



ThinkSystem DW612S Neptune DWC  
Enclosure  
User Guide



**Machine Types:** 7D1L

**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/](https://pubs.lenovo.com/safety_documentation/)

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

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

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## Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

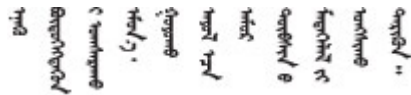
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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



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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

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

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

مەزكۇر مەھسۇلاتنى ئورنىتىشتىن بۇرۇن بىخەتەرلىك ئۇچۇرلىرىنى ئوقۇپ چىقىڭ.

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canjbinj soengq cungj vahgangj ancien siusik.

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## Safety inspection checklist

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

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

**Note:** The set-up of the server is made in the server room only.

### CAUTION:

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

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

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

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

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

- a. Go to:

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

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



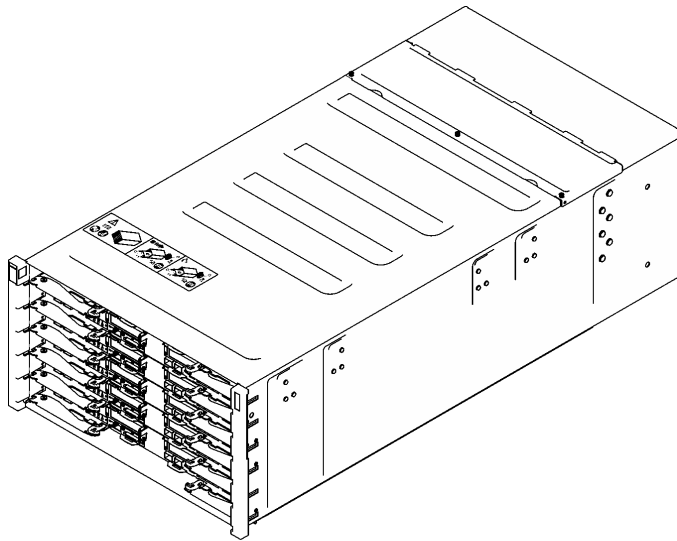


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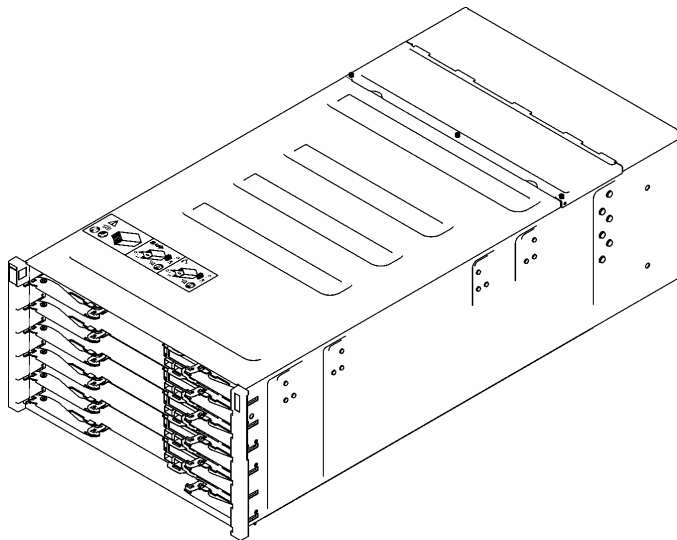
## Chapter 1. Introduction

The ThinkSystem DW612S Neptune DWC Solution 6U enclosure is designed for high performance computing. This solution includes a single enclosure that can contain up to six ThinkSystem high-density servers, which are designed to deliver a dense, scalable platform for distributed enterprise and hyperconverged.

Figure 1. ThinkSystem DW612S Neptune DWC Solution installed with SD650 V3

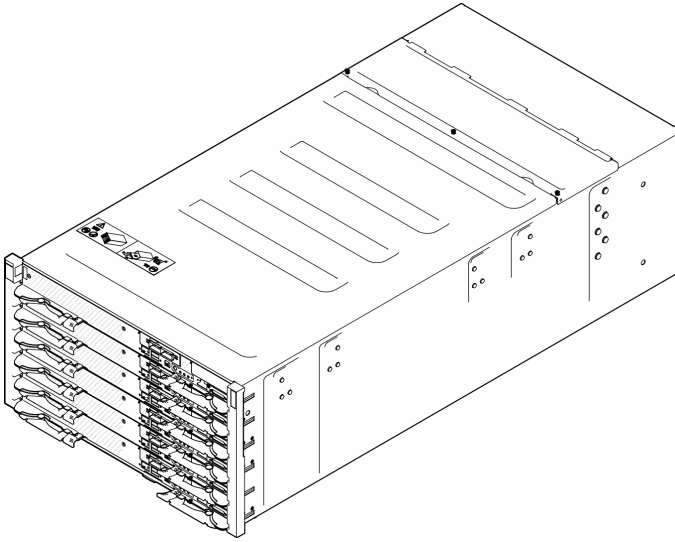


SD650 V3

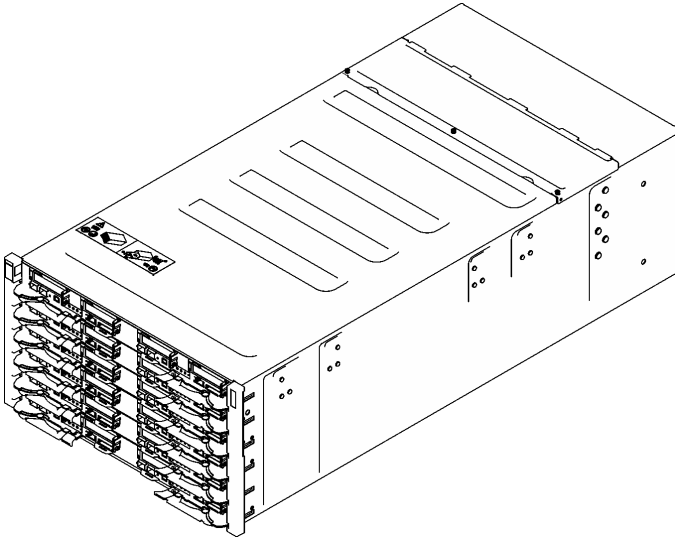


SD650-I V3

Figure 2. ThinkSystem DW612S Neptune DWC Solution installed with SD650-I V3



*Figure 3. ThinkSystem DW612S Neptune DWC Solution installed with SD650-N V3*



*Figure 4. ThinkSystem DW612S Neptune DWC Solution installed with SD665 V3*

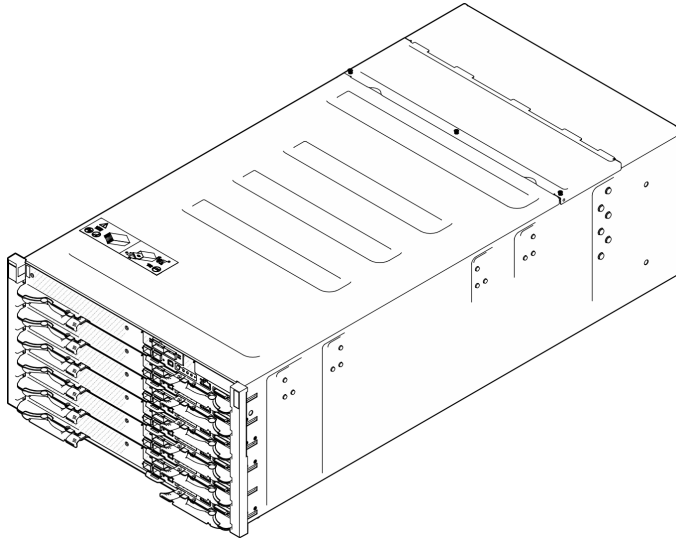


Figure 5. ThinkSystem DW612S Neptune DWC Solution installed with SD665-N V3

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## 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.

Your solution implements the following features and technologies:

- **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>

- **Lenovo XClarity Controller (XCC)**

The Lenovo XClarity Controller is the common management controller for Lenovo ThinkSystem server hardware. The Lenovo XClarity Controller consolidates multiple management functions in a single chip on the server system board (system board assembly). Some of the features that are unique to the Lenovo XClarity Controller are enhanced performance, higher-resolution remote video, and expanded security options.

The server supports Lenovo XClarity Controller 2 (XCC2). For additional information about Lenovo XClarity Controller 2 (XCC2), refer to <https://pubs.lenovo.com/lxcc-overview/>.

- **UEFI-compliant server 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).

- **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 synchronous dynamic random-access memory (SDRAM) registered dual inline memory modules (DIMMs) with error correcting code (ECC). For more information about the specific types and maximum amount of memory, see “Technical Specifications” in the *User Guide* of each high-density server..

- **Integrated network support**

The tray comes with an integrated 1-port Gigabit Ethernet controller with RJ-45 connector and 2-port 25Gb Ethernet controller with SFP28 connector, which support connection to a 1000 Mbps network.

- **Large data-storage capacity**

See the “Specifications” section in the *User Guide* of the high-density server.

- **Lightpath Diagnostics**

Lightpath Diagnostics provides LEDs to help you diagnose problems. For more information about the Lightpath Diagnostics, see “[Troubleshooting by system LEDs and diagnostics display](#)” on page 193.

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

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

- **Active Energy Manager**

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

- **Optional power capabilities**

The solution supports a maximum of nine 2400W or 2600W hot-swap power supplies, or three 7200W DWC PSUs.

**Note:** Do not mix power supplies in the same unit of solution.

- **ThinkSystem RAID support**

See the “Specifications” section in the *User Guide* of the high-density server.

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## Tech Tips

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

To find the Tech Tips available for your server:

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

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

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## Security advisories

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

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

[https://datacentersupport.lenovo.com/product\\_security/home](https://datacentersupport.lenovo.com/product_security/home)

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## Specifications

Summary of the specifications of enclosure. Depending on the model, some features might not be available, or some specifications might not apply.

### Technical specifications

Integrated functions and I/O connectors
<ul style="list-style-type: none"><li>Hot-swappable System Management Module 2 (SMM2)</li></ul> <p><b>Note:</b> See <a href="https://pubs.lenovo.com/mgt_tools_smm2/">https://pubs.lenovo.com/mgt_tools_smm2/</a> for more details about System Management Module.</p>
Network
10/100/1000 Mb Ethernet port dedicated for System Management Module (SMM2).

### Mechanical specifications

Dimension
<ul style="list-style-type: none"><li>Height: 263.3 mm (10.40 inches)</li><li>Depth: 914.5 mm (36.00 inches)</li><li>Width: 447.0 mm (17.60 inches)</li></ul>
Weight
<ul style="list-style-type: none"><li>Weight:<ul style="list-style-type: none"><li>Empty enclosure (with midplane, SMM2, and cables): approximately 25 kg (55 lbs)</li><li>Fully configured (stand-alone):<ul style="list-style-type: none"><li>Enclosure with six SD650 V3 trays and three DWC PSU: approximately 168.34 kg (371.19 lbs)</li><li>Enclosure with six SD650-I V3 trays: approximately 176.62 kg (389.45 lbs)</li><li>Enclosure with six SD650-N V3 trays and three DWC PSU: approximately 183.3 kg (404.11 lbs)</li><li>Enclosure with six SD665 V3 trays and three DWC PSU: approximately 173.7 kg (382.9 lbs)</li><li>Enclosure with six SD665-N V3 trays and three DWC PSU: approximately 188.7 kg (416 lbs)</li></ul></li></ul></li></ul>

## 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 1. Limits for particulates and gases

Contaminant	Limits
Reactive gases	<p>Severity level G1 as per ANSI/ISA 71.04-1985<sup>1</sup>:</p> <ul style="list-style-type: none"> <li>The copper reactivity level shall be less than 300 Angstroms per month (<math>\text{\AA}/\text{month} \approx 0.0039 \mu\text{g}/\text{cm}^2\text{-hour}</math> weight gain).<sup>2</sup></li> <li>The silver reactivity level shall be less than 200 <math>\text{\AA}/\text{month}</math> (<math>\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour}</math> weight gain).<sup>3</sup></li> <li>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.</li> </ul>
Airborne particulates	<p>Data centers must meet the cleanliness level of ISO 14644-1 class 8.</p> <p>For data centers without airside economizer, the ISO 14644-1 class 8 cleanliness might be met by choosing one of the following filtration methods:</p> <ul style="list-style-type: none"> <li>The room air might be continuously filtered with MERV 8 filters.</li> <li>Air entering a data center might be filtered with MERV 11 or preferably MERV 13 filters.</li> </ul> <p>For data centers with airside economizers, the choice of filters to achieve ISO class 8 cleanliness depends on the specific conditions present at that data center.</p> <ul style="list-style-type: none"> <li>The deliquescent relative humidity of the particulate contamination should be more than 60% RH.<sup>4</sup></li> <li>Data centers must be free of zinc whiskers.<sup>5</sup></li> </ul>
<p><sup>1</sup> ANSI/ISA-71.04-1985. <i>Environmental conditions for process measurement and control systems: Airborne contaminants</i>. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.</p> <p><sup>2</sup> The derivation of the equivalence between the rate of copper corrosion growth in the thickness of the corrosion product in <math>\text{\AA}/\text{month}</math> and the rate of weight gain assumes that <math>\text{Cu}_2\text{S}</math> and <math>\text{Cu}_2\text{O}</math> grow in equal proportions.</p> <p><sup>3</sup> The derivation of the equivalence between the rate of silver corrosion growth in the thickness of the corrosion product in <math>\text{\AA}/\text{month}</math> and the rate of weight gain assumes that <math>\text{Ag}_2\text{S}</math> is the only corrosion product.</p> <p><sup>4</sup> The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.</p> <p><sup>5</sup> Surface debris is randomly collected from 10 areas of the data center on a 1.5 cm diameter disk of sticky electrically conductive tape on a metal stub. If examination of the sticky tape in a scanning electron microscope reveals no zinc whiskers, the data center is considered free of zinc whiskers.</p>	

## Management options

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

### Overview

Options	Description
Lenovo XClarity Controller	<p>Baseboard management controller (BMC)</p> <p>Consolidates the service processor functionality, Super I/O, video controller, and remote presence capabilities into a single chip on the server system board (system board assembly).</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• CLI application</li> <li>• Web GUI interface</li> <li>• Mobile application</li> <li>• Redfish API</li> </ul> <p><b>Usage and downloads</b></p> <p><a href="https://pubs.lenovo.com/lxcc-overview/">https://pubs.lenovo.com/lxcc-overview/</a></p>
Lenovo XCC Logger Utility	<p>Application that reports the XCC events to local OS system log.</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• CLI application</li> </ul> <p><b>Usage and downloads</b></p> <ul style="list-style-type: none"> <li>• <a href="https://pubs.lenovo.com/lxcc-logger-linux/">https://pubs.lenovo.com/lxcc-logger-linux/</a></li> <li>• <a href="https://pubs.lenovo.com/lxcc-logger-windows/">https://pubs.lenovo.com/lxcc-logger-windows/</a></li> </ul>
Lenovo XClarity Administrator	<p>Centralized interface for multi-server management.</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• Web GUI interface</li> <li>• Mobile application</li> <li>• REST API</li> </ul> <p><b>Usage and downloads</b></p> <p><a href="http://sysmgmt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/aug_product_page.html">http://sysmgmt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/aug_product_page.html</a></p>
Lenovo XClarity Essentials toolset	<p>Portable and light toolset for server configuration, data collection, and firmware updates. Suitable both for single-server or multi-server management contexts.</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• <b>OneCLI</b>: CLI application</li> <li>• <b>Bootable Media Creator</b>: CLI application, GUI application</li> <li>• <b>UpdateXpress</b>: GUI application</li> </ul> <p><b>Usage and downloads</b></p> <p><a href="https://pubs.lenovo.com/lxce-overview/">https://pubs.lenovo.com/lxce-overview/</a></p>

Options	Description
Lenovo XClarity Provisioning Manager	<p>UEFI-based embedded GUI tool on a single server that can simplify management tasks.</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• Web interface (BMC remote access)</li> <li>• GUI application</li> </ul> <p><b>Usage and downloads</b></p> <p><a href="https://pubs.lenovo.com/lxpm-overview/">https://pubs.lenovo.com/lxpm-overview/</a></p> <p><b>Important:</b> 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 <a href="https://pubs.lenovo.com/lxpm-overview/">https://pubs.lenovo.com/lxpm-overview/</a>.</p>
Lenovo XClarity Integrator	<p>Series of applications that integrate the management and monitoring functionalities of the Lenovo physical servers 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.</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• GUI application</li> </ul> <p><b>Usage and downloads</b></p> <p><a href="https://pubs.lenovo.com/lxci-overview/">https://pubs.lenovo.com/lxci-overview/</a></p>
Lenovo XClarity Energy Manager	<p>Application that can manage and monitor server power and temperature.</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• Web GUI Interface</li> </ul> <p><b>Usage and downloads</b></p> <p><a href="https://datacentersupport.lenovo.com/solutions/Invo-lxem">https://datacentersupport.lenovo.com/solutions/Invo-lxem</a></p>
Lenovo Capacity Planner	<p>Application that supports power consumption planning for a server or rack.</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• Web GUI Interface</li> </ul> <p><b>Usage and downloads</b></p> <p><a href="https://datacentersupport.lenovo.com/solutions/Invo-lcp">https://datacentersupport.lenovo.com/solutions/Invo-lcp</a></p>
System Management Module 2 (ThinkSystem high-density servers only)	<p>A hot-swap enclosure management module that helps you easily manage the system power supplies and fan speeds. It monitors the fan, power and enclosure status with event logs.</p> <p><b>Interface</b></p> <ul style="list-style-type: none"> <li>• Web GUI Interface</li> </ul> <p><b>Usage and downloads</b></p> <p><a href="https://pubs.lenovo.com/mgt_tools_smm2/">https://pubs.lenovo.com/mgt_tools_smm2/</a></p>



## Functions

Options		Functions							
		Multi-system mgmt	OS deployment	System configuration	Firmware updates <sup>1</sup>	Event/alert monitoring	Inventory/logs	Power mgmt	Power planning
Lenovo XClarity Controller				√	√ <sup>2</sup>	√	√ <sup>4</sup>		
Lenovo XCC Logger Utility						√			
Lenovo XClarity Administrator		√	√	√	√ <sup>2</sup>	√	√ <sup>4</sup>		
Lenovo XClarity Essentials toolset	OneCLI	√		√	√ <sup>2</sup>	√	√		
	Bootable Media Creator			√	√ <sup>2</sup>		√ <sup>4</sup>		
	UpdateXpress			√	√ <sup>2</sup>				
Lenovo XClarity Provisioning Manager			√	√	√ <sup>3</sup>		√ <sup>5</sup>		
Lenovo XClarity Integrator		√	√ <sup>6</sup>	√	√	√	√	√ <sup>7</sup>	
Lenovo XClarity Energy Manager		√				√		√	
Lenovo Capacity Planner									√ <sup>8</sup>
System Management Module 2(ThinkSystem high-density servers only)					√	√	√	√	

### 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 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 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 using Lenovo Capacity Planner before purchasing any new parts.

## DW612S enclosure and high-density server support matrix

Refer to this section for information on the supported high-density server configurations for your enclosure.

## Supported high-density server configurations for DW612S enclosure

The DW612S enclosure supports the following high-density server configurations:

- “SD650 V3 high-density server” on page 10
- “SD650-I V3 high-density server” on page 11
- “SD650-N V3 high-density server” on page 12
- “SD665 V3 high-density server” on page 13
- “SD665-N V3 high-density server” on page 14

## SD650 V3 high-density server

Refer to this section to for a brief introduction on the DW612S enclosure configuration with six SD650 V3 server.

For more information on SD650 V3 high-density server, see <https://pubs.lenovo.com/sd650-v3/>.

**Attention:** Start with slot 1 when installing trays into the DW612S enclosure.

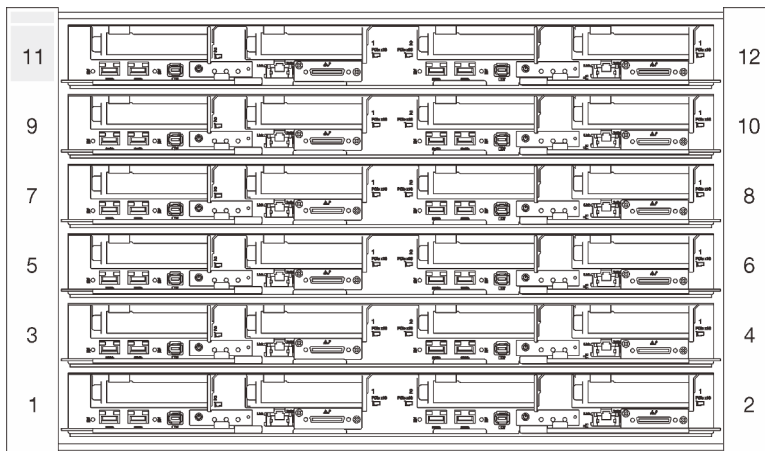


Figure 6. DW612S enclosure with six SD650 V3 server

### Notes:

- The illustration in this section is for reference only.
- The slot numbers are indicated on both sides of the enclosure.

Table 2. DW612S enclosure with six SD650 V3 server

Number of SD650 V3 server	Power supply configurations
Six	<ul style="list-style-type: none"> <li>• Supports six or nine hot-swap 2400W or 2600W AC power supplies.                             <ul style="list-style-type: none"> <li>– Sine-wave input (50-60 Hz) required</li> <li>– Input voltage for 2400W power supplies:                                     <ul style="list-style-type: none"> <li>– 200-240 Vac, 240 Vdc</li> </ul> </li> <li>– Input voltage for 2600W power supplies:                                     <ul style="list-style-type: none"> <li>– 200-208 Vac, 240 Vdc (output up to 2400W only)</li> <li>– 208-240 Vac, 240 Vdc</li> </ul> </li> </ul> </li> <li>– Six power supplies: 5+1 with oversubscription, or Non-redundancy</li> <li>– Nine power supplies: 8+1 without oversubscription</li> <li>• Supports two or three hot-swap DWC 7200W power supplies.                             <ul style="list-style-type: none"> <li>– Input voltage:                                     <ul style="list-style-type: none"> <li>– 200-208 Vac (work as 6900W)</li> <li>– 220-240 Vac, 240 Vdc (work as 7200W)</li> </ul> </li> <li>– Two DWC PSUs: work as 5+1 with oversubscription, or Non-redundancy</li> <li>– Three DWC PSUs: work as 8+1 without oversubscription</li> </ul> </li> </ul> <p><b>CAUTION:</b>  <b>Power supplies and redundant power supplies in the enclosure must be with the same brand, power rating, wattage or efficiency level.</b></p>

## SD650-I V3 high-density server

Refer to this section to for a brief introduction on the DW612S enclosure configuration with six SD650-I V3 server.

For more information on SD650-I V3 high-density server, see <https://pubs.lenovo.com/sd650-i-v3/>.

**Attention:** Start with slot 1 when installing trays into the DW612S enclosure.



Figure 7. DW612S enclosure with six SD650-I V3 server

**Notes:**

- The illustration in this section is for reference only.
- The slot numbers are indicated on both sides of the enclosure.

Table 3. DW612S enclosure with six SD650-I V3 server

Number of SD650-I V3 server	Power supply configurations
Six	<ul style="list-style-type: none"> <li>• Supports nine hot-swap 2400W or 2600W AC power supplies.               <ul style="list-style-type: none"> <li>– Sine-wave input (50-60 Hz) required</li> <li>– Input voltage for 2400W power supplies:                   <ul style="list-style-type: none"> <li>– 200-240 Vac, 240 Vdc</li> </ul> </li> <li>– Input voltage for 2600W power supplies:                   <ul style="list-style-type: none"> <li>– 200-208 Vac, 240 Vdc (output up to 2400W only)</li> <li>– 208-240 Vac, 240 Vdc</li> </ul> </li> <li>– Nine power supplies: 8+1 without oversubscription</li> <li>– 2400W AC power supplies is Delta only.</li> </ul> <p><b>Note:</b> Mixing PSUs manufactured by different vendors is not supported.</p> <li>• Supports three hot-swap DWC 7200W power supplies.               <ul style="list-style-type: none"> <li>– Input voltage:                   <ul style="list-style-type: none"> <li>– 200-208 Vac (work as 6900W)</li> <li>– 220-240 Vac, 240 Vdc (work as 7200W)</li> </ul> </li> <li>– Three DWC PSUs: work as 8+1 without oversubscription.</li> </ul> <p><b>CAUTION:</b> Power supplies and redundant power supplies in the enclosure must be with the same brand, power rating, wattage or efficiency level.</p> </li></li></ul>

## SD650-N V3 high-density server

Refer to this section to for a brief introduction on the DW612S enclosure configuration with six SD650-N V3 server.

For more information on SD650-N V3 high-density server, see <https://pubs.lenovo.com/sd650-n-v3/>.

**Attention:** Start with slot 1 when installing trays into the DW612S enclosure.

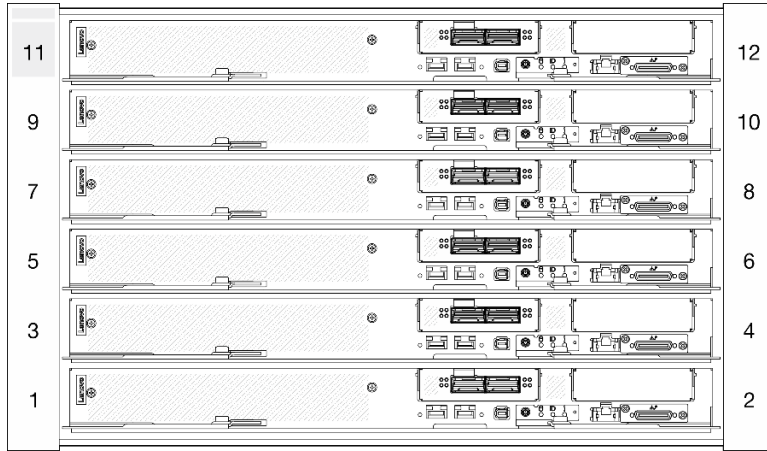


Figure 8. DW612S enclosure with six SD650-N V3 server

**Notes:**

- The illustration in this section is for reference only.
- The slot numbers are indicated on both sides of the enclosure.

Table 4. DW612S enclosure with six SD665-N V3 server

Number of SD665-N V3 server	Power supply configurations
Six	<ul style="list-style-type: none"> <li>• Supports nine hot-swap 2600W AC power supplies.               <ul style="list-style-type: none"> <li>– Sine-wave input (50-60 Hz) required</li> <li>– Input voltage for 2600W power supplies:                   <ul style="list-style-type: none"> <li>– 200-208 Vac, 240 Vdc (output up to 2400W only)</li> <li>– 208-240 Vac, 240 Vdc</li> </ul> </li> <li>– Nine power supplies: 8+1 without oversubscription</li> </ul> </li> <li>• Supports three hot-swap DWC 7200W power supplies.               <ul style="list-style-type: none"> <li>– Input voltage:                   <ul style="list-style-type: none"> <li>– 200-208 Vac (work as 6900W)</li> <li>– 220-240 Vac, 240 Vdc (work as 7200W)</li> </ul> </li> <li>– Three DWC PSUs: work as 8+1 without oversubscription</li> </ul> </li> </ul> <p><b>CAUTION:</b>  <b>Power supplies and redundant power supplies in the enclosure must be with the same brand, power rating, wattage or efficiency level.</b></p> <p><b>Mixing PSUs manufactured by different vendors is not supported.</b></p> <p><b>Note:</b> Refer to <a href="https://thinksystem.lenovofiles.com/help/topic/mgt_tools_smm2/c_overview.html">https://thinksystem.lenovofiles.com/help/topic/mgt_tools_smm2/c_overview.html</a> for more details of solution power status.</p>

## SD665 V3 high-density server

Refer to this section to for a brief introduction on the DW612S enclosure configuration with six SD665 V3 server.

For more information on SD665 V3 high-density server, see <https://pubs.lenovo.com/sd665-v3/>.

**Attention:** Start with slot 1 when installing trays into the DW612S enclosure.

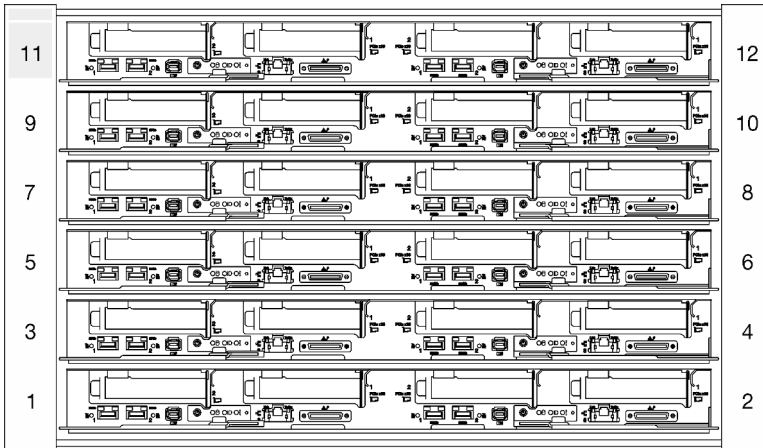


Figure 9. DW612S enclosure with six SD665 V3 server

**Notes:**

- The illustration in this section is for reference only.
- The slot numbers are indicated on both sides of the enclosure.

Table 5. DW612S enclosure with six SD665 V3 server

Number of SD665 V3 server	Power supply configurations
Six	<ul style="list-style-type: none"> <li>• Supports six or nine hot-swap 2400W or 2600W power supplies.               <ul style="list-style-type: none"> <li>– Sine-wave input (50-60 Hz) required</li> <li>– Input voltage for 2400W power supplies:                   <ul style="list-style-type: none"> <li>– 200-240 Vac, 240 Vdc</li> </ul> </li> <li>– Input voltage for 2600W power supplies:                   <ul style="list-style-type: none"> <li>– 200-208 Vac, 240 Vdc (output up to 2400W only)</li> <li>– 208-240 Vac, 240 Vdc</li> </ul> </li> <li>– Six power supplies: 5+1 with oversubscription, or Non-redundancy</li> <li>– Nine power supplies: 8+1 without oversubscription</li> </ul> </li> <li>• Supports two or three hot-swap DWC 7200W power supplies.               <ul style="list-style-type: none"> <li>– Input voltage:                   <ul style="list-style-type: none"> <li>– 200-208 Vac (work as 6900W)</li> <li>– 220-240 Vac, 240 Vdc (work as 7200W)</li> </ul> </li> <li>– Two DWC PSUs: work as 5+1 with oversubscription, or Non-redundancy</li> <li>– Three DWC PSUs: work as 8+1 without oversubscription</li> </ul> </li> </ul> <p><b>CAUTION:</b>  <b>Power supplies and redundant power supplies in the enclosure must be with the same brand, power rating, wattage or efficiency level.</b></p>

**SD665-N V3 high-density server**

Refer to this section to for a brief introduction on the DW612S enclosure configuration with six SD665-N V3 server.

For more information on SD665-N V3 high-density server, see <https://pubs.lenovo.com/sd665-n-v3/>.

**Attention:** Start with slot 1 when installing trays into the DW612S enclosure.



Figure 10. DW612S enclosure with six SD665-N V3 server

**Notes:**

- The illustration in this section is for reference only.
- The slot numbers are indicated on both sides of the enclosure.

Table 6. DW612S enclosure with six SD665-N V3 server

Number of SD665-N V3 server	Power supply configurations
Six	<ul style="list-style-type: none"> <li>• Supports nine hot-swap 2600W power supplies. <ul style="list-style-type: none"> <li>– Sine-wave input (50-60 Hz) required</li> <li>– Input voltage for 2600W power supplies: <ul style="list-style-type: none"> <li>– 200-208 Vac, 240 Vdc (output up to 2400W only)</li> <li>– 208-240 Vac, 240 Vdc</li> </ul> </li> <li>– Nine power supplies: 8+1 without oversubscription</li> </ul> </li> <li>• Supports three hot-swap DWC 7200W power supplies. <ul style="list-style-type: none"> <li>– Input voltage: <ul style="list-style-type: none"> <li>– 200-208 Vac (work as 6900W)</li> <li>– 220-240 Vac, 240 Vdc (work as 7200W)</li> </ul> </li> <li>– Three DWC PSUs: work as 8+1 without oversubscription</li> </ul> </li> </ul> <p><b>CAUTION:</b> Power supplies and redundant power supplies in the enclosure must be with the same brand, power rating, wattage or efficiency level.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Refer to <a href="https://pubs.lenovo.com/mgt_tools_smm2/c_overview">https://pubs.lenovo.com/mgt_tools_smm2/c_overview</a> for more details of solution power status.</li> <li>• Mixing PSUs manufactured by different vendors is not supported.</li> </ul>





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## Chapter 2. Enclosure components

This section contains information about each of the components associated with the enclosure.

---

### Enclosure front view

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

#### Notes:

- The 6U enclosure supports up to six trays.
- Each tray contains two nodes; one left node and one right node (when viewed from front of enclosure).

#### Enclosure

##### Notes:

- The illustrations in this document might differ slightly from your hardware.
- The following illustration shows six trays installed in the enclosure.
- The slot numbers are indicated on both sides of the enclosure.

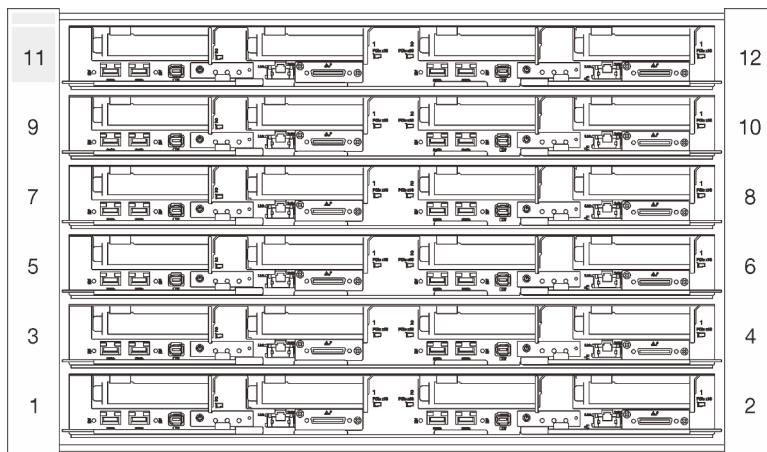


Figure 11. Enclosure with six SD650 V3 trays



Figure 12. Enclosure with six SD650-I V3 trays

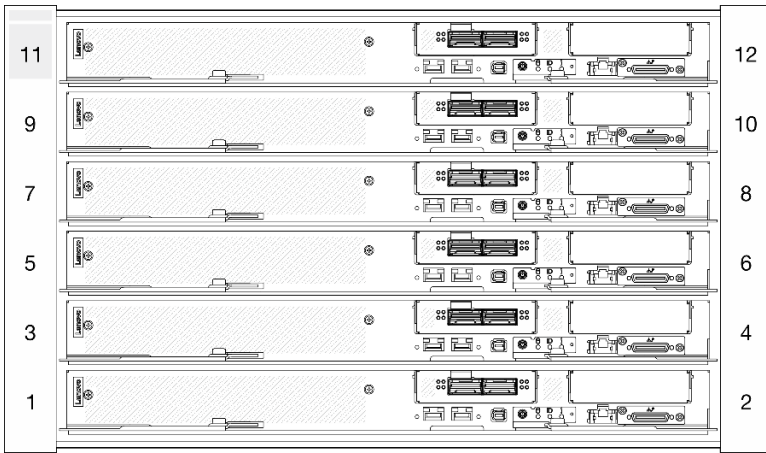


Figure 13. Enclosure with six SD650-N V3 trays

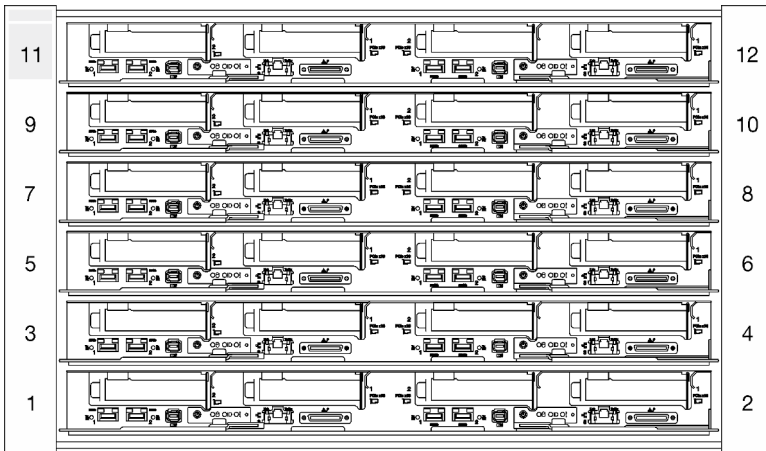


Figure 14. Enclosure with six SD665 V3 trays

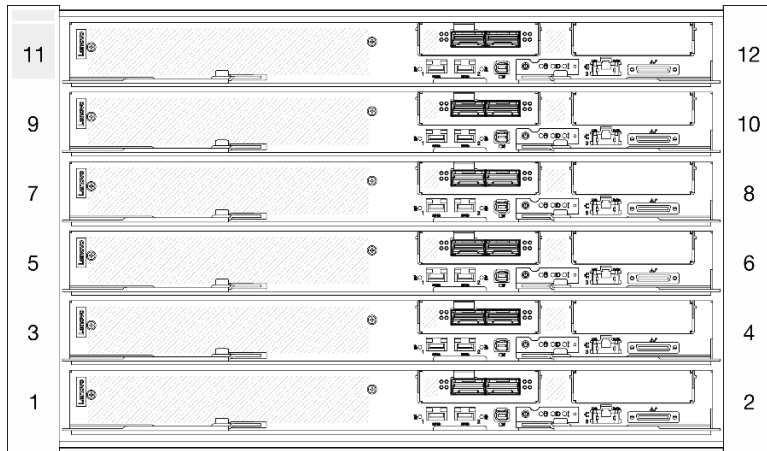


Figure 15. Enclosure with six SD665-N V3 trays

## System Management Module 2 (SMM 2)

The following illustration shows the connectors and buttons on the SMM2 module.

For SMM2 LEDs, see “[System Management Module 2 \(SMM 2\) LEDs](#)” on page 193.

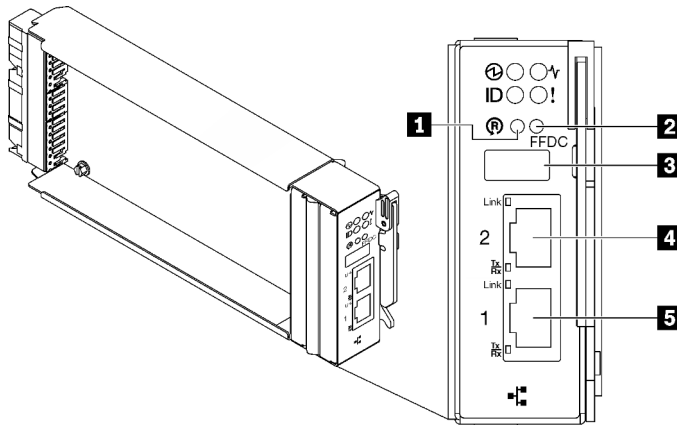


Figure 16. SMM2 connectors

Table 7. SMM2 connectors and LEDs

<b>1</b> Reset button hole	<b>4</b> Ethernet port 2
<b>2</b> USB port service mode button (FFDC dump)	<b>5</b> Ethernet port 1
<b>3</b> USB 2.0 connector	

**1 Reset button:** Press the button for 1 to 4 seconds, SMM2 reboots. Press over 4 seconds, SMM2 reboots and loads to the default settings.

**2 USB port service mode button (FFDC dump):** Press this button to collect FFDC logs after inserting the USB storage device to the USB 2.0 connector.

**3 USB 2.0 connector:** Insert the USB storage device to this connector and then press the **USB port service mode button** to collect FFDC logs.

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

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

---

## PSU slot numbering

Use this information to identify the PSU slot numbering.

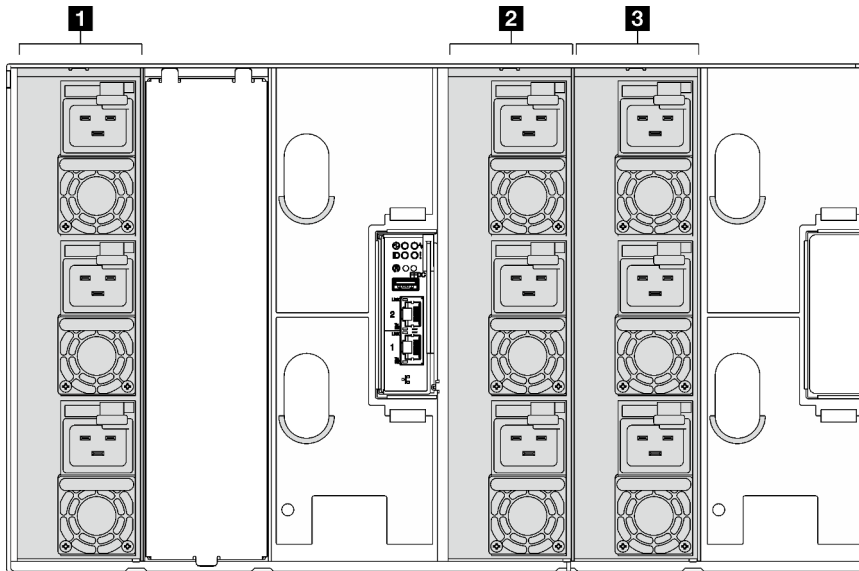


Figure 17. PSU slot numbering with hot-swap PSU

<b>1</b> Hot-swap power supply 1-3 (from bottom to top)	<b>3</b> Hot-swap power supply 7-9 (from bottom to top)
<b>2</b> Hot-swap power supply 4-6 (from bottom to top)	

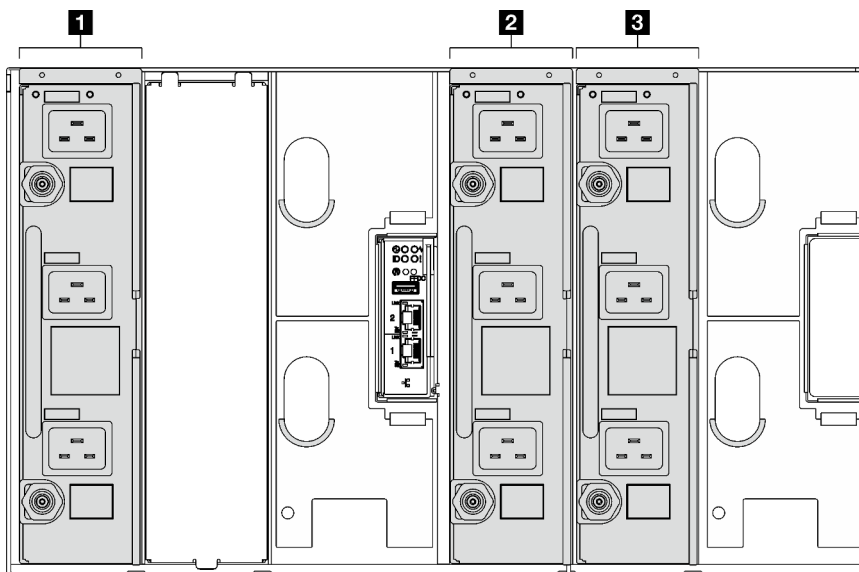


Figure 18. PSU slot numbering with DWC PSU

<b>1</b> DWC PSU 1	<b>3</b> DWC PSU 3
<b>2</b> DWC PSU 2	

---

## System LEDs and diagnostics display

See the following section for information on available enclosure LEDs and diagnostics display.

For more information, refer to [“Troubleshooting by system LEDs and diagnostics display”](#) on page 193.



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## Chapter 3. Parts list

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

For more information about ordering parts:

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

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

**Note:** Depending on the model, your solution might look slightly different from the illustration.

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

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If Lenovo installs a Tier 1 CRU at your request with no service agreement, you will be charged for the installation.
- **Tier 2 customer replaceable unit (CRU):** You may install a Tier 2 CRU yourself or request Lenovo to install it, at no additional charge, under the type of warranty service that is designated for your 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.

## Enclosure parts list

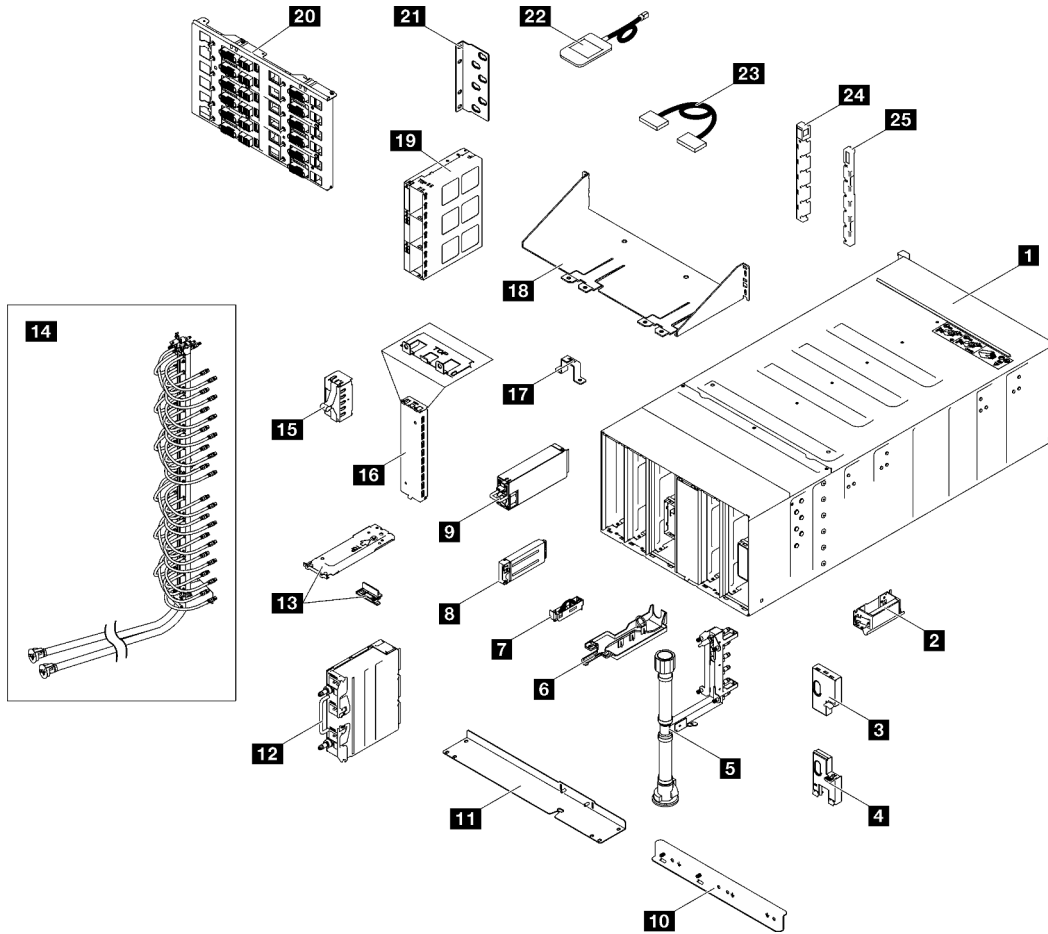


Figure 19. Enclosure parts list

Table 8. Enclosure parts list

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
For more information about ordering parts:					
1. Go to <a href="http://datacentersupport.lenovo.com">http://datacentersupport.lenovo.com</a> and navigate to the support page for your solution.					
2. Click <b>Parts</b> .					
3. Enter the serial number to view a listing of parts for your solution.					
<b>1</b>	6U enclosure assembly			√	
<b>2</b>	Lift handle			√	
<b>3</b>	Upper EMC shield			√	
<b>4</b>	Lower EMC shield			√	
<b>5</b>	Manifold assembly			√	
<b>6</b>	Drip sensor tray			√	



Table 8. Enclosure parts list (continued)

Index	Description	Tier 1 CRU	Tier 2 CRU	FRU	Consumable and Structural part
7	Drip sensor assembly			√	
8	System Management Module 2			√	
9	Power supply	√			
10	DWC PSU manifold bottom bracket			√	
11	DWC PSU manifold top bracket			√	
12	DWC PSU			√	
13	DWC PSU bracket and stopper			√	
14	DWC PSU manifold			√	
15	PSU cage filler			√	
16	DWC PSU filler			√	
17	Manifold retention bracket			√	
18	Enclosure shipping bracket			√	
19	PSU cage			√	
20	High-power midplane			√	
21	Support bracket			√	
22	External LCD diagnostics handset	√			
23	Cable			√	
24	EIA cover left			√	
25	EIA cover right			√	

## Power cords

Several power cords are available, depending on the country and region where the server is installed.

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

1. Go to:  
<http://dcsc.lenovo.com/#/>
2. Click **Preconfigured Model** or **Configure to order**.
3. Enter the machine type and model for your server to display the configurator page.
4. Click **Power** → **Power Cables** to see all line cords.

### Notes:

- For your safety, a power cord with a grounded attachment plug is provided to use with this product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.
- Power cords for this product that are used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

- For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.
- For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.
- For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.
- Power cords for a specific country or region are usually available only in that country or region.

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## Chapter 4. Unboxing and setup

Information in this section assists you on unboxing and setting up the server. When unboxing the server, check if the items in the package are correct, and learn where to find information of server serial number and Lenovo XClarity Controller access. Make sure to follow the instructions in [“Solution setup checklist” on page 28](#) when setting up the server.

---

### 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:

- DWC tray
- Enclosure
- Rail kit
- Four detachable chassis lift handles
- One console breakout cable (also known as a KVM Dongle)
- Material box, including items such as power cords\*, accessory kit, and printed documents.

#### Notes:

- Some of the items listed are available on select models only.
- Items marked with asterisk(\*) are optional.

If any item is missing or damaged, contact your place of purchase. Ensure that you retain your proof of purchase and packing material. They might be required to receive warranty service.

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### Identify the solution and access the Lenovo XClarity Controller

This section contains instruction on how to identify your solution and where to find the Lenovo XClarity Controller access information.

#### 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.

The illustration below shows the location of the ID label which contains the enclosure model number, machine type, and serial number of the solution. You can also add other system information labels to the front of the enclosure in the customer label spaces.

**Note:** Depending on the model, your solution might look slightly different from the illustration.

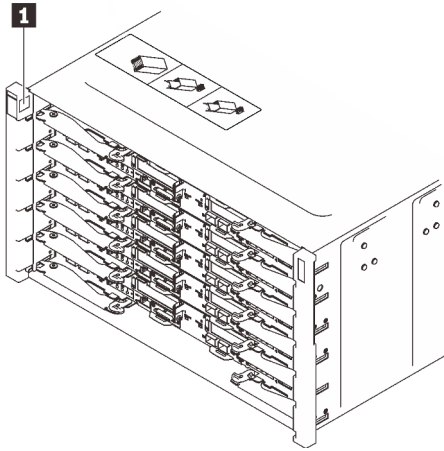


Figure 20. Enclosure label on the front of the enclosure

Table 9. Enclosure label on the front of the enclosure

<b>1</b> Enclosure label
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## 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.

### Setup the solution hardware

Complete the following procedures to setup the solution hardware.

1. Unpack the solution package. See [“Solution package contents” on page 27](#).
2. Install any required hardware or solution options. See the related topics in [Chapter 5 “Enclosure hardware replacement procedures” on page 31](#).
3. Connect all external cables to the solution. See [Chapter 2 “Enclosure components” on page 17](#) for connectors locations.

Typically, you will need to connect the following cables:

- Connect solution to the power source
- Connect solution to the data network
- Connect the solution to the storage device
- Connect the solution to the management network

4. Power on the solution. For power button and power LED, see the “[Troubleshooting by system LEDs and diagnostics display](#)” on page 193

The node power button LED (Green) states are as followed:

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

**Flashing rapidly (4 times per second):** The 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 node is turned off and is ready to be turned on. You can press the power button to turn on the node.

**On:** The node is turned on.

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

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

**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 solution processor, see “Opening and Using the XClarity Controller Web Interface” section in the XCC documentation compatible with your solution at <https://pubs.lenovo.com/lxcc-overview/>.

5. Validate the solution. Make sure that the power LED, Ethernet connector LED, and network LED are lit with green light, which means the solution hardware was set up successfully.

See “[Troubleshooting by system LEDs and diagnostics display](#)” on page 193 for more information on the LED indications.

### Configure the system

Complete the following procedures to configure the system. For detailed instructions, refer to [Chapter 6 “System configuration”](#) on page 177.

1. Set the network connection for the Lenovo XClarity Controller to the management network.
2. Update the firmware for the solution, if necessary.
3. Configure the firmware for the solution.

The following information is available for RAID configuration:

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

4. Install the operating system.
5. Back up the solution configuration.
6. Install the applications and programs for which the solution is intended to be used.



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## Chapter 5. Enclosure hardware replacement procedures

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

For more information about ordering parts:

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

**Note:** If you replace a part, such as an adapter, that contains firmware, you might also need to update the firmware for that part. For more information about updating firmware, See “[Update the firmware](#)” on page 179.

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### Installation Guidelines

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

Before installing optional devices, read the following notices carefully:

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

- Read the safety information and guidelines to ensure your safety at work:
  - A complete list of safety information for all products is available at:  
[https://pubs.lenovo.com/safety\\_documentation/](https://pubs.lenovo.com/safety_documentation/)
  - The following guidelines are available as well: “[Handling static-sensitive devices](#)” on page 34.
- 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>.
  - For the option package contents, see <https://serveroption.lenovo.com/>.
- For more information about ordering parts:
  1. Go to <http://datacentersupport.lenovo.com> and navigate to the support page for your server.
  2. Click **Parts**.
  3. Enter the serial number to view a listing of parts for your server.
- 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 <https://datacentersupport.lenovo.com/products/servers/thinksystem/dw612-enclosure/downloads/driver-list/> 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 before you update the code.

- If you replace a part, such as an adapter, that contains firmware, you might also need to update the firmware for that part. For more information about updating firmware, See “[Update the firmware](#)” on page 179.

- 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 (system board assembly) 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.
  - When replacing power supply units or fans, make sure to refer to redundancy rules for these components.
  - Blue on a component indicates touch points, where you can grip to remove a component from or install it in the server, open or close a latch, and so on.
  - Terra-cotta on a component or a terra-cotta on or near a component indicates that the component can be hot-swapped if the server and operating system support hot-swap capability, which means that you can remove or install the component while the server is still running. (Terra-cotta can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
  - The Red strip on the drives, adjacent to the release latch, indicates that the drive can be hot-swapped if the server and operating system support hot-swap capability. This means that you can remove or install the drive while the server is still running.
- Note:** See the system specific instructions for removing or installing a hot-swap drive for any additional procedures that you might need to perform before you remove or install the drive.
- After finishing working on the server, make sure you reinstall all safety shields, guards, labels, and ground wires.

## Safety inspection checklist

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

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

**Note:** The set-up of the server is made in the server room only.

**CAUTION:**



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

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

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

1. Make sure that the power is off and the power cord is disconnected.
  2. Check the power cord.
    - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
    - Make sure that the power cord is the correct type.
- To view the power cords that are available for the server:
- a. Go to:
    - <http://dcsc.lenovo.com/#/>
    - b. Click **Preconfigured Model** or **Configure to order**.
    - c. Enter the machine type and model for your server to display the configurator page.
    - d. Click **Power → Power Cables** to see all line cords.
  - Make sure that the insulation is not frayed or worn.
3. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
  4. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
  5. Check for worn, frayed, or pinched cables.
  6. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

## System reliability guidelines

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

Make sure the following requirements are met:

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

## Handling static-sensitive devices

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

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

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

---

## Power on and power off the solution

Follow the instructions in this section to power on and power off the solution.

### Power on the solution

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

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

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

For information about powering off the solution, see [“Power off the solution” on page 36](#).

The node power button LED (Green) states are as followed:

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

**Flashing rapidly (4 times per second):** The 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 node is turned off and is ready to be turned on. You can press the power button to turn on the node.

