

Lenovo

ThinkSystem DA240 Enclosure and ThinkSystem SD630 V2 Compute Node Maintenance Manual



Machine Types: 7D1J and 7D1K

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 solution, which can be found at:

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

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

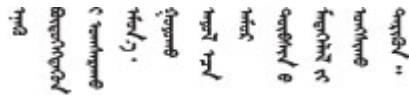
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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



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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

ཐོན་ཁུངས་འདི་བདེ་སྤྱོད་མ་བྱས་གོང་། རྒྱ་རྒྱུ་ཡིད་གཟབ་
བྱ་འདྲ་མིན་ཡོད་པའི་འོད་སྤེར་བལྟ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

مەزكۇر مەھسۇلاتنى ئورنىتىشتىن بۇرۇن بىخەتەرلىك ئۇچۇرلىرىنى ئوقۇپ چىقىڭ.

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canjbinj soengq cungj vahgangj ancien siusik.

Safety inspection checklist

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

Notes:

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

- a. Go to:

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

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

Chapter 1. Introduction

The ThinkSystem DA240 Enclosure Type 7D1J and ThinkSystem SD630 V2 Compute Node Type 7D1K is a 2U solution designed for high-performance computing. This solution includes a single enclosure that can contain up to four SD630 V2 compute nodes, which are designed to deliver a dense, scalable platform for distributed enterprise and hyper-converged solutions.



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

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

Specifications

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

Enclosure specifications

Features and specifications of the enclosure.

Table 1. Enclosure specifications

Specification	Description
Dimension	2U enclosure <ul style="list-style-type: none">• Height: 87.0 mm (3.4 inches)• Depth: 936.9 mm (36.8 inches)• Width: 488.0 mm (19.2 inches)
Weight (depending on the configuration)	<ul style="list-style-type: none">• Minimum configuration (with one minimal configuration node): 24.3 kg (53.5 lbs)• Maximum configuration (with four maximal configuration nodes): 44.2 kg (97.4 lbs)
System fans	Supports up to three 8080 dual-rotor hot-swap fans. <ul style="list-style-type: none">• Two fans:<ul style="list-style-type: none">– Processors with TDP (thermal design power) \leq 165W (up to 30°C)• Three fans:<ul style="list-style-type: none">– Processors with TDP (thermal design power) \geq 185W (up to 25°C)– Processors with TDP (thermal design power) \leq 165W (up to 35°C) except for Intel(R) Xeon(R) Gold 6334 (165W, 8 core)– Intel(R) Xeon(R) Gold 6334 (165W, 8 core) (up to 25°C)

Table 1. Enclosure specifications (continued)

Specification	Description
Power supply	<p>Supports two hot-swap ac power supplies.</p> <ul style="list-style-type: none"> • Input voltage: 200-240 Vac • Wattage: 1800W, 2400W and 2600W <p>CAUTION:</p> <ul style="list-style-type: none"> • Power supplies and redundant power supplies in the enclosure must be with the same power rating, wattage or level. • 240 VDC input is ONLY supported in Chinese Mainland. • Power supply with 240 VDC input cannot support hot plugging power cord function. To remove the power cord, please turn off solution or disconnect DC power sources at the breaker panel. Then, remove the power cord.
System Management Module 2 (SMM2)	<p>Hot-swappable (see “System Management Module 2 (SMM2)” on page 25 and <i>System Management Module 2 User Guide</i> for more information).</p>
Acoustical noise emissions	<p>The solution has the following acoustic noise emissions declaration:</p> <ul style="list-style-type: none"> • Sound power level ($L_{WA,d}$): <ul style="list-style-type: none"> – Idling: Typical configuration: 6.1 Bel; Max configuration: 6.1 Bel – Operating: Typical configuration: 7.6 Bel; Max configuration: 8.9 Bel • Sound pressure level ($L_{p,Am}$): <ul style="list-style-type: none"> – Idling: Typical configuration: 45 dBA; Max configuration: 61 dBA – Operating: Typical configuration: 61 dBA; Max configuration: 74 dBA <p>Notes:</p> <ul style="list-style-type: none"> • These sound levels were measured in controlled acoustical environments according to procedures specified by ISO7779 and are reported in accordance with ISO 9296. • The declared acoustic sound levels are based on the specified configurations, which may change slightly depending on configuration/conditions. <ul style="list-style-type: none"> – Typical configuration: Two 205W processors, 16x 16GB DIMMs, 1x S4510 240GB SSD, 1x Mellanox HDR200 ConnectX-6 adapter, 25Gb SFP+ LOM, TPM 2.0, two 2400W power supply units – Max configuration: Two 250W processors, 16x 64GB DIMMs, 1x S4510 240GB SSD, 1x Mellanox HDR200 ConnectX-6 adapter, 25Gb SFP+ LOM, TPM 2.0, two 2400W power supply units • Government regulations (such as those prescribed by OSHA or European Community Directives) may govern noise level exposure in the workplace and may apply to you and your solution installation. The actual sound pressure levels in your installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room; the noise levels from other equipment; the room ambient temperature, and employee's location in relation to the equipment. Further, compliance with such government regulations depends on a variety of additional factors, including the duration of employees' exposure and whether employees wear hearing protection. Lenovo recommends that you consult with qualified experts in this field to determine whether you are in compliance with the applicable regulations.
Heat output	<p>Approximate heat output:</p> <ul style="list-style-type: none"> • Minimum configuration (with one minimal configuration node): 1799.22 BTU per hour (573 watts) • Maximum configuration (with four maximal configuration nodes): 6672.5 BTU per hour (2125 watts)

Table 1. Enclosure specifications (continued)

Specification	Description
Electrical input	<ul style="list-style-type: none"> • Sine-wave input (50-60 Hz) required • Input voltage range: <ul style="list-style-type: none"> – Minimum: 200 Vac – Maximum: 240 Vac <p>CAUTION: In order for the ThinkSystem products to operate error free in both a DC or AC electrical environment, a TN-S earthing system which complies to 60364-1 IEC 2005 standard has to be present or installed.</p>
Minimal configuration for debugging	<ul style="list-style-type: none"> • One ThinkSystem DA240 Enclosure • One ThinkSystem SD630 V2 Compute Node • One processor in processor socket 1 • One DIMM in slot 2 in the compute node • One 7mm 2.5-inch SATA/NVMe solid-state drive • One SMM2 • One CFF v4 1800-watt power supply • Two system fans

Compute node specifications

Features and specifications of the compute node.

Table 2. Compute node specifications

Specification	Description
Processor (depending on the model)	<p>Supports two 3rd Gen Intel® Xeon® Scalable, up to 250W processors per compute node.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. Use the Setup utility to determine the type and speed of the processors in the node. 2. For a list of supported processors, see https://serverproven.lenovo.com/.
Memory	<p>See “Memory module installation order” in <i>Setup Guide</i> for detailed information about memory configuration and setup.</p> <ul style="list-style-type: none"> • Minimum: 16 GB (single DDR4 DRAM RDIMM with one processor) • Maximum: 2048 GB with 16 x 128 GB RDIMMs • Memory module types: Industry-standard double-data-rate 4 (DDR4), dynamic random-access memory (DRAM) registered dual in-line memory modules (RDIMMs) with error-correcting code (ECC) • Capacity (depending on the model): 16 GB, 32 GB, 64 GB, and 128 GB RDIMM • Slots: Supports up to 16 DIMM slots <p>For a list of supported memory modules, see https://serverproven.lenovo.com/.</p>
Drive bays	<p>Supports up to two 7mm 2.5-inch hot-swap SATA/NVMe solid-state drive bays or one 15mm 2.5-inch hot-swap NVMe solid-state drive bay per compute node.</p>
M.2 drive/backplane	<p>The ThinkSystem M.2 backplane supports up to two identical M.2 drives.</p>
Expansion slot	<p>One expansion slot is available per compute node.</p> <ul style="list-style-type: none"> • Slot 1: PCI Express 4.0 x16; half-height, half-length (HHHL)

Table 2. Compute node specifications (continued)

Specification	Description
RAID	<ul style="list-style-type: none"> • Supports RAID levels 0 and 1 for SATA storage including 7mm 2.5-inch solid-state drives and M.2 drives. • Supports RAID levels 0 and 1 for NVMe storage (Intel VROC NVMe RAID). <p>Notes:</p> <ul style="list-style-type: none"> – VROC Intel-SSD-Only supports Intel NVMe drives. – VROC Premium requires an activation key for non-Intel NVMe drives. For more information about acquiring and installing the activation key, see https://fod.lenovo.com/lkms
Video controller (integrated into Lenovo XClarity Controller)	<ul style="list-style-type: none"> • ASPEED • SVGA compatible video controller • Avocent Digital Video Compression • Video memory is not expandable <p>Note: Maximum video resolution is 1920 x 1200 at 60 Hz.</p>
Input/Output (I/O) features	<ul style="list-style-type: none"> • Node operator panel • USB 3.0 Console Breakout Cable connector • External LCD diagnostics handset connector • One 1 Gb RJ45 Ethernet port with share-NIC feature for Lenovo XClarity Controller • One 25 Gb SFP28 Ethernet port with share-NIC feature for Lenovo XClarity Controller <p>Note: Lenovo XClarity Controller can be accessed by either RJ45 Ethernet port or SFP28 Ethernet port.</p>
Size	<p>Compute node</p> <ul style="list-style-type: none"> • Height: 40.7 mm (1.6 inches) • Depth: 615.2 mm (24.2 inches) • Width: 214.7 mm (8.4 inches)
Weight (depending on the configuration)	<ul style="list-style-type: none"> • Minimum weight: 3.9 kg (8.6 lbs) • Maximum weight: 6.4 kg (14.1 lbs)
Power rating	12.2 VDC, 70 A
Operating systems	<p>Supported and certified operating systems:</p> <ul style="list-style-type: none"> • Microsoft Windows Server • VMware ESXi • Red Hat Enterprise Linux • SUSE Linux Enterprise Server <p>References:</p> <ul style="list-style-type: none"> • Complete list of available operating systems: https://lenovopress.lenovo.com/osig. • OS deployment instructions: “Deploy the operating system” in <i>Setup Guide</i>.

Table 2. Compute node specifications (continued)

Specification	Description
Ambient temperature management	<p>Adjust ambient temperature when specific components are installed:</p> <ul style="list-style-type: none"> • Keep ambient temperature to 30°C or lower when one or more of the following processors are installed: <ul style="list-style-type: none"> – Processors with TDP (thermal design power) 165 watts or lower • Keep ambient temperature to 25°C or lower when one or more of the following processors are installed: <ul style="list-style-type: none"> – Processors with TDP (thermal design power) higher than 165 watts – Intel(R) Xeon(R) Gold 6334 (165 watts, 8 core)
Environment	<p>The ThinkSystem SD630 V2 Compute Node complies with ASHRAE Class A2 specifications.</p> <p>The ThinkSystem SD630 V2 Compute Node is supported in the following environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Operating: 10°C - 35°C (50°F - 95°F); the maximum ambient temperature decreases by 1°C for every 300 m (984 ft) increase in altitude above 900 m (2,953 ft) – Solution powered off: 5°C to 45°C (41°F to 113°F) • Maximum altitude: 3,050 m (10,000 ft) • Relative humidity (non-condensing): <ul style="list-style-type: none"> – Operating: 20% - 80%, maximum dew point: 21°C (70°F) – Solution powered off: 8% - 80%, maximum dew point: 27°C (81°F) • Particulate contamination: <p>Attention: Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the solution. For information about the limits for particulates and gases, see “Particulate contamination” on page 5.</p>

Particulate contamination

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

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

Table 3. Limits for particulates and gases

Contaminant	Limits
Reactive gases	<p>Severity level G1 as per ANSI/ISA 71.04-1985¹:</p> <ul style="list-style-type: none"> The copper reactivity level shall be less than 200 Angstroms per month ($\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour}$ weight gain).² The silver reactivity level shall be less than 200 Angstroms per month ($\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour}$ weight gain).³ The reactive monitoring of gaseous corrosivity must be conducted approximately 5 cm (2 in.) in front of the rack on the air inlet side at one-quarter and three-quarter frame height off the floor or where the air velocity is much higher.
Airborne particulates	<p>Data centers must meet the cleanliness level of ISO 14644-1 class 8.</p> <p>For data centers without airside economizer, the ISO 14644-1 class 8 cleanliness might be met by choosing one of the following filtration methods:</p> <ul style="list-style-type: none"> The room air might be continuously filtered with MERV 8 filters. Air entering a data center might be filtered with MERV 11 or preferably MERV 13 filters. <p>For data centers with airside economizers, the choice of filters to achieve ISO class 8 cleanliness depends on the specific conditions present at that data center.</p> <ul style="list-style-type: none"> The deliquescent relative humidity of the particulate contamination should be more than 60% RH.⁴ Data centers must be free of zinc whiskers.⁵
<p>cu</p> <p>¹ ANSI/ISA-71.04-1985. <i>Environmental conditions for process measurement and control systems: Airborne contaminants</i>. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.</p> <p>² The derivation of the equivalence between the rate of copper corrosion growth in the thickness of the corrosion product in $\text{\AA}/\text{month}$ and the rate of weight gain assumes that Cu_2S and Cu_2O grow in equal proportions.</p> <p>³ The derivation of the equivalence between the rate of silver corrosion growth in the thickness of the corrosion product in $\text{\AA}/\text{month}$ and the rate of weight gain assumes that Ag_2S is the only corrosion product.</p> <p>⁴ The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.</p> <p>⁵ Surface debris is randomly collected from 10 areas of the data center on a 1.5 cm diameter disk of sticky electrically conductive tape on a metal stub. If examination of the sticky tape in a scanning electron microscope reveals no zinc whiskers, the data center is considered free of zinc whiskers.</p>	

Firmware updates

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

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/system-x/system-x3850-x6/6241/downloads>
- You can subscribe to product notification to stay up to date on firmware updates:
 - <https://datacentersupport.lenovo.com/tw/en/solutions/ht509500>

UpdateXpress System Packs (UXSPs)

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

Update method terminology

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

Firmware updating tools

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

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

Tool	Update Methods Supported	Core System Firmware Updates	I/O Devices Firmware Updates	Graphical user interface	Command line interface	Supports UXSPs
Lenovo XClarity Essentials 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 your server might encounter. These Tech Tips (also called retain tips or service bulletins) provide procedures to work around issues or solve problems related to the operation of your server.

To find the Tech Tips available for your server:

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

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

Security advisories

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

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

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

Power on the compute node

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

A compute node can be turned on (power LED on) in any of the following ways:

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

For information about powering off the compute node, see [“Power off the compute node” on page 11](#).

Power off the compute node

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

To power off the compute node that is in a standby state (power status LED flashes once per second):

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

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

When in a standby state, the compute node can respond to remote power-on requests sent to the Lenovo XClarity Controller. For information about powering on the compute node, see [“Power on the compute node” on page 10](#).

Chapter 2. Solution components

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

Identifying your solution

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

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

The enclosure machine type, model number and serial number are on the ID label that can be found on the front of the enclosure, as shown in the following illustration.

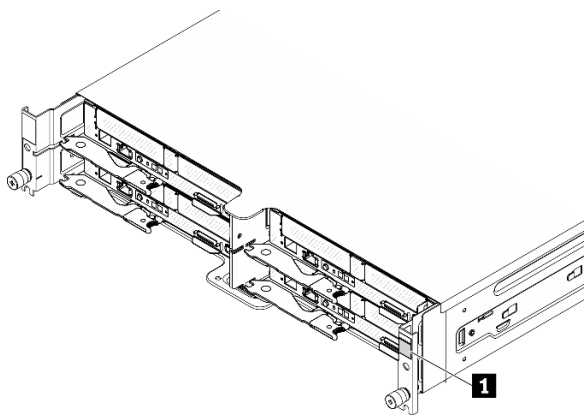


Figure 1. ID label on the front of the enclosure

Table 4. ID label on the front of the enclosure

1 Enclosure ID label

The compute node model number and serial number are on the ID label that can be found on the front of the compute node (on the underside of the network access tag), as shown in the following illustration.

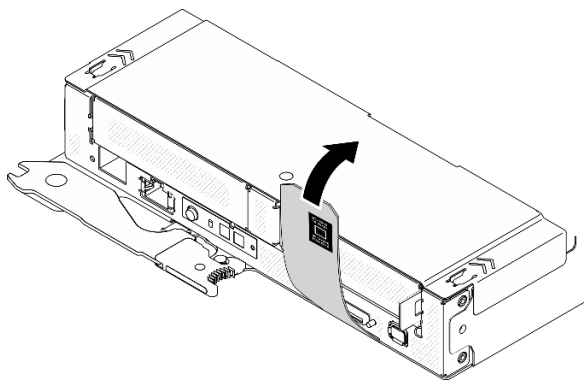


Figure 2. ID label on the front of the compute node

Network access tag

The Lenovo XClarity Controller network access information can be found on the pull-out information tag located on the front of the compute node. You can also use the information tag for your own compute node labeling information such as the host name, the system name and the inventory bar code. Keep the network access tag for future reference.

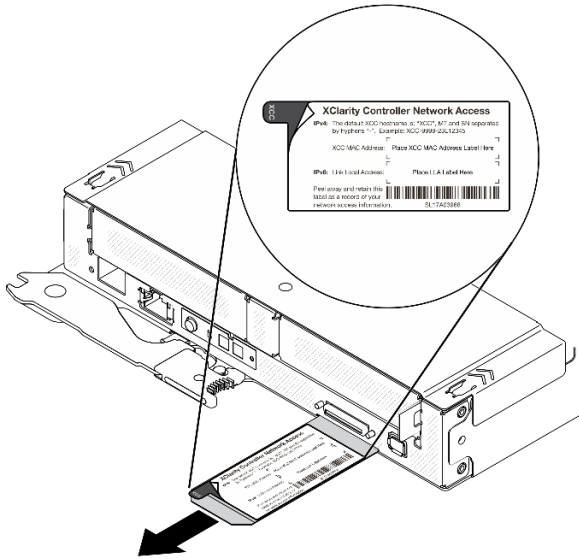


Figure 3. Network access tag on the front of the compute node

QR code

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

The following illustration shows the QR code (<https://support.lenovo.com/p/servers/sd630v2>) for ThinkSystem DA240 Enclosure and ThinkSystem SD630 V2:

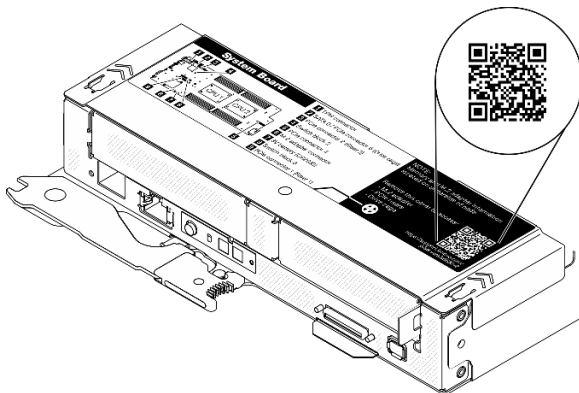


Figure 4. System service label and QR code

Front view

Enclosure

Notes:

1. The illustrations in this document might differ slightly from your hardware.
2. For proper cooling, each compute node bay must be installed with either a compute node or a node filler before the solution is powered on.

The enclosure supports up to **four** compute nodes.

The following illustration shows the front view of the enclosure and respective node bays in the enclosure.

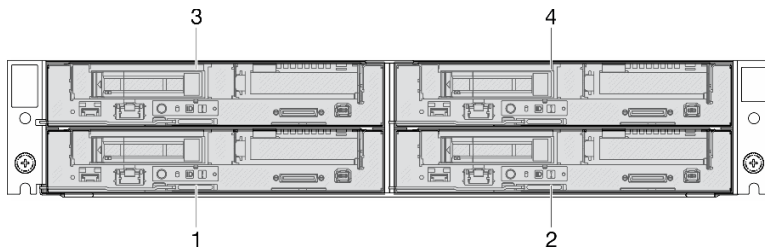


Figure 5. Enclosure front view with compute nodes and node bay numbering

Compute node

The following illustration shows the controls, LEDs, and connectors on the front of the compute node.

Configuration with two 7mm 2.5-inch SATA/NVMe SSDs and PCIe riser

See the following illustration for components, connectors, drive bay and PCIe slot numbering in the configuration with two 7mm 2.5-inch SATA/NVMe SSDs and a PCIe riser.

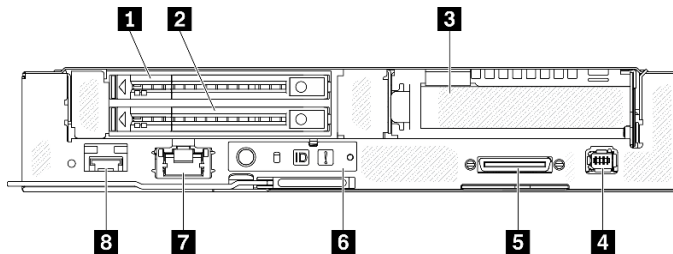


Figure 6. Configuration with two 7mm 2.5-inch SATA/NVMe SSDs and PCIe riser

Table 5. Components in configuration with two 7mm 2.5-inch SATA/NVMe SSDs and PCIe riser

1 7mm 2.5-inch SATA/NVMe SSD bay 1	5 USB 3.0 Console Breakout Cable connector
2 7mm 2.5-inch SATA/NVMe SSD bay 0	6 Node operator panel
3 PCIe slot 1	7 1 Gb RJ45 Ethernet port with share-NIC feature for Lenovo XClarity Controller *
4 External diagnostics connector	8 25 Gb SFP28 Ethernet port with share-NIC feature for Lenovo XClarity Controller *

Note: * Lenovo XClarity Controller can be accessed by either RJ45 Ethernet port or SFP28 Ethernet port.

Configuration with 15mm 2.5-inch NVMe SSD and PCIe riser

See the following illustration for components, connectors, drive bay and PCIe slot numbering in the configuration with a 15mm 2.5-inch NVMe SSD and a PCIe riser.

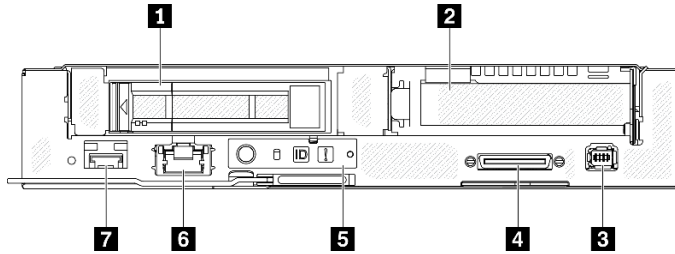


Figure 7. Configuration with 15mm 2.5-inch NVMe SSD and PCIe riser

Table 6. Components in configuration with 15mm 2.5-inch NVMe SSD and PCIe riser

1 15mm 2.5-inch NVMe SSD bay	5 Node operator panel
2 PCIe slot 1	6 1 Gb RJ45 Ethernet port with share-NIC feature for Lenovo XClarity Controller *
3 External diagnostics connector	7 25 Gb SFP28 Ethernet port with share-NIC feature for Lenovo XClarity Controller *
4 USB 3.0 Console Breakout Cable connector	

Note: * Lenovo XClarity Controller can be accessed by either RJ45 Ethernet port or SFP28 Ethernet port.

Front LEDs and buttons

The following illustration shows LEDs and buttons on the front of the compute node.

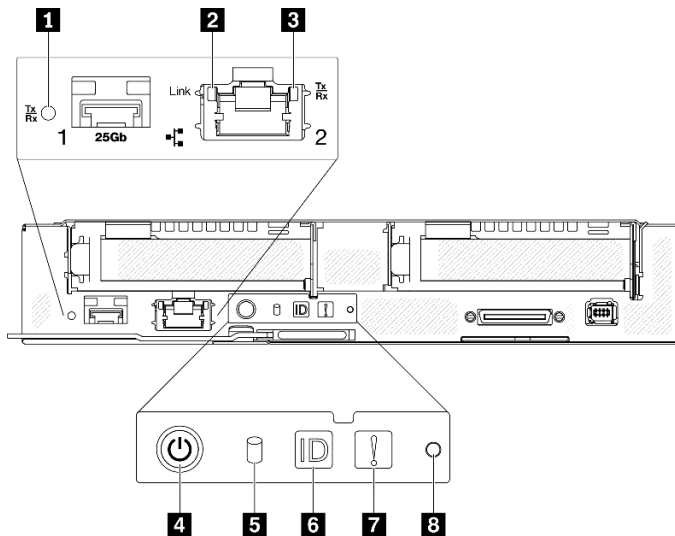


Figure 8. Front LEDs and buttons

Table 7. Front LEDs and buttons

1 25 Gb SFP28 Ethernet port link and activity LED (green)	5 M.2 drive activity LED (green)
2 1 Gb RJ45 Ethernet port link LED (green)	6 Identification button / LED (blue)
3 1 Gb RJ45 Ethernet port activity LED (green)	7 System error LED (yellow)
4 Node power button / LED (green)	8 NMI pinhole

1 25 Gb SFP28 Ethernet port link and activity LED (green): Use this green LED to distinguish the network status.

Off: The network is disconnected.

Blinking: The network is accessing.

On: The network is established.

2 1 Gb RJ45 Ethernet port link LED (green): Use this green LED to distinguish the network status.

Off: The network link is disconnected.

On: The network link is established.

3 1 Gb RJ45 Ethernet port activity LED (green): Use this green LED to distinguish the network status.

Off: The node is disconnected from a LAN.

Blinking: The network is connected and active.

4 Node power button / LED (green): When this LED is lit (green), it indicates that the compute node has power. This green LED indicates the power status of the compute node:

Off: Power is not present; the power supply or the LED itself has failed.

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

Flashing slowly (once per second): The compute node is turned off, connected to power through the enclosure and ready to be turned on. You can press the power button to turn on the node.

On: The compute node is turned on and connected to power through the enclosure.

5 M.2 drive activity LED (green):

- For SATA SSDs, this LED is on when the SSD is powered; when this LED is flashing, it indicates that the drive is actively reading or writing data.
- For NVMe SSDs, this LED is on solid when the SSD is powered and when the SSD is actively reading or writing data.

6 Identification button / LED (blue): Use this blue LED to visually locate the compute node among others. This LED is also used as a presence detection button. You can use Lenovo XClarity Administrator to light this LED remotely.

Note: The behavior of this LED is determined by the SMM2 ID LED when SMM2 ID LED is turned on or blinking. For the exact location of SMM2 ID LED, see [“System Management Module 2 \(SMM2\)” on page 25](#).

Table 8. Different SMM2 ID LED modes and Node ID LED behaviors

SMM2 identification LED	Node identification LEDs
Off	When this option is activated, SMM2 ID LED would first turn off the ID LED on all the compute nodes in the enclosure and enter the accept mode, in which the LED behavior is determined by the node ID LEDs (see “Enclosure rear overview” in <i>System Management Module 2 User Guide</i> for more information).

Table 8. Different SMM2 ID LED modes and Node ID LED behaviors (continued)

On	All of the node ID LEDs will be on except the blinking ones, which will remain blinking.
Blink	All of the node ID LEDs will be blinking regardless of previous status.

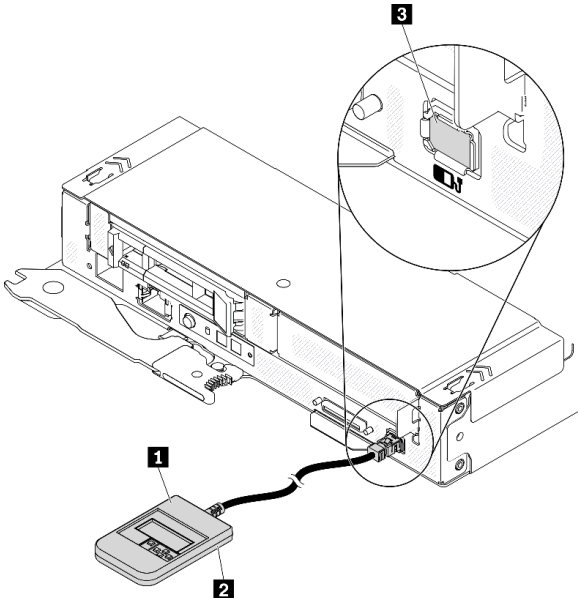
7 System error LED (yellow): When this LED (yellow) is lit, it indicates that at least one system error has occurred. Check the event log for additional information.

8 NMI pinhole: Insert the tip of a straightened paper clip into this pinhole to force a non-maskable interrupt (NMI) upon the node, and consequent memory dump would take place. Only use this function while advised by Lenovo support representative.

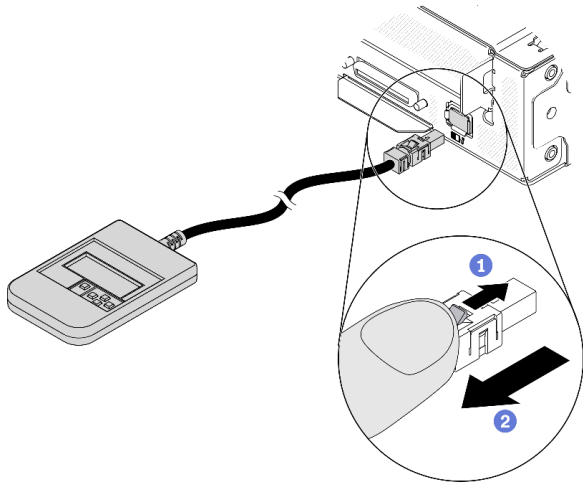
External LCD diagnostics handset

The external LCD diagnostics handset is an external device that is connected to the compute node with a cable, and it allows quick access to system information such as errors, system status, firmware, network, and health information.

Location of the external LCD diagnostics handset

Location	Callouts
<p>The external LCD diagnostics handset is connected to the compute node with an external cable.</p> 	<p>1 External LCD diagnostics handset</p>
	<p>2 Magnetic bottom With this component, the diagnostic handset can be attached to the top or side of the rack with hands spared for service tasks.</p>
	<p>3 External diagnostics connector This connector is located on the front of the compute node, and is used to connect an external LCD diagnostics handset.</p>

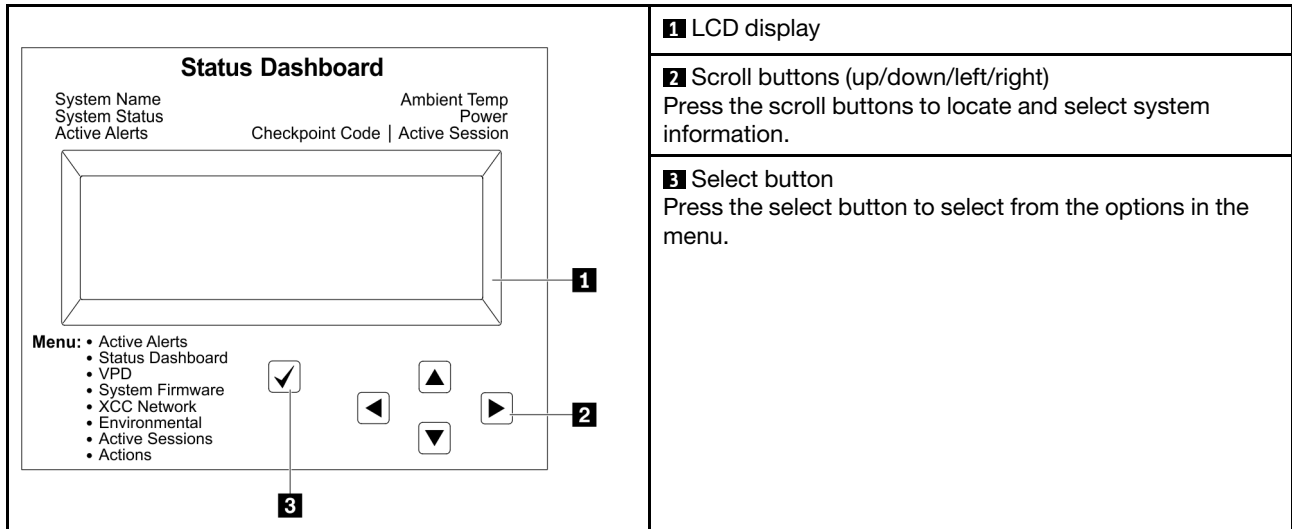
Note: When unplugging the external handset, see the following instructions:



- 1 Press and hold on the latch on top of the connector.
- 2 Pull to disconnect the cable from the compute node.

Display panel overview

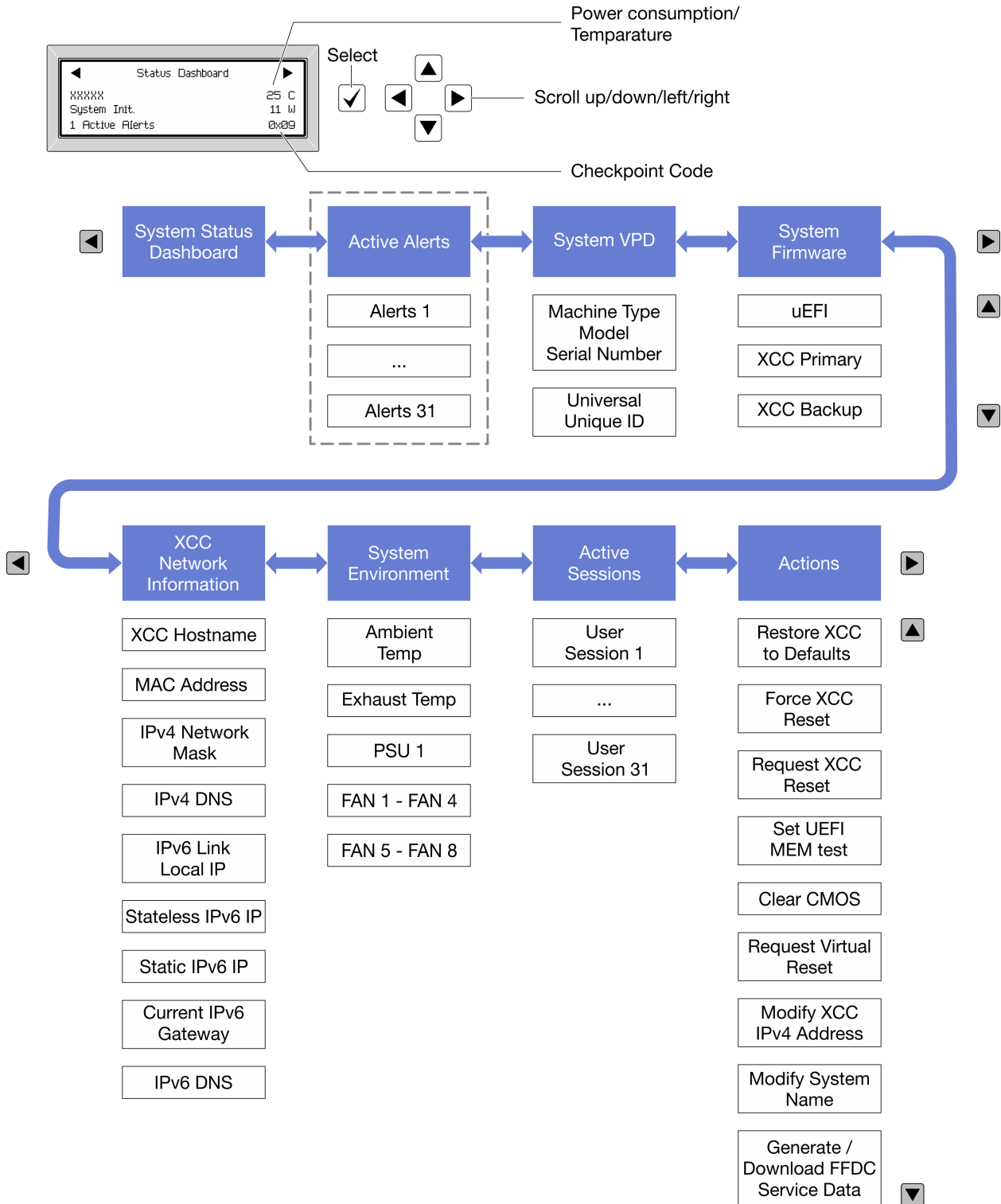
The diagnostics device consists of an LCD display and 5 navigation buttons.



Option flow diagram

The LCD panel displays various system information. Navigate through the options with the scroll keys.

Depending on the model, the options and entries on the LCD display might be different.



Full menu list

Following is the list of available options. Switch between an option and the subordinate information entries with the select button, and switch among options or information entries with the scroll buttons.

Depending on the model, the options and entries on the LCD display might be different.

Home Menu (System Status Dashboard)

Home Menu	Example
<ul style="list-style-type: none"> 1 System name 2 System status 3 Active alert quantity 4 Temperature 5 Power consumption 6 Checkpoint code 	<p>The screenshot shows a 'Status Dashboard' screen with the following elements: <ul style="list-style-type: none"> 1: Points to the system name 'xxxxxx'. 2: Points to the system status 'System Init.'. 3: Points to the active alert quantity '1 Active Alerts'. 4: Points to the temperature '25 C'. 5: Points to the power consumption '11 W'. 6: Points to the checkpoint code '0x09'. </p>

Active Alerts

Sub Menu	Example
Home screen: Active error quantity Note: The “Active Alerts” menu displays only the quantity of active errors. If no errors occur, the “Active Alerts” menu will not be available during navigation.	1 Active Alerts
Details screen: <ul style="list-style-type: none"> • Error message ID (Type: Error/Warning/Information) • Occurrence time • Possible sources of the error 	Active Alerts: 1 Press ▼ to view alert details FQXSPPU009N(Error) 04/07/2020 02:37:39 PM CPU 1 Status: Configuration Error

System VPD Information

Sub Menu	Example
<ul style="list-style-type: none"> • Machine type and serial number • Universal Unique ID (UUID) 	Machine Type: xxxx Serial Num: xxxxxx Universal Unique ID: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

System Firmware

Sub Menu	Example
UEFI <ul style="list-style-type: none"> Firmware level (status) Build ID Version number Release date 	UEFI (Inactive) Build: DOE101P Version: 1.00 Date: 2019-12-26
XCC Primary <ul style="list-style-type: none"> Firmware level (status) Build ID Version number Release date 	XCC Primary (Active) Build: DVI399T Version: 4.07 Date: 2020-04-07
XCC Backup <ul style="list-style-type: none"> Firmware level (status) Build ID Version number Release date 	XCC Backup (Active) Build: D8BT05I Version: 1.00 Date: 2019-12-30

XCC Network Information

Sub Menu	Example
<ul style="list-style-type: none"> XCC hostname MAC address IPv4 Network Mask IPv4 DNS IPv6 Link Local IP Stateless IPv6 IP Static IPv6 IP Current IPv6 Gateway IPv6 DNS <p>Note: Only the MAC address that is currently in use is displayed (extension or shared).</p>	XCC Network Information XCC Hostname: XCC-xxxx-SN MAC Address: xx:xx:xx:xx:xx:xx IPv4 IP: xx.xx.xx.xx IPv4 Network Mask: x.x.x.x IPv4 Default Gateway: x.x.x.x

System Environmental Information

Sub Menu	Example
<ul style="list-style-type: none">Ambient temperatureExhaust temperaturePSU statusSpinning speed of fans by RPM	Ambient Temp: 24 C Exhaust Temp: 30 C PSU1: Vin= 213 w Inlet= 26 C FAN1 Front: 21000 RPM FAN2 Front: 21000 RPM FAN3 Front: 21000 RPM FAN4 Front: 21000 RPM

Active Sessions

Sub Menu	Example
Quantity of active sessions	Active User Sessions: 1

Actions

Sub Menu	Example
Several quick actions are available: <ul style="list-style-type: none">Restore XCC to DefaultsForce XCC ResetRequest XCC ResetSet UEFI Memory TestClear CMOSRequest Virtual ReseatModify XCC Static IPv4 Address/Net mask/GatewayModify System NameGenerate/Download FFDC Service Data	Request XCC Reset? This will request the BMC to reboot itself. Hold $\sqrt{\quad}$ for 3 seconds

Rear view

The following illustration shows the connectors and LEDs on the rear of the solution.

Enclosure

The following illustration shows the components on the rear of the enclosure.

The following illustration shows the rear view of the entire system.

