



# ThinkSystem SD665-N V3 Neptune DWC Tray Hardware Maintenance Guide



**Machine Types:** 7DAZ

## 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.

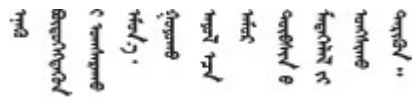
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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་ཁུངས་འདི་བདེ་སྤྱད་མ་བྱས་གོང་། སྐྱོར་གྱི་ཡིད་གཟབ་  
བྱ་འདྲ་མིན་ཡིད་པའི་འོད་མེར་བལྟ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

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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. GPU power and maximum number of trays in the enclosure

Follow the information in this section to determine GPU power setting and number of trays in the enclosure.

There are three GPU power capping modes for SD665-N V3. Each mode supports different maximum number of tray installed in the DW612S enclosure, which are listed in the guideline below. **Make sure** to follow the guideline when configuring GPU power capping or changing number of trays in the enclosure.

### **Guideline on GPU power capping and maximum tray number in the enclosure:**

- TGP Max mode: 700W (default mode, maximum 4 trays in the enclosure)
- TGP User selected optimal: 600W (maximum 5 trays in the enclosure)
- TGP User selected minimum: 500W (maximum 6 trays in the enclosure)

For information on water temperature and tray number, see the Water requirement section in “Environmental specifications” from *SD665-N V3 User Guide*.

**Note:** Mismatching GPU power capping value and maximum tray number may cause GPU performance impact.



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## Chapter 2. 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” in *User Guide* or *System Configuration Guide*.

---

### 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 6.
- 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/sd665nv3/7daz/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” in *User Guide* or *System Configuration Guide*.

- 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.
- Orange on a component or a orange on or near a component indicates that the component can be hot-swapped if the server and operating system support hot-swap capability, which means that you can remove or install the component while the server is still running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- The Red strip on the drives, adjacent to the release latch, indicates that the drive can be hot-swapped if the server and operating system support hot-swap capability. This means that you can remove or install the drive while the server is still running.

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

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

## Safety inspection checklist

Use the information in this section to identify potentially unsafe conditions with your 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.
- All processor sockets must contain either a socket cover or a processor.

## 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.

---

## Memory module installation rules and order

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

For information on the types of memory module supported by this server, see “Memory” section in [“Technical specifications” on page 408](#).

**Available memory mode:** following memory configuration is available:

- One-processor configurations—Independent memory mode
  - 8 DIMMs per processor, total of 8 DIMMs per node
  - 12 DIMMs per processor, total of 12 DIMMs per node
  - For details, see [“One-processor configuration—DRAM DIMM installation order for Independent Mode” on page 7](#)
- Two-processor configurations—Independent memory mode
  - 8 DIMMs per processor, total of 16 DIMMs per node
  - 12 DIMMs per processor, total of 24 DIMMs per node
  - For details, see [“Two-processor configuration—DRAM DIMM installation order for Independent Mode” on page 7](#)
- Mixing DIMM capacity, types, and brand are not allowed. All the DIMM installed in the system must be identical.

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:

Specific information about the required installation order of memory modules in your solution based on the system configuration and memory mode that you are implementing is shown below.

### Memory modules and processors layout

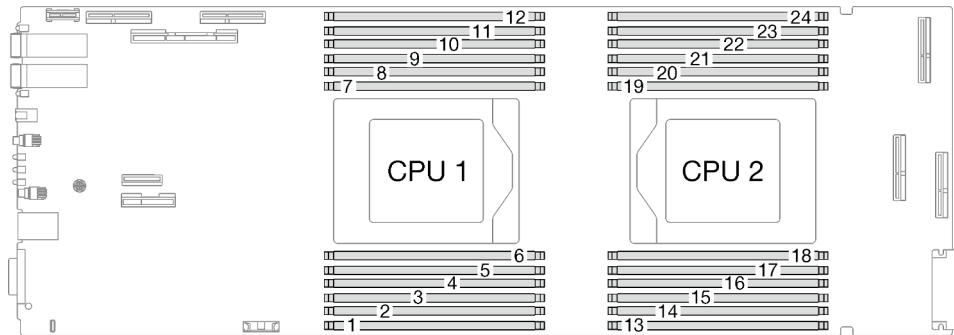


Figure 1. Memory modules and processors layout

The memory-channel configuration table below shows the relationship between the processors, memory channels, and memory module slot numbers.

Table 1. Channel and slot information of DIMMs around processors

Processor	Processor 1												Processor 2											
Channel	F	E	D	C	B	A	G	H	I	J	K	L	L	K	J	I	H	G	A	B	C	D	E	F
DIMM slot number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

### One-processor configuration—DRAM DIMM installation order for Independent Mode

**Note:** If processor socket 2 is empty, DIMM fillers should be removed from the DIMM slots surrounding socket 2 (slot 13 to slot 24).

Table 2. One-processor configuration—DRAM DIMM installation order for Independent Mode

Processor	Processor 1											
DIMM slots	1	2	3	4	5	6	7	8	9	10	11	12
8 DIMMs		2		4	5	6	7	8	9		11	

### Two-processor configuration—DRAM DIMM installation order for Independent Mode

Table 3. Two-processor configuration—DRAM DIMM installation order for Independent Mode

Processor	Processor 1												Processor 2											
DIMM slots	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Total 16 DIMMs		2		4	5	6	7	8	9		11			14		16	17	18	19	20	21		23	
Total of 24 DIMMs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

---

## Gap pad/Putty pad identification and location

Follow the information in this section to identify their shape, location, and orientation of the various gap pads and putty pads used in SD665-N V3.

### Installation Guidelines for gap pad and putty pad

For the gap pad and putty pad used in SD665-N V3, see the following sections:

- [“Water loop and GPU node — Gap pad/Putty pad identification and location” on page 9](#)
- [“Compute node components — Gap pad/Putty pad identification and location” on page 11](#)

**Attention:** There are two types of thermal pad: putty pad and gap pad.

- Gap pad—Replace gap pad if it is damaged or missing.
- Putty pad— When replacing components, **always** replace putty pads with new ones.

Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

## Water loop and GPU node — Gap pad/Putty pad identification and location

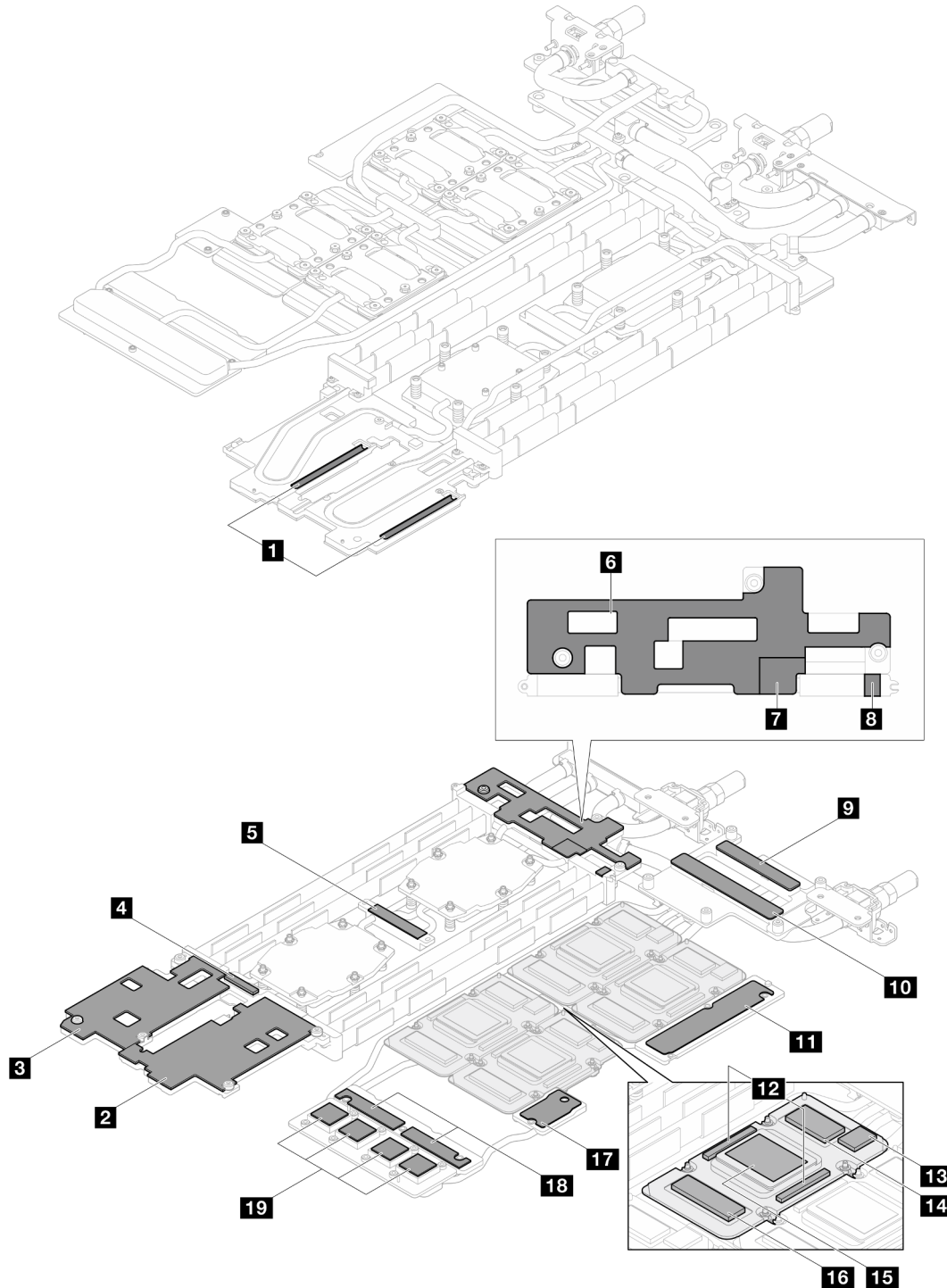


Figure 2. Water loop and GPU node — Gap pad/Putty pad identification and location

Pad index	Pad type	Attached component	Pad orientation
<b>1</b>	Gap pad	Compute node water loop	Gray side facing outward
<b>2</b>	Gap pad	Compute node water loop	Gray side facing outward

Pad index	Pad type	Attached component	Pad orientation
<b>3</b>	Gap pad	Compute node water loop	Gray side facing outward
<b>4</b>	<b>Putty pad</b>	Compute node water loop	Both sides can be facing outward
<b>5</b>	<b>Putty pad</b>	Compute node water loop	Both sides can be facing outward
<b>6</b>	Gap pad	Compute node water loop	Gray side facing outward
<b>7</b>	Gap pad	Compute node water loop	Gray side facing outward
<b>8</b>	Gap pad	Compute node water loop	Gray side facing outward
<b>9</b>	<b>Putty pad</b>	GPU node water loop	Both sides can be facing outward
<b>10</b>	<b>Putty pad</b>	GPU node water loop	Both sides can be facing outward
<b>11</b>	<b>Putty pad</b>	GPU node water loop	Align pad cutout to the screw hole and opening on the water loop
<b>12</b>	<b>Putty pad</b>	GPU	Both sides can be facing outward
<b>13</b>	<b>Putty pad</b>	GPU	Both sides can be facing outward
<b>14</b>	<b>Putty pad</b>	GPU	Both sides can be facing outward
<b>15</b>	Phase change material (PCM)	GPU node water loop	Both sides can be facing outward <b>Note:</b> A PCM jig is required for installing the PCM to GPU node water loop.
<b>16</b>	<b>Putty pad</b>	GPU	Both sides can be facing outward
<b>17</b>	<b>Putty pad</b>	GPU node water loop	Both sides can be facing outward
<b>18</b>	<b>Putty pad</b>	GPU node water loop	Align pad cutout to the screw hole and opening on the water loop
<b>19</b>	<b>Putty pad</b>	GPU node water loop	Both sides can be facing outward

## Compute node components — Gap pad/Putty pad identification and location

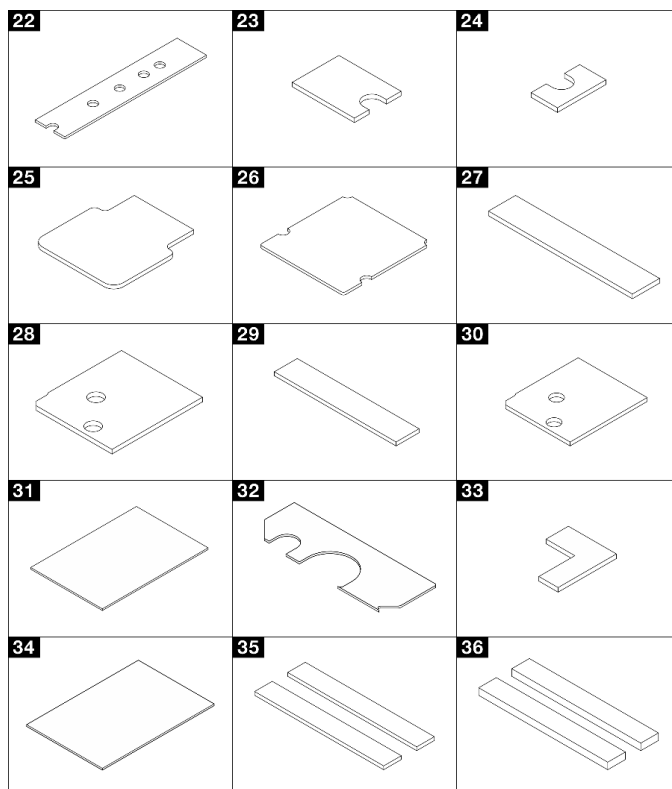
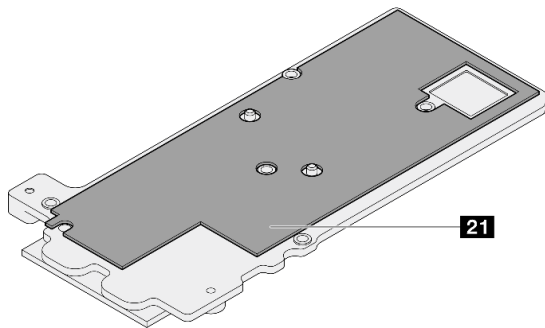
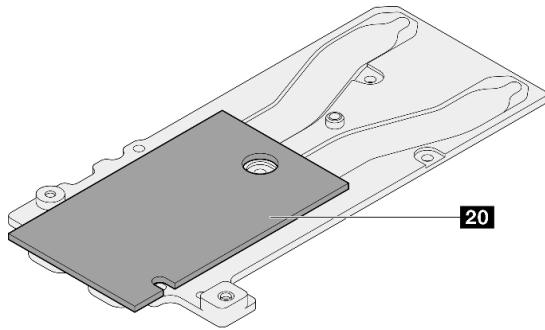


Table 4. Compute node components — Gap pad/Putty pad identification and location

Pad index	Pad type	Attached component	Pad orientation
<b>20</b>	Putty pad	OSFP module conduction plate	Align pad cutout to the screw hole and opening on the interface plate as shown in: <ul style="list-style-type: none"> <li>“Install the water loop” on page 40</li> <li>“Install the OSFP module and the network board (trained technician only)” on page 153</li> </ul>
<b>21</b>	Putty pad	OSFP module conduction plate	
<b>22</b>	Putty pad	M.2 backplane assembly	Align pad cutout to the screw hole and opening on the interface plate as shown in “Install an M.2 drive” on page 118.
<b>23</b>	Putty pad	M.2 backplane assembly	Align pad cutout to the screw hole and opening on the interface plate as shown in “Install the M.2 backplane assembly” on page 120.
<b>24</b>	Putty pad	M.2 backplane assembly	
<b>25</b>	Putty pad	M.2 backplane assembly	
<b>26</b>	Putty pad	M.2 backplane assembly	
<b>27</b>	Gap pad	Conduction plate for: <ul style="list-style-type: none"> <li>U.2 7mm drive</li> <li>U.2 15mm drive</li> <li>U.3 15mm drive</li> </ul>	Gray side facing outward
<b>28</b>	Gap pad	Drive cage for: <ul style="list-style-type: none"> <li>U.2 7mm drive</li> <li>U.2 15mm drive</li> <li>U.3 15mm drive</li> </ul>	Align pad cutout to the screw hole and opening on the interface plate as shown in “Install a drive cage assembly” on page 82
<b>29</b>	Putty pad	Conduction for U.3 7mm drive	Both sides can be facing outward
<b>30</b>	Gap pad	Drive cage for U.3 7mm drive	Align pad cutout to the screw hole and opening on the interface plate as shown in “Install a drive cage assembly” on page 82
<b>31</b>	Gap pad	E3.S drive conduction plate	Apply the adhesive side to the E3.S drive conduction plate, see “Install an E3.s drive” on page 104
<b>32</b>	Putty pad		Align pad cutout to the screw hole and opening on the interface plate as shown in “Install an E3.s drive” on page 104
<b>33</b>	Putty pad		
<b>34</b>	Gap pad	E3.S drive cage	Apply the adhesive side to the water loop.



Pad index	
<b>35</b>	VR 2.5 mm Putty Pad <ul style="list-style-type: none"> <li>Both sides can be facing outward</li> <li>Attached to the VR conduction plate</li> <li>See: <ul style="list-style-type: none"> <li><a href="#">“Install the system board” on page 237</a></li> <li><a href="#">“Transfer the system board” on page 251</a></li> <li><a href="#">“Install the water loop” on page 40</a></li> </ul> </li> </ul>
<b>36</b>	VR 1.5mm Putty Pad <ul style="list-style-type: none"> <li>Both sides can be facing outward</li> <li>Attached to the VR conduction plate</li> <li>See: <ul style="list-style-type: none"> <li><a href="#">“Transfer the system board” on page 251</a></li> <li><a href="#">“Install the water loop” on page 40</a></li> </ul> </li> </ul>

## 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).

Power button location and power LED are specified in [“Troubleshooting by system LEDs and diagnostics display” on page 416](#).

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.

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

For information about powering off the solution, see [“Power off the solution” on page 13](#).

### 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.

Power button location and power LED are specified in [“Troubleshooting by system LEDs and diagnostics display” on page 416](#).

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 13](#).

---

## Replace components in the tray

Use the following information to remove and install tray components.

### 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

**Important:** For your safety, use the lift tool to remove the tray from the rack.

**Attention:**

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

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

#### Procedure

Step 1. Remove the tray.

- a. ① Rotate the front cam handles until they stop.
- b. 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.

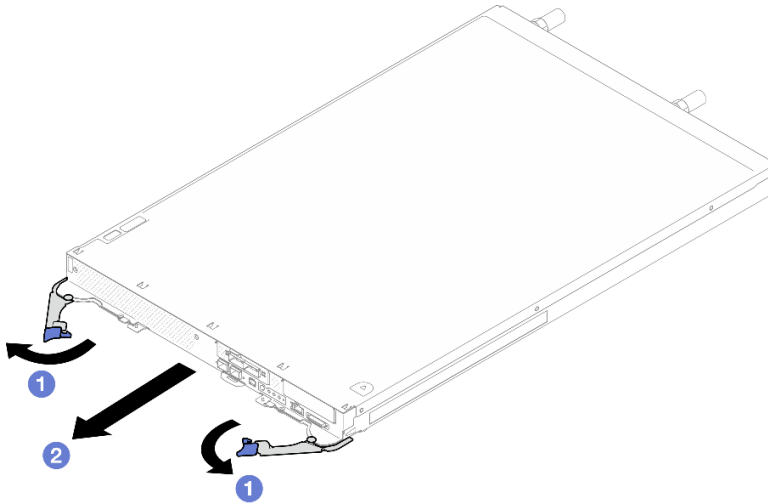


Figure 3. Tray removal

**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 15](#).
- 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

**Attention:**

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.
- When installing different DWC trays in the DW612S enclosure, make sure to follow the rules in [“Guidance on mixing trays configuration for the DW612S enclosure” in User Guide](#).

**Attention:** 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:**

- Up to six SD665-N V3 trays can be installed in the DW612S 6U enclosure. For more information on the number of trays in the enclosure, see [Chapter 1 “GPU power and maximum number of trays in the enclosure” on page 1](#).
- 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 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.

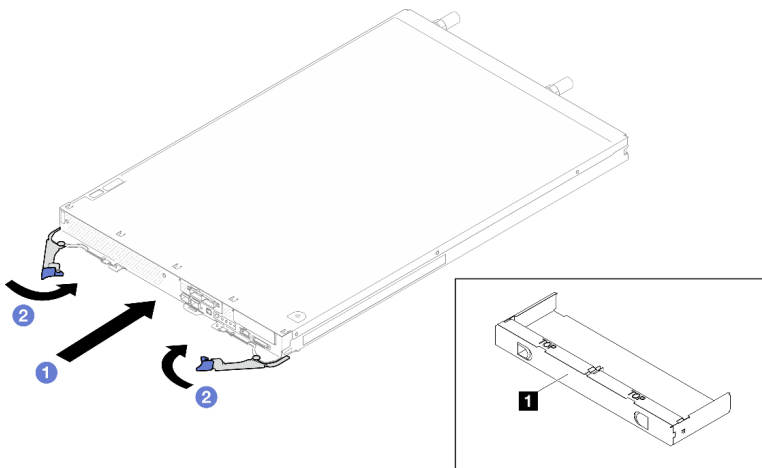


Figure 4. Tray installation

**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](#)

## Tray cover replacement

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

### Remove the tray cover

Use this information to remove the tray cover.

## About this task

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

## Procedure

Step 1. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).

Step 2. Press on the release latch and the push point at the same time and slide the cover toward the rear of the DWC tray.

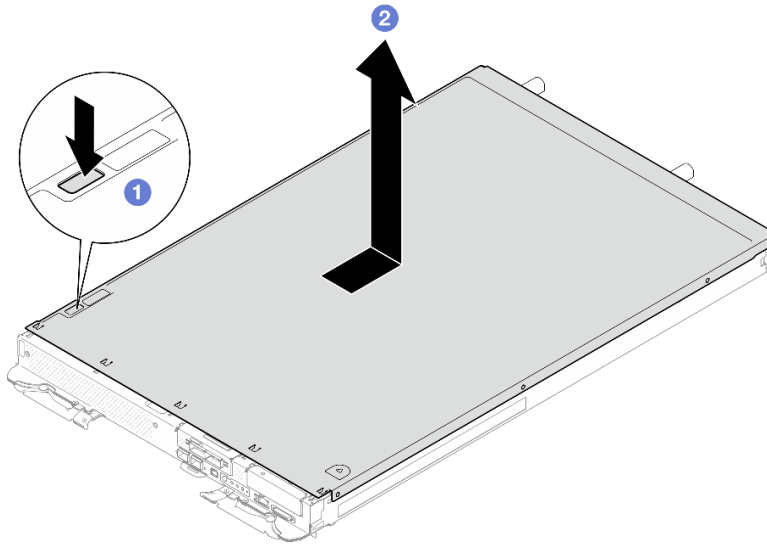


Figure 5. Tray cover removal

Step 3. Lift the cover off the DWC tray and set it aside.

**Note:** Service label instructions are located on the underside of each tray cover.

## 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 tray cover

Use this information to install the tray cover.

## About this task

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.

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

## Procedure

Step 1. Position the cover on top of the tray and slide the cover towards the front of the tray.

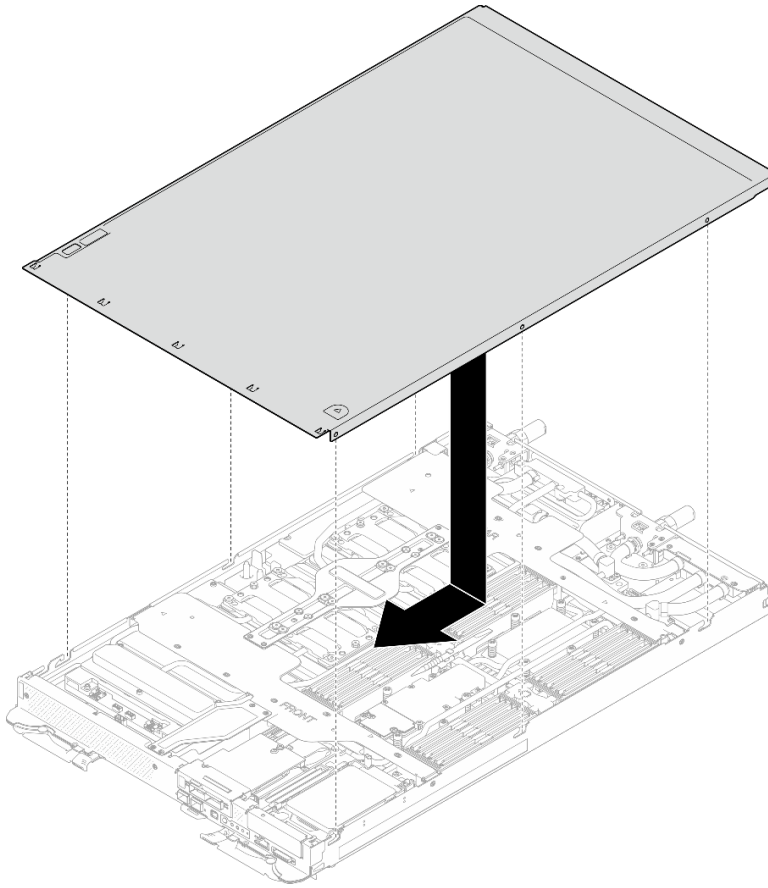


Figure 6. Tray cover installation

**Important:** Before you slide the cover forward, make sure that all the tabs on the front, rear, and side of the cover are engaged with the enclosure correctly. If all the tabs do not engage the enclosure correctly, it will be very difficult to install the cover later.

### After you finish

1. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
2. Connect all required external cables to the solution.

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

3. 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](#)

## Cross braces replacement

Use the following procedures to remove and install the cross braces in SD665-N V3 tray.

### Remove the cross braces

Use this information to remove the cross braces.

## About this task

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

## Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).

Step 2. Remove the front cable cover (x4 M3.5 screws).

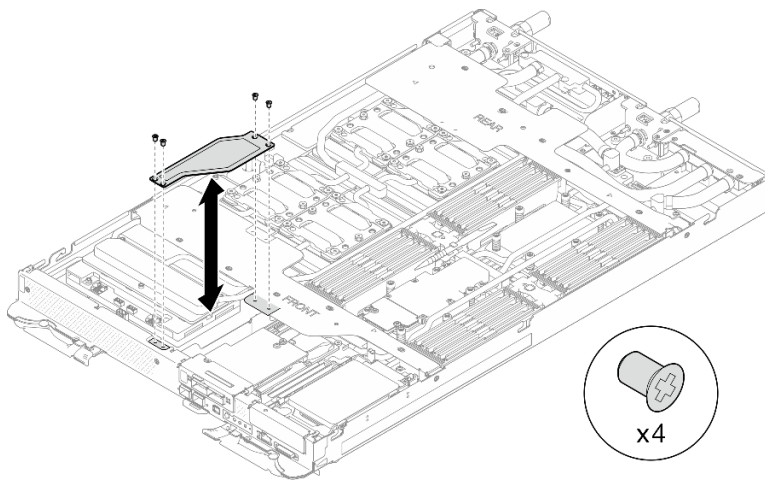


Figure 7. Removing front cable cover

Step 3. Remove the front and rear cross braces (x7 M3.5 screws for each cross brace).



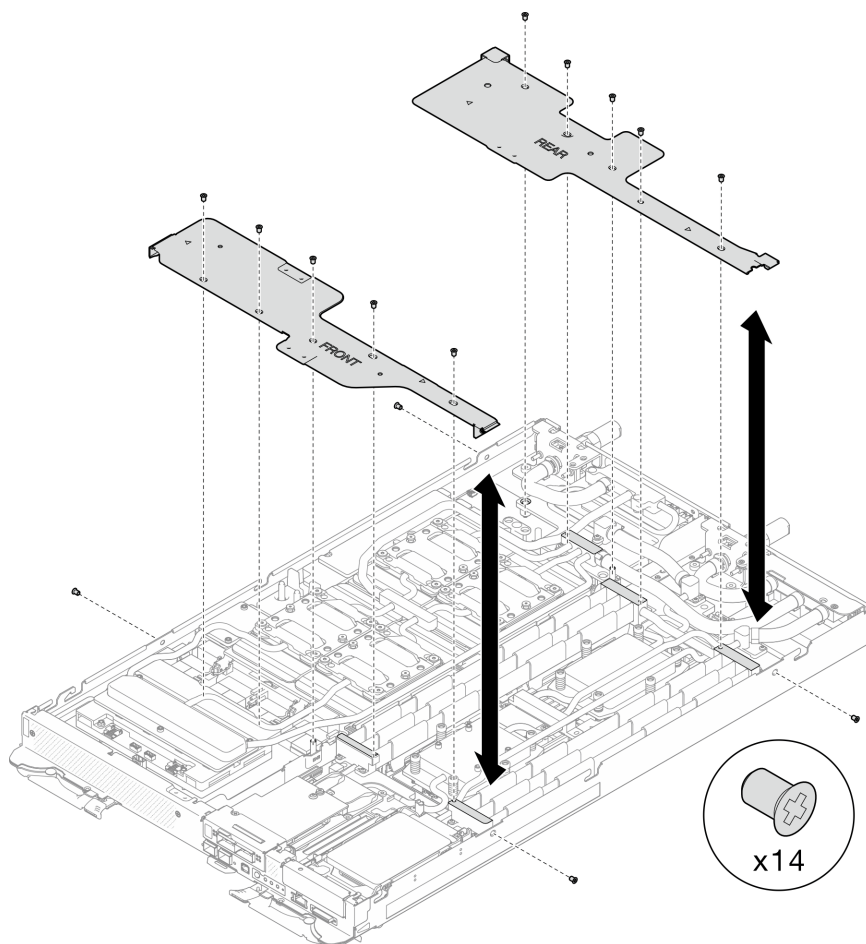


Figure 8. Removing front and rear cross braces

## 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 cross braces

Use this information to install the cross braces.

## About this task

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.

## Procedure

Step 1. Install the front and rear cross braces (x7 M3.5 screws for each cross brace).

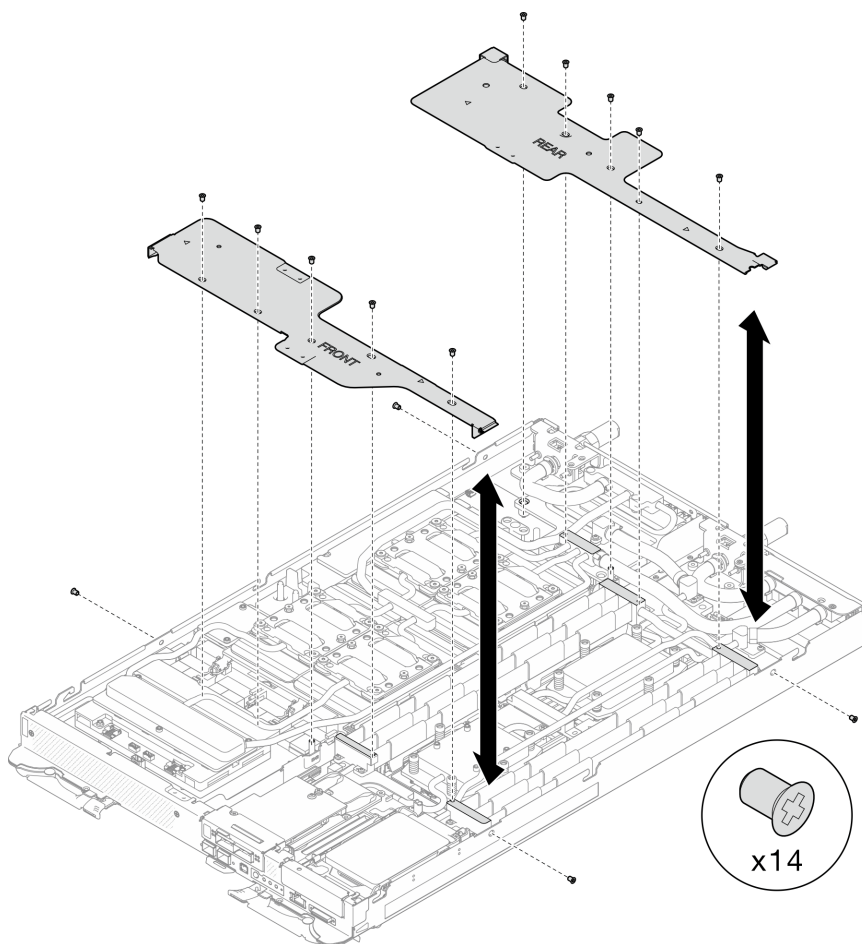


Figure 9. Installing front and rear cross braces

Step 2. Install the front cable cover (x4 M3.5 screws).

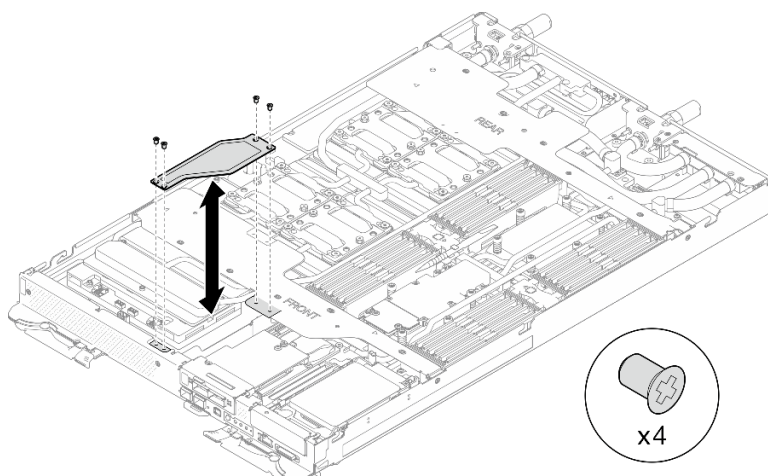


Figure 10. Installing the front cable cover

## After you finish

1. Install the tray cover. See [“Install the tray cover”](#) on page 18.

2. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
3. Connect all required external cables to the solution.

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

4. 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](#)

## Water loop replacement

Use the following procedures to remove and install the water loop in the SD665-N V3 tray.

### Attention:

- The water loop replacement procedure requires trained personnel.
- For your safety, use lift tool to remove the tray from the enclosure.

## Remove the water loop

Use this information to remove the water loop in the SD665-N V3 tray.

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Compute node water loop carrier
- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)
- SD665-N V3 OSFP Putty Pad Kit
- VR Conduction Plate 12.0
- VR 1.5mm Putty Pad
- VR 2.5 mm Putty Pad

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Drive gap pad or putty pad kits according to the drives installed in the tray. See their respective replacement procedures for more information.
- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Hex screw (OSFP module conduction plate)	4.5 mm hex head screwdriver

Screw Type	Screwdriver Type
Torx T10 screw	Torx T10 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

## Procedure

Step 1. Make preparations for this task.

- Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- Remove the cross braces. See [“Remove the cross braces” on page 19](#).
- Remove the DIMM comb. See [“Remove a DIMM comb” on page 71](#).
- Remove memory modules. See [“Remove a memory module” on page 124](#).
- Remove the M.2 backplane assembly. See [“Remove the M.2 backplane assembly” on page 113](#).

**Note:** The M.2 backplane cold plate needs to be removed as well.

- Remove the bus bar. See [“Remove the bus bar” on page 266](#).
- Remove the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
- Remove the drive cage. See [“Remove a drive cage assembly” on page 74](#).
- Remove the OSFP module. See [“Remove the OSFP module” on page 139](#).

### Separate the water loop from the GPU node.

Step 2. Remove the carrier board power cable from the GPU node.

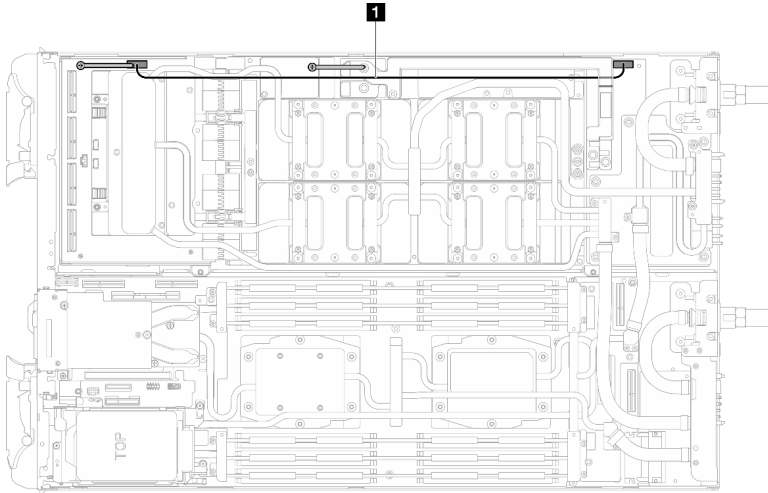


Figure 11. Carrier board power cable removal

Cable	From (carrier board)	To (GPU node power distribution board)
1 Carrier board power cable	Power and side band connector	Power connector

Step 3. Remove cable tie from the GPU board.

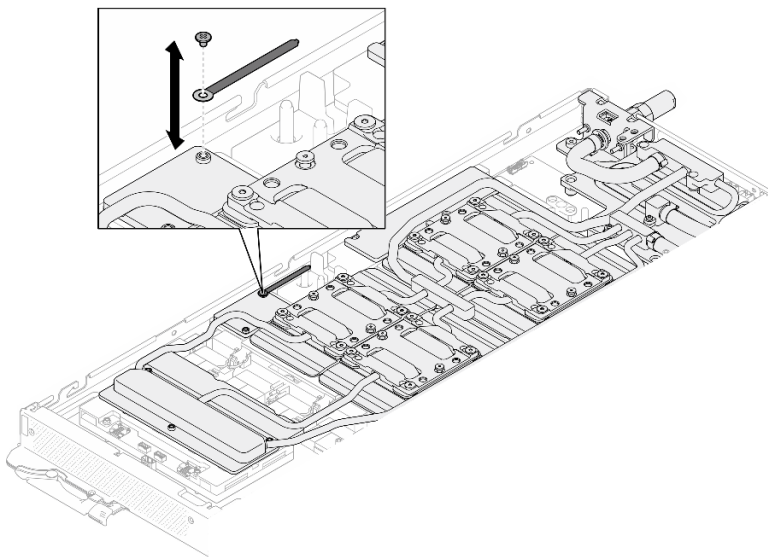
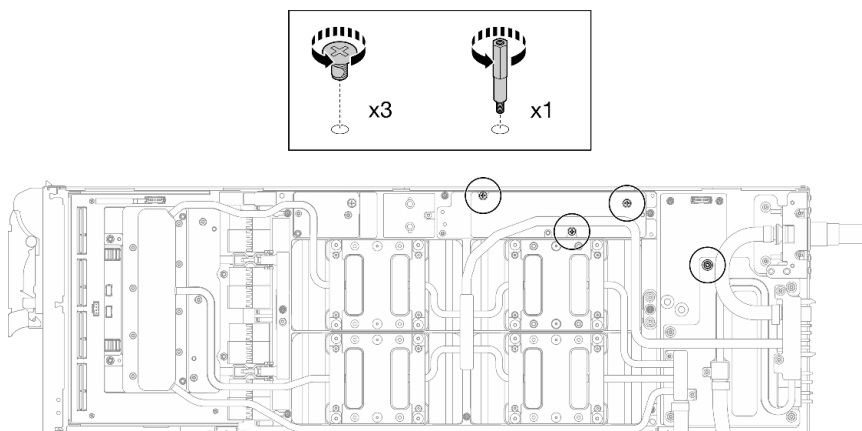


Figure 12. Cable tie removal

Step 4. Remove the Hex screw (x1) and the PH1 screws (x3) from the water loop with a torque screwdriver set to the proper torque.

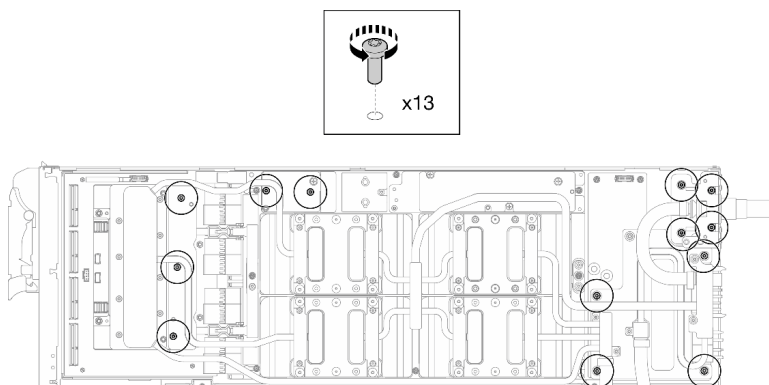
**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



*Figure 13. Water loop Hex and PH1 screws removal (GPU node)*

- Step 5. Remove water loop screws and quick connect screws (x13 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



*Figure 14. Water loop Torx T10 screws removal (GPU node)*

- Step 6. Remove the quick connect screws (x4 Torx T10) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

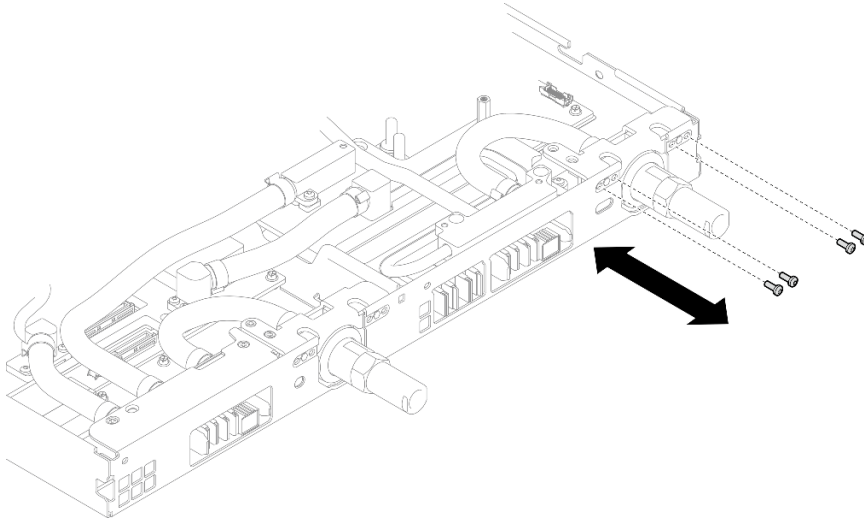


Figure 15. Quick connect screw removal (GPU node)

- Step 7. Follow the screw removal sequence specified on the network board label, and remove network cold plate screws (x8 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

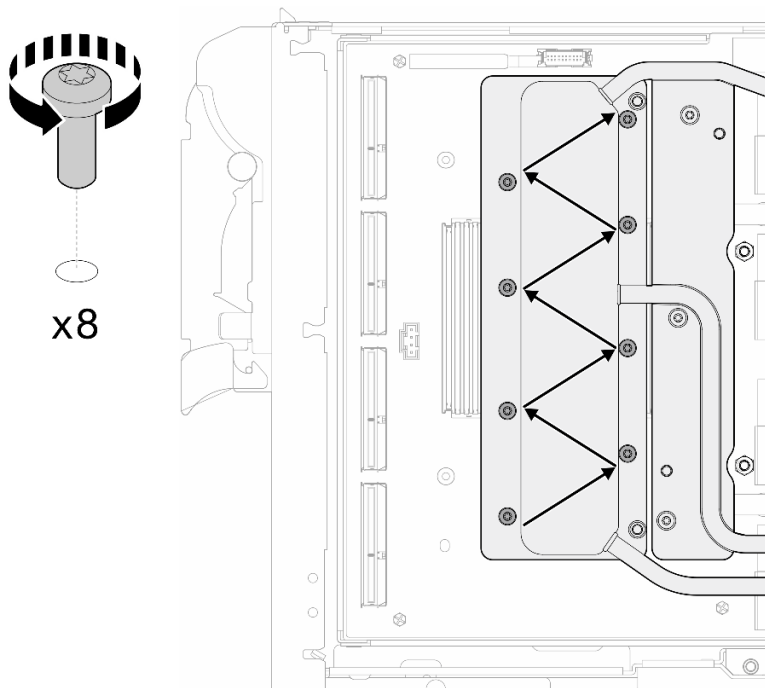


Figure 16. Network card screw removal

- Step 8. Loosen GPU cold plate screws (x16 Torx T10 screws) in the diagonal pattern with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/loosened is 3.5 +/- 0.5 lb-in (0.4 +/- 0.06 N-m).

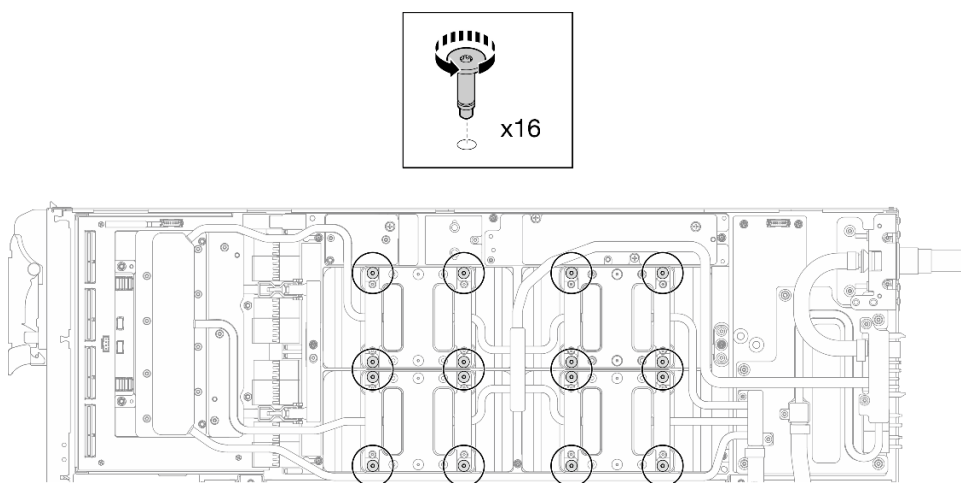


Figure 17. Loosening GPU cold plate screw

Step 9. Release the front and rear MISC conduction plates of the water loop from the GPU board.

- a. ❶ Insert a flat head screwdriver into the gaps between the MISC conduction plates (front and rear) and the GPU board. Then, slightly rotate the flat head screwdriver.

**Note:** Locations of the gaps for inserting flat head screwdriver is shown in the illustration below.

- b. ❷ The front and rear MISC conduction plates release from the GPU board slightly.

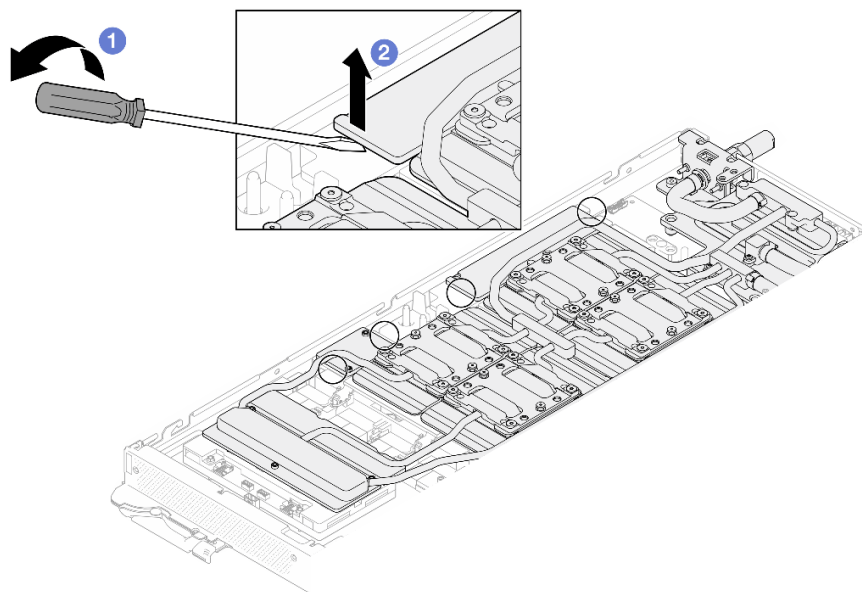


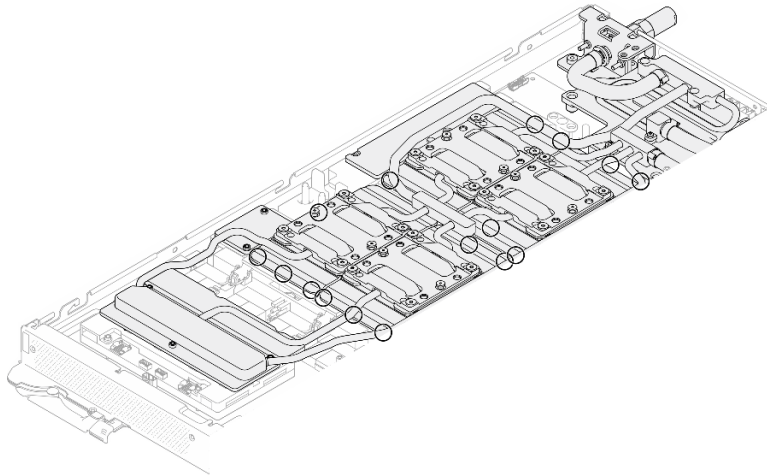
Figure 18. Releasing the front and rear MISC conduction plates release from the GPU board

Step 10. Release the GPU cold plates from the GPUs.

- a. There are notches on the sides of the GPU cold plates for inserting a flat head screwdriver. The locations of the notches are shown in the illustration below.

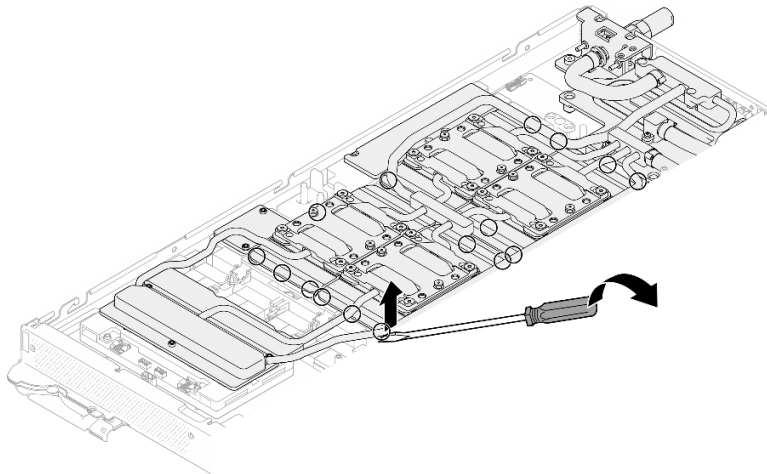


**Attention:** Inserting the flat head screwdriver **ONLY** to the notches circled in the illustration below. Otherwise, the screwdriver may damage the GPUs.



*Figure 19. Notches for releasing GPU cold plates*

- b. Insert a flat screwdriver into all the notches shown in the illustration; then, slightly rotate the screwdriver to release the GPU cold plates from the GPUs.



*Figure 20. Releasing the GPU cold plate from the GPU*

- Step 11. Gently put the water loop carrier down onto the water loop and ensure it is seated firmly on the water loop.

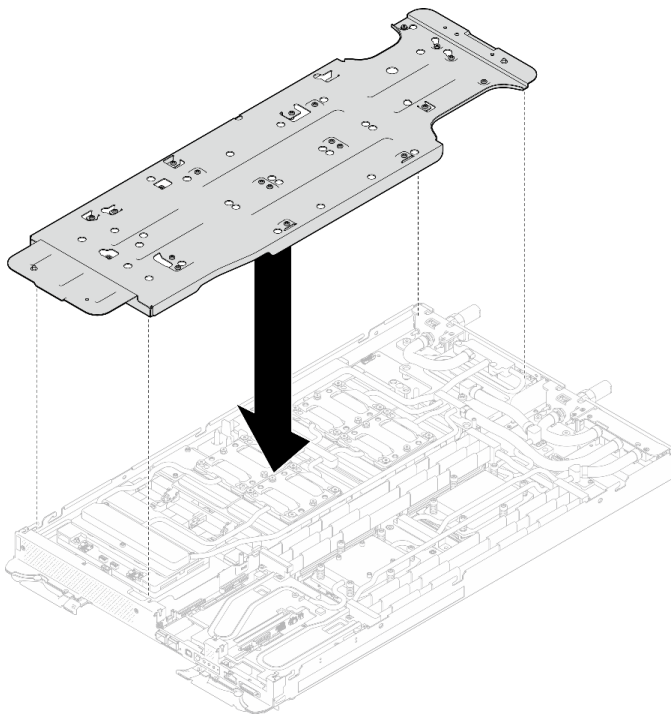


Figure 21. Water loop carrier installation (GPU node)

Step 12. Tighten water loop carrier screws (x20 Phillips #2 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

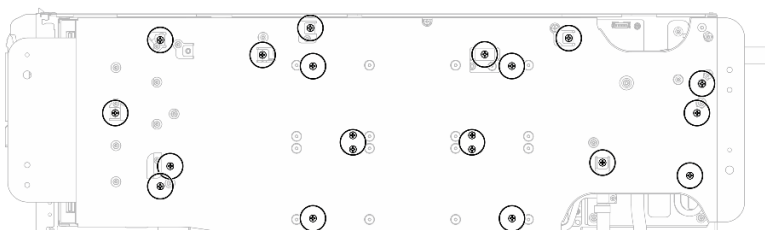
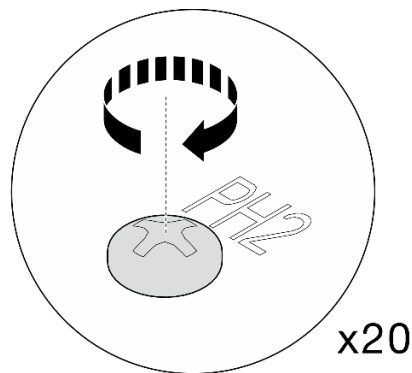


Figure 22. Water loop screw and quick connect screw removal (GPU node)

Step 13. Carefully rotate the GPU node side water loop so that it is sitting on top of the Compute node side water loop.

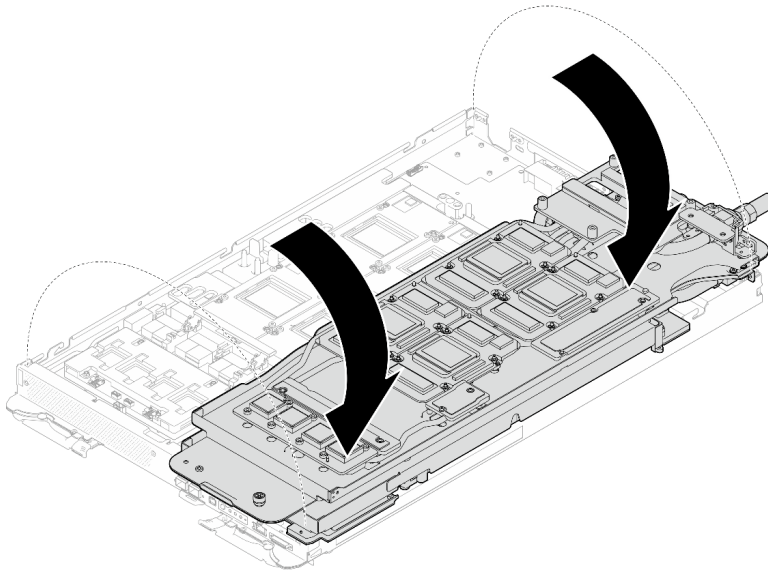


Figure 23. Folding the GPU node side water loop onto the Compute node side water loop

Step 14. **Immediately** clean the PCM off all the GPUs with alcohol cleaning pads. **Gently** clean the PCM to avoid GPU damages.

**Attention:**

- It is recommended to clean the PCM while it is in liquid state.
- The electrical components around the die on the GPUs are extremely delicate. When removing the PCM and cleaning the GPU die, avoid touching the electrical components to prevent damages.

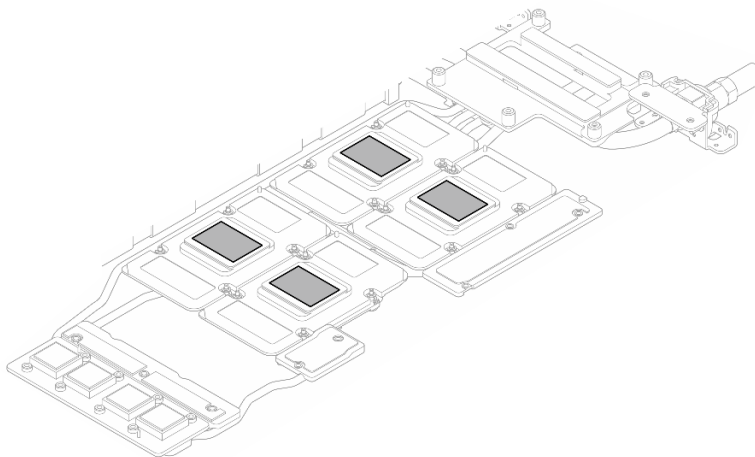
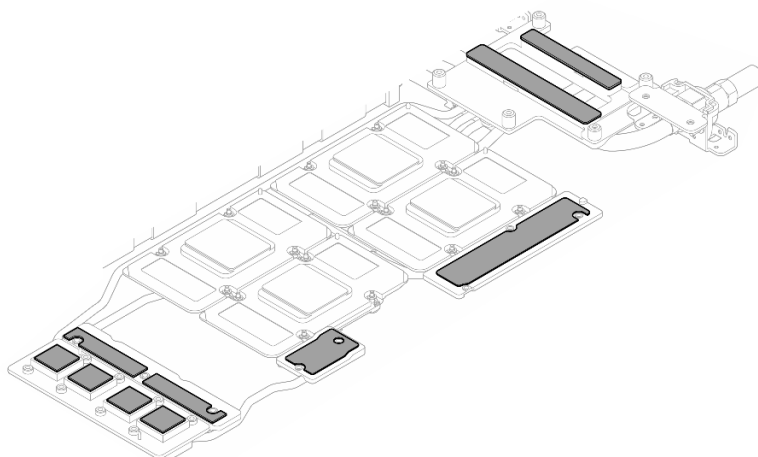


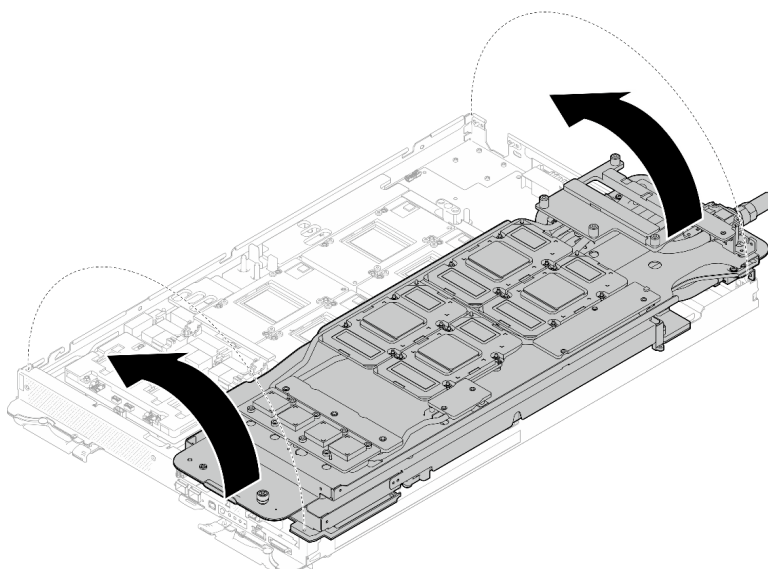
Figure 24. Cleaning PCM off from all GPUs

Step 15. With alcohol cleaning pads, wipe off any remaining putty pad and PCMs from the water loop and components in the GPU node.



*Figure 25. Cleaning putty pads from water loop*

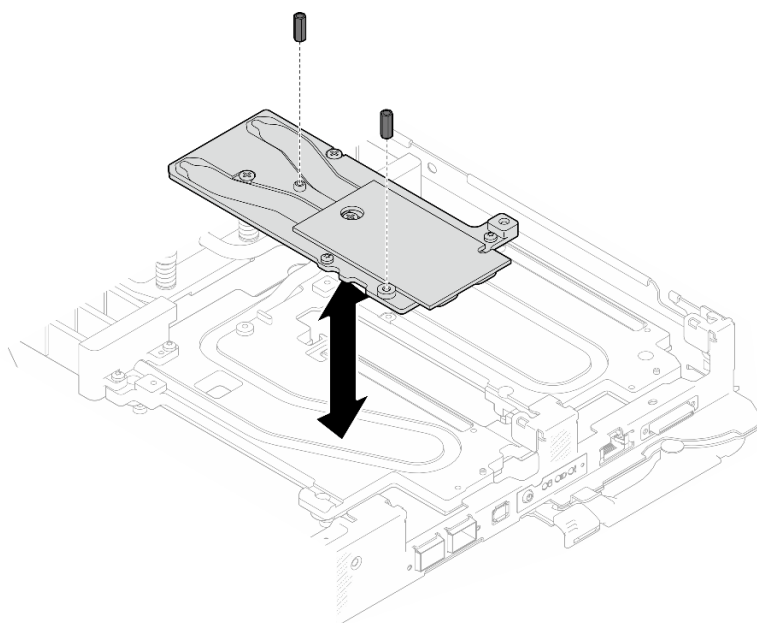
Step 16. Flip the GPU node water loop back to the GPU node.



*Figure 26. Flipping GPU node water loop to the GPU node*

**Separate the water loop from the compute node.**

Step 17. Remove the two Hex screws from the OSFP module with a 4.5 mm hex head screwdriver.



*Figure 27. OSFP module conduction plate Hex screws removal*

Step 18. Remove the OSFP module conduction plate. With alcohol cleaning pads, wipe of any remaining putty pads from the conduction plate.

Screw Type	Screwdriver Type
<b>1</b> M3x5 screw (x3)	Phillips #1 head screwdriver
<b>2</b> M3 screw (x2)	T10 screwdriver

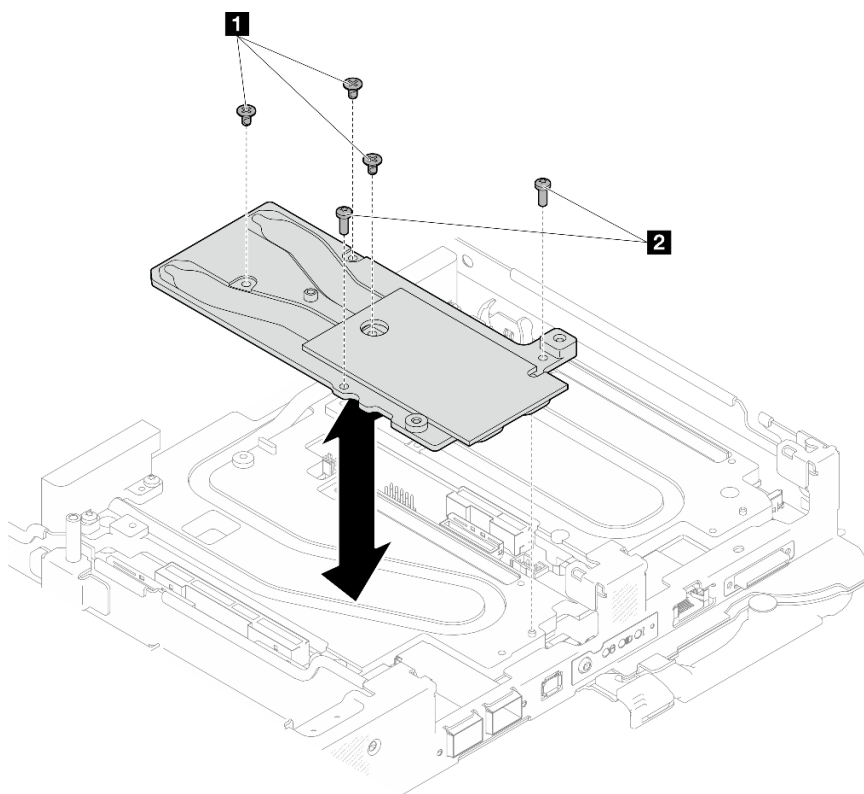


Figure 28. OSFP module conduction plate removal

Step 19. Remove the five Torx T10 screws to loosen the quick connect.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

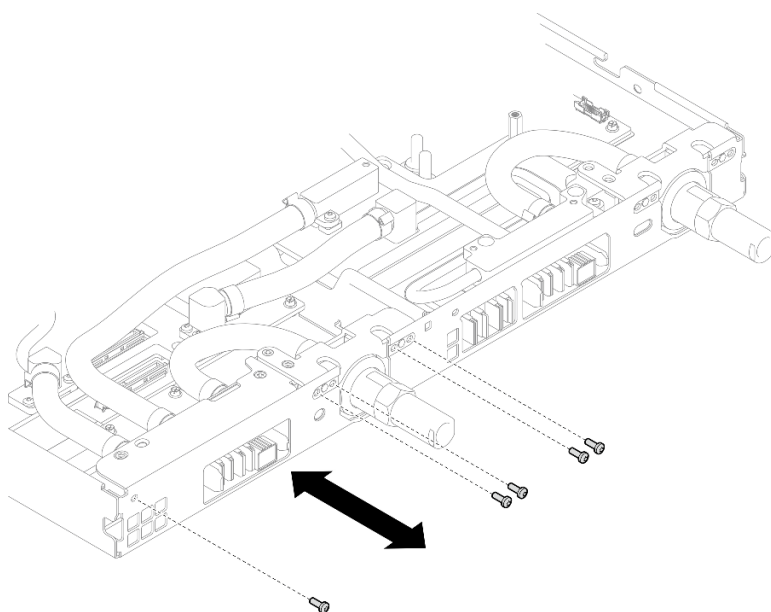


Figure 29. Quick connect screw removal (Compute node)

Step 20. Remove water loop screws and quick connect screws (14x Torx T10 screws per node) with a torque screwdriver set to the proper torque.

**Notes:**

- For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.
- When removing the **1** VR cold plate screws (x2), remove the washers, too. **Make sure** to keep the washers for future use.