**On:** The node is turned on.

See the following illustrations for the power button location of each supported high-density server:

**1** SD650 V3 power button

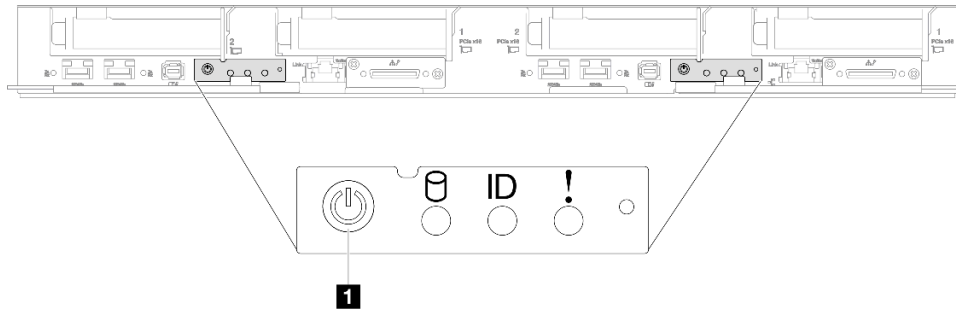


Figure 21. SD650 V3 power button location

**1** SD650-I V3 power button

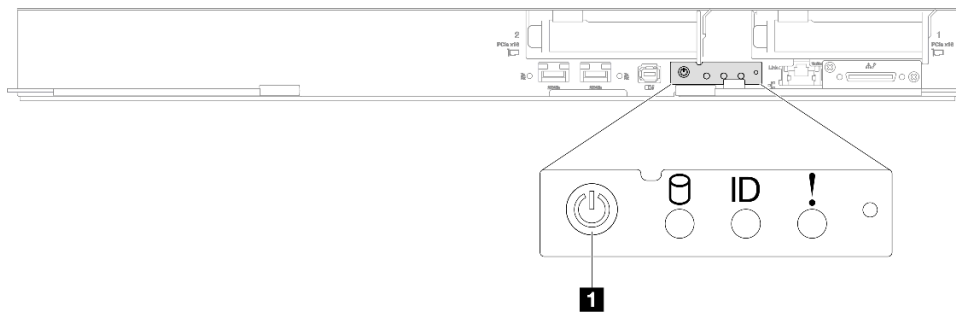


Figure 22. SD650-I V3 power button location

**1** SD650-N V3 power button

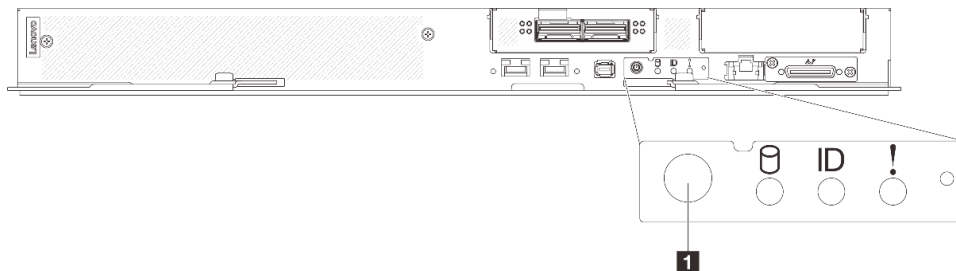


Figure 23. SD650-N V3 power button location

### 1 SD665 V3 power button

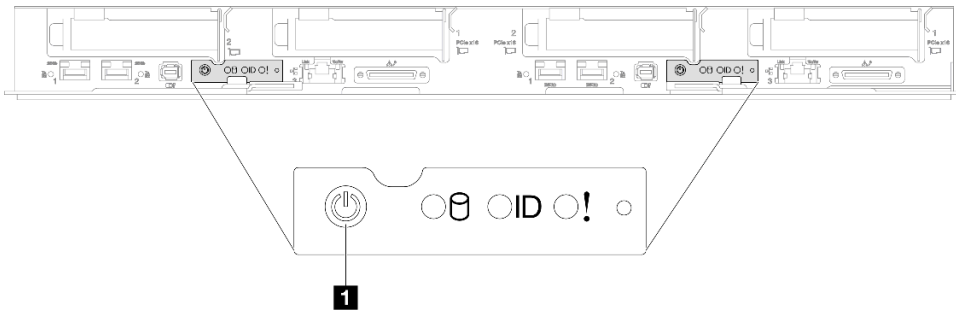


Figure 24. SD665 V3 power button location

### 1 SD665-N V3 power button

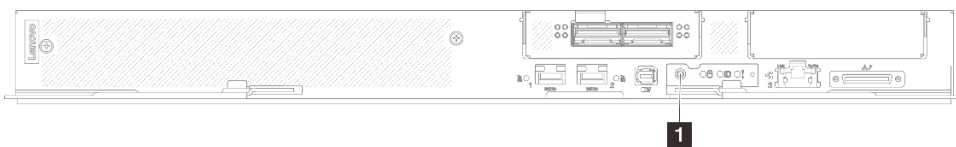


Figure 25. SD665-N V3 power button location

## Power off the solution

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

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

**Note:** The Lenovo XClarity Controller can place the solution 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 solution can respond to remote power-on requests sent to the Lenovo XClarity Controller. For information about powering on the solution, see [“Power on the solution” on page 34](#).

The node power button LED (Green) states are as followed:

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

**Flashing rapidly (4 times per second):** The 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 node is turned off and is ready to be turned on. You can press the power button to turn on the node.

**On:** The node is turned on.

See the following illustrations for the power button location of each supported high-density server:

**1** SD650 V3 power button

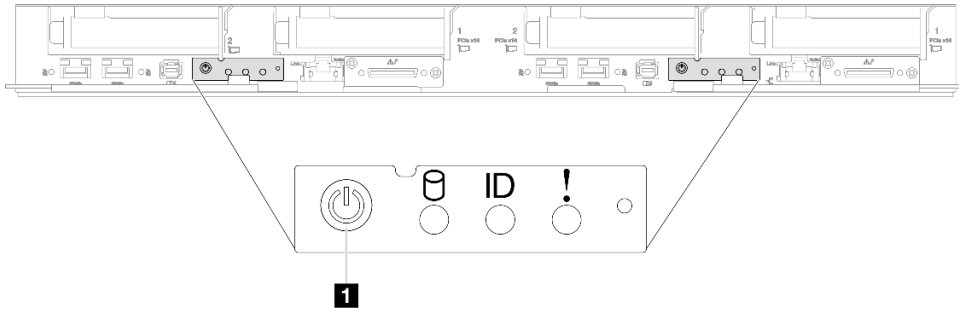


Figure 26. SD650 V3 power button location

**1** SD650-I V3 power button

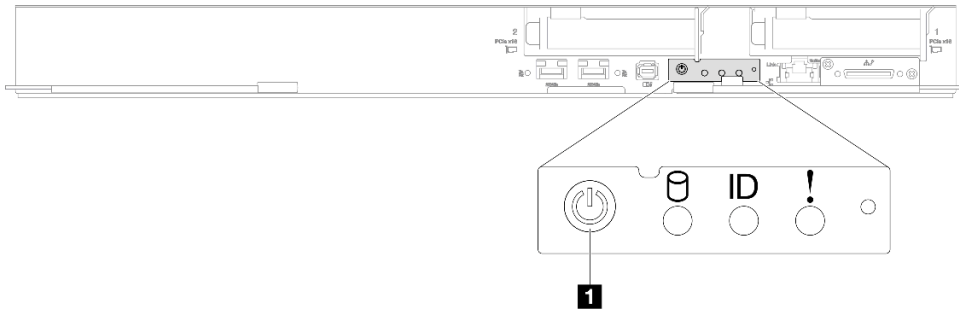


Figure 27. SD650-I V3 power button location

**1** SD650-N V3 power button

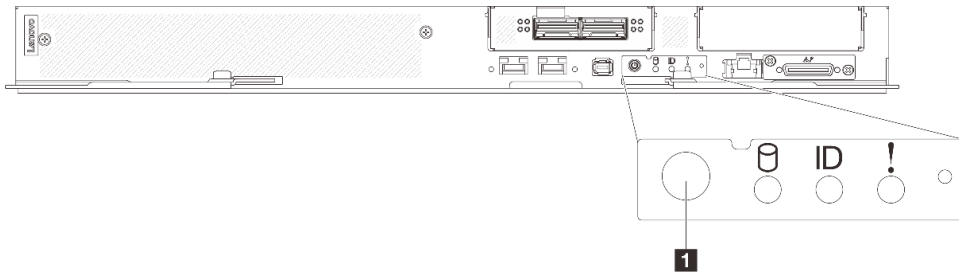


Figure 28. SD650-N V3 power button location

### 1 SD665 V3 power button

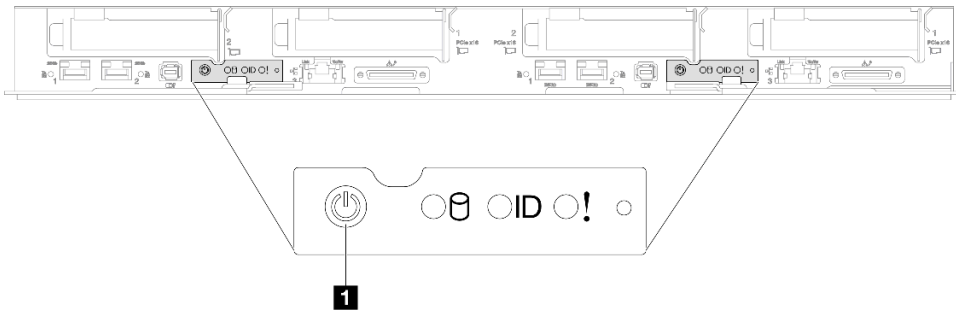


Figure 29. SD665 V3 power button location

### 1 SD665-N V3 power button

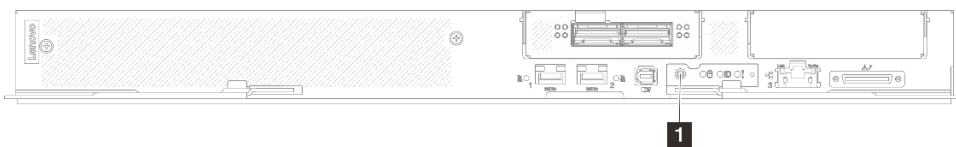


Figure 30. SD665-N V3 power button location

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## Enclosure replacement

Use the following procedures to remove and install the enclosure.

The enclosure installation/removal task requires three trained technicians.

### Remove the enclosure from the rack

Use this information to remove the enclosure from the rack.

#### About this task

#### S002



#### **CAUTION:**

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

#### **Attention:**

- Read [“Installation Guidelines” on page 31](#) and [“Safety inspection checklist” on page 32](#) to ensure that you work safely.
- Three trained technicians are needed to complete the enclosure installation/removal task.
  - Two technicians hold front and rear handles at both sides of the enclosure.

- One technician protects cables from damage.
- Follow the following steps to shut down the solution if needed.
  1. Record the machine type model, the enclosure serial number, and retrieve the existing universally unique identifier (UUID) information from the enclosure midplane that you are removing. The procedure for obtaining this data might require different steps depending on the functional state of the enclosure.
    - a. Log onto the Lenovo XClarity Controller and access the command-line interface (CLI). You can access the XCC CLI through a direct serial or Ethernet connection to the XCC, or through a Secure Shell (SSH) connection to the XCC. You must authenticate with the XCC before issuing commands.
    - b. Query for the machine type model, enclosure serial number, and the UUID values by using the CLI `info` command. Record this information before you proceed.
  2. Enclosure is not operating:
    - a. Obtain the enclosure serial number and the machine type model from one of the enclosure labels.
    - b. Record the enclosure serial number, the machine type model, and the UUID before you proceed.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

## Procedure

Step 1. Make preparations for this task.

- a. Remove all trays in the front of the enclosure. See [“Remove a DWC tray from the enclosure” on page 49](#).
- b. Remove the EMC shields. See [“Remove an EMC shield” on page 104](#).
- c. Remove the drip sensor assembly. See [“Remove the drip sensor assembly” on page 52](#).
- d. Remove the SMM2 and SMM2 support bracket. See [“Remove the SMM2” on page 168](#).
- e. Remove all power supplies. See [“Remove a hot-swap power supply” on page 116](#) or [“Remove a DWC PSU” on page 93](#).
- f. Remove the manifold. See [“Remove the manifold” on page 121](#).

Step 2. Remove eight screws to remove two support brackets on both sides.

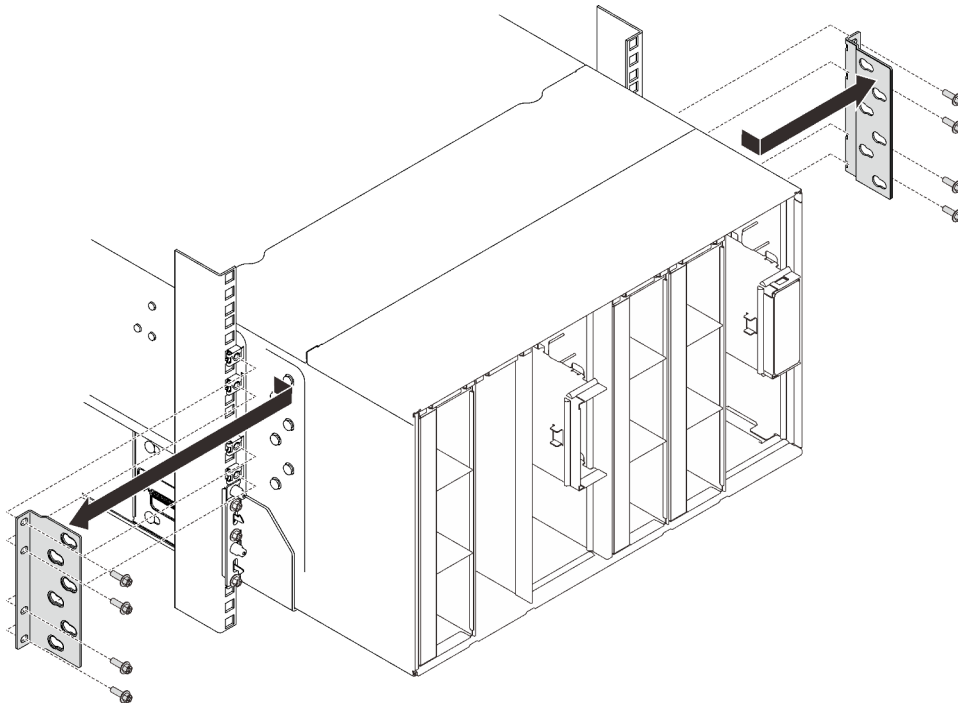


Figure 31. Support bracket removal

Step 3. Remove the two EIA covers from the front of the enclosure, then, remove the six screws that secure the enclosure to the rack.

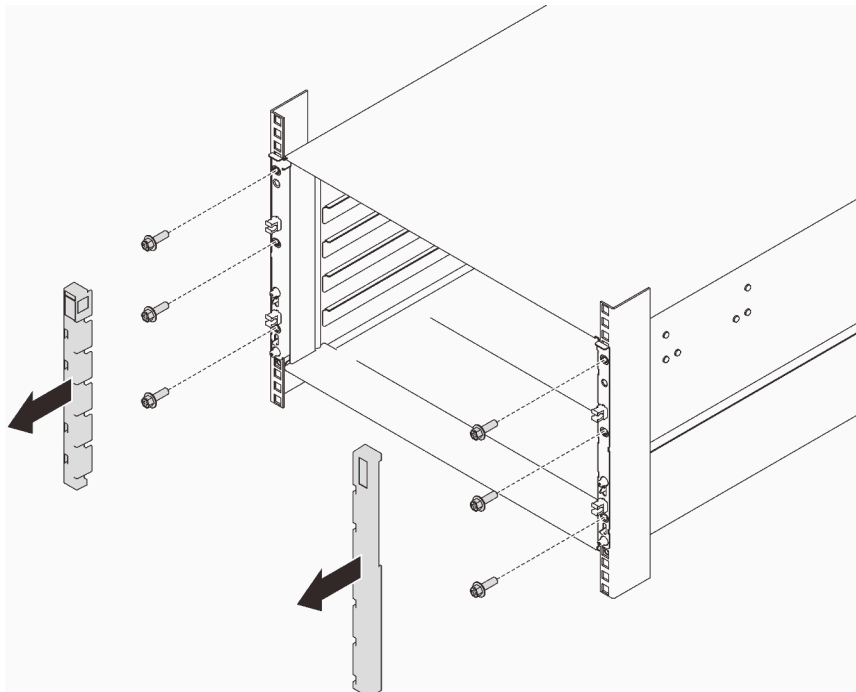


Figure 32. EIA cover removal

Step 4. Slide the enclosure out until it allows you to attach front handles at both sides. Align slots on the handles with posts on the enclosure and slide handles up until they lock into places.



**Attention:** Three trained technicians are required to complete the enclosure installation/removal task.

- Two technicians must hold the front and rear handles at both sides of the enclosure.
- One technician must protect the cables from damage.

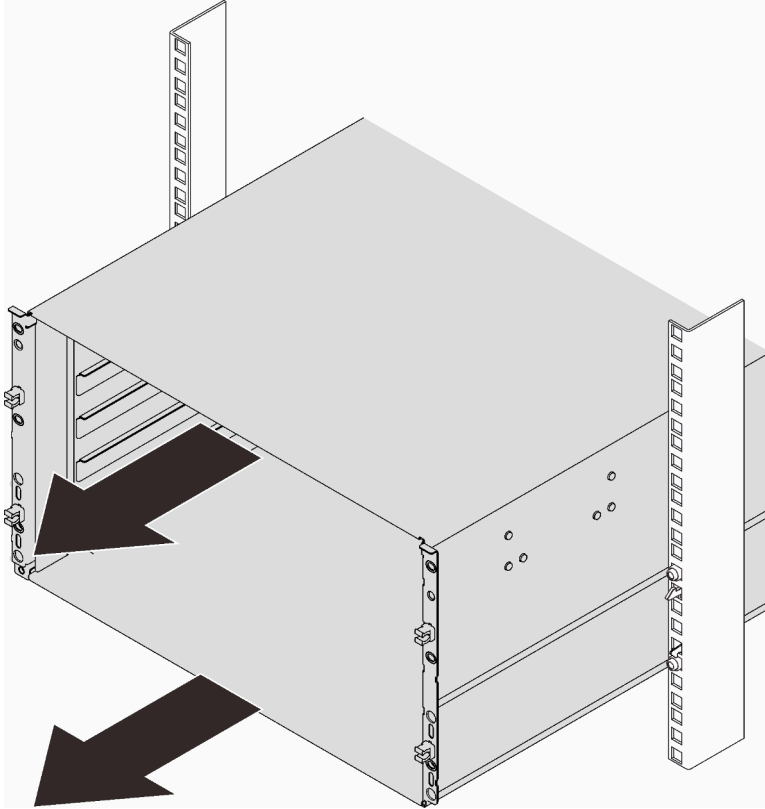


Figure 33. Sliding the enclosure

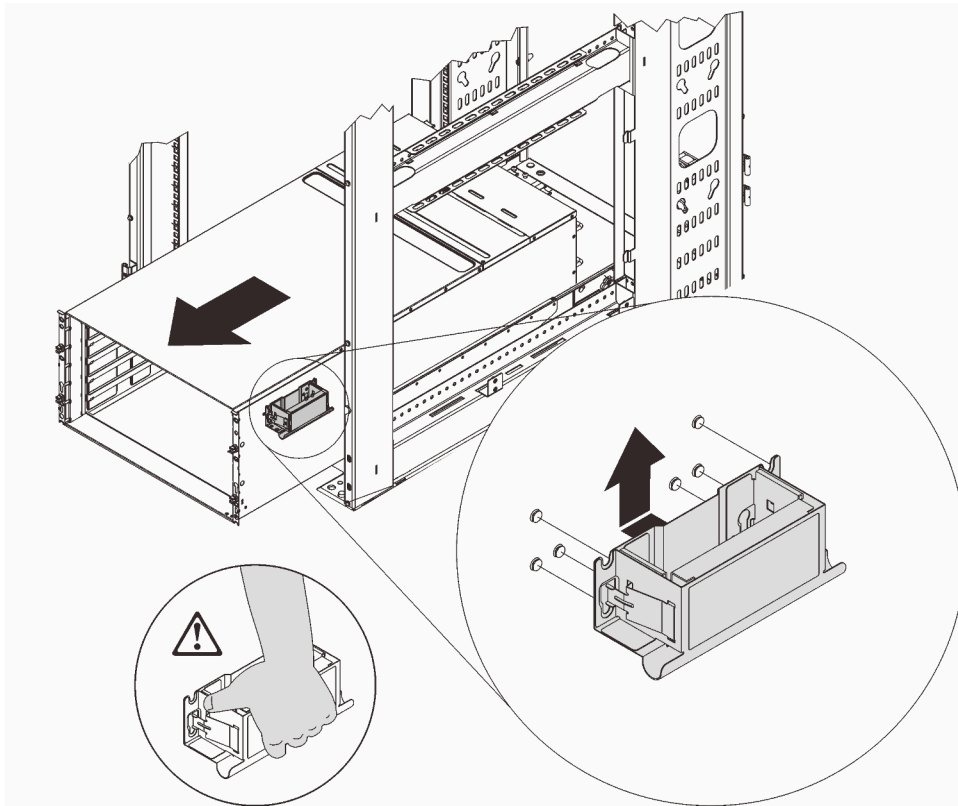


Figure 34. Front handle installation

- Step 5. Hold front handles at both sides and slide the enclosure out until you have enough space to install rear handles.

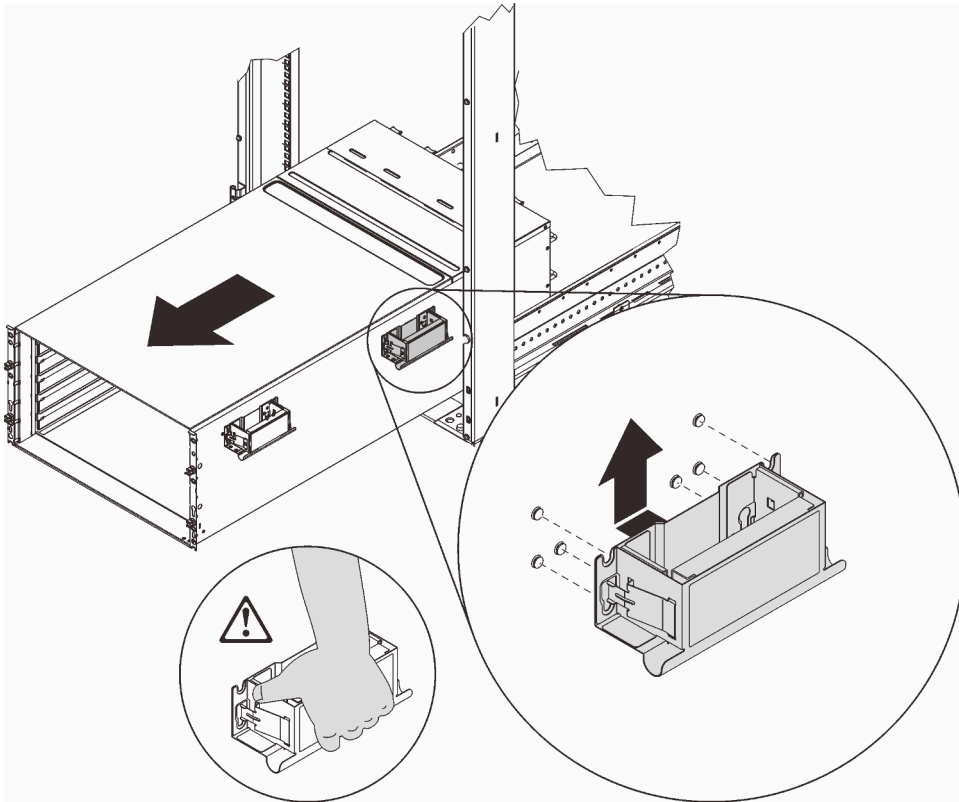


Figure 35. Rear handle installation

Step 6. Carefully hold front and rear handles at both sides to slide the enclosure out of the rack; then, gently put the enclosure on a stable work surface.

**Note:** Make sure all handle posts are secured before lifting.

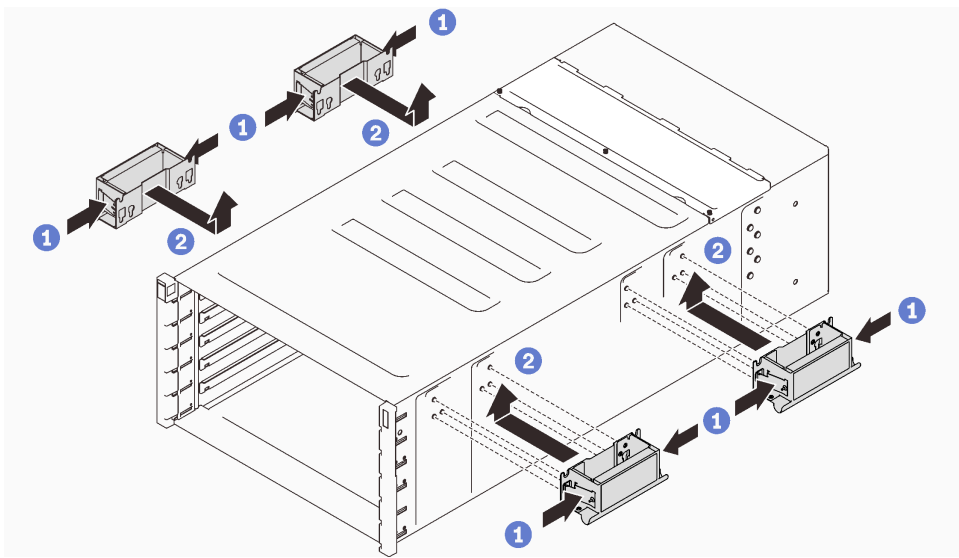


Figure 36. Attaching four handles

## After you finish

1. To remove the rails from a rack, follow the instructions that are provided in [https://serveroption.lenovo.com/rail\\_options/rail\\_options\\_high-density\\_servers](https://serveroption.lenovo.com/rail_options/rail_options_high-density_servers).
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Install the enclosure in the rack

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

### About this task

#### S002



#### **CAUTION:**

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

#### **Attention:**

- Read “Installation Guidelines” on page 31 and “Safety inspection checklist” on page 32 to ensure that you work safely.
- Three trained technicians are needed to complete the enclosure installation/removal task.
  - Two technicians hold front and rear handles at both sides of the enclosure.
  - One technician protects cables from damage.
- To install the rails into a rack, follow the instructions that are provided in [https://serveroption.lenovo.com/rail\\_options/rail\\_options\\_high-density\\_servers](https://serveroption.lenovo.com/rail_options/rail_options_high-density_servers).

After rails are installed successfully, complete the following steps to install the enclosure in a rack.

### Procedure

Step 1. Ensure all four handles are attached to the enclosure.

**Note:** Make sure all handle posts are secured before lifting.

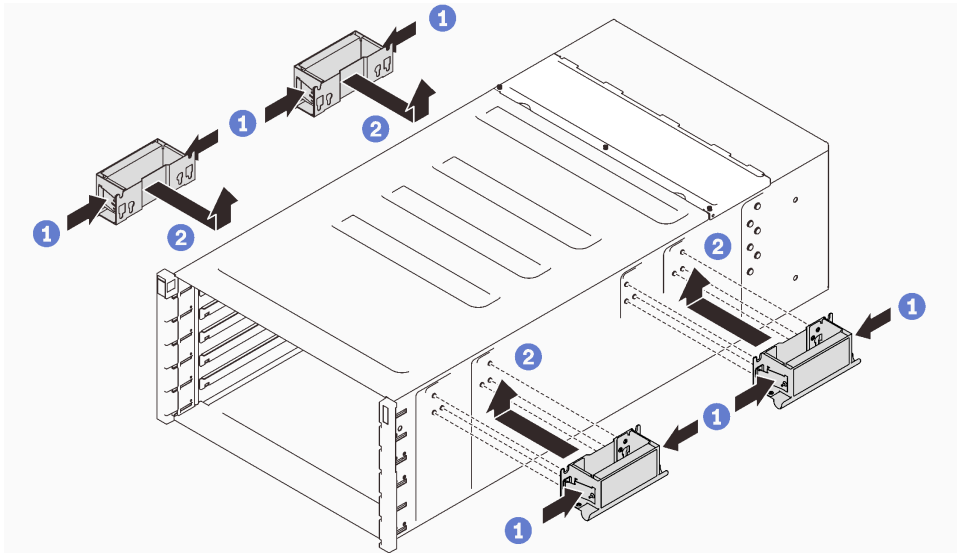


Figure 37. Attaching four handles

Step 2. Carefully put the enclosure into the rack and slide the enclosure until rear handles are near front rack rails; then, remove rear handles at both sides.

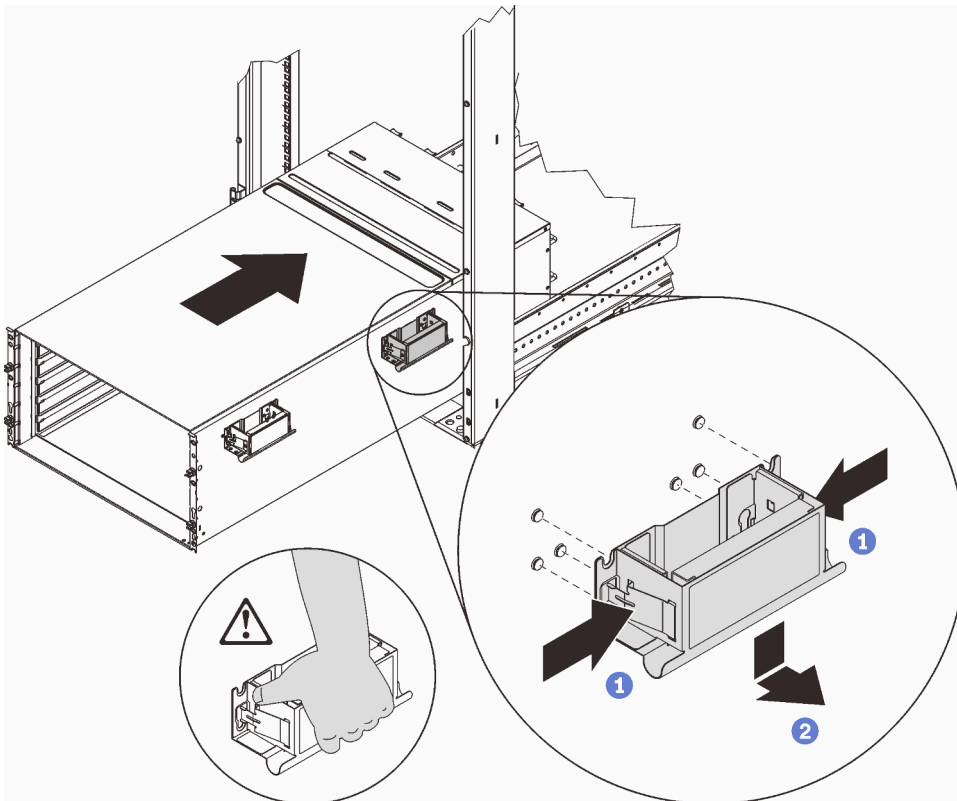


Figure 38. Rear handle removal

Step 3. Slide the enclosure farther into the rack until front handles are near front rack rails; then, remove front handles at both sides.

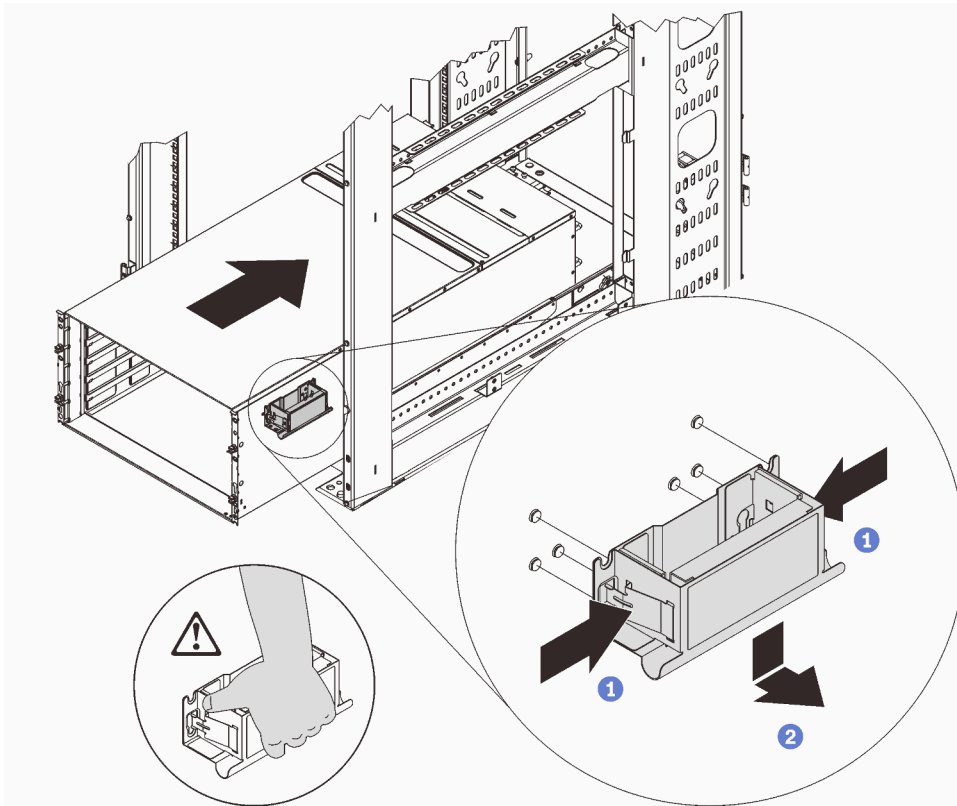


Figure 39. Front handle removal

Step 4. Slide the enclosure all the way back to the rack.

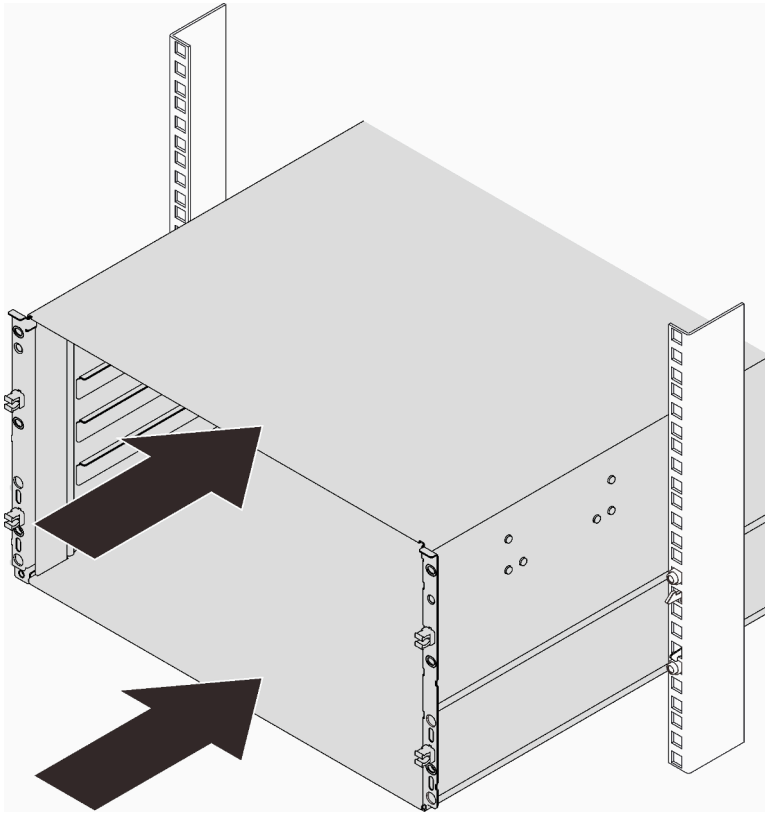


Figure 40. Sliding the rack

Step 5. Secure the enclosure to the rack with six screws; then, reinstall the EIA covers.

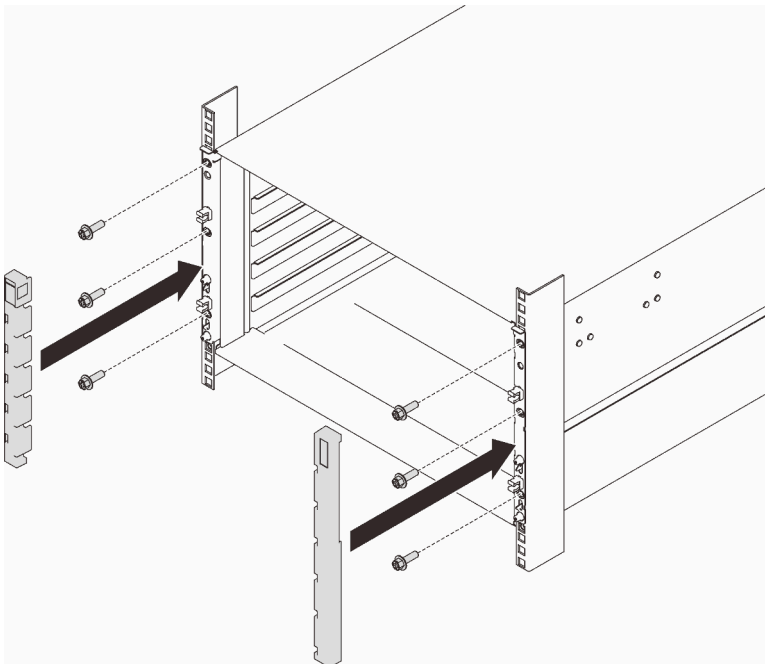


Figure 41. EIA cover installation

Step 6. Secure the two support brackets on the rear enclosure with eight screws.

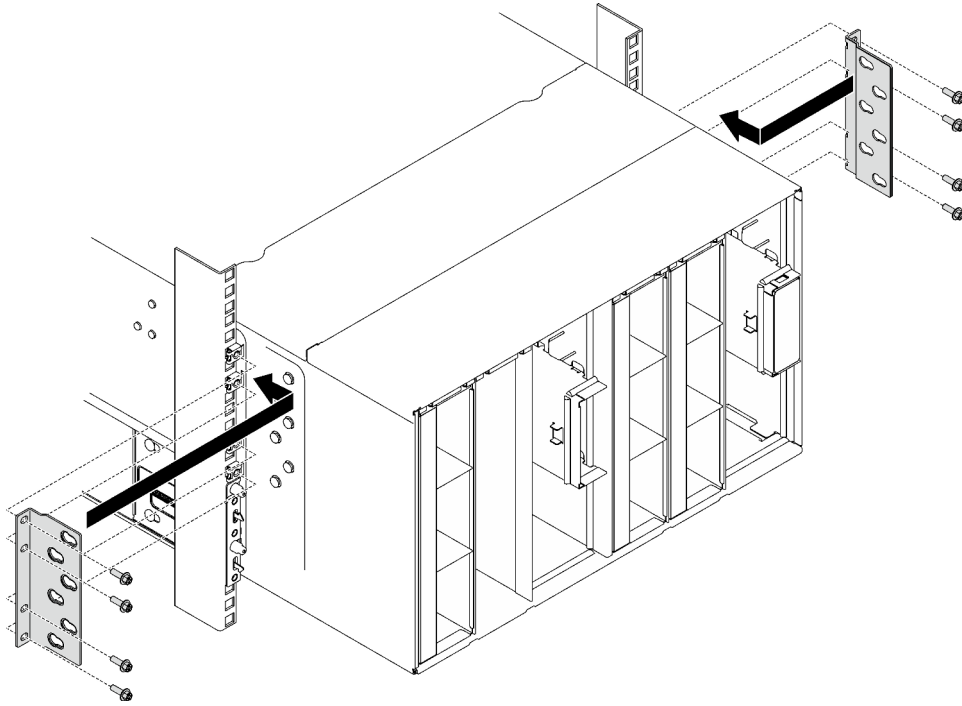


Figure 42. Support bracket installation

Step 7. Install the shipping bracket.

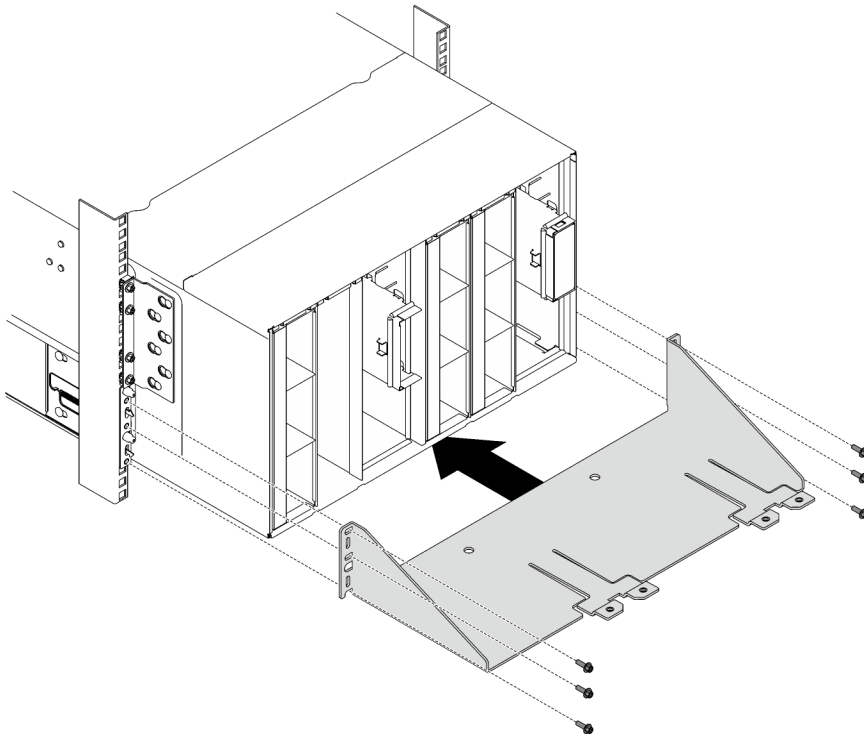


Figure 43. Shipping bracket installation

**After you finish**



1. Install the manifold. See [“Install the manifold” on page 137](#).
2. Install all power supplies. See [“Install a hot-swap power supply” on page 118](#) or [“Install a DWC PSU” on page 100](#).
3. Install the SMM2 and SMM2 support bracket. See [“Install the SMM2” on page 172](#).
4. Install the drip sensor assembly. See [“Install the drip sensor assembly” on page 54](#).
5. Install the EMC shields. See [“Install an EMC shield” on page 106](#).
6. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 51](#).
7. Install any other required components.
8. Connect all required cables.
9. Connect the enclosure to power.
10. Write down new enclosure midplane serial number (for example: **Y030UN34B063**) and UUID (for example: **2E2B686CC6B311E2907C6FAE8B16A49E**).
11. Update the solution firmware to the latest level.
12. Log in to the web interface.
13. Go to **System Information** section, click on the **Midplane VPD** tab.
14. Update the new enclosure midplane serial number and UUID onto the fan and power controller.
15. Close the release handles on the tray in order to seat the nodes in the enclosure midplane connectors.
16. Restart any nodes that you shut down. See the documentation that comes with the compute node for detailed instructions.
17. The fan and power controller is powered-on automatically.

---

## DWC tray replacement

Use the following procedures to remove and install a DWC tray.

### Remove a DWC tray from the enclosure

Use this information to remove a DWC tray from the enclosure.

#### About this task

##### S002



#### **CAUTION:**

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

#### **Attention:**

- Read [“Installation Guidelines” on page 31](#) and [“Safety inspection checklist” on page 32](#) to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.

- Use extra force to disconnect QSFP cables if they are connected to the solution.
- For your safety, use the lift tool to remove the tray from the rack.

**Note:** The following illustration might differ slightly from your hardware, but the installation method is the same.

## Procedure

Step 1. Remove the tray.

- 1 Rotate the front cam handles as shown in the illustration. The tray moves out of the tray bay approximately 0.6 cm (0.25 inch).
- 2 Pull the DWC tray out of the enclosure until you see the warning icon in the right side of the cover; then, adjust hands and grip tray (~49 lb.) at sides to carefully pull out of enclosure.

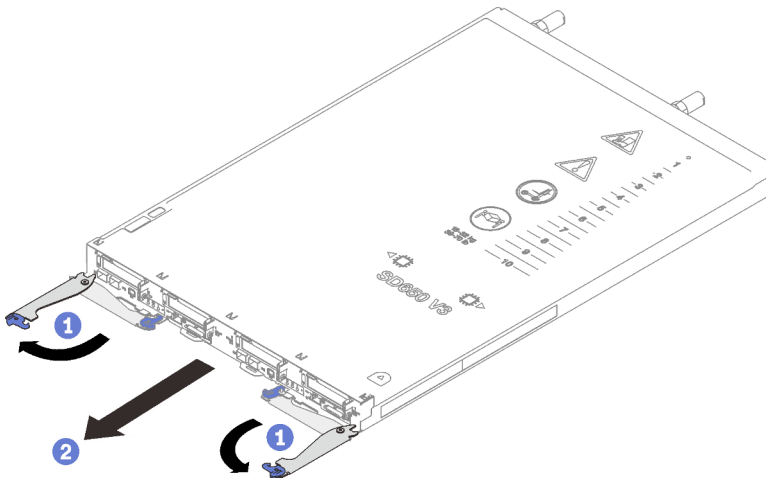


Figure 44. Tray removal

### Attention:

- To maintain proper system cooling, do not operate the enclosure without a DWC tray or tray bay filler installed in each tray bay. For more information, see [“Install a DWC tray in the enclosure” on page 51](#).
- When you remove the DWC tray, note the tray bay number. Reinstalling a DWC tray into a different tray bay from the one it was removed from can have unintended consequences. Some configuration information and update options are established according to tray bay number. If you reinstall the DWC tray into a different tray bay, you might have to reconfigure the DWC tray.

Step 2. Once the DWC tray has been serviced, place the tray back into the original position as soon as possible.

## After you finish

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

### Demo video

[Watch the procedure on YouTube](#)

## Install a DWC tray in the enclosure

Use this information to install a DWC tray in the enclosure.

### About this task

#### S002



#### **CAUTION:**

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

#### **Attention:**

- Read [“Installation Guidelines” on page 31](#) and [“Safety inspection checklist” on page 32](#) to ensure that you work safely.

**Note:** For your safety, use the lift tool to install the tray into the rack.

### Procedure

**Note:** The following illustration might differ slightly from your hardware, but the installation method is the same.

Step 1. Select the tray bay to install the tray.

#### **Attention:**

- To maintain proper system cooling, do not operate the enclosure without a DWC tray or tray bay filler installed in each tray bay. See the picture below for reference.
- Start with slot 1 when installing trays into the DW612S enclosure.
- If you are reinstalling a DWC tray that you removed, you must install it in the same tray bay from which you removed it. Some DWC tray configuration information and update options are established according to tray bay number. Reinstalling a DWC tray into a different tray bay can have unintended consequences. If you reinstall the DWC tray into a different tray bay, you might have to reconfigure the DWC nodes in the tray.

Step 2. Install the tray.

- a. ① Make sure that the front cam handles on the DWC tray are in the open position; then, insert the DWC tray into the tray bay until it stops.
- b. ② Rotate the front cam handles on the front of the DWC tray to the closed position to secure the tray in the enclosure.

**Note:** Depending on the model, your solution might look slightly different from the illustration.

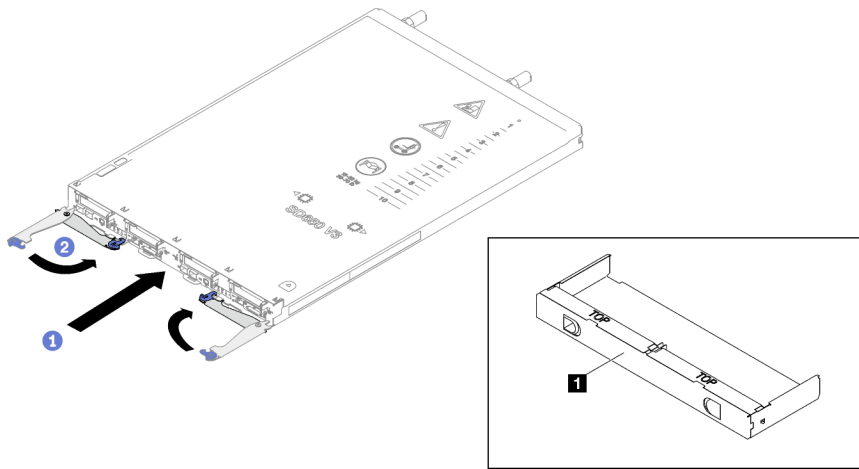


Figure 45. Tray installation

**1** Tray bay filler

**Note:** After the DWC tray is installed, the XCC in the DWC tray initializes. This process takes approximately 110 seconds. The power LED flashes rapidly, and the power button on the DWC tray does not respond until this process is complete.

Step 3. Connect all required external cables to the enclosure.

**Note:** Use extra force to connect QSFP cables to the solution.

Step 4. Press the power buttons to turn on both nodes in the DWC tray.

Step 5. Make sure that the power LED on the front operator panel is lit continuously, indicating that the each node is receiving power and is turned on.

Step 6. If you have other trays to install, do so now.

## After you finish

- If this is the initial installation of the DWC tray in the enclosure, you must configure the DWC tray through the Setup Utility and install the DWC tray operating system.
- If you have changed the configuration of the DWC tray or if you are installing a different DWC tray from the one that you removed, you must configure the DWC tray through the Setup Utility, and you might have to install the DWC tray operating system.

## Demo video

[Watch the procedure on YouTube](#)

---

## Replace components in the enclosure

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

### Drip sensor assembly replacement

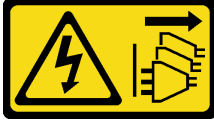
Use the following procedures to remove and install the drip sensor assembly.

#### Remove the drip sensor assembly

Use this information to remove the drip sensor assembly.

## About this task

S002



### CAUTION:

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

### Attention:

- Read [“Installation Guidelines” on page 31](#) and [“Safety inspection checklist” on page 32](#) to ensure that you work safely.

## Procedure

Step 1. Remove the EMC shields. See [“Remove an EMC shield” on page 104](#).

Step 2. Remove the drip sensor assembly.

- a. ① Push the latch up upwards.
- b. ② Slide the drip sensor assembly backwards, then; lift the drip sensor assembly up to clear sensor post and pull it out of the enclosure.

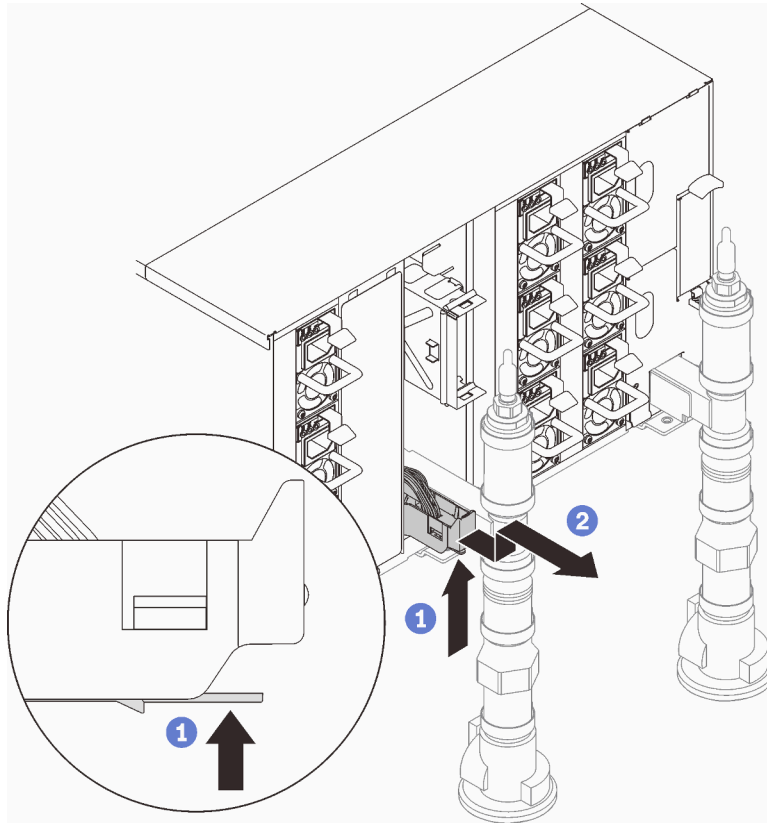


Figure 46. Drip sensor assembly removal

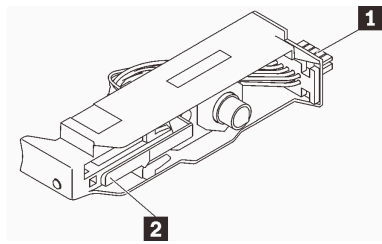


Figure 47. Drip sensor assembly

Table 10. Drip sensor assembly

<b>1</b> Connector	<b>2</b> Latch
--------------------	----------------

## After you finish

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

## Demo video

[Watch the procedure on YouTube](#)

## Install the drip sensor assembly

Use this information to install the drip sensor assembly.

## About this task

### S002



#### **CAUTION:**

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

#### **Attention:**

- Read “[Installation Guidelines](#)” on page 31 and “[Safety inspection checklist](#)” on page 32 to ensure that you work safely.

**Firmware and driver download:** You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/products/servers/thinksystem/dw612-enclosure/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “[Update the firmware](#)” on page 179 for more information on firmware updating tools.

## **Procedure**

Step 1. Align the drip sensor assembly with the enclosure and slide it into place.

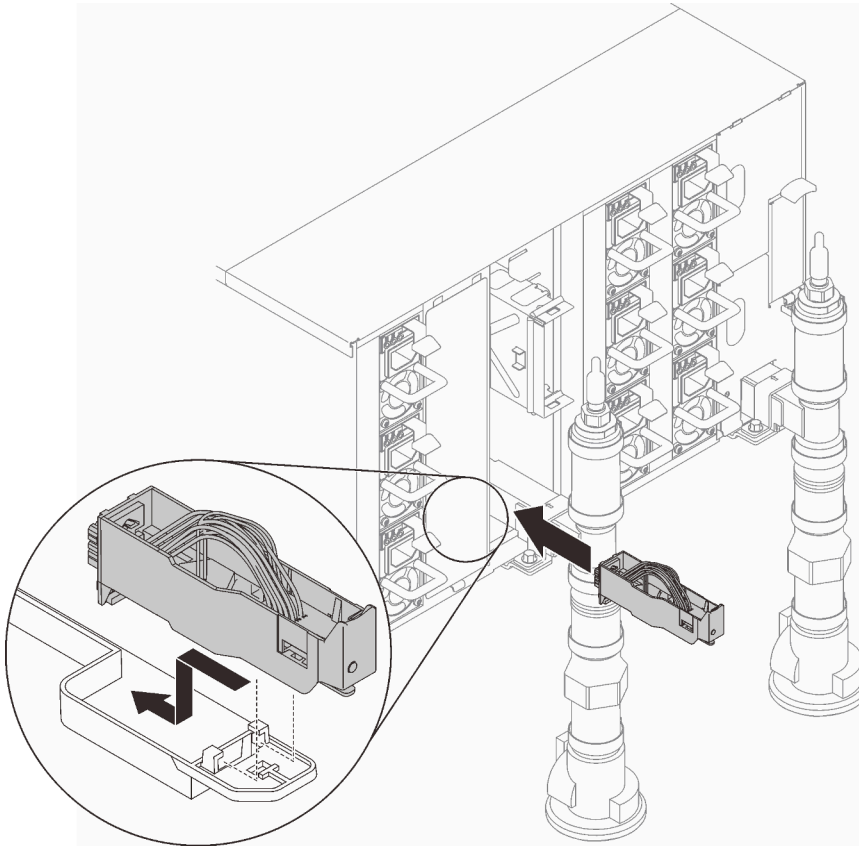


Figure 48. Drip sensor assembly installation

## After you finish

Install the EMC shields. See [“Install an EMC shield” on page 106](#).