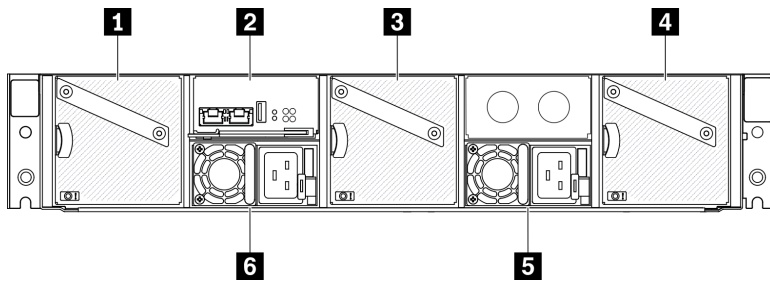


Figure 9. Enclosure rear view

Table 9. Enclosure rear view

1 Fan 1	4 Fan 3
2 System Management Module 2	5 Power supply 2
3 Fan 2	6 Power supply 1

Notes:

- The illustrations in this document might differ slightly from your hardware.
- Make sure the power cord is properly connected to every power supply unit installed.

System Management Module 2 (SMM2)

The following illustration shows the connectors and LEDs on the rear of the System Management Module 2 (SMM2).

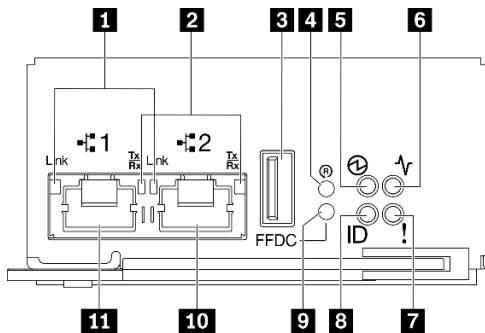


Figure 10. SMM2 connectors and LEDs

Table 10. SMM2 connectors and LEDs

1 Ethernet port 1 and port 2 link (RJ-45) LED (green)	7 Check log LED (yellow)
2 Ethernet port 1 and port 2 activity (RJ-45) LED (green)	8 Identification LED (blue)
3 USB connector	9 USB port service mode button
4 Reset pinhole	10 Ethernet port 2
5 Power LED (green)	11 Ethernet port 1
6 Status LED (green)	

1 Ethernet port 1 and port 2 link (RJ-45) LED (green): When this LED is lit (green), it indicates that there is an active connection through the remote management and console (Ethernet) port 1 and port 2 to the management network.

2 Ethernet port 1 and port 2 activity (RJ-45) LED (green): When this LED is flashing (green), it indicates that there is an activity through the remote management and console (Ethernet) port 1 and port 2 over the management network.

3 USB connector: Insert the USB storage device to this connector and then press the **USB port service mode button** to collect FFDC logs.

4 Reset pinhole: Press the button for one to four seconds, SMM2 reboots. Press over four seconds, SMM2 reboots and loads to the default settings.

5 Power LED: When this LED is lit (green), it indicates that the SMM2 has power.

6 Status LED: This LED (green) indicates the operating status of the SMM2.

- **Continuously on:** The SMM2 has encountered one or more problems.
- **Off:** When the enclosure power is on, it indicates the SMM2 has encountered one or more problems.
- **Flashing:** The SMM2 is working.
 - During the pre-boot process, the LED flashes rapidly.
 - Ten times per second: The SMM2 hardware is working and the firmware is ready to initialize.
 - Two times per second: The firmware is initializing.
 - When the pre-boot process is completed and the SMM2 is working correctly, the LED flashes at a slower speed (about once every two seconds).

7 Check log LED: When this LED is lit (yellow), it indicates that a system error has occurred. Check the SMM2 event log for additional information.

8 Identification LED: When this LED is lit (blue), it indicates the enclosure location in a rack.

9 USB port service mode button: Press this button to collect FFDC logs after inserting the USB storage device to the **USB connector**.

10 Ethernet port 2: Use this connector to access SMM2 management.

11 Ethernet port 1: Use this connector to access SMM2 management.

Power supply

The ThinkSystem DA240 Enclosure Type 7D1J supports two autoranging power supplies.

The power supplies get electrical power from a 200 - 240 Vac power source and convert the AC input into 12.2 V outputs. The power supplies are capable of autoranging within the input voltage range. There is one common power domain for the enclosure that distributes power to each of the compute nodes through the system power distribution boards.

AC redundancy is achieved by distributing the AC power cord connections between independent AC circuits.

Each power supply has internal fans and a controller. The power supply controller can be powered by any installed power supply that is providing power through the power distribution boards.

Attention: The power supplies contain internal cooling fans. Do not obstruct the fan exhaust vents.

It is required to install two power supplies regardless of the type of power supply, the enclosure power load, or selected enclosure power policy.

The ThinkSystem DA240 Enclosure Type 7D1J does not support mixing of low input voltage power supplies with high input voltage power supplies. For example, if you install a power supply with an input voltage of 100 - 127 Vac in an enclosure that is powered by 200 - 240 Vac power supplies, the 100 - 127 Vac power supply will not power on. A configuration error will be flagged to indicate that this power supply configuration is not supported.

The following illustration shows the power supply:

Note: The power supplies for your solution might look slightly different from that shown in the illustration.

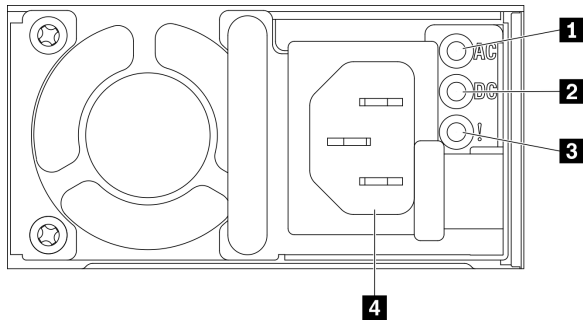


Figure 11. Power supply LEDs and connectors

1 Input (AC) power LED (green)	3 Power supply error LED (yellow)
2 Output (DC) power LED (green)	4 Power cord connector

There are three LEDs on each power supply:

1 AC power LED (green): When this LED is lit (green), it indicates that AC power is being supplied to the power supply.

2 DC power LED (green): When this LED is lit (green), it indicates that DC power is being supplied from the power supply to the power distribution boards in the enclosure.

3 Power supply error LED (yellow): When this LED is lit (yellow), it indicates that there is a fault with the power supply.

Note: Before unplugging the AC power cord from one power supply or removing one power supply from the enclosure, verify that the capacity of the other power supply is sufficient to meet the minimum power requirements for all components in the enclosure.

System board layout

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

System-board internal connectors

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

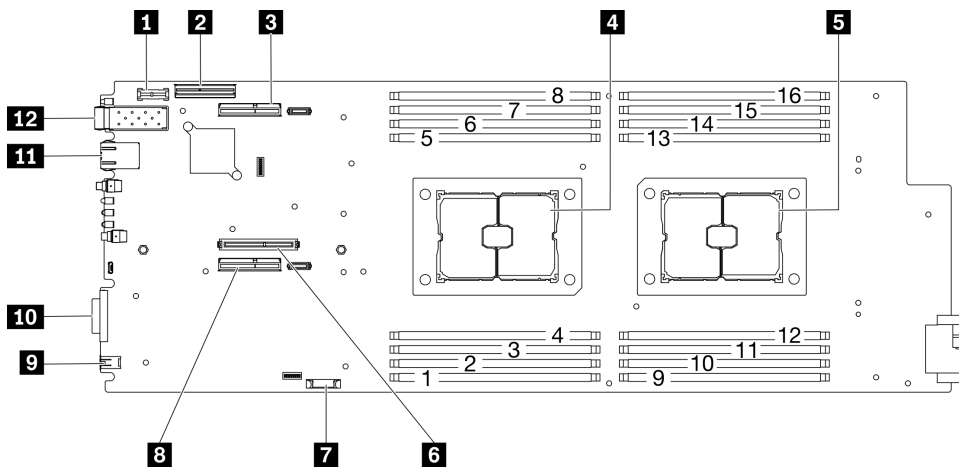


Figure 12. Internal connectors on the system board

Table 11. Internal connectors on the system board

1 TPM connector	7 CMOS battery (CR2032) socket
2 SATA/NVMe connector	8 PCIe riser 1 connector (x16)
3 PCIe riser 2 connector (x16)	9 External diagnostics connector
4 Processor 1	10 USB 3.0 Console Breakout Cable connector
5 Processor 2	11 1 Gb RJ45 Ethernet connector
6 M.2 connector	12 25 Gb SFP28 Ethernet connector

The following illustration shows the location of the DIMM connectors on the system board.

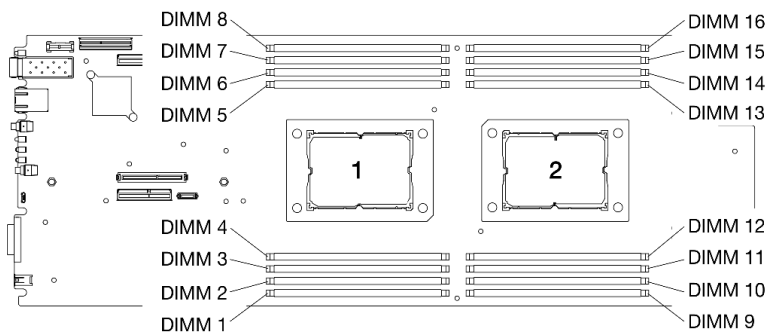


Figure 13. The location of the DIMM connectors on the system board

System-board switches

The following illustration shows the location and description of the switches.

Important:

1. If there is a clear protective sticker on the switch blocks, you must remove and discard it to access the switches.
2. Any system-board switch or jumper block that is not shown in the illustrations in this document are reserved.

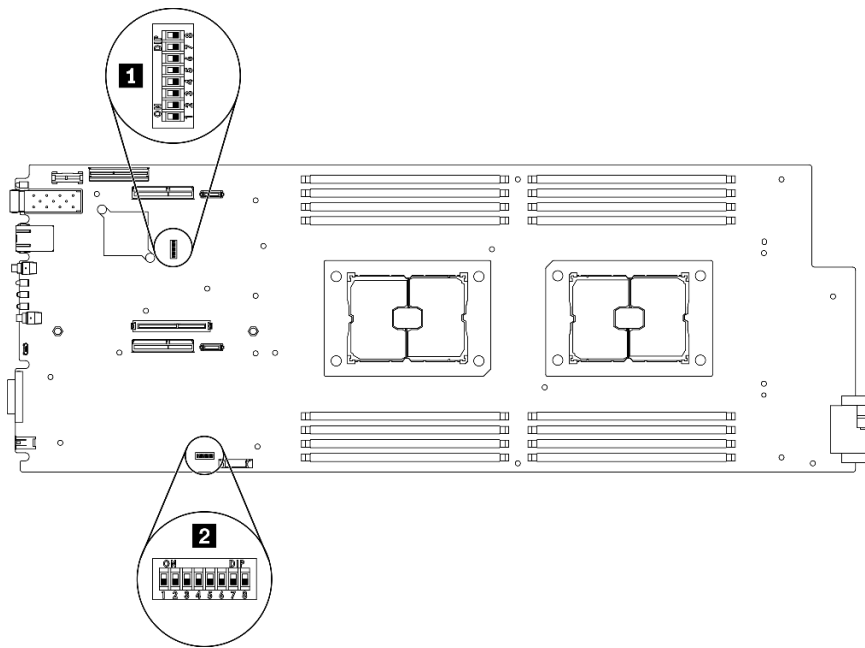


Figure 14. Location of the switches on the system board

The following table describes the switches on the system board:

Table 12. Switch definition

Switch block	Switch	Switch name	Usage description	
			Open	Close
1 SW2	4	Password override jumper	Overrides the power-on password	Normal (default)
	7	Lenovo XClarity Controller force update	Enables Lenovo XClarity Controller force update	Normal (default)
2 SW3	3	CMOS clear jumper	Clears the real-time clock (RTC) registry	Normal (default)

Important:

1. Before you change any switch settings or move any jumpers, turn off the solution. Then, disconnect all power cords and external cables. Review the information in https://pubs.lenovo.com/safety_documentation/, “Installation Guidelines” on page 39, and “Power off the compute node” on page 11.
2. Any system-board switches or jumper blocks that are not shown in the illustrations in this document are reserved.

Internal cable routing

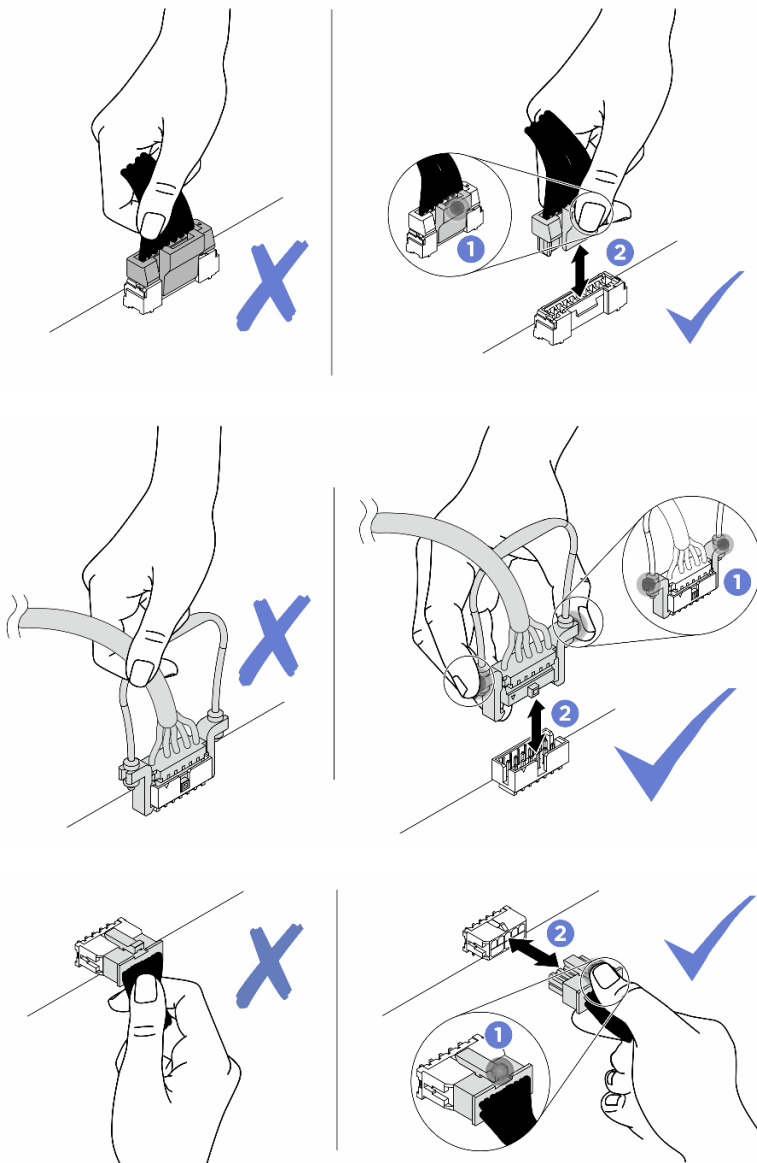
Some of the components in the compute node have internal cable connectors.

Attention:

- Some options, such as RAID adapter and backplanes, might require additional internal cabling. See the documentation that is provided for the option to determine any additional cabling requirements and instructions.

- Strictly observe the following instructions to avoid damaging cable sockets on the system board. Any damage to the cable sockets might require replacing the system board.
 - Connect cable connectors vertically or horizontally in alignment with the orientations of the corresponding cable sockets, avoiding any tilt.
 - To disconnect cables from the system board, do as follows:
 1. Press and hold all latches, release tabs, or locks on cable connectors to release the cable connectors.
 2. Remove the cable connectors vertically or horizontally in alignment with the orientations of the corresponding cable sockets, avoiding any tilt.

Note: The cable connectors might look different from those in the illustration, but the removal procedure is the same.



7mm 2.5-inch SATA/NVMe drive backplane cable

Use this section to understand how to route cables for the two 7mm 2.5-inch SATA/NVMe drive backplanes.

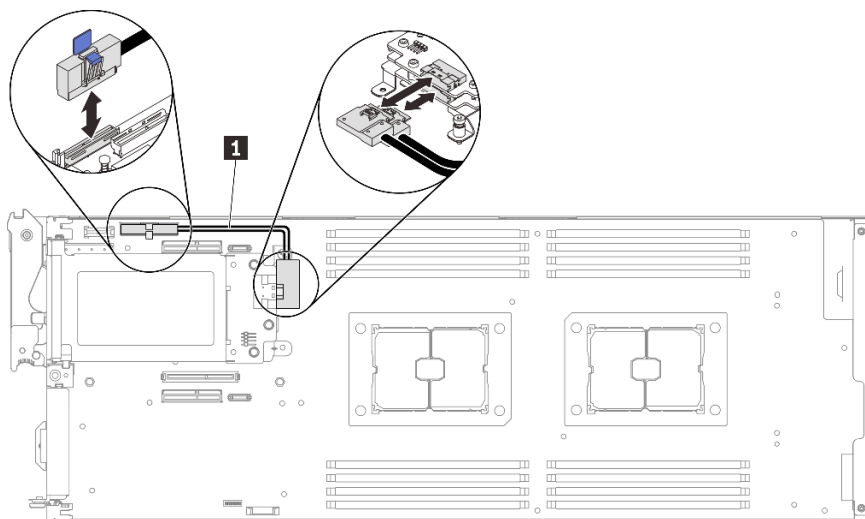


Figure 15. Cable routing for two 7mm 2.5-inch SATA/NVMe drive backplanes

Cable	From	To
1 Y cable for the 7mm 2.5-inch SATA/NVMe drive backplanes	SATA/NVMe connector on the system board	Slimline x8 connector on the two backplanes

15mm 2.5-inch NVMe drive backplane cable

Use this section to understand how to route cables for the 15mm 2.5-inch NVMe drive backplane.

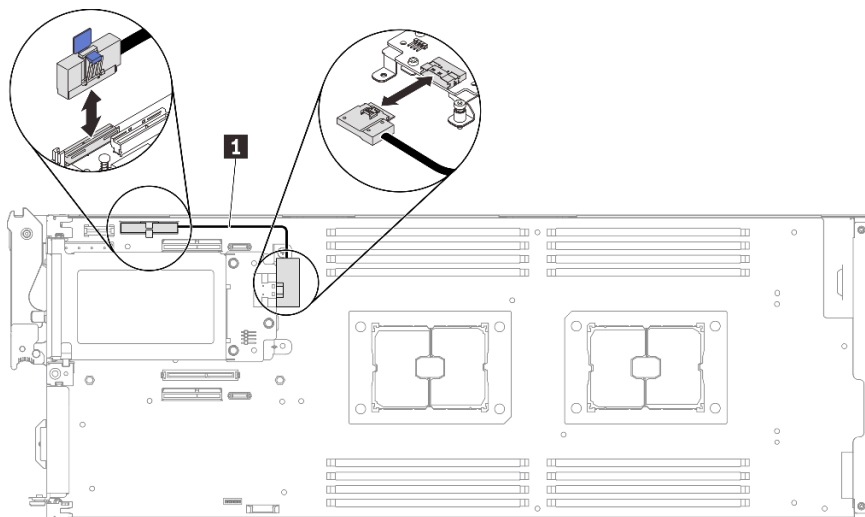


Figure 16. Cable routing for 15mm 2.5-inch NVMe drive backplane

Cable	From	To
1 Cable for the 15mm 2.5-inch NVMe drive backplane	NVMe connector on the system board	Slimline x8 connector on the backplane

Power distribution boards and fan cables

Use this section to understand how to route cables for the power distribution boards and system fans.

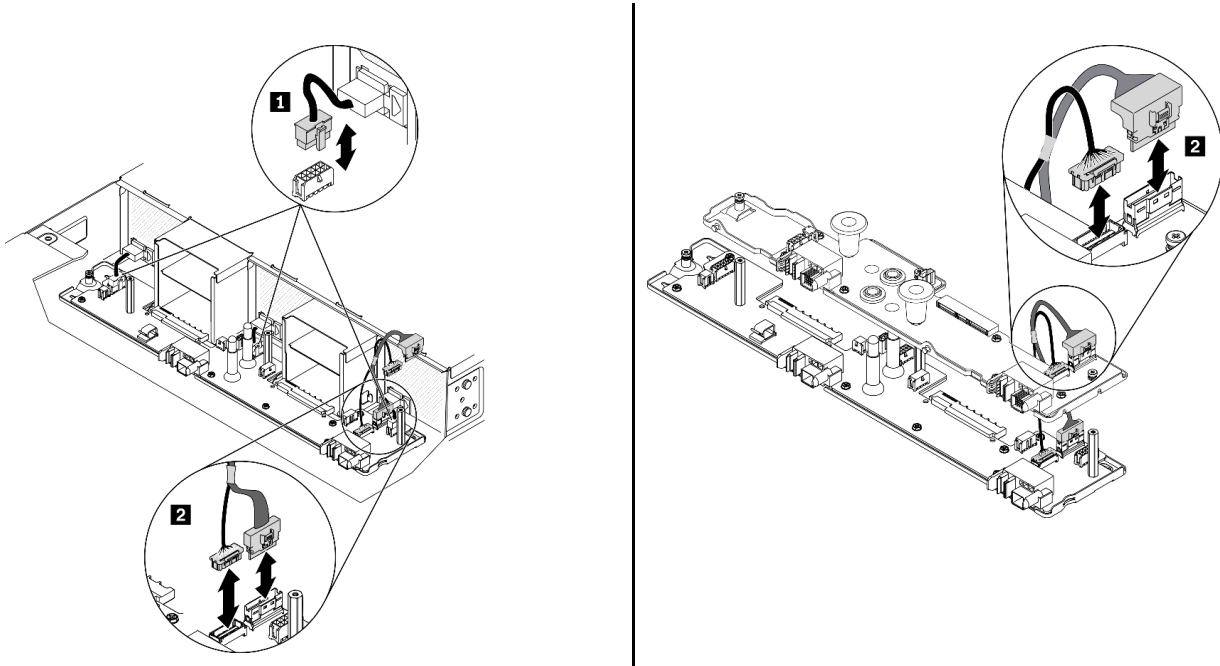


Figure 17. Cable routing for the power distribution boards and fans

Cable	From	To
1 Three fan cables	Fan connectors on the system fans	Fan connectors on the lower power distribution board
2 Two interconnect cables (bundled together as illustrated)	Interconnect cables connectors on the lower power distribution board	Interconnect cables connectors on the upper power distribution board

Note: Before installing the upper power distribution board and connecting the two interconnect cables between the lower and upper power distribution boards, make sure that the enclosure air baffles have been installed into the enclosure (see [“Install the enclosure air baffles”](#) on page 54).

USB 3.0 Console Breakout Cable

Use this information for details about the USB 3.0 Console Breakout Cable.

Use the USB 3.0 Console Breakout Cable to connect external I/O devices to a compute node. The USB 3.0 Console Breakout Cable connects through the USB 3.0 Console Breakout Cable connector on the front of each compute node (see [“Compute node”](#) on page 15). The USB 3.0 Console Breakout Cable has connectors for a display device (video), a USB 3.2 Gen 1 connector for a USB keyboard or mouse, and a serial port connector.

The following illustration identifies the connectors and components on the USB 3.0 Console Breakout Cable.

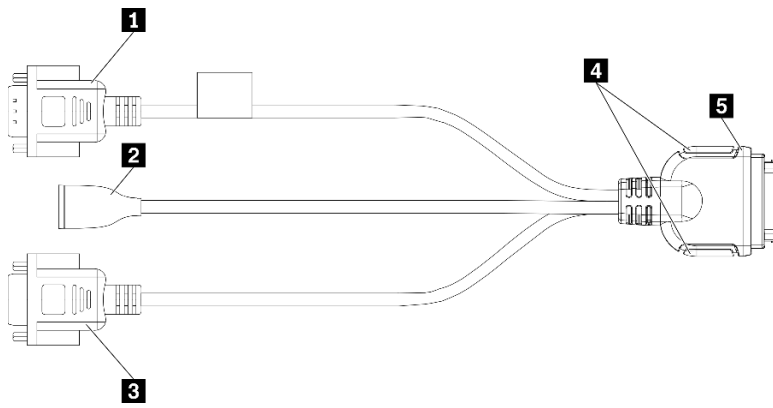


Figure 18. Connectors and components on the USB 3.0 Console Breakout Cable

Table 13. Connectors and components on the USB 3.0 Console Breakout Cable

1 Serial port connector	4 Captive screws
2 USB 3.2 Gen 1 connector	5 To USB 3.0 Console Breakout Cable connector
3 VGA connector	

Parts list

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

Note: Depending on the model, your solution might look slightly different from that in the following illustrations.

Enclosure components

This section includes the components that come with the enclosure.

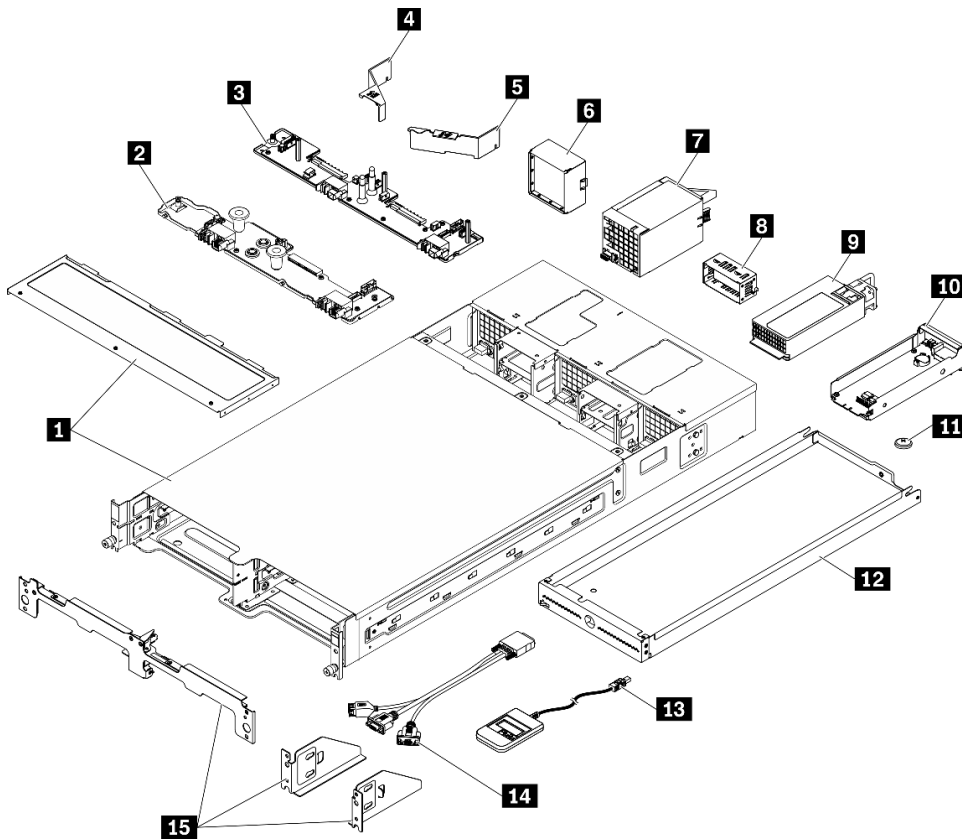




Figure 19. Enclosure components

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 solution.
- **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 14. Parts list – Enclosure

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
<p>For more information about ordering the parts shown in Figure 19 “Enclosure components” on page 34:</p> <p>https://datacentersupport.lenovo.com/us/en/products/servers/thinksystem/da240-enclosure/7d1j/parts</p> <p>It is highly recommended that you check the power summary data for your server/solution using Lenovo Capacity Planner before purchasing any new parts.</p>					
1	Enclosure	√			
2	Upper power distribution board		√		
3	Lower power distribution board			√	
4	Enclosure air baffle for power supply 2 (marked with )	√			
5	Enclosure air baffle for power supply 1 (marked with )	√			
6	Fan filler panel (for the configuration with two system fans)	√			
7	8080 dual-rotor fan	√			
8	Power supply filler panel	√			
9	Power supply	√			
10	System Management Module 2 (SMM2)	√			
11	CMOS battery (CR2032) for SMM2				√
12	Compute node bay filler	√			
13	External LCD diagnostics handset	√			
14	USB 3.0 Console Breakout Cable	√			
15	Shipping bracket	√			

Compute node components

This section includes the components that come with the compute node.

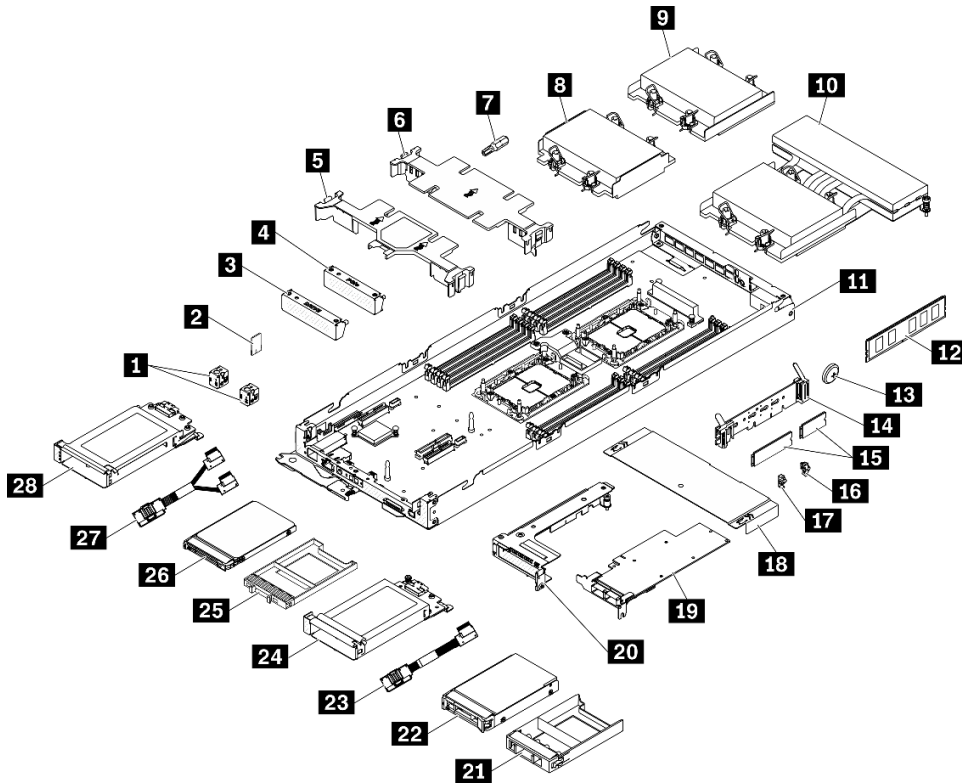


Figure 20. Compute node components

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 solution.
- **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 15. Parts list — Compute node

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
<p>For more information about ordering the parts shown in Figure 20 “Compute node components” on page 36:</p> <p>https://datacentersupport.lenovo.com/us/en/products/servers/thinksystem/sd630v2/7d1k/parts</p> <p>It is highly recommended that you check the power summary data for your server/solution using Lenovo Capacity Planner before purchasing any new parts.</p>					
1	Spacers (SATA and NVMe)	√			
2	TPM card (Chinese Mainland only)	√			
3	Drive cage filler panel	√			
4	PCIe cage filler panel	√			
5	Front air baffle	√			
6	Middle air baffle	√			
7	Heat sink Torx T30 nut		√		
8	Processor and heat sink assembly (113x124x23.5mm heat sink for low TDP configuration)			√	
9	Processor and heat sink assembly (113x124x23.5mm heat sink for high TDP configuration)			√	
10	Processor and heat sink assembly (T-shaped heat sink)			√	
11	Compute node tray (including the system board)			√	
12	DIMM	√			
13	CMOS battery (CR2032)				√
14	M.2 backplane	√			
15	M.2 drive	√			
16	M.2 retainer clip (double-sided)	√			
17	M.2 retainer clip (single-sided)	√			
18	Node front cover	√			
19	PCIe adapter	√			
20	PCIe riser assembly		√		
21	15mm solid-state drive filler	√			
22	15mm 2.5-inch NVMe solid-state drive	√			
23	NVMe cable (Slimline x16 to Slimline x8)	√			
24	15mm 2.5-inch drive cage (including one drive backplane)	√			

Table 15. Parts list – Compute node (continued)

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
25	7mm solid-state drive filler	✓			
26	7mm 2.5-inch SATA/NVMe solid-state drive	✓			
27	SATA/NVMe Y-cable (Slimline x16 to 2x Slimline x8)	✓			
28	7mm 2.5-inch drive cage (including two drive backplanes)	✓			

Chapter 3. Hardware replacement procedures

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

For more information about ordering parts:

- <https://datacentersupport.lenovo.com/us/en/products/servers/thinksystem/da240-enclosure/7d1j/parts>
- <https://datacentersupport.lenovo.com/us/en/products/servers/thinksystem/sd630v2/7d1k/parts>

Note: If you replace a part, such as an adapter, that contains firmware, you might also need to update the firmware for that part. For more information about updating firmware, see “[Firmware updates](#)” on page 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 42 and “[Working inside the solution with the power on](#)” on page 41.
- Make sure the components you are installing are supported by your server. For a list of supported optional components for the server, see <https://serverproven.lenovo.com/>.
- 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 DA240 Enclosure and ThinkSystem SD630 V2 Compute Node Drivers and Software](#) to download firmware updates for your server.

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

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

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

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

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

Safety inspection checklist

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

Notes:

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

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

System reliability guidelines

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

Make sure the following requirements are met:

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

Working inside the solution with the power on

You might need to keep the power on with the enclosure 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 solution might stop and data loss might occur when internal solution 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 solution with the power on.

- Avoid loose-fitting clothing, particularly around your forearms. Button or roll up long sleeves before working inside the solution.
- Prevent your necktie, scarf, badge rope, or hair from dangling into the solution.
- 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 solution as you lean over it.
- Avoid dropping any metallic objects, such as paper clips, hairpins, and screws, into the solution.

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 solution 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 solution 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 solution 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 solution 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.

Replace components in the enclosure

Use the following information to remove and install the enclosure components.

Compute node replacement

Use the following procedures to remove and install the compute node from the DA240 Enclosure.

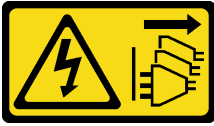
Remove a compute node from the enclosure

Use this information to remove a compute node from the DA240 Enclosure.

About this task

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

- **S002**



CAUTION:

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

Attention: Read the “Installation Guidelines” on page 39 to ensure that you work safely.

Procedure

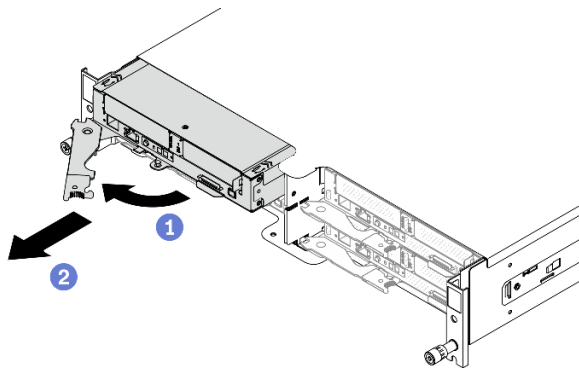


Figure 21. Compute node removal

- Step 1. Turn off the corresponding compute node on which you are going to perform the task.
- Step 2. Remove the compute node from the enclosure.
 - a. ① Release and rotate the front handle on the compute node as shown in the illustration.
 - b. ② Slide the compute node out about 10 inches (25.4 cm); then, grip the node with both hands and carefully pull it out of the enclosure.

Attention:

- 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 could lead to unintended consequences. Certain configuration information and update options are established based on respective node bay numbers. If you reinstall the compute node into a different node bay, you might have to reconfigure the compute node.
- Install either a node bay filler or another compute node in the node bay within one minute.
- To maintain proper system cooling, do not operate the DA240 Enclosure without a compute node or node bay filler installed in each node bay.

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

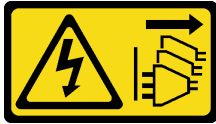
Replace a defective compute node

Use this information to replace a defective compute node.

About this task

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

- **S002**



CAUTION:

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

Attention:

- Only trained service technicians are allowed to perform this procedure. Unauthorized personnel should not attempt to replace this component.
- If possible, back up all compute node settings, including the settings of the optional components installed in the compute node.
- Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Important: After a compute node is replaced, it is required to 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 one before you proceed (see [“Firmware updates” on page 6](#) for more information).

Procedure

- Step 1. Make preparations for this task.
 - a. Turn off the corresponding compute node on which you are going to perform the task.
 - b. Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure” on page 42](#)).
- Step 2. Remove the node front cover (see [“Remove the node front cover” on page 117](#)).
- Step 3. Remove the node air baffles (see [“Remove the front air baffle” on page 113](#) and [“Remove the middle air baffle” on page 115](#)).
- Step 4. Remove all of the drives and fillers (if any) and place them on the static protective surface (see [“Remove a hot-swap solid-state drive” on page 85](#)).

Note: Record the drive bay number when removing the drives so that you can install them back into the same drive bays in the replacement compute node.

- Step 5. Remove the drive cage assembly and place it on the static protective surface (see [“Remove the drive cage assembly” on page 93](#)).
- Step 6. Remove the PCIe riser assembly and place it on the static protective surface (see [“Remove the PCIe riser assembly” on page 122](#)).

- Step 7. Make sure the correct spacer (SATA or NVMe) has been installed into the replacement compute node (see “Replace SATA and NVMe spacers” in *ThinkSystem DA240 Enclosure Type 7D1J and ThinkSystem SD630 V2 Compute Node Type 7D1K Setup Guide*).
- Step 8. Install the drive cage assembly in the replacement compute node (see [“Install the drive cage assembly” on page 95](#)).
- Step 9. Install the drives that were removed earlier into the replacement compute node (see [“Install a hot-swap solid-state drive” on page 87](#)).
- Step 10. Install the PCIe riser assembly into the replacement compute node (see [“Install the PCIe riser assembly” on page 123](#)).
- Step 11. Transfer the two processor-heat-sink modules (PHM) from the defective compute node to the replacement unit.
- Remove the socket cover from processor socket 1 in which you plan to install processor 1 in the replacement compute node.
 - Remove the PHM (processor 1) from the defective compute node (see [“Remove a processor and heat sink” on page 125](#)).
 - Install the PHM (processor 1) into the socket in the replacement compute node (see [“Install a processor and heat sink” on page 131](#)).
 - Orient the socket cover that was removed earlier above the empty processor socket 1 in the defective compute node; then, gently press on the four corners of the socket cover that you placed on the empty processor socket in to secure the cover to the socket.
 - Repeat the previous steps for processor 2 and its T-shaped heat sink.

Attention: When transferring a PHM to a replacement compute node:

- Remove and install only one PHM at a time. As the system board supports two processors, install the PHMs starting with the first processor socket.
- Each processor socket must always contain a cover or a PHM. Always protect an empty processor socket in a compute node with a socket cover.
- Install the removed PHM to the replacement compute node immediately after its removal.

- Step 12. Remove one memory module at a time from the defective compute node (see [“Remove a memory module” on page 107](#)), and immediately install it into the same memory module slot in the replacement compute node (see [“Install a memory module” on page 110](#)) until all of the memory modules are transferred.
- Step 13. If a M.2 backplane has been installed in the compute node, remove it (see [“Remove the M.2 backplane” on page 101](#)) and install it in the replacement compute node (see [“Install the M.2 backplane” on page 102](#)).
- Step 14. If a TPM card has been installed in the compute node, remove it from the compute node and install it in the replacement compute node.
- Step 15. Route and connect all cables transferred in previous steps (see [“Internal cable routing” on page 29](#)).
- Step 16. Install the node air baffles in the replacement compute node (see [“Install the front air baffle” on page 114](#) and [“Install the middle air baffle” on page 116](#)).

Note: For proper cooling and airflow, make sure to install the node air baffles. Operating the compute node without the air baffles might lead to component damage.

- Step 17. Install the node front cover in the replacement compute node (see [“Install the node front cover” on page 119](#)).

After you finish

1. Install the replacement compute node into the enclosure (see [“Install a compute node in the enclosure” on page 46](#)).
2. 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 48](#).
3. Enable Trusted Platform Module (TPM). See [“Enable TPM” on page 50](#).
4. Optionally, enable UEFI Secure Boot. See [“Enable UEFI Secure Boot” on page 52](#).
5. 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. See the *Lenovo XClarity Provisioning Manager User Guide*, which is available for download at: <https://pubs.lenovo.com/lxpm-overview/>
6. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.
7. If you are planning to recycle the compute node, follow the instruction in [“Disassemble the compute node for recycle” on page 167](#) for compliance with local regulations.

Important: Before returning the defective compute node, make sure that a socket cover is securely attached to each empty processor socket and the cover was re-installed over the defective node.