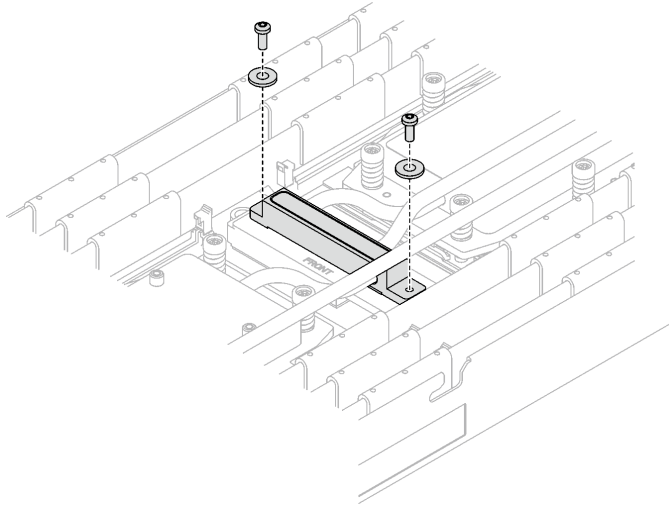


Figure 30. VR cold plate screws with washer

**1** VR cold plate screws (x2)

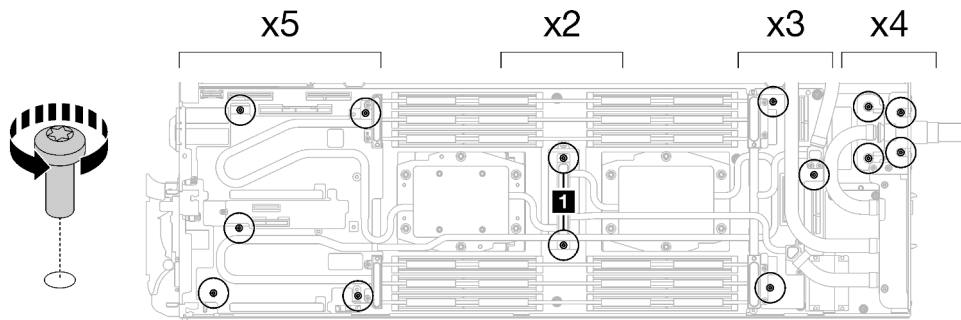


Figure 31. Water loop screw removal

Step 21. Remove processor cold plate screws (12x Torx T20 screws per node). Follow the screw sequence specified on the processor cold plate label and loosen the screws with a general screwdriver. Fully loosen each screw; then, proceed to the next screw.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 1.12-1.46 newton-meters, 10-13 inch-pounds

Fully loosen each screw in this order: 6 → 5 → 4 → 3 → 2 → 1

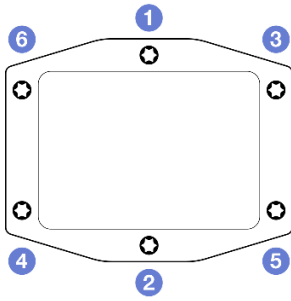


Figure 32. Processor cold plate label

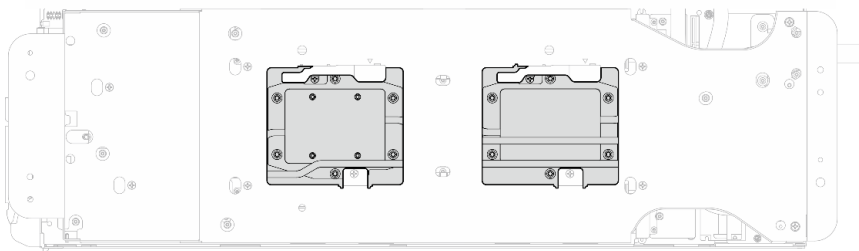
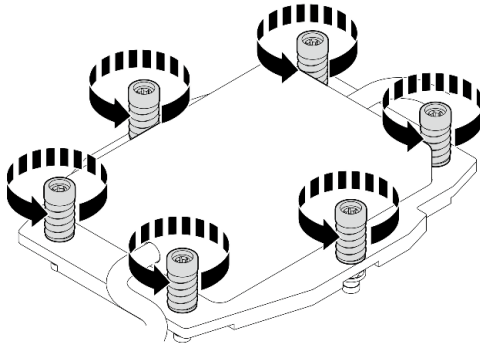
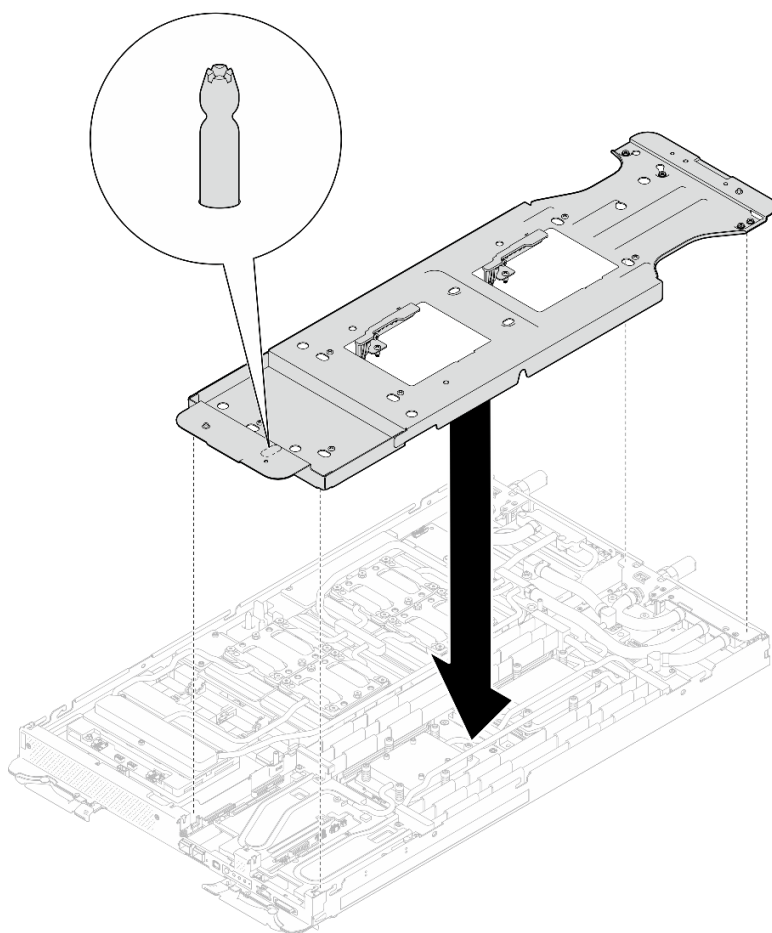


Figure 33. Processor cold plate removal

Step 22. Orient the water loop carrier with the guide pin; then, gently put the water loop carrier down and ensure it is seated firmly on the water loop.





*Figure 34. Water loop carrier installation (Compute node)*

Step 23. Tighten water loop carrier screws (x12 Phillips #2 screws).

**Note:** Select screw holes marked as **R** on the rear of the shipping bracket.

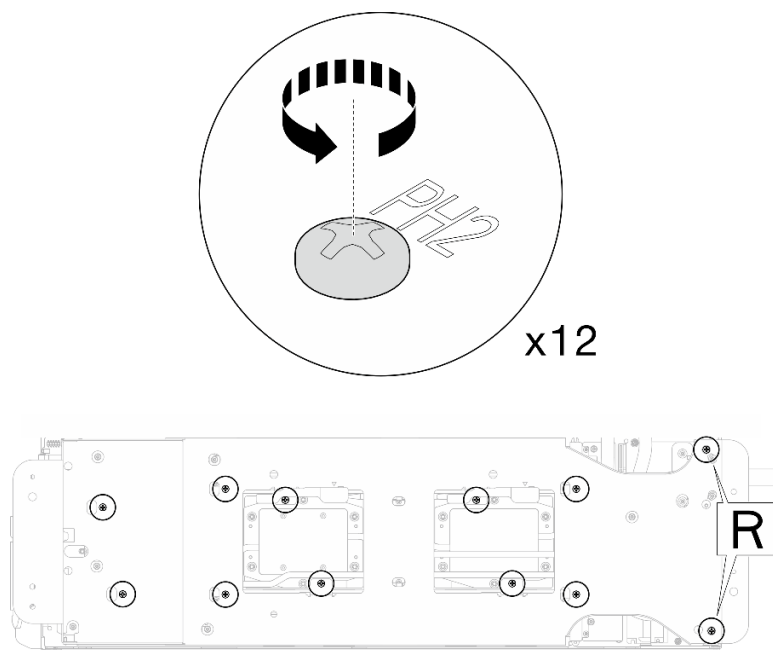


Figure 35. Water loop carrier screws installation (Compute node)

Step 24. Rotate the latch on the water loop carrier to separate the water loop from processors.

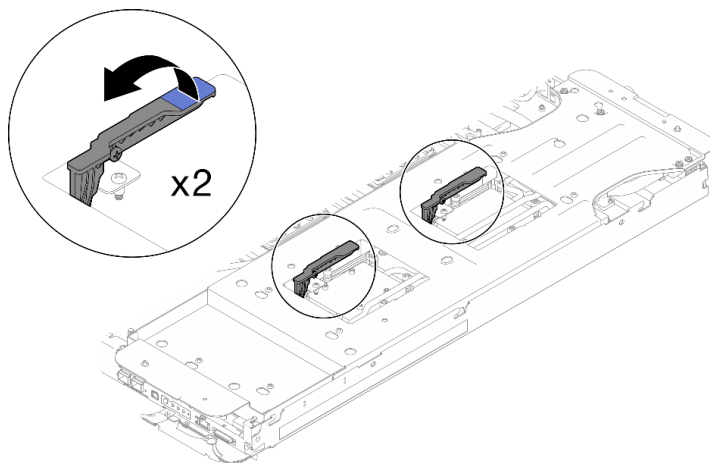
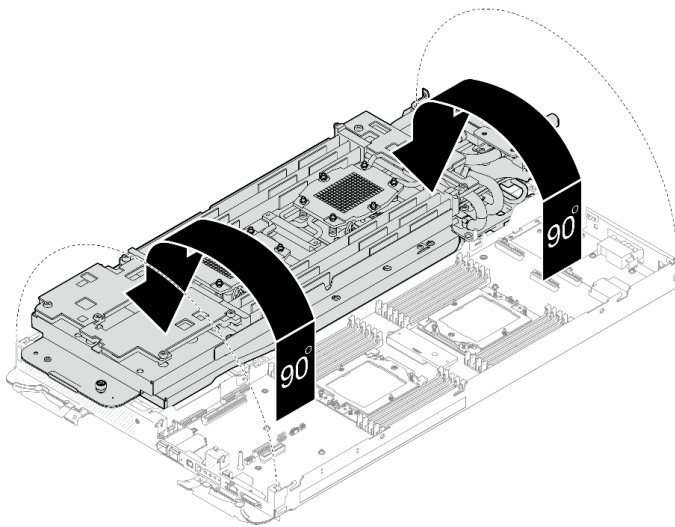


Figure 36. Separate water loop from processor

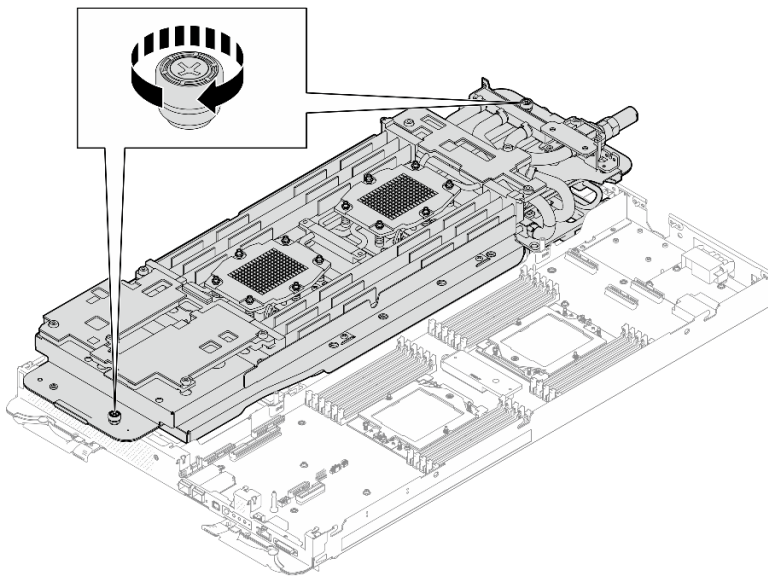
**Securing two water loops with shipping brackets together.**

Step 25. Carefully rotate the water loop so that the Compute node side water loop is sitting on top of the GPU node side water loop.



*Figure 37. Folding the water loop*

Step 26. Fasten two captive thumbscrews to secure water loop carriers to each other.



*Figure 38. Tightening captive thumbscrews*

Step 27. Carefully lift the water loop up off the system board and out of the node.

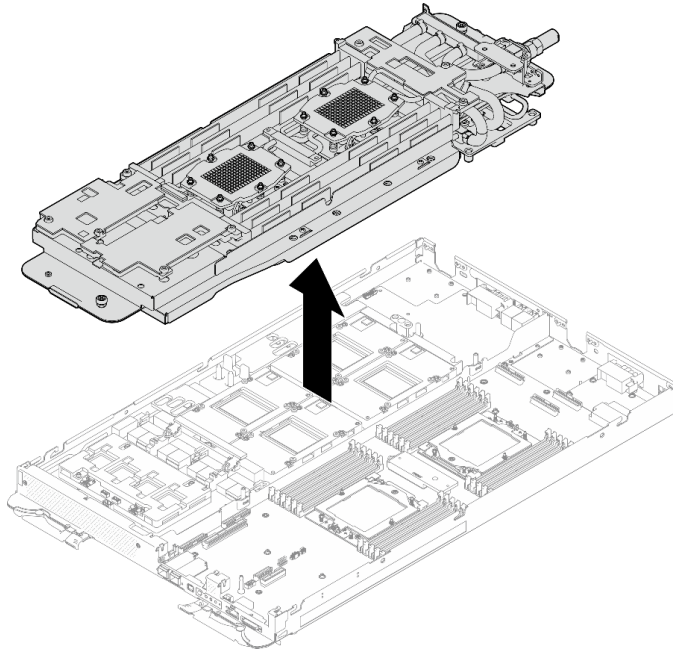


Figure 39. Water loop removal

Step 28. With alcohol cleaning pads, wipe off any remaining putty pad from the water loop and components in the compute node

## 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 water loop

Use this information to install the water loop in the SD665-N V3 tray.

## About this task

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

## Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Compute node water loop carrier
- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)
- SD665-N V3 OSFP Putty Pad Kit
- VR Conduction Plate 12.0
- VR 1.5mm Putty Pad
- VR 2.5 mm Putty Pad

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Drive gap pad or putty pad kits according to the drives installed in the tray. See their respective replacement procedures for more information.
- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Hex screw (OSFP module conduction plate)	4.5 mm hex head screwdriver
Torx T10 screw	Torx T10 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

#### Attention:

- Read “[Installation Guidelines](#)” on page 3 and “[Safety inspection checklist](#)” on page 4 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

## Procedure

**Attention:** Make sure that the retaining clips on all memory module connectors are in the locked position.

- Step 1. **If you are installing a new water loop to the tray**, before starting to install the water loop, complete replacing the VR conduction plate first, see [“Install the VR conduction plate for water loop replacement” on page 60](#). **If you are reinstalling the water loop after replacing the system board, processor, or power distribution board**, skip this step.
- Step 2. When removing the water loop from the package box, **make sure** to hold the touch points marked in grey in the illustration below.

**Attention:** Holding the water loop anywhere other than the touch points may cause damage to it.

Top image	Isometric view of water loop
Bottom image	Top view of the water loop

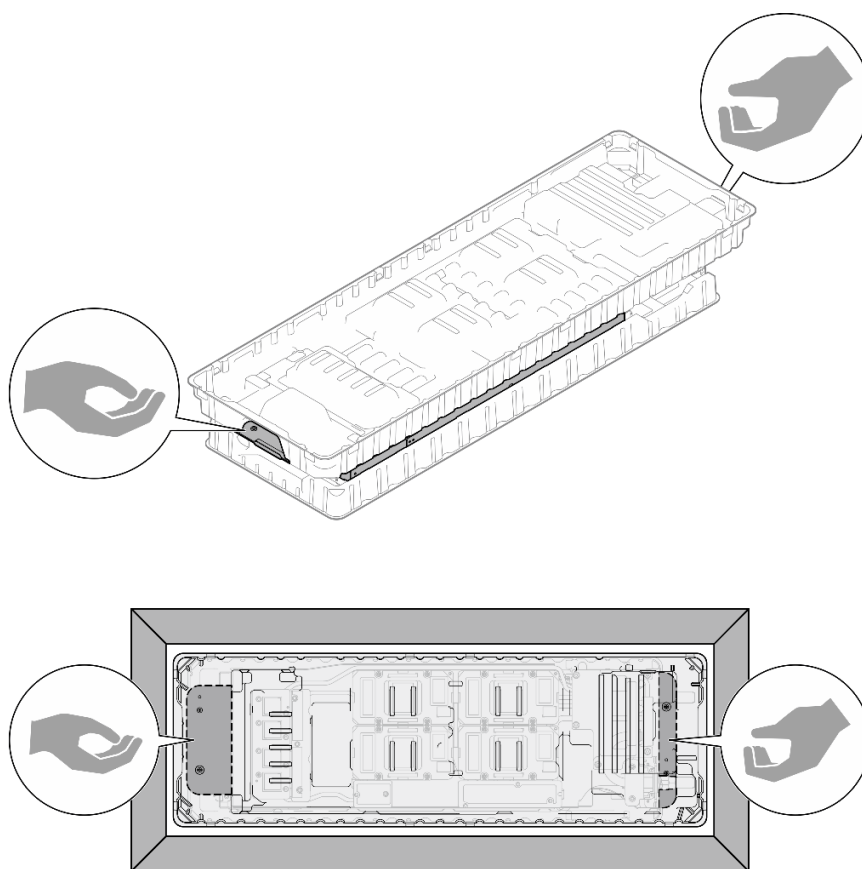
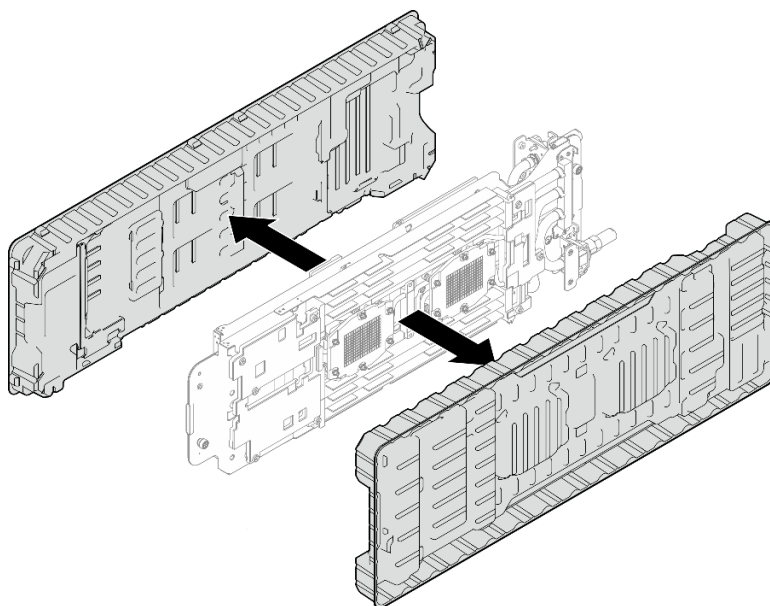


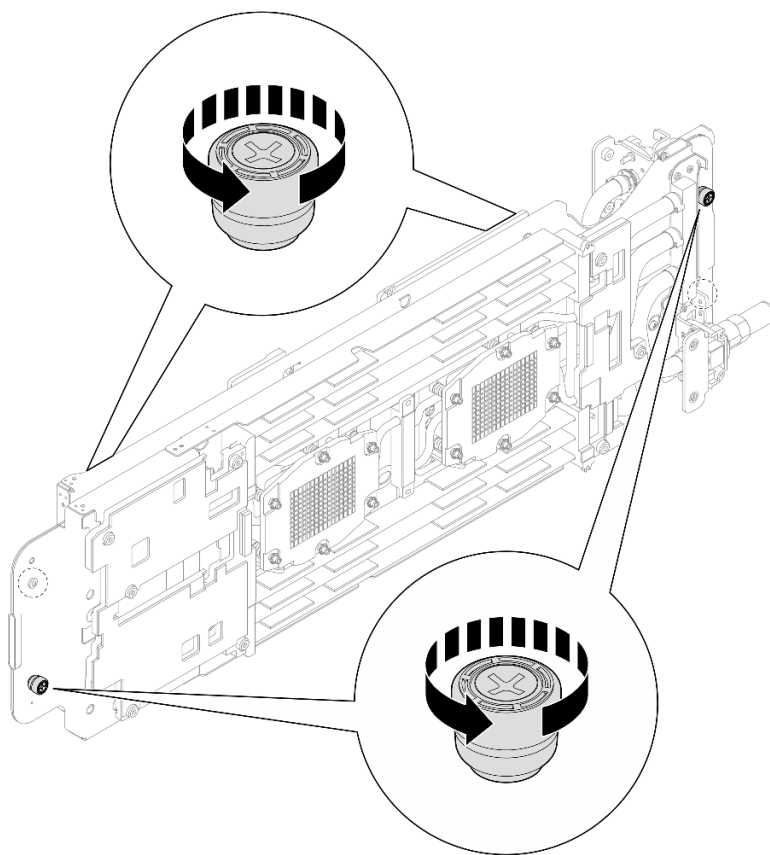
Figure 40. Touching points when removing water loop from package box

- Step 3. If needed, remove plastic grease covers from the underside of processor cold plates.



*Figure 41. Plastic grease covers removal*

Step 4. Fully loosen four captive thumbscrews on the water loop carrier.



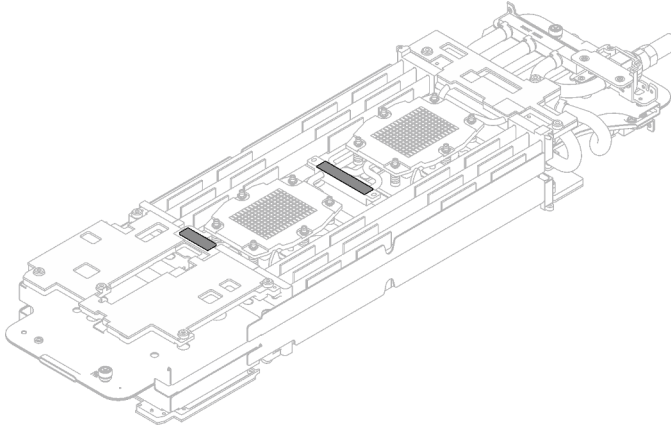
*Figure 42. Loosening water loop carrier captive thumbscrews*

**Compute node** water loop gap pad/putty pad replacement. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

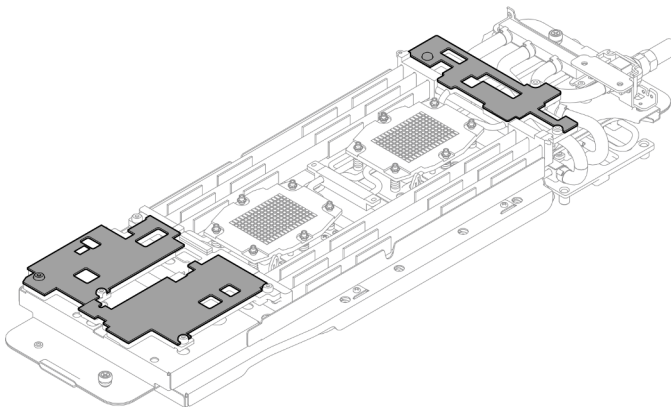
Step 5. Check the both gap pads and putty pads on the bottom side and top side of the **compute node water loop**.

- a. Replace the putty pads with new ones.
- b. Replace the gap pads with new ones if any of them is damaged or detached.

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**



*Figure 43. Water loop bottom side putty pads (compute node side)*



*Figure 44. Water loop bottom side gap pads (compute node side)*



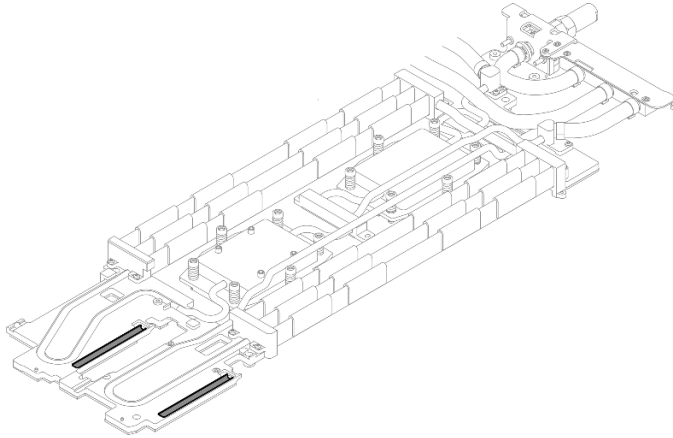


Figure 45. Water loop top side gap pads (compute node side)

**GPU node** water loop gap pad/putty pad replacement. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 6. Replace the Phase Change Material (PCM) and putty pads on the GPU node water loop with new ones.

- a. ① Install the PCM jig on the GPU cold plate.
- b. ② Attach the PCM to the square opening of the jig.
- c. Repeat to replace the PCM of all four GPU cold plates.

**Attention:**

- PCM cannot be reused. PCM must be replaced with new ones every time the water loop is removed.
- After PCM is replaced, there is an expected short duration of throttling before the GPU returns to normal operation. This is due to the PCM requiring a break-in period after being replaced.
- After replacing the GPU PCM and putty pads, servicers must perform the H100/H200 GPU PCM TIM melting procedure to monitor the GPU until the PCM Thermal Interface Material (TIM) has melted.
  - When performing the melting H100/H200 GPU PCM TIM procedures, the minimum water temperature is 35°C (95°F). Do not operate the melting process with water temperature lower than 35°C (95°F).
  - See [PCM TIM Melt Procedure for Neptune Water Cooled Servers with Nvidia H100 H200 GPUs](#) (trained technicians only).

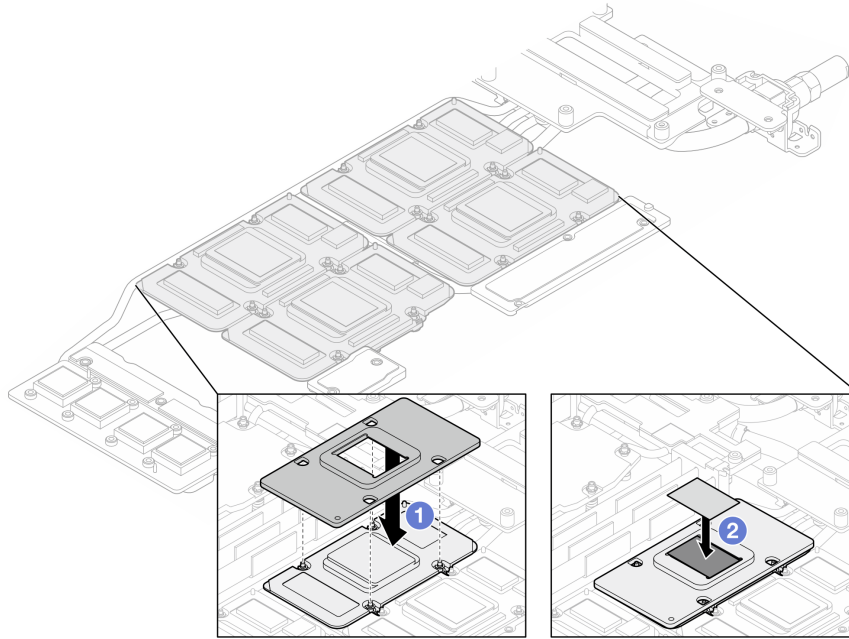


Figure 46. Water loop GPU cold plate PCM replacement (GPU node)

- d. Replace the putty pads on the GPU node water loop.

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

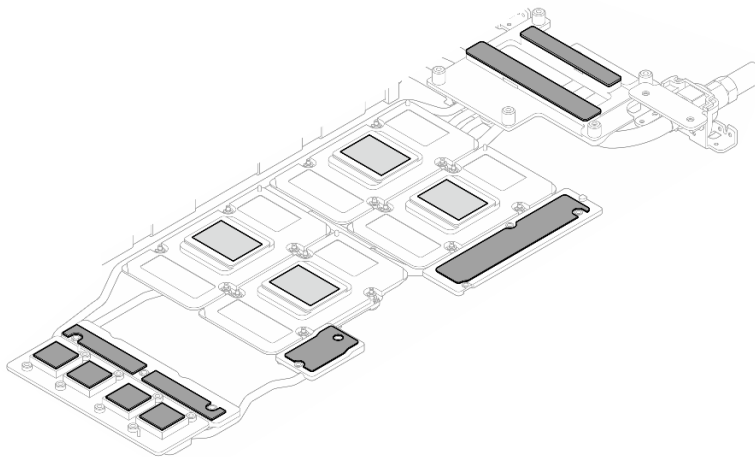


Figure 47. Water loop putty pads replacement (GPU node)

- e. Replace the putty pads (x5) on the GPU. Make sure to align the putty pads to the GPU VR (1) and the markings on GPU. Repeat to replace all putty pads on the four GPUs.

**1** GPU VR (Cover the GPU VR with putty pad)

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

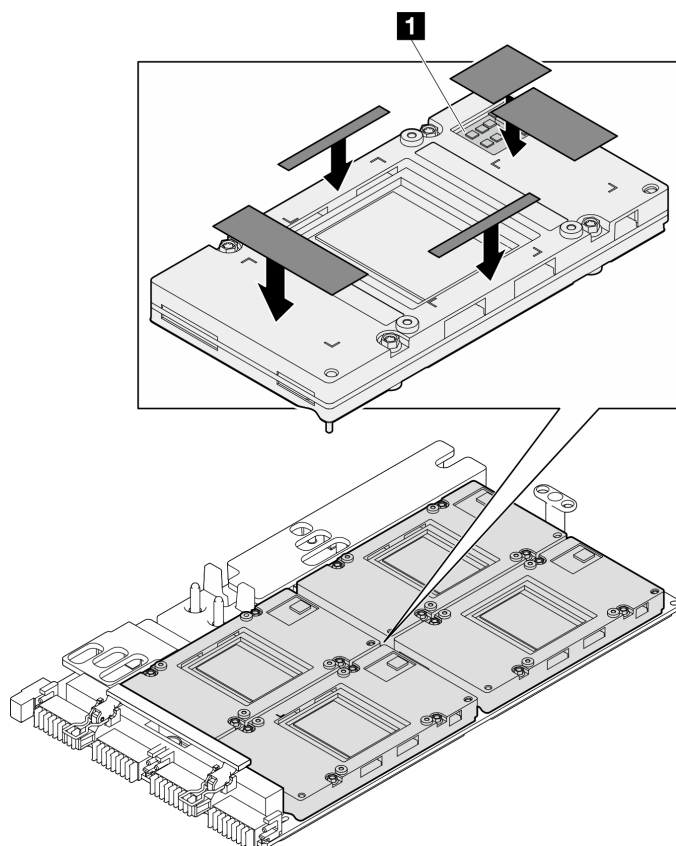


Figure 48. GPU putty pads replacement

Step 7. Install the **compute node** side of the water loop to the tray.

- a. ① Carefully hold the water loop with both hands and flip it.
- b. ② Carefully position the water loop onto the three guide pins, one near the front of the node and two near the rear of the node; then, gently lower down the water loop and ensure it is seated firmly on the system board.

**Attention:** Keep the water loop at an upright position to prevent damaging the system board.

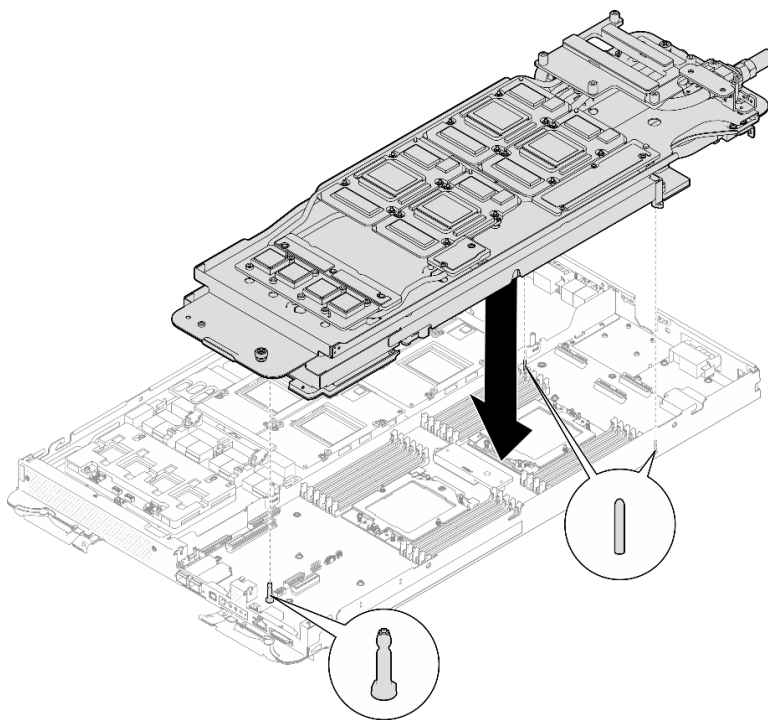


Figure 49. Water loop carrier installation

Step 8. Unfold and install the other side of the water loop as shown.

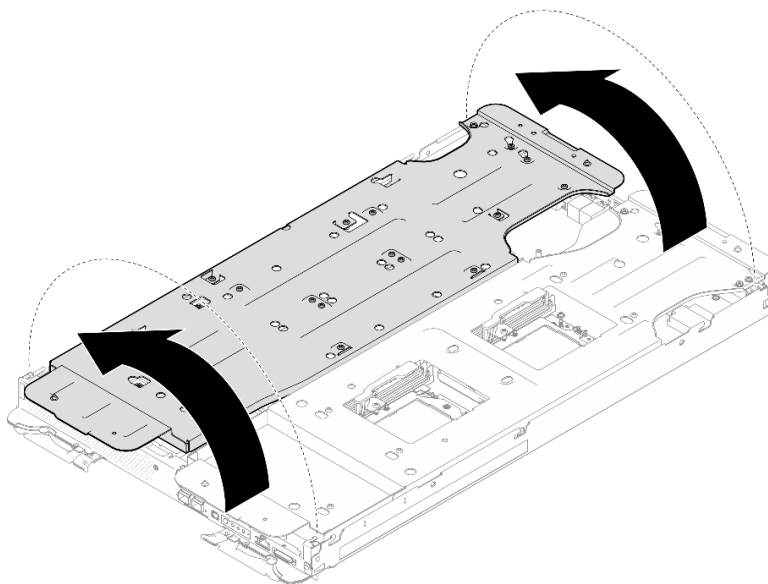


Figure 50. Unfolding water loop

### Install water loop to the compute node

Step 9. Install processor cold plate screws (x12 Torx T20 screws for the CPU node). Follow the screw sequence specified below and tighten the screws with a torque screwdriver. Fully tighten each screw; then, proceed to the next screw.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 1.12-1.46 newton-meters, 10-13 inch-pounds

**Fully tighten each screw the order below:**

Pro- ces- sor	Screw sequence
A	2 → 1 → 4 → 6 → 5 → 3
B	2 → 1 → 5 → 3 → 4 → 6

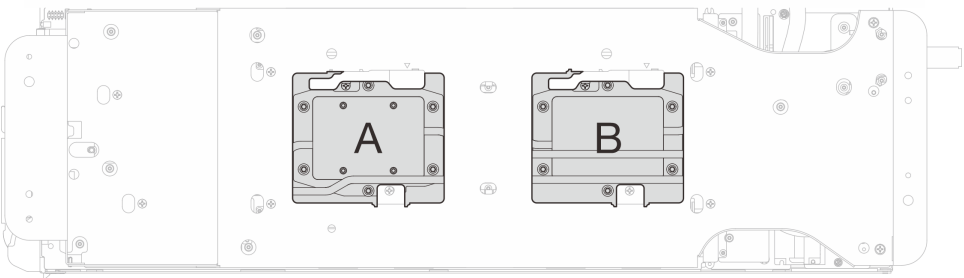
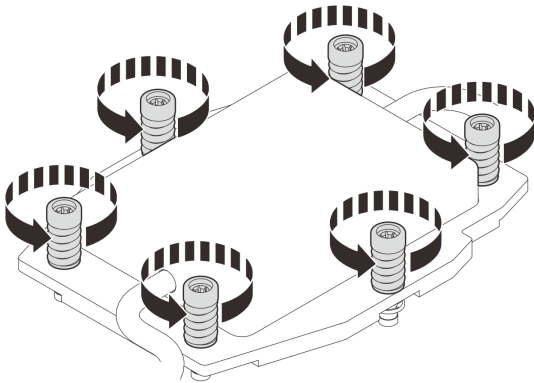
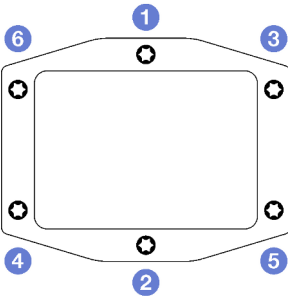


Figure 51. Processor cold plate installation

Step 10. Loosen water loop carrier screws (12x Phillips #2 screws).

**Note:** Select screw holes marked as **R** on the rear of the shipping bracket.

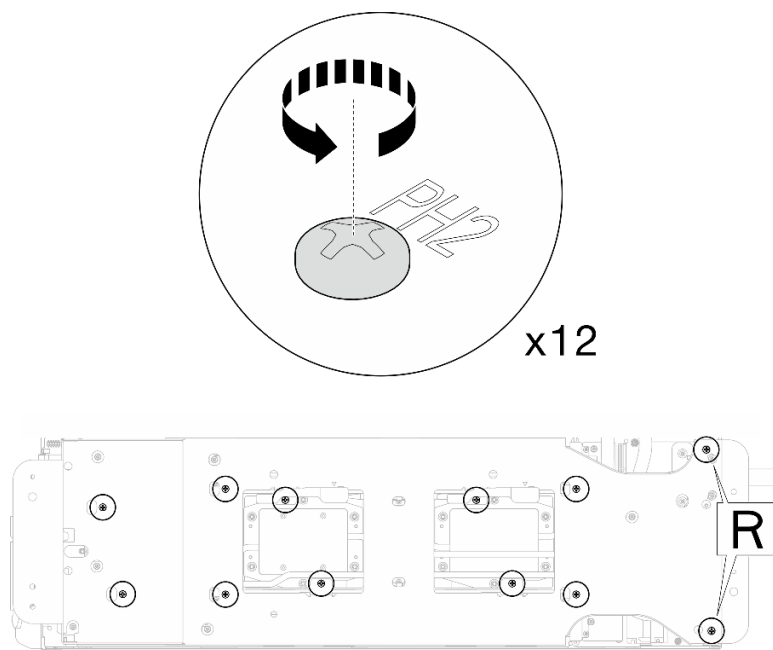


Figure 52. Loosening water loop carrier screws

Step 11. Remove the water loop carrier from the compute node.

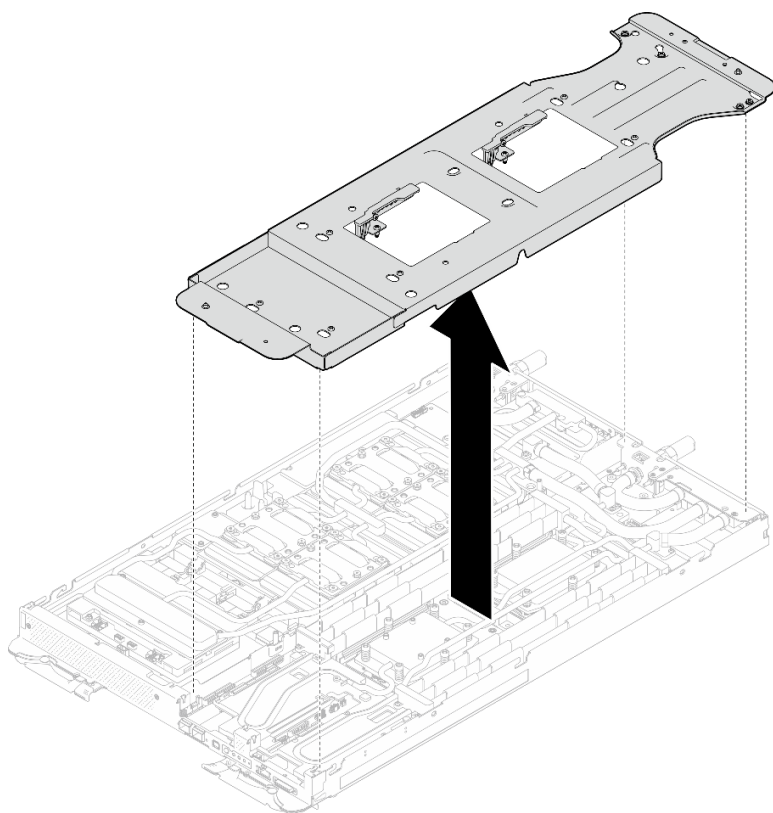


Figure 53. Water loop carrier removal (Compute node)

Step 12. Install water loop screws and quick connect screws (14x Torx T10 screws per node) with a torque screwdriver set to the proper torque.

**Notes:**

- For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.
- Install the **1** VR cold plate screws (x2) with washers. Use the washers previously removed from the water loop.

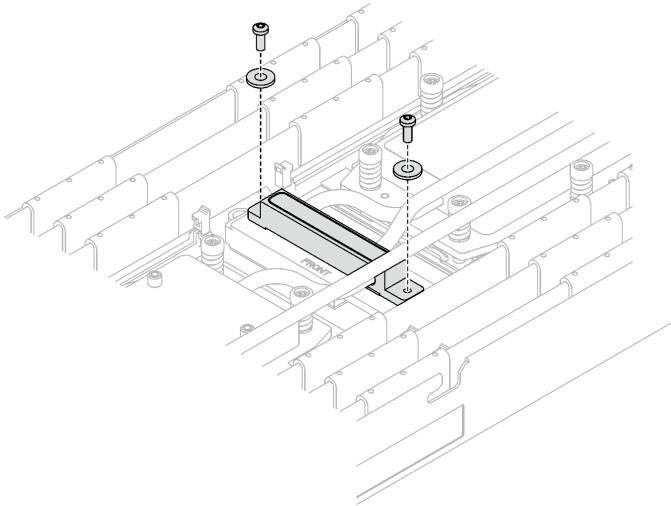


Figure 54. VR cold plate screws with washer

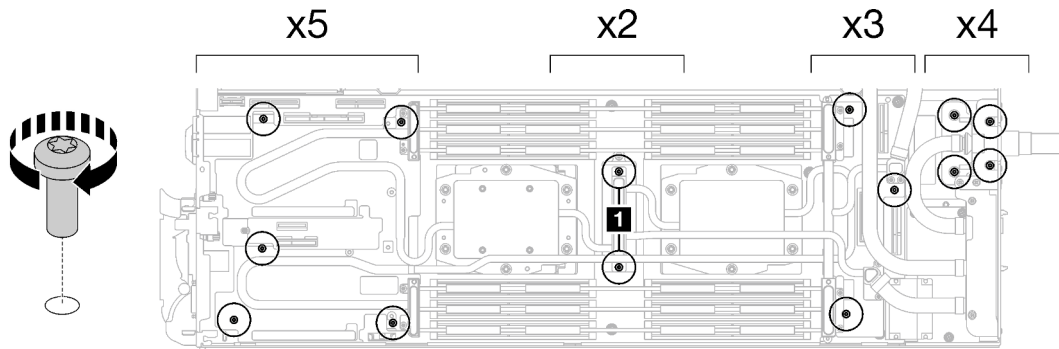


Figure 55. Water loop screws and quick connect screws installation

Step 13. Install the five Torx T10 screws to secure the quick connect.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

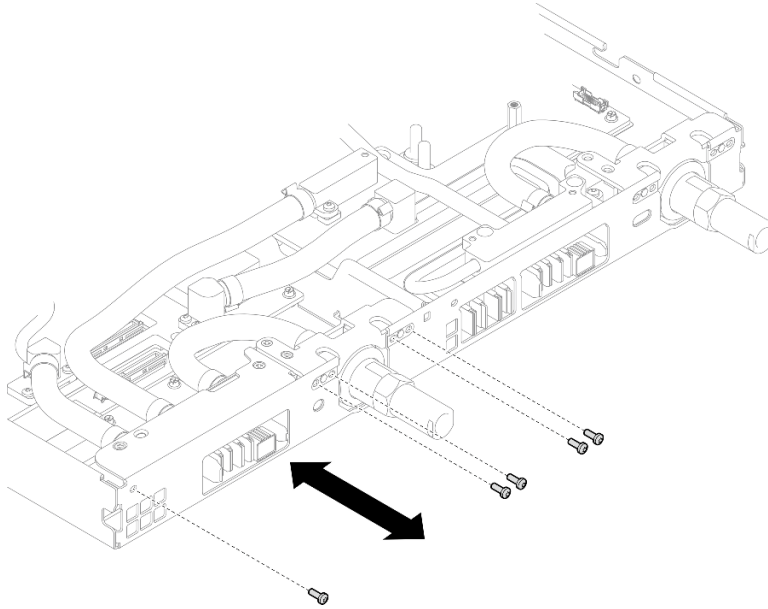


Figure 56. Quick connect screw installation (Compute node)

Step 14. Replace the putty pads on the top side and the bottom side of the OSFP module conduction plate.

**Attention: Putty pad cannot be reused. Whenever a component is removed, putty pads must be replaced with new ones before reinstalling the component.**

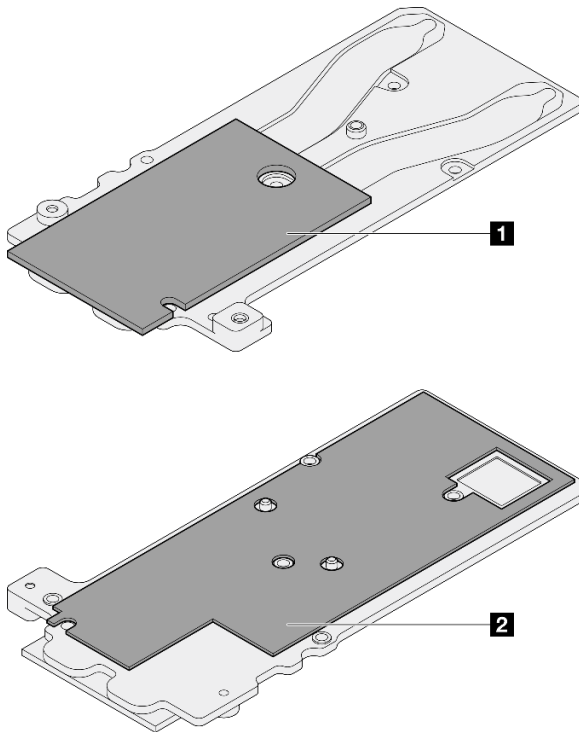


Figure 57. OSFP module conduction plate putty pads replacement



- |  |
|--|
| <b>1</b> Conduction plate top putty pad    |
| <b>2</b> Conduction plate bottom putty pad |

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 15. Install the OSFP module conduction plate onto the water loop.

Screw Type	Screwdriver Type
<b>1</b> M3x5 screw (x3)	Phillips #1 head screwdriver
<b>2</b> M3 screw (x2)	T10 screwdriver

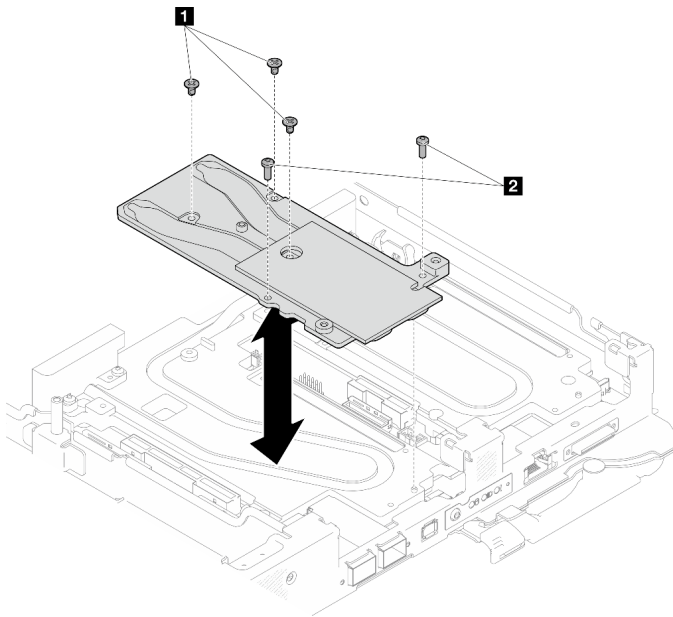


Figure 58. Installing the OSFP module conduction plate

Step 16. Install the two Hex screws to the OSFP module with a 4.5 mm hex head screwdriver.

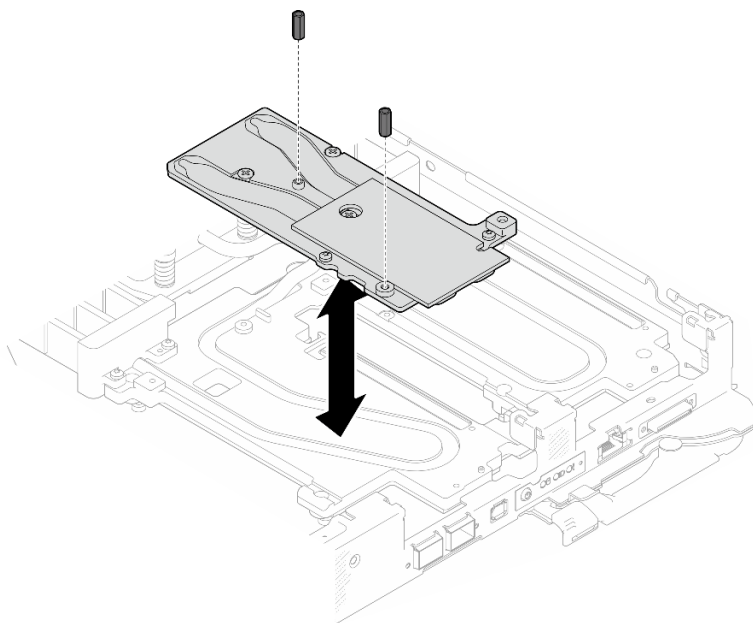


Figure 59. OSFP module conduction plate Hex screws installation

### Install water loop to the GPU node

Step 17. Loosen water loop carrier screws (x20 Phillips #2 screws).

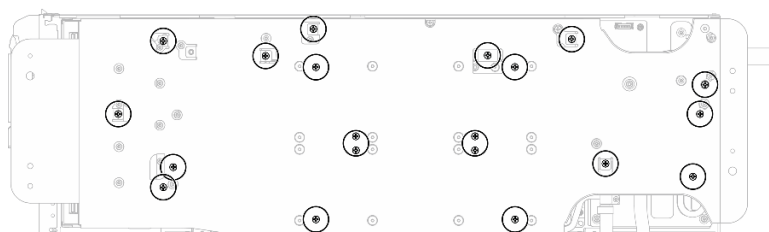
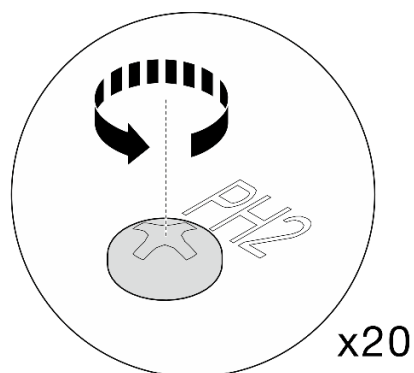


Figure 60. Water loop screws and quick connect screws installation (GPU node)

Step 18. Remove the water loop carrier from the GPU node.

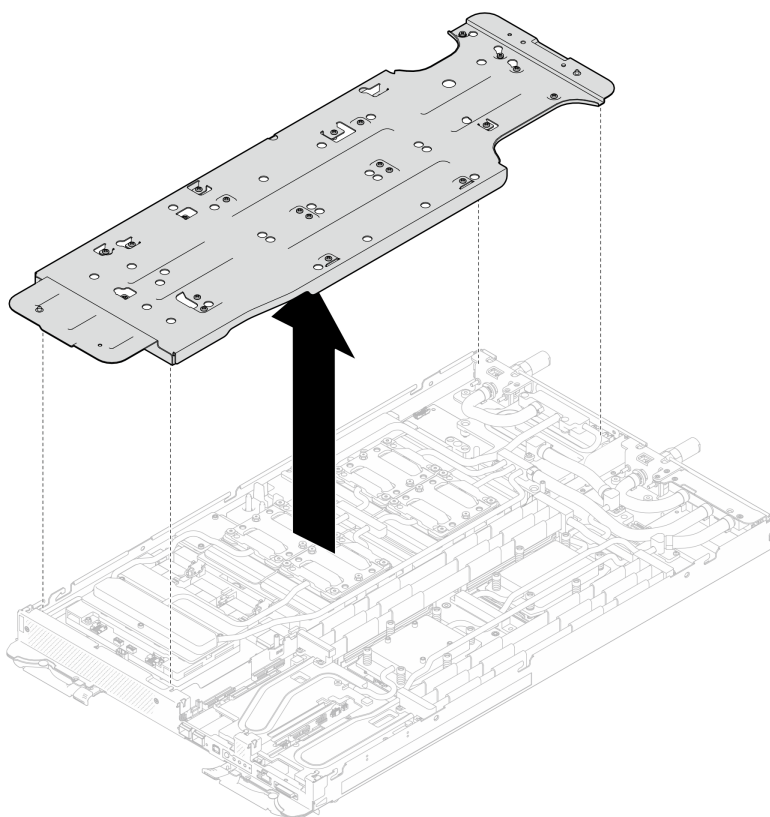


Figure 61. Water loop carrier removal (GPU node)

Step 19. Install GPU cold plate screws (x16 T10 screws).

- a. Install GPU cold plate screws following the GPU cold plates installation sequence: **GPU 2 → GPU 4 → GPU 1 → GPU 3**

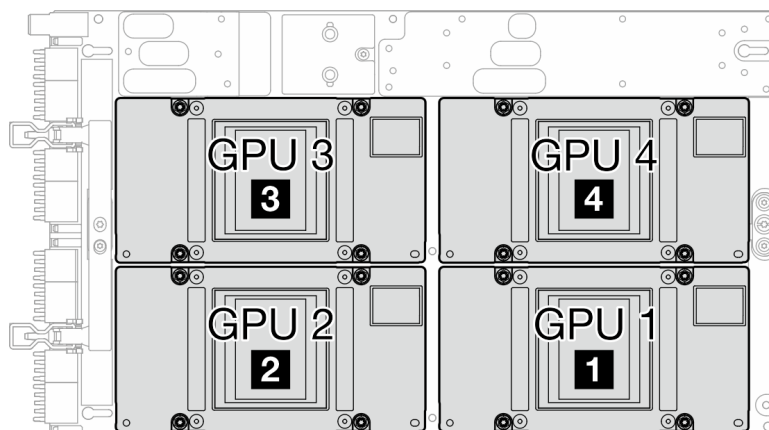


Figure 62. GPU numbering

- b. Set the torque screwdriver to 1.5 +/- 0.5 lb-in (0.1 +/- 0.06 N-m); then, fasten the GPU cold plate screws.
- c. Set the torque screwdriver to 4 +/- 0.5 lb-in (0.45 +/- 0.06 N-m); then, fasten the GPU cold plate screws.

- d. Set the torque screwdriver to 4 +/- 0.5 lb-in (0.45 +/- 0.06 N-m); then, fasten the GPU cold plate screws until all screws are fully tightened.

**Note:** Make sure to follow the screw sequence on the GPU cold plate label: ① → ② → ③ → ④

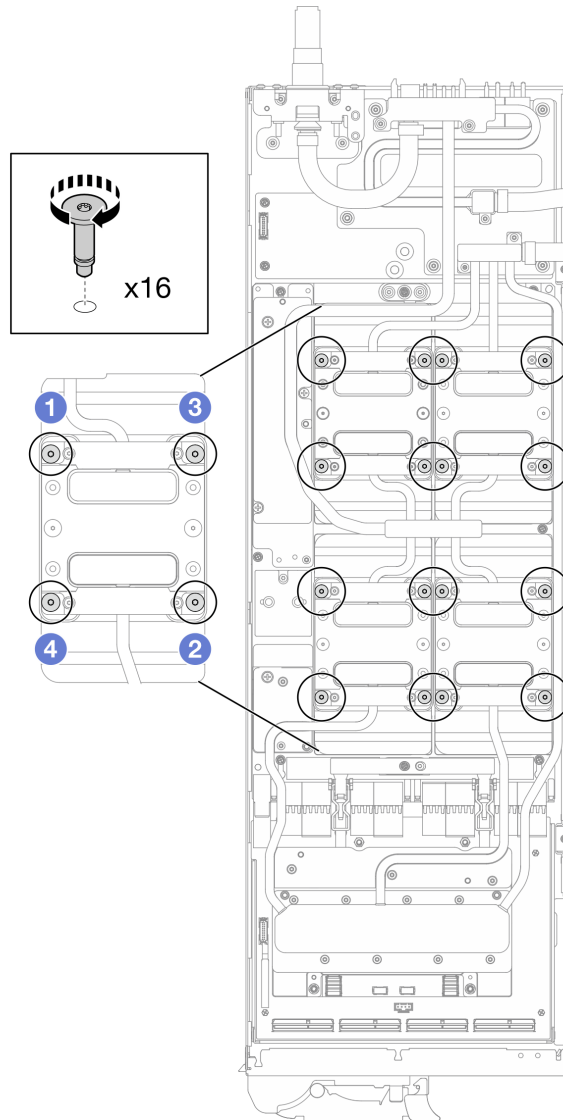


Figure 63. GPU cold plate screw installation

Step 20. Follow the screw installation sequence specified on the network board label, and install network cold plate screws (x8 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

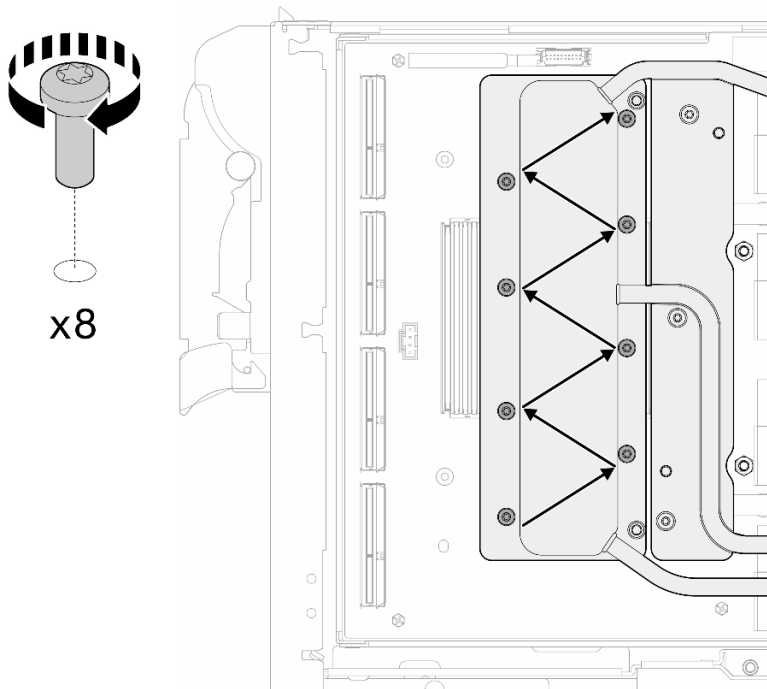


Figure 64. Network card screw installation

Step 21. Install the quick connect screws (x4 Torx T10) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

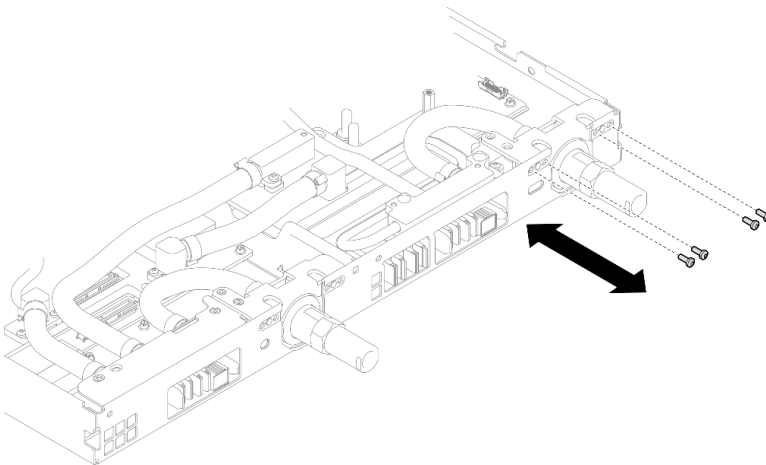


Figure 65. Quick connect screw installation (GPU node)

Step 22. Install water loop screws and quick connect screws (x13 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

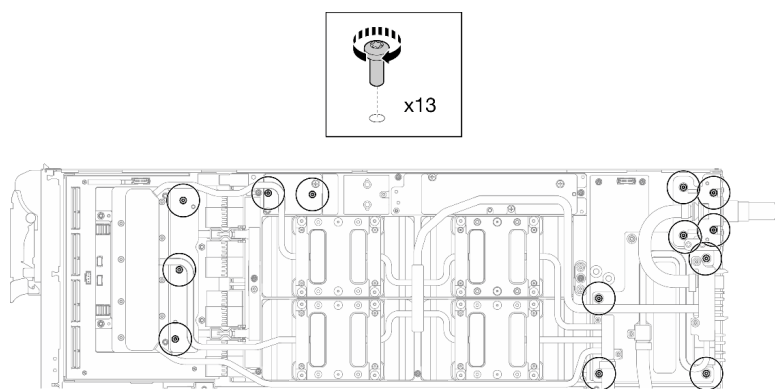


Figure 66. Water loop Torx T10 screws installation (GPU node)

Step 23. Install the Hex screw (x1) and the PH1 screws (x3).

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

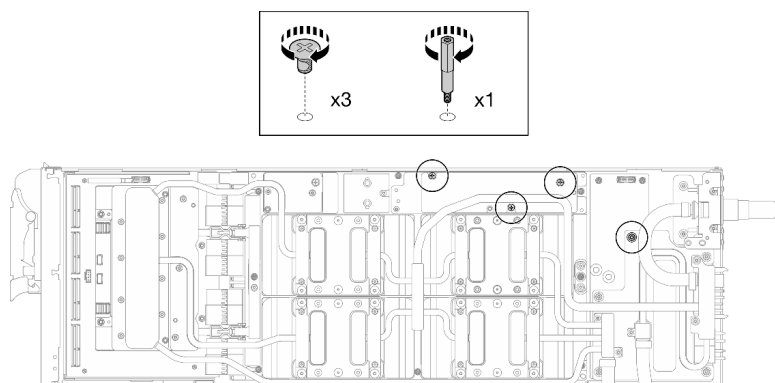


Figure 67. Water loop Hex and PH1 screws installation (GPU node)

Step 24. Install the cable tie to the GPU board.

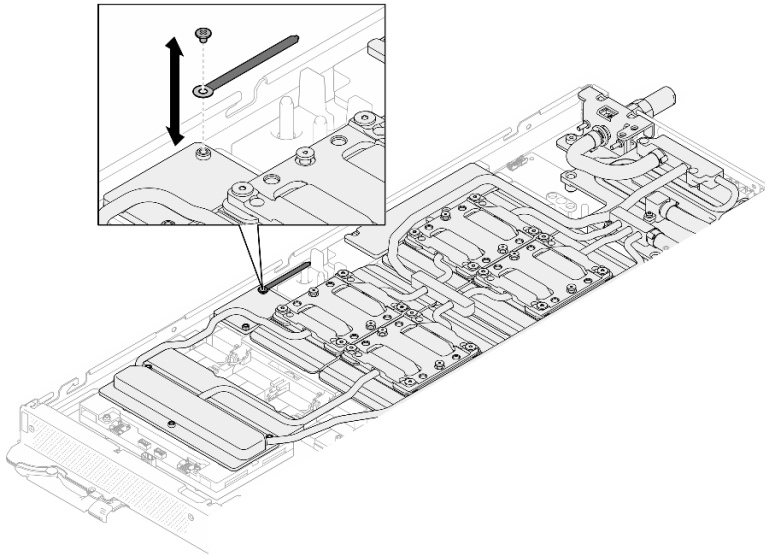


Figure 68. Installing the cable tie

Step 25. Connect the carrier board power cable.

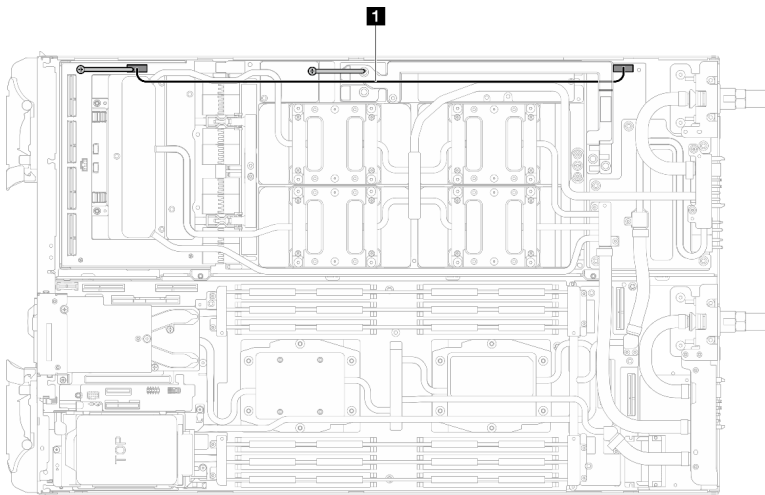


Figure 69. Connecting carrier board power cable

Cable	From (carrier board)	To (GPU node power distribution board)
<b>1</b> Carrier board power cable	Power and side band connector	Power connector

## After you finish

1. Install the OSFP module. See [“Install the OSFP module” on page 164](#).
2. Install the drive cage. See [“Install a drive cage assembly” on page 82](#).
3. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
4. Install the bus bar. See [“Install the bus bar” on page 267](#).
5. Install the M.2 backplane assembly. See [“Install the M.2 backplane assembly” on page 120](#).

6. Install the memory modules. See [“Install a memory module” on page 131](#).
7. Install the cross braces. See [“Install the cross braces” on page 21](#).
8. Install the tray cover. See [“Install the tray cover” on page 18](#).
9. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
10. Connect all required external cables to the solution.

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

11. 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](#)

## Install the VR conduction plate for water loop replacement

Use this information to install the VR conduction plate for water loop replacement in the SD665-N V3 tray.

### About this task

#### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- VR Conduction Plate 12.0
- VR 2.5 mm Putty Pad
- VR 1.5mm Putty Pad

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.

## Procedure

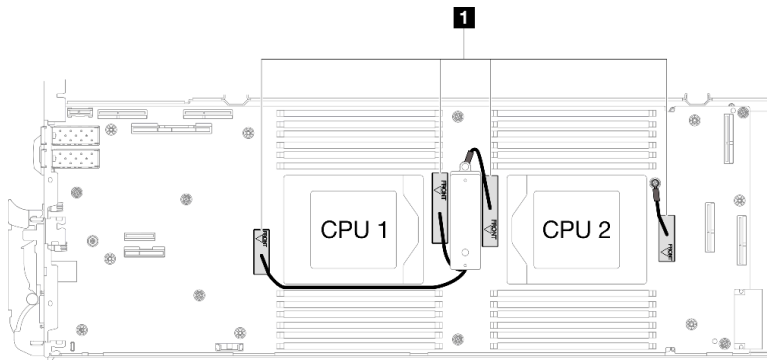
**Attention:** This procedure is ONLY for installing a new water loop. Skip this procedure if you are reinstalling the water loop after replacing the system board, processor, or power distribution board.

