ThinkSystem DA240 Enclosure and ThinkSystem SD630 V2 Compute Node Setup Guide

Machine Type: 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

Contents

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

Solution package contents

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

The solution package includes the following items:

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

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

Features

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

Enclosure:

- **Redundant cooling and optional power capabilities**

  The enclosure supports two 1800-watt and 2400-watt hot-swap ac power supplies and a maximum of three 8080 dual-rotor hot-swap fans, which provide redundancy for a typical configuration. The redundant cooling by the fans in the enclosure enables continued operation if one of them fails.

  Note: You cannot mix 1800-watt and 2400-watt power supplies in the enclosure.

- **Integrated network support**

  The enclosure comes with two RJ45 Ethernet ports located on the System Management Module 2 which support the connection to a 10 Mbps, 100 Mbps, or 1000 Mbps network.

- **Systems-management capabilities**

  The enclosure comes with the System Management Module 2 (SMM2). When the SMM2 is used with the systems-management software that comes with the solution, you can manage the functions of the solution locally and remotely. The SMM2 also provides system monitoring, event recording, and network alert capability. For additional information, see *System Management Module 2 User Guide* at https://thinksystem.lenovofiles.com/help/topic/mgt_tools_smm2/r_smm2_users_guide.html.

Compute node:

- **Multi-core processing**

  Each compute node supports two 3rd Gen Intel® Xeon® Scalable, up to 250W processors.

- **Flexible data-storage capacity and hot-swap capability**

  The solution supports up to two 7mm 2.5-inch hot-swap SATA/NVMe solid-state drives or one 15mm 2.5-inch hot-swap NVMe solid-state drive per compute node.

- **Active Memory**

  The Active Memory feature improves the reliability of memory through memory mirroring. Memory mirroring mode replicates and stores data on two pairs of DIMMs within two channels simultaneously. If a failure occurs, the memory controller switches from the primary pair of memory DIMMs to the backup pair of DIMMs.

- **Large system-memory capacity**

  The solution supports up to maximum of 1024 GB of system memory (with 16 x 64 GB RDIMMs). Industry-standard double-data-rate 4 (DDR4), dynamic random-access memory (DRAM) registered dual in-line memory modules (RDIMMs) with error-correcting code (ECC) are supported. For more information about the specific types and maximum amount of memory, see "Compute node specifications" on page 6.

- **PCI adapter capabilities**

  The solution supports one 1U PCIe Gen4 x16 adapter per compute node.

- **ThinkSystem RAID support**

  Each compute node supports RAID levels 0 and 1 for SATA storage including 7mm 2.5-inch solid-state drives and M.2 drives.

- **Features on Demand**

  If a Features on Demand feature is integrated in the solution or in an optional device that is installed in the solution, you can purchase an activation key to activate the feature. For information about Features on Demand, see: https://fod.lenovo.com/lkms

- **Integrated network support**

  Each compute node comes with an integrated 1-port 1Gb Ethernet controller with a RJ45 connector and 1-port 25Gb Ethernet controller with a SFP28 connector for Lenovo XClarity Controller.

- **Redundant networking connection**

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

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

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

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).

- **Lenovo XClarity Controller (XCC)**

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

  Some of the features that are unique to the Lenovo XClarity Controller are enhanced performance, higher-resolution remote video, and expanded security options. For additional information about the Lenovo XClarity Controller, refer to the XCC documentation compatible with your solution 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/.

- **UEFI-compliant solution firmware**

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

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

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

- **Light path diagnostics**

  Light path diagnostics provides LEDs to help you diagnose problems. For more information about the light path diagnostics, see Light path diagnostics panel and Light path diagnostics LEDs.

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

  Each compute node provides a QR code on the system service label which is located on the top of the compute node. 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.

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 • 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)	• 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.
	• Two fans:
	  – Processors with TDP (thermal design power) ≤ 165W (up to 30°C)
	• Three fans:
	  – Processors with TDP (thermal design power) ≥ 185W (up to 25°C)
	  – Processors with TDP (thermal design power) ≤ 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)

Power supply	Supports two hot-swap ac power supplies. • Input voltage: 200-240 Vac • Wattage: 1800W, 2400W and 2600W **CAUTION:** • **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)	Hot-swappable (see "System Management Module 2 (SMM2)" on page 25 and *System Management Module 2 User Guide* for more information).

Table 1. Enclosure specifications (continued)

Specification	Description

Acoustical noise emissions	The solution has the following acoustic noise emissions declaration:
	• Sound power level (L_{WAd}):
	   – 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_{pAm}):
	   – Idling: Typical configuration: 45 dBA; Max configuration: 61 dBA
	   – Operating: Typical configuration: 61 dBA; Max configuration: 74 dBA
	Notes:
	• These sound levels were measured in controlled acoustical environments according to procedures specified by ISO7779 and are reported in accordance with ISO 9296.
	• The declared acoustic sound levels are based on the specified configurations, which may change slightly depending on configuration/conditions.
	   – 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	Approximate heat output: • 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)

Electrical input	• Sine-wave input (50-60 Hz) required
	• Input voltage range:
	   – Minimum: 200 Vac
	   – Maximum: 240 Vac
	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.

Minimal configuration for debugging	• 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)	Supports two 3rd Gen Intel® Xeon® Scalable, up to 250W processors per compute node. **Notes:** 1. Use the Setup utility to determine the type and speed of the processors in the node. 2. For a list of supported processors, see https://serverproven.lenovo.com/.
Memory	See "Memory module installation rules and order" on page 43 for detailed information about memory configuration and setup. • 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 For a list of supported memory modules, see https://serverproven.lenovo.com/.
Drive bays	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.
M.2 drive/backplane	The ThinkSystem M.2 backplane supports up to two identical M.2 drives.
Expansion slot	One expansion slot is available per compute node. • Slot 1: PCI Express 4.0 x16; half-height, half-length (HHHL)
RAID	• 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). **Notes:** – 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)	• ASPEED • SVGA compatible video controller • Avocent Digital Video Compression • Video memory is not expandable **Note:** Maximum video resolution is 1920 x 1200 at 60 Hz.
Input/Output (I/O) features	• 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 **Note:** Lenovo XClarity Controller can be accessed by either RJ45 Ethernet port or SFP28 Ethernet port.

Table 2. Compute node specifications (continued)

Specification	Description
Size	Compute node • 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)	• 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	Supported and certified operating systems: • Microsoft Windows Server • VMware ESXi • Red Hat Enterprise Linux • SUSE Linux Enterprise Server References: • Complete list of available operating systems: https://lenovopress.lenovo.com/osig. • OS deployment instructions: "Deploy the operating system" on page 92.

Ambient temperature management	Adjust ambient temperature when specific components are installed:
	• Keep ambient temperature to 30°C or lower when one or more of the following processors are installed:
	  – 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:
	  – Processors with TDP (thermal design power) higher than 165 watts
	  – Intel(R) Xeon(R) Gold 6334 (165 watts, 8 core)

Environment	The ThinkSystem SD630 V2 Compute Node complies with ASHRAE Class A2 specifications.
	The ThinkSystem SD630 V2 Compute Node is supported in the following environment:
	• Air temperature:
	  – 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):
	  – Operating: 20% - 80%, maximum dew point: 21°C (70°F)
	  – Solution powered off: 8% - 80%, maximum dew point: 27°C (81°F)
	• Particulate contamination:
	
	Attention: Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the solution. For information about the limits for particulates and gases, see *Particulate contamination* .

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

cu

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

[2] The derivation of the equivalence between the rate of copper corrosion growth in the thickness of the corrosion product in Å/month and the rate of weight gain assumes that Cu$_2$S and Cu$_2$O grow in equal proportions.

[3] The derivation of the equivalence between the rate of silver corrosion growth in the thickness of the corrosion product in Å/month and the rate of weight gain assumes that Ag$_2$S is the only corrosion product.

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

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

Management options

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

Overview

Options	Description
Lenovo XClarity Controller	Baseboard management controller. (BMC) Consolidates the service processor functionality, Super I/O, video controller, and remote presence capabilities into a single chip on the server/solution system board. **Interface** • CLI application • Web GUI interface • Mobile application • REST API **Usage and downloads** https://pubs.lenovo.com/lxcc-overview/
Lenovo XClarity Administrator	Centralized interface for multi-server/solution management. **Interface** • Web GUI interface • Mobile application • REST API **Usage and downloads** http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/aug_product_page.html
Lenovo XClarity Essentials toolset	Portable and light toolset for server/solution configuration, data collection, and firmware updates. Suitable both for single-server/solution or multi-server/solution management contexts. **Interface** • **OneCLI**: CLI application • **Bootable Media Creator**: CLI application, GUI application • **UpdateXpress**: GUI application **Usage and downloads** https://pubs.lenovo.com/lxce-overview/

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

Functions

Options		Functions							
		Multi-system mgmt	OS deploy-ment	System configu-ration	Firm-ware up-dates[1]	Event-s/alert moni-toring	Inven-tory/ logs	Pow-er mgmt	Power planning
Lenovo XClarity Controller				√	√[2]	√	√[4]		
Lenovo XClarity Administrator		√	√	√	√[2]	√	√[4]		
Lenovo XClarity Essen-tials toolset	OneCLI	√		√	√[2]	√	√[4]		
	Bootable Media Creator			√	√[2]		√[4]		
	UpdateXpress			√	√[2]				
Lenovo XClarity Provisioning Manager			√	√	√[3]		√[5]		
Lenovo XClarity Integrator		√	√[6]	√	√	√	√	√[7]	
Lenovo XClarity Energy Manager		√				√		√	
Lenovo Capacity Planner									√[8]

Notes:

1. Most options can be updated through the Lenovo tools. Some options, such as GPU firmware or Omni-Path firmware require the use of supplier tools.

2. The server/solution UEFI settings for option ROM must be set to **Auto** or **UEFI** to update firmware using Lenovo XClarity Administrator, Lenovo XClarity Essentials, or Lenovo XClarity Controller.

3. Firmware updates are limited to Lenovo XClarity Provisioning Manager, Lenovo XClarity Controller, and UEFI updates only. Firmware updates for optional devices, such as adapters, are not supported.

4. The server/solution UEFI settings for option ROM must be set to **Auto** or **UEFI** for detailed adapter card information, such as model name and firmware levels, to be displayed in Lenovo XClarity Administrator, Lenovo XClarity Controller, or Lenovo XClarity Essentials.

5. Limited inventory.

6. The Lenovo XClarity Integrator deployment check for System Center Configuration Manager (SCCM) supports Windows operating system deployment.

7. Power management function is supported only by Lenovo XClarity Integrator for VMware vCenter.

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

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.

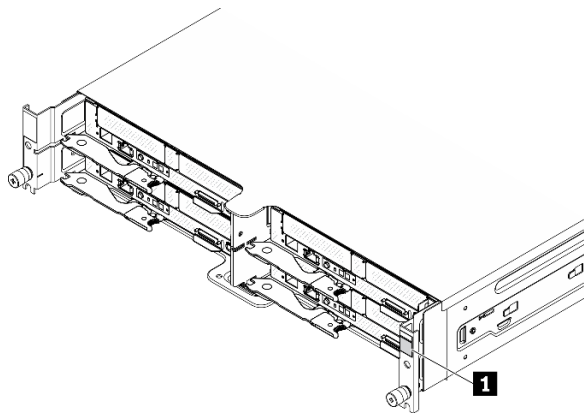*Figure 1. ID label on the front of the enclosure*

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.
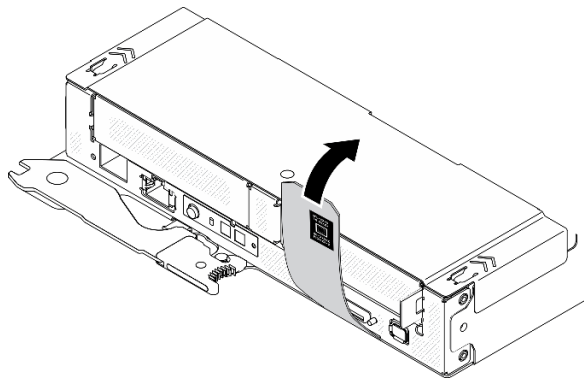

Figure 2. ID label on the front of the compute node

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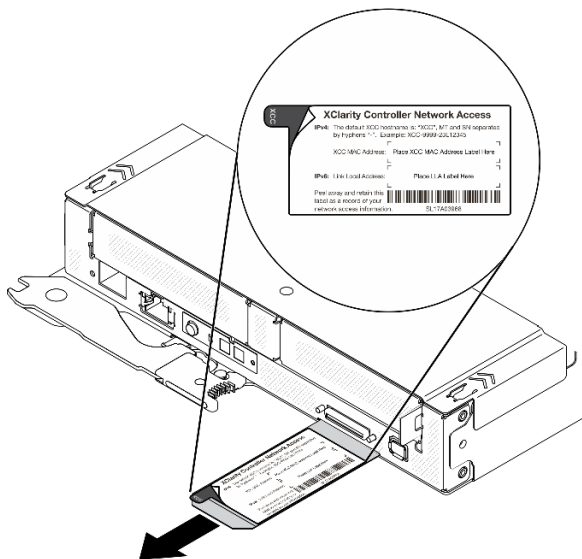
Figure 3. Network access tag on the front of the compute node

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.

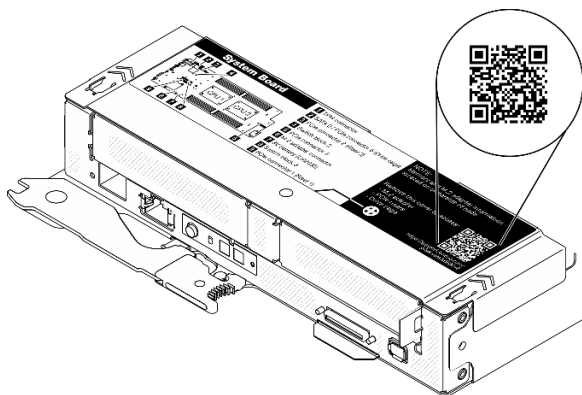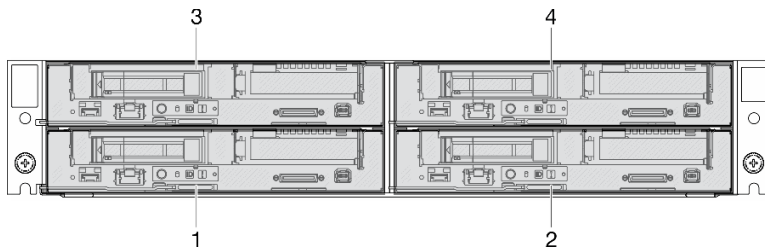*Figure 5. Enclosure front view with compute nodes and node bay numbering*

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.
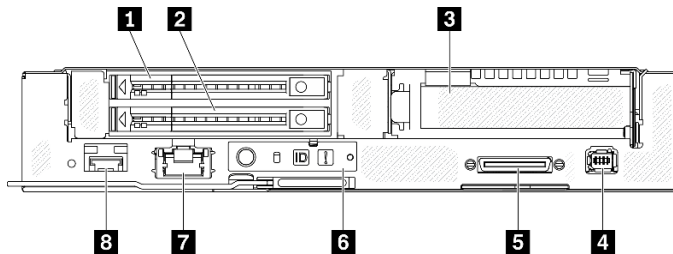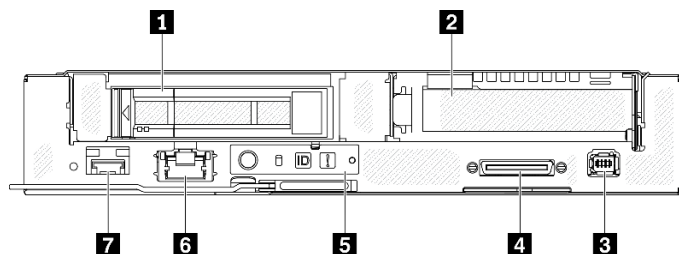

Figure 7. Configuration with 15mm 2.5-inch NVMe SSD and PCIe riser

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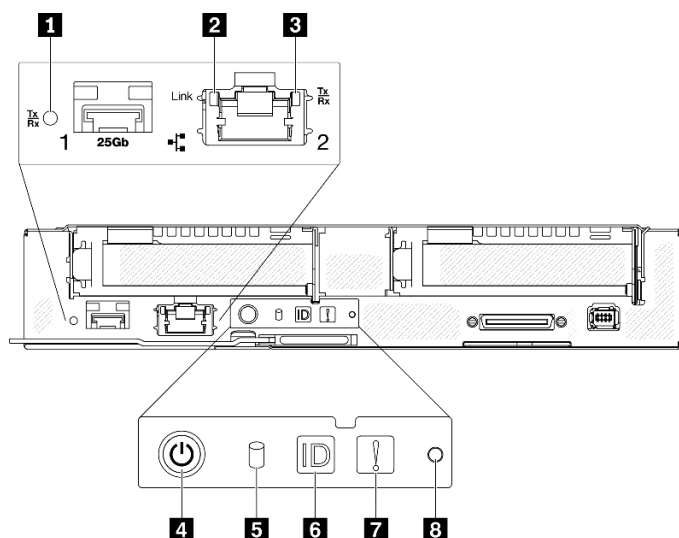
2 1 Gb RJ45 Ethernet port link LED (green): Use this green LED to distinguish the network status.

