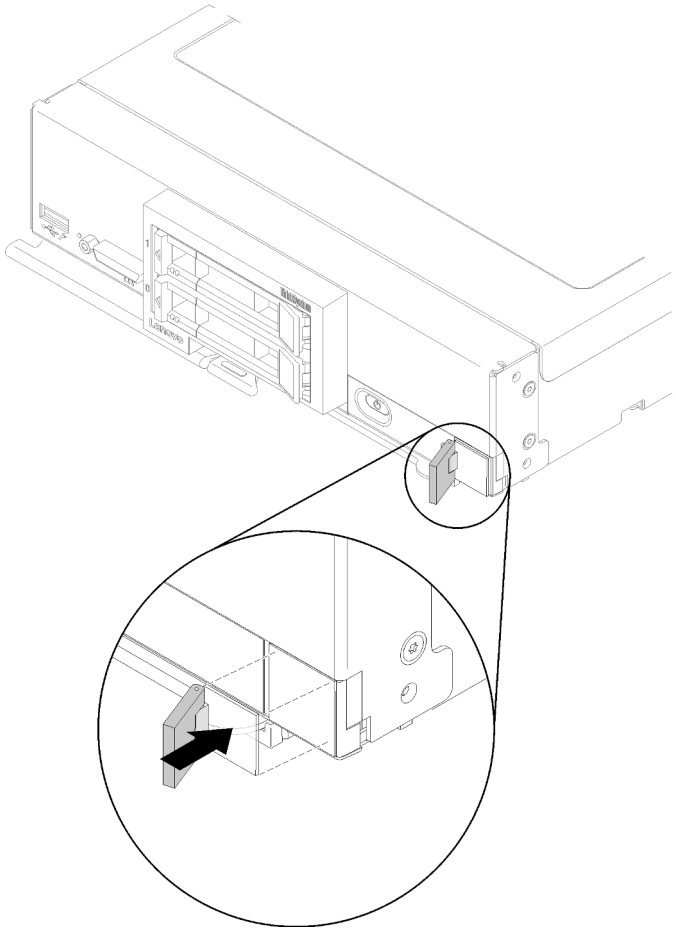

Figure 60. RFID tag installation

Step 1. Make sure that the surface you are installing the tag on is thoroughly clean and dry.

Step 2. Open the RFID tag; then, remove the backing from the base of the RFID tag to expose the adhesive.

Step 3. Position the RFID tag over the ID label on the front panel of the compute node.

Step 4. Press the RFID tag securely against the bezel and hold firmly in place for 30 seconds.

Notes:

- Allow 30 minutes before closing or opening the RFID tag.
- Allow 24 hours to achieve near maximum adhesion.

Demo video

Watch the procedure on YouTube

RAID adapter replacement

Use the following information to remove and install a RAID adapter.

Remove a RAID adapter

Use this information to remove a RAID adapter.

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

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).

The RAID adapter uses a specific drive backplane.

- If you need to remove the RAID adapter to access components on the system board (for example DIMM sockets 13-24), there is no need to remove the backplane.
- If you are removing only the RAID adapter to replace it, there is no need to remove the backplane.

To remove the RAID adapter, complete the following steps:

Step 1. Locate the RAID adapter installed in the compute node.

Step 2. Remove the RAID adapter.

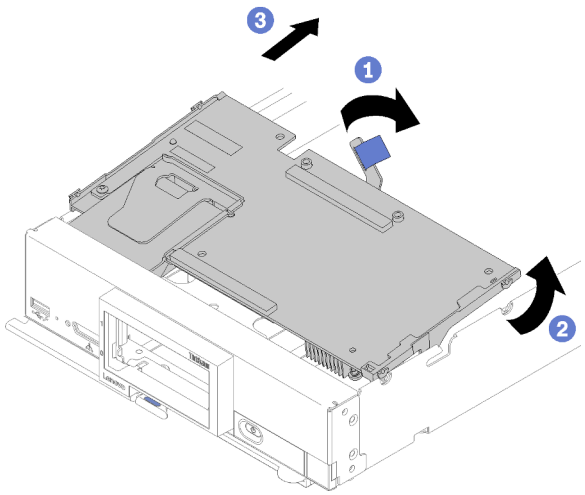

Figure 61. RAID adapter removal

a. Rotate the lever on the hard disk drive backplane to disengage the RAID adapter from the backplane connector.
b. Lift the RAID adapter and remove it from the compute node.

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

Demo video

Watch the procedure on YouTube

Install a RAID adapter

Use this information to install a RAID adapter.

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

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To install a RAID adapter, complete the following steps:

Step 1. If a drive backplane is installed in the compute note that is not compatible with the RAID adapter, remove it (see “Remove the 2.5-inch drive backplane” on page 31).

Note: All drive backplanes use the same connector on the system board; however, there are two alignment slots in the drive cage to accommodate different backplane types. Make sure that you align the backplane and system board connectors when inserting the backplane in the drive cage.

Step 2. If you are installing both the RAID adapter and drive backplane, first install the backplane in the system-board assembly (see “Install a 2.5-inch drive backplane” on page 32). The drive backplane goes in the rear alignment slots on the drive cage.

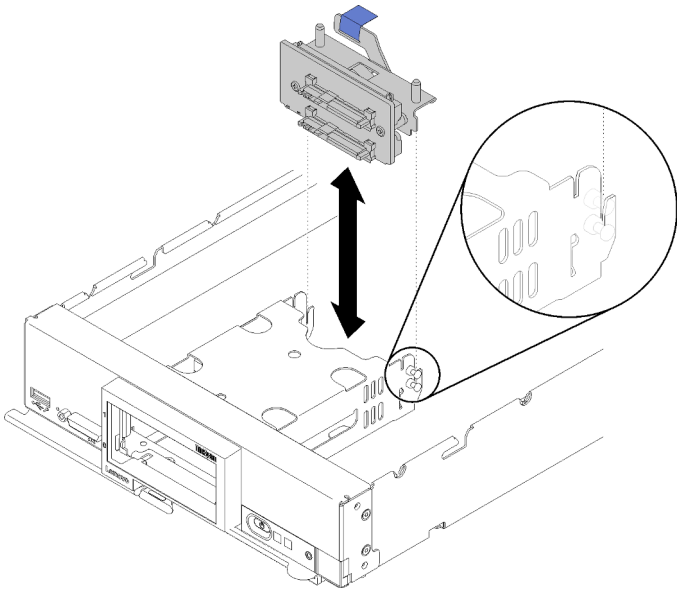

Figure 62. Drive backplane installation

Step 3. Touch the static-protective package that contains the RAID adapter to an *unpainted* metal surface on any grounded rack component; then, remove the controller from the package.

Note: For the Lenovo ThinkSystem RAID 930-4i-2GB 2 Drive Adapter Kit, make sure that the flash power module is installed before installing the controller in the compute node (see “Install the flash power module” on page 52).

Step 4. Locate the RAID adapter connector on the drive backplane.

Step 5. Orient the connector on the RAID adapter with the connector on the drive backplane.

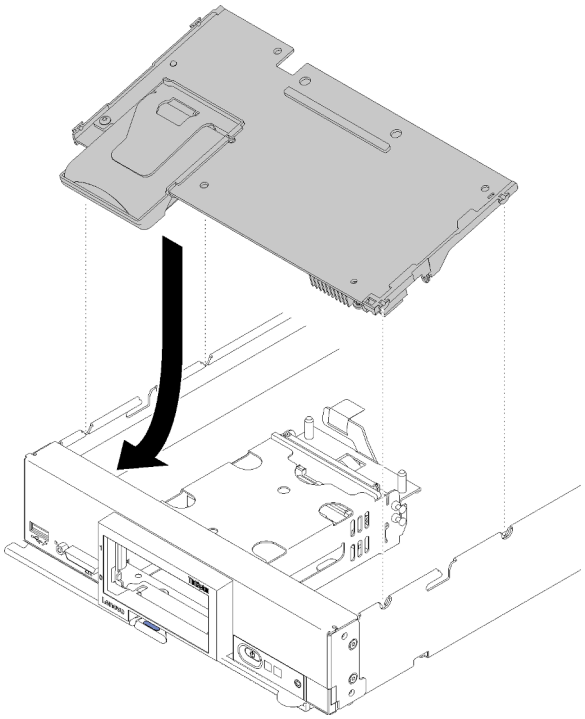

Figure 63. RAID adapter installation

Step 6. Firmly press on the foam to seat the RAID adapter into the connector.

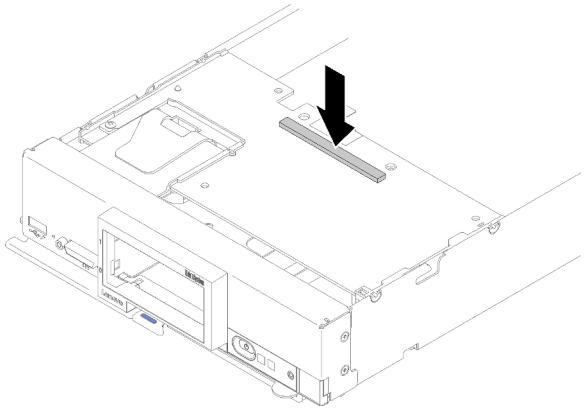

Figure 64. RAID adapter installation

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

1. Install any removed storage drives and drive bay fillers (see “Install a 2.5-inch hot-swap drive” on page 30).

   Note: Install storage drives in the same bay locations as from which they were removed.
2. Install the compute node cover (see “Install the compute node cover” on page 47).
3. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
4. Power on the compute node.
5. Configure the RAID array.

Demo video

Watch the procedure on YouTube

Storage cage replacement

Use the following information to remove and install the storage cage.

Remove the storage cage

Use this information to remove the storage cage.

Before you remove the storage cage, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see “Remove the compute node cover” on page 46).

To remove the storage cage, complete the following steps:

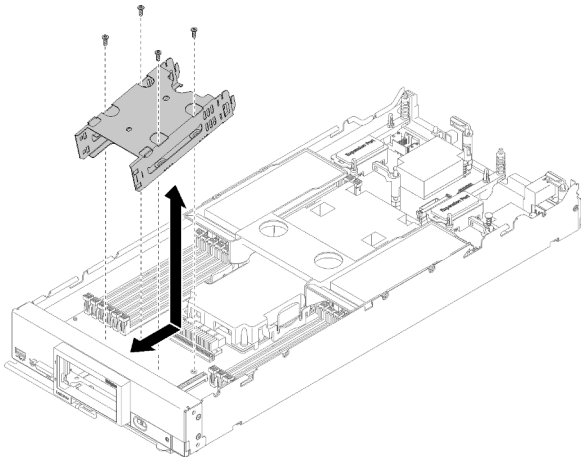

Figure 65. Storage cage removal

Step 1. Remove the bezel (see “Remove the bezel” on page 38).

Step 2. Remove any storage drives, optional drive components, and drive bay fillers and set them aside on a static-protective surface (see “Remove a 2.5-inch hot-swap drive” on page 29).

Step 3. Remove the 2.5” drive backplane (see “Remove the 2.5-inch drive backplane” on page 31).

Step 4. Using a T10 Torx screwdriver, remove the four screws from the cage and rotate the cage from under the compute node front panel; then, remove the cage from the compute node at an angle.

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

Demo video

Watch the procedure on YouTube

Install the storage cage

Use this information to install the storage cage.

Before you install the storage cage, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To install the storage cage, complete the following steps:

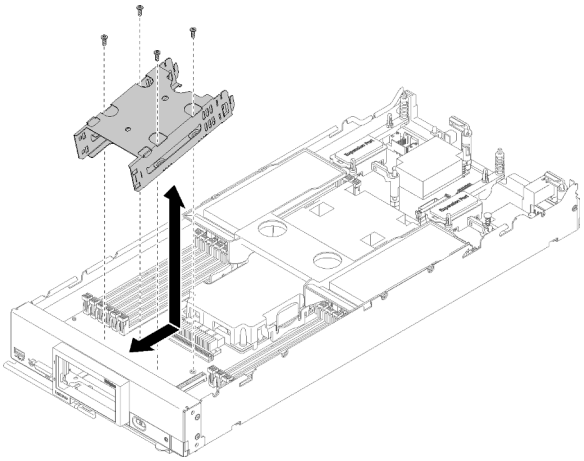

Figure 66. Storage cage installation

Step 1. Position the cage in the compute node front panel at an angle and rotate the cage into position on the system board.

Step 2. Align the cage with the screw holes on the system board.

Step 3. Using a T10 Torx screwdriver, insert the four screws and secure the cage in the compute node.

After you install the storage cage, complete the following steps:

1. Install the 2.5” drive backplane (see “Install a 2.5-inch drive backplane” on page 32).
2. Install the bezel (see “Install the bezel” on page 39).
3. Install any removed storage drives, optional drive components, and drive bay fillers (see “Install a 2.5-inch hot-swap drive” on page 30).
4. Install the compute node cover (see “Install the compute node cover” on page 47).
5. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
6. Power on the compute node.

Demo video

Watch the procedure on YouTube

System-board assembly replacement

Use the following information to remove and install the system-board assembly.

Important: Before you return the system-board assembly, make sure that you install the CPU socket covers from the new system-board assembly. To replace a CPU socket cover:

1. Take a socket cover from the CPU socket assembly on the new system-board assembly and orient it correctly above the CPU socket assembly on the removed system-board assembly.
2. Gently press down the socket cover legs to the CPU socket assembly, pressing on the edges to avoid damage to the socket pins. You might hear a click on the socket cover is securely attached.
3. **Make sure** that the socket cover is securely attached to the CPU socket assembly.

Remove and replace the system-board assembly

Notes:

- This procedure should be performed only by trained service technicians.
- If possible, back up all compute node settings, including the settings for any options installed in the compute node.

Before you replace the system-board assembly, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
4. Carefully lay the replacement system-board assembly (system board FRU) and the defective system-board assembly (defective node) side-by-side on a flat, static-protective surface.

Important: When you replace the system-board assembly, you must update the compute node with the latest firmware or restore the pre-existing firmware. Make sure that you have the latest firmware or a copy of the preexisting firmware before you proceed (see “Firmware updates” on page 6 for more information).