- Step 1. Replace the VR conduction plate on the system board with VR Conduction Plate 12.0 .
- If the system board is **with** shielding cables, proceed to [For system board with shielding cables](#).



- If the system board is **without** shielding cables, proceed to [For system board without shielding cables](#).

#### 1 Shielding cables



#### For system board **with** shielding cables

Step 2. Paste VR 2.5 mm Putty Pad to the VR Conduction Plate 12.4 (including washers).

- Remove the two M3 screws to remove the VR conduction plate out of the system board.
- Discard the VR conduction plate.

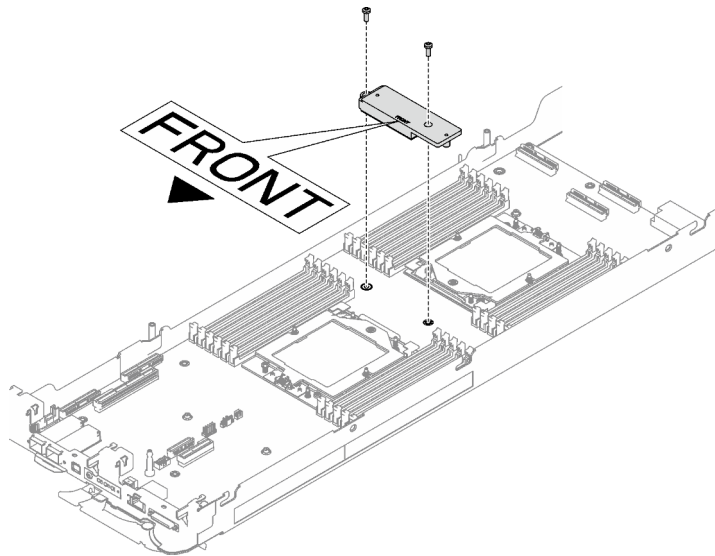


Figure 70. VR conduction plate removal

- Paste the VR 2.5 mm Putty Pad to the bottom side of the VR Conduction Plate 12.4 (including washers). Make sure to follow [Gap pad/putty pad replacement guidelines](#).

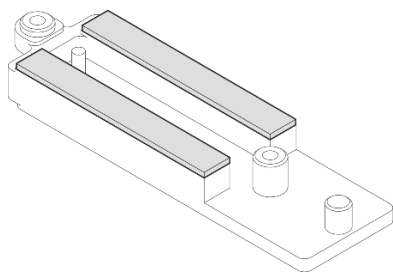


Figure 71. Putty pads on the bottom side of the VR conduction plate

Step 3. Install the VR Conduction Plate 12.4 (including washers) to the system board.

- a. Locate the screw holes for shielding cable 1/2 and shielding cable 3.

<b>1</b> Screw hole for shielding cable 1/2
<b>2</b> Screw hole for shielding cable 3

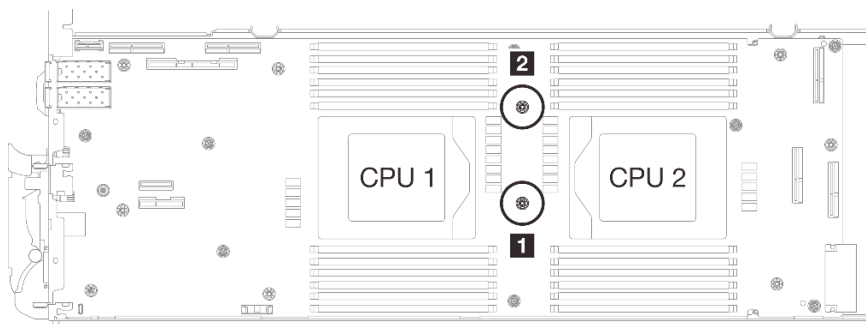


Figure 72. Location of screw holes of shielding cable 1/2 and 3

- b. Align shielding cable 1/2 and shielding cable 3 to the screw holes on system board. **Make sure the ring terminals of the cable are placed in the angle shown below.**

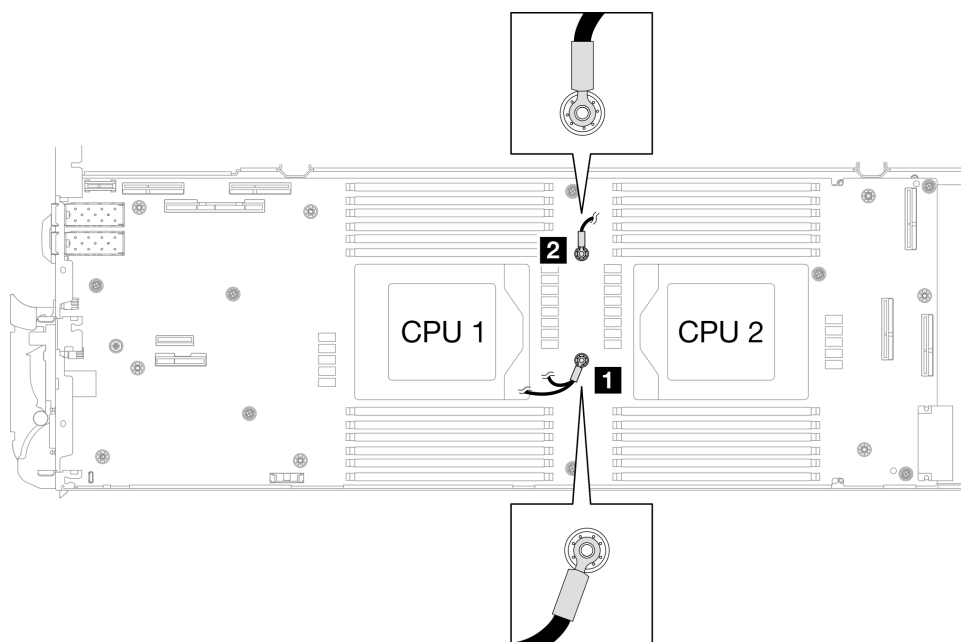


Figure 73. Aligning shielding cable 1/2 and shielding cable 3 with screw holes

- c. ① Keep the FRONT marking on the VR conduction plate pointing the front of the tray. Then, place the VR conduction plate on top of the two cable ring terminals.

**Note:** A putty pad is attached to the bottom side of the VR conduction plate. Carefully hold the VR conduction plate to avoid damaging the putty pad.

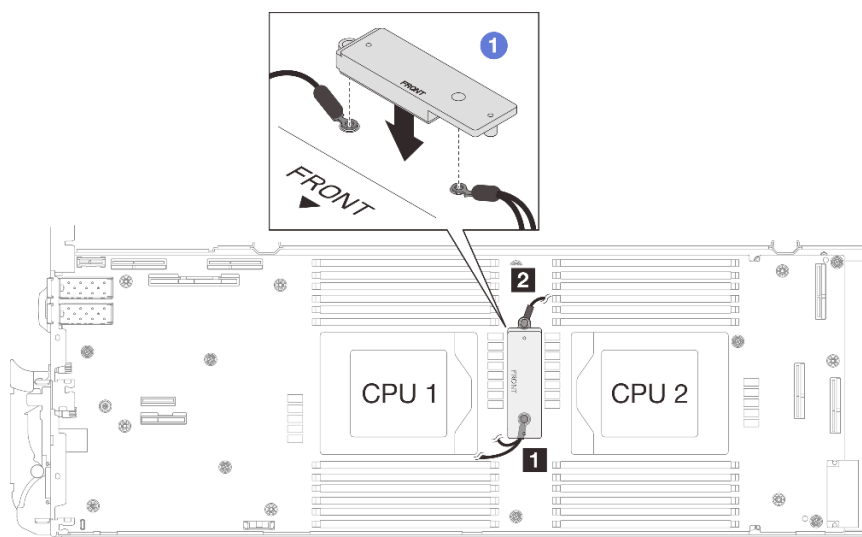


Figure 74. Aligning VR conduction plate, shielding cables, and system board screw holes

- d. ② Slightly press down the VR conduction plate.

**Attention:** The following items will be secured by screw. Make sure they are aligned and do not block each other.

- Screw hole on the system board
- The hole on the ring terminal of the shielding cage cable

- Screw hole on the VR conduction plate

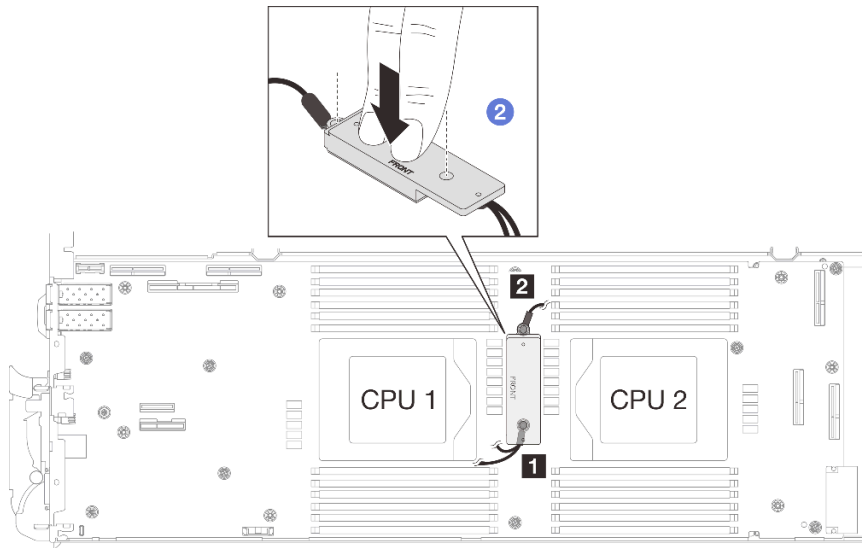


Figure 75. Pressing on the VR conduction plate

- While pressing down the VR conduction plate, place the screws into the two screw holes on the VR conduction plate. Then, fasten the two screws to secure the cables to the system board. **DO NOT fasten the screws until both screws are placed into the VR conduction plate.**

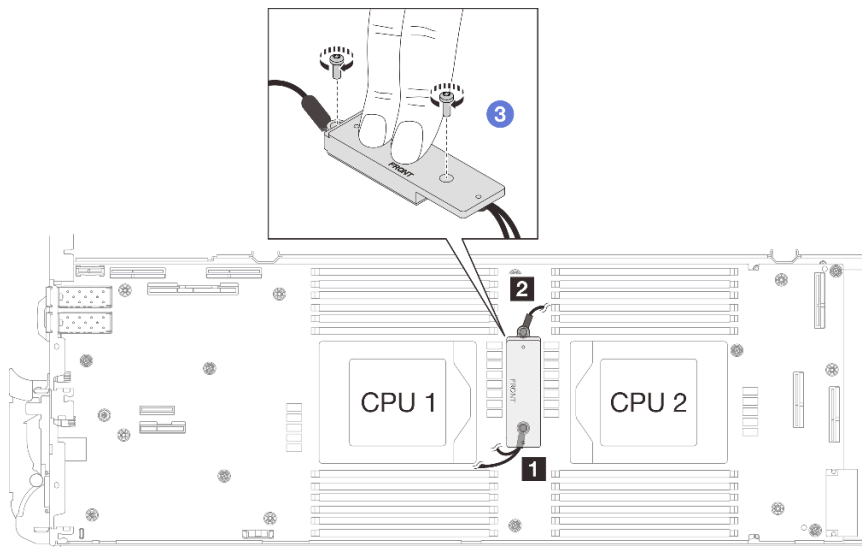


Figure 76. Installing shielding cable 1/2 and 3

#### For system board *without* shielding cables

- Step 4. Replace the VR conduction plate on the system board with VR Conduction Plate 12.0 .
- Remove the two M3 screws to remove the VR conduction plate out of the system board.
  - Discard the VR conduction plate.

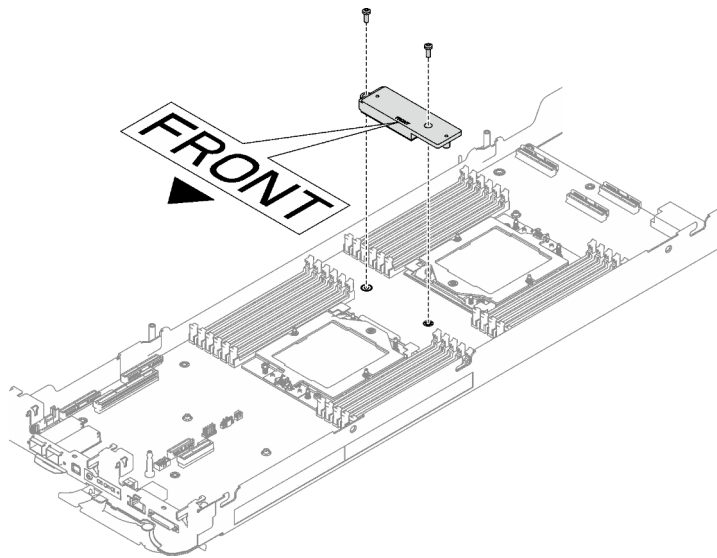


Figure 77. VR conduction plate removal

- c. Paste the VR putty pad VR 1.5mm Putty Pad to the bottom side of VR Conduction Plate 12.0 . Make sure to follow [Gap pad/putty pad replacement guidelines](#).

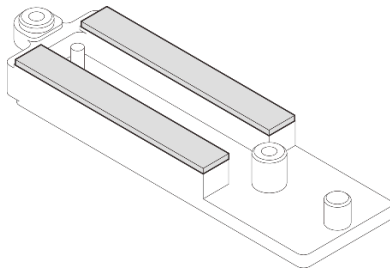


Figure 78. Putty pads on the bottom side of the VR conduction plate

- d. Install the VR Conduction Plate 12.0 to the system board.

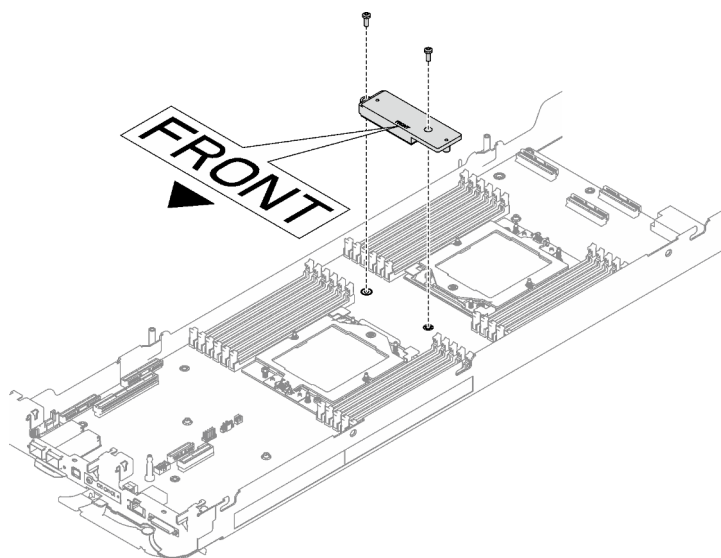


Figure 79. VR conduction plate removal

## After you finish

Proceed to install the water loop. See [“Install the water loop” on page 40](#).

---

## Replace components in the compute node

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

### Notes:

- The illustrations in this document are for reference only and might differ slightly from your hardware.
- The replacement procedures in this section uses the right node as an example, the replacement procedures for the left node are similar.

## CMOS battery (CR2032) replacement

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

### Remove the CMOS battery (CR2032)

Use this information to remove the CMOS battery.

### About this task

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

- **S004**



### CAUTION:

When replacing the lithium battery, use only Lenovo specified part number or an equivalent type of 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**

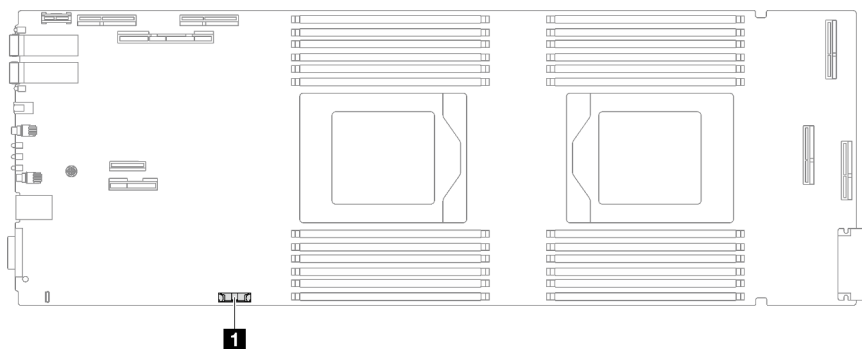


**CAUTION:**

**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 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- The following notes describe information that you must consider when replacing the battery.
  - Lenovo has designed this product with your safety in mind. The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.
  - If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.
  - After you replace the battery, you must reconfigure the solution and reset the system date and time.



*Figure 80. CMOS battery location*

Table 5. CMOS battery location

<b>1</b> CMOS battery
-----------------------

## Procedure

Step 1. Make preparations for this task.

- Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14.](#)
- Remove the tray cover. See [“Remove the tray cover” on page 17.](#)
- Remove the cross braces. See [“Remove the cross braces” on page 19.](#)
- Remove the drive cage. See [“Remove a drive cage assembly” on page 74.](#)

Step 2. Remove the CMOS battery:

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

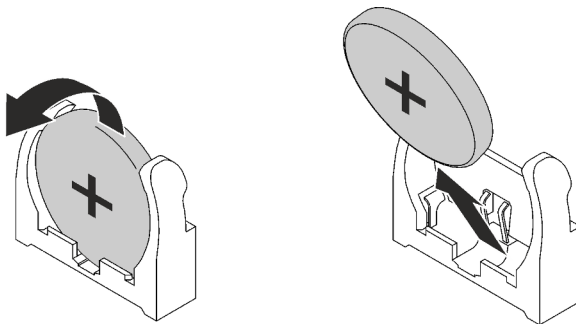


Figure 81. CMOS battery removal

- Pivot the battery toward the middle of the compute node.
- Lift the battery from the socket.

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

## After you finish

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

### Demo video

[Watch the procedure on YouTube](#)

## Install the CMOS battery (CR2032)

Use this information to install the CMOS battery.

## About this task

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

- **S004**





**CAUTION:**

When replacing the lithium battery, use only Lenovo specified part number or an equivalent type of 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 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.
- The following notes describe information that you must consider when replacing the battery.
  - Lenovo has designed this product with your safety in mind. The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.
  - If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.
  - After you replace the battery, you must reconfigure the solution and reset the system date and time.

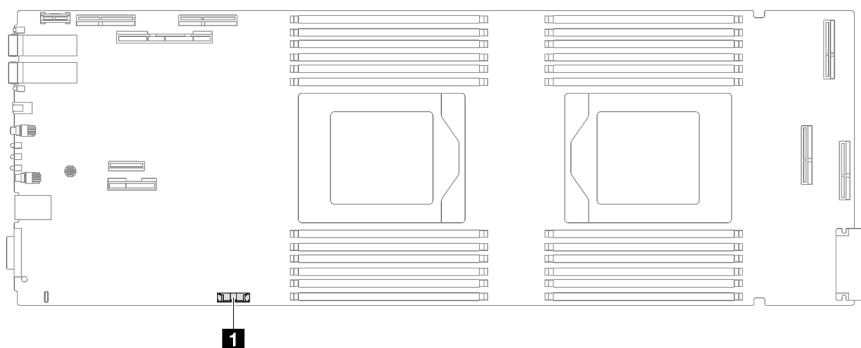


Figure 82. CMOS battery location

Table 6. CMOS battery location

<b>1</b> CMOS battery
-----------------------

## Procedure

- Step 1. Follow any special handling and installation instructions that come with the CMOS battery.
- Step 2. Insert the new CMOS battery:
  - a. Face the positive (+) symbol to the center of the node; then, place the battery into the seat until it clicks in place.
  - b. As you slide the CMOS battery into place, press the top of the CMOS battery into the socket. Make sure that the battery clip holds the battery securely.

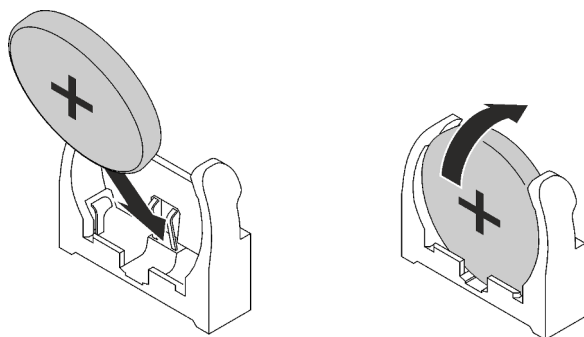


Figure 83. CMOS battery installation

## After you finish

1. Install the drive cage. See [“Install a drive cage assembly” on page 82](#).
2. Install the cross braces. See [“Install the cross braces” on page 21](#).
3. Install the tray cover. See [“Install the tray cover” on page 18](#).
4. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
5. Connect all required external cables to the solution.

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

6. 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](#)

## DIMM comb replacement

Use the following procedures to remove and install a DIMM comb.

### Remove a DIMM comb

Use this information to remove a DIMM comb.

### About this task

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

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

### Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).

Step 2. Remove the memory module tool attached to the DIMM comb.

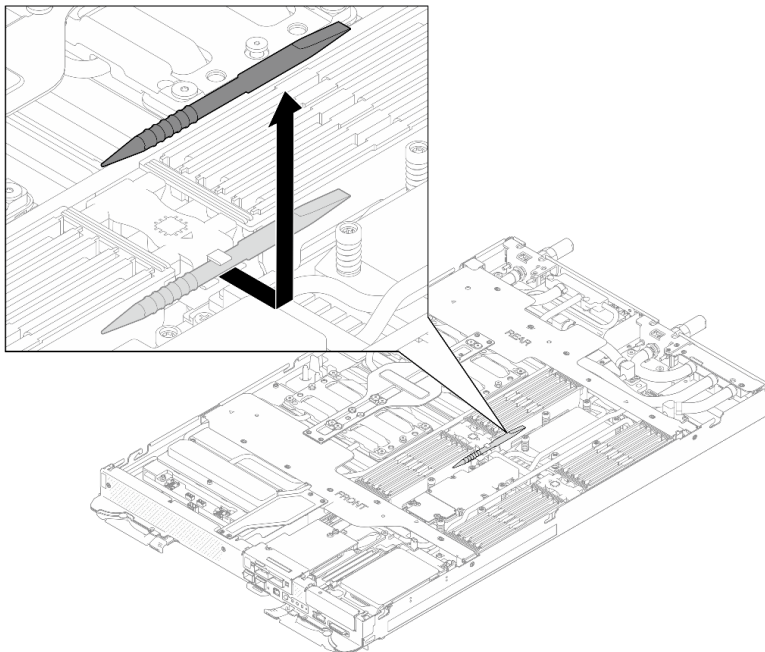


Figure 84. Memory module tool removal

**Note:** Memory module tool is recommended due to space limitations caused by location of water loop tubes through the memory section.

Step 3. Gently hold the DIMM comb and remove it out of the chassis.

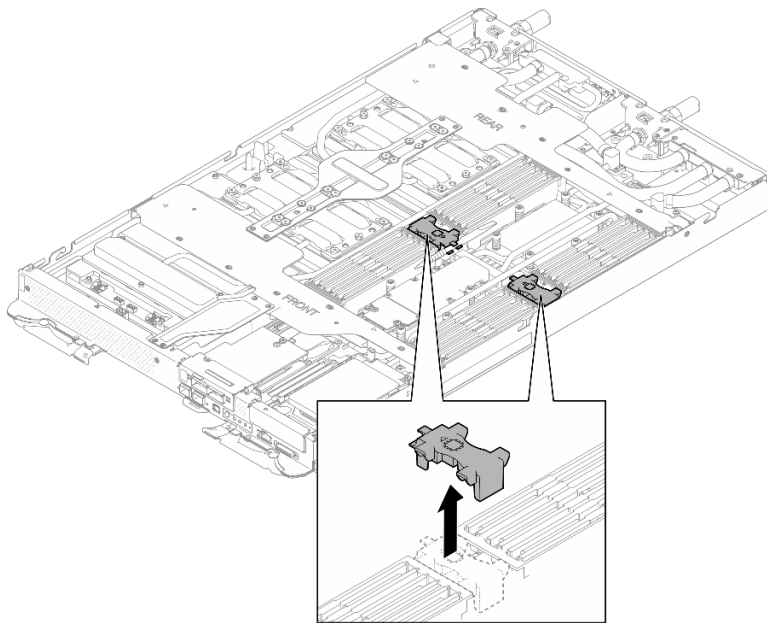


Figure 85. DIMM comb removal

## 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 a DIMM comb

Use this information to install a DIMM comb.

## About this task

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.

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

## Procedure

Step 1. Align the DIMM comb with the slots and insert it into the node.

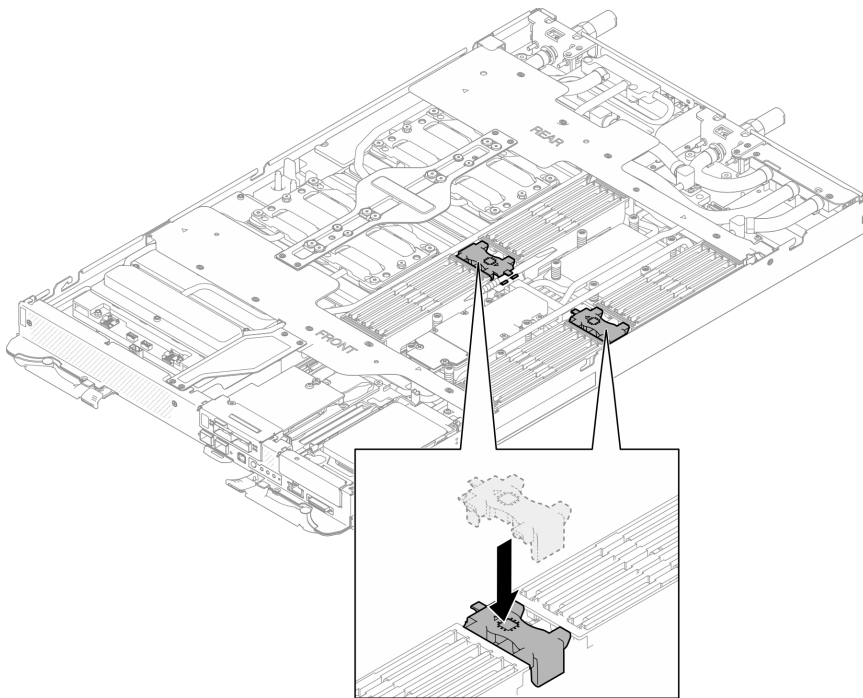


Figure 86. DIMM comb installation

Step 2. Install the memory module tool to the DIMM comb.

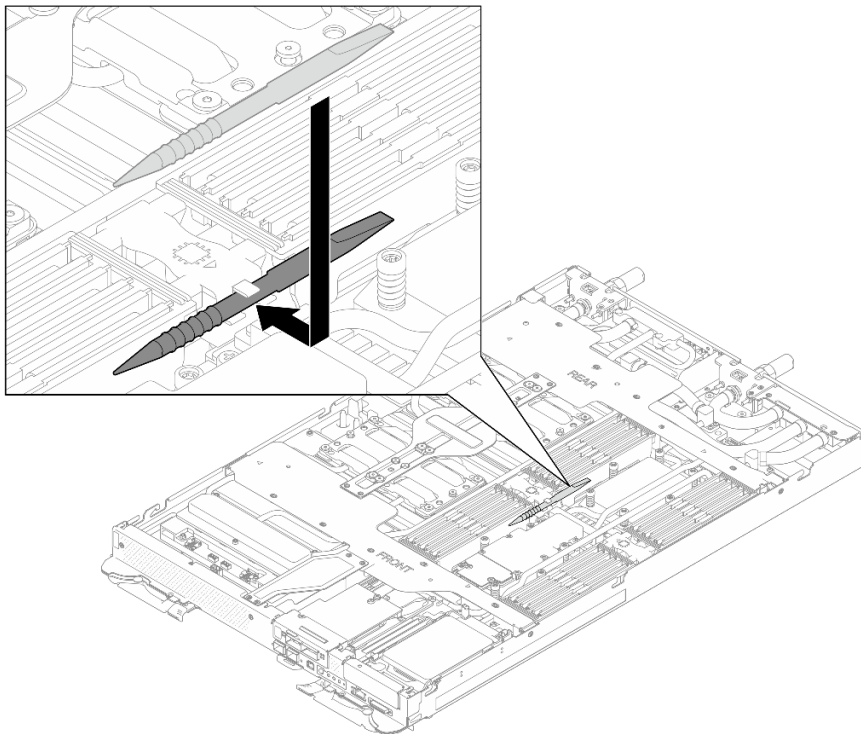


Figure 87. Memory module tool

## After you finish

1. Install the tray cover. See [“Install the tray cover” on page 18.](#)

2. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
3. Connect all required external cables to the solution.

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

4. 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](#)

## Drive and drive cage assembly replacement

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

### Remove a drive cage assembly

Use this information to remove a drive cage assembly.

### About this task

#### Required tools

You may need the SD665-N V3 Water Loop Gap Pad Kit to properly replace the component.

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

### Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- c. Remove the cross braces. See [“Remove the cross braces” on page 19](#).
- d. Remove the M.2 backplane assembly. See [“Remove the M.2 backplane assembly” on page 113](#).

Step 2. Disconnect the drive cable from the system board.

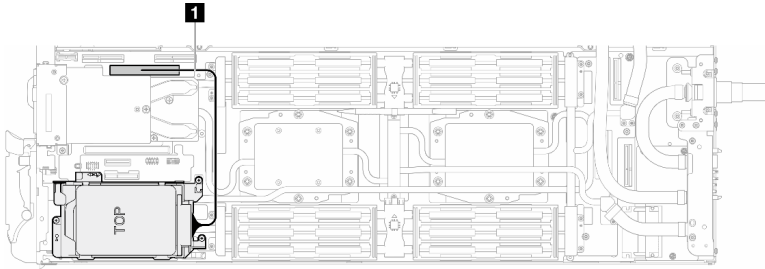


Figure 88. Disconnecting drive cable

Table 7. Drive assembly cable routing

Cable	From	To
<b>1</b>	Drive cage assembly	PCIe 2/SATA connector on system board.

Step 3. Remove the drive cage assembly.

- a. **1** Remove the 3 screws.
- b. **2** Remove the drive assembly out of the node.

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

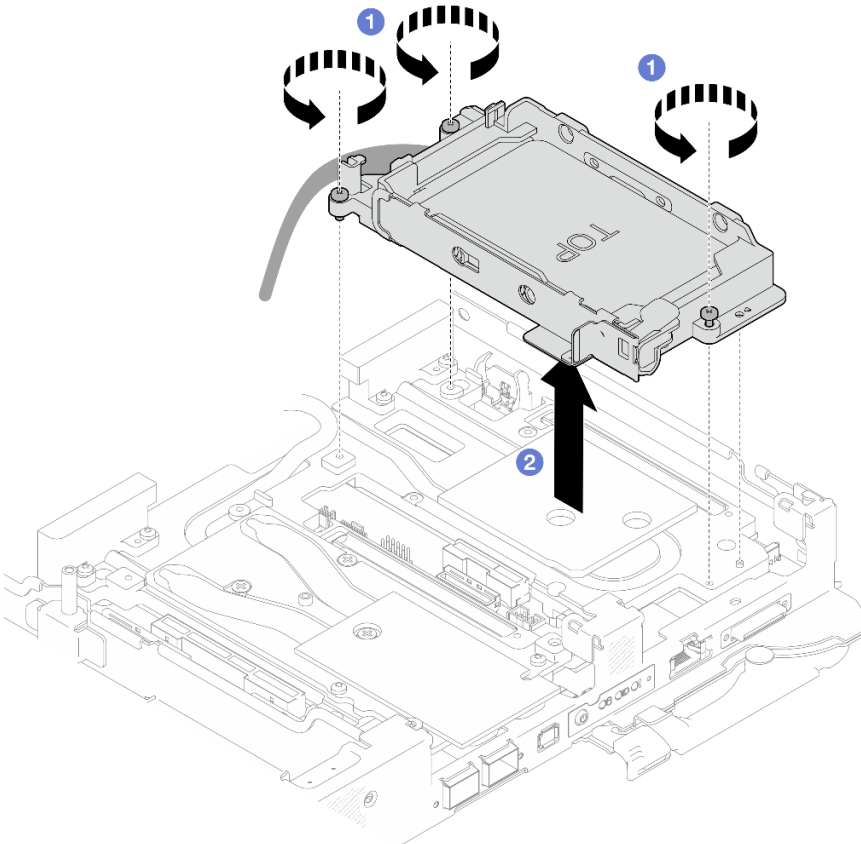


Figure 89. One 7 mm drive cage assembly removal

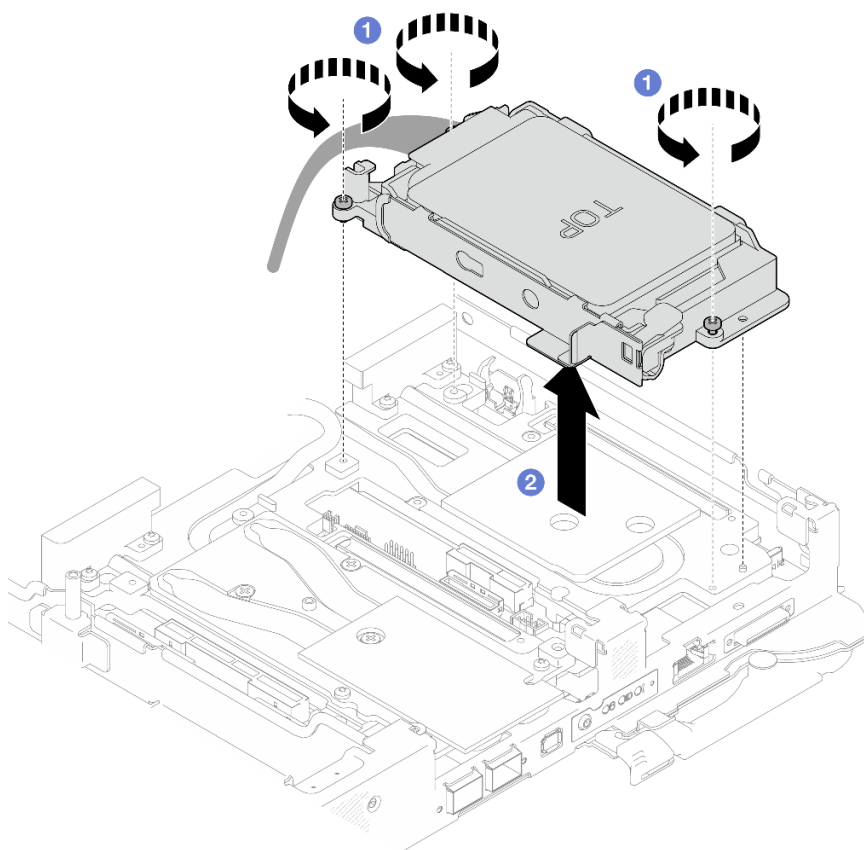


Figure 90. Two 7 mm drive cage assembly removal

Step 4. If necessary, remove the blank bezel fillers.

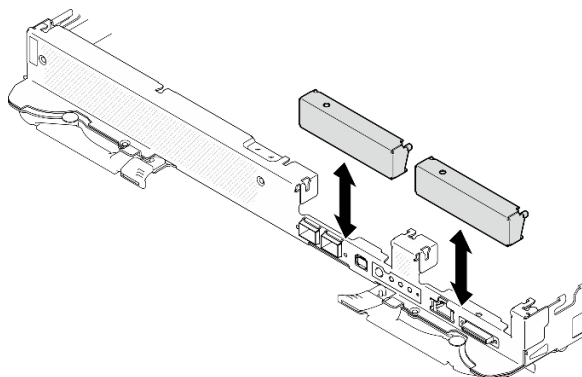


Figure 91. Blank bezel filler removal

## 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.

## Demo video

[Watch the procedure on YouTube](#)



## Remove a drive

Use this information to remove a drive.

### About this task

#### Required tools

You may need the following kits and to properly replace the component.

- SD665-N V3 Water Loop Gap Pad Kit
- Conduction Plate Parts U2

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

### Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- c. Remove the cross braces. See [“Remove the cross braces” on page 19](#).
- d. Remove the drive cage. See [“Remove a drive cage assembly” on page 74](#).

Step 2. There are different procedures for removing one and two drives, follow the steps according to your configuration.

**For removing one 7 mm drive, complete the following steps.**

1. ① Remove the drive out of the bottom of the drive cage.
2. ② Disconnect the cable from the drive.

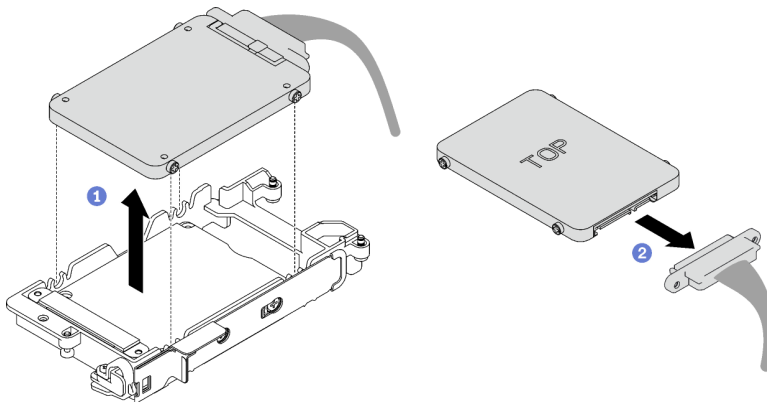


Figure 92. One 7 mm drive removal

**For removing two 7 mm drives, complete the following steps.**

1. Remove the upper drive.

- a. ① Push and hold the release latch.
- b. ② Slide the metal tab to the unlocked position.
- c. ③ Pivot the drive out of the top of the drive cage as shown.
- d. ④ Disconnect the cable from the drive.

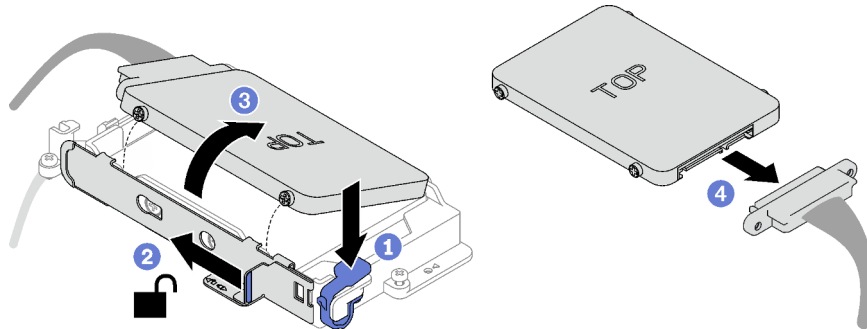


Figure 93. Upper drive removal

2. Remove the lower drive.
  - a. ① Remove the drive out of the bottom of the drive cage.
  - b. ② Disconnect the cable from the drive.

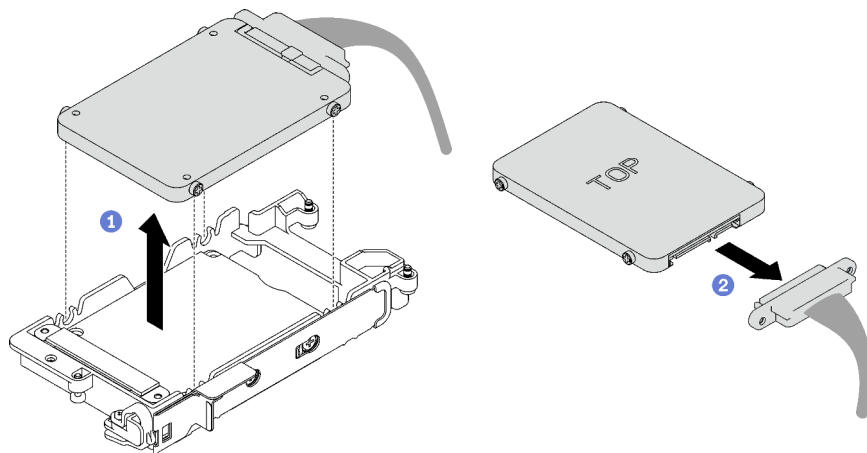


Figure 94. Lower drive removal

3. If necessary, remove the four screws securing the conduction plate and lift it out of the drive cage.

**Note:** Make sure the metal tab is in the unlocked position.

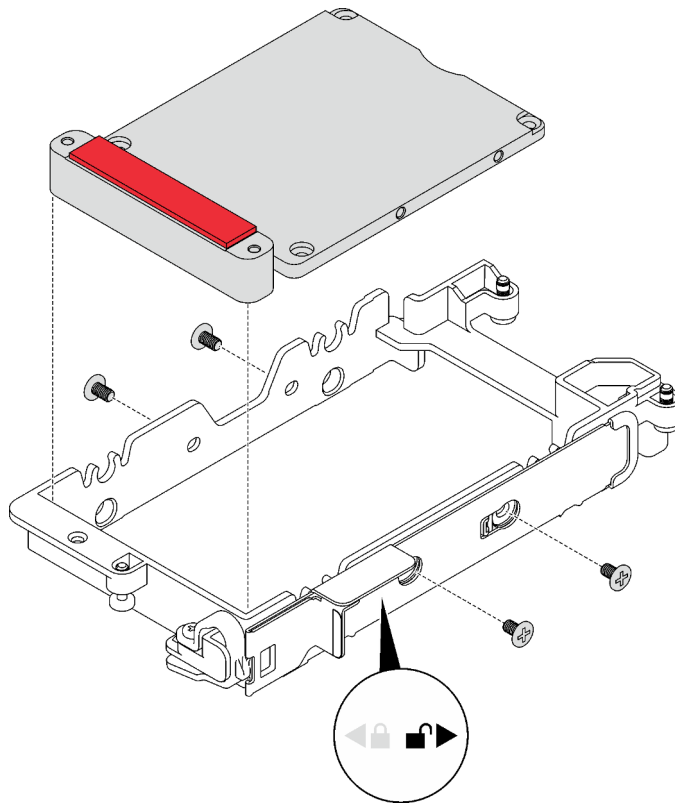


Figure 95. Conduction plate removal

## 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 a drive

Use this information to install a drive.

## About this task

### Required tools

You may need the following kits and to properly replace the component.

- SD665-N V3 Water Loop Gap Pad Kit
- Conduction Plate Parts U2

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:

- *Required Tools* list in the following section.
- [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

## Procedure

Step 1. **For installing one 7 mm drive, complete the following steps.**

1. ① Find the cable with its plugger marked as **SSD 0/2**, and connect it to the drive.
2. ② Flip the drive over.
3. ③ Install the drive into the bottom of the drive cage and make sure it is secured in place.

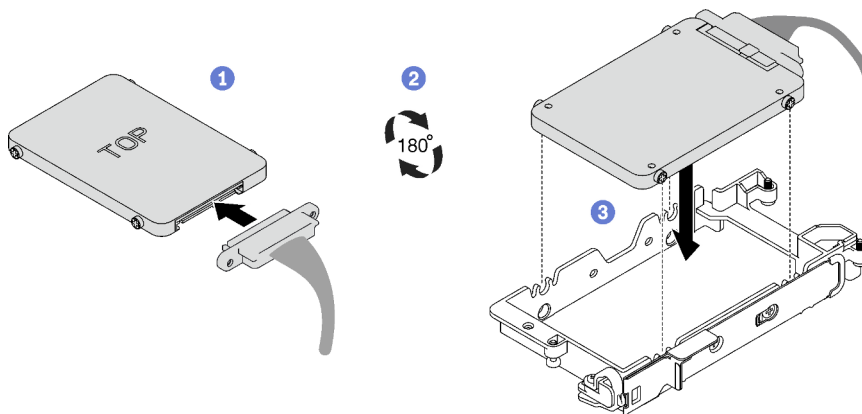


Figure 96. 7 mm drive installation

**Note:** Secure the unconnected cable plugger on top side of the drive cage.

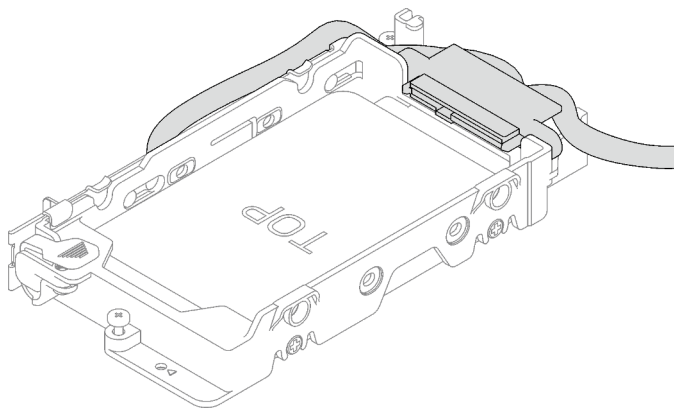


Figure 97. Securing the unplugged cable plugger

Step 2. **For installing two 7 mm drives, complete the following steps.**

1. If removed, install the conduction plate into the bottom of the drive cage and secure it with four screws.

There are gap pads located on both side of the conduction plate.

- If the small gap pad (1) is damaged or detached, replace it with a new one.
- If the bigger gap pad (2) is damaged or detached, discard the conduction plate. Then, install a new conduction plate already installed with the two gap pads.

**Note:** Make sure the metal tab is in the unlocked position.

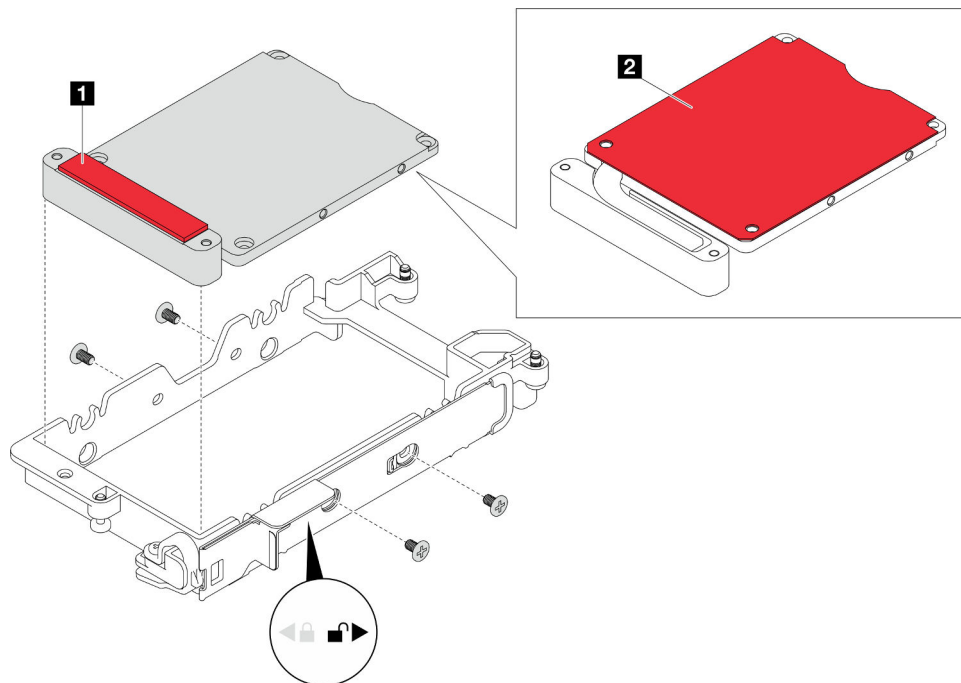


Figure 98. Conduction plate installation

2. Install the lower drive.

- 1 Find the cable with its plugger marked as **SSD 0/2**, and connect it to the drive.
- 2 Flip the drive over.
- 3 Install the drive into the bottom of the drive cage and make sure it is secured in place.

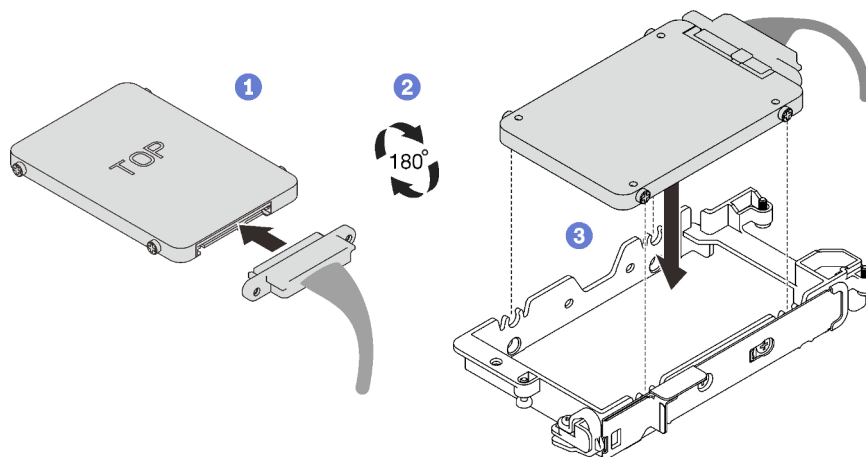


Figure 99. Lower drive installation (7mm drive)

3. Install the upper drive.
  - a. ① Find the cable with its plugger marked as **SSD 1/3**, and connect it to the drive. Then, pivot the drive into the top of the drive cage as shown.
  - b. ② Push and hold the release latch.
  - c. ③ Slide the metal tab to the locked position.

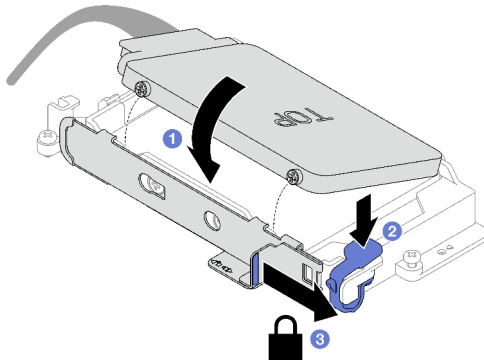


Figure 100. Upper drive installation (7mm drive)

## After you finish

1. Install the drive cage. See [“Install a drive cage assembly” on page 82](#).
2. Install the cross braces. See [“Install the cross braces” on page 21](#).
3. Install the tray cover. See [“Install the tray cover” on page 18](#).
4. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
5. Connect all required external cables to the solution.

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

6. 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](#)

## Install a drive cage assembly

Use this information to install a drive cage assembly.

## About this task

### Required tools

You may need the SD665-N V3 Water Loop Gap Pad Kit to properly replace the component.

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.
- Ensure the drives are installed correctly into the drive cage assembly. See [“Install a drive” on page 79](#).

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - “Gap pad/Putty pad identification and location” on page 8
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

## Procedure

Step 1. Make sure the blank bezel fillers are installed. If not, install them to the node.

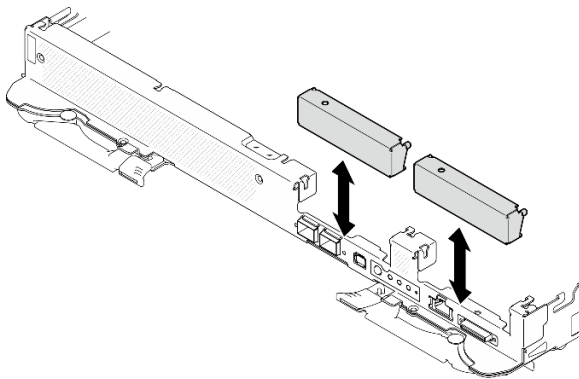


Figure 101. Blank bezel filler installation

Step 2. If the gap pad located on the reverse side of the drive cage is damaged or missing, replace it with a new one. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

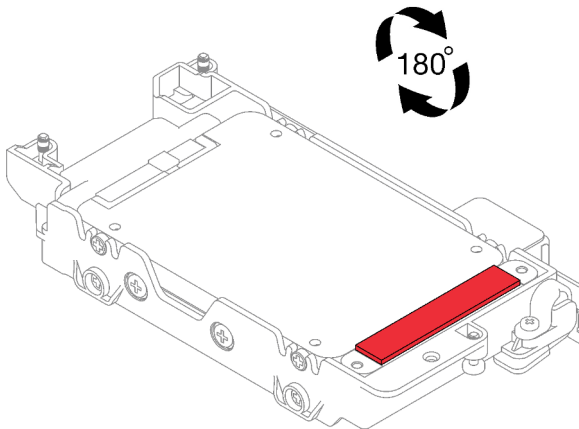


Figure 102. Gap pad location

Step 3. If the drive cage gap pad is damaged or missing, replace it with a new one. See the following for the gap pad location for each drive cage. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

**Note:** Align the gap pad with marking on water loop when attaching gap pad.

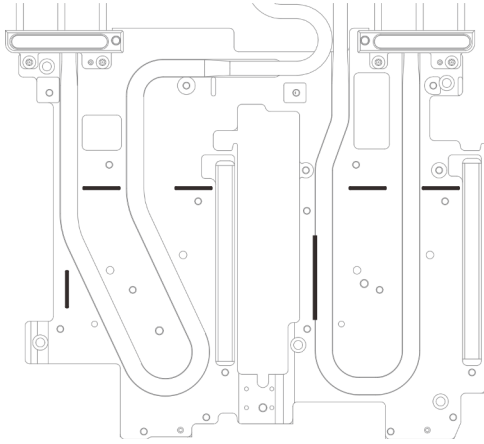


Figure 103. Markings on water loop for gap pad alignment

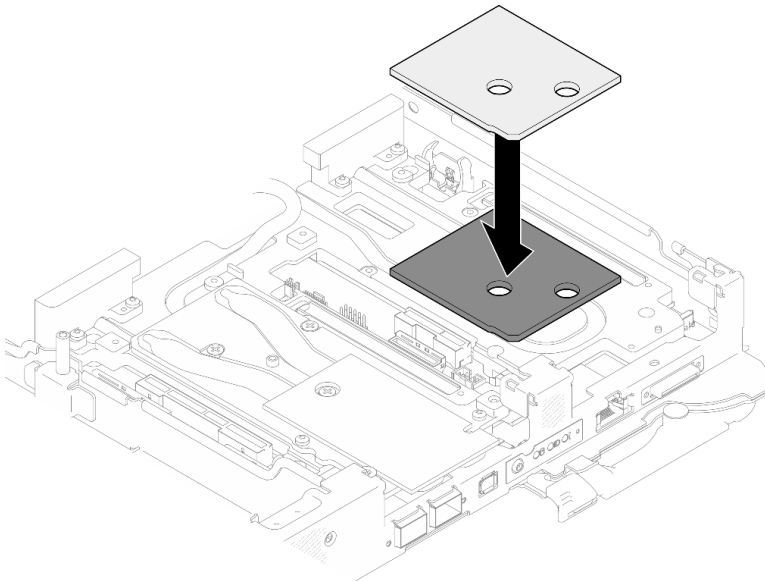


Figure 104. Replacing gap pad

- Step 4. Install the drive cage assembly.
- 1 Install the drive assembly into the node.
  - 2 Secure the 3 screws.

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



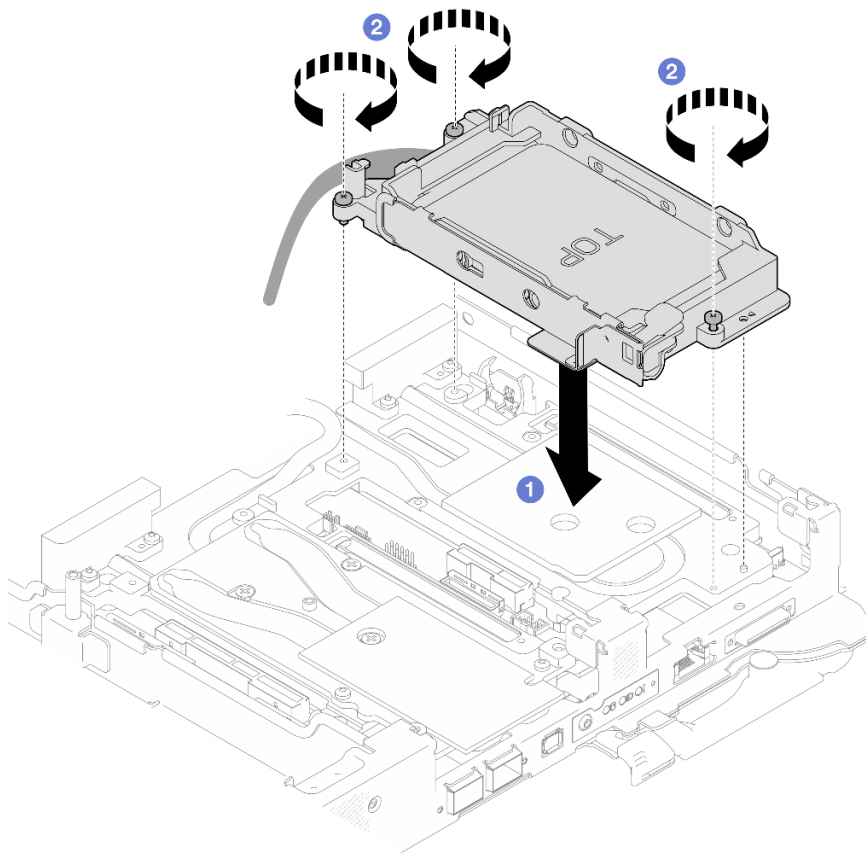


Figure 105. One 7 mm drive cage assembly installation

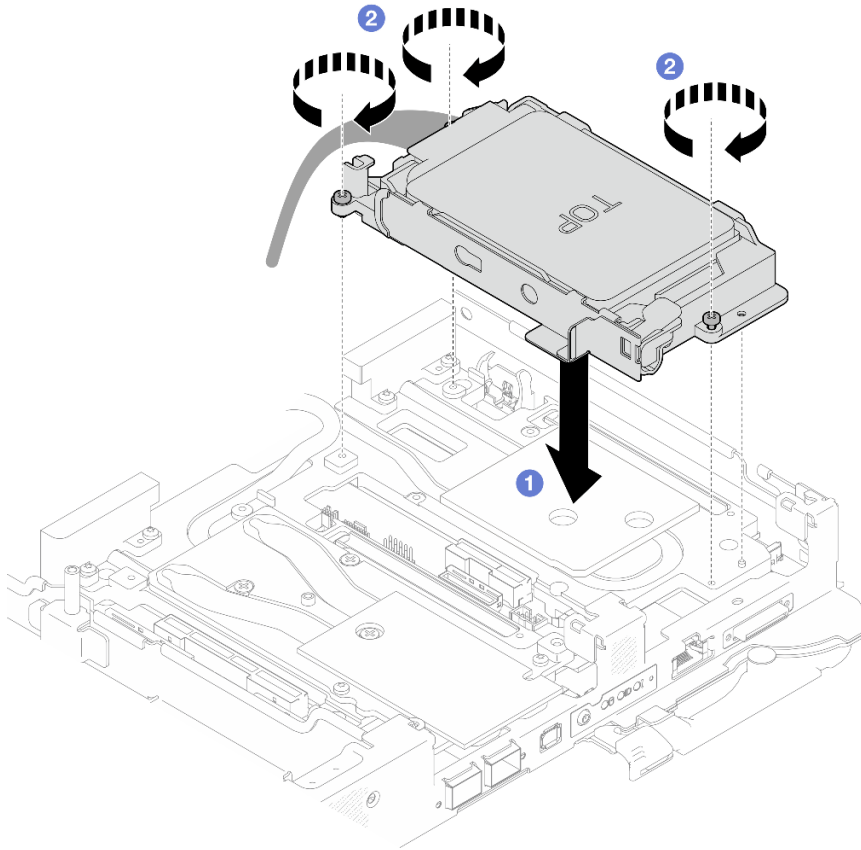


Figure 106. Two 7 mm drive cage assembly installation

Step 5. Connect the drive cage assembly cable to the system board. For more information, see “System-board connectors” section in *User Guide* or *System Configuration Guide*.

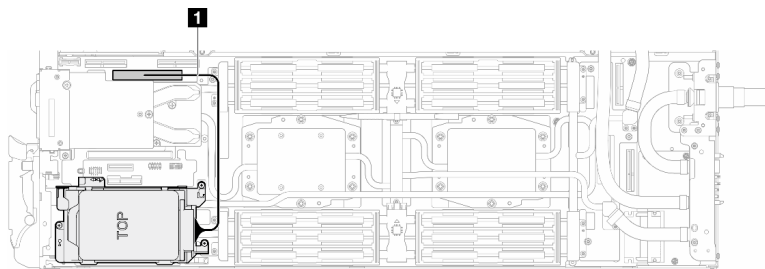


Figure 107. Connecting drive cage cables

Table 8. Drive assembly cable routing

Cable	From	To
<b>1</b>	Drive cage assembly	PCIe 2/SATA connector on system board.

## After you finish

1. Install the cross braces. See [“Install the cross braces” on page 21](#).
2. Install the tray cover. See [“Install the tray cover” on page 18](#).

3. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
4. Connect all required external cables to the solution.

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

5. 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](#)

## 7mm NVMe drive and drive cage assembly replacement

Use the following procedures to remove and install a 7mm NVMe drive and drive cage assembly.

### Remove a 7mm NVMe drive cage assembly

Use this information to remove a 7mm NVMe drive cage assembly.

### About this task

#### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- SD665-N V3 Water Loop Gap Pad Kit
- Conduction Plate Parts U3 7mm Dual
- U3 7mm Dual Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

### Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- c. Remove the cross braces. See [“Remove the cross braces” on page 19](#).
- d. Remove the M.2 backplane assembly. See [“Remove the M.2 backplane assembly” on page 113](#).

Step 2. Disconnect the drive cable from the system board.

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

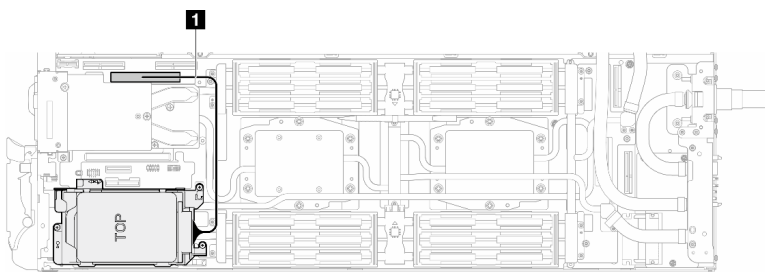


Figure 108. Disconnecting 7mm drive cable

Table 9. Drive assembly cable routing

Cable	From	To
<b>1</b>	Drive cage assembly	PCIe 2/SATA connector on system board.

Step 3. Remove the drive cage assembly.

- a. **1** Remove the 3 screws.
- b. **2** Remove the drive assembly out of the node.

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

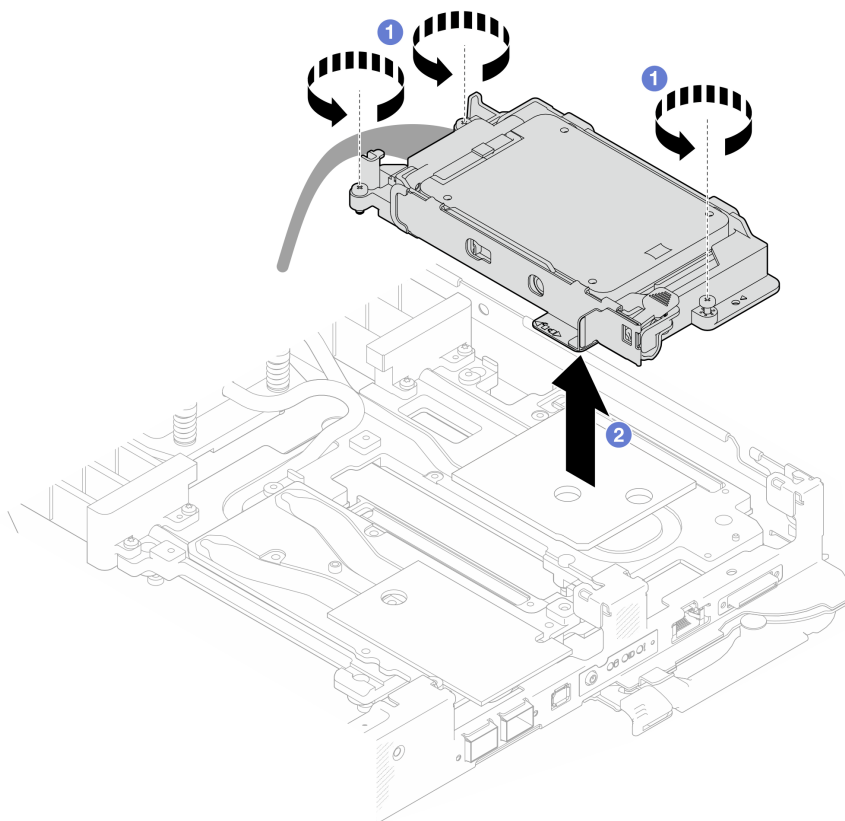


Figure 109. 7mm NVMe drive cage assembly removal

Step 4. If necessary, remove the blank bezel fillers.

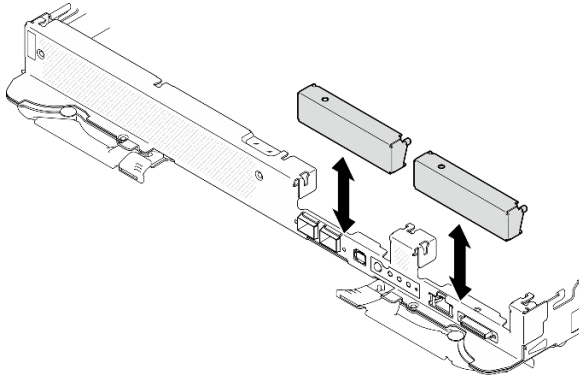


Figure 110. Blank bezel filler removal

## 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.

### Demo video

[Watch the procedure on YouTube](#)

## Remove a 7mm NVMe drive

Use this information to remove a 7mm NVMe drive.

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- SD665-N V3 Water Loop Gap Pad Kit
- Conduction Plate Parts U3 7mm Dual
- U3 7mm Dual Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

## Procedure

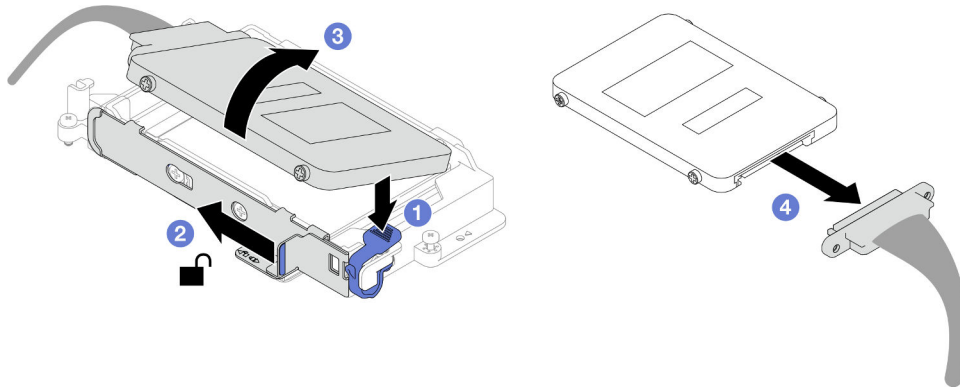
Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- c. Remove the cross braces. See [“Remove the cross braces” on page 19](#).

- d. Remove the 7mm NVMe drive cage. See [“Remove a 7mm NVMe drive cage assembly” on page 87](#).