Demo video

[Watch the procedure on YouTube](#)

Install a compute node in the enclosure

Use this information to install a compute node in the DA240 Enclosure.

About this task

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

- **S002**



CAUTION:

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

Attention:

- Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.
- Be careful when you are removing or installing the compute node to avoid damaging the node connector (s).

Procedure

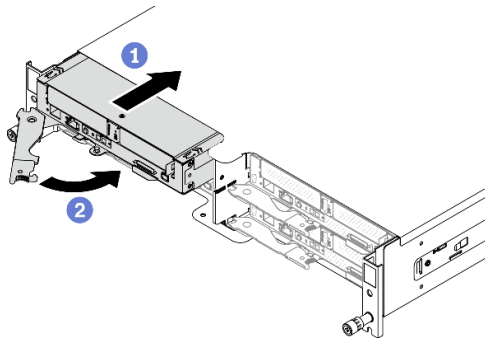


Figure 22. Compute node installation

Step 1. Install a compute node in the enclosure.

- a. ① Make sure that the front handle on the compute node is in the fully open position; then, slide the compute node into the node bay until it stops.
- b. ② Rotate the front handle to the fully closed position until the handle latch clicks.

Attention:

- If you are reinstalling a compute node that you removed, you must install it in the same node bay from which you removed it. Certain configuration information and update options are established based on respective node bay numbers. Reinstalling a compute node into a different node bay could lead to unintended consequences. If you reinstall the compute node into a different node bay, you might have to reconfigure the compute node.
- The time required for a compute node to initialize varies by system configurations. The power LED flashes rapidly; the power button on the compute node will not respond until the power LED flashes slowly, indicating that the initialization process is complete.
- To maintain proper system cooling, do not operate the DA240 Enclosure without a compute node or node bay filler installed in each node bay.

Step 2. If you have other compute nodes to install, do so now.

After you finish

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

1. Check the power LED to make sure it transitions between fast blink and slow blink to indicate the node is ready to be powered on; then, power on the node.
2. 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.
3. If this is the initial installation of the node in the enclosure, you must configure the node through the Lenovo XClarity Provisioning Manager and install the node operating system. See <https://pubs.lenovo.com/lxpm-overview/> for more details.
4. If compute node access over local console is not available:
 - a. Access Lenovo XClarity Controller web interface (see https://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/dw1lm_c_accessingtheimmwebinterface.html).
 - b. Set up Lenovo XClarity Controller network connection through Lenovo XClarity Provisioning Manager (see https://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/dw1lm_t_settinguptheimmnetworkconnection.html).

- c. Log in to Lenovo XClarity Controller (see https://sysmgmt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/dw1lm_t_loggingintotheimm.html).
5. 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 “System Configuration” in *Setup Guide* for more details.
6. You can place identifying information on the pull out label tab that are accessible from the front of the node.

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 `xxxxxyyyyyy`, where `xxxx` is the machine type and `yyyyyy` is the server model number.

`<s/n>`

The serial number on the server. Type `zzzzzzzz` (length 8-10 characters), where `zzzzzzzz` is the serial number.

`<system model>`

The system model. Type `system yyyyyyyy`, where `yyyyyyy` 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/xcc-overview/>.

Enable TPM

The solution supports Trusted Platform Module (TPM) Version 2.0.

Note: For customers in Chinese Mainland, integrated TPM is not supported. However, customers in Chinese Mainland can install a Lenovo-qualified TPM adapter (sometimes called a daughter card).

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

CAUTION:

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

Set the TPM policy

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

There are two methods available to set the TPM policy:

- From Lenovo XClarity Provisioning Manager

To set the TPM policy from Lenovo XClarity Provisioning Manager:

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

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

- From Lenovo XClarity Essentials OneCLI

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

To set the TPM policy from Lenovo XClarity Essentials OneCLI:

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

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

2. Configure the TPM_TCM_POLICY into XCC:
 - For customers in Chinese Mainland with no TPM, or customers that require to disable TPM:
`OneCli.exe config set imm.TpmTcmPolicy "NeitherTpmNorTcm" --override --imm <userid>:<password>@<ip_address>`
 - For customers in Chinese Mainland that require to enable TPM:
`OneCli.exe config set imm.TpmTcmPolicy "NationZTPM20Only" --override --imm <userid>:<password>@<ip_address>`
 - For customers outside Chinese Mainland that require to enable TPM:
`OneCli.exe config set imm.TpmTcmPolicy "TpmOnly" --override --imm <userid>:<password>@<ip_address>`
3. Issue reset command to reset system:
`OneCli.exe misc oshpower reboot --imm <userid>:<password>@<ip_address>`
4. Read back the value to check whether the change has been accepted:
`OneCli.exe config show imm.TpmTcmPolicy --override --imm <userid>:<password>@<ip_address>`

Notes:

- If the read back value is matched it means the TPM_TCM_POLICY has been set correctly.
imm.TpmTcmPolicy is defined as below:
 - Value 0 use string "Undefined", which means UNDEFINED policy.
 - Value 1 use string "NeitherTpmNorTcm", which means TPM_PERM_DISABLED.
 - Value 2 use string "TpmOnly", which means TPM_ALLOWED.
 - Value 4 use string "NationZTPM20Only", which means NationZ_TPM20_ALLOWED.
 - Below 4 steps must also be used to 'lock' the TPM_TCM_POLICY when using OneCli/ASU commands:
5. Read TpmTcmPolicyLock to check whether the TPM_TCM_POLICY has been locked, command as below:
`OneCli.exe config show imm.TpmTcmPolicyLock --override --imm <userid>:<password>@<ip_address>`
The value must be 'Disabled', it means TPM_TCM_POLICY is NOT locked and must be set.
 6. Lock the TPM_TCM_POLICY:
`OneCli.exe config set imm.TpmTcmPolicyLock "Enabled" --override --imm <userid>:<password>@<ip_address>`
 7. Issue reset command to reset system, command as below:
`OneCli.exe misc oshpower reboot --imm <userid>:<password>@<ip_address>`
During the reset, UEFI will read the value from imm.TpmTcmPolicyLock, if the value is 'Enabled' and the imm.TpmTcmPolicy value is valid, UEFI will lock the TPM_TCM_POLICY setting.
Note: The valid values for imm.TpmTcmPolicy include 'NeitherTpmNorTcm', 'TpmOnly', and 'NationZTPM20Only'.
If the imm.TpmTcmPolicyLock is set as 'Enabled' but imm.TpmTcmPolicy value is invalid, UEFI will reject the 'lock' request and change imm.TpmTcmPolicyLock back to 'Disabled'.
 8. Read back the value to check whether the 'Lock' is accepted or rejected. Command as below:
`OneCli.exe config show imm.TpmTcmPolicy --override --imm <userid>:<password>@<ip_address>`

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

imm.TpmTcmPolicyLock is defined as below:

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

Enable UEFI Secure Boot

Optionally, you can enable UEFI Secure Boot.

There are two methods available to enable UEFI Secure Boot:

- From Lenovo XClarity Provisioning Manager

To enable UEFI Secure Boot from Lenovo XClarity Provisioning Manager:

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

- 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_<br>address>
```

where:

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

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

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

Note: If disabling UEFI secure boot is needed, run the following command:

```
OneCli.exe config set SecureBootConfiguration.SecureBootSetting Disabled --bmc <userid>:<password>@<ip_<br>address>
```

Enclosure air baffles replacement

Use the following procedures to remove and install the enclosure air baffles.

Remove the enclosure air baffles

Use this information to remove the enclosure air baffles.

About this task

Attention: Read the “[Installation Guidelines](#)” on page 39 to ensure that you work safely.

Procedure

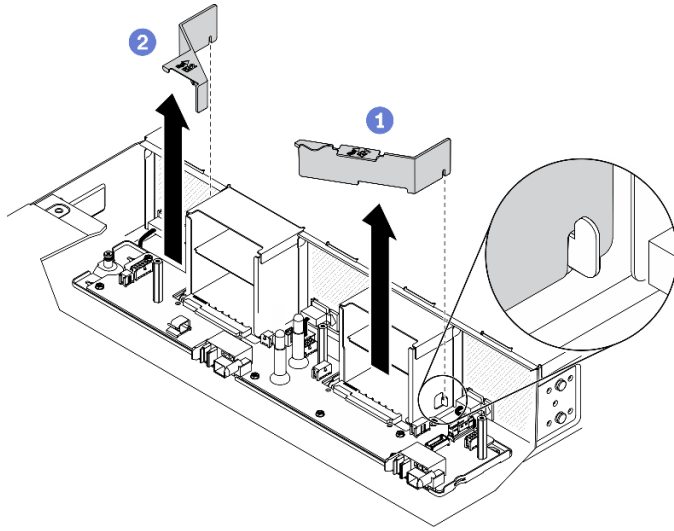


Figure 23. Enclosure air baffles removal

Step 1. Make preparations for this task.

- a. Turn off the solution and peripheral devices and disconnect the power cords and all external cables (see “[Power off the compute node](#)” on page 11).
- b. If the solution is installed in a rack, remove the solution from the rack (see “[Remove the server/solution from the rails](#)” in *Rack Installation Guide* [Remove the server/solution from the rails](#)).

CAUTION:

To avoid a drop hazard, slide the enclosure out of the rack slowly and steadily. Make sure to grip the enclosure with both hands when pulling it forward on the slide rails and lifting it out of the rack. Use safe practices when lifting.

- c. Remove the components listed below from the enclosure in the following order:
 - Compute node(s) (see “[Remove a compute node from the enclosure](#)” on page 42).
 - System Management Module 2 (see “[Remove the hot-swap SMM2](#)” on page 74).
 - Power supplies (see “[Remove a hot-swap power supply](#)” on page 61).
 - Enclosure cover (see “[Remove the enclosure cover](#)” on page 55).
 - Upper power distribution board (see “[Remove the upper power distribution board](#)” on page 65).

Step 2. Remove the enclosure air baffles from the enclosure.

- a. ① Disengage the air baffle marked with ❶ from the hook on the side of the power supply bay 1 and lift it out of the enclosure.
- b. ② Disengage the air baffle marked with ❷ from the hook on the side of the power supply bay 2 and lift it out of the enclosure.

Attention: For proper cooling and airflow, replace the enclosure air baffles before you turn on the compute node. Operating the node without the enclosure air baffles might damage node components.

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install the enclosure air baffles

Use this information to install the enclosure air baffles.

About this task

Attention: Read the “[Installation Guidelines](#)” on [page 39](#) to ensure that you work safely.

Procedure

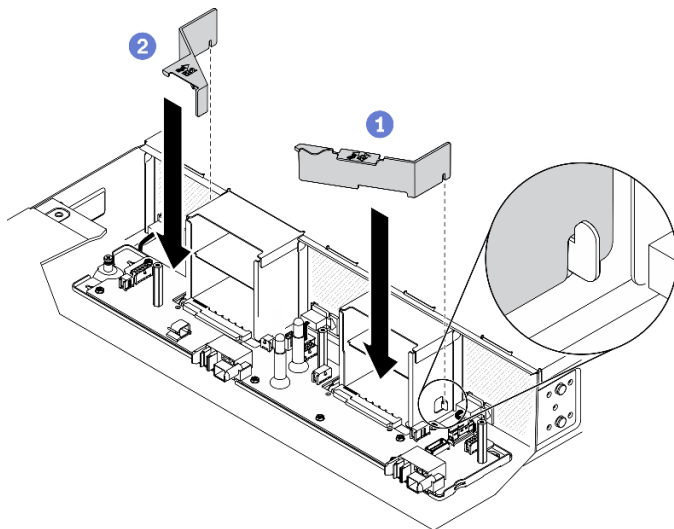




Figure 24. Enclosure air baffles installation

Note: Before installing the enclosure air baffles, make sure that the lower power distribution board has been installed into the enclosure (see “[Install the lower power distribution board](#)” on [page 69](#)).

Step 1. Install the enclosure air baffles in the enclosure.

- a. **1** Align the notch on the air baffle marked with  **1** with the hook on the side of the power supply bay 1. Press the air baffle down until it is securely seated.
- b. **2** Align the notch on the air baffle marked with  **2** with the hook on the side of the power supply bay 2. Press the air baffle down until it is securely seated.

Attention: For proper cooling and airflow, replace the enclosure air baffles before you turn on the compute node. Operating the node without the enclosure air baffles might damage node components.

After you finish

1. Reinstall the components listed below into the enclosure in the following order:
 - a. Upper power distribution board (see “[Install the upper power distribution board](#)” on [page 71](#)).

- b. Enclosure cover (see [“Install the enclosure cover” on page 56](#)).
 - c. Compute node(s) (see [“Install a compute node in the enclosure” on page 46](#)).
 - d. System Management Module 2 (see [“Install the hot-swap SMM2” on page 74](#)).
 - e. Power supplies (see [“Install a hot-swap power supply” on page 63](#)).
2. Install the solution back to the rack if necessary.
 3. Reconnect power cords and all external cables.
 4. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Enclosure cover replacement

Use the following procedures to remove and install the enclosure cover.

Remove the enclosure cover

Use this information to remove the enclosure cover.

About this task

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.

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

- Step 1. Make preparations for this task.
 - a. Turn off the solution and peripheral devices and disconnect the power cords and all external cables (see [“Power off the compute node” on page 11](#)).

- b. If the solution is installed in a rack, remove the solution from the rack (see “Remove the server/solution from the rails” in *Rack Installation Guide* [Remove the server/solution from the rails](#)).

CAUTION:

To avoid a drop hazard, slide the enclosure out of the rack slowly and steadily. Make sure to grip the enclosure with both hands when pulling it forward on the slide rails and lifting it out of the rack. Use safe practices when lifting.

Step 2. Remove the enclosure cover from the enclosure.

- a. ① Use Phillips #1 screwdriver to loosen the three captive screws on the enclosure cover.
- b. ② Slightly rotate the enclosure cover outwards and pull it out of the enclosure.

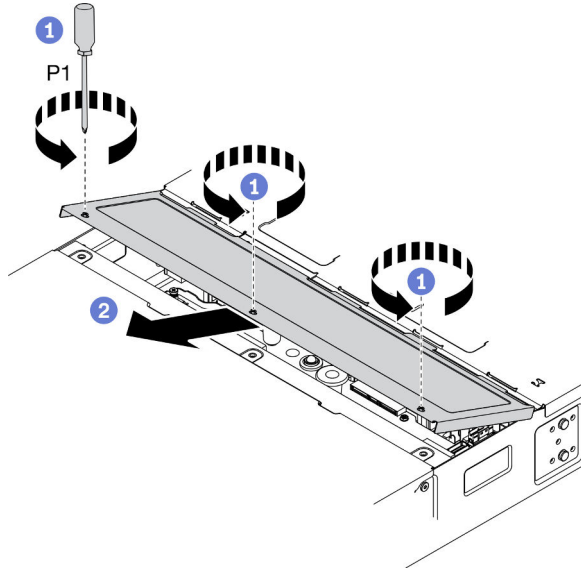


Figure 25. Enclosure cover removal

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install the enclosure cover

Use this information to install the enclosure cover.

About this task

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.

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Procedure

Step 1. Install the enclosure cover into the enclosure.

- 1 Insert the enclosure cover tabs into the slots on the enclosure; then, rotate the enclosure cover inwards.
- 2 Use Phillips #1 screwdriver to fasten the three captive screws on the enclosure cover.

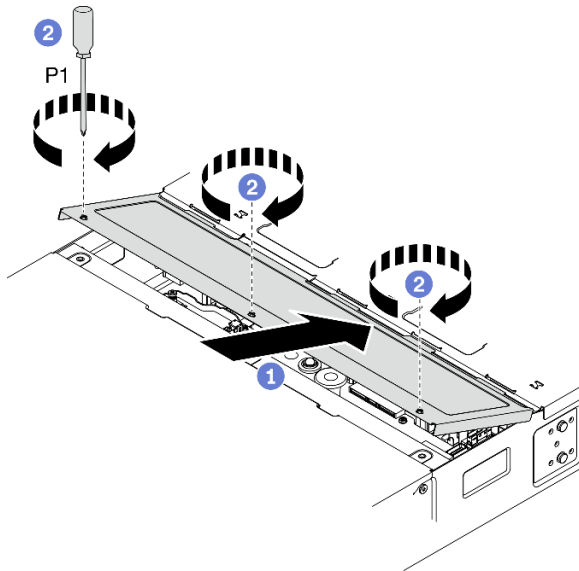


Figure 26. Enclosure cover installation

After you finish

1. Install the solution back to the rack if necessary.
2. Reconnect power cords and all external cables.
3. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Hot-swap fan replacement

Use the following procedures to remove and install a hot-swap fan.

Remove a hot-swap fan

Use this information to remove a hot-swap fan.

About this task

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

- **S017**



CAUTION:

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

- **S033**



CAUTION:

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

Attention:

- Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.
- Static electricity that is released to internal solution components when the solution is powered-on might cause the solution to halt, which might result in the loss of data. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding system when you work inside the solution with the power on.

Procedure

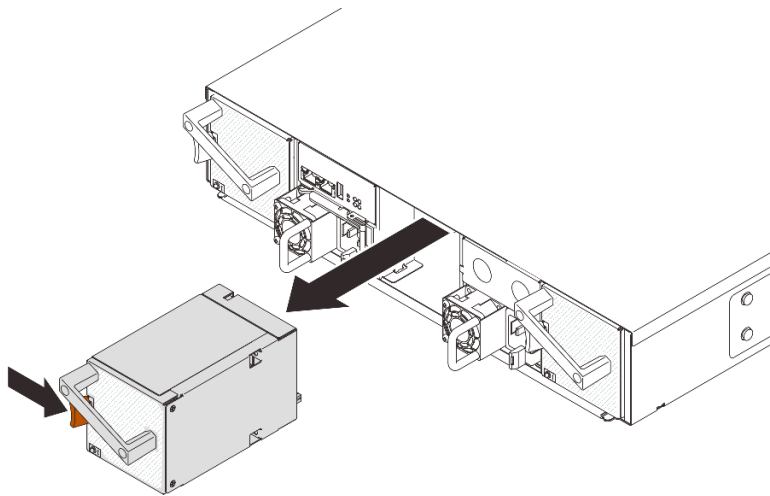


Figure 27. Hot-swap fan removal

Step 1. Press and hold the orange latch to release the fan from the socket.

Step 2. Grasp the fan and carefully pull it out of the enclosure.

Attention:

- When replacing a fan with power on, complete the replacement within 30 seconds to ensure proper operation
- To maintain proper system cooling, do not operate the DA240 Enclosure without a fan or fan filler installed in each socket.

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install a hot-swap fan

Use this information to install a hot-swap fan.

About this task

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

- **S017**



CAUTION:

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

- **S033**



CAUTION:

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

Attention:

- Read the “[Installation Guidelines](#)” on page 39 to ensure that you work safely.
- Static electricity that is released to internal solution components when the solution is powered-on might cause the solution to halt, which might result in the loss of data. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding system when you work inside the solution with the power on.

Procedure

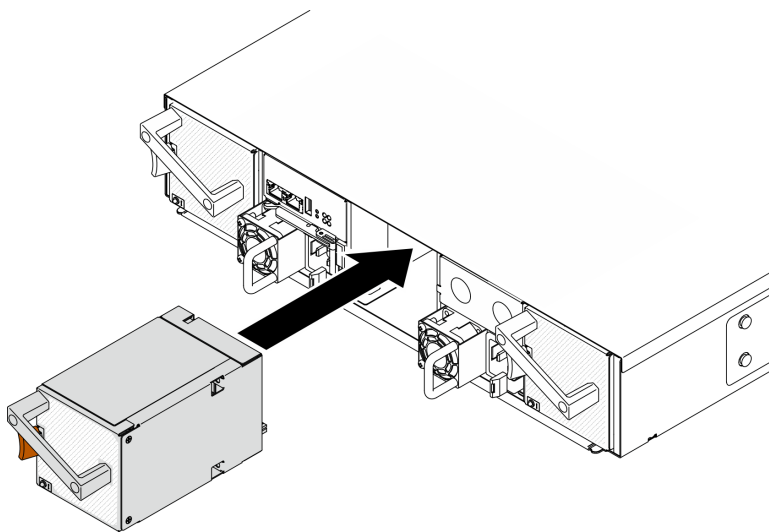


Figure 28. Hot-swap fan installation

- Step 1. Align the fan with the fan socket on the enclosure.
- Step 2. Press and hold the orange latch; then, slide the fan into the socket until it clicks into place.

Attention:

- When replacing a fan with power on, complete the replacement within 30 seconds to ensure proper operation.
- To maintain proper system cooling, do not operate the DA240 Enclosure without a fan or a fan filler panel installed in each socket.
- For the configuration with two system fans, make sure that a fan filler panel has been installed in **fan socket 2** before operating the DA240 Enclosure. For the location of the fan socket, refer to the rear view of “[Enclosure](#)” on page 24.

After you finish

For DA240 Enclosure, you can further monitor the system fan status in the **Cooling** section in the SMM2 WebGUI.

Demo video

[Watch the procedure on YouTube](#)

Hot-swap power supply replacement

Use the following procedures to remove and install a hot-swap power supply.

Remove a hot-swap power supply

Use this information to remove a power supply.

About this task

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

- S001



 **DANGER**

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- Connect all power cords to a properly wired and grounded electrical outlet/source.
- Connect any equipment that will be attached to this product to properly wired outlets/sources.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- The device might have more than one power cord, to remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

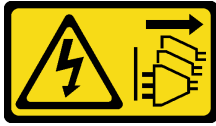
- S002



CAUTION:

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

- S019



CAUTION:

The power-control button on the device does not turn off the electrical current supplied to the device. The device also might have more than one connection to dc power. To remove all electrical current from the device, ensure that all connections to dc power are disconnected at the dc power input terminals.

- S035



CAUTION:

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

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Procedure

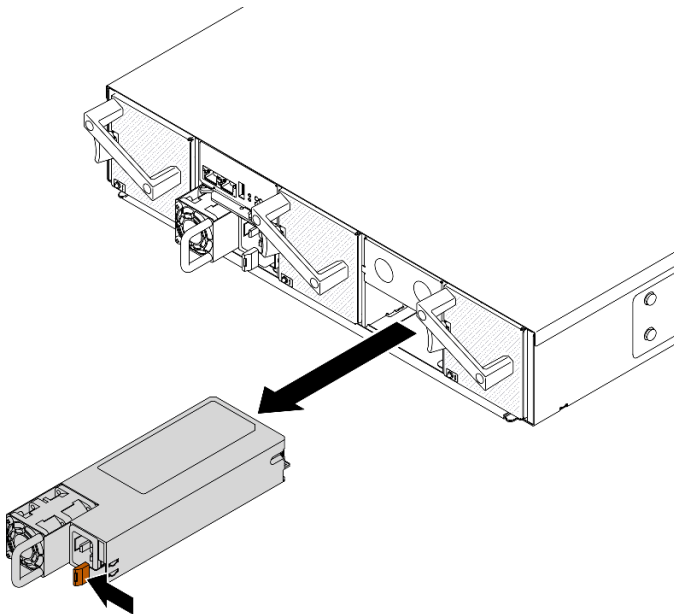


Figure 29. Hot-swap power supply removal

- Step 1. Disconnect the power cord from the connector on the back of the power supply.
- Step 2. Press and hold the orange release tab to the left.
- Step 3. Grasp the handle and pull the power supply out of the bay.

Attention:

- If only one hot-swap power supply is installed in the solution, you must turn off the solution before removing the power supply.
- A removed hot-swap power supply must be replaced within two minutes after removal.

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install a hot-swap power supply

Use this information to install a power supply.

About this task

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

- **S001**



Electrical current from power, telephone, and communication cables is hazardous.
To avoid a shock hazard:

- Connect all power cords to a properly wired and grounded electrical outlet/source.
- Connect any equipment that will be attached to this product to properly wired outlets/sources.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- The device might have more than one power cord, to remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

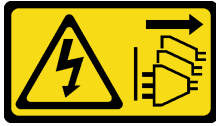
- **S002**



CAUTION:

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

- **S019**



CAUTION:

The power-control button on the device does not turn off the electrical current supplied to the device. The device also might have more than one connection to dc power. To remove all electrical current from the device, ensure that all connections to dc power are disconnected at the dc power input terminals.

- S035



CAUTION:

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

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Procedure

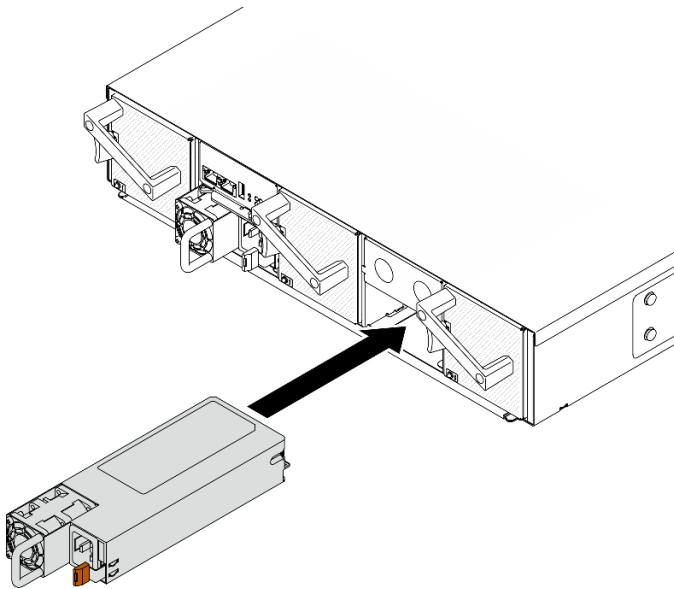


Figure 30. Hot-swap power supply installation

Step 1. Slide the hot-swap power supply into the bay until the release latch clicks into place.

Important: During normal operation, each power-supply bay must contain either a power supply or power-supply filler panel for proper cooling.

Step 2. Connect one end of the power cord to the AC connector on the back of the new power supply. Then, connect the other end of the power cord to a properly grounded electrical outlet.

After you finish

Make sure that the AC power LED on the power supply is lit, indicating that the power supply is operating correctly. If the compute node is turned on, make sure that the DC power LED on the power supply is lit as well.

Demo video

[Watch the procedure on YouTube](#)

Power distribution boards replacement

Use the following procedures to remove and install the upper and lower power distribution boards.

Remove the upper power distribution board

Use this information to remove the upper power distribution board.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

Step 1. Make preparations for this task.

- a. Turn off the solution and peripheral devices and disconnect the power cords and all external cables (see [“Power off the compute node” on page 11](#)).
- b. If the solution is installed in a rack, remove the solution from the rack (see [“Remove the server/solution from the rails” in *Rack Installation Guide*](#) [Remove the server/solution from the rails](#)).

CAUTION:

To avoid a drop hazard, slide the enclosure out of the rack slowly and steadily. Make sure to grip the enclosure with both hands when pulling it forward on the slide rails and lifting it out of the rack. Use safe practices when lifting.

- c. Remove the components listed below from the enclosure in the following order:
 - Compute node(s) (see [“Remove a compute node from the enclosure” on page 42](#)).
 - System Management Module 2 (see [“Remove the hot-swap SMM2” on page 74](#)).
 - Power supplies (see [“Remove a hot-swap power supply” on page 61](#)).
 - Enclosure cover (see [“Remove the enclosure cover” on page 55](#)).

Step 2. Disconnect the interconnect cables for power distribution boards and loosen the captive screws.

- a. ① Disconnect the two interconnect cables (bundled together as illustrated) from the upper power distribution board (see [“Power distribution boards and fan cables” on page 31](#)).
- b. ② Loosen the three captive screws on the upper power distribution board with a Phillips #1 screwdriver.

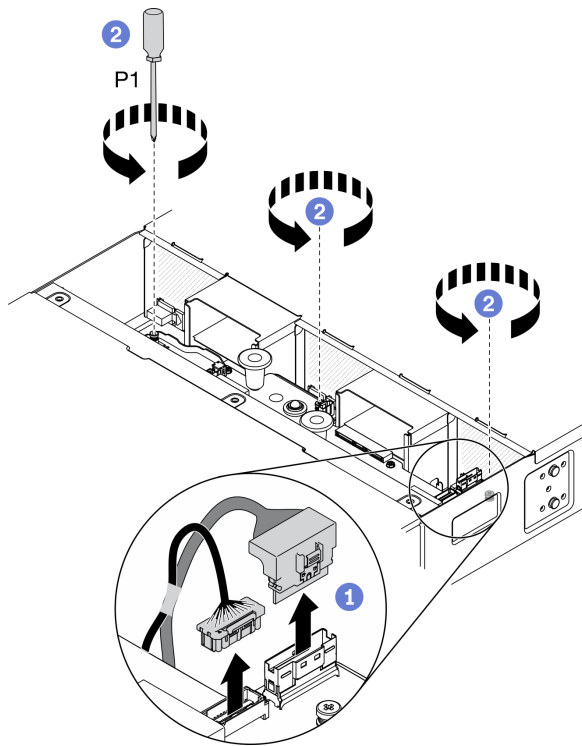


Figure 31. Disconnecting interconnect cables for power distribution boards and loosening captive screws

Step 3. Remove the upper power distribution board from the enclosure.

- a. 1 Hold the two blue knobs to slightly lift up the upper power distribution board.
- b. 2 Tilt the upper power distribution board at an angle as illustrated.
- c. 3 Lift the upper power distribution board out of the enclosure.

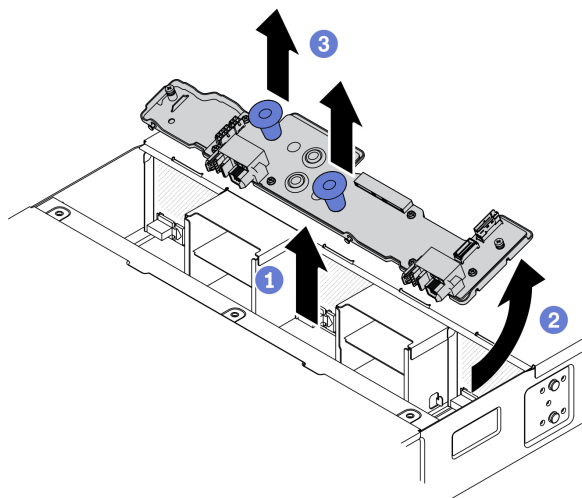


Figure 32. Upper power distribution board removal

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Remove the lower power distribution board

Use this information to remove the lower power distribution board.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

Step 1. Make preparations for this task.

- a. Turn off the solution and peripheral devices and disconnect the power cords and all external cables (see [“Power off the compute node” on page 11](#)).
- b. If the solution is installed in a rack, remove the solution from the rack (see [“Remove the server/solution from the rails” in *Rack Installation Guide*](#)).

CAUTION:

To avoid a drop hazard, slide the enclosure out of the rack slowly and steadily. Make sure to grip the enclosure with both hands when pulling it forward on the slide rails and lifting it out of the rack. Use safe practices when lifting.

- c. Remove the components listed below from the enclosure in the following order:
 - Compute node(s) (see [“Remove a compute node from the enclosure” on page 42](#)).
 - System Management Module 2 (see [“Remove the hot-swap SMM2” on page 74](#)).
 - Power supplies (see [“Remove a hot-swap power supply” on page 61](#)).
 - Enclosure cover (see [“Remove the enclosure cover” on page 55](#)).
 - Upper power distribution board (see [“Remove the upper power distribution board” on page 65](#)).
 - Enclosure air baffles (see [“Remove the enclosure air baffles” on page 52](#)).

Step 2. Disconnect the fan cables and the interconnect cables for power distribution boards (see [“Power distribution boards and fan cables” on page 31](#)).

- a. ❶ Disconnect the three fan cables from the lower power distribution board.
- b. ❷ Disconnect the two interconnect cables (bundled together as illustrated) from the lower power distribution board.

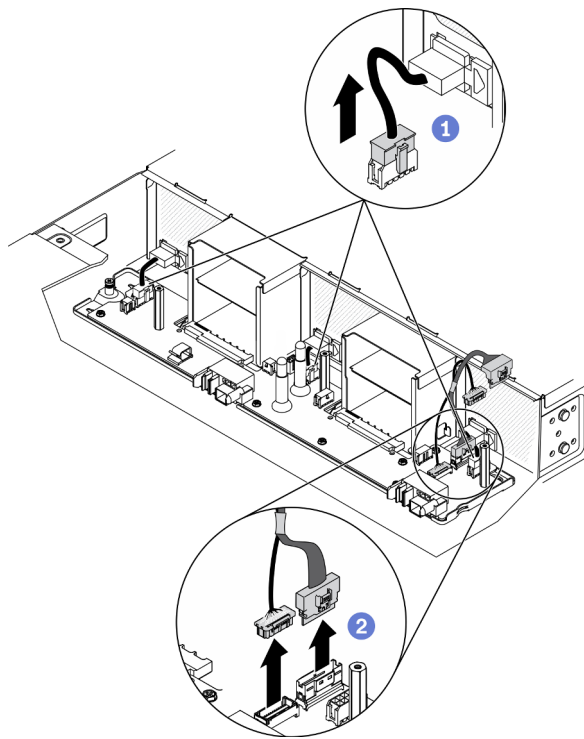


Figure 33. Disconnecting the fan cables and the interconnect cables for power distribution boards

Step 3. Loosen the captive screw and release the lower power distribution board from the T-head posts.

- a. ① Loosen the captive screw on the lower power distribution board with a Phillips #1 screwdriver.
- b. ② Grasp the two standoffs located in the middle and on the left side of the lower power distribution board and slide the board towards the left to disengage the three T-head posts from the keyholes on the board.

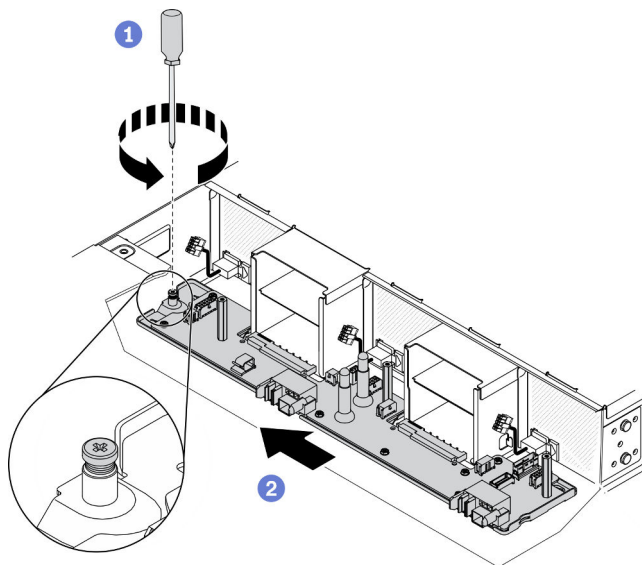


Figure 34. Loosening the captive screw and disengaging the T-head posts

- Step 4. Remove the lower power distribution board from the enclosure.
- 1 Slightly lift up the lower power distribution board and rotate the front of the board upwards to a vertical position.
 - 2 Lift the lower power distribution board out of the enclosure.

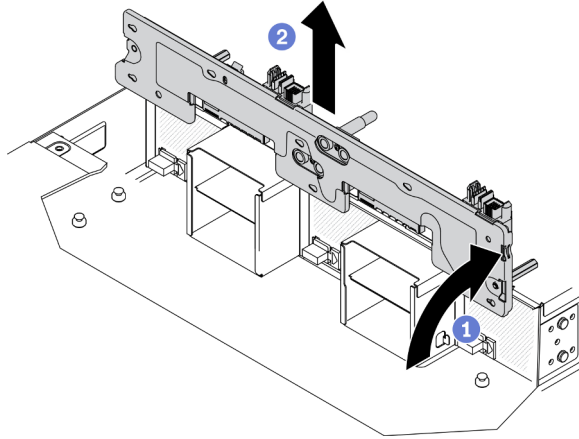


Figure 35. Lower power distribution board removal

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install the lower power distribution board

Use this information to install the lower power distribution board.

About this task

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Procedure

- Step 1. Place the lower power distribution board into the enclosure.
- 1 Hold the lower power distribution board by the two standoffs located in the middle and on the left side of the board. Lower the board into the enclosure in a vertical position as illustrated.
 - 2 Rotate the front of the lower power distribution board forwards to a horizontal position with the two power bus bars pointing up. Then, align the three T-head posts with the large opening of the keyholes on the board and gently place the board into the enclosure.

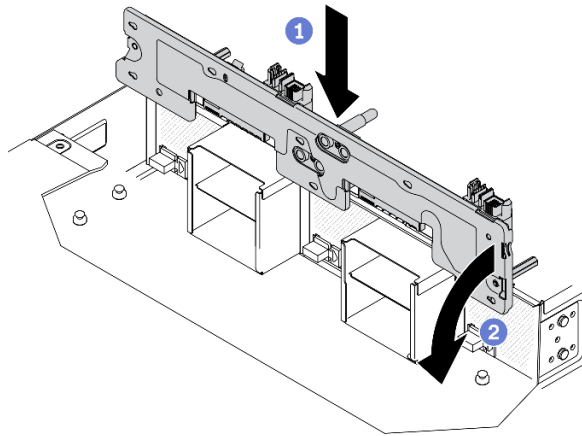


Figure 36. Placing the lower power distribution board into the enclosure

- Step 2. Secure the lower power distribution board to the enclosure.
- a. ① Slide the lower power distribution board towards the right until the three T-head posts are firmly seated in the keyholes.
 - b. ② Tighten the captive screw with a Phillips #1 screwdriver to secure the lower power distribution board to the enclosure.

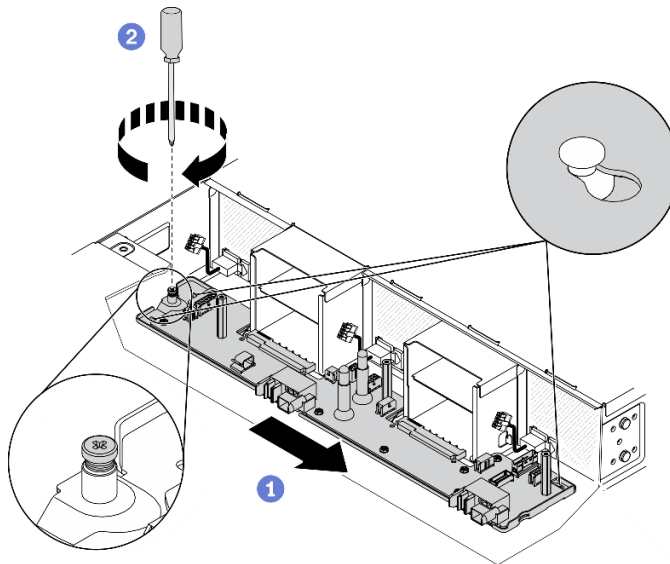


Figure 37. Securing the lower power distribution board

- Step 3. Connect the fan cables and the interconnect cables for power distribution boards (see [“Power distribution boards and fan cables”](#) on page 31).
- a. ① Connect the two interconnect cables (bundled together as illustrated) to the lower power distribution board.
 - b. ② Connect the three fan cables to the lower power distribution board.

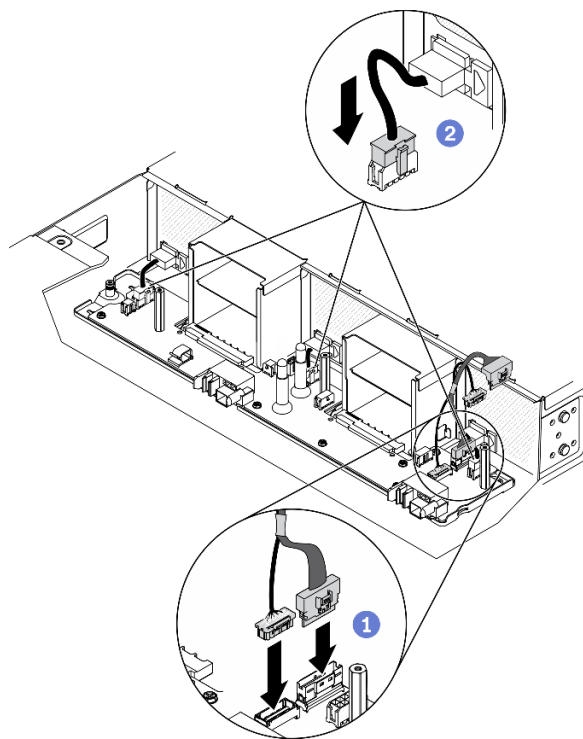


Figure 38. Connecting the fan cables and the interconnect cables for power distribution boards

After you finish

1. Reinstall the components listed below into the enclosure in the following order:
 - a. Enclosure air baffles (see [“Install the enclosure air baffles” on page 54](#)).
 - b. Upper power distribution board (see [“Install the upper power distribution board” on page 71](#)).
 - c. Enclosure cover (see [“Install the enclosure cover” on page 56](#)).
 - d. Compute node(s) (see [“Install a compute node in the enclosure” on page 46](#)).
 - e. System Management Module 2 (see [“Install the hot-swap SMM2” on page 74](#)).
 - f. Power supplies (see [“Install a hot-swap power supply” on page 63](#)).
2. Install the solution back to the rack if necessary.
3. Reconnect power cords and all external cables.
4. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Install the upper power distribution board

Use this information to install the upper power distribution board.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

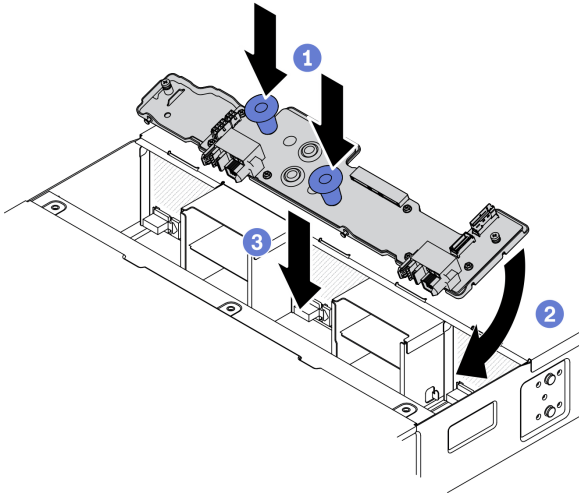


Figure 39. Upper power distribution board installation

Note: Before installing the upper power distribution board, make sure that the lower power distribution board and enclosure air baffles have been installed into the enclosure (see [“Install the lower power distribution board”](#) on page 69 and [“Install the enclosure air baffles”](#) on page 54).

Step 1. Install the upper power distribution board into the enclosure.

- a. ① Hold the two blue knobs to rotate the front of the upper power distribution board downward.
- b. ② Lower the upper power distribution board at an angle into the enclosure.
- c. ③ Align the two openings in the middle of the upper power distribution board with the two power bus bars on the lower power distribution board. Then, slide the board into place while rotating the rear of the board downward to a horizontal position.

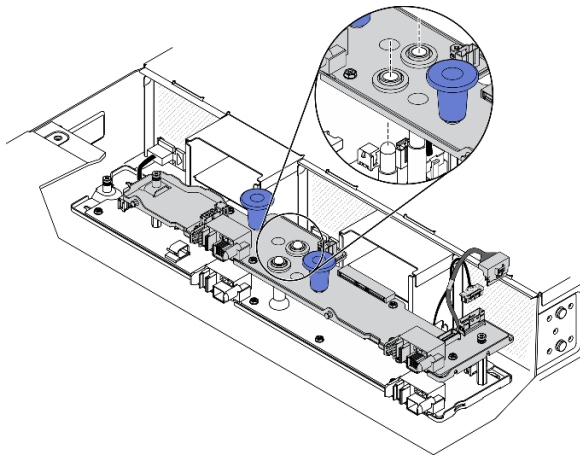


Figure 40. Upper power distribution board alignment in the enclosure

Step 2. Tighten the captive screws and connect the interconnect cables for power distribution boards.

- a. ① Tighten the three captive screws on the upper power distribution board with a Phillips #1 screwdriver.
- b. ② Connect the two interconnect cables (bundled together as illustrated) to the upper power distribution board (see [“Power distribution boards and fan cables”](#) on page 31).

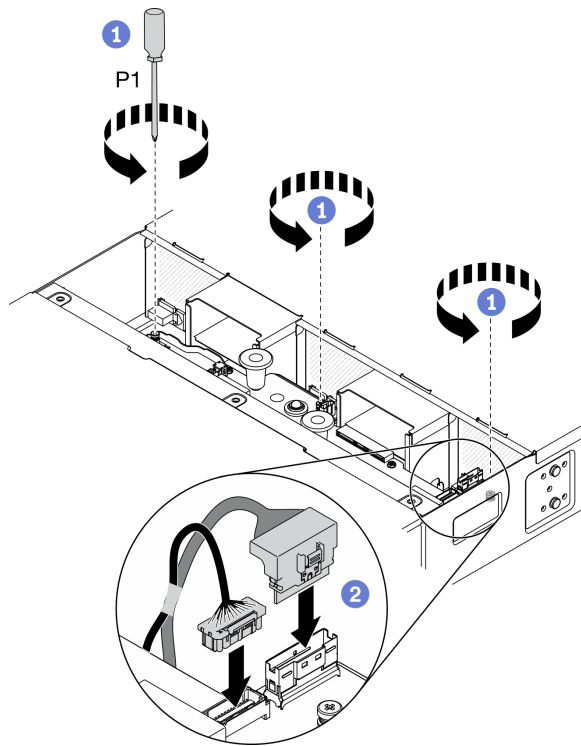


Figure 41. Connecting interconnect cables for power distribution boards

After you finish

1. Reinstall the components listed below into the enclosure in the following order:
 - a. Enclosure cover (see “Install the enclosure cover” on page 56).
 - b. Compute node(s) (see “Install a compute node in the enclosure” on page 46).
 - c. System Management Module 2 (see “Install the hot-swap SMM2” on page 74).
 - d. Power supplies (see “Install a hot-swap power supply” on page 63).
2. Install the solution back to the rack if necessary.
3. Reconnect power cords and all external cables.
4. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

System Management Module 2 (SMM2) and related components replacement

Use the following procedures to remove and install the System Management Module 2 (SMM2) and its related components.

Hot-swap System Management Module 2 (SMM2) replacement

Use the following procedures to remove and install the hot-swap System Management Module 2 (SMM2).

Remove the hot-swap SMM2

Use this information to remove the hot-swap System Management Module 2 (SMM2).

About this task

Attention: Read the “[Installation Guidelines](#)” on page 39 to ensure that you work safely.

Procedure

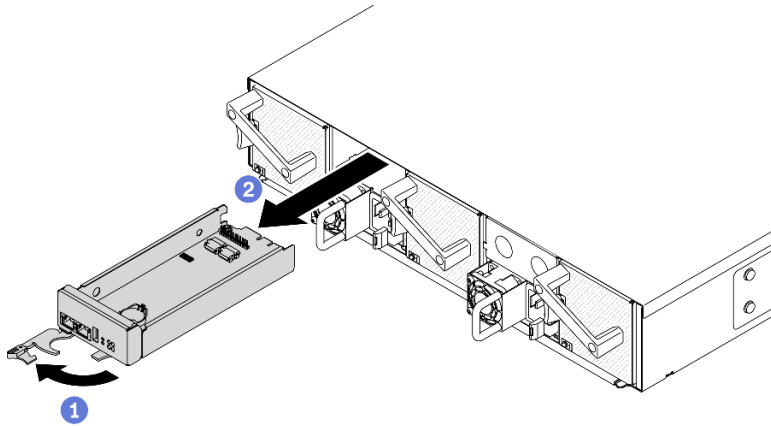


Figure 42. Hot-swap SMM2 removal

- Step 1. Remove the hot-swap SMM2 from the enclosure.
- 1 Release and rotate the front handle on the SMM2 as shown in the illustration.
 - 2 Slide the SMM2 out of the enclosure.

Attention:

- The system fans will ramp up to full speed after the SMM2 has been removed from the enclosure.
- Replace the SMM2 as soon as possible after removal to ensure proper operation of the system.

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install the hot-swap SMM2

Use this information to install the hot-swap System Management Module 2 (SMM2).

About this task

Attention: Read the “[Installation Guidelines](#)” on page 39 to ensure that you work safely.

Procedure

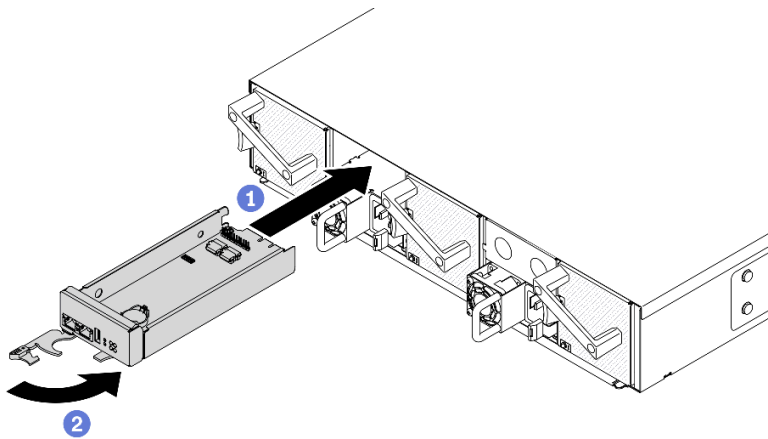


Figure 43. Hot-swap SMM2 installation

Step 1. Install the hot-swap SMM2 in the enclosure.

- a. ① Make sure that the front handle on the SMM2 is in the fully open position. Then, slide the SMM2 into the enclosure until it stops.
- b. ② Rotate the front handle to the fully closed position until the handle latch clicks into place.

After you finish

1. When the status LED on the SMM2 goes from fast blinking to slow blinking, it indicates the SMM2 is ready. Meanwhile, if the status LED is off or continuously lit, it indicates the SMM2 has encountered one or more problems.
2. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

USB flash drive replacement for SMM2 data backup and restore

Use this information to remove and install the USB flash drive from and to the SMM2 for data backup and restore.

About this task

Attention: Read the “[Installation Guidelines](#)” on page 39 to ensure that you work safely.

Procedure

Step 1. Align the USB flash drive with the connector on the SMM2 and push it in until it is firmly connected.

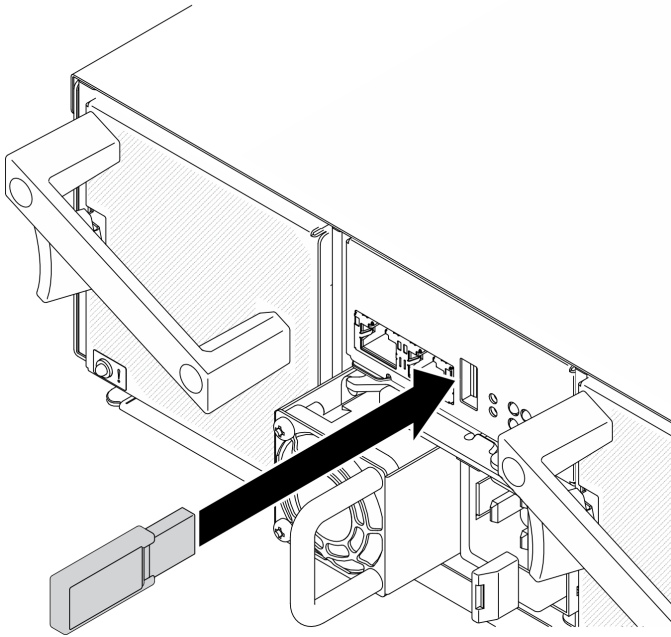


Figure 44. USB flash drive installation

- Step 2. Complete the following steps to perform backup of SMM2 settings, enclosure VPD and PDB (power distribution boards) VPD.
- a. Update the solution firmware to the latest level.
 - b. Log in to SMM2 web interface.
 - c. Go to the **Configuration** section, select **Backup and Restore Configuration**, and perform SMM2 settings backup via **Backup Configuration to Storage Device**.
- Note:** Alternatively, you can choose to back up SMM2 settings via **Backup Configuration from Network**.
- d. Go to the **System Information** section, select **Enclosure VPD** or **PDB VPD**, and perform data backup respectively.
- Step 3. After data backup is completed, pull the USB flash drive out of the connector to remove it from the SMM2.

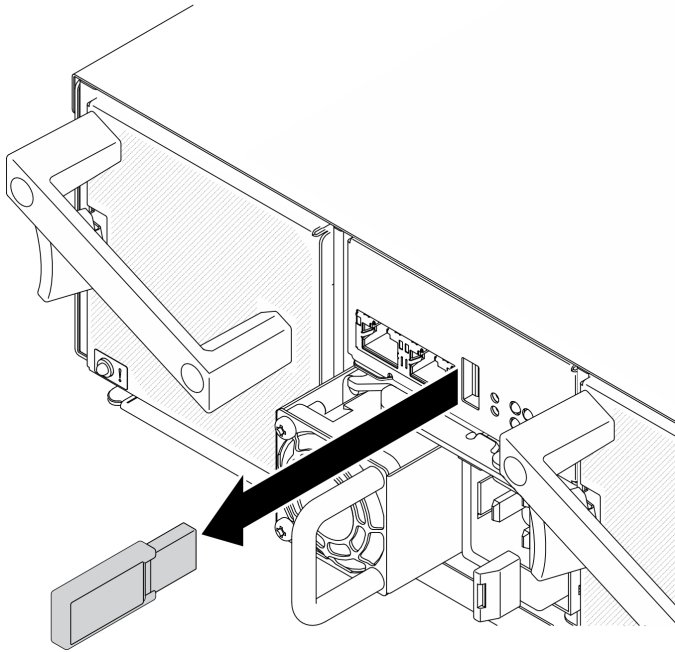


Figure 45. USB flash drive removal

- Step 4. Remove the SMM2 from the enclosure (see “[Remove the hot-swap SMM2](#)” on page 74).
- Step 5. Install the new SMM2 (see “[Install the hot-swap SMM2](#)” on page 74).
- Step 6. Keep the USB flash drive and install it to the new SMM2 (see Step 1).
- Step 7. Log in to the SMM2 web interface and perform data restore of SMM2 settings, enclosure VPD and PDB VPD.

Note: If SMM2 settings are backed up via the network, restore and apply the configurations via **Restore from Network Backup Configuration** in **Backup and Restore Configuration**.

After you finish

For more detailed information, see “Backup and Restore Configuration” in *System Management Module 2 User Guide* at https://thinksystem.lenovofiles.com/help/topic/mgt_tools_smm2/c_smm_recovery.html.

System Management Module 2 (SMM2) battery replacement

Use the following procedures to remove and install the CMOS battery (CR2032) for System Management Module 2 (SMM2).

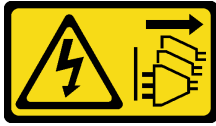
Remove the CMOS battery (CR2032) from the SMM2

Use this information to remove the CMOS battery (CR2032) from the System Management Module 2 (SMM2).

About this task

To avoid potential danger, read and follow the following safety statements.

- **S002**



CAUTION:

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

- **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.

- **S005**



CAUTION:

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

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Make sure to read the following notes carefully before replacing the CMOS battery in the System Management Module 2 (SMM2).

- Do not make CMOS battery in contact with any metal surface during the replacement. Any contact with a metal surface, such as the compute node and enclosure side, can cause damages to the battery.
- When replacing the battery, you must replace it with another CMOS battery of the exact same type (CR2032) made by the same manufacturer.
- After you replace the battery, you must reconfigure the solution and reset the system date and time.
- Dispose of the battery as required by local ordinances or regulations.

Procedure

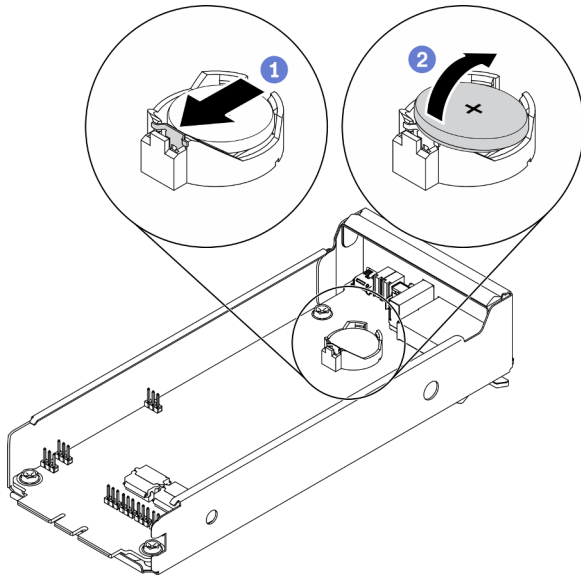


Figure 46. SMM2 battery removal

- Step 1. Remove the SMM2 from the enclosure (see [“Remove the hot-swap SMM2”](#) on page 74).
- Step 2. Remove the CMOS battery from the SMM2.
- a. ① Gently press the battery retaining clip with your fingernail. The battery should pop up when it is released.
 - b. ② Use your thumb and index finger to lift the battery out of the socket.
- Attention:** Do not lift the battery with excessive force, as it may cause damages to the socket on the SMM2. Any damage to the socket may require replacing the SMM2.
- Step 3. Dispose of the CMOS battery as required by local ordinances or regulations.

After you finish

If you are instructed to return the component or optional device, follow all of the 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) into the SMM2

Use this information to install the CMOS battery (CR2032) into the System Management Module 2 (SMM2).

About this task

To avoid potential danger, read and follow the following safety statements.

- **S002**



CAUTION:

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

- **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.

- **S005**



CAUTION:

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

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Make sure to read the following notes carefully before replacing the CMOS battery in the System Management Module 2 (SMM2).

- Do not make CMOS battery in contact with any metal surface during the replacement. Any contact with a metal surface, such as the compute node and enclosure side, can cause damages to the battery.
- When replacing the battery, you must replace it with another CMOS battery of the exact same type (CR2032) made by the same manufacturer.