See “System-board layout” on page 16 for more information about the locations of the connectors, switches, and LEDs on the system board.

To remove and replace the system-board assembly, complete the following steps:

Important: To avoid damage when replacing a defective system-board assembly, transfer internal components between the defective system-board assembly and the replacement system-board assembly one at a time. Unless otherwise noted, install each internal component in the replacement system-board assembly immediately after removing it from the defective system-board assembly.

Step 1. Remove any storage drives, optional drive components, and hard disk drive bay fillers from the defective system-board assembly and set them aside on a static-protective surface (see “Remove a 2.5-inch hot-swap drive” on page 29).

Note: When removing the storage drives, make note of the drive bay from which the drive was removed so that you can install the drive back in to the same drive bay.

Step 2. Remove the storage drive bezel from the defective system-board assembly and immediately install it on the replacement system-board assembly (see “Remove the bezel” on page 38 and “Install the bezel” on page 39).

Step 3. Remove the covers from both compute nodes (see “Remove the compute node cover” on page 46). Keep the cover that comes with the replacement system-board assembly for reference and re-install it on the defective system-board assembly prior to returning the defective system-board assembly.

Step 4. If a RAID adapter is installed in the defective system-board assembly, remove it and set it aside on a static-protective surface (see “Remove a RAID adapter” on page 83).

Step 5. Remove the hard disk drive backplane from the defective system-board assembly and immediately install it in the replacement system-board assembly (see “Remove the 2.5-inch drive backplane” on page 31 and “Install a 2.5-inch drive backplane” on page 32).

Step 6. Install any removed disk drives, optional drive components, and disk drive bay fillers into the replacement system-board assembly (see “Install a 2.5-inch hot-swap drive” on page 30).

Step 7. Remove the air baffle from the defective system-board assembly and set it aside (see “Remove the air baffle” on page 34).

Step 8. Transfer processor and heat sink assembly 1 (rear processor) from the defective system-board assembly to the replacement system-board assembly (see “Remove a processor and heat sink” on page 72 and “Install a processor and heat sink” on page 75).

Attention:

- Remove and install only one processor at a time.
- When removing and installing a processor, protect the other processor socket with a socket cover.
- When transferring a processor to a replacement system-board assembly, install the socket cover in the defective system-board assembly immediately after installing the processor in the replacement system-board assembly.

Step 9. Repeat Step 8 Step 8 on page 89 for the processor and heat sink assembly 2 (front processor), if one is installed.

Step 10. Remove the DIMMs one at a time from the defective system-board assembly (see "Remove a memory module" on page 66 and immediately install them in the replacement system-board assembly (see "Install a memory module" on page 68).

Attention:

- Remove and install only one DIMM at a time.

Step 11. Remove all of the installed components in the following list from the defective system-board assembly; then, immediately install them on the replacement system-board assembly:

- I/O expansion adapters. See procedures:
  - "Remove an I/O expansion adapter" on page 57 and "Install an I/O expansion adapter" on page 58
- M.2 Backplane. See procedures:
  - "Remove the M.2 backplane" on page 60 and "Install the M.2 backplane" on page 61
- Fabric connector (if present). See procedures:
  - "Remove a fabric connector" on page 49 and "Install a fabric connector" on page 50
- TCM (if present). See procedures:
  - "Remove the TCM/TPM adapter (for Chinese Mainland only)" on page 99 and "Install the TCM/TPM adapter (for Chinese Mainland only)" on page 100

    Attention: TPM/TCM policy settings may need to be made when the TCM module is re-installed on the replacement system-board assembly. For details, see "Set the TPM policy" on page 95.

Step 12. If a RAID adapter was removed from the defective system-board assembly, install it in the replacement system-board assembly (see "Install a RAID adapter" on page 84).

Step 13. Install the air baffle in the replacement system-board assembly (see "Install the air baffle" on page 34). The air baffle is required to maintain system cooling.

Note: Retaining clips on the DIMM connectors must be in the closed position to install the air baffle.

Step 14. Install the compute node cover that you removed from the defective system-board assembly onto the replacement system-board assembly (see "Install the compute node cover" on page 47).

Step 15. Make sure that both processor sockets on defective system-board assembly have socket covers installed; then, install the compute node cover that came with the replacement system-board assembly onto the defective system-board assembly (see "Install the compute node cover" on page 47).

Note: Retention clips that secure the I/O expansion adapters must be in the closed position to install the cover.

Step 16. If a blank ID label plate is on the replacement system-board assembly, remove it and discard (see “Remove the ID label plate” on page 55).

Step 17. Remove the ID label plate that has machine type and serial number information from the front panel of the defective system-board assembly and immediately install it on the replacement system-board assembly (see “Remove the ID label plate” on page 55 and “Install the ID label plate” on page 56).

Note: If your compute node has an RFID tag, it is already attached to the ID label plate.

Step 18. The replacement system-board assembly comes with a Repair Identification (RID) tag. Using a fine tip indelible ink pen, transfer the machine type and serial number from the defective system-board assembly to the label on the Repair Identification tag; then, place the tag in the recessed area 1 on the bottom of replacement system-board assembly.

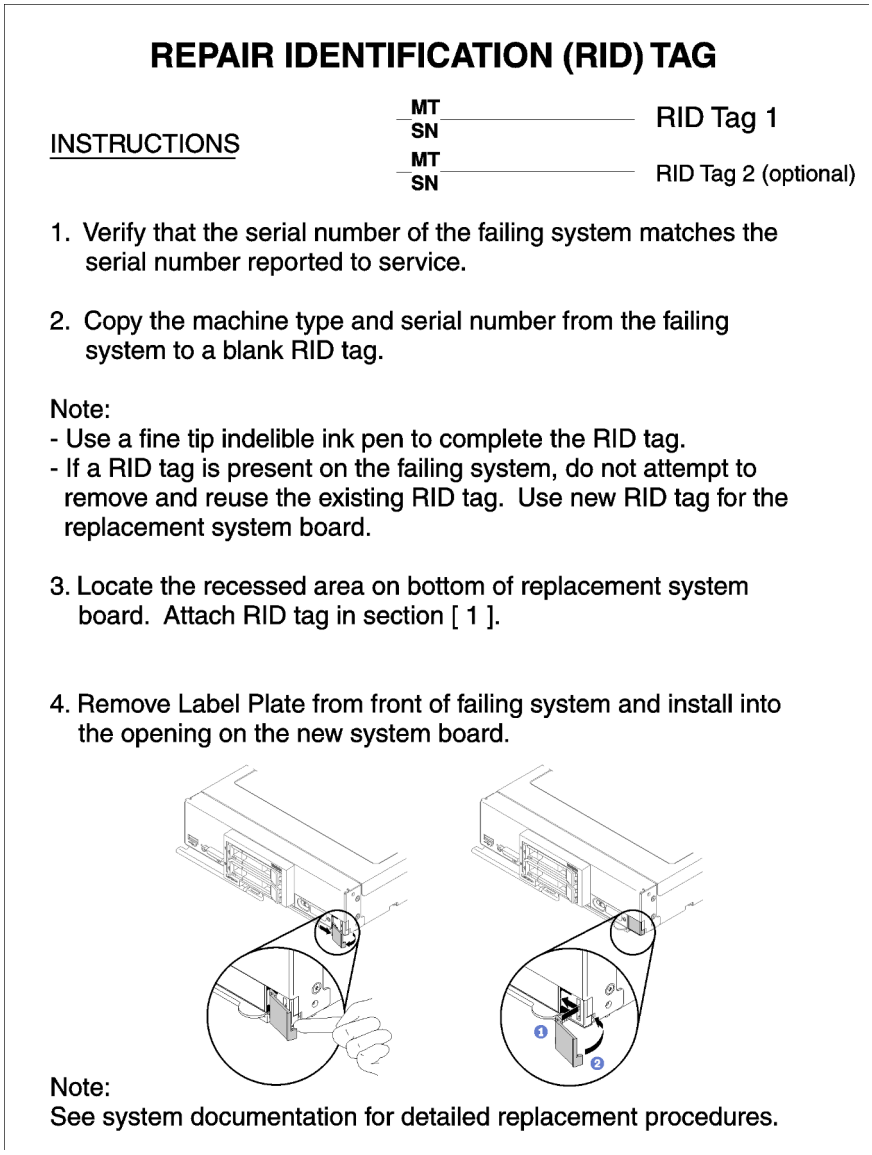

Figure 67. Repair Identification (RID) tag

After you transfer components to the replacement system-board assembly, complete the following steps:

1. Install the compute node in the chassis (see “Install the compute node in the chassis” on page 28).

2. If an Attention label is on the replacement system-board assembly front panel above the power button, read it; then, remove the label and discard it before turning on the compute node.
3. Use the CMM Web Interface to restore the IP address of the compute node XClarity controller. See Starting the web interface in the "Flex System Chassis Management Module: User's Guide" at https://pubs.lenovo.com/cmm2/cmm_ug_startwebinterface for more information.

   Note: If you configured static IP addresses, you will not be able to access the node remotely or from a management device until the IP address of the XClarity controller is restored.
4. Update the machine type and serial number with new vital product data (VPD). Use the Lenovo XClarity Provisioning Manager to update the machine type and serial number. See “Update the machine type and serial number” on page 92.
5. Enable Trusted Platform Module (TPM) (see “Enable TPM/TCM” on page 94).
6. Optionally, enable Secure Boot (see “Enable UEFI Secure Boot” on page 98).
7. Update the compute node configuration.
   - Download and install the latest device drivers: http://datacentersupport.lenovo.com
   - Update the system firmware. See “Firmware updates” on page 6.
   - Update the UEFI configuration.
   - Reconfigure the disk arrays if you have installed or removed a hot-swap drive or a RAID adapter. See the LXPM documentation version compatible with your server at https://pubs.lenovo.com/lxpm-overview/.

Note: Make sure the latest version of ThinkSystem M.2 with Mirroring Enablement Kit Firmware is applied to avoid virtual disk/array missing after system board replacement.

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

Important: Before you return the system-board assembly, make sure that you install the CPU socket covers from the new system-board assembly. To replace a CPU socket cover:

1. Take a socket cover from the CPU socket assembly on the new system-board assembly and orient it correctly above the CPU socket assembly on the removed system-board assembly.
2. Gently press down the socket cover legs to the CPU socket assembly, pressing on the edges to avoid damage to the socket pins. You might hear a click on the socket cover is securely attached.
3. **Make sure** that the socket cover is securely attached to the CPU socket assembly.

Demo video

Watch the procedure on YouTube

Update the machine type and serial number

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

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

- From Lenovo XClarity Provisioning Manager

  To update the machine type and serial number from Lenovo XClarity Provisioning Manager:

  1. Start the server and press the key according to the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface.

2. If the power-on Administrator password is required, enter the password.
3. From the System Summary page, click **Update VPD**.
4. Update the machine type and serial number.

- From Lenovo XClarity Essentials OneCLI

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

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

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

  1. Download and install Lenovo XClarity Essentials OneCLI.

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

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

  2. Copy and unpack the OneCLI package, which also includes other required files, to the server. Make sure that you unpack the OneCLI and the required files to the same directory.
  3. After you have Lenovo XClarity Essentials OneCLI in place, type the following commands to set the machine type and serial number:
     ```
     onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model> [access_method]
     onecli config set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n> [access_method]
     onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifier <system model> [access_method]
     onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifierEx <system model> --override [access_method]
     ```

     Where:

     <m/t_model>
     The server machine type and model number. Type `xxxxyyy`, where *xxxx* is the machine type and *yyy* is the server model number.

     <s/n>
     The serial number on the server. Type `zzzzzzz`, where *zzzzzzz* is the serial number.

     <system model>
     The system model. Type `system yyyyyyyy`, where *yyyyyyyy* is the product identifier.

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

     – Online authenticated LAN access, type the command:
       `[--bmc-username <xcc_user_id> --bmc-password <xcc_password>]`

       Where:

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

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

       Example commands are as follows:
       ```
       onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model> --bmc-username <xcc_user_id>
       --bmc-password <xcc_password>
       onecli config set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n> --bmc-username <xcc_user_id> --bmc-
       password <xcc_password>
       ```

```
onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifier <system model> --bmc-username xcc_user_
id --bmc-password xcc_password
onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifierEx <system model> --override --bmc-
username xcc_user_id --bmc-password xcc_password
```

– Online KCS access (unauthenticated and user restricted):

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

  Example commands are as follows:

```
onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model>
onecli config set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n>
onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifier <system model>
onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifierEx <system model> --override
```

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

– Remote LAN access, type the command:

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

  Where:

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

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

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

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

  Example commands are as follows:

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


onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifier <system model> --bmc xcc_user_id:xcc_
password@xcc_external_ip
onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifierEx <system model> --override --bmc xcc_
user_id:xcc_password@xcc_external_ip
```

4. Reset the Lenovo XClarity Controller to the factory defaults. See “Resetting the BMC to Factory Default” section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/.

Enable TPM/TCM

The server supports Trusted Platform Module (TPM), Version 1.2 or Version 2.0

Note: For customers in Chinese Mainland, integrated TPM is not supported. However, customers in Chinese Mainland can install a Trusted Cryptographic Module (TCM) adapter or a NationZ TPM adapter (sometimes called a daughter card). Customers in Chinese Mainland should download Lenovo Business Vantage to enable TCM. For more information, see https://datacentersupport.lenovo.com/en/en/downloads/ds548665-18alenovo_business_vantage_-release_letter-_20171205_v221770130-for-unknown-os and https://download.lenovo.com/servers/mig/2021/02/09/43299/LBV_v2.2.177.0130_readme_20180903.txt.

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

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

Set the TPM policy

By default, a replacement system board is shipped with the TPM policy set to **undefined**. You must modify this setting to match the setting that was in place for the system board that is being replaced.

There are two methods available to set the TPM policy:

- From Lenovo XClarity Provisioning Manager

  To set the TPM policy from Lenovo XClarity Provisioning Manager:

  1. Start the server and press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface.
  2. If the power-on Administrator password is required, enter the password.
  3. From the System Summary page, click **Update VPD**.
  4. Set the policy to one of the following settings.
     - **TPM 2.0 enabled - China only**. Customers in the Chinese Mainland should choose this setting if a NationZ TPM 2.0 adapter is installed.
     - **TPM enabled - ROW**. Customers outside of the Chinese Mainland should choose this setting.
     - **Permanently disabled**. Customers in the Chinese Mainland should use this setting if no TPM adapter is installed.

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

- From Lenovo XClarity Essentials OneCLI

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

  To set the TPM policy from Lenovo XClarity Essentials OneCLI:

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

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

     Note: The imm.TpmTcmPolicyLock value must be 'Disabled', which means TPM_TCM_POLICY is NOT locked and changes to the TPM_TCM_POLICY are permitted. If the return code is ‘Enabled’ then no changes to the policy are permitted. The planar may still be used if the desired setting is correct for the system being replaced.
  2. Configure the TPM_TCM_POLICY into XCC:
     - For the customer in Chinese Mainland with no TCM/TPM:
       ```
       OneCli.exe config set imm.TpmTcmPolicy "NeitherTpmNorTcm" --override --imm <userid>:<password>@<ip_address>
       ```
     - For the customer in Chinese Mainland that has installed TCM/TPM module on the original system (TCM/TPM module should be moved to the FRU prior to changing policy)
       ```
       OneCli.exe config set imm.TpmTcmPolicy "TcmOnly" --override --imm <userid>:<password>@<ip_address>
       ```
     - For the customer outside of Chinese Mainland:
       ```
       OneCli.exe config set imm.TpmTcmPolicy "TpmOnly" --override --imm <userid>:<password>@<ip_address>
       ```
  3. Issue reset command to reset system:

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

4. Read back the value to check whether the change has been accepted:
```
OneCli.exe config show imm.TpmTcmPolicy --override --imm <userid>:<password>@<ip_address>
```

   Notes:

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

     imm.TpmTcmPolicy is defined as below:

     – Value 0 use string “Undefined” , which means UNDEFINED policy.
     – Value 1 use string “NeitherTpmNorTcm”, which means TPM_PERM_DISABLED.
     – Value 2 use string “TpmOnly”, which means TPM_ALLOWED.
     – Value 4 use string “TcmOnly”, which means TCM_ALLOWED.

   – Below 4 steps must also be used to ‘lock’ the TPM_TCM_POLICY when using OneCli/ASU commands:

5. Read TpmTcmPolicyLock to check whether the TPM_TCM_POLICY has been locked , command as below:
```
OneCli.exe config show imm.TpmTcmPolicyLock --override --imm <userid>:<password>@<ip_address>
```

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

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

7. Issue reset command to reset system, command as below:
```
OneCli.exe misc ospower reboot --imm <userid>:<password>@<ip_address>
```

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

   The valid values for imm.TpmTcmPolicy include 'NeitherTpmNorTcm', 'TcmOnly' and 'TpmOnly'.

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

8. Read back the value to check whether the ‘Lock’ is accepted or rejected. Command as below:
```
OneCli.exe config show imm.TpmTcmPolicy --override --imm <userid>:<password>@<ip_address>
```

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

   imm.TpmTcmPolicyLock is defined as below:

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

   Procedure also requires that Physical Presence is enabled. The Default value for FRU will be enabled.

```
PhysicalPresencePolicyConfiguration.PhysicalPresencePolicy=Enable
```

Assert Physical Presence

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

If the Physical Presence Policy is enabled, you can assert Physical Presence through the Lenovo XClarity Controller, through hardware jumpers or switches on the system board, through F1 UEFI Setup Utility or with Lenovo XClarity Essentials OneCLI.

Notes: If the Physical Presence Policy has been disabled:

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

Assert Physical Presence through the Lenovo XClarity Controller

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

1. Log in to the Lenovo XClarity Controller interface.

   For information about logging in to the Lenovo XClarity Controller, see the “Opening and Using the XClarity Controller Web Interface” section in the XCC documentation version compatible with your server at https://pubs.lenovo.com/lxcc-overview/.
2. Click **BMC Configuration → Security** and verify that Physical Presence is set to **assert**.

Assert Physical Presence through the hardware

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

“System-board switches” on page 17

Set the TPM version

To be able to set the TPM version, Physical Presence must be asserted.

The Lenovo XClarity Provisioning Manager or the Lenovo XClarity Essentials OneCLI can be used to set the TPM version.

To set the TPM version:

1. Download and install Lenovo XClarity Essentials OneCLI.
   a. Go to http://datacentersupport.lenovo.com and navigate to the support page for your server.
   b. Click **Drivers & Software**.
   c. Navigate to the version of Lenovo XClarity Essentials OneCLI for your operating system and download the package.
2. Run the following command to set the TPM version:

   Note: You can change the TPM version from 1.2 to 2.0 and back again. However, you can toggle between versions a maximum of 128 times.

   To set the TPM version to version 2.0:

   ```
   OneCli.exe config set TrustedComputingGroup.DeviceOperation "Update to TPM2.0 compliant"
   --bmc userid:password@ip_address
   ```

   To set the TPM version to version 1.2:

   ```
   OneCli.exe config set TrustedComputingGroup.DeviceOperation "Update to TPM1.2 compliant"
   --bmc userid:password@ip_address
   ```

   where:

   - *<userid>:<password>* are the credentials used to access the BMC (Lenovo XClarity Controller interface) of your server. The default user ID is USERID, and the default password is PASSW0RD (zero, not an uppercase o)

- <*ip_address*> is the IP address of the BMC.

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

https://pubs.lenovo.com/lxce-onecli/onecli_r_set_command

3. Alternatively, you can use the following Advanced Settings Utility (ASU) commands:

To set the TPM version to version 2.0:

```
asu64 set TPMVersion.TPMVersion "Update to TPM2.0 compliant" --host <ip_address>
--user <userid> --password <password> --override
```

To set the TPM version to version 1.2:

```
asu64 set TPMVersion.TPMVersion "Update to TPM1.2 compliant" --host <ip_address>
--user <userid> --password <password> --override
```

where:

- <*userid*> and <*password*> are the credentials used to the BMC (Lenovo XClarity Controller interface) of your server. The default user ID is USERID, and the default password is PASSW0RD (zero, not an uppercase o)
- <*ip_address*> is the IP address of the BMC.

Enable UEFI Secure Boot

Optionally, you can enable UEFI Secure Boot.

There are two methods available to enable UEFI Secure Boot:

- From Lenovo XClarity Provisioning Manager

  To enable UEFI Secure Boot from Lenovo XClarity Provisioning Manager:

  1. Start the server and press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.)
  2. If the power-on Administrator password is required, enter the password.
  3. From the UEFI Setup page, click **System Settings → Security → Secure Boot**.
  4. Enable Secure Boot and save the settings.

- From Lenovo XClarity Essentials OneCLI

  To enable UEFI Secure Boot from Lenovo XClarity Essentials OneCLI:

  1. Download and install Lenovo XClarity Essentials OneCLI.

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

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

  2. Run the following command to enable Secure Boot:
     `OneCli.exe config set SecureBootConfiguration.SecureBootSetting Enabled --bmc <userid>:<password>@<ip_address>`

     where:

     – <*userid*>:<*password*> are the credentials used to access the BMC (Lenovo XClarity Controller interface) of your server. The default user ID is USERID, and the default password is PASSW0RD (zero, not an uppercase o)
     – <*ip_address*> is the IP address of the BMC.

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

https://pubs.lenovo.com/lxce-onecli/onecli_r_set_command

Note: If disabling UEFI secure boot is needed, run the following command:
`OneCli.exe config set SecureBootConfiguration.SecureBootSetting Disabled --bmc` *<userid>:<password>@<ip_address>*

TCM/TPM adapter replacement (for Chinese Mainland only)

Use the following information to remove and install the TCM/TPM adapter (sometimes called a daughter card).

For customers in Chinese Mainland, integrated TPM is not supported. However, customers in Chinese Mainland can install a Trusted Cryptographic Module (TCM) adapter or a TPM adapter (sometimes called a daughter card).

Remove the TCM/TPM adapter (for Chinese Mainland only)

Use this information to remove the TCM/TPM adapter.

Before you remove the TCM/TPM adapter, complete the following steps:

1. Read "Installation Guidelines" on page 23 to ensure that you work safely.
2. Power off the corresponding compute node that you are going to perform the task on.
3. Remove the compute node from the chassis (see "Remove the compute node from the chassis" on page 27).
4. Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
5. Remove the compute node cover (see "Remove the compute node cover" on page 46).

Attention:

- When the TCM/TPM adapter is removed, all TCM/TPM adapter functions will be disabled.

To remove the TCM/TPM adapter, complete the following steps:

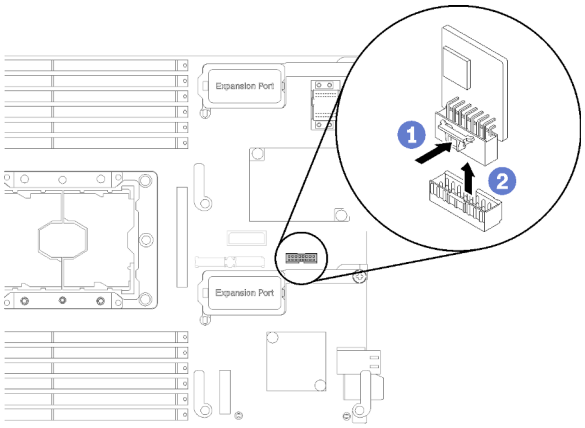

Figure 68. TCM/TPM adapter removal

Step 1. Locate the TCM/TPM adapter connector on the system board (see "System-board connectors" on page 16).

Step 2. If an I/O expansion adapter is installed in the I/O expansion 1 connector (see “System-board connectors” on page 16 for the location of the connector), you will need to remove it first (see “Remove an I/O expansion adapter” on page 57), as it will block your access to the TCM/TPM adapter connector.

Step 3. Carefully hold the TCM/TPM adapter by its edges; then, gently press on the latch, and lift it from the system board.

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

Install the TCM/TPM adapter (for Chinese Mainland only)

Use this information to install the TCM/TPM adapter.

Before you remove the TCM/TPM adapter, complete the following steps:

1. Read “Installation Guidelines” on page 23 to ensure that you work safely.

To install the TCM/TPM adapter, complete the following steps:

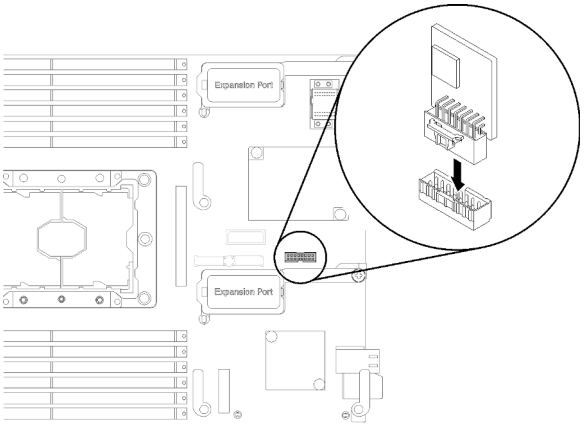

Figure 69. TCM/TPM adapter installation

Step 1. Locate the TCM/TPM adapter connector on the system board (see “System-board connectors” on page 16).

Step 2. If an I/O expansion adapter is installed in the I/O expansion 1 connector (see “System-board connectors” on page 16 for the location of the connector), you will need to remove it first (see “Remove an I/O expansion adapter” on page 57), as it will block your access to the TCM/TPM adapter connector.

Step 3. Touch the static-protective package that contains the TCM/TPM adapter to any *unpainted* metal surface on the Lenovo Flex System chassis or any *unpainted* metal surface on any other grounded rack component; then, remove the TCM/TPM adapter from the package.

Step 4. Carefully hold the TCM/TPM adapter by its edges and insert it into the TCM/TPM adapter connector on the system board.

After you install the TCM/TPM adapter, complete the following steps:

1. Install the compute node cover (see “Install the compute node cover” on page 47).
2. Install the compute node into the chassis (see “Install the compute node in the chassis” on page 28).
3. Power on the compute node.

Chapter 4. Problem determination

Use the information in this section to isolate and resolve issues that you might encounter while using your server.

Lenovo servers can be configured to automatically notify Lenovo Support if certain events are generated. You can configure automatic notification, also known as Call Home, from management applications, such as the Lenovo XClarity Administrator. If you configure automatic problem notification, Lenovo Support is automatically alerted whenever a server encounters a potentially significant event.

To isolate a problem, you should typically begin with the event log of the application that is managing the server:

- If you are managing the server from the Lenovo XClarity Administrator, begin with the Lenovo XClarity Administrator event log.
- If you are using some other management application, begin with the Lenovo XClarity Controller event log.

Event logs

An *alert* is a message or other indication that signals an event or an impending event. Alerts are generated by the Lenovo XClarity Controller or by UEFI in the servers. These alerts are stored in the Lenovo XClarity Controller Event Log. If the server is managed by the Chassis Management Module 2 or by the Lenovo XClarity Administrator, alerts are automatically forwarded to those management applications.

Note: For a listing of events, including user actions that might need to be performed to recover from an event, see the *Messages and Codes Reference*, which is available at: http://thinksystem.lenovofiles.com/help/topic/7X16/pdf_files.html

Lenovo XClarity Administrator event log

If you are using Lenovo XClarity Administrator to manage server, network, and storage hardware, you can view the events from all managed devices through the XClarity Administrator.

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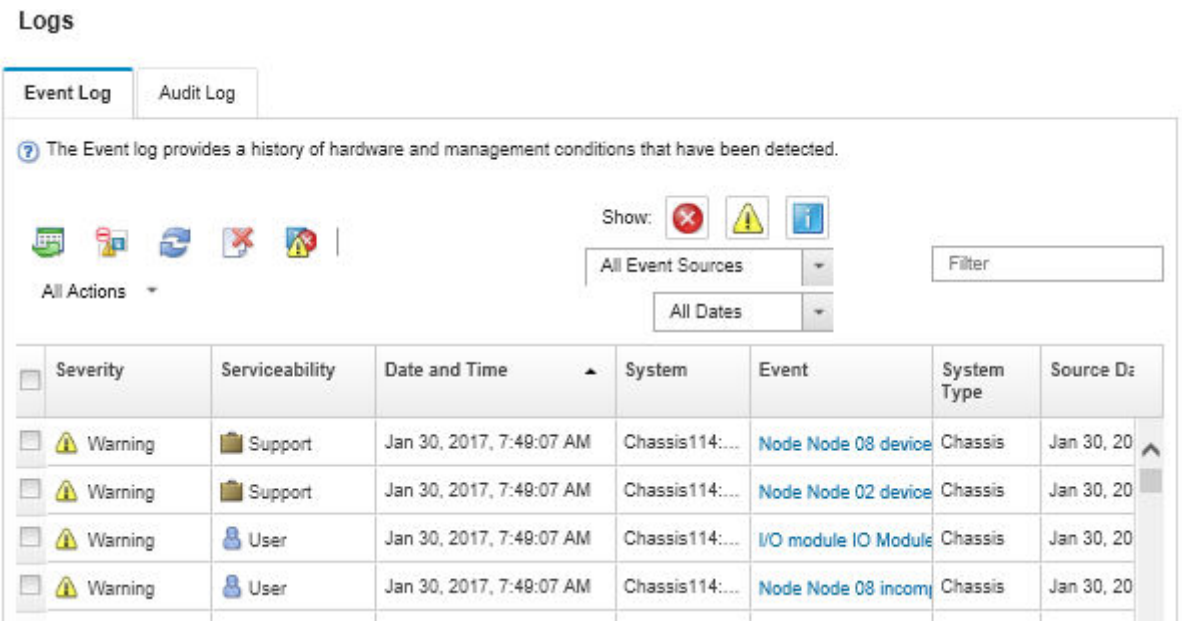


Figure 70. Lenovo XClarity Administrator event log

For more information about working with events from XClarity Administrator, see:

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

Chassis Management Module 2 event log

The CMM 2 event log contains all events received by the CMM 2 from all components in the chassis, including switch modules, compute nodes, fans, and power supplies.

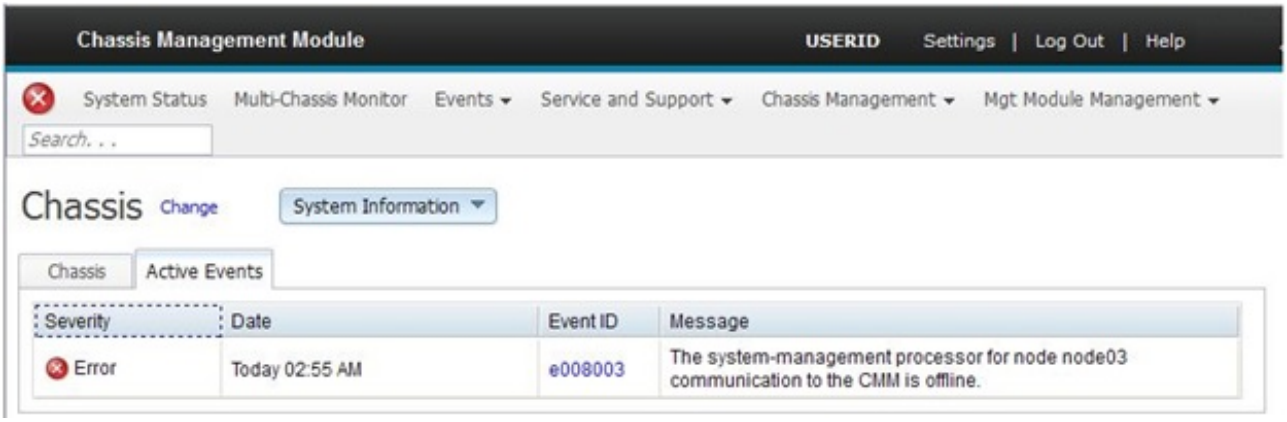


Figure 71. CMM 2 event log

For more information about accessing the CMM event log, see:

https://pubs.lenovo.com/cmm2/cmm_ui_events

Lenovo XClarity Controller event log

The Lenovo XClarity Controller monitors the physical state of the server and its components using sensors that measure internal physical variables such as temperature, power-supply voltages, fan speeds, and

component status. The Lenovo XClarity Controller provides various interfaces to systems management software and to system administrators and users to enable remote management and control of a server.

The Lenovo XClarity Controller monitors all components of the server and posts events in the Lenovo XClarity Controller event log.

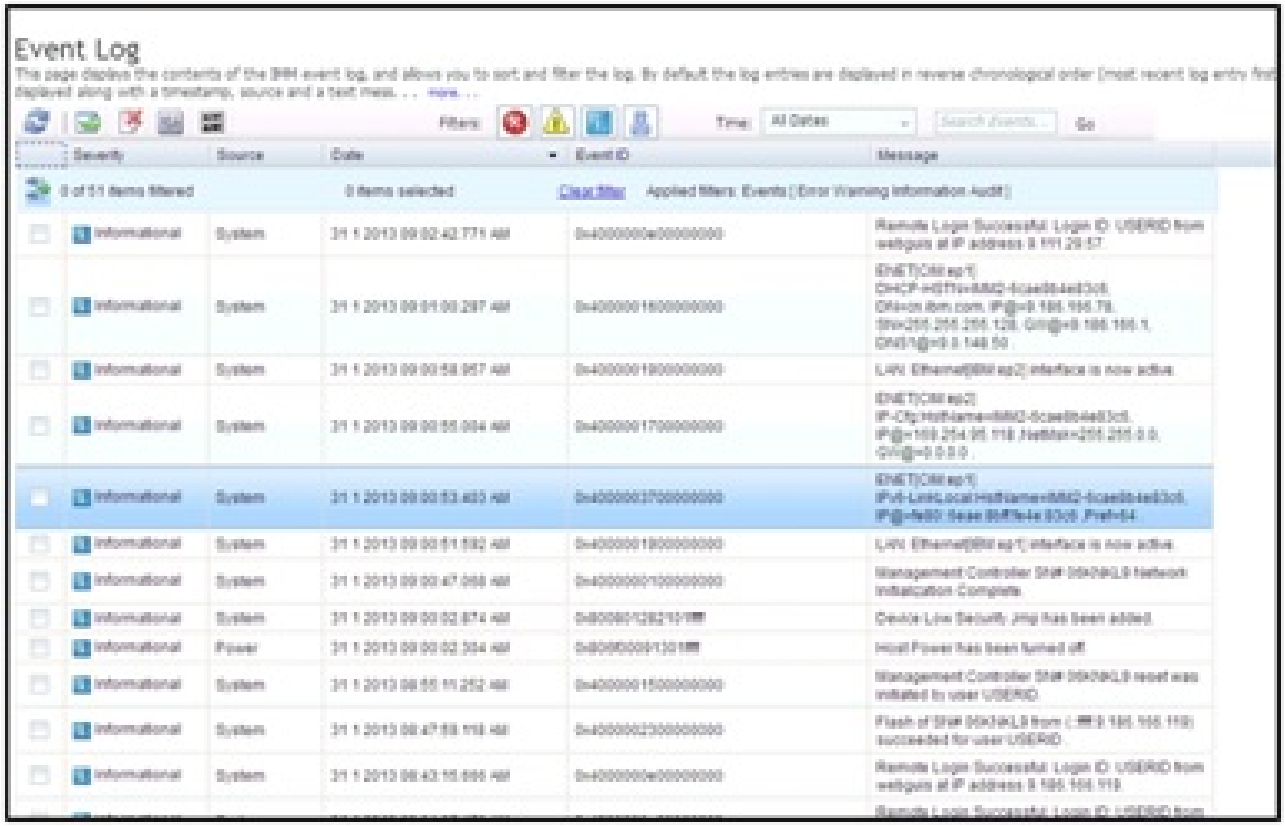


Figure 72. Lenovo XClarity Controller event log

For more information about accessing the Lenovo XClarity Controller event log, see:

"Viewing Event Logs" section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/

Light path diagnostics

Use this information as an overview of light path diagnostics.

Light path diagnostics is a system of LEDs above the control panel and on various internal components of the compute node. When an error occurs, LEDs can be lit throughout the compute node to help identify the source of the error.

Viewing the light path diagnostics LEDs

Use this information to locate and identify the light path diagnostics LEDs.

Before you work inside the compute node to view the light path diagnostics LEDs, read the safety information, which is available at "Safety" on page iii and the "Installation Guidelines" on page 23.

If an error occurs, view the light path diagnostics LEDs in the following order:

1. Look at the control panel on the front of the compute node.

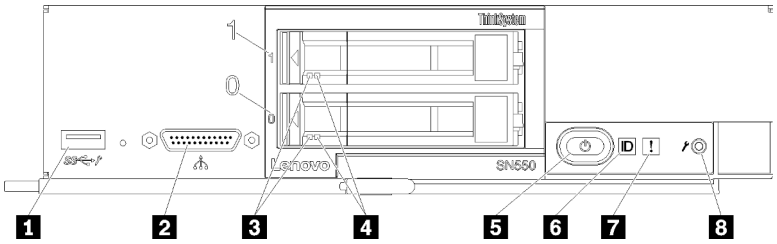


Figure 73. Compute node control panel buttons, connectors, and LEDs

Table 18. Compute node control panel buttons, connectors, and LEDs

1 USB connector	5 Power button/LED (green)
2 Console breakout cable connector	6 Identification LED
3 Drive activity LED (green)	7 Fault LED (yellow)
4 Drive status LED (yellow)	8 USB management button

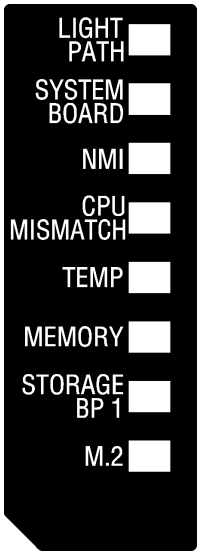
- If the fault LED is lit, it indicates that an error has occurred; view the light path diagnostics panel and LEDs to isolate the failing component.
- If the I/O expansion unit fault LED is lit, it indicates that an error has occurred in an I/O expansion unit that is installed in the compute node; check the XClarity Controller or CMM event log and the light path diagnostics LEDs to isolate the failing component.

2. To view the light path diagnostics LEDs, select one of the following procedures:
   - You can view the LEDs through the CMM **led** command, the CMM web interface and the Lenovo XClarity Administrator application (if installed).
     - For more information about the CMM **led** command, see the *Flex System Chassis Management Module: Command-Line Interface Reference Guide* at https://pubs.lenovo.com/cmm2/cli_command_led.
     - From the CMM web interface, select **Compute Nodes** from the Chassis Management menu. For more information, see the "Flex System Chassis Management Module: User's Guide" at https://pubs.lenovo.com/cmm2/cmm_user_guide. All fields and options are described in the CMM web interface online help.
     - For more information about the Lenovo XClarity Administrator application, see https://datacentersupport.lenovo.com/products/solutions-and-software/software/lenovo-xclarity/solutions/ht115665.
   - If you are in the same location as the compute node, you can complete the following steps:
     a. Remove the compute node from the Lenovo Flex System chassis, (see “Remove the compute node from the chassis” on page 27 for instructions).
     b. Carefully lay the compute node on a flat, static-protective surface.
     c. Open the compute node cover (see “Remove the compute node cover” on page 46 for instructions).
     d. Remove the air baffle.
     e. Press and hold the power button. When you press the power button, LEDs on the light path diagnostics panel and the system board will be lit if there are any hardware-related issues.

Note: The power source for light path diagnostics is designed only to last a short time. If you press the power button and the light path diagnostics LED lights, light path diagnostics is charged to light the LEDs.

The following illustration shows the LEDs on the light path diagnostics panel.

Figure 74. LEDs on the light path diagnostics panel



Light path diagnostics LEDs

Use this information to diagnose possible errors that are indicated by the light path diagnostics LEDs.

The following table describes the LEDs on the light path diagnostics panel and the light path diagnostics LEDs on the system board.

See "Viewing the light path diagnostics LEDs" on page 103 for information about lighting the LEDs.

Note: Additional information about error conditions is in the CMM event log.

Table 19. Light path diagnostics LEDs

Light path diagnostics LED	Description
Light path diagnostics	The power source for the light path diagnostics LEDs is charged.
System board	The system board has failed.
NMI	The system board has failed.
CPU Mismatch	The processors are mismatched.
Temperature	The system temperature has exceeded a threshold level.
Memory	A memory error has occurred.
Storage BP 1	A hard disk drive backplane error has occurred.
M.2	A M.2 backplane error has occurred.

System-board LEDs

Use this information to locate the system-board LEDs.

The following illustration shows the locations of the LEDs on the system board.

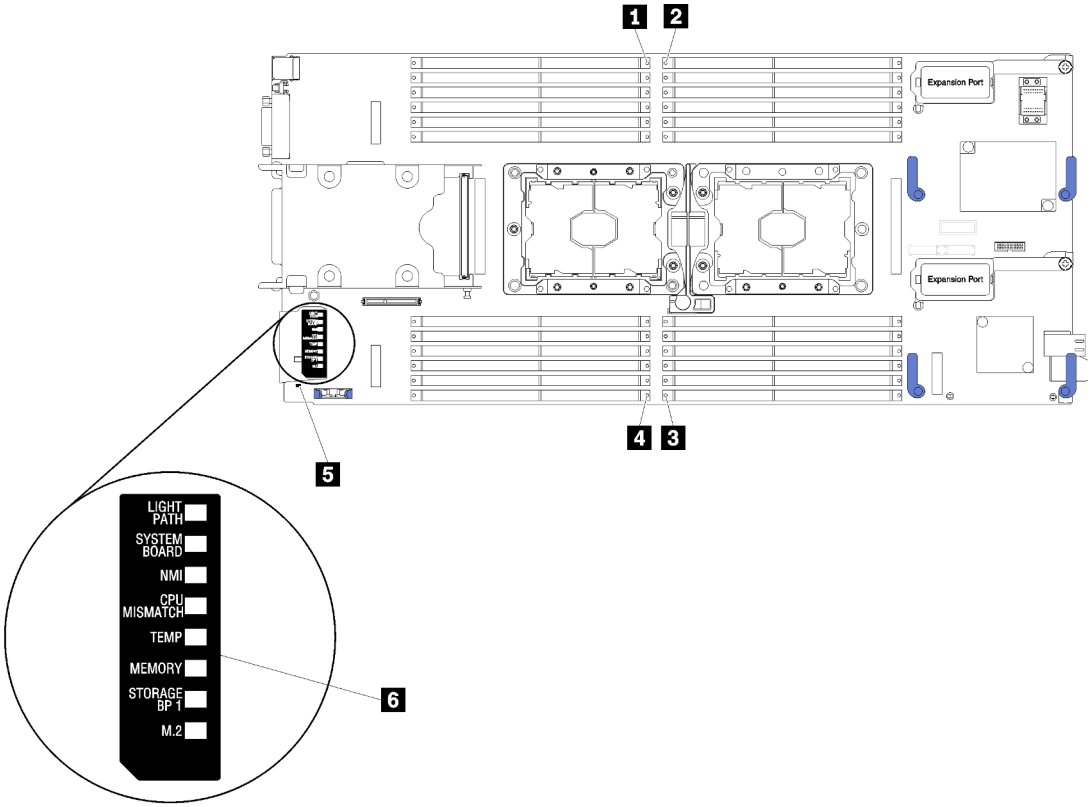


Figure 75. System-board LEDs

Table 20. System-board LEDs

1 DIMM error 13–18 LEDs	4 DIMM error 19–24 LEDs
2 DIMM error 1–6 LEDs	5 Battery error LEDs
3 DIMM error 7–12 LEDs	6 Light path diagnostics LEDs

See “Light path diagnostics LEDs” on page 105 for information about how to interpret the system-board LEDs.

General problem determination procedures

Use the information in this section to resolve problems if the event log does not contain specific errors or the server is inoperative.

If you are not sure about the cause of a problem and the power supplies are working correctly, complete the following steps to attempt to resolve the problem:

1. Power off the server.
2. Make sure that the server is cabled correctly.

3. Remove or disconnect the following devices if applicable, one at a time, until you find the failure. Power on and configure the server each time you remove or disconnect a device.
   - Any external devices.
   - Surge-suppressor device (on the server).
   - Printer, mouse, and non-Lenovo devices.
   - Each adapter.
   - Hard disk drives.
   - Memory modules until you reach the minimum configuration that is supported for the server.

     See “Specifications” on page 2 to determine the minimum configuration for your server.
4. Power on the server.

If the problem is solved when you remove an adapter from the server, but the problem recurs when you install the same adapter again, suspect the adapter. If the problem recurs when you replace the adapter with a different one, try a different PCIe slot.

If the problem appears to be a networking problem and the server passes all system tests, suspect a network cabling problem that is external to the server.

Troubleshooting by symptom

Use this information to find solutions to problems that have identifiable symptoms.

To use the symptom-based troubleshooting information in this section, complete the following steps:

1. Check the event log of the application that is managing the server and follow the suggested actions to resolve any event codes.
   - If you are managing the server from the Lenovo XClarity Administrator, begin with the Lenovo XClarity Administrator event log.
   - If you are managing the server from the Chassis Management Module 2, begin with the Chassis Management Module 2 event log.
   - If you are using some other management application, begin with the Lenovo XClarity Controller event log.

   For more information about event logs, see “Event logs” on page 101)
2. Review this section to find the symptoms that you are experiencing and follow the suggested actions to resolve the issue.
3. If the problem persists, contact support (see “Contacting Support” on page 131).

Hard disk drive problems

Use this information to resolve issues related to the hard disk drives.

- “Server cannot recognize a hard drive” on page 107
- “Multiple hard drives fail” on page 108
- “Multiple hard drives are offline” on page 109