**Step 2. Remove the upper drive.**

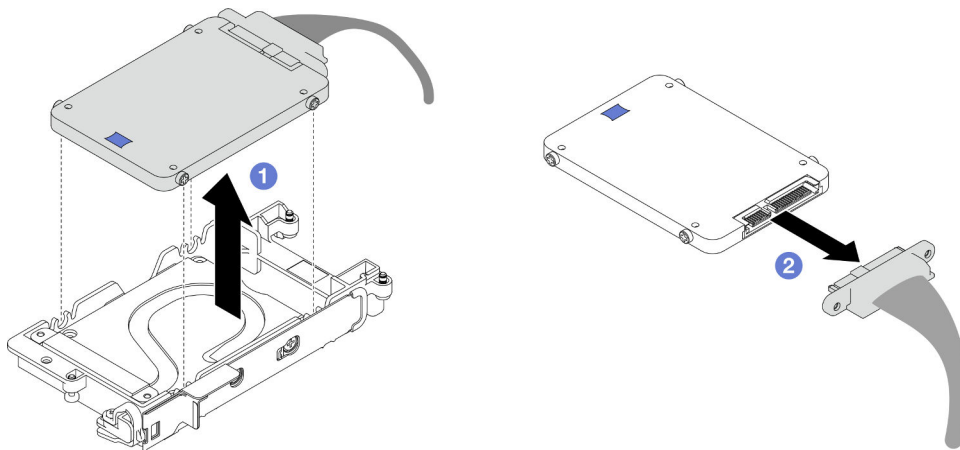
- a. ① Push and hold the release latch.
- b. ② Slide the metal tab to the unlocked position.
- c. ③ Pivot the drive out of the top of the drive cage as shown.
- d. ④ Disconnect the cable from the drive.



*Figure 111. Upper drive removal (7mm NVMe)*

**Step 3. Remove the lower drive.**

- a. ① Remove the drive out of the bottom of the drive cage.
- b. ② Disconnect the cable from the drive.



*Figure 112. Lower drive 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 a 7mm NVMe drive

Use this information to install a 7mm NVMe drive.

### About this task

#### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- SD665-N V3 Water Loop Gap Pad Kit
- Conduction Plate Parts U3 7mm Dual
- U3 7mm Dual Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

### Procedure

- Step 1. If the gap pad on the conduction plate is damaged or detached, discard the conduction plate. Then, install a new conduction plate already attached with the gap pad.

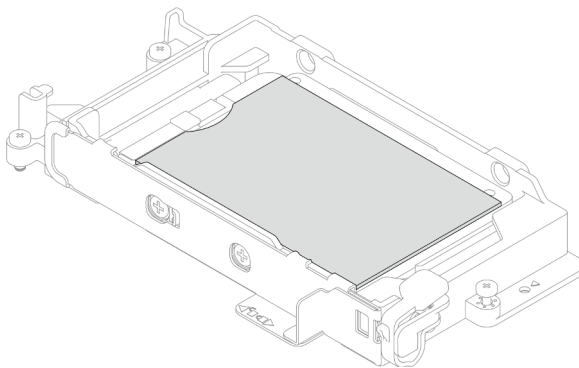


Figure 113. Conduction plate gap pad installation

- Step 2. Install the conduction plate to the drive cage.
- 1 Unlock the metal tab on the drive cage.
  - 2 Align the conduction plate to two guide pins on the drive cage; then, install the conduction plate to the drive cage as shown.
  - 3 Install the four screws to secure the conduction plate to the drive cage.

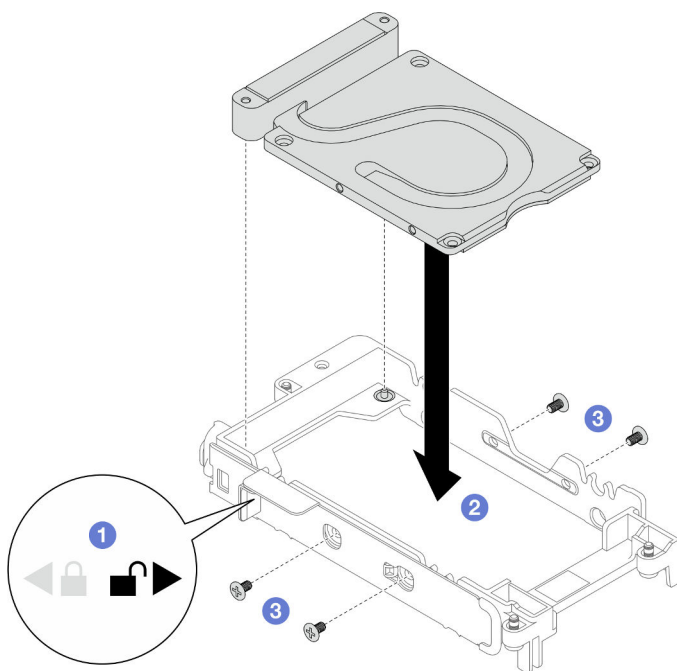


Figure 114. Conduction plate installation

Step 3. Install the lower drive.

- a. ① Connect the cable with **SSD 0/2** marked on plugger to the drive.
- b. ② Install the drive into the bottom of the drive cage and make sure it is secured in place.

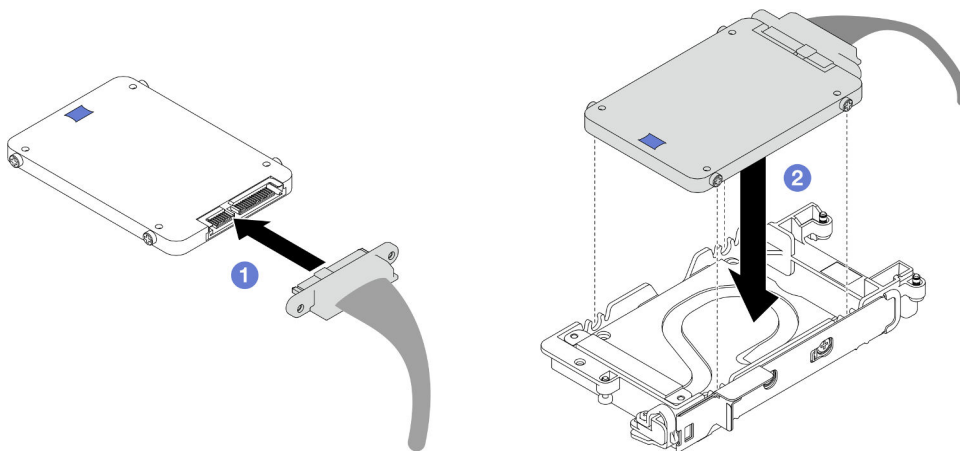


Figure 115. Lower drive installation

Step 4. Install the upper drive.

- a. ① Connect the cable with **SSD 1/3** marked on plugger to the drive. Then, insert the screws on the drive into the two screw holes on the drive cage.
- b. ② Rotate the drive into the drive cage.
- c. ③ Press the drive into the drive cage.
- d. ④ While pressing down the drive, push and hold the release latch.
- e. ⑤ Slide the metal tab to the lock position.



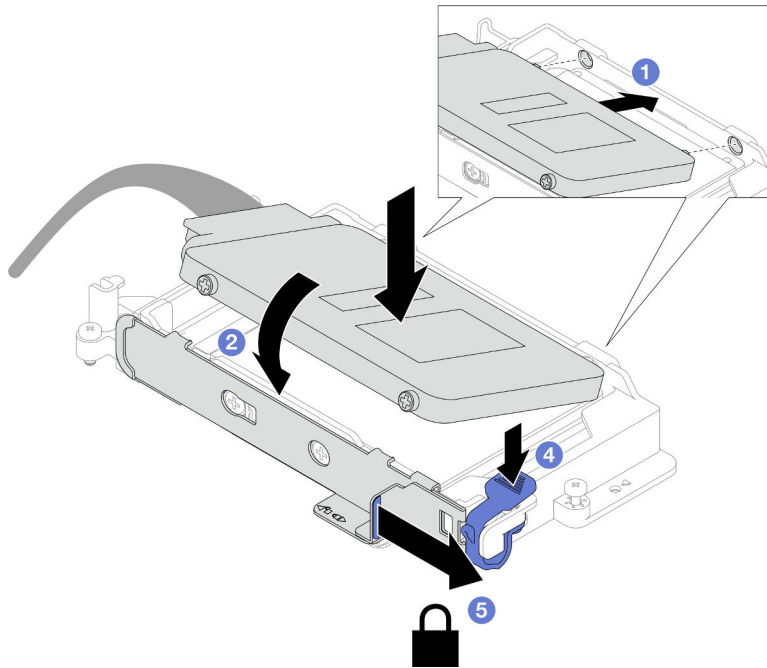
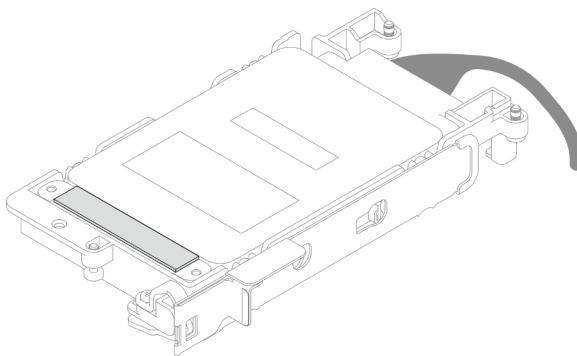


Figure 116. Upper drive installation

- Step 5. Replace the putty pad on the conduction plate. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

**Attention:** Putty pad cannot be reused. Whenever a component is removed, putty pads must be replaced with new ones before reinstalling the component.



## After you finish

1. Install the 7mm NVMe drive cage. See [“Install a 7mm NVMe drive cage assembly” on page 94](#).
2. Install the cross braces. See [“Install the cross braces” on page 21](#).
3. Install the tray cover. See [“Install the tray cover” on page 18](#).
4. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
5. Connect all required external cables to the solution.

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

6. 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](#)

## Install a 7mm NVMe drive cage assembly

Use this information to install a 7mm NVMe drive cage assembly.

### About this task

#### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.
- Ensure the drives are installed correctly into the drive cage assembly. See [“Install a drive” on page 79](#).

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- SD665-N V3 Water Loop Gap Pad Kit
- Conduction Plate Parts U3 7mm Dual
- U3 7mm Dual Putty Pad Kit

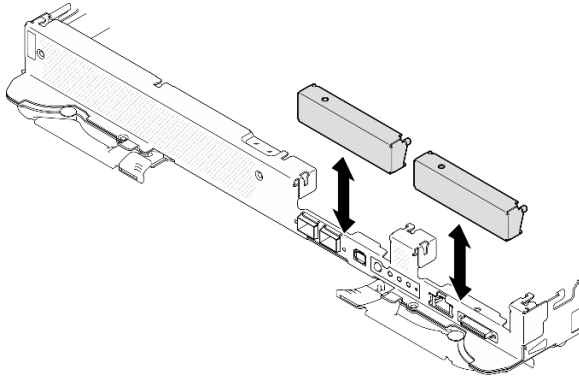
**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

## Procedure

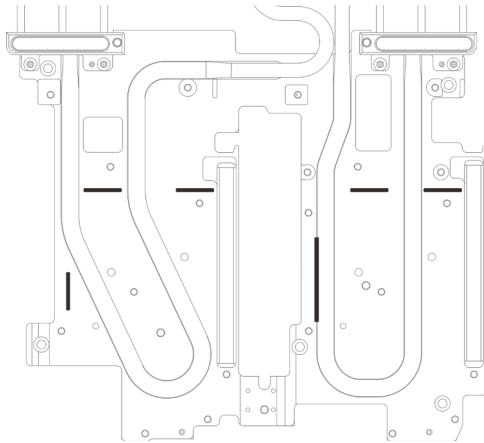
Step 1. Make sure the blank bezel fillers are installed. If not, install them to the node.



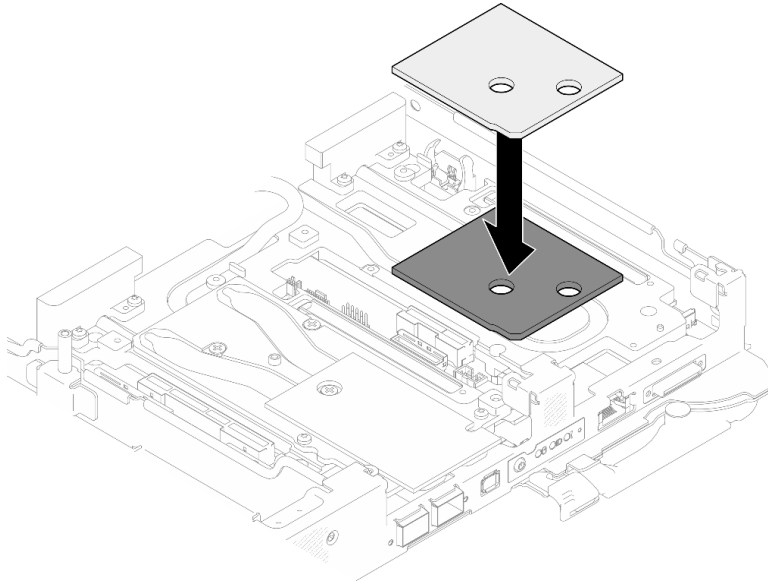
*Figure 117. Blank bezel filler installation*

- Step 2. If the drive cage gap pad is damaged or missing, replace it with a new one. See the following for the gap pad location for each drive cage. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

**Note:** Align the gap pad with marking on water loop when attaching gap pad.



*Figure 118. Markings on water loop for gap pad alignment*



*Figure 119. Replacing gap pad*

- Step 3. Install the drive cage assembly.
- a. ① Install the drive assembly into the node.
  - b. ② Secure the 3 screws.

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

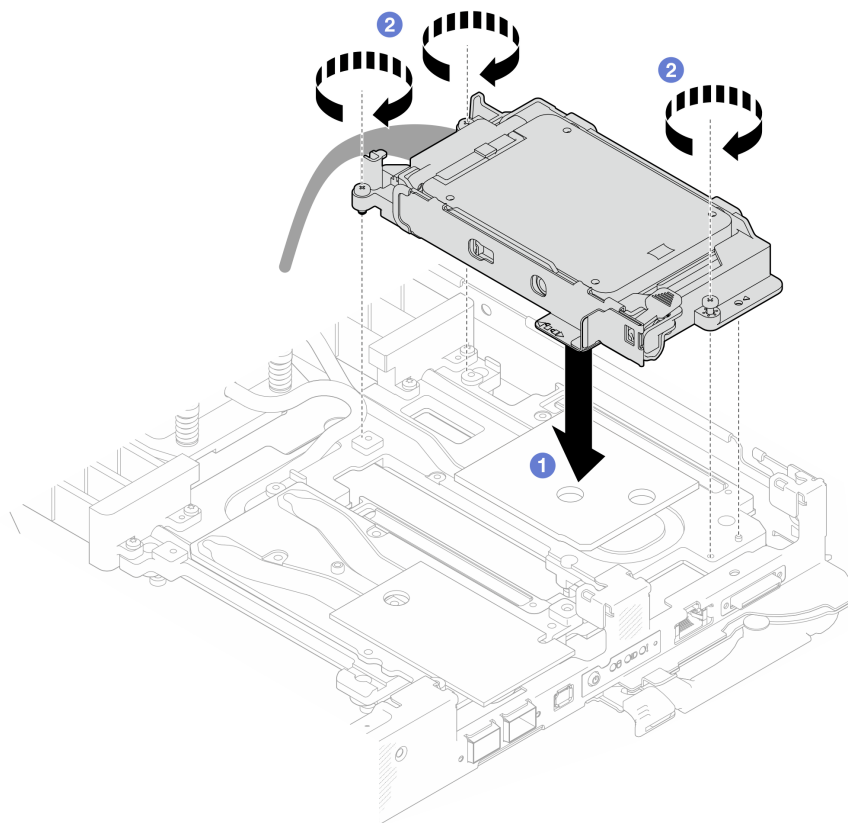


Figure 120. 7mm NVMe drive cage assembly installation

Step 4. Connect the drive cage assembly cable to the system board. For more information, see “System-board connectors” section in *User Guide* or *System Configuration Guide*.

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

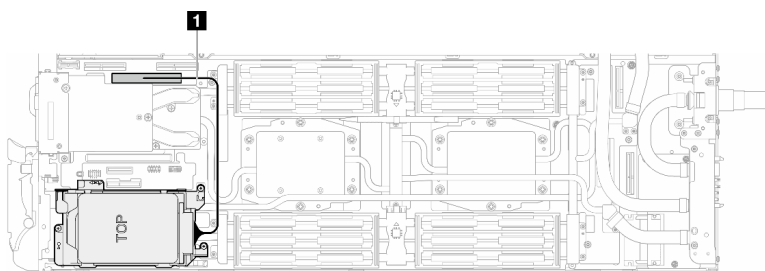


Figure 121. Connecting 7mm drive cage cables

Table 10. Drive assembly cable routing

Cable	From	To
<b>1</b>	Drive cage assembly	PCIe 2/SATA connector on system board.

## After you finish

1. Install the cross braces. See [“Install the cross braces” on page 21](#).

2. Install the tray cover. See [“Install the tray cover” on page 18](#).
3. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
4. Connect all required external cables to the solution.

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

5. 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](#)

## E3.S drive and drive cage assembly replacement

Use the following procedures to remove and install an E3.S drive and drive cage assembly.

### Remove the E3.S drive cage assembly

Use this information to remove the E3.S drive cage assembly.

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- E3.S Drive Conduction Plate Assembly
- E3S Putty Pad Kit
- E3S Gap Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

## Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- c. Remove the cross braces. See [“Remove the cross braces” on page 19](#).
- d. Remove the M.2 backplane assembly. See [“Remove the M.2 backplane assembly” on page 113](#).

Step 2. Disconnect the E3.S drive cable from the system board.

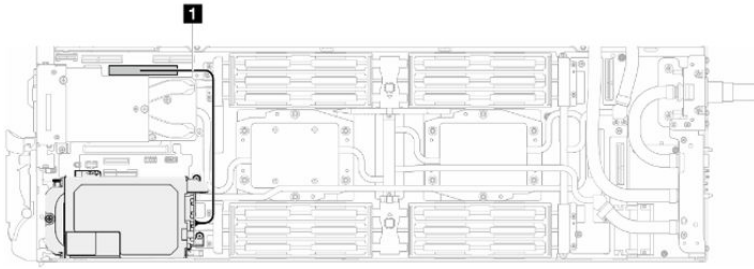


Figure 122. Disconnecting E3.S drive cable

Table 11. Drive assembly cable routing

Cable	From	To
<b>1</b>	Drive cage assembly	PCIe 2/SATA connector on system board.

- Step 3. Remove the E3.S drive cage assembly.
- 1 Remove the three screws.
  - 2 Remove the E3.S drive cage assembly out of the node.

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

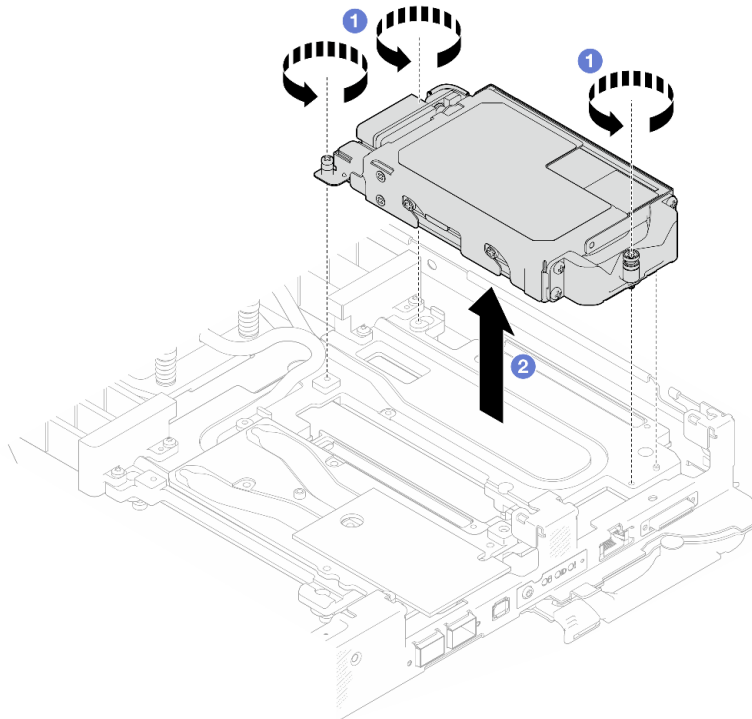


Figure 123. E3.S drive cage assembly removal

- Step 4. If necessary, remove the blank bezel fillers.

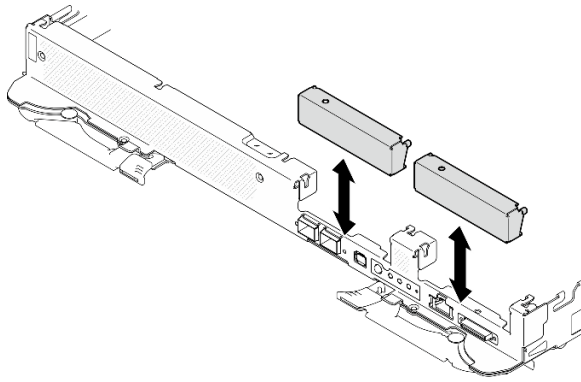


Figure 124. Blank bezel filler removal

## 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.

### Demo video

[Watch the procedure on YouTube](#)

## Remove an E3.s drive

Use this information to remove an E3.s drive.

SD665-N V3 supports E3.s 1T drive.

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- E3.S Drive Conduction Plate Assembly
- E3S Putty Pad Kit
- E3S Gap Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

## Procedure

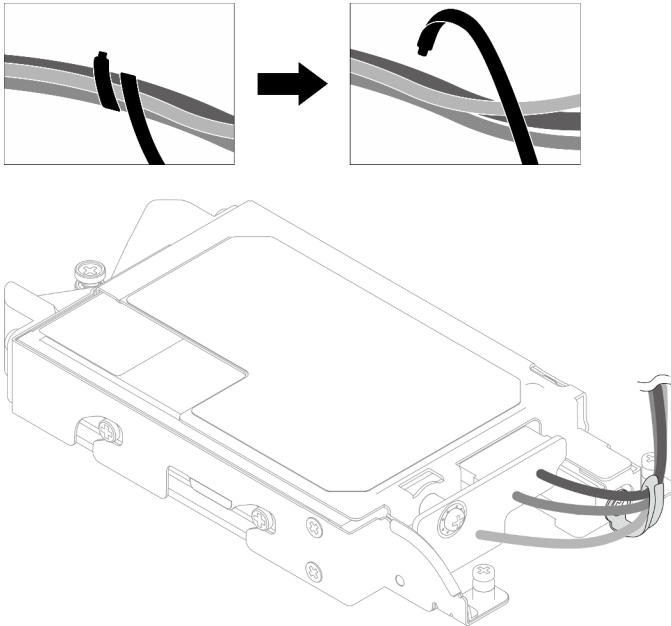
Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).



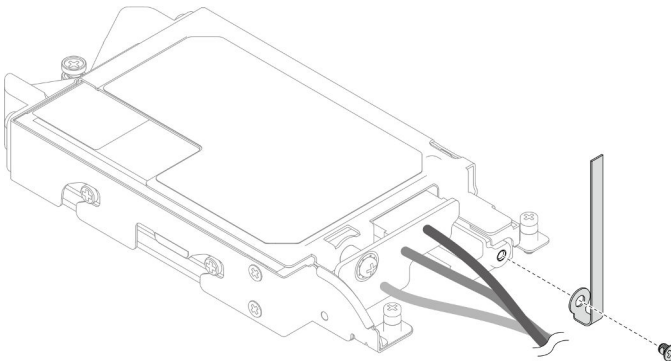
- b. Remove the tray cover. See [“Remove the tray cover” on page 17.](#)
- c. Remove the cross braces. See [“Remove the cross braces” on page 19.](#)
- d. Remove the drive cage. See [“Remove a drive cage assembly” on page 74.](#)

Step 2. The cables on the E3.s drive cable-ended backplane are bundled with the cable tie. Unfasten the cable tie to release the cables from it.



*Figure 125. Release cables from the cable tie*

Step 3. Remove the screw; then, remove the cable tie from the E3.s drive cage.



*Figure 126. Cable tie removal*

Step 4. Remove the E3.s drive cable-ended backplane.

- a. ❶ Remove the screw.
- b. ❷ Remove the backplane from the E3.s drive cage.

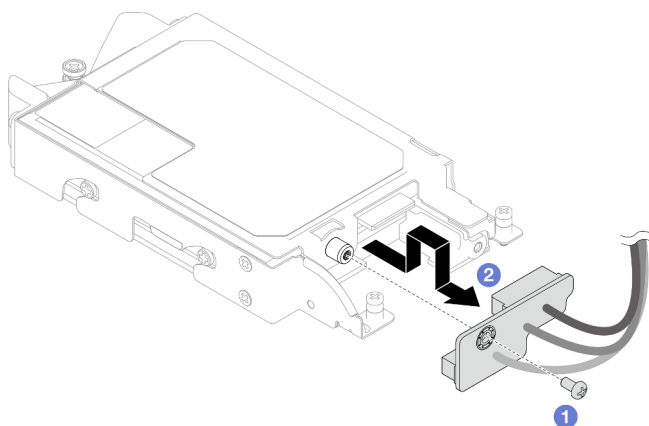


Figure 127. E3.s drive cable-ended backplane removal

Step 5. Remove the bottom E3.s drive from the drive cage.

- a. ① Flip the drive cage; then, remove the four screws.
- b. ② Remove the bottom E3.s drive from the E3.s drive cage.

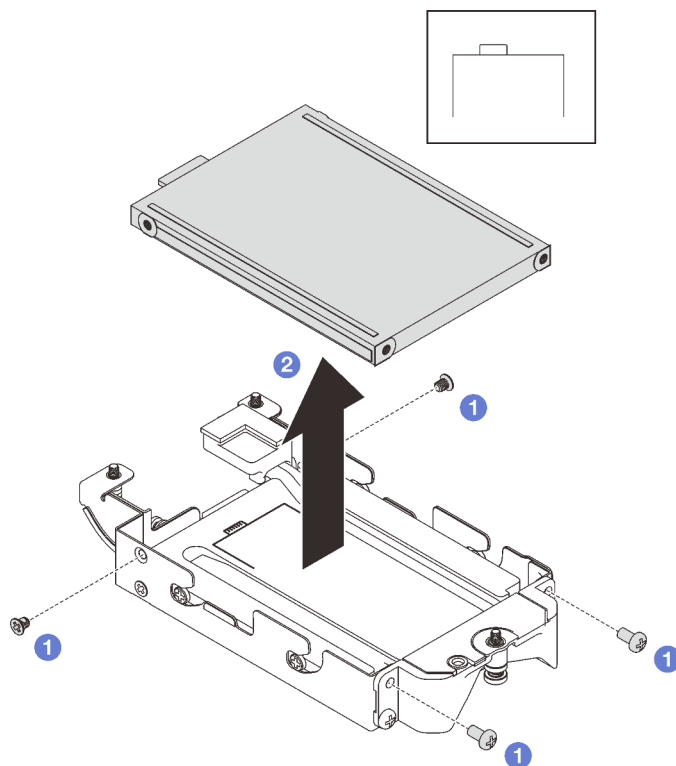


Figure 128. Bottom E3.s drive removal

Step 6. Remove the conduction plate.

- a. ① Remove the two screws.
- b. ② Insert a flat head screwdriver into the notch on the corner of the drive cage; then, slightly rotate the screwdriver to release the conduction plate from the E3.s 1T drive cage.
- c. ③ Remove the conduction plate from the E3.s drive cage.

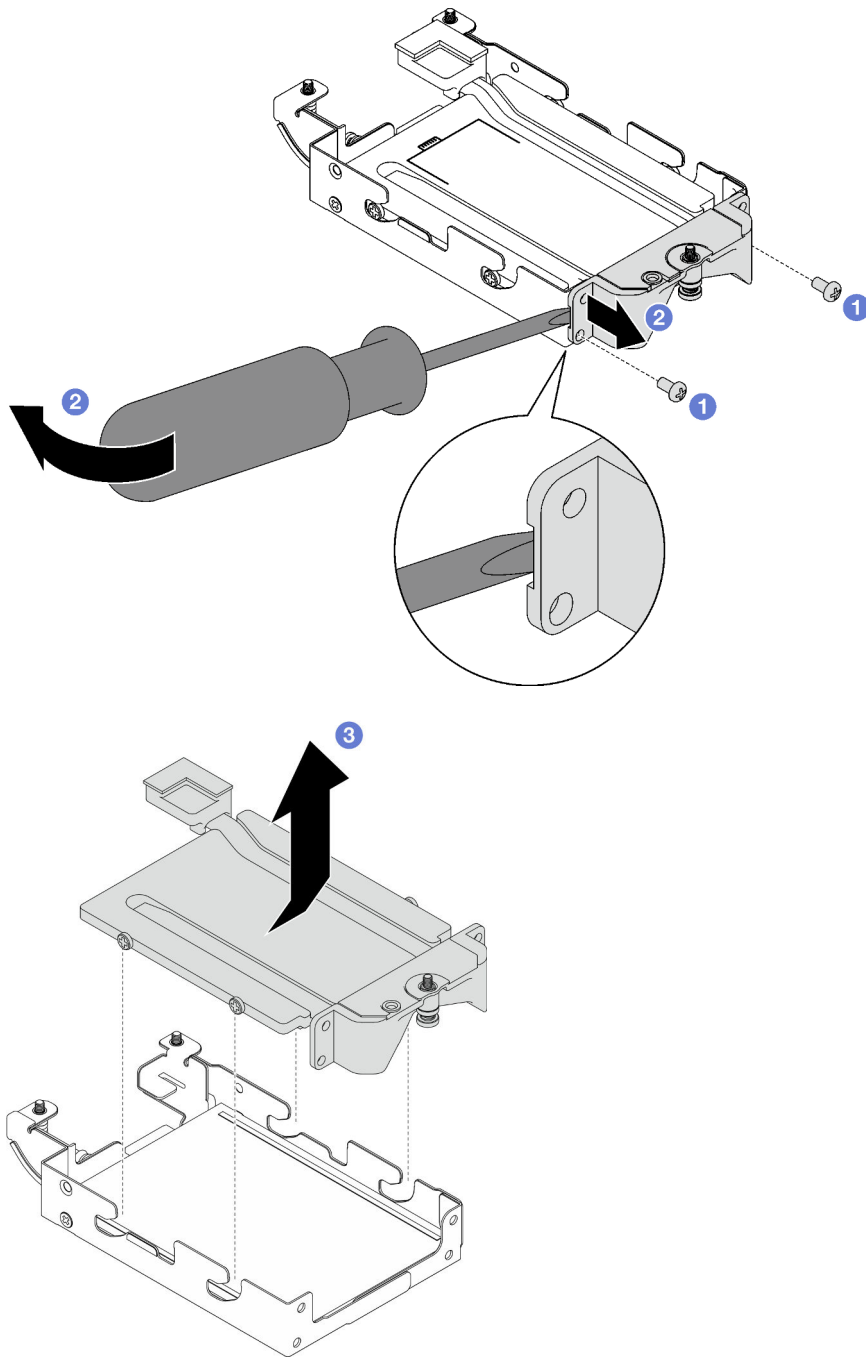


Figure 129. Conduction plate removal

Step 7. Remove the top E3.s drive.

- a. ① Remove the two screws.
- b. ② Remove the top E3.s drive from the drive cage.

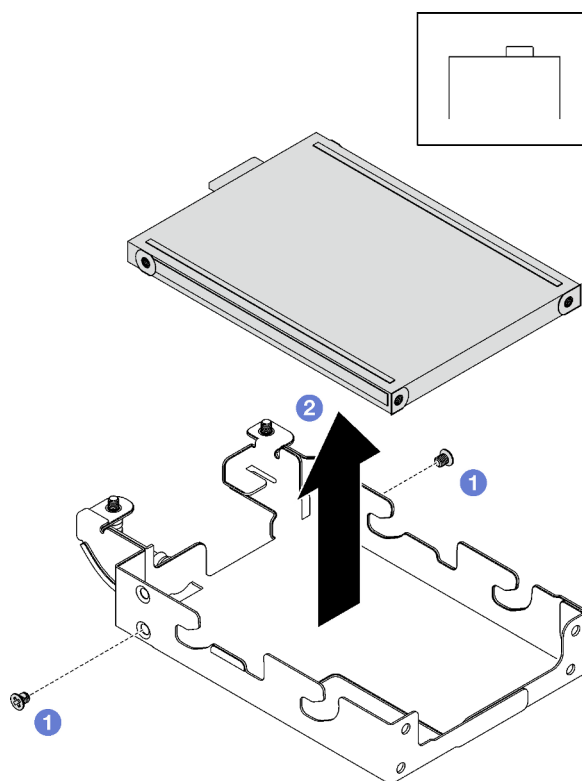


Figure 130. Top E3.s drive removal

## 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 an E3.s drive

Use this information to install an E3.s drive.

SD665-N V3 supports E3.s 1T drive.

## About this task

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

**Attention:**

- Read “[Installation Guidelines](#)” on page 3 and “[Safety inspection checklist](#)” on page 4 to ensure that you work safely.

**Required tools**

Make sure you have the required tools listed below in hand to properly replace the component.

- E3.S Drive Conduction Plate Assembly
- E3S Putty Pad Kit
- E3S Gap Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

**Procedure**

Step 1. Install the top E3.s drive to the E3.s drive cage.

- a. ① Orient the E3.s drive so that the connector is on the right side as shown. Then, place the E3.s drive into the E3.S drive cage.
- b. ② Fasten the two screws to secure the E3.s drive to the E3.s drive cage

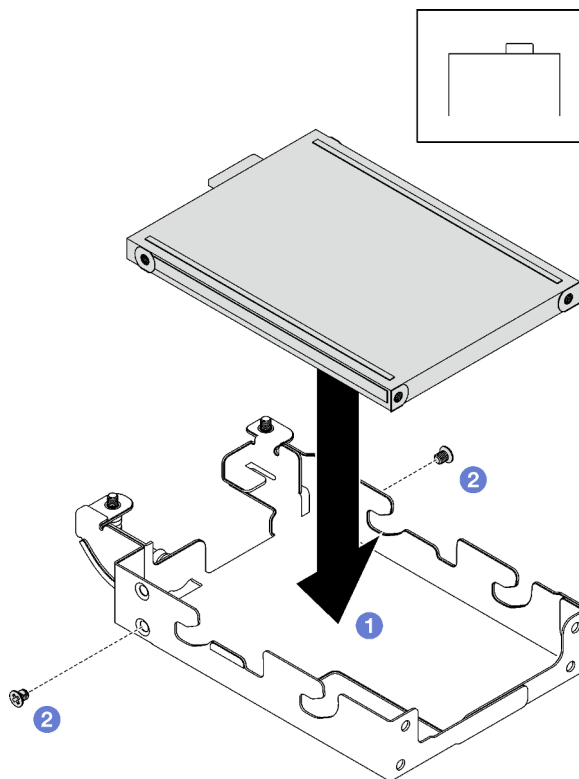


Figure 131. Top E3.s drive installation

Step 2. If the gap pad located on the conduction plate is damaged or detached, discard the conduction plate. Then, install a new conduction plate already attached with the gap pad.

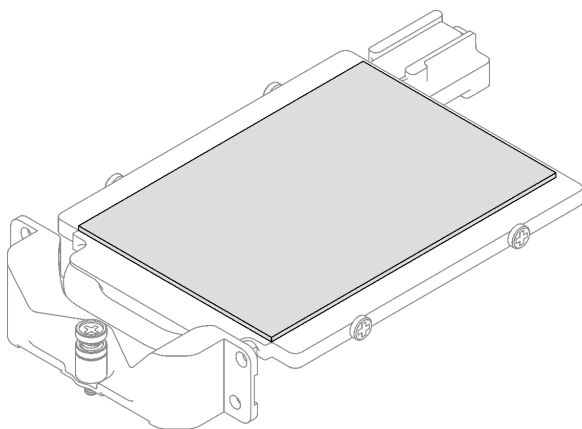


Figure 132. Replacing the conduction plate gap pad

- Step 3. Replace the putty pads on the conduction plate with new ones. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

**Attention: Putty pad cannot be reused. Whenever a component is removed, putty pads must be replaced with new ones before reinstalling the component.**

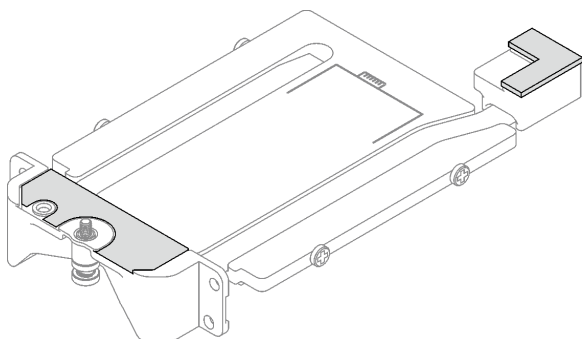
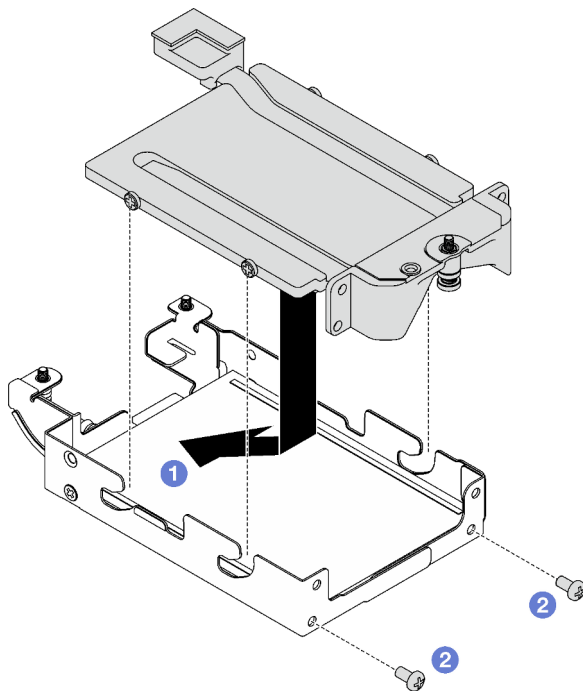


Figure 133. Replacing the conduction plate putty pads

- Step 4. Install the conduction plate to the drive cage.
- a. ① Hold the conduction plate at an angle; then, insert the conduction plate into the E3.s drive cage.
  - b. ② Fasten the two screws to secure the conduction plate to the E3.s drive cage.



*Figure 134. E3.s drive conduction plate installation*

Step 5. Install the bottom E3.s drive.

- a. ① Orient the E3.s drive so that the connector is on the left side as shown. Then, place the bottom E3.s drive into the E3.s drive cage.
- b. ② Fasten the four screws to secure the bottom E3.s drive to the E3.s drive cage.

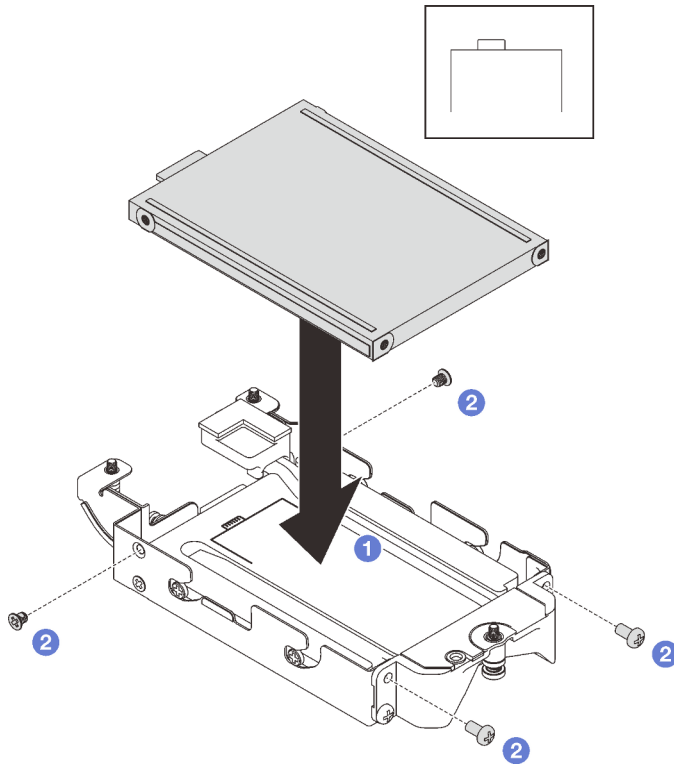


Figure 135. Bottom E3.s drive installation

Step 6. Install the E3.s drive cable-ended backplane.

- a. ① Align the backplane to the screw hole on the E3.s drive cage; then, insert the backplane to the E3.s drive cage.
- b. ② Fasten the screw to secure the backplane to the E3.s drive cage.

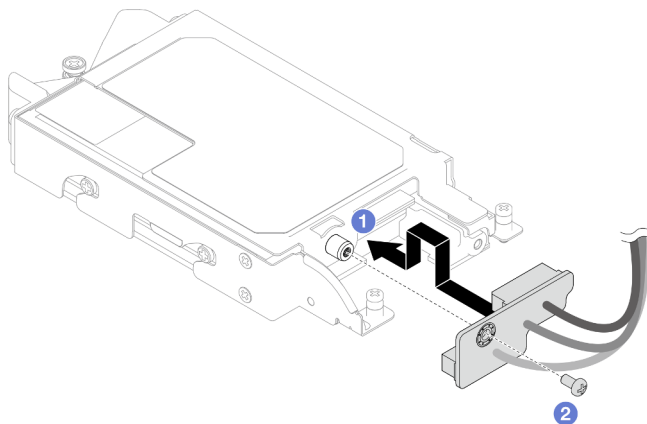


Figure 136. E3.s cable-ended backplane installation

Step 7. Fasten the screw to install the cable tie to the E3.s drive cage.



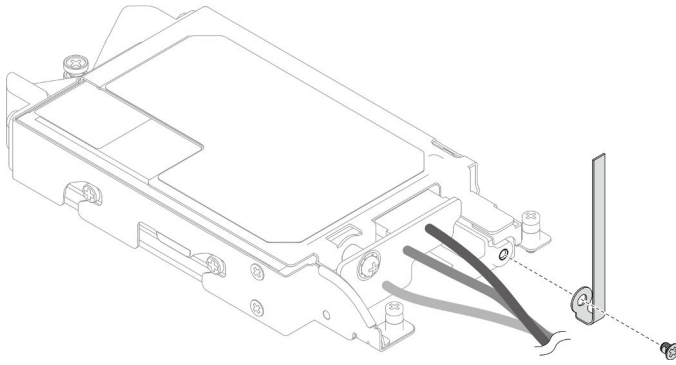


Figure 137. Cable tie installation

Step 8. Bundle the cables on the E3.s drive cable-ended backplane with the cable tie.

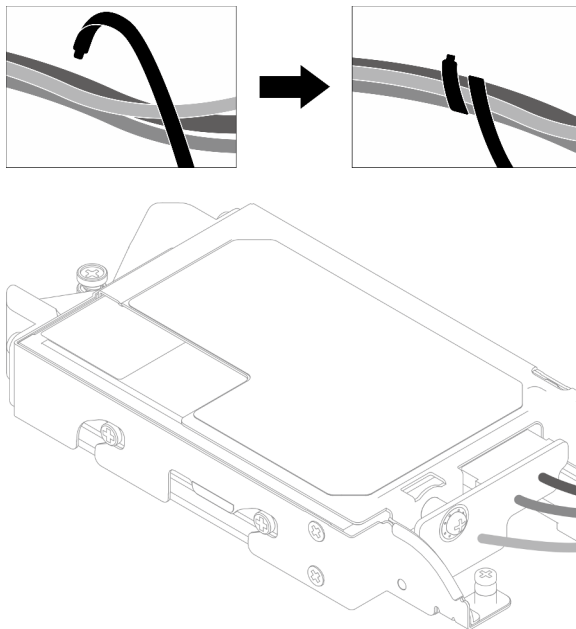


Figure 138. Bundling cables with cable tie

## After you finish

1. Install the drive cage. See [“Install a drive cage assembly” on page 82](#).
2. Install the cross braces. See [“Install the cross braces” on page 21](#).
3. Install the tray cover. See [“Install the tray cover” on page 18](#).
4. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
5. Connect all required external cables to the solution.

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

6. 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](#)

## Install the E3.S drive cage assembly

Use this information to install the E3.S drive cage assembly.

### About this task

#### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- E3.S Drive Conduction Plate Assembly
- E3S Putty Pad Kit
- E3S Gap Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.
- Ensure the drives are installed correctly into the drive cage assembly. See [“Install a drive” on page 79](#).

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

### Procedure

Step 1. Make sure the blank bezel fillers are installed. If not, install them to the node.

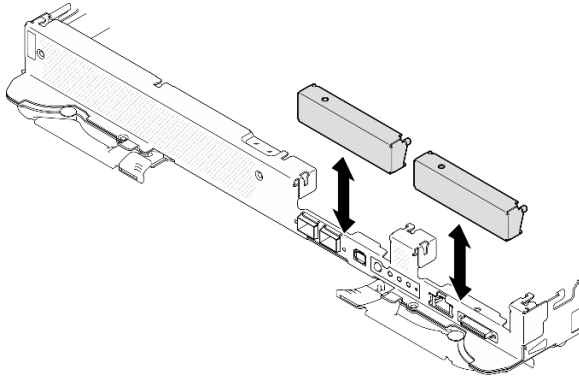


Figure 139. Blank bezel filler installation

- Step 2. If the E3.S drive cage gap pad is damaged or missing, replace it with a new one. See the following for the gap pad location for each drive cage. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

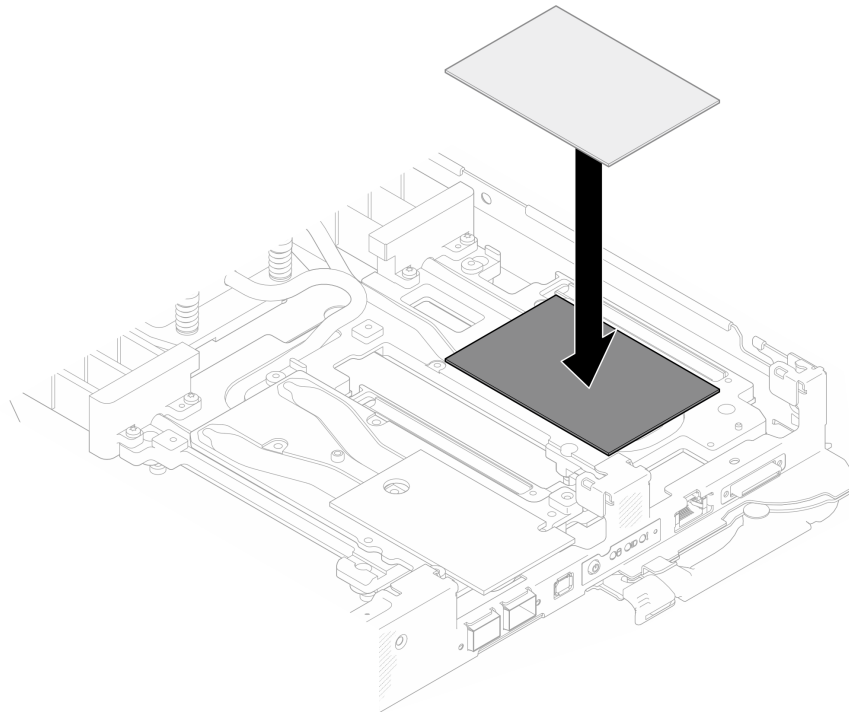


Figure 140. Replacing gap pad

- Step 3. Install the E3.S drive cage assembly.
- a. ❶ Install the E3.S drive assembly into the node.
  - b. ❷ Secure the 3 screws.

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

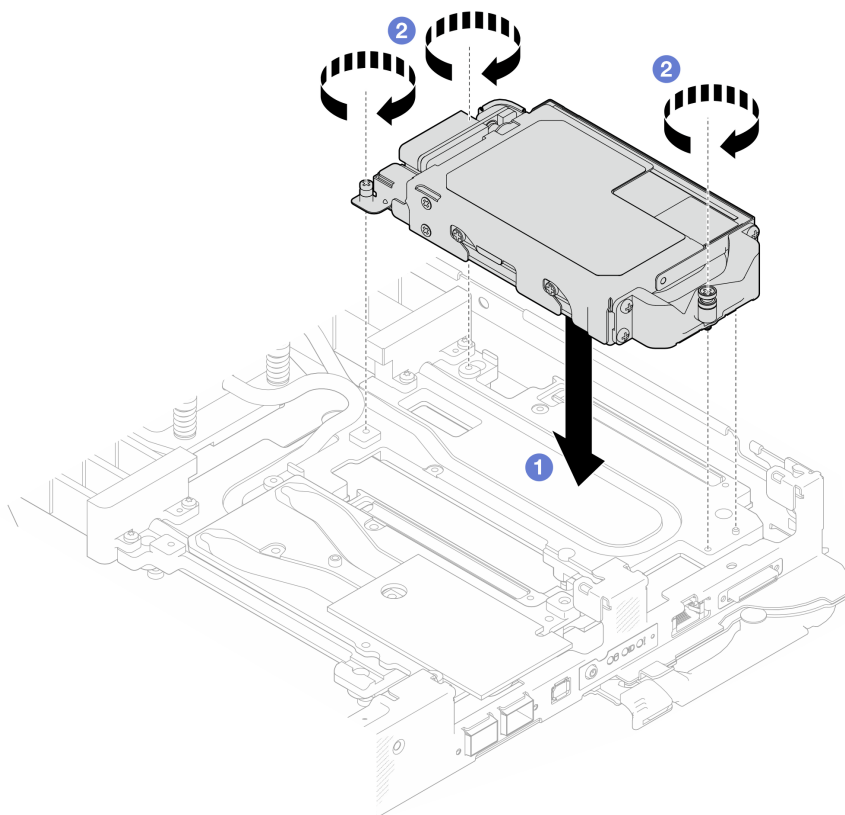


Figure 141. E3.S drive cage assembly installation

Step 4. Connect the drive cage assembly cable to the system board. For more information, see “System-board connectors” section in *User Guide* or *System Configuration Guide*.

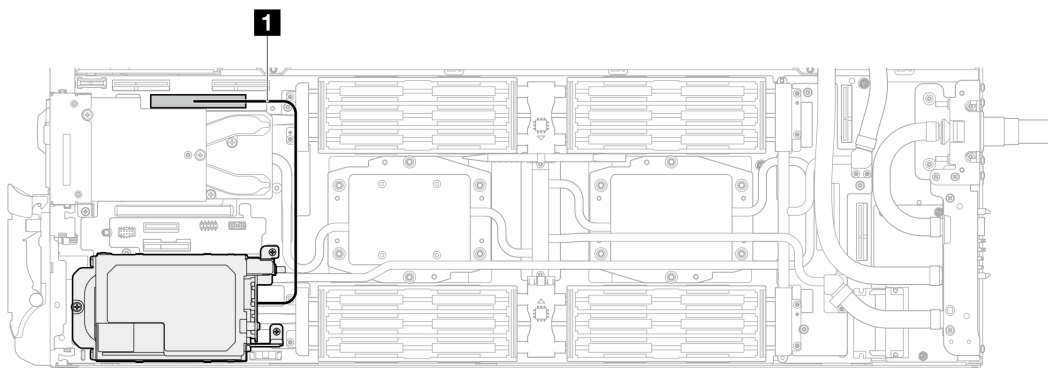


Figure 142. E3.S drives cable routing

Table 12. E3.S drives cable routing

Cable	From	To
<b>1</b>	Drive cage assembly	PCIe 2/SATA connector on system board.

## After you finish

1. Install the cross braces. See [“Install the cross braces” on page 21](#).

2. Install the tray cover. See [“Install the tray cover” on page 18](#).
3. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
4. Connect all required external cables to the solution.

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

5. 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](#)

## M.2 drive and backplane assembly replacement

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

### Remove the M.2 backplane assembly

Use this information to remove the M.2 backplane assembly.

### About this task

#### Required tools

Make sure you have the following kits to properly replace the component:

- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Conduction Plate Parts
- M.2 Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

#### Attention:

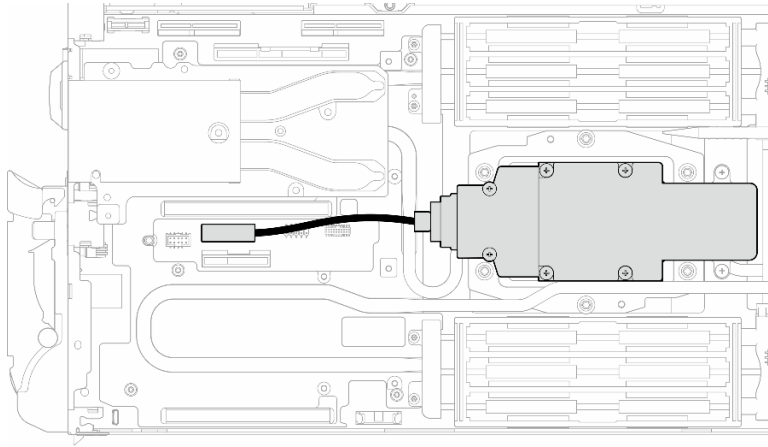
- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

### Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- c. Remove the cross braces. See [“Remove the cross braces” on page 19](#).

Step 2. Disconnect the cable from the system board.



*Figure 143. M.2 backplane assembly cable removal*

Step 3. Remove the M.2 backplane assembly.

- a. ① Remove the six screws.
- b. ② Remove the M.2 backplane assembly out from the node.
- c. ③ Disconnect the cable from the M.2 backplane assembly.

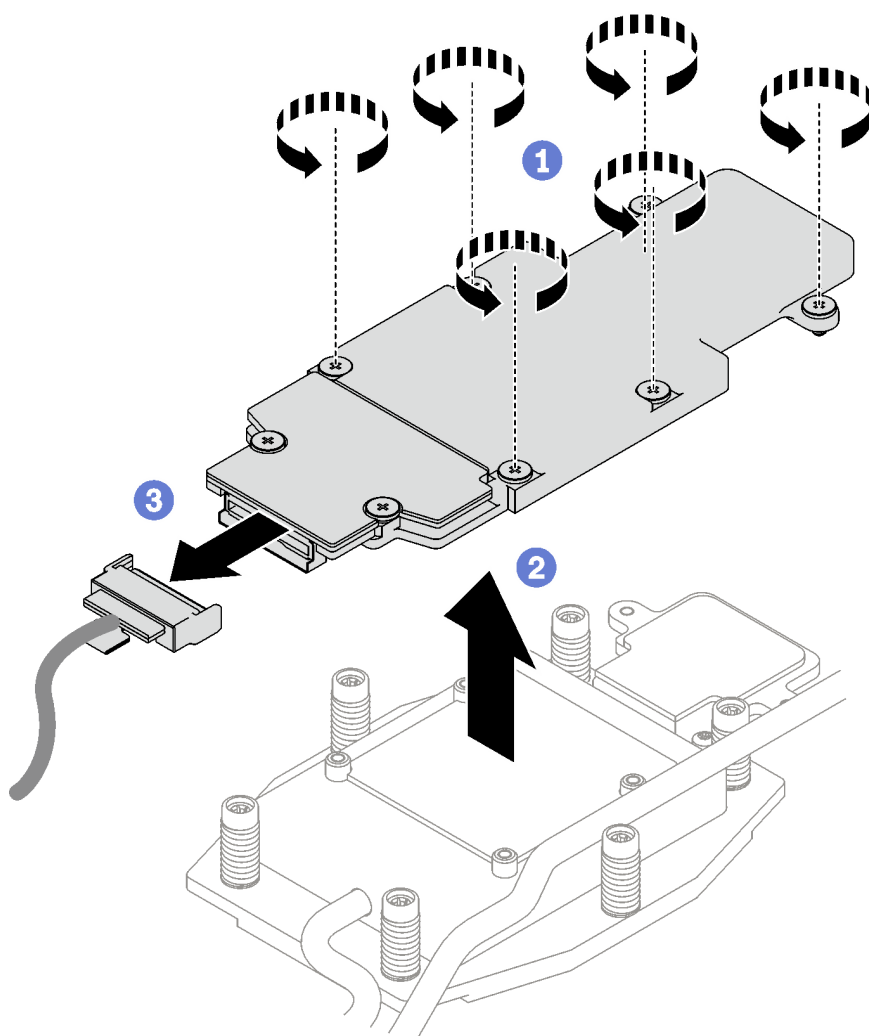
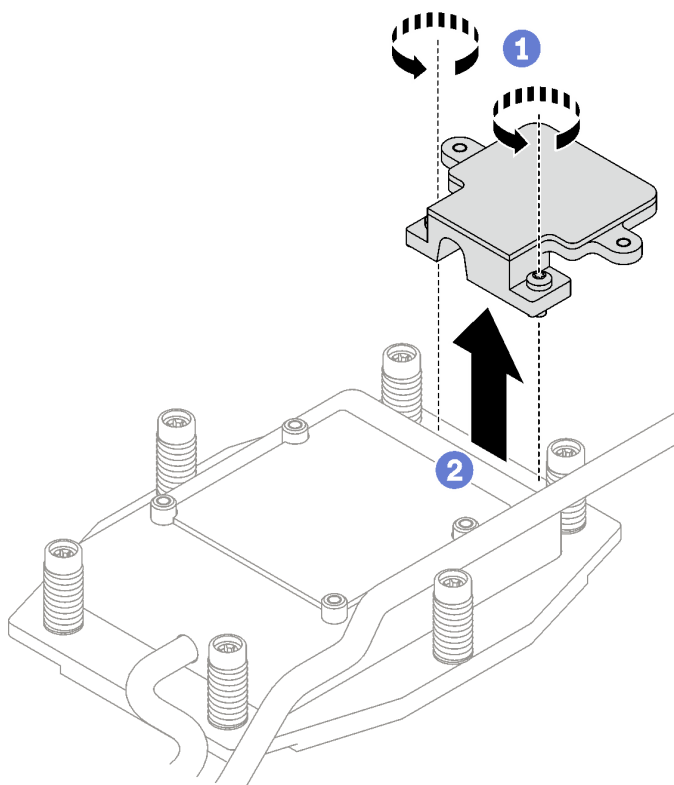


Figure 144. M.2 backplane assembly removal

- Step 4. **(Optional)** If you are removing the water loop, remove the M.2 backplane cold plate.
- 1 Unfasten the two screws.
  - 2 Remove the M.2 backplane cold plate from the processor cold plate.



## 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 M.2 backplane assembly for recycle, follow the instructions below:

**Attention:** You can only disassemble the M.2 backplane assembly for recycle. Do not disassemble it for any other purposes.

Make sure the M.2 drive is removed from the M.2 backplane. To remove the M.2 drive, see [“Remove an M.2 drive” on page 117](#).

1. ① Loosen the two screws.
2. ② Carefully lift the M.2 board out of the M.2 bracket.



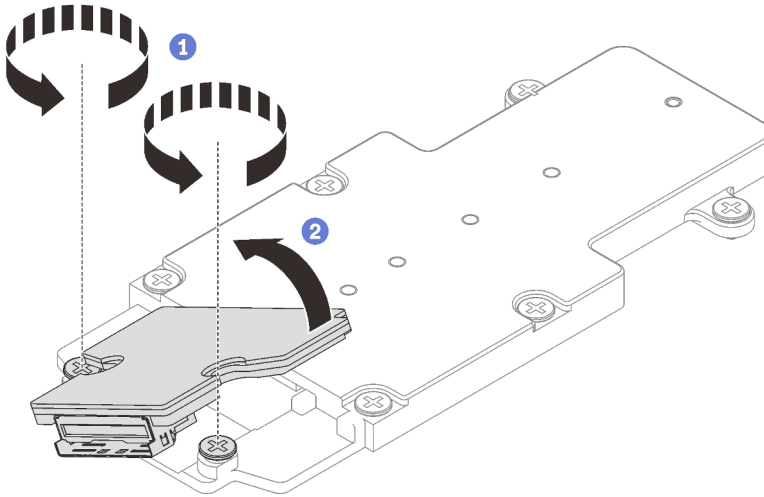


Figure 145. Disassembling M.2 backplane assembly

3. Recycle the unit in compliance with local regulations.

### Demo video

[Watch the procedure on YouTube](#)

### Remove an M.2 drive

Use this information to remove an M.2 drive.

### About this task

#### Required tools

Make sure you have the M.2 Putty Pad Kit and SD665-N V3 Miscellaneous Parts Kit to properly replace the component. **Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

### Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- c. Remove the cross braces. See [“Remove the cross braces” on page 19](#).
- d. Remove the M.2 backplane assembly. See [“Remove the M.2 backplane assembly” on page 113](#).

Step 2. Remove the M.2 drive.

- a. ① Remove the screw securing the M.2 drive.
- b. ② Rotate the M.2 drive away from the M.2 backplane assembly at an angle (approximately 30 degrees).
- c. ③ Pull the M.2 drive away from the connector on the M.2 backplane assembly.

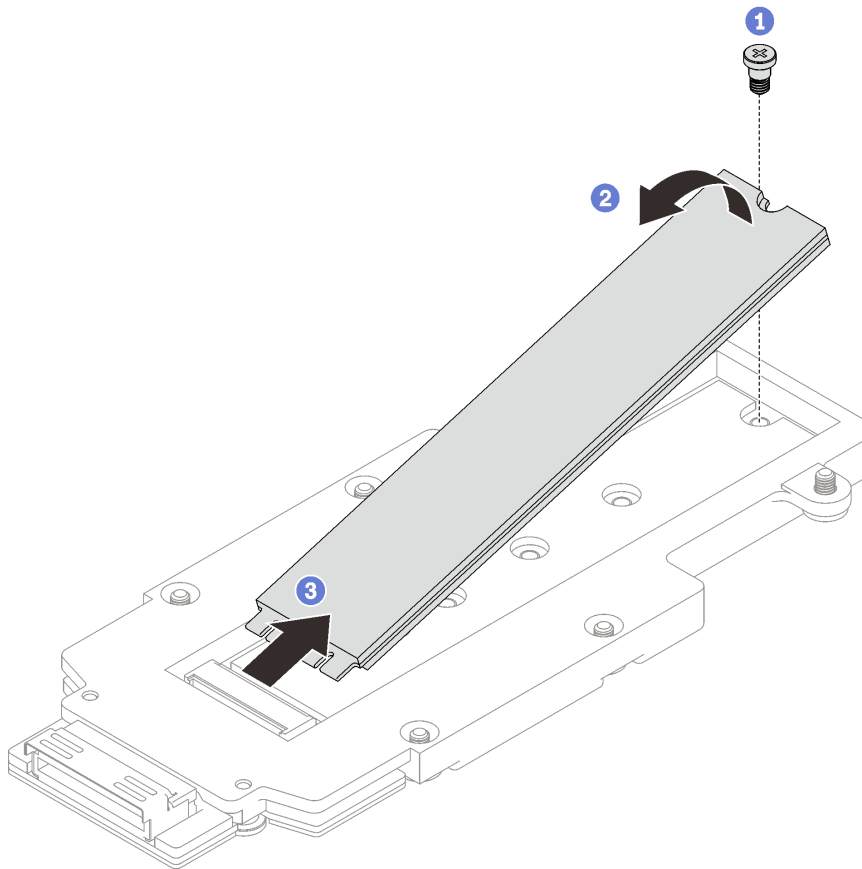


Figure 146. M.2 drive removal

## 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 an M.2 drive

Use this information to install an M.2 drive.

## About this task

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.

- “[Gap pad/Putty pad identification and location](#)” on page 8
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

## Required tools

Make sure you have the M.2 Putty Pad Kit and SD665-N V3 Miscellaneous Parts Kit to properly replace the component. **Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

## Attention:

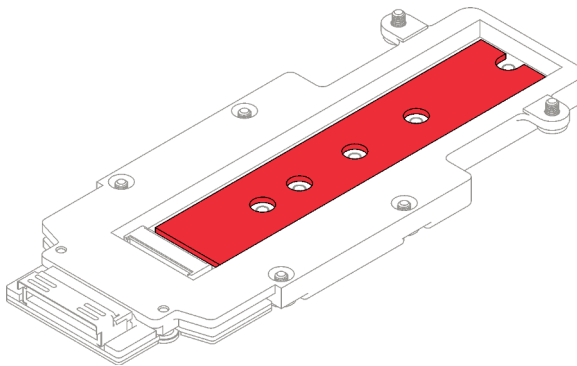
- Read “[Installation Guidelines](#)” on page 3 and “[Safety inspection checklist](#)” on page 4 to ensure that you work safely.

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

## Procedure

Step 1. Replace the M.2 backplane gap pad with a new one. Make sure to follow [Gap pad/putty pad replacement guidelines](#)



Step 2. Install the M.2 drive.

- 1 Insert the M.2 drive at an angle (approximately 30 degrees) into the connector on the M.2 backplane assembly.
- 2 Rotate the M.2 drive into the M.2 backplane assembly.
- 3 Secure the M.2 drive with one screw into the corresponding hole.

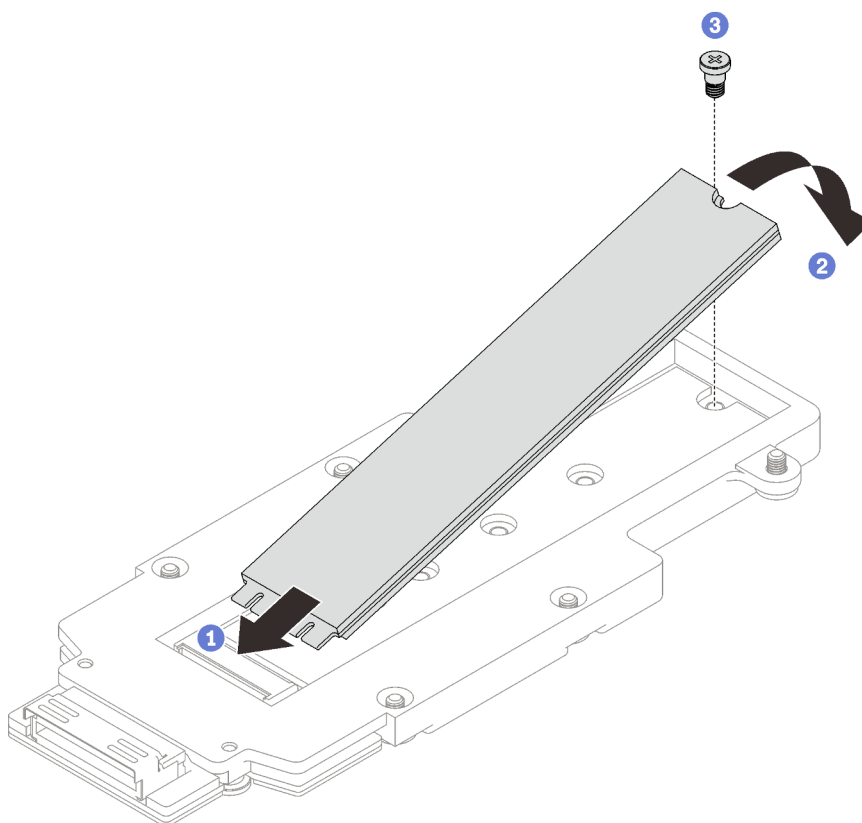


Figure 147. M.2 drive installation

## After you finish

1. Install the M.2 backplane assembly. See [“Install the M.2 backplane assembly” on page 120](#).
2. Install the cross braces. See [“Install the cross braces” on page 21](#).
3. Install the tray cover. See [“Install the tray cover” on page 18](#).
4. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
5. Connect all required external cables to the solution.