- After you replace the battery, you must reconfigure the solution and reset the system date and time.
- Dispose of the battery as required by local ordinances or regulations.

Procedure

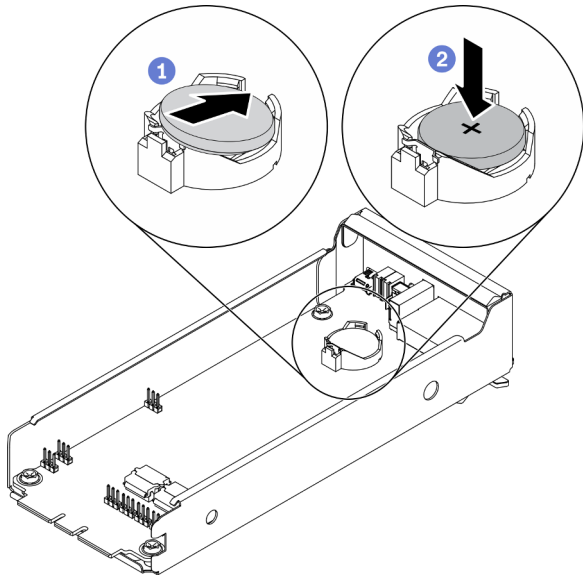


Figure 47. SMM2 battery installation

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

Step 2. Insert the new CMOS battery into the SMM2.

- a. ① Orient the battery so that the positive (+) side faces up and tilt the battery to insert it into the socket.
- b. ② Press the battery down into the socket until it clicks into place. Make sure that the battery clip holds the battery securely.

After you finish

1. Reinstall the SMM2 (see [“Install the hot-swap SMM2” on page 74](#)).
2. Connect all cables to the SMM2.
3. Start the Setup Utility and reset the configuration.
4. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Replace components in the compute node

Use the following information to remove and install components from and into the compute node.

CMOS battery (CR2032) replacement

Use the following procedures to remove and install the CMOS battery (CR2032).

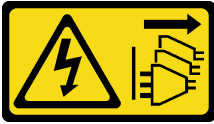
Remove the CMOS battery (CR2032)

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

About this task

To avoid potential danger, read and follow the following safety statements.

- **S002**



CAUTION:

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

- **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.

- **S005**



CAUTION:

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

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Make sure to read the following notes carefully before replacing the CMOS battery in the compute node.

- Do not make CMOS battery in contact with any metal surface during the replacement. Any contact with a metal surface, such as the compute node and enclosure side, can cause damages to the battery.
- When replacing the battery, you must replace it with another CMOS battery of the exact same type (CR2032) made by the same manufacturer.
- After you replace the battery, you must reconfigure the solution and reset the system date and time.
- Dispose of the battery as required by local ordinances or regulations.

Procedure

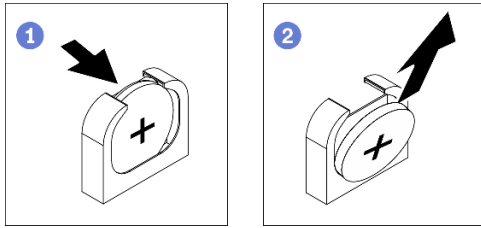


Figure 48. CMOS battery removal

Step 1. Make preparations for this task.

- a. Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure”](#) on page 42).
- b. Remove the node front cover from the compute node (see [“Remove the node front cover”](#) on page 117).

Step 2. Remove the CMOS battery from the compute node.

- a. ① Gently push on one side of the battery until it leaves the socket.
- b. ② Use your thumb and index finger to lift the battery out of the socket.

Attention: Do not lift the battery with excessive force, as it may cause damages to the socket on the system board. Any damage to the socket may require replacing the system board.

Step 3. Dispose of the CMOS battery as required by local ordinances or regulations.

After you finish

If you are instructed to return the component or optional device, follow all of the 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).

About this task

To avoid potential danger, read and follow the following safety statements.

- S002



CAUTION:

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

- **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.

- **S005**



CAUTION:

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

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Make sure to read the following notes carefully before replacing the CMOS battery in the compute node.

- Do not make CMOS battery in contact with any metal surface during the replacement. Any contact with a metal surface, such as the compute node and enclosure side, can cause damages to the battery.
- When replacing the battery, you must replace it with another CMOS battery of the exact same type (CR2032) made by the same manufacturer.
- After you replace the battery, you must reconfigure the solution and reset the system date and time.
- Dispose of the battery as required by local ordinances or regulations.

Procedure

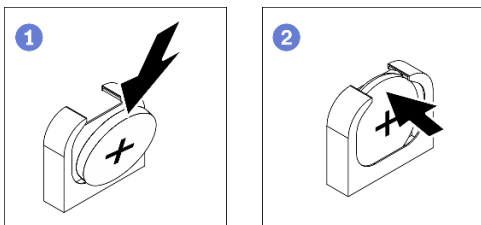


Figure 49. CMOS battery installation

- Step 1. Follow any special handling and installation instructions that come with the CMOS battery.
- Step 2. Install the new CMOS battery into the compute node.
 - a. ① Orient the battery so that the positive (+) side faces up.
 - b. ② Tilt the battery to insert it into the socket. Make sure that the battery clip holds the battery securely.

After you finish

1. Reinstall the node front cover into the compute node (see [“Install the node front cover” on page 119](#)).
2. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure” on page 46](#)).
3. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Drive replacement

Use the following procedures to remove and install a drive.

Remove a hot-swap solid-state drive

Use this information to remove a hot-swap solid-state drive. This section applies to 7mm 2.5-inch SATA/NVMe and 15mm 2.5-inch NVMe solid-state drives.

About this task

Attention:

- Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.
- To make sure that there is adequate system cooling, do not operate the solution for more than two minutes without either a drive or a filler installed in each bay.
- Before you remove or make changes to drives, drive controllers (including controllers that are integrated on the system board), drive backplanes or drive cables, back up all important data that is stored on drives.

Procedure

- Step 1. Make sure that you have saved the data on your drive before removing it from the compute node.
- Step 2. Based on your configuration, follow the corresponding procedures to remove a 7mm 2.5-inch SATA/NVMe or 15mm 2.5-inch NVMe solid-state drive.

Remove a 7mm 2.5-inch SATA/NVMe solid-state drive:

- a. ① Slide the latch to unlock the drive handle.
- b. ② Grasp the handle and slide the drive out of the drive bay.

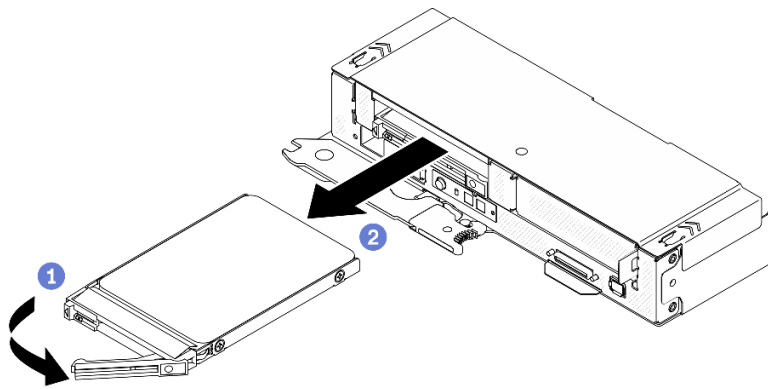


Figure 50. 7mm solid-state drive removal

Remove a 15mm 2.5-inch NVMe solid-state drive:

- a. 1 Slide the latch to unlock the drive handle.
- b. 2 Grasp the handle and slide the drive out of the drive bay.

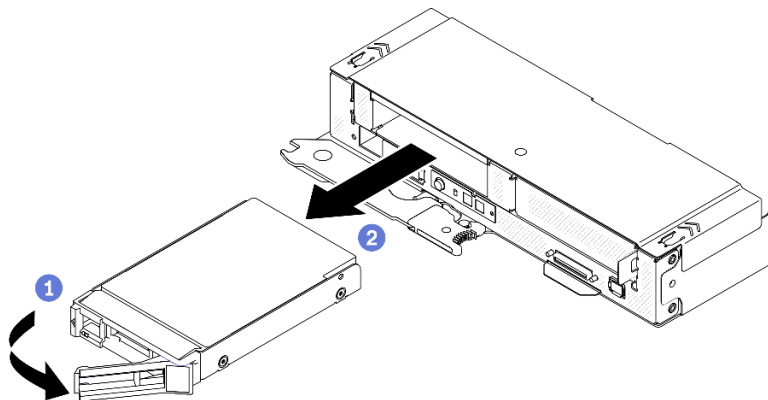


Figure 51. 15mm solid-state drive removal

After you finish

1. Install a drive filler or a replacement unit (see [“Install a hot-swap solid-state drive” on page 87](#)) as soon as possible.

Important: During normal operation, the drive bay must contain either a drive or a drive filler for proper cooling.

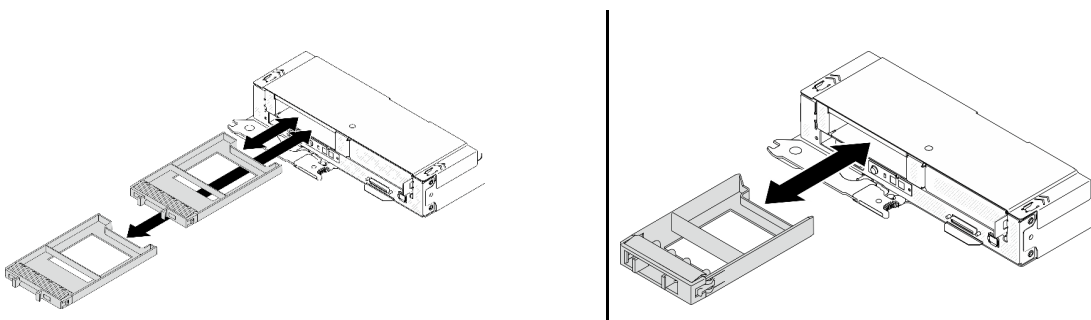


Figure 52. 7mm / 15mm solid-state drive fillers installation

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

Demo video

[Watch the procedure on YouTube](#)

Install a hot-swap solid-state drive

Use this information to install a hot-swap solid-state drive. This section applies to 7mm 2.5-inch SATA/NVMe and 15mm 2.5-inch NVMe solid-state drives.

About this task

Attention:

- Read the “[Installation Guidelines](#)” on page 39 to ensure that you work safely.
- Touch the static-protective package that contains the drive to any unpainted metal surface on the solution; then, remove the drive from the package and place it on a static-protective surface.

The following notes describe the type of drives that the compute node supports and other information that you must consider when you install a drive. For a list of supported drives, see <https://serverproven.lenovo.com/>.

- Locate the documentation that comes with the drive and follow those instructions in addition to the instructions in this chapter.
- You can install up to two 7mm 2.5-inch SATA/NVMe solid-state drives or one 15mm 2.5-inch NVMe solid-state drive into each drive cage.
- The electromagnetic interference (EMI) integrity and cooling of the solution are protected by having all bays and PCI and PCIe slots covered or occupied. When you install a drive, PCI, or PCIe adapter, save the EMC shield and filler panel from the bay or PCI or PCIe adapter slot cover in the event that you later remove the device.
- For a complete list of supported optional devices for the node, see <https://serverproven.lenovo.com/>.

Procedure

Step 1. If a drive filler has been installed in the drive bay, remove it.

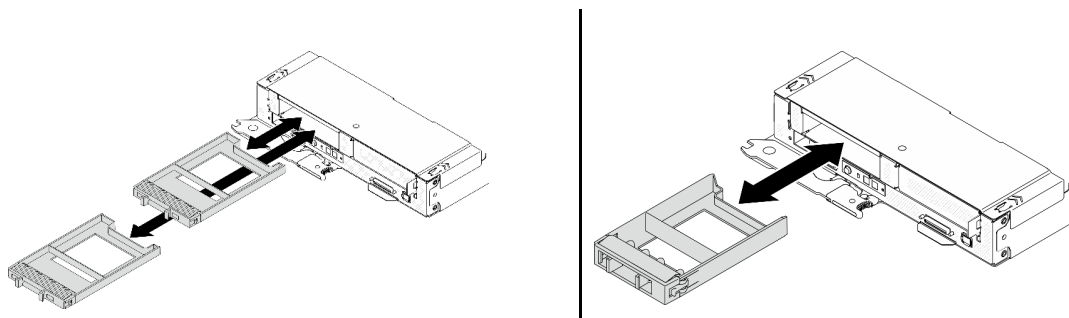


Figure 53. 7mm / 15mm solid-state drive fillers removal

Step 2. Based on your configuration, follow the corresponding procedures to install a 7mm 2.5-inch SATA/NVMe or 15mm 2.5-inch NVMe solid-state drive.

Install a 7mm 2.5-inch SATA/NVMe solid-state drive:

- a. ① Make sure that the drive handle is in the open position. Then, align the drive with the guide rails in the bay and gently push the drive into the bay until the drive stops.
- b. ② Rotate the drive handle to the fully closed position until the handle latch clicks.

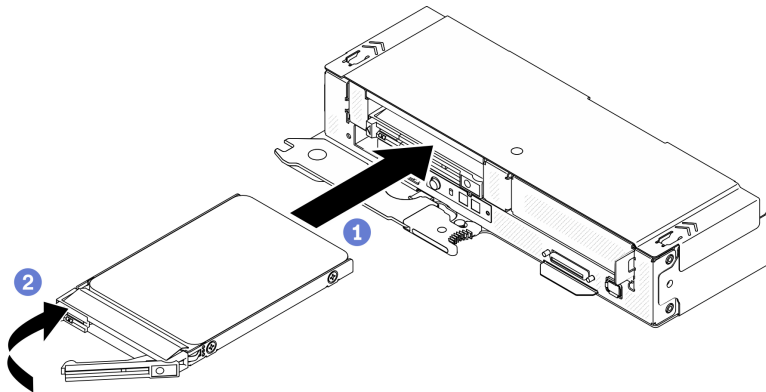


Figure 54. 7mm solid-state drive installation

Install a 15mm 2.5-inch NVMe solid-state drive:

- a. ① Make sure that the drive handle is in the open position. Then, align the drive with the guide rails in the bay and gently push the drive into the bay until the drive stops.
- b. ② Rotate the drive handle to the fully closed position until the handle latch clicks.

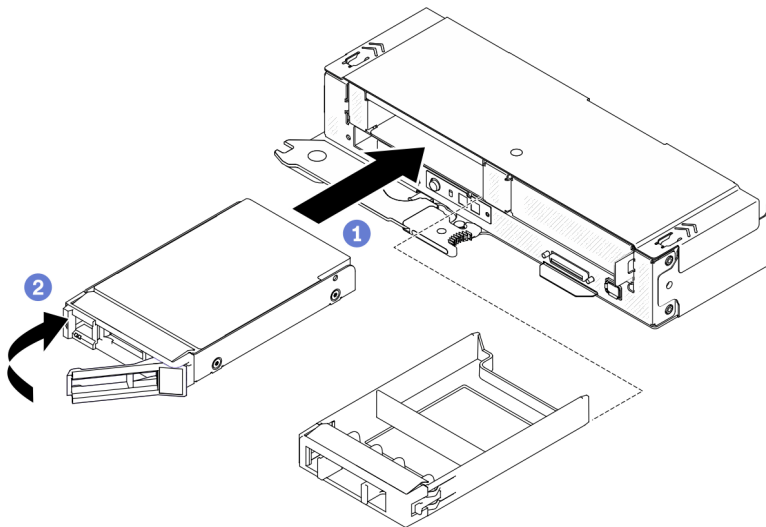


Figure 55. 15mm solid-state drive installation

After you finish

1. Check the drive status LED to verify that the drive is operating correctly. If the yellow drive status LED of a drive is lit continuously, that drive is faulty and must be replaced. If the green drive activity LED is flashing, the drive is being accessed.
2. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Drive backplane replacement

Use the following procedures to remove and install a drive backplane.

Remove a drive backplane

Use this information to remove a drive backplane.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

Step 1. Make preparations for this task.

- a. Turn off the corresponding compute node on which you are going to perform the task.
- b. Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure” on page 42](#)).
- c. Remove the components listed below from the compute node in the following order:

Attention: To avoid damaging the system board, make sure to follow the instructions in [“Internal cable routing” on page 29](#) when disconnecting cables from the system board.

- Node front cover (see [“Remove the node front cover” on page 117](#)).
- All of the drives and fillers (if any) previously installed and place the drives on the static protective surface (see [“Remove a hot-swap solid-state drive” on page 85](#)).
- The cable connecting the system board and 7mm or 15mm drive backplanes (see [“7mm 2.5-inch SATA/NVMe drive backplane cable” on page 30](#) or [“15mm 2.5-inch NVMe drive backplane cable” on page 31](#)).
- Drive cage assembly (see [“Remove the drive cage assembly” on page 93](#)).

Step 2. Based on your configuration, follow the corresponding procedures to remove two 7mm 2.5-inch SATA/NVMe or one 15mm 2.5-inch NVMe solid-state drive backplane from the drive cage.

Remove two backplanes for the configuration with two 7mm 2.5-inch SATA/NVMe solid-state drives:

- a. Remove the upper backplane: **1** Remove the three screws from the upper backplane. **2** Slightly tilt and disengage the backplane; then, pull it out of the drive cage at an angle (approximately 30 degrees).

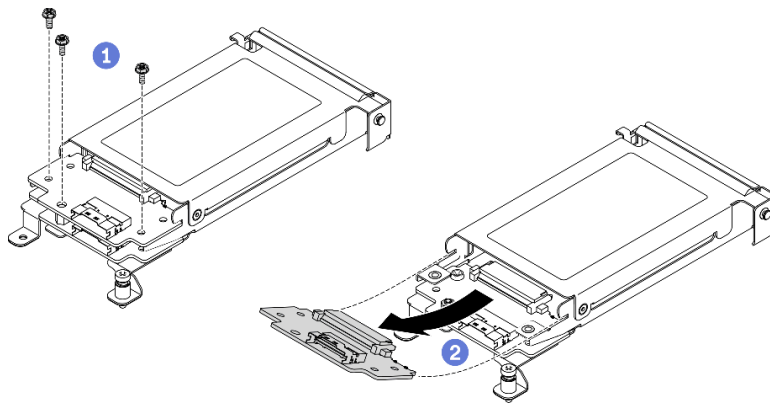


Figure 56. 7mm drive upper backplane removal

- b. Remove the lower backplane: ① Remove the two screws and one standoff from the lower backplane. ② Slightly tilt and disengage the backplane; then, pull it out of the drive cage at an angle (approximately 20 degrees).

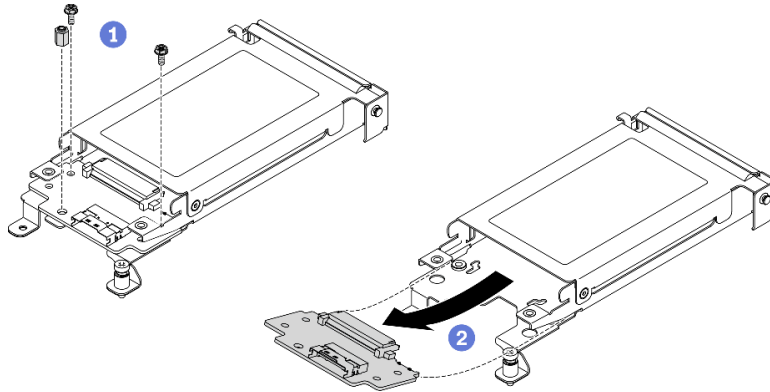


Figure 57. 7mm drive lower backplane removal

Remove one backplane for the configuration with a 15mm 2.5-inch NVMe solid-state drive:

- a. ① Remove the three screws from the backplane.
- b. ② Disengage the backplane and pull it out of the drive cage.

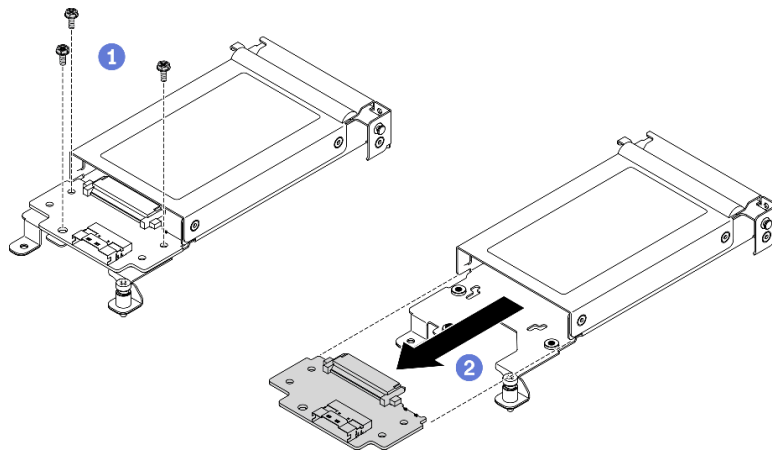


Figure 58. 15mm drive backplane removal

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install a drive backplane

Use this information to install a drive backplane.

About this task

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Procedure

Step 1. Based on your configuration, follow the corresponding procedures to install two 7mm 2.5-inch SATA/NVMe or one 15mm 2.5-inch NVMe solid-state drive backplane into the drive cage.

Install two backplanes for the configuration with two 7mm 2.5-inch SATA/NVMe solid-state drives:

- a. Install the lower backplane: **1** Align the lower backplane with the lower backplane slot in the drive cage. Then, insert the backplane at an angle (approximately 20 degrees) into the slot until it is fully seated. **2** Fasten the two screws and one standoff to secure the lower backplane.

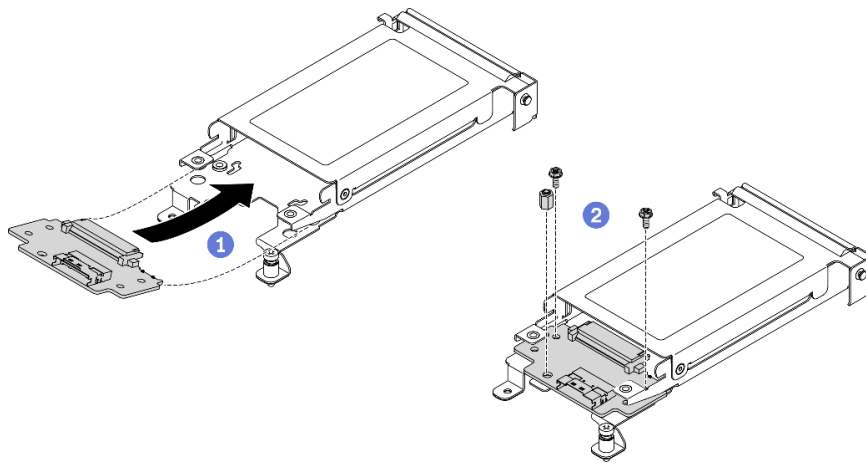


Figure 59. 7mm drive lower backplane installation

- b. Install the upper backplane: ① Align the upper backplane with the upper backplane slot in the drive cage. Then, insert the backplane at an angle (approximately 30 degrees) into the slot until it is fully seated. ② Fasten the three screws to secure the upper backplane.

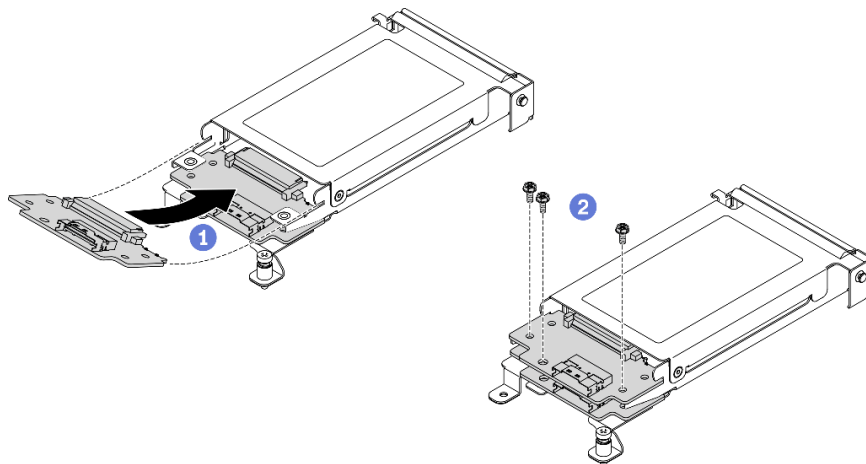


Figure 60. 7mm drive upper backplane installation

Install one backplane for the configuration with a 15mm 2.5-inch NVMe solid-state drive:

- a. ① Align the backplane with the backplane slots in the drive cage. Then, press the backplane into the slots until it is fully seated.
- b. ② Fasten the three screws to secure the backplane.

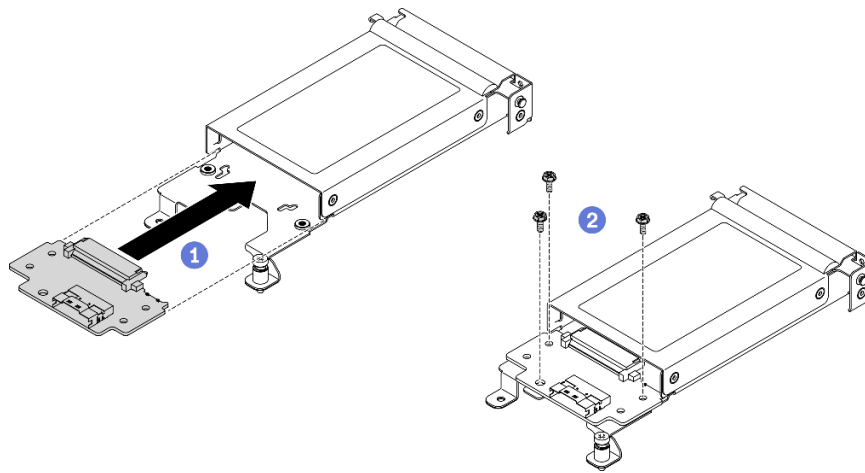


Figure 61. 15mm drive backplane installation

Note: All of the 7mm and 15mm 2.5-inch drive backplanes share the same connector on the system board.

After you finish

1. Reconnect the power cable to the system board and the signal cables to the drive backplane(s).
2. Reinstall the components listed below into the compute node in the following order:
 - a. Drive cage assembly (see [“Install the drive cage assembly” on page 95](#)).
 - b. The cable connecting the system board and 7mm or 15mm drive backplanes (see [“7mm 2.5-inch SATA/NVMe drive backplane cable” on page 30](#) or [“15mm 2.5-inch NVMe drive backplane cable” on page 31](#)).
 - c. Drive(s) (see [“Install a hot-swap solid-state drive” on page 87](#)).
 - d. Node front cover (see [“Install the node front cover” on page 119](#)).
3. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure” on page 46](#)).
4. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Drive cage assembly replacement

Use the following procedures to remove and install the drive cage assembly.

Remove the drive cage assembly

Use this information to remove the drive cage assembly.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

Step 1. Make preparations for this task.

- a. Turn off the corresponding compute node on which you are going to perform the task.
- b. Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure” on page 42](#)).
- c. Remove the components listed below from the compute node in the following order:
 - Node front cover (see [“Remove the node front cover” on page 117](#)).
 - All of the drives and fillers (if any) previously installed and place them on the static protective surface (see [“Remove a hot-swap solid-state drive” on page 85](#)).

Step 2. Based on your existing configuration, follow the corresponding procedures to remove a 7mm or 15mm drive cage assembly.

Remove a 7mm drive cage assembly:

- a. Disconnect the cable connecting the system board and drive backplanes (see [“7mm 2.5-inch SATA/NVMe drive backplane cable” on page 30](#)).

Attention: To avoid damaging the system board, make sure to follow the instructions in [“Internal cable routing” on page 29](#) when disconnecting cables from the system board.

- b. Remove the screw on the left and loosen the captive screw on the right as illustrated.
- c. Lift the drive cage assembly out of the compute node tray.

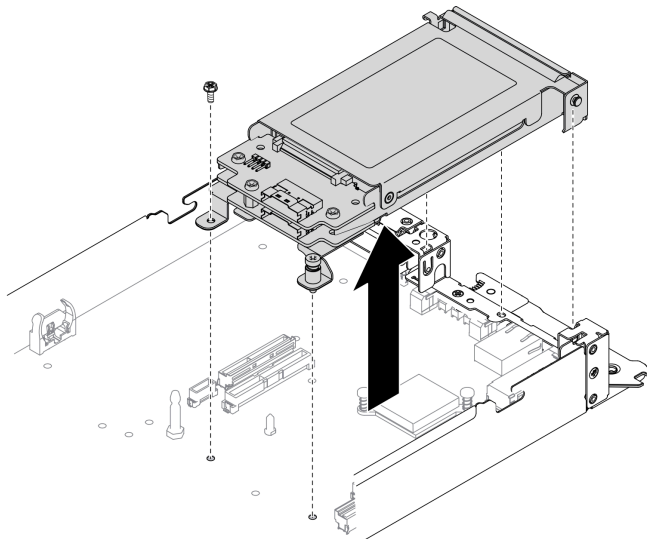


Figure 62. 7mm drive cage assembly removal

Remove a 15mm drive cage assembly:

- a. Disconnect the cable connecting the system board and drive backplane (see [“15mm 2.5-inch NVMe drive backplane cable” on page 31](#)).

Attention: To avoid damaging the system board, make sure to follow the instructions in [“Internal cable routing” on page 29](#) when disconnecting cables from the system board.

- b. Remove the screw on the left and loosen the captive screw on the right as illustrated.
- c. Lift the drive cage assembly out of the compute node tray.

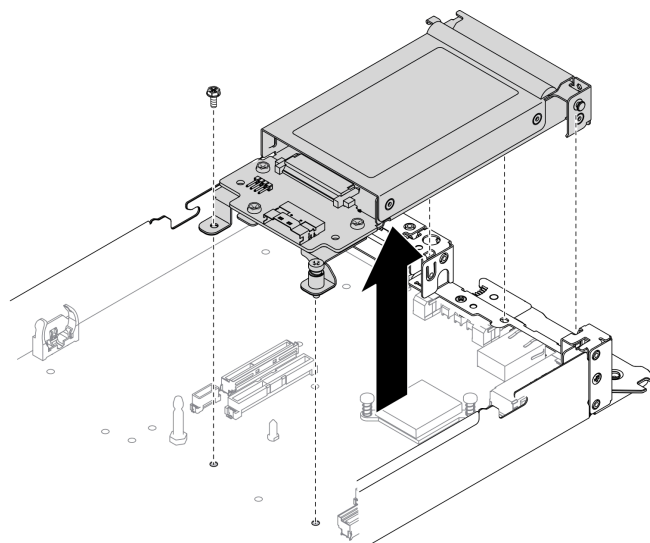


Figure 63. 15mm drive cage assembly removal

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install the drive cage assembly

Use this information to install the drive cage assembly.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

- Step 1. Install the SATA or NVMe spacer into the compute node tray based on the type of drive(s) you will install into the drive cage assembly (see “Replace SATA and NVMe spacers” in *ThinkSystem DA240 Enclosure Type 7D1J and ThinkSystem SD630 V2 Compute Node Type 7D1K Setup Guide*).
- Step 2. Follow the corresponding procedures to install a 7mm or 15mm drive cage assembly.

Install a 7mm drive cage assembly:

- a. Align the hook and guide pin on the rear end of the drive cage assembly with the notches on the SATA/NVMe spacer and on the compute node tray as illustrated. Then, lower the drive cage assembly into the tray until the hook and guide pin are secured in place.

Important: During normal operation, the drive bay must contain either a drive cage assembly or drive bay filler for proper cooling.

- b. Fasten the screw on the left and tighten the captive screw on the right to secure the drive cage assembly to the compute node tray.

- c. Reconnect the cable connecting the system board and drive backplanes (see [“7mm 2.5-inch SATA/NVMe drive backplane cable”](#) on page 30).

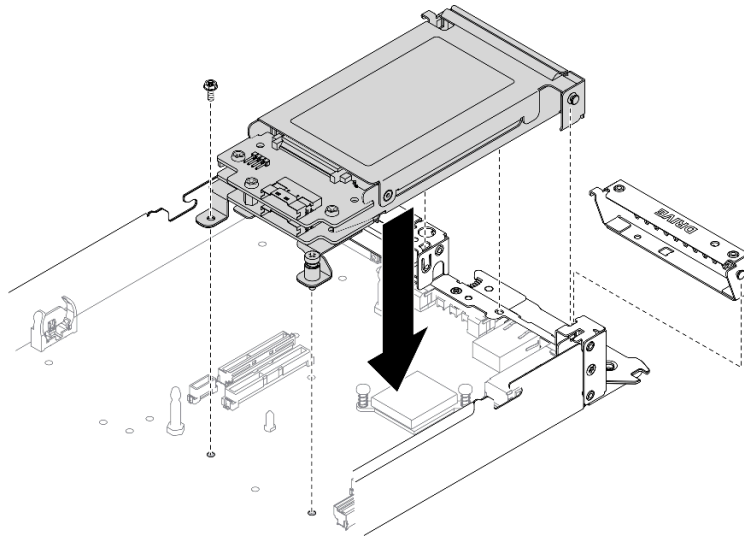


Figure 64. 7mm drive cage assembly installation

Install a 15mm drive cage assembly:

- a. Align the hook and guide pin on the rear end of the drive cage assembly with the notches on the NVMe spacer and on the compute node tray as illustrated. Then, lower the drive cage assembly into the tray until the hook and guide pin are secured in place.

Important: During normal operation, the drive bay must contain either a drive cage assembly or drive cage filler panel for proper cooling.

- b. Fasten the screw on the left and tighten the captive screw on the right to secure the drive cage assembly to the compute node tray.
- c. Reconnect the cable connecting the system board and drive backplane (see [“15mm 2.5-inch NVMe drive backplane cable”](#) on page 31).

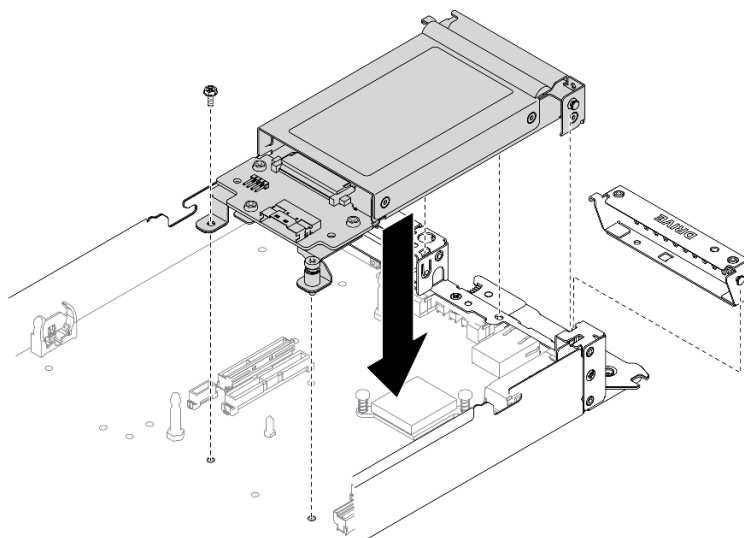


Figure 65. 15mm drive cage assembly installation

After you finish

1. Reinstall the components listed below into the compute node in the following order:
 - a. Drive(s) (see [“Install a hot-swap solid-state drive” on page 87](#)).
 - b. Node front cover (see [“Install the node front cover” on page 119](#)).
2. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure” on page 46](#)).
3. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

External LCD diagnostics handset replacement

Use the following procedures to remove or install the external LCD diagnostics handset.

Remove the external LCD diagnostics handset

Follow instructions in this section to remove the external LCD diagnostics handset.

About this task

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.

- **S017**



CAUTION:

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

- **S033**



CAUTION:

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

About this task

Attention: Read the “[Installation Guidelines](#)” on page 39 to ensure that you work safely.

Procedure

- Step 1. Turn off the corresponding compute node on which you are going to perform the task.
- Step 2. Disconnect the external LCD diagnostics handset cable.
 - a. ① Press and hold on the latch on top of the connector.
 - b. ② Pull to disconnect the cable from the compute node.

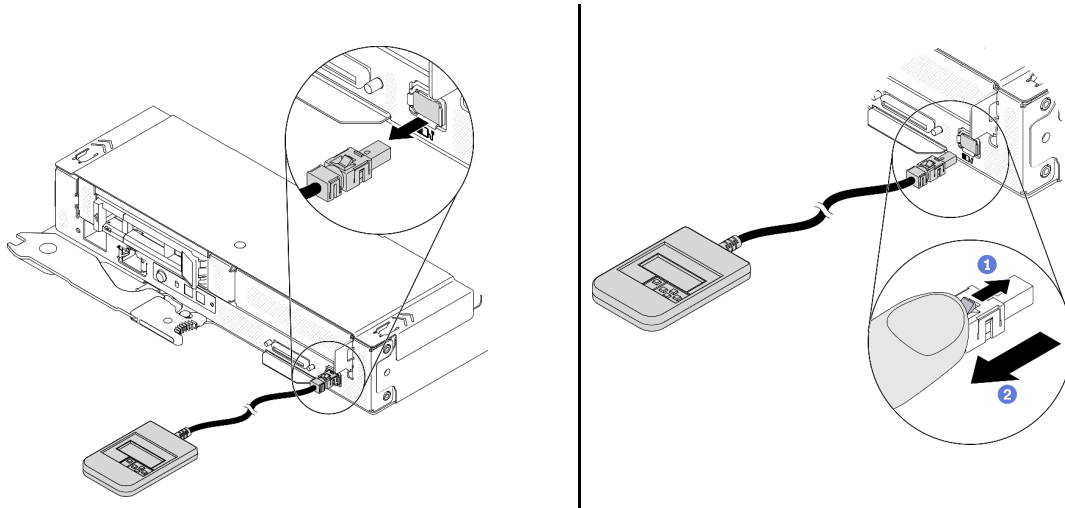


Figure 66. Disconnecting the external LCD diagnostics handset cable

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install the external LCD diagnostics handset

Follow instructions in this section to install the external LCD diagnostics handset.

About this task

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.

- **S017**



CAUTION:

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

- **S033**



CAUTION:

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

About this task

Attention:

- Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the solution; then, remove it from the package and place it on a static-protective surface.

Procedure

Step 1. Align the connector on the cable with that on the compute node and push it in.

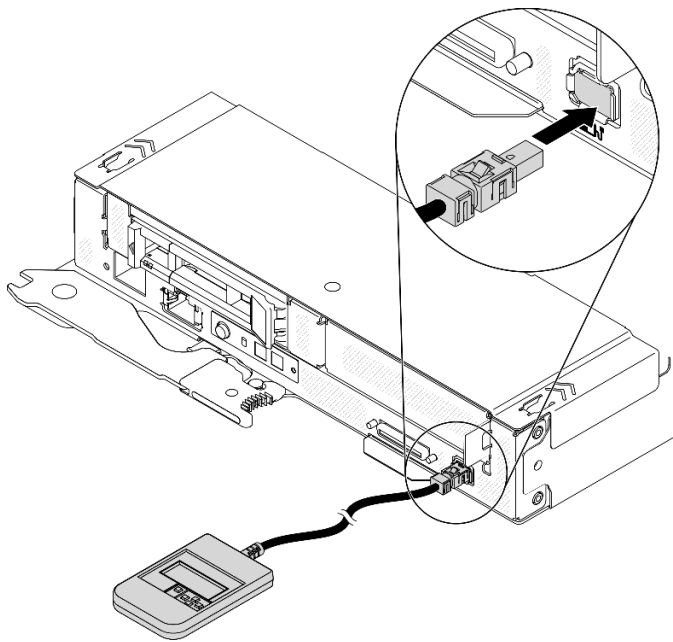


Figure 67. Connecting the external LCD diagnostics handset cable

Step 2. Attach the external LCD diagnostics handset to a metal surface with the magnetic bottom.

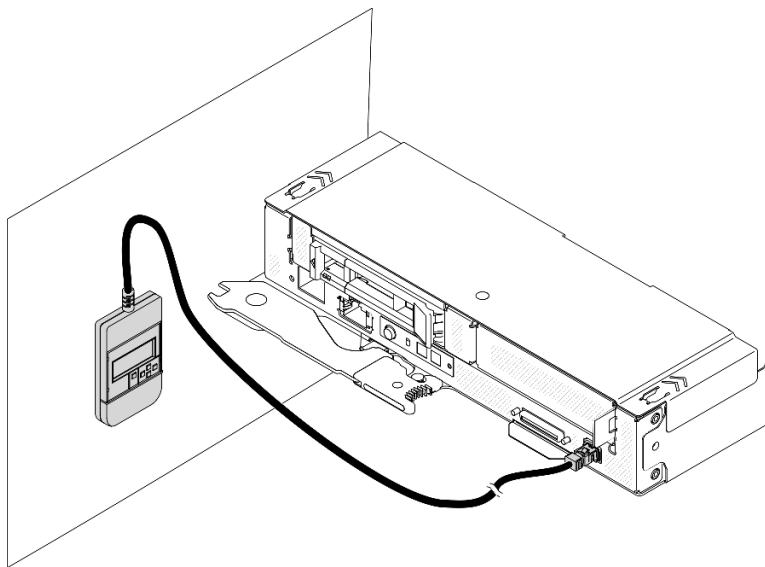


Figure 68. Attaching the external LCD diagnostics handset to a metal surface

After you finish

Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

M.2 backplane replacement

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

Remove the M.2 backplane

Use this information to remove the M.2 backplane.

About this task

To avoid potential danger, read and follow the following safety statements.

- **S001**



**Electrical current from power, telephone, and communication cables is hazardous.
To avoid a shock hazard:**

- Connect all power cords to a properly wired and grounded electrical outlet/source.
- Connect any equipment that will be attached to this product to properly wired outlets/sources.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- The device might have more than one power cord, to remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Procedure

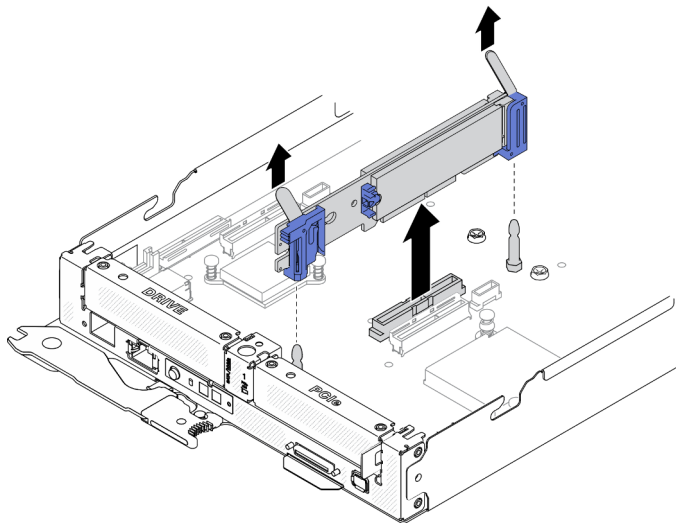


Figure 69. M.2 backplane removal

Step 1. Make preparations for this task.

- a. Turn off the corresponding compute node on which you are going to perform the task.
- b. Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure” on page 42](#)).
- c. Remove the node front cover from the compute node (see [“Remove the node front cover” on page 117](#)).

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

After you finish

If you are instructed to return the component or optional device, follow all of the 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.

About this task

To avoid potential danger, read and follow the following safety statements.

- **S001**



Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- **Connect all power cords to a properly wired and grounded electrical outlet/source.**
- **Connect any equipment that will be attached to this product to properly wired outlets/sources.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **The device might have more than one power cord, to remove all electrical current from the device, ensure that all power cords are disconnected from the power source.**

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

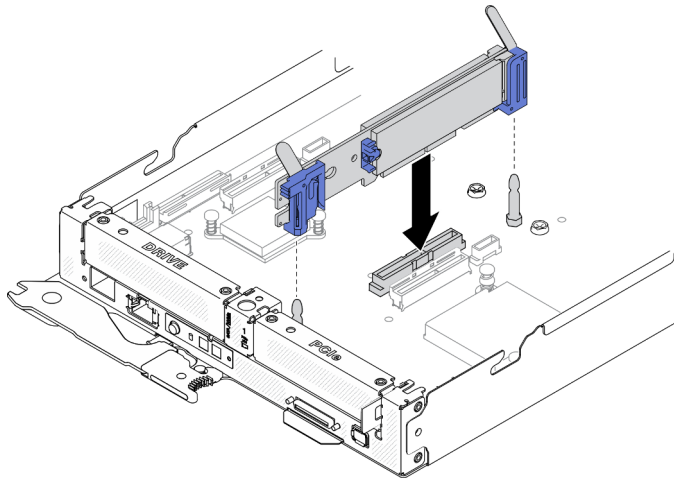


Figure 70. M.2 backplane installation

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 pins on the system board; then, insert the backplane into the system board connector. Press down on the M.2 backplane to fully seat it.

After you finish

1. Reinstall the node front cover into the compute node (see [“Install the node front cover” on page 119](#)).
2. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure” on page 46](#)).
3. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

M.2 drive replacement

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

Remove an M.2 drive from the M.2 backplane

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

About this task

To avoid potential danger, read and follow the following safety statements.

- **S001**



 **DANGER**

Electrical current from power, telephone, and communication cables is hazardous. To avoid a shock hazard:

- **Connect all power cords to a properly wired and grounded electrical outlet/source.**
- **Connect any equipment that will be attached to this product to properly wired outlets/sources.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **The device might have more than one power cord, to remove all electrical current from the device, ensure that all power cords are disconnected from the power source.**

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Procedure

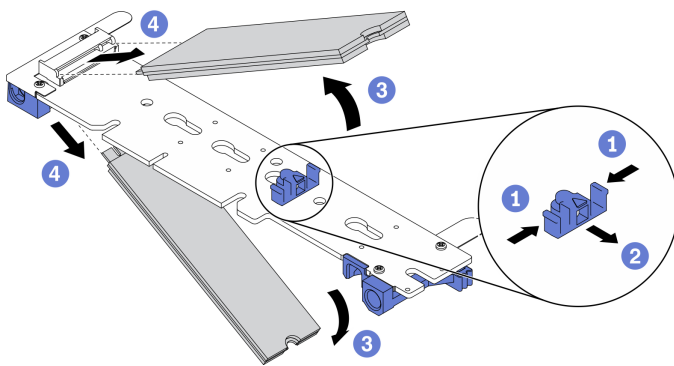


Figure 71. M.2 drive removal

Step 1. Make preparations for this task.

- a. Turn off the corresponding compute node on which you are going to perform the task.
- b. Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure”](#) on page 42).
- c. Remove the components listed below from the compute node in the following order:
 - Node front cover (see [“Remove the node front cover”](#) on page 117).
 - M.2 backplane (see [“Remove the M.2 backplane”](#) on page 101).

Step 2. Remove an M.2 drive from the M.2 backplane.

- a. **1** Press both sides of the retainer.
- b. **2** Slide the retainer backwards 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 be released outward when you slide the retainer backwards.

- c. **3** Rotate the M.2 drive away from the M.2 backplane.
- d. **4** Remove the M.2 drive by pulling away from the connector at an angle (approximately 30 degrees).

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install an M.2 drive into the M.2 backplane

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

About this task

To avoid potential danger, read and follow the following safety statements.

- **S001**



 **DANGER**

**Electrical current from power, telephone, and communication cables is hazardous.
To avoid a shock hazard:**

- Connect all power cords to a properly wired and grounded electrical outlet/source.
- Connect any equipment that will be attached to this product to properly wired outlets/sources.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- The device might have more than one power cord, to remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

Attention: Read the “[Installation Guidelines](#)” on page 39 to ensure that you work safely.

Procedure

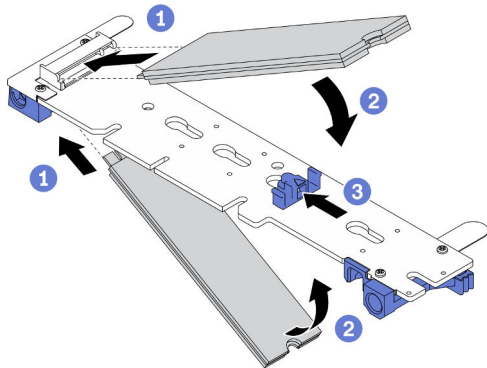


Figure 72. M.2 drive installation

Step 1. Install an M.2 drive into the M.2 backplane.

- a. ❶ Locate the connector on each side of the M.2 backplane and insert the M.2 drive at an angle (approximately 30 degrees) into the connector.
- b. ❷ Rotate the M.2 drive until the notch catches on the lip of the retainer.
- c. ❸ Slide the retainer forward (toward the connector) to secure the M.2 drive in the M.2 backplane.

Note: 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.

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.

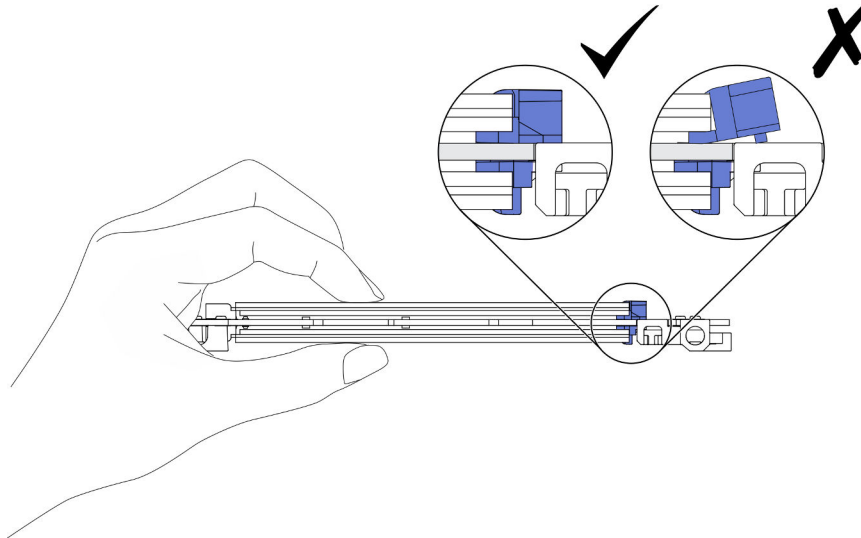


Figure 73. M.2 drive installation

After you finish

1. Reinstall the components listed below into the compute node in the following order:
 - a. M.2 backplane (see [“Install the M.2 backplane”](#) on page 102).
 - b. Node front cover (see [“Install the node front cover”](#) on page 119).
2. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure”](#) on page 46).
3. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

How to 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.

About this task

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Procedure

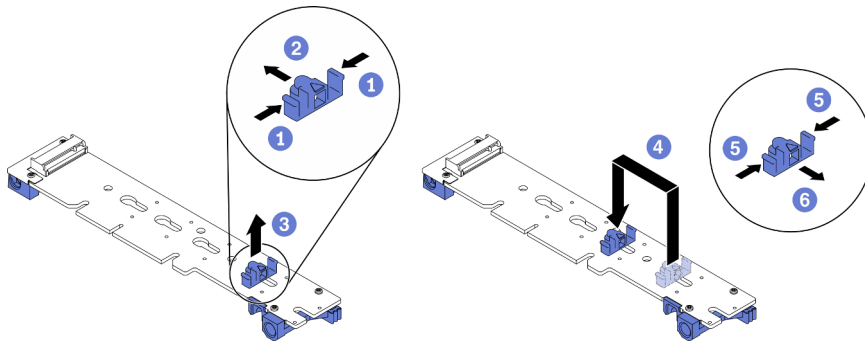


Figure 74. M.2 backplane retainer adjustment

- Step 1. Adjust the position of the retainer on the M.2 backplane.
- 1 Press both sides of the retainer.
 - 2 Move the retainer forward until it is in the large opening of the keyhole.
 - 3 Remove the retainer from the backplane.
 - 4 Locate the correct keyhole into which the retainer should be installed to accommodate the particular size of the M.2 drive you wish to install. Then, insert the retainer into the keyhole.
 - 5 Press both sides of the retainer again.
 - 6 Slide the retainer backwards until the nubs are in the holes.

Memory module replacement

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

Remove a memory module

Use this information to remove a memory module. This section applies to both RDIMMs and 3DS RDIMMs.

About this task

Attention:

- Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.
- Memory modules are sensitive to static discharge and require special handling. Refer to the standard guidelines for [“Handling static-sensitive devices” on page 42](#).
 - Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
 - Never hold two or more memory modules together so that they do not touch each other. Do not stack memory modules directly on top of each other during storage.
 - Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory module connector housing.
 - Handle memory modules with care: never bend, twist, or drop a memory module.
 - Do not use any metal tools (such as jigs or clamps) to handle the memory modules, because the rigid metals may damage the memory modules.
 - Do not insert memory modules while holding packages or passive components, which can cause package cracks or detachment of passive components by the high insertion force.

The following illustration shows the location of the DIMM connectors on the system board.

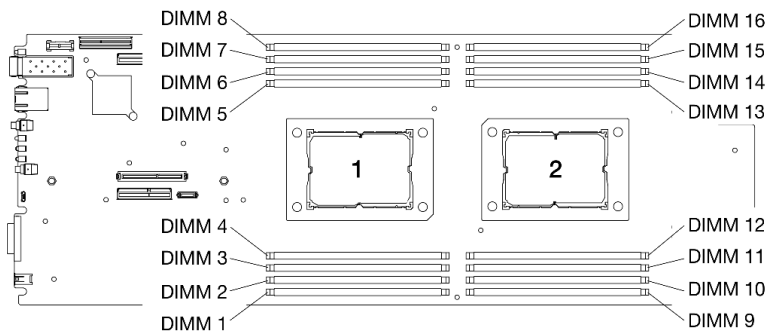


Figure 75. The location of the DIMM connectors on the system board

Procedure

Step 1. Make preparations for this task.

- a. Turn off the corresponding compute node on which you are going to perform the task.
- b. Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure”](#) on page 42).
- c. Remove the node air baffles (see [“Remove the front air baffle”](#) on page 113 and [“Remove the middle air baffle”](#) on page 115).