## Demo video

[Watch the procedure on YouTube](#)

## DWC PSU bracket replacement

Use the following procedures to remove and install the DWC PSU bracket.

### Remove a DWC PSU bracket

Use this information to remove a DWC PSU bracket.

## About this task

### S001





 **DANGER**

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

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

**S002**



**CAUTION:**

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

**S035**



**CAUTION:**

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

**CAUTION:**



**High touch current. Connect to earth before connecting to supply.**

**Attention:**

- Read [“Installation Guidelines” on page 31](#) and [“Safety inspection checklist” on page 32](#) to ensure that you work safely.
- Disconnect the power cord from the connector on the back of the power supply.
- If only one DWC PSU is installed in the solution, you must turn off the solution before removing the power supply.

## Procedure

Step 1. Make preparations for this task.

- a. Remove the DWC PSU, see “Remove a DWC PSU” on page 93.

Step 2. Remove the DWC PSU bracket.

- a. ① Remove the screw located at WC2.
- b. ② Remove the screw located at WC1.
- c. ③ Slide the DWC PSU bracket out of the enclosure.

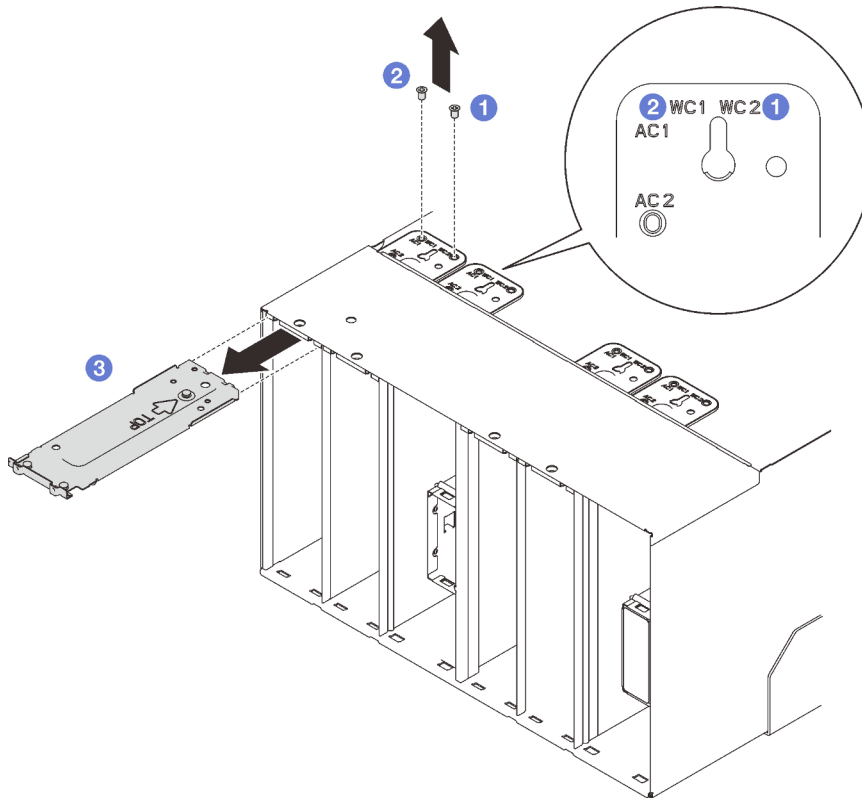


Figure 49. DWC PSU bracket removal

## After you finish

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

If the PSU slot will remain empty, install the DWC PSU filler into the enclosure; then, secure it with two screws.

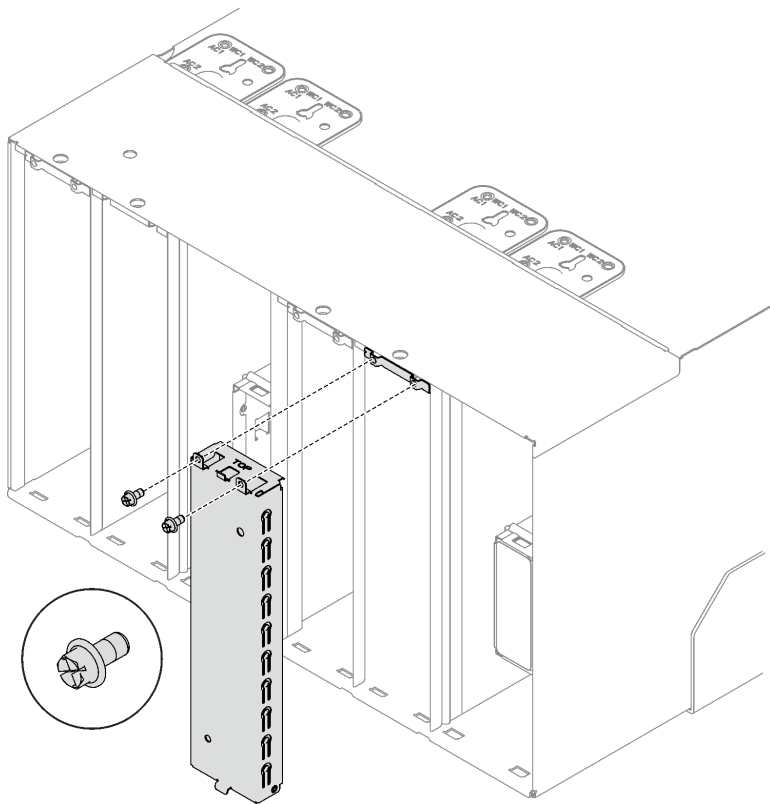


Figure 50. DWC PSU filler installation

### Demo video

[Watch the procedure on YouTube](#)

### Install a DWC PSU bracket

Use this information to install a DWC PSU bracket.

### About this task

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.

**S035**



**CAUTION:**

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

**CAUTION:**



**High touch current. Connect to earth before connecting to supply.**

**Attention:**

- Read “[Installation Guidelines](#)” on page 31 and “[Safety inspection checklist](#)” on page 32 to ensure that you work safely.
- The following notes describe the type of power supply that the enclosure supports and other information that you must consider when you install a power supply:
  - Make sure you follow the guidelines in “[PSU configuration](#)” on page 184.
  - For redundancy support, you must install an additional hot-swap power supply or DWC PSU, if one is not installed in your model.
  - Make sure that the devices that you are installing are supported. For a list of supported optional devices for the enclosure, see <https://serverproven.lenovo.com>.
- If a DWC PSU filler is installed, remove the two screws; then, remove the DWC PSU filler.

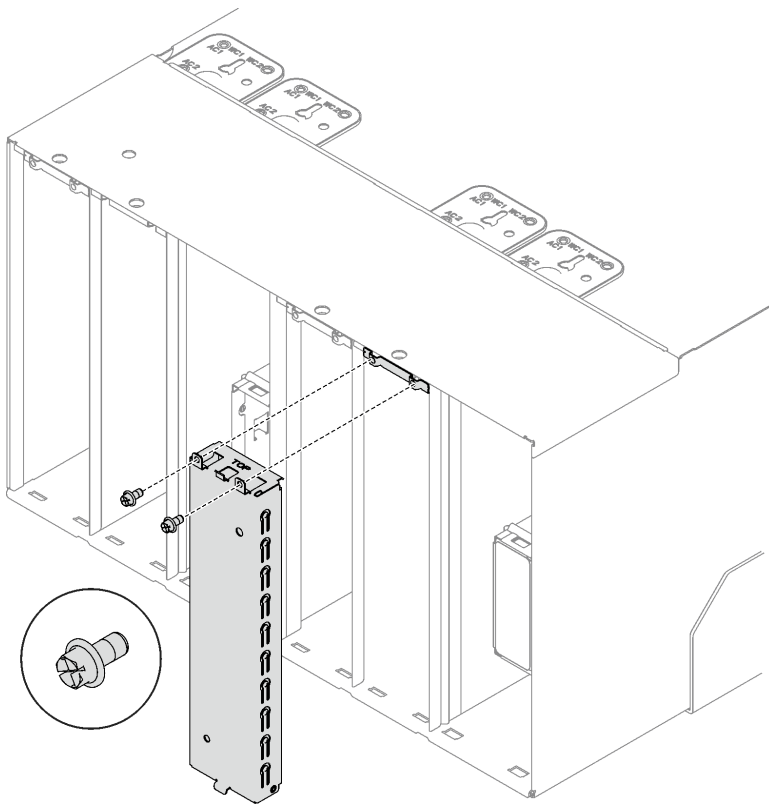


Figure 51. DWC PSU filler removal

## Procedure

Step 1. Make sure the stopper is securely installed in the enclosure.

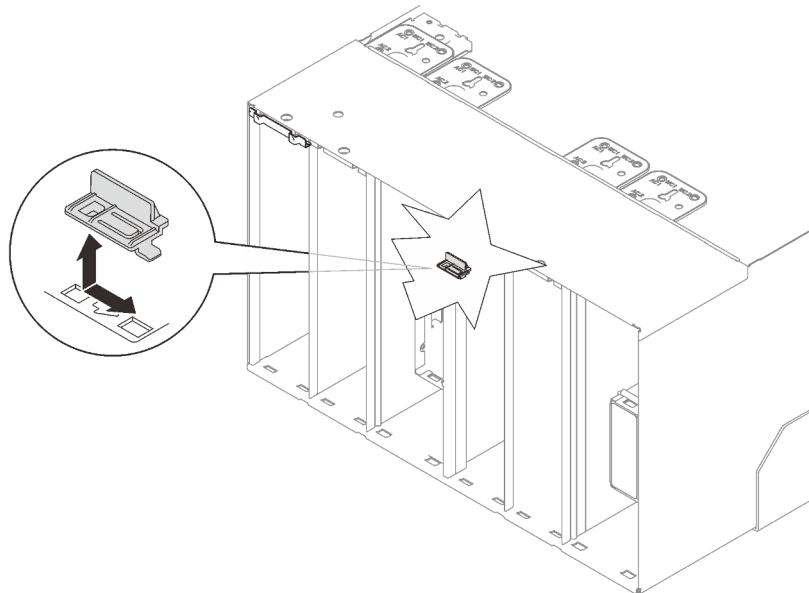


Figure 52. Stopper location

Step 2. Install the DWC PSU bracket.

- a. 1 Slide the DWC PSU bracket into the enclosure.
- b. 2 Secure the screw located at WC 1.
- c. 3 Secure the screw located at WC 2.

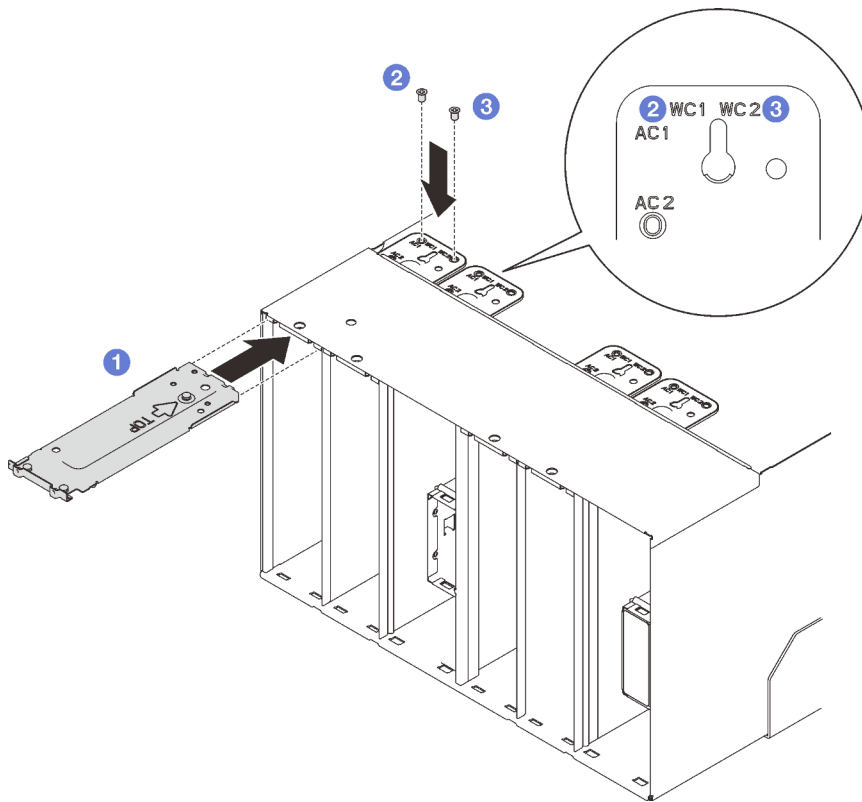


Figure 53. DWC PSU bracket installation

## After you finish

Install the DWC PSU, see “[Install a DWC PSU](#)” on page 100.

## Demo video

[Watch the procedure on YouTube](#)

## DWC PSU manifold replacement

Use the following procedures to remove and install the DWC PSU manifold.

### Remove the DWC PSU manifold

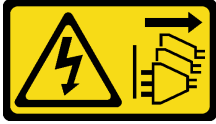
Use this information to remove the DWC PSU manifold.

## About this task

### CAUTION:

The water might cause irritation to the skin and eyes. Avoid direct contact with the lubricant.

## 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.

**S038**



**CAUTION:**

Eye protection should be worn for this procedure.

## L011



تحذير: يجب ارتداء النظارات الواقية لهذا الاجراء. (L011)

**AVISO:** Para este procedimento, são necessários óculos de proteção. (L011)

**ВНИМАНИЕ:** За тази процедура са необходими предпазни очила. (L011)

**ATTENTION :** Cette procédure requiert des lunettes de protection. (L011)

警告: 该过程需要护目镜。 (L011)

警告 : 此程序需要護目鏡。 (L011)

OPREZ: Za izvođenje postupka su potrebne zaštitne naočale. (L011)

**POZOR:** K tomuto postupu jsou nutné ochranné brýle. (L011)

**Pas på!** Proceduren kræver beskyttelsesbriller. (L011)

**WAARSCHUWING:** Voor deze procedure is een beschermende bril vereist. (L011)

**CAUTION:** Protective eyewear is needed for the procedure. (L011)

**VAROITUS:** Toimet edellyttävät silmänsuojaimien käyttöä. (L011)

**Vorsicht:** Bei dieser Prozedur eine Schutzbrille tragen. (L011)

**ΠΡΟΣΟΧΗ:** Για τη συγκεκριμένη διαδικασία απαιτούνται προστατευτικά γυαλιά. (L011)

**VESZÉLY:** Az eljáráshoz védőszemüveget kell viselni. (L011)

**ATTENZIONE:** per la procedura sono necessarie protezioni per gli occhi. (L011)

危険: この作業には目を保護する道具が必要です。  
(L011)

주의: 이 절차에는 보호용 안경이 필요합니다. (L011)



**ВНИМАНИЕ:** За изведување на постапката потребни се заштитни очила. (L011)

تنبه :  
باحتياط  
في  
العمل  
على  
الآلة  
التي  
تحتوي  
على  
أجزاء  
متحركة  
(L011)

**ADVARSEL:** Vernebriller må benyttes for denne prosedyren. (L011)

**ZAGROŻENIE:** Procedura wymaga zastosowania okularów ochronnych. (L011)

**CUIDADO:** É necessário utilizar protecção ocular para a execução deste procedimento. (L011)

**ОСТОРОЖНО:** При выполнении этой операции необходимо надеть защитные очки. (L011)

**VÝSTRAHA:** Vykonanie tejto procedúry vyžaduje pomôcku na ochranu očí. (L011)

**POZOR:** Za ta postopek je potrebna zaščitna oprema za oči. (L011)

**PRECAUCIÓN:** Utilice protección ocular para llevar a cabo el procedimiento. (L011)

**Varning:** Skyddsglasögon krävs. (L011)

ཉེན་བརྗེ། : བཞོལ་སྐྱོད་འདིའི་གོ་རེམ་ལ་སྲུང་སྐྱོབ་རུས་པ་ལྷན་པའི་མིག་གེལ་གོན་དགོས། (L011)

ئاگاھلاندۇرۇش: سز مەشغۇلات جەريانىدا كۆز ئاسراش كۆزەينىكى تاقىۋېلىشىڭىز كېرەك. (L011)

Daezsingj: Aen cauhcoz neix aeu yungh yenjinging baujhoh lwgda. (L011)

## L014



تحذير: يجب ارتداء القفازات الكيميائية المقاومة لهذا الاجراء. (L014)

**AVISO:** Para este procedimento, são necessárias luvas com resistência química. (L014)

**ВНИМАНИЕ:** За тази процедура са необходими химически устойчиви ръкавици. (L014)

**ATTENTION :** Cette procédure requiert des gants de protection contre les produits chimiques. (L014)

警告: 该过程需要化学防护手套。 (L014)

警告: 此程序需要抗化學劑手套。 (L014)

**OPREZ:** Za ovaj postupak su potrebne kemijski otporne zaštitne rukavice. (L014)

**POZOR:** K tomuto postupu jsou nutné ochranné brýle. (L014)

**Pas på!** Bær handsker, der er modstandsdygtige over for kemikalier, når du skal udføre denne proces. (L014)

**WAARSCHUWING:** Voor deze procedure zijn tegen chemicaliën beschermende handschoenen vereist. (L014)

**CAUTION:** Chemical resistant gloves are needed for this procedure. (L014)

**VAROITUS:** Toimet edellyttävät kemiallisesti kestävästä materiaaleista valmistettujen suojakäsineiden käyttöä. (L014)

**Vorsicht:** Bei dieser Aktion müssen chemische Schutzhandschuhe getragen werden. (L014)

**ΠΡΟΣΟΧΗ:** Για τη συγκεκριμένη διαδικασία απαιτούνται ειδικά γάντια, ανθεκτικά στις χημικές ουσίες. (L014)

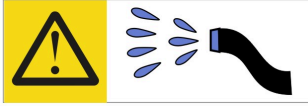
**VIGYÁZAT:** Az eljáráshoz vegyi anyagokkal szemben ellenálló védőszemüveget kell viselni. (L014)

**ATTENZIONE:** per questa procedura sono necessari guanti resistenti ad agenti chimici. (L014)

危険: この作業には化学耐性のあるグローブが必要です。 (L014)



## L016



خطر: قد يتم التعرض لخطر الصدمة الكهربائية بسبب الماء أو المحلول المائي الذي يوجد بهذا المنتج.  
تجنب العمل في أو بالقرب من أي جهاز فعال بأيدي مبللة أو عند وجود تسرب للماء. (L016)

**AVISO: Risco de choque elétrico devido à presença de água ou solução aquosa no produto. Evite trabalhar no equipamento ligado ou próximo a ele com as mãos molhadas ou quando houver a presença de água derramada. (L016)**

**ОПАСНО:** Риск от токов удар поради вода или воден разтвор, присъстващи в продукта.  
Избягвайте работа по или около оборудване под напрежение,  
докато сте с мокри ръце или когато наоколо има разляна вода.  
(L016)

**DANGER: Risque de choc électrique lié à la présence d'eau ou d'une solution aqueuse dans ce produit. Évitez de travailler avec ou à proximité d'un équipement sous tension avec des mains mouillées ou lorsque de l'eau est renversée. (L016)**

危險: 由于本产品中存在水或者水溶液，因此存在电击风险。请避免使用潮湿的手在带电设备或者有水溅出的环境附近工作。(L016)

危險: 本產品中有水或水溶液，會造成電擊的危險。手濕或有潑濺的水花時，請避免使用或靠近帶電的設備。(L016)

OPASNOST: Rizik od električnog udara zbog vode ili tekućine koja postoji u ovom proizvodu.  
Izbjegavajte rad u  
blizini opreme pod naponom s mokrim rukama ili kad je u blizini prolivena  
tekućina.  
(L016)

**NEBEZPEČÍ: Riziko úrazu elektrickým proudem v důsledku vody nebo vodního roztoku přítomného v tomto produktu. Dejte pozor, abyste při práci s aktivovaným vybavením nebo v jeho blízkosti neměli mokré ruce a vyvarujte se potřísnění nebo polití produktu vodou. (L016)**

**Fare! Risiko for stød på grund af vand eller en vandig opløsning i produktet. Undgå at arbejde med eller i nærheden af strømførende udstyr med våde hænder, eller hvis der er spildt vand. (L016)**

**GEVAAR: Risco op elektrische schok door water of waterachtige oplossing die aanwezig is in dit product. Vermijd werken aan of naast apparatuur die onder spanning staat als u natte handen hebt of als gemorst water aanwezig is. (L016)**

**DANGER: Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present. (L016)**



**ОПАСНО: Риск поражения электрическим током вследствие присутствия в этом продукте воды или водного раствора. Избегайте выполнения работ на оборудовании, находящемся под напряжением, или рядом с таким оборудованием влажными руками или при наличии пролитой воды. (L016)**

NEBEZPEČENSTVO: Riziko úrazu elektrickým prúdom v dôsledku prítomnosti vody alebo vodného roztoku v tomto produkte. Vyhnite sa práci na zapnutom zariadení alebo v jeho blízkosti s vlhkými rukami, alebo keď je prítomná rozliata voda. (L016)

NEVARNOST: Nevarnost električnega udara zaradi vode ali vodne raztopine, prisotne v izdelku. Ne delajte na opremi ali poleg opreme pod energijo z mokrimi rokami ali ko je prisotna razlita voda. (L016)

**PELIGRO: Existe riesgo de choque eléctrico por agua o por una solución de agua que haya en este producto. Evite trabajar en equipos bajo tensión o cerca de los mismos con las manos húmedas o si hay agua derramada. (L016)**

**Fara: Risk för elektriska stötar på grund av vatten eller vattenbaserat medel i denna produkt. Arbeta inte med eller i närheten av elektriskt laddad utrustning om du har våta händer eller vid vattenspill. (L016)**

ཉེན་བརྒྱུ: རྩོམ་རྒྱུ་འདི་ནི་ནང་དུ་རྒྱུ་ལྡན་པའི་གཞུག་གཞུག་ལ་འདྲེན་པའི་ལས་སྐྱོད་ལྟུག་པའི་ཉེན་ཁ་ཡོད། ལག་པའི་ཐོག་ལྟུ་ཡོད་པའི་རྩོམ་ཐོག་མར་བཞུར་བའི་གནས་ཚུལ་འདི་གསོག་ཡོད་པའི་སྐྱོག་ཆས་ལ་བཞག་སྟེ་བྱེད་མི་ཉེན་པོ། (L016)

خەتەرلىك: بۇ مەھسۇلاتتا سۇ ياكى ئېرىتمە بولغاچقا، شۇڭا توك سوقۇۋېتىش خەۋپى مەۋجۇتدۇر. قول ھۆل ھالەتتە ۋە ياكى سۇ سىرغىپ چىققان ھالەتتە، توكلۇق ئۇسكۇنىگە قارىتا ۋە ياكى توكلۇق ئۇسكۇنىنىڭ ئەتراپىدا مەشغۇلات ئېلىپ بارغىلى بولمايدۇ. (L016)

Yungyiemj: Youzyiz aen canjbinj miz raemx roxnaeuz raemx yungzyiz, sojyij miz yungyiemj bungqden. Mboujndaej fwngz miz raemx seiz youq ndaw sezbi roxnaeuz youq henzgyawj guhhong. (L016)

**Attention:**

- Read “Installation Guidelines” on page 31 and “Safety inspection checklist” on page 32 to ensure that you work safely.
- Ensure proper handling procedures are followed when working with any chemically treated water used in the compute rack cooling system. Ensure that material safety data sheets (MSDS) and safety information are provided by the water chemical treatment supplier and that proper personal protective equipment (PPE) is available as recommended by the water chemical treatment supplier. Protective gloves and eyewear may be recommended as a precaution.
- The task in this section requires two or more people.

**Procedure**

- Step 1. If the node is turned on, turn off the node.
- Step 2. Disconnect the power cord from the electrical outlet; then, disconnect the other end of the power cord from the back of the power supply.
- Step 3. At the front of the rack, press the unlock pin (1) and close both Eaton ball valves (2); then disconnect the hoses.

**CAUTION:**

**Water is under pressure and may spray when initially opening the ball valve.**

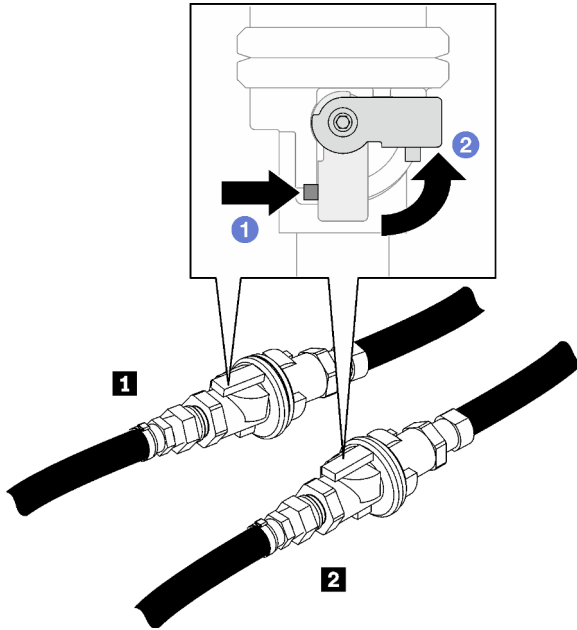


Figure 54. Eaton ball valves closed

Table 11. Eaton ball valves

1 Rack supply (DWC PSU manifold)	2 Rack return (DWC PSU manifold)
----------------------------------	----------------------------------

Step 4. Place the rack return hose in a bucket, then press the ball valve unlock pin and slowly rotate the valve actuator handle until the valve opens about 1/4 of the way.

**Note:** Do not fully open the rack ball valve or you will reduce your ability to control the flow as you drain the rack.

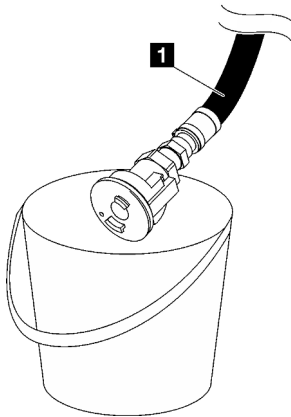


Figure 55. Rack return hose in bucket

Table 12. Rack return hose in bucket

1 Rack return (DWC PSU manifold)
----------------------------------

Step 5. Connect the hose assembly (supplied to customer installation site) to the top quick connect at Location A (top of the DWC manifold) and place the other end in a bucket. Slowly open the hose valve to allow air to flow into the hose. Close the hose valve once water stops flowing (it may take approximately one minute).

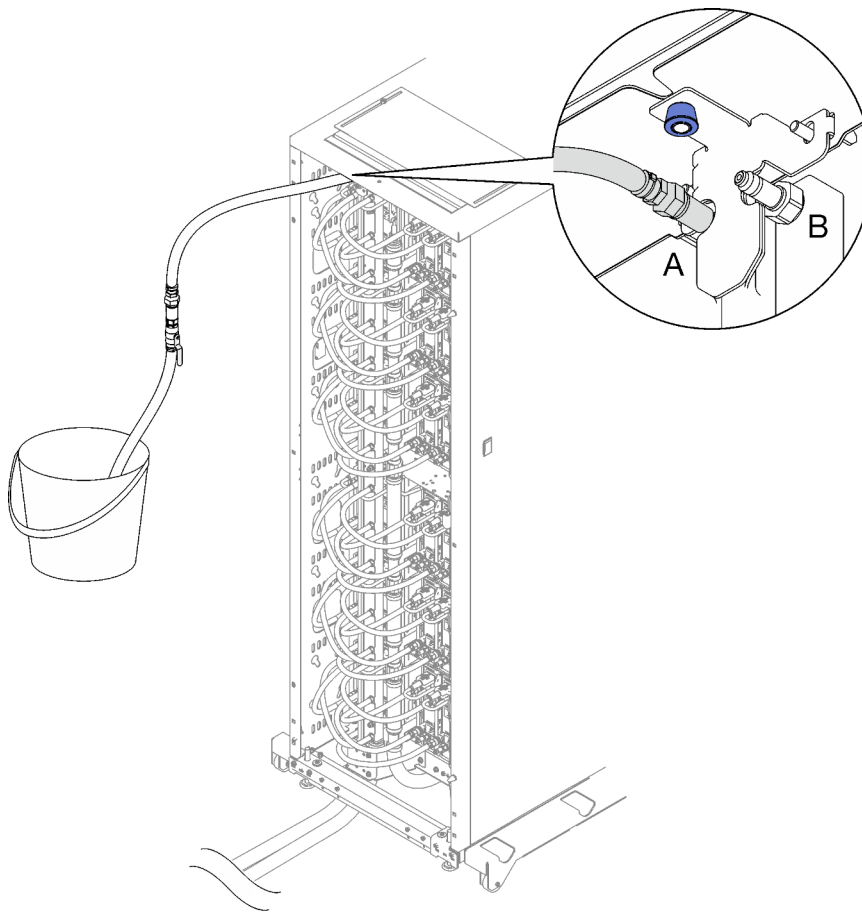


Figure 56. Hose assembly to top quick connect

- Step 6. Depress the lock pin and rotate the valve actuator handle in the opposite direction on the rack return hose to close the ball valve.
- Step 7. Place the rack supply hose in a bucket, then press the ball valve unlock pin and slowly rotate the valve actuator handle until the valve opens about 1/4 of the way.

**Note:** Do not fully open the rack ball valve or you will reduce your ability to control the flow as you drain the rack.

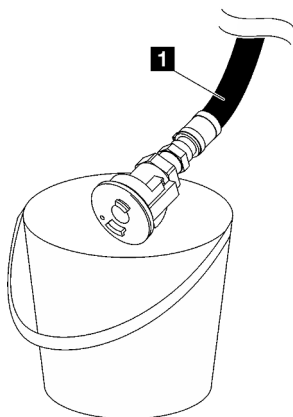


Figure 57. Rack supply hose in bucket



Table 13. Rack supply hose in bucket

**1** Rack supply (DWC PSU manifold)

Step 8. Disconnect the hose assembly from Location A and connect it to Location B. Slowly open the hose valve to allow air to flow into the hose. Close the hose valve once water stops flowing (it may take approximately one minute).

**Note:** Be sure to always close the valve on the hose before disconnecting it.

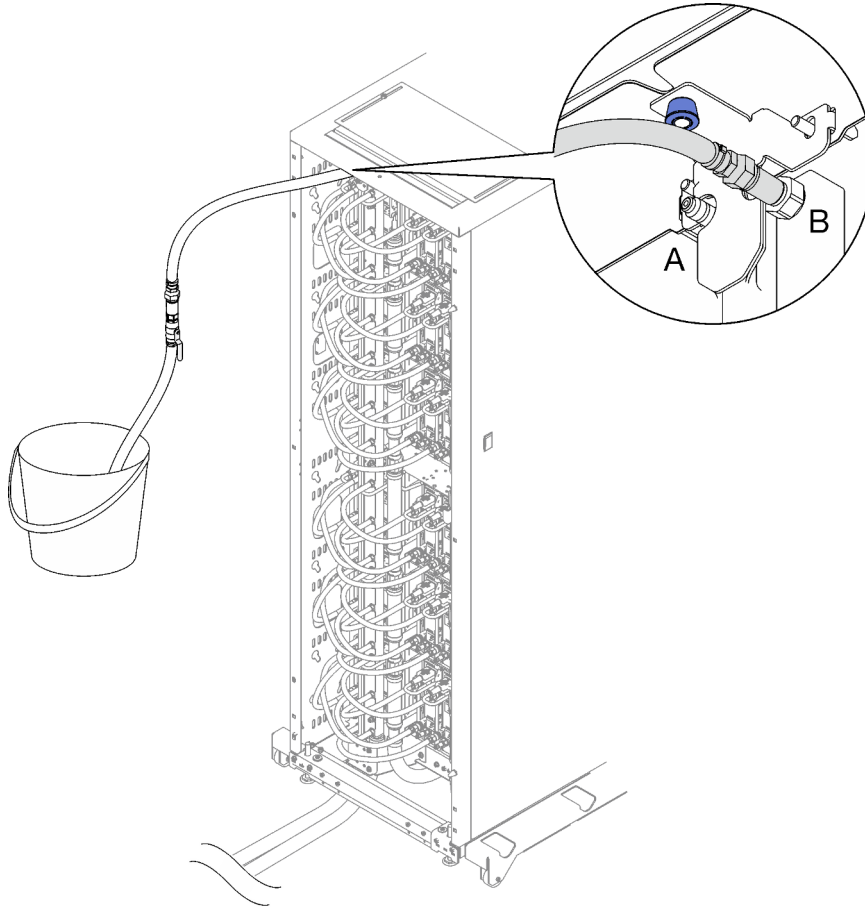
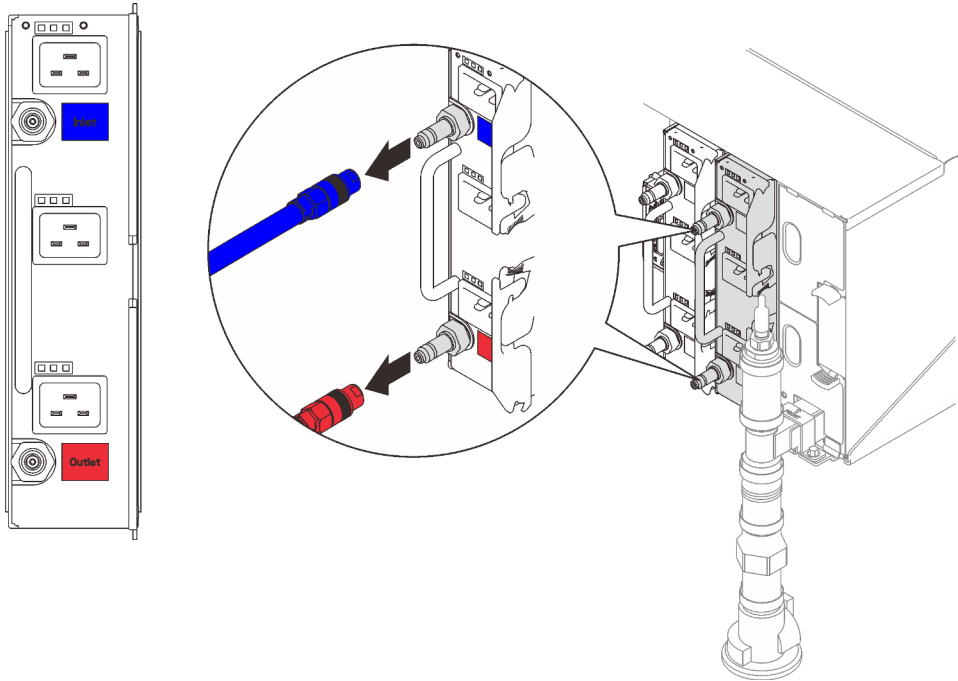


Figure 58. Hose assembly at Location B

Step 9. Disconnect the hose assembly from Location B.

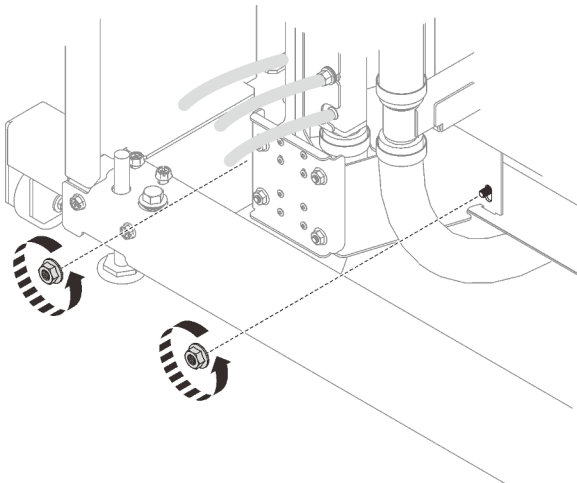
Step 10. Close the valve on the rack supply hose.

Step 11. Disconnect all DWC PSU Manifold hoses from all DWC Power Supply Quick Disconnects



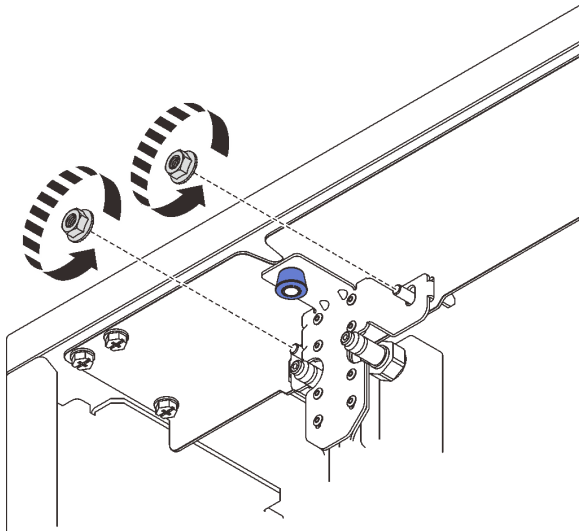
*Figure 59. DWC PSU hose assembly removal*

Step 12. Remove the two nuts that secure the bottom rack manifold mounting bracket to the rack cabinet.



*Figure 60. Bottom rack manifold mounting bracket nuts removal*

Step 13. Remove the two nuts that secure top rack manifold mounting bracket to the rack cabinet.



*Figure 61. Top rack manifold mounting bracket nuts removal*

Step 14. Remove the DWC PSU manifold assembly.

- a. ① Pull down on plunger knob and hold while rotating manifold out and away from rack.
- b. ② Rotate the top part of the DWC PSU manifold assembly from the rack cabinet as shown.
- c. ③ Lift the DWC PSU manifold assembly out of the bottom rack manifold mounting bracket to remove it from the rack cabinet. (Ensure manifold is clear of the threaded studs on the bottom rack manifold mounting bracket before lifting it out of rack).

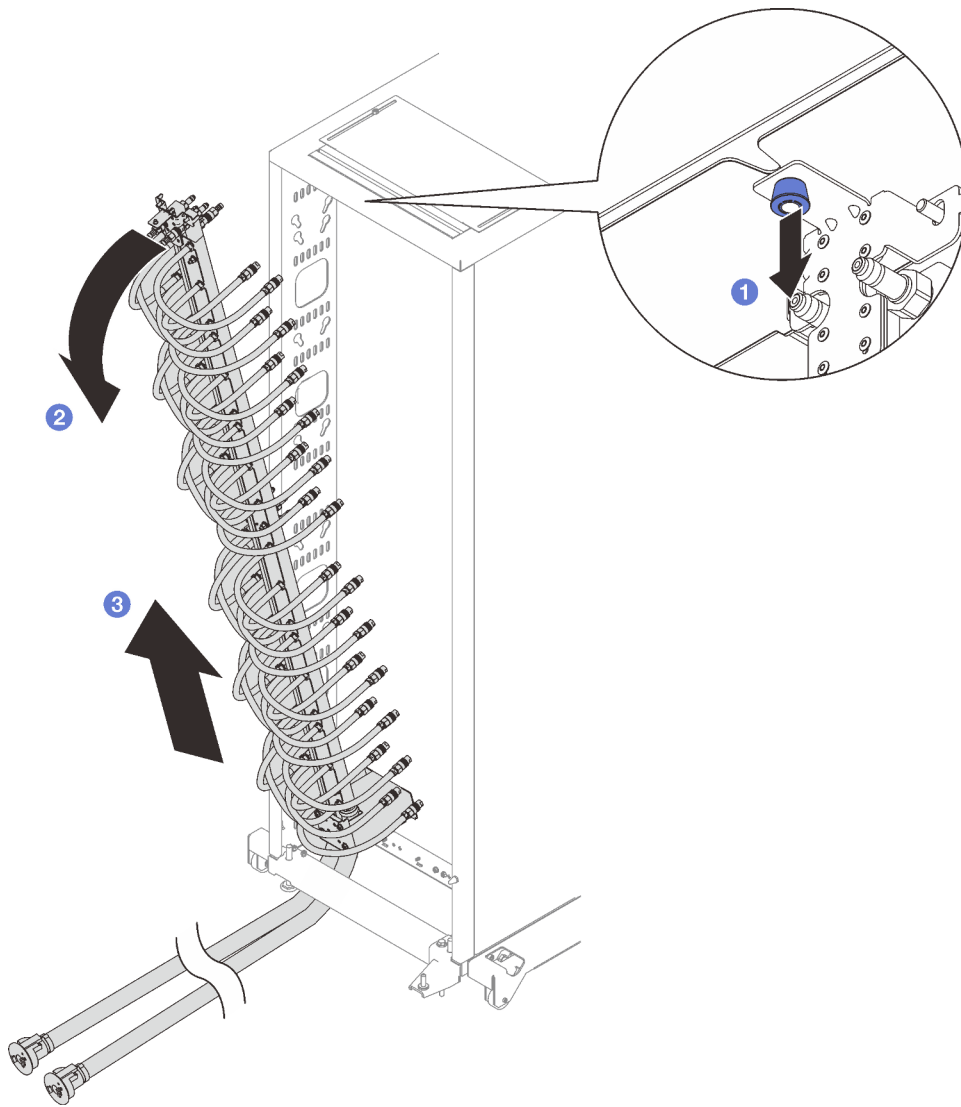
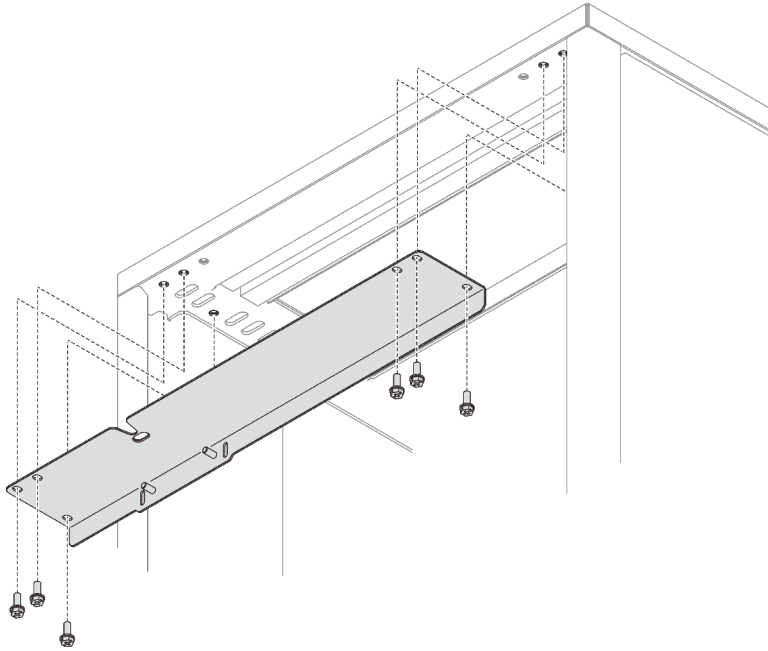


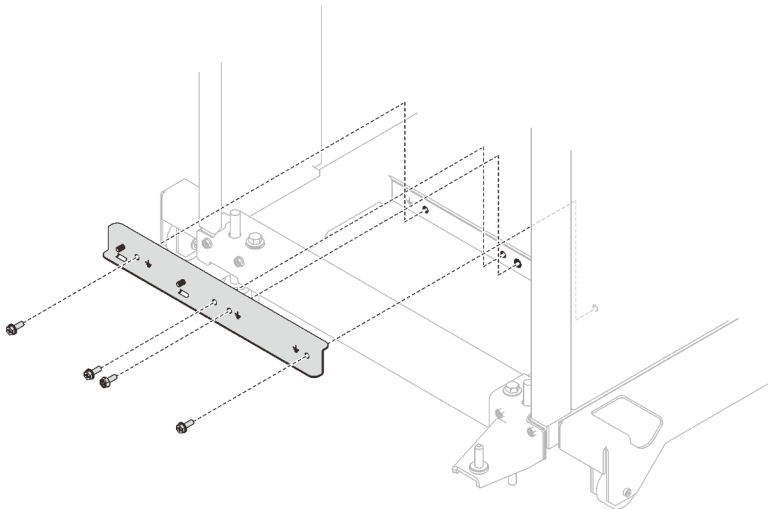
Figure 62. DWC PSU manifold assembly removal

Step 15. Remove six screws to remove the top rack manifold mounting bracket.



*Figure 63. Top rack manifold mounting bracket removal*

Step 16. Remove four screws to remove the bottom rack manifold mounting bracket.



*Figure 64. Bottom rack manifold mounting bracket removal*

## **After you finish**

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

## **Demo video**

[Watch the procedure on YouTube](#)

## Install the DWC PSU manifold

Use this information to install the DWC PSU manifold.

### About this task

#### CAUTION:

The water might cause irritation to the skin and eyes. Avoid direct contact with the lubricant.

#### 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.

#### S038



#### CAUTION:

Eye protection should be worn for this procedure.

## L011



تحذير: يجب ارتداء النظارات الواقية لهذا الاجراء. (L011)

**AVISO:** Para este procedimento, são necessários óculos de proteção. (L011)

**ВНИМАНИЕ:** За тази процедура са необходими предпазни очила. (L011)

**ATTENTION :** Cette procédure requiert des lunettes de protection. (L011)

警告: 该过程需要护目镜。 (L011)

警告 : 此程序需要護目鏡。 (L011)

OPREZ: Za izvođenje postupka su potrebne zaštitne naočale. (L011)

**POZOR:** K tomuto postupu jsou nutné ochranné brýle. (L011)

**Pas på!** Proceduren kræver beskyttelsesbriller. (L011)

**WAARSCHUWING:** Voor deze procedure is een beschermende bril vereist. (L011)

**CAUTION:** Protective eyewear is needed for the procedure. (L011)

**VAROITUS:** Toimet edellyttävät silmänsuojaimien käyttöä. (L011)

**Vorsicht:** Bei dieser Prozedur eine Schutzbrille tragen. (L011)

**ΠΡΟΣΟΧΗ:** Για τη συγκεκριμένη διαδικασία απαιτούνται προστατευτικά γυαλιά. (L011)

**VESZÉLY:** Az eljáráshoz védőszemüveget kell viselni. (L011)

**ATTENZIONE:** per la procedura sono necessarie protezioni per gli occhi. (L011)

危険: この作業には目を保護する道具が必要です。  
(L011)

주의: 이 절차에는 보호용 안경이 필요합니다. (L011)

**ВНИМАНИЕ:** За изведување на постапката потребни се заштитни очила. (L011)

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تعمیر : بنس  
(L011)

**ADVARSEL:** Vernebriller må benyttes for denne prosedyren. (L011)

**ZAGROŻENIE:** Procedura wymaga zastosowania okularów ochronnych. (L011)

**CUIDADO:** É necessário utilizar protecção ocular para a execução deste procedimento. (L011)

**ОСТОРОЖНО:** При выполнении этой операции необходимо надеть защитные очки. (L011)

**VÝSTRAHA:** Vykonanie tejto procedúry vyžaduje pomôcku na ochranu očí. (L011)

**POZOR:** Za ta postopek je potrebna zaščitna oprema za oči. (L011)

**PRECAUCIÓN:** Utilice protección ocular para llevar a cabo el procedimiento. (L011)

**Varning:** Skyddsglasögon krävs. (L011)

ཉེན་བརྟེན་ : བཞོལ་སྐྱོད་འདིའི་གོ་རིམ་ལ་སྲུང་སྐྱོབ་རྒྱས་པ་ལྟན་པའི་མིག་གཤམ་གྱི་དགོས་པ། (L011)

ئاگاھلاندۇرۇش : سز مەشغۇلات جەريانىدا كۆز ئاسراش كۆزەينىكى تاقىۋېلىشىڭىز كېرەك. (L011)

Daezsinj: Aen cauhcoz neix aeu yungh yenjinging baujhoh lwgda. (L011)



## L014



تحذير: يجب ارتداء القفازات الكيميائية المقاومة لهذا الاجراء. (L014)

**AVISO:** Para este procedimento, são necessárias luvas com resistência química. (L014)

**ВНИМАНИЕ:** За тази процедура са необходими химически устойчиви ръкавици. (L014)

**ATTENTION :** Cette procédure requiert des gants de protection contre les produits chimiques. (L014)

警告: 该过程需要化学防护手套。 (L014)

警告: 此程序需要抗化學劑手套。 (L014)

OPREZ: Za ovaj postupak su potrebne kemijski otporne zaštitne rukavice. (L014)

**POZOR:** K tomuto postupu jsou nutné ochranné brýle. (L014)

**Pas på!** Bær handsker, der er modstandsdygtige over for kemikalier, når du skal udføre denne proces. (L014)

**WAARSCHUWING:** Voor deze procedure zijn tegen chemicaliën beschermende handschoenen vereist. (L014)

**CAUTION:** Chemical resistant gloves are needed for this procedure. (L014)

**VAROITUS:** Toimet edellyttävät kemiallisesti kestävästä materiaaleista valmistettujen suojakäsineiden käyttöä. (L014)

**Vorsicht:** Bei dieser Aktion müssen chemische Schutzhandschuhe getragen werden. (L014)

**ΠΡΟΣΟΧΗ:** Για τη συγκεκριμένη διαδικασία απαιτούνται ειδικά γάντια, ανθεκτικά στις χημικές ουσίες. (L014)

**VIGYÁZAT:** Az eljáráshoz vegyi anyagokkal szemben ellenálló védőszemüveget kell viselni. (L014)

**ATTENZIONE:** per questa procedura sono necessari guanti resistenti ad agenti chimici. (L014)

危険: この作業には化学耐性のあるグローブが必要です。 (L014)

주의: 이 절차를 수행하려면 내화학성 장갑을 착용해야 합니다. (L014)

**ВНИМАНИЕ:** За изведывање на оваа постапка потребни се ракавици за хемиска заштита. (L014)

تعليمات :  
يحتاج  
إلى  
ارتداء  
قفازات  
مقاومة  
كيميائية  
عند  
التعامل  
مع  
المواد  
الكيميائية  
(L014)

**ADVARSEL:** Vernehansker av motstandsdyktig materiale må benyttes for denne prosedyren. (L014)

**ZAGROŽENIE:** Procedura wymaga użycia rękawic ochronnych. (L014)

**CUIDADO:** É necessária a utilização de luvas resistentes a químicos para a execução deste procedimento. (L014)

**ОСТОРОЖНО:** Для этой процедуры необходимы перчатки, устойчивые к химическим воздействиям. (L014)

**VÝSTRAHA:** Vykonanie tejto procedúry vyžaduje rukavice odolné chemikáliám. (L014)

**POZOR:** Za delo so potrebné proti kemičnim sredstvom odporne rokavice. (L014)

**PRECAUCIÓN:** Utilice guantes resistentes a los productos químicos para llevar a cabo el procedimiento. (L014)

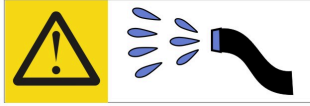
**Varning:** Kemikalietåliga handskar behövs. (L014)

ཉེན་ལ། : བཞོལ་སྐྱོད་འདིའི་གོ་རིམ་ལ་སྲུང་སྐྱོབ་རུས་པ་ལྡན་པའི་རྩིས་འགྲུར་རུལ་འགོག་ལག་ཁྱུབས་གོན་དགོས།  
(L014)

ئاگاھلاندۇرۇش : بۇ مەشغۇلات جەريانىدا خىمىيىلىك چىرىشتىن ساقلىنىش پەللىنى كىيىۋېلىشىڭىز كېرەك. (L014)

Daezsingj: Aen cauhcoz neix aeu yungh madfwngz naih vayoz myaex. (L014)

## L016



خطر: قد يتم التعرض لخطر الصدمة الكهربائية بسبب الماء أو المحلول المائي الذي يوجد بهذا المنتج.  
تجنب العمل في أو بالقرب من أي جهاز فعال بأيدي مبللة أو عند وجود تسرب للماء. (L016)

**AVISO: Risco de choque elétrico devido à presença de água ou solução aquosa no produto. Evite trabalhar no equipamento ligado ou próximo a ele com as mãos molhadas ou quando houver a presença de água derramada. (L016)**

**ОПАСНО:** Риск от токов удар поради вода или воден разтвор, присъстващи в продукта.  
Избягвайте работа по или около оборудване под напрежение,  
докато сте с мокри ръце или когато наоколо има разляна вода.  
(L016)

**DANGER: Risque de choc électrique lié à la présence d'eau ou d'une solution aqueuse dans ce produit. Évitez de travailler avec ou à proximité d'un équipement sous tension avec des mains mouillées ou lorsque de l'eau est renversée. (L016)**

危險: 由于本产品中存在水或者水溶液，因此存在电击风险。请避免使用潮湿的手在带电设备或者有水溅出的环境附近工作。(L016)

危險: 本產品中有水或水溶液，會造成電擊的危險。手濕或有潑濺的水花時，請避免使用或靠近帶電的設備。(L016)

**OPASNOST:** Rizik od električnog udara zbog vode ili tekućine koja postoji u ovom proizvodu.  
Izbjegavajte rad u  
blizini opreme pod naponom s mokrim rukama ili kad je u blizini prolivena  
tekućina.  
(L016)

**NEBEZPEČÍ:** Riziko úrazu elektrickým proudem v důsledku vody nebo vodního roztoku přítomného v tomto produktu. Dejte pozor, abyste při práci s aktivovaným vybavením nebo v jeho blízkosti neměli mokré ruce a vyvarujte se potřísnění nebo polití produktu vodou. (L016)

**Fare!** Risiko for stød på grund af vand eller en vandig opløsning i produktet. Undgå at arbejde med eller i nærheden af strømførende udstyr med våde hænder, eller hvis der er spildt vand. (L016)

**GEVAAR:** Risico op elektrische schok door water of waterachtige oplossing die aanwezig is in dit product. Vermijd werken aan of naast apparatuur die onder spanning staat als u natte handen hebt of als gemorst water aanwezig is. (L016)

**DANGER:** Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present. (L016)



**ОПАСНО: Риск поражения электрическим током вследствие присутствия в этом продукте воды или водного раствора. Избегайте выполнения работ на оборудовании, находящемся под напряжением, или рядом с таким оборудованием влажными руками или при наличии пролитой воды. (L016)**

NEBEZPEČENSTVO: Riziko úrazu elektrickým prúdom v dôsledku prítomnosti vody alebo vodného roztoku v tomto produkte. Vyhnite sa práci na zapnutom zariadení alebo v jeho blízkosti s vlhkými rukami, alebo keď je prítomná rozliata voda. (L016)

NEVARNOST: Nevarnost električnega udara zaradi vode ali vodne raztopine, prisotne v izdelku. Ne delajte na opremi ali poleg opreme pod energijo z mokrimi rokami ali ko je prisotna razlita voda. (L016)

**PELIGRO: Existe riesgo de choque eléctrico por agua o por una solución de agua que haya en este producto. Evite trabajar en equipos bajo tensión o cerca de los mismos con las manos húmedas o si hay agua derramada. (L016)**

**Fara: Risk för elektriska stötar på grund av vatten eller vattenbaserat medel i denna produkt. Arbeta inte med eller i närheten av elektriskt laddad utrustning om du har våta händer eller vid vattenspill. (L016)**

ཉེན་བརྒྱུ: རྩོམ་ཚུལ་འདིའི་ནང་དུ་རྒྱ་འཕྲུལ་རྒྱུའི་ག་ཤེར་ག་ཟུགས་འདུས་ཡོད་པ་སུ། དེ་ལས་སློབ་ལྗགས་པའི་ཉེན་ཁ་ཡོད། ལག་པའི་ཐོག་ལྗགས་པའི་འཕྲུལ་རྩོམ་མེད་ལུང་བའི་གནས་ཚུལ་འོག་སློབ་ཡོད་པའི་སློབ་ཚུལ་ལ་བཞག་སློབ་བྱེད་མི་ཉེན་པོ། (L016)

خەتەرلىك: بۇ مەھسۇلاتتا سۇ ياكى ئېرىتمە بولغاچقا، شۇڭا توك سوقۇۋېتىش خەۋپى مەۋجۇتدۇر. قول ھۆل ھالەتتە ۋە ياكى سۇ سىرغىپ چىققان ھالەتتە، توكلۇق ئۇسكۇنىگە قارىتا ۋە ياكى توكلۇق ئۇسكۇنىنىڭ ئەتراپىدا مەشغۇلات ئېلىپ بارغىلى بولمايدۇ. (L016)

Yungyiemi: Youzyiz aen canjbinj miz raemx roxnaeuz raemx yungzyiz, sojyij miz yungyiemi bungqden. Mboujndaej fwngz miz raemx seiz youq ndaw sezbi roxnaeuz youq henzgyawj guhhong. (L016)

**Attention:**

- Read “Installation Guidelines” on page 31 and “Safety inspection checklist” on page 32 to ensure that you work safely.
- Ensure proper handling procedures are followed when working with any chemically treated water used in the compute rack cooling system. Ensure that material safety data sheets (MSDS) and safety information are provided by the water chemical treatment supplier and that proper personal protective equipment (PPE) is available as recommended by the water chemical treatment supplier. Protective gloves and eyewear may be recommended as a precaution.
- The task in this section requires two or more people.