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

6. 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](#)

## Install the M.2 backplane assembly

Use this information to install the M.2 backplane assembly.

## About this task

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - [Required Tools](#) list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)

- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

## Required tools

Make sure you have the following kits to properly replace the component:

- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Conduction Plate Parts
- M.2 Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

## Attention:

- Read “[Installation Guidelines](#)” on page 3 and “[Safety inspection checklist](#)” on page 4 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

## Procedure

- Step 1. Replace the putty pad on bottom side of the M.2 backplane cold plate with new ones. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

**Attention: Putty pad cannot be reused. Whenever a component is removed, putty pads must be replaced with new ones before reinstalling the component.**

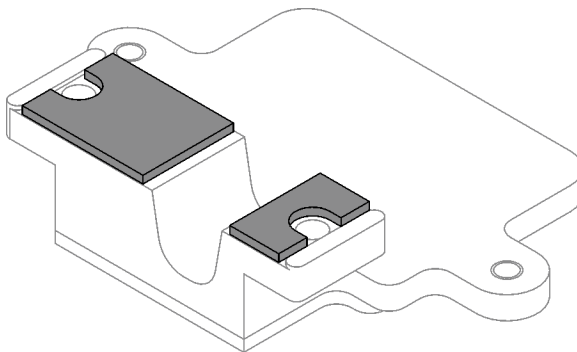


Figure 148. Putty pads on the M.2 backplane cold plate (bottom side)

- Step 2. Install the M.2 backplane cold plate.
- 1 Place the M.2 cold plate onto the front processor (Processor 1) cold plate.
  - 2 Fasten the two screws to secure the M.2 backplane cold plate to the processor cold plate.

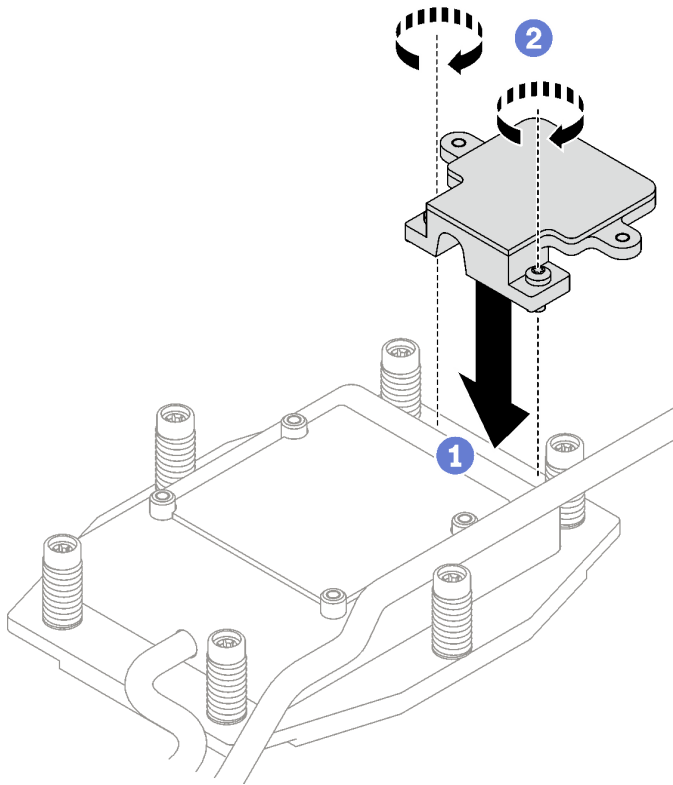


Figure 149. M.2 backplane cold plate installation

- Step 3. Replace the putty pad on the processor (Processor 1) cold plate and the M.2 backplane cold plate with new ones. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

**Attention: Putty pad cannot be reused. Whenever a component is removed, putty pads must be replaced with new ones before reinstalling the component.**

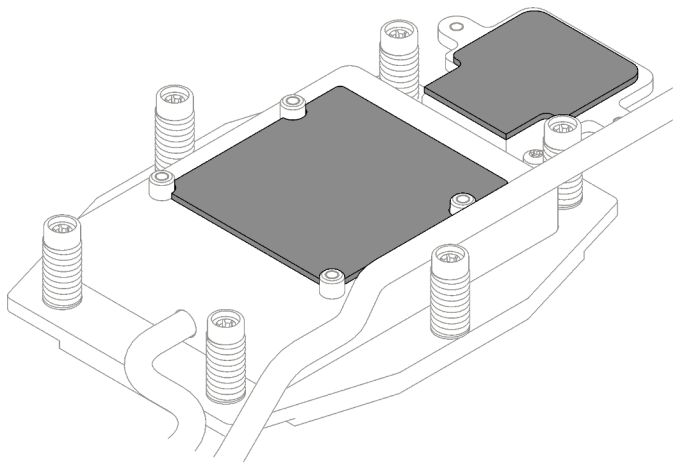


Figure 150. Putty pads on processor cold plate and M.2 cold plate

- Step 4. Install the M.2 backplane assembly.
- 1 Connect the cable to the M.2 backplane assembly.
  - 2 Install the M.2 backplane assembly into the node.

- c. ③ Secure the six screws.

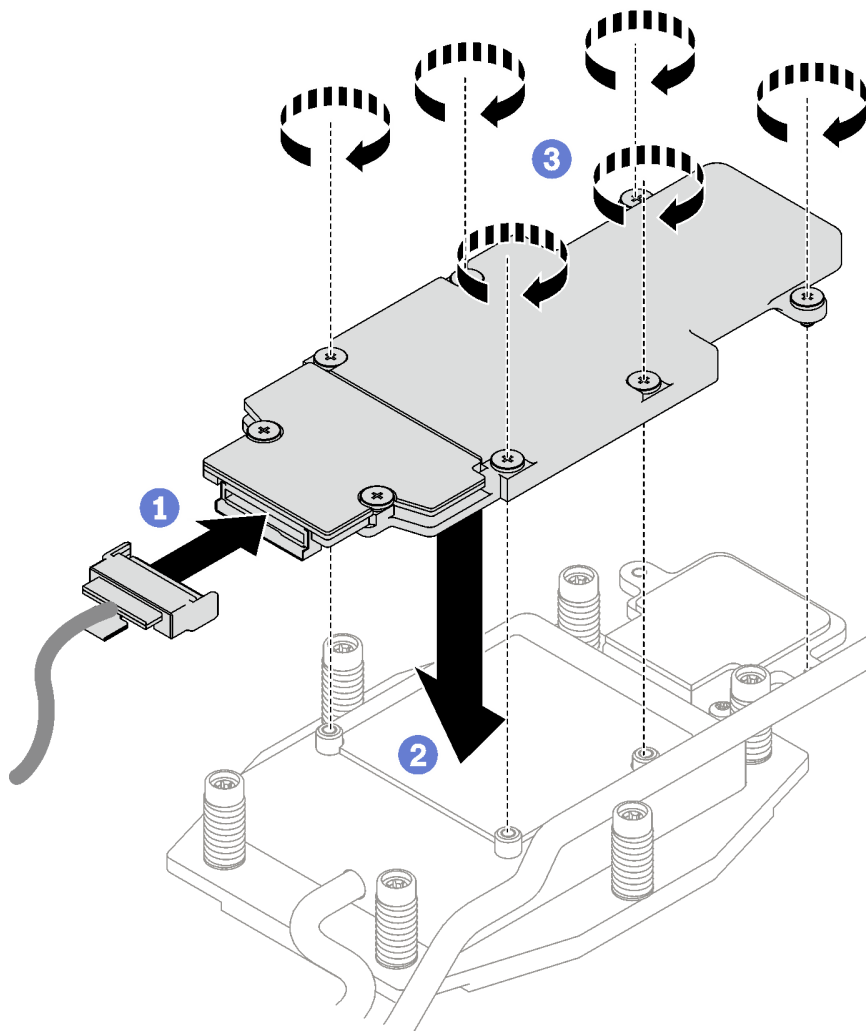


Figure 151. M.2 backplane assembly installation

Step 5. Connect the cable to the system board.

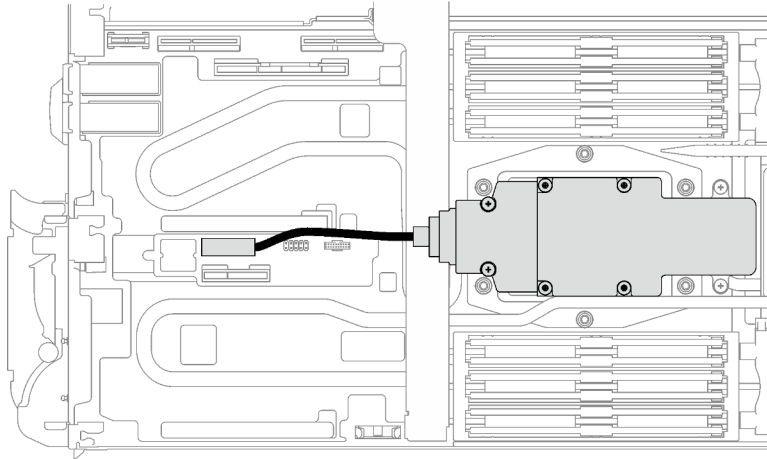


Figure 152. M.2 backplane assembly cable installation

## After you finish

1. Install the cross braces. See [“Install the cross braces” on page 21](#).
2. Install the tray cover. See [“Install the tray cover” on page 18](#).
3. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
4. Connect all required external cables to the solution.

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

5. 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](#)

## Memory module replacement

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

### Remove a memory module

Use this information to remove a memory module.

### About this task

**Important:** When removing/installing the memory module, do not tilt the memory module and keep it at an upright position to prevent damaging the gap pad.

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.



- Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.
- Memory modules are sensitive to static discharge and require special handling. In addition to the standard guidelines for [“Handling static-sensitive devices” on page 6](#):
  - Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
  - Never hold two or more memory modules together so that they touch. Do not stack memory modules directly on top of each other during storage.
  - Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory-module connector housing.
  - Handle memory modules with care: never bend, twist, or drop a memory module.
- Before installing 24 Gb DRAM RDIMMs, make sure to update the UEFI firmware to the latest version first, then remove all existing 16 Gb DRAM RDIMMs.

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

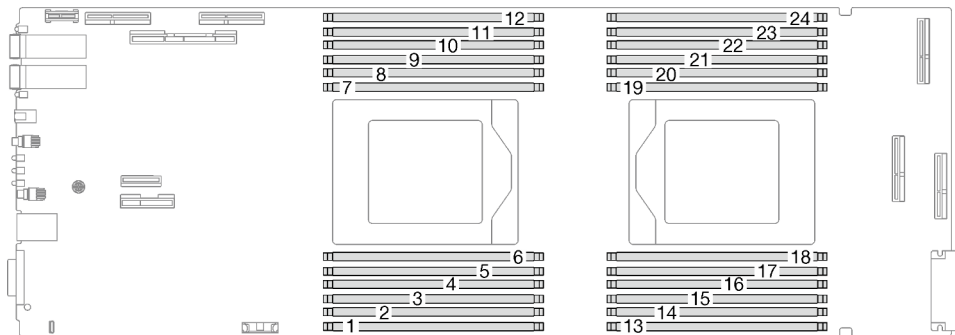


Figure 153. Memory module connector location

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

## Procedure

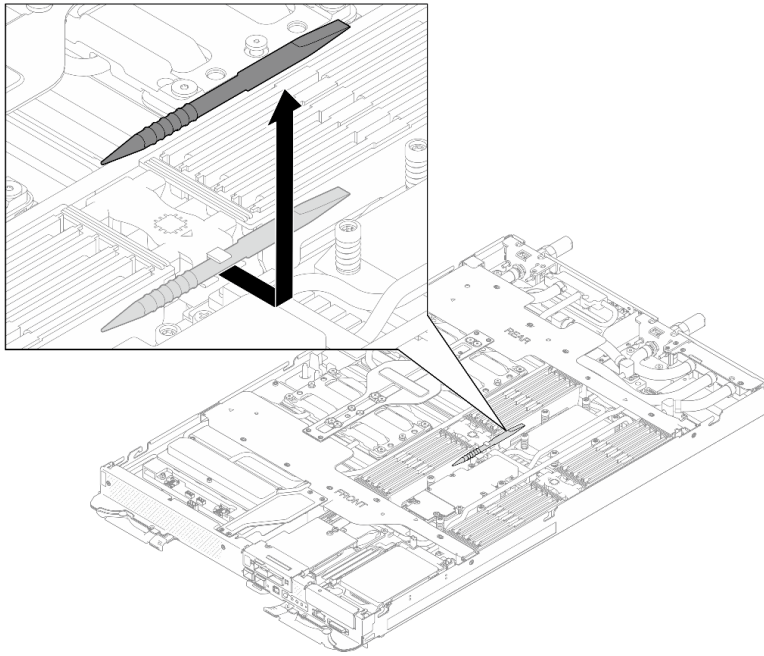
### Notes:

- Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.
- Depending on the model, your solution might look slightly different from the illustration.

Step 1. Make preparations for this task.

- Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- Remove the tray cover. See [“Remove the tray cover” on page 17](#).

Step 2. Remove the memory module tool attached to the DIMM comb.

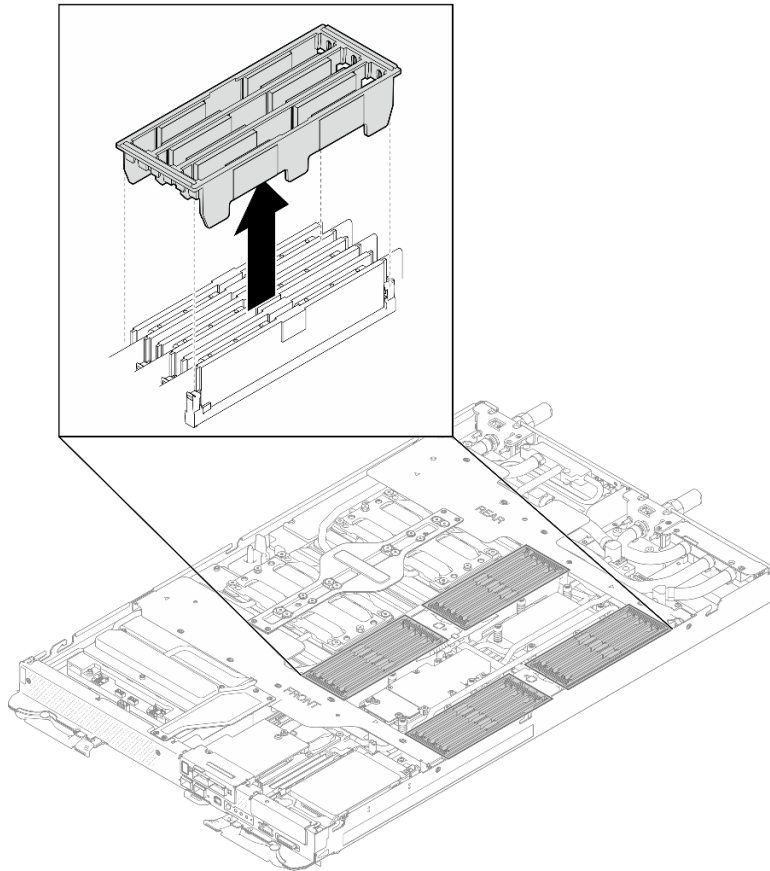


*Figure 154. Memory module tool removal*

**Note:** Memory module tool is recommended due to space limitations caused by location of water loop tubes through the memory section.

Step 3. Remove the DIMM cover.

**Note:** Do not tilt the DIMM cover and keep it at an upright position to prevent damaging the gap pads.



*Figure 155. DIMM cover removal*

- Step 4. Carefully use the memory module tool to press the retaining clips outward on each end of the memory module connector.

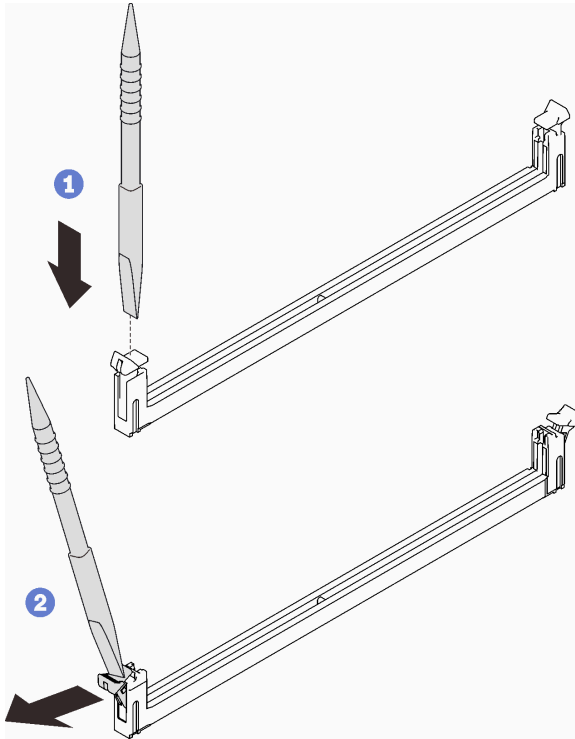


Figure 156. Memory module removal

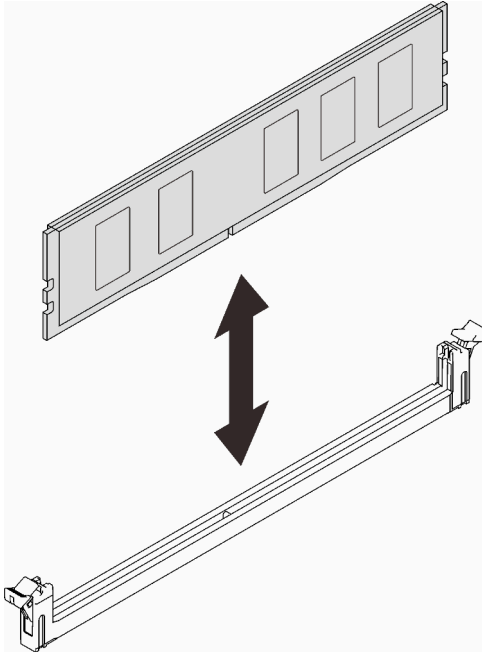
**Attention:**

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

Step 5. Carefully remove the memory module.

**Attention:**

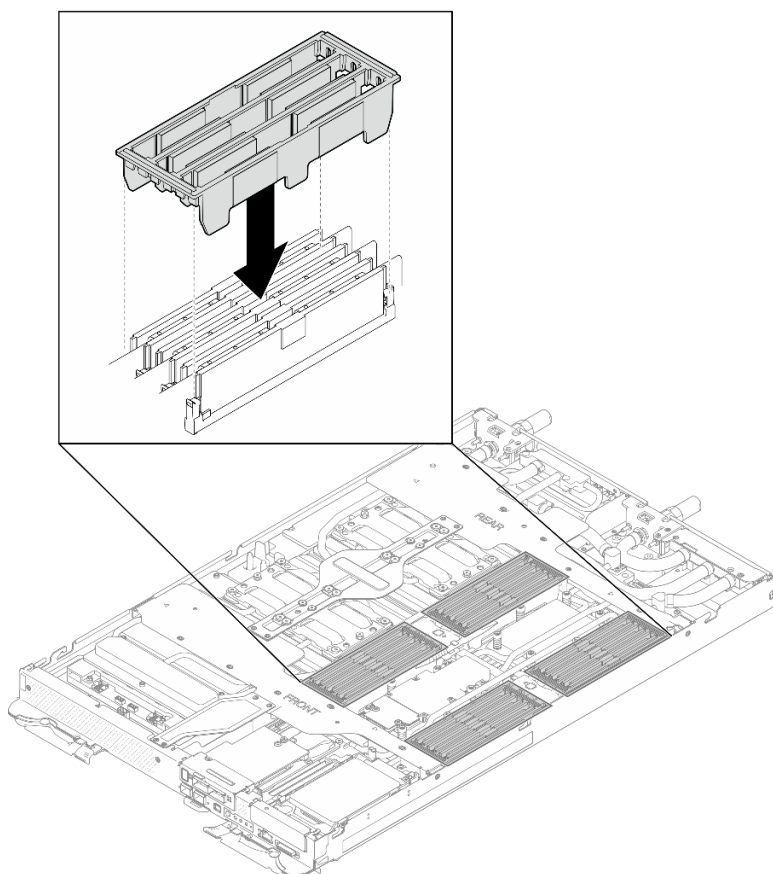
- If processor socket 2 is empty, DIMM fillers should be removed from the DIMM slots surrounding socket 2 (slot 13 to slot 24).
- When removing/installing the memory module, do not tilt the memory module and keep it at an upright position to prevent damaging the gap pad.



*Figure 157. Memory module removal*

Step 6. Install the DIMM cover.

**Note:** Do not tilt the DIMM cover and keep it at an upright position to prevent damaging the gap pads.



*Figure 158. DIMM cover installation*

Step 7. Install the memory module tool to the DIMM comb.

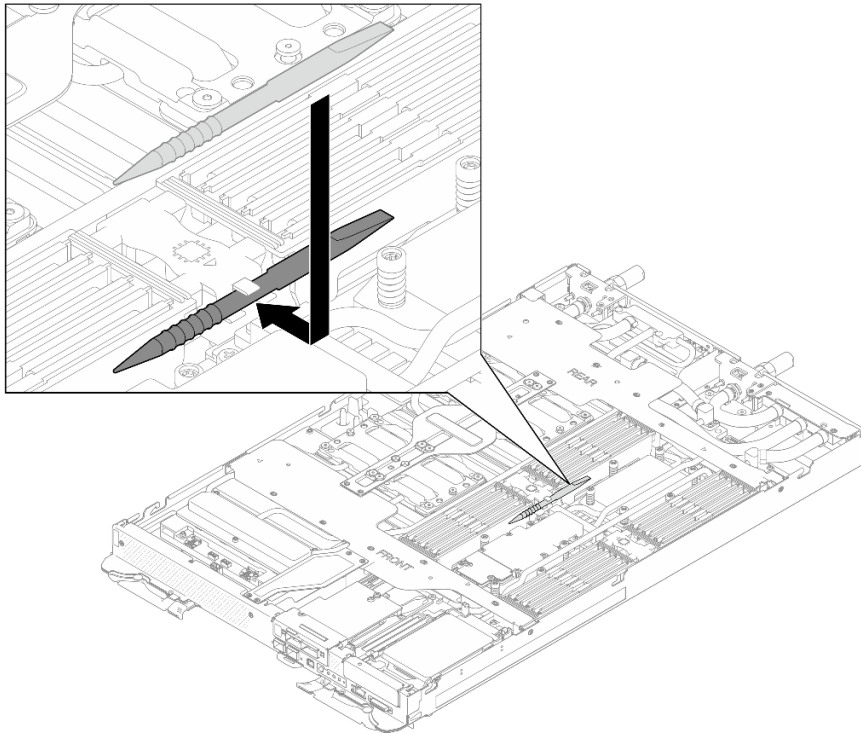


Figure 159. Memory module tool

## 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 memory module

Use this information to install a memory module.

## About this task

See for detailed information about memory configuration and setup.

**Important:** When removing/installing the memory module, do not tilt the memory module and keep it at an upright position to prevent damaging the gap pad.

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.
- Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.
- Memory modules are sensitive to static discharge and require special handling. In addition to the standard guidelines for [“Handling static-sensitive devices” on page 6](#):

- Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
- Never hold two or more memory modules together so that they touch. Do not stack memory modules directly on top of each other during storage.
- Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory-module connector housing.
- Handle memory modules with care: never bend, twist, or drop a memory module.
- Do not use any metal tools (such as jigs or clamps) to handle the memory modules, because the rigid metals may damage the memory modules.
- Do not insert memory modules while holding packages or passive components, which can cause package cracks or detachment of passive components by the high insertion force.
- If processor socket 2 is empty, DIMM fillers should be removed from the DIMM slots surrounding socket 2 (slot 13 to slot 24).
- Before installing 24 Gb DRAM RDIMMs, make sure to update the UEFI firmware to the latest version first, then remove all existing 16 Gb DRAM RDIMMs.

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

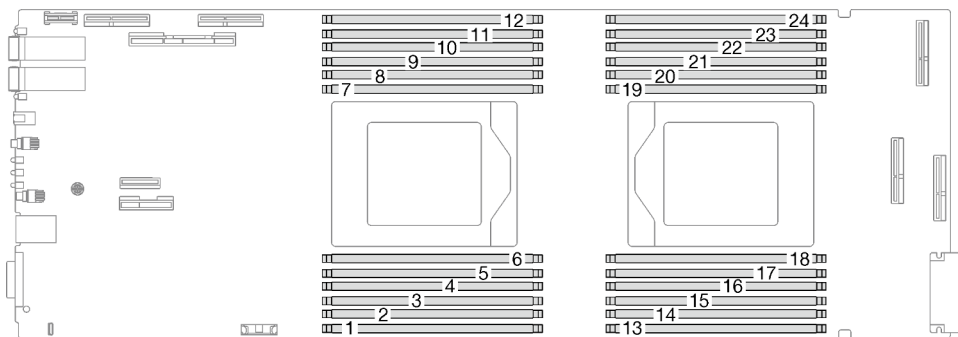


Figure 160. Memory module connector location

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

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

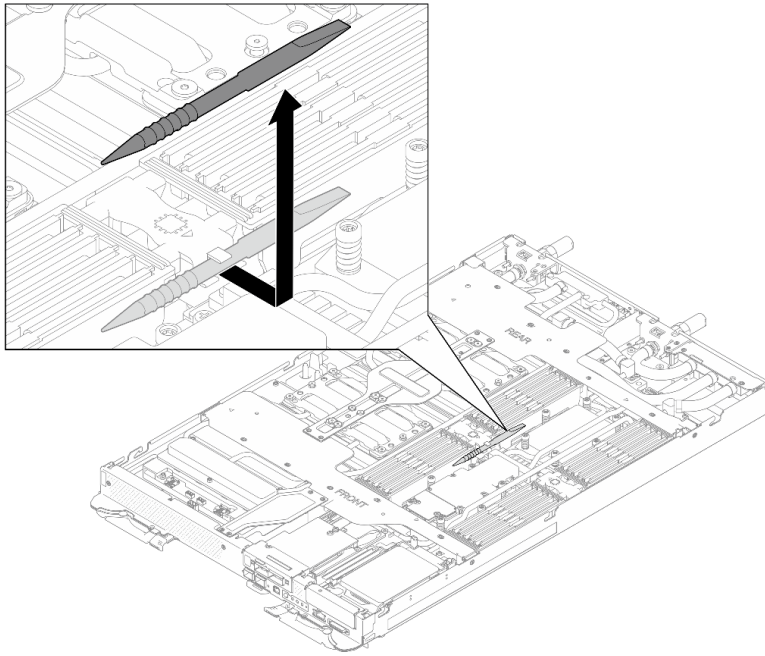
## Procedure

### Notes:

- Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.
- Depending on the model, your solution might look slightly different from the illustration.

Step 1. Remove the memory module tool attached to the DIMM comb.



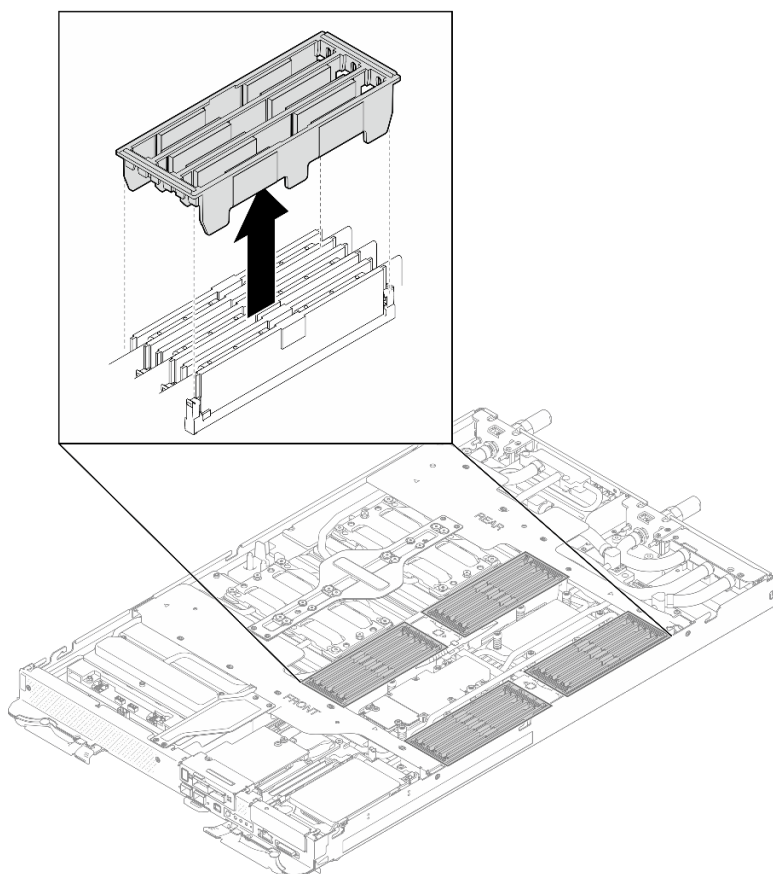


*Figure 161. Memory module tool removal*

**Note:** Memory module tool is recommended due to space limitations caused by location of water loop tubes through the memory section.

Step 2. Remove the DIMM cover.

**Note:** Do not tilt the DIMM cover and keep it at an upright position to prevent damaging the gap pads.



*Figure 162. DIMM cover removal*

- Step 3. Carefully use the memory module tool to press the retaining clips outward on each end of the memory module connector.

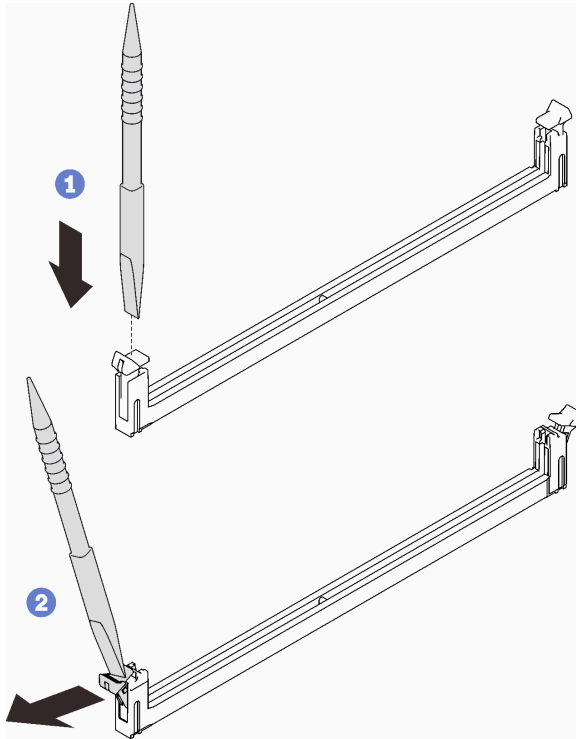


Figure 163. Pressing retaining clips on memory module connector

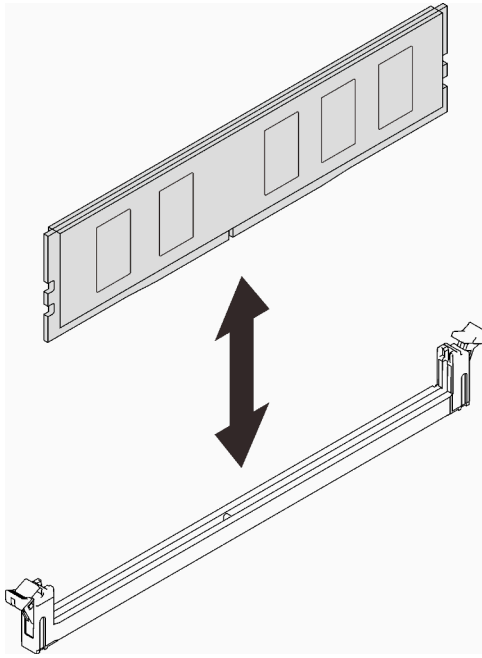
**Attention:**

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

- Step 4. Touch the static-protective package that contains the memory module to any unpainted metal surface on the outside of the node; then, remove the memory module from the package.
- Step 5. Align the memory module with the slot, and gently place the memory module on the slot with both hands.
- Step 6. Firmly press both ends of the memory module straight down into the slot until the retaining clips snap into the locked position.

**Attention:**

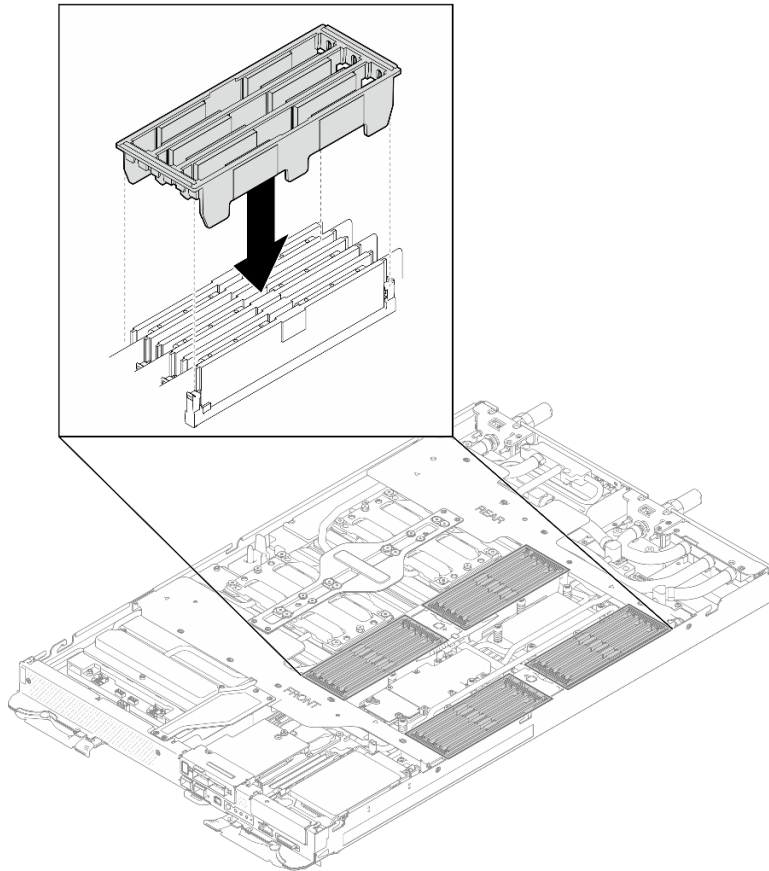
- If processor socket 2 is empty, DIMM fillers should be removed from the DIMM slots surrounding socket 2 (slot 13 to slot 24).
- When removing/installing the memory module, do not tilt the memory module and keep it at an upright position to prevent damaging the gap pad.
- If there is a gap between the memory module and the retaining clips, the memory module has not been correctly inserted; open the retaining clips, remove the memory module, and then reinsert it.



*Figure 164. Memory module installation*

Step 7. Install the DIMM cover.

**Note:** Do not tilt the DIMM cover and keep it at an upright position to prevent damaging the gap pads.



*Figure 165. DIMM cover installation*

Step 8. Install the memory module tool to the DIMM comb.

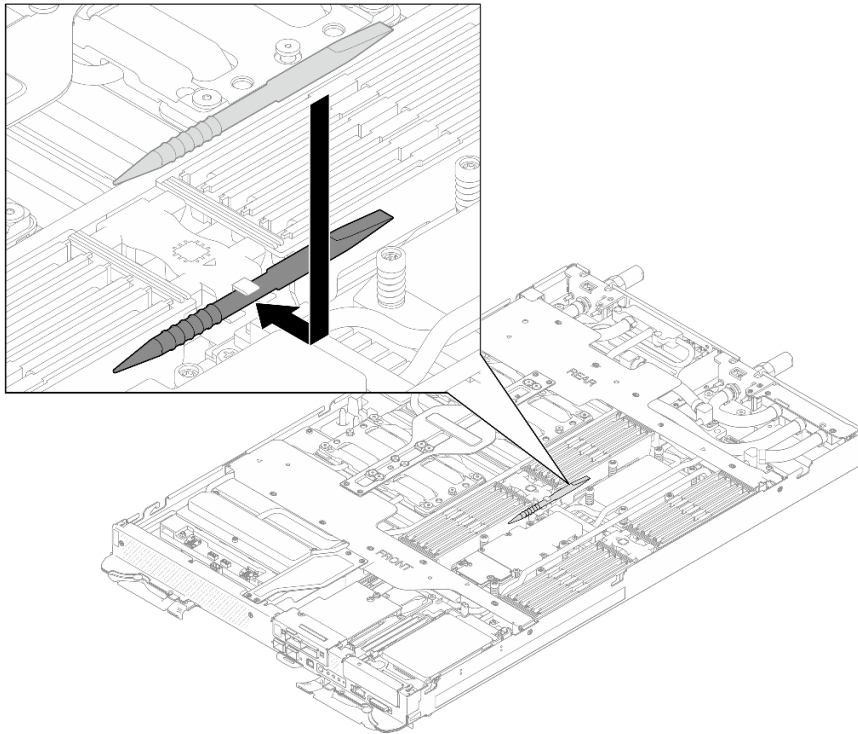


Figure 166. Memory module tool

### After you finish

1. Install the tray cover. See [“Install the tray cover” on page 18](#).
2. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
3. Connect all required external cables to the solution.

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

4. 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](#)

## OSFP module and network board replacement (trained technician only)

Use the following procedures to remove and install the OSFP module and network board.

If replacing only the network board, refer to [“Network board \(trained technician only\)” on page 340](#).

### Remove the OSFP module and network board (trained technician only)

Use this information to remove the OSFP module and network board.

**Attention:** If replacing only the network board, refer to [“Network board \(trained technician only\)” on page 340](#).

### About this task

## Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)
- SD665-N V3 OSFP Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screw and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.  
Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type/Usage	Screwdriver Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Releasing OSFP module from conduction plate	Flat head screwdriver
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

## Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

## Remove the OSFP module

### Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- c. Remove the cross braces. See [“Remove the cross braces” on page 19](#).
- d. Remove the bus bar. See [“Remove the bus bar” on page 266](#).

- e. Remove the M.2 backplane assembly. See [“Remove the M.2 backplane assembly” on page 113.](#)

Step 2. Disconnect the drive cage cable.

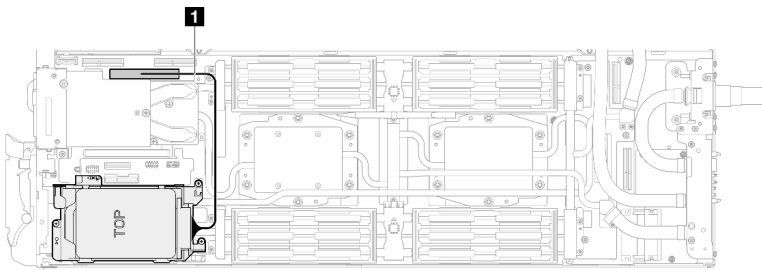


Figure 167. Disconnecting drive cable

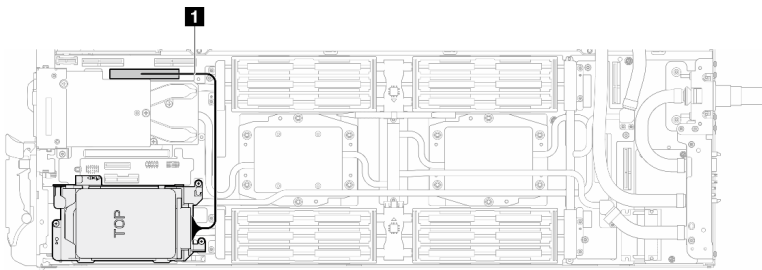


Figure 168. Disconnecting 7mm drive cable

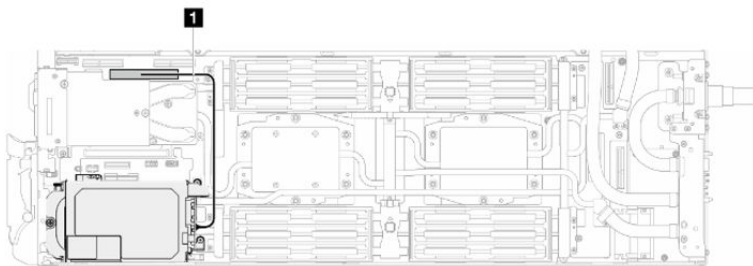


Figure 169. Disconnecting E3.S drive cable

Step 3. Disconnect MCIO cables from carrier board.

**One-processor configuration: disconnect all MCIO cables from the carrier board**



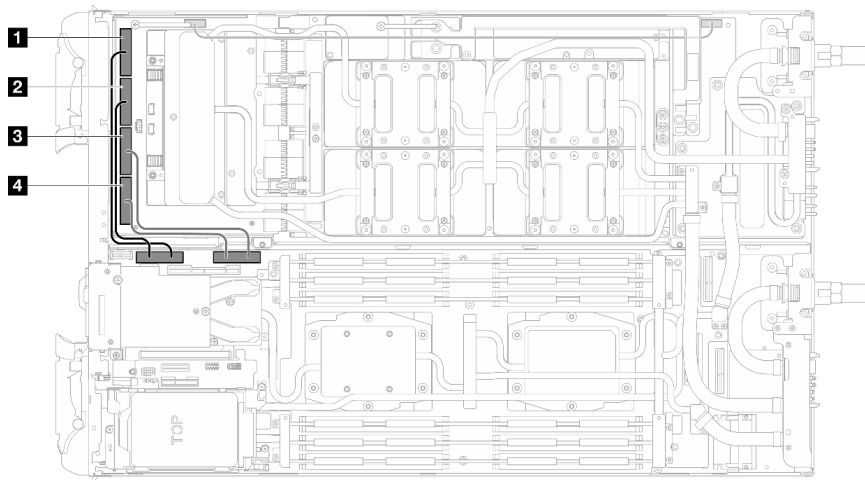


Figure 170. One-processor configuration—Disconnecting all MCIO cables

Cable index	From (carrier board in GPU node)	To (system board in compute node)
<b>1</b>	MCIO 1 cable	PCIe 4
<b>2</b>	MCIO 2 cable	
<b>3</b>	MCIO 3 cable	PCIe 3
<b>4</b>	MCIO 4 cable	

**Two-processors configuration: disconnect MCIO 2, MCIO 3, and MCIO 4 cables from the carrier board**

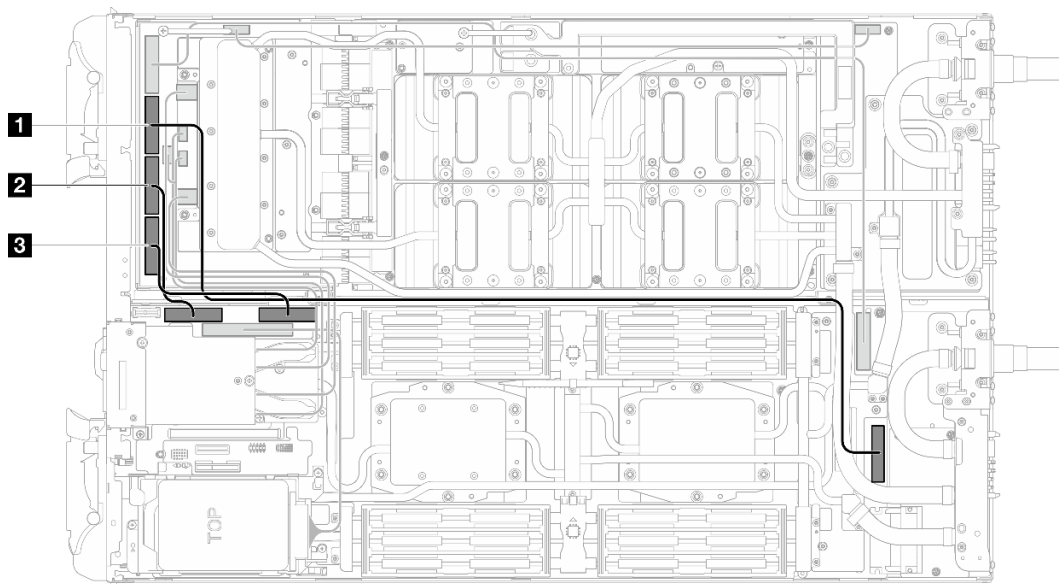


Figure 171. Two-processors configuration—Disconnecting MCIO 2, MCIO 3, and MCIO 4 cables

Cable index	From (carrier board in GPU node)	To (system board in compute node)
<b>1</b>	MCIO 2 cable	PCIe 5
<b>2</b>	MCIO 3 cable	PCIe 4
<b>3</b>	MCIO 4 cable	PCIe 3

Step 4. Disconnect the OSFP module cables from the network board on the GPU node.

**CAUTION:**

- Hold the cable connector at 45 degree angle when inserting it into the port.
- Have extremely precaution when reseating the connectors that have a 45 degree label on them as they are fragile and will get damage if not installed in the correct 45 degree angle.

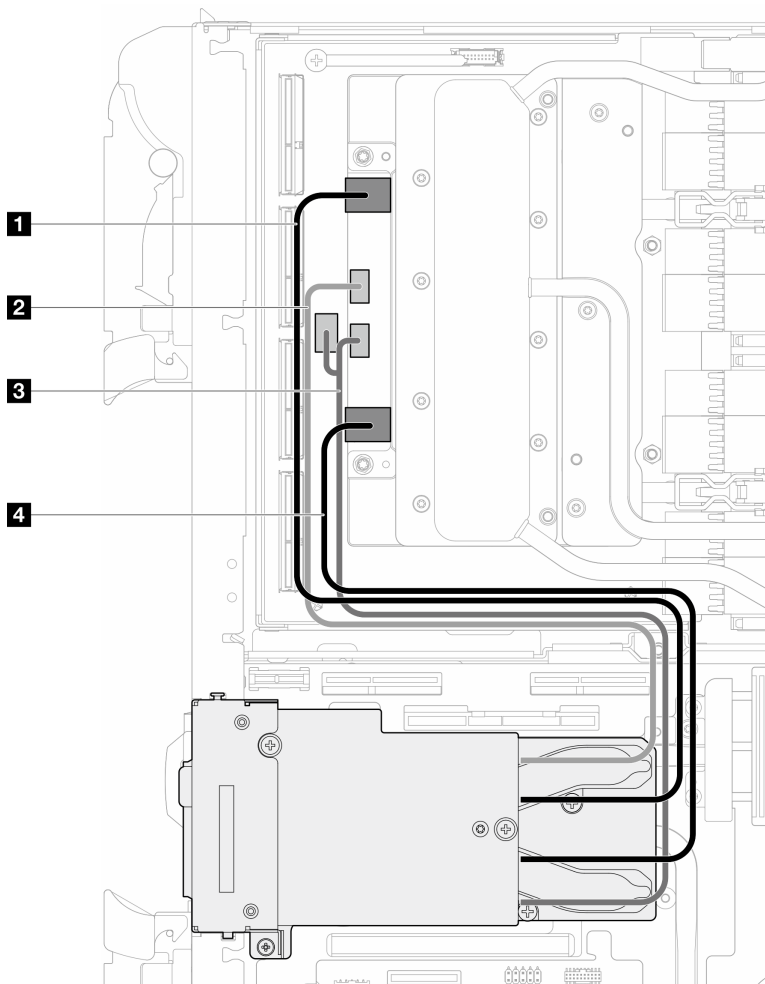


Figure 172. Disconnecting OSFP module cables from the network board

Cable	From OSFP module connectors	To Network board connectors
<b>1</b> Network cable (long)	Network connector (near GPU node)	Port 0
<b>2</b> Power cable	Power connector P1	OOB port 0
<b>3</b> Power cable	Power connector P2	OOB port 1 (on network board) and power connector (on carrier board)
<b>4</b> Network cable (short)	Network connector (near Compute node)	Port 1

Step 5. Remove the three screws from the OSFP module.

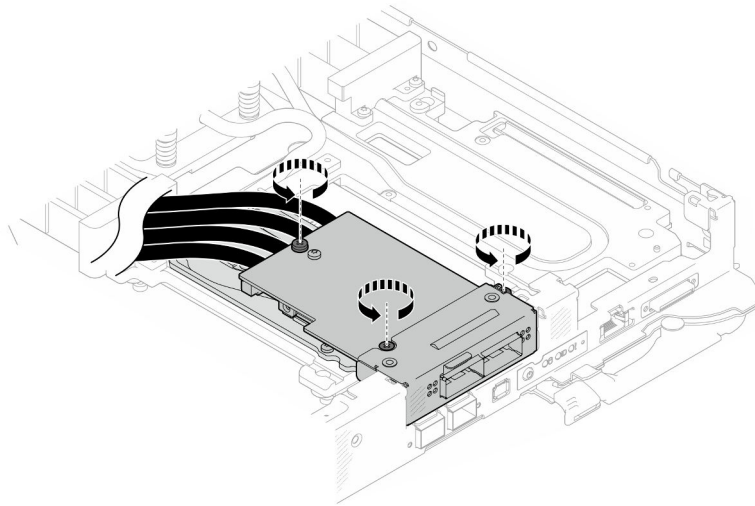


Figure 173. Removing the OSFP module

Step 6. Remove the OSFP module.

- a. **1** Insert a flat head screwdriver into the gap between the OSFP module and the OSFP module conduction plate; then, rotate the flat head screwdriver to release the OSFP module from the conduction plate.
- b. **2** Carefully hold the OSFP module by its edges and keep the OSFP module at an angle. Then, remove it from the compute node.

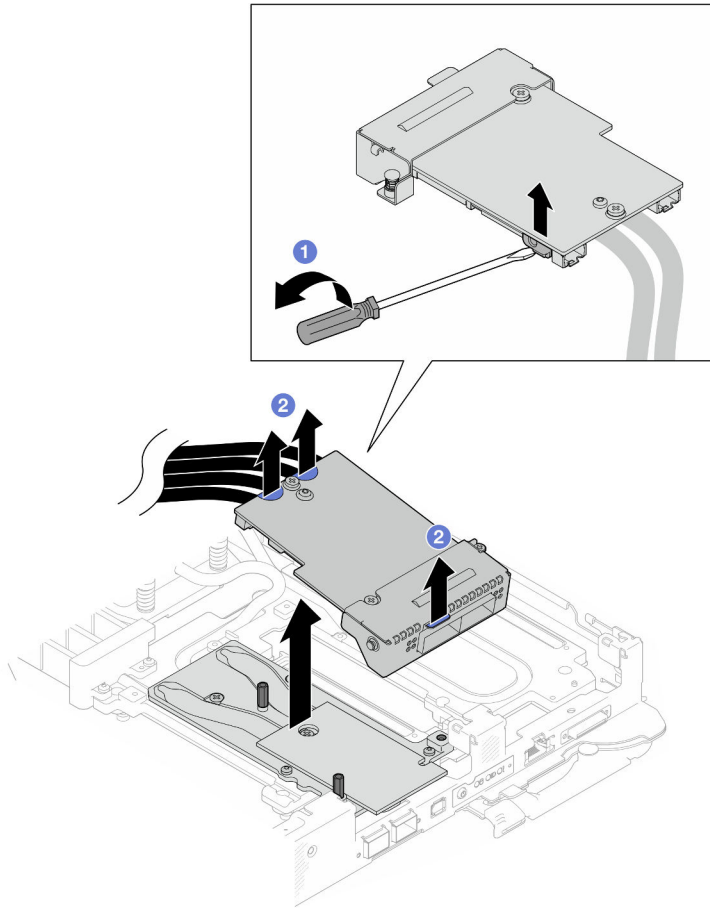


Figure 174. Removing the OSFP module

Step 7. Disconnect the power cables from the OSFP module.

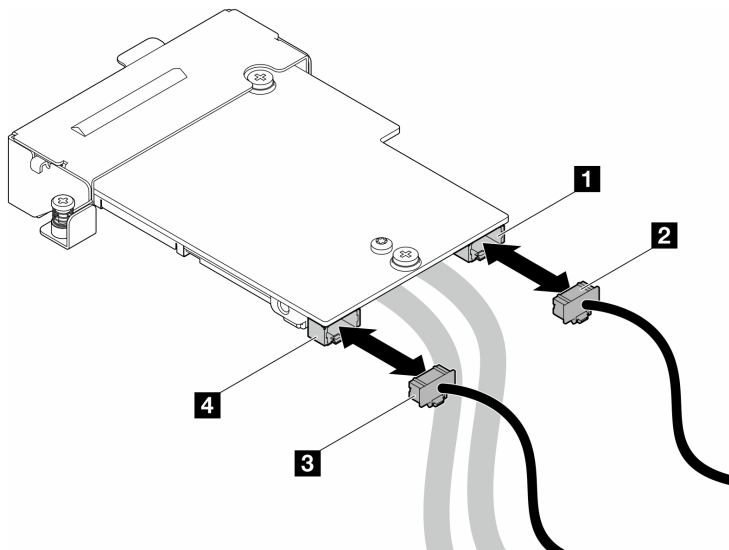


Figure 175. OSFP module power cables removal

## Remove the network board

Step 1. Remove the carrier board power cable from the GPU node.

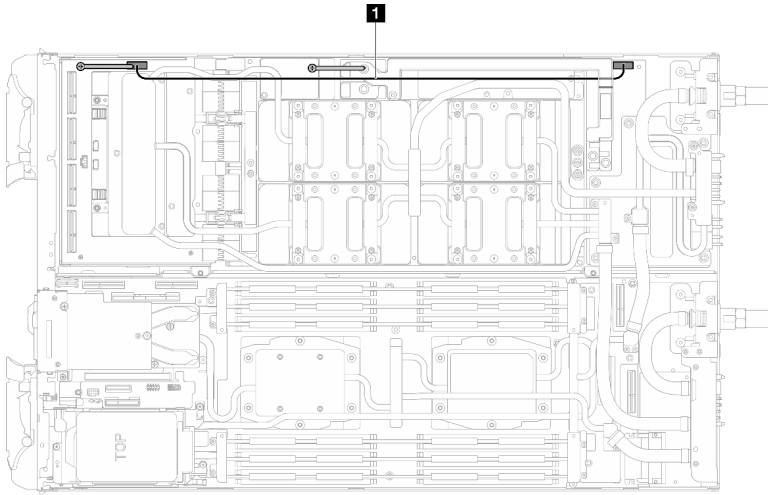


Figure 176. Carrier board power cable removal

Cable	From (carrier board)	To (GPU node power distribution board)
1 Carrier board power cable	Power and side band connector	Power connector

Step 2. Remove cable tie from the GPU board.

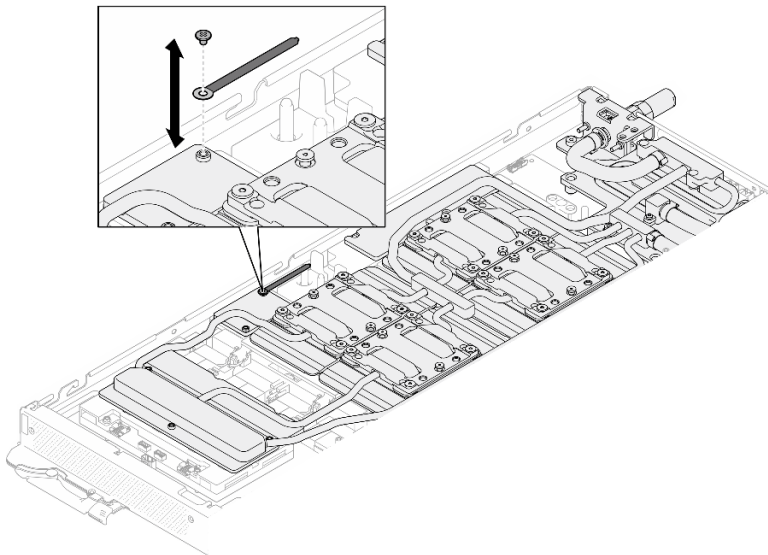


Figure 177. Cable tie removal

Step 3. Remove the Hex screw (x1) and the PH1 screws (x3) from the water loop with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

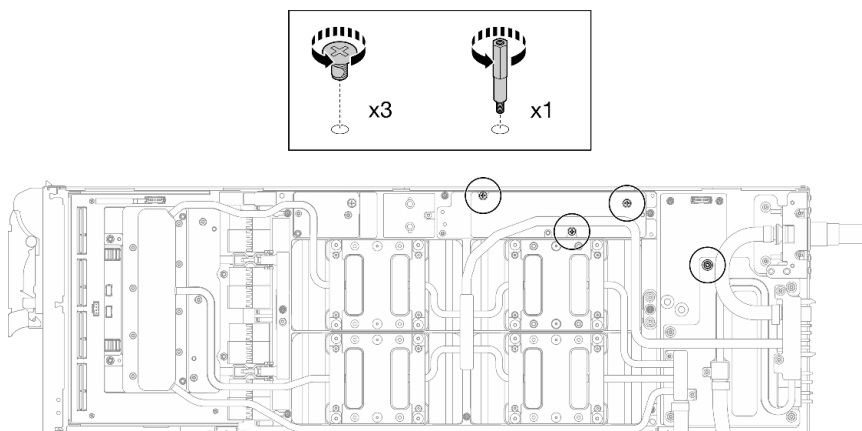


Figure 178. Water loop Hex and PH1 screws removal (GPU node)

- Step 4. Remove water loop screws and quick connect screws (x13 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

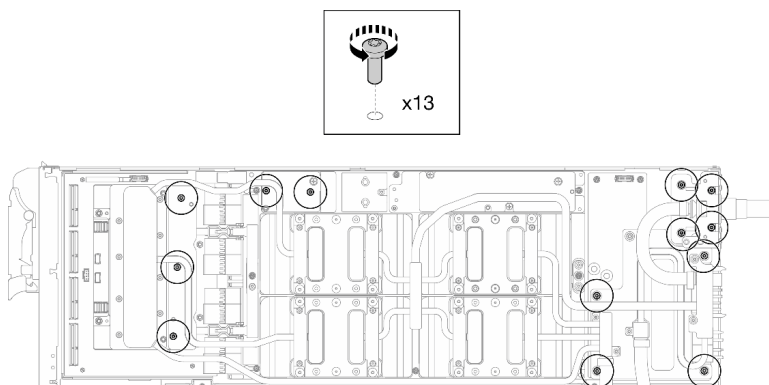


Figure 179. Water loop Torx T10 screws removal (GPU node)

- Step 5. Remove the quick connect screws (x4 Torx T10) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

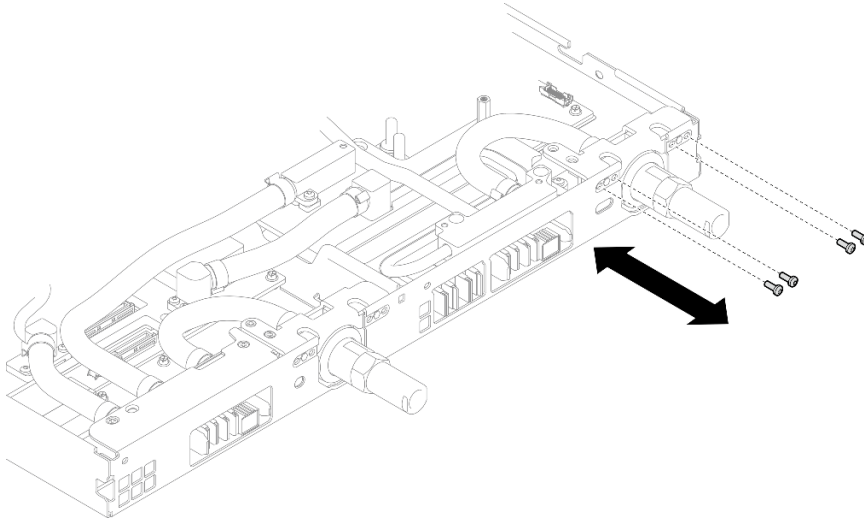


Figure 180. Quick connect screw removal (GPU node)

- Step 6. Follow the screw removal sequence specified on the network board label, and remove network cold plate screws (x8 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

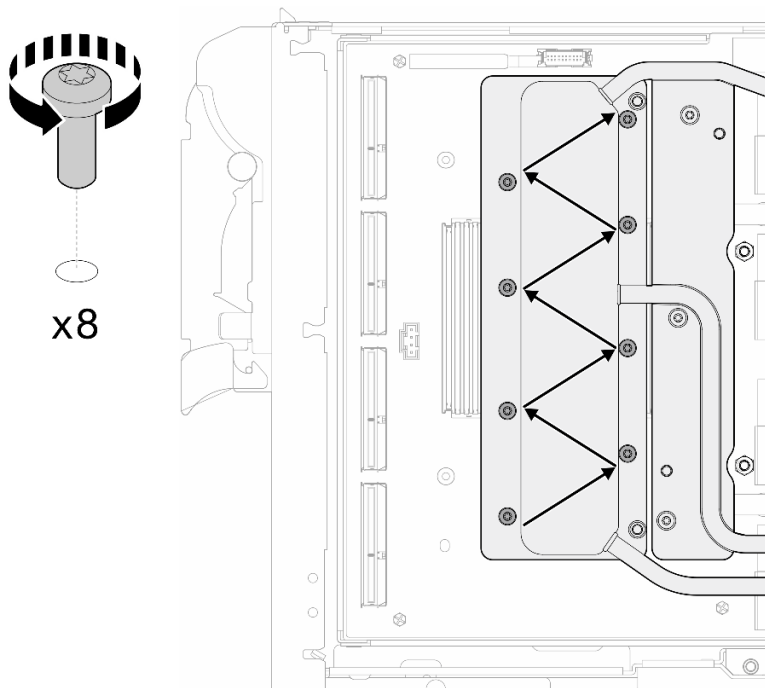


Figure 181. Network card screw removal

- Step 7. Loosen GPU cold plate screws (x16 Torx T10 screws) in the diagonal pattern with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/loosened is 3.5 +/- 0.5 lb-in (0.4 +/- 0.06 N-m).

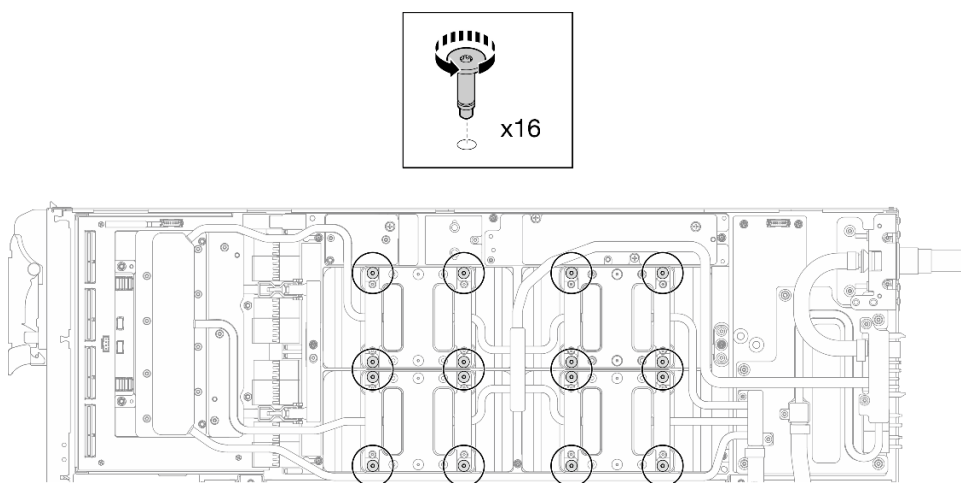


Figure 182. Loosening GPU cold plate screw

Step 8. Release the front and rear MISC conduction plates of the water loop from the GPU board.

- a. ❶ Insert a flat head screwdriver into the gaps between the MISC conduction plates (front and rear) and the GPU board. Then, slightly rotate the flat head screwdriver.

**Note:** Locations of the gaps for inserting flat head screwdriver is shown in the illustration below.

- b. ❷ The front and rear MISC conduction plates release from the GPU board slightly.

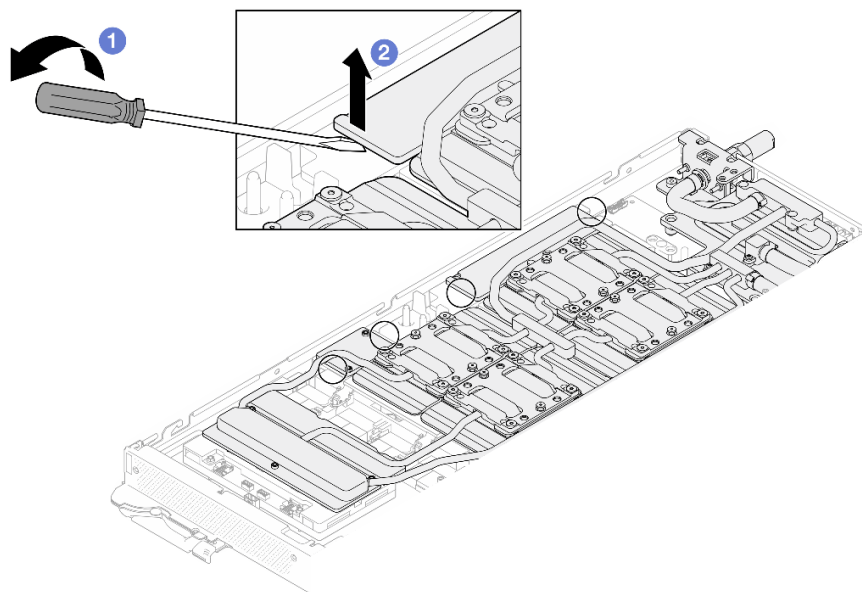


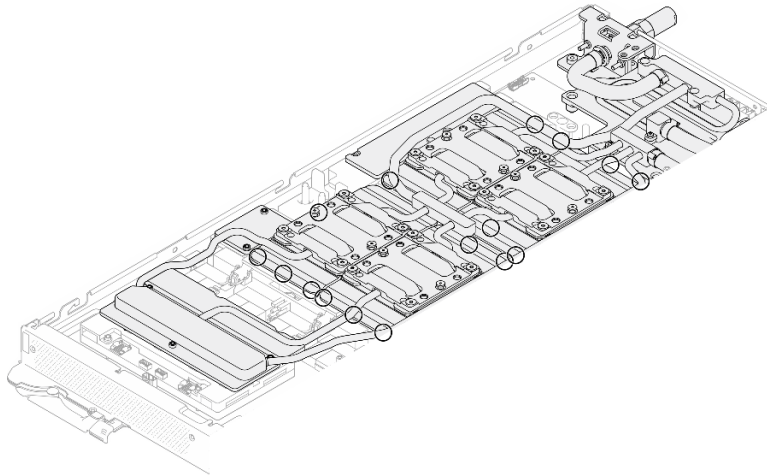
Figure 183. Releasing the front and rear MISC conduction plates release from the GPU board

Step 9. Release the GPU cold plates from the GPUs.