Note: If any of the DIMMs will be replaced from DIMM connectors 1 to 8, remove both of the front air baffle and middle air baffle; if any of the DIMMs will be replaced from DIMM connectors 9 to 16, remove only the middle air baffle.

Step 2. Determine which DIMM you want to remove from the compute node and locate its corresponding connector on the system board.

Step 3. Open the retaining clips on each end of the DIMM connector. If necessary, you can use a pointed tool to open the retaining clips due to space constraints. Pencils are not recommended as a tool as they may not be strong enough.

- a. ① Place the tip of the tool in the recess on the top of the retaining clip.
- b. ② Carefully rotate the retaining clip away from the DIMM connector.

Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, open and close the retaining clips gently.

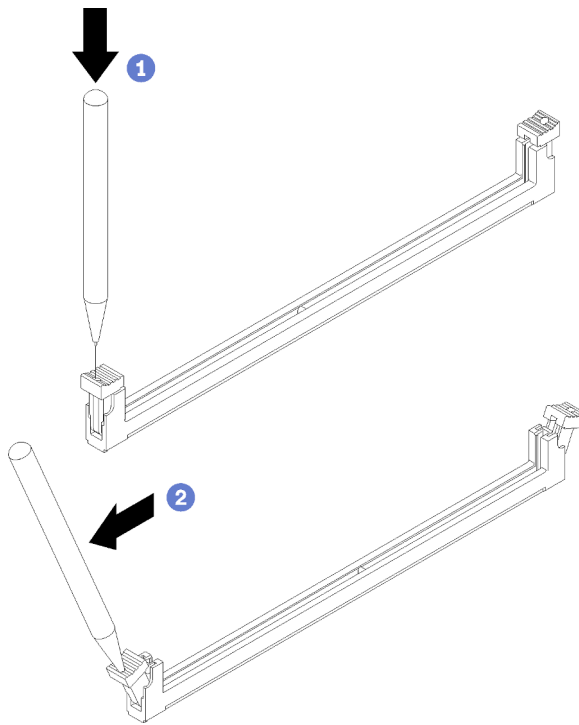


Figure 76. Opening retaining clips

Step 4. Remove the DIMM.

- a. ① Make sure that the retaining clips are in the fully open position.
- b. ② Pull the DIMM out of the connector with both hands.

Attention:

- The retaining clips for adjacent DIMM connectors of processor 1 and processor 2 cannot be open at the same time. Remove or install the DIMMs for each processor one at a time and close the retaining clips after removing a DIMM.
- If you are not immediately replacing the DIMM, install the node air baffles (see [“Install the front air baffle” on page 114](#) and [“Install the middle air baffle” on page 116](#)). The retaining clips on the DIMM connectors must be in the closed position before you install the node air baffles.

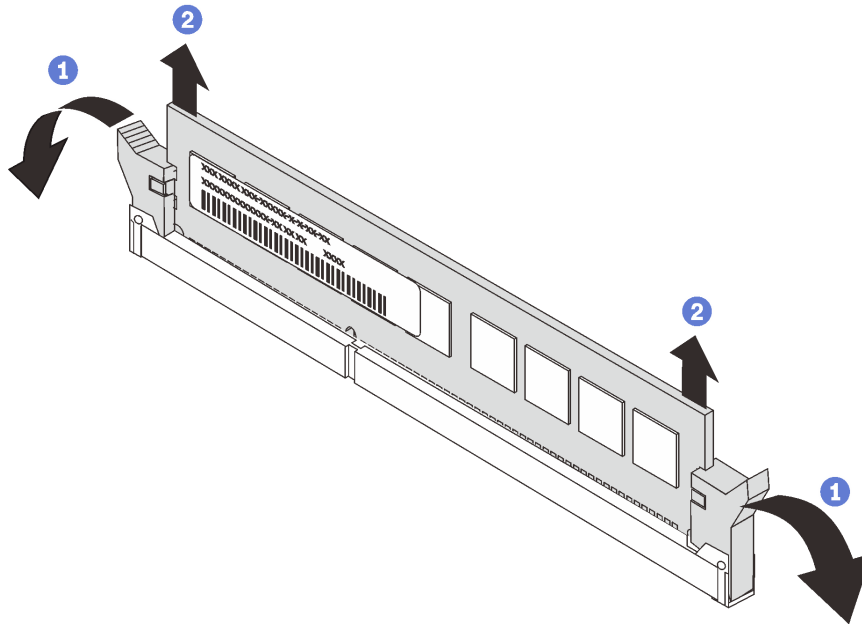


Figure 77. DIMM removal

After you finish

If you are instructed to return the component or optional device, follow all of the 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. This section applies to both RDIMMs and 3DS RDIMMs.

About this task

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

Attention:

- Read the “[Installation Guidelines](#)” on [page 39](#) to ensure that you work safely.
- Memory modules are sensitive to static discharge and require special handling. Refer to the standard guidelines for “[Handling static-sensitive devices](#)” on [page 42](#).
 - Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
 - Never hold two or more memory modules together so that they do not touch each other. Do not stack memory modules directly on top of each other during storage.
 - Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory module connector housing.
 - Handle memory modules with care: never bend, twist, or drop a memory module.

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

The following illustration shows the location of the DIMM connectors on the system board.

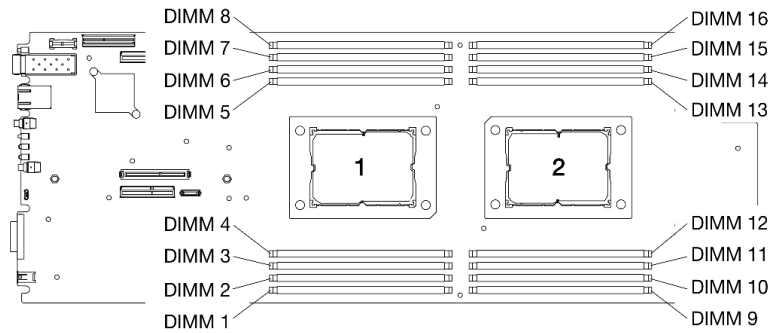


Figure 78. The location of the DIMM connectors on the system board

Procedure

- Step 1. Determine which DIMM you want to install in the compute node and locate its corresponding connector on the system board.
- Step 2. Open the retaining clips on each end of the DIMM connector. If necessary, you can use a pointed tool to open the retaining clips due to space constraints. Pencils are not recommended as a tool as they may not be strong enough.
 - 1 Place the tip of the tool in the recess on the top of the retaining clip.
 - 2 Carefully rotate the retaining clip away from the DIMM connector.

Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, open and close the retaining clips gently.

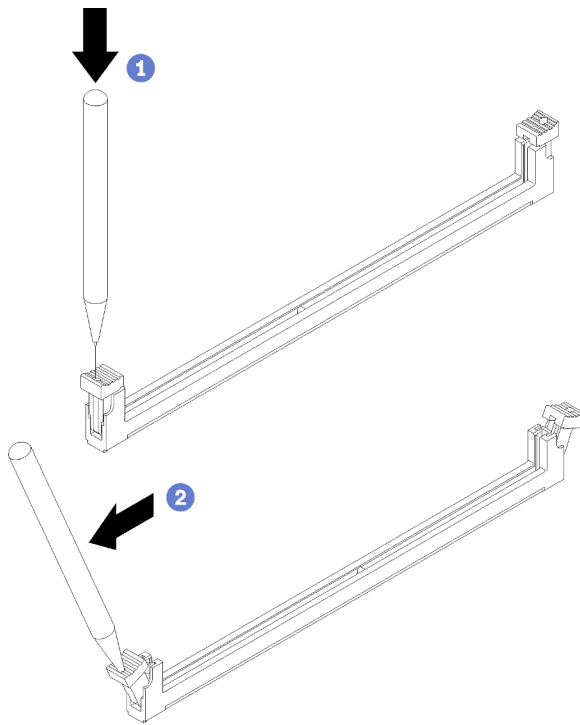


Figure 79. Opening retaining clips

- Step 3. Touch the static-protective package that contains the DIMM to any unpainted surface on the outside of the compute node. Then, remove the DIMM from the package and place it on a static-protective surface.
- Step 4. Install the DIMM.
- 1 Make sure that the retaining clips are in the fully open position.
 - 2 Align the DIMM with its connector and gently place the DIMM on the connector with both hands.
 - 3 Firmly press both ends of the DIMM straight down into the connector until the retaining clips snap into the locked position.

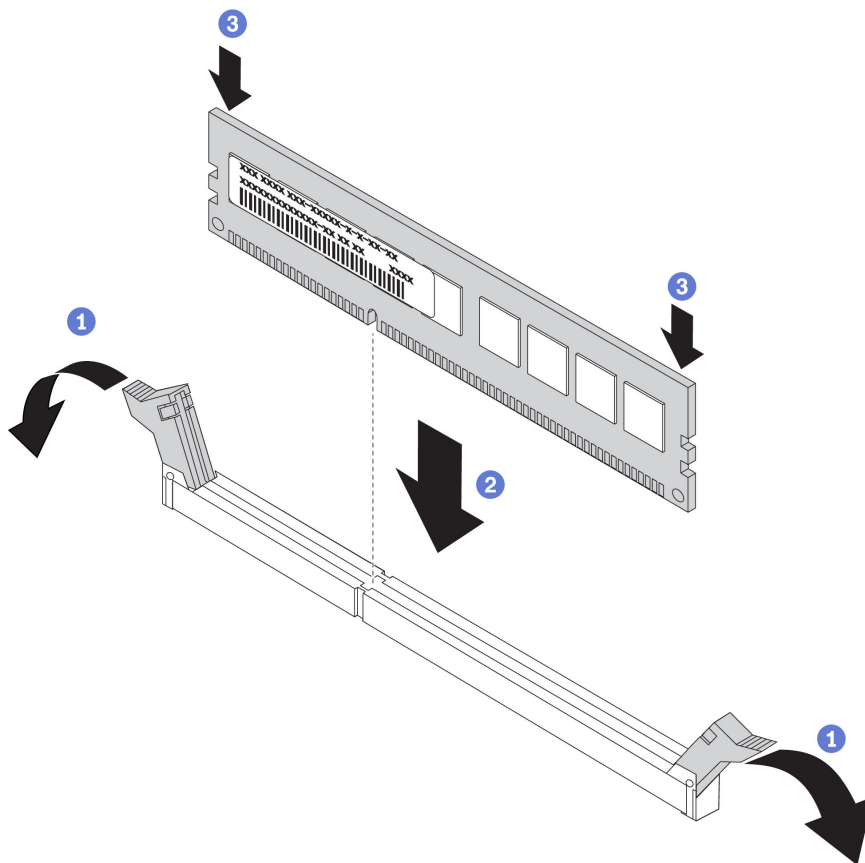


Figure 80. DIMM installation

Note: If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly inserted. In this case, open the retaining clips, remove the DIMM, and then reinsert it.

After you finish

1. Reinstall the node air baffles (see [“Install the front air baffle”](#) on page 114 and [“Install the middle air baffle”](#) on page 116).
2. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure”](#) on page 46).
3. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Node air baffles replacement

Use the following procedures to remove and install the air baffles in the compute node.

Remove the front air baffle

Use this information to remove the front air baffle.

About this task

Attention: Read the “[Installation Guidelines](#)” on page 39 to ensure that you work safely.

Procedure

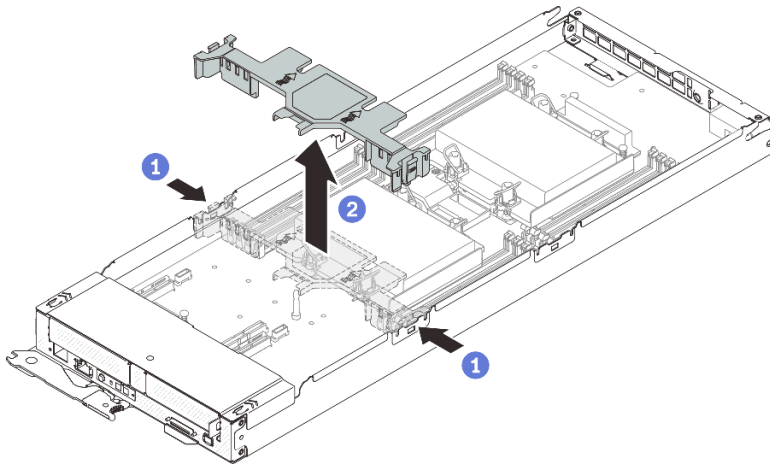


Figure 81. Front air baffle removal

- Step 1. Make preparations for this task.
- Turn off the corresponding compute node on which you are going to perform the task.
 - Remove the compute node from the enclosure (see “[Remove a compute node from the enclosure](#)” on page 42).
- Step 2. Remove the front air baffle from the compute node.
- 1 Slightly push the right and left release latches.
 - 2 Lift the front air baffle out of the compute node.

Attention: For proper cooling and airflow, replace the front air baffle before you turn on the compute node. Operating the node without the front air baffle might damage node components.

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install the front air baffle

Use this information to install the front air baffle.

About this task

Attention: Read the “[Installation Guidelines](#)” on page 39 to ensure that you work safely.

Procedure

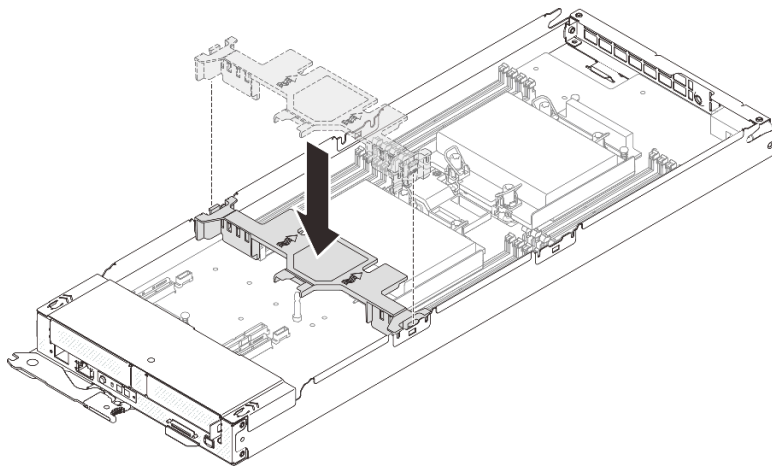


Figure 82. Front air baffle installation

- Step 1. Align the front air baffle tabs with the baffle slots located on both sides of the compute node in between the drive cage assembly/PCIe riser assembly and DIMM connectors 1 to 8.
- Step 2. Lower the front air baffle into the compute node and press it down until it is securely seated.

Attention:

- For proper cooling and airflow, reinstall the front air baffle before you turn on the compute node. Operating the node without the front air baffle might damage node components.
- Ensure that the M.2 adapter pull tab is tucked under the front air baffle.
- Pay attention to the cables routed along the sidewalls of the compute node as they may catch under the front air baffle.

After you finish

1. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure” on page 46](#)).
2. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Remove the middle air baffle

Use this information to remove the middle air baffle.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

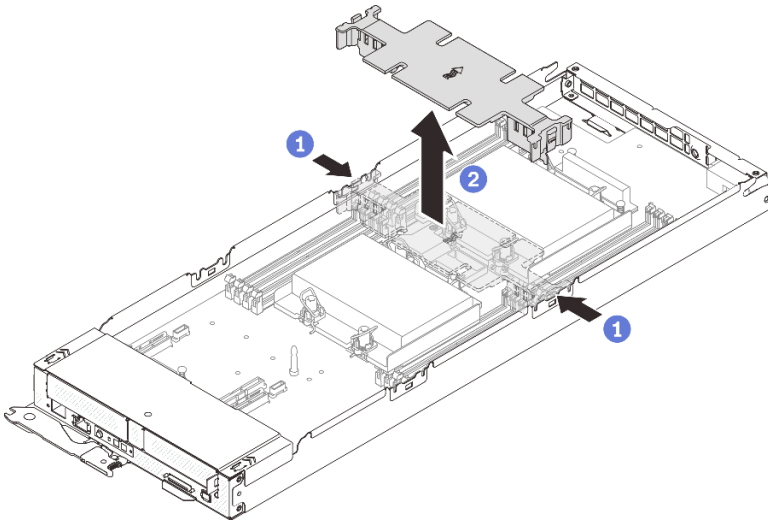


Figure 83. Middle air baffle removal

Step 1. Make preparations for this task.

- a. Turn off the corresponding compute node on which you are going to perform the task.
- b. Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure” on page 42](#)).

Step 2. Remove the middle air baffle from the compute node.

- a. ① Slightly push the right and left release latches.
- b. ② Lift the middle air baffle out of the compute node.

Attention: For proper cooling and airflow, replace the middle air baffle before you turn on the compute node. Operating the node without the middle air baffle might damage node components.

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install the middle air baffle

Use this information to install the middle air baffle.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

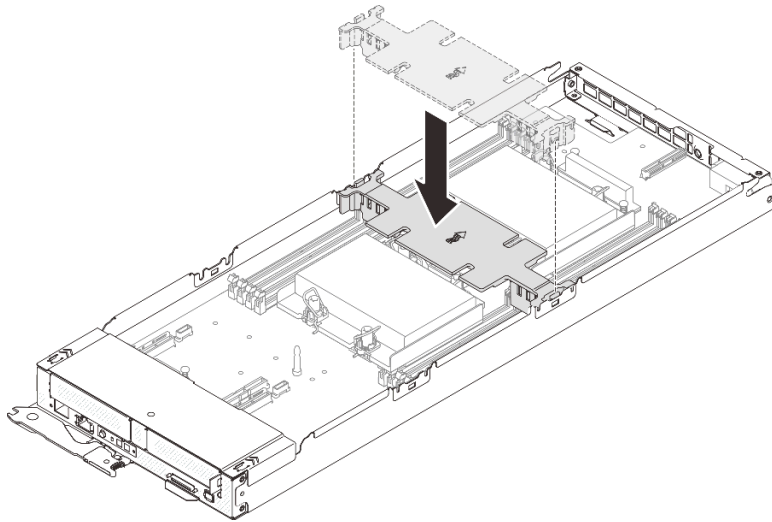


Figure 84. Middle air baffle installation

- Step 1. Align the middle air baffle tabs with the baffle slots located on both sides of the compute node in between DIMM connectors 1 to 8 and 9 to 16.
- Step 2. Lower the middle air baffle into the compute node and press it down until it is securely seated.

Attention:

- For proper cooling and airflow, reinstall the middle air baffle before you turn on the compute node. Operating the node without the middle air baffle might damage node components.
- Pay attention to the cables routed along the sidewalls of the compute node as they may catch under the middle air baffle.

After you finish

1. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure” on page 46](#)).
2. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Node front cover replacement

Use the following procedures to remove and install the node front cover.

Remove the node front cover

Use this information to remove the node front cover.

About this task

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.

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Procedure

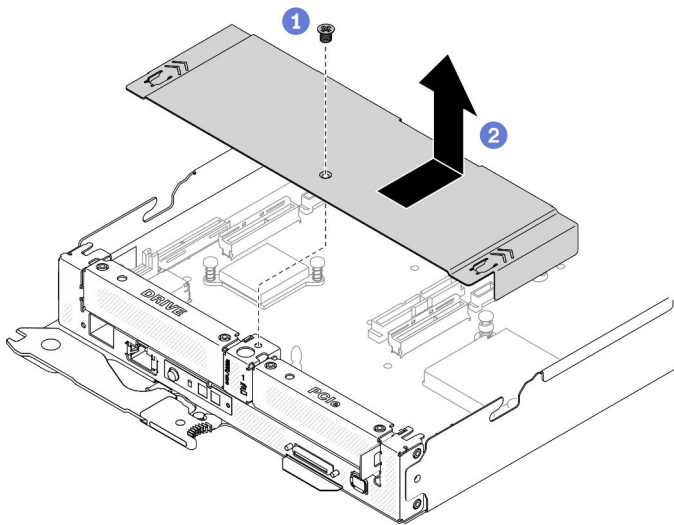


Figure 85. Node front cover removal

Step 1. Make preparations for this task.

- Turn off the corresponding compute node on which you are going to perform the task.
- Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure”](#) on page 42).

Step 2. Remove the node front cover from the compute node.

- ① Loosen the screw on the node front cover.
- ② Press on the two push points on the node front cover to slide the cover toward the rear of the compute node until it has disengaged from the node. Then, lift the cover away from the node.

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install the node front cover

Use this information to install the node front cover.

About this task

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.

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Procedure

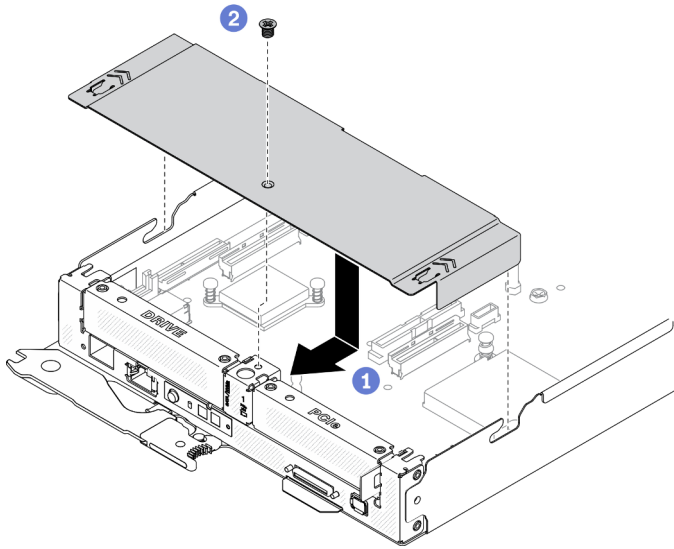


Figure 86. Node front cover installation

Step 1. Install the node front cover into the compute node.

- a. 1 Align the pins on the inside of the node front cover with the notches in the side walls of the compute node. Then, position the cover on top of the node and slide the cover forward until it latches in place.
- b. 2 Fasten the screw on the node front cover.

After you finish

1. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure”](#) on page 46).
2. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

PCIe adapter replacement

Use the following procedures to remove and install a PCIe adapter from and into the riser cage.

Remove a PCIe adapter

Use this information to remove a PCIe adapter.

About this task

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Procedure

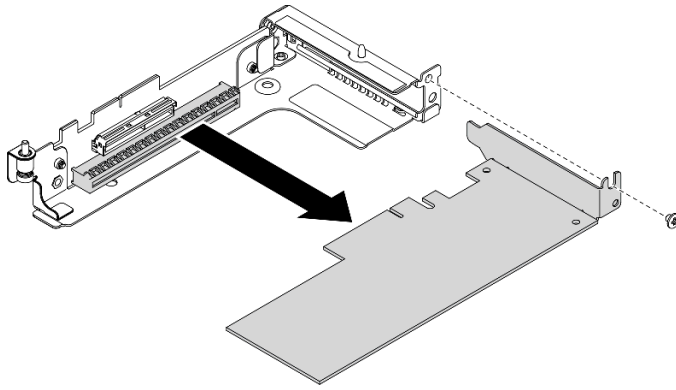


Figure 87. PCIe adapter removal

Step 1. Make preparations for this task.

- a. Turn off the corresponding compute node on which you are going to perform the task.
- b. Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure” on page 42](#)).
- c. Remove the components listed below from the compute node in the following order:
 - Node front cover (see [“Remove the node front cover” on page 117](#)).
 - Front air baffle (see [“Remove the front air baffle” on page 113](#)).
 - PCIe riser assembly (see [“Remove the PCIe riser assembly” on page 122](#)).

Step 2. Remove the screw; then, grasp the adapter by its edges and carefully pull it out of the PCIe riser-cage.

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install a PCIe adapter

Use this information to install a PCIe adapter.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

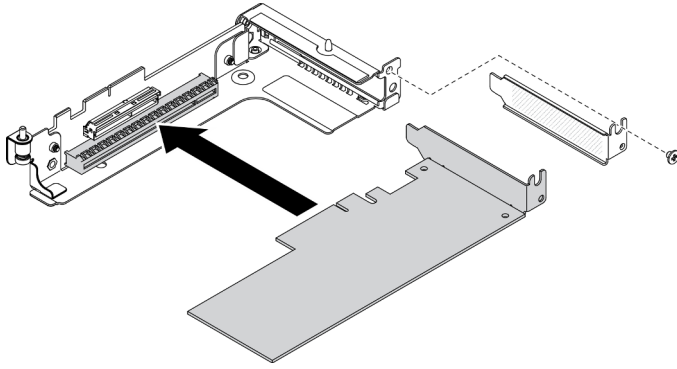


Figure 88. PCIe adapter installation

- Step 1. Remove the screw; then, remove the filler from the PCIe riser-cage.
- Step 2. Align the adapter with the PCIe connector on the riser-cage; then, carefully press the adapter straight into the connector until it is securely seated.
- Step 3. Fasten the screw to secure the adapter.

After you finish

1. Reinstall the components listed below into the compute node in the following order:
 - a. PCIe riser assembly (see [“Install the PCIe riser assembly” on page 123](#)).
 - b. Front air baffle (see [“Install the front air baffle” on page 114](#)).
 - c. Node front cover (see [“Install the node front cover” on page 119](#)).
2. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure” on page 46](#)).
3. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

PCIe riser assembly replacement

Use the following procedures to remove and install the PCIe riser assembly.

Remove the PCIe riser assembly

Use this information to remove the PCIe riser assembly.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

- Step 1. Make preparations for this task.
 - a. Turn off the corresponding compute node on which you are going to perform the task.
 - b. Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure” on page 42](#)).

- c. Remove the components listed below from the compute node in the following order:
 - Node front cover (see [“Remove the node front cover”](#) on page 117).
 - Front air baffle (see [“Remove the front air baffle”](#) on page 113).

Step 2. Remove the PCIe riser assembly from the compute node.

- a. Loosen the captive screw on the PCIe riser assembly.
- b. Carefully grasp the PCIe riser assembly by its edges and lift it out of the compute node tray.

Note: The PCIe riser assembly is located on the left side of the compute node as illustrated while the drive cage assembly is on the right.

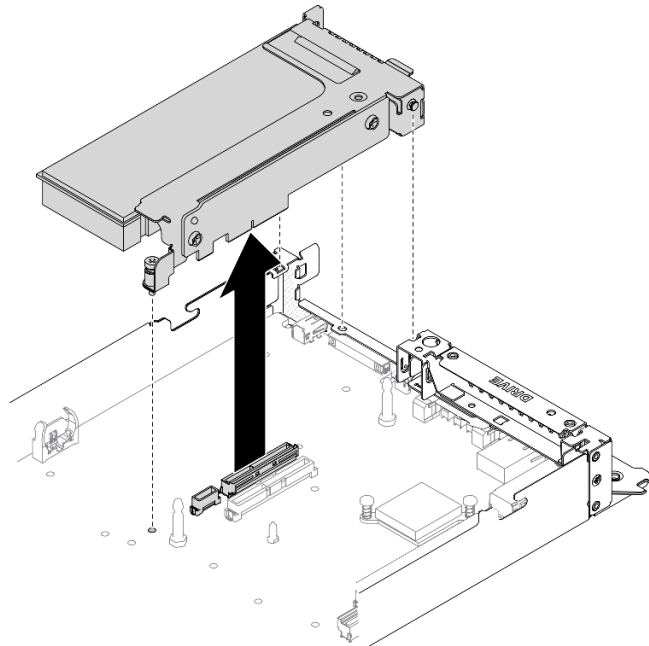


Figure 89. PCIe riser assembly removal

After you finish

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

Demo video

[Watch the procedure on YouTube](#)

Install the PCIe riser assembly

Use this information to install the PCIe riser assembly.

About this task

Attention: Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.

Procedure

Step 1. Install the PCIe riser assembly into the compute node.

- a. Align the guide pin and hook on the rear end of the PCIe riser assembly with the notches on the spacer and on the compute node tray as illustrated. Then, insert the PCIe riser assembly into the connector located in the middle of the system board.
- b. Tighten the captive screw to secure the PCIe riser assembly to the compute node tray.

Important: During normal operation, the PCIe bay must contain either a PCIe riser assembly or PCIe riser filler panel for proper cooling.

Note: The PCIe riser assembly is located on the left side of the compute node as illustrated while the drive cage assembly is on the right.

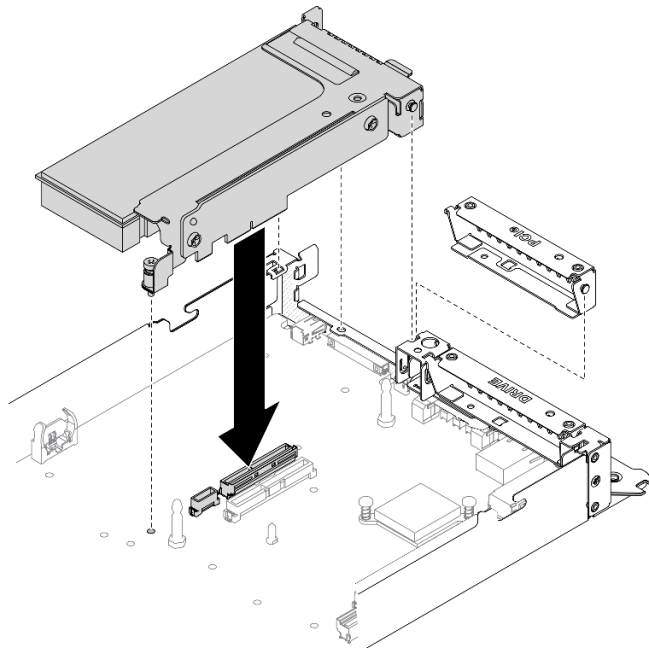


Figure 90. PCIe riser assembly installation

After you finish

1. Reconnect the power cable to the system board and the signal cables to the PCIe adapter.
2. Reinstall the components listed below into the compute node in the following order:
 - a. Front air baffle (see [“Install the front air baffle” on page 114](#)).
 - b. Node front cover (see [“Install the node front cover” on page 119](#)).
3. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure” on page 46](#)).
4. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Processor replacement

Use this information to remove and install a processor.

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

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). This task requires a Torx T30 driver. This procedure must be executed by a trained technician.

About this task

- **S002**



CAUTION:

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

Attention:

- Read the “[Installation Guidelines](#)” on page 39 to ensure that you work safely.
- 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.
- Each processor socket must always contain a cover or a PHM. 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.
- Do not allow the thermal grease on the processor or heat sink to come in contact with anything. Contact with any surface can compromise the thermal grease, rendering it ineffective. Thermal grease can damage components, such as the electrical connectors in the processor socket.
- 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.

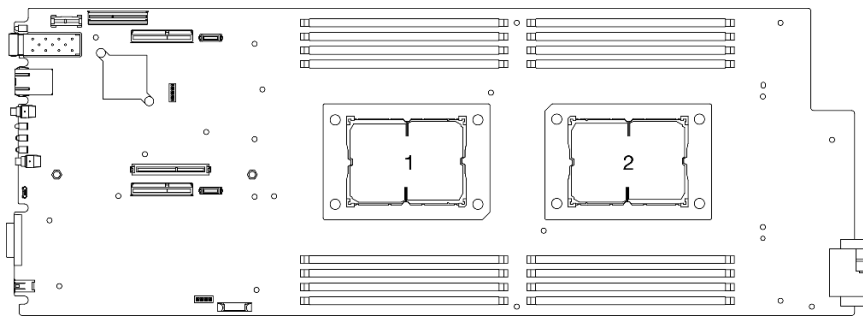


Figure 91. Processor locations on system board

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

The following illustration shows the components of the PHM.

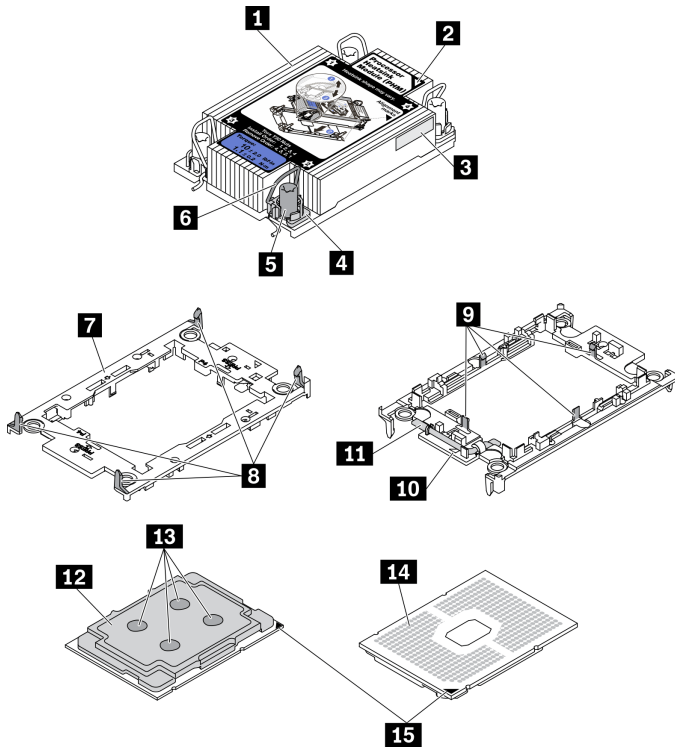


Figure 92. PHM components

1 Heat sink	9 Clips to secure processor in carrier
2 Heat sink triangular mark	10 Carrier triangular mark
3 Processor identification label	11 Processor ejector handle
4 Nut and wire bail retainer	12 Processor heat spreader
5 Torx T30 nut	13 Thermal grease
6 Anti-tilt wire bail	14 Processor contacts
7 Processor carrier	15 Processor triangular mark
8 Clips to secure carrier to heat sink	

Procedure

Step 1. Make preparations for this task.

- a. Turn off the corresponding compute node on which you are going to perform the task.
- b. Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure”](#) on page 42).
- c. Remove the node air baffles from the compute node (see [“Remove the front air baffle”](#) on page 113 and [“Remove the middle air baffle”](#) on page 115).

Step 2. Remove the PHM from the system board.

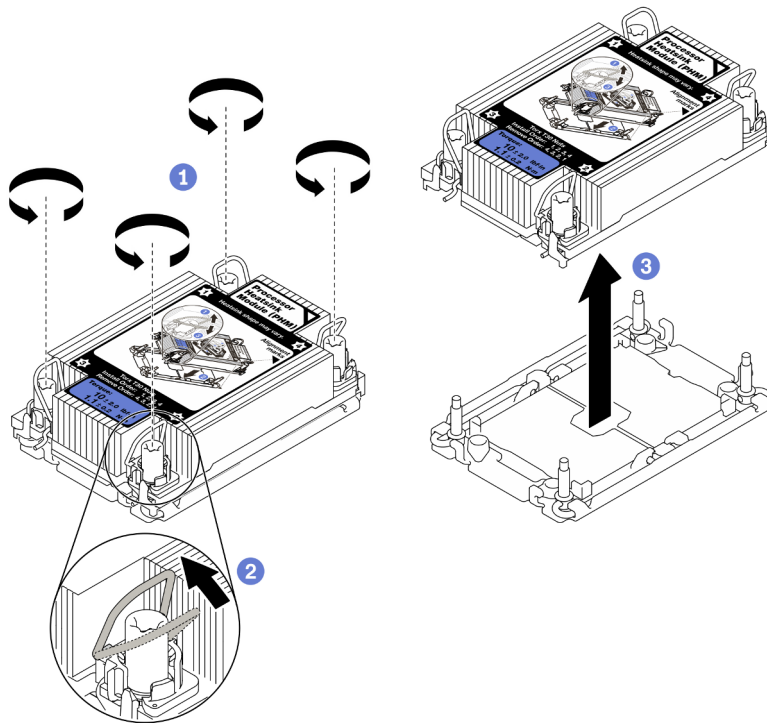


Figure 93. PHM removal

- a. ① Fully loosen the Torx T30 nuts on the PHM *in the removal sequence shown on the heat-sink label*.

Note: For reference, the torque required to fully loosen or tighten the fasteners is 1.1 newton-meters, 10 inch-pounds.

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

- b. ② Rotate the anti-tilt wire bails inward.
- c. ③ Carefully lift the PHM from the processor socket. If the PHM cannot be fully lifted out of the socket, further loosen the Torx T30 nuts and try lifting the PHM again.

Notes:

- Do not touch the contacts on the bottom of the processor.
- Keep the processor socket clean from any object to prevent possible damages.

Step 3. Based on your configuration, follow the corresponding procedures to remove the T-shaped heat sink that comes with processor 2.

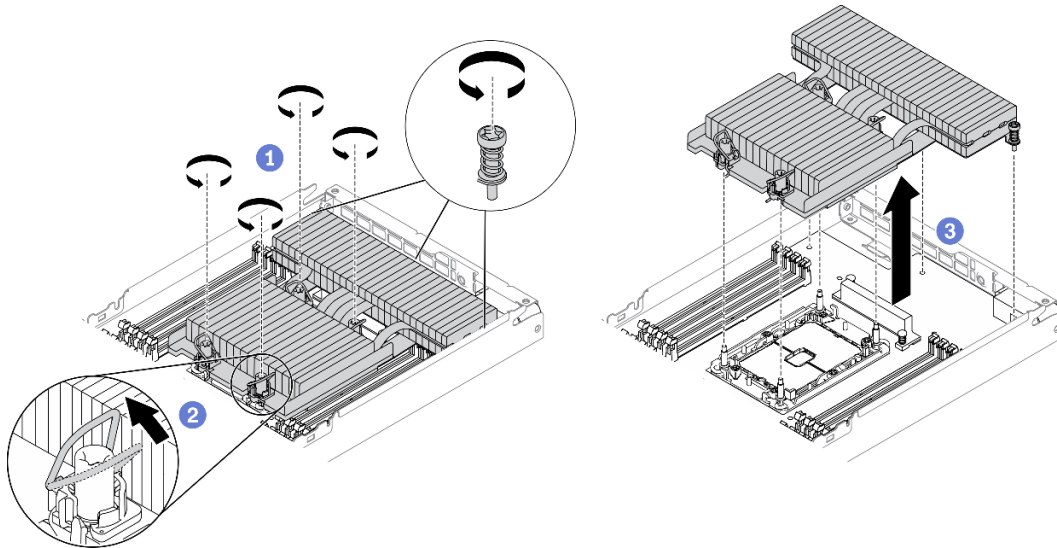


Figure 94. T-shaped heat sink removal

- a. ① Fully loosen the three captive screws and four Torx T30 nuts *in the removal sequence shown* on the T-shaped heat sink label as illustrated below.

Note: For reference, the torque required to fully loosen or tighten the fasteners is 1.1 newton-meters, 10 inch-pounds.

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

Removal sequence: 7, 6, 5, 4, 3, 2, 1.

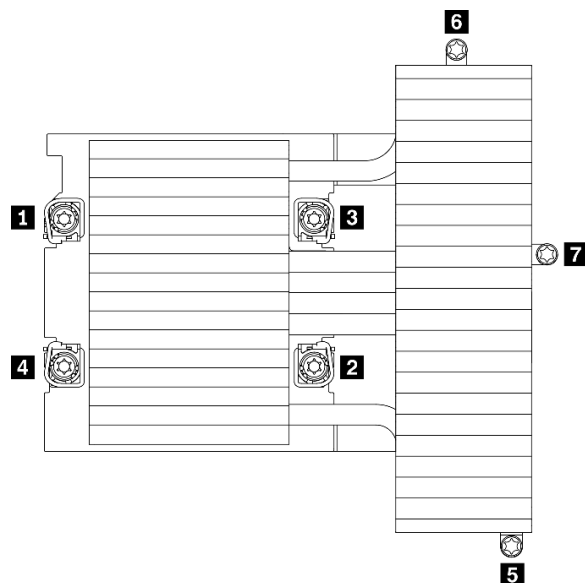



Figure 95. Torx T30 nuts and screws numbering on T-shaped heat sink label

1 2 3 4 Torx T30 nuts	5 6 7 Captive screws
-----------------------	----------------------

- b. ② Rotate the anti-tilt wire bails inward.

- c.  Carefully lift the T-shaped heat sink from the processor socket. If it cannot be fully lifted out of the socket, further loosen the Torx T30 nuts and try lifting the T-shaped heat sink again.

After you finish

- Each processor socket must always contain a cover or a PHM. Protect empty processor sockets with a cover or install a new PHM.
- If you are removing the PHM as part of a system board replacement, set the PHM aside.
- If you are reusing the processor or heat sink, separate the processor from its retainer (see [“Separate the processor from carrier and heat sink” on page 129](#)).
- If you are instructed to return the defective component, package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Demo video

[Watch the procedure on YouTube](#)

Separate the processor from carrier and heat sink

This task has instructions for separating a processor and its carrier from an assembled processor and heat sink, known as a processor-heat-sink module (PHM). This procedure must be executed by a trained technician.

About this task

Attention:

- Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.
- Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.
- Do not touch the processor contacts. Contaminants on the processor contacts, such as oil from your skin, can cause connection failures.
- Do not allow the thermal grease on the processor or heat sink to come in contact with anything. Contact with any surface can compromise the thermal grease, rendering it ineffective. Thermal grease can damage components, such as the electrical connectors in the processor socket.

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

Procedure

- Step 1. Remove the corresponding processor-heat-sink module (PHM) on which you are going to perform the task (see [“Remove a processor and heat sink” on page 125](#)).
- Step 2. Separate the processor from the heat sink and carrier.

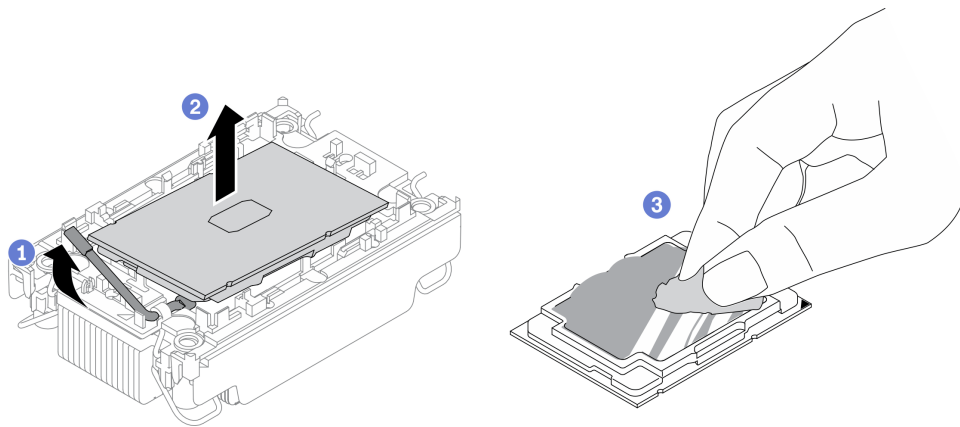


Figure 96. Separating a processor from the heat sink and carrier

Note: Do not touch the contacts on the processor.

- a. ① Lift the handle to release the processor from the carrier.
- b. ② Hold the processor by its edges; then, lift the processor from the heat sink and carrier.
- c. ③ Without putting the processor down, wipe the thermal grease from the top of the processor with an alcohol cleaning pad; then, place the processor on a static protective surface with the processor-contact side up.

Step 3. Separate the processor carrier from the heat sink.

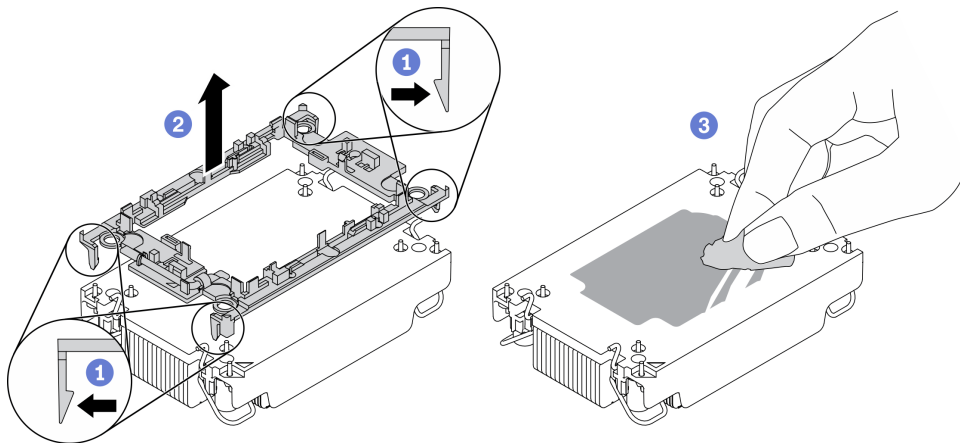


Figure 97. Separating a processor carrier from the heat sink

Note: The processor carrier will be discarded and replaced with a new one.

- a. ① Release the retaining clips from the heat sink.
- b. ② Lift the carrier from the heat sink.
- c. ③ Wipe the thermal grease from the bottom of the heat sink with an alcohol cleaning pad.

After you finish

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

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). This task requires a Torx T30 driver. This procedure must be executed by a trained technician.

About this task

Attention:

- Read the “[Installation Guidelines](#)” on [page 39](#) to ensure that you work safely.
- 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.
- Each processor socket must always contain a cover or a PHM. 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.
- Do not allow the thermal grease on the processor or heat sink to come in contact with anything. Contact with any surface can compromise the thermal grease, rendering it ineffective. Thermal grease can damage components, such as the electrical connectors in the processor socket.
- 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.

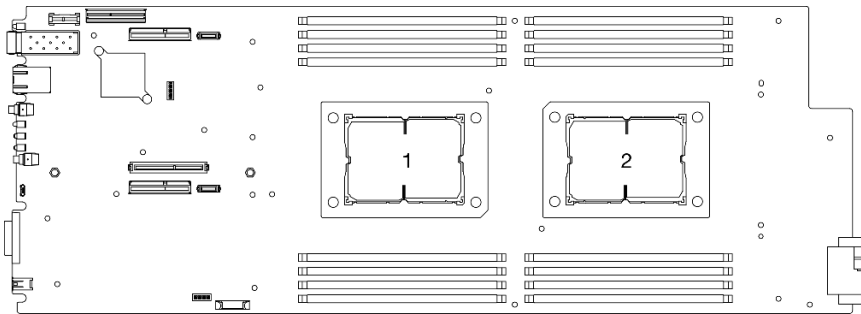


Figure 98. Processor locations on system board

Notes:

- The heat sink, processor, and processor carrier for your system might be different from those shown in the illustrations.
- 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 solution. 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 DA240 Enclosure and ThinkSystem SD630 V2 Compute Node Setup Guide*.
- The following types of heat sinks are applicable to SD630 V2:

Processors with TDP (thermal design power) \leq 165W:

- **113x124x23.5mm heat sink (aluminum fins)** is applicable to both processor socket 1 and 2.

Processors with TDP (thermal design power) \geq 185W:

- **113x124x23.5mm heat sink (copper fins)** is only applicable to processor socket 1.
- **T-shaped heat sink** is only applicable to processor socket 2.
- Make sure to install the correct number of fans based on your configuration.
 - **Two fans:**
 - Processors with TDP (thermal design power) \leq 165W
 - **Three fans:**
 - Processors with TDP (thermal design power) \geq 185W
 - Intel(R) Xeon(R) Gold 6334 (165W, 8 core)

The following illustration shows the components of the PHM.

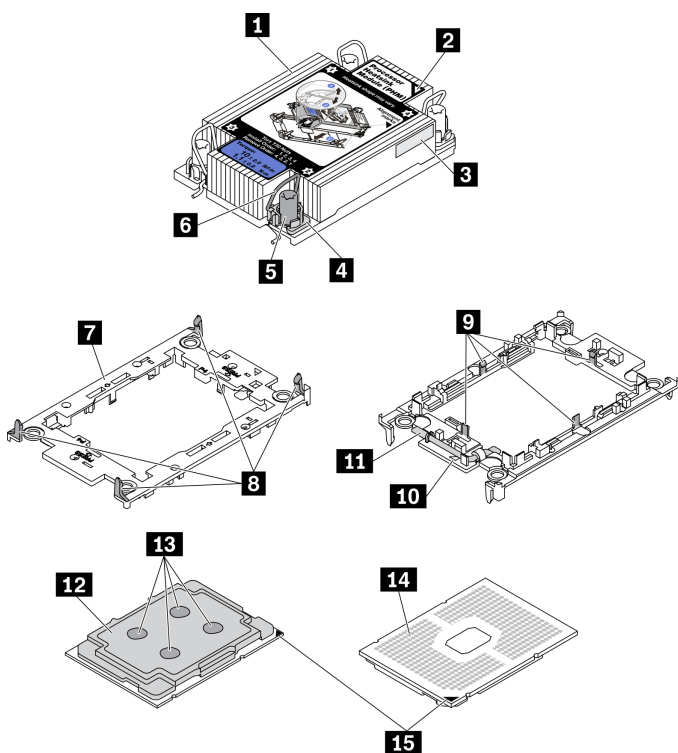


Figure 99. PHM components

1 Heat sink	9 Clips to secure processor in carrier
2 Heat sink triangular mark	10 Carrier triangular mark
3 Processor identification label	11 Processor ejector handle
4 Nut and wire bail retainer	12 Processor heat spreader
5 Torx T30 nut	13 Thermal grease
6 Anti-tilt wire bail	14 Processor contacts
7 Processor carrier	15 Processor triangular mark
8 Clips to secure carrier to heat sink	

Procedure

Step 1. If you are replacing a processor and reusing the heat sink:

- a. Remove the processor identification label from the heat sink and replace it with the new label that comes with the replacement processor.
- b. If there is any old thermal grease on the heat sink, wipe the thermal grease from the bottom of the heat sink with an alcohol cleaning pad.

Step 2. If you are replacing a heat sink and reusing the processor:

- a. 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 closest to the triangular alignment mark.

Note: 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.

- b. Install the processor in new carrier.

Note: Replacement heat sinks come with both gray and black processor carriers. Make sure to use the carrier with the same color as the one you discarded earlier.

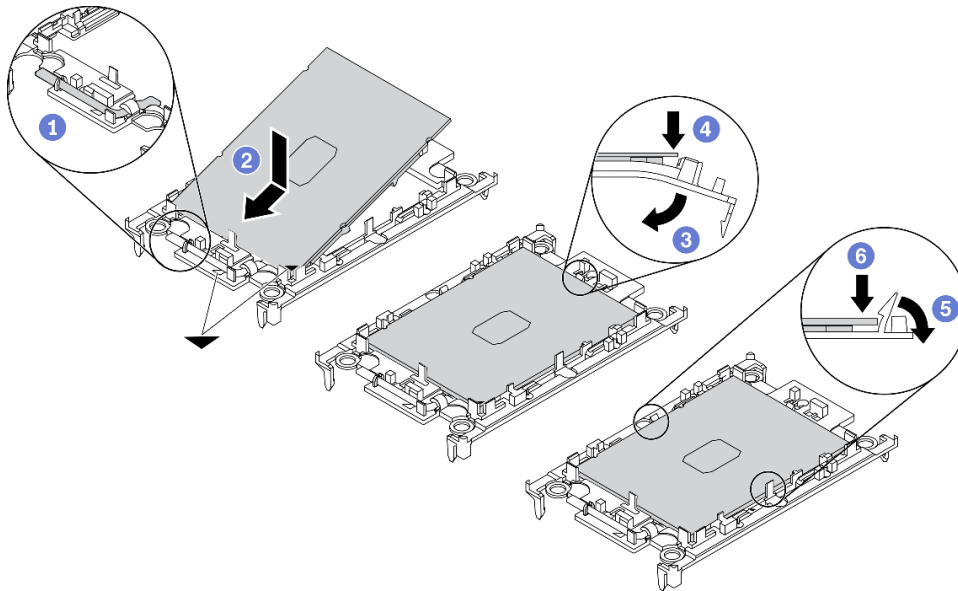


Figure 100. Installing a processor carrier

1. 1 Make sure the handle on the carrier is in the closed position.
2. 2 Align the processor on the new carrier so that the triangular marks align; then, insert the marked end of the processor into the carrier.
3. 3 Hold the inserted end of the processor in place; then, pivot the unmarked end of the carrier down and away from the processor.
4. 4 Press the processor and secure the unmarked end under the clip on the carrier.
5. 5 Carefully pivot the sides of the carrier down and away from the processor.
6. 6 Press the processor and secure the sides under the clips on the carrier.

Note: To prevent the processor from falling out of the carrier, keep the processor-contact side up and hold the processor-carrier assembly by the sides of the carrier.

Step 3. Apply thermal grease.

- a. Carefully place the processor and carrier in the shipping tray with the processor-contact side down. Make sure the triangular mark on the carrier is aligned with the triangular mark in the shipping tray.
- b. If there is any old thermal grease on the processor, gently wipe the top of the processor with an alcohol cleaning pad.

Note: Make sure the alcohol has fully evaporated before applying new thermal grease.

- c. 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.

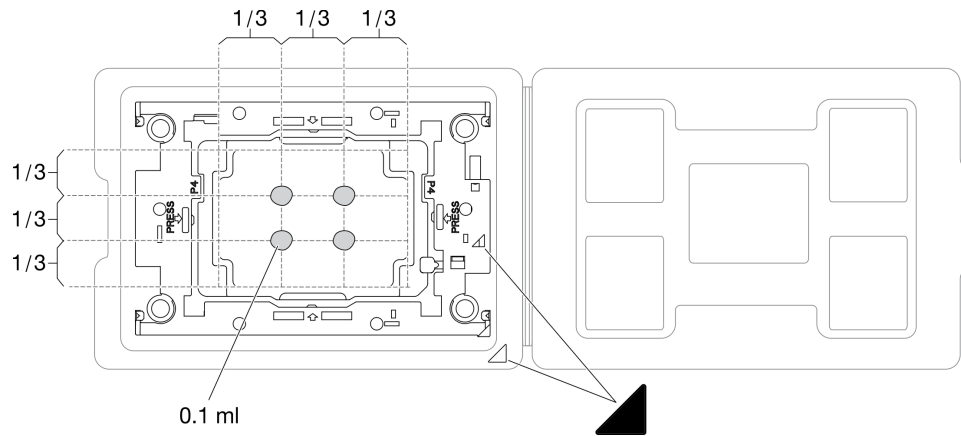


Figure 101. Thermal grease application with processor in shipping tray

Step 4. Assemble the processor and heat sink.

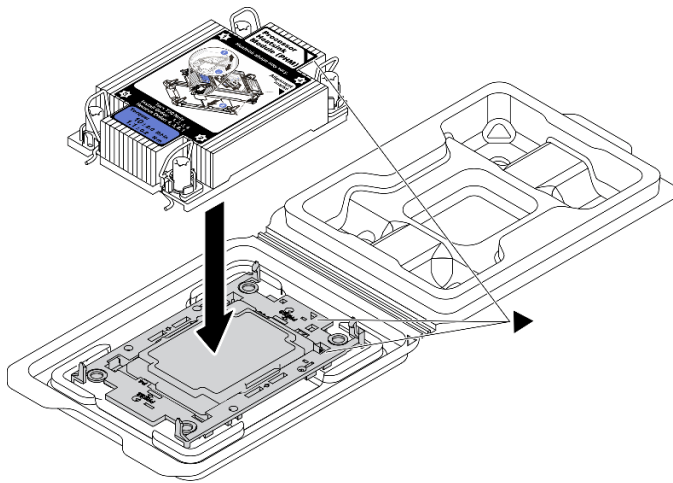


Figure 102. Assembling the PHM with processor in shipping tray

- a. Align the triangular mark on the heat sink label with the triangular mark on the processor carrier and processor.
- b. Install the heat sink onto the processor-carrier.
- c. Press the carrier into place until the clips at all four corners engage.

Step 5. Install the processor-heat-sink module into the system board socket.

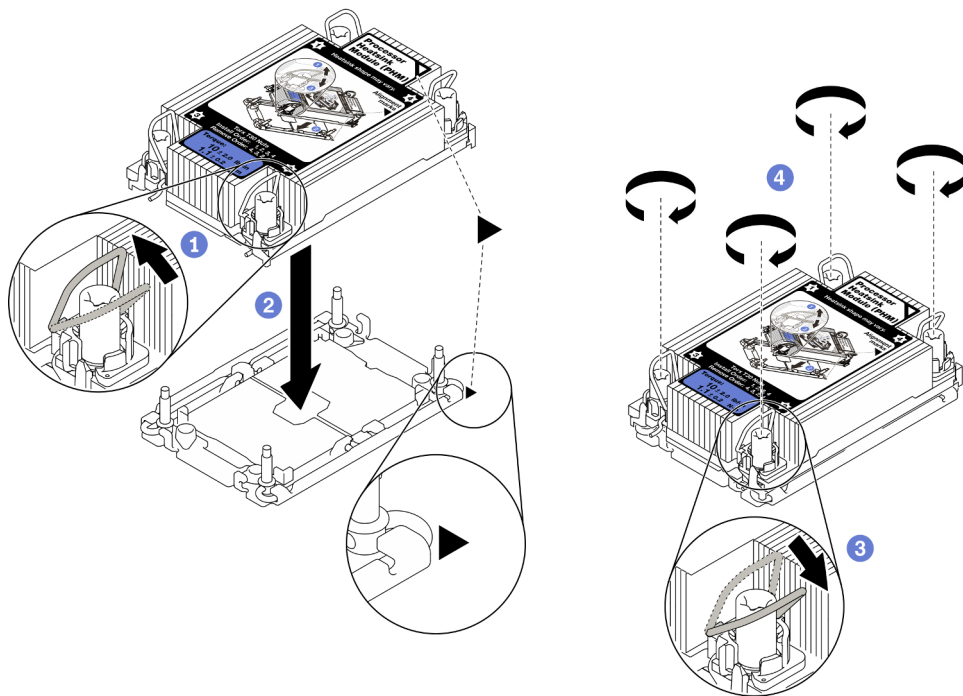


Figure 103. PHM installation

- a. ① Rotate the anti-tilt wire bails inward.
- b. ② Align the triangular mark and four Torx T30 nuts on the PHM with the triangular mark and threaded posts of the processor socket; then, insert the PHM into the processor socket.
- c. ③ Rotate the anti-tilt wire bails outward until they engage with the hooks in the socket.
- d. ④ Fully tighten the Torx T30 nuts *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.

Note: For reference, the torque required to fully tighten or loosen the fasteners is 1.1 newton-meters, 10 inch-pounds.

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

- Step 6. Based on your configuration, follow the corresponding procedures to install the T-shaped heat sink that comes with processor 2.

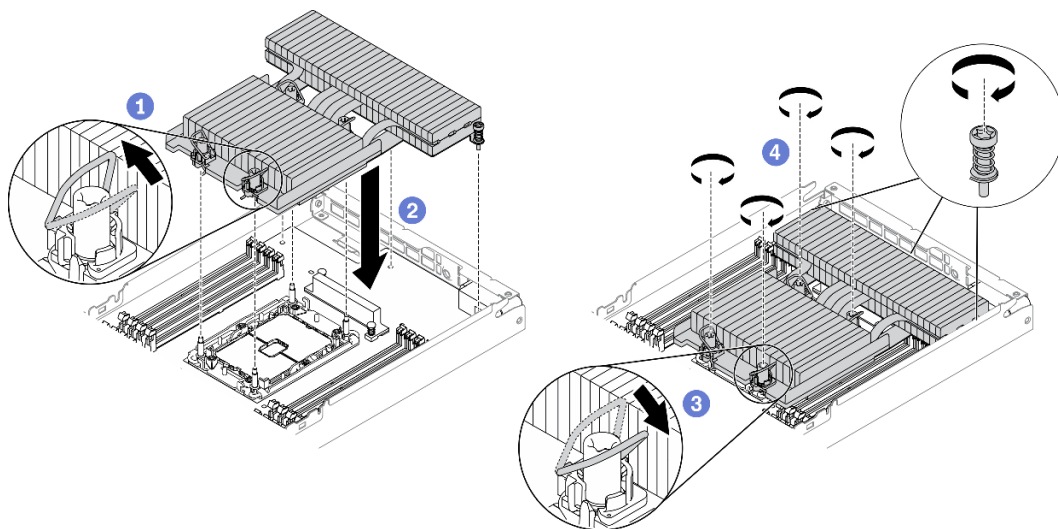


Figure 104. T-shaped heat sink installation

- a. ① For the four Torx T30 nuts, rotate the anti-tilt wire bails inward.
- b. ② Align the triangular mark and four Torx T30 nuts on the T-shaped heat sink with the triangular mark and threaded posts of the processor socket; then, insert the T-shaped heat sink into the processor socket.
- c. ③ Rotate the anti-tilt wire bails outward until they engage with the hooks in the socket.
- d. ④ Fully tighten the four Torx T30 nuts and three captive screws *in the installation sequence shown* on the T-shaped heat sink label as illustrated below. Then, visually inspect to make sure that there is no gap between the screw shoulder beneath the heat sink and the processor socket.

Note: For reference, the torque required to fully tighten or loosen the fasteners is 1.1 newton-meters, 10 inch-pounds.

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

Installation sequence: 1, 2, 3, 4, 5, 6, 7.

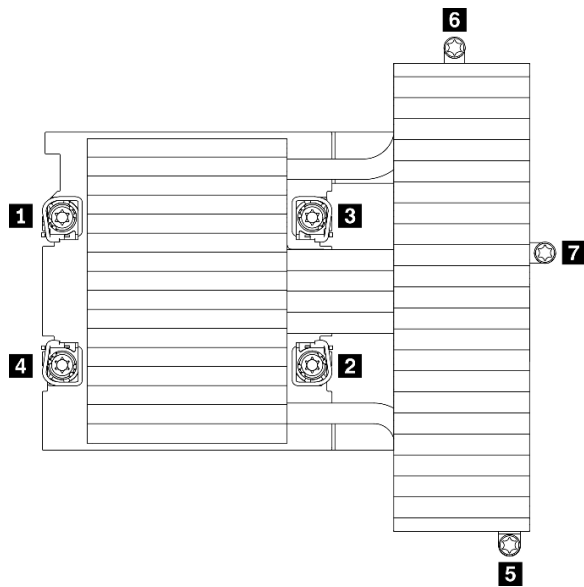


Figure 105. Torx T30 nuts and screws numbering on T-shaped heat sink label

1 2 3 4 Torx T30 nuts	5 6 7 Captive screws
------------------------------	-----------------------------

After you finish

1. Reinstall the node air baffles (see [“Install the front air baffle”](#) on page 114 and [“Install the middle air baffle”](#) on page 116).
2. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure”](#) on page 46).
3. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Heat sink Torx T30 nut replacement

Use this information to remove and install a heat sink Torx T30 nut.

Remove a heat sink Torx T30 nut

This task has instructions for removing a PEEK (Polyether ether ketone) Torx T30 nut on the heat sink.

About this task

Attention:

- Read the [“Installation Guidelines”](#) on page 39 to ensure that you work safely.
- Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.
- Do not touch the processor contacts. Contaminants on the processor contacts, such as oil from your skin, can cause connection failures.

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

Procedure

Step 1. Make preparations for this task.

- a. Turn off the corresponding compute node on which you are going to perform the task.
- b. Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure” on page 42](#)).
- c. Remove the components listed below from the compute node in the following order:
 - Node air baffles (see [“Remove the front air baffle” on page 113](#) and [“Remove the middle air baffle” on page 115](#)).