- “A replacement hard disk drive does not rebuild” on page 109
- “Green hard disk drive activity LED does not represent actual state of associated drive” on page 109
- “Yellow hard disk drive status LED does not represent actual state of associated drive” on page 109

Server cannot recognize a hard drive

Complete the following steps until the problem is solved.

1. Observe the associated yellow hard disk drive status LED. If the LED is lit, it indicates a drive fault.
2. If the status LED is lit, remove the drive from the bay, wait 45 seconds, and reinsert the drive, making sure that the drive assembly connects to the hard disk drive backplane.
3. Observe the associated green hard disk drive activity LED and the yellow status LED and perform corresponding operations in different situations:
   - If the green activity LED is flashing and the yellow status LED is not lit, the drive is recognized by the controller and is working correctly. Run the diagnostics tests for the hard disk drives. When you start a server and press the key according to the on-screen instructions, the LXPM is displayed by default. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.)You can perform hard drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → HDD test/Disk Drive Test**.*
   - If the green activity LED is flashing and the yellow status LED is flashing slowly, the drive is recognized by the controller and is rebuilding.
   - If neither LED is lit or flashing, check whether the hard disk drive backplane is correctly seated. For details, go to step 4.
   - If the green activity LED is flashing and the yellow status LED is lit, replace the drive. If the activity of the LEDs remains the same, go to step Hard disk drive problems. If the activity of the LEDs changes, return to step 1.
4. Make sure that the hard disk drive backplane is correctly seated. When it is correctly seated, the drive assemblies correctly connect to the backplane without bowing or causing movement of the backplane.
5. Reseat the backplane power cable and repeat steps 1 through 3.
6. Reseat the backplane signal cable and repeat steps 1 through 3.
7. Suspect the backplane signal cable or the backplane:
   - Replace the affected backplane signal cable.
   - Replace the affected backplane.
8. Run the diagnostics tests for the hard disk drives. When you start a server and press the key according to the on-screen instructions, the LXPM is displayed by default. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.) You can perform hard drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → HDD test/Disk Drive Test**.*

   Based on those tests:
   - If the backplane passes the test but the drives are not recognized, replace the backplane signal cable and run the tests again.
   - Replace the backplane.
   - If the adapter fails the test, disconnect the backplane signal cable from the adapter and run the tests again.
   - If the adapter fails the test, replace the adapter.

Multiple hard drives fail

Complete the following steps until the problem is solved:

- View the Lenovo XClarity Controller event log for events related to power supplies or vibration issues and resolve those events.
- Make sure that the device drivers and firmware for the hard disk drive and server are at the latest level

Important: Some cluster solutions require specific code levels or coordinated code updates. If the device is part of a cluster solution, verify that the latest level of code is supported for the cluster solution before you update the code.

Multiple hard drives are offline

Complete the following steps until the problem is solved:

- View the Lenovo XClarity Controller event log for events related to power supplies or vibration issues and resolve those events.
- View the storage subsystem log for events related to the storage subsystem and resolve those events.

A replacement hard disk drive does not rebuild

Complete the following steps until the problem is solved:

1. Make sure that the hard disk drive is recognized by the adapter (the green hard disk drive activity LED is flashing).
2. Review the SAS/SATA RAID adapter documentation to determine the correct configuration parameters and settings.

Green hard disk drive activity LED does not represent actual state of associated drive

Complete the following steps until the problem is solved:

1. If the green hard disk drive activity LED does not flash when the drive is in use, run the diagnostics tests for the hard disk drives. When you start a server and press the key according to the on-screen instructions, the LXPM is displayed by default. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.) You can perform hard drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → HDD test/Disk Drive Test**.*
2. If the drive passes the test, replace the backplane.
3. If the drive fails the test, replace the drive.

Yellow hard disk drive status LED does not represent actual state of associated drive

Complete the following steps until the problem is solved:

1. Turn off the server.
2. Reseat the SAS/SATA adapter.
3. Reseat the backplane signal cable and backplane power cable.
4. Reseat the hard disk drive.
5. Power on the server and observe the activity of the hard disk drive LEDs.

Note: *Depending on the LXPM version, you may see **HDD test** or **Disk Drive Test**.

Intermittent problems

Use this information to solve intermittent problems.

- “Intermittent external device problems” on page 109
- “Intermittent KVM problems” on page 110
- “Intermittent unexpected reboots” on page 110

Intermittent external device problems

Complete the following steps until the problem is solved.

1. Make sure that the correct device drivers are installed. See the manufacturer's website for documentation.
2. For a USB device:

a. Restart the compute node and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.) Then, click **System Settings → Devices and I/O Ports → USB Configuration**.
b. Connect the device to another port. If using a USB hub, remove the hub and connect the device directly to the compute node. Make sure that the device is configured correctly for the port.

Intermittent KVM problems

Complete the following steps until the problem is solved.

Video problems:

1. Make sure that all cables and the console breakout cable are properly connected and secure.
2. Make sure that the monitor is working properly by testing it on another compute node.
3. Test the console breakout cable on a working compute node to ensure that it is operating properly. Replace the console breakout cable if it is defective.

Keyboard problems:

Make sure that all cables and the console breakout cable are properly connected and secure.

Mouse problems:

Make sure that all cables and the console breakout cable are properly connected and secure.

Intermittent unexpected reboots

Note: Some correctable errors require that the compute node reboot so that it can disable a device, such as a memory DIMM or a processor to allow the machine to boot up properly.

Complete the following steps until the problem is solved.

1. See the management controller event log to check for an event code that indicates a reboot. See “Event logs” on page 101 for information about viewing the event log.

Memory problems

Use this information to resolve issues related to memory.

- “Displayed system memory less than installed physical memory” on page 110
- “Multiple memory modules in a channel identified as failing” on page 111
- “Attempt to change to another DCPMM mode fails” on page 111
- “Extra namespace appears in an interleaved region” on page 112

Displayed system memory less than installed physical memory

Complete the following steps until the problem is solved.

1. Make sure that:
   a. You have installed the correct type of memory (see “Specifications” on page 2).
   b. Memory mirroring or memory sparing mode does not account for the discrepancy.

      To determine the status of a DIMM, restart the compute node and press the key according to the on-screen instructions to display theLXPM interface. Then, click **System settings → Memory**.

2. If new memory has recently been installed, make sure that no configuration events are reported in the event log. If there are any events, resolve them.

   Note: DIMMs are verified as authentic Lenovo or IBM modules by the UEFI software. If any non-authentic DIMMs are detected, an informational message appears in the system event log and memory performance might be limited. Non-authentic DIMMs are not covered by your Lenovo warranty.
3. If the compute node was recently installed, moved, or serviced, make sure that the DIMMs are correctly seated in the connectors (see “Install a memory module” on page 68).
4. Make sure that all DIMMs are enabled. The compute node might have automatically disabled a DIMM when it detected a problem, or a DIMM might have been manually disabled.

   To determine the status of a DIMM, restart the compute node and press the key according to the on-screen instructions to display theLXPM interface. Then, click **System settings → Memory**.
5. Run memory diagnostics. When you start a compute node and press the key according to the on-screen instructions, the LXPM interface is displayed by default. You can perform memory diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → Memory test**.
6. Remove DIMMs until the compute node is showing the correct amount of memory. Install one DIMM at a time until you can determine which DIMM is not working properly. Remove that DIMM and replace it with a good DIMM.

   Note: After you install or remove a DIMM, you must change and save the new configuration information by using the Setup utility. When you turn on the compute node, a message indicates that the memory configuration has changed. Press the key according to the on-screen instructions to display the LXPM interface. Then, save the configuration.
7. If the problem remains, contact Lenovo Support.

Multiple memory modules in a channel identified as failing

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

1. Reseat the memory modules; then, restart the solution.
2. Remove the highest-numbered memory module of those that are identified and replace it with an identical known good memory module; then, restart the solution. Repeat as necessary. If the failures continue after all identified memory modules are replaced, go to step 4.
3. Return the removed memory modules, one at a time, to their original connectors, restarting the solution after each memory module, until a memory module fails. Replace each failing memory module with an identical known good memory module, restarting the solution after each memory module replacement. Repeat step 3 until you have tested all removed memory modules.
4. Replace the highest-numbered memory module of those identified; then, restart the solution. Repeat as necessary.
5. Reverse the memory modules between the channels (of the same processor), and then restart the solution. If the problem is related to a memory module, replace the failing memory module.
6. (Trained technician only) Install the failing memory module into a memory module connector for processor 2 (if installed) to verify that the problem is not the processor or the memory module connector.
7. (Trained technician only) Replace the system board.

Attempt to change to another DCPMM mode fails

After the DCPMM mode is changed and the system is successfully restarted, if the DCPMM mode stays the same instead of being changed, check the DRAM DIMMs and DCPMM capacity to see if it meets the requirement of the new mode (see “DC Persistent Memory Module (DCPMM) setup” in *Setup Guide*).

Extra namespace appears in an interleaved region

If there are two created namespaces in one interleaved region, VMware ESXi ignores the created namespaces and creates an extra new namespace during system booting. To solve this problem, delete the created namespaces in either the Setup Utility or the operating system before the first booting with ESXi.

Network problems

Use this information to resolve issues related to networking, such as issues with ping, communications, or login.

Access problems

Use this information to resolve issues related to logging in to the CMM 2 or an I/O module.

- "Cannot log in to CMM 2" on page 112
- "Cannot log in to I/O module" on page 112

Cannot log in to CMM 2

Complete the following steps until the problem is solved:

1. Make sure that you are using the correct password and that the capitals lock is off.
2. Restore the CMM 2 default settings by pressing the reset button on the CMM.

Cannot log in to I/O module

Complete the following steps until the problem is solved:

1. Make sure that you are using the correct password and that the capitals lock is off.
2. Contact Lenovo Support for further assistance if you have forgotten the password.

Communication problems

Use this information to resolve issues related to the communication between devices.

- "A compute node cannot communicate with the CMM 2 on the data network" on page 112
- "A compute node cannot communicate with an I/O module" on page 113
- "One or more compute nodes cannot communicate with the SAN" on page 113

A compute node cannot communicate with the CMM 2 on the data network

Note: Communications errors from compute nodes can take up to 20 minutes to appear in the CMM 2 event log.

Complete the following steps until the problem is solved:

1. Make sure that all ports in the connection path are enabled and that you can ping the CMM 2. If you are unable to ping the CMM 2, see "A compute node in the chassis cannot ping the CMM 2 on management network" on page 115.
2. Make sure that the protocols that you are using are enabled. By default, only secure protocols are enabled, for example, SSH and HTTPS.
3. Make sure that you can log into the CMM 2. If you are unable to log in to the CMM 2, see "Cannot log in to CMM 2" on page 112.
4. Reset the CMM 2 to the default settings by pressing the reset button on the CMM 2.

   Press and hold the button for 10 seconds to reset the CMM 2 configuration settings. All user modified configuration settings are reset to the factory default values.

A compute node cannot communicate with an I/O module

Complete the following steps until the problem is solved:

1. Make sure that all ports in the connection path are enabled and that you can ping the I/O module. If you are unable to ping the I/O module, see “A compute node cannot ping an I/O module” on page 117.
2. Make sure that the protocols that you are using are enabled. By default, only secure protocols are enabled, for example, SSH and HTTPS.
3. Make sure that you can log into the I/O module. If you are unable to log in to the I/O module, see “Cannot log in to I/O module” on page 112.
4. Use a serial cable to connect to the I/O module to further isolate the problem. You can also link to the I/O module through an external Ethernet port.

One or more compute nodes cannot communicate with the SAN

Complete the following steps until the problem is solved:

1. Make sure that:
   - The I/O module is powered on and the appropriate ports are enabled on the I/O module.
   - The CMM 2 has reported that the I/O module has completed POST and that no errors have been reported in the logs.
   - The SAN device is powered on and is functional.
   - All cables between the I/O module and the SAN device are properly connected and secure, and that the activity LEDs are lit on the appropriate ports.
2. See the documentation for the I/O module for additional information about troubleshooting SAN connectivity or network connectivity issues.

Connectivity problems

Use this information to resolve issues related to the connectivity between the compute node and the Ethernet network.

- “A compute node cannot connect to the data network (Ethernet) during initial setup” on page 113
- “Intermittently, a compute node cannot connect to the data network (Ethernet)” on page 114
- “Multiple compute nodes cannot connect to the data network (Ethernet) during initial setup” on page 114
- “Intermittently, multiple compute nodes cannot connect to the data network (Ethernet)” on page 115