- a. There are notches on the sides of the GPU cold plates for inserting a flat head screwdriver. The locations of the notches are shown in the illustration below.

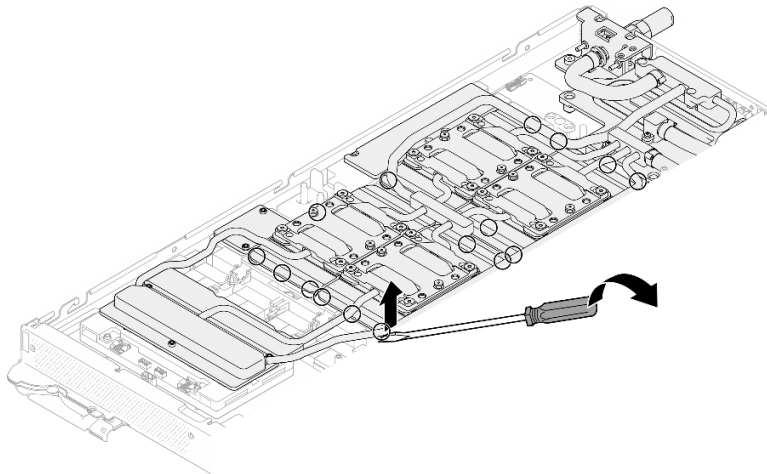


**Attention:** Inserting the flat head screwdriver **ONLY** to the notches circled in the illustration below. Otherwise, the screwdriver may damage the GPUs.



*Figure 184. Notches for releasing GPU cold plates*

- b. Insert a flat screwdriver into all the notches shown in the illustration; then, slightly rotate the screwdriver to release the GPU cold plates from the GPUs.



*Figure 185. Releasing the GPU cold plate from the GPU*

Step 10. Gently put the water loop carrier down onto the water loop and ensure it is seated firmly on the water loop.

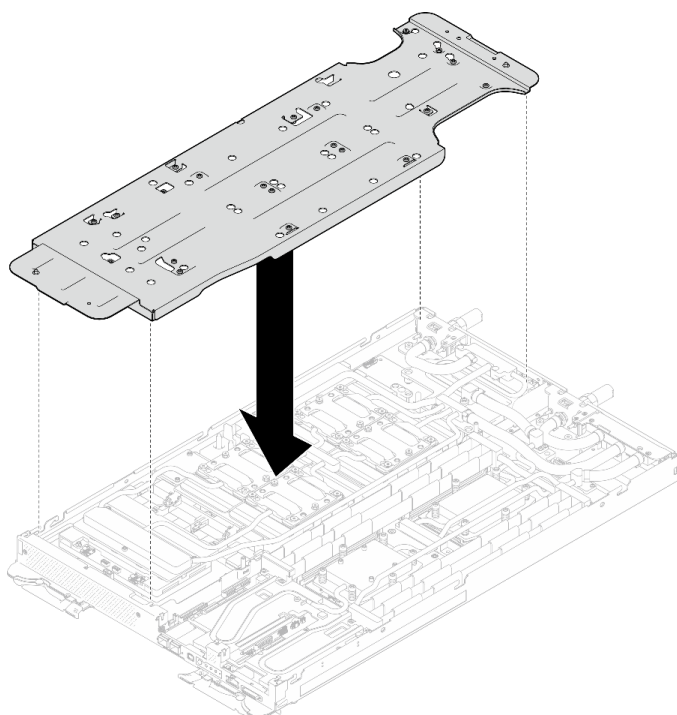


Figure 186. Water loop carrier installation (GPU node)

Step 11. Tighten water loop carrier screws (x20 Phillips #2 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

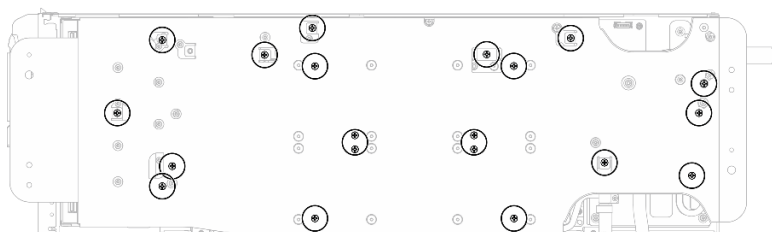
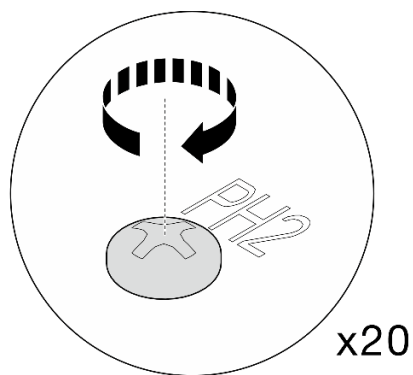


Figure 187. Water loop screw and quick connect screw removal (GPU node)

Step 12. Carefully rotate the GPU node side water loop so that it is sitting on top of the Compute node side water loop.

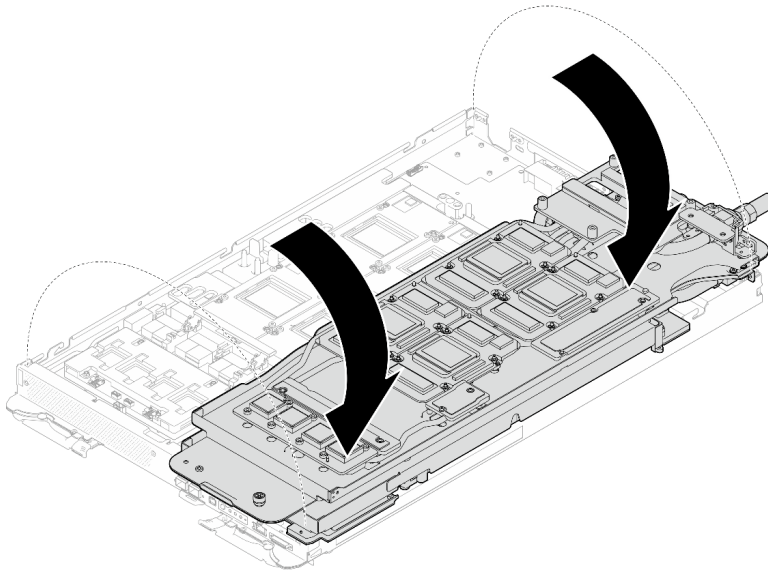


Figure 188. Folding the GPU node side water loop onto the Compute node side water loop

Step 13. **Immediately** clean the PCM off all the GPUs with alcohol cleaning pads. **Gently** clean the PCM to avoid GPU damages.

**Attention:**

- It is recommended to clean the PCM while it is in liquid state.
- The electrical components around the die on the GPUs are extremely delicate. When removing the PCM and cleaning the GPU die, avoid touching the electrical components to prevent damages.

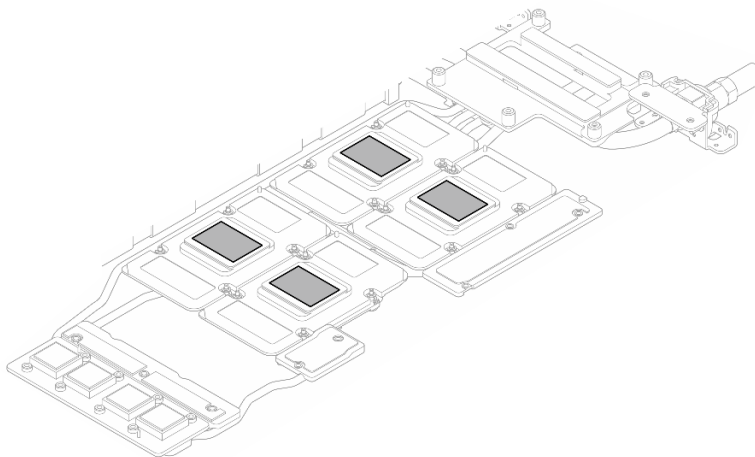


Figure 189. Cleaning PCM off from all GPUs

Step 14. With alcohol cleaning pads, wipe off any remaining putty pad and PCMs from the water loop and components in the GPU node.

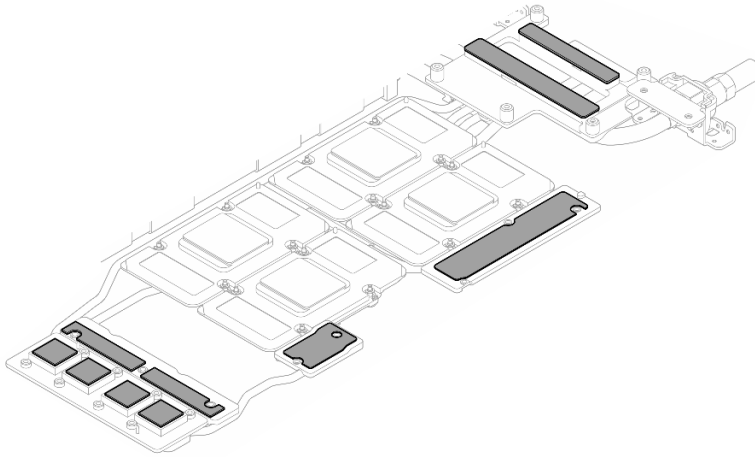


Figure 190. Cleaning putty pads from water loop

Step 15. Follow the sequence shown in the illustration below to remove the network board screws (x4 Torx T15 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 0.9 newton-meters, 7.96 inch-pounds.

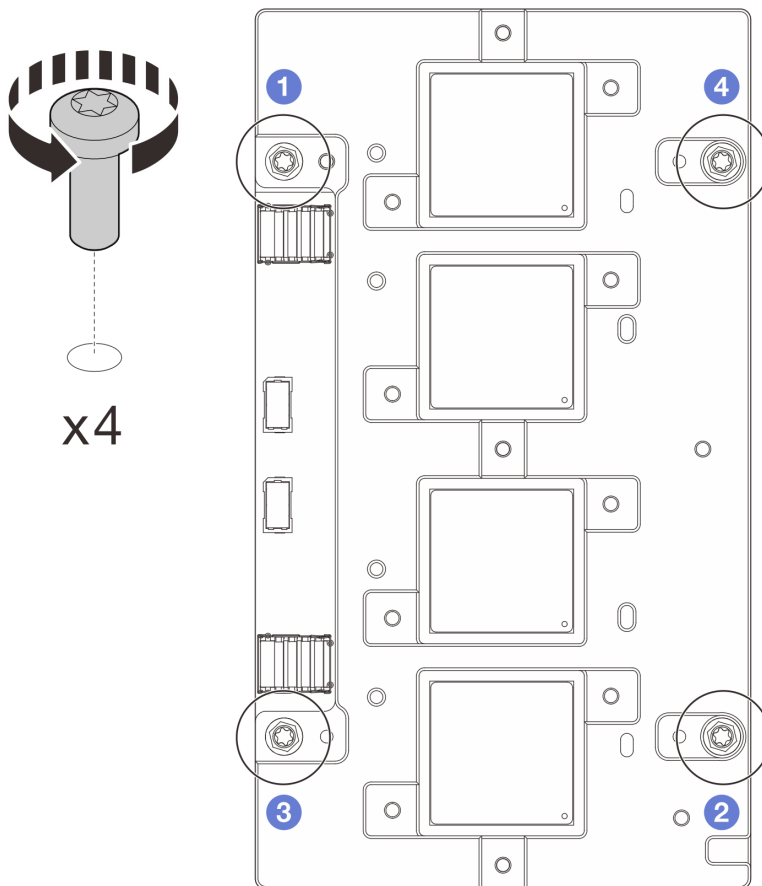


Figure 191. Network board screws removal

Step 16. Remove the network board from the GPU node.

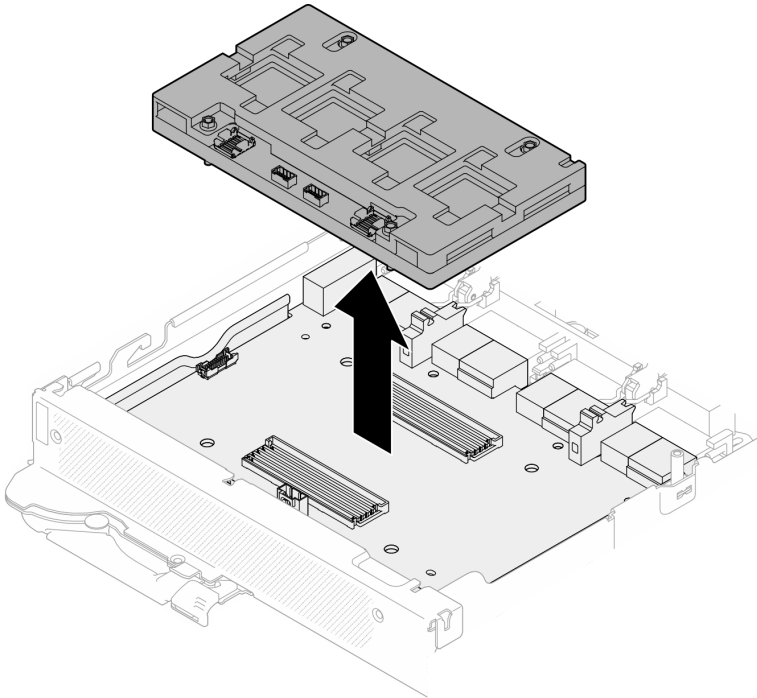


Figure 192. Removing the network board

## 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](#)

[Watch the procedure on YouTube](#)

## Install the OSFP module and the network board (trained technician only)

Use this information to install the OSFP module and network board.

**Attention:** If replacing only the network board, refer to [“Network board \(trained technician only\)” on page 340](#).

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)
- SD665-N V3 OSFP Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screw and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.  
Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type/Usage	Screwdriver Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Releasing OSFP module from conduction plate	Flat head screwdriver
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.

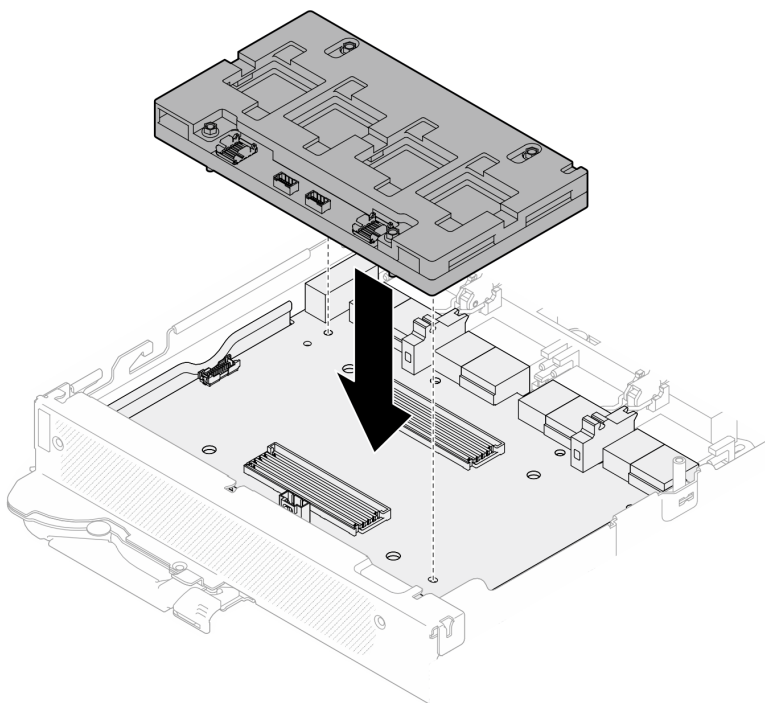
**Firmware and driver download:** You might need to update the firmware or driver after replacing a component.

- Go to <https://datacentersupport.lenovo.com/products/servers/thinksystem/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

### Install the network board

#### Procedure

Step 1. Align the network board to the guide holes on the carrier board; then, place the network board onto the carrier board.



*Figure 193. Installing the network board*

- Step 2. Follow the sequence shown in the illustration below to fasten the network board screws (x4 Torx T15 screws) to the carrier board.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 0.9 newton-meters, 7.96 inch-pounds.

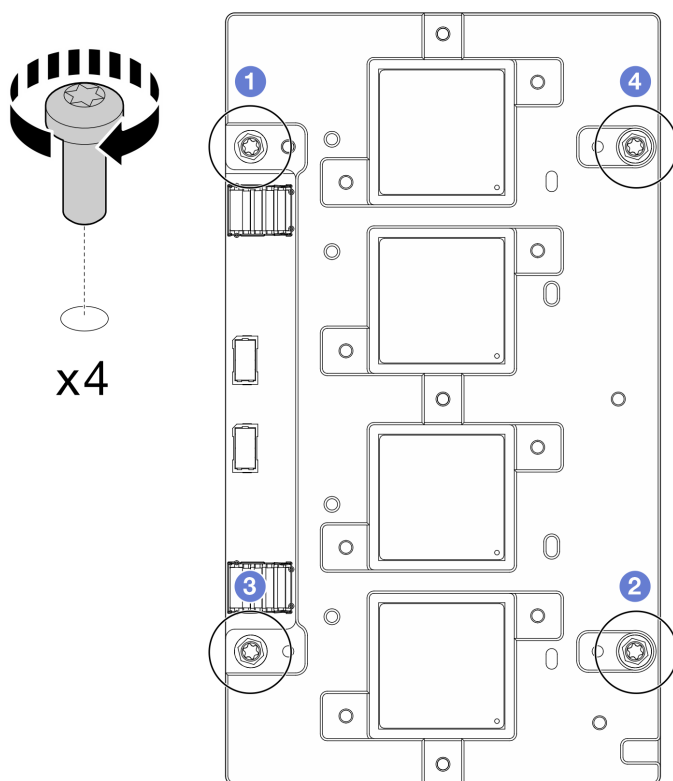


Figure 194. Network board screws installation

**GPU node** water loop gap pad/putty pad replacement. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 3. Replace the Phase Change Material (PCM) and putty pads on the GPU node water loop with new ones.

- a. ① Install the PCM jig on the GPU cold plate.
- b. ② Attach the PCM to the square opening of the jig.
- c. Repeat to replace the PCM of all four GPU cold plates.

**Attention:**

- PCM cannot be reused. PCM must be replaced with new ones every time the water loop is removed.
- After PCM is replaced, there is an expected short duration of throttling before the GPU returns to normal operation. This is due to the PCM requiring a break-in period after being replaced.
- After replacing the GPU PCM and putty pads, servicers must perform the H100/H200 GPU PCM TIM melting procedure to monitor the GPU until the PCM Thermal Interface Material (TIM) has melted.
  - When performing the melting H100/H200 GPU PCM TIM procedures, the minimum water temperature is 35°C (95°F). Do not operate the melting process with water temperature lower than 35°C (95°F).
  - See [PCM TIM Melt Procedure for Neptune Water Cooled Servers with Nvidia H100 H200 GPUs](#) (trained technicians only).



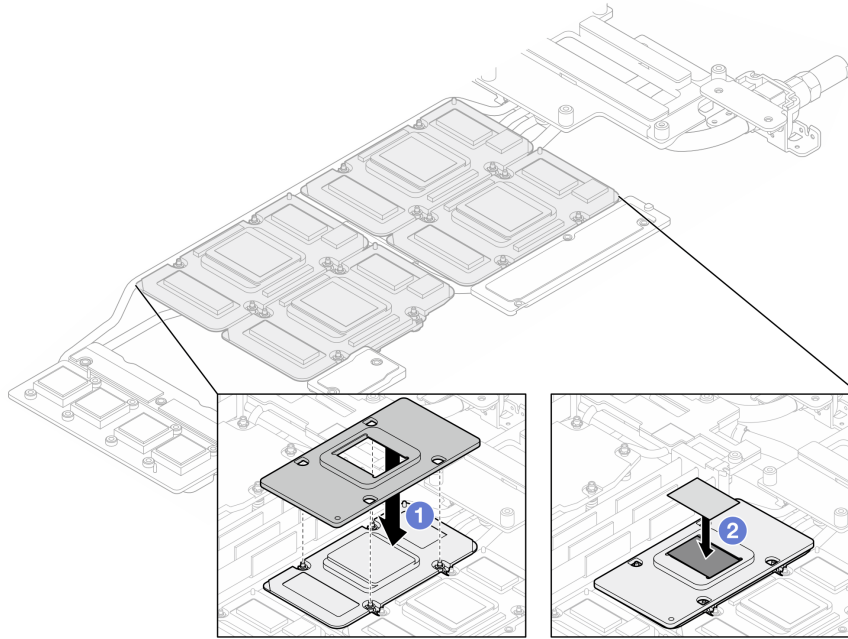


Figure 195. Water loop GPU cold plate PCM replacement (GPU node)

- d. Replace the putty pads on the GPU node water loop.

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

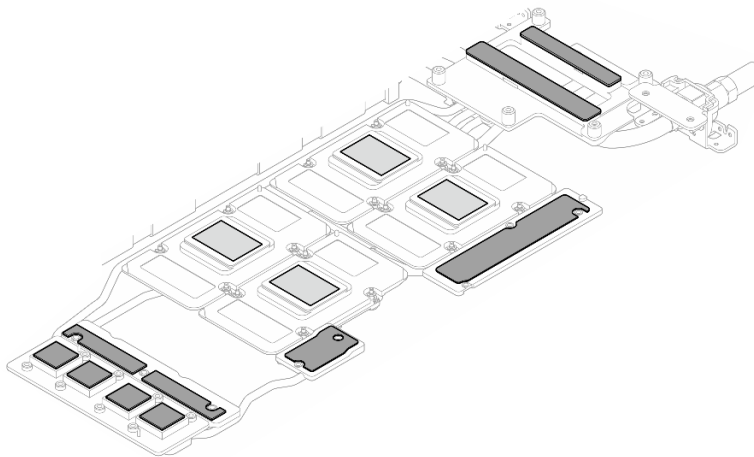


Figure 196. Water loop putty pads replacement (GPU node)

- e. Replace the putty pads (x5) on the GPU. Make sure to align the putty pads to the GPU VR (1) and the markings on GPU. Repeat to replace all putty pads on the four GPUs.

**1** GPU VR (Cover the GPU VR with putty pad)

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

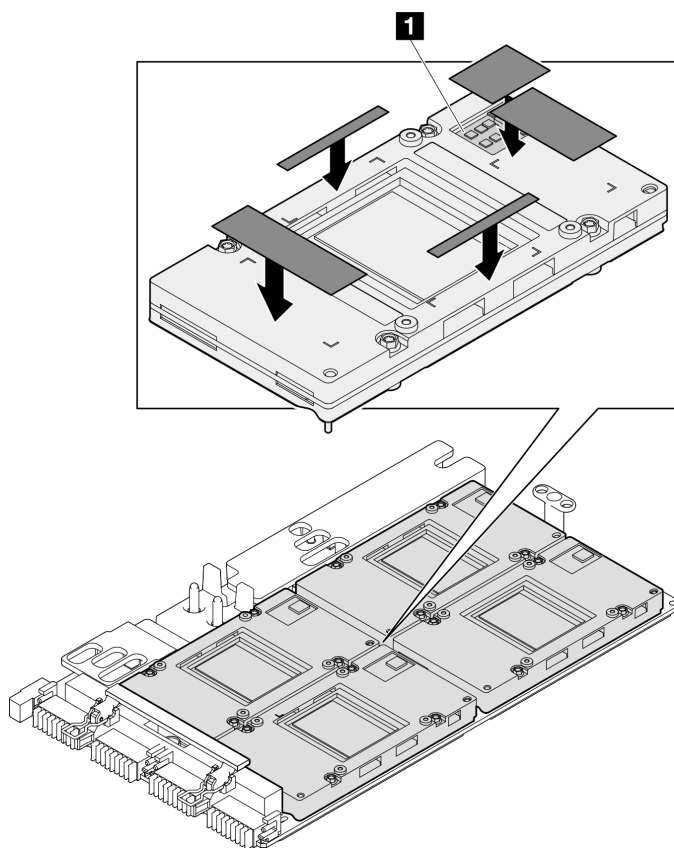


Figure 197. GPU putty pads replacement

Step 4. Unfold the water loop and place it onto the GPU node.

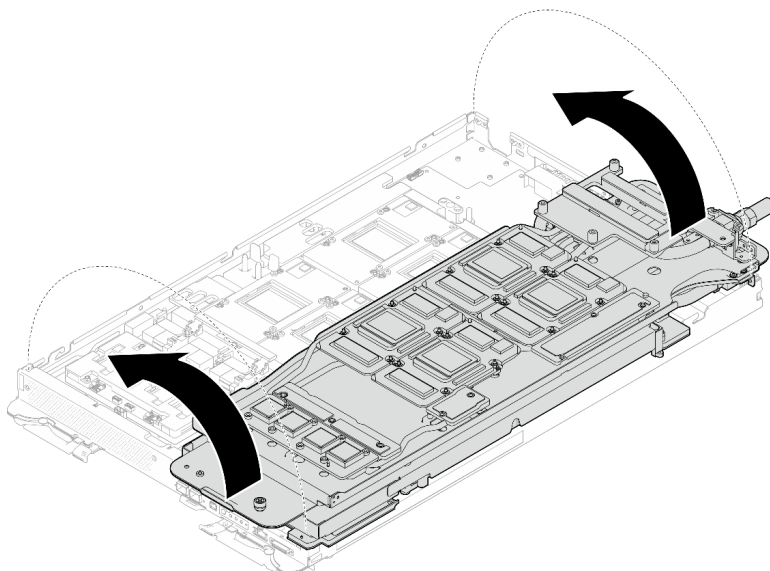


Figure 198. Unfolding the water loop to GPU node

Step 5. Loosen water loop carrier screws (x20 Phillips #2 screws).

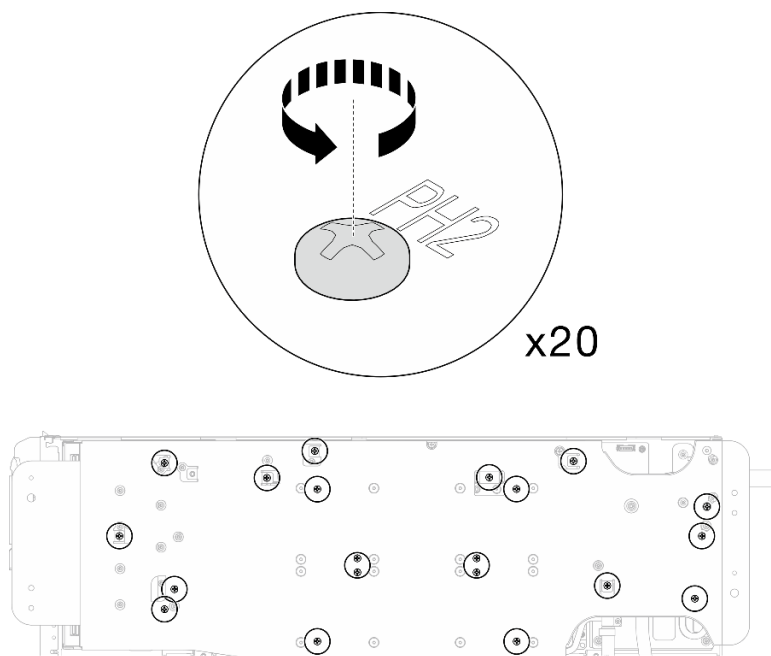


Figure 199. Water loop screws and quick connect screws installation (GPU node)

Step 6. Remove the water loop carrier from the GPU node.

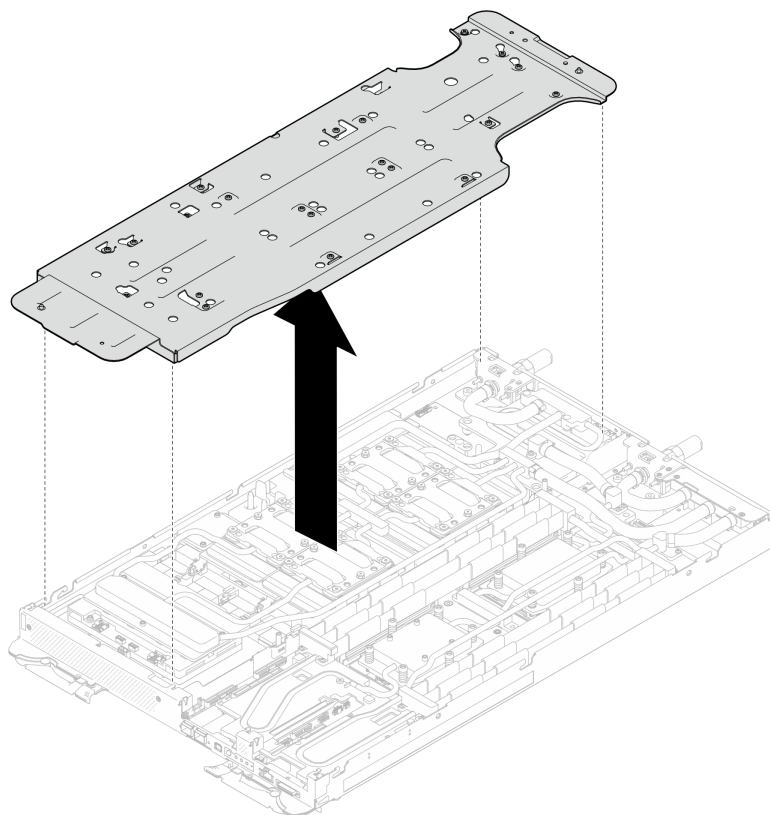


Figure 200. Water loop carrier removal (GPU node)

Step 7. Install GPU cold plate screws (x16 T10 screws).

- a. Install GPU cold plate screws following the GPU cold plates installation sequence: **GPU 2 → GPU 4 → GPU 1 → GPU 3**

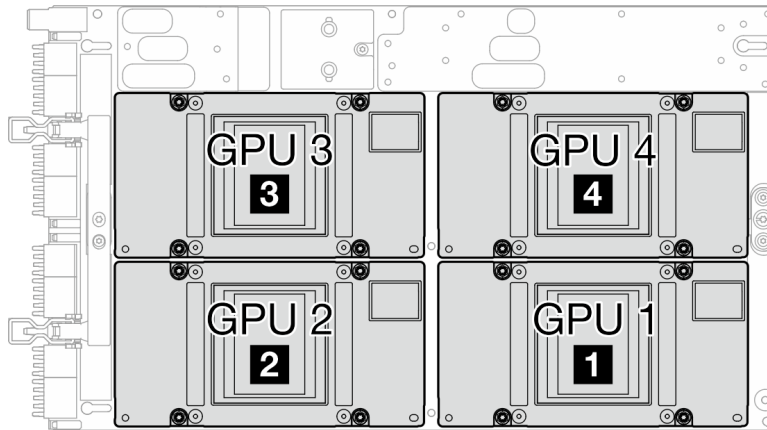


Figure 201. GPU numbering

- b. Set the torque screwdriver to 1.5 +/- 0.5 lb-In (0.1 +/- 0.06 N-m); then, fasten the GPU cold plate screws.
- c. Set the torque screwdriver to 4 +/- 0.5 lb-In (0.45 +/- 0.06 N-m); then, fasten the GPU cold plate screws.
- d. Set the torque screwdriver to 4 +/- 0.5 lb-In (0.45 +/- 0.06 N-m); then, fasten the GPU cold plate screws until all screws are fully tightened.

**Note:** Make sure to follow the screw sequence on the GPU cold plate label: ① → ② → ③ → ④

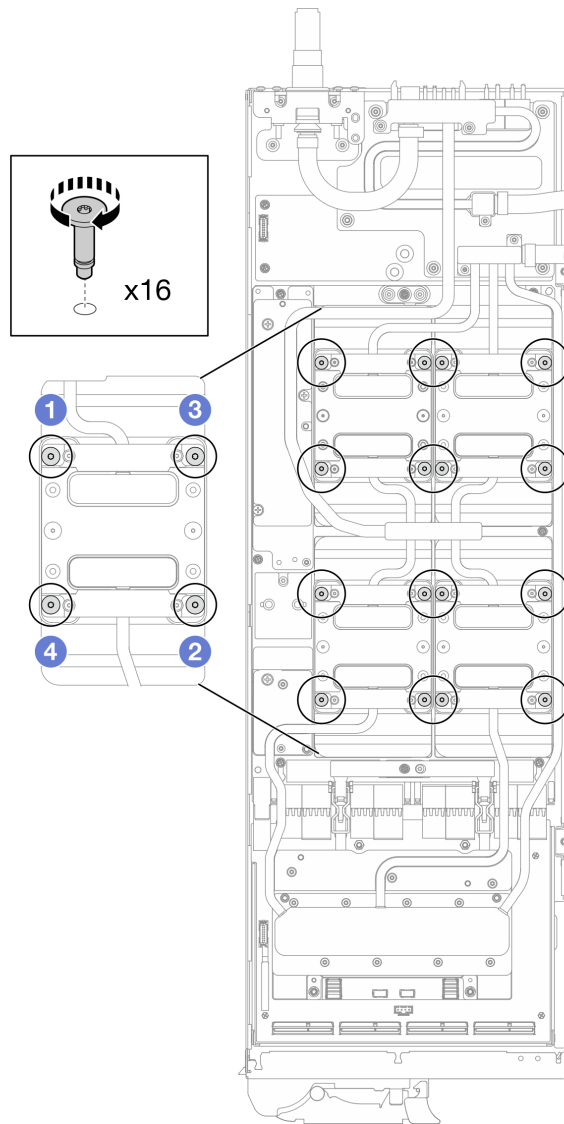


Figure 202. GPU cold plate screw installation

Step 8. Follow the screw installation sequence specified on the network board label, and install network cold plate screws (x8 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

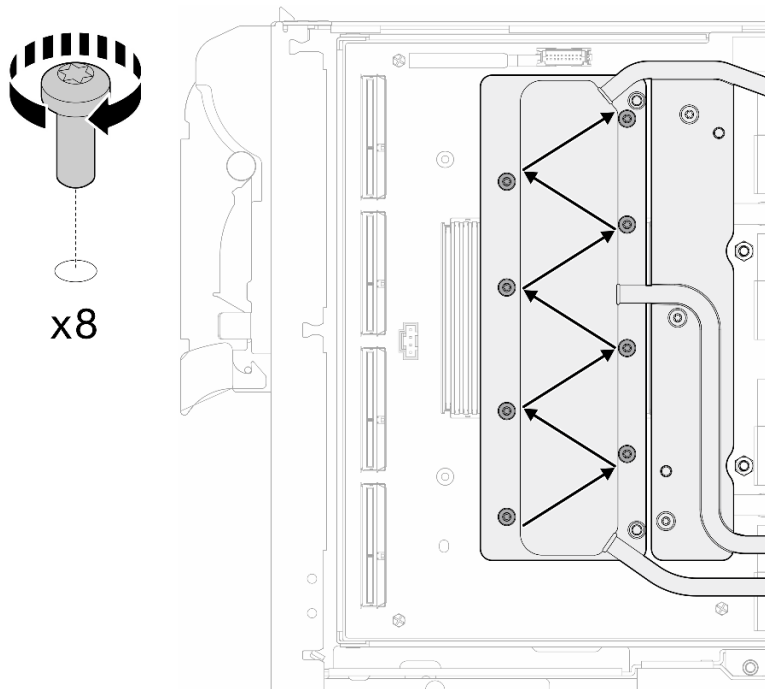


Figure 203. Network card screw installation

Step 9. Install the quick connect screws (x4 Torx T10) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

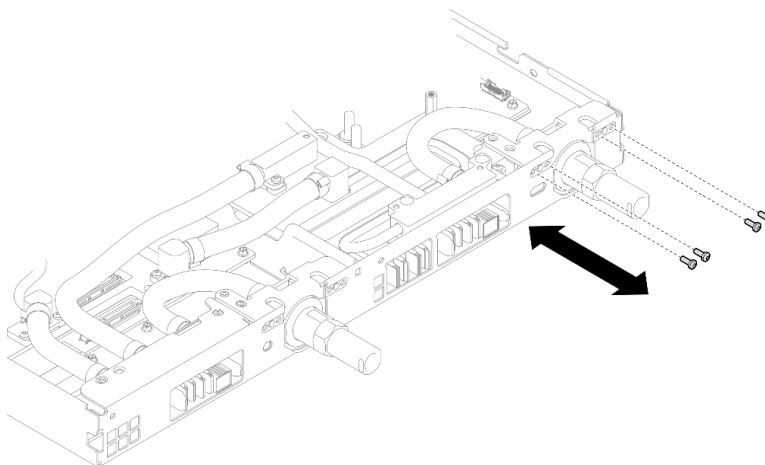
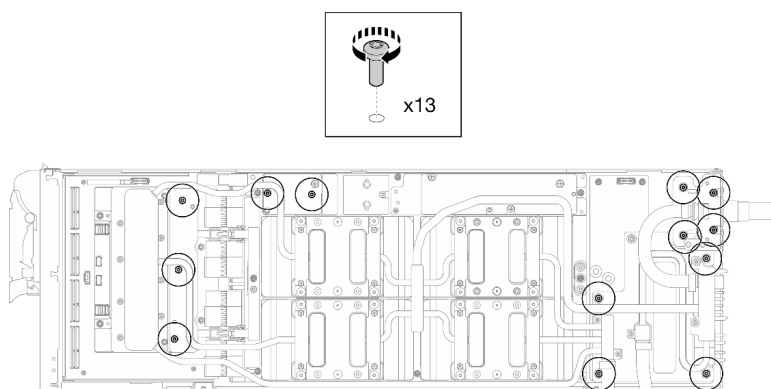


Figure 204. Quick connect screw installation (GPU node)

Step 10. Install water loop screws and quick connect screws (x13 Torx T10 screws) with a torque screwdriver set to the proper torque.

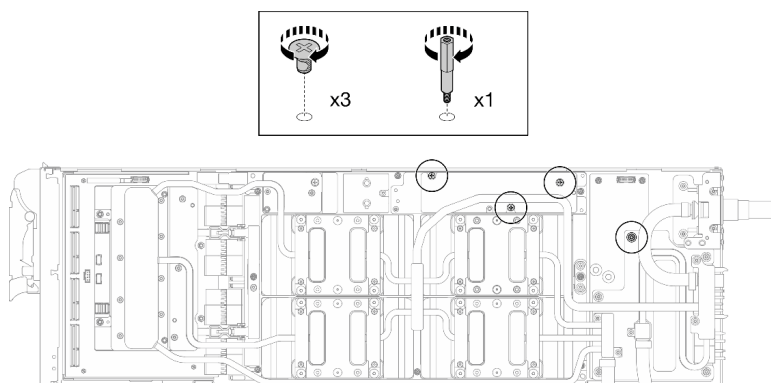
**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



*Figure 205. Water loop Torx T10 screws installation (GPU node)*

Step 11. Install the Hex screw (x1) and the PH1 screws (x3).

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



*Figure 206. Water loop Hex and PH1 screws installation (GPU node)*

Step 12. Install the cable tie to the GPU board.

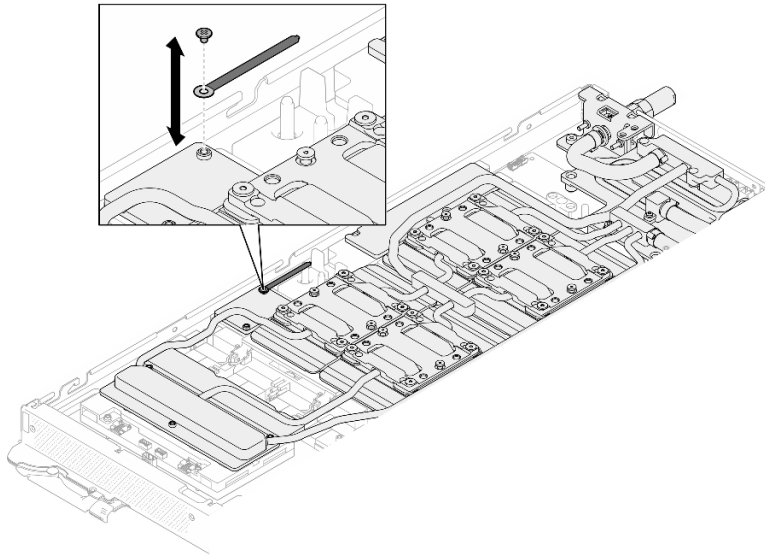


Figure 207. Installing the cable tie

Step 13. Connect the carrier board power cable.

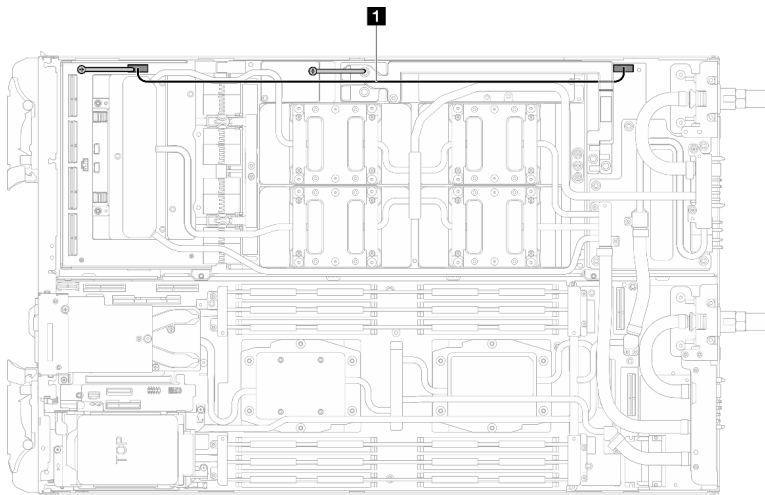


Figure 208. Connecting carrier board power cable

Cable	From (carrier board)	To (GPU node power distribution board)
<b>1</b> Carrier board power cable	Power and side band connector	Power connector

### Install the OSFP module

Step 1. Replace the putty pad on the OSFP module conduction plate with a new one. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**



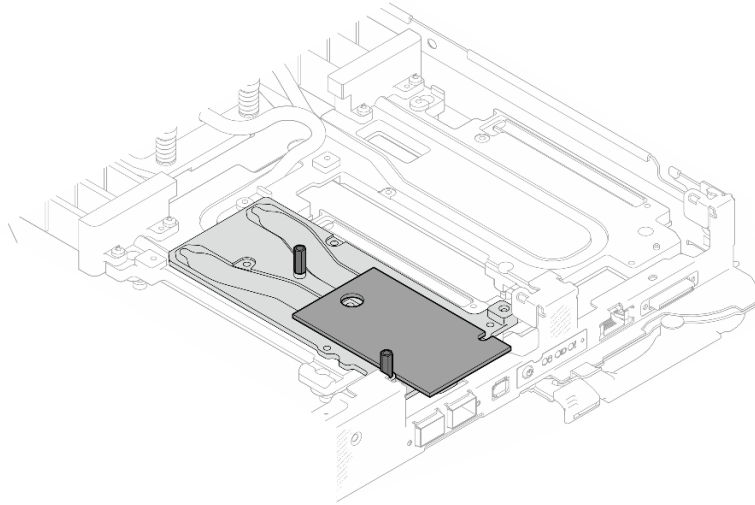


Figure 209. Replacing the putty pad on the OSFP module

Step 2. Connect the two OSFP module power cables. Connect power cable labeled as P1 to Power connector 1 on the OSFP module, and P2 to Power connector 2.

OSFP module	connects to	Power cable
<b>1</b> Power connector 1		<b>2</b> P1
<b>4</b> Power connector 2		<b>4</b> P2

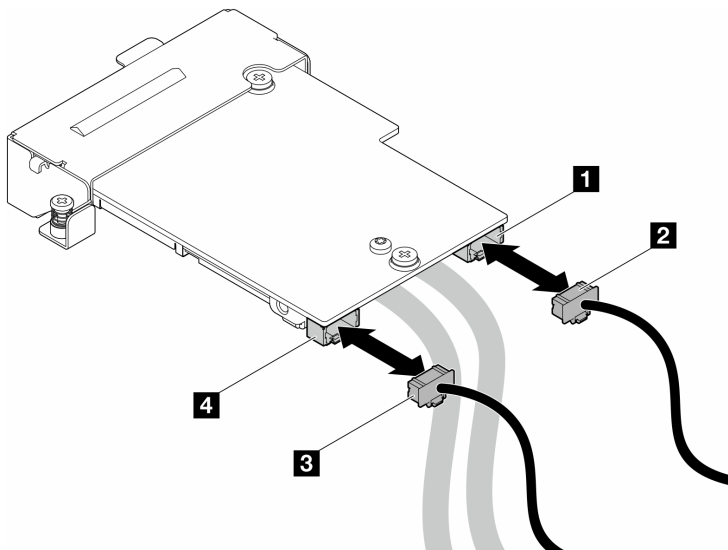


Figure 210. OSFP module power cables installation

Step 3. Install the OSFP module.

- a. **1** Align the OSFP module to the guide pins, and install the OSFP module to the compute node.
- b. **2** Tighten the three screws to secure the OSFP module to the compute node.

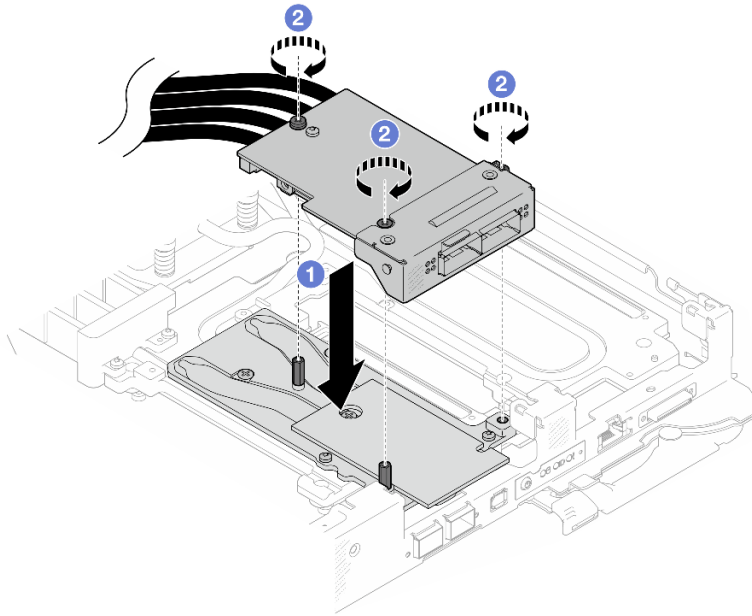


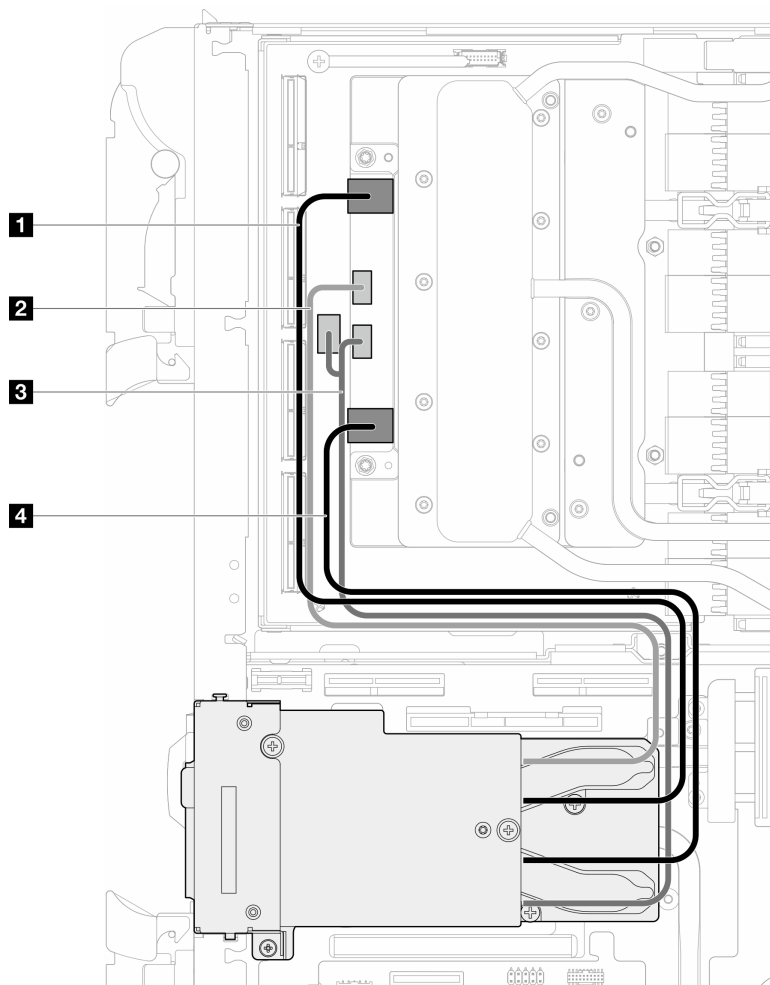
Figure 211. OSFP module installation

Step 4. Connect the OSFP module cables to the network board on the GPU node.

**CAUTION:**

- Hold the cable connector at 45 degree angle when inserting it into the port.
- Have extremely precaution when reseating the connectors that have a 45 degree label on them as they are fragile and will get damage if not installed in the correct 45 degree angle.

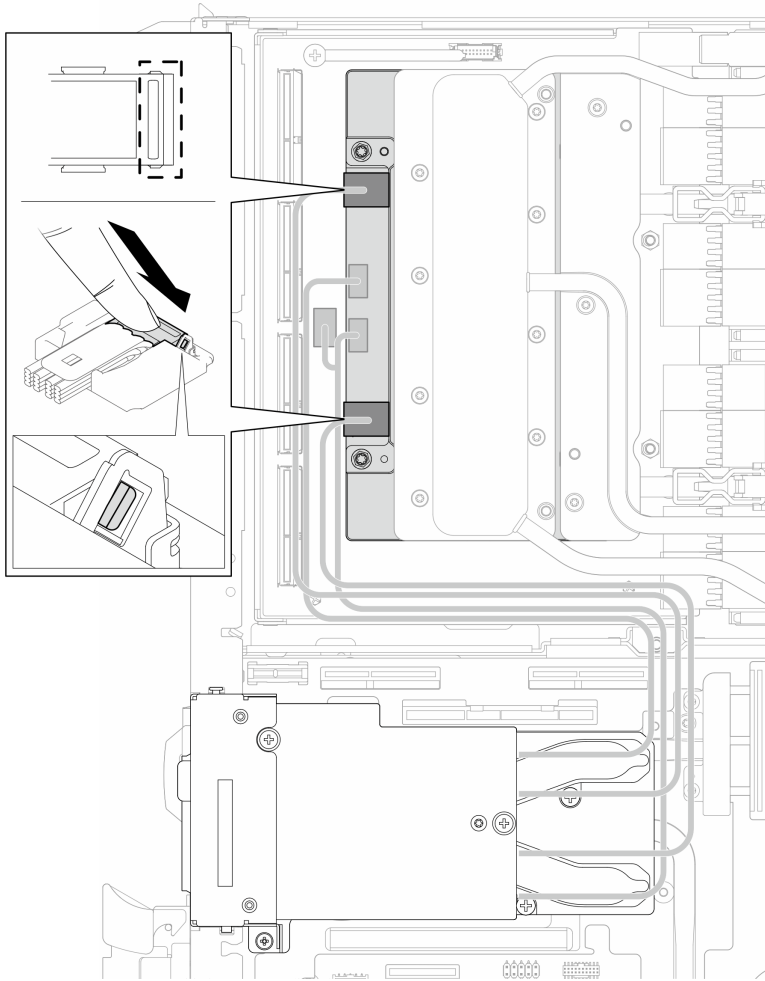




Cable	From OSFP module connectors	To Network board connectors
<b>1</b> Network cable (long)	Network connector (near GPU node)	Port 0
<b>2</b> Power cable	Power connector P1	OOB port 0
<b>3</b> Power cable	Power connector P2	OOB port 1 (on network board) and power connector (on carrier board)
<b>4</b> Network cable (short)	Network connector (near Compute node)	Port 1

Figure 212. Connecting the OSFP module cables to the network board

Step 5. Press the network cable connector to properly connect the cable plug to the connector. **Make sure** the latch is fully engaged to the connector.



*Figure 213. Pressing network cable plug*

- Step 6. Connect MCIO cables to the carrier board. Carrier board cable routing is different for one-processor configuration and two-processor configuration, see the following for details.

**One-processor configuration: connect all MCIO cables to the carrier board**

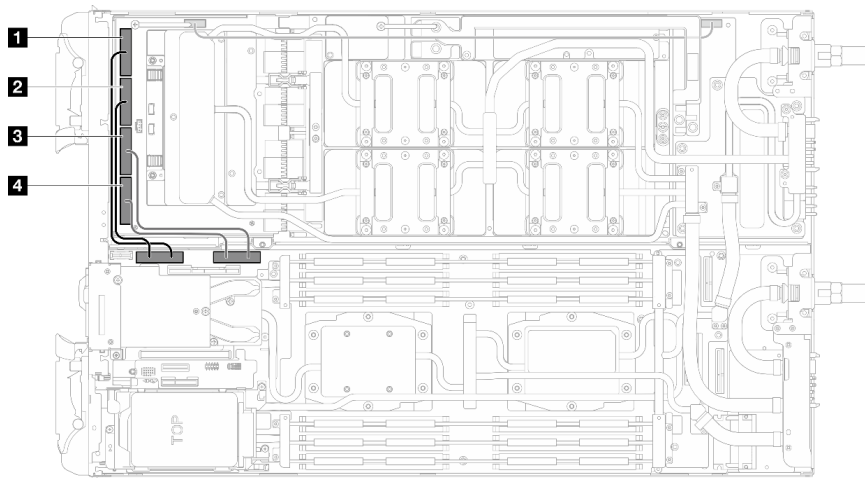


Figure 214. One-processor configuration—Connecting all MCIO cables to the carrier board

Cable index	From (carrier board in GPU node)	To (system board in compute node)
<b>1</b>	MCIO 1 cable	PCIe 4
<b>2</b>	MCIO 2 cable	
<b>3</b>	MCIO 3 cable	PCIe 3
<b>4</b>	MCIO 4 cable	

**Two-processors configuration: connect MCIO 1, MCIO 2, and MCIO 3 cables**

**Make sure** to follow the sequence **3** → **1** → **2**.

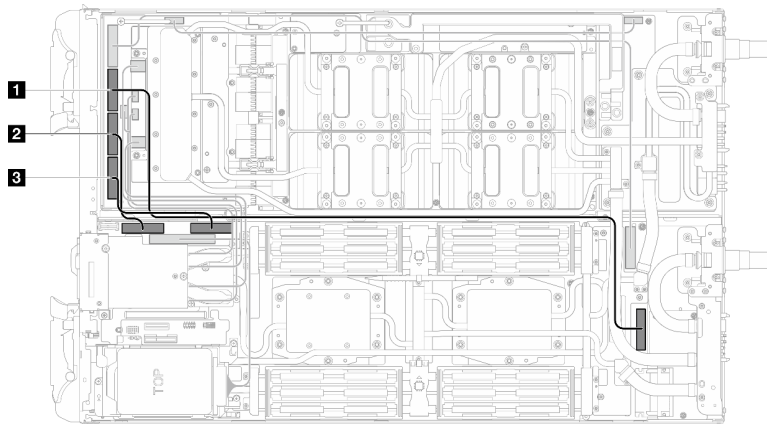


Figure 215. Two-processor configuration—Connecting MCIO 2, MCIO 3, and MCIO 4 cable to the GPU node

Cable index	From (carrier board in GPU node)	To (system board in compute node)
<b>1</b>	MCIO 2 cable	PCIe 5
<b>2</b>	MCIO 3 cable	PCIe 4
<b>3</b>	MCIO 4 cable	PCIe 3

Step 7. Connect the drive cable.

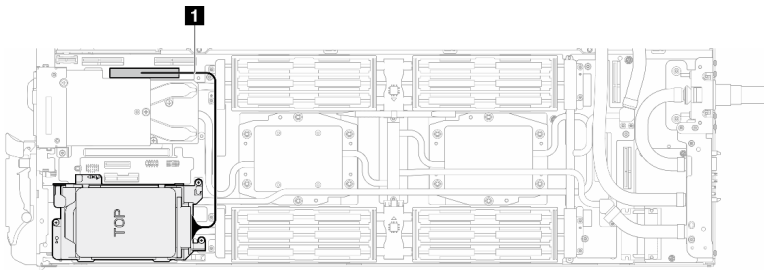


Figure 216. Connecting drive cage cables

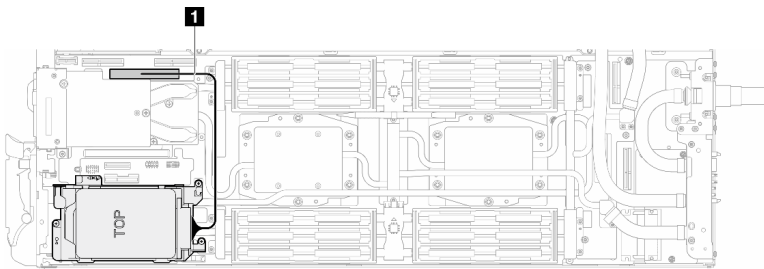


Figure 217. Connecting 7mm drive cage cables

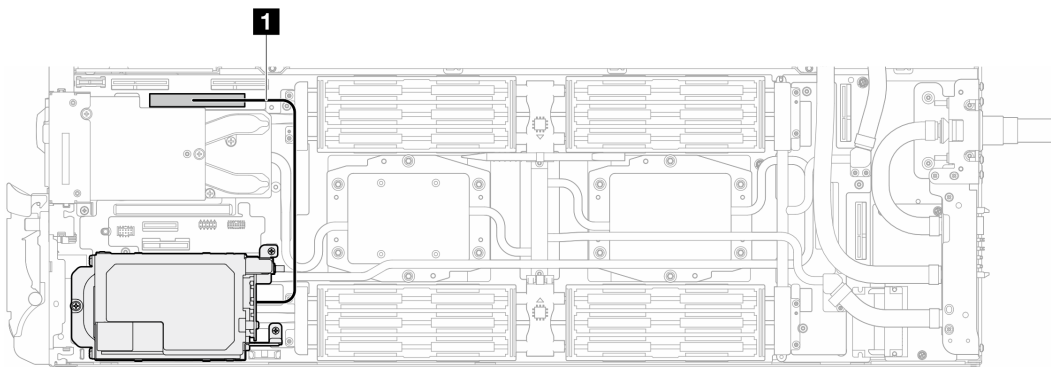


Figure 218. E3.S drives cable routing

## After you finish

1. Install the M.2 backplane assembly. See [“Install the M.2 backplane assembly” on page 120.](#)
2. Install the bus bar. See [“Install the bus bar” on page 267.](#)
3. Install the cross braces. See [“Install the cross braces” on page 21.](#)
4. Install the tray cover. See [“Install the tray cover” on page 18.](#)
5. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15.](#)
6. Connect all required external cables to the solution.

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

7. 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](#)

[Watch the procedure on YouTube](#)

## Power distribution board replacement

Use the following procedures to remove and install the power distribution board.

### Remove the power distribution board

Use this information to remove the power distribution board.

### About this task

#### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Compute node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 OSFP Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Drive gap pad or putty pad kits according to the drives installed in the tray. See their respective replacement procedures for more information.
- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screwdriver Type	Screw Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Hex screw (OSFP module conduction plate)	4.5 mm hex head screwdriver
Torx T10 head screwdriver	Torx T10 screw
Torx T20 head screwdriver	Torx T20 screw
Phillips #2 head screwdriver	Phillips #2 screw
3/16" hex head screwdriver	M3 screw

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

## Procedure

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

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14.](#)
- b. Remove the tray cover. See [“Remove the tray cover” on page 17.](#)
- c. Remove the cross braces. See [“Remove the cross braces” on page 19.](#)
- d. Remove the DIMM comb. See [“Remove a DIMM comb” on page 71.](#)
- e. Remove memory modules. See [“Remove a memory module” on page 124.](#)
- f. Remove the M.2 backplane assembly. See [“Remove the M.2 backplane assembly” on page 113.](#)

**Note:** The M.2 backplane cold plate needs to be removed as well.

- g. Remove the bus bar. See [“Remove the bus bar” on page 266.](#)
- h. Remove the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401.](#)
- i. Remove the drive cage. See [“Remove a drive cage assembly” on page 74.](#)
- j. Remove the OSFP module. See [“Remove the OSFP module” on page 139.](#)

Step 2. Remove the two Hex screws from the OSFP module with a 4.5 mm hex head screwdriver.

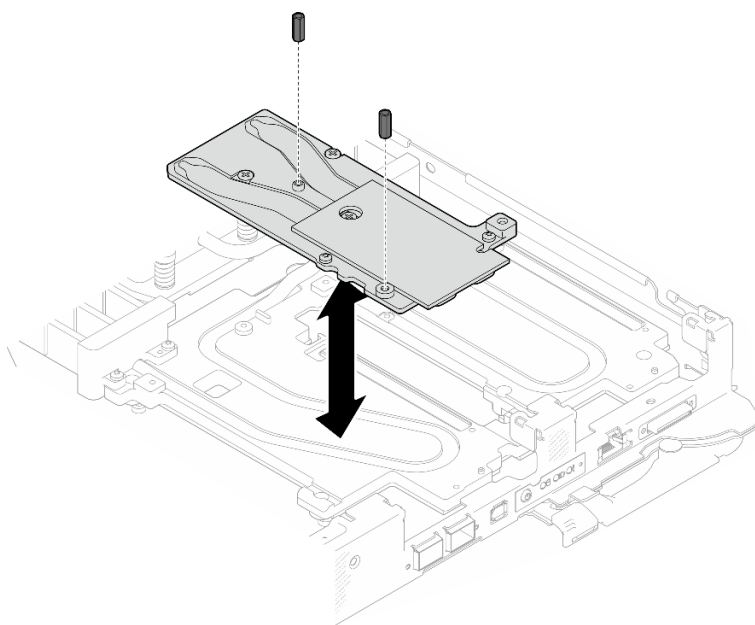


Figure 219. OSFP module conduction plate Hex screws removal

Step 3. Remove the OSFP module conduction plate. With alcohol cleaning pads, wipe of any remaining putty pads from the conduction plate.

Screw Type	Screwdriver Type
❶ M3x5 screw (x3)	Phillips #1 head screwdriver
❷ M3 screw (x2)	T10 screwdriver



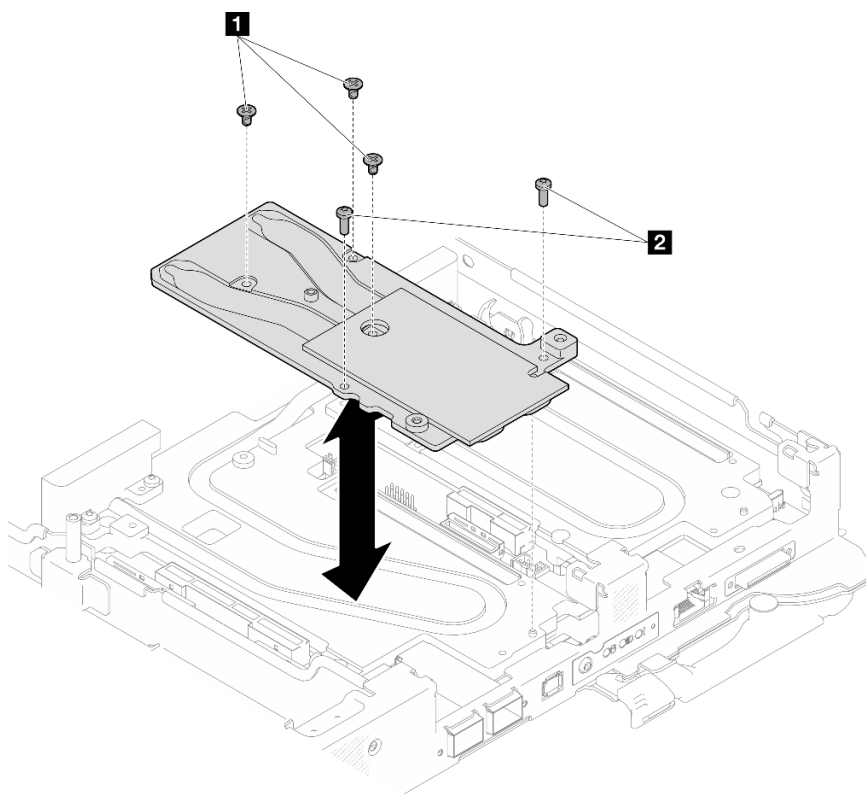


Figure 220. OSFP module conduction plate removal

Step 4. Remove the five Torx T10 screws to loosen the quick connect.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

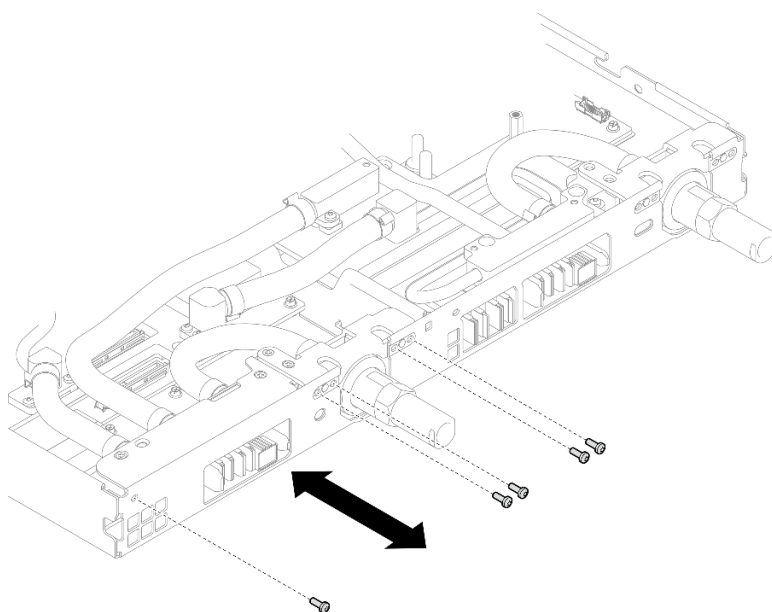


Figure 221. Quick connect screw removal (Compute node)

Step 5. Remove water loop screws and quick connect screws (14x Torx T10 screws per node) with a torque screwdriver set to the proper torque.

**Notes:**

- For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.
- When removing the **1** VR cold plate screws (x2), remove the washers, too. **Make sure** to keep the washers for future use.