 - Processor and heat sink (see [“Remove a processor and heat sink” on page 125](#)).

Step 2. Remove the Torx T30 nut.

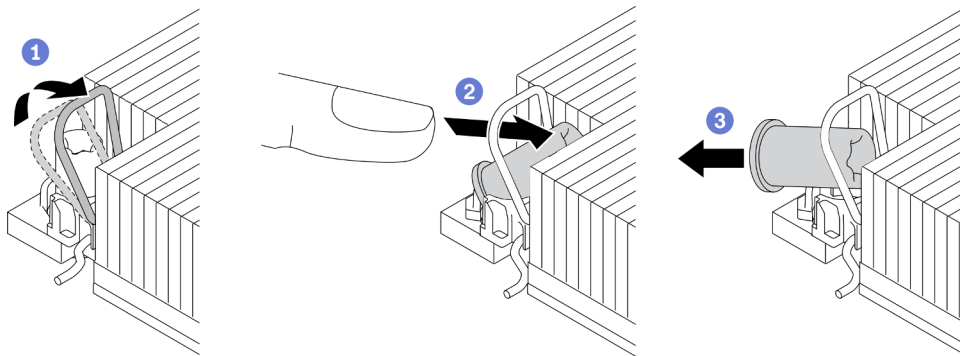


Figure 106. Removing a Torx T30 nut from the heat sink

Note: Do not touch the gold contacts on the bottom of the processor.

- a. ① Rotate the anti-tilt wire bail inwards.
- b. ② Push the upper edge of the Torx T30 nut towards the center of the heat sink until it disengages.
- c. ③ Remove the Torx T30 nut.

Attention: Visually inspect the removed Torx T30 nut, if the nut is cracked or damaged, make sure no debris or broken pieces are left inside your solution.

After you finish

1. Install a new Torx T30 nut (see [“Install a heat sink Torx T30 nut” on page 138](#)).
2. If you are instructed to return the defective component, please package the part to prevent any shipping damage. Reuse the packaging the new part arrived in and follow all packaging instructions.

Demo video

[Watch the procedure on YouTube](#)

Install a heat sink Torx T30 nut

This task has instructions for installing a PEEK (Polyether ether ketone) Torx T30 nut on the heat sink.

About this task

Attention:

- Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.
- Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.
- Do not touch the processor contacts. Contaminants on the processor contacts, such as oil from your skin, can cause connection failures.

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

Procedure

Step 1. Install the Torx T30 nut.

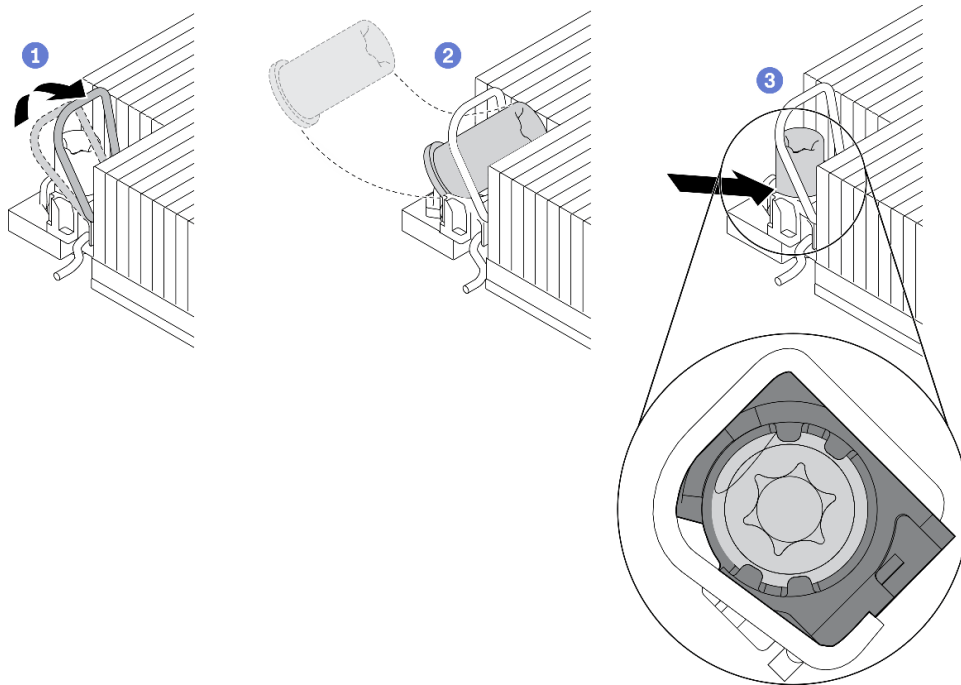


Figure 107. Installing a Torx T30 nut into the heat sink

Note: Do not touch the gold contacts on the bottom of the processor.

- a. ① Rotate the anti-tilt wire bail inwards.
- b. ② Orient the Torx T30 nut under the anti-tilt wire bail; then, align the Torx T30 nut with the socket at an angle as shown.
- c. ③ Push the lower edge of the Torx T30 nut into the socket until it clicks into place. Make sure the Torx T30 nut is secured under the four clips in the socket.

After you finish

1. Reinstall the components listed below into the compute node in the following order:
 - a. Processor and heat sink (see [“Install a processor and heat sink” on page 131](#)).

- b. Node air baffles (see [“Install the front air baffle” on page 114](#) and [“Install the middle air baffle” on page 116](#)).
2. Reinstall the compute node into the enclosure (see [“Install a compute node in the enclosure” on page 46](#)).
3. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate the node is ready to be powered on.

Demo video

[Watch the procedure on YouTube](#)

Chapter 4. Problem determination

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

Lenovo servers/solutions 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/solution encounters a potentially significant event.

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

- If you are managing the solution 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 solutions. These alerts are stored in the Lenovo XClarity Controller Event Log. If the solution is managed by the System 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://ralfss28.labs.lenovo.com:8787/help/topic/royce/pdf_files.html

Lenovo XClarity Administrator event log

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

Logs

Event Log Audit Log

The Event log provides a history of hardware and management conditions that have been detected.

Show:

All Event Sources Filter

All Actions All Dates

Severity	Serviceability	Date and Time	System	Event	System Type	Source ID
Warning	Support	Jan 30, 2017, 7:49:07 AM	Chassis114:...	Node Node 08 device	Chassis	Jan 30, 20
Warning	Support	Jan 30, 2017, 7:49:07 AM	Chassis114:...	Node Node 02 device	Chassis	Jan 30, 20
Warning	User	Jan 30, 2017, 7:49:07 AM	Chassis114:...	I/O module IO Module	Chassis	Jan 30, 20
Warning	User	Jan 30, 2017, 7:49:07 AM	Chassis114:...	Node Node 08 incom	Chassis	Jan 30, 20

Figure 108. 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

System Management Module 2 event log

The SMM2 event log contains all events received from all nodes in the enclosure. In addition, it includes events related to power and cooling.

Note: New SMM2 events are appended to the end of the event log. The log can store up to 4,096 events; you must clear the log to add additional events.

Event Log

To sort system event logs, click the 'Date/Time'.

System Event Count (Current / Maximum) 8 / 4090

Event ID	Severity	Date/Time ↓	Description
0x21070841	✔	2017-04-18 13:30:42 (UTC+0000)	NODE2_PRESENT: Slot Or Connector sensor, Informational was asserted
0x080707a5	✔	2017-04-18 13:30:42 (UTC+0000)	PS2_EPOW: Power Supply sensor, Monitor was asserted
0x080701aa	⚠	2017-04-18 13:30:42 (UTC+0000)	PSU_Policy_Lost: Power Supply sensor, transition to Non-Critical from OK was asserted
0x086f03e1	✔	2017-04-18 13:30:42 (UTC+0000)	PS2: Power Supply sensor, Power Supply input lost (AC/DC) was asserted
0x086f00e1	✔	2017-04-18 13:30:42 (UTC+0000)	PS2: Power Supply sensor, Presence detected was asserted
0x086f00e0	✔	2017-04-18 13:30:42 (UTC+0000)	PS1: Power Supply sensor, Presence detected was asserted
0x1d6f0030	✔	2017-04-18 13:30:42 (UTC+0000)	SMM_POWER_ON: System Boot Initiated sensor, Initiated by power up was asserted
0x106f0202	✔	2017-04-18 13:29:41 (UTC+0000)	EvtLogDisabled: Event Logging Disabled sensor, Log Area Reset/Cleared was asserted

Figure 109. SMM2 event log

Lenovo XClarity Controller event log

The Lenovo XClarity Controller monitors the physical state of the solution 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 solution.

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

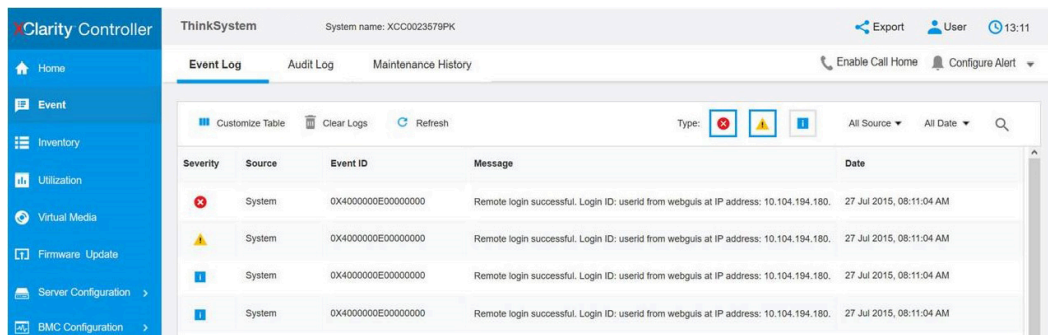


Figure 110. Lenovo XClarity Controller event log

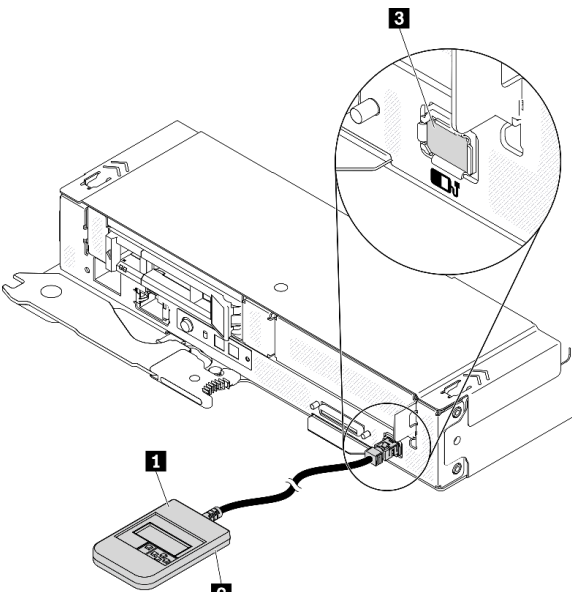
For more information about accessing the Lenovo XClarity Controller event log, see:

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

Light path diagnostics

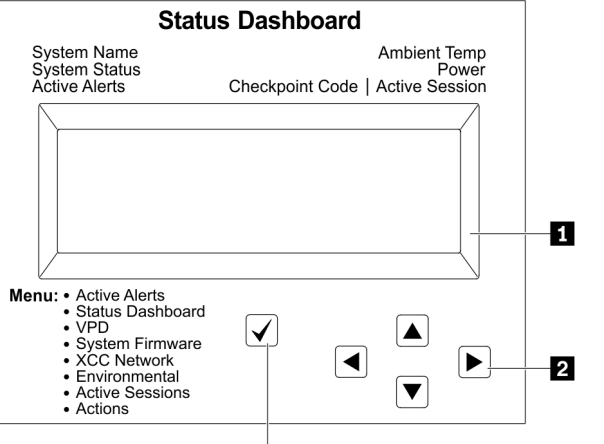
Light path diagnostics is a system of LEDs on various external and internal components of the solution that leads you to the failed component. By viewing the LEDs in a particular order, you can often identify the source of the error.

Information of failed components is often available on external LCD diagnostics handset.

Location	Callouts
<p>The external LCD diagnostics handset is connected to the compute node with an external cable.</p> 	<p>1 External LCD diagnostics handset</p> <p>2 Magnetic bottom With this component, the diagnostic handset can be attached to the top or side of the rack with hands spared for service tasks.</p> <p>3 External diagnostics connector This connector is located on the front of the compute node, and is used to connect an external LCD diagnostics handset.</p>

Display panel overview

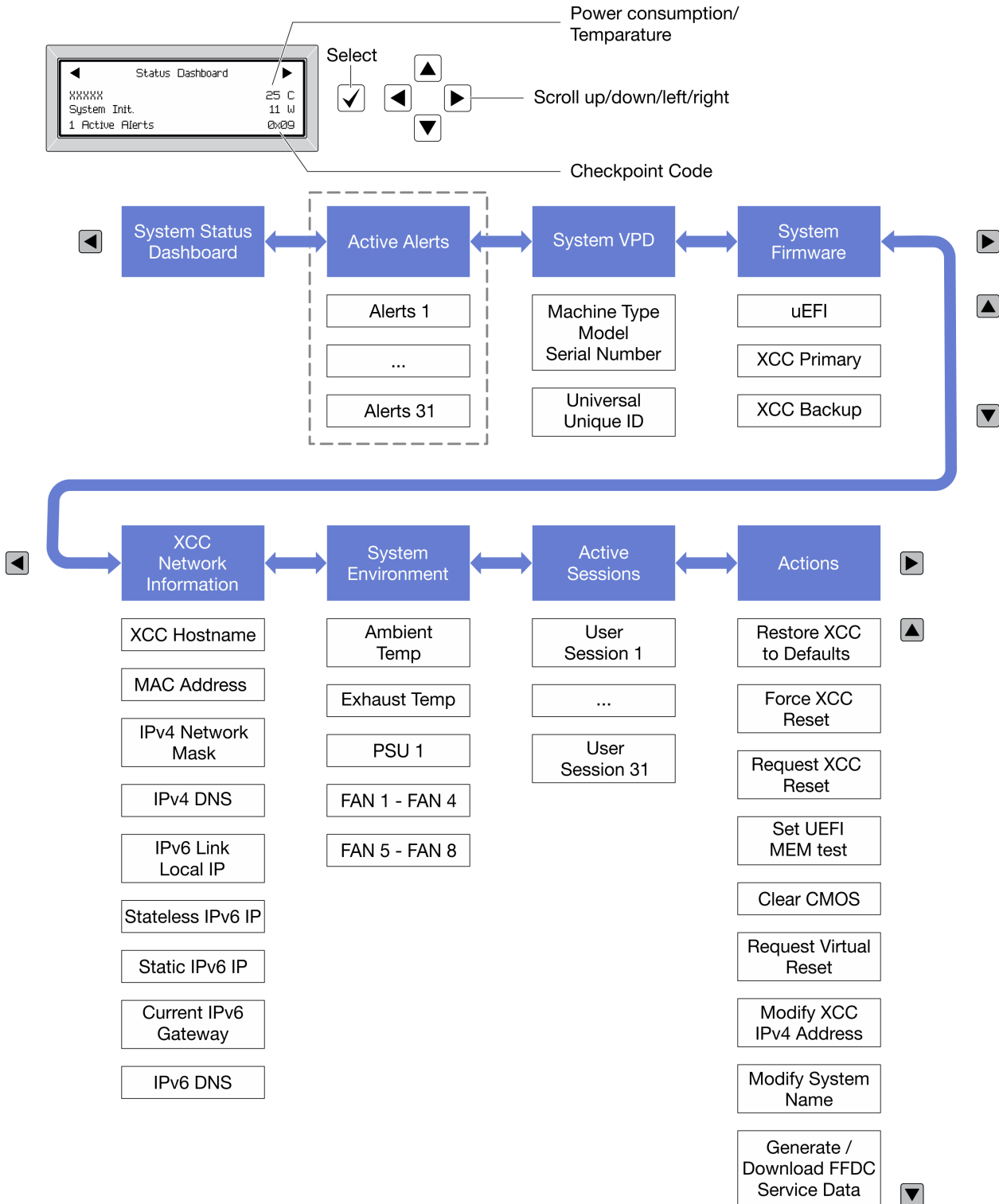
The diagnostics device consists of an LCD display and 5 navigation buttons.

	<p>1 LCD display</p> <p>2 Scroll buttons (up/down/left/right) Press the scroll buttons to locate and select system information.</p> <p>3 Select button Press the select button to select from the options in the menu.</p>
---	---

Option flow diagram

The LCD panel displays various system information. Navigate through the options with the scroll keys.

Depending on the model, the options and entries on the LCD display might be different.



Power supply LEDs

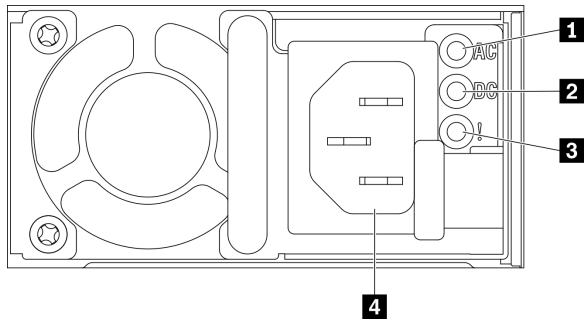


Figure 111. Power supply LEDs and connectors

1 Input (AC) power LED (green)	3 Power supply error LED (yellow)
2 Output (DC) power LED (green)	4 Power cord connector

The following table describes the problems that are indicated by various combinations of the power supply LEDs on an AC power supply and suggested actions to correct the detected problems.

AC power supply LEDs			Description	Action	Notes
AC	DC	Error (!)			
On	On/ Blinking	Off	Normal operation.		When the DC LED is blinking at the 4Hz rate, the power supply is at zero-output mode, i.e. no DC power output from this power supply.
Off	Off	Off	No AC power to the solution or a problem with the AC power source.	<ol style="list-style-type: none"> 1. Check the AC power to the solution. 2. Make sure that the power cord is connected to a functioning power source. 3. Restart the solution. If the error remains, check the power supply LEDs. 4. If the problem remains, replace the power supply. 	This is a normal condition when no AC power is present.
Off	Off	On	The power supply has failed.	Replace the power supply.	
Off	On/ Blinking	Off	The power supply has failed.	Replace the power supply.	
Off	On/ Blinking	On	The power supply has failed.	Replace the power supply.	

On	Off	Off	Power-supply not fully seated, faulty system board, or the power supply has failed.	<ol style="list-style-type: none"> 1. Reseat the power supply. 2. Use the Power Configurator utility to ensure current system power consumption is under limitation. 3. Check the error LEDs on the system board and the Lenovo XClarity Controller error messages. 	Typically indicates a power supply is not fully seated.
On	Off	On	The power supply has failed.	Replace the power supply.	
On	On/ Blinking	On	The power supply has failed.	Replace the power supply.	

System-board LEDs

The following illustration shows the light-emitting diodes (LEDs) on the system board.

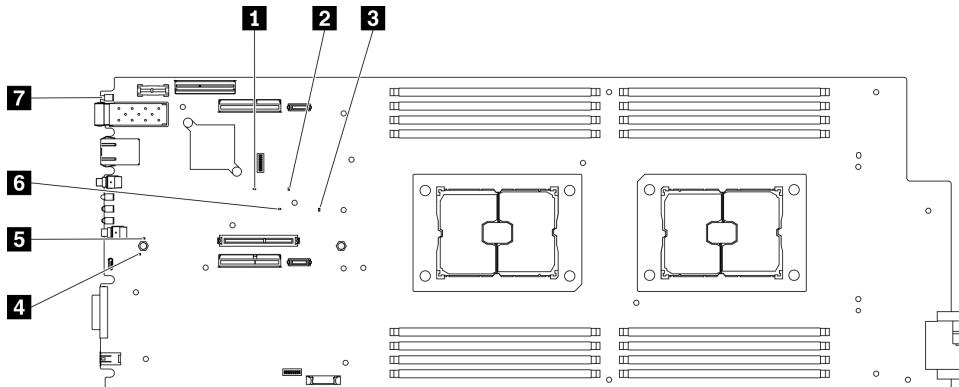


Figure 112. System-board LEDs

Table 16. System board LEDs and behaviors

LED	Behaviors & descriptions
1 XCC image invalid LED (yellow)	<ul style="list-style-type: none"> • On: XCC image security check failed. • Off: XCC image security check passed
2 FPGA image valid LED (green)	<ul style="list-style-type: none"> • On: FPGA image security check passed. • Off: FPGA image security check failed.
3 SEP heartbeat LED (green)	<ul style="list-style-type: none"> • Blinking: SEP is functioning. • On: SEP is malfunctioning. • Off: SEP is malfunctioning.
4 ME heartbeat LED (green)	<ul style="list-style-type: none"> • Blinking: PCH ME is functioning. • On: PCH ME is malfunctioning. • Off: PCH ME is malfunctioning.

Table 16. System board LEDs and behaviors (continued)

LED	Behaviors & descriptions
5 XCC heartbeat LED (green)	<ul style="list-style-type: none"> • Blinking slowly: XCC is functioning. • Blinking rapidly and constantly: XCC is malfunctioning. • On: XCC is malfunctioning. • Off: XCC is malfunctioning.
6 UEFI image valid LED (green)	<ul style="list-style-type: none"> • On: UEFI flash contents security check passed. • Off: UEFI flash contents security check failed.
7 Network activity LED (green, visible from front view)	<ul style="list-style-type: none"> • Blinking: There are on-going network activities. • On: Network is established, while there is no activity. • Off: There is no established network.

General problem determination procedures

Use the information in this section to resolve problems if the event log does not contain specific errors or the solution 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 solution.
2. Make sure that the solution 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 solution each time you remove or disconnect a device.
 - Any external devices.
 - Surge-suppressor device (on the solution).
 - Printer, mouse, and non-Lenovo devices.
 - Each adapter.
 - Hard disk drives.
 - Memory modules until you reach the minimum configuration that is supported for the solution.

Note: To determine the minimum configuration for your solution, see [“Enclosure specifications” on page 1](#).

4. Power on the solution.

If the problem is solved when you remove an adapter from the compute node, 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 compute node passes all system tests, suspect a network cabling problem that is external to the node.

Resolving suspected power problems

Power problems can be difficult to solve. For example, a short circuit can exist anywhere on any of the power distribution buses. Usually, a short circuit will cause the power subsystem to shut down because of an overcurrent condition.

Complete the following steps to diagnose and resolve a suspected power problem.

Step 1. Check the event log and resolve any errors related to the power.

Note: Start with the event log of the application that is managing the solution. For more information about event logs, see [“Event logs” on page 141](#)

Step 2. Check for short circuits, for example, if a loose screw is causing a short circuit on a circuit board.

Step 3. Remove the adapters and disconnect the cables and power cords to all internal and external devices until the solution is at the minimum configuration that is required for the solution to start. See [“Enclosure specifications” on page 1](#) to determine the minimum configuration for your solution.

Step 4. Reconnect all ac power cords and turn on the solution. If the solution starts successfully, reseal the adapters and devices one at a time until the problem is isolated.

If the solution does not start from the minimum configuration, see [“Power supply LEDs” on page 145](#) to replace the components in the minimum configuration one at a time until the problem is isolated.

Resolving suspected Ethernet controller problems

The method that you use to test the Ethernet controller depends on which operating system you are using. See the operating-system documentation for information about Ethernet controllers, and see the Ethernet controller device-driver readme file.

Complete the following steps to attempt to resolve suspected problems with the Ethernet controller.

Step 1. Make sure that the correct device drivers, which come with the solution are installed and that they are at the latest level.

Step 2. Make sure that the Ethernet cable is installed correctly.

- The cable must be securely attached at all connections. If the cable is attached but the problem remains, try a different cable.
- Make sure that the cable rating is applicable for the network speed selected. For example, an SFP+ cable is only suitable for 10G operation. An SFP25 cable is needed for 25G operation. Likewise for Base-T operation, a CAT5 cable is required for 1G Base-T operation while a CAT6 cable is required for 10G Base-T operation.

Step 3. Set both the adapter port and the switch port to auto-negotiation. If auto-negotiation is not supported on one of the ports, try configuring both ports manually to match each other.

Step 4. Check the Ethernet controller LEDs on the server. These LEDs indicate whether there is a problem with the connector, cable, or hub.

Although some adapters may vary, when installed vertically the adapter link LED is typically on the left of the port and the activity LED is typically on the right.

- The Ethernet link status LED is lit when the Ethernet controller receives a link indication from the switch. If the LED is off, there might be a defective connector or cable or a problem with the switch.
- The Ethernet transmit/receive activity LED is lit when the Ethernet controller sends or receives data over the Ethernet network. If the Ethernet transmit/receive activity is off, make sure that the hub and network are operating and that the correct device drivers are installed.

Step 5. Check the Network activity LED on the rear of the server. The Network activity LED is lit when data is active on the Ethernet network. If the Network activity LED is off, make sure that the hub and network are operating and that the correct device drivers are installed.

Step 6. Check for operating-system-specific causes of the problem, and also make sure that the operating system drivers are installed correctly.

Step 7. Make sure that the device drivers on the client and solution are using the same protocol.

If the Ethernet controller still cannot connect to the network but the hardware appears to be working, the network administrator must investigate other possible causes of the error.

Troubleshooting by symptom

See this section 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 solution and follow the suggested actions to resolve any event codes.
 - If you are managing the solution from the Lenovo XClarity Administrator, begin with the Lenovo XClarity Administrator event log.
 - If you are managing the solution from the System Management Module 2, begin with the System 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 141](#))

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 175](#)).

Drive problems

See this section to resolve issues related to the drives.

- [“Solution cannot recognize a drive” on page 149](#)
- [“Multiple drives fail” on page 150](#)
- [“Multiple drives are offline” on page 150](#)
- [“A replacement drive does not rebuild” on page 150](#)
- [“Green drive activity LED does not represent actual state of associated drive” on page 151](#)
- [“Yellow drive status LED does not represent actual state of associated drive” on page 151](#)
- [“Not all drives are recognized” on page 151](#)
- [“Solution stops responding during drive stress test” on page 151](#)
- [“A drive has failed with yellow LED lit” on page 151](#)
- [“A newly installed drive is not recognized.” on page 151](#)

Solution cannot recognize a drive

Complete the following procedure to solve the problem.

1. Observe the associated yellow drive status LED. If the LED is lit, it indicates a drive fault.
2. If the LED is lit, remove the drive from the bay, wait 45 seconds, and reinsert the drive, making sure that the drive assembly connects to the drive backplane.
3. Observe the associated green drive activity LED and the yellow status LED:
 - 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 solution and press the key specified in the on-screen instructions, the Lenovo XClarity Provisioning

Manager interface is displayed by default. You can perform hard drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → Disk Drive Test**.

- If the green activity LED is flashing and the yellow status LED is flashing slowly, the drive is recognized by the controller and is rebuilding.
 - If neither LED is lit or flashing, check the drive backplane.
 - 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 drive problems. If the activity of the LEDs changes, return to step 1.
4. Make sure that the drive backplane is correctly seated. When it is correctly seated, the drive assemblies correctly connect to the backplane without bowing or causing movement of the backplane.
 5. Reseat the backplane power cable and repeat steps 1 through 3.
 6. Reseat the backplane signal cable and repeat steps 1 through 3.
 7. Suspect the backplane signal cable or the backplane:
 - Replace the affected backplane signal cable.
 - Replace the affected backplane.
 8. Run the diagnostics tests for the SAS/SATA adapter and hard disk drives. When you start a solution and press the key according to the on-screen instructions, the LXPM interface is displayed by default. (For more information, see the “Startup” section in the LXPM documentation compatible with your solution 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**.

Depending on the LXPM version, you may see **HDD test** or **Disk Drive Test**.

Based on those tests:

- If the adapter passes the test but the drives are not recognized, replace the backplane signal cable and run the tests again.
- Replace the backplane.
- If the adapter fails the test, disconnect the backplane signal cable from the adapter and run the tests again.
- If the adapter fails the test, replace the adapter.

Multiple drives fail

Complete the following procedure to solve the problem.

- 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 solution are at the latest level

Multiple drives are offline

Complete the following procedure to solve the problem.

- View the Lenovo XClarity Controller event log for events related to power supplies or vibration issues and resolve those events.
- View the storage subsystem log for events related to the storage subsystem and resolve those events.

A replacement drive does not rebuild

Complete the following procedure to solve the problem.

1. Make sure that the drive is recognized by the adapter (the green drive activity LED is flashing).

2. Review the SATA RAID adapter documentation to determine the correct configuration parameters and settings.

Green drive activity LED does not represent actual state of associated drive

Complete the following procedure to solve the problem.

1. If the green 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 solution and press the key specified in the on-screen instructions, the Lenovo XClarity Provisioning Manager interface is displayed by default. You can perform hard drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → Disk Drive Test**
2. If the drive passes the test, replace the backplane.
3. If the drive fails the test, replace the drive.

Yellow drive status LED does not represent actual state of associated drive

Complete the following procedure to solve the problem.

1. Turn off the solution.
2. Reseat the SATA adapter.
3. Reseat the backplane signal cable and backplane power cable.
4. Reseat the drive.
5. Power on the solution and observe the activity of the drive LEDs.

Not all drives are recognized

Complete the following procedure to solve the problem.

1. Set up RAID configuration before you run the drive stress test.
2. Remove the drive that is not recognized (see [“Remove a hot-swap solid-state drive” on page 85](#)); then, run the Lenovo XClarity Provisioning Manager drive test.
3. Make sure all installed drives are recognized.

Solution stops responding during drive stress test

Complete the following procedure to solve the problem.

1. Set up RAID configuration before you run the drive stress test.
2. Remove the drive that was being tested when the solution stopped responding (see [“Remove a hot-swap solid-state drive” on page 85](#)), and run the diagnostics again.

A drive has failed with yellow LED lit

Complete the following procedure to solve the problem.

1. Check the Lenovo XClarity Controller event log for drive events and resolve the problem.

A newly installed drive is not recognized.

Complete the following procedure to solve the problem.

1. Set up RAID configuration.
2. Check the Lenovo XClarity Controller event log, and resolve related errors if found any.
3. If the LED is lit, remove the drive from the drive bay, wait 45 seconds, and reinsert the drive. Make sure that the drive assembly connects to the drive backplane.

4. Observe the associated green drive activity LED and the yellow status LED:
 - 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 Lenovo XClarity Provisioning Manager drive test to determine whether the drive is detected (see <https://sysmgt.lenovofiles.com/help/topic/LXPM/diagnostics.html>).
 - 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 the drive backplane.
 - If the green activity LED is flashing and the yellow status LED is lit, replace the drive. If the activity of the LEDs remain the same, go to step
5. If the activity of the LEDs changes, return to step 1. 5. Make sure that a drive backplane is present to install the drive into.
6. Make sure that the drive backplane is correctly seated. When it is correctly seated, the drive assemblies would be correctly connected to the backplane without bowing or causing movement of the backplane.
7. Reseat the backplane power cable and repeat step 1 to step 3.
8. Reseat the backplane signal cable and repeat step 1 to sept 3.
9. Suspect the backplane signal cable or the backplane:
 - a. Replace the affected backplane signal cable.
 - b. Replace the affected backplane.
10. (Trained service technician only) Replace the system board.

Fan problems

See this section to resolve issues related the to fans.

- [“Abnormally high RPM \(revolutions per minute\)” on page 152](#)

Abnormally high RPM (revolutions per minute)

Complete the following procedure to solve the problem.

1. Check to see if the system inlet perforation or heat sinks are clogged.
2. Make sure that all air baffles are correctly installed in the solution.
3. Check the thermal grease on the processor , and make sure it's not contaminated.

Intermittent problems

See this section to solve intermittent problems.

- [“Intermittent external device problems” on page 152](#)
- [“Intermittent KVM problems” on page 153](#)
- [“Intermittent unexpected reboots” on page 153](#)

Intermittent external device problems

Complete the following procedure to solve the problem.

1. Make sure that the correct device drivers are installed. See the manufacturer's website for documentation.
2. For a USB device:

- a. Make sure that the device is configured correctly.

Restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your solution 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 procedure to solve the problem.

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

Complete the following procedure to solve the problem.

Note: Some uncorrectable errors require that the solution reboot so that it can disable a device, such as a memory DIMM or a processor to allow the machine to boot up properly.

1. See the management controller event log to check for an event code that indicates a reboot. See “[Event logs](#)” on [page 141](#) for information about viewing the event log.

Keyboard, mouse, or USB-device problems

See this section to solve problems related to a keyboard, mouse, or USB device.

- “[All or some keys on the keyboard do not work.](#)” on [page 153](#)
- “[Mouse does not work.](#)” on [page 154](#)
- “[USB-device does not work.](#)” on [page 154](#)

All or some keys on the keyboard do not work.

1. Make sure that:
 - The keyboard cable is securely connected.
 - The solution and the monitor are turned on.
2. If you are using a USB keyboard, run the Setup utility and enable keyboardless operation.
3. If you are using a USB keyboard and it is connected to a USB hub, disconnect the keyboard from the hub and connect it directly to the solution.
4. Replace the keyboard.

Mouse does not work.

1. Make sure that:
 - The mouse cable is securely connected to the solution.
 - The mouse device drivers are installed correctly.
 - The solution and the monitor are turned on.
 - The mouse option is enabled in the Setup utility.
2. If you are using a USB mouse and it is connected to a USB hub, disconnect the mouse from the hub and connect it directly to the solution.
3. Try to install the USB mouse into a different USB port if available.
4. Replace the mouse.

USB-device does not work.

1. Make sure that:
 - The correct USB device driver is installed.
 - The operating system supports USB devices.
2. Make sure that the USB configuration options are set correctly in system setup.

Restart the solution and press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager system setup interface. Then, click **System Settings → Devices and I/O Ports → USB Configuration**.

3. If you are using a USB hub, disconnect the USB device from the hub and connect it directly to the solution.

Memory problems

See this section to resolve issues related to memory.

- [“Displayed system memory is less than installed physical memory” on page 154](#)
- [“Multiple memory modules in a channel identified as failing” on page 155](#)
- [“Invalid memory population detected” on page 155](#)

Displayed system memory is less than installed physical memory

Complete the following procedure to solve the problem.

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

1. Make sure that:
 - No error LEDs are lit on the operator information panel.
 - No memory module error LEDs are lit on the system board.
 - Memory mirrored channel does not account for the discrepancy.
 - The memory modules are seated correctly.
 - You have installed the correct type of memory module.
 - After changing or replacing a memory module, memory configuration is updated accordingly in the Setup Utility.
 - All banks of memory are enabled. The solution might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.
 - There is no memory mismatch when the solution is at the minimum memory configuration.

2. Reseat the memory modules, and then restart the solution.
3. Check the POST error log:
 - If a memory module was disabled by a systems-management interrupt (SMI), replace the memory module.
 - If a memory module was disabled by the user or by POST, reseat the memory module; then, run the Setup utility and enable the memory module.
4. Re-enable all memory modules using the Setup utility, and then restart the solution.
5. (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.
6. (Trained technician only) Replace the system board.

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.

Complete the following procedure to solve the problem.

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.

Invalid memory population detected

If this warning message appears, complete the following steps:

Invalid memory population (unsupported DIMM population) detected. Please verify memory configuration is valid.

1. See “Memory module installation guidelines” in *Setup Guide* to make sure the present memory module population sequence is supported.
2. If the present sequence is indeed supported, see if any of the modules is displayed as “disabled” in Setup Utility.
3. Reseat the module that is displayed as “disabled,” and reboot the system.
4. If the problem persists, replace the memory module that is displayed as “disabled.”

Monitor and video problems

See this section to solve problems related to a monitor or video.

- [“Incorrect characters are displayed” on page 156](#)

- [“Screen is blank” on page 156](#)
- [“Screen goes blank when you start some application programs” on page 156](#)
- [“The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.” on page 156](#)
- [“The wrong characters appear on the screen” on page 157](#)
- [“Management controller remote presence cannot work” on page 157](#)

Incorrect characters are displayed

Complete the following steps:

1. Verify that the language and locality settings are correct for the keyboard and operating system.
2. If the wrong language is displayed, update the solution firmware to the latest level. See [“Firmware updates” on page 6](#).