> **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 *System Management Module 2 User Guide* for more information).

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

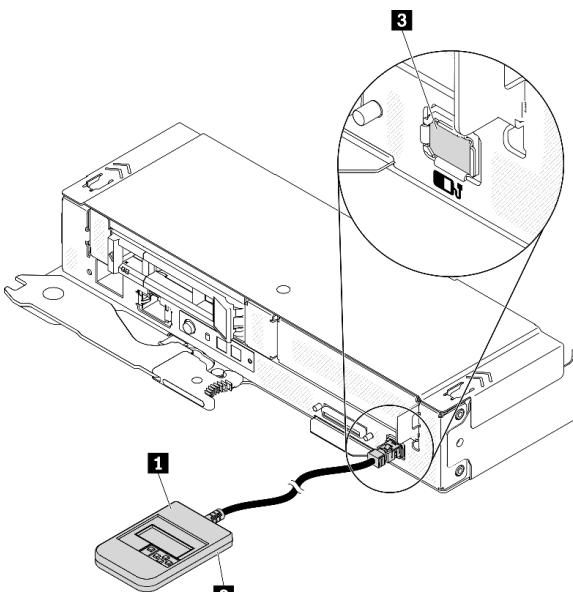| On	All of the node ID LEDs will be on except the blinking ones, which will remain blinking.
Blink	All of the node ID LEDs will be blinking regardless of previous status.

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
The external LCD diagnostics handset is connected to the compute node with an external cable. 	**1** External LCD diagnostics handset
	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.
	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.

Note: When unplugging the external handset, see the following instructions:
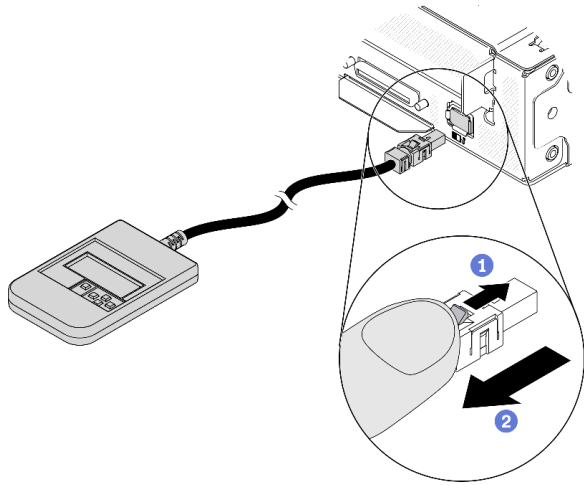
① Press and hold on the latch on top of the connector.

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.

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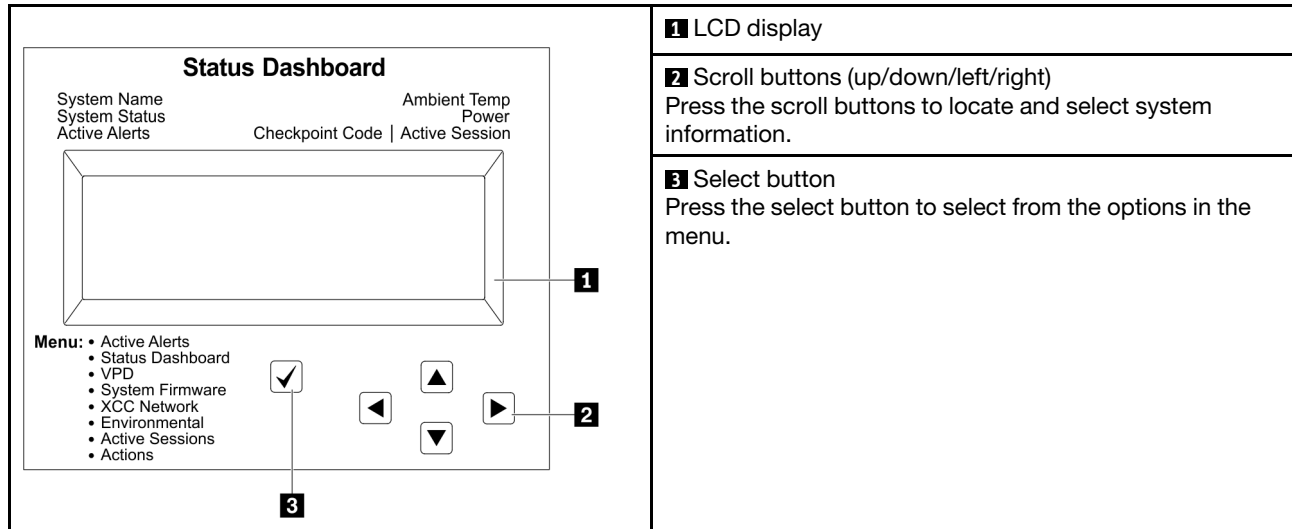
Option flow diagram

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.
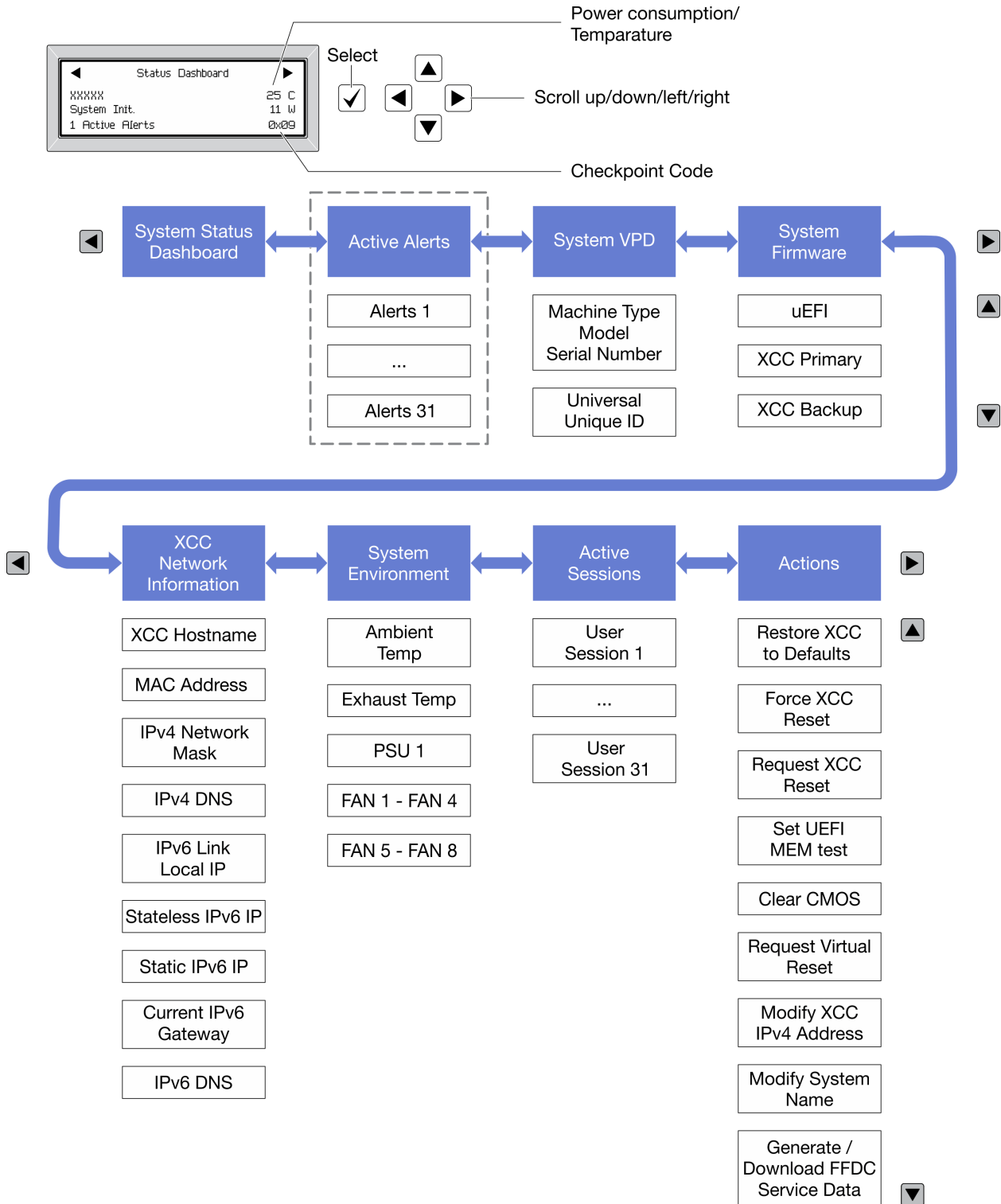
Full menu list

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
1 System name **2** System status **3** Active alert quantity **4** Temperature **5** Power consumption **6** Checkpoint code	◄ Status Dashboard ► **1** xxxxx 25 C **4** **2** System Init. 11 W **5** **3** 1 Active Alerts 0x09 **6**

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: • 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
• Machine type and serial number • Universal Unique ID (UUID)	Machine Type: xxxx Serial Num: xxxxxx Universal Unique ID: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

System Firmware

Sub Menu	Example
UEFI • Firmware level (status) • Build ID • Version number • Release date	UEFI (Inactive) Build: D0E101P Version: 1.00 Date: 2019-12-26
XCC Primary • Firmware level (status) • Build ID • Version number • Release date	XCC Primary (Active) Build: DVI399T Version: 4.07 Date: 2020-04-07
XCC Backup • 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
• XCC hostname • MAC address • IPv4 Network Mask • IPv4 DNS • IPv6 Link Local IP • Stateless IPv6 IP • Static IPv6 IP • Current IPv6 Gateway • IPv6 DNS **Note:** Only the MAC address that is currently in use is displayed (extension or shared).	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

• Ambient temperature
• Exhaust temperature
• PSU status
• Spinning 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:
• Restore XCC to Defaults
• Force XCC Reset
• Request XCC Reset
• Set UEFI Memory Test
• Clear CMOS
• Request Virtual Reseat
• Modify XCC Static IPv4 Address/Net mask/Gateway
• Modify System Name
• Generate/Download FFDC Service Data
	`Request XCC Reset?`
	`This will request the BMC to reboot itself.`
	`Hold √ 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.

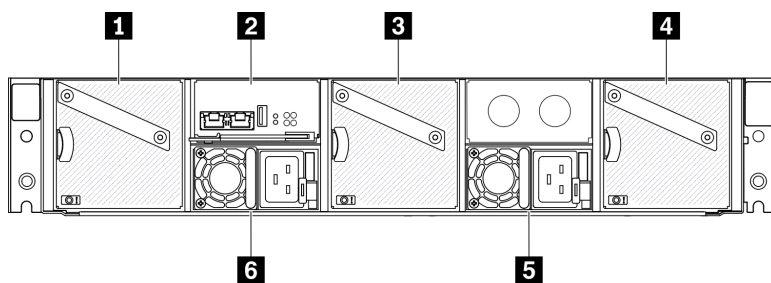The following illustration shows the rear view of the entire system.

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).
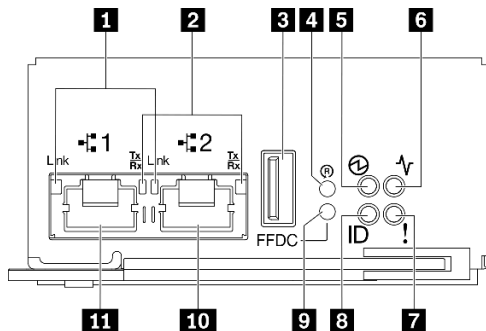
Figure 10. SMM2 connectors and LEDs

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)	

◨ 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.

◨ 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.

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

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

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

◨ 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).

◨ 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.

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

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

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

◨ 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.
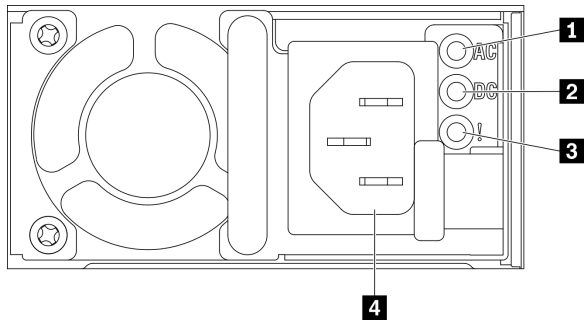

Figure 11. Power supply LEDs and connectors

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.
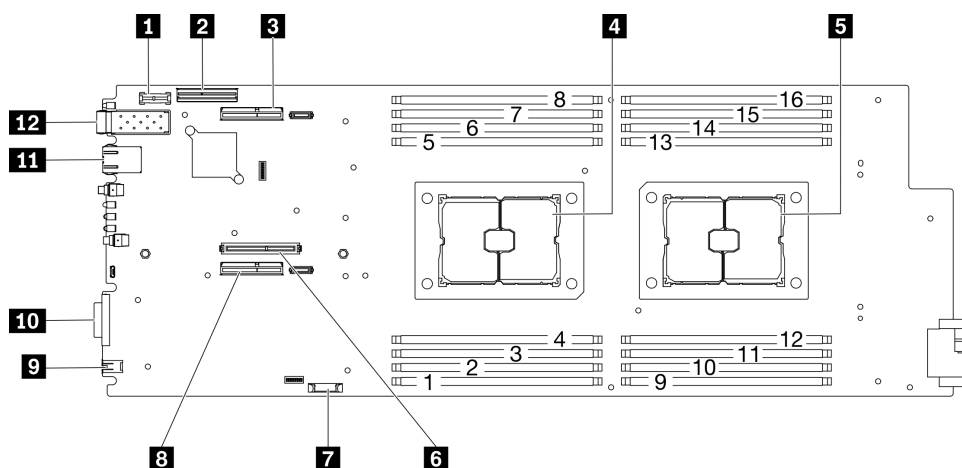
Figure 12. Internal connectors on the system board

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.