A compute node cannot connect to the data network (Ethernet) during initial setup

Complete the following steps until the problem is solved:

1. If you have just updated the firmware for one or more devices in the chassis (I/O module, CMM 2, etc), install the previous level of firmware.
2. Make sure that:
   - The I/O module is powered on and the appropriate ports are enabled on the I/O module.
   - All cables between the I/O module and the network device (switch or router) are properly connected and secure, and that the activity LEDs are lit on the appropriate ports.
3. From the compute node operating system, verify the network settings, such as IP address, subnet mask (if using IPv4), DHCP settings, and vLAN settings, to ensure that the settings match the settings of the network device. See the documentation for the operating system for information about checking network settings.
4. From the compute node operating system, make sure that the network device is active. See the documentation for the operating system for information about viewing network devices.

5. Check the Lenovo support Web site for any firmware updates that might apply to this issue. You can view the release notes for a firmware update to determine the issues addressed by the update.
6. Check the Lenovo support Web site for any service bulletins that are related to network connectivity.
7. (Trained service technician only) Perform the following steps:
   a. Force the Link/duplex speed.
   b. Check the connectors on the I/O module to ensure that there are no bent pins.
   c. Check the connectors on the chassis midplane to ensure there are no bent pins.
   d. Remove the I/O module and install a working I/O module in the same I/O module bay.
   e. If the problem is resolved, replace the I/O module that you removed.

Intermittently, a compute node cannot connect to the data network (Ethernet)

Complete the following steps until the problem is solved:

1. Make sure that the network cables are correctly connected in the switch module ports and the switch module is correctly seated.
2. Update the NIC device driver, or the storage device controller device driver.
3. See the documentation for the I/O module for resolving connectivity issues.

Multiple compute nodes cannot connect to the data network (Ethernet) during initial setup

Complete the following steps until the problem is solved:

1. Make sure that:
   - The I/O module is powered on and the appropriate ports are enabled on the I/O module.
   - All cables between the I/O module and the network device (switch or router) are properly connected and secure, and that the activity LEDs are lit on the appropriate ports.
2. From the compute node operating system, verify the network settings, such as IP address, subnet mask (if using IPv4), DHCP settings, and vLAN settings, to ensure that the settings match the settings of the network device. See the documentation for the operating system for information about checking network settings.
3. From the compute node operating system, make sure that the network device is active. See the documentation for the operating system for information about viewing network devices.
4. Make sure that the proper device drivers are installed for the compute node Ethernet device.
5. Check the Lenovo support Web site for any firmware updates that might apply to this issue. You can view the release notes for a firmware update to determine the issues addressed by the update.
6. Remove the compute node from the chassis and check the connectors at the back of the node for bent pins. If the pins are bent, contact Lenovo Support. See Removing a compute node from a chassis.
7. Install the compute node in another compute node bay to see if the problem persists. See Installing a compute node in a chassis. If the problem persists, make sure that this compute node is connected to a port that has been enabled and that the vLAN settings enable that port to connect to the network.
8. Check the Lenovo support Web site for any service bulletins that are related to network connectivity.
9. (Trained service technician only) Perform the following steps:
   a. Force the Link/duplex speed.
   b. Check the connectors on the I/O module to ensure that there are no bent pins.
   c. Check the connectors on the chassis midplane to ensure there are no bent pins.
   d. Remove the I/O module and install a working I/O module in the same I/O module bay.
   e. If the problem is resolved, replace the I/O module that you removed.

Intermittently, multiple compute nodes cannot connect to the data network (Ethernet)

Complete the following steps until the problem is solved:

1. Using the diagnostic tools that are provided by the device manufacturer, test the I/O module that the devices are connected to.
2. Attempt to connect one compute node to the network first, and connect other compute nodes, one by one, to try to isolate the problem.
3. Update the I/O module firmware, if necessary.

   Note: Restarting the compute node and running POST diagnostics on the I/O module might also help isolate the problem; however, this might have other ramifications to the network.

Ping problems

Use this information to resolve issues related to the ability to ping the CMM 2 or an I/O module.

- "A compute node in the chassis cannot ping the CMM 2 on management network" on page 115
- "Multiple compute nodes in the chassis cannot ping the CMM 2 on management network" on page 116
- "CMM 2 cannot ping a CMM 2 in a different chassis" on page 116
- "A compute node cannot ping an I/O module" on page 117
- "Multiple compute nodes cannot ping an I/O module" on page 117

A compute node in the chassis cannot ping the CMM 2 on management network

Complete the following steps until the problem is solved:

1. Make sure that the CMM 2 is powered on and the applicable ports are enabled on the CMM 2.
2. Make sure that the compute node BMC (Lenovo XClarity Controller) has acquired an IP address from the CMM 2 by using the Setup utility on the node.

   Note: If the CMM 2 recently lost connection to the DCHP server, you must reset the BMC by using the CMM 2 interface so that a new IP address can be acquired.
3. In the CMM 2 user interface, click **Chassis Management → Component IP Configuration** and make sure that the IP address that is listed is the same as the IP address that is displayed in the Setup utility. If it is not the same IP address, configure the BMC network settings correctly or reset the BMC to automatically acquire a new IP address.
4. Check http://datacentersupport.lenovo.com for any firmware updates that might apply to this problem. You can view the release notes for a firmware update to determine the issues that the update addresses.
5. Remove the compute node from the chassis and check the connectors on the back of the node for bent pins. If the pins are bent, contact Lenovo Support.
6. Install the compute node in another node bay to determine whether the problem remains. If the problem remains, make sure that the compute node is connected to a port that has been enabled and that the vLAN settings allow that port to connect to the network.
7. Check http://datacentersupport.lenovo.com for any tech tips (service bulletins) that are related to network connectivity.
8. (Trained service technician only) Complete the following steps:
   a. Force the link/duplex speed.
   b. Check the connectors on the I/O module to make sure that no pins are bent.
   c. Check the connectors on the chassis midplane to make sure that no pins are bent.
   d. Remove the CMM 2 and install a working CMM 2 in the same bay.
   e. If the problem is solved, replace the CMM 2 that you removed.

Multiple compute nodes in the chassis cannot ping the CMM 2 on management network

Complete the following steps until the problem is solved:

1. Make sure that the CMM 2 is powered on and the applicable ports are enabled on the CMM 2. If the CMM 2 is hung, reset the CMM 2.
2. Reset the CMM 2.
3. Check for firmware updates for the CMM 2.
4. Reset the CMM 2 to factory defaults and attempt to discover the nodes again. Allow enough time for each BMC to acquire a network address.
5. Replace the CMM 2.
6. Make sure that the compute node BMC has acquired an IP address from the CMM 2 by using the Setup utility on the node.

   Note: If the CMM 2 recently lost connection to the DCHP server, you must reset the BMC by using the CMM 2 interface so that a new IP address can be acquired.
7. In the CMM 2 user interface, click **Chassis Management → Component IP Configuration** and make sure that the IP address that is listed is the same as the IP address that is displayed in the Setup utility. If it is not the same IP address, configure the BMC network settings correctly or reset the BMC to automatically acquire a new IP address.
8. Check http://datacentersupport.lenovo.com for any firmware updates that might apply to this problem. You can view the release notes for a firmware update to determine the issues that the update addresses.
9. Remove the compute node from the chassis and check the connectors on the back of the node for bent pins. If the pins are bent, contact Lenovo Support.
10. Check http://datacentersupport.lenovo.com for any tech tips (service bulletins) that are related to network connectivity.
11. (Trained service technician only) Complete the following steps:
    a. Force the link/duplex speed.
    b. Check the connectors on the CMM 2 to make sure that no pins are bent.
    c. Check the connectors on the chassis midplane to make sure that no pins are bent.
    d. Remove the CMM 2 and install a working CMM 2 in the same bay.
    e. If the problem is solved, replace the CMM 2 that you removed.

CMM 2 cannot ping a CMM 2 in a different chassis

Complete the following steps until the problem is solved:

1. Make sure that the CMM 2 are powered on and the applicable ports are enabled.
   a. If the CMM 2 is powered on and hung, reset the CMM 2.
   b. Make sure that the compute node BMC, the management node, and the CMM 2 are all on the same subnet.
2. Verify that the cables between the CMM 2 and the top-of-rack switch are correctly connected and that the activity LEDs are lit on the applicable ports.
3. Make sure that the management node has a correct IP address and is on the same subnet as the CMM 2.
4. Make sure that the compute node BMC has acquired an IP address from the CMM 2 by using the Setup utility on the node.

   Note: If the CMM 2 recently lost connection to the DCHP server, you must to reset the BMC by using the CMM 2 interface so that a new IP address can be acquired.

5. In the CMM 2 user interface, click **Chassis Management → Component IP Configuration** and make sure that the IP address that is listed is the same as the IP address that is displayed in the Setup utility. If it is not the same IP address, configure the BMC network settings correctly or reset the BMC to automatically acquire a new IP address.
6. Check http://datacentersupport.lenovo.com for any firmware updates that might apply to this problem. You can view the release notes for a firmware update to determine the issues that the update addresses.
7. Check http://datacentersupport.lenovo.com for any tech tips (service bulletins) that are related to network connectivity.
8. Remove the compute node from the chassis and check the connectors on the back of the node and on the midplane for bent pins. If the pins are bent, contact Lenovo Support.
9. (Trained service technician only) Complete the following steps:
   a. Force the link/duplex speed.
   b. Check the connectors on the nodes and on the midplane to make sure that no pins are bent.
   c. Replace the I/O expansion card in the management node.
   d. Replace the management node.

A compute node cannot ping an I/O module

Complete the following steps until the problem is solved:

1. If you have recently updated the firmware for one or more devices in the chassis (I/O module) and have verified the network settings, install the previous level of firmware.
2. Make sure that the I/O module is powered on and the applicable ports are enabled on the I/O module.
3. Make sure that all network cables are correctly connected and that the activity LEDs are lit. If the cables are correctly connected and the LEDs are not lit, replace the cable.
4. Check http://datacentersupport.lenovo.com for any firmware updates that might apply to this problem. You can view the release notes for a firmware update to determine the issues that are addressed by the update.
5. Remove the node from the chassis and check the connectors at the back of the node for bent pins. If the pins are bent, go to http://datacentersupport.lenovo.com to submit a service request.
6. Install the compute node in another node bay, if one is available. If the problem remains, make sure that the compute node is connected to a port that has been enabled and that the vLAN settings allow that port to connect to the network.
7. Check http://datacentersupport.lenovo.com for any tech tips that are related to I/O-module connectivity.
8. If the problem remains, replace the I/O module, and go to http://datacentersupport.lenovo.com to submit a service request.
9. (Trained service technician only) Complete the following steps:
   a. Force the link/duplex speed.
   b. Check the connectors on the I/O module to make sure that no pins are bent.
   c. Check the connectors on the chassis midplane to make sure that no pins are bent.
   d. Remove the I/O module and install a working I/O module in the same I/O bay.
   e. If the problem is solved, replace the I/O module that you removed.

Multiple compute nodes cannot ping an I/O module

Complete the following steps until the problem is solved:

1. If you have recently updated the firmware for one or more devices in the chassis (I/O module or CMM 2), install the previous level of firmware.
2. Make sure that the I/O module is powered on and the applicable ports are enabled on the I/O module.

3. Make sure that all network cables are correctly connected and that the activity LEDs are lit.
4. From the compute node operating system, verify that the network device is active. Check also the network settings, such as IP address, subnet mask (if you are using IPv4), DNS, DHCP settings, and vLAN settings to make sure that the settings match the settings of the network device. See the documentation that comes with the operating system for information about viewing network devices and checking the network settings.
5. Check http://datacentersupport.lenovo.com for any firmware updates that might apply to this problem. You can view the release notes for a firmware update to determine the issues that are addressed by the update.
6. Check http://datacentersupport.lenovo.com for any tech tips (service bulletins) that are related to network connectivity.
7. (Trained service technician only) Complete the following steps:
   a. Force the link/duplex speed.
   b. Check the connectors on the I/O module to make sure that no pins are bent.
   c. Check the connectors on the chassis midplane to make sure that no pins are bent.
   d. Remove the I/O module and install a working I/O module in the same I/O bay.
   e. If the problem is solved, replace the I/O module that you removed.

Observable problems

Use this information to solve observable problems.

- "Server hangs during the UEFI boot process" on page 118
- "The compute node immediately displays the POST Event Viewer when it is turned on" on page 119
- "Compute node is unresponsive (POST is complete and operating system is running)" on page 119
- "Voltage planar fault is displayed in the event log" on page 119
- "Unusual smell" on page 120
- "Compute node seems to be running hot" on page 120
- "Cannot enter legacy mode after installing a new adapter" on page 120
- "Cracked parts or cracked chassis" on page 120

Server hangs during the UEFI boot process

If the system hangs during the UEFI boot process with the message `UEFI: DXE INIT` on the display, make sure that Option ROMs were not configured with a setting of **Legacy**. You can remotely view the current settings for Option ROMs by running the following command using the Lenovo XClarity Essentials OneCLI:

```
onecli config show EnableDisableAdapterOptionROMSupport --bmc xcc_userid:xcc_password@xcc_ipaddress
```

To recover a system that hangs during the boot process with Legacy Option ROM settings, see the following Tech Tip:

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

If legacy Option ROMs must be used, do not set slot Option ROMs to **Legacy** on the Devices and I/O Ports menu. Instead, set slot Option ROMs to **Auto** (the default setting), and set the System Boot Mode to **Legacy Mode**. Legacy option ROMs will be invoked shortly before the system boots.

The compute node 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 light path diagnostics LEDs.
2. Make sure that the compute node supports all the processors and that the processors match in speed and cache size.

   You can view processor details from system setup.

   To determine if the processor is supported for the compute node, see https://serverproven.lenovo.com/.
3. (Trained technician only) Make sure that processor 1 is seated correctly
4. (Trained technician only) Remove processor 2 and restart the compute node.
5. Replace the following components one at a time, in the order shown, restarting the compute node each time:
   a. (Trained technician only) Processor
   b. (Trained technician only) System board

Compute node is unresponsive (POST is complete and operating system is running)

Complete the following steps until the problem is solved.

- If you are in the same location as the compute node, complete the following steps:
  1. If you are using a KVM connection, make sure that the connection is operating correctly. Otherwise, make sure that the keyboard and mouse are operating correctly.
  2. If possible, log in to the compute node and verify that all applications are running (no applications are hung).
  3. Restart the compute node.
  4. If the problem remains, make sure that any new software has been installed and configured correctly.
  5. Contact your place of purchase of the software or your software provider.
- If you are accessing the compute node from a remote location, complete the following steps:
  1. Make sure that all applications are running (no applications are hung).
  2. Attempt to log out of the system and log back in.
  3. Validate the network access by pinging or running a trace route to the compute node from a command line.
     a. If you are unable to get a response during a ping test, attempt to ping another compute node in the enclosure to determine whether it is a connection problem or compute node problem.
     b. Run a trace route to determine where the connection breaks down. Attempt to resolve a connection issue with either the VPN or the point at which the connection breaks down.
  4. Restart the compute node remotely through the management interface.
  5. If the problem remains, verify that any new software has been installed and configured correctly.
  6. Contact your place of purchase of the software or your software provider.

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 2 for the minimally required number of processors and DIMMs.
2. Restart the system.

- If the system restarts, add each of the items that you removed one at a time, restarting the system each time, until the error occurs. Replace the item for which the error occurs.
- If the system does not restart, suspect the system board.

Unusual smell

Complete the following steps until the problem is solved.

1. An unusual smell might be coming from newly installed equipment.
2. If the problem remains, contact Lenovo Support.

Compute node seems to be running hot

Complete the following steps until the problem is solved.

Multiple compute nodes or chassis:

1. Make sure that the room temperature is within the specified range (see “Specifications” on page 2).
2. Check the management processor event log for rising temperature events. If there are no events, the compute node is running within normal operating temperatures. Note that you can expect some variation in temperature.

Cannot enter legacy mode after installing a new adapter

Complete the following procedure to solve the problem.

1. Go to **UEFI Setup → Devices and I/O Ports → Set Option ROM Execution Order**.
2. Move the RAID adapter with operation system installed to the top of the list.
3. Select **Save**.
4. Reboot the system and auto boot to operation system.

Cracked parts or cracked chassis

Contact Lenovo Support.

Optional-device problems

Use this information to solve problems related to optional devices.

- “External USB device is not recognized” on page 120
- “PCIe adapter is not recognized or is not functioning” on page 121
- “Insufficient PCIe resources are detected.” on page 121
- “A Lenovo optional device that was just installed does not work.” on page 121
- “A Lenovo optional device that worked previously does not work now” on page 122

External USB device is not recognized

Complete the following steps until the problem is resolved:

1. Update the UEFI firmware to the latest version.
2. Make sure that the proper drivers are installed on the compute node. See the product documentation for the USB device for information about device drivers.
3. Use the Setup utility to make sure that the device is configured correctly.
4. If the USB device is plugged into a hub or the console breakout cable, unplug the device and plug it directly into the USB port on the front of the compute node.

PCIe adapter is not recognized or is not functioning

Complete the following steps until the problem is resolved:

1. Update the UEFI firmware to the latest version.
2. Check the event log and resolve any issues related to the device.
3. Validate that the device is supported for the server (see https://serverproven.lenovo.com/). Make sure that the firmware level on the device is at the latest supported level and update the firmware if applicable.
4. Make sure that the adapter is installed in a correct slot.
5. Make sure that the proper device drivers are installed for the device.
6. Resolve any resource conflicts if running legacy mode (UEFI). Check legacy ROM boot orders and modify the UEFI setting for MM config base.

   Note: Ensure that you modify the ROM boot order associated with the PCIe adapter to the first execution order.
7. Check http://datacentersupport.lenovo.com for any tech tips (also known as retain tips or service bulletins) that might be related to the adapter.
8. Ensure any adapter external connections are correct and that the connectors are not physically damaged.
9. Make sure that the PCIe adapter is installed with the supported operating system.

Insufficient PCIe resources are detected.

If you see an error message stating “Insufficient PCI Resources Detected,” complete the following steps until the problem is resolved:

1. Press Enter to access System Setup Utility.
2. Select **System Settings → Devices and I/O Ports → MM Config Base**; then, modify the setting to increase the device resources. For example, modify 3 GB to 2 GB or modify 2 GB to 1 GB.
3. Save the settings and restart the system.
4. If the error recurs with the highest device resource setting (1GB), shutdown the system and remove some PCIe devices; then, power on the system.
5. If the reboot failed, repeat step 1 to step 4.
6. If the error recurs, press Enter to access System Setup Utility.
7. Select **System Settings → Devices and I/O Ports → PCI 64–Bit Resource Allocation**, then; modify the setting from **Auto** to **Enable**.
8. If the Boot Device does not support MMIO above 4GB for Legacy Boot, use UEFI Boot Mode or remove/disable some PCIe devices.
9. DC cycle the system and ensure the system is enter UEFI boot menu or the operating system; then, capture the FFDC log.
10. Contact Lenovo technical support.

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

1. Make sure that:
   - The device is supported for the server (see https://serverproven.lenovo.com/).
   - You followed the installation instructions that came with the device and the device is installed correctly.
   - You have not loosened any other installed devices or cables.
   - You updated the configuration information in system setup. When you start a server and press the key according to the on-screen instructions to display the Setup Utility. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/

lxpm-overview/.) Whenever memory or any other device is changed, you must update the configuration.

2. Reseat the device that you have just installed.
3. Replace the device that you have just installed.
4. Reseat the cable connection and check there is no physical damage to the cable.
5. If there is any cable damages, then replace the cable.

A Lenovo optional device that worked previously does not work now

1. Make sure that all of the cable connections for the device are secure.
2. If the device comes with test instructions, use those instructions to test the device.
3. Reseat the cable connection and check if any physical parts have been damaged, .
4. Replace the cable.
5. Reseat the failing device.
6. Replace the failing device.

Performance problems

Use this information to solve performance problems.

- "Network performance" on page 122
- "Operating system performance" on page 122

Network performance

Complete the following steps until the problem is solved:

1. Isolate which network is operating slowly (such as storage, data, and management). You might find it helpful to use ping tools or operating-system tools such as task manager or resource manager.
2. Check for traffic congestion on the network.
3. Update the NIC device driver, or the storage device controller device driver.
4. Use the traffic-diagnostic tools that are provided by the IO-module manufacturer.

Operating system performance

Complete the following steps until the problem is solved:

1. If you have recently made changes to the compute node (for example updated device drivers or installed software applications) remove the changes.
2. Check for any networking issues.
3. Check the operating system logs for performance related errors.
4. Check for events related to high temperatures and power issues as the compute node might be throttled to help with cooling. If it is throttled, reduce the workload on the compute node to help improve performance.
5. Check for events related to disabled DIMMs. If you do not have enough memory for the application workload, your operating system will have poor performance.
6. Ensure that the workload is not too high for the configuration.

Power on and power off problems

Use this information to resolve issues when powering on or powering off the compute node.

- “Single compute node does not power on” on page 123
- “Multiple compute nodes do not power on” on page 123
- “Compute node does not power off” on page 123

Single compute node does not power on

Complete the following steps until the problem is resolved:

1. If you recently installed, moved, or serviced the compute node, reseat the compute node in the bay. If the compute node was not recently installed, moved, or serviced, perform a virtual reseat through the CMM **service** command. For more information about the CMM **service** command, see the "Flex System Chassis Management Module: Command-Line Interface Reference Guide" at https://pubs.lenovo.com/cmm2/cli_command_service.
2. Check the event log on the CMM 2 for any events that are related to the compute node and solve them.
3. Make sure that the CMM 2 can recognize the compute node. Log in to the CMM 2 user interface and verify that the compute node appears in the chassis view. If the CMM 2 cannot recognize the compute node, remove it, and inspect the compute node and the back of the node bay to make sure that there is no physical damage to the connectors.
4. Make sure that the power policy that is implemented on the CMM 2 is sufficient to enable the compute node node to power on. You can view the power policy using theCMM 2 **pmpolicy** command or the CMM 2 web interface.
   - For more information about the CMM 2 **pmpolicy** command, see the "Flex System Chassis Management Module: Command-Line Interface Reference Guide" at https://pubs.lenovo.com/cmm2/cli_command_pmpolicy.
   - From the CMM 2 web interface, select **Power Modules and Management** from the Chassis Management menu. For more information, see the the "Flex System Chassis Management Module: User's Guide" at https://pubs.lenovo.com/cmm2/cmm_user_guide. All fields and options are described in the CMM 2 web interface online help.
5. Replace the system-board assembly (see “Remove and replace the system-board assembly” on page 88).