**Procedure**

Step 1. Tighten four screws to secure the bottom rack manifold mounting bracket to the rack cabinet.

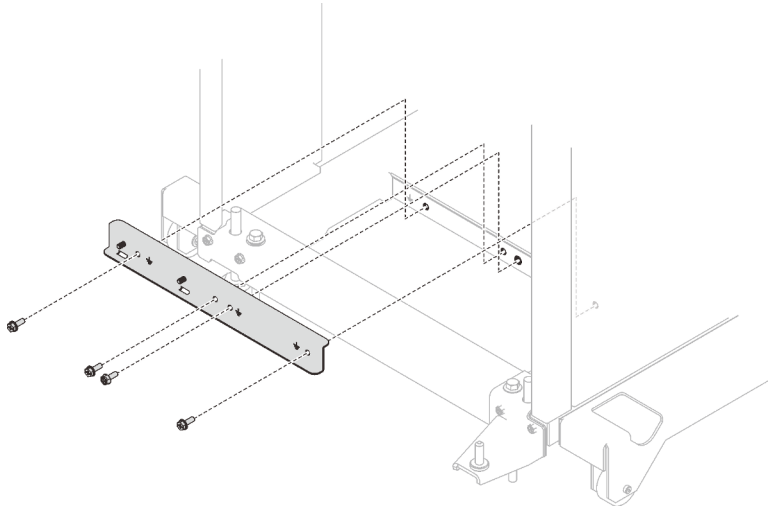


Figure 65. Bottom rack manifold mounting bracket installation

Step 2. Tighten six screws to secure the top rack manifold mounting bracket to the rack cabinet.

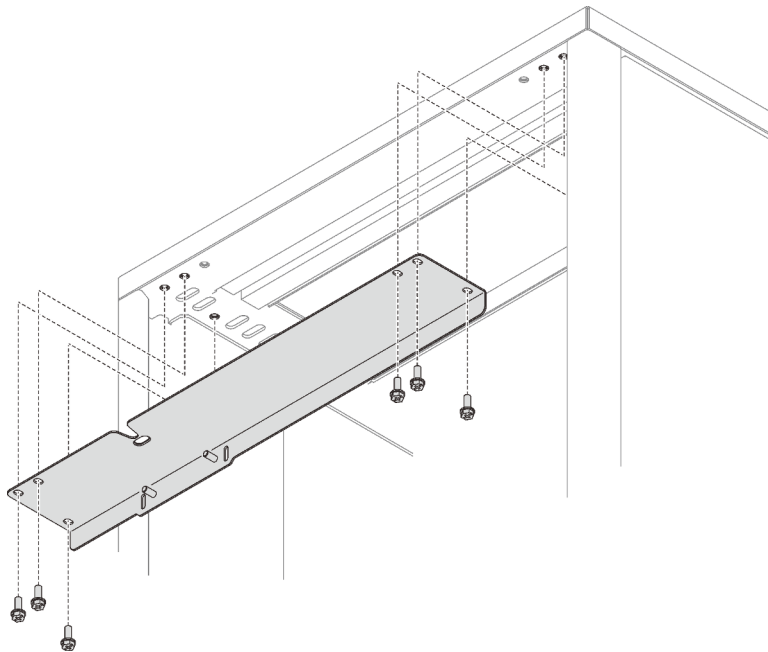


Figure 66. Top rack manifold mounting bracket installation

Step 3. Install the DWC PSU manifold assembly.

- a. ① Route Supply/Return Hoses under bottom rack shipping bracket as shown.
- b. ② There are tabs on the bottom right and bottom left of the manifold. On each tab there is a retention slot. Position the tabs at an angle while aligning the retention slots to the threaded studs; then, insert the tabs into the tab slots on the bottom rack manifold mounting bracket.

①	Bottom rack shipping bracket
②	Bottom rack manifold mounting bracket

<b>3</b> Tab slot on <b>2</b>
<b>4</b> Tab on the bottom of the manifold
<b>5</b> Retention slot on the bottom of the manifold
<b>6</b> Threaded stud on <b>2</b>

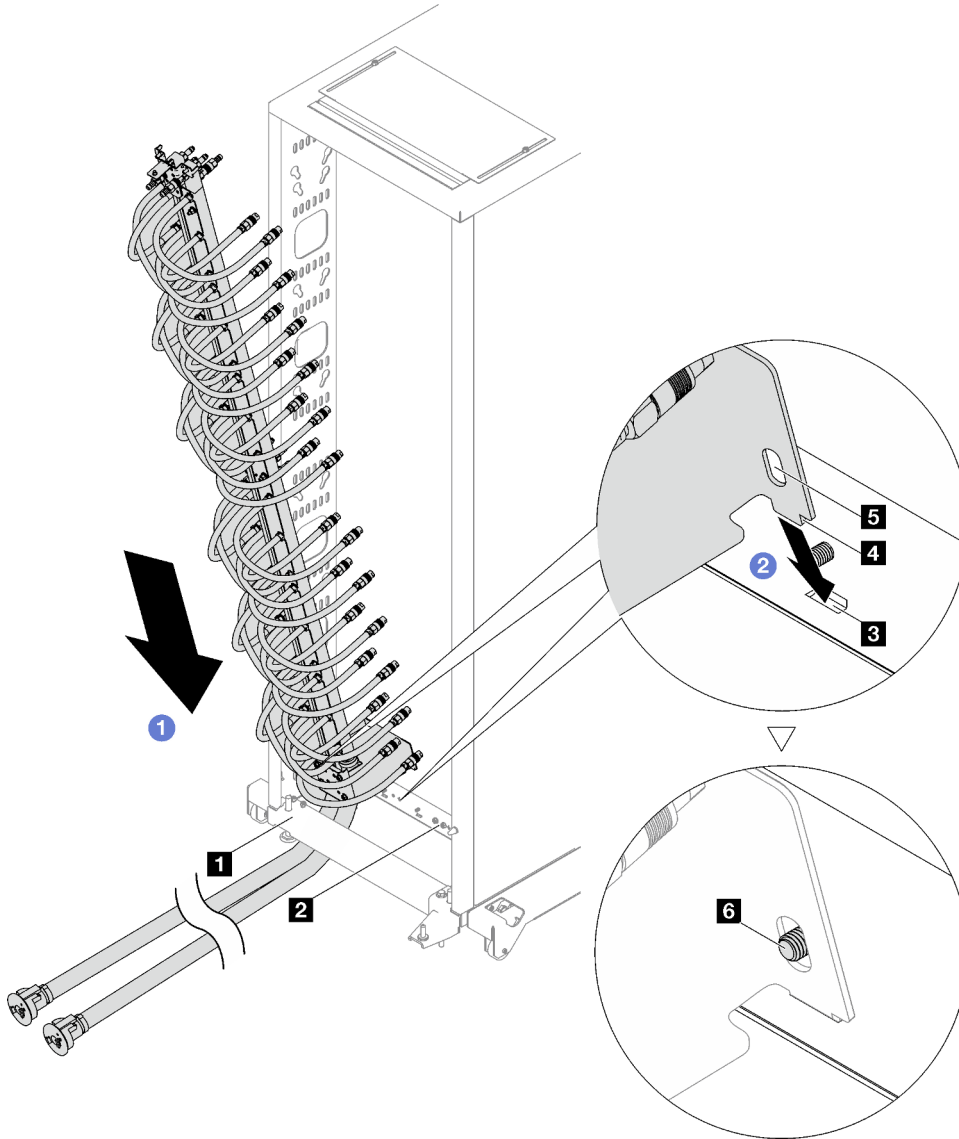
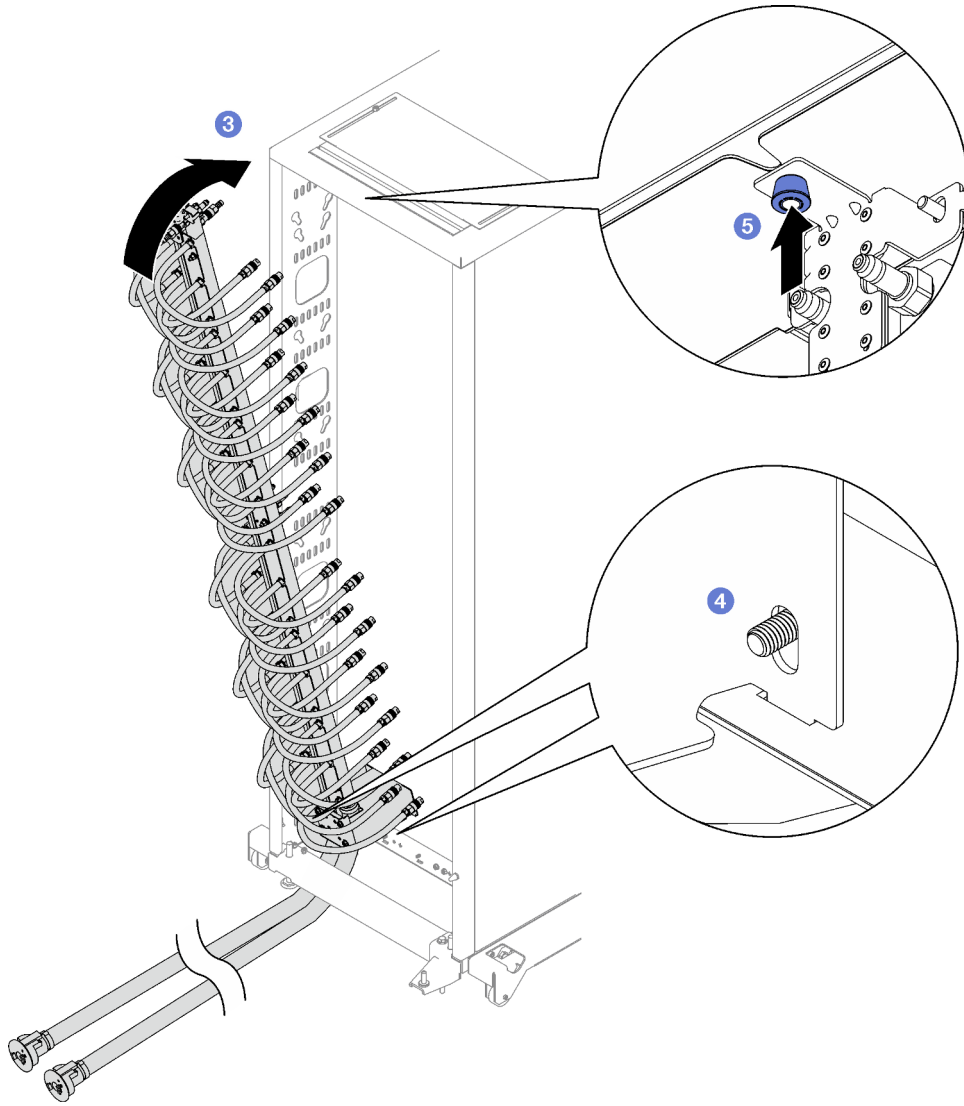


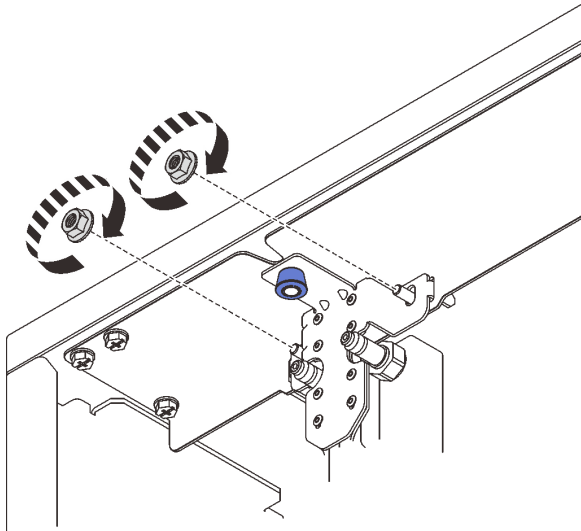
Figure 67. DWC PSU manifold assembly installation

- c. **3** Rotate the top part of the DWC PSU manifold assembly into the rack cabinet as shown.
- d. **4** Make sure the threaded studs stick through the retention slot.
- e. **5** Make sure the plunger is secured in place.



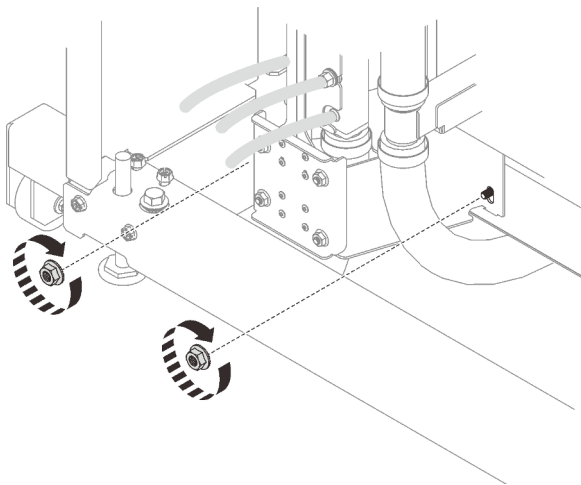
Step 4. Install and tighten the two nuts on the top rack manifold mounting bracket as shown.





*Figure 68. Top rack manifold mounting bracket nuts installation*

Step 5. Install and tighten the two nuts on the bottom rack manifold mounting bracket as shown.



*Figure 69. Bottom rack manifold mounting bracket nuts installation*

Step 6. Connect the DWC PSU manifold hose assembly to the DWC power supply quick connect.

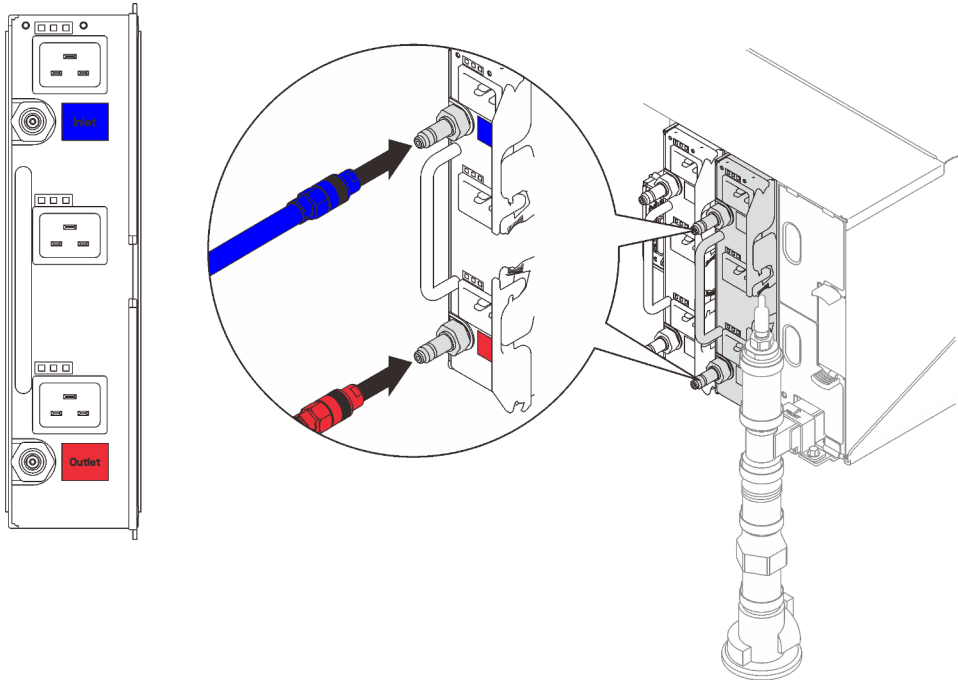


Figure 70. DWC PSU hose assembly installation

Step 7. At the front of the rack, connect the facility supply hose to the rack return hose. Press the unlock pin and partially open the supply hose, about 1/4 of the way.

**Note:** Do not fully open the facility ball valve or you will reduce your ability to control the flow as you fill the rack.

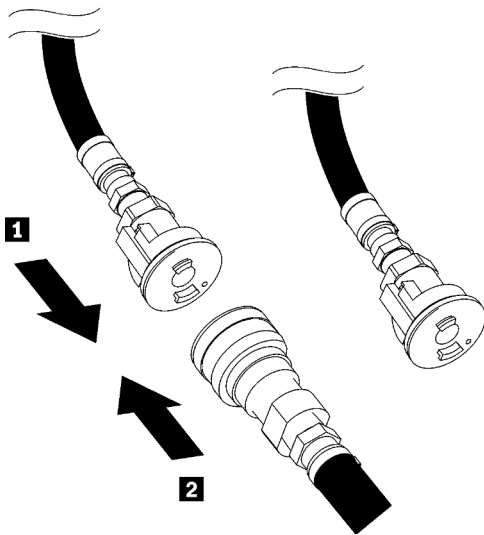
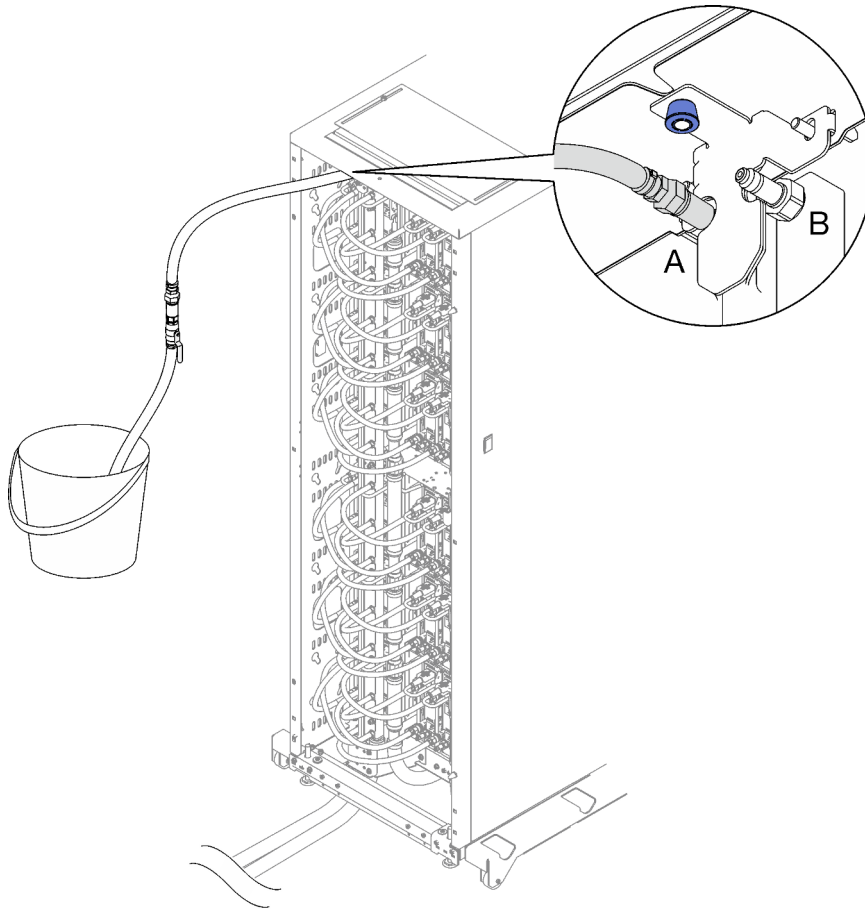


Figure 71. Facility supply hose to rack return hose connection

<b>1</b> Rack return (DWC PSU manifold)	<b>2</b> Facility supply (DWC PSU manifold)
---	---

Step 8. Connect the hose assembly (supplied to customer installation site) to the top quick connect at Location A (top of the DWC manifold) and place the other end in a bucket. Slowly open the hose

valve to allow air to flow out of the hose. Close the hose valve once a steady stream of water flows into the bucket or there are minimal bubbles in the sight-glass.



*Figure 72. Hose assembly at Location A*

- Step 9. Disconnect the hose assembly from Location A and connect it to Location B. Slowly open the hose valve to allow air to flow out of the hose. Close the hose valve once a steady stream of water flows into the bucket or there are minimal bubbles in the sight-glass.

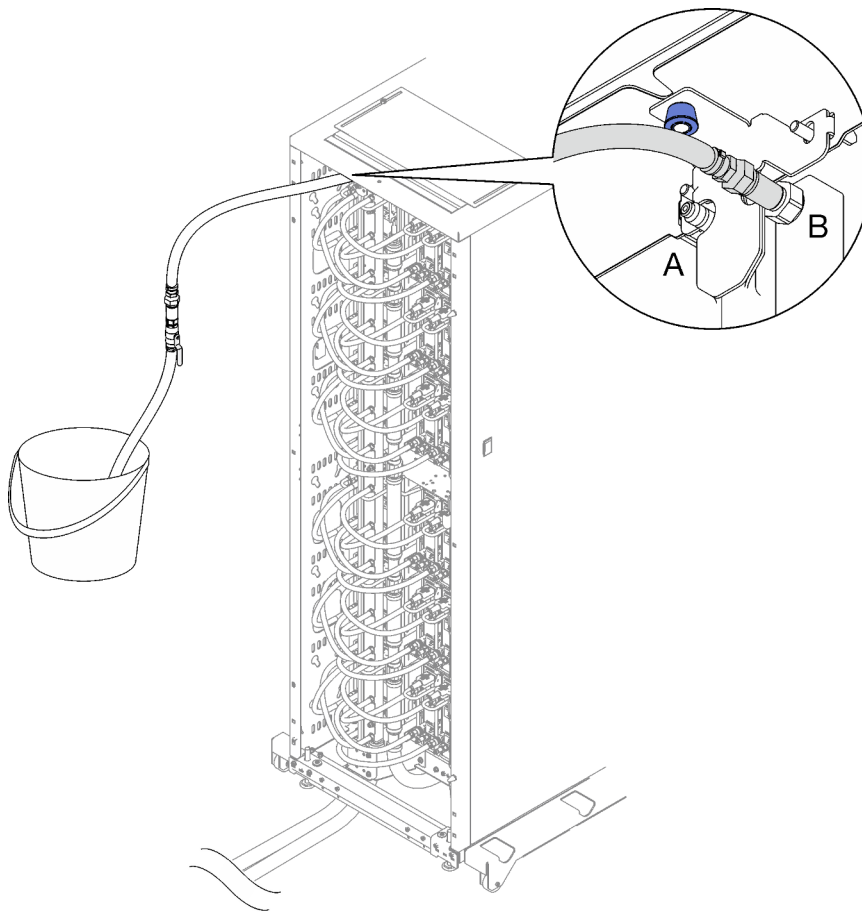


Figure 73. Hose assembly at Location B

Step 10. Go to the front of the rack, disconnect the facility supply hose from the rack return hose and connect the facility supply hose to the rack supply hose.

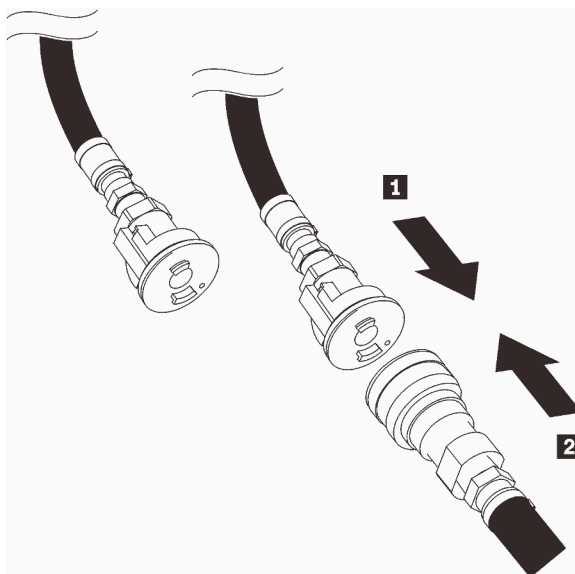


Figure 74. Facility supply hose to the rack supply hose connection

<b>1</b> Rack supply (DWC PSU manifold)	<b>2</b> Facility supply (DWC PSU manifold)
---	---

Step 11. Repeat the filling process and connect the hose assembly first to Location B then Location A.

**Notes:**

- Be sure to always close the valve on the hose before disconnecting it.
- There should be minimal air present in the sight glass.

Step 12. Once completed, go back to the front and connect the facility return hose to the rack return hose. Fully open all connections on both the supply and return side. The DWC PSU manifold should be completely filled.

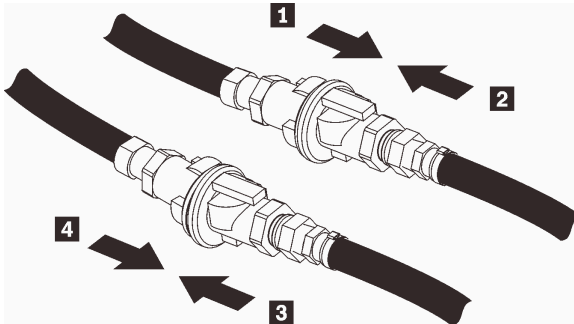


Figure 75. Facility return hose to the rack return hose connection

<b>1</b> Rack supply (DWC PSU manifold)	<b>3</b> Facility return (DWC PSU manifold)
<b>2</b> Facility supply (DWC PSU manifold)	<b>4</b> Rack return (DWC PSU manifold)

Step 13. Connect one end of the power cord for the power supply into the AC connector on the back of the power supply; then, connect the other end of the power cord into a properly grounded electrical outlet.

Step 14. If the node is turned off, turn on the node.

Step 15. Make sure that the AC power LED on the power supply is lit, indicating that the power supply is operating correctly. If the solution is turned on, make sure that the dc power LED on the power supply is lit also.

**Demo video**

[Watch the procedure on YouTube](#)

**DWC PSU replacement**

Use the following procedures to remove and install the DWC PSU.

**Remove a DWC PSU**

Use this information to remove a DWC PSU.

**About this task**

S001



 **DANGER**

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

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

#### S002



#### **CAUTION:**

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

#### S035



#### **CAUTION:**

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

#### **CAUTION:**



**High touch current. Connect to earth before connecting to supply.**

#### **Attention:**

- Read “[Installation Guidelines](#)” on page 31 and “[Safety inspection checklist](#)” on page 32 to ensure that you work safely.
- Disconnect the power cord from the connector on the back of the power supply.
- If only one DWC PSU is installed in the solution, you must turn off the solution before removing the power supply.

**Important:** Before removing the DWC PSU, it is strongly suggested to reduce the power loading of each node installed in the enclosure by turning the node into idle state or power off state.

When removing the DWC PSU, the following SMM2 event messages may appear. These SMM2 event messages can be ignored before a replacement DWC PSU is installed. For more information, see *ThinkSystem DW612S Neptune DWC Enclosure SMM2 Messages and Codes Reference*.

SMM2 messages		Value of ## (The value variation of ## indicates different DWC PSU detected by the SMM.)
<b>These events were asserted due to insufficient power bank, and can be ignored.</b>		
180701F1	PSoC Throttle O	N/A
180702F9	Encl PMax Exceed	N/A
180702FA	Encl PMin Exceed	N/A
<b>On PSU removed from the chassis, these events can be treated as normal.</b>		
080707##	PSU # EPOW	92, 93, 94, 95, 96, 97, 98, 99, or 9A, representing PSU 1~9
080800##	PSU #: Device Absent	80, 81, 82, 83, 84, 85, 86, 87, or 88, representing PSU 1~9
086F01##	PSU #: Failure detected	80, 81, 82, 83, 84, 85, 86, 87, or 88, representing PSU 1~9
086F01##	PSU # Vin UV	A4, A5, A6, A7, A8, A9, AA, AB, or AC, representing PSU 1~9
086F03##	PSU #: input lost	80, 81, 82, 83, 84, 85, 86, 87, or 88, representing PSU 1~9
<b>On PSU which stays in the chassis, these events might happen depending on the system loading.</b>		
080701##	PSU # Throttle	9B, 9C, 9D, 9E, 9F, A0, A1, A2, or A3, representing PSU 1~9
086F01##	PSU # Iout OC	AD, AE, AF, B0, B1, B2, B3, B4, or B5, representing PSU 1~9
086F01##	PSU # Over Temp	C8, C9, CA, CB, CC, CD, CE, CF, or D0, representing PSU 1~9

## Procedure

- Step 1. Disconnect the power cords from the electrical outlet; then, disconnect the other end of the power cords from the back of the power supply.

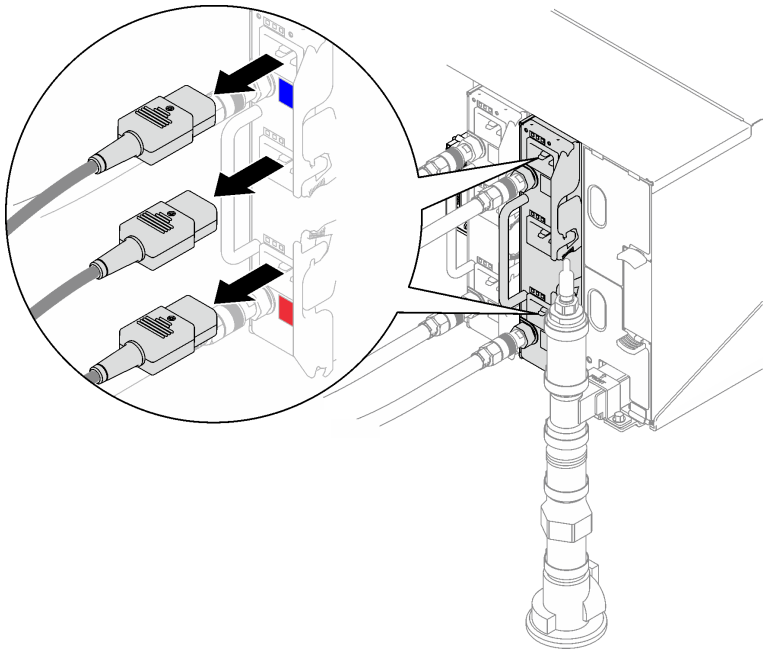


Figure 76. DWC PSU power cords removal

Step 2. Disconnect the DWC PSU manifold hose assembly from the DWC power supply quick connect.

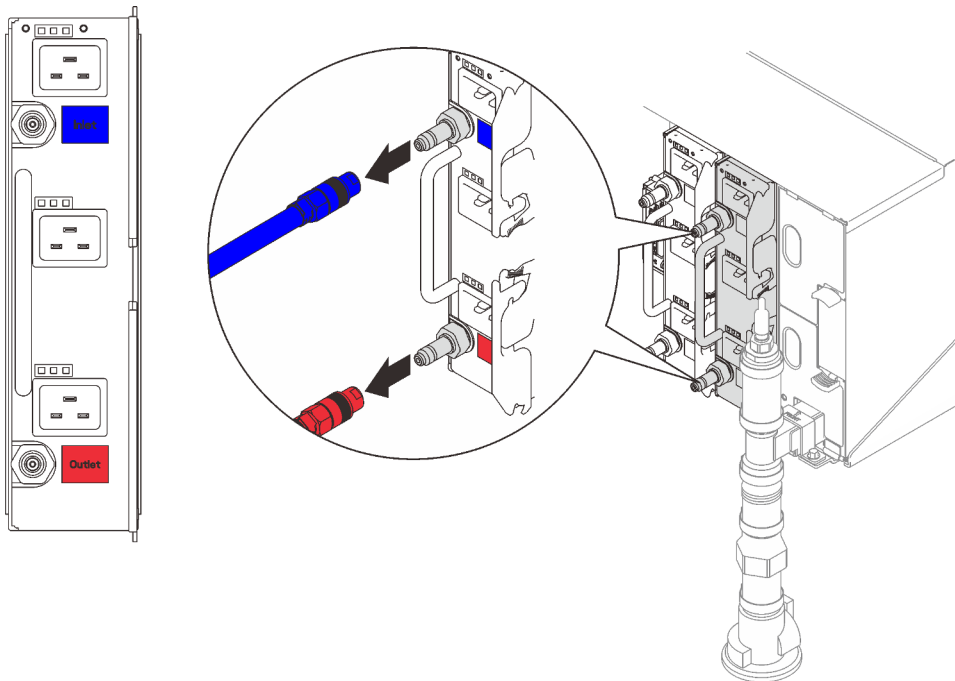


Figure 77. DWC PSU hose assembly removal

Step 3. Remove the DWC power supply.

- a. 1 Rotate the cam handles outwards, the DWC PSU will move slightly out of the bay.
- b. 2 Grasp the handle and pull the DWC power supply out of the bay.



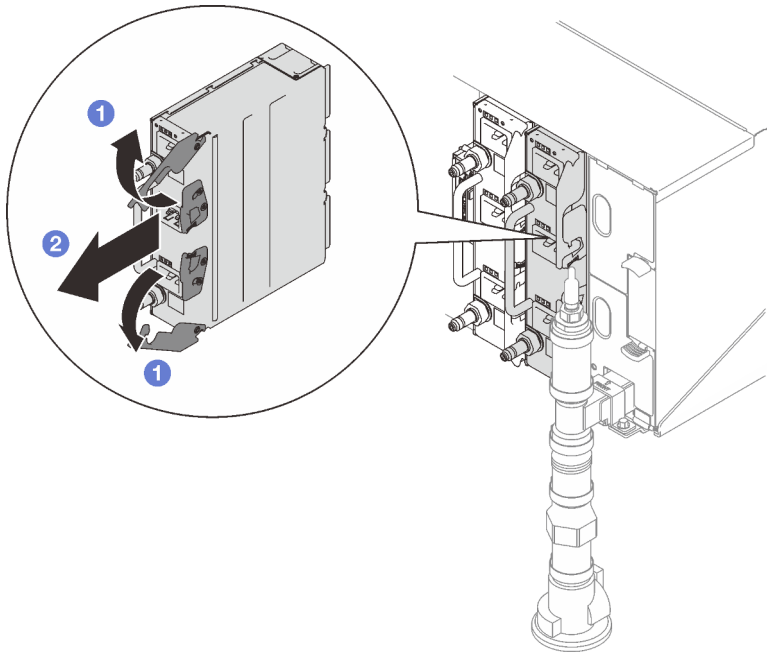


Figure 78. DWC power supply removal

### After you finish

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

If the PSU slot will remain empty, install the DWC PSU filler into the enclosure; then, secure it with two screws.

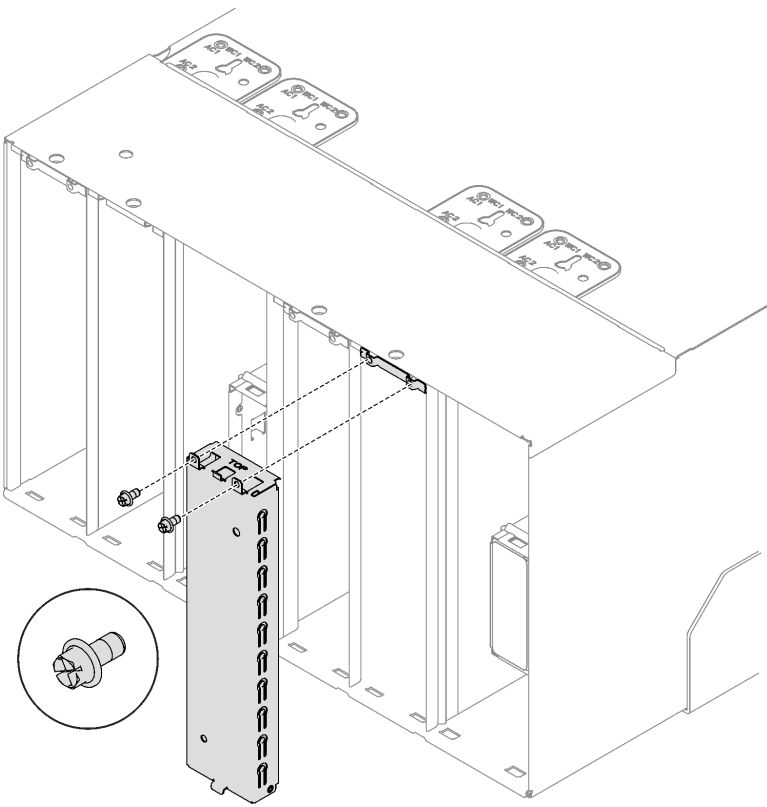


Figure 79. DWC PSU filler installation

To drain the DWC power supply, follow the instructions below:

1. Place the DWC power supply standing upright (*Inlet* top, *Outlet* bottom) on an elevated flat surface.
2. Make sure the valve on the hose assembly (supplied to customer installation site) is closed (valve handle perpendicular to the hose); then, connect the hose to *Outlet* quick connect and place the other end in the bucket. Slowly open the hose valve to allow water to flow out of the hose. Close the hose valve once water stops flowing.

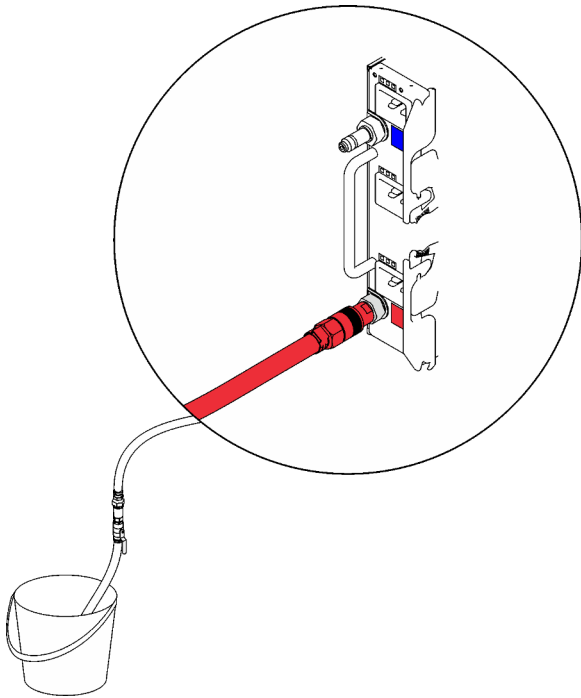


Figure 80. DWC power supply removal

3. Disconnect the hose assembly from *Outlet* quick connect and connect it to *Inlet* quick connect; then, turn the DWC power supply upside down (*Outlet* top, *Inlet* bottom). Slowly open the hose valve to allow water to flow out of the hose. Close the hose valve once water stops flowing.

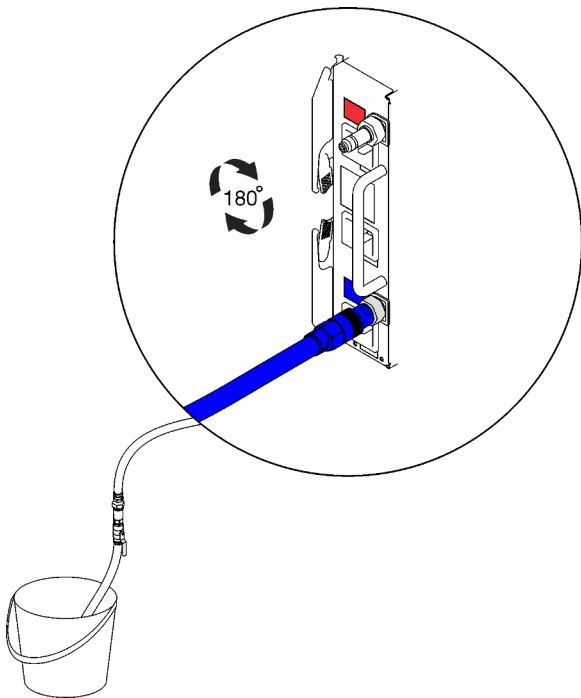


Figure 81. DWC power supply removal

4. Disconnect the hose assembly.

## Demo video

[Watch the procedure on YouTube](#)

## Install a DWC PSU

Use this information to install a DWC PSU.

## About this task

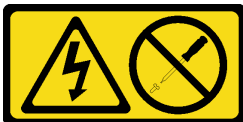
### S001



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

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

### S035



#### CAUTION:

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

#### CAUTION:



**High touch current. Connect to earth before connecting to supply.**

#### Attention:

- Read [“Installation Guidelines” on page 31](#) and [“Safety inspection checklist” on page 32](#) to ensure that you work safely.

- The following notes describe the type of power supply that the enclosure supports and other information that you must consider when you install a power supply:
  - Make sure you follow the guidelines in “PSU configuration” on page 184.
  - For redundancy support, you must install an additional hot-swap power supply or DWC PSU, if one is not installed in your model.
  - Make sure that the devices that you are installing are supported. For a list of supported optional devices for the enclosure, see <https://serverproven.lenovo.com>.
- If a DWC PSU filler is installed, remove the two screws; then, remove the DWC PSU filler.

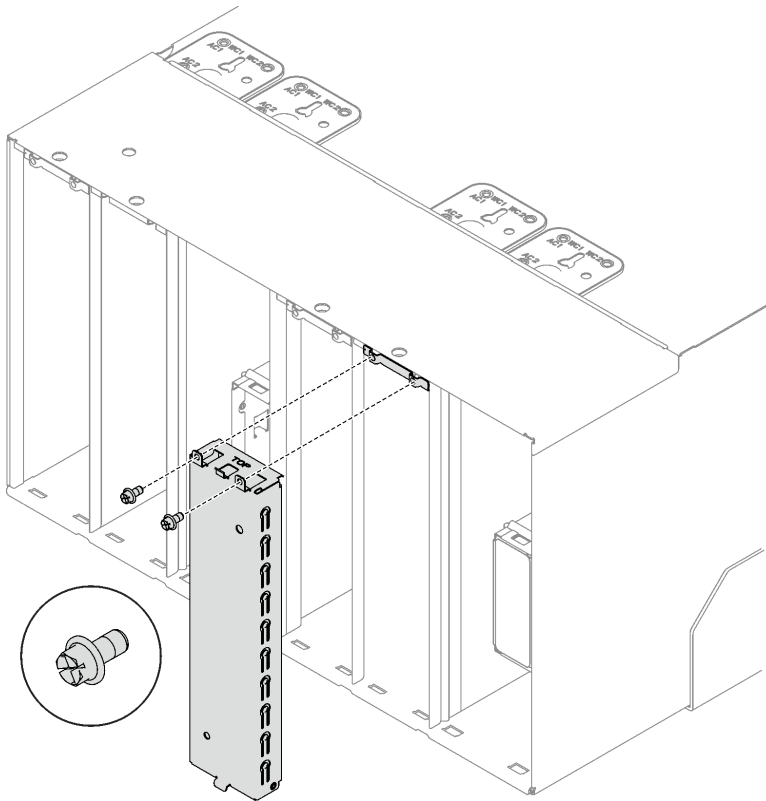


Figure 82. DWC PSU filler removal

**Firmware and driver download:** You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/products/servers/thinksystem/dw612-enclosure/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 179 for more information on firmware updating tools.

## Procedure

- Step 1. If a DWC PSU shipping bracket is installed; after final rack placement, remove the four screws and remove the DWC PSU shipping bracket.

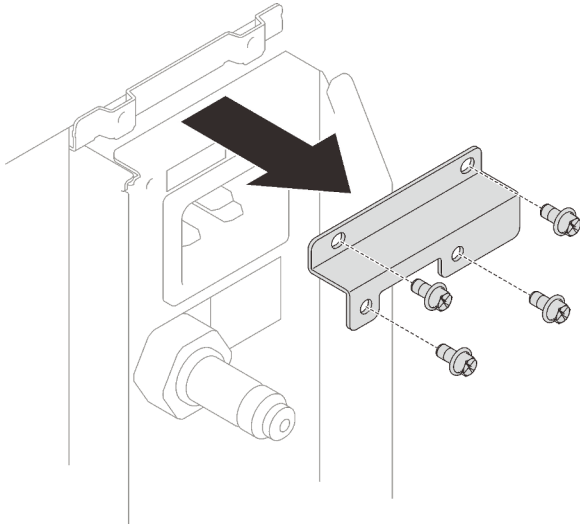


Figure 83. DWC PSU shipping bracket removal

Step 2. Install the DWC power supply.

- a. ① Slide the DWC power supply into the bay until it stops.
- b. ② Rotate the cam handles inwards to secure the DWC power supply in place.

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

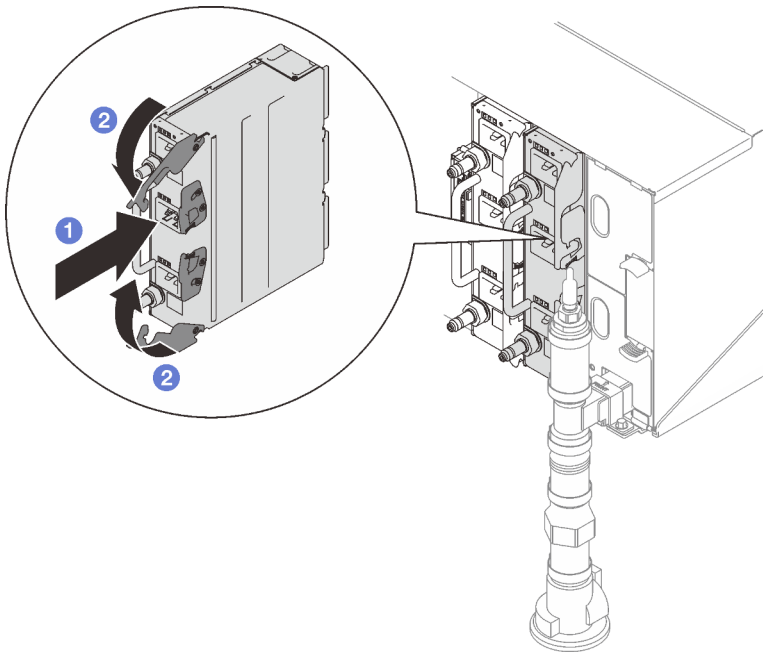


Figure 84. DWC power supply installation

Step 3. Connect the DWC PSU manifold hose assembly to the DWC power supply quick connect.

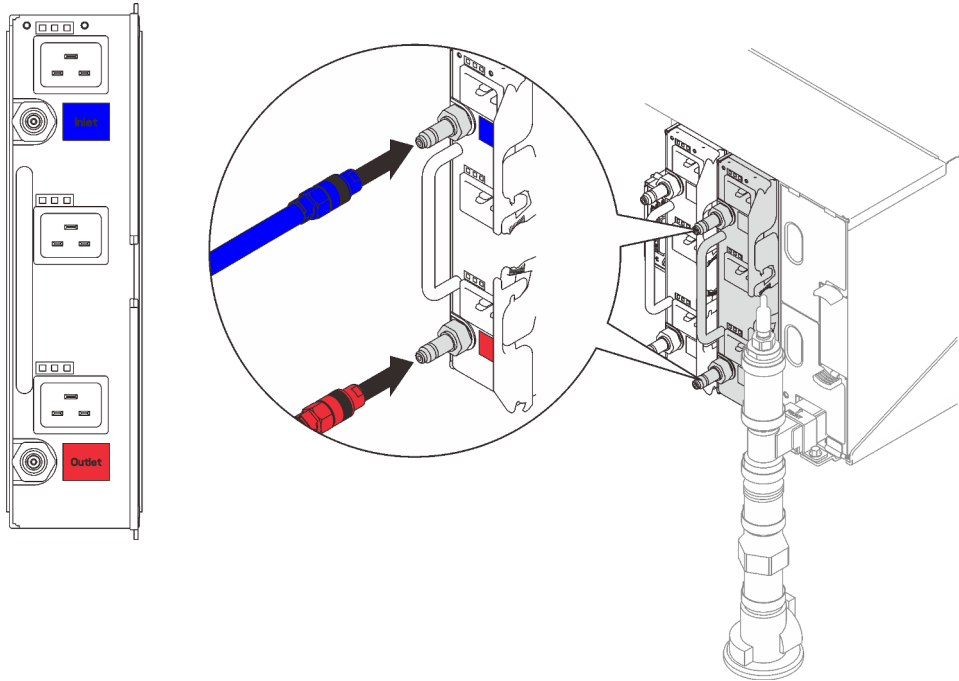


Figure 85. DWC PSU hose assembly installation

Step 4. Connect one end of the power cords for the power supply into the AC connector on the back of the power supply; then, connect the other end of the power cords into a properly grounded electrical outlet.

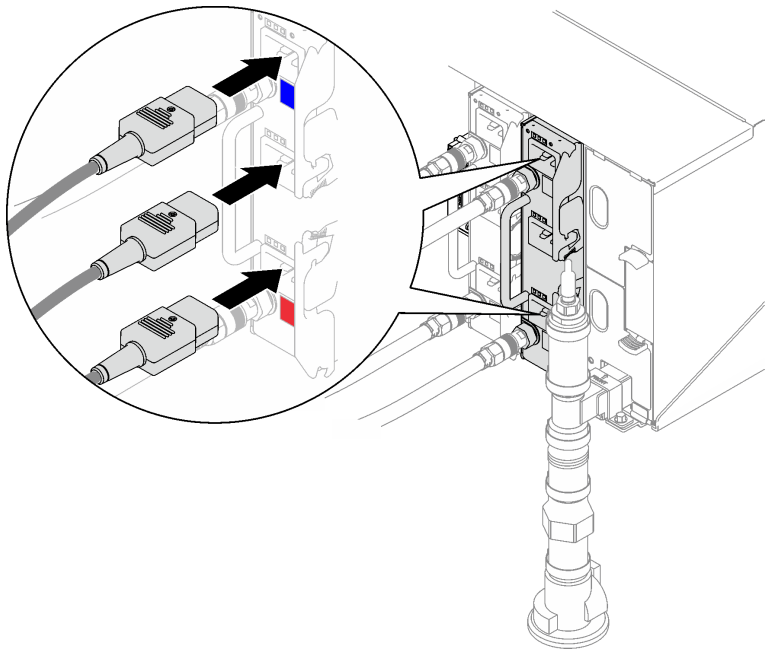


Figure 86. DWC PSU power cords installation

Step 5. If the node is turned off, turn on the node.

Step 6. Make sure that the AC power LED on the power supply is lit, indicating that the power supply is operating correctly. If the solution is turned on, make sure that the dc power LED on the power supply is lit also.

## After you finish

1. Reconnect the power cords and any cables that you removed.
2. Turn on all compute nodes.

## Demo video

[Watch the procedure on YouTube](#)

## EMC shield replacement

Use the following procedures to remove and install an EMC shield replacement.

### Remove an EMC shield

Use this information to remove an EMC shield.

## About this task

### S002



### CAUTION:

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

### Attention:

- Read “[Installation Guidelines](#)” on page 31 and “[Safety inspection checklist](#)” on page 32 to ensure that you work safely.

### Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-A9Ws8PYIbxz9Jblrq1zoYd>.

## Procedure

Step 1. Remove the lower EMC shield.

- a. ① Press and hold the blue latch.
- b. ② Rotate the top of the shield outwards.
- c. ③ Lift the shield up to clear the manifold pipe that enters the enclosure.



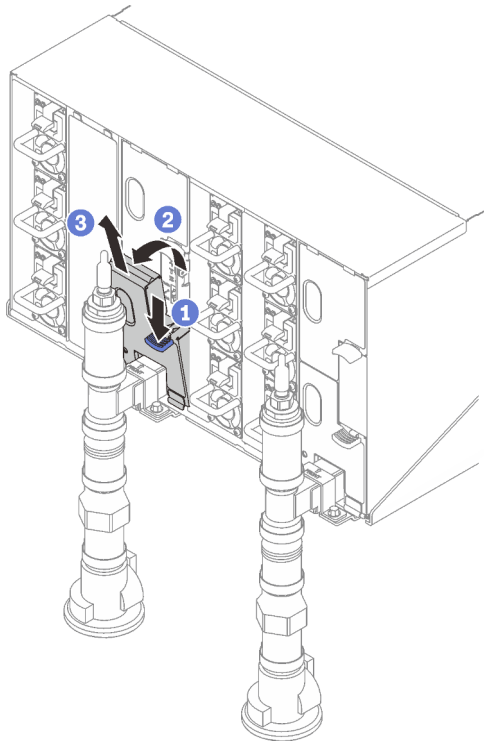


Figure 87. Lower EMC shield removal

**Note:** If there is a manifold vertical pipe in front of the EMC shield, you will need to slide the EMC shield sideways to remove it from underneath the pipe.

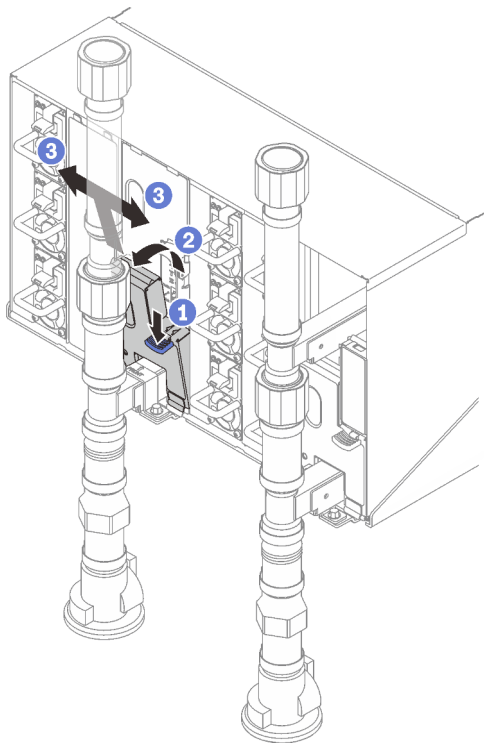


Figure 88. EMC shield removal

Step 2. Remove the upper EMC shield.

- a. ① Press and hold the blue latch.
- b. ② Rotate the bottom of the shield outwards.
- c. ③ Lift the shield up to clear the manifold pipe that enters the enclosure.

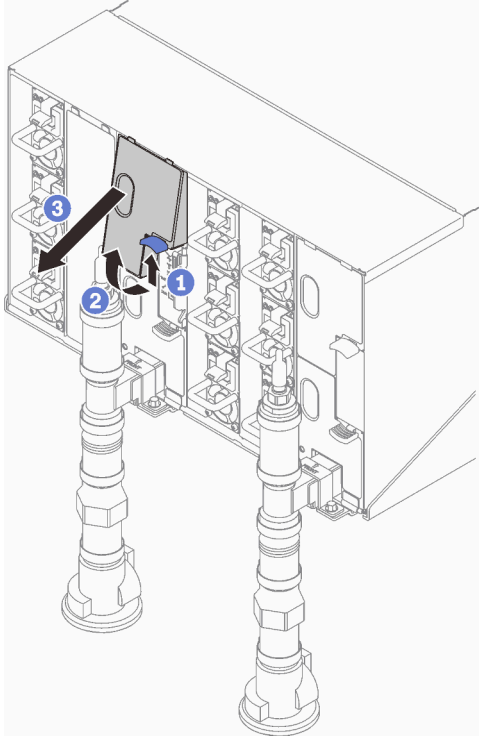


Figure 89. Upper EMC shield removal

## After you finish

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

## Install an EMC shield

Use this information to install an EMC shield.

## About this task

### S002



### **CAUTION:**

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

**Attention:**

- Read “Installation Guidelines” on page 31 and “Safety inspection checklist” on page 32 to ensure that you work safely.

**Watch the procedure**

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-A9Ws8PYIbxz9Jblrq1zoYd>.

**Procedure**

- Step 1. Install the upper EMC shield.
- 1 Align the top of the EMC shield with the enclosure.
  - 2 Rotate the bottom of the EMC shield inwards until it is secured in place.