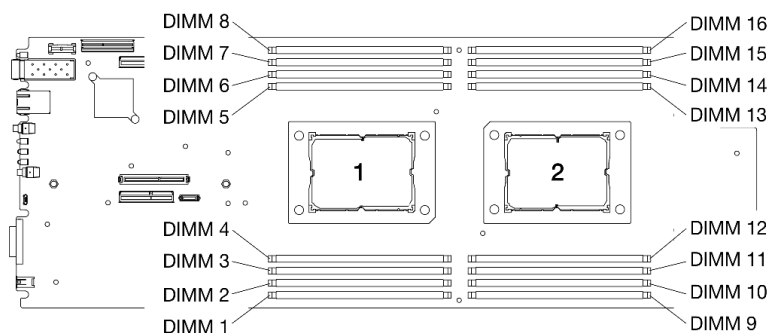Figure 13. The location of the DIMM connectors on the system board

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.
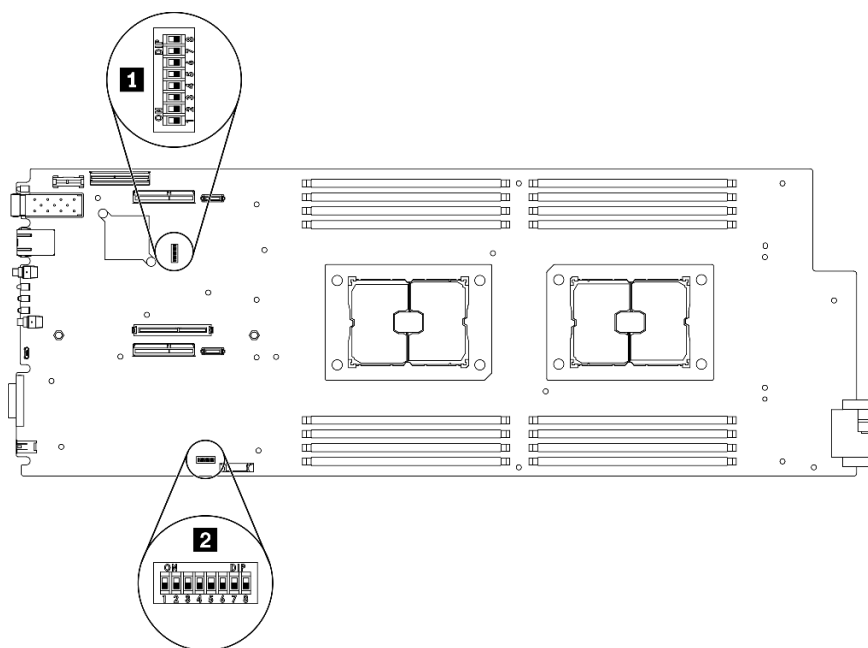
Figure 14. Location of the switches on the system board

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 40, and "Power off the compute node" on page 84.

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.

Notes:

- Disengage all latches, release tabs, or locks on cable connectors when you disconnect cables from the system board. Failing to release them before removing the cables will damage the cable sockets on the system board, which are fragile. Any damage to the cable sockets might require replacing the system board.

- 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.

7mm 2.5-inch SATA/NVMe drive backplane cable

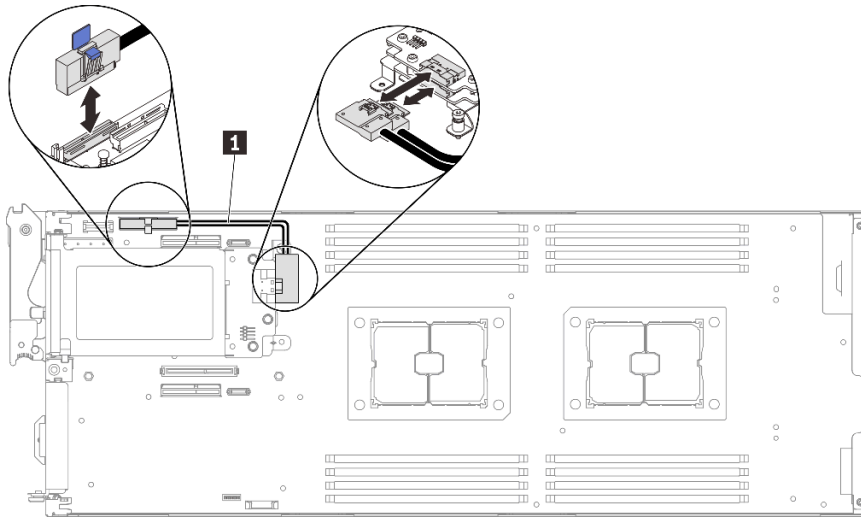Use this section to understand how to route cables for the two 7mm 2.5-inch SATA/NVMe drive backplanes.

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

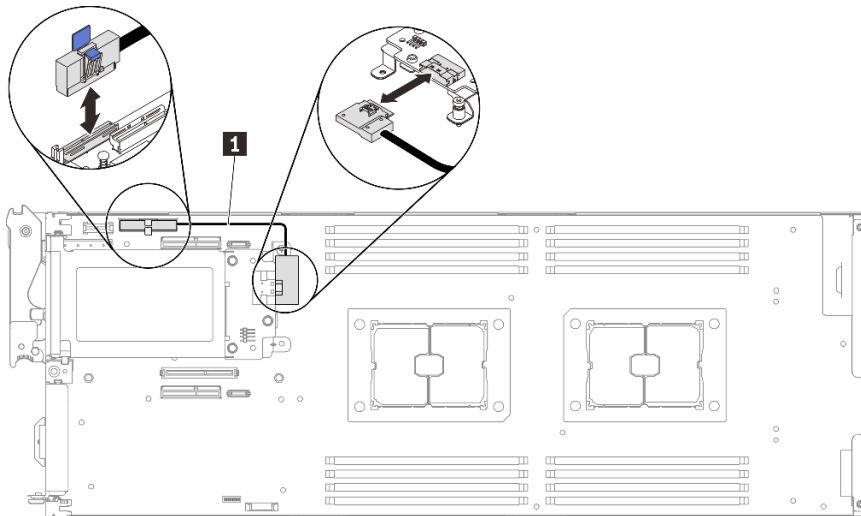Use this section to understand how to route cables for the 15mm 2.5-inch NVMe drive backplane.

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

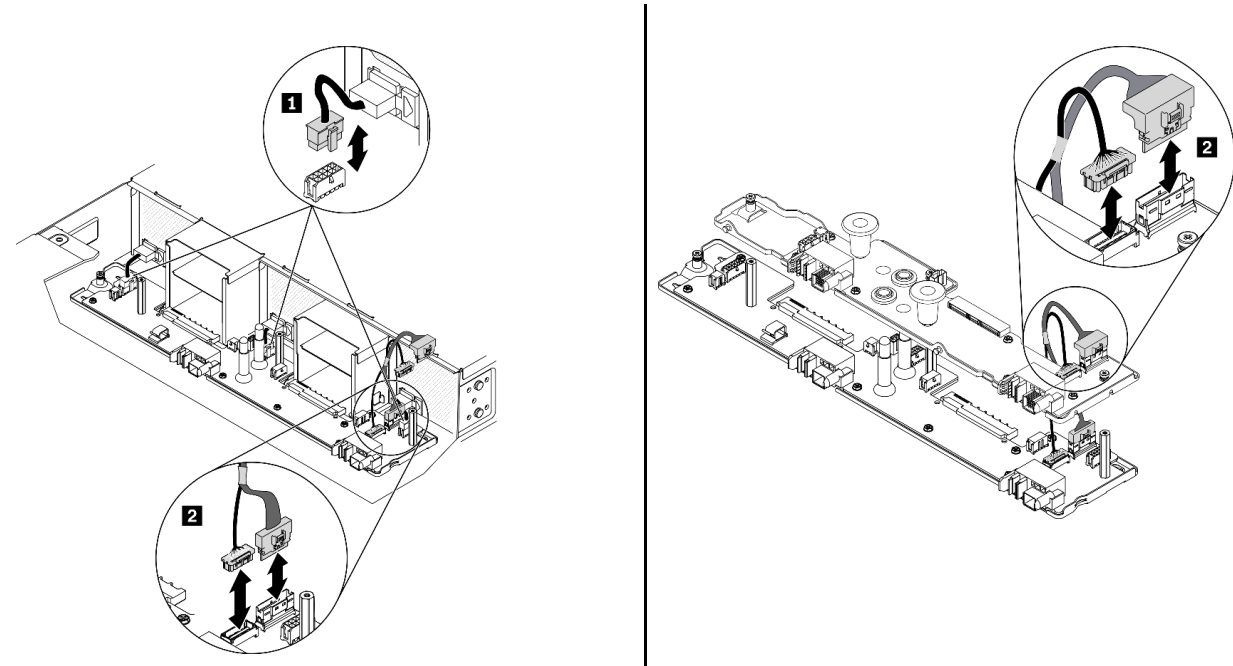Use this section to understand how to route cables for the power distribution boards and system fans.

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" in *Maintenance Manual*).

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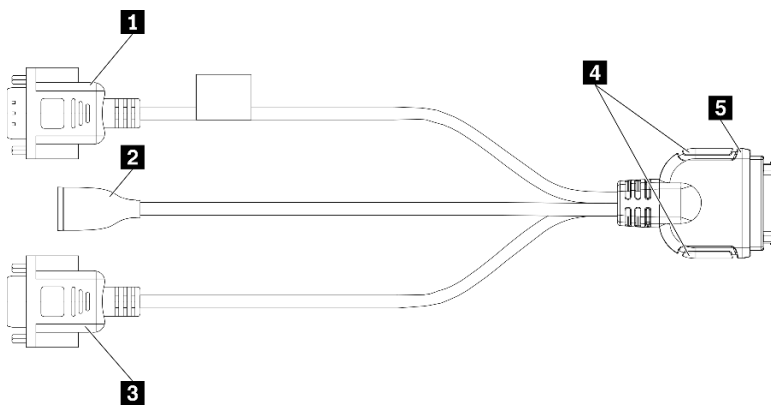
Figure 18. Connectors and components on the USB 3.0 Console Breakout Cable

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

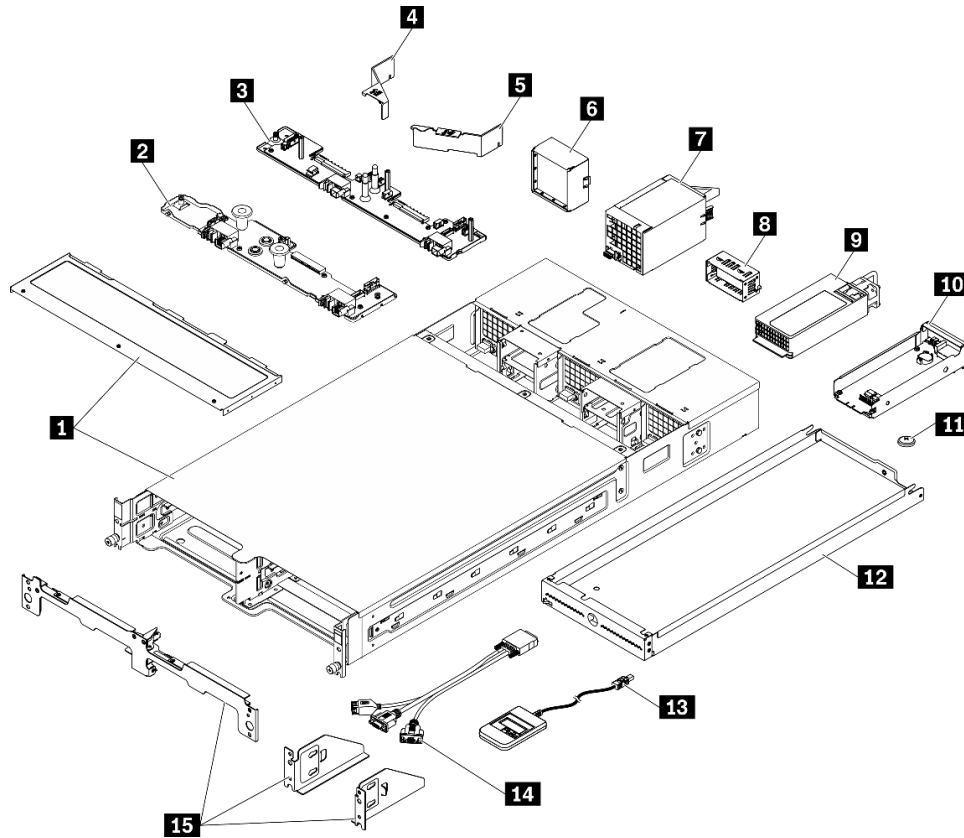This section includes the components that come with the enclosure.

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	Consuma-ble and Structural part
For more information about ordering the parts shown in Figure 19 "Enclosure components" on page 33: https://datacentersupport.lenovo.com/us/en/products/servers/thinksystem/da240-enclosure/7d1j/parts It is highly recommended that you check the power summary data for your server/solution using Lenovo Capacity Planner before purchasing any new parts.					
1	Enclosure	√			
2	Upper power distribution board		√		
3	Lower power distribution board			√	
4	Enclosure air baffle for power supply 2 (marked with ▣2)	√			
5	Enclosure air baffle for power supply 1 (marked with ▣1)	√			
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

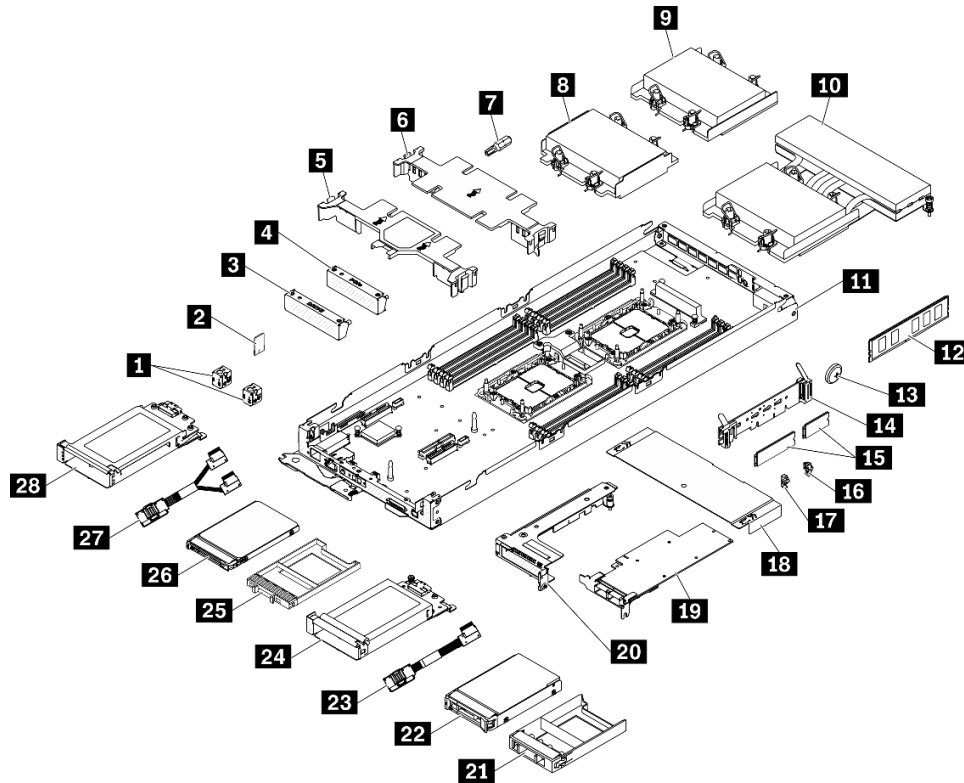This section includes the components that come with the compute node.

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	Consuma-ble and Structural part
For more information about ordering the parts shown in Figure 20 "Compute node components" on page 35: https://datacentersupport.lenovo.com/us/en/products/servers/thinksystem/sd630v2/7d1k/parts It is highly recommended that you check the power summary data for your server/solution using Lenovo Capacity Planner before purchasing any new parts.					
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	Consuma-ble 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. Solution hardware setup

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

Solution setup checklist

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

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

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

1. Unpack the solution package. See "Solution package contents" on page 1.
2. Set up the solution hardware.
   a. Install any required hardware or solution options. See the related topics in "Install solution hardware options" on page 47.
   b. If necessary, install the solution into a standard rack cabinet by using the rail kit shipped with the solution. See the *Rack Installation Instructions* that comes with optional rail kit.
   c. Connect the Ethernet cables and power cords to the solution. See "Rear view" on page 24 to locate the connectors. See "Cable the solution" on page 83 for cabling best practices.
   d. Power on the solution. See "Power on the compute node" on page 83.