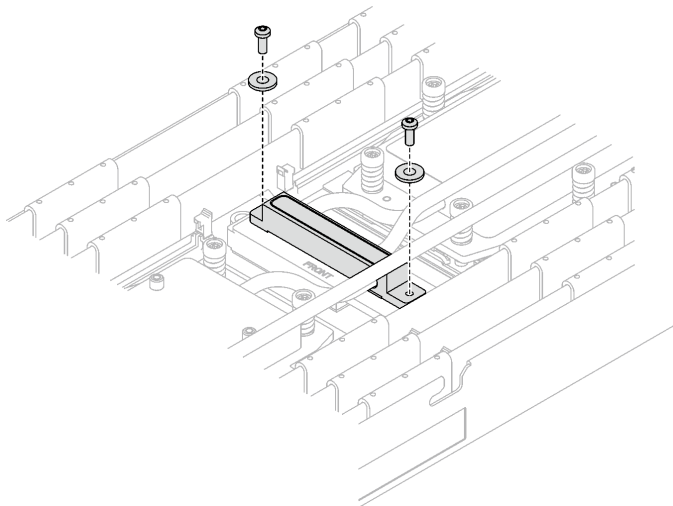


Figure 222. VR cold plate screws with washer

**1** VR cold plate screws (x2)

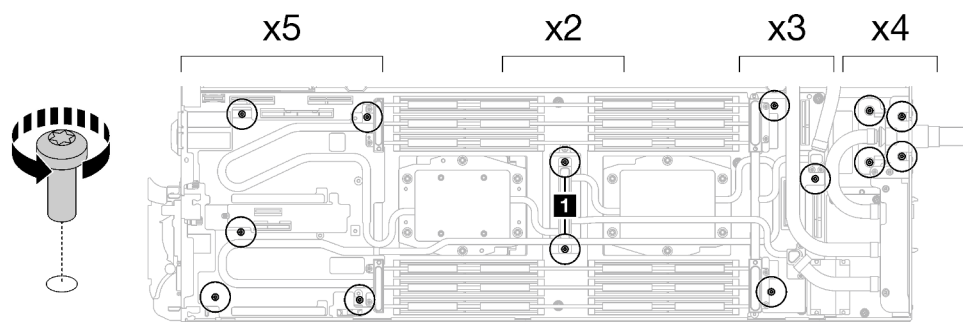


Figure 223. Water loop screw removal

Step 6. Remove processor cold plate screws (12x Torx T20 screws per node). Follow the screw sequence specified on the processor cold plate label and loosen the screws with a general screwdriver. Fully loosen each screw; then, proceed to the next screw.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 1.12-1.46 newton-meters, 10-13 inch-pounds

Fully loosen each screw in this order: 6 → 5 → 4 → 3 → 2 → 1

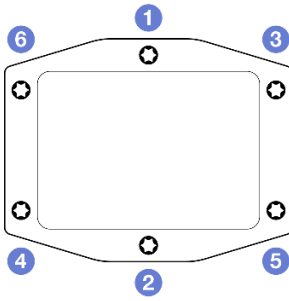


Figure 224. Processor cold plate label

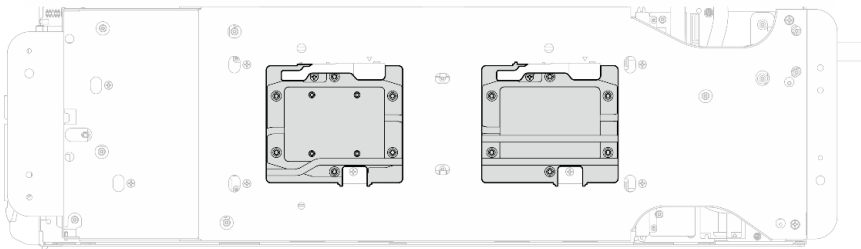
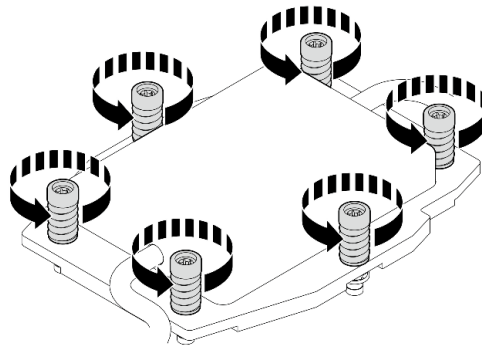
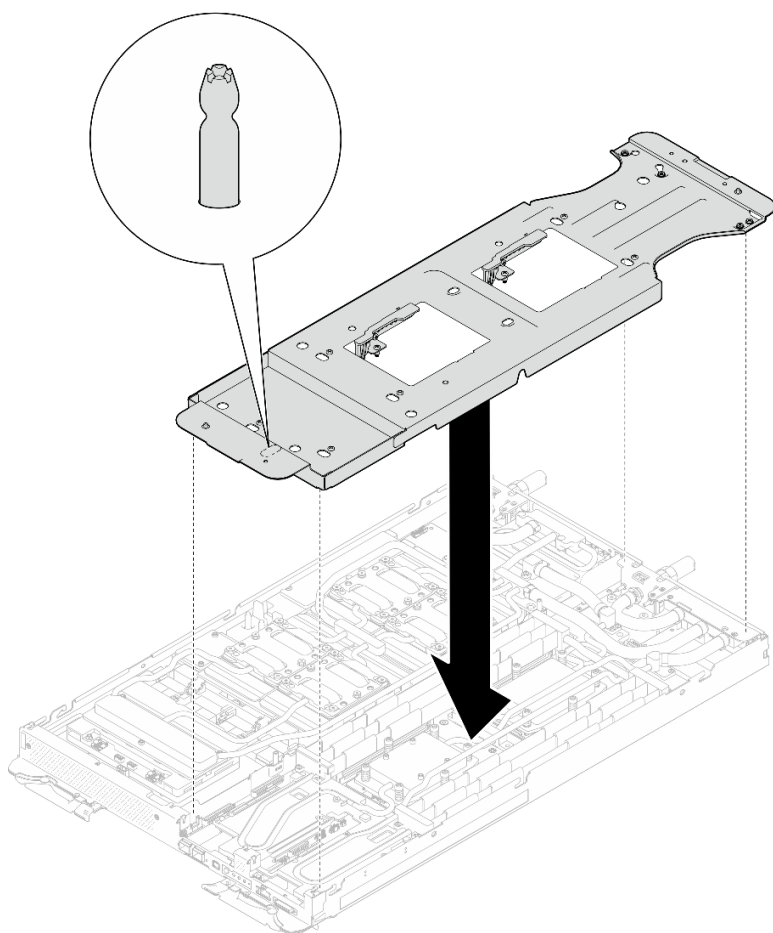


Figure 225. Processor cold plate removal

- Step 7. Orient the water loop carrier with the guide pin; then, gently put the water loop carrier down and ensure it is seated firmly on the water loop.



*Figure 226. Water loop carrier installation (Compute node)*

Step 8. Tighten water loop carrier screws (x12 Phillips #2 screws).

**Note:** Select screw holes marked as **R** on the rear of the shipping bracket.

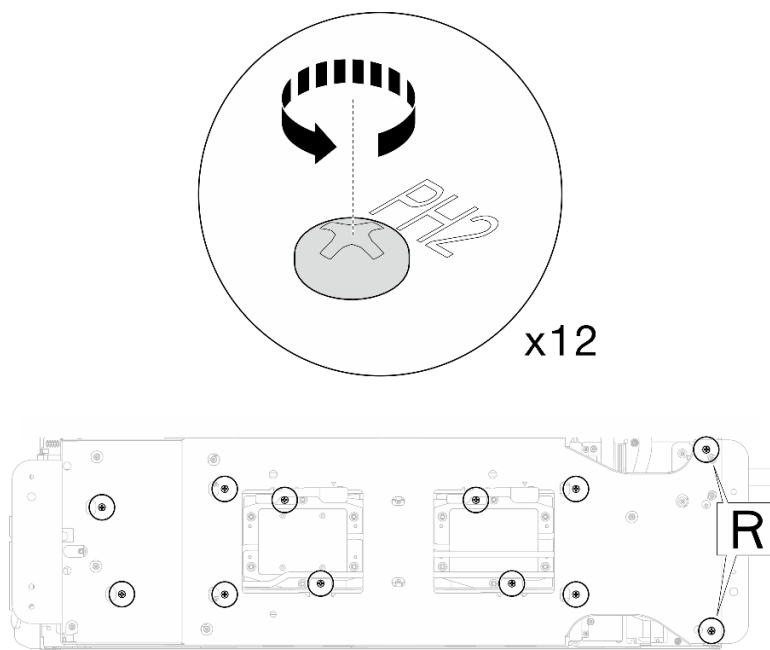


Figure 227. Water loop carrier screws installation (Compute node)

Step 9. Rotate the latch on the water loop carrier to separate the water loop from processors.

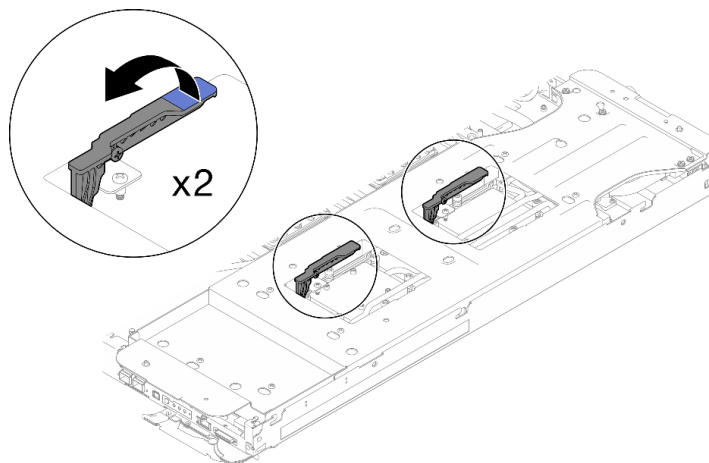


Figure 228. Separate water loop from processor

Step 10. Carefully rotate the water loop so one half is sitting on top of the other half.

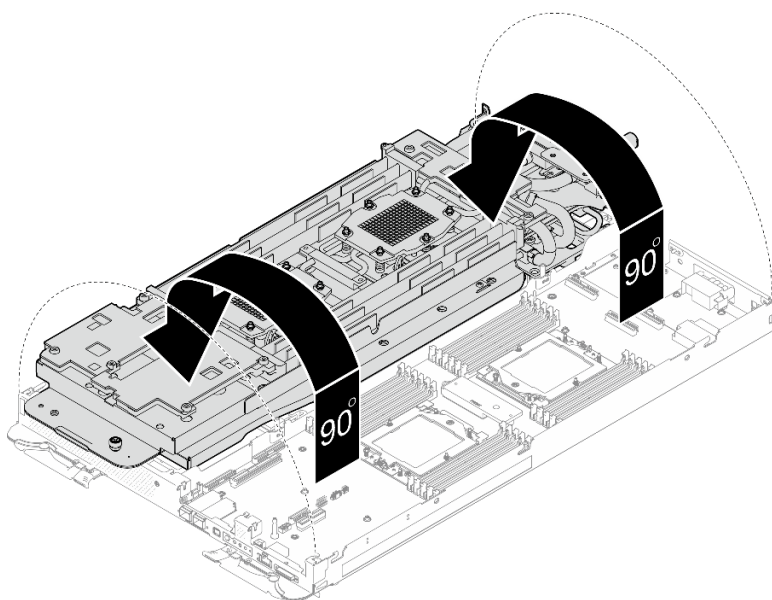


Figure 229. Folding the water loop

Step 11. Remove the power distribution board.

- a. ❶ Remove the five M3 screws (per node) with a 3/16" hex head screwdriver.
- b. ❷ Gently pull the power distribution board connector to disconnect it from the system board.
- c. ❸ Carefully pull the power distribution board inwards to disengage it from the node.

**Note:** Use a 3/16" hex head screwdriver to ensure the proper removal and installation.

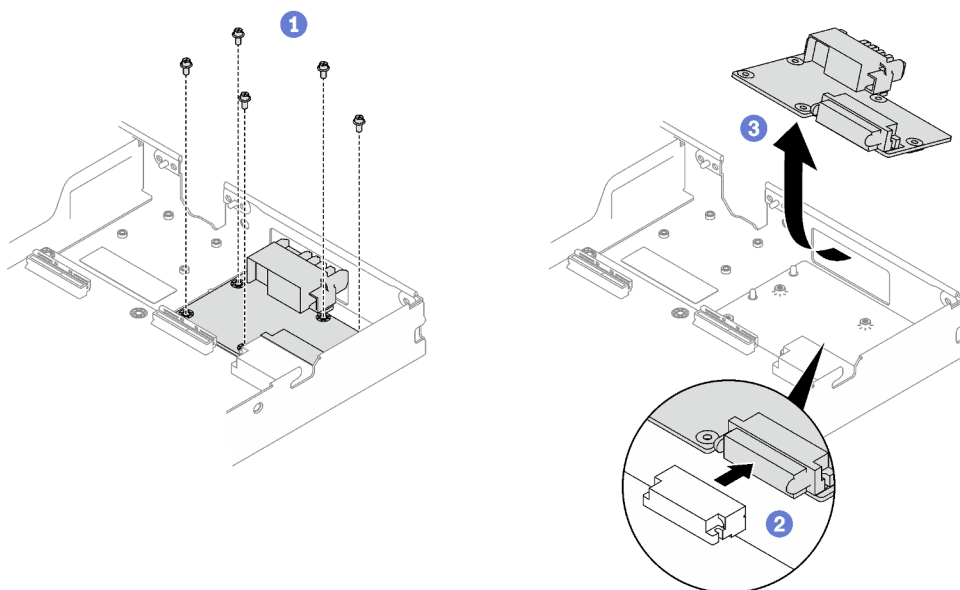


Figure 230. Power distribution board removal

Step 12. With an alcohol cleaning pad, wipe off any remaining thermal grease, gap pads, and putty pads from the processor and water loop.

## 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 power distribution board

Use this information to install the power distribution board.

## About this task

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

## Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Compute node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 OSFP Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Drive gap pad or putty pad kits according to the drives installed in the tray. See their respective replacement procedures for more information.
- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screwdriver Type	Screw Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Hex screw (OSFP module conduction plate)	4.5 mm hex head screwdriver
Torx T10 head screwdriver	Torx T10 screw
Torx T20 head screwdriver	Torx T20 screw
Phillips #2 head screwdriver	Phillips #2 screw
3/16" hex head screwdriver	M3 screw

## Attention:

- Read “Installation Guidelines” on page 3 and “Safety inspection checklist” on page 4 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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

## Procedure

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

Step 1. Install the power distribution board.

- 1 Tilt the power distribution board and align it with the hole; then, slide it into place.
- 2 Gently push the power distribution board connector to ensure it is connected to the system board.
- 3 Fasten the five M3 screws with a 3/16" hex head screwdriver.

**Note:** Use a 3/16" hex head screwdriver to ensure the proper removal and installation.

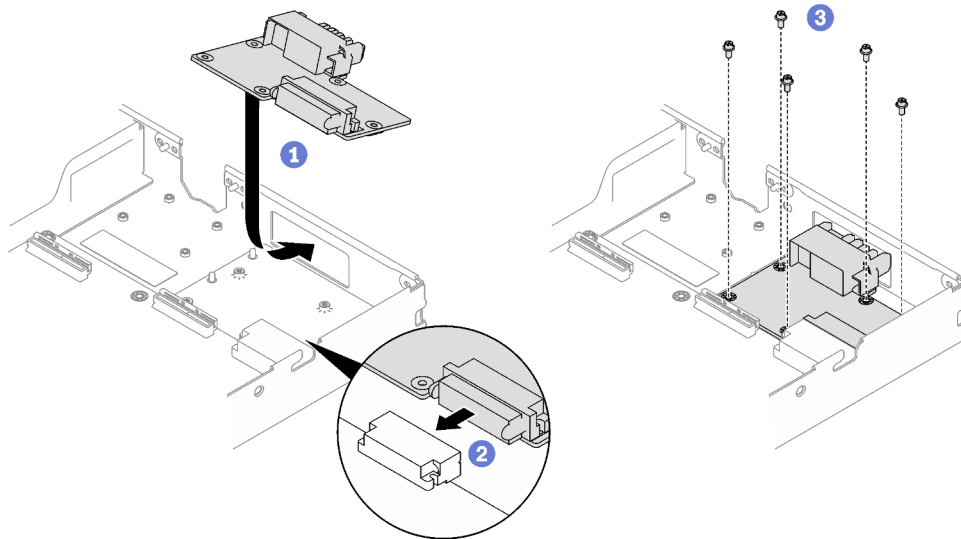


Figure 231. Power distribution board installation

Step 2. Apply the thermal grease on the top of the processor with syringe by forming four uniformly spaced dots, while each dot consists of about 0.1 ml of thermal grease.

**Note:** Carefully place the processor and retainer on a flat surface with the processor-contact side down.



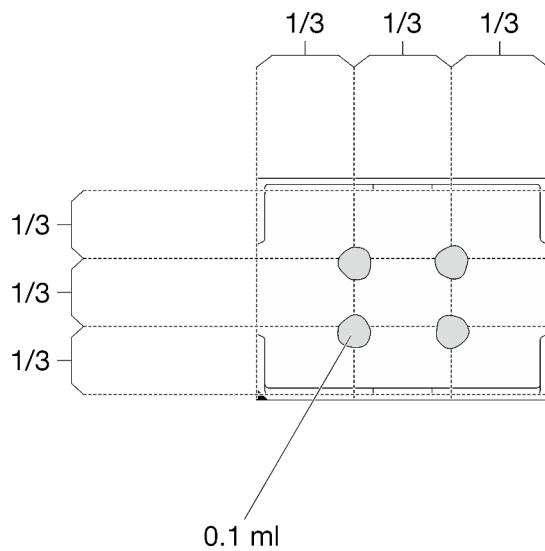


Figure 232. Thermal grease application

- Step 3. Check the gap pads on the bottom side and top side of the water loop, if any of them are damaged or missing, replace them with the new ones.

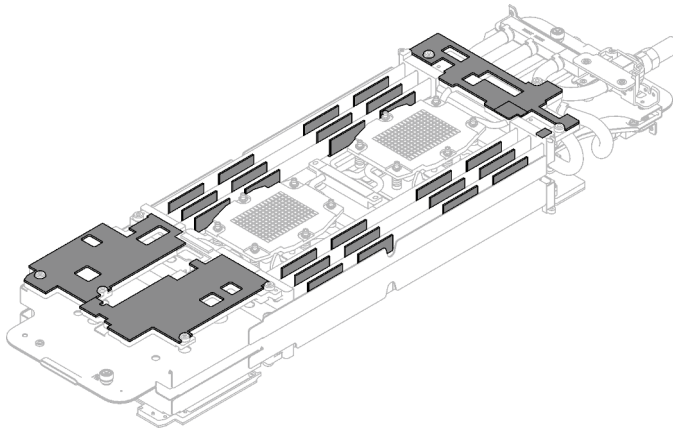


Figure 233. Water loop gap pads (bottom side)

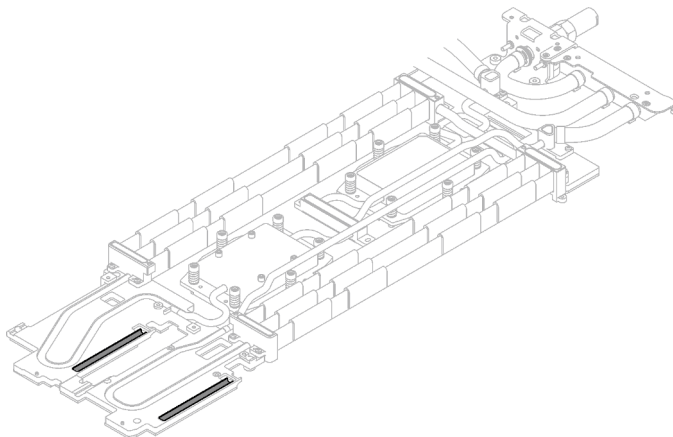


Figure 234. Water loop gap pads (top side)

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 4. Replace the putty pads on the water loop with new ones.

**Attention:** Putty pad cannot be reused. Whenever a component is removed, putty pads must be replaced with new ones before reinstalling the component.

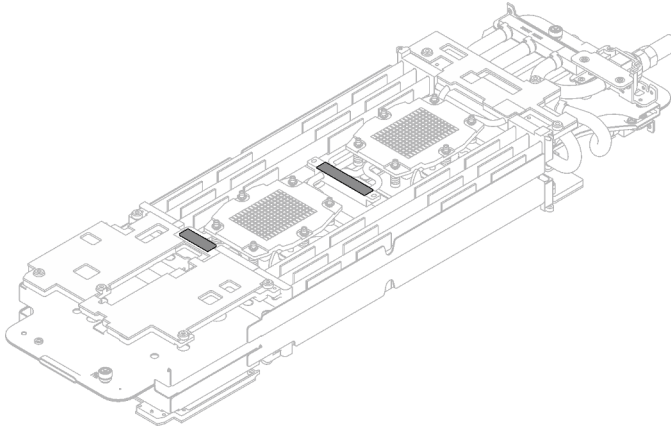


Figure 235. Water loop putty pads

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 5. Carefully rotate the top side of the water loop, position the water loop on the two guide pins near the rear of the node; then, gently put the water loop down and ensure it is firmly seated on the system board.

**Attention:** Make sure to align the water loop with the three guide pins on the right side compute node.

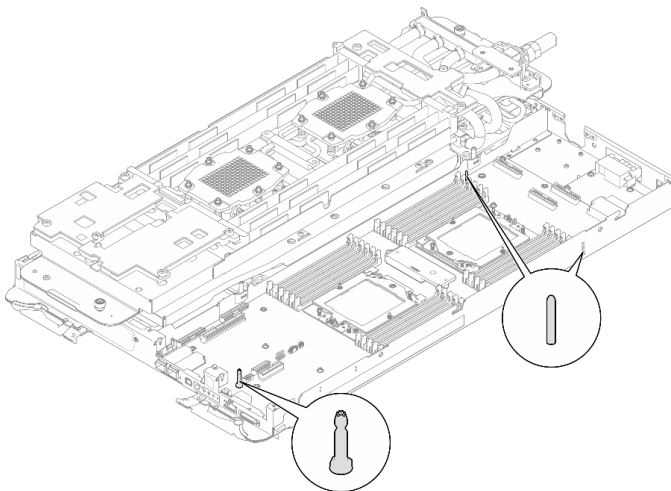
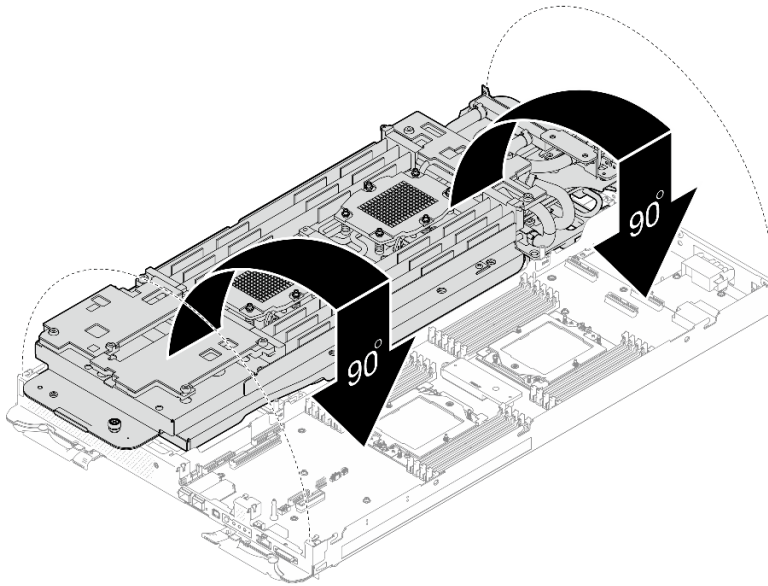


Figure 236. Guide pins on the compute node

**Attention:**

1. Slightly lift the water loop, then rotate it.
2. Do not tilt the water loop. Keep the water loop horizontal with the tray.
3. Install the water loop to the tray



*Figure 237. Water loop installation*

- Step 6. Install processor cold plate screws (x12 Torx T20 screws for the CPU node). Follow the screw sequence specified below and tighten the screws with a torque screwdriver. Fully tighten each screw; then, proceed to the next screw.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 1.12-1.46 newton-meters, 10-13 inch-pounds

Fully tighten each screw the order below:

Pro- ces- sor	Screw sequence
A	2 → 1 → 4 → 6 → 5 → 3
B	2 → 1 → 5 → 3 → 4 → 6

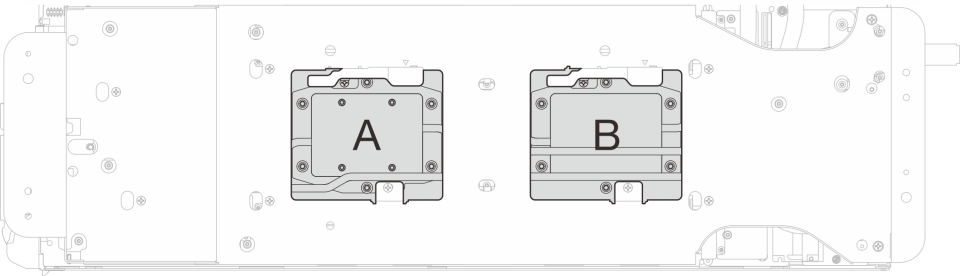
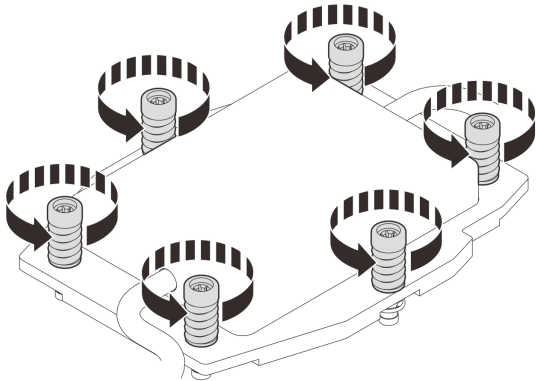
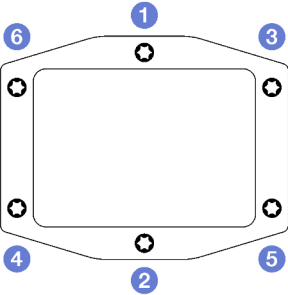


Figure 238. Processor cold plate installation

Step 7. Loosen water loop carrier screws (12x Phillips #2 screws).

**Note:** Select screw holes marked as **R** on the rear of the shipping bracket.

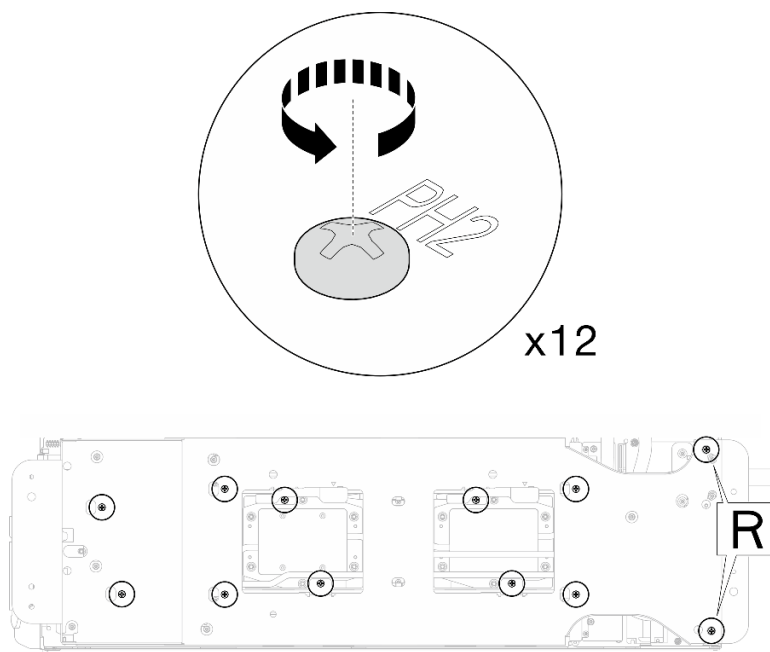


Figure 239. Loosening water loop carrier screws

Step 8. Remove the water loop carrier from the compute node.

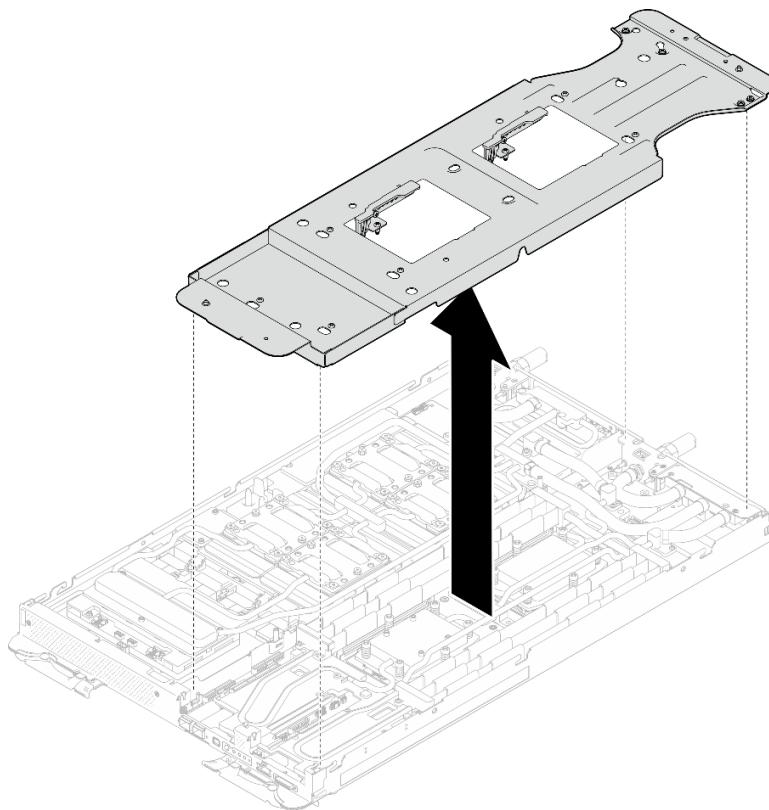


Figure 240. Water loop carrier removal (Compute node)

Step 9. Install water loop screws and quick connect screws (14x Torx T10 screws per node) with a torque screwdriver set to the proper torque.

**Notes:**

- For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.
- Install the **1** VR cold plate screws (x2) with washers. Use the washers previously removed from the water loop.

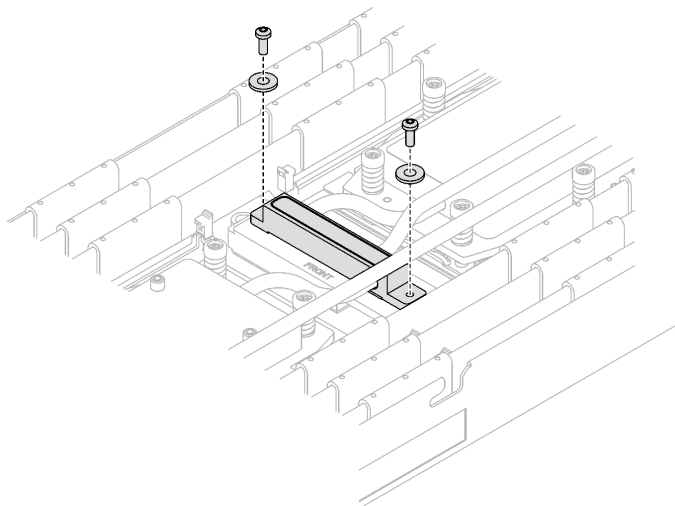


Figure 241. VR cold plate screws with washer

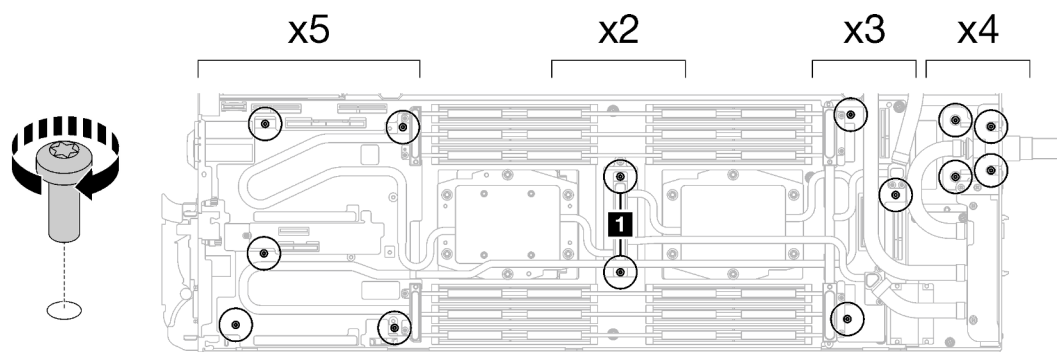


Figure 242. Water loop screws and quick connect screws installation

Step 10. Install the five Torx T10 screws to secure the quick connect.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

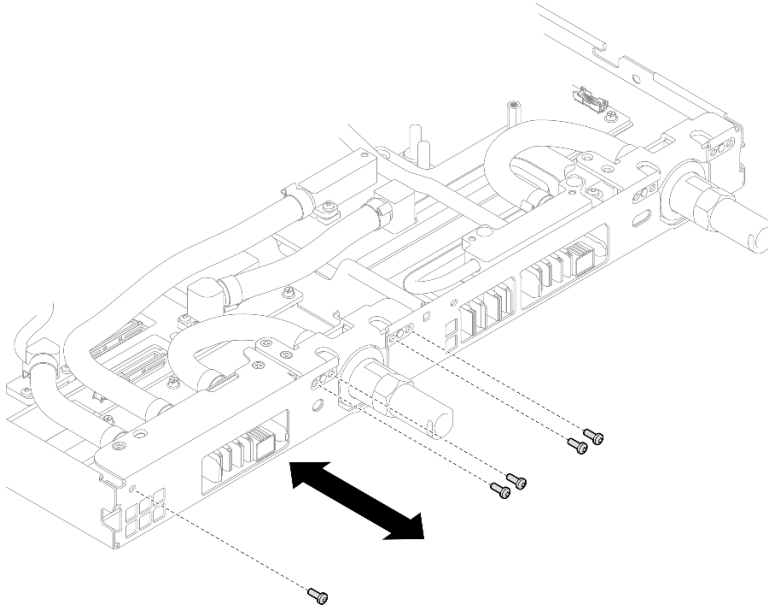


Figure 243. Quick connect screw installation (Compute node)

Step 11. Replace the putty pads on the top side and the bottom side of the OSFP module conduction plate.

**Attention: Putty pad cannot be reused. Whenever a component is removed, putty pads must be replaced with new ones before reinstalling the component.**

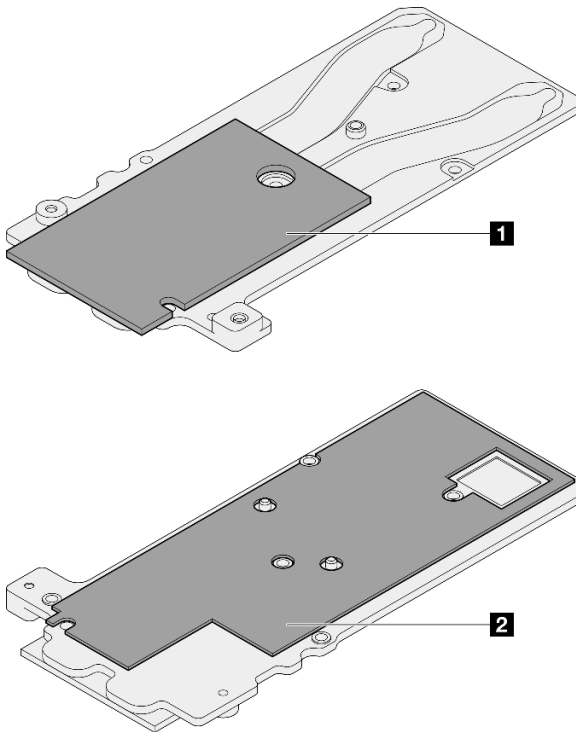


Figure 244. OSFP module conduction plate putty pads replacement

- 1** Conduction plate top putty pad
- 2** Conduction plate bottom putty pad

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 12. Install the OSFP module conduction plate onto the water loop.

Screw Type	Screwdriver Type
<b>1</b> M3x5 screw (x3)	Phillips #1 head screwdriver
<b>2</b> M3 screw (x2)	T10 screwdriver

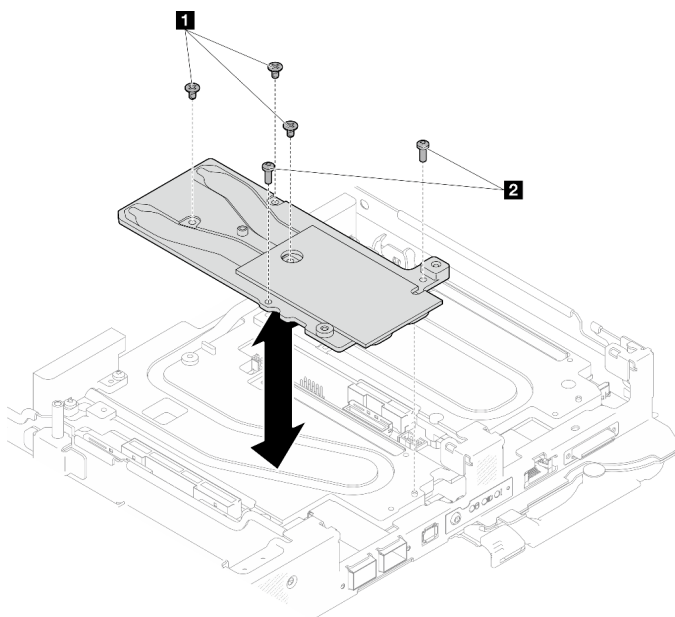


Figure 245. Installing the OSFP module conduction plate

Step 13. Install the two Hex screws to the OSFP module with a 4.5 mm hex head screwdriver.



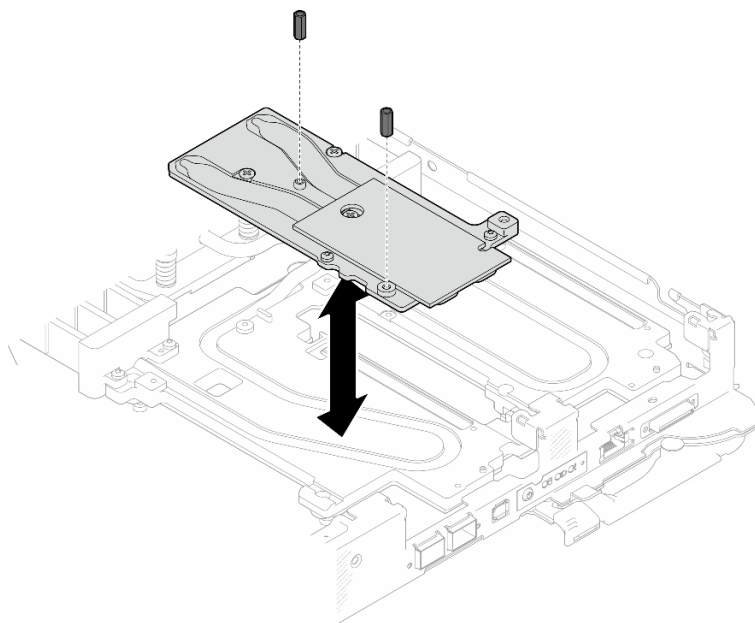


Figure 246. OSFP module conduction plate Hex screws installation

## After you finish

1. Install the OSFP module. See [“Install the OSFP module” on page 164](#).
2. Install the drive cage. See [“Install a drive cage assembly” on page 82](#).
3. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
4. Install the bus bar. See [“Install the bus bar” on page 267](#).
5. Install the M.2 backplane assembly. See [“Install the M.2 backplane assembly” on page 120](#).
6. Install the memory modules. See [“Install a memory module” on page 131](#).
7. Install the DIMM comb. See [“Install a DIMM comb” on page 72](#).
8. Install the cross braces. See [“Install the cross braces” on page 21](#).
9. Install the tray cover. See [“Install the tray cover” on page 18](#).
10. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
11. Connect all required external cables to the solution.

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

12. 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](#)

## Processor replacement

Use the following procedures to replace an assembled processor.

**Attention:** Before you begin replacing a processor, make sure that you have an alcohol cleaning pad and thermal grease.

### Important:

- The processor in your solution can throttle in response to thermal conditions, temporarily lowering its speed to reduce heat output. In instances where a few processor cores are throttled for an extremely short time period (100 ms or less), the only indication might be an entry in the operating system event log with no corresponding entry in the system XCC event log. If this situation occurs, the event can be ignored and processor replacement is not required.
- Before replacing a processor, check the current PSB fuse policy. See “Service process before replacement” at [Service process for updating PSB fuse state](#).
- After replacing a processor, ensure that the processor fuse status is expected without unexpected XCC event logs. See “Service process after replacing a processor” at [Service process for updating PSB fuse state](#).

## Remove a processor

This task has instructions for removing an assembled processor.

### About this task

**Attention:** The system will load factory default UEFI settings when Processor 1 is removed. In this case, make sure to back up the UEFI settings before processor 1 removal.

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Compute node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 OSFP Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Drive gap pad or putty pad kits according to the drives installed in the tray. See their respective replacement procedures for more information.
- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screwdriver Type	Screw Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Hex screw (OSFP module conduction plate)	4.5 mm hex head screwdriver
Torx T10 head screwdriver	Torx T10 screw
Torx T20 head screwdriver	Torx T20 screw

Screwdriver Type	Screw Type
Phillips #1 head screwdriver	Phillips #1 screw
Phillips #2 head screwdriver	Phillips #2 screw

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- Each processor socket must always contain a cover. When removing or installing a processor, protect empty processor sockets with a cover.
- Do not touch the processor socket or processor contacts. Processor-socket contacts are very fragile and easily damaged. Contaminants on the processor contacts, such as oil from your skin, can cause connection failures.
- Do not allow the thermal grease on the processor or water loop to come in contact with anything. Contact with any surface can compromise the thermal grease, rendering it ineffective. Thermal grease can damage components, such as electrical connectors in the processor socket. Do not remove the grease cover from the cold plate until you are instructed to do so.
- Before you install a new or replace a processor, update your system firmware to the latest level. See [“Update the firmware” in System Configuration Guide](#).
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

**Attention:** If processor socket 2 is empty, DIMM fillers should be removed from the DIMM slots surrounding socket 2 (slot 13 to slot 24).

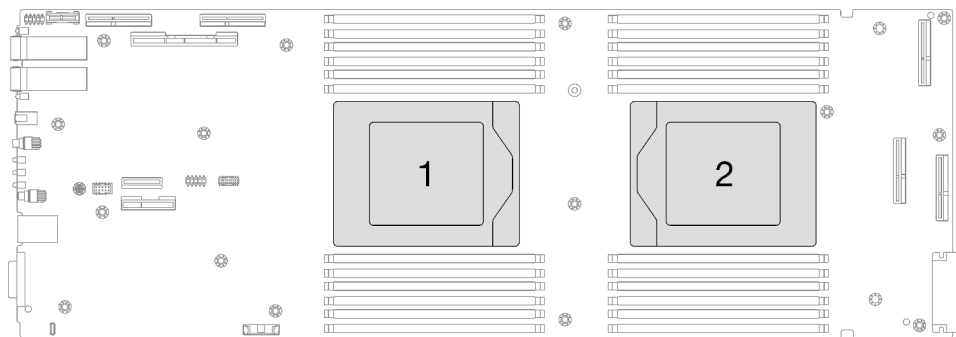


Figure 247. Processor locations

## Procedure

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

Step 1. Make preparations for this task.

- Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- Remove the cross braces. See [“Remove the cross braces” on page 19](#).

- d. Remove the DIMM comb. See [“Remove a DIMM comb” on page 71.](#)
- e. Remove memory modules. See [“Remove a memory module” on page 124.](#)
- f. Remove the M.2 backplane assembly. See [“Remove the M.2 backplane assembly” on page 113.](#)
- g. Remove the bus bar. See [“Remove the bus bar” on page 266.](#)
- h. Remove the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401.](#)
- i. Remove the drive cage. See [“Remove a drive cage assembly” on page 74.](#)
- j. Remove the OSFP module. See [“Remove the OSFP module” on page 139.](#)

Step 2. Remove the two Hex screws from the OSFP module with a 4.5 mm hex head screwdriver.

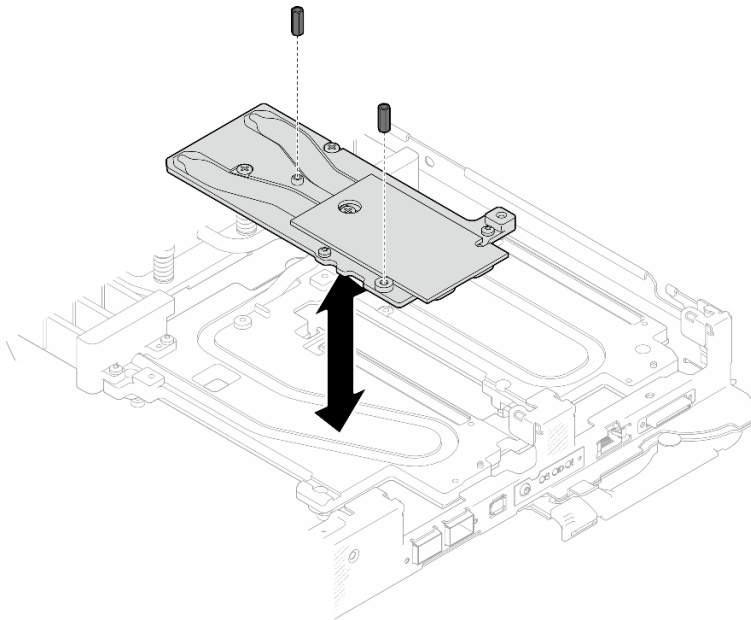


Figure 248. OSFP module conduction plate Hex screws removal

Step 3. Remove the OSFP module conduction plate. With alcohol cleaning pads, wipe of any remaining putty pads from the conduction plate.

Screw Type	Screwdriver Type
<b>1</b> M3x5 screw (x3)	Phillips #1 head screwdriver
<b>2</b> M3 screw (x2)	T10 screwdriver

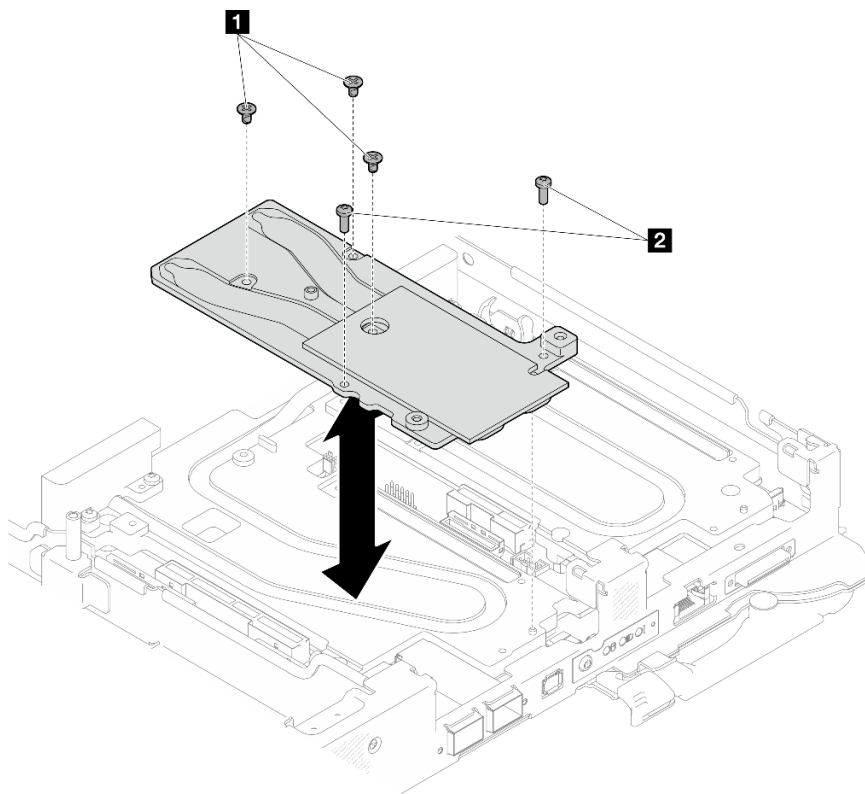


Figure 249. OSFP module conduction plate removal

Step 4. Remove the five Torx T10 screws to loosen the quick connect.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

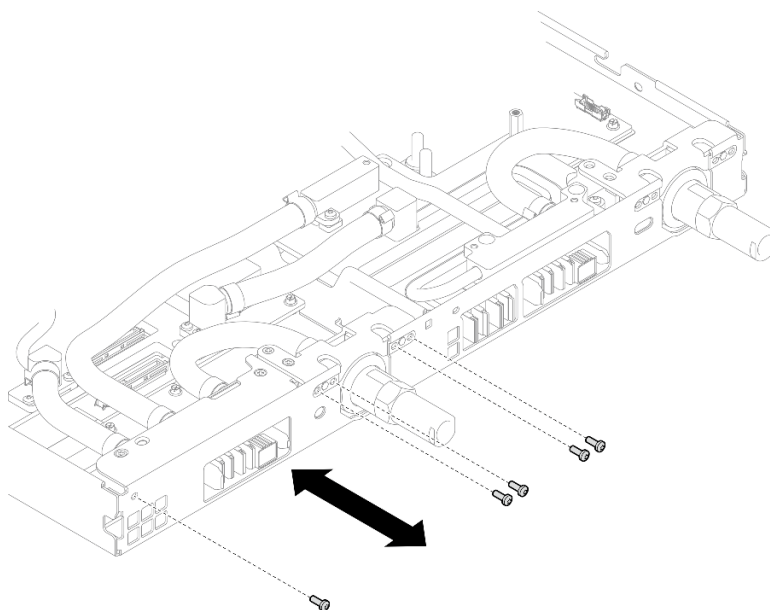


Figure 250. Quick connect screw removal (Compute node)

Step 5. Remove water loop screws and quick connect screws (14x Torx T10 screws per node) with a torque screwdriver set to the proper torque.

**Notes:**

- For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.
- When removing the **1** VR cold plate screws (x2), remove the washers, too. **Make sure** to keep the washers for future use.

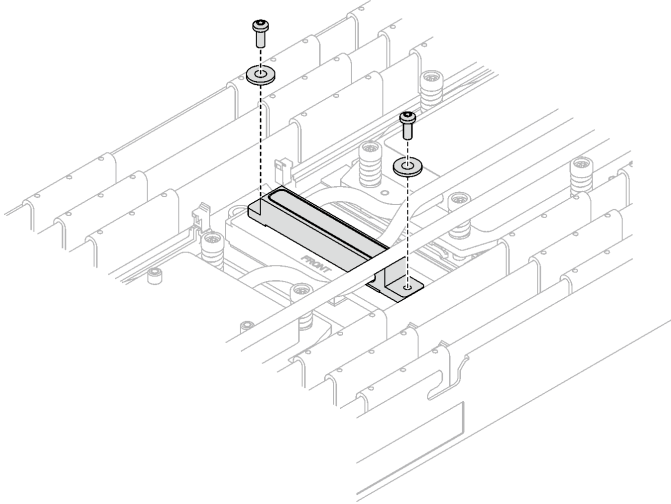


Figure 251. VR cold plate screws with washer

**1** VR cold plate screws (x2)

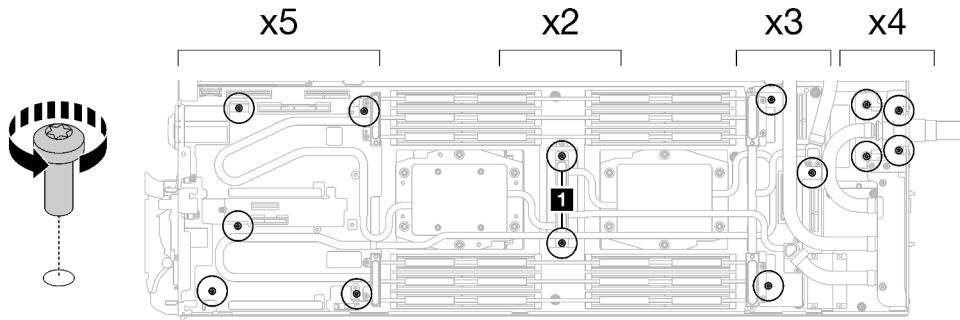


Figure 252. Water loop screw removal

Step 6. Remove processor cold plate screws (12x Torx T20 screws per node). Follow the screw sequence specified on the processor cold plate label and loosen the screws with a general screwdriver. Fully loosen each screw; then, proceed to the next screw.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 1.12-1.46 newton-meters, 10-13 inch-pounds

Fully loosen each screw in this order: 6 → 5 → 4 → 3 → 2 → 1

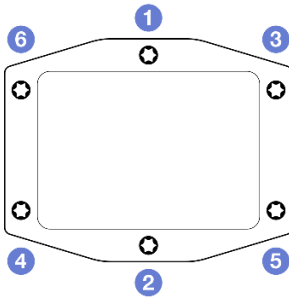


Figure 253. Processor cold plate label

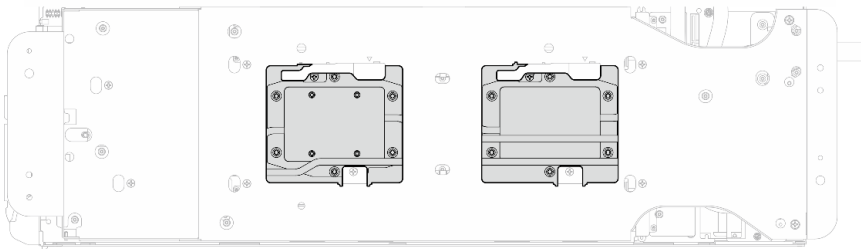
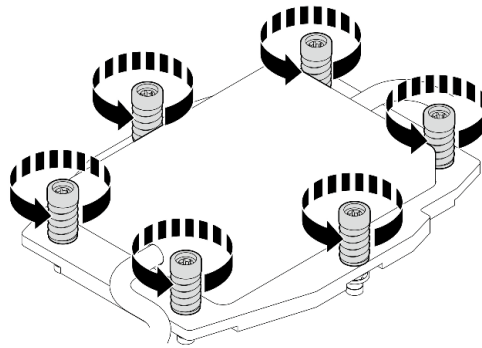
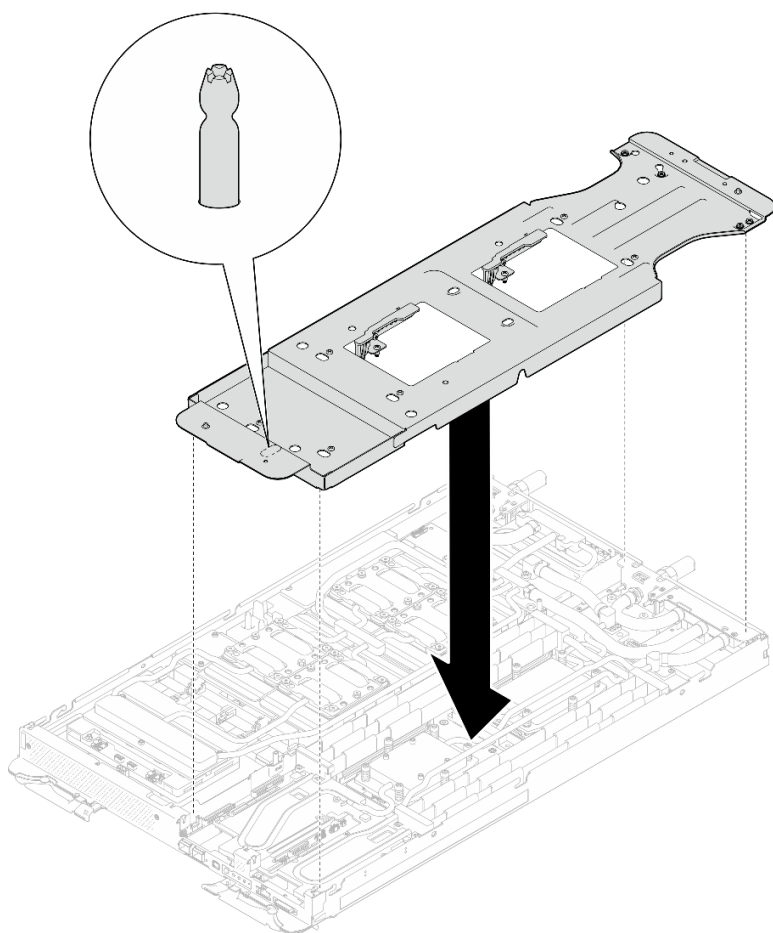


Figure 254. Processor cold plate removal

- Step 7. Orient the water loop carrier with the guide pin; then, gently put the water loop carrier down and ensure it is seated firmly on the water loop.



*Figure 255. Water loop carrier installation (Compute node)*

Step 8. Tighten water loop carrier screws (x12 Phillips #2 screws).

**Note:** Select screw holes marked as **R** on the rear of the shipping bracket.



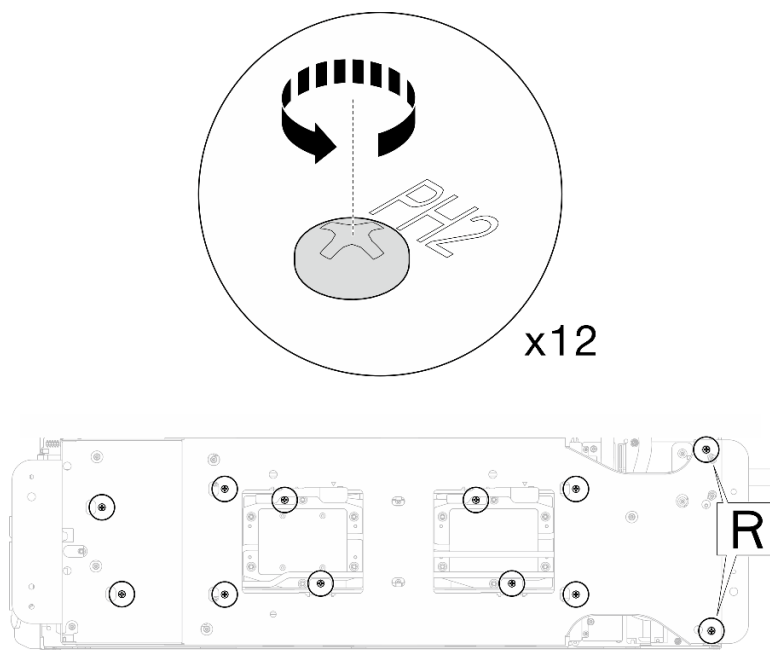


Figure 256. Water loop carrier screws installation (Compute node)

Step 9. Rotate the latch on the water loop carrier to separate the water loop from processors.

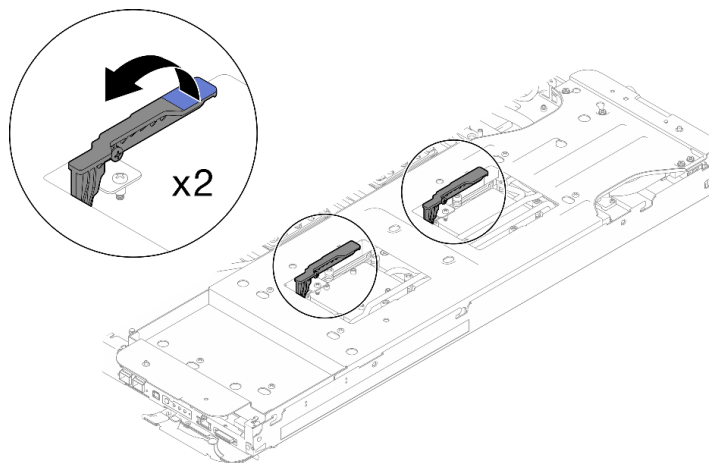


Figure 257. Separate water loop from processor

Step 10. Carefully rotate the water loop so one half is sitting on top of the other half.

**Note:** Do not tilt the water loop. Keep the water loop horizontal with the tray.

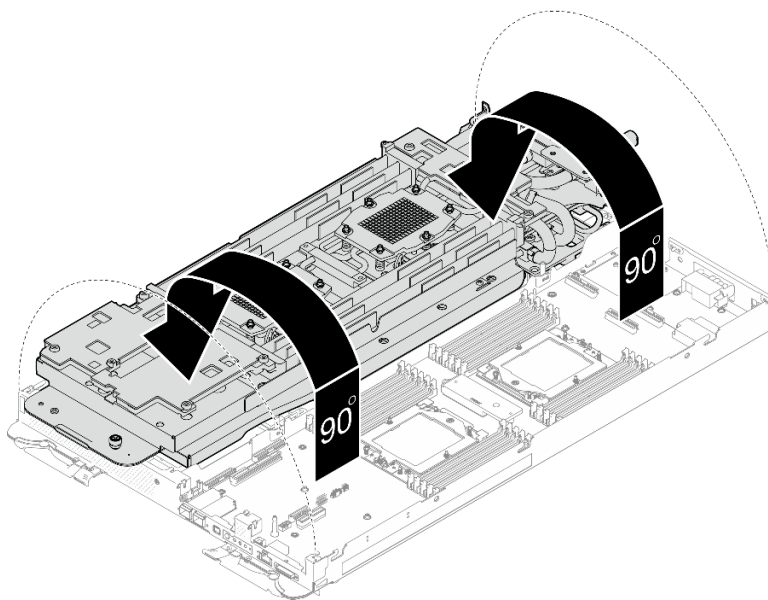


Figure 258. Folding the water loop

#### Step 11. Remove the processor

- a. ① Use a Torx T20 screwdriver to loosen the retention frame screw; then, rotate the retention frame to the open position
- b. ② Slightly lift up the rail frame in the direction shown. The processor in the rail frame is spring-loaded.
- c. ③ Hold the blue tab of the processor carrier and slide the processor carrier out of the rail frame.

**Note:** If processor socket 2 is empty, DIMM fillers should be removed from the DIMM slots surrounding socket 2 (slot 13 to slot 24).

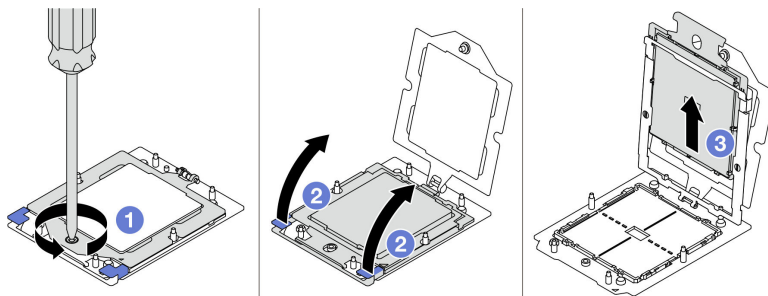


Figure 259. Processor removal

Step 12. Without putting the processor down, wipe off the thermal grease from the top of the processor with an alcohol cleaning pad; then, place the processor on a static protective surface with the processor-contact side up.

Step 13. With an alcohol cleaning pad, wipe off any remaining thermal grease, gap pad, and putty pad from the water loop.

### 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 processor

This task has instructions for installing a processor.

### About this task

#### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Compute node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 OSFP Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Drive gap pad or putty pad kits according to the drives installed in the tray. See their respective replacement procedures for more information.
- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screwdriver Type	Screw Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Hex screw (OSFP module conduction plate)	4.5 mm hex head screwdriver
Torx T10 head screwdriver	Torx T10 screw
Torx T20 head screwdriver	Torx T20 screw
Phillips #1 head screwdriver	Phillips #1 screw
Phillips #2 head screwdriver	Phillips #2 screw

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

- Each processor socket must always contain a cover. When removing or installing a processor, protect empty processor sockets with a cover.
- Do not touch the processor socket or processor contacts. Processor-socket contacts are very fragile and easily damaged. Contaminants on the processor contacts, such as oil from your skin, can cause connection failures.
- Do not allow the thermal grease on the processor or water loop to come in contact with anything. Contact with any surface can compromise the thermal grease, rendering it ineffective. Thermal grease can damage components, such as electrical connectors in the processor socket. Do not remove the grease cover from the cold plate until you are instructed to do so.
- Before you install a new or replace a processor, update your system firmware to the latest level. See “Update the firmware” in *System Configuration Guide*.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

#### Notes:

- See <https://serverproven.lenovo.com> for a list of processors supported for your system. All processors on the system board must have the same speed, number of cores, and frequency.
- Optional devices available for your system might have specific processor requirements. See the documentation that comes with the optional device for information.

**Attention:** If processor socket 2 is empty, DIMM fillers should be removed from the DIMM slots surrounding socket 2 (slot 13 to slot 24).

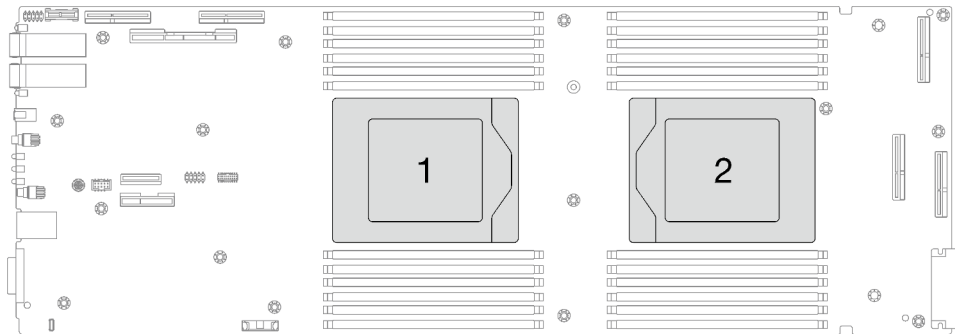


Figure 260. Processor locations

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

## Procedure

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

**Attention:** If processor socket 2 is empty, DIMM fillers should be removed from the DIMM slots surrounding socket 2 (slot 13 to slot 24).

Step 1. Follow the following steps if you are replacing processors:

- a. If there is any old thermal grease on the bottom of the cold plate on water loop, gently clean the thermal grease using an alcohol cleaning pad.
- b. Remove the processor identification label from the water loop and replace it with the new label that comes with the replacement processor. If you are unable to remove the label and place it on the new water loop, or if the label is damaged during transfer, write the processor serial number from the processor identification label on the new water loop in the same location as the label would be placed using a permanent marker.

Step 2. Install the processor.

- a. ❶ Slide the processor carrier into the rail frame.

**Attention: Make sure the processor carrier is well seated inside the rail frame.**

- b. ❷ Use index finger of both hands to press down the rail frame.
- c. ❸ Use the index finger of both hands to push the rail frame down until the blue latches lock into place.

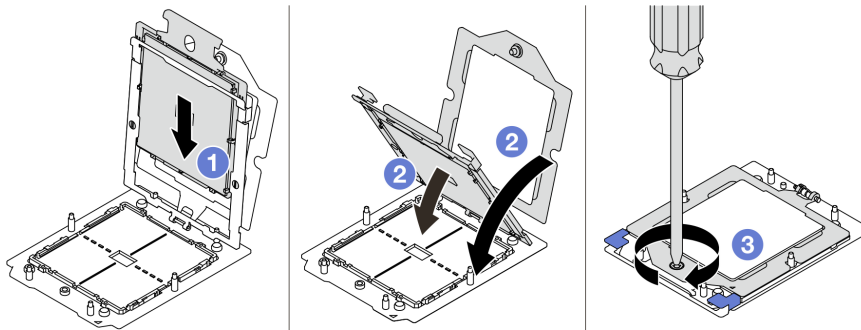


Figure 261. Install the processor into the rail frame

- d. There are two semicircular cutouts and one oval cutout on the rail frame. **Make sure** the studs on the processor socket are seated in the center of these three cutouts. If the stud is seated near left side or right side, the stud placement is incorrect. If the stud placement is incorrect, repeat Step 2.1, 2.2, and 2.3 (❶, ❷, and ❸) to reinstall the processor carrier to the rail frame until the placement is correct.