   Note: Until you are able to replace the system-board assembly, you can attempt to power on the compute node from the CMM 2.

Multiple compute nodes do not power on

Complete the following steps until the problem is resolved:

1. If you recently installed, moved, or serviced the computer nodes, reseat the compute nodes in the bays. If the compute nodes were not recently installed, moved, or serviced, perform a virtual reseat through the CMM **service** command. For more information about the CMM **service** command, see the "Flex System Chassis Management Module: Command-Line Interface Reference Guide" at https://pubs.lenovo.com/cmm2/cli_command_service.
2. Check the CMM 2 event log for any events that are related to the compute nodes, and solve them.

Compute node does not power off

Complete the following steps until the problem is resolved:

1. Attempt to power off the compute node through the CMM 2 interface.
2. Attempt to restart the system-management processor for the compute node through the CMM 2 interface. Click the compute node in the chassis view and then click **Restart System Mgmt Processor**. After the system-management processor has been restarted, attempt to power off the node from the CMM 2.
3. Attempt to power off the compute node by using the power button on the front of the compute node.

4. Attempt to reset the compute node from the CMM 2 command-line interface (CLI) by using the `reset` command.
5. Reseat the CMM 2. Then, perform steps 1-4 again.

Software problems

Use this information to solve software problems.

1. To determine whether the problem is caused by the software, make sure that:
   - The compute node has the minimum memory that is needed to use the software. For memory requirements, see the information that comes with the software.

     Note: If you have just installed an adapter or memory, the compute node might have a memory-address conflict.
   - The software is designed to operate on the compute node.
   - Other software works on the compute node.
   - The software works on another compute node.
2. If you receive any error messages while you use the software, see the information that comes with the software for a description of the messages and suggested solutions to the problem.
3. Contact your place of purchase of the software.

Appendix A. Hardware disassembling for recycle

Follow the instructions in this section to recycle components with compliance with local laws or regulations.

Disassemble the compute node for chassis recycle

Follow the instructions in this section to disassemble the compute node before recycling the chassis.

About this task

Attention:

- Read “Installation Guidelines” on page 23 to ensure that you work safely.
- Power off the corresponding compute node that you are going to perform the task on.
- Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
- Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.

Note: Refer to local environmental, waste or disposal regulations to ensure compliance.

Procedure

Step 1. Remove the compute node cover. See “Remove the compute node cover” on page 46.

Step 2. Remove the 2.5-inch hot-swap drives and hot-swap drive bay fillers (if any). See “Remove a 2.5-inch hot-swap drive” on page 29.

Step 3. Remove the bezel. See “Remove the bezel” on page 38.

Step 4. Remove the RAID adapter. See “Remove a RAID adapter” on page 83.

Step 5. Remove the flash power module. See “Remove the flash power module” on page 51.

Step 6. Remove the 2.5-inch drive backplane. See “Remove the 2.5-inch drive backplane” on page 31.

Step 7. Remove the fabric connector. See “Remove a fabric connector” on page 49.

Step 8. Remove the I/O expansion adapters. See “Remove an I/O expansion adapter” on page 57.

Step 9. Remove the M.2 backplane. See “Remove the M.2 backplane” on page 60.

Step 10. Remove the air baffle. See “Remove the air baffle” on page 34.

Step 11. Remove the PHM. See “Remove a processor and heat sink” on page 72.

Step 12. Remove the DIMMs. See “Remove a memory module” on page 66.

Step 13. Remove the CMOS battery. See “Remove the CMOS battery - CR2032” on page 43.

Step 14. Remove the TCM/TPM adapter. See “Remove the TCM/TPM adapter (for Chinese Mainland only)” on page 99.

Step 15. Remove the system board. See “Disassemble the system board for recycle” on page 126

After you finish

After disassembling the compute node, recycle the unit in compliance with local regulations.

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Disassemble the system board for recycle

Follow the instructions in this section to disassemble the system board before recycling.

About this task

Attention:

- Read “Installation Guidelines” on page 23 to ensure that you work safely.
- Power off the corresponding compute node that you are going to perform the task on.
- Remove the compute node from the chassis (see “Remove the compute node from the chassis” on page 27).
- Carefully lay the compute node on a flat, static-protective surface, orienting the compute node with the bezel pointing toward you.
- Make sure you have T8 Torx, T10 Torx, Phillips #1, and hex socket drivers available.

Note: Refer to local environmental, waste or disposal regulations to ensure compliance.

Procedure

Step 1. Disassemble the compute node. See “Disassemble the compute node for chassis recycle” on page 125.

Step 2. Remove the screws from the bottom side of the chassis.

a. Carefully place the compute node on its side, making sure the protruding part of the handle is at the top so that the compute node is stable.

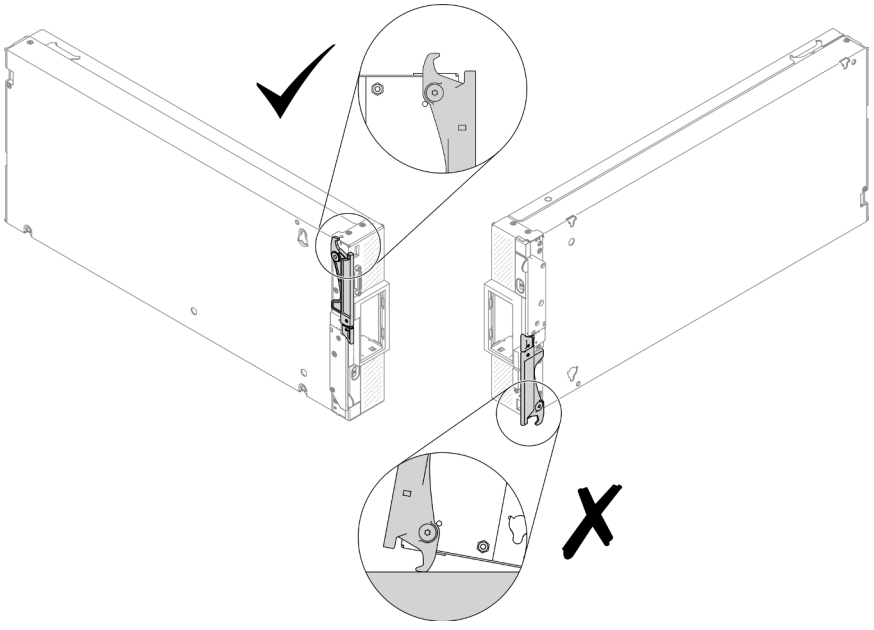

Figure 76. Compute node positioning direction

b. Using a T10 Torx screwdriver and a Phillips #1 screwdriver, remove the screws from the bottom side of the chassis. Remove the I/O expansion adapter retention clips away from the system board.

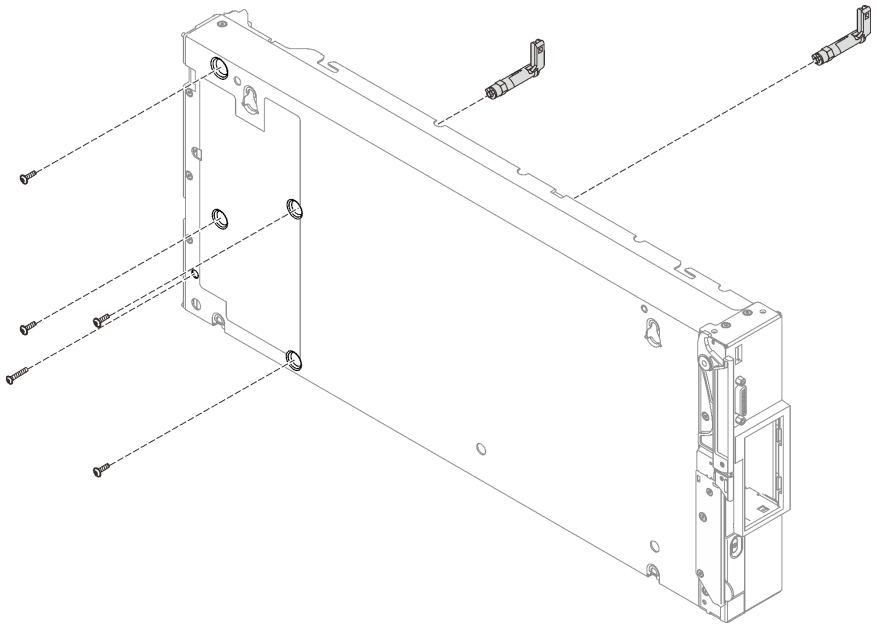

Figure 77. Screws removal from bottom side of the chassis

Step 3. Remove the chassis bulkhead. See "Remove the bulkhead" on page 41.

Step 4. Remove the front panel.

a. Pull out the Lenovo XClarity Controller tag.

b. Using the T8 Torx screwdriver, remove the eight screws securing the front panel.

c. Using a hex socket driver, remove the fasteners securing the KVM connector on the front of the compute node.

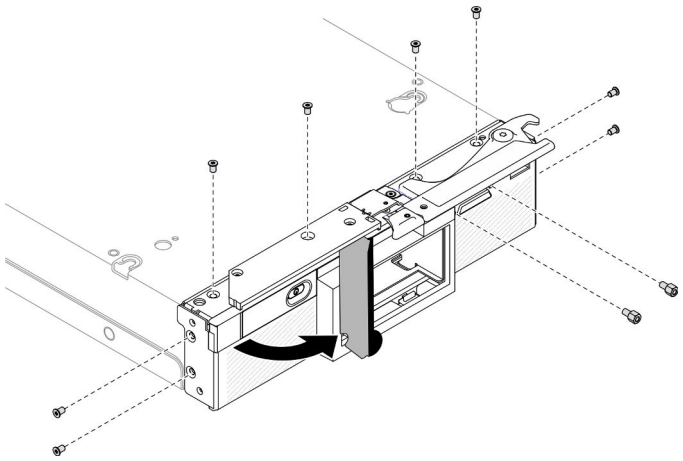

Figure 78. Unfastening front panel screws

d. Carefully place the compute node to the bottom-side-down orientation, remove the front panel from the compute node.

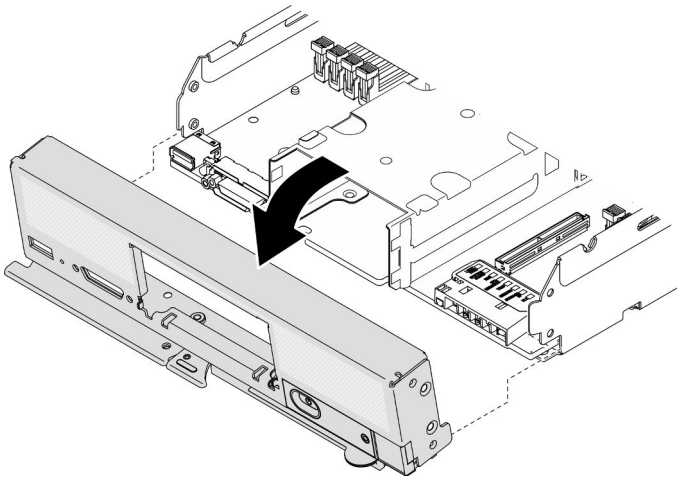

Figure 79. Removing the front panel

Step 5. Remove the storage cage. See “Remove the storage cage ” on page 86.

Step 6. Remove the four screws securing the system board to the chassis; then, lift the system board out of the chassis.

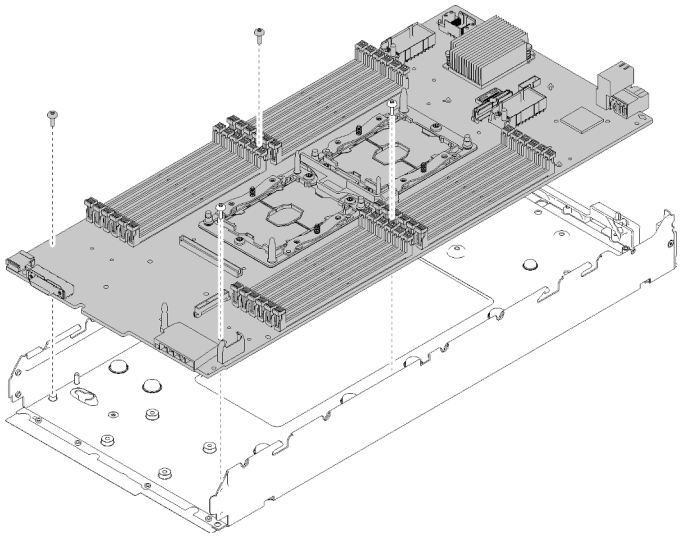

Figure 80. Removing the system board

After you finish

After disassembling the compute node, recycle the unit in compliance with local regulations.

Appendix B. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about Lenovo products, you will find a wide variety of sources available from Lenovo to assist you.

On the World Wide Web, up-to-date information about Lenovo systems, optional devices, services, and support are available at:

http://datacentersupport.lenovo.com

Note: IBM is Lenovo's preferred service provider for ThinkSystem.

Before you call

Before you call, there are several steps that you can take to try and solve the problem yourself. If you decide that you do need to call for assistance, gather the information that will be needed by the service technician to more quickly resolve your problem.

Attempt to resolve the problem yourself

You can solve many problems without outside assistance by following the troubleshooting procedures that Lenovo provides in the online help or in the Lenovo product documentation. The Lenovo product documentation also describes the diagnostic tests that you can perform. The documentation for most systems, operating systems, and programs contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

You can find the product documentation for your ThinkSystem products at https://pubs.lenovo.com/

You can take these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Check for updated software, firmware, and operating-system device drivers for your Lenovo product. The Lenovo Warranty terms and conditions state that you, the owner of the Lenovo product, are responsible for maintaining and updating all software and firmware for the product (unless it is covered by an additional maintenance contract). Your service technician will request that you upgrade your software and firmware if the problem has a documented solution within a software upgrade.
- If you have installed new hardware or software in your environment, check https://serverproven.lenovo.com/ to make sure that the hardware and software are 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.

Gathering information needed to call Support

If you require warranty service for your Lenovo product, the service technicians will be able to assist you more efficiently if you prepare the appropriate information before you call. You can also go to http://datacentersupport.lenovo.com/warrantylookup for more information about your product warranty.

Gather the following information to provide to the service technician. This data will help the service technician quickly provide a solution to your problem and ensure that you receive the level of service for which you might have contracted.

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- Hardware and Software Maintenance agreement contract numbers, if applicable
- Machine type number (Lenovo 4-digit machine identifier)
- Model number
- Serial number
- Current system UEFI and firmware levels
- Other pertinent information such as error messages and logs

As an alternative to calling Lenovo Support, you can go to https://support.lenovo.com/servicerequest to submit an Electronic Service Request. Submitting an Electronic Service Request will start the process of determining a solution to your problem by making the pertinent information available to the service technicians. The Lenovo service technicians can start working on your solution as soon as you have completed and submitted an Electronic Service Request.

Collecting service data

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

Service data can be collected through the following tools:

- **Lenovo XClarity Provisioning Manager**

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

- **Lenovo XClarity Controller**

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

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

- **Chassis Management Module 2 (CMM 2)**

  Use the Download Service Data function of the CMM 2 to collect service data for compute nodes.

  For more information about downloading service data from the CMM 2, see https://pubs.lenovo.com/cmm2/cmm_ui_service_and_support.

- **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 https://pubs.lenovo.com/lxce-onecli/onecli_r_getinfor_command.

Contacting Support

You can contact Support to obtain help for your issue.

You can receive hardware service through a Lenovo Authorized Service Provider. To locate a service provider authorized by Lenovo to provide warranty service, go to https://datacentersupport.lenovo.com/serviceprovider and use filter searching for different countries. For Lenovo support telephone numbers, see https://datacentersupport.lenovo.com/supportphonelist for your region support details.

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Taiwan Region BSMI RoHS declaration

單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (PB)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr^{+6})	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機架	○	○	○	○	○	○
外部蓋板	○	○	○	○	○	○
機械組合件	–	○	○	○	○	○
空氣傳動設備	–	○	○	○	○	○
冷卻組合件	–	○	○	○	○	○
內存模組	–	○	○	○	○	○
處理器模組	–	○	○	○	○	○
電纜組合件	–	○	○	○	○	○
電源供應器	–	○	○	○	○	○
儲備設備	–	○	○	○	○	○
電路卡	–	○	○	○	○	○
光碟機	–	○	○	○	○	○

備考1. 〝超出0.1 wt %〞及〝超出0.01 wt %〞係指限用物質之百分比含量超出百分比含量基準值。

Note1 : “exceeding 0.1wt%” and “exceeding 0.01 wt%” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考2. 〝○〞係指該項限用物質之百分比含量未超出百分比含量基準值。

Note2 : “○”indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考3. 〝-〞係指該項限用物質為排除項目。

Note3 : The “-“ indicates that the restricted substance corresponds to the exemption.

0220

Taiwan Region import and export contact information

Contacts are available for Taiwan Region import and export information.

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

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Lenovo

Part Number: SP47A10572

Printed in China

(1P) P/N: SP47A10572