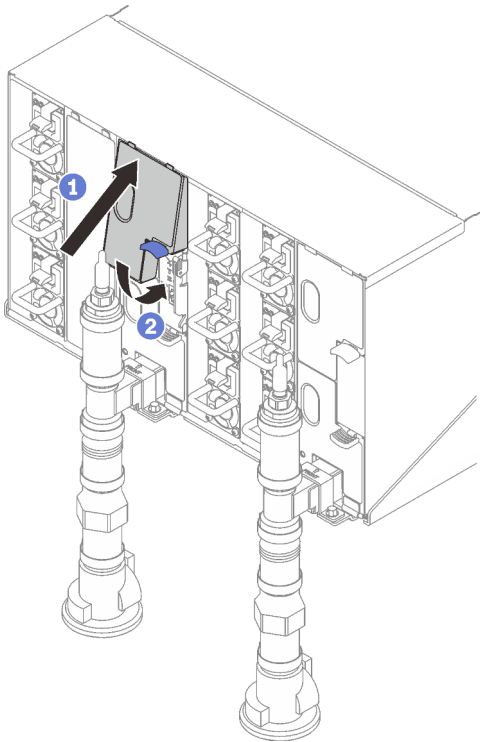


Figure 90. Upper EMC shield installation

- Step 2. Install the lower EMC shield.
- 1 Align the bottom of the EMC shield with the enclosure.
  - 2 Rotate the top of the EMC shield inwards until it is secured in place.

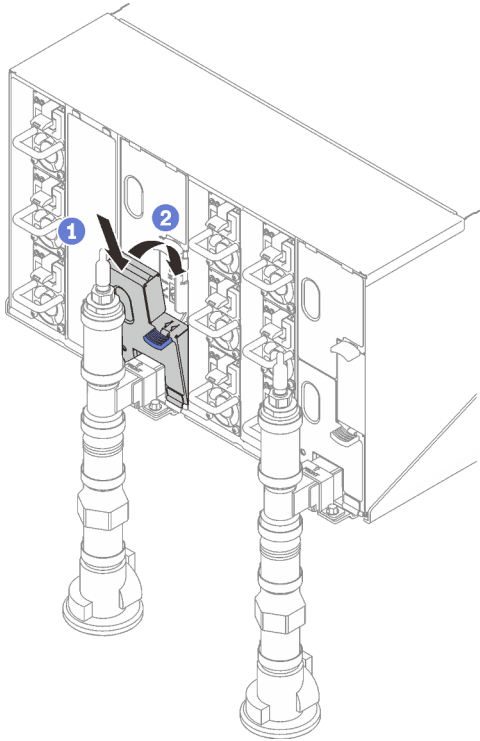


Figure 91. Lower EMC shield installation

## Enclosure midplane replacement

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

### Remove the enclosure midplane

Use this information to remove the enclosure midplane.

### About this task

#### S002



#### **CAUTION:**

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

#### **Attention:**

- Read [“Installation Guidelines” on page 31](#) and [“Safety inspection checklist” on page 32](#) to ensure that you work safely.
- Follow the following steps to shut down the solution.
  1. Record the machine type model, the enclosure serial number, and retrieve the existing universally unique identifier (UUID) information from the enclosure midplane that you are removing. The

procedure for obtaining this data might require different steps depending on the functional state of the enclosure.

- a. Log onto the Lenovo XClarity Controller and access the command-line interface (CLI). You can access the XCC CLI through a direct serial or Ethernet connection to the XCC, or through a Secure Shell (SSH) connection to the XCC. You must authenticate with the XCC before issuing commands.
  - b. Query for the machine type model, enclosure serial number, and the UUID values by using the CLI `info` command. Record this information before you proceed.
2. Enclosure is not operating:
- a. Obtain the enclosure serial number and the machine type model from one of the enclosure labels.
  - b. Record the enclosure serial number, the machine type model, and the UUID before you proceed.
- Shut down the operating system and turn off any compute nodes in the enclosure. See the documentation that comes with the compute node for detailed instructions.
  - Disconnect all external cables from the enclosure.
  - Use extra force to disconnect QSFP cables if they are connected to the solution.

## Procedure

Step 1. Make preparations for this task.

- a. Remove all trays in the front of the enclosure. See [“Remove a DWC tray from the enclosure” on page 49](#).
- b. Remove the EMC shields. See [“Remove an EMC shield” on page 104](#).
- c. Remove the drip sensor assembly. See [“Remove the drip sensor assembly” on page 52](#).
- d. Remove the SMM2 and SMM2 support bracket. See [“Remove the SMM2” on page 168](#).
- e. Remove all power supplies. See [“Remove a hot-swap power supply” on page 116](#) or [“Remove a DWC PSU” on page 93](#).
- f. Remove the manifold. See [“Remove the manifold” on page 121](#).
- g. Remove the enclosure from the rack. See [“Remove the enclosure from the rack” on page 38](#).

Step 2. Remove the top cover.

- a. ① Loosen the three screws on the top cover.
- b. ② Rotate the top cover outwards.

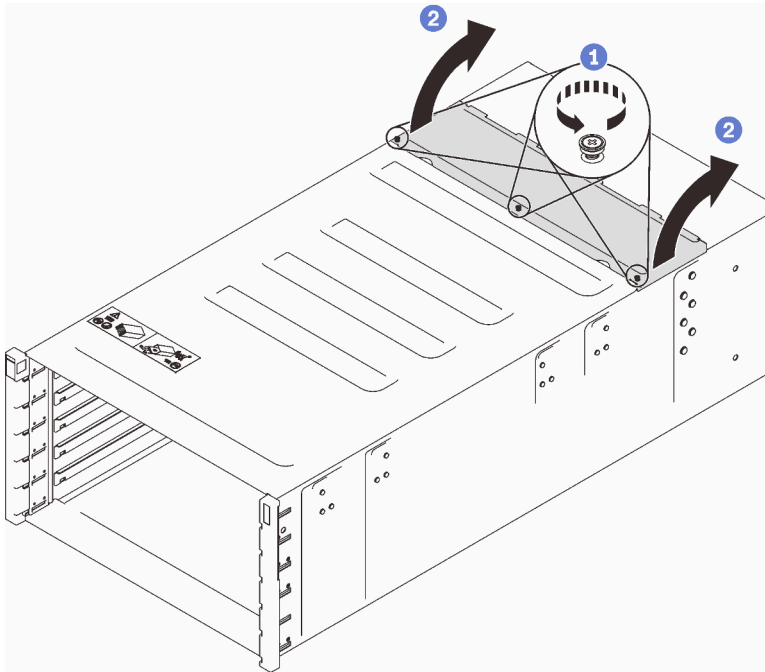


Figure 92. Top cover outward rotation

Step 3. Remove the enclosure midplane from an enclosure.

- a. ① Unplug two drip sensor cables on the enclosure midplane.

**Note:** Make sure that you do not grasp the connectors on the enclosure midplane. You could damage the connectors.

- b. ② Loosen two screws that secure the enclosure midplane to the enclosure.
- c. ③ Carefully grasp the enclosure midplane and slide it away from the enclosure.

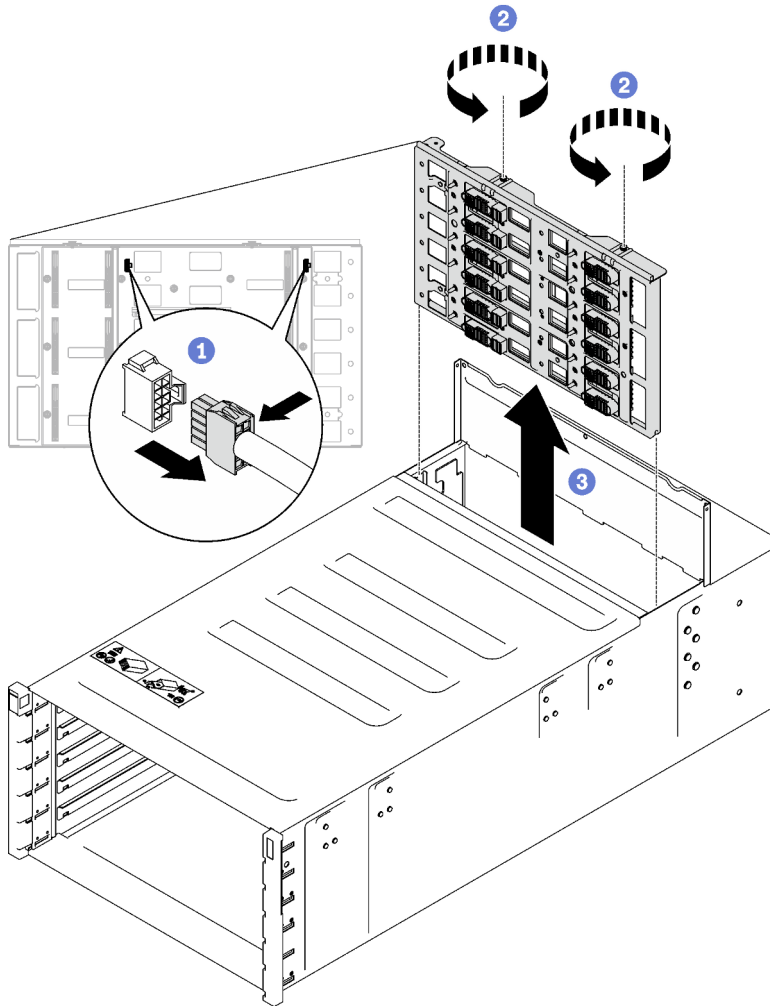


Figure 93. Enclosure midplane removal

## After you finish

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

## Demo video

[Watch the procedure on YouTube](#)

## Install the enclosure midplane

(Trained service technician only) Use this information to install the enclosure midplane.

## About this task

**S002**



**CAUTION:**

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

**Attention:**

- Read [“Installation Guidelines” on page 31](#) and [“Safety inspection checklist” on page 32](#) to ensure that you work safely.

**Firmware and driver download:** You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/products/servers/thinksystem/dw612-enclosure/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to [“Update the firmware” on page 179](#) for more information on firmware updating tools.

**Procedure**

- Step 1. Make sure the two drip sensor cables are secured to the enclosure and routed through the cable clips.



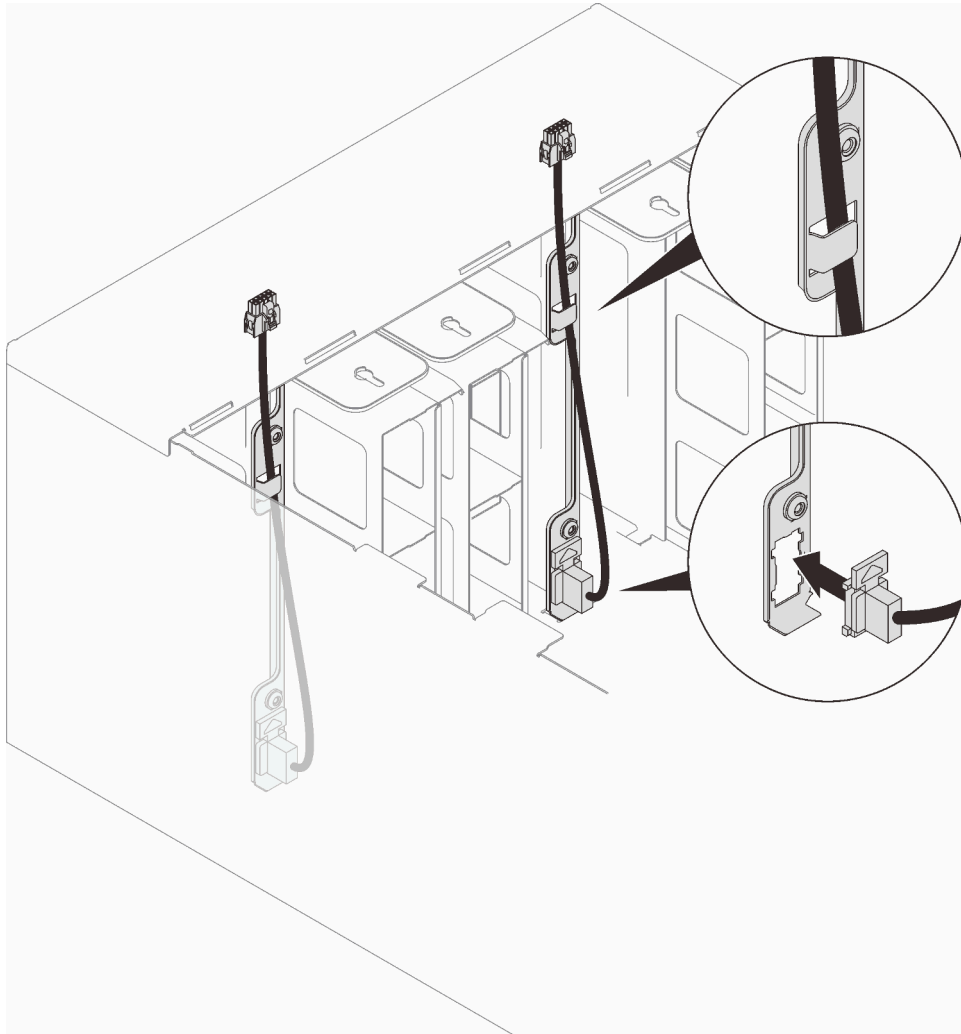


Figure 94. Drip sensor cable installation

Step 2. Install the midplane.

- a. ① Carefully align the enclosure midplane with the guide pins in the enclosure; then, slide the midplane into the enclosure.

**Attention:** Do not grasp the connectors on the enclosure midplane when you install it in the enclosure. Touching the connectors might damage the connector pins.

- b. ② Fasten two screws on the top of the midplane.
- c. ③ Connect the drip sensor cables to the midplane.

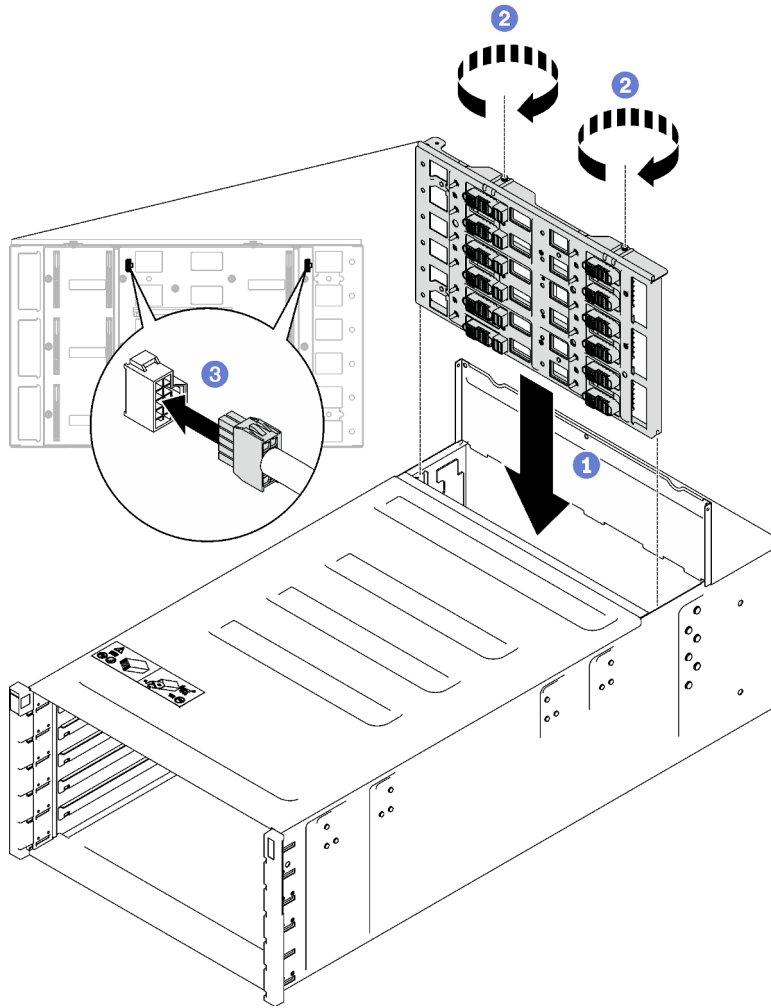


Figure 95. Enclosure midplane installation

Step 3. Install the top cover.

- a. ① Insert the rear top cover tabs into the slot on the enclosure; then, rotate the top cover inwards.
- b. ② Tighten the captive screws on the top cover.

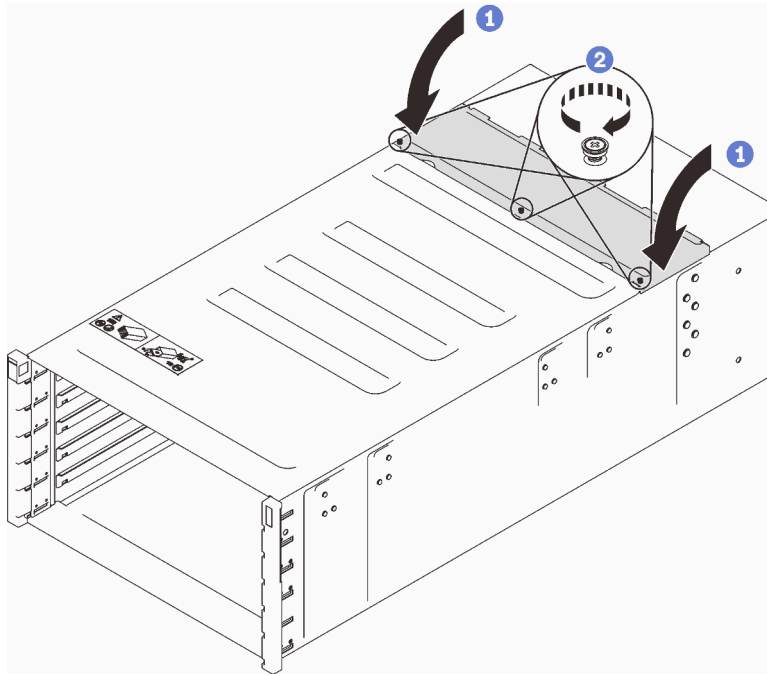


Figure 96. Top cover inward rotation

## After you finish

1. Install the enclosure into the rack. See [“Install the enclosure in the rack” on page 44](#).
2. Install the manifold. See [“Install the manifold” on page 137](#).
3. Install all power supplies. See [“Install a hot-swap power supply” on page 118](#) or [“Install a DWC PSU” on page 100](#).
4. Install the SMM2 and SMM2 support bracket. See [“Install the SMM2” on page 172](#).
5. Install the drip sensor assembly. See [“Install the drip sensor assembly” on page 54](#).
6. Install the EMC shields. See [“Install an EMC shield” on page 106](#).
7. Install all trays into the front of the enclosure. See [“Install a DWC tray in the enclosure” on page 51](#).
8. Install any other required components.
9. Connect all required cables.
10. Connect the enclosure to power.
11. Write down new enclosure midplane serial number (for example: **Y030UN348063**) and UUID (for example: **2E2B686CC6B311E2907C6EAE8B16A49E**).
12. Update the solution firmware to the latest level.
13. Log in to the web interface.
14. Go to **System Information** section, click on the **Midplane VPD** tab.
15. Update the new enclosure midplane serial number and UUID onto the fan and power controller.
16. Close the release handles on the tray in order to seat the nodes in the enclosure midplane connectors.
17. Restart any nodes that you shut down. See the documentation that comes with the compute node for detailed instructions.
18. The fan and power controller is powered-on automatically.

## Demo video

[Watch the procedure on YouTube](#)

## Hot-swap power supply replacement

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

### Remove a hot-swap power supply

Use this information to remove a hot-swap power supply.

#### About this task

##### S001



**DANGER**

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

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

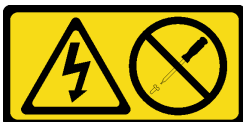
##### S002



#### **CAUTION:**

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

##### S035



#### **CAUTION:**

Never remove the cover on a power supply or any part that has this label attached. Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no

serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

**CAUTION:**



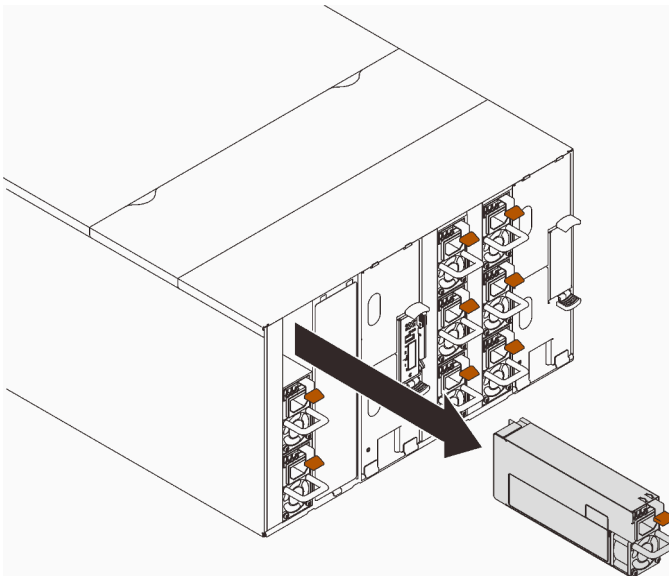
**High touch current. Connect to earth before connecting to supply.**

**Attention:**

- Read “[Installation Guidelines](#)” on page 31 and “[Safety inspection checklist](#)” on page 32 to ensure that you work safely.
- Disconnect the power cord from the connector on the back of the power supply.
- If only one hot-swap power supply is installed in the solution, you must turn off the solution before removing the power supply.

**Procedure**

- Step 1. Disconnect the power cord from the electrical outlet; then, disconnect the other end of the power cord from the back of the power supply.
- Step 2. Press and hold the orange release tab.
- Step 3. Grasp the handle and pull the power supply out of the bay.



*Figure 97. Hot-swap power supply removal*

**After you finish**

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

If the PSU slot will remain empty, install the PSU filler into the enclosure.

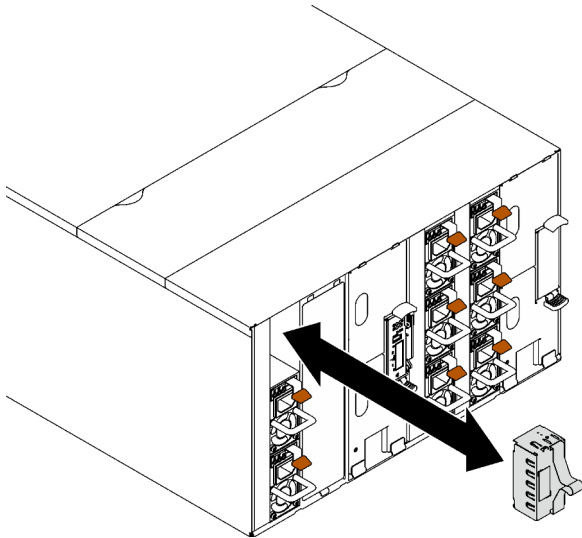


Figure 98. PSU filler installation

### Demo video

[Watch the procedure on YouTube](#)

### Install a hot-swap power supply

Use this information to install a hot-swap power supply.

### About this task

**Important:** Mixing PSUs manufactured by different vendors is not supported.

#### S001



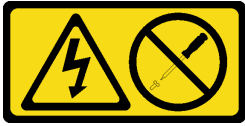
 **DANGER**

**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.**

#### S035



**CAUTION:**

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

**CAUTION:**



**High touch current. Connect to earth before connecting to supply.**

**Attention:**

- Read “[Installation Guidelines](#)” on page 31 and “[Safety inspection checklist](#)” on page 32 to ensure that you work safely.
- The following notes describe the type of power supply that the enclosure supports and other information that you must consider when you install a power supply:
  - Make sure you follow the guidelines in “[PSU configuration](#)” on page 184.
  - For redundancy support, you must install an additional hot-swap power supply, if one is not installed in your model.
  - Make sure that the devices that you are installing are supported. For a list of supported optional devices for the enclosure, see <https://serverproven.lenovo.com>.

**Firmware and driver download:** You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/products/servers/thinksystem/dw612-enclosure/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “[Update the firmware](#)” on page 179 for more information on firmware updating tools.

## Procedure

Step 1. If there is a PSU filler installed, remove it from the enclosure.

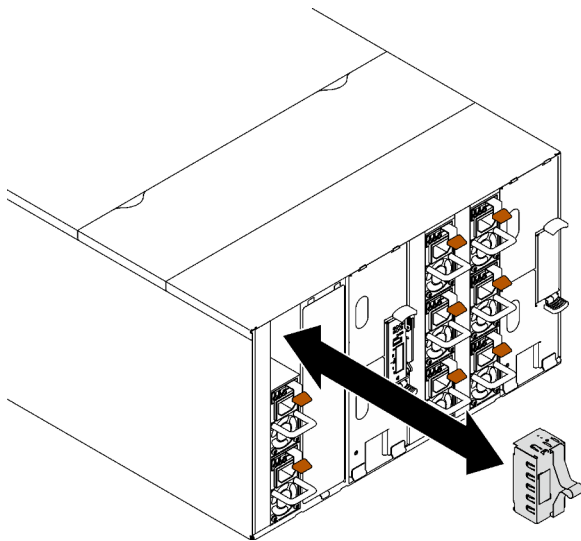


Figure 99. PSU filler removal

Step 2. Slide the hot-swap power supply into the bay until the release latch clicks into place.

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

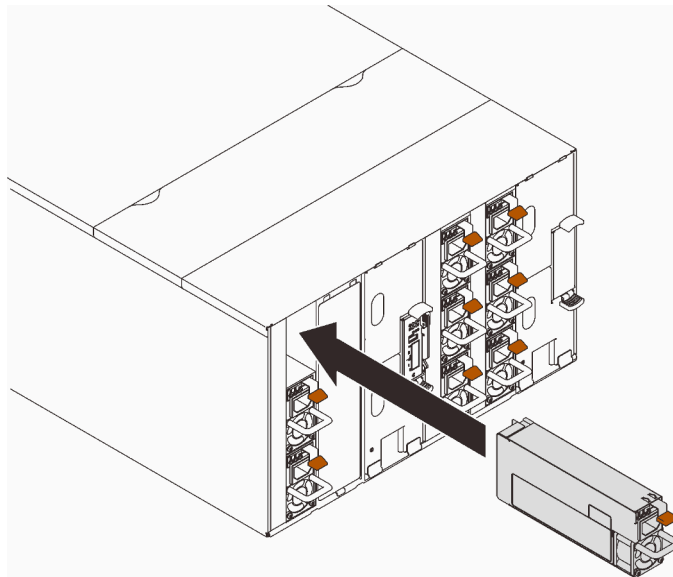


Figure 100. Hot-swap power supply installation

Step 3. Connect one end of the power cord for the new power supply into the AC connector on the back of the power supply; then, connect the other end of the power cord into a properly grounded electrical outlet.

Step 4. If the node is turned off, turn on the node.

Step 5. Make sure that the AC power LED on the power supply is lit, indicating that the power supply is operating correctly. If the solution is turned on, make sure that the dc power LED on the power supply is lit also.



## After you finish

1. Reconnect the power cords and any cables that you removed.
2. Turn on all compute nodes.

## Demo video

[Watch the procedure on YouTube](#)

## Manifold replacement

Use the following procedures to remove and install the manifold.

### Remove the manifold

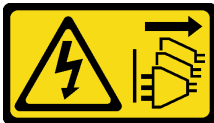
Use this information to remove the manifold.

### About this task

#### CAUTION:

The water might cause irritation to the skin and eyes. Avoid direct contact with the lubricant.

#### 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.

#### S038



#### CAUTION:

Eye protection should be worn for this procedure.

## L011



تحذير: يجب ارتداء النظارات الواقية لهذا الاجراء. (L011)

**AVISO:** Para este procedimento, são necessários óculos de proteção. (L011)

**ВНИМАНИЕ:** За тази процедура са необходими предпазни очила. (L011)

**ATTENTION :** Cette procédure requiert des lunettes de protection. (L011)

警告: 该过程需要护目镜。 (L011)

警告 : 此程序需要護目鏡。 (L011)

OPREZ: Za izvođenje postupka su potrebne zaštitne naočale. (L011)

**POZOR:** K tomuto postupu jsou nutné ochranné brýle. (L011)

**Pas på!** Proceduren kræver beskyttelsesbriller. (L011)

**WAARSCHUWING:** Voor deze procedure is een beschermende bril vereist. (L011)

**CAUTION:** Protective eyewear is needed for the procedure. (L011)

**VAROITUS:** Toimet edellyttävät silmänsuojaimien käyttöä. (L011)

**Vorsicht:** Bei dieser Prozedur eine Schutzbrille tragen. (L011)

**ΠΡΟΣΟΧΗ:** Για τη συγκεκριμένη διαδικασία απαιτούνται προστατευτικά γυαλιά. (L011)

**VESZÉLY:** Az eljáráshoz védőszemüveget kell viselni. (L011)

**ATTENZIONE:** per la procedura sono necessarie protezioni per gli occhi. (L011)

危険: この作業には目を保護する道具が必要です。  
(L011)

주의: 이 절차에는 보호용 안경이 필요합니다. (L011)

**ВНИМАНИЕ:** За изведување на постапката потребни се заштитни очила. (L011)

تنبه :  
باحتياط  
في  
ارتداء  
نظارة  
السلامة  
(L011)

**ADVARSEL:** Vernebriller må benyttes for denne prosedyren. (L011)

**ZAGROŻENIE:** Procedura wymaga zastosowania okularów ochronnych. (L011)

**CUIDADO:** É necessário utilizar protecção ocular para a execução deste procedimento. (L011)

**ОСТОРОЖНО:** При выполнении этой операции необходимо надеть защитные очки. (L011)

**VÝSTRAHA:** Vykonanie tejto procedúry vyžaduje pomôcku na ochranu očí. (L011)

**POZOR:** Za ta postopek je potrebna zaščitna oprema za oči. (L011)

**PRECAUCIÓN:** Utilice protección ocular para llevar a cabo el procedimiento. (L011)

**Varning:** Skyddsglasögon krävs. (L011)

ཉེན་བརྗེ། : བཞོལ་སྐྱོད་འདིའི་གོ་རེམ་ལ་སྲུང་སྐྱོབ་རུས་པ་ལྷན་པའི་མིག་གཤམ་གོན་དགོས། (L011)

ئاگاھلاندۇرۇش: سز مەشغۇلات جەريانىدا كۆز ئاسراش كۆزەينىكى تاقىۋېلىشىڭىز كېرەك. (L011)

Daezsingj: Aen cauhcoz neix aeu yungh yenjinging baujhoh lwgda. (L011)

## L014



تحذير: يجب ارتداء القفازات الكيميائية المقاومة لهذا الاجراء. (L014)

**AVISO:** Para este procedimento, são necessárias luvas com resistência química. (L014)

**ВНИМАНИЕ:** За тази процедура са необходими химически устойчиви ръкавици. (L014)

**ATTENTION :** Cette procédure requiert des gants de protection contre les produits chimiques. (L014)

警告: 该过程需要化学防护手套。 (L014)

警告: 此程序需要抗化學劑手套。 (L014)

**OPREZ:** Za ovaj postupak su potrebne kemijski otporne zaštitne rukavice. (L014)

**POZOR:** K tomuto postupu jsou nutné ochranné brýle. (L014)

**Pas på!** Bær handsker, der er modstandsdygtige over for kemikalier, når du skal udføre denne proces. (L014)

**WAARSCHUWING:** Voor deze procedure zijn tegen chemicaliën beschermende handschoenen vereist. (L014)

**CAUTION:** Chemical resistant gloves are needed for this procedure. (L014)

**VAROITUS:** Toimet edellyttävät kemiallisesti kestävästä materiaaleista valmistettujen suojakäsineiden käyttöä. (L014)

**Vorsicht:** Bei dieser Aktion müssen chemische Schutzhandschuhe getragen werden. (L014)

**ΠΡΟΣΟΧΗ:** Για τη συγκεκριμένη διαδικασία απαιτούνται ειδικά γάντια, ανθεκτικά στις χημικές ουσίες. (L014)

**VIGYÁZAT:** Az eljáráshoz vegyi anyagokkal szemben ellenálló védőszemüveget kell viselni. (L014)

**ATTENZIONE:** per questa procedura sono necessari guanti resistenti ad agenti chimici. (L014)

危険: この作業には化学耐性のあるグローブが必要です。 (L014)

주의: 이 절차를 수행하려면 내화학성 장갑을 착용해야 합니다. (L014)

**ВНИМАНИЕ:** За изведовање на оваа постапка потребни се ракавици за хемиска заштита. (L014)

تعليمات :  
يجب  
ارتداء  
قفازات  
مقاومة  
كيميائية  
عند  
التعامل  
مع  
المواد  
الكيميائية  
(L014)

**ADVARSEL:** Vernehansker av motstandsdyktig materiale må benyttes for denne prosedyren. (L014)

**ZAGROŻENIE:** Procedura wymaga użycia rękawic ochronnych. (L014)

**CUIDADO:** É necessária a utilização de luvas resistentes a químicos para a execução deste procedimento. (L014)

**ОСТОРОЖНО:** Для этой процедуры необходимы перчатки, устойчивые к химическим воздействиям. (L014)

**VÝSTRAHA:** Vykonanie tejto procedúry vyžaduje rukavice odolné chemikáliám. (L014)

**POZOR:** Za delo so potrebne proti kemičnim sredstvom odporne rokavice. (L014)

**PRECAUCIÓN:** Utilice guantes resistentes a los productos químicos para llevar a cabo el procedimiento. (L014)

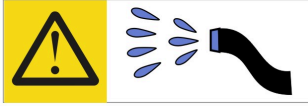
**Varning:** Kemikalietålīga handskar behövs. (L014)

ཉེན་ལ། : བཞོལ་སྐྱོད་འདིའི་གོ་རིམ་ལ་སྲུང་སྐྱོབ་རུས་པ་ལྷན་པའི་རྗེས་འགྲུར་རུལ་འགོག་ལག་ཁྱབས་གོན་དགོས།  
(L014)

ئاگاھلاندۇرۇش : بۇ مەشغۇلات جەريانىدا خىمىيىلىك چىرىشتىن ساقلىنىش پەللىنى كىيىۋېلىشىڭىز كېرەك. (L014)

Daezsingj: Aen cauhcoz neix aeu yungh madfwngz naih vayoz myaex. (L014)

## L016



خطر: قد يتم التعرض لخطر الصدمة الكهربائية بسبب الماء أو المحلول المائي الذي يوجد بهذا المنتج.  
تجنب العمل في أو بالقرب من أي جهاز فعال بأيدي مبللة أو عند وجود تسرب للماء. (L016)

**AVISO: Risco de choque elétrico devido à presença de água ou solução aquosa no produto. Evite trabalhar no equipamento ligado ou próximo a ele com as mãos molhadas ou quando houver a presença de água derramada. (L016)**

**ОПАСНО:** Риск от токов удар поради вода или воден разтвор, присъстващи в продукта.  
Избягвайте работа по или около оборудване под напрежение,  
докато сте с мокри ръце или когато наоколо има разляна вода.  
(L016)

**DANGER: Risque de choc électrique lié à la présence d'eau ou d'une solution aqueuse dans ce produit. Évitez de travailler avec ou à proximité d'un équipement sous tension avec des mains mouillées ou lorsque de l'eau est renversée. (L016)**

危險: 由于本产品中存在水或者水溶液，因此存在电击风险。请避免使用潮湿的手在带电设备或者有水溅出的环境附近工作。(L016)

危險: 本產品中有水或水溶液，會造成電擊的危險。手濕或有潑濺的水花時，請避免使用或靠近帶電的設備。(L016)

OPASNOST: Rizik od električnog udara zbog vode ili tekućine koja postoji u ovom proizvodu.  
Izbjegavajte rad u  
blizini opreme pod naponom s mokrim rukama ili kad je u blizini prolivena  
tekućina.  
(L016)

**NEBEZPEČÍ: Riziko úrazu elektrickým proudem v důsledku vody nebo vodního roztoku přítomného v tomto produktu. Dejte pozor, abyste při práci s aktivovaným vybavením nebo v jeho blízkosti neměli mokré ruce a vyvarujte se potřísnění nebo polití produktu vodou. (L016)**

**Fare! Risiko for stød på grund af vand eller en vandig opløsning i produktet. Undgå at arbejde med eller i nærheden af strømførende udstyr med våde hænder, eller hvis der er spildt vand. (L016)**

**GEVAAR: Risco op elektrische schok door water of waterachtige oplossing die aanwezig is in dit product. Vermijd werken aan of naast apparatuur die onder spanning staat als u natte handen hebt of als gemorst water aanwezig is. (L016)**

**DANGER: Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present. (L016)**



**ОПАСНО: Риск поражения электрическим током вследствие присутствия в этом продукте воды или водного раствора. Избегайте выполнения работ на оборудовании, находящемся под напряжением, или рядом с таким оборудованием влажными руками или при наличии пролитой воды. (L016)**

NEBEZPEČENSTVO: Riziko úrazu elektrickým prúdom v dôsledku prítomnosti vody alebo vodného roztoku v tomto produkte. Vyhnite sa práci na zapnutom zariadení alebo v jeho blízkosti s vlhkými rukami, alebo keď je prítomná rozliata voda. (L016)

NEVARNOST: Nevarnost električnega udara zaradi vode ali vodne raztopine, prisotne v izdelku. Ne delajte na opremi ali poleg opreme pod energijo z mokrimi rokami ali ko je prisotna razlita voda. (L016)

**PELIGRO: Existe riesgo de choque eléctrico por agua o por una solución de agua que haya en este producto. Evite trabajar en equipos bajo tensión o cerca de los mismos con las manos húmedas o si hay agua derramada. (L016)**

**Fara: Risk för elektriska stötar på grund av vatten eller vattenbaserat medel i denna produkt. Arbeta inte med eller i närheten av elektriskt laddad utrustning om du har våta händer eller vid vattenspill. (L016)**

ཉེན་བརྒྱ: རྩོམ་ཚུལ་འདི་ནི་ནང་དུ་རྒྱ་ལྡན་ཆུ་འཛུལ་གྱི་ཤེར་གཟུགས་འདུས་ཡོད་པ་སྟེ་དེ་ལས་སློབ་ཆུག་པའི་ཉེན་ཁ་ཡོད། ལག་པའི་ཐོག་ཆུ་ཡོད་པའམ་ཆུ་ཐིག་མར་བཞུར་བའི་གནས་ཚུལ་འོག་སློབ་ཆུག་ཡོད་པའི་སློབ་ཆས་ལ་བཞག་སྟེ་བྱེད་མི་ཉེན་པོ་འཕྲོད་ཀྱི་སྲིད། (L016)

خەتەرلىك: بۇ مەھسۇلاتتا سۇ ياكى ئېرىتمە بولغاچقا، شۇڭا توك سوقۇۋېتىش خەۋپى مەۋجۇتدۇر. قول ھۆل ھالەتتە ۋە ياكى سۇ سىرغىپ چىققان ھالەتتە، توكلۇق ئۇسكۇنىگە قارىتا ۋە ياكى توكلۇق ئۇسكۇنىنىڭ ئەتراپىدا مەشغۇلات ئېلىپ بارغىلى بولمايدۇ. (L016)

Yungyiemj: Youzyiz aen canjbinj miz raemx roxnaeuz raemx yungzyiz, sojyij miz yungyiemj bungqden. Mboujndaej fwnqz miz raemx seiz youq ndaw sezbi roxnaeuz youq henzgyawj guhhong. (L016)

### Attention:

- Read [“Installation Guidelines” on page 31](#) and [“Safety inspection checklist” on page 32](#) to ensure that you work safely.
- Ensure proper handling procedures are followed when working with any chemically treated water used in the compute rack cooling system. Ensure that material safety data sheets (MSDS) and safety information are provided by the water chemical treatment supplier and that proper personal protective equipment (PPE) is available as recommended by the water chemical treatment supplier. Protective gloves and eyewear may be recommended as a precaution.
- The task in this section requires two or more people.

### Procedure

Step 1. Make preparations for this task.

- a. Remove all trays in the front of the enclosure. See [“Remove a DWC tray from the enclosure” on page 49](#).
- b. Remove the EMC shields. See [“Remove an EMC shield” on page 104](#).
- c. Remove the drip sensor assembly. See [“Remove the drip sensor assembly” on page 52](#).
- d. Remove the SMM2 and SMM2 support bracket. See [“Remove the SMM2” on page 168](#).
- e. Remove all power supplies. See [“Remove a hot-swap power supply” on page 116](#) or [“Remove a DWC PSU” on page 93](#).
- f. Remove the DWC PSU manifold. See [“Remove the DWC PSU manifold” on page 62](#).

Step 2. At the front of the rack, close both Eaton ball valves.



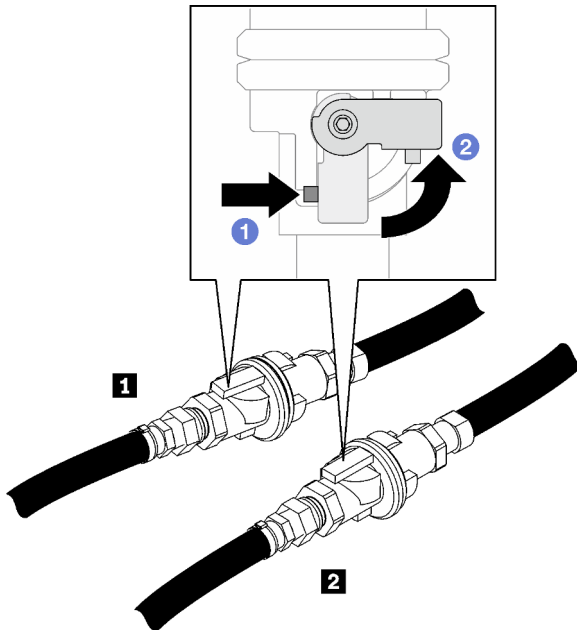


Figure 101. Eaton ball valves closed

Table 14. Eaton ball valves

<b>1</b> Rack supply	<b>2</b> Rack return
----------------------	----------------------

Step 3. Remove the red quick connect plug covers from the tops of each manifold, and on the rear of each manifold section.

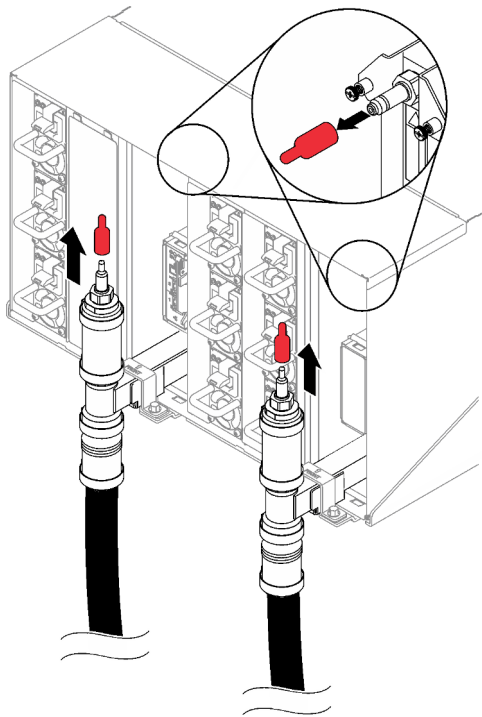


Figure 102. Quick connect plug covers removal

Step 4. Connect the hose assembly (supplied to customer installation site) to the top quick connect at Location A (top of the rack). Make sure the hose still remains in the bucket with the valve closed (valve handle perpendicular to the hose).

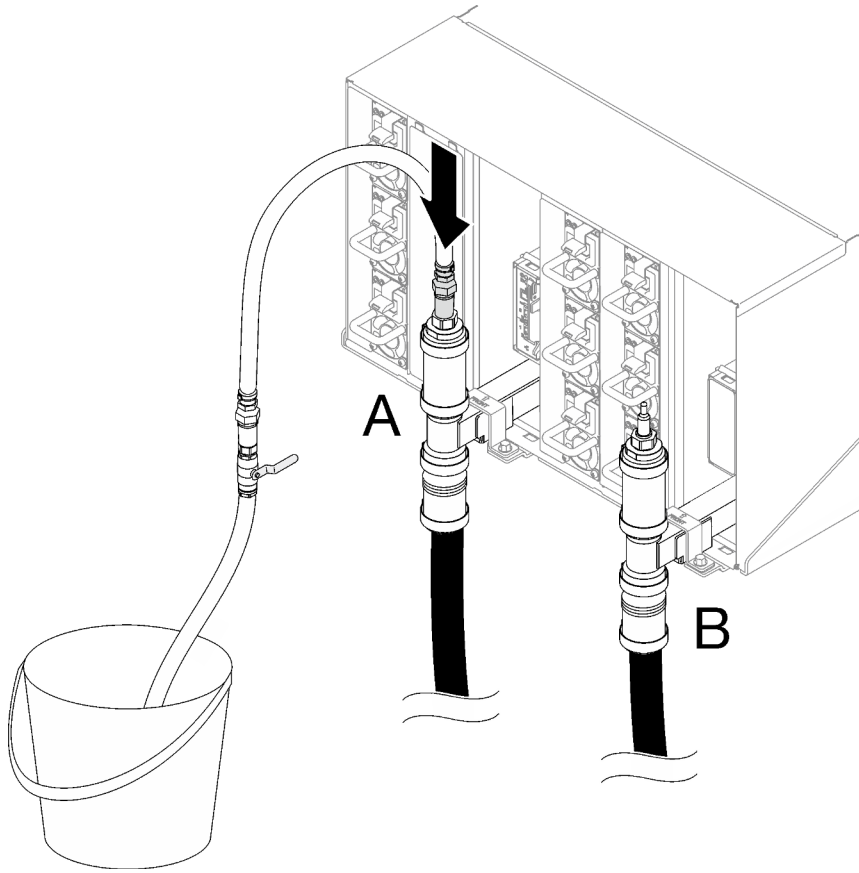


Figure 103. Hose assembly to top quick connect

Step 5. Slowly open the hose valve to allow a steady stream of water to drain. Close the hose valve once water stops flowing (it may take approximately one minute).

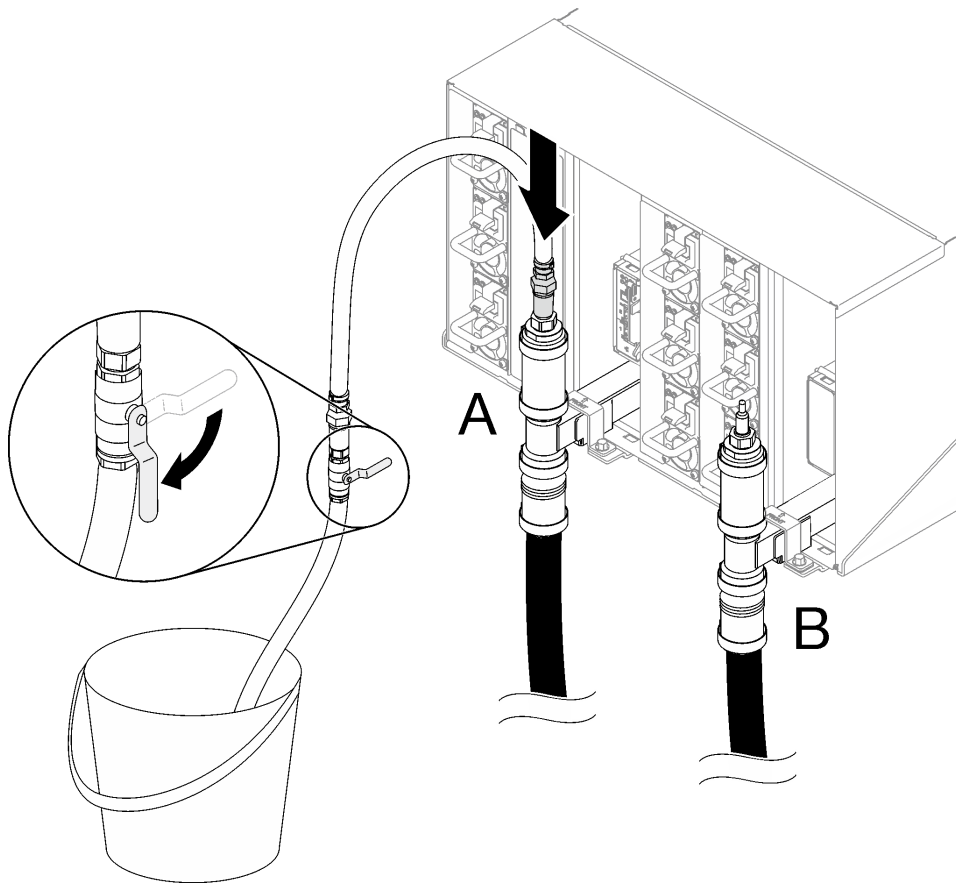


Figure 104. Hose assembly at Location A

- Step 6. Disconnect the hose assembly from Location A and connect it to Location B. Slowly open the hose valve to allow a steady stream of water to drain. Close the hose valve once water stops flowing.

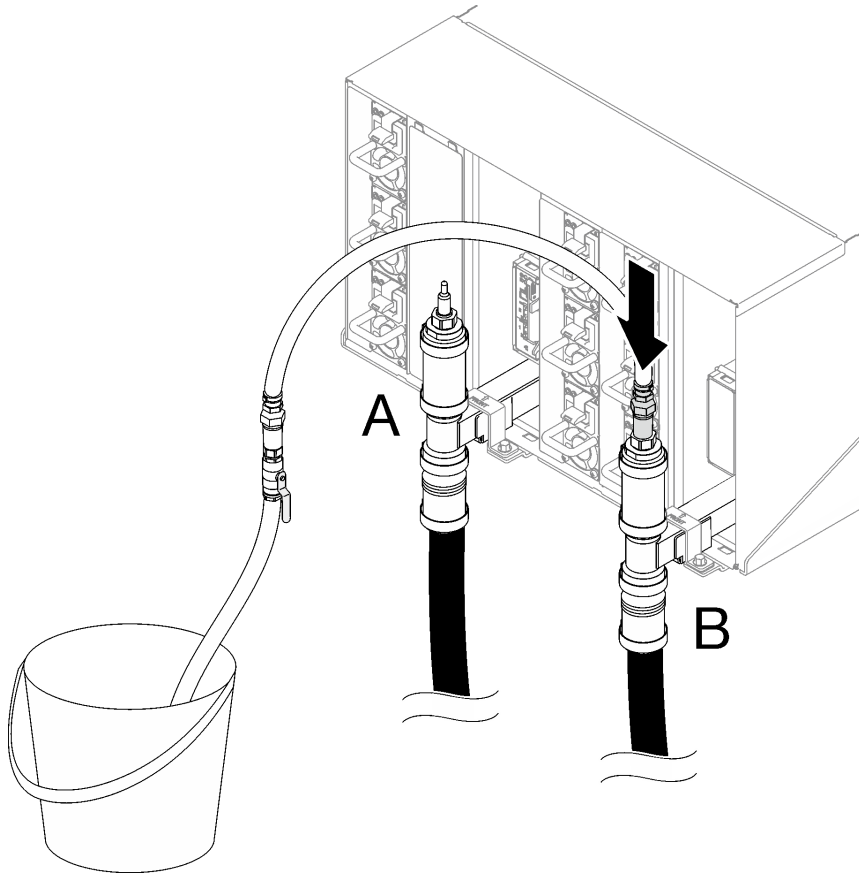


Figure 105. Hose assembly at Location B

Step 7. Disconnect the hose assembly from Location B and connect it to Location C. Slowly open the hose valve to allow a steady stream of water to drain. Close the hose valve once water stops flowing.

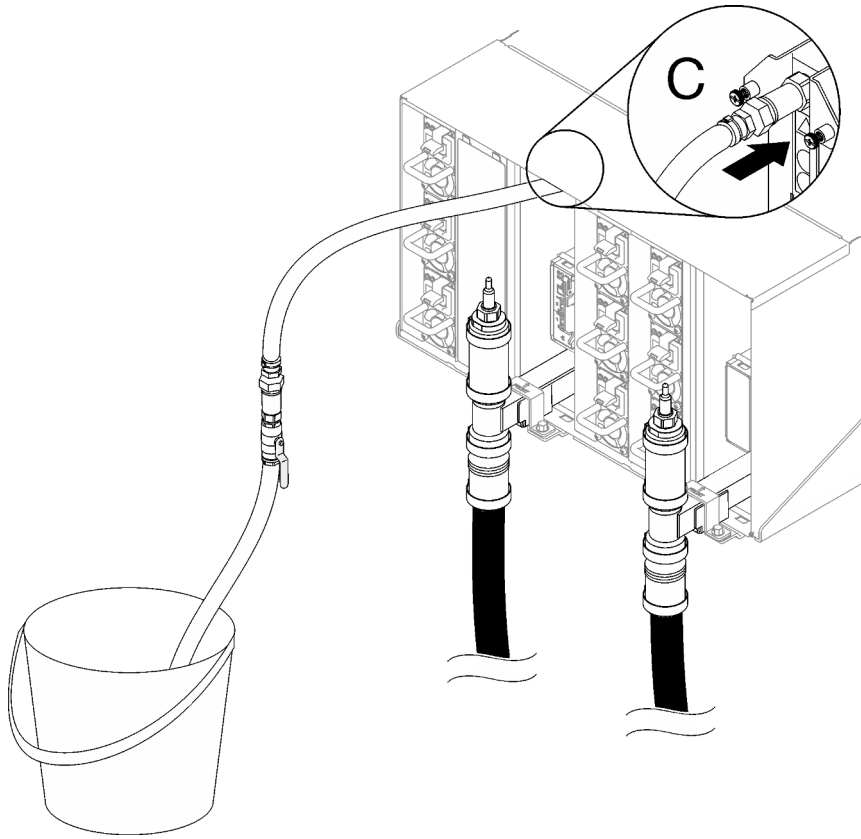


Figure 106. Hose assembly at Location C

Step 8. Disconnect the hose assembly from Location C and connect it to Location D. Slowly open the hose valve to allow a steady stream of water to drain. Close the hose valve once water stops flowing.

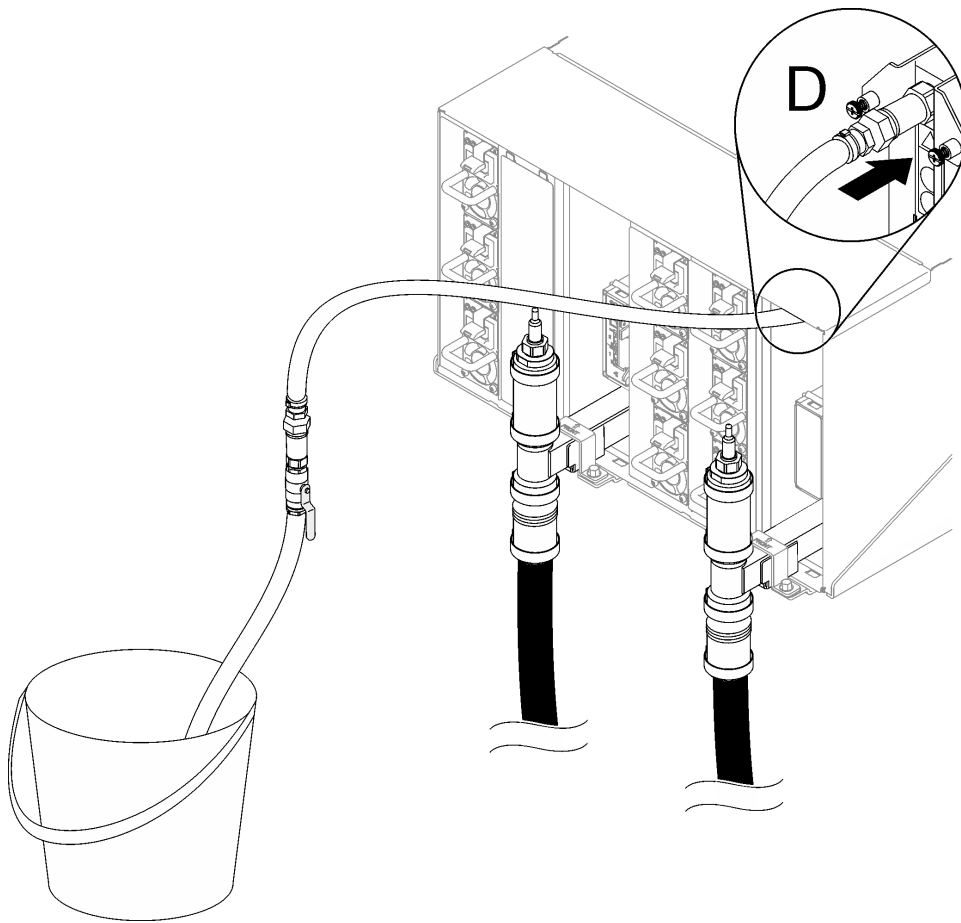
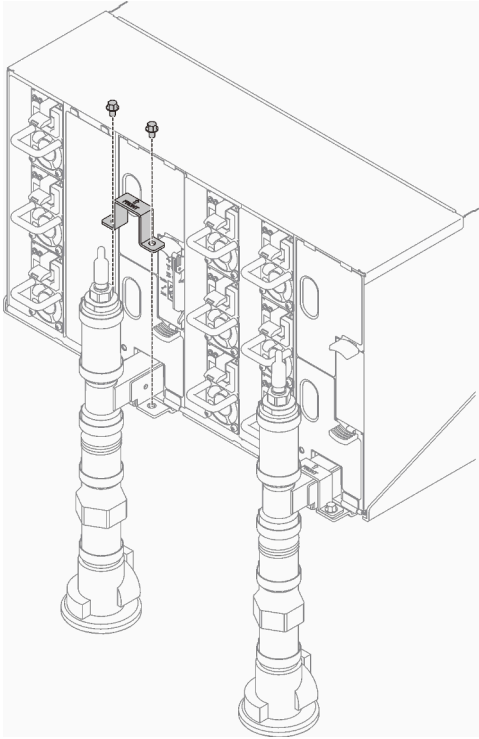


Figure 107. Hose assembly at Location D

- Step 9. Starting from the top enclosure to the bottom enclosure, continue to each enclosure by reaching into each enclosure Location C and Location D quick connects to allow a steady stream of water to drain. Repeat the draining process until all Location C and Location D in the entire rack have been drained.
- Step 10. At this point, the manifold should be properly drained to allow for service. Since there still can be some water left in the manifold, prepare work area with absorbent cloths to collect any water that may drain out.
- Step 11. Determine which manifold needs to be replaced.
- Step 12. Remove manifold retention bracket that is retaining the manifold (top enclosure position only).