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

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

   e. Validate that the solution hardware was set up successfully. See "Validate solution setup" on page 84.
3. Configure the system.
   a. Connect the Lenovo XClarity Controller to the management network. See "Set the network connection for the Lenovo XClarity Controller" on page 85.
   b. Update the firmware for the solution, if necessary. See "Update the firmware" on page 86.
   c. Configure the firmware for the solution. See "Configure the firmware" on page 89.

      The following information is available for RAID configuration:

      - https://lenovopress.com/lp0578-lenovo-raid-introduction
      - https://lenovopress.com/lp0579-lenovo-raid-management-tools-and-resources

   d. Install the operating system. See "Deploy the operating system" on page 92.
   e. Back up the solution configuration. See "Back up the solution configuration" on page 93.
   f. Install the applications and programs for which the solution is intended to be used.

Installation guidelines

Use the installation guidelines to install components in your server.

Before installing optional devices, read the following notices carefully:

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

- Read the safety information and guidelines to ensure 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 42.

- 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:

     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.

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

Guidelines to work inside the solution with the power on.

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

Use this information to handle static-sensitive devices.

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

- Limit your movement to prevent building up static electricity around you.
- Take additional care when handling devices during cold weather, for heating would reduce indoor humidity and increase static electricity.
- Always use an electrostatic-discharge wrist strap or other grounding system, particularly when working inside the 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.

Memory module installation rules and order

Memory modules must be installed in a specific order based on the memory configuration that you implement on your server.

The following memory configurations and population sequences are supported for the ThinkSystem DA240 Enclosure and ThinkSystem SD630 V2 Compute Node:

- "Independent memory mode: Installation guidelines and sequence" on page 44
- "Memory mirroring mode: Installation guidelines and sequence" on page 45

Memory module installation guidelines

The following notes describe the types of DIMMs that the compute node supports and other information that you must consider when you install DIMMs. This section applies to both RDIMMs and 3DS RDIMMs.

General memory module installation guidelines

The DIMM (memory) population sequences in this section show all of the memory population combinations that are supported by your compute node. Each processor in your compute node has four memory controllers, each memory controller has two memory channels, and each memory channel has one DIMM slot. To populate balanced memory configurations for the best memory performance, observe the following guidelines:

- The operating speed of the compute node is determined by the operating mode, memory speed, memory ranks, memory population and processor.
- The compute node only supports industry-standard double-data-rate 4 (DDR4), dynamic random-access memory (DRAM) registered dual in-line memory modules (RDIMMs) with error-correcting code (ECC). Confirm that the compute node supports the DIMM that you are installing (see https://serverproven.lenovo.com/).
- Do not mix RDIMMs and 3DS RDIMMs in the same compute node.
- Install an equal number of DIMMs for each DIMM type.

- You can use compatible DIMMs from various manufacturers in the same pair.
- Install higher capacity (ranked) DIMMs first, following the specified population sequence.
- When you install or remove DIMMs, the compute node configuration information changes. When you restart the compute node, the system displays a message that indicates that the memory configuration has changed. You can use the Setup utility to view the node configuration information, see Chapter 4 "System configuration" on page 85 for more information.

For more detailed installation guidelines and DIMM population sequences in the independent and memory mirroring mode, refer to

- "Independent memory mode: Installation guidelines and sequence" on page 44
- "Memory mirroring mode: Installation guidelines and sequence" on page 45

Independent memory mode: Installation guidelines and sequence

Memory module installation order for independent memory mode with two processors installed in a compute node.

The following illustration shows the location of the DIMM connectors on the system board.
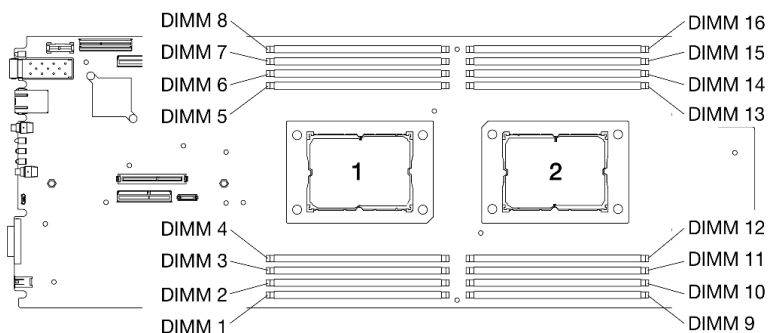
Figure 21. The location of the DIMM connectors on the system board

See the following table for memory channels and DIMM slots information around a processor.

Table 16. Memory channels and DIMM slots information around a processor

Integrated Memory Controller (iMC)	Controller 0		Controller 1		Controller 2		Controller 3	
Channel	Channel 0	Channel 1	Channel 0	Channel 1	Channel 0	Channel 1	Channel 0	Channel 1
DIMM connector (Processor 1)	2	1	4	3	7	8	5	6
DIMM connector (Processor 2)	15	16	13	14	10	9	12	11

Independent memory mode — DIMM installation guidelines

- Install the DIMMs for processor 1 before working on processor 2. Balance the DIMMs across the two processors so that all processors have the same memory capacity.

- Populate memory controller 0 first for each processor. Balance the DIMMs across the processor memory controllers so all of the memory controllers have exactly the same DIMM population and memory capacity.

- DA240 Enclosure and ThinkSystem SD630 V2 supports up to two types of memory capacity.

- Of all the memory controllers, make sure that memory channel 0 and memory channel 1 are configured with the same total memory capacity respectively. It is required to install DIMMs with the same capacity for memory channel 0 . However, the total memory capacity of memory channel 0 is allowed to be different from that of memory channel 1.

- A maximum of eight logical ranks per memory channel are allowed.

- Populate all memory channels for optimal performance. For memory configurations that do not require or allow use of all memory channels, all memory channels that are populated should have the same number of DIMMs, the same total memory capacity, and the same total number of memory ranks.

- Memory configurations with DIMM quantities of 4, 8, 12, and 16 are supported.

- Installing an equal number of DIMMs for each processor is recommended. A minimum of two DDR4 DIMM is required for each processor.

Independent memory mode — DIMM population sequence

For the independent mode, install the DIMMs (of the same capacity) in the following order: 2, 15, 4, 13, 7, 10, 5, 12, 1, 16, 8, 9, 3, 14, 6, 11

Note: When adding one or more DIMMs during a memory upgrade, you might need to remove some DIMMs that are already installed to new locations.

Table 17. DIMM population sequence in the independent memory mode

Total	Processor 1								Processor 2								Total
DIMMs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	DIMMs
4^1		2		4									13		15		4^1
4^2		2	3											14	15		4^2
$8^{1\ \&\ 3}$		2		4	5		7			10		12	13		15		8^1
8^2		2	3			6	7			10	11			14	15		8^2
12^1	1	2		4	5		7	8	9	10		12	13		15	16	12^1
$16^{3\ \&\ 4}$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	16

Notes:

1. Follow this population sequence if all of the DIMMs have the same memory capacity.

2. Follow this population sequence if the DIMMs in memory channel 0 have a different memory capacity from those in memory channel 1.

3. DIMM configurations that support Sub NUMA Clustering (SNC), which can be enabled via UEFI.

4. DIMM configurations that support Software Guard Extensions (SGX), see "Enable Software Guard Extensions (SGX)" on page 91 to enable this feature.

Memory mirroring mode: Installation guidelines and sequence

Memory module installation order for memory mirroring with two processors installed in a compute node.

The following illustration shows the location of the DIMM connectors on the system board.
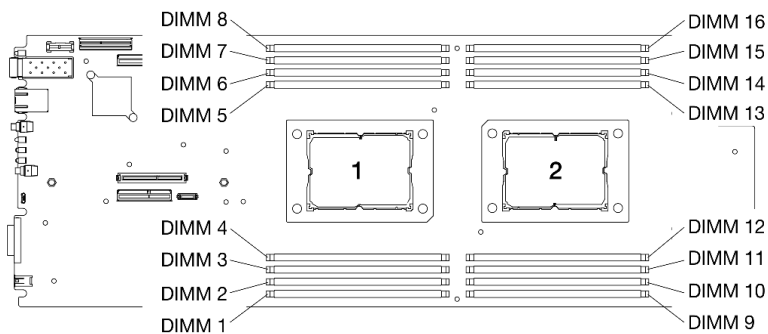
Figure 22. The location of the DIMM connectors on the system board

See the following table for memory channels and DIMM slots information around a processor.

Table 18. Memory channels and DIMM slots information around a processor

Integrated Memory Controller (iMC)	Controller 0		Controller 1		Controller 2		Controller 3	
Channel	Channel 0	Channel 1	Channel 0	Channel 1	Channel 0	Channel 1	Channel 0	Channel 1
DIMM connector (Processor 1)	2	1	4	3	7	8	5	6
DIMM connector (Processor 2)	15	16	13	14	10	9	12	11

Memory mirroring mode — DIMM installation guidelines

- Memory mirroring can be configured across memory channel 0 and memory channel 1.
- The total memory capacity of memory channel 0 must equal to that of memory channel 1.
- Populate both memory channel 0 and memory channel 1 of each memory controller.
- For the memory-mirroring mode, ThinkSystem SD630 V2 Compute Node only supports the memory configuration with 16 DIMMs. Populate all of the DIMM slots with DIMMs that are identical in capacity and architecture.

Memory mirroring mode — DIMM population sequence

Note: When adding one or more DIMMs during a memory upgrade, you might need to remove some DIMMs that are already installed to new locations.

Table 19. DIMM population sequence in the memory mirroring mode

Total	Processor 1								Processor 2								Total
DIMMs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	**DIMMs**
16[1]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	**16**

Notes:

1. DIMM configurations that support Sub NUMA Clustering (SNC), which can be enabled via UEFI.

Install solution hardware options

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

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

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

- Make sure the components you are installing are supported by your server. For a list of supported optional components for the server, see https://serverproven.lenovo.com/.
- Always download and apply the latest firmware. This will help ensure that any known issues are addressed, and that your server is ready to work with optimal performance. Go to ThinkSystem DA240 Enclosure and ThinkSystem SD630 V2 Compute Node Drivers and Software to download firmware updates for your server.
- It is good practice to make sure that the server is working correctly before you install an optional component.
- Follow the installation procedures in this section and use appropriate tools. Incorrectly installed components can cause system failure from damaged pins, damaged connectors, loose cabling, or loose components.

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 40 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
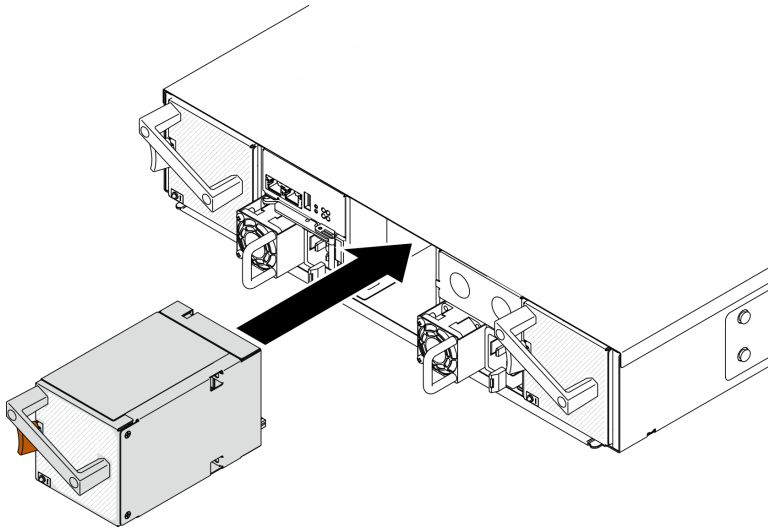
Figure 23. Hot-swap fan installation

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.

Demo video

Watch the procedure on YouTube

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 40 to ensure that you work safely.

Procedure
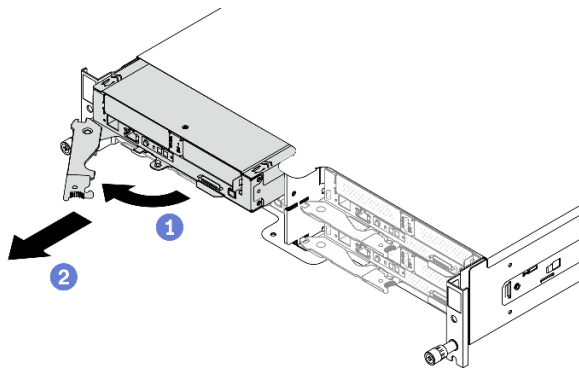
Figure 24. Compute node removal

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. ❶ Release and rotate the front handle on the compute node as shown in the illustration.

   b. ❷ 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.

Demo video

Watch the procedure on YouTube

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 warning symbol with general hazard and electrical hazard triangles]

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 warning symbol with general hazard and electrical hazard triangles labeled >240VA]

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 40 to ensure that you work safely.

Procedure
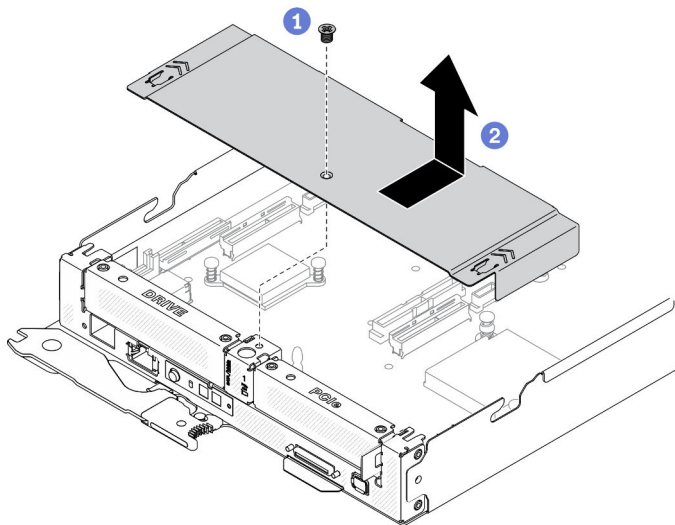
Figure 25. Node front cover removal

Step 1.   Remove the node front cover from the compute node.

    a.   ❶ Loosen the screw on the node front cover.

    b.   ❷ 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.

Demo video

Remove the node air baffles

Use the following procedures to remove 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 40 to ensure that you work safely.

Procedure
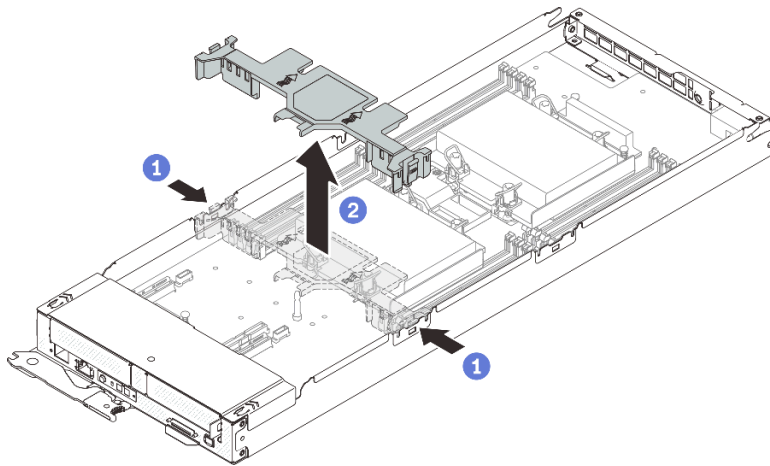
Figure 26. Front air baffle removal

Step 1. Remove the front air baffle from the compute node.

   a. ❶ Slightly push the right and left release latches.

   b. ❷ 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.