Screen is blank

1. If the solution is attached to a KVM switch, bypass the KVM switch to eliminate it as a possible cause of the problem: connect the monitor cable directly to the correct connector on the solution.
2. If the solution installed with the graphical adapters while turning on the solution, the Lenovo logo displays on the screen after approximately 3 minutes. This is normal operation while the system loads.
3. Make sure that:
 - The solution is turned on and there is power supplied to the solution.
 - The monitor cables are connected correctly.
 - The monitor is turned on and the brightness and contrast controls are adjusted correctly.
4. Make sure that the correct solution is controlling the monitor, if applicable.
5. Make sure that the video output is not affected by corrupted solution firmware; see [“Firmware updates” on page 6](#).
6. If the problem remains, contact Lenovo Support.

Screen goes blank when you start some application programs

1. Make sure that:
 - The application program is not setting a display mode that is higher than the capability of the monitor.
 - You installed the necessary device drivers for the application.

The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.

1. If the monitor self-tests show that the monitor is working correctly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescents, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor.

Attention: Moving a color monitor while it is turned on might cause screen discoloration.

Move the device and the monitor at least 305 mm (12 in.) apart, and turn on the monitor.

Notes:

- a. To prevent diskette drive read/write errors, make sure that the distance between the monitor and any external diskette drive is at least 76 mm (3 in.).
 - b. Non-Lenovo monitor cables might cause unpredictable problems.
2. Reseat the monitor cable.
 3. Replace the components listed in step 2 one at a time, in the order shown, restarting the solution each time:

- a. Monitor cable
- b. Video adapter (if one is installed)
- c. Monitor
- d. (Trained technician only) System board.

The wrong characters appear on the screen

Complete the following steps until the problem is solved:

1. Verify that the language and locality settings are correct for the keyboard and operating system.
2. If the wrong language is displayed, update the solution firmware to the latest level. See [“Firmware updates” on page 6](#).

Management controller remote presence cannot work

The management controller remote presence function is unable to display the system screen when an optional video adapter is present. To use the management controller remote presence function, remove the optional video adapter or use the onboard VGA as the display device.

Network problems

See this section to resolve issues related to networking.

- [“Could not log in using LDAP account with SSL enabled” on page 157](#)
- [“Network connection is lost or with degraded performance” on page 157](#)
- [“Network settings can not be changed” on page 157](#)

Could not log in using LDAP account with SSL enabled

Complete the following procedure to solve the problem:

1. Make sure that the license key is valid.
2. Generate a new license key and log in again.

Network connection is lost or with degraded performance

Complete the following procedure to solve the problem:

1. Network connection may be lost or with degraded performance with exposure to conducted and/or radiated frequency. Take appropriate actions in this case.

Network settings can not be changed

Complete the following procedure to solve the problem:

1. Go to **Setup Utility → BMC Settings → Network Settings**, and check if the system is configured as following:
 - In **Network Interface Port**, **Dedicated** is set.
 - In **Fail-over Rule**, **Failover to Shared NIC** is set.
 - In **Failed over to Shared NIC → Network Settings**, **Independence** is set.
2. If the system is indeed configured so, go to **Setup Utility → BMC Settings → Network Settings → Network Interface Port**, and select **Shared NIC**.
3. Change network settings as you plan, and save the settings.
4. Go to **Setup Utility → BMC Settings → Network Settings → Network Interface Port**, and select **Dedicated**.

Observable problems

See this section to solve observable problems.

- “The solution immediately displays the POST Event Viewer when it is turned on” on page 158
- “Solution is unresponsive (POST is complete and operating system is running)” on page 158
- “Solution is unresponsive (POST failed and cannot start System Setup)” on page 159
- “Voltage planar fault is displayed in the event log” on page 159
- “Unusual smell” on page 159
- “Solution seems to be running hot” on page 159
- “Cannot enter legacy mode after installing a new adapter” on page 159
- “Cracked parts or cracked enclosure” on page 160

The solution immediately displays the POST Event Viewer when it is turned on

Complete the following procedure to solve the problem.

1. Correct any errors that are indicated by the light path diagnostics LEDs.
2. Make sure that the solution 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 solution, 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 solution.
5. Replace the following components one at a time, in the order shown, restarting the solution each time:
 - a. (Trained technician only) Processor
 - b. (Trained technician only) System board

Solution is unresponsive (POST is complete and operating system is running)

Complete the following procedure to solve the problem.

- If you are in the same location as the solution, 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 solution and verify that all applications are running (no applications are hung).
 3. Restart the solution.
 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 solution 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 solution from a command line.
 - a. If you are unable to get a response during a ping test, attempt to ping another solution in the enclosure to determine whether it is a connection problem or solution 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 solution 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.

Solution is unresponsive (POST failed and cannot start System Setup)

Configuration changes, such as added devices or adapter firmware updates, and firmware or application code problems can cause the solution to fail POST (the power-on self-test).

If this occurs, the solution responds in either of the following ways:

- The solution restarts automatically and attempts POST again.
- The solution hangs, and you must manually restart the solution for the solution to attempt POST again.

After a specified number of consecutive attempts (automatic or manual), the solution reverts to the default UEFI configuration and starts System Setup so that you can make the necessary corrections to the configuration and restart the solution. If the solution is unable to successfully complete POST with the default configuration, there might be a problem with the system board.

You can specify the number of consecutive restart attempts in System Setup. Restart the solution and press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager system setup interface. Then, click **System Settings** → **Recovery and RAS** → **POST Attempts** → **POST Attempts Limit**. Available options are 3, 6, 9, and disable.

Voltage planar fault is displayed in the event log

Complete the following procedure to solve the problem.

1. Revert the system to the minimum configuration. See [“Enclosure specifications” on page 1](#) for the minimally required number of processors and DIMMs.
2. Restart the system.
 - If the system restarts, add each of the items that you removed one at a time, restarting the system each time, until the error occurs. Replace the item for which the error occurs.
 - If the system does not restart, suspect the system board.

Unusual smell

Complete the following procedure to solve the problem.

1. An unusual smell might be coming from newly installed equipment.
2. If the problem remains, contact Lenovo Support.

Solution seems to be running hot

Complete the following procedure to solve the problem.

Multiple solutions or enclosures:

1. Make sure that the room temperature is within the specified range (see [“Compute node specifications” on page 3](#)).
2. Check the management processor event log for rising temperature events. If there are no events, the solution 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 enclosure

Contact Lenovo Support.

Optional-device problems

See this section to solve problems related to optional devices.

- [“External USB device not recognized” on page 160](#)
- [“PCIe adapter is not recognized or is not functioning” on page 160](#)
- [“A Lenovo optional device that was just installed does not work.” on page 160](#)
- [“A Lenovo optional device that worked previously does not work now. ” on page 161](#)

External USB device not recognized

Complete the following steps until the problem is resolved:

1. Make sure that the proper drivers are installed on the solution. See the product documentation for the USB device for information about device drivers.
2. Use the Setup utility to make sure that the device is configured correctly.
3. 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 solution.

PCIe adapter is not recognized or is not functioning

Complete the following steps until the problem is resolved:

1. Check the event log and resolve any issues related to the device.
2. Validate that the device is supported for the solution (see <https://serverproven.lenovo.com/>).
3. Make sure that the adapter is installed in a correct slot.
4. Make sure that the proper device drivers are installed for the device.
5. Resolve any resource conflicts if running legacy mode (UEFI).
6. Check <http://datacentersupport.lenovo.com> for any tech tips (also known as retain tips or service bulletins) that might be related to the adapter.
7. Ensure any adapter external connections are correct and that the connectors are not physically damaged.

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

1. Check the Lenovo XClarity Controller event log for any events associated with the device.
2. Make sure that the following conditions are met:
 - The device is installed in the correct port.
 - The device is designed for the solution (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 the Setup utility. Whenever memory or any other device is changed, you must update the configuration.
3. Reseat the device that you just installed.
 4. Replace the device that you just installed.

A Lenovo optional device that worked previously does not work now.

1. Check the Lenovo XClarity Controller event log for any events associated with the device.
2. Make sure that all of the cable connections for the device are secure.
3. Reseat the failing device.
4. If the device comes with test instructions, use those instructions to test the device.
5. If the failing device is a SCSI device, make sure that the following conditions are met:
 - The cables for all external SCSI devices are connected correctly.
 - The last device in each SCSI chain, or the end of the SCSI cable, is terminated correctly.
 - Any external SCSI device is turned on. You must turn on an external SCSI device before you turn on the solution.
6. Replace the failing device.

Power on and power off problems

See this section to resolve issues when powering on or powering off the solution.

- [“Embedded hypervisor is not in the boot list” on page 161](#)
- [“Solution does not power on” on page 161](#)
- [“Solution does not power off” on page 162](#)
- [“Unexpected shutdown with LED not lit” on page 163](#)

Embedded hypervisor is not in the boot list

Complete the following steps until the problem is resolved:

1. Make sure that the optional embedded hypervisor flash device is selected on the boot manager <F12> Select Boot Device at startup.
2. Make sure that the embedded hypervisor flash device is seated in the connector correctly.
3. See the documentation that comes with the optional embedded hypervisor flash device to validate that the device is configured correctly.
4. Make sure that other software works on the server.

Solution does not power on

Complete the following steps until the problem is resolved:

Note: The power-control button will not function until approximately 5 to 10 seconds after the solution has been connected to power.

1. Make sure that the power-control button is working correctly:
 - a. Disconnect the solution power cords.
 - b. Reconnect the power cords.
 - c. (Trained technician only) Reseat the operator information panel cable, and then repeat steps 1a and 1b.

- (Trained technician only) If the solution starts, reseal the operator information panel. If the problem remains, replace the operator information panel.
 - If the solution does not start, bypass the power-control button by using the force power-on jumper. If the solution starts, reseal the operator information panel. If the problem remains, replace the operator information panel.
2. Make sure that the reset button is working correctly:
 - a. Disconnect the solution power cords.
 - b. Reconnect the power cords.
 - c. (Trained technician only) Reseat the operator information panel cable, and then repeat steps 2a and 2b.
 - (Trained technician only) If the solution starts, replace the operator information panel.
 - If the solution does not start, go to step 3.
 3. Make sure that both power supplies installed in the solution are of the same type. Mixing different power supplies in the solution will cause a system error (the system-error LED on the front panel turns on).
 4. Make sure that:
 - The power cords are correctly connected to the solution and to a working electrical outlet.
 - The type of memory that is installed is correct.
 - The DIMMs are fully seated.
 - The LEDs on the power supply do not indicate a problem.
 - The processors are installed in the correct sequence.
 5. Reseat the following components:
 - a. Operator information panel connector
 - b. Power supplies
 6. Replace the following components. restarting the solution each time:
 - a. Operator information panel connector
 - b. Power supplies
 7. If you just installed an optional device, remove it, and restart the solution. If the solution now starts, you might have installed more devices than the power supplies support.
 8. See “[Power supply LEDs](#)” on page 145.
 9. If the error recurs, check FFDC logs for more details.

Notes: To collect FFDC logs, you can perform one of the following actions:

- Insert a USB storage device to the USB connector on SMM2 and then press the USB port service mode button to collect FFDC logs. See “[System Management Module 2 \(SMM2\)](#)” on page 25 for the location of the connector and button.
- Login to the SMM2 WebGUI and click on the **Capture** button of FFDC in the **Management Module** section under **Enclosure Rear Overview** (see “Enclosure Rear Overview” in *System Management Module 2 User Guide* https://thinksystem.lenovofiles.com/help/topic/mgt_tools_smm2/c_chassis_rear_overview.html?cp=3_4_2_2_0_1).

Solution does not power off

Complete the following steps until the problem is resolved:

1. Determine whether you are using an Advanced Configuration and Power Interface (ACPI) or a non-ACPI operating system. If you are using a non-ACPI operating system, complete the following steps:
 - a. Press Ctrl+Alt+Delete.
 - b. Turn off the solution by pressing the power-control button and holding it down for 5 seconds.

- c. Restart the solution.
 - d. If the solution fails POST and the power-control button does not work, disconnect the power cord for 20 seconds; then, reconnect the power cord and restart the solution.
2. If the problem remains or if you are using an ACPI-aware operating system, suspect the system board.

Unexpected shutdown with LED not lit

Complete the following steps until the problem is resolved:

1. Check the Lenovo XClarity Controller event log, and resolve related errors if found any.
2. Reseat power supply.
3. If the error recurs, replace power supply.

Processor problems

See this section to solve problems related to a monitor or video.

- [“The solution goes directly to the POST event viewer when it is turned on.” on page 163](#)

The solution goes directly to the POST event viewer when it is turned on.

1. Check the light path diagnostics LEDs and the Lenovo XClarity Controller event log, and resolve any errors that have occurred.
2. Make sure that the solution 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 solution, 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 solution.
5. Replace the following components one at a time, in the order shown, restarting the solution each time:
 - a. (Trained technician only) Processor
 - b. (Trained technician only) System board

Serial-device problems

See this section to solve problems with serial ports or devices.

- [“Number of displayed serial ports is less than the number of installed serial ports” on page 163](#)
- [“Serial device does not work” on page 163](#)

Number of displayed serial ports is less than the number of installed serial ports

Complete the following procedure to solve the problem.

1. Make sure that:
 - Each port is assigned a unique address in the Setup utility and none of the serial ports is disabled.
 - The serial-port adapter (if one is present) is seated correctly
2. Reseat the serial port adapter.
3. Replace the serial port adapter.

Serial device does not work

Complete the following procedure to solve the problem.

1. Make sure that:

- The device is compatible with the solution.
 - The serial port is enabled and is assigned a unique address.
 - The device is connected to the correct connector.
2. Reseat the following components:
 - a. Failing serial device.
 - b. Serial cable.
 3. Replace the following components:
 - a. Failing serial device.
 - b. Serial cable.
 4. (Trained technician only) Replace the system board.

Software problems

See this section to solve software problems.

1. To determine whether the problem is caused by the software, make sure that:
 - The solution 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 solution might have a memory-address conflict.

 - The operating system is on the ServerProven list (see <https://serverproven.lenovo.com/>) and supported by your hardware.
 - The software is designed to operate on the solution.
 - Other software works on the solution.
 - The software works on another solution.
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. Check the operating system logs for any events related to your software and attempt to resolve them.
4. Contact your place of purchase of the software.

System Management Module 2 problems

Use this information to resolve issues related the to the System Management Module 2.

- [“System Management Module 2 does not power on” on page 164](#)
- [“System Management Module 2 status LED is not flashing normally” on page 164](#)
- [“System Management Module 2 ping failure” on page 165](#)
- [“System fans failed while the System Management Module 2 is working normally” on page 165](#)

System Management Module 2 does not power on

Complete the following steps until the problem is resolved:

1. Check if the power supplies are installed correctly and power supply LEDs are lit normally.
2. Reseat the SMM2 and check the LED status again.
3. If the problem persists, replace the SMM2.

System Management Module 2 status LED is not flashing normally

When the SMM2 is working, its status LED flashes at a slower speed (about once every two seconds).

If the SMM2 status LED is continuously on or off, or it has been flashing rapidly (two or 10 times per second) for more than 15 minutes, it indicates that the SMM2 may have encountered a problem.

Complete the following steps until the problem is resolved:

1. Reseat the SMM2.
2. If the problem persists, replace the SMM2.

System Management Module 2 ping failure

Complete the following steps until the problem is solved.

1. Check the SMM2 IP address and network status via Lenovo XClarity Controller.
2. Alternatively, you can check SMM2 LEDs to diagnose the SMM2 status (see “[System Management Module 2 \(SMM2\)](#)” on page 25 for SMM2 LEDs details).
 - If the SMM2 power LED and the status LED are working abnormally, reinstall the SMM2.
3. If the problem persists, replace the SMM2.

System fans failed while the System Management Module 2 is working normally

Complete the following steps until the problem is solved.

1. Check SMM2 FFDC and SNMP event logs to see if there is any fan fault or absence issue.

Notes: To collect FFDC logs, you can perform one of the following actions:

- Insert a USB storage device to the USB connector on SMM2 and then press the USB port service mode button to collect FFDC logs. See “[System Management Module 2 \(SMM2\)](#)” on page 25 for the location of the connector and button.
 - Login to the SMM2 WebGUI and click on the **Capture** button of FFDC in the **Management Module** section under **Enclosure Rear Overview** (see “Enclosure Rear Overview” in *System Management Module 2 User Guide* at https://thinksystem.lenovofiles.com/help/topic/mgt_tools_smm2/c_chassis_rear_overview.html?cp=3_4_2_2_0_1).
2. If there is a fan fault or absence issue, reseat the failing fans.
 3. Check the SMM2 FFDC and SNMP event logs to see if there is any compute node communication issue.

Note: To protect the compute node from thermal damages, the SMM2 is designed to ramp up all system fans if the compute node lost its communication with the SMM2.

- If the problem persists, reset Lenovo XClarity Controller and login to Lenovo XClarity Controller to collect FFDC logs and check if there is any warning or error reported.
4. If the problem persists, please consult with the technical service.

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 recycle

Follow the instructions in this section to disassemble the compute node for recycle.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

- Step 1. Make preparations for this task.
- Turn off the corresponding compute node on which you are going to perform the task.
 - Remove the compute node from the enclosure (see [“Remove a compute node from the enclosure” on page 42](#)).

- Step 2. Remove all of the existing components from the compute node and install them into the replacement compute node (see [“Replace a defective compute node” on page 44](#)).

Note: Make sure to install the drives and memory modules to their corresponding drive bay or slot in the replacement compute node.

- Step 3. Remove the CMOS battery (see [“Remove the CMOS battery \(CR2032\)” on page 81](#)).

- Step 4. Remove the two M.2 backplane guide pins with a screwdriver.

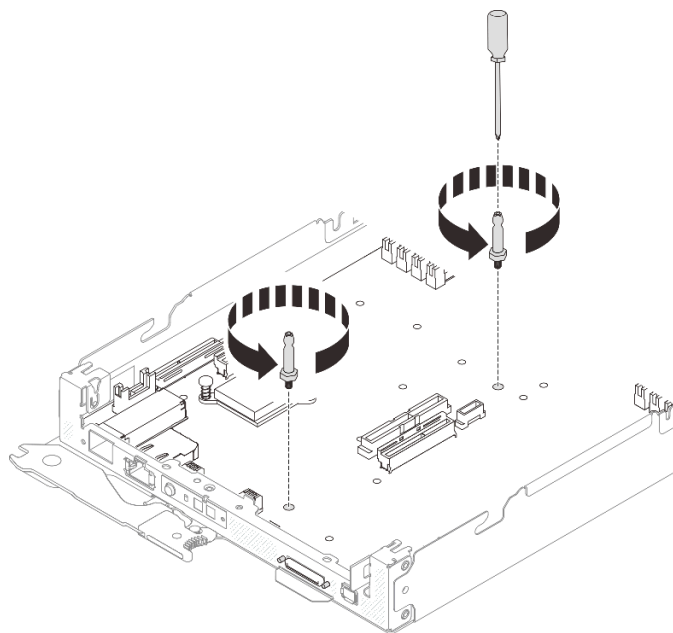


Figure 113. M.2 backplane guide pins removal

- Step 5. Remove the following 14 screws that secure the system board to the compute node tray.

- Twelve Phillips #1 screws on the system board (with a torque screwdriver set to the proper torque).

Note: For reference, the torque required to fully loosen or tighten the screws is 0.5-0.6 newton-meters, 4.5-5.5 inch-pounds.

- Two jackscrews on the front of the compute node tray.

Notes:

- Use a 2.5x0.4mm flat head screwdriver to remove and install jackscrews.
- For reference, the torque required to fully loosen or tighten the jackscrews is 0.059 newton-meters, 0.52 inch-pounds.

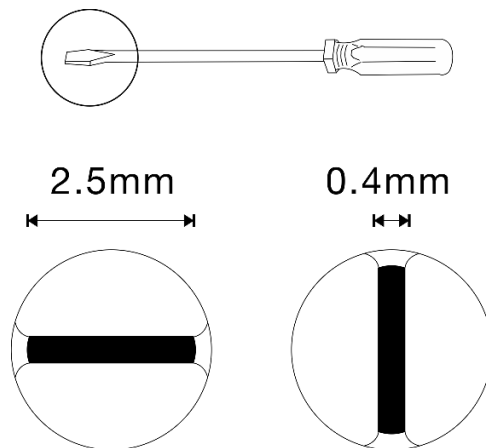


Figure 114. 2.5x0.4mm flat head screwdriver

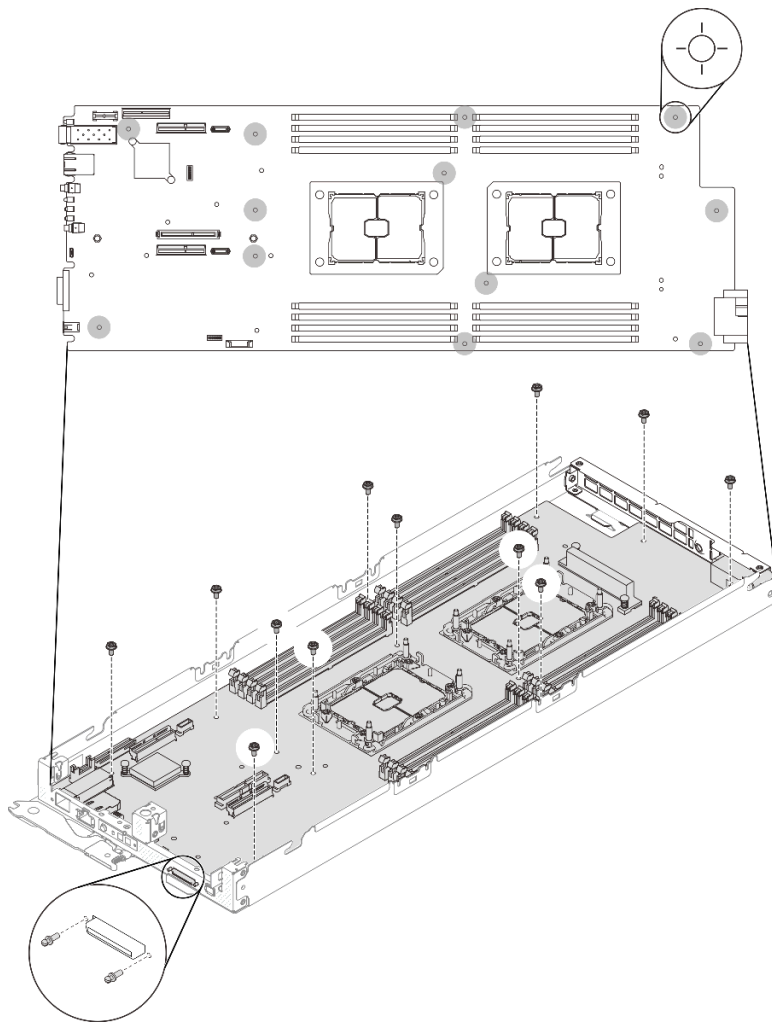


Figure 115. Screws removal

Step 6. Remove the two screws that secure the rear bracket; then, remove the bracket from the compute node tray.

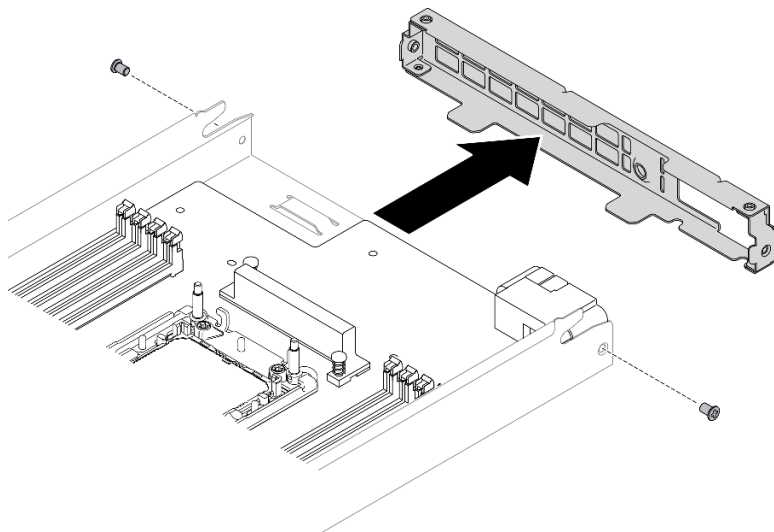


Figure 116. Rear bracket removal

Step 7. Tilt the system board at an angle and gently slide the system board backwards and lift it out of the compute node tray.

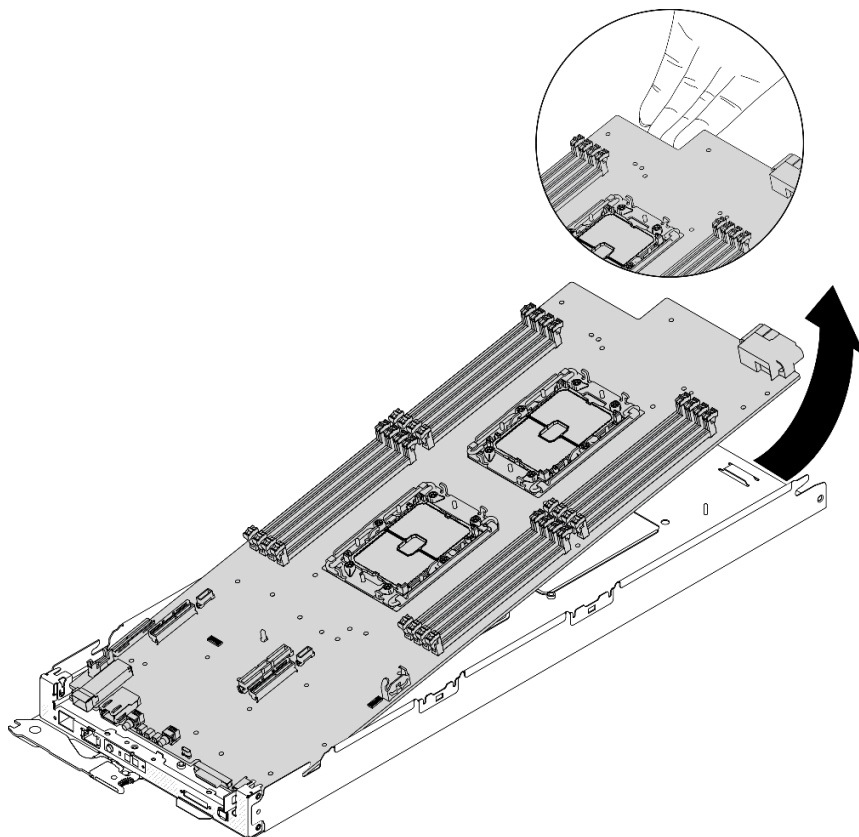


Figure 117. Disassembling the compute node

After you finish

After disassembling the compute node, comply with local regulations when recycling it.

Disassemble the enclosure for recycle

Follow the instructions in this section to disassemble the enclosure for recycle.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

Step 1. Make preparations for this task.

- a. Turn off the solution and peripheral devices and disconnect the power cords and all external cables (see [“Power off the compute node” on page 11](#)).
- b. If the solution is installed in a rack, remove the solution from the rack (see [“Remove the server/solution from the rails” in *Rack Installation Guide*](#)[Remove the server/solution from the rails](#)).

CAUTION:

To avoid a drop hazard, slide the enclosure out of the rack slowly and steadily. Make sure to grip the enclosure with both hands when pulling it forward on the slide rails and lifting it out of the rack. Use safe practices when lifting.

Step 2. Remove all of the compute nodes (see [“Remove a compute node from the enclosure” on page 42](#)).

Step 3. Remove the power supplies (see [“Remove a hot-swap power supply” on page 61](#)).

Step 4. Remove the SMM2 (see [“Remove the hot-swap SMM2” on page 74](#)).

Step 5. Remove the fans (see [“Remove a hot-swap fan” on page 58](#)).

Step 6. Remove the enclosure cover (see [“Remove the enclosure cover” on page 55](#)).

Step 7. Remove the upper power distribution board (see [“Remove the upper power distribution board” on page 65](#)).

Step 8. Remove the enclosure air baffles (see [“Remove the enclosure air baffles” on page 52](#)).

Step 9. Remove the lower power distribution board (see [“Remove the lower power distribution board” on page 67](#)).

After you finish

After disassembling the enclosure, comply with local regulations when recycling it.

Disassemble the SMM2 for recycle

Follow the instructions in this section to disassemble the System Management Module 2 (SMM2) for recycle.

About this task

Attention: Read the [“Installation Guidelines” on page 39](#) to ensure that you work safely.

Procedure

Step 1. Make preparations for this task.

- a. Turn off the solution and peripheral devices and disconnect the power cords and all external cables (see [“Power off the compute node” on page 11](#)).

- b. If the solution is installed in a rack, remove the solution from the rack (see “Remove the server/solution from the rails” in *Rack Installation Guide* [Remove the server/solution from the rails](#)).

CAUTION:

To avoid a drop hazard, slide the enclosure out of the rack slowly and steadily. Make sure to grip the enclosure with both hands when pulling it forward on the slide rails and lifting it out of the rack. Use safe practices when lifting.

- Step 2. Remove the SMM2 from the enclosure (see “[Remove the hot-swap SMM2](#)” on page 74).
- Step 3. Remove the CMOS battery (CR2032) from the SMM2 module (see “[Remove the CMOS battery \(CR2032\) from the SMM2](#)” on page 77).
- Step 4. Remove the SMM2 board.
 - a. Remove the four screws that secure the SMM2 board to the module.
 - b. Gently slide the SMM2 board backwards and then lift it out of the module.

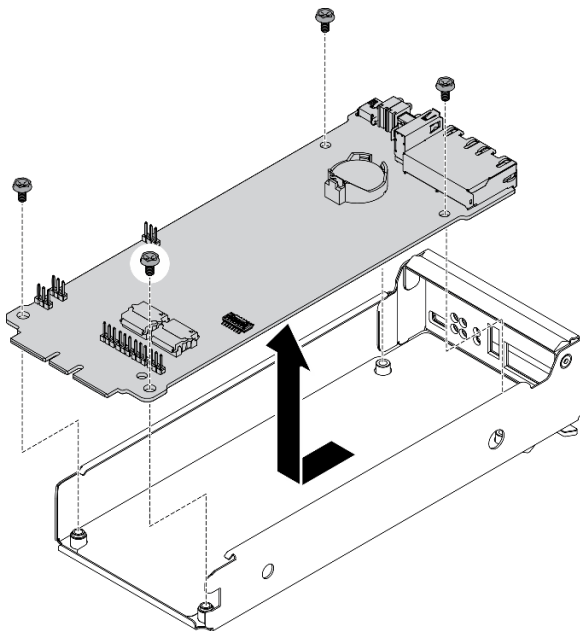


Figure 118. SMM2 board removal

After you finish

After disassembling the SMM2, comply with local regulations when recycling it.

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.

- 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 solution 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 solution. 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 solution 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 solution at <https://pubs.lenovo.com/lxcc-overview/>.

- **Lenovo XClarity Administrator**

Lenovo XClarity Administrator can be set up to collect and send diagnostic files automatically to Lenovo Support when certain serviceable events occur in Lenovo XClarity Administrator and the managed endpoints. You can choose to send diagnostic files to Lenovo Support using Call Home or to another service provider using SFTP. You can also manually collect diagnostic files, open a problem record, and send diagnostic files to the Lenovo Support 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 solution, 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/supportphonenumberlist> for your region support details.

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Important notes

Processor speed indicates the internal clock speed of the processor; other factors also affect application performance.

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1 024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

When referring to drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity can vary depending on operating environments.

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This product may not be certified in your country for connection by any means whatsoever to interfaces of public telecommunications networks. Further certification may be required by law prior to making any such connection. Contact a Lenovo representative or reseller for any questions.

Electronic emission notices

When you attach a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices that are supplied with the monitor.

Taiwan Region BSMI RoHS declaration

單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁶⁺)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機架	○	○	○	○	○	○
外部蓋板	○	○	○	○	○	○
機械組零件	-	○	○	○	○	○
空氣傳動設備	-	○	○	○	○	○
冷卻組零件	-	○	○	○	○	○
內存模組	-	○	○	○	○	○
處理器模組	-	○	○	○	○	○
電纜組零件	-	○	○	○	○	○
電源供應器	-	○	○	○	○	○
儲備設備	-	○	○	○	○	○
印刷電路板	-	○	○	○	○	○

備考1. “超出0.1 wt %” 及 “超出0.01 wt %” 係指限用物質之百分比含量超出百分比含量基準值。
 Note1 : “exceeding 0.1wt%” and “exceeding 0.01 wt%” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考2. “○” 係指該項限用物質之百分比含量未超出百分比含量基準值。
 Note2 : “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考3. “-” 係指該項限用物質為排除項目。
 Note3 : The “-” indicates that the restricted substance corresponds to the exemption.

Taiwan 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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