*Figure 108. Retention bracket removal*

Step 13. Remove the manifold.

- a. ① Remove four screws (using the screwdriver contained in the manifold repair kit) between manifold bracket and enclosure.
- b. ② Remove the manifold from the enclosure.
- c. ③ Remove the drip sensor tray from the manifold.

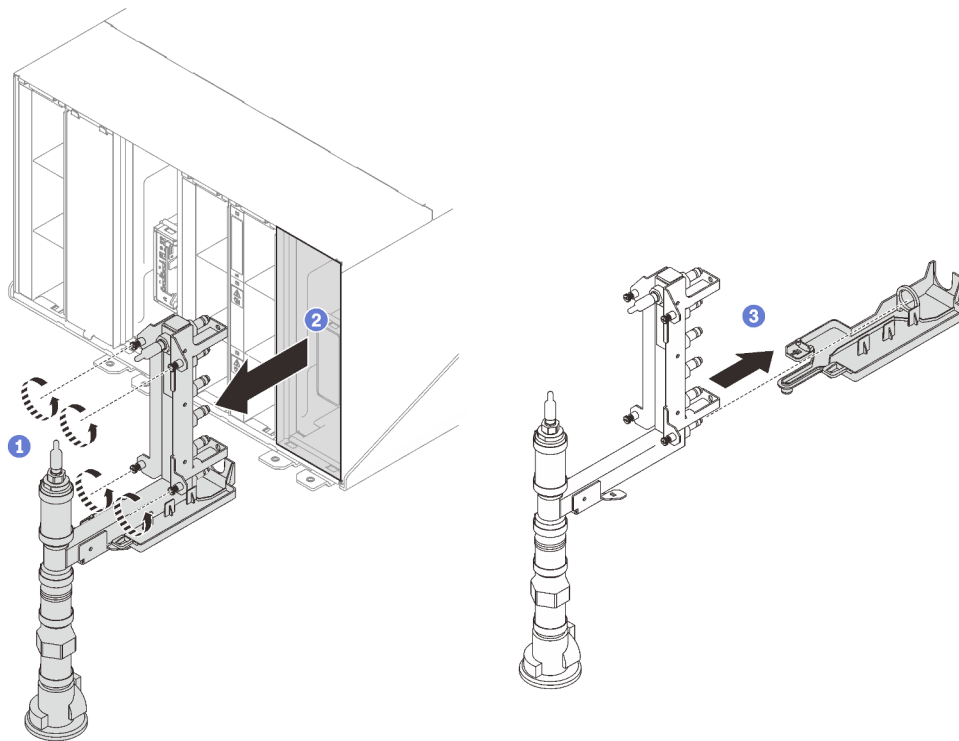


Figure 109. Manifold removal

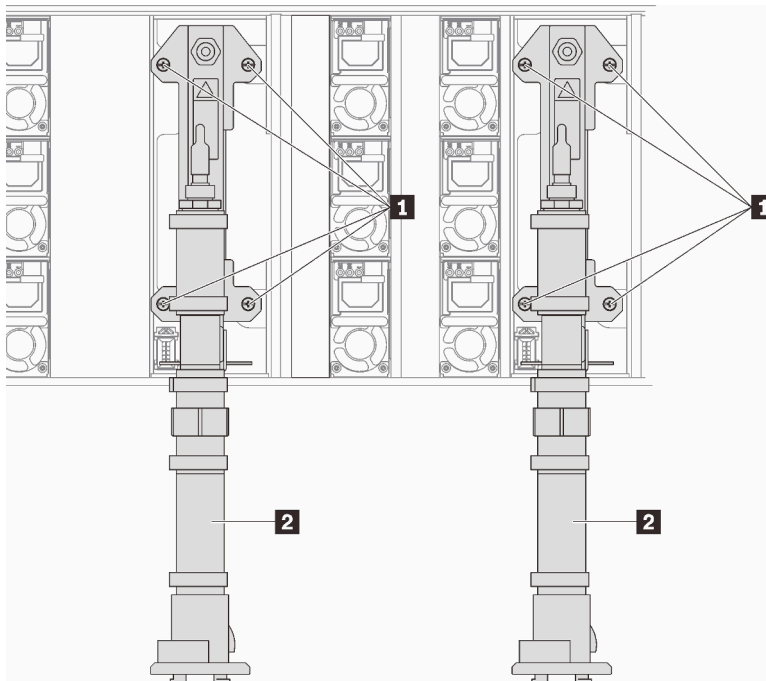


Figure 110. Manifold screw locations

Table 15. Manifold screw locations

<b>1</b> Screws	<b>2</b> Manifold
-----------------	-------------------



- Step 14. Repeat the previous step for all manifold sections until you can remove the entire manifold and lay it on the ground.
- Step 15. If you need to replace a manifold section.
- Place a pan under the manifold section that needs to be replaced.
  - Use the 41 mm wrench supplied with the replacement manifold section kit to disconnect the couplings.
  - Disconnect the manifold section that needs to be replaced.

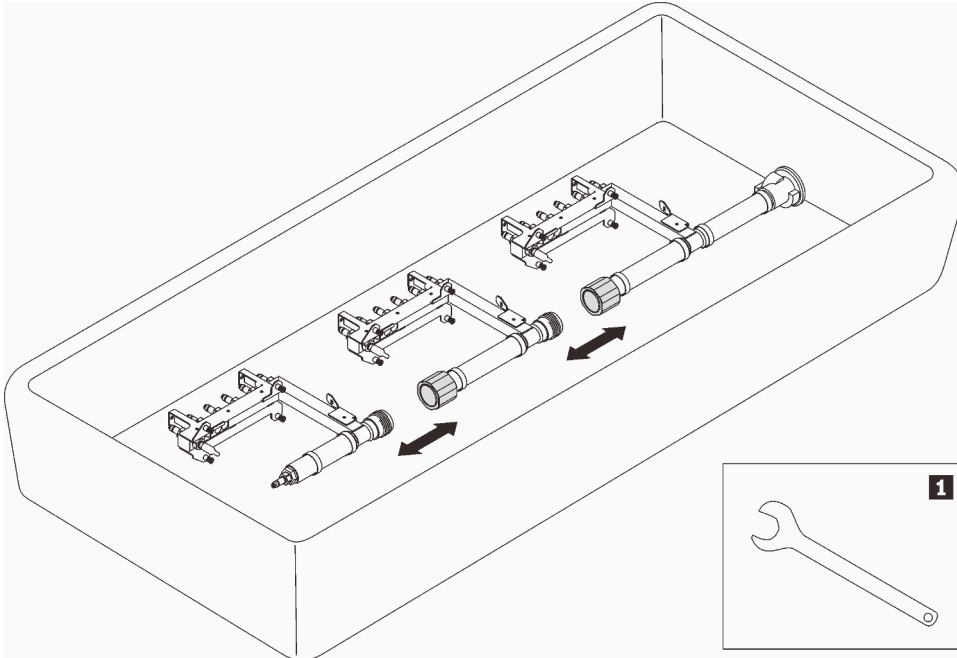


Figure 111. Manifold disassemble

Table 16. Manifold disassemble

<b>1</b> 41 mm wrench
-----------------------

## After you finish

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

## Demo video

[Watch the procedure on YouTube](#)

## Install the manifold

Use this information to install the manifold.

## About this task

### CAUTION:

The water might cause irritation to the skin and eyes. Avoid direct contact with the lubricant.

**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.

**S038**



**CAUTION:**

Eye protection should be worn for this procedure.

## L011



تحذير: يجب ارتداء النظارات الواقية لهذا الاجراء. (L011)

**AVISO:** Para este procedimento, são necessários óculos de proteção. (L011)

**ВНИМАНИЕ:** За тази процедура са необходими предпазни очила. (L011)

**ATTENTION :** Cette procédure requiert des lunettes de protection. (L011)

警告: 该过程需要护目镜。 (L011)

警告 : 此程序需要護目鏡。 (L011)

OPREZ: Za izvođenje postupka su potrebne zaštitne naočale. (L011)

**POZOR:** K tomuto postupu jsou nutné ochranné brýle. (L011)

**Pas på!** Proceduren kræver beskyttelsesbriller. (L011)

**WAARSCHUWING:** Voor deze procedure is een beschermende bril vereist. (L011)

**CAUTION:** Protective eyewear is needed for the procedure. (L011)

**VAROITUS:** Toimet edellyttävät silmänsuojaimien käyttöä. (L011)

**Vorsicht:** Bei dieser Prozedur eine Schutzbrille tragen. (L011)

**ΠΡΟΣΟΧΗ:** Για τη συγκεκριμένη διαδικασία απαιτούνται προστατευτικά γυαλιά. (L011)

**VESZÉLY:** Az eljáráshoz védőszemüveget kell viselni. (L011)

**ATTENZIONE:** per la procedura sono necessarie protezioni per gli occhi. (L011)

危険: この作業には目を保護する道具が必要です。  
(L011)

주의: 이 절차에는 보호용 안경이 필요합니다. (L011)

**ВНИМАНИЕ:** За изведување на постапката потребни се заштитни очила. (L011)

تعمير : بنس  
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تعمير : بنس  
تعمير : بنس  
تعمير : بنس  
تعمير : بنس  
(L011)

**ADVARSEL:** Vernebriller må benyttes for denne prosedyren. (L011)

**ZAGROŻENIE:** Procedura wymaga zastosowania okularów ochronnych. (L011)

**CUIDADO:** É necessário utilizar protecção ocular para a execução deste procedimento. (L011)

**ОСТОРОЖНО:** При выполнении этой операции необходимо надеть защитные очки. (L011)

**VÝSTRAHA:** Vykonanie tejto procedúry vyžaduje pomôcku na ochranu očí. (L011)

**POZOR:** Za ta postopek je potrebna zaščitna oprema za oči. (L011)

**PRECAUCIÓN:** Utilice protección ocular para llevar a cabo el procedimiento. (L011)

**Varning:** Skyddsglasögon krävs. (L011)

ཉེན་བརྟེན་ : བཞོལ་སྐྱོད་འདིའི་གོ་རིམ་ལ་སྲུང་སྐྱོབ་རུ་ས་པ་ལྷན་པའི་མིག་གཤམ་གྱི་དགོས་པ། (L011)

ئاگاھلاندۇرۇش : سز مەشغۇلات جەريانىدا كۆز ئاسراش كۆزەينىكى تاقىۋېلىشىڭىز كېرەك. (L011)

Daezsingj: Aen cauhcoz neix aeu yungh yenjging baujhoh lwgda. (L011)

## L014



تحذير: يجب ارتداء القفازات الكيميائية المقاومة لهذا الاجراء. (L014)

**AVISO:** Para este procedimento, são necessárias luvas com resistência química. (L014)

**ВНИМАНИЕ:** За тази процедура са необходими химически устойчиви ръкавици. (L014)

**ATTENTION :** Cette procédure requiert des gants de protection contre les produits chimiques. (L014)

警告: 该过程需要化学防护手套。 (L014)

警告: 此程序需要抗化學劑手套。 (L014)

**OPREZ:** Za ovaj postupak su potrebne kemijski otporne zaštitne rukavice. (L014)

**POZOR:** K tomuto postupu jsou nutné ochranné brýle. (L014)

**Pas på!** Bær handsker, der er modstandsdygtige over for kemikalier, når du skal udføre denne proces. (L014)

**WAARSCHUWING:** Voor deze procedure zijn tegen chemicaliën beschermende handschoenen vereist. (L014)

**CAUTION:** Chemical resistant gloves are needed for this procedure. (L014)

**VAROITUS:** Toimet edellyttävät kemiallisesti kestävästä materiaaleista valmistettujen suojakäsineiden käyttöä. (L014)

**Vorsicht:** Bei dieser Aktion müssen chemische Schutzhandschuhe getragen werden. (L014)

**ΠΡΟΣΟΧΗ:** Για τη συγκεκριμένη διαδικασία απαιτούνται ειδικά γάντια, ανθεκτικά στις χημικές ουσίες. (L014)

**VIGYÁZAT:** Az eljáráshoz vegyi anyagokkal szemben ellenálló védőszemüveget kell viselni. (L014)

**ATTENZIONE:** per questa procedura sono necessari guanti resistenti ad agenti chimici. (L014)

危険: この作業には化学耐性のあるグローブが必要です。 (L014)

주의: 이 절차를 수행하려면 내화학성 장갑을 착용해야 합니다. (L014)

**ВНИМАНИЕ:** За изведовање на оваа постапка потребни се ракавици за хемиска заштита. (L014)

تعليمات :  
يحتاج  
إلى  
ارتداء  
قفازات  
مقاومة  
كيميائية  
عند  
التعامل  
مع  
المواد  
الكيميائية  
(L014)

**ADVARSEL:** Vernehansker av motstandsdyktig materiale må benyttes for denne prosedyren. (L014)

**ZAGROŽENIE:** Procedura wymaga użycia rękawic ochronnych. (L014)

**CUIDADO:** É necessária a utilização de luvas resistentes a químicos para a execução deste procedimento. (L014)

**ОСТОРОЖНО:** Для этой процедуры необходимы перчатки, устойчивые к химическим воздействиям. (L014)

**VÝSTRAHA:** Vykonanie tejto procedúry vyžaduje rukavice odolné chemikáliám. (L014)

**POZOR:** Za delo so potrebné proti kemičnim sredstvom odporne rokavice. (L014)

**PRECAUCIÓN:** Utilice guantes resistentes a los productos químicos para llevar a cabo el procedimiento. (L014)

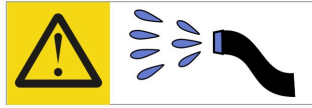
**Varning:** Kemikalietåliga handskar behövs. (L014)

ཉེན་ལ། : བཞོལ་སྐྱོད་འདིའི་གོ་རིམ་ལ་སྲུང་སྐྱོབ་རུ་ས་པ་ལྷན་པའི་རྩ་ས་འགྲུར་རུ་ལ་འགོག་ལག་ཁྱབ་ས་གོན་དགོས།  
(L014)

ئاگاھلاندۇرۇش : بۇ مەشغۇلات جەريانىدا خىمىيىلىك چىرىشتىن ساقلىنىش پەللىنى كىيىۋېلىشىڭىز كېرەك. (L014)

Daezsingj: Aen cauhcoz neix aeu yungh madfwngz naih vayoz myaex. (L014)

## L016



خطر: قد يتم التعرض لخطر الصدمة الكهربائية بسبب الماء أو المحلول المائي الذي يوجد بهذا المنتج.  
تجنب العمل في أو بالقرب من أي جهاز فعال بأيدي مبللة أو عند وجود تسرب للماء. (L016)

**AVISO: Risco de choque elétrico devido à presença de água ou solução aquosa no produto. Evite trabalhar no equipamento ligado ou próximo a ele com as mãos molhadas ou quando houver a presença de água derramada. (L016)**

**ОПАСНО:** Риск от токов удар поради вода или воден разтвор, присъстващи в продукта.  
Избягвайте работа по или около оборудване под напрежение,  
докато сте с мокри ръце или когато наоколо има разляна вода.  
(L016)

**DANGER: Risque de choc électrique lié à la présence d'eau ou d'une solution aqueuse dans ce produit. Évitez de travailler avec ou à proximité d'un équipement sous tension avec des mains mouillées ou lorsque de l'eau est renversée. (L016)**

危險: 由于本产品中存在水或者水溶液，因此存在电击风险。请避免使用潮湿的手在带电设备或者有水溅出的环境附近工作。(L016)

危險: 本產品中有水或水溶液，會造成電擊的危險。手濕或有潑濺的水花時，請避免使用或靠近帶電的設備。(L016)

**OPASNOST:** Rizik od električnog udara zbog vode ili tekućine koja postoji u ovom proizvodu.  
Izbjegavajte rad u  
blizini opreme pod naponom s mokrim rukama ili kad je u blizini prolivena  
tekućina.  
(L016)

**NEBEZPEČÍ:** Riziko úrazu elektrickým proudem v důsledku vody nebo vodního roztoku přítomného v tomto produktu. Dejte pozor, abyste při práci s aktivovaným vybavením nebo v jeho blízkosti neměli mokré ruce a vyvarujte se potřísnění nebo polití produktu vodou. (L016)

**Fare!** Risiko for stød på grund af vand eller en vandig opløsning i produktet. Undgå at arbejde med eller i nærheden af strømførende udstyr med våde hænder, eller hvis der er spildt vand. (L016)

**GEVAAR:** Risico op elektrische schok door water of waterachtige oplossing die aanwezig is in dit product. Vermijd werken aan of naast apparatuur die onder spanning staat als u natte handen hebt of als gemorst water aanwezig is. (L016)

**DANGER:** Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present. (L016)





**ОПАСНО: Риск поражения электрическим током вследствие присутствия в этом продукте воды или водного раствора. Избегайте выполнения работ на оборудовании, находящемся под напряжением, или рядом с таким оборудованием влажными руками или при наличии пролитой воды. (L016)**

NEBEZPEČENSTVO: Riziko úrazu elektrickým prúdom v dôsledku prítomnosti vody alebo vodného roztoku v tomto produkte. Vyhnite sa práci na zapnutom zariadení alebo v jeho blízkosti s vlhkými rukami, alebo keď je prítomná rozliata voda. (L016)

NEVARNOST: Nevarnost električnega udara zaradi vode ali vodne raztopine, prisotne v izdelku. Ne delajte na opremi ali poleg opreme pod energijo z mokrimi rokami ali ko je prisotna razlita voda. (L016)

**PELIGRO: Existe riesgo de choque eléctrico por agua o por una solución de agua que haya en este producto. Evite trabajar en equipos bajo tensión o cerca de los mismos con las manos húmedas o si hay agua derramada. (L016)**

**Fara: Risk för elektriska stötar på grund av vatten eller vattenbaserat medel i denna produkt. Arbeta inte med eller i närheten av elektriskt laddad utrustning om du har våta händer eller vid vattenspill. (L016)**

ཉེན་བརྒྱུ: རྩོམ་ཚུལ་འདི་ནི་ནང་དུ་རྒྱ་འཕྲུལ་རྒྱུ་ལེན་གཟུགས་འདུས་ཡོད་པ་སེ། དེ་ལས་སློབ་ཚུགས་པའི་ཉེན་ཁ་ཡོད། ལམ་པའི་ཐོག་ཚུ་ཡོད་པ་འཕྲུལ་རྒྱུ་ལེན་མཁུ་བ་ལྟུང་བའི་གནས་ཚུལ་འོག་སློབ་ཡོད་པའི་སློབ་ཚུལ་ལ་བཞག་སློབ་བྱེད་མི་ཉེན་ཁ། (L016)

خەتەرلىك: بۇ مەھسۇلاتتا سۇ ياكى ئېرىتمە بولغاچقا، شۇڭا توك سوقۇۋېتىش خەۋپى مەۋجۇتدۇر. قول ھۆل ھالەتتە ۋە ياكى سۇ سىرغىپ چىققان ھالەتتە، توكلۇق ئۇسكۇنىگە قارىتا ۋە ياكى توكلۇق ئۇسكۇنىنىڭ ئەتراپىدا مەشغۇلات ئېلىپ بارغىلى بولمايدۇ. (L016)

Yungyiemi: Youzyiz aen canjbinj miz raemx roxnaeuz raemx yungzyiz, sojyij miz yungyiemi bungqden. Mboujndaej fwngz miz raemx seiz youq ndaw sezbi roxnaeuz youq henzgyawj guhhong. (L016)

**Attention:**

- Read “[Installation Guidelines](#)” on page 31 and “[Safety inspection checklist](#)” on page 32 to ensure that you work safely.
- Ensure proper handling procedures are followed when working with any chemically treated water used in the compute rack cooling system. Ensure that material safety data sheets (MSDS) and safety information are provided by the water chemical treatment supplier and that proper personal protective equipment (PPE) is available as recommended by the water chemical treatment supplier. Protective gloves and eyewear may be recommended as a precaution.
- The task in this section requires two or more people.

**Procedure**

- Step 1. Make sure all trays are removed from the enclosure. See “[Remove a DWC tray from the enclosure](#)” on page 49.
- Step 2. Install new manifold section into the manifold and connect couplings.

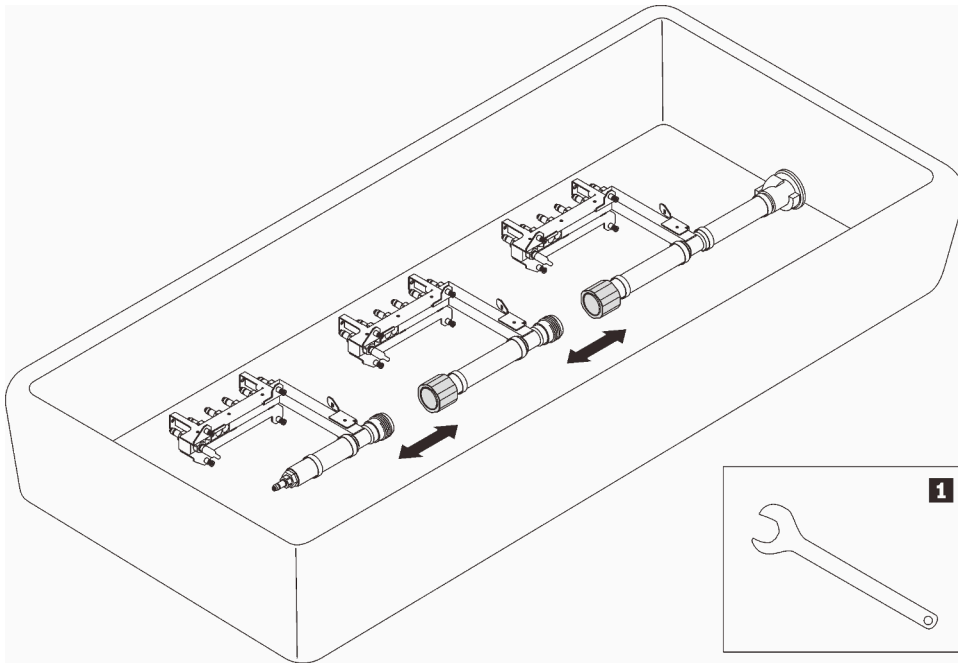


Figure 112. Manifold disassemble

Table 17. Manifold disassemble

<b>1</b> 41 mm wrench
-----------------------

Step 3. Install the manifold.

- a. **1** Align the drip sensor tray with the manifold and slide it into the place.
- b. **2** Align the manifold with the enclosure and slide it into the place.
- c. **3** For each manifold, tighten four screws (using the screwdriver contained in the manifold repair kit) between manifold bracket and enclosure.

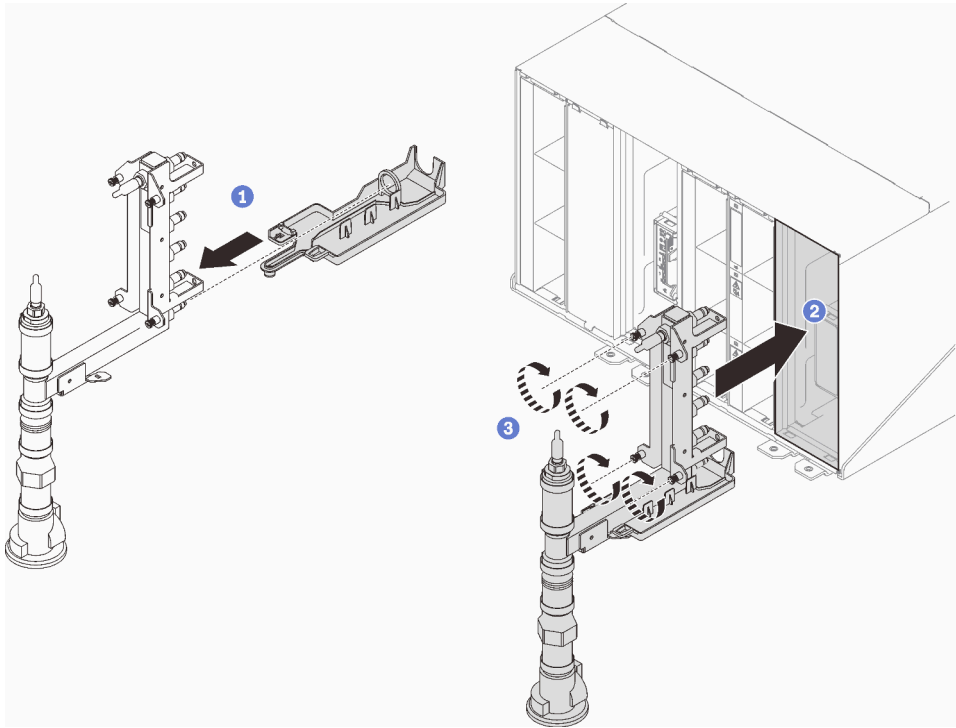


Figure 113. Manifold installation

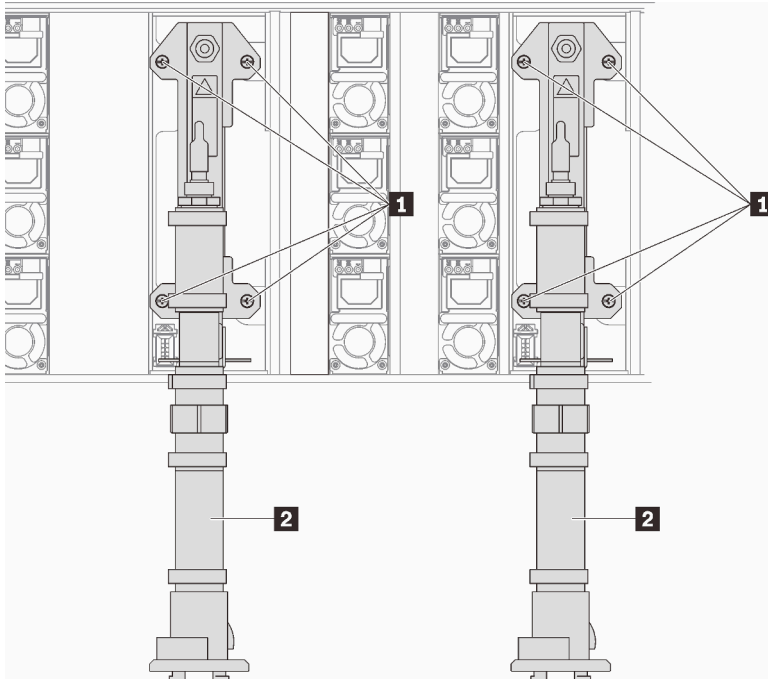


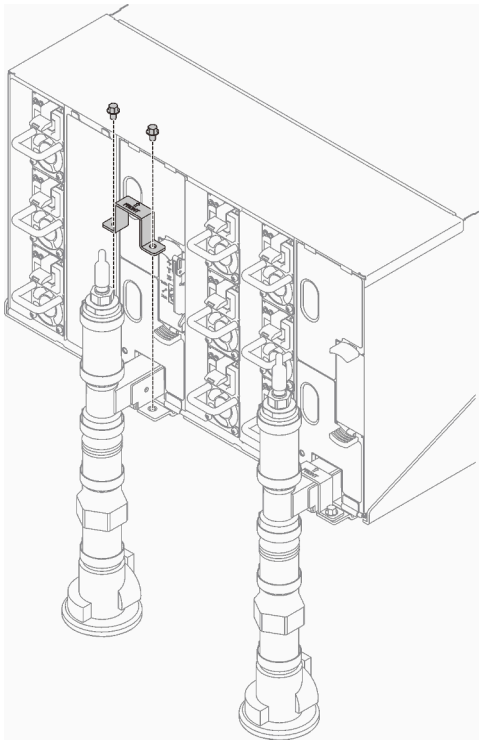
Figure 114. Manifold screw locations

Table 18. Manifold screw locations

<b>1</b> Screws	<b>2</b> Manifold
-----------------	-------------------

Step 4. Continue to connect the other manifold sections working from the top down to the bottom.

Step 5. Install manifold retention bracket that is retaining the manifold (top enclosure position only).



*Figure 115. Retention bracket installation*

Step 6. Remove the red quick connect plug covers from the tops of each manifold, and on the rear of each manifold section.

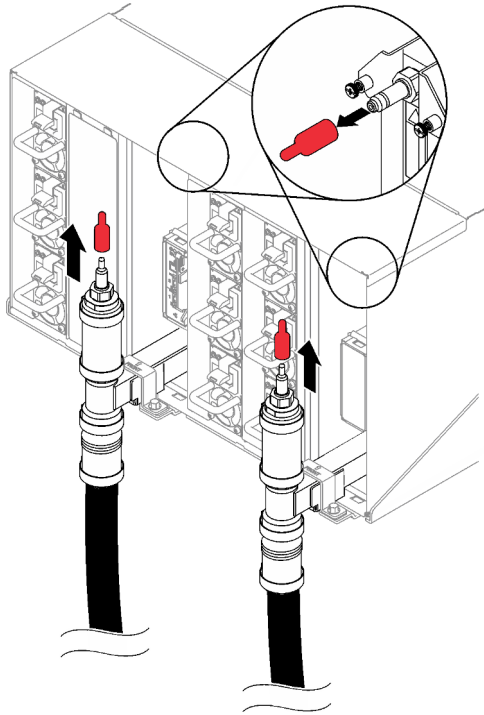


Figure 116. Quick connect plug covers removal

- Step 7. Connect the hose assembly (supplied to customer installation site) to the top quick connect at Location A (top of the rack). Make sure the hose still remains in the bucket with the valve closed (valve handle perpendicular to the hose).

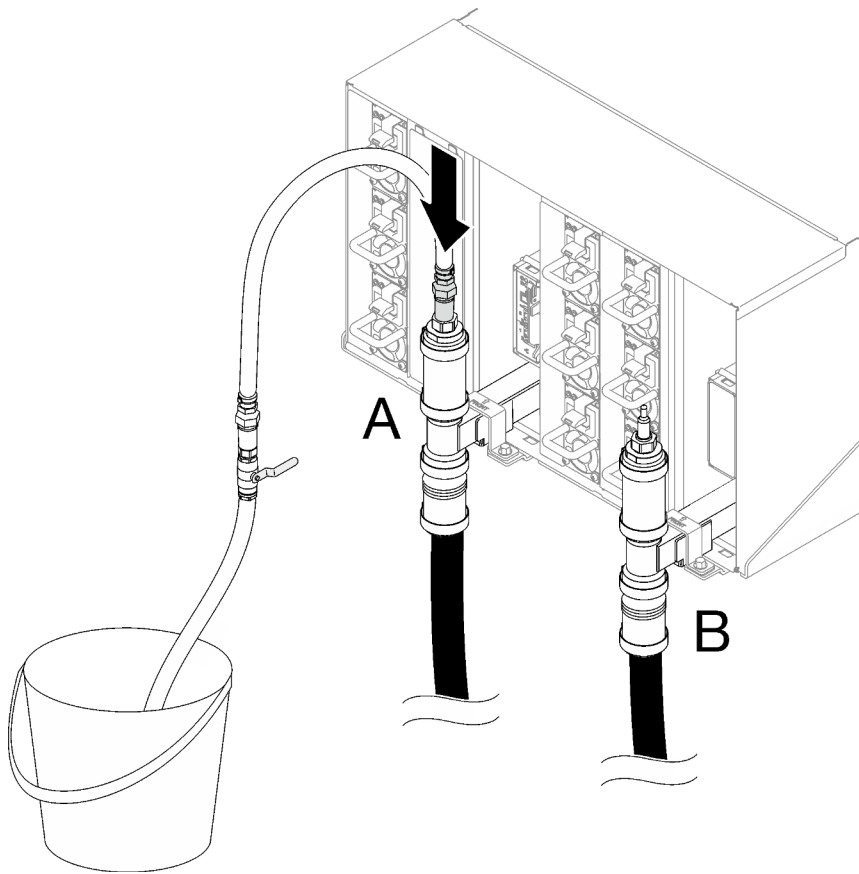


Figure 117. Hose assembly to top quick connect

Step 8. At the front of the rack, connect the facility supply hose to the rack return hose. Partially open the supply hose, about 1/4 of the way.

**Note:** Do not fully open the facility ball valve or you will reduce your ability to control the flow as you fill the rack.

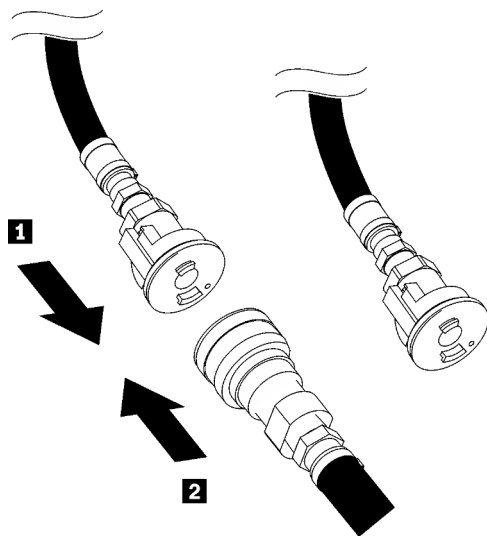


Figure 118. Facility supply hose to rack return hose connection

**1** Rack return

**2** Facility supply

Step 9. Slowly open the hose valve to allow air to flow out of the hose. Close the hose valve once a steady stream of water flows into the bucket or there are minimal bubbles in the sight-glass (it may take approximately one to two minutes).

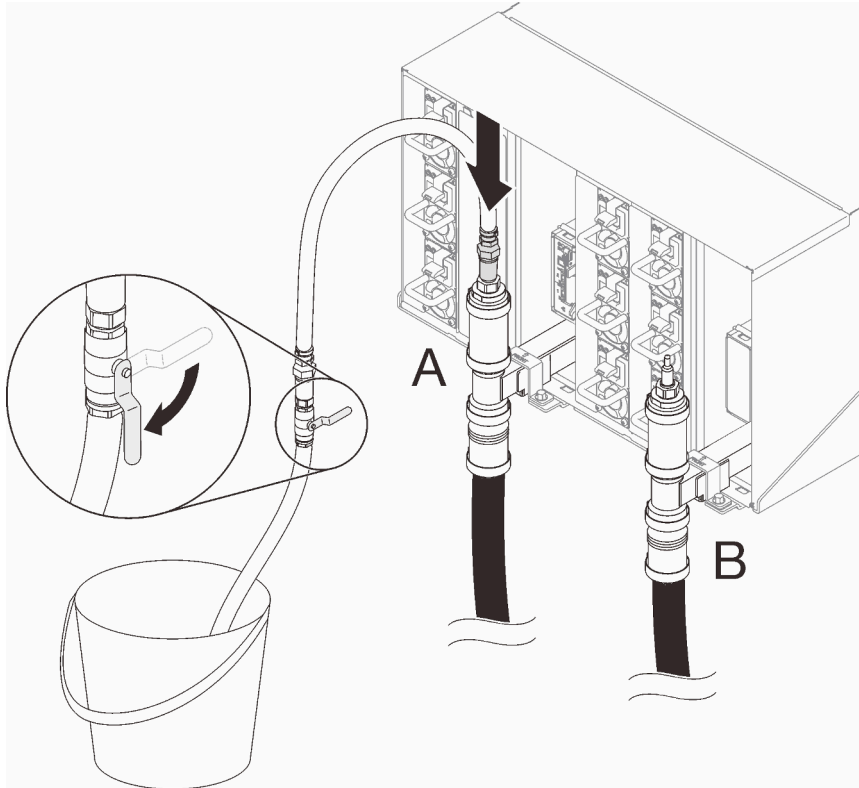


Figure 119. Hose assembly at Location A

Step 10. Disconnect the hose assembly from Location A and connect it to Location B. Slowly open the hose valve to allow air to flow out of the hose. Close the hose valve once a steady stream of water flows into the bucket or there are minimal bubbles in the sight-glass.

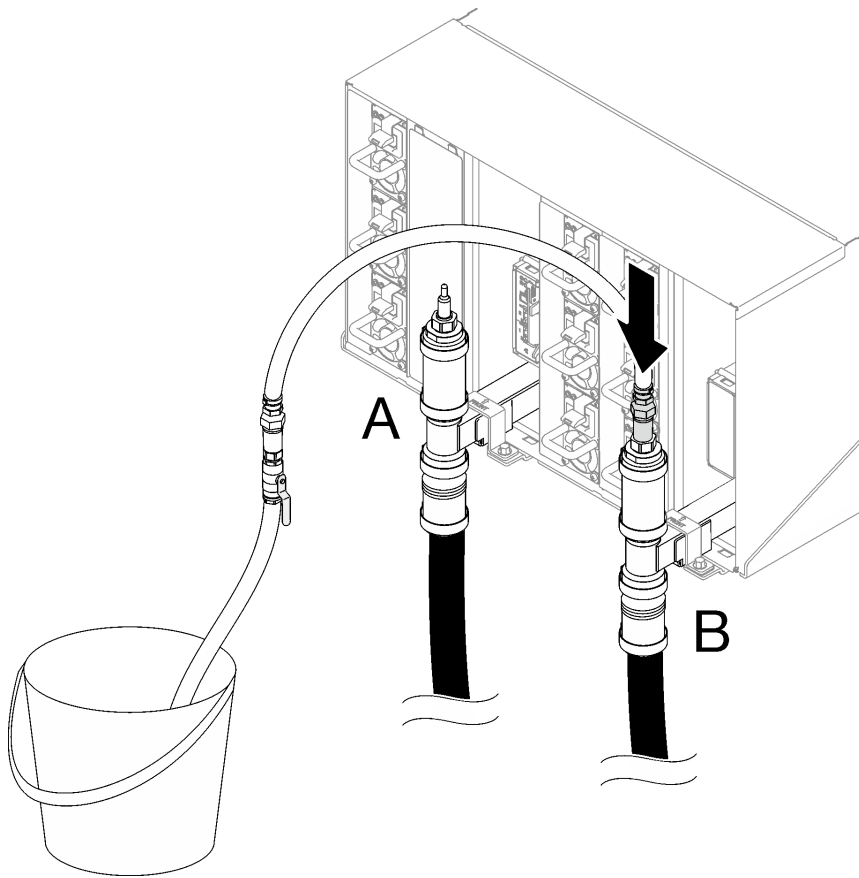


Figure 120. Hose assembly at Location B

Step 11. Go to the front of the rack, disconnect the facility supply hose from the rack return hose and connect the facility supply hose to the rack supply hose.

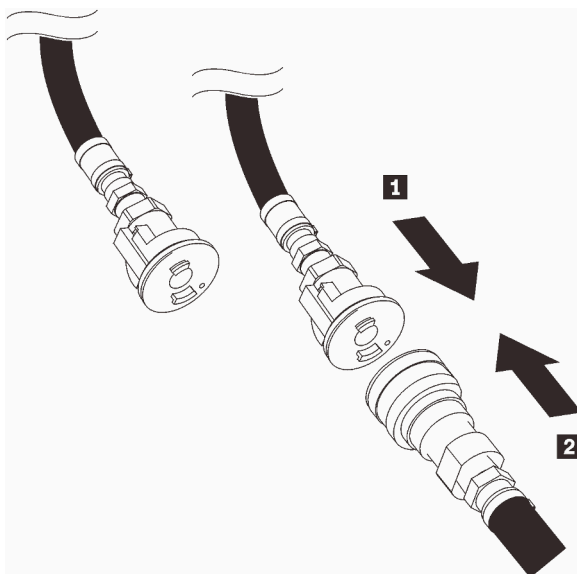


Figure 121. Facility supply hose to the rack supply hose connection



**1** Rack supply

**2** Facility supply

Step 12. Go to the back of the rack, make sure that the hose is still connected to Location B. Slowly open the hose valve to allow air to flow out of the hose. Close the hose valve once a steady stream of water flows into the bucket or there are minimal bubbles in the sight-glass.

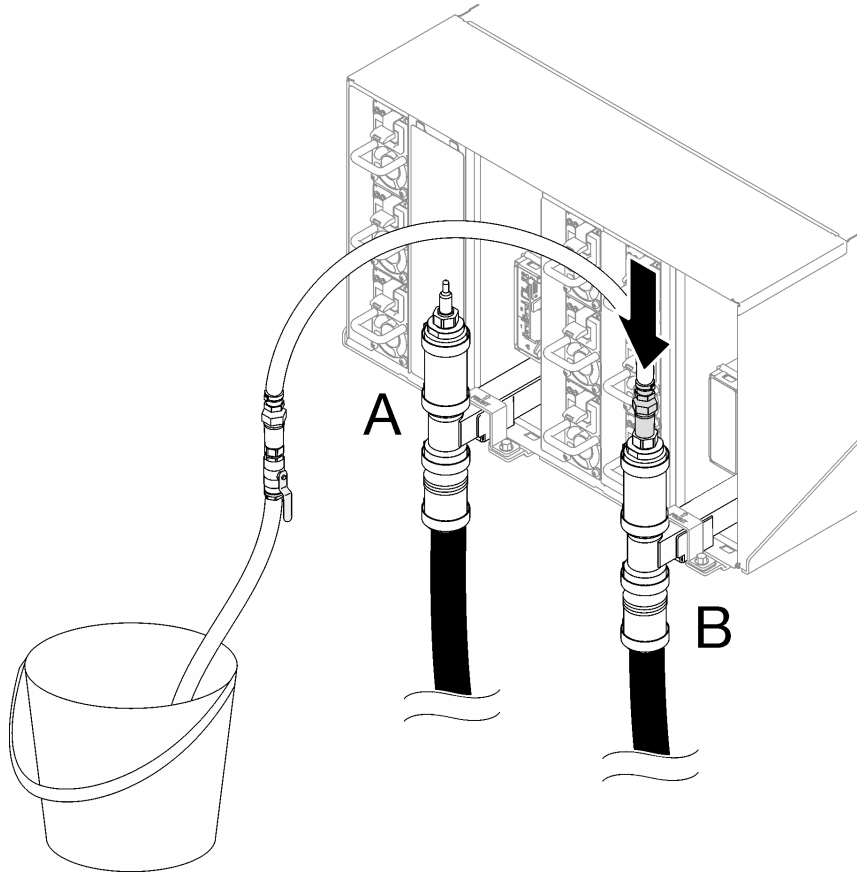


Figure 122. Hose assembly at Location B

Step 13. Disconnect the hose assembly from Location B and connect it to Location A. Slowly open the hose valve to allow air to flow out of the hose. Close the hose valve once a steady stream of water flows into the bucket or there are minimal bubbles in the sight-glass.

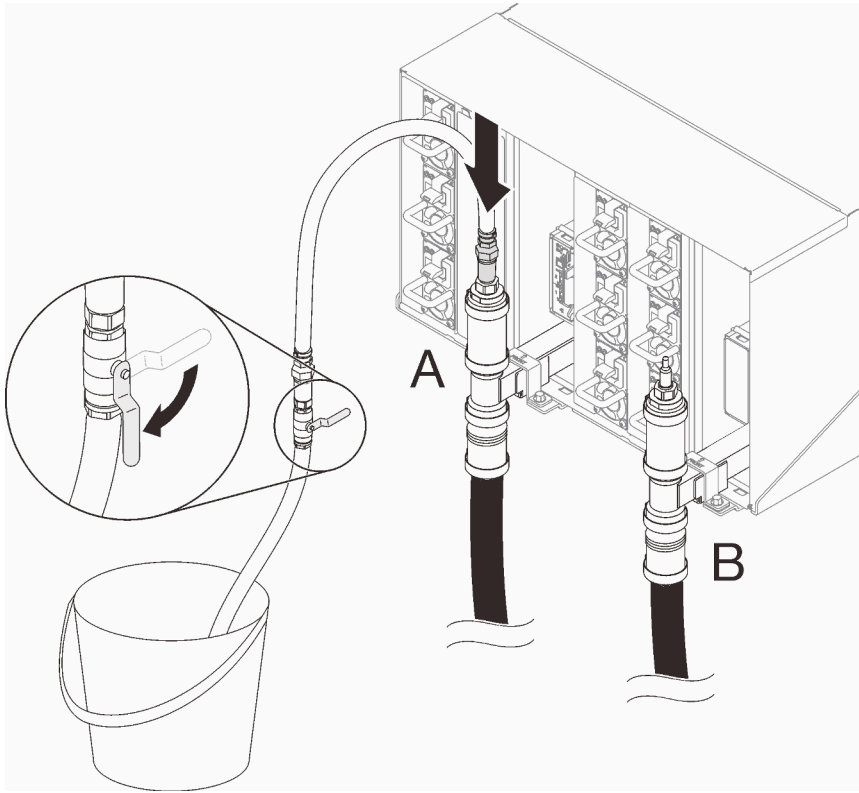


Figure 123. Hose assembly at Location A

Step 14. Disconnect the hose assembly from Location A and connect it to Location C. Slowly open the hose valve to allow air to flow out of the hose. Close the hose valve once a steady stream of water flows into the bucket or there are minimal bubbles in the sight-glass (it may take approximately ten to fifteen seconds).

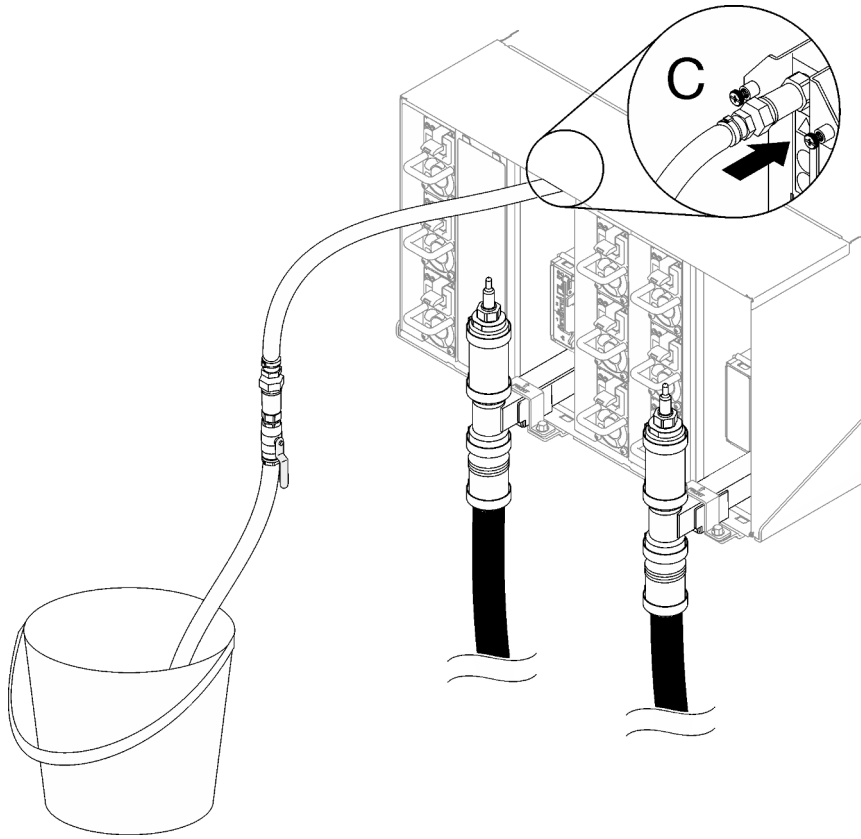


Figure 124. Hose assembly at Location C

Step 15. Disconnect the hose assembly from Location C and connect it to Location D. Slowly open the hose valve to allow air to flow out of the hose. Close the hose valve once a steady stream of water flows into the bucket or there are minimal bubbles in the sight-glass.

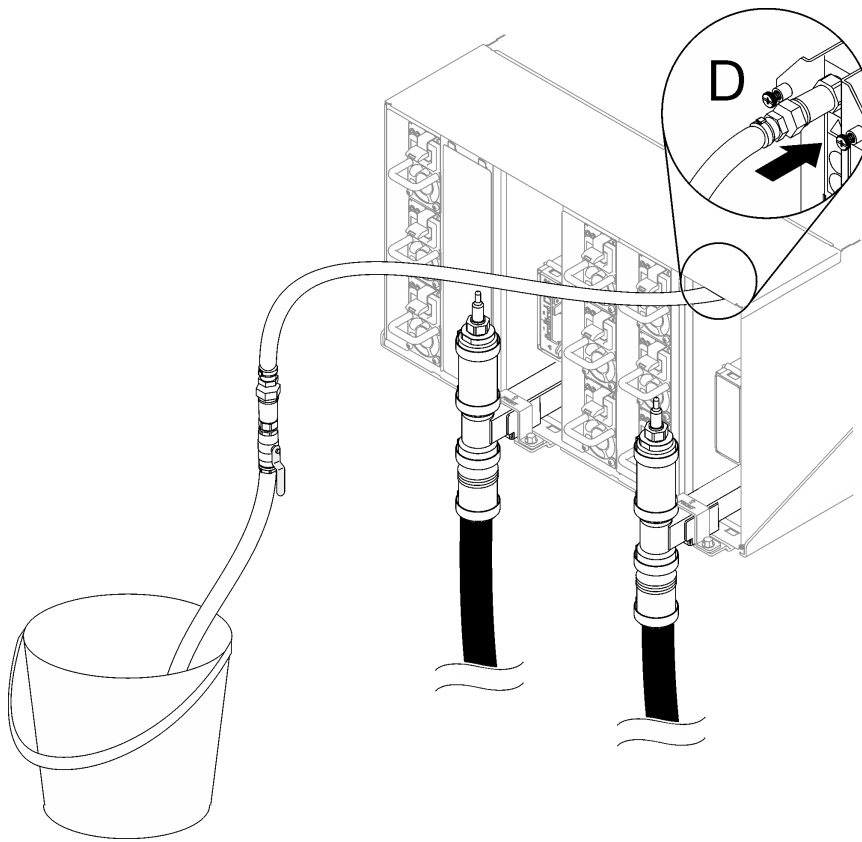


Figure 125. Hose assembly at Location D

Step 16. Starting from the top enclosure to the bottom enclosure, continue to each enclosure by reaching into each enclosure Location C and Location D quick connects to allow a steady stream of water to flow. Repeat the filling process until all Location C and Location D in the entire rack have been filled.

**Notes:**

- Be sure to always close the valve on the hose before disconnecting it from one of the enclosure locations as you work your way down the rack.
- There should be minimal air present in the sight glass.

Step 17. Once completed, go back to the front and connect the facility return hose to the rack return hose. Fully open all connections on both the supply and return side. The manifold should be completely filled.

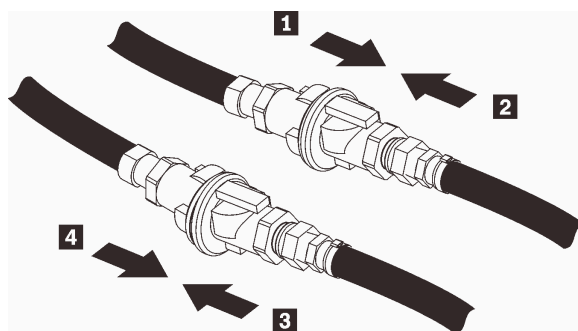


Figure 126. Facility return hose to the rack return hose connection

<b>1</b> Rack supply	<b>3</b> Facility return
<b>2</b> Facility supply	<b>4</b> Rack return

Step 18. Check for leaks at the rear or the rack.

## After you finish

- Install the DWC PSU manifold. See “[Install the DWC PSU manifold](#)” on page 78.
- Install all power supplies. See “[Install a hot-swap power supply](#)” on page 118 or “[Install a DWC PSU](#)” on page 100.
- Install the SMM2 and SMM2 support bracket. See “[Install the SMM2](#)” on page 172.
- Install the drip sensor assembly. See “[Install the drip sensor assembly](#)” on page 54.
- Install the EMC shields. See “[Install an EMC shield](#)” on page 106.
- Install all trays into the front of the enclosure. See “[Install a DWC tray in the enclosure](#)” on page 51.

## Demo video

[Watch the procedure on YouTube](#)

## PSU cage replacement

Use the following procedures to remove and install the PSU cage.

### Remove a PSU cage

Use this information to remove a PSU cage.

## About this task

### S001

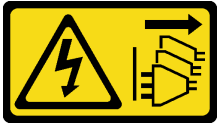


**Electrical current from power, telephone, and communication cables is hazardous.**

**To avoid a shock hazard:**

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

### S002



**CAUTION:**

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

**S035**



**CAUTION:**

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

**CAUTION:**



**High touch current. Connect to earth before connecting to supply.**

**Attention:**

- Read [“Installation Guidelines” on page 31](#) and [“Safety inspection checklist” on page 32](#) to ensure that you work safely.
- Disconnect the power cord from the connector on the back of the power supply.
- If only one hot-swap power supply is installed in the solution, you must turn off the solution before removing the power supply.

**Procedure**

Step 1. Make preparations for this task.

- a. Remove the power supply, see [“Remove a hot-swap power supply” on page 116](#).

Step 2. Remove the PSU cage.

- a. ① Remove the screw located at AC2.
- b. ② Remove the screw located at AC1.
- c. ③ Slide the PSU cage out of the enclosure.