Demo video

Remove the middle air baffle
Use this information to remove the middle air baffle.

About this task

Attention: Read the "Installation guidelines" on page 40 to ensure that you work safely.

Procedure

Figure 27. Middle air baffle removal

Step 1.   Remove the middle air baffle from the compute node.

    a.   ❶ Slightly push the right and left release latches.

    b.   ❷ 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.

Demo video

[Watch the procedure on YouTube](#)

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**

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 40 to ensure that you work safely.

Procedure

Figure 28. M.2 backplane removal

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

Demo video

Watch the procedure on YouTube

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 40 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. ❶ Slide the latch to unlock the drive handle.

b. ❷ Grasp the handle and slide the drive out of the drive bay.
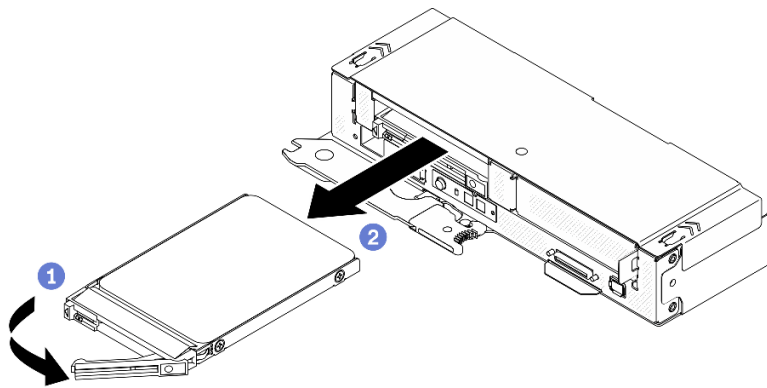
Figure 29. 7mm solid-state drive removal

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

a. ❶ Slide the latch to unlock the drive handle.

b. ❷ Grasp the handle and slide the drive out of the drive bay.
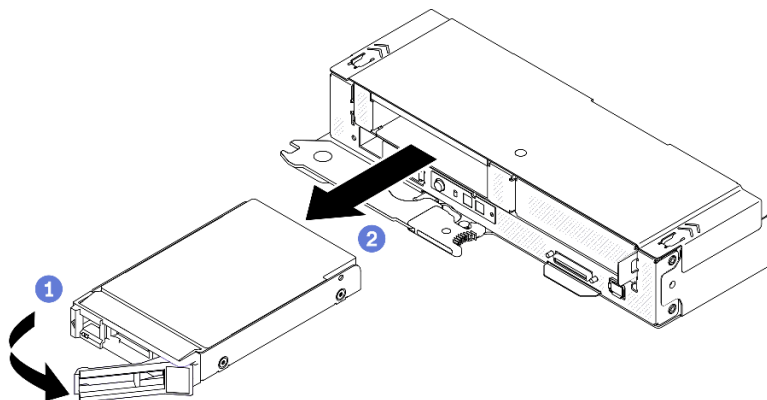
Figure 30. 15mm solid-state drive removal

Step 3. Place the drive(s) on the static protective surface to be installed back into the drive cage assembly if needed.

Demo video

Remove the drive cage assembly

Use this information to remove the drive cage assembly.

About this task

Attention: Read the to ensure that you work safely.

Procedure

Step 1. 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).

    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.
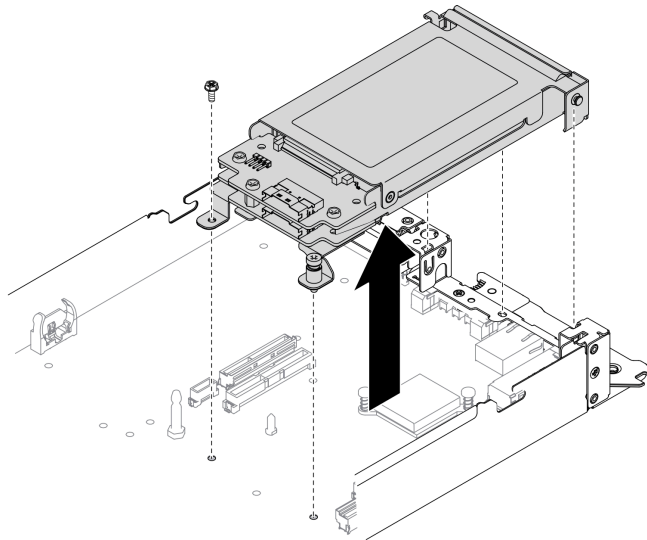
Figure 31. 7mm drive cage assembly removal

    Remove a 15mm drive cage assembly:

    a. Disconnect the cable connecting the system board and drive backplane (see).

    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.
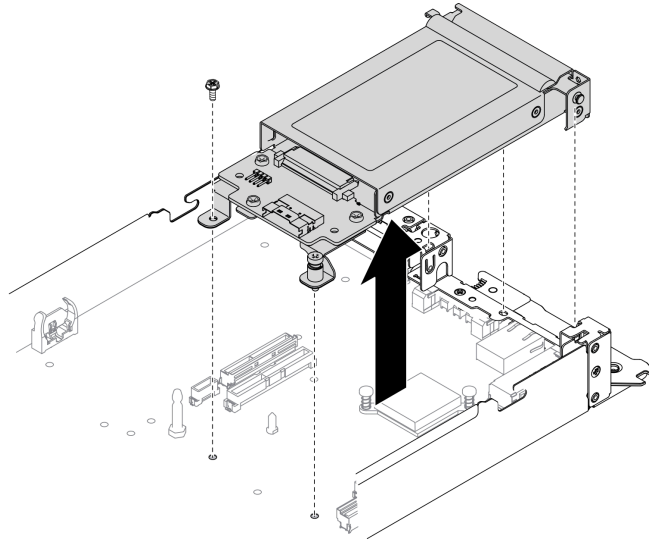
Figure 32. 15mm drive cage assembly removal

Demo video

Watch the procedure on YouTube

Remove the PCIe riser assembly

Use this information to remove the PCIe riser assembly.

About this task

Attention: Read the "Installation guidelines" on page 40 to ensure that you work safely.

Procedure

Step 1. 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.
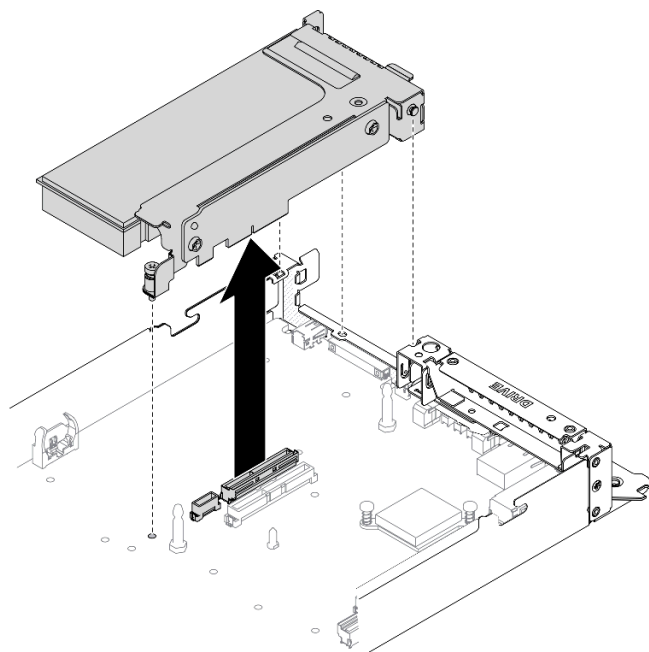
Figure 33. PCIe riser assembly removal

Demo video

Watch the procedure on YouTube

Remove a PCIe adapter

Use this information to remove a PCIe adapter.

About this task

Attention: Read the "Installation guidelines" on page 40 to ensure that you work safely.
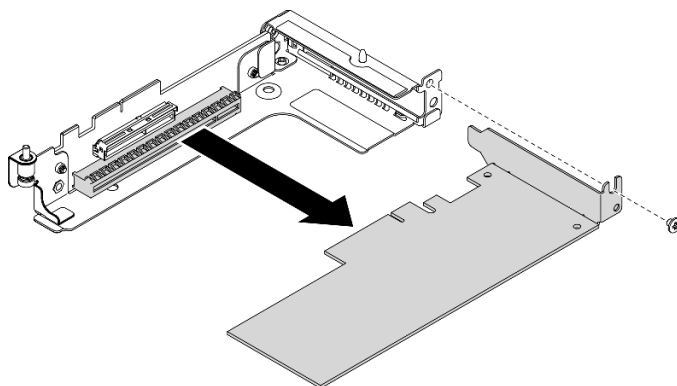
Procedure

Figure 34. PCIe adapter removal

Step 1. Remove the screw; then, grasp the adapter by its edges and carefully pull it out of the PCIe riser-cage.

Demo video

Replace SATA and NVMe spacers

Use this information to replace a SATA or NVMe spacer based on the configuration of your compute node.

About this task

Attention: Read the "Installation guidelines" on page 40 to ensure that you work safely.

Procedure

Notes: Make sure the following components have been removed from the compute node before replacing a spacer:

- Front air baffle (see "Remove the front air baffle" on page 51).
- Node front cover (see "Remove the node front cover" on page 49).
- Drive cage assembly (see "Remove the drive cage assembly" on page 55).
- PCIe riser assembly (see "Remove the PCIe riser assembly" on page 56).

Step 1. Remove the existing spacer from the compute node by removing the screw located inside of the spacer as illustrated.

Step 2. Install the SATA or NVMe spacer based on the type of drive(s) you will install into the drive cage assembly.
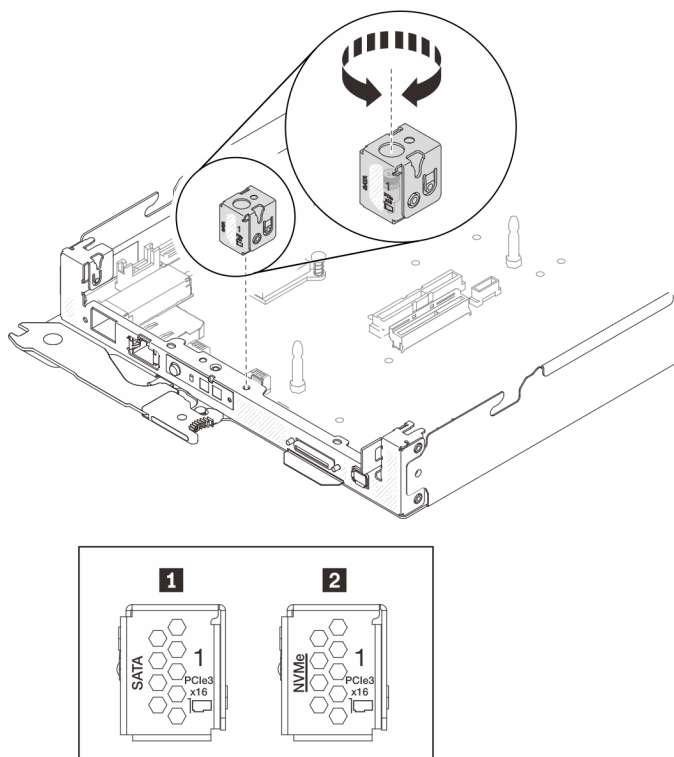
Figure 35. SATA and NVMe spacers installation

Table 20. List of spacers

1 SATA spacer	**2** NVMe spacer

    a.   Align the opening on top of the spacer with the slot on the compute node tray as illustrated.

    b.   Insert the screw into the slot through the opening on top of the spacer and tighten the screw to secure the spacer to the compute node tray.

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 40 to ensure that you work safely.

Procedure

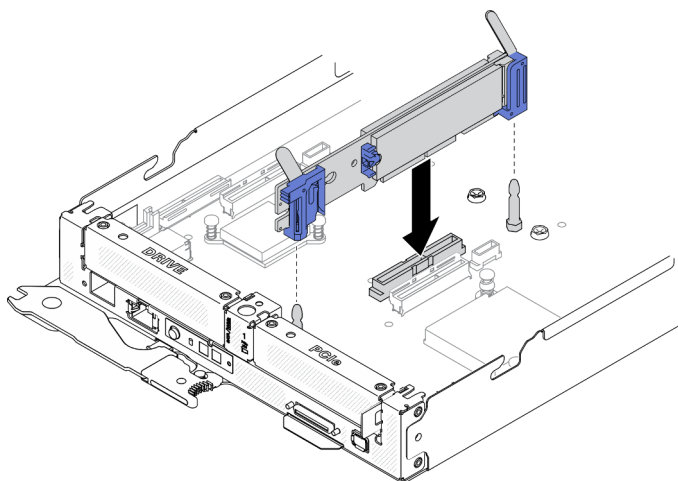*Figure 36. M.2 drive installation*

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.
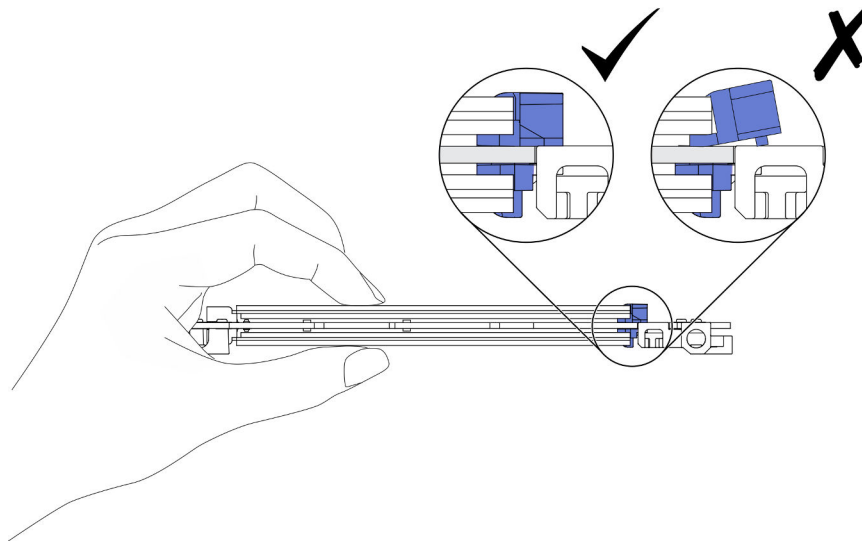
Figure 37. M.2 drive installation

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 40 to ensure that you work safely.

Procedure
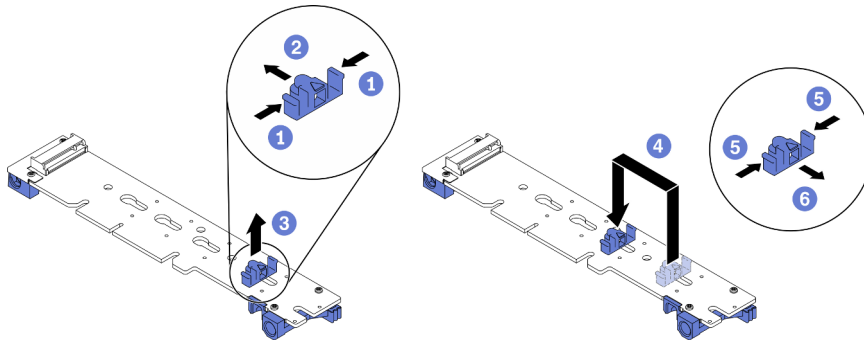
Figure 38. M.2 backplane retainer adjustment

Step 1.   Adjust the position of the retainer on the M.2 backplane.

   a.   ❶ Press both sides of the retainer.

   b.   ❷ Move the retainer forward until it is in the large opening of the keyhole.

   c.   ❸ Remove the retainer from the backplane.

   d.   ❹ 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.

   e.   ❺ Press both sides of the retainer again.

   f.   ❻ Slide the retainer backwards until the nubs are in the holes.

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**

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 40 to ensure that you work safely.

Procedure

Figure 39. M.2 backplane installation

Step 1. Align the openings located at the bottom of the blue plastic supports at each end of the M.2 backplane with the guide 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.

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 40 to ensure that you work safely.

Procedure

Notes: Make sure the following components are in place before installing the drive cage assembly:

• Two 7mm 2.5-inch SATA/NVMe backplanes or one 15mm 2.5-inch NVMe solid-state drive backplane

• The correct SATA or NVMe spacer 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 1. 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).
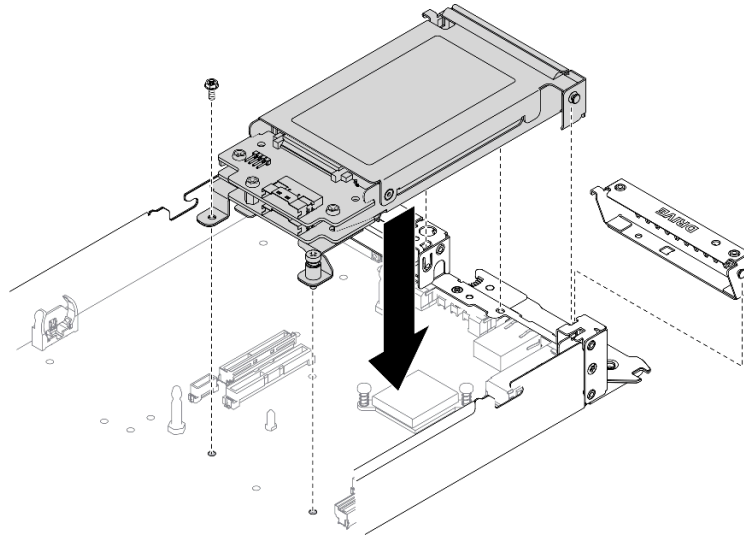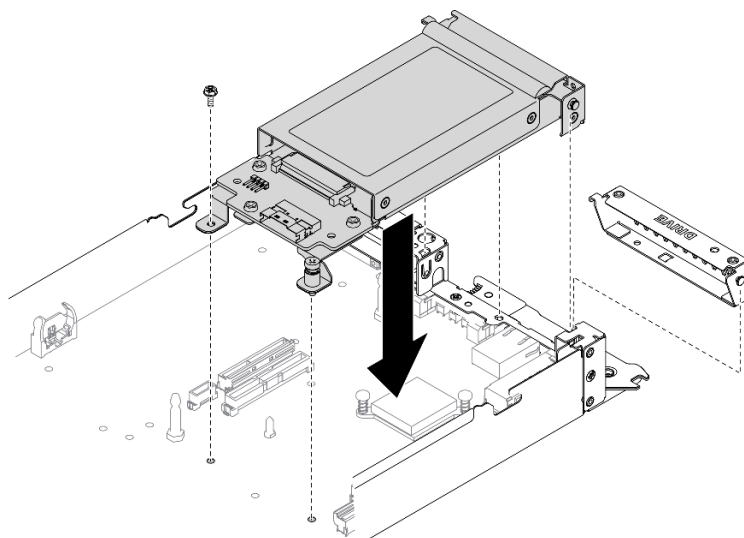

Figure 40. 7mm drive cage assembly installation

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 30).

Figure 41. 15mm drive cage assembly installation

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 40 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.
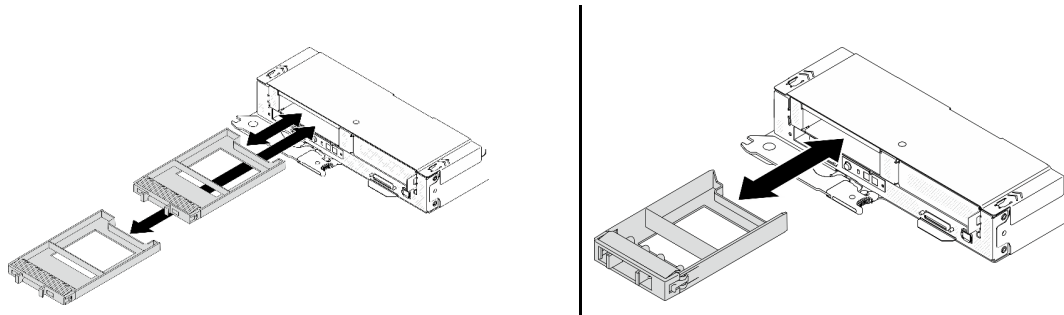
Figure 42. 7mm / 15mm solid-state drive fillers removal

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. ❶ 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. ❷ Rotate the drive handle to the fully closed position until the handle latch clicks.
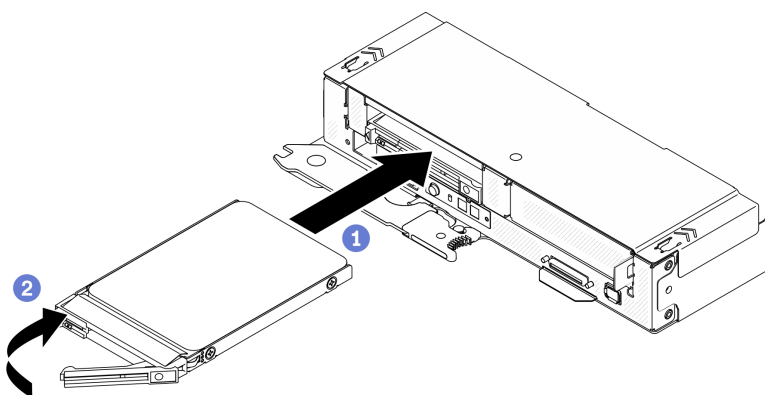
Figure 43. 7mm solid-state drive installation

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

a. ❶ 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. ❷ Rotate the drive handle to the fully closed position until the handle latch clicks.
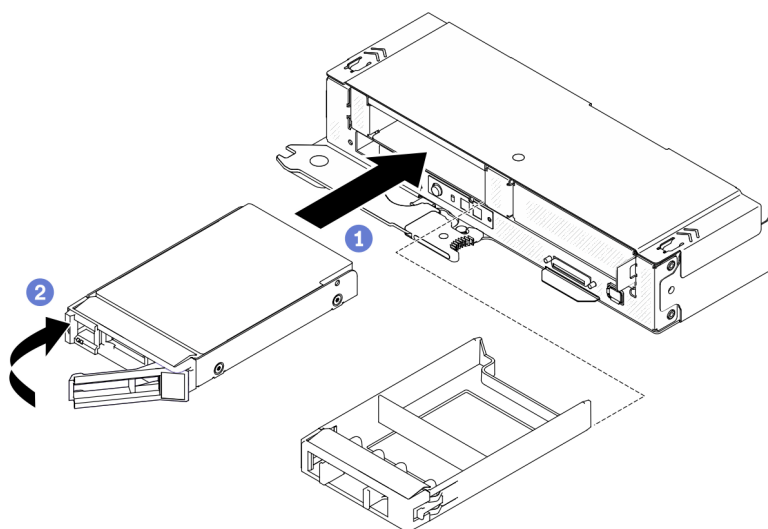
Figure 44. 15mm solid-state drive installation

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 40 to ensure that you work safely.

Procedure
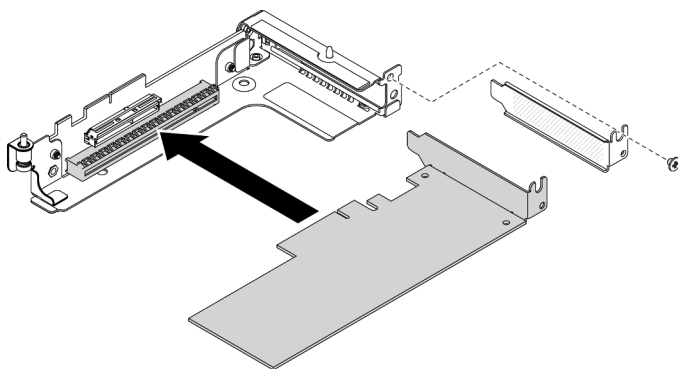
Figure 45. PCIe adapter installation

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.

Demo video

Install the PCIe riser assembly

Use this information to install the PCIe riser assembly.

About this task

Attention: Read the "Installation guidelines" on page 40 to ensure that you work safely.

Procedure

Note: Make sure a PCIe adapter has been installed into the PCIe riser assembly.

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.
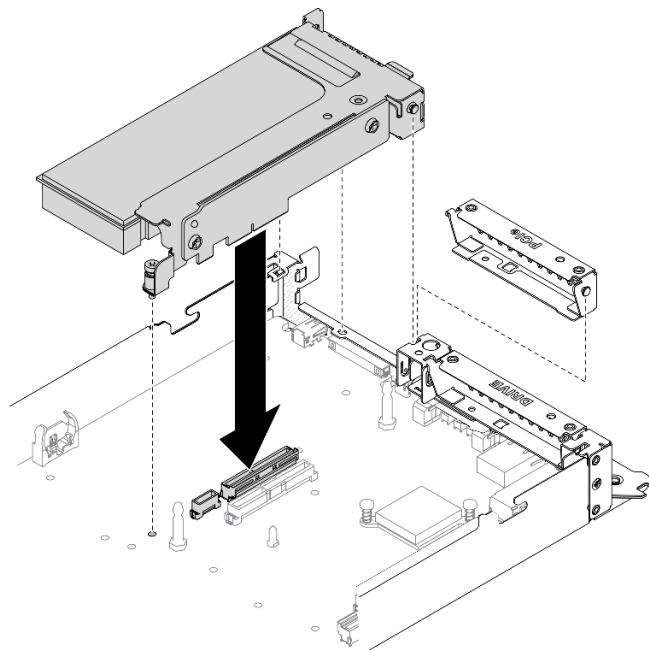
Figure 46. PCIe riser assembly installation

Demo video

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 rules and order" on page 43 for detailed information about memory configuration and setup.

Attention:

- Read the "Installation guidelines" on page 40 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.
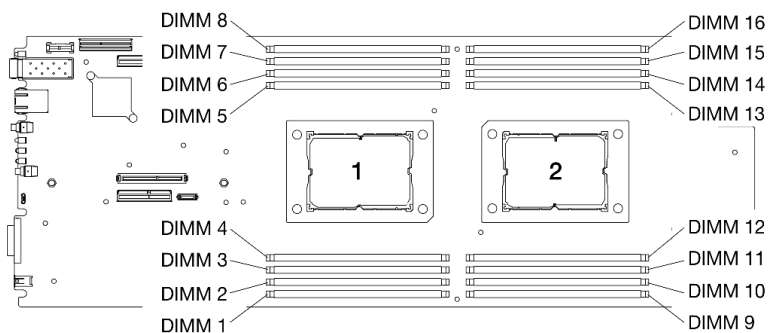
Figure 47. The location of the DIMM connectors on the system board

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.

    a. ❶ Place the tip of the tool in the recess on the top of the retaining clip.

    b. ❷ 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.
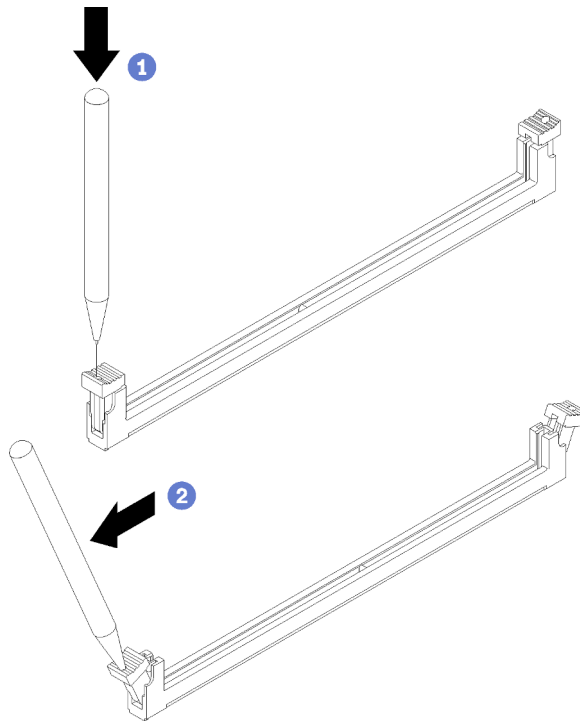
Figure 48. Opening retaining clips

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.

    a. ❶ Make sure that the retaining clips are in the fully open position.

    b. ❷ Align the DIMM with its connector and gently place the DIMM on the connector with both hands.

    c. ❸ Firmly press both ends of the DIMM straight down into the connector until the retaining clips snap into the locked position.
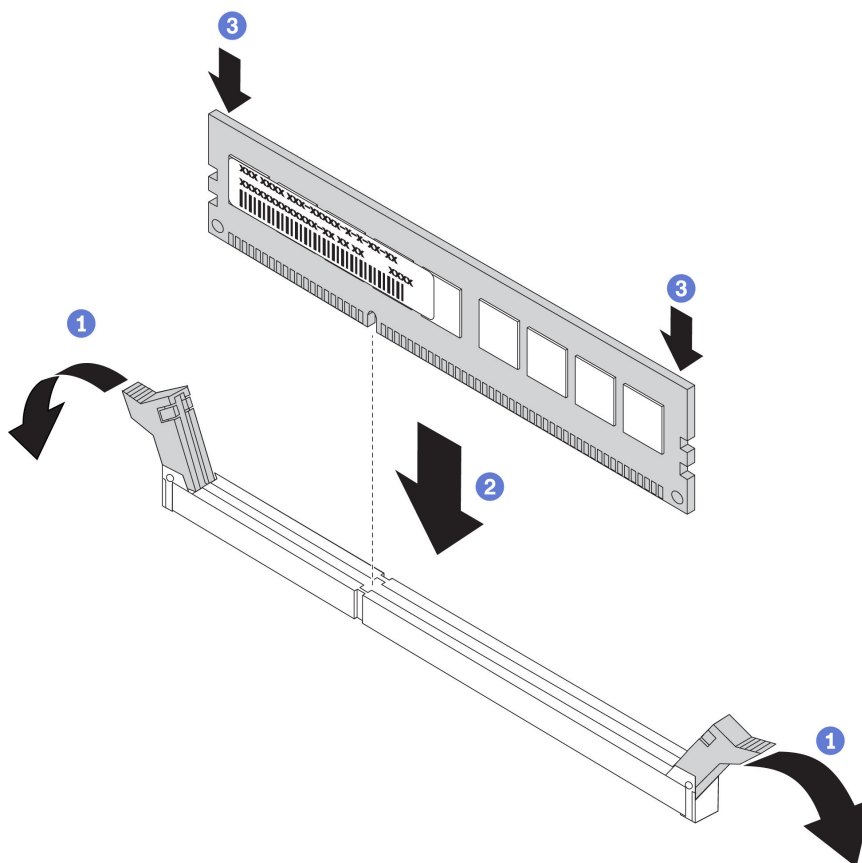
Figure 49. DIMM installation

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.

Demo video

Watch the procedure on YouTube

Install a processor-heat-sink module

The processor and heat sink are removed together as part of a processor-heat-sink-module (PHM) assembly. PHM installation requires a Torx T30 driver.