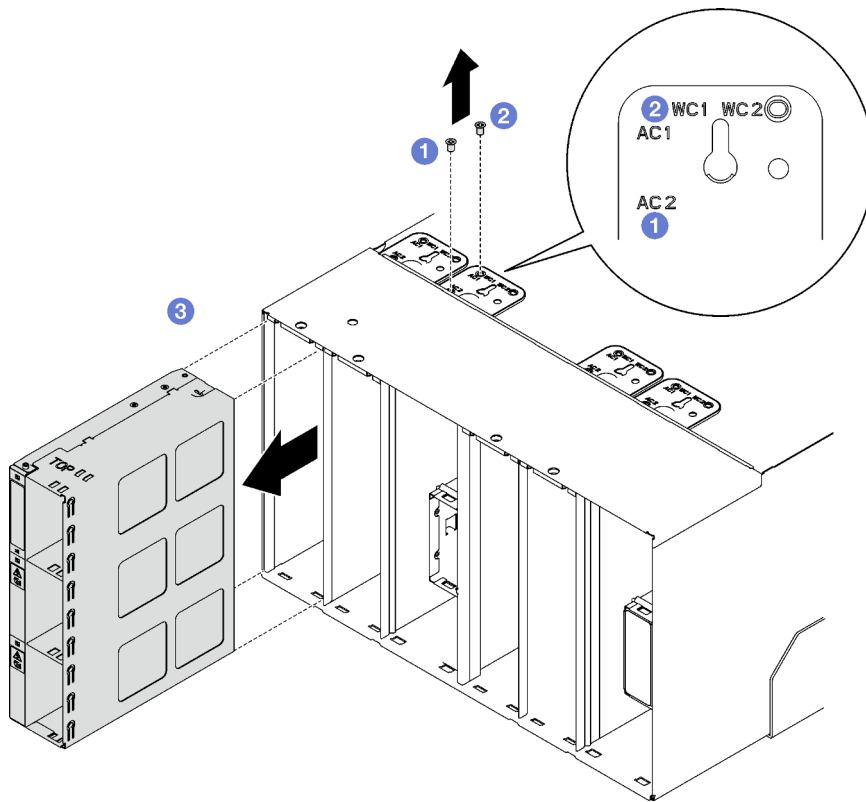


Figure 127. PSU cage removal

### After you finish

1. The enclosure should always be installed with PSU cages, see [“Install a PSU cage” on page 159](#).
2. If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

### Install a PSU cage

Use this information to install a PSU cage.

### About this task

**S001**

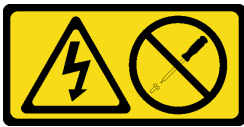


 **DANGER**

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.

**S035**



**CAUTION:**

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

**CAUTION:**



**High touch current. Connect to earth before connecting to supply.**

**Attention:**

- Read “[Installation Guidelines](#)” on page 31 and “[Safety inspection checklist](#)” on page 32 to ensure that you work safely.
- The following notes describe the type of power supply that the enclosure supports and other information that you must consider when you install a power supply:
  - Make sure you follow the guidelines in “[PSU configuration](#)” on page 184.
  - For redundancy support, you must install an additional hot-swap power supply, if one is not installed in your model.
  - Make sure that the devices that you are installing are supported. For a list of supported optional devices for the enclosure, see <https://serverproven.lenovo.com>.

## Procedure

Step 1. Install the PSU cage.

- 1 Slide the PSU cage into the enclosure.
- 2 Secure the screw located at AC1.
- 3 Secure the screw located at AC2.



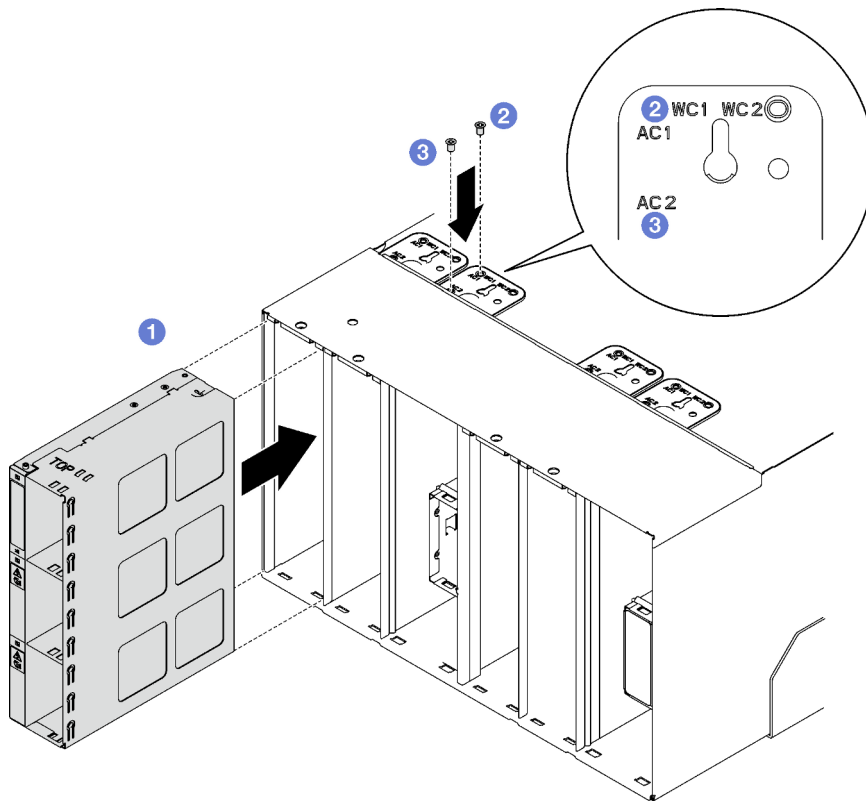


Figure 128. PSU cage installation

### After you finish

Each PSU slot should be installed with a PSU or PSU filler. To install a PSU, see [“Install a hot-swap power supply” on page 118](#). To install the PSU filler, see the illustration below:

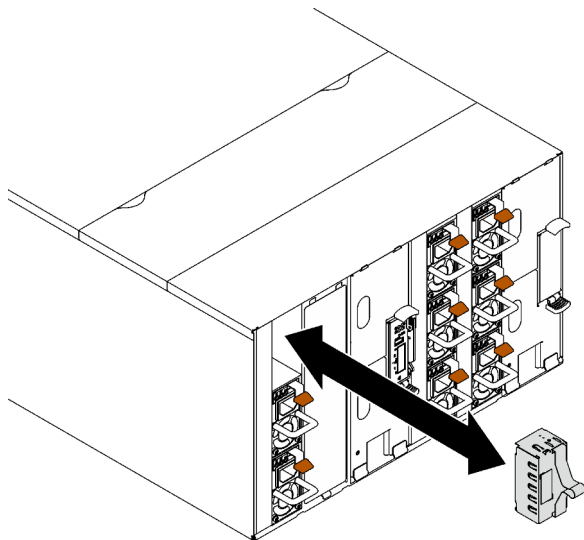


Figure 129. PSU filler installation

## SMM2 battery replacement

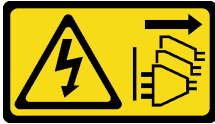
Use the following procedures to remove and install the SMM2 battery.

### Remove the SMM2 battery

Use this information to remove the SMM2 battery.

#### About this task

##### S002



##### **CAUTION:**

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

##### S004



##### **CAUTION:**

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

*Do not:*

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

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

##### S005



##### **CAUTION:**

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

**Attention:**

- Read “[Installation Guidelines](#)” on page 31 and “[Safety inspection checklist](#)” on page 32 to ensure that you work safely.

## Procedure

Step 1. Make preparations for this task.

- Remove the SMM2 and SMM2 support bracket. See “[Remove the SMM2](#)” on page 168.
- If you want to migrate current enclosure settings and the enclosure midplane VPD onto the new SMM2, make sure you have done the following:
  - You had performed SMM2 settings backup, the enclosure VPD backup, and the midplane VPD backup procedures.
  - Keep the old USB key which is removed from the SMM2 and install it onto the new SMM2.

Step 2. Locate the battery.

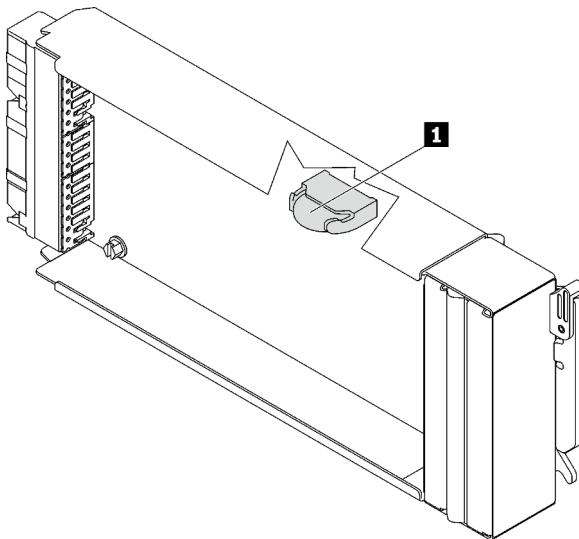


Figure 130. SMM2 battery location

Table 19. SMM2 battery location

<b>1</b> SMM2 battery
-----------------------

Step 3. Using your fingernail, press the battery retaining clip. The battery should pop free.

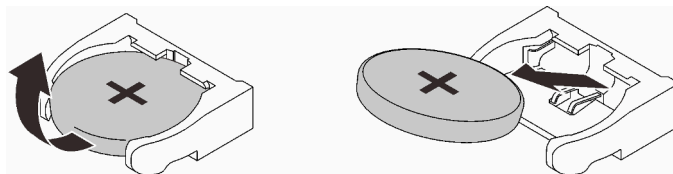


Figure 131. SMM2 battery removal

**Note:** Do not lift the battery by using excessive force. Failing to remove the battery properly may damage the socket on the SMM2. Any damage to the socket may require replacing the SMM2.

Step 4. Dispose of the battery as required by local ordinances or regulations. See *Environmental Notices* for more information.

Step 5. Store original SMM2 VPD back to new SMM2 for warranty remaining, if it is replaced.

## After you finish

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

### Demo video

[Watch the procedure on YouTube](#)

## Install the SMM2 battery

Use this information to install the SMM2 battery.

### About this task

#### S002



#### CAUTION:

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

#### S004



#### CAUTION:

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

*Do not:*

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

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

#### S005



**CAUTION:**

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

**Attention:**

- Read “[Installation Guidelines](#)” on page 31 and “[Safety inspection checklist](#)” on page 32 to ensure that you work safely.
- When replacing the battery, you must replace it with a lithium battery of the same type from the same manufacturer.

**Procedure**

Step 1. Locate the battery.

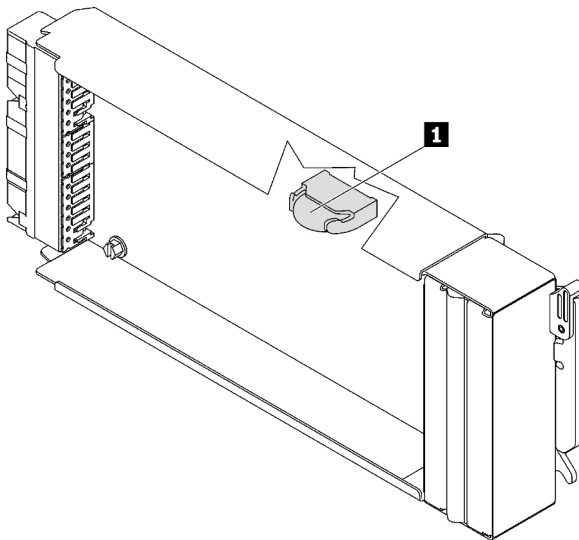


Figure 132. SMM2 battery location

Table 20. SMM2 battery location

<b>1</b> SMM2 battery
-----------------------

- Step 2. Follow any special handling and installation instructions that come with the battery.
- Step 3. Tilt the battery so that you can insert it into the socket.
- Step 4. As you slide the battery into place, press the battery down into the socket until it clicks into place.

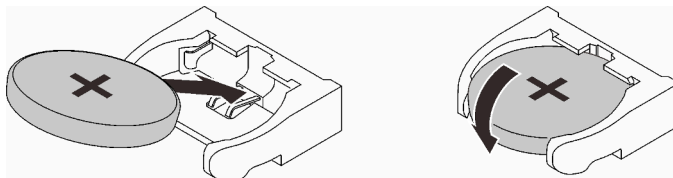


Figure 133. SMM2 battery installation

## After you finish

1. Install the SMM2 and SMM2 support bracket. See “Install the SMM2” on page 172.
2. After you replace the battery, you must reconfigure the SMM2 settings.
3. Start the Setup utility and reset the configuration.

## Demo video

[Watch the procedure on YouTube](#)

## System Management Module 2 (SMM2) replacement

Use the following procedures to remove and install the SMM2.

Go to [https://pubs.lenovo.com/mgt\\_tools\\_smm2/](https://pubs.lenovo.com/mgt_tools_smm2/) for see more details about System Management Module 2.

## USB flash drive replacement for SMM2 data backup and restore

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

## About this task

### Procedure

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

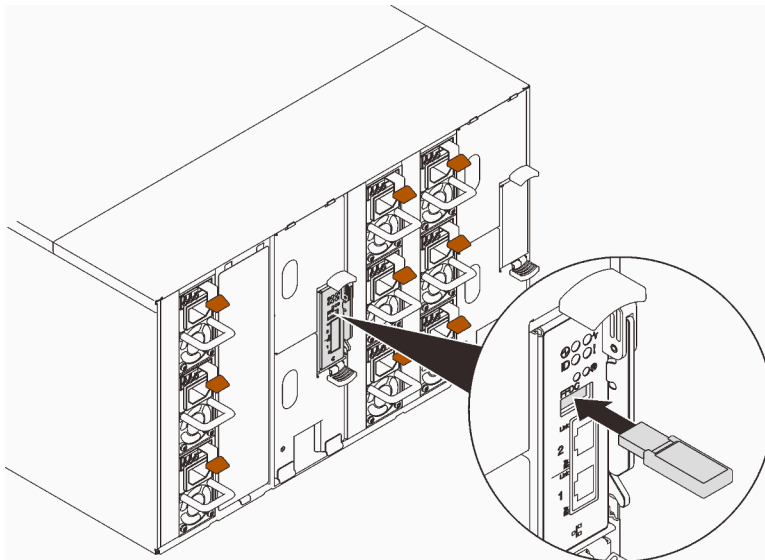


Figure 134. USB flash drive installation

- Step 2. Complete the following steps to perform backup of SMM2 settings, enclosure VPD and power distribution boards (PDB) VPD.
- a. Update the solution firmware to the latest level.
  - b. Log in to SMM2 web interface.
  - c. Go to the **Configuration** section, select **Backup and Restore Configuration**, and perform SMM2 settings backup via **Backup Configuration to Storage Device**.

**Note:** Alternatively, you can choose to back up SMM2 settings via **Backup Configuration from Network**.

- d. Go to the **System Information** section, select **Enclosure VPD** or **PDB VPD**, and perform data backup respectively.

Step 3. After data backup is completed, pull the USB flash drive out of the connector to remove it from the SMM2.

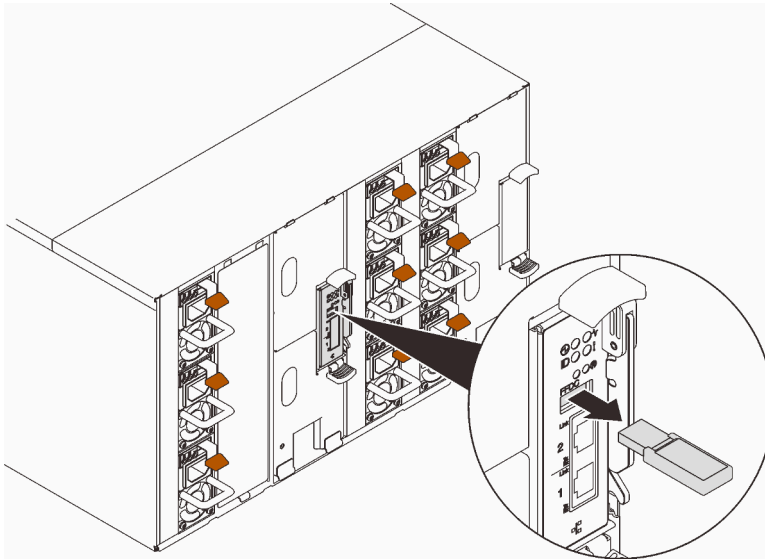


Figure 135. USB flash drive removal

Step 4. Remove the SMM2 from the enclosure. See “[Remove the SMM2](#)” on page 168.

Step 5. Install the new SMM2. See “[Install the SMM2](#)” on page 172.

Step 6. Keep the USB flash drive and install it to the new SMM2.

Step 7. Log in to the SMM2 web interface and perform data restore of SMM2 settings, enclosure VPD and PDB VPD.

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

## After you finish

For more detailed information, see “Backup and Restore Configuration” in *System Management Module 2 User Guide* at [https://pubs.lenovo.com/mgt\\_tools\\_smm2/c\\_smm\\_recovery](https://pubs.lenovo.com/mgt_tools_smm2/c_smm_recovery).

## Backup and Restore

Configurations are automatically saved when they are set or modified. You can back up or restore the configurations to or from a local device.

If a storage device is inserted and detected, it can be used for SMM2 to preserve and migrate SEL and user configurations. SMM2 only keeps the latest configuration file in the storage device for backup and restore.

**Note:** The storage device can be a USB device depending on the machine types. The storage capacity of the USB storage device should be higher than 1 GB. The support file system is FAT32. For more details, refer to “[USB flash drive replacement for SMM2 data backup and restore](#)” on page 166.

# Backup and Restore Configuration

Latest Network backup file time: N/A	
Backup Configuration from Network	<input type="button" value="Apply"/>
Restore from Network Backup Configuration	
<input type="button" value="Choose File"/> No file chosen	<input type="button" value="Apply"/>
<hr/>	
Latest storage device backup file time: N/A	
Backup Configuration to storage device	<input type="button" value="Apply"/>
Restore Configuration from storage device	<input type="button" value="Apply"/>
Note:	
The storage device can be a USB device	

Figure 136. SMM2 Backup and Restore Configuration

- **Backup:** Allows users to back up SEL and the following enclosure configurations to a local device or USB storage device.
  - Power supply redundancy policy
  - Oversubscription mode
  - Zero output
  - Enclosure capping/saving or compute node capping/saving
  - Acoustic mode setting
  - Power restore policy
  - The settings in the configuration tabs
- **Restore:** Allows users to restore and apply the configurations stored in a local device or USB storage device to SMM2.

## Remove the SMM2

Use this information to remove the SMM2.

### About this task

#### S002



#### **CAUTION:**

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

#### S038





**CAUTION:**  
Eye protection should be worn for this procedure.

**Attention:**

- Read [“Installation Guidelines” on page 31](#) and [“Safety inspection checklist” on page 32](#) to ensure that you work safely.
- If you want to migrate current enclosure settings and the enclosure midplane VPD onto the new SMM2, make sure you have done the following:
  1. You had performed SMM2 settings backup, the enclosure VPD backup, and the midplane VPD backup procedures.
  2. Keep the old USB key which is removed from the SMM2 and install it onto the new SMM2.

**Procedure**

Step 1. Make preparations for this task.

- a. Remove the EMC shields. See [“Remove an EMC shield” on page 104](#).
- b. If you want to migrate current enclosure settings and the enclosure midplane VPD onto the new SMM2, make sure you have done the following:
  1. You had performed SMM2 settings backup, the enclosure VPD backup, and the midplane VPD backup procedures.
  2. Keep the old USB key which is removed from the SMM2 and install it onto the new SMM2.

Step 2. Remove the SMM2.

- a. ① Rotate the latch outwards.
- b. ② Slide the SMM2 out of the support bracket.

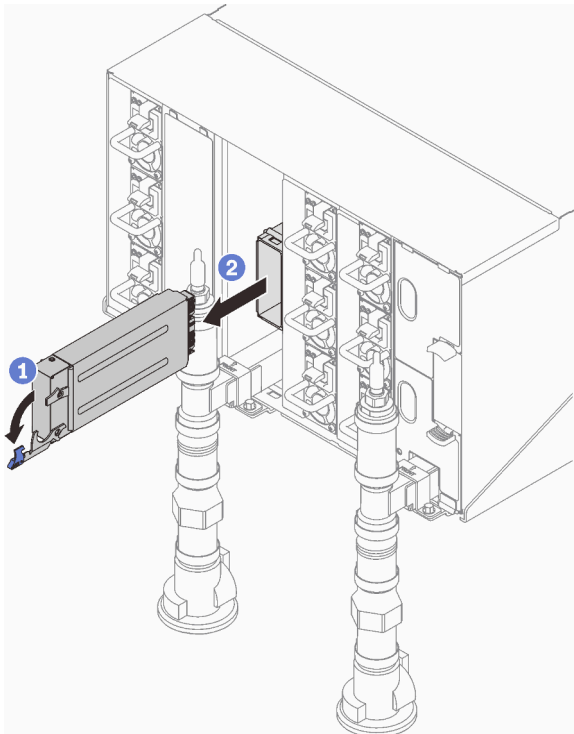


Figure 137. SMM2 removal

Step 3. Remove the support bracket.

- a. ① Press and hold the release tabs on the support bracket.
- b. ② Slightly lift the support bracket upwards to disengage it with the enclosure wall.
- c. ③ Remove the support bracket away from the enclosure wall.
- d. ④ Slide the support bracket out of the enclosure.

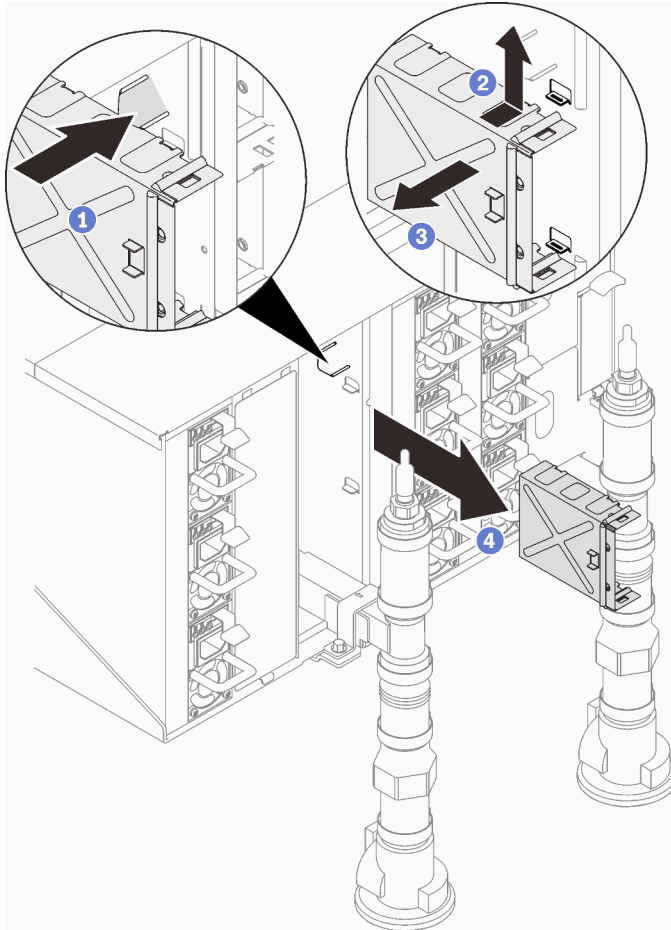


Figure 138. Support bracket removal

Step 4. If necessary, remove the blank filler.

- a. ① Press and hold the release tabs on the blank filler.
- b. ② Slightly lift the blank filler upwards to disengage it with the enclosure wall.
- c. ③ Remove the blank filler away from the enclosure wall.
- d. ④ Slide the blank filler out of the enclosure.

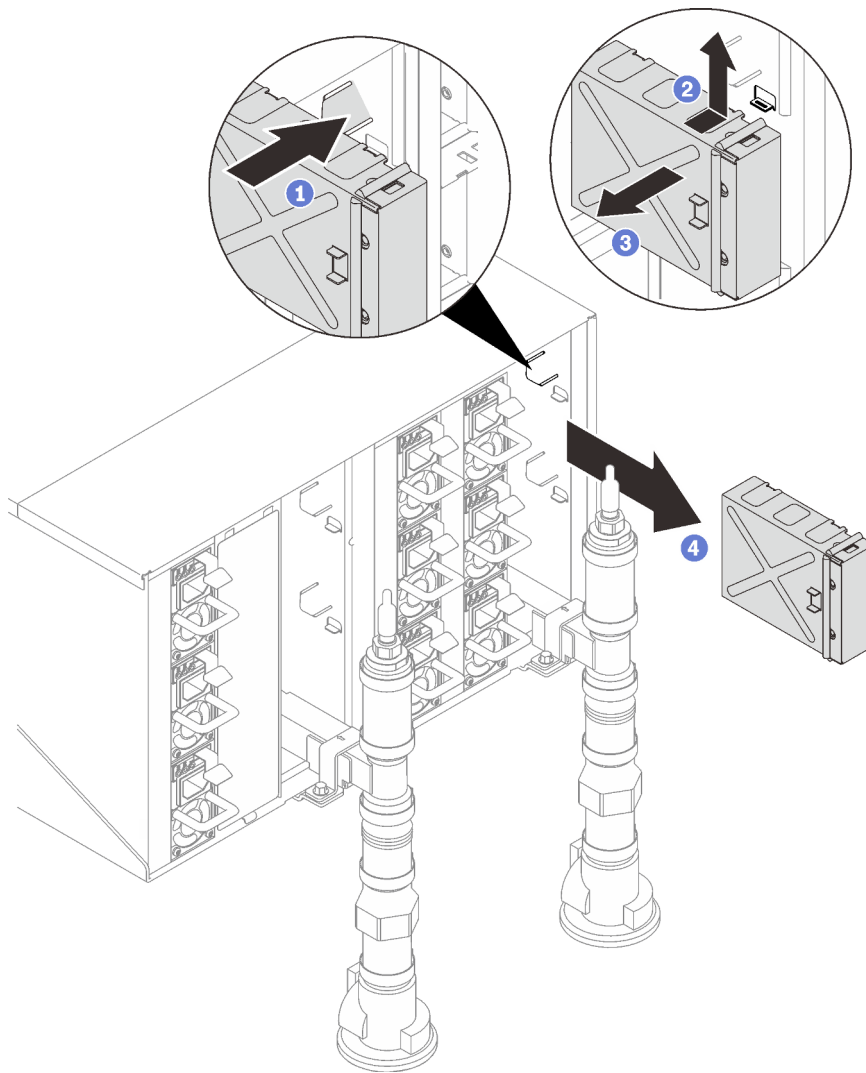


Figure 139. Blank filler removal

## After you finish

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

If you need to disassemble the SMM2 for recycle, follow the instructions below:

**Attention:** You can only disassemble the SMM2 for recycle. Do not disassemble it for any other purposes.

1. Remove the SMM2 battery. See [“Remove the SMM2 battery”](#) on page 162.
2. Remove the four screws that secure the SMM2 board to the module.
3. Gently slide the SMM2 board out of the module.

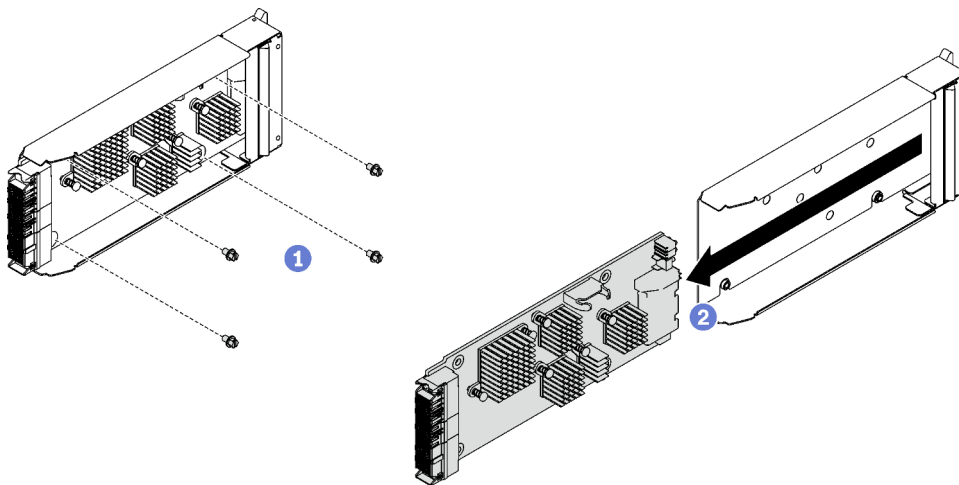


Figure 140. SMM2 board removal

4. Recycle the unit in compliance with local regulations.

#### Demo video

[Watch the procedure on YouTube](#)

#### Install the SMM2

Use this information to install the SMM2.

#### About this task

##### S002



#### CAUTION:

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

##### S038



#### CAUTION:

Eye protection should be worn for this procedure.

#### Attention:

- Read [“Installation Guidelines”](#) on page 31 and [“Safety inspection checklist”](#) on page 32 to ensure that you work safely.

**Firmware and driver download:** You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/products/servers/thinksystem/dw612-enclosure/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” on page 179 for more information on firmware updating tools.

## Procedure

Step 1. Install the SMM2 module support bracket.

- 1 Slide the support bracket into the enclosure.
- 2 Align and insert the support bracket into the enclosure wall until it engages.

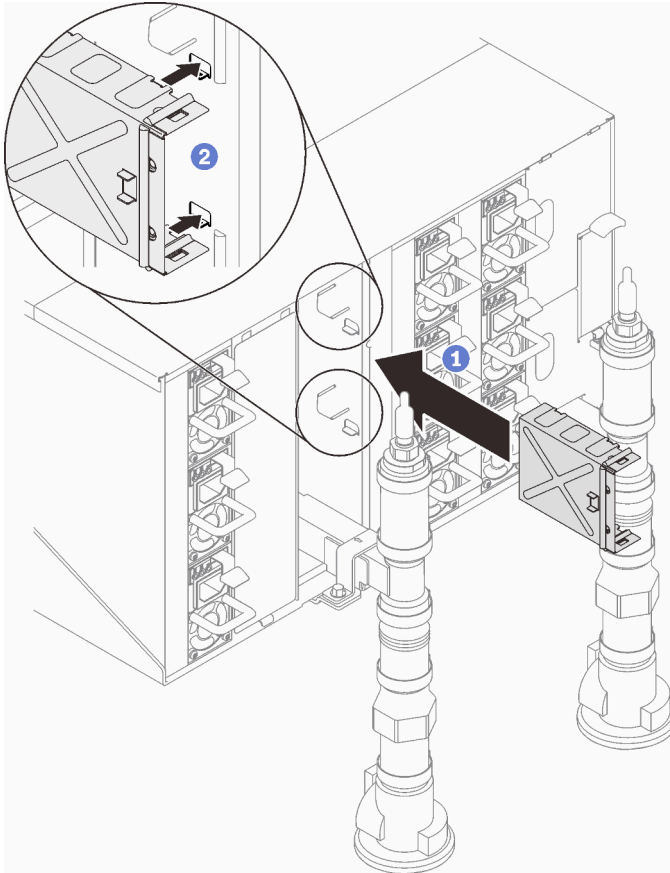


Figure 141. Support bracket installation

Step 2. Install the SMM2 module.

- 1 Align and slide the SMM2 module into the support bracket.
- 2 Rotate the latch inwards to secure the SMM2 module.

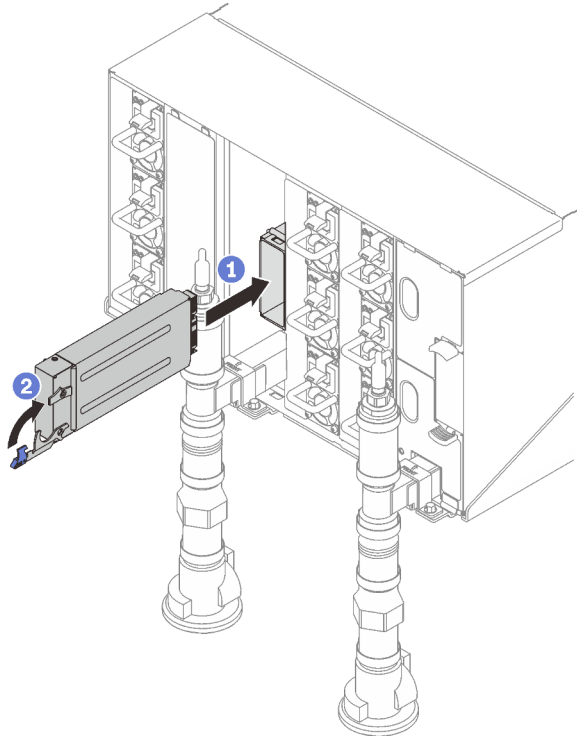


Figure 142. SMM2 installation

Step 3. If necessary, install the blank filler.

- a. ① Slide the blank filler into the enclosure.
- b. ② Align and insert the blank filler into the enclosure wall until it engages.

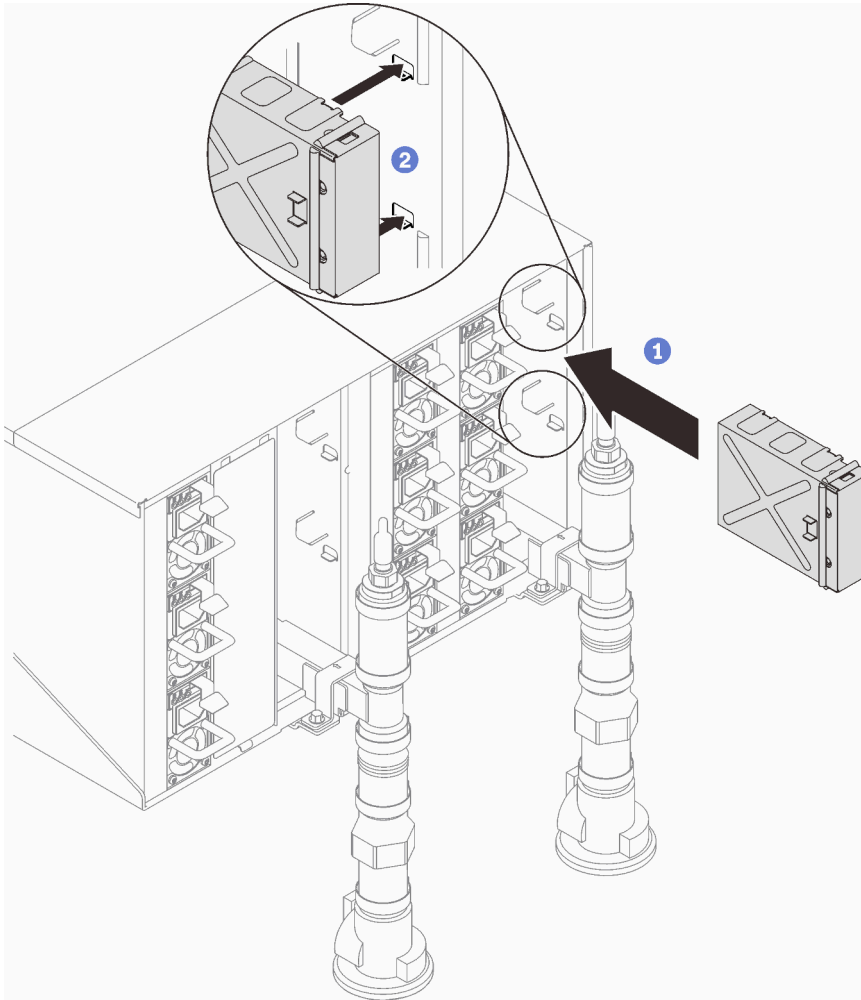


Figure 143. Blank filler installation

### After you finish

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

### Demo video

[Watch the procedure on YouTube](#)

### Complete the parts replacement

Go through the checklist to complete parts replacement

To complete the parts replacement, do the following:

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your solution.

2. Properly route and secure the cables in the solution. Refer to the cable connecting and routing information for each component.
3. Reconnect external cables and power cords to the solution.

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

4. Power on the solution and any peripheral devices. See “Power on the solution” on page 34.
5. Update the solution configuration.
  - Download and install the latest device drivers: <http://datacentersupport.lenovo.com>.
  - Update the system firmware. See “Update the firmware” on page 179.
  - Update the UEFI configuration. See <https://pubs.lenovo.com/uefi-overview/>.
  - Reconfigure the disk arrays if you have installed or removed a hot-swap drive or a RAID adapter. See <https://pubs.lenovo.com/lxpm-overview/> for the LXPM documentation compatible with your solution.



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## Chapter 6. System configuration

Complete these procedures to configure your system.

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### Set the network connection for the Lenovo XClarity Controller

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

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

- If a monitor is attached to the server, you can use Lenovo XClarity 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 server.
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 is attached to the server, you can set the network connection through the System Management Module interface. Connect an Ethernet cable from your laptop to the Ethernet port on the System Management Module, which is located at the rear of the server.

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

To access the System Management Module interface, the System Management Module network must be enabled. For more information about accessing the System Management Module, see: *System Management Module User’s Guide* at [https://pubs.lenovo.com/mgt\\_tools\\_smm2/](https://pubs.lenovo.com/mgt_tools_smm2/).

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. See the “Identify the server and the access the Lenovo XClarity Controller” section in the *User Guide* of the high-density server.

- 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 location of Lenovo XClarity Controller USB connector and USB 3.0 Console Breakout Cable connector, see the “Front View” section in the *User Guide* of the high-density server.

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

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## Set front USB port for Lenovo XClarity Controller connection

Before you can access the Lenovo XClarity Controller through the front USB port, you need to configure the USB port for Lenovo XClarity Controller connection.

### Server support

To see if your server supports accessing Lenovo XClarity Controller through the front USB port, check one of the following:

- Refer to [Chapter 2 “Enclosure components” on page 17](#).



- If there is a wrench icon on the USB port of your server, you can set the USB port to connect to Lenovo XClarity Controller.

### Setting the USB port for Lenovo XClarity Controller connection

You can switch the USB port between normal and Lenovo XClarity Controller management operation by performing one of the following steps.

- Hold the ID button for at least 3 second until its LED flashes slowly (once every couple of seconds). See [Chapter 2 “Enclosure components” on page 17](#) for ID button location.
- From the Lenovo XClarity Controller management controller CLI, run the `usbfp` command. For information about using the Lenovo XClarity Controller CLI, see the “Command-line interface” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.
- From the Lenovo XClarity Controller management controller web interface, click **BMC Configuration → Network → Front Panel USB Port Manager**. For information about Lenovo XClarity Controller web interface functions, see the “Description of XClarity Controller functions on web interface” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.

### Checking USB port current setting

You can also check the current setting of the USB port using the Lenovo XClarity Controller management controller CLI (`usbfp` command) or the Lenovo XClarity Controller management controller web interface (**BMC Configuration → Network → Front Panel USB Port Manager**). See the “Command-line interface” and “Description of XClarity Controller functions on web interface” sections in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.

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## 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:
  - <https://lenovopress.lenovo.com/lp0656-lenovo-thinksystem-firmware-and-driver-update-best-practices>
- The latest firmware of the high-density server can be found at the following site:
  - <https://datacentersupport.lenovo.com/products/servers/thinksystem/sd650v3/7d7m/downloads/driver-list/>
  - <https://datacentersupport.lenovo.com/products/servers/thinksystem/sd650iv3/7d7l/downloads/driver-list/>
  - <https://datacentersupport.lenovo.com/products/servers/thinksystem/sd665v3/7d9p/downloads/driver-list/>
- You can subscribe to product notification to stay up to date on firmware updates:
  - <https://datacentersupport.lenovo.com/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
<b>Lenovo XClarity Provisioning Manager (LXPM)</b>	In-band <sup>2</sup> On-Target	√		√		
<b>Lenovo XClarity Controller (XCC)</b>	Out-of-band Off-Target	√	Selected I/O devices	√		
<b>Lenovo XClarity Essentials OneCLI (OneCLI)</b>	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√	√
<b>Lenovo XClarity Essentials UpdateXpress (LXCE)</b>	In-band Out-of-band On-Target Off-Target	√	All I/O devices	√		√
<b>Lenovo XClarity Essentials Bootable Media Creator (BoMC)</b>	In-band Out-of-band Off-Target	√	All I/O devices	√ (BoMC application)	√ (BoMC application)	√
<b>Lenovo XClarity Administrator (LXCA)</b>	In-band <sup>1</sup> Out-of-band <sup>2</sup> Off-Target	√	All I/O devices	√		√
<b>Lenovo XClarity Integrator (LXCI) for VMware vCenter</b>	Out-of-band Off-Target	√	Selected I/O devices	√		
<b>Lenovo XClarity Integrator (LXCI) for Microsoft Windows Admin Center</b>	In-band Out-of-band On-Target Off-Target	√	All I/O devices	√		√
<b>Lenovo XClarity Integrator (LXCI) for Microsoft System Center Configuration Manager</b>	In-band On-Target	√	All I/O devices	√		√
<b>Notes:</b>						
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](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/Invo-xpress>

- **Lenovo XClarity Essentials Bootable Media Creator**

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

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

<https://datacentersupport.lenovo.com/solutions/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](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/>

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## Configure the firmware

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

**Important:** Lenovo does not recommend setting option ROMs to **Legacy**, but you can conduct this setting if necessary. Note that this setting prevents UEFI drivers for the slot devices from loading, which may cause negative side effects to Lenovo software, such as LXCA, OneCLI, and XCC. These side effects include but are not limited to the inability to determine adapter card details, such as model name and firmware levels. For example, "ThinkSystem RAID 930-16i 4GB Flash" may be displayed as "Adapter 06:00:00". In some cases, the functionality on a specific PCIe adapter may not be enabled properly.

- **Lenovo XClarity Provisioning Manager (LXPM)**

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:

- Search for the LXPM documentation version compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>
- *UEFI User Guide* at <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](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](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, the command-line interface, or Redfish API.

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/>

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## Memory module configuration

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

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

<https://lenovopress.lenovo.com/servers/options/memory>

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

[https://dcsc.lenovo.com/#/memory\\_configuration](https://dcsc.lenovo.com/#/memory_configuration)

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## 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.

Make sure to refer to “Memory module installation rules and order” section in the *User Guide* of the high-density server, which specifies whether your server supports SGX and lists the memory module population sequence for SGX configuration.

Complete the following steps to enable SGX.

- Step 1. 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 2. Go to **System settings** → **Processors** → **UMA-Based Clustering** and disable the option.
- Step 3. Go to **System settings** → **Processors** → **Total Memory Encryption (TME)** and enable the option.
- Step 4. Save the changes, then go to **System settings** → **Processors** → **SW Guard Extension (SGX)** and enable the option.

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## RAID configuration

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

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

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

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

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

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

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

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## PSU configuration

Refer to the following section for more information on the PSU configurations.

- “SD650 V3 PSU configuration” on page 184
- “SD650-I V3 PSU configuration” on page 185
- “SD650-N V3 PSU configuration” on page 186
- “SD665 V3 PSU configuration” on page 187
- “SD665-N V3 PSU configuration” on page 187

### SD650 V3 PSU configuration

#### PSU support matrix

Validate the power requirements for your configuration using the latest version of the Power Configurator to ensure that the number of power supplies selected are adequate for supporting your chassis configuration. The Power Configurator tool can be found at <https://datacentersupport.lenovo.com/solutions/Invo-lcp>.

#### CAUTION:

**Failure to validate the configuration with the Power Configurator tool could result in system errors, failure to power on, or microprocessor throttling, and limiting system's ability to leverage all the microprocessor performance.**

**Note:** The tables below are based on nodes with all DIMM slots, PCIe slots, and hard disk drives populated.



Component	SD650 V3 support configurations
ThinkSystem 2400W (230V) v2 Platinum PSU	6 or 9 PSUs
ThinkSystem 2600W (230V) v2 Titanium PSU	6 or 9 PSUs Mixing PSUs manufactured by different vendors is not supported.
7200W Titanium DWC PSU	2 or 3 PSUs
High Power Midplane	Supported
Standard Midplane (Air PSU only)	Supported
SMM2	Supported

### Power policy

Component	SD650 V3 power policy
ThinkSystem 2400W (230V) v2 Platinum PSU	6 PSU: 5+1 with OVS, or Non-redundancy 9 PSU: 8+1 without OVS
ThinkSystem 2600W (230V) v2 Titanium PSU	6 PSU: 5+1 with OVS, or Non-redundancy 9 PSU: 8+1 without OVS
7200W Titanium DWC PSU	2 PSUs configured as 5+1 redundancy without OVS 3 PSUs configured as 8+1 redundancy without OVS

**Note:** OVS (Oversubscription) of the power system allows for more efficient use of the available system power.

### SD650-I V3 PSU configuration

#### PSU support matrix

Validate the power requirements for your configuration using the latest version of the Power Configurator to ensure that the number of power supplies selected are adequate for supporting your chassis configuration. The Power Configurator tool can be found at <https://datacentersupport.lenovo.com/solutions/Invo-lcp>.

#### CAUTION:

**Failure to validate the configuration with the Power Configurator tool could result in system errors, failure to power on, or microprocessor throttling, and limiting system's ability to leverage all the microprocessor performance.**

**Note:** The tables below are based on nodes with all DIMM slots, PCIe slots, and hard disk drives populated.

Component	SD650-I V3 support configurations
ThinkSystem 2400W (230V) v2 Platinum PSU	6 or 9 PSUs
ThinkSystem 2600W (230V) v2 Titanium PSU	6 or 9 PSUs Mixing PSUs manufactured by different vendors is not supported.
7200W Titanium DWC PSU	3 PSUs

Component	SD650-I V3 support configurations
High Power Midplane	Supported
Standard Midplane (Air PSU only)	Supported
SMM2	Supported

### Power policy

Component	SD650-I V3 power policy
ThinkSystem 2400W (230V) v2 Platinum PSU	9 PSU: 8+1 without OVS
ThinkSystem 2600W (230V) v2 Titanium PSU	6 PSU: 5+1 with OVS, or Non-redundancy 9 PSU: 8+1 without OVS
7200W Titanium DWC PSU	3 PSUs configured as 8+1 redundancy without OVS

**Note:** OVS (Oversubscription) of the power system allows for more efficient use of the available system power.

### SD650-N V3 PSU configuration

#### PSU support matrix

Validate the power requirements for your configuration using the latest version of the Power Configurator to ensure that the number of power supplies selected are adequate for supporting your chassis configuration. The Power Configurator tool can be found at <https://datacentersupport.lenovo.com/solutions/Invo-lcp>.

#### CAUTION:

**Failure to validate the configuration with the Power Configurator tool could result in system errors, failure to power on, or microprocessor throttling, and limiting system's ability to leverage all the microprocessor performance.**

**Note:** The tables below are based on nodes with all DIMM slots, PCIe slots, and hard disk drives populated.

Component	SD650-N V3 support configurations
ThinkSystem 2600W (230V) v2 Titanium PSU	9 PSUs
7200W Titanium DWC PSU	3 PSUs
High Power Midplane	Supported
Standard Midplane (Air PSU only)	Supported
SMM2	Supported

### Power policy

Component	SD650-N V3 power policy
ThinkSystem 2600W (230V) v2 Titanium PSU	9 PSU: 8+1 without OVS
7200W Titanium DWC PSU	3 PSUs configured as 8+1 redundancy without OVS

**Note:** OVS (Oversubscription) of the power system allows for more efficient use of the available system power.

## SD665 V3 PSU configurations

### PSU support matrix

Validate the power requirements for your configuration using the latest version of the Power Configurator to ensure that the number of power supplies selected are adequate for supporting your chassis configuration. The Power Configurator tool can be found at <https://datacentersupport.lenovo.com/solutions/Invo-lcp>.

#### CAUTION:

**Failure to validate the configuration with the Power Configurator tool could result in system errors, failure to power on, or microprocessor throttling, and limiting system's ability to leverage all the microprocessor performance.**

**Note:** The tables below are based on nodes with all DIMM slots, PCIe slots, and hard disk drives populated.

Component	SD665 V3 support configurations
ThinkSystem 2400W (230V) v2 Platinum PSU	6 or 9 PSUs
ThinkSystem 2600W (230V) v2 Titanium PSU	6 or 9 PSUs Mixing PSUs manufactured by different vendors is not supported.
7200W Titanium DWC PSU	2 or 3 PSUs
High Power Midplane	Supported
SMM2	Supported

### Power policy

Component	SD665 V3 power policy
ThinkSystem 2400W (230V) v2 Platinum PSU	6 PSU: 5+1 with OVS, or Non-redundancy 9 PSU: 8+1 without OVS
ThinkSystem 2600W (230V) v2 Titanium PSU	6 PSU: 5+1 with OVS, or Non-redundancy 9 PSU: 8+1 without OVS
7200W Titanium DWC PSU	2 PSUs configured as 5+1 redundancy with OVS 3 PSUs configured as 8+1 redundancy without OVS

**Note:** OVS (Oversubscription) of the power system allows for more efficient use of the available system power.

## SD665-N V3 PSU configurations

### PSU support matrix

Validate the power requirements for your configuration using the latest version of the Power Configurator to ensure that the number of power supplies selected are adequate for supporting your chassis configuration. The Power Configurator tool can be found at <https://datacentersupport.lenovo.com/solutions/Invo-lcp>.

#### CAUTION:

**Failure to validate the configuration with the Power Configurator tool could result in system errors, failure to power on, or microprocessor throttling, and limiting system's ability to leverage all the microprocessor performance.**

**Note:** The tables below are based on nodes with all DIMM slots, PCIe slots, and hard disk drives populated.

Component	SD665-N V3 support configurations
ThinkSystem 2600W (230V) v2 Titanium PSU	9 PSUs <b>Note:</b> Mixing PSUs manufactured by different vendors is not supported.
7200W Titanium DWC PSU	3 PSUs
High Power Midplane	Supported
SMM2	Supported

### Power policy

Component	SD665-N V3 power policy
ThinkSystem 2600W (230V) v2 Titanium PSU	9 PSU: 8+1 without OVS
7200W Titanium DWC PSU	3 PSUs configured as 8+1 redundancy without OVS

**Note:** OVS (Oversubscription) of the power system allows for more efficient use of the available system power.

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## 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](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](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](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](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](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.

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## **Back up the server configuration**

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

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

- **Management processor**

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

“Backing up the BMC configuration” section in the XCC documentation compatible with your server 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](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 server.



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## Chapter 7. Problem determination

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

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

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

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

### Web resources

- **Tech tips**

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

To find the Tech Tips available for your server:

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

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

- **Lenovo Data Center Forum**

- Check [https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv\\_eg](https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg) to see if someone else has encountered a similar problem.

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## Event logs

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

**Note:** For a listing of events, including user actions that might need to be performed to recover from an event, see the *Messages and Codes Reference*, which is available at [https://pubs.lenovo.com/dw612s\\_neptune\\_enclosure/pdf\\_files](https://pubs.lenovo.com/dw612s_neptune_enclosure/pdf_files).

### Lenovo XClarity Administrator event log

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

## Logs

Severity	Serviceability	Date and Time	System	Event	System Type	Source ID
Warning	Support	Jan 30, 2017, 7:48:07 AM	Chassis114:...	Node Node 08 device	Chassis	Jan 30, 20
Warning	Support	Jan 30, 2017, 7:48:07 AM	Chassis114:...	Node Node 02 device	Chassis	Jan 30, 20
Warning	User	Jan 30, 2017, 7:48:07 AM	Chassis114:...	I/O module IO Module	Chassis	Jan 30, 20
Warning	User	Jan 30, 2017, 7:48:07 AM	Chassis114:...	Node Node 08 incom	Chassis	Jan 30, 20

Figure 144. Lenovo XClarity Administrator event log

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

[http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/events\\_vieweventlog.html](http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/events_vieweventlog.html)

### System Management Module 2 event log

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

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

#### Event Log

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

System Event Count (Current / Maximum) 8 / 4090

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

1

Figure 145. SMM2 event log

### Lenovo XClarity Controller event log

The Lenovo XClarity Controller monitors the physical state of the server and its components using sensors that measure internal physical variables such as temperature, power-supply voltages, fan speeds, and component status. The Lenovo XClarity Controller provides various interfaces to systems management software and to system administrators and users to enable remote management and control of a server.



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

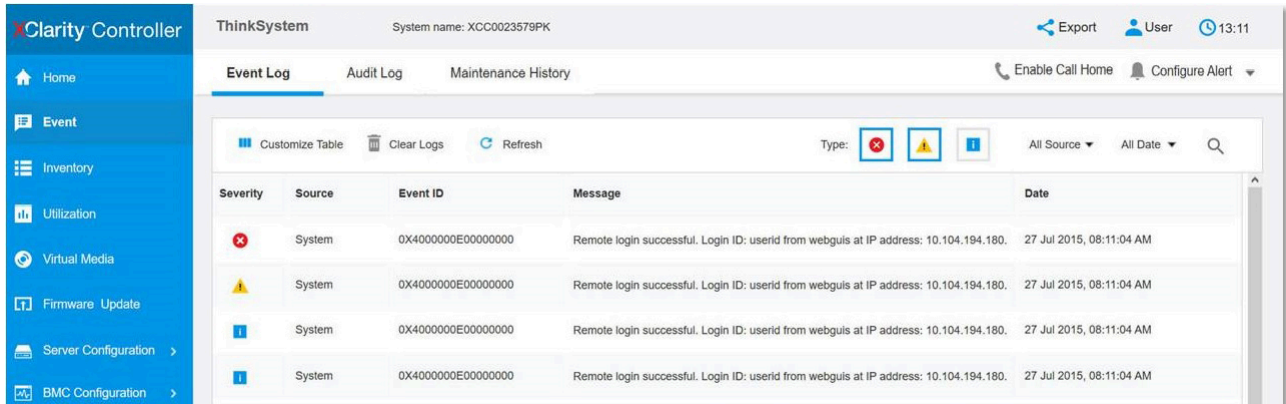


Figure 146. Lenovo XClarity Controller event log

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

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

## Troubleshooting by system LEDs and diagnostics display

See the following section for information on available system LEDs and diagnostics display.

### System Management Module 2 (SMM 2) LEDs

The following illustration shows the LEDs on the SMM2 module.

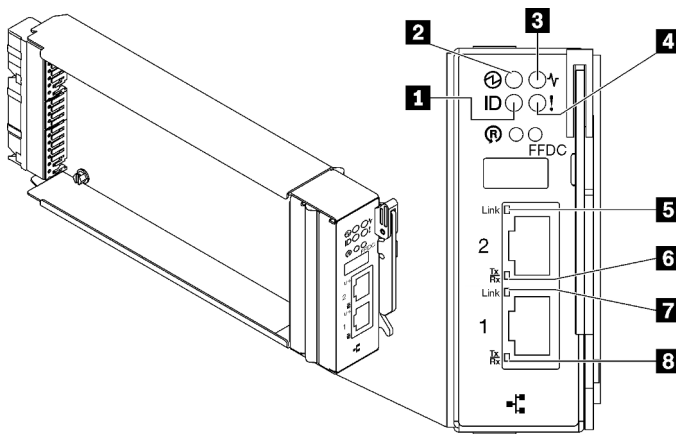


Figure 147. SMM2 LEDs

Table 21. SMM2 connectors and LEDs

<b>1</b> Identification LED (blue)	<b>5</b> Ethernet port 2 link (RJ-45) LED (green)
<b>2</b> Power LED (green)	<b>6</b> Ethernet port 2 activity (RJ-45) LED (green)

Table 21. SMM2 connectors and LEDs (continued)

<b>3</b> Status LED (green)	<b>7</b> Ethernet port 1 link (RJ-45) LED (green)
<b>4</b> Check log LED (yellow)	<b>8</b> Ethernet port 1 activity (RJ-45) LED (green)

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

**2 Power-on LED:** When this LED is lit (green), it indicates that the SMM2 has power.

**3 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).

**4 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.

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

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

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

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

## Power supply LEDs

This topic provides information about various power supply LED status and corresponding action suggestions.

For SD650 V2/SD650-N V2, see the “Specifications” section in *Maintenance Manual* of the high-density server for information on minimal configuration required to start the solution.

The following minimal configuration is required for the solution to start:

- **SD650 V3**
  - One DW612S Enclosure
  - One SD650 V3 tray (with two compute nodes)
  - Two processors per node
  - 16 DIMMs per node
  - Two CFF v4 power supplies (2400W or above) or one DWC PSU
  - One drive (any type) (If OS is needed for debugging)

- **SD650-I V3**
  - One DW612S Enclosure
  - One SD650-I V3 tray (with one compute node and one GPU node)
  - Two processors on the compute node
  - Four Intel OAM GPU on the GPU node
  - 16 DIMMs on the compute node
  - Two CFF v4 power supplies (2400W or above) or one DWC PSU
  - One drive (any type) (If OS is needed for debugging)
- **SD650-N V3**
  - One DW612S Enclosure
  - One SD650-N V3 tray
  - Two processors on the compute node
  - One NVIDIA HGX H100 4-GPU board and network board (4 Connect-X 7)
  - 2 DIMMs per node in slot 4 and slot 13. (one DIMM per processor)
  - Two CFF v4 power supplies or one DWC PSU
  - One drive (any type) (If OS is needed for debugging)
- **SD665 V3**
  - One DW612S Enclosure
  - One SD665 V3 tray (with two compute nodes)
  - Two processors per node
  - 2 DIMMs per node in slot 6 and slot 19. (one DIMM per processor)
  - Two CFF v4 power supplies (2400W or above) or one DWC PSU
  - One drive (any type) (If OS is needed for debugging)
- **SD665-N V3**
  - One DW612S Enclosure
  - One SD665-N V3 tray
  - Two processors on the compute node
  - One NVIDIA HGX H100 4-GPU board and network board (4 Connect-X 7)
  - 2 DIMMs per node in slot 6 and slot 19. (one DIMM per processor)
  - Two CFF v4 power supplies or one DWC PSU
  - One drive (any type) (If OS is needed for debugging)

The power supplies get electrical power from a 200 - 240 V ac power source and convert the ac input into 12 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 DWC tray and modules through the system midplane.