About this task

Attention:

- Read the "Installation guidelines" on page 40 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.
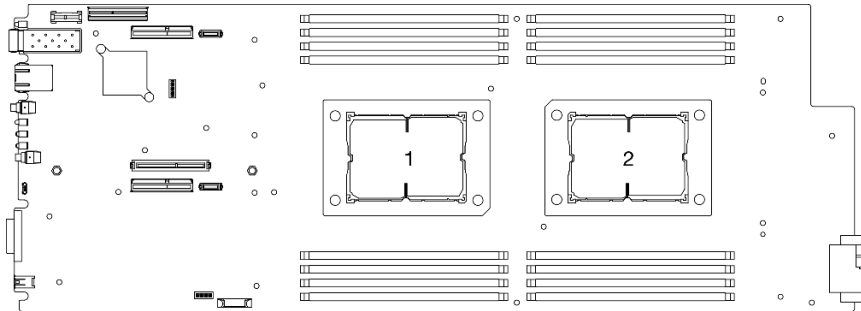

Figure 50. Processor locations on system board

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 server. 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" on page 86.
- For ThinkSystem DA240 Enclosure and ThinkSystem SD630 V2 Compute Node, T-shaped heat sink is only applicable to processor socket 2.
- Installing an additional PHM can change the memory requirements for your system. See "Install a memory module" on page 68 for a list of processor-to-memory relationships.
- The following types of heat sinks are applicable to SD630 V2:

  Processors with TDP (thermal design power) ≤ 165W:

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

  Processors with TDP (thermal design power) ≥ 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) ≤ 165W
  - **Three fans:**
    – Processors with TDP (thermal design power) ≥ 185W
    – Intel(R) Xeon(R) Gold 6334 (165W, 8 core)

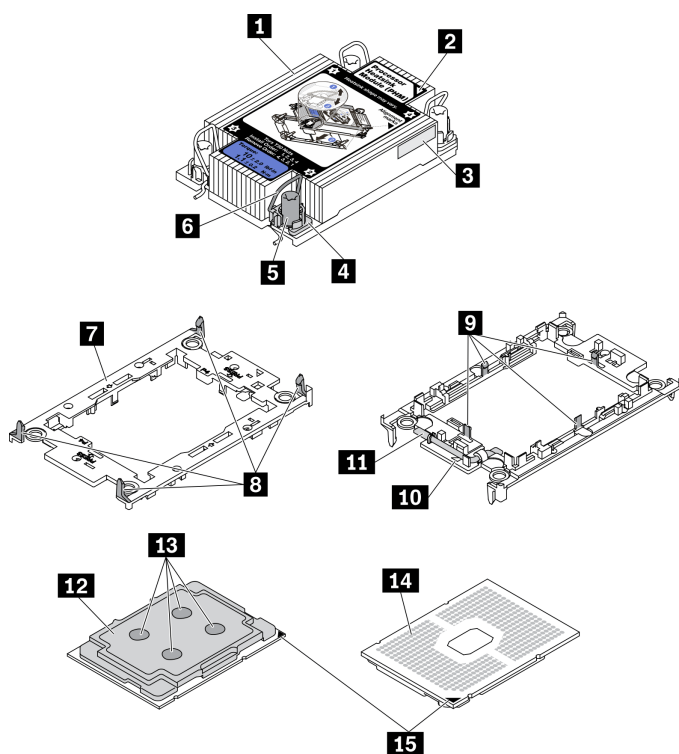The following illustration shows the components of the PHM.

Figure 51. 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	

Watch the procedure

A video of this procedure is available at YouTube: https://youtube.com/playlist?list=PLYV5R7hVcs-DsSgQ7SWFAPzJ58fh7vt2P.

Procedure

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

Step 2. Install the processor-heat-sink module into the system board socket.
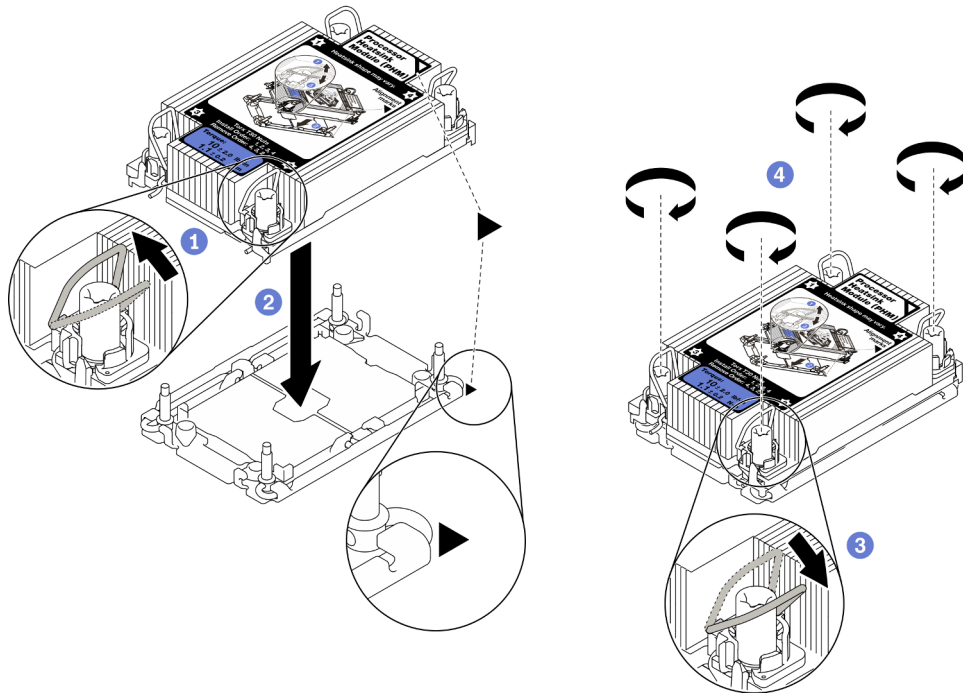
Figure 52. PHM installation

a. ❶ Rotate the anti-tilt wire bails inward.

b. ❷ 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. ❸ Rotate the anti-tilt wire bails outward until they engage with the hooks in the socket.

d. ❹ 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 3. Based on your configuration, follow the corresponding procedures to install the T-shaped heat sink that comes with processor 2.
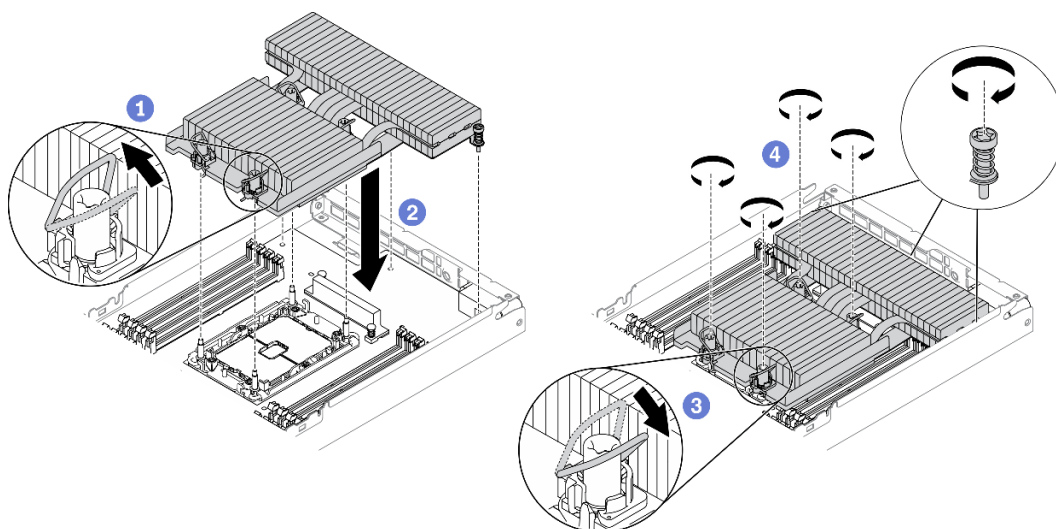
Figure 53. T-shaped heat sink installation

a. ❶ For the four Torx T30 nuts, rotate the anti-tilt wire bails inward.

b. ❷ 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. ❸ Rotate the anti-tilt wire bails outward until they engage with the hooks in the socket.

d. ❹ 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.
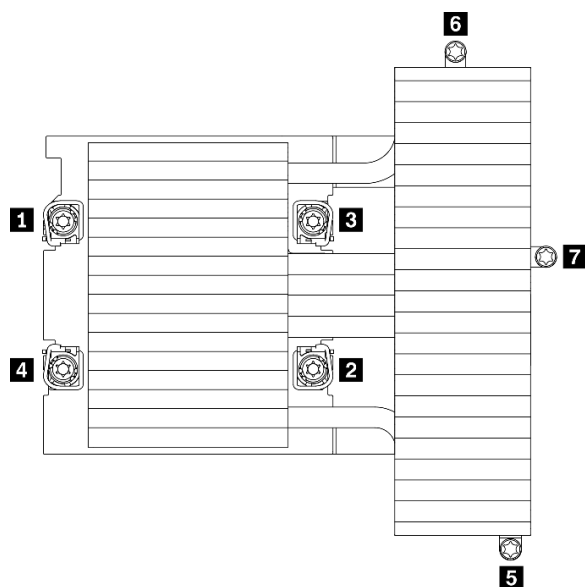
Figure 54. Torx T30 nuts and screws numbering on T-shaped heat sink label

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 76 and "Install the middle air baffle" on page 75).

2. Reinstall the compute node into the enclosure (see "Install a compute node in the enclosure" on page 78).

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

Install the node air baffles

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

Install the middle air baffle

Use this information to install the middle air baffle.

About this task

Attention: Read the "Installation guidelines" on page 40 to ensure that you work safely.
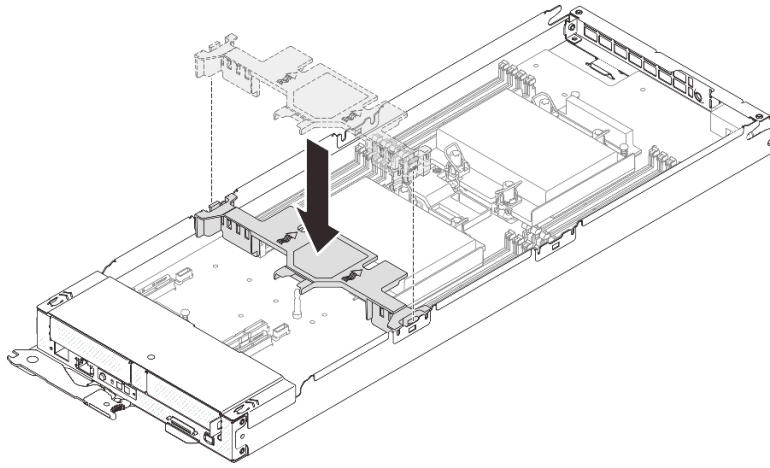
Procedure
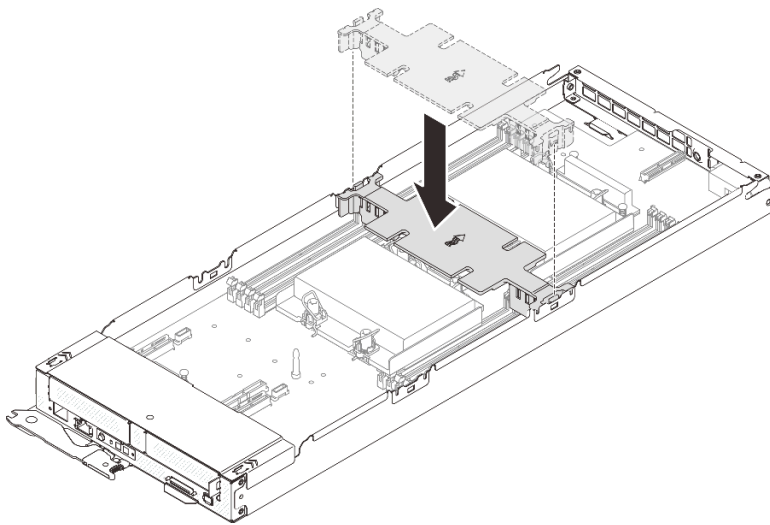
Figure 55. Middle air baffle installation

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.

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 40 to ensure that you work safely.

Procedure

Figure 56. 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.

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 40 to ensure that you work safely.
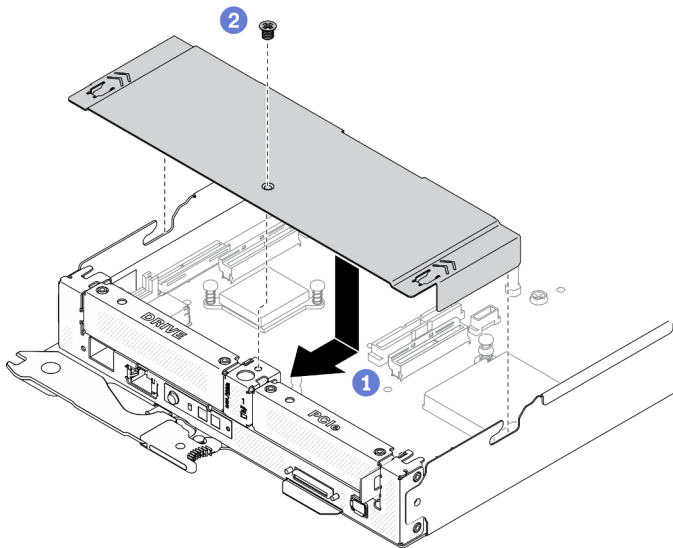
Procedure

Figure 57. Node front cover installation

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

    a.   **❶** 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.   **❷** Fasten the screw on the node front cover.

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 40 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
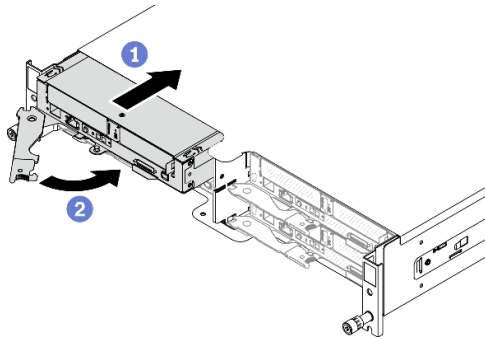
Figure 58. Compute node installation

Step 1. Install a compute node in the enclosure.

    a. ❶ 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. ❷ 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://sysmgt.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 Chapter 4 "System configuration" on page 85 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

Install a USB 3.0 Console Breakout Cable

Refer to "USB 3.0 Console Breakout Cable" on page 31 to identify the connectors and components on the USB 3.0 Console Breakout Cable and 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).

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.

- <u>S014</u>

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 40 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.
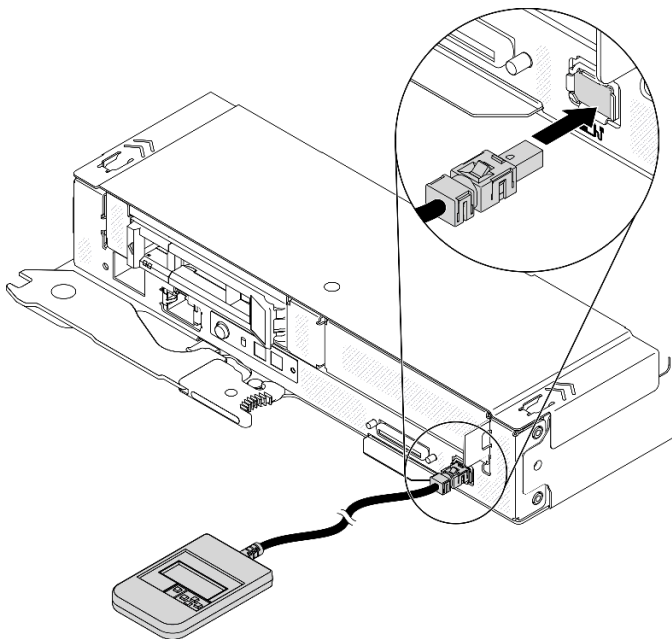
Figure 59. Connecting the external LCD diagnostics handset cable

Step 2.   Attach the external LCD diagnostics handset to a metal surface with the magnetic bottom.
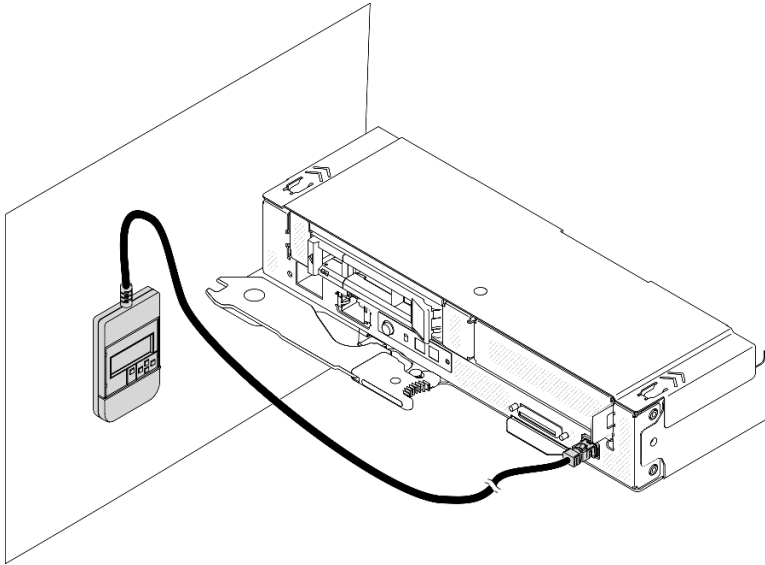
Figure 60. Attaching the external LCD diagnostics handset to a metal surface

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

Install the enclosure into the rails

Follow the instructions to install the enclosure into the rails.