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 midplane.

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

You have to install all of nine power supplies regardless of the type of power supply, the enclosure power load, or selected enclosure power policy.

The enclosure 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 V ac in a enclosure that is powered by 200 - 240 V ac power supplies, the 100 - 127 V power supply will not power on. The same restriction applies to a enclosure that is powered by 100 - 127 V ac power supplies. If you install a 200 - 240 V ac power supply in a enclosure that is powered by 100 - 127 V ac power supplies, the 200 - 240 V ac power supply will not power on.

The following illustration shows the LEDs on the power supply:

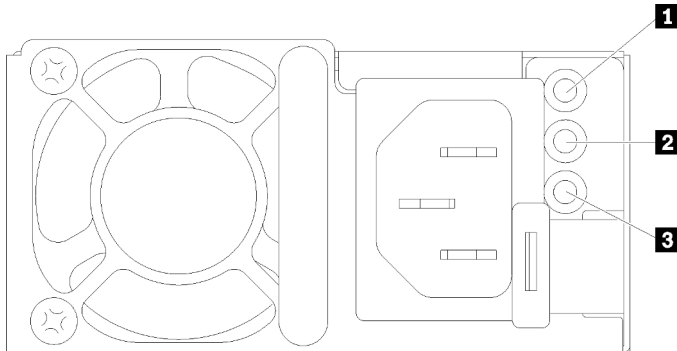


Figure 148. AC power supply LEDs

<b>1</b> Input (AC) power LED (green)	<b>3</b> Power supply error LED (yellow)
<b>2</b> Output (DC) power LED (green)	

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 enclosure midplane.

**3 Power supply error LED (yellow):** When this LED is lit (yellow), it indicates that there is a fault with the power supply. Dump the FFDC log from the system and contact Lenovo back end support team for PSU data log reviewing.

**Note:** Before unplugging the ac power cord from the power supply, or removing the power supply from the enclosure, verify that the capacity of the remaining power supplies are sufficient to meet the minimum power requirements for all components in the enclosure.

## DWC power supply LEDs

This topic provides information about various DWC power supply LED status and corresponding action suggestions.

For SD650 V2/SD650-N V2, see the “Specifications” section in *User Guide* of the high-density server for information on minimal configuration required to start the solution.

The following minimal configuration is required for the solution to start:

- **SD650 V3**
  - One DW612S Enclosure
  - One SD650 V3 tray (with two compute nodes)
  - Two processors per node
  - 16 DIMMs per node
  - Two CFF v4 power supplies (2400W or above) or one DWC PSU
  - One drive (any type) (If OS is needed for debugging)
- **SD650-I V3**
  - One DW612S Enclosure
  - One SD650-I V3 tray (with one compute node and one GPU node)
  - Two processors on the compute node
  - Four Intel OAM GPU on the GPU node
  - 16 DIMMs on the compute node
  - Two CFF v4 power supplies (2400W or above) or one DWC PSU
  - One drive (any type) (If OS is needed for debugging)
- **SD650-N V3**
  - One DW612S Enclosure
  - One SD650-N V3 tray
  - Two processors on the compute node
  - One NVIDIA HGX H100 4-GPU board and network board (4 Connect-X 7)
  - 2 DIMMs per node in slot 4 and slot 13. (one DIMM per processor)
  - Two CFF v4 power supplies or one DWC PSU
  - One drive (any type) (If OS is needed for debugging)
- **SD665 V3**
  - One DW612S Enclosure
  - One SD665 V3 tray (with two compute nodes)
  - Two processors per node
  - 2 DIMMs per node in slot 6 and slot 19. (one DIMM per processor)
  - Two CFF v4 power supplies (2400W or above) or one DWC PSU
  - One drive (any type) (If OS is needed for debugging)
- **SD665-N V3**
  - One DW612S Enclosure
  - One SD665-N V3 tray
  - Two processors on the compute node
  - One NVIDIA HGX H100 4-GPU board and network board (4 Connect-X 7)
  - 2 DIMMs per node in slot 6 and slot 19. (one DIMM per processor)
  - Two CFF v4 power supplies or one DWC PSU
  - One drive (any type) (If OS is needed for debugging)

The power supplies get electrical power from a 200 - 240 V ac power source and convert the ac input into 12 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 DWC tray and modules through the system midplane.

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

Each DWC power supply has internal water loops and a controller. The power supply controller can be powered by any installed power supply that is providing power through the midplane.

You have to install all three DWC power supplies regardless of the type of power supply, the enclosure power load, or selected enclosure power policy.

The enclosure 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 V ac in a enclosure that is powered by 200 - 240 V ac power supplies, the 100 - 127 V power supply will not power on. The same restriction applies to a enclosure that is powered by 100 - 127 V ac power supplies. If you install a 200 - 240 V ac power supply in a enclosure that is powered by 100 - 127 V ac power supplies, the 200 - 240 V ac power supply will not power on.

The following illustration shows the LEDs on the DWC power supply:

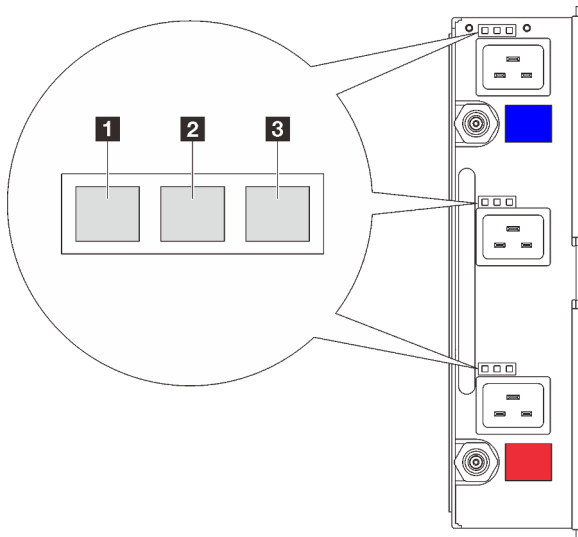


Figure 149. DWC power supply LEDs

<b>1</b> Input (AC) power LED (green)	<b>3</b> Power supply error LED (yellow)
<b>2</b> Output (DC) power LED (green)	

There are nine LEDs on each DWC power supply (three per power supply bay):

**1 AC power LED (green):** When this LED is lit (green), it indicates that ac power is being supplied to the DWC power supply in the corresponding power supply bay.

**2 DC power LED (green):** When this LED is lit (green), it indicates that dc power is being supplied from the corresponding power supply bay to the enclosure midplane.

**3 Power supply error LED (yellow):** When this LED is lit (yellow), it indicates that there is a fault with the corresponding power supply bay. Dump the FFDC log from the system and contact Lenovo back end support team for PSU data log reviewing.

**Note:** Before unplugging the ac power cord from the DWC power supply, or removing the DWC power supply from the enclosure, verify that the capacity of the remaining power supplies are sufficient to meet the minimum power requirements for all components in the enclosure.

## Drip sensor LED

The following illustration shows the light-emitting diodes (LEDs) on the drip sensor.

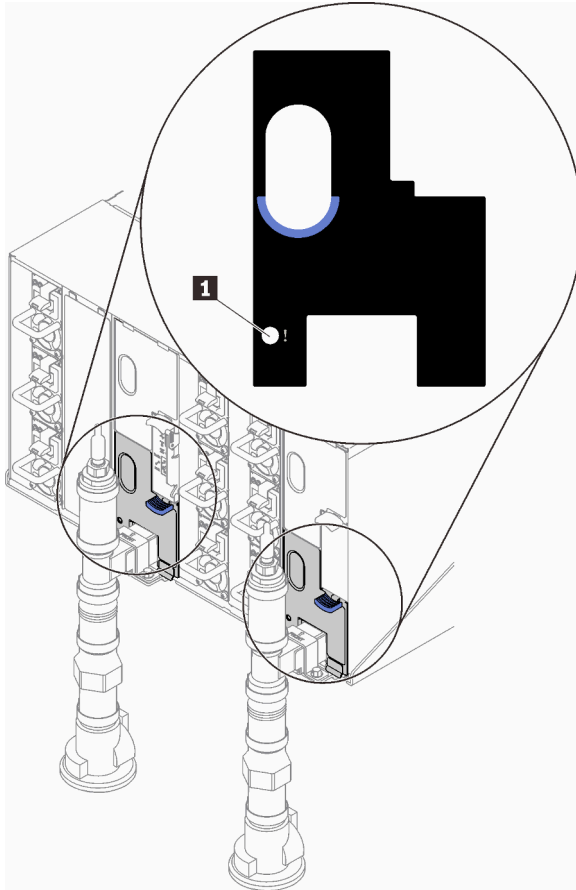


Figure 150. Drip sensor LED

Table 22. Drip sensor LED

<b>1</b> Drip sensor LED (yellow)
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**1 Drip sensor LED:** When this LED is lit (yellow), it indicates that the drip sensor detects water in its respective catch basin.

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## General problem determination procedures

Use the information in this section to resolve problems if the event log does not contain specific errors or the server is inoperative.

If you are not sure about the cause of a problem and the power supplies are working correctly, complete the following steps to attempt to resolve the problem:

1. Power off the server.

2. Make sure that the server is cabled correctly.
3. Remove or disconnect the following devices if applicable, one at a time, until you find the failure. Power on and configure the server each time you remove or disconnect a device.
  - Any external devices.
  - Surge-suppressor device (on the server).
  - Printer, mouse, and non-Lenovo devices.
  - Each adapter.
  - Hard disk drives.
  - Memory modules until you reach the minimal configuration for debugging that is supported for the server.

For SD650 V2/SD650-N V2, see <https://pubs.lenovo.com/sd650-v2/>.

To determine the minimal configuration for your server, see “Minimal configuration for debugging” section in *User Guide* of your high-density server.:

- SD650 V3: <https://pubs.lenovo.com/sd650-v3/>
- SD650-I V3: <https://pubs.lenovo.com/sd650-i-v3/>
- SD650-N V3: <https://pubs.lenovo.com/sd650-n-v3/>
- SD665 V3: <https://pubs.lenovo.com/sd665-v3/>
- SD665-N V3: <https://pubs.lenovo.com/sd665-n-v3/>

4. Power on the server.

If the problem is solved when you remove an adapter from the server, but the problem recurs when you install the same adapter again, suspect the adapter. If the problem recurs when you replace the adapter with a different one, try a different PCIe slot.

If the problem appears to be a networking problem and the server passes all system tests, suspect a network cabling problem that is external to the server.

## Resolving suspected power problems

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

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

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

**Note:** Start with the event log of the application that is managing the server. For more information about event logs, see “Event logs” on page 191.

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

Step 3. Remove the adapters and disconnect the cables and power cords to all internal and external devices until the server is at the minimal configuration for debugging that is required for the server to start. To determine the minimal configuration for your server, see “Minimal configuration for debugging” in “Technical specifications” section in *User Guide* of your high-density server.

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

If the server does not start from the minimal configuration, replace the components in the minimal configuration one at a time until the problem is isolated.



## Resolving suspected Ethernet controller problems

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

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

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

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

- The cable must be securely attached at all connections. If the cable is attached but the problem remains, try a different cable.
- If you set the Ethernet controller to operate at 100 Mbps or 1000 Mbps, you must use Category 5 cabling.

Step 3. Determine whether the hub supports auto-negotiation. If it does not, try configuring the integrated Ethernet controller manually to match the speed and duplex mode of the hub.

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

Ethernet controller LED locations are specified in [“Troubleshooting by system LEDs and diagnostics display” on page 193](#).

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

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

Network activity LED location is specified in [“Troubleshooting by system LEDs and diagnostics display” on page 193](#).

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

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

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

---

## Troubleshooting by symptom

Use this information to find solutions to problems that have identifiable symptoms.

To use the symptom-based troubleshooting information in this section, complete the following steps:

1. Check the event log of the application that is managing the server and follow the suggested actions to resolve any event codes.
  - If you are managing the server from the Lenovo XClarity Administrator, begin with the Lenovo XClarity Administrator event log.
  - If you are using some other management application, begin with the Lenovo XClarity Controller event log.

For more information about event logs (see “Event logs” on page 191).

2. Review this section to find the symptoms that you are experiencing and follow the suggested actions to resolve the issue.
3. If the problem persists, contact support (see “Contacting Support” on page 223).

## Hard disk drive problems

Use this information to resolve issues related to the hard disk drives.

- “Server cannot recognize a hard drive” on page 202

### Server cannot recognize a hard drive

Complete the following steps until the problem is solved.

1. Verify that the drive is supported for the server. See <https://serverproven.lenovo.com> for a list of supported hard drives.
2. Make sure that the drive is seated in the drive bay properly and that there is no physical damage to the drive connectors.
3. Run the diagnostics tests for the SAS/SATA adapter and hard disk drives. When you start a server and press the key according to the on-screen instructions, the LXPM interface is displayed by default. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) You can perform hard drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → 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.

## Intermittent problems

Use this information to solve intermittent problems.

- “Intermittent external device problems” on page 202
- “Intermittent KVM problems” on page 203
- “Intermittent unexpected reboots” on page 203

### Intermittent external device problems

Complete the following steps until the problem is solved.

1. Update the UEFI and XCC firmware to the latest versions.
2. Make sure that the correct device drivers are installed. See the manufacturer's website for documentation.
3. For a USB device:
  - a. Make sure that the device is configured correctly.

Restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation)

compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Then, click **System Settings** → **Devices and I/O Ports** → **USB Configuration**.

- b. Connect the device to another port. If using a USB hub, remove the hub and connect the device directly to the compute node. Make sure that the device is configured correctly for the port.

### Intermittent KVM problems

Complete the following steps until the problem is solved.

#### Video problems:

1. Make sure that all cables and the console breakout cable are properly connected and secure.
2. Make sure that the monitor is working properly by testing it on another compute node.
3. Test the console breakout cable on a working compute node to ensure that it is operating properly. Replace the console breakout cable if it is defective.

#### Keyboard problems:

Make sure that all cables and the console breakout cable are properly connected and secure.

#### Mouse problems:

Make sure that all cables and the console breakout cable are properly connected and secure.

### Intermittent unexpected reboots

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

1. If the reset occurs during POST and the POST watchdog timer is enabled, make sure that sufficient time is allowed in the watchdog timeout value (POST Watchdog Timer).

To check the POST watchdog time, restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Then, click **BMC Settings** → **POST Watchdog Timer**.

2. If the reset occurs after the operating system starts, enter the operating system when the system operates normally and set up operating system kernel dump process (Windows and Linux base operating systems will be using different method). Enter the UEFI setup menus and disable the feature, or disable it with the following OneCli command.  
`OneCli.exe config set SystemRecovery.RebootSystemOnNMI Disable --bmcxcc_userid PASSWORD@xcc_ipaddress`
3. See the management controller event log to check for an event code that indicates a reboot. See “[Event logs](#)” on page 191 for information about viewing the event log. If you are using Linux base operating system, then capture all logs back to Lenovo support for further investigation.

### Keyboard, mouse, KVM switch or USB-device problems

Use this information to solve problems related to a keyboard, mouse, KVM switch or USB-device problems.

- “[All or some keys on the keyboard do not work](#)” on page 204
- “[Mouse does not work](#)” on page 204
- “[KVM switch problems](#)” on page 204
- “[USB-device does not work](#)” on page 204

### All or some keys on the keyboard do not work

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

### Mouse does not work

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

### KVM switch problems

1. Make sure that the KVM switch is supported by your server.
2. Make sure that the KVM switch is powered on correctly.
3. If the keyboard, mouse or monitor can be operated normally with direct connection to the server, then replace the KVM switch.

### USB-device does not work

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

Restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) Then, click **System Settings → Devices and I/O Ports → USB Configuration**.

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

## Memory problems

See this section to resolve issues related to memory.

### Common memory problems

- [“Multiple memory modules in a channel identified as failing” on page 205](#)
- [“Displayed system memory is less than installed physical memory” on page 205](#)
- [“Invalid memory population detected” on page 206](#)

## Multiple memory modules in a channel identified as failing

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

Complete the following procedure to solve the problem.

1. Reseat the memory modules; then, restart the server.
2. Remove the highest-numbered memory module of those that are identified and replace it with an identical known good memory module; then, restart the server. Repeat as necessary. If the failures continue after all identified memory modules are replaced, go to step 4.
3. Return the removed memory modules, one at a time, to their original connectors, restarting the server after each memory module, until a memory module fails. Replace each failing memory module with an identical known good memory module, restarting the server after each memory module replacement. Repeat step 3 until you have tested all removed memory modules.
4. Replace the highest-numbered memory module of those identified; then, restart the server. Repeat as necessary.
5. Reverse the memory modules between the channels (of the same processor), and then restart the server. If the problem is related to a memory module, replace the failing memory module.
6. (Trained technician only) Install the failing memory module into a memory module connector for processor 2 (if installed) to verify that the problem is not the processor or the memory module connector.
7. (Trained technician only) Replace the system board (system board assembly).

## 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 server from the power source; then, wait 10 seconds before restarting the server.

1. Make sure that:
  - No error LEDs are lit. See [“Troubleshooting by system LEDs and diagnostics display” on page 193](#).
  - No memory module error LEDs are lit on the system board (system board assembly).
  - Memory mirrored channel does not account for the discrepancy.
  - The memory modules are seated correctly.
  - You have installed the correct type of memory module (see “Memory module installation rules and order” section in the *User Guide* of your high-density server for requirements).
  - After changing or replacing a memory module, memory configuration is updated accordingly in the Setup Utility.
  - All banks of memory are enabled. The server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.
  - There is no memory mismatch when the server is at the minimum memory configuration.
2. Reseat the memory modules, and then restart the server.
3. Check the POST error log:
  - If a memory module was disabled by a systems-management interrupt (SMI), replace the memory module.
  - If a memory module was disabled by the user or by POST, reseat the memory module; then, run the Setup Utility and enable the memory module.
4. Run memory diagnostics. When you start a solution and press the key according to the on-screen instructions, the LXPM interface is displayed by default. (For more information, see the “Startup” section

in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.) You can perform memory diagnostics with this interface. From the Diagnostic page, go to **Run Diagnostic → Advanced Memory Test**.

5. Reverse the modules between the channels (of the same processor), and then restart the server. If the problem is related to a memory module, replace the failing memory module.
6. Re-enable all memory modules using the Setup Utility, and then restart the server.
7. (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.
8. (Trained technician only) Replace the system board (system board assembly).

### Invalid memory population detected

If this warning message appears, complete the following steps:

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

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

## Monitor and video problems

Use this information to solve problems related to a monitor or video.

- “Screen is blank” on page 206
- “Screen goes blank when you start some application programs” on page 207
- “The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted” on page 207

### Screen is blank

**Note:** Make sure that the expected boot mode has not been changed from the UEFI to Legacy or vice versa.

1. If the server is attached to a KVM switch, bypass the KVM switch to eliminate it as a possible cause of the problem: connect the monitor cable directly to the correct connector on the rear of the server.
2. The management controller remote presence function is disabled if you install an optional video adapter. To use the management controller remote presence function, remove the optional video adapter.
3. If the server is installed with the graphical adapters while turning on the server, the Lenovo logo is displayed on the screen after approximately 3 minutes. This is normal operation while the system loads.
4. Make sure that:
  - The server is turned on and there is power supplied to the server.
  - The monitor cables are connected correctly.
  - The monitor is turned on and the brightness and contrast controls are adjusted correctly.
5. Make sure that the correct server is controlling the monitor, if applicable.
6. Make sure that corrupted server firmware is not affecting the video; see “Update the firmware” on page 179.
7. Observe the LEDs on the system board (system board assembly); if the codes are changing, go to step 6.
8. Replace the following components one at a time, in the order shown, restarting the server each time:
  - a. Monitor

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

### **Screen goes blank when you start some application programs**

1. Make sure that:

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

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

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

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

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

**Notes:**

- a. To prevent diskette drive read/write errors, make sure that the distance between the monitor and any external diskette drive is at least 76 mm (3 in.).
  - b. Non-Lenovo monitor cables might cause unpredictable problems.
2. Reseat the monitor cable.
  3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time:
    - a. Monitor cable
    - b. Video adapter (if one is installed)
    - c. Monitor
    - d. (Trained technician only) System board (system board assembly).

## **Network problems**

Use this information to resolve issues related to networking.

- [“Cannot wake server using Wake on LAN” on page 207](#)
- [“Could not log in using LDAP account with SSL enabled” on page 208](#)

### **Cannot wake server using Wake on LAN**

Complete the following steps until the problem is resolved:

1. If you are using the dual-port network adapter and the server is connected to the network using Ethernet 5 connector, check the system-error log or IMM2 system event log (see [“Event logs” on page 191](#)), make sure:
  - a. Fan 3 is running in standby mode, if Emulex dual port 10GBase-T embedded adapter is installed.
  - b. The room temperature is not too high. See “Specifications” section in the *User Guide* of your high-density server.
  - c. The air vents are not blocked.
  - d. The air baffle is installed securely.
2. Reseat the dual-port network adapter.

3. Turn off the server and disconnect it from the power source; then, wait 10 seconds before restarting the server.
4. If the problem still remains, replace the dual-port network adapter.

### Could not log in using LDAP account with SSL enabled

Complete the following steps until the problem is resolved:

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

## Observable problems

Use this information to solve observable problems.

- [“Server hangs during the UEFI boot process” on page 208](#)
- [“The server immediately displays the POST Event Viewer when it is turned on” on page 208](#)
- [“Server is unresponsive \(POST is complete and operating system is running\)” on page 209](#)
- [“Server is unresponsive \(POST failed and cannot start System Setup\)” on page 209](#)
- [“Voltage planar fault is displayed in the event log” on page 209](#)
- [“Unusual smell” on page 210](#)
- [“Server seems to be running hot” on page 210](#)
- [“Cannot enter legacy mode after installing a new adapter” on page 210](#)
- [“Cracked parts or cracked chassis” on page 210](#)

### Server hangs during the UEFI boot process

If the system hangs during the UEFI boot process with the message UEFI: DXE INIT on the display, make sure that Option ROMs were not configured with a setting of **Legacy**. You can remotely view the current settings for Option ROMs by running the following command using the Lenovo XClarity Essentials OneCLI:

```
onecli config show EnableDisableAdapterOptionROMSupport --bmc xcc_userid:xcc_password@xcc_ipaddress
```

To recover a system that hangs during the boot process with Legacy Option ROM settings, see the following Tech Tip:

<https://datacentersupport.lenovo.com/solutions/ht506118>

If legacy Option ROMs must be used, do not set slot Option ROMs to **Legacy** on the Devices and I/O Ports menu. Instead, set slot Option ROMs to **Auto** (the default setting), and set the System Boot Mode to **Legacy Mode**. Legacy option ROMs will be invoked shortly before the system boots.

### The server immediately displays the POST Event Viewer when it is turned on

Complete the following steps until the problem is solved.

1. Correct any errors that are indicated by the system LEDs and diagnostics display.
2. Make sure that the server 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 server, 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 server.
5. Replace the following components one at a time, in the order shown, restarting the server each time:
  - a. (Trained technician only) Processor
  - b. (Trained technician only) System board (system board assembly)

### **Server is unresponsive (POST is complete and operating system is running)**

Complete the following steps until the problem is solved.

- If you are in the same location as the compute node, complete the following steps:
  1. If you are using a KVM connection, make sure that the connection is operating correctly. Otherwise, make sure that the keyboard and mouse are operating correctly.
  2. If possible, log in to the compute node and verify that all applications are running (no applications are hung).
  3. Restart the compute node.
  4. If the problem remains, make sure that any new software has been installed and configured correctly.
  5. Contact your place of purchase of the software or your software provider.
- If you are accessing the compute node from a remote location, complete the following steps:
  1. Make sure that all applications are running (no applications are hung).
  2. Attempt to log out of the system and log back in.
  3. Validate the network access by pinging or running a trace route to the compute node from a command line.
    - a. If you are unable to get a response during a ping test, attempt to ping another compute node in the enclosure to determine whether it is a connection problem or compute node problem.
    - b. Run a trace route to determine where the connection breaks down. Attempt to resolve a connection issue with either the VPN or the point at which the connection breaks down.
  4. Restart the compute node remotely through the management interface.
  5. If the problem remains, verify that any new software has been installed and configured correctly.
  6. Contact your place of purchase of the software or your software provider.

### **Server is unresponsive (POST failed and cannot start System Setup)**

Configuration changes, such as added devices or adapter firmware updates, and firmware or application code problems can cause the server to fail POST (the power-on self-test).

If this occurs, the server responds in either of the following ways:

- The server restarts automatically and attempts POST again.
- The server hangs, and you must manually restart the server for the server to attempt POST again.

After a specified number of consecutive attempts (automatic or manual), the server reverts to the default UEFI configuration and starts System Setup so that you can make the necessary corrections to the configuration and restart the server. If the server is unable to successfully complete POST with the default configuration, there might be a problem with the system board (system board assembly). You can specify the number of consecutive restart attempts in System Setup. Click **System Settings → Recovery → POST Attempts → POST Attempts Limit**. Available options are 3, 6, 9, and 255.

### **Voltage planar fault is displayed in the event log**

Complete the following steps until the problem is solved.

1. Revert the system to the minimum configuration. For the minimally required number of processors and DIMMs, see “Specifications” section in the *User Guide* of your high-density server.
2. Restart the system.
  - If the system restarts, add each of the removed items one at a time and restart 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 (system board assembly).

### Unusual smell

Complete the following steps until the problem is solved.

1. An unusual smell might be coming from newly installed equipment.
2. If the problem remains, contact Lenovo Support.

### Server seems to be running hot

Complete the following steps until the problem is solved.

Multiple compute nodes or chassis:

1. Make sure that the room temperature is within the specified range. See “Specifications” section in the *User Guide* of your high-density server.
2. Make sure that the fans are installed correctly.
3. Update the UEFI and XCC firmware to the latest versions.
4. Make sure that the fillers in the server are installed correctly. For detailed installation procedures, see:
  - [Chapter 5 “Enclosure hardware replacement procedures” on page 31](#)
  - The “Hardware replacement procedures” section in the *User Guide* of your high-density server.
5. Use the IPMI command to ramp up the fan speed to the full fan speed to see whether the issue can be resolved.

**Note:** The IPMI raw command should only be used by trained technician and the each system has its own specific PMI raw command.

6. Check the management processor event log for rising temperature events. If there are no events, the compute node is running within normal operating temperatures. Note that you can expect some variation in temperature.

### Cannot enter legacy mode after installing a new adapter

Complete the following procedure to solve the problem.

1. Go to **UEFI Setup → Devices and I/O Ports → Set Option ROM Execution Order**.
2. Move the RAID adapter with operation system installed to the top of the list.
3. Select **Save**.
4. Reboot the system and auto boot to operation system.

### Cracked parts or cracked chassis

Contact Lenovo Support.

## Optional-device problems

Use this information to solve problems related to optional devices.

- [“Insufficient PCIe resources are detected” on page 211](#)

- “A Lenovo optional device that was just installed does not work” on page 211
- “A Lenovo optional device that worked previously does not work now” on page 211

### **Insufficient PCIe resources are detected**

If you see an error message stating “Insufficient PCI Resources Detected,” complete the following steps until the problem is resolved:

1. Press Enter to access System Setup Utility.
2. Select **System Settings → Devices and I/O Ports → MM Config Base**; then, modify the setting to increase the device resources. For example, modify 3 GB to 2 GB or modify 2 GB to 1 GB.
3. Save the settings and restart the system.
4. If the error recurs with the highest device resource setting (1GB), shutdown the system and remove some PCIe devices; then, power on the system.
5. If the reboot failed, repeat step 1 to step 4.
6. If the error recurs, press Enter to access System Setup Utility.
7. Select **System Settings → Devices and I/O Ports → PCI 64–Bit Resource Allocation**, then; modify the setting from **Auto** to **Enable**.
8. If the Boot Device does not support MMIO above 4GB for Legacy Boot, use UEFI Boot Mode or remove/disable some PCIe devices.
9. Contact Lenovo technical support.

### **A Lenovo optional device that was just installed does not work**

1. Make sure that:
  - The device is supported for the server (see <https://serverproven.lenovo.com>).
  - 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.
2. Reseat the device that you have just installed.
3. Replace the device that you have just installed.

### **A Lenovo optional device that worked previously does not work now**

1. Make sure that all of the cable connections for the device are secure.
2. If the device comes with test instructions, use those instructions to test the device.
3. If the failing device is a SCSI device, make sure that:
  - The cables for all external SCSI devices are connected correctly.
  - Any external SCSI device is turned on. You must turn on an external SCSI device before you turn on the server.
4. Reseat the failing device.
5. Replace the failing device.

## **Power on and power off problems**

Use this information to resolve issues when powering on or powering off the server.

- “Server does not power on” on page 212
- “Server does not power off” on page 212

## Server does not power on

Complete the following steps until the problem is resolved:

**Note:** The power button will not function until approximately five to ten seconds after the server has been connected to power to allow the BMC to complete initialization.

1. Make sure that the power button is working correctly:
  - a. Disconnect the server power cords.
  - b. Reconnect the power cords.
  - c. (Trained technician only) Reseat the front operator panel cable, and then repeat steps 1a and 1b.
    - (Trained technician only) If the server starts, reseal the front operator panel. If the problem remains, replace the front operator panel.
    - If the server does not start, bypass the power button by using the force power-on jumper. If the server starts, reseal the front operator panel. If the problem remains, replace the front operator panel.
2. Make sure that the reset button is working correctly:
  - a. Disconnect the server power cords.
  - b. Reconnect the power cords.
  - c. (Trained technician only) Reseat the front operator panel cable, and then repeat steps 2a and 2b.
    - (Trained technician only) If the server starts, replace the front operator panel.
    - If the server does not start, go to step 3.
3. Make sure that both power supplies installed in the server are of the same type. Mixing different power supplies in the server will cause a system error (the system-error LED on the front operator panel turns on).
4. Make sure that:
  - The power cords are correctly connected to the server and to a working electrical outlet.
  - The type of memory that is installed is correct and the installation rules are met.
  - The DIMMs are fully seated with lock latches fully closed.
  - 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. Front operator panel connector
  - b. Power supplies
6. Replace the following components and restart the server each time:
  - a. Front operator panel connector
  - b. Power supplies
7. If you just installed an optional device, remove it, and restart the server. If the server now starts, you might have installed more devices than the power supply supports.
8. Implement the minimum configuration (one processor and one DIMM) to check whether any specific components lock the power permission.
9. Collect the failure information by capturing the system logs and provide it to Lenovo support.
10. See [“Power supply LEDs” on page 194](#).

## Server does not power off

Complete the following steps until the problem is resolved:

1. Determine whether you are using an Advanced Configuration and Power Interface (ACPI) or a non-ACPI operating system. If you are using a non-ACPI operating system, complete the following steps:
  - a. Press Ctrl+Alt+Delete.
  - b. Turn off the server by pressing the power button and holding it down for 5 seconds.
  - c. Restart the server.
  - d. If the server fails POST and the power button does not work, disconnect the power cord for 20 seconds; then, reconnect the power cord and restart the server.
2. If the problem remains or if you are using an ACPI-aware operating system, suspect the system board (system board assembly).

## Power problems

Use this information to resolve issues related to power.

### System error LED is on and event log "Power supply has lost input" is displayed

To resolve the problem, ensure that:

1. The power supply is properly connected to a power cord.
2. The power cord is connected to a properly grounded electrical outlet for the server.
3. Make sure that the power supply AC source is stable within the supported range.
4. Swap the power supply to see if the issue follows the power supply, if it follows the power supply, then replace the failing one.
5. Review the event log and see how the problem it is to follow the event log actions to resolved the problems.

## Serial-device problems

Use this information to solve problems related to serial devices.

- ["Number of serial ports identified by the operating system is less than the number of installed ports" on page 213](#)
- ["Serial device does not work" on page 213](#)

### Number of serial ports identified by the operating system is less than the number of installed ports

1. Make sure that:
  - Each port is assigned a unique address in the Setup utility and none of the serial ports is disabled.
  - The serial-port adapter (if one is present) is seated correctly.
2. Reseat the serial port adapter.
3. Replace the serial port adapter.

### Serial device does not work

1. Make sure that:
  - The device is compatible with the server.
  - The serial port is enabled and is assigned a unique address.
  - The device is connected to the correct connector (see "System-board connectors" section in the *User Guide* of your high-density server).
2. Reseat the following components:
  - a. Failing serial device
  - b. Serial cable

3. Replace the following components one at a time, restarting the server each time:
  - a. Failing serial device
  - b. Serial cable
4. (Trained technician only) Replace the system board (system board assembly).

## System Management Module 2 problems

Use this information to resolve issues related the to the System Management Module.

- [“System Management Module 2 does not power on” on page 214](#)
- [“System Management Module 2 status LED is not flashing normally” on page 214](#)
- [“System Management Module 2 ping failure” on page 214](#)

### System Management Module 2 does not power on

Complete the following steps until the problem is resolved:

1. Check if the power supplies are installed correctly and power supply LEDs are lit normally.
2. Reseat the SMM2 and check the LED status again.
3. If the problem persists, replace the SMM2.

### System Management Module 2 status LED is not flashing normally

When the SMM2 is working, its status LED flashes at a slower speed (about once every two seconds).

If the SMM2 status LED is continuously on or off, or it has been flashing rapidly (two or 10 times per second) for more than 15 minutes, it indicates that the SMM2 may have encountered a problem.

Complete the following steps until the problem is resolved:

1. Reseat the SMM2.
2. If the problem persists, replace the SMM2.

### System Management Module 2 ping failure

Complete the following steps until the problem is solved.

1. Check the SMM2 IP address and network status via Lenovo XClarity Controller.
2. Alternatively, you can check SMM2 LEDs to diagnose the SMM2 status (see [“System Management Module 2 \(SMM 2\) LEDs” on page 193](#) for SMM2 LEDs details).
  - If the SMM2 power LED and the status LED are working abnormally, reseat the SMM2.
3. If the problem persists, replace the SMM2.

## Software problems

Use this information to solve software problems.

1. To determine whether the problem is caused by the software, make sure that:
  - The server has the minimum memory that is needed to use the software. For memory requirements, see the information that comes with the software.

**Note:** If you have just installed an adapter or memory, the server might have a memory-address conflict.

- The software is designed to operate on the server.
- Other software works on the server.

- The software works on another server.
2. If you receive any error messages while you use the software, see the information that comes with the software for a description of the messages and suggested solutions to the problem.
  3. Contact your place of purchase of the software.

## Water leak problems

Use this information to resolve issues related to water leaks.

The DW612S design is robust, and is unlikely to leak. If the water is observed outside of the enclosure, make sure the both enclosure and rack power supplies have been disconnected. If no water is observed outside of the enclosure, but there is a suspicion of a water leak in the enclosure or in one of the six compute trays, complete the following steps to determine the source of the leak. The enclosure is equipped with a pair of drip sensor assemblies to help detect any water leaks.

**Note:** A small leak may not reach either of the drip sensors to trigger a warning. Visual confirmation of a small leak may be required.

### Suspicious leakage symptoms

The following situations might occur due to leakage problems:

- **Processor over temperature error indicated by the System Error "!" LED being solid ON at the front of the node**
- **One or more of the nodes shut down unexpectedly**
- **Enclosure SMM2 management may report the following events:**
  - [18040179](#) : DripSensor 1 Out: Chassis, Predictive Failure asserted was asserted.
  - [1804017A](#) : DripSensor 2 Out: Chassis, Predictive Failure asserted was asserted.
  - [18080076](#) : DripSensor 1: Chassis, Device Removed / Device Absent was asserted.
  - [18080077](#) : DripSensor 2: Chassis, Device Removed / Device Absent was asserted.

Possible causes of a leak:

- **Leak at quick connects during installation or removal procedures**
- **Leak in the water loop tubing**

Complete the following steps in order until you are able to isolate the cause of the potential leak:

1. Check enclosure SMM2 messages to see if any leakage warnings have been reported. See [ThinkSystem DW612S Neptune DWC Enclosure SMM 2 Messages and Codes Reference](#) for more information.
2. Walk to the rear of the rack and visually check the status of each enclosure's left and right side drip sensor LEDs.

Users usually have multiple enclosures per rack. Each enclosure has two drip sensors.

**Note:** Each enclosure has two drip sensors that should turn on a yellow LED visible through a hole located in the lower left leg of the lower EMC shield if the sensor detects moisture in its drip sensor catch basin.

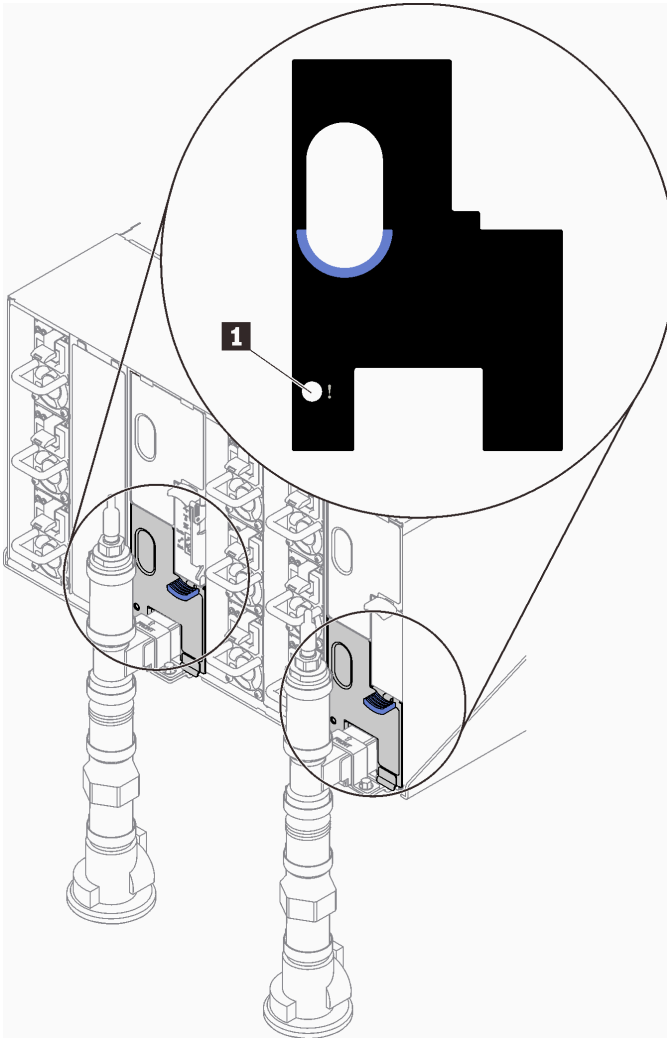


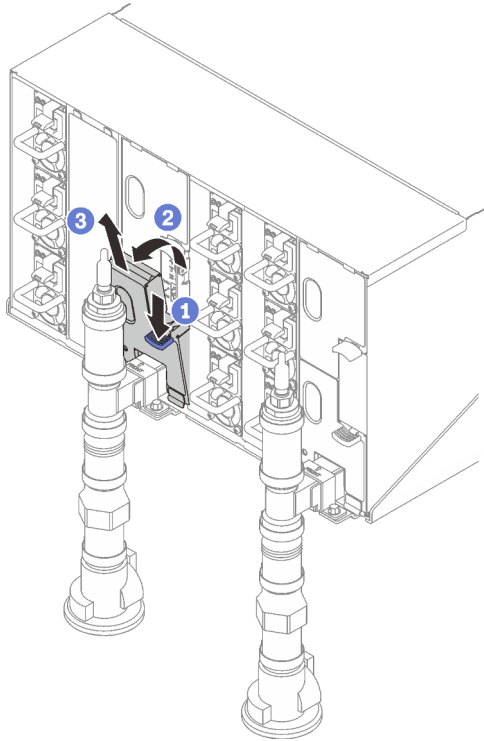
Figure 151. Drip sensor LED

Table 23. Drip sensor LED

<b>1</b> Drip sensor LED (yellow)
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3. Visually check the drip sensor catch basin for any moisture.
  - a. Remove the lower and upper EMC shields in the front of the left drip sensor.





**Note:** If there is a manifold vertical pipe in front of the EMC shield, you need to slide it sideways out from underneath the pipe.

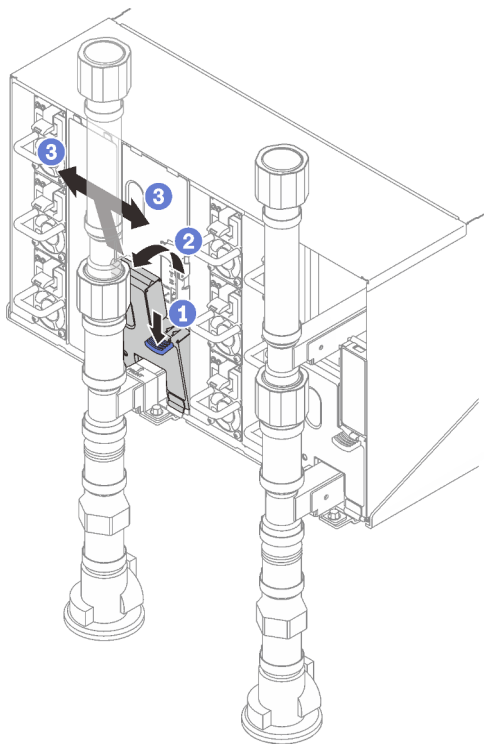


Figure 152. Lower EMC shield removal

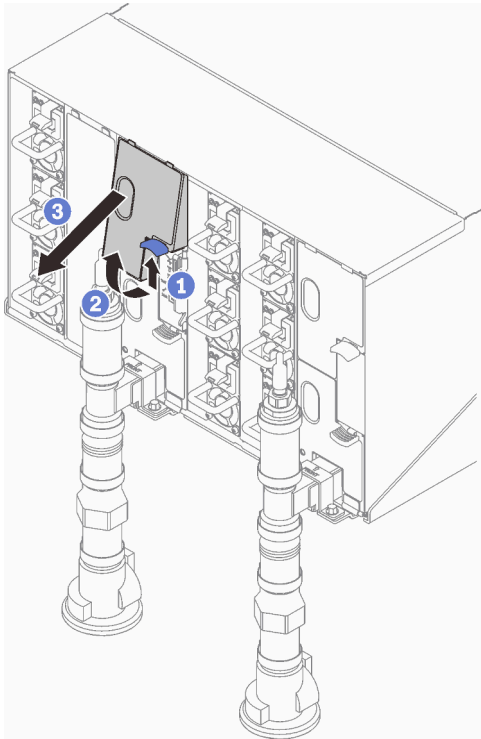


Figure 153. Upper EMC shield removal

- b. Use a flashlight to visually inspect the plastic catch basin for any moisture.
- c. Re-install the upper and lower EMC shields.

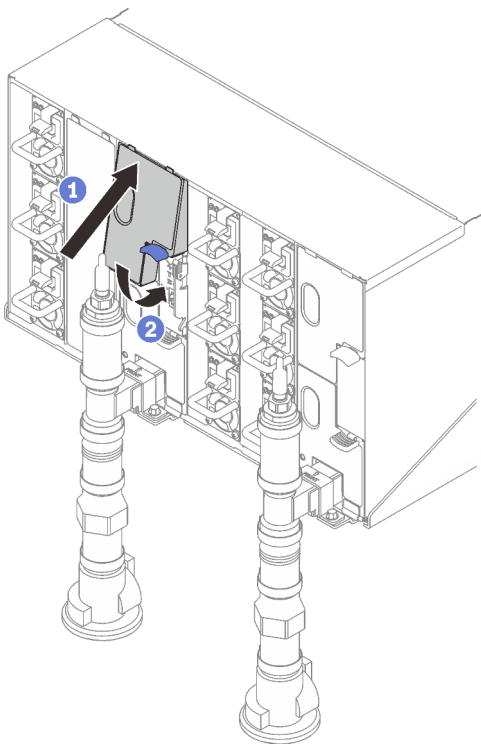


Figure 154. Upper EMC shield installation

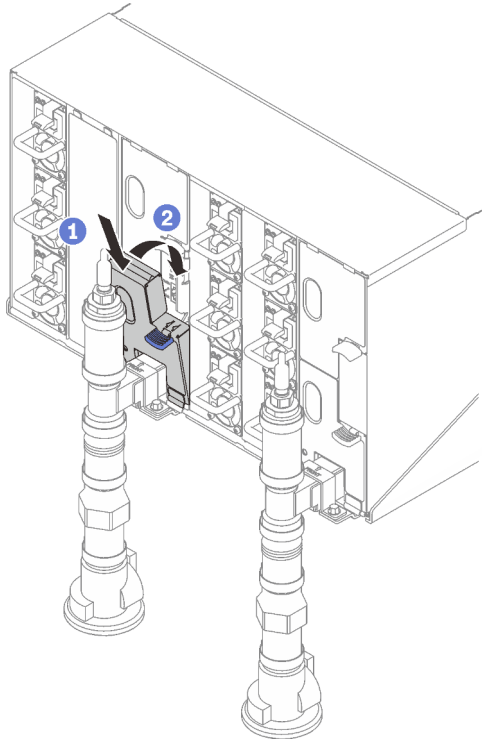


Figure 155. Lower EMC shield installation

- d. Repeat steps for the right side drip sensor catch basin.
- 4. Power down all nodes either through the OS or by pressing and holding the power button for five seconds.

**Note:** Green Power LED for each node (two per compute nodes) should be blinking to indicate the nodes are in standby state.

- 5. Disconnect power cords from all six enclosure power supplies.

**Important:** Fully disconnect the power to the entire enclosure prior to attempting to identify a leak within an enclosure.

- 6. Check the water loop for any moisture.
  - a. Remove the top node (bays 11&12) from the enclosure, place it on a stable work surface, remove the cover, and carefully inspect the entire water loop (both rubber and copper tubing) for any signs of moisture. Re-install the tray into enclosure. (See “Hardware replacement procedures” chapter in the *User Guide* of the high-density servers supported by DW612S enclosure at [“Documents download” on page 225.](#))
  - b. Repeat steps for the tray in bays 9 and 10.
  - c. Repeat steps for the tray in bays 7 and 8.
  - d. Repeat steps for the tray in bays 5 and 6.
  - e. Repeat steps for the tray in bays 3 and 4.
  - f. Repeat steps for the tray in bays 1 and 2.

**Note:** It is important to visually inspect the bottom of the enclosure with a flashlight prior to re-installing the bottom most tray (bays 1 and 2) into the enclosure.

- 7. If you are unable to identify the problem in the steps above, then you may need to replace one or more of the tray water loops (See “Hardware replacement procedures” chapter in the *User Guide* of the high-

density servers supported by DW612S enclosure at [“Documents download” on page 225.](#)) Contact Product Engineer for the further assistance.

**Important:** The procedures above only cover the Lenovo DWC solution (from the Eaton Ball valves up through the manifold and into the enclosures and compute trays). If your datacenter Cooling Distribution Unit experiences repeated or frequent low water alerts then you should inspect the data center plumbing between the cooling distribution unit and the Lenovo DWC solution (rack).

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## 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

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### 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 online help also describes the diagnostic tests that you can perform. The documentation for most systems, operating systems, and programs contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

You can find the product documentation for your ThinkSystem products at the following location:

<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. (See the following links) 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.
  - Drivers and software downloads
    - <https://datacentersupport.lenovo.com/products/servers/thinksystem/sd650v3/7d7m/downloads/driver-list/>
    - <https://datacentersupport.lenovo.com/products/servers/thinksystem/sd650iv3/7d7l/downloads/driver-list/>
    - <https://datacentersupport.lenovo.com/products/servers/thinksystem/sd650iv3/7d7l/downloads/driver-list/>
  - Operating system support center
    - <https://datacentersupport.lenovo.com/solutions/server-os>
  - Operating system installing instructions
    - <https://pubs.lenovo.com/#os-installation>

- 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.
- Refer to [Chapter 7 “Problem determination” on page 191](#) for instructions on isolating and solving issues.
- Go to <http://datacentersupport.lenovo.com> and check for information to help you solve the problem.

To find the Tech Tips available for your server:

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

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

- Check Lenovo Data Center Forum at [https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv\\_eg](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). Machine type number can be found on the ID label, see “Identifying the server and access the Lenovo XClarity Controller” in the *User Guide* of the high-density server.
- 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.

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## Collecting service data

To clearly identify the root cause of a server issue or at the request of Lenovo Support, you might need collect service data that can be used for further analysis. Service data includes information such as event logs and hardware inventory.

Service data can be collected through the following tools:

- **Lenovo XClarity Provisioning Manager**

Use the Collect Service Data function of Lenovo XClarity Provisioning Manager to collect system service data. You can collect existing system log data or run a new diagnostic to collect new data.

- **Lenovo XClarity Controller**

You can use the Lenovo XClarity Controller web interface or the CLI to collect service data for the server. The file can be saved and sent to Lenovo Support.

- For more information about using the web interface to collect service data, see the “Backing up the BMC configuration” section in the XCC documentation compatible with your server at <https://pubs.lenovo.com/lxcc-overview/>.
- For more information about using the CLI to collect service data, see the “XCC `ffdc` command” section in the XCC documentation compatible with your server 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.

You can find more information about setting up automatic problem notification within the Lenovo XClarity Administrator at [http://sysmgmt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/admin\\_setupcallhome.html](http://sysmgmt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/admin_setupcallhome.html).

- **Lenovo XClarity Essentials OneCLI**

Lenovo XClarity Essentials OneCLI has inventory application to collect service data. It can run both in-band and out-of-band. When running in-band within the host operating system on the server, OneCLI can collect information about the operating system, such as the operating system event log, in addition to the hardware service data.

To obtain service data, you can run the `getinfor` command. For more information about running the `getinfor`, see [https://pubs.lenovo.com/lxce-onecli/onecli\\_r\\_getinfor\\_command](https://pubs.lenovo.com/lxce-onecli/onecli_r_getinfor_command).

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## 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/supportphonenumber> for your region support details.





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## Appendix B. Documents and supports

This section provides handy documents, driver and firmware downloads, and support resources.

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### Documents download

This section provides introduction and download link for handy documents.

- Rail Installation Guide

- *Rail Installation Guide for DW612S Enclosure*

- *ThinkSystem DW612S Neptune DWC Enclosure User Guide*

Complete overview, system configuration, hardware components replacing, and troubleshooting.

Selected chapters from *User Guide*:

- *System Configuration Guide* : Server overview, components identification, system LEDs and diagnostics display, product unboxing, setting up and configuring the server.
- *Hardware Maintenance Guide* : Installing hardware components, cable routing, and troubleshooting.

For high-density servers supported by DW612S Neptune DWC Enclosure, see:

- <https://pubs.lenovo.com/sd650-v3/>
- <https://pubs.lenovo.com/sd650-i-v3/>
- <https://pubs.lenovo.com/sd650-n-v3/>
- <https://pubs.lenovo.com/sd665-v3/>
- <https://pubs.lenovo.com/sd665-n-v3/>

- *ThinkSystem DW612S Neptune DWC Enclosure SMM2 Messages and Codes Reference*

SMM2 events

For XClarity Controller, LXPM, and uEFI events for high density servers supported by DW612S Neptune DWC Enclosure, see:

- [https://pubs.lenovo.com/sd650-v3/sd650\\_v3\\_messages\\_reference.pdf](https://pubs.lenovo.com/sd650-v3/sd650_v3_messages_reference.pdf)
- [https://pubs.lenovo.com/sd650-i-v3/sd650\\_i\\_v3\\_messages\\_reference.pdf](https://pubs.lenovo.com/sd650-i-v3/sd650_i_v3_messages_reference.pdf)
- [https://pubs.lenovo.com/sd650-n-v3/sd650\\_n\\_v3\\_messages\\_reference.pdf](https://pubs.lenovo.com/sd650-n-v3/sd650_n_v3_messages_reference.pdf)
- [https://pubs.lenovo.com/sd665-v3/sd665\\_v3\\_messages\\_reference.pdf](https://pubs.lenovo.com/sd665-v3/sd665_v3_messages_reference.pdf)
- [https://pubs.lenovo.com/sd665-n-v3/sd665\\_n\\_v3\\_messages\\_reference.pdf](https://pubs.lenovo.com/sd665-n-v3/sd665_n_v3_messages_reference.pdf)

- *UEFI Manual*

- UEFI setting introduction

**Note:** DW612S enclosure can be installed in the ThinkSystem Heavy Duty Full Depth Rack Cabinets. For ThinkSystem Heavy Duty Full Depth Rack Cabinets User Guide, see [https://pubs.lenovo.com/hdc\\_rackcabinet/](https://pubs.lenovo.com/hdc_rackcabinet/).

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### Support websites

This section provides driver and firmware downloads and support resources.

## Support and downloads

- Lenovo Data Center Forum
  - [https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv\\_eg](https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg)
- Lenovo License Information Documents
  - <https://datacentersupport.lenovo.com/documents/Invo-eula>
- Lenovo Press website (Product Guides/Datasheets/White papers)
  - <https://lenovopress.lenovo.com/>
- Lenovo Privacy Statement
  - <https://www.lenovo.com/privacy>
- Lenovo Product Security Advisories
  - [https://datacentersupport.lenovo.com/product\\_security/home](https://datacentersupport.lenovo.com/product_security/home)
- Lenovo Product Warranty Plans
  - <http://datacentersupport.lenovo.com/warrantylookup>
- Lenovo Server Operating Systems Support Center website
  - <https://datacentersupport.lenovo.com/solutions/server-os>
- Lenovo ServerProven website (Options compatibility lookup)
  - <https://serverproven.lenovo.com>
- Operating System Installation Instructions
  - <https://pubs.lenovo.com/#os-installation>
- Submit an eTicket (service request)
  - <https://support.lenovo.com/servicerequest>
- Subscribe to Lenovo Data Center Group product notifications (Stay up to date on firmware updates)
  - <https://datacentersupport.lenovo.com/solutions/ht509500>

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## Appendix C. Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area.

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Morrisville, NC 27560  
U.S.A.  
Attention: Lenovo Director of Licensing*

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Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

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All other trademarks are the property of their respective owners.

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## Important notes

Processor speed indicates the internal clock speed of the processor; other factors also affect application performance.

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1 024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity can vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard-disk-drive bays with the largest currently supported drives that are available from Lenovo.

Maximum memory might require replacement of the standard memory with an optional memory module.

Each solid-state memory cell has an intrinsic, finite number of write cycles that the cell can incur. Therefore, a solid-state device has a maximum number of write cycles that it can be subjected to, expressed as total bytes written (TBW). A device that has exceeded this limit might fail to respond to system-generated commands or might be incapable of being written to. Lenovo is not responsible for replacement of a device that has exceeded its maximum guaranteed number of program/erase cycles, as documented in the Official Published Specifications for the device.

Lenovo makes no representations or warranties with respect to non-Lenovo products. Support (if any) for the non-Lenovo products is provided by the third party, not Lenovo.

Some software might differ from its retail version (if available) and might not include user manuals or all program functionality.

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## Electronic emission notices

When you attach a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices that are supplied with the monitor.

Additional electronic emissions notices are available at:

[https://pubs.lenovo.com/important\\_notices/](https://pubs.lenovo.com/important_notices/)

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## Taiwan Region import and export contact information

Contacts are available for Taiwan Region import and export information.

委製商/進口商名稱: 台灣聯想環球科技股份有限公司  
進口商地址: 台北市南港區三重路 66 號 8 樓  
進口商電話: 0800-000-702





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