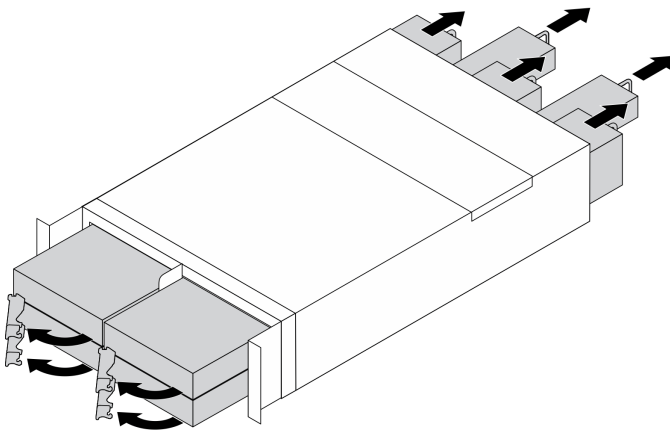Step 1.   Remove all of the compute nodes, power supplies, fans, and SMM2 from the enclosure to reduce its weight.

Figure 61. Removing components to reduce the enclosure's weight

Step 2.   Align and place the enclosure onto the rails; then, slide it into the rack along the rails.
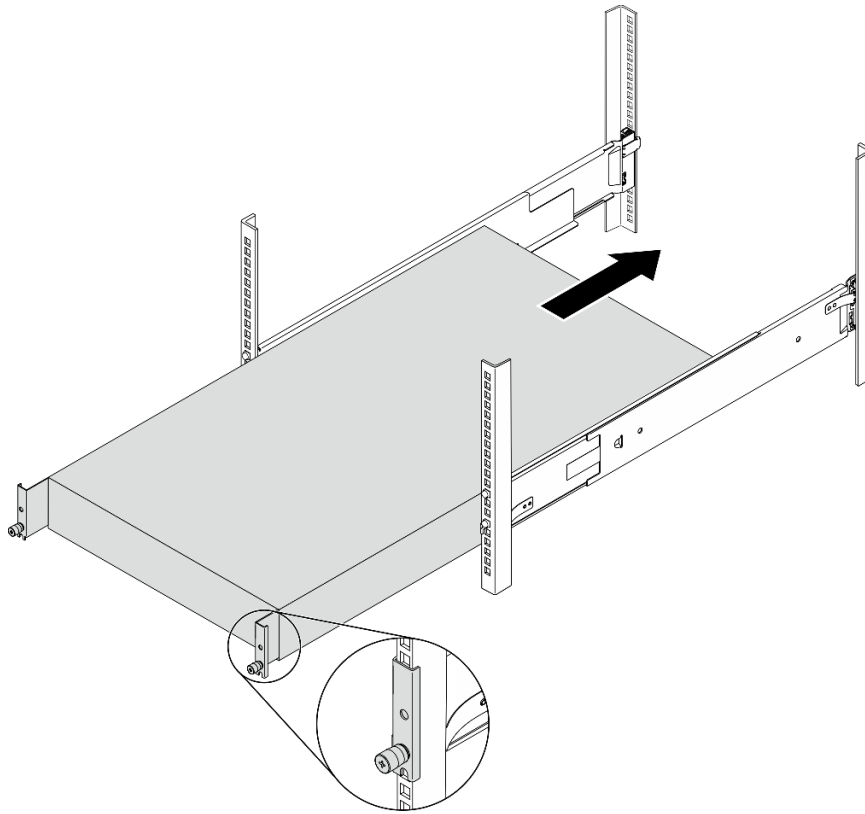
Figure 62. Installing the enclosure into the rails

CAUTION:
Use safe practices when lifting the enclosure.

Step 3.   Secure the captive screws.

Step 4.   Reinstall all of the solution components that you previously removed.

Cable the solution

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

Connect the solution to power.

Connect the solution to the network.

Connect the solution to any storage devices.

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 .

Validate solution setup

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

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 .

Chapter 4. System configuration

Complete these procedures to configure your system.

Set the network connection for the Lenovo XClarity Controller

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

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

* If a monitor is attached to the solution, you can use Lenovo XClarity Provisioning Manager to set the network connection.

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

  1. Start the solution.

  2. Press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.)

  3. Go to **LXPM ➙ UEFI Setup ➙ BMC Settings** to specify how the Lenovo XClarity Controller will connect to the network.

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

  4. Click **OK** to apply the setting and wait for two to three minutes.

  5. Use an IPv4 or IPv6 address to connect Lenovo XClarity Controller.

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

* If no monitor attached to the solution, you can set the network connection through the System Management Module 2 interface. Connect an Ethernet cable from your laptop to the Ethernet port on the System Management Module 2, which is located at the rear of the solution.

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

  To access the System Management Module 2 interface, the System Management Module 2 network must be enabled. For more information, see *System Management Module 2 User Guide*.

  The default IPv4 address and the IPv6 Link Local Address (LLA) is provided on the Lenovo XClarity Controller Network Access label that is affixed to the Pull Out Information Tab.

* If you are using the Lenovo XClarity Administrator Mobile app from a mobile device, you can connect to the Lenovo XClarity Controller through the Lenovo XClarity Controller USB connector or USB 3.0 Console Breakout Cable. For the location of Lenovo XClarity Controller USB connector and USB 3.0 Console Breakout Cable connector, see "Compute node" on page 15.

To connect using the Lenovo XClarity Administrator Mobile app:

1. If applicable, connect the USB 3.0 Console Breakout Cable to the front panel.
2. Connect the USB cable of your mobile device to the Lenovo XClarity Controller USB connector or USB 3.0 Console Breakout Cable.
3. On your mobile device, enable USB tethering.
4. On your mobile device, launch the Lenovo XClarity Administrator mobile app.
5. If automatic discovery is disabled, click **Discovery** on the USB Discovery page to connect to the Lenovo XClarity Controller.

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

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

Enable System Management Module 2 network connection via Lenovo XClarity Controller

If no USB 3.0 Console Breakout Cable is available to access Lenovo XClarity Controller logs with, enable System Management Module 2 network connection via Lenovo XClarity Controller first.

For more information, see *System Management Module 2 User Guide*.

Update the firmware

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

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

- Best practices related to updating firmware is available at the following site:
  - 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	√		√
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	√		

Tool	Update Methods Supported	Core System Firmware Updates	I/O Devices Firmware Updates	Graphical user interface	Command line interface	Supports UXSPs
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/

- **Lenovo XClarity Controller**

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

  Notes:

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

    For additional information about configuring Ethernet over USB, see:

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

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

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

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

- **Lenovo XClarity Essentials OneCLI**

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

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

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

- **Lenovo XClarity Essentials UpdateXpress**

Lenovo XClarity Essentials UpdateXpress provides most of OneCLI update functions through a graphical user interface (GUI). It can be used to acquire and deploy 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/

Configure the firmware

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

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

- **Lenovo XClarity Provisioning Manager**

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

  Notes: The Lenovo XClarity Provisioning Manager provides a Graphical User Interface to configure a server. The text-based interface to system configuration (the Setup Utility) is also available. From Lenovo XClarity Provisioning Manager, you can choose to restart the server and access the text-based interface. In addition, you can choose to make the text-based interface the default interface that is displayed when you start LXPM. To do this, go to **Lenovo XClarity Provisioning Manager ➙ UEFI Setup ➙ System Settings ➙ <F1>Start Control ➙ Text Setup**. To start the server with Graphic User Interface, select **Auto** or **Tool Suite**.

  See the following documentations for more information:

  – *Lenovo XClarity Provisioning Manager User Guide*

    – Search for the LXPM documentation version compatible with your server at https://pubs.lenovo.com/lxpm-overview/

  – *UEFI User Guide*

    – https://pubs.lenovo.com/uefi-overview/

- **Lenovo XClarity Essentials OneCLI**

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

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

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

- **Lenovo XClarity Administrator**

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

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

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

- **Lenovo XClarity Controller**

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

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

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

Memory configuration

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

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

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

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

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

For specific information about the required installation order of memory modules in your compute node(s) based on the system configuration and memory mode that you are implementing, see "Memory module installation guidelines" on page 43.

Enable Software Guard Extensions (SGX)

Intel® Software Guard Extensions (Intel® SGX) operates under the assumption that the security perimeter includes only the internals of the CPU package, and leaves the DRAM untrusted.

Complete the following steps to enable SGX.

Step 1. Make sure you follow the memory module population sequence for SGX configurations in "Independent memory mode: Installation guidelines and sequence" on page 44. (DIMM configuration must be at least 8 DIMMs per socket to support SGX).

Step 2. Restart the system. Before the operating system starts up, press the key specified in the on-screen instructions to enter the Setup Utility. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.)

Step 3. Go to **System settings → Processors → UMA-Based Clustering** and disable the option.

Step 4. Go to **System settings → Processors → Total Memory Encryption (TME)** and enable the option.

Step 5. Save the changes, then go to **System settings → Processors → SW Guard Extension (SGX)** and enable the option.

Note: For more information, see https://lenovopress.lenovo.com/lp1471.pdf.

RAID configuration

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

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

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

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

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

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

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

Notes:

- Before setting up RAID for NVMe drives, follow the below steps to enable VROC:

    1. Restart the system. Before the operating system starts up, press the key specified in the on-screen instructions to enter the Setup Utility.

    2. Go to **System settings ➜ Devices and I/O Ports ➜ Intel VMD** and enable the option.

    3. Save the changes and reboot the system.

- VROC Intel-SSD-Only supports RAID levels 0 and 1 with Intel NVMe drives.

- VROC Premium requires an activation key and supports RAID levels 0 and 1 with non-Intel NVMe drives. For more information about acquiring and installing the activation key, see https://fod.lenovo.com/lkms

Deploy the operating system

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

Available operating systems

- Microsoft Windows Server
- VMware ESXi
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server

Complete list of available operating systems: https://lenovopress.lenovo.com/osig.

Tool-based deployment

- **Multi-server**

    Available tools:

    - Lenovo XClarity Administrator

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

    - Lenovo XClarity Essentials OneCLI

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

    - Lenovo XClarity Integrator deployment pack for SCCM (for Windows operating system only)

        https://pubs.lenovo.com/lxci-deploypack-sccm/dpsccm_c_endtoend_deploy_scenario

- **Single-server**

    Available tools:

    - Lenovo XClarity Provisioning Manager

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

    - Lenovo XClarity Essentials OneCLI

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

    - Lenovo XClarity Integrator deployment pack for SCCM (for Windows operating system only)

        https://pubs.lenovo.com/lxci-deploypack-sccm/dpsccm_c_endtoend_deploy_scenario

Manual deployment

If you cannot access the above tools, follow the instructions below, download the corresponding *OS Installation Guide*, and deploy the operating system manually by referring to the guide.

1. Go to https://datacentersupport.lenovo.com/solutions/server-os.
2. Select an operating system from the navigation pane and click **Resources**.
3. Locate the "OS Install Guides" area and click the installation instructions. Then, follow the instructions to complete the operation system deployment task.

Back up the solution configuration

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

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

- **Management processor**

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

  "Backing up the BMC configuration" section in the XCC documentation compatible with your solution at https://pubs.lenovo.com/lxcc-overview/.

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

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

- **Operating system**

  Use your backup methods to back up the operating system and user data for the solution.

Update the Vital Product Data (VPD)

After initial setup of the system, you can update some Vital Product Data (VPD), such as asset tag and Universal Unique Identifier (UUID).

Update the Universal Unique Identifier (UUID)

Optionally, you can update the Universal Unique Identifier (UUID).

There are two methods available to update the UUID:

- From Lenovo XClarity Provisioning Manager

  To update the UUID from Lenovo XClarity Provisioning Manager:

  1. Start the server and press the key according to the on-screen instructions. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.) The Lenovo XClarity Provisioning Manager interface is displayed by default.
  2. If the power-on Administrator password is required, enter the password.
  3. From the System Summary page, click **Update VPD**.
  4. Update the UUID.

- From Lenovo XClarity Essentials OneCLI

Lenovo XClarity Essentials OneCLI sets the UUID in the Lenovo XClarity Controller. Select one of the following methods to access the Lenovo XClarity Controller and set the UUID:

– 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 UUID 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 command to set the UUID:
   `onecli config createuuid SYSTEM_PROD_DATA.SysInfoUUID [access_method]`

   Where:

   [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 command is as follows:
   > `onecli config createuuid SYSTEM_PROD_DATA.SysInfoUUID --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 command is as follows:
   > `onecli config createuuid SYSTEM_PROD_DATA.SysInfoUUID`

   > **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 external IP address. There is no default value. This parameter is required.

   > *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).

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

Example command is as follows:
```
onecli config createuuid SYSTEM_PROD_DATA.SysInfoUUID --bmc <xcc_user_id>:<xcc_password>@<xcc_external_ip>
```

4. Restart the Lenovo XClarity Controller.

5. Restart the server.

Update the asset tag

Optionally, you can update the asset tag.

There are two methods available to update the asset tag:

- From Lenovo XClarity Provisioning Manager

    To update the asset tag from Lenovo XClarity Provisioning Manager:

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

    2. If the power-on Administrator password is required, enter the password.

    3. From the System Summary page, click **Update VPD**.

    4. Update the asset tag information.

- From Lenovo XClarity Essentials OneCLI

    Lenovo XClarity Essentials OneCLI sets the asset tag in the Lenovo XClarity Controller. Select one of the following methods to access the Lenovo XClarity Controller and set the asset tag:

    - 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 asset tag 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 command to set the DMI:
    ```
    onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag> [access_method]
    ```

        Where:

        <asset_tag>
            The server asset tag number. Type `aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa`, where *aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa* is the asset tag number.

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

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

Where:

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

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

Example command is as follows:

```
onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag> --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 command is as follows:

```
onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag>
```

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 command is as follows:

```
onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag> --bmc <xcc_user_id>:<xcc_
password>@<xcc_external_ip>
```

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

Chapter 5. Resolving installation issues

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

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

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, reseat 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, reseat 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" in *Setup Guide*.

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).

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

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 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.

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.

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.

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 3 for the minimally required number of processors and DIMMs.

2. Restart the system.

- If the system restarts, add each of the items that you removed one at a time, restarting the system each time, until the error occurs. Replace the item for which the error occurs.

- If the system does not restart, suspect the system board.

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about Lenovo products, you will find a wide variety of sources available from Lenovo to assist you.

On the World Wide Web, up-to-date information about Lenovo systems, optional devices, services, and support are available at:

http://datacentersupport.lenovo.com

Note: 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/supportphonelist for your region support details.

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