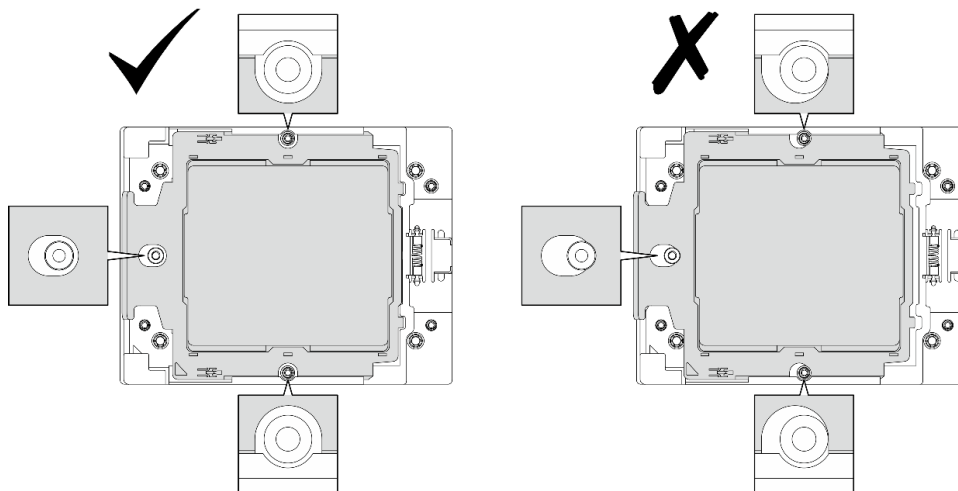


Figure 262. Processor socket studs placement

- e. ④ Slightly press the processor carrier to ensure the processor is correctly seated in the socket..

**Attention:** To avoid processor damage, do not apply excessive force to the processor. Pressing on the processor can be done only when the processor socket studs are in the center of the semicircular cutouts.

- f. ⑤ Close the retention frame.
- g. ⑥ Use a Torx T20 screwdriver to tighten the screw.

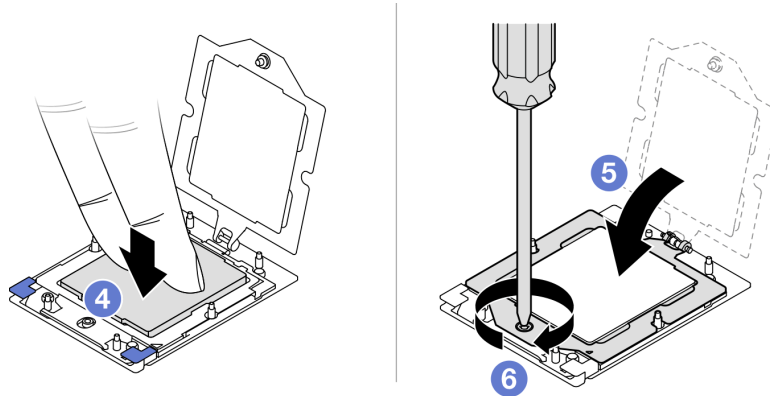


Figure 263. Securing the retention frame to the processor socket

- Step 3. Apply the thermal grease on the top of the processor with syringe by forming four uniformly spaced dots, while each dot consists of about 0.1 ml of thermal grease.

**Note:** Carefully place the processor and retainer on a flat surface with the processor-contact side down.

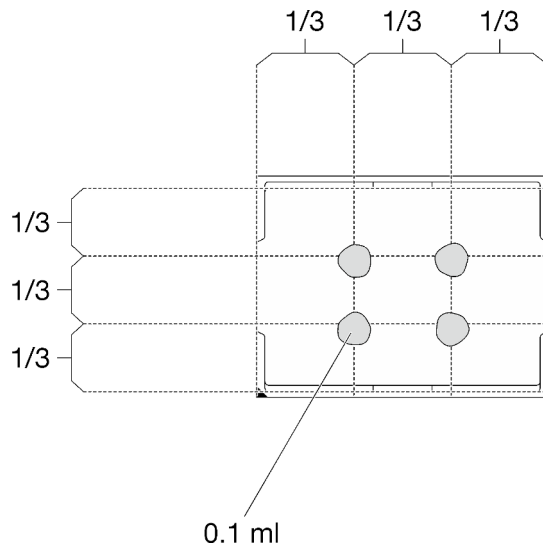
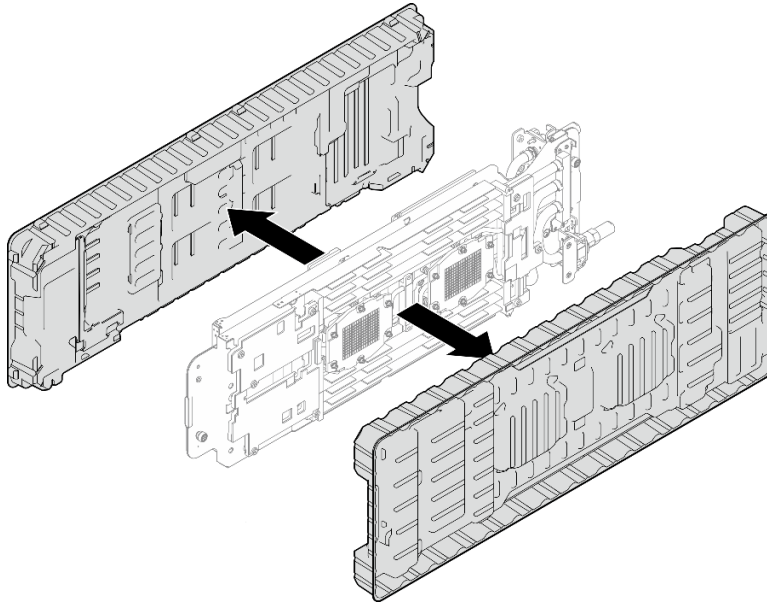


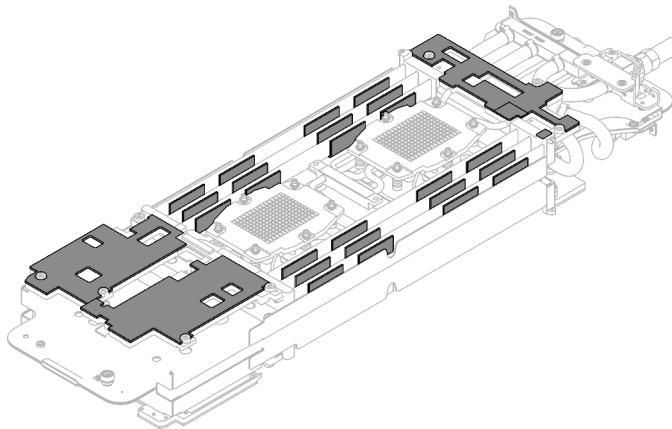
Figure 264. Thermal grease application

- Step 4. If needed, remove plastic grease covers from the underside of processor cold plates.



*Figure 265. Plastic grease covers removal*

- Step 5. Check the gap pads on the bottom side and top side of the water loop, if any of them are damaged or missing, replace them with the new ones.



*Figure 266. Water loop gap pads (bottom side)*



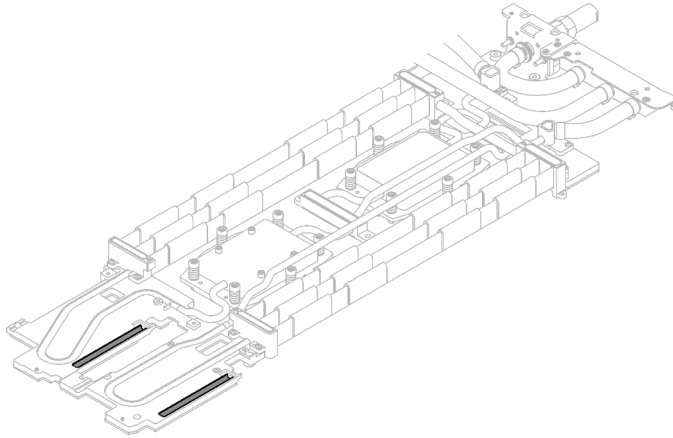


Figure 267. Water loop gap pads (top side)

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 6. Replace the putty pads on the water loop with new ones.

**Attention:** Putty pad cannot be reused. Whenever a component is removed, putty pads must be replaced with new ones before reinstalling the component.

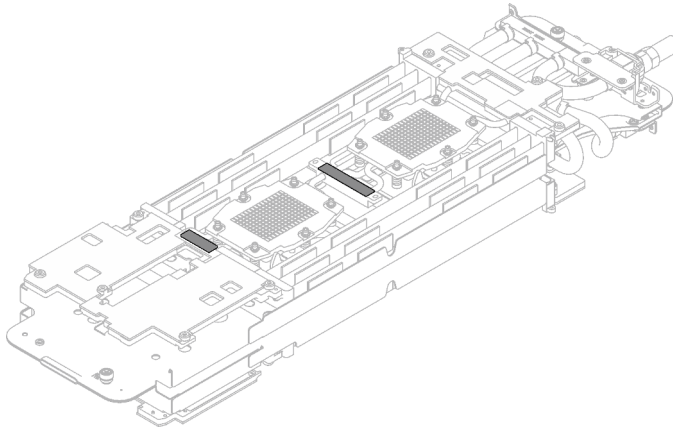


Figure 268. Water loop putty pads

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 7. Carefully rotate the top side of the water loop, position the water loop on the two guide pins near the rear of the node; then, gently put the water loop down and ensure it is firmly seated on the system board.

**Attention:** Make sure to align the water loop with the three guide pins on the right side compute node.

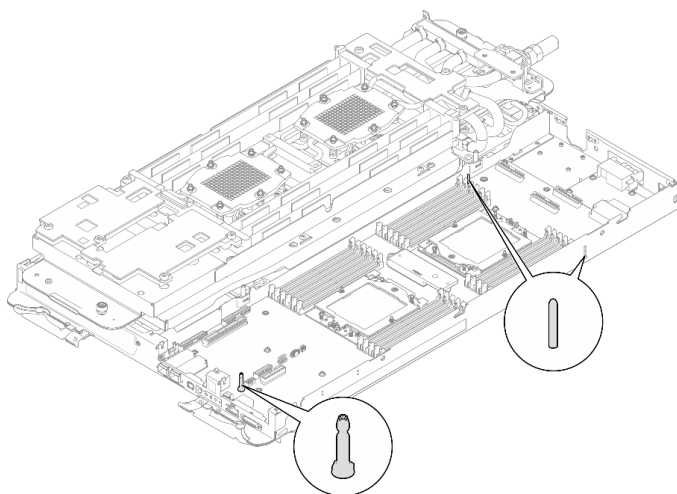


Figure 269. Guide pins on the compute node

**Attention:**

1. Slightly lift the water loop, then rotate it.
2. Do not tilt the water loop. Keep the water loop horizontal with the tray.
3. Install the water loop to the tray

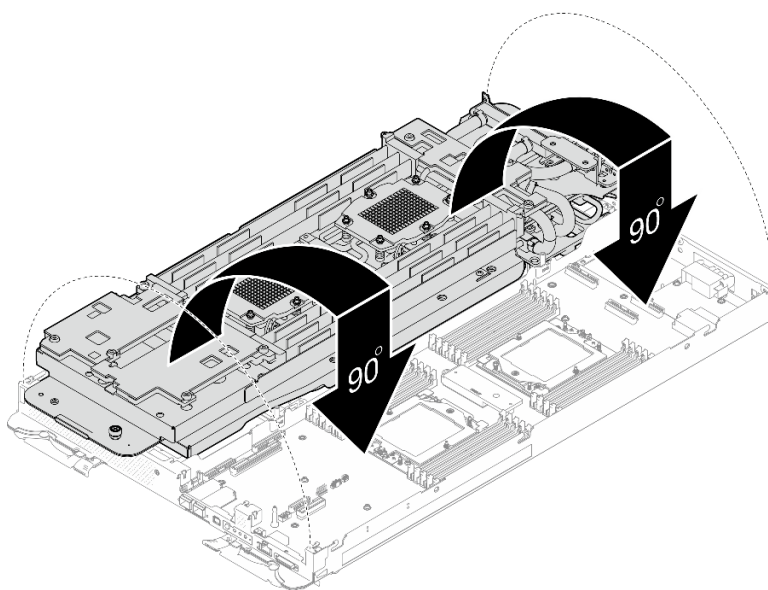


Figure 270. Water loop installation

Step 8. Install processor cold plate screws (x12 Torx T20 screws for the CPU node). Follow the screw sequence specified below and tighten the screws with a torque screwdriver. Fully tighten each screw; then, proceed to the next screw.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 1.12-1.46 newton-meters, 10-13 inch-pounds

Fully tighten each screw the order below:

Pro- ces- sor	Screw sequence
A	2 → 1 → 4 → 6 → 5 → 3
B	2 → 1 → 5 → 3 → 4 → 6

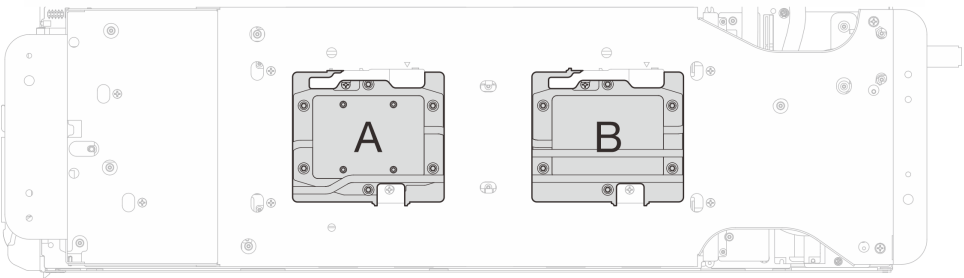
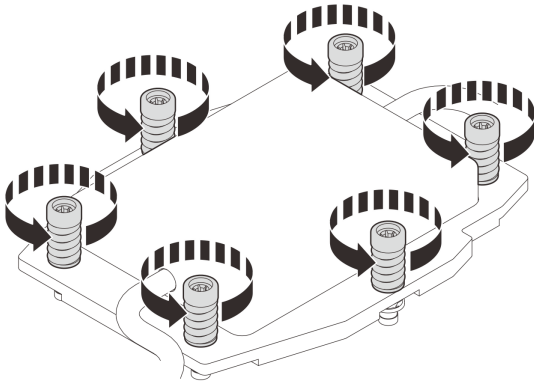
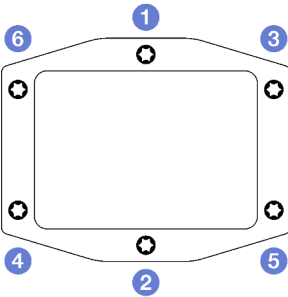
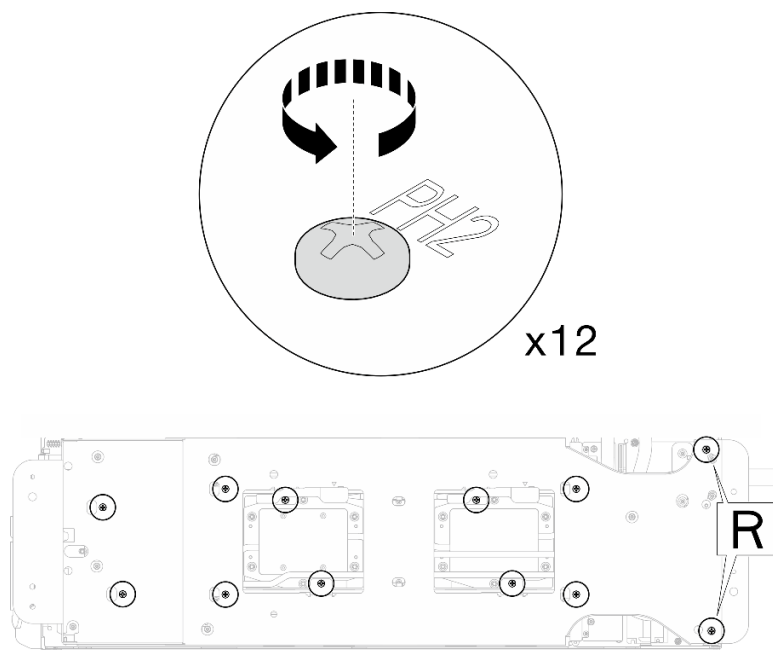


Figure 271. Processor cold plate installation

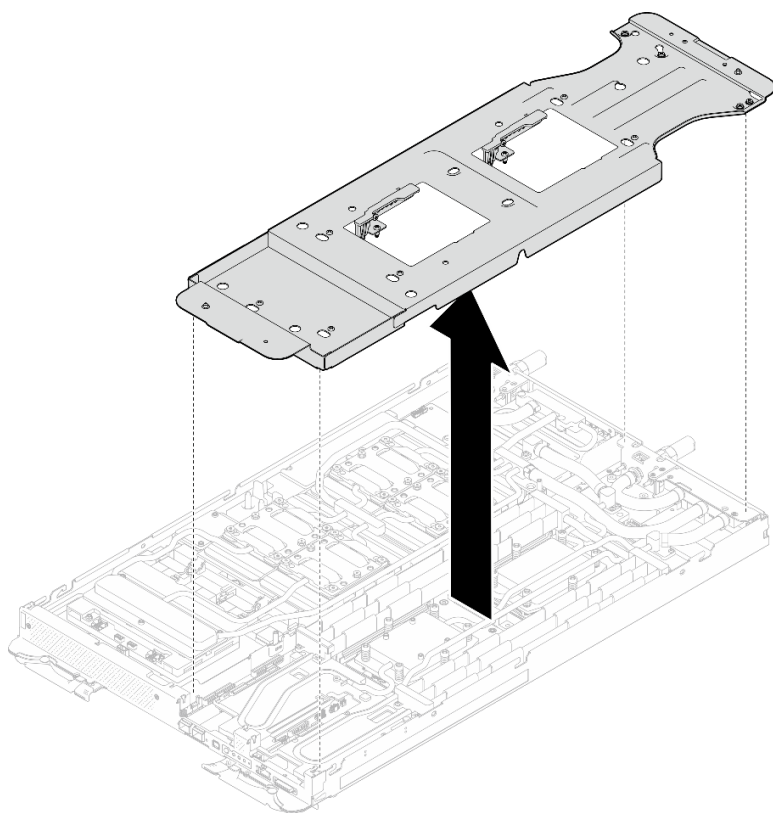
Step 9. Loosen water loop carrier screws (12x Phillips #2 screws).

**Note:** Select screw holes marked as **R** on the rear of the shipping bracket.



*Figure 272. Loosening water loop carrier screws*

Step 10. Remove the water loop carrier from the compute node.



*Figure 273. Water loop carrier removal (Compute node)*

Step 11. Install water loop screws and quick connect screws (14x Torx T10 screws per node) with a torque screwdriver set to the proper torque.

**Notes:**

- For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.
- Install the **1** VR cold plate screws (x2) with washers. Use the washers previously removed from the water loop.

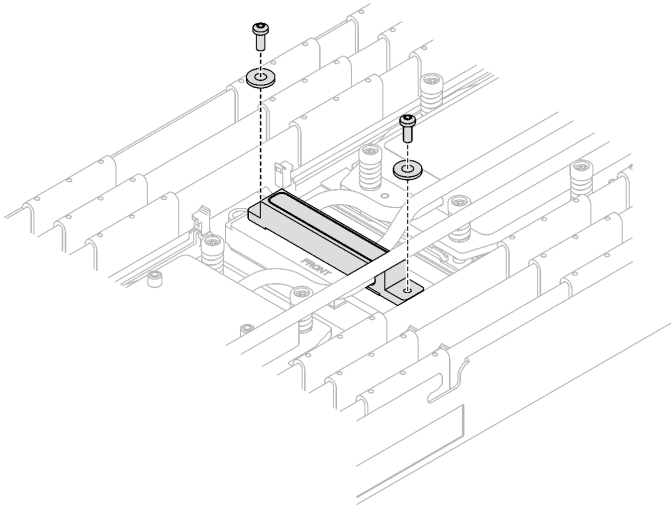


Figure 274. VR cold plate screws with washer

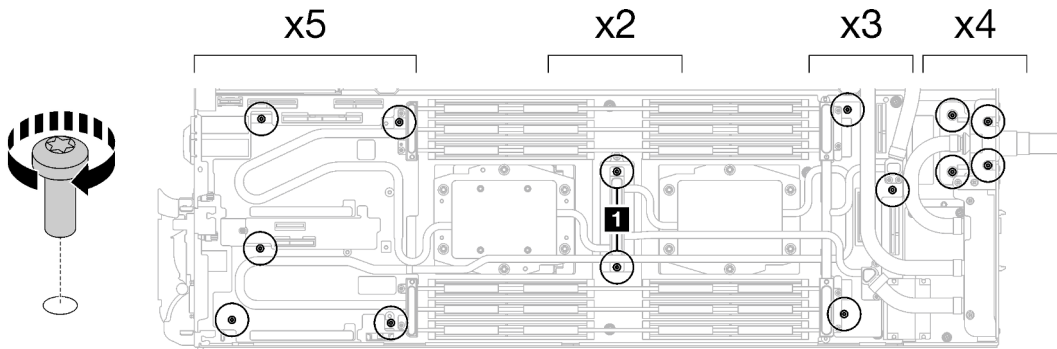


Figure 275. Water loop screws and quick connect screws installation

Step 12. Install the five Torx T10 screws to secure the quick connect.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

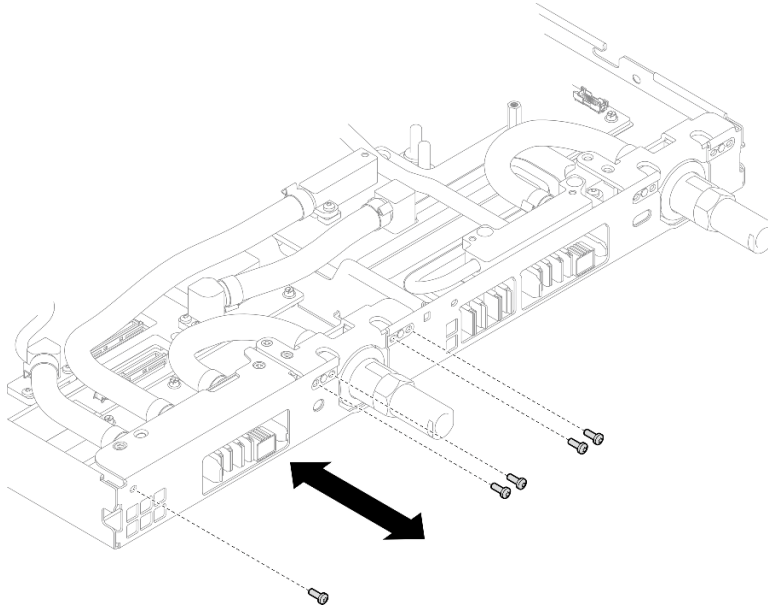


Figure 276. Quick connect screw installation (Compute node)

Step 13. Replace the putty pads on the top side and the bottom side of the OSFP module conduction plate.

**Attention: Putty pad cannot be reused. Whenever a component is removed, putty pads must be replaced with new ones before reinstalling the component.**

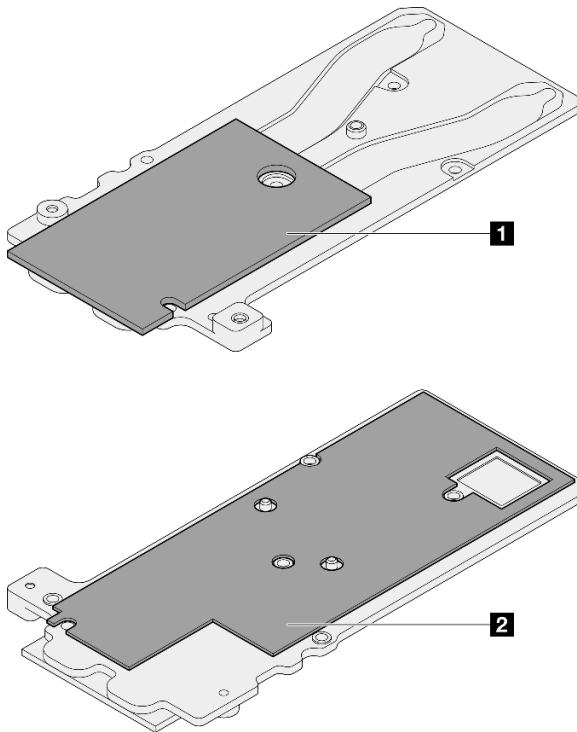


Figure 277. OSFP module conduction plate putty pads replacement

- |  |
|--|
| <b>1</b> Conduction plate top putty pad    |
| <b>2</b> Conduction plate bottom putty pad |

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 14. Install the OSFP module conduction plate onto the water loop.

Screw Type	Screwdriver Type
<b>1</b> M3x5 screw (x3)	Phillips #1 head screwdriver
<b>2</b> M3 screw (x2)	T10 screwdriver

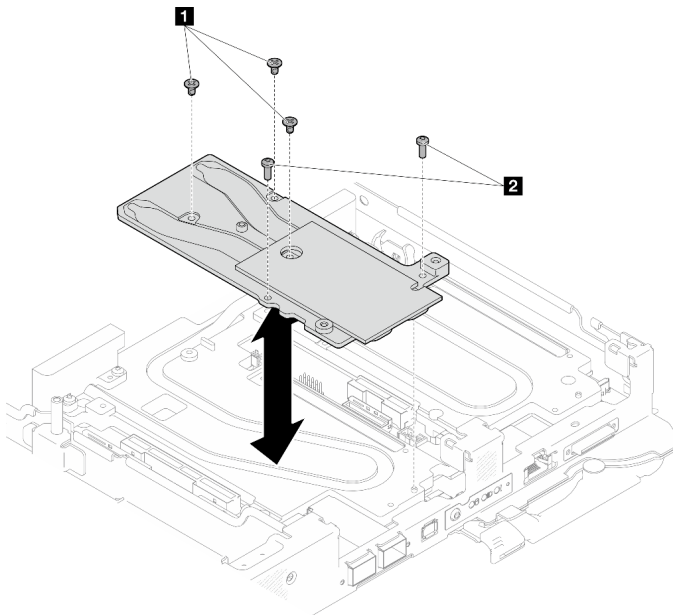


Figure 278. Installing the OSFP module conduction plate

Step 15. Install the two Hex screws to the OSFP module with a 4.5 mm hex head screwdriver.

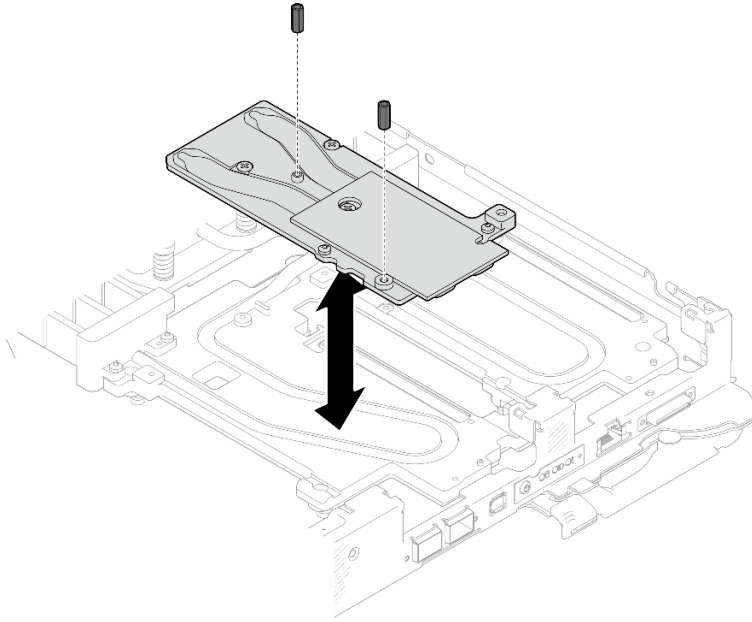


Figure 279. OSFP module conduction plate Hex screws installation

## After you finish

1. Install the OSFP module. See [“Install the OSFP module” on page 164](#).
2. Install the drive cage. See [“Install a drive cage assembly” on page 82](#).
3. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
4. Install the bus bar. See [“Install the bus bar” on page 267](#).
5. Install the M.2 backplane assembly. See [“Install the M.2 backplane assembly” on page 120](#).
6. Install the memory modules. See [“Install a memory module” on page 131](#).
7. Install the DIMM comb. See [“Install a DIMM comb” on page 72](#).
8. Install the cross braces. See [“Install the cross braces” on page 21](#).
9. Install the tray cover. See [“Install the tray cover” on page 18](#).
10. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
11. Connect all required external cables to the solution.

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

12. 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](#)

## Processor socket protective film replacement

Use the following procedures to remove and install the processor socket protective film.

### Remove the processor socket protective film

This task has instructions for removing the processor socket protective film.



## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Compute node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 OSFP Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Drive gap pad or putty pad kits according to the drives installed in the tray. See their respective replacement procedures for more information.
- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Hex screw	6 mm hex head screwdriver
Torx T10 screw	Torx T10 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

## Procedure

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

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- c. Remove the cross braces. See [“Remove the cross braces” on page 19](#).
- d. Remove the DIMM comb. See [“Remove a DIMM comb” on page 71](#).
- e. Remove memory modules. See [“Remove a memory module” on page 124](#).
- f. Remove the M.2 backplane assembly. See [“Remove the M.2 backplane assembly” on page 113](#).

- g. Remove the bus bar. See [“Remove the bus bar” on page 266](#).
- h. Remove the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
- i. Remove the drive cage. See [“Remove a drive cage assembly” on page 74](#).
- j. Remove the OSFP module. See [“Remove the OSFP module” on page 139](#).

Step 2. Remove the two Hex screws from the OSFP module with a 4.5 mm hex head screwdriver.

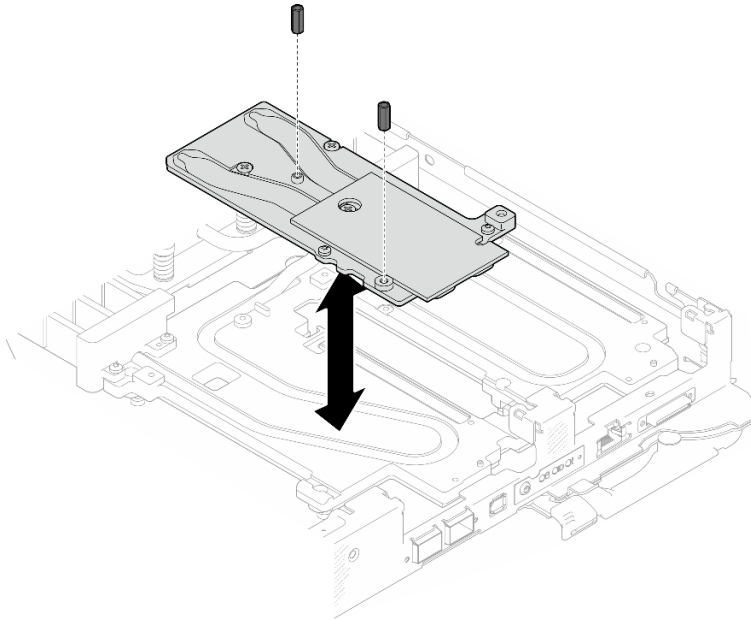


Figure 280. OSFP module conduction plate Hex screws removal

Step 3. Remove the OSFP module conduction plate. With alcohol cleaning pads, wipe of any remaining putty pads from the conduction plate.

Screw Type	Screwdriver Type
<b>1</b> M3x5 screw (x3)	Phillips #1 head screwdriver
<b>2</b> M3 screw (x2)	T10 screwdriver

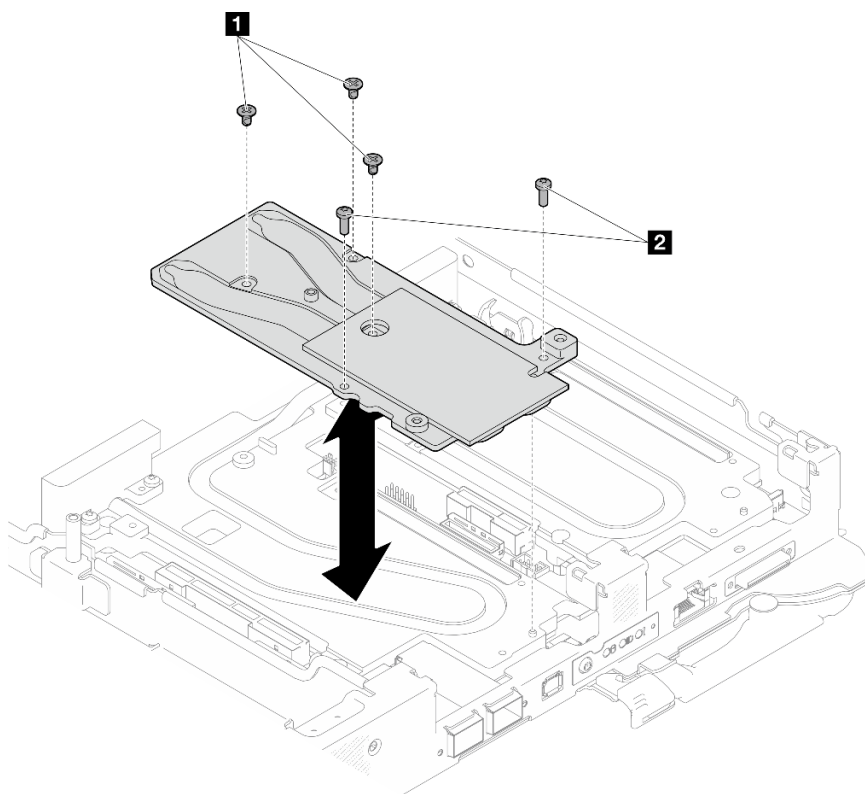


Figure 281. OSFP module conduction plate removal

Step 4. Remove the five Torx T10 screws to loosen the quick connect.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

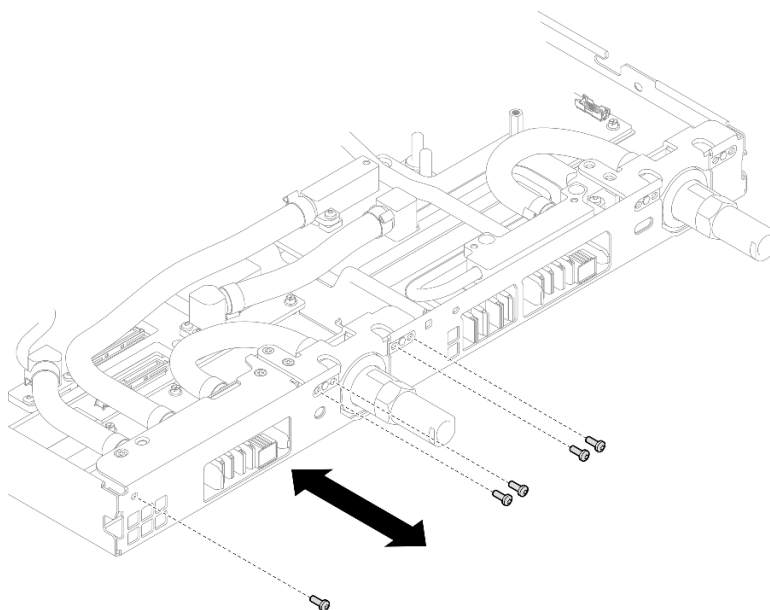


Figure 282. Quick connect screw removal (Compute node)

Step 5. Remove water loop screws and quick connect screws (14x Torx T10 screws per node) with a torque screwdriver set to the proper torque.

**Notes:**

- For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.
- When removing the **1** VR cold plate screws (x2), remove the washers, too. **Make sure** to keep the washers for future use.

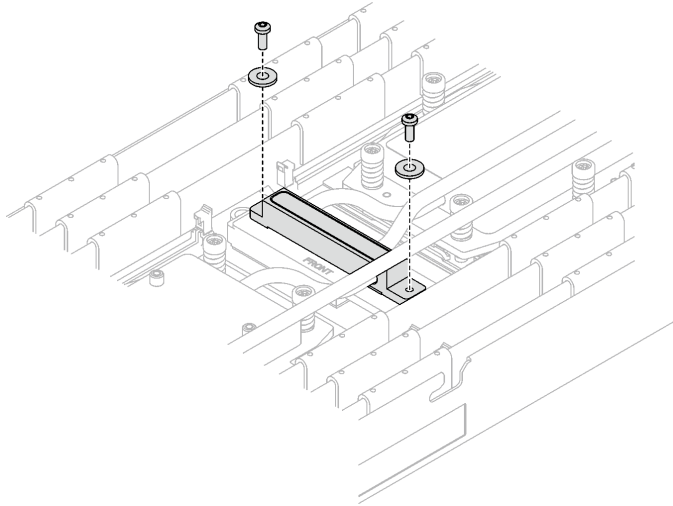


Figure 283. VR cold plate screws with washer

**1** VR cold plate screws (x2)

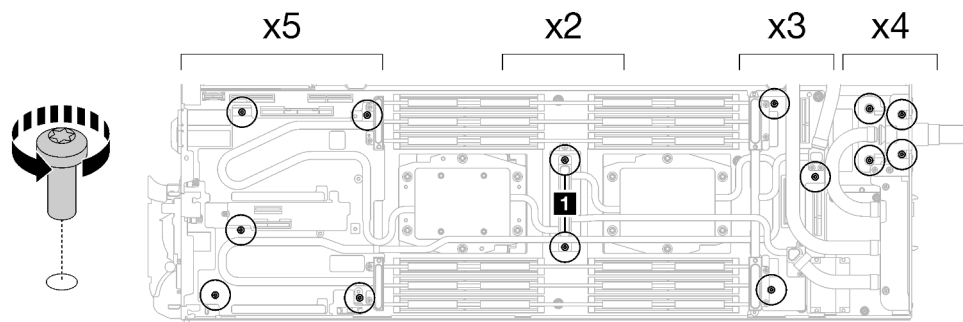


Figure 284. Water loop screw removal

Step 6. Remove processor cold plate screws (12x Torx T20 screws per node). Follow the screw sequence specified on the processor cold plate label and loosen the screws with a general screwdriver. Fully loosen each screw; then, proceed to the next screw.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 1.12-1.46 newton-meters, 10-13 inch-pounds

Fully loosen each screw in this order: 6 → 5 → 4 → 3 → 2 → 1

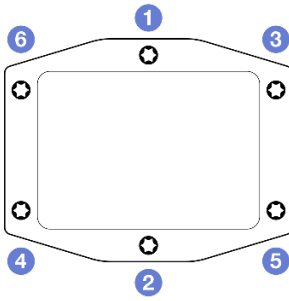


Figure 285. Processor cold plate label

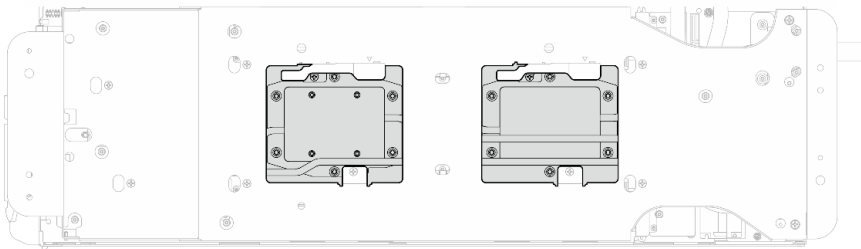
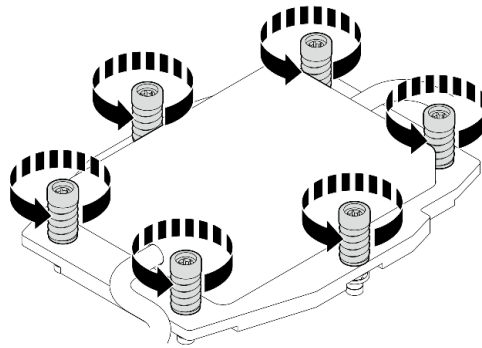
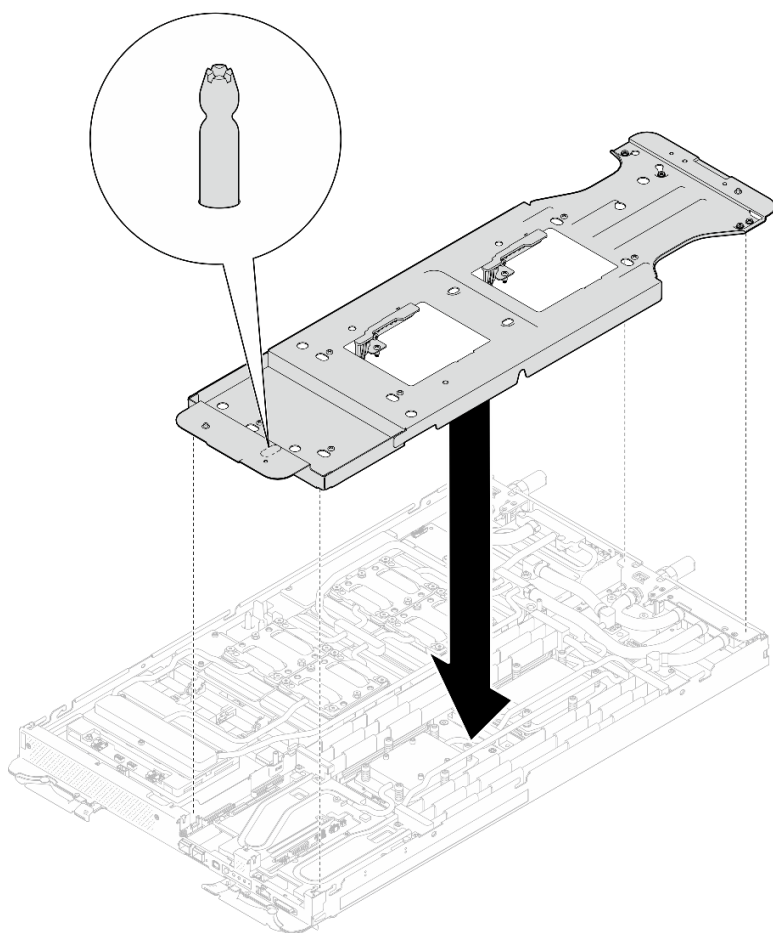


Figure 286. Processor cold plate removal

- Step 7. Orient the water loop carrier with the guide pin; then, gently put the water loop carrier down and ensure it is seated firmly on the water loop.



*Figure 287. Water loop carrier installation (Compute node)*

Step 8. Tighten water loop carrier screws (x12 Phillips #2 screws).

**Note:** Select screw holes marked as **R** on the rear of the shipping bracket.

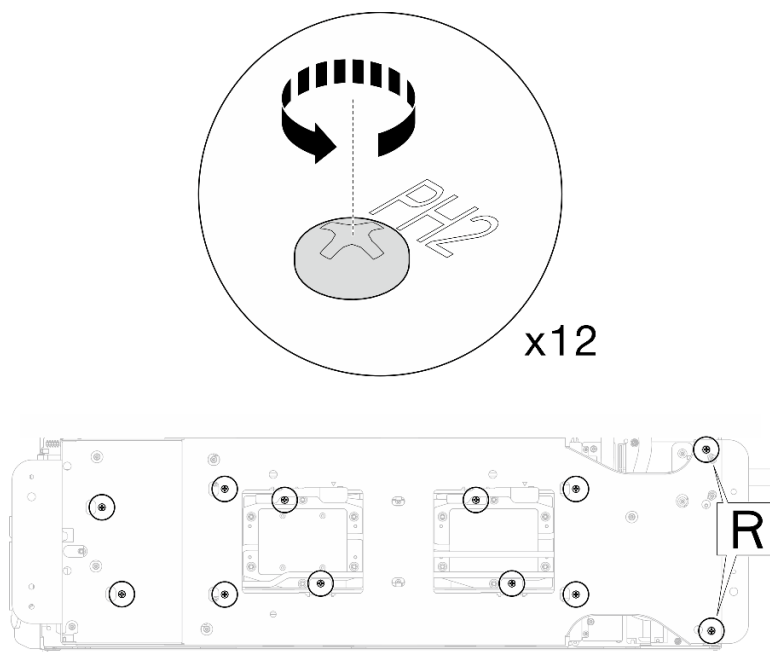


Figure 288. Water loop carrier screws installation (Compute node)

Step 9. Rotate the latch on the water loop carrier to separate the water loop from processors.

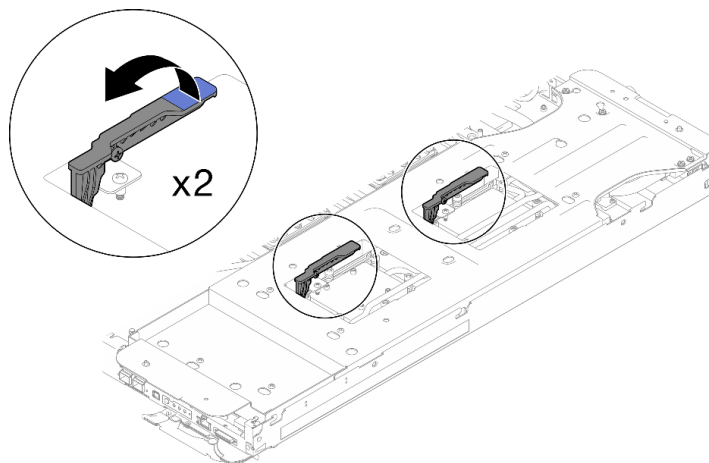


Figure 289. Separate water loop from processor

Step 10. Carefully rotate the water loop so one half is sitting on top of the other half.

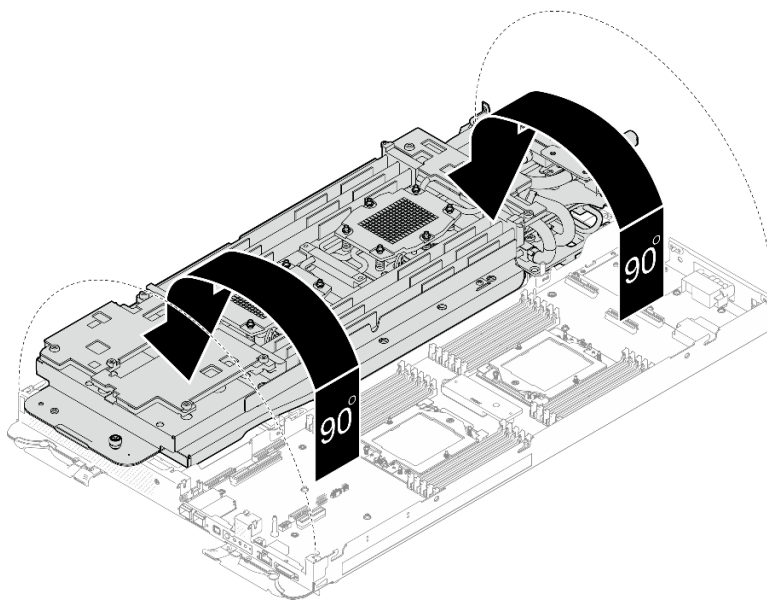


Figure 290. Folding the water loop

Step 11. Remove the processor socket protective film from the processor socket.

**Attention:** Processor socket protective film can only be installed in processor socket 2.

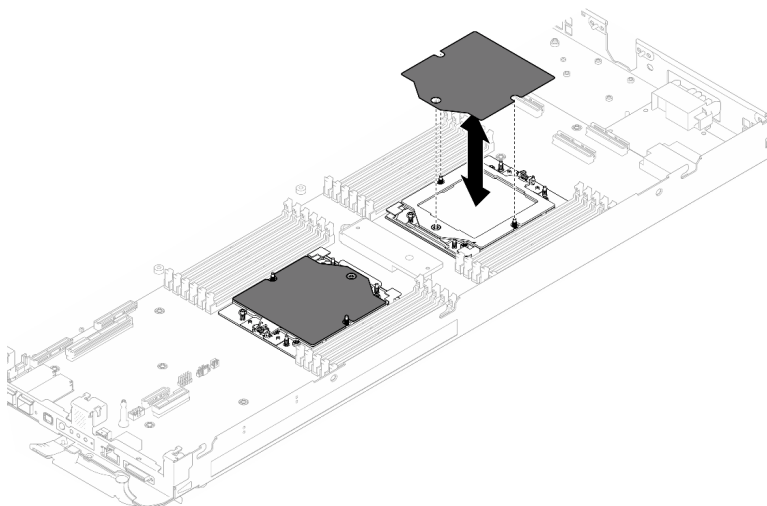


Figure 291. Processor socket protective film removal

Step 12. With an alcohol cleaning pad, wipe off any remaining thermal grease from the water loop and from the top of the processor.

## 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 the processor socket protective film

This task has instructions for installing the processor socket protective film.

### About this task

#### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

#### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Compute node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 OSFP Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Drive gap pad or putty pad kits according to the drives installed in the tray. See their respective replacement procedures for more information.
- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Hex screw	6 mm hex head screwdriver
Torx T10 screw	Torx T10 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

## Procedure

Step 1. Install the processor socket protective film to the processor socket.

**Attention:** Processor socket protective film can only be installed in processor socket 2.

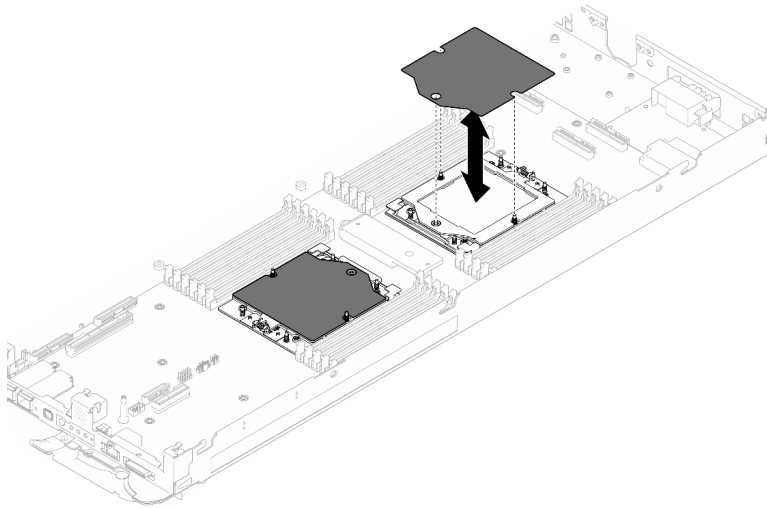


Figure 292. Processor socket protective film installation

Step 2. Apply the thermal grease on the top of the processor with syringe by forming four uniformly spaced dots, while each dot consists of about 0.1 ml of thermal grease.

**Note:** Carefully place the processor and retainer on a flat surface with the processor-contact side down.

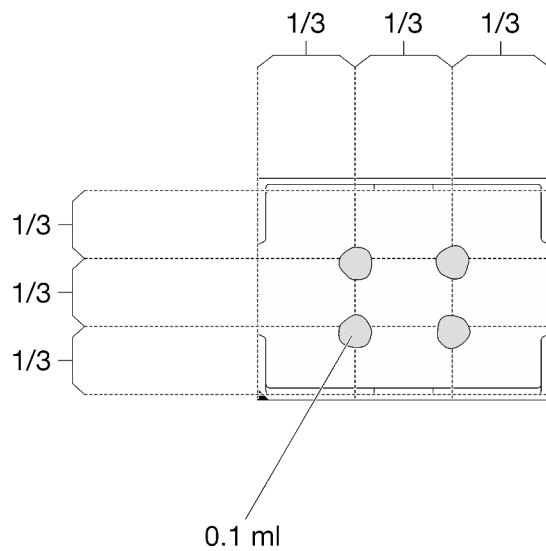


Figure 293. Thermal grease application

Step 3. If needed, remove plastic grease covers from the underside of processor cold plates.

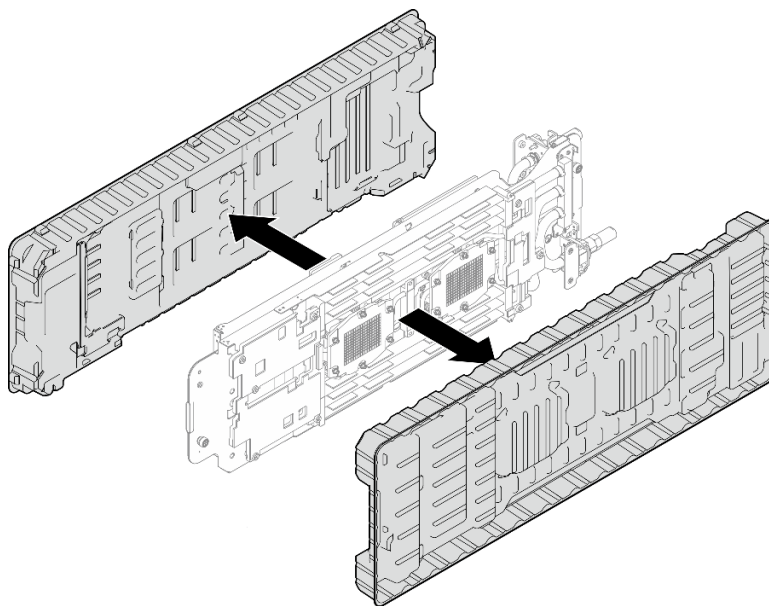


Figure 294. Plastic grease covers removal

Step 4. Check the gap pads on the bottom side and top side of the water loop, if any of them are damaged or missing, replace them with the new ones.

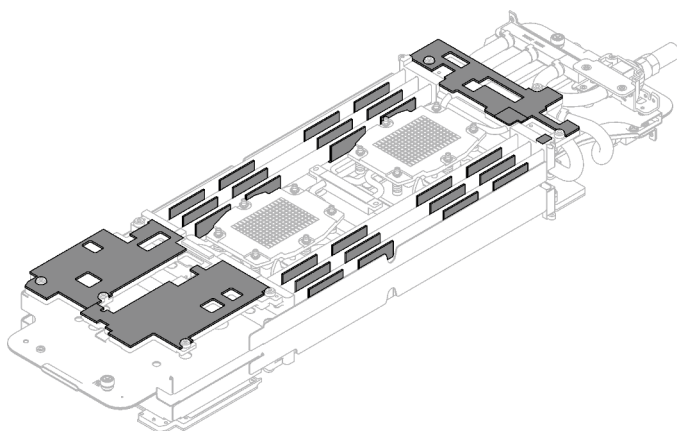


Figure 295. Water loop gap pads (bottom side)

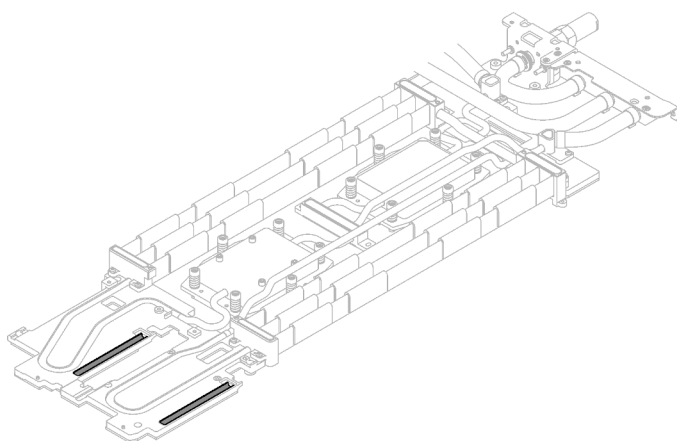


Figure 296. Water loop gap pads (top side)

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 5. Replace the putty pads on the water loop with new ones.

**Attention: Putty pad cannot be reused. Whenever a component is removed, putty pads must be replaced with new ones before reinstalling the component.**

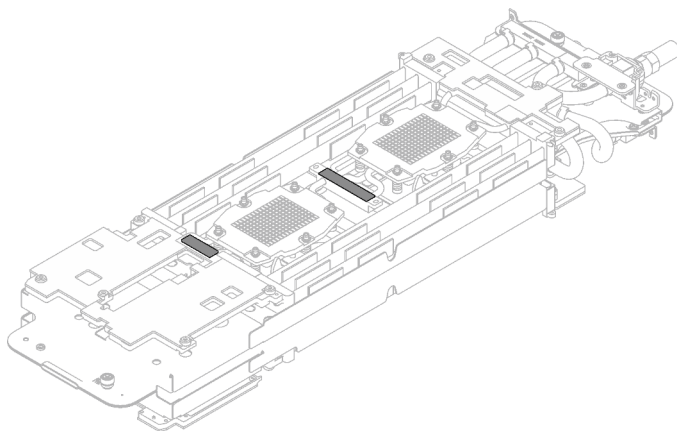


Figure 297. Water loop putty pads

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 6. Carefully rotate the top side of the water loop, position the water loop on the two guide pins near the rear of the node; then, gently put the water loop down and ensure it is firmly seated on the system board.

**Attention:** Make sure to align the water loop with the three guide pins on the right side compute node.

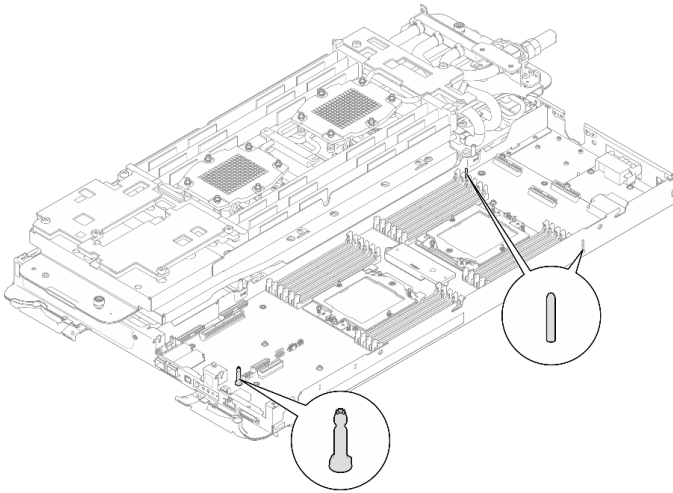


Figure 298. Guide pins on the compute node

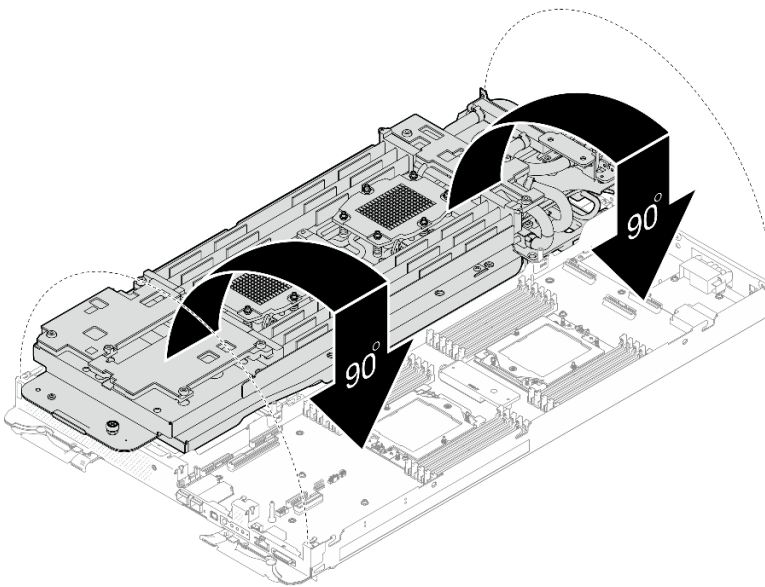


Figure 299. Water loop installation

Step 7. Install processor cold plate screws (x12 Torx T20 screws for the CPU node). Follow the screw sequence specified below and tighten the screws with a torque screwdriver. Fully tighten each screw; then, proceed to the next screw.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 1.12-1.46 newton-meters, 10-13 inch-pounds

Fully tighten each screw the order below:

Pro- ces- sor	Screw sequence
A	2 → 1 → 4 → 6 → 5 → 3
B	2 → 1 → 5 → 3 → 4 → 6

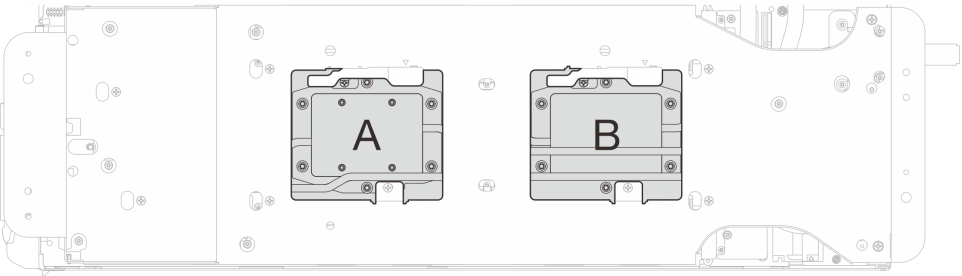
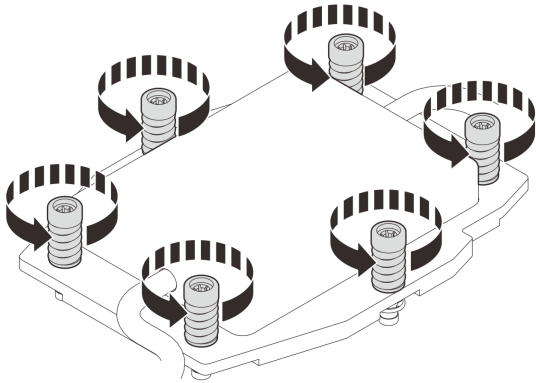
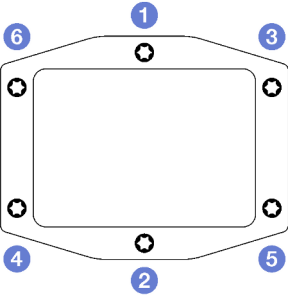


Figure 300. Processor cold plate installation

Step 8. Loosen water loop carrier screws (12x Phillips #2 screws).

**Note:** Select screw holes marked as **R** on the rear of the shipping bracket.

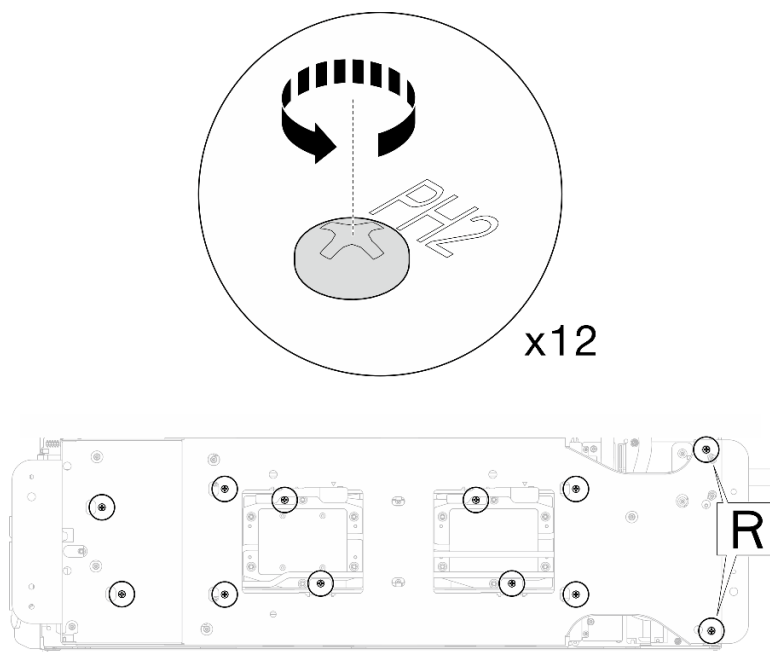


Figure 301. Loosening water loop carrier screws

Step 9. Remove the water loop carrier from the compute node.

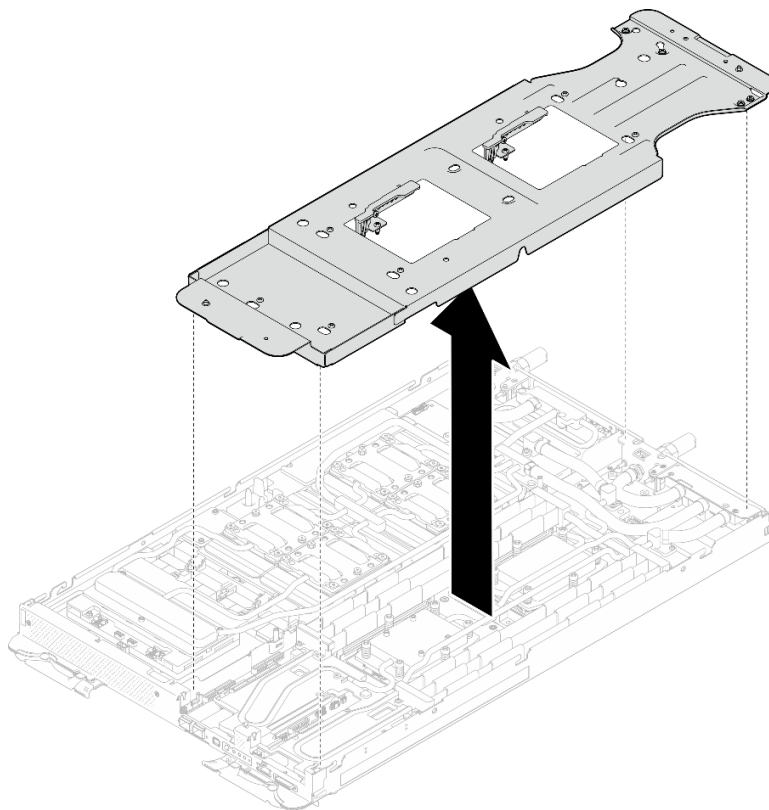


Figure 302. Water loop carrier removal (Compute node)

Step 10. Install water loop screws and quick connect screws (14x Torx T10 screws per node) with a torque screwdriver set to the proper torque.

**Notes:**

- For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.
- Install the **1** VR cold plate screws (x2) with washers. Use the washers previously removed from the water loop.

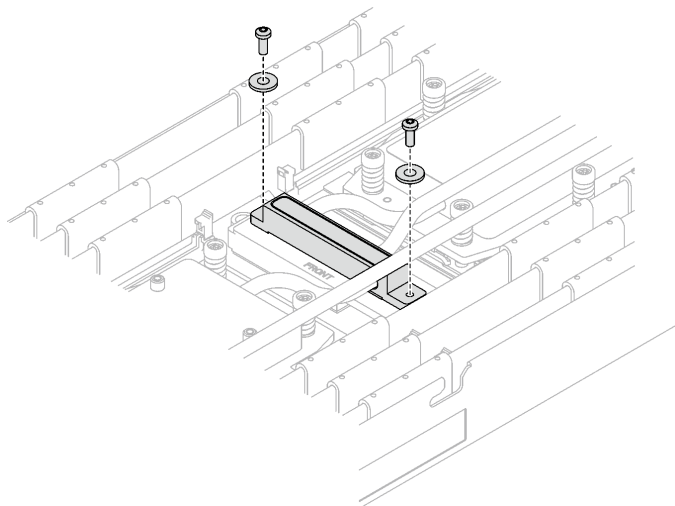


Figure 303. VR cold plate screws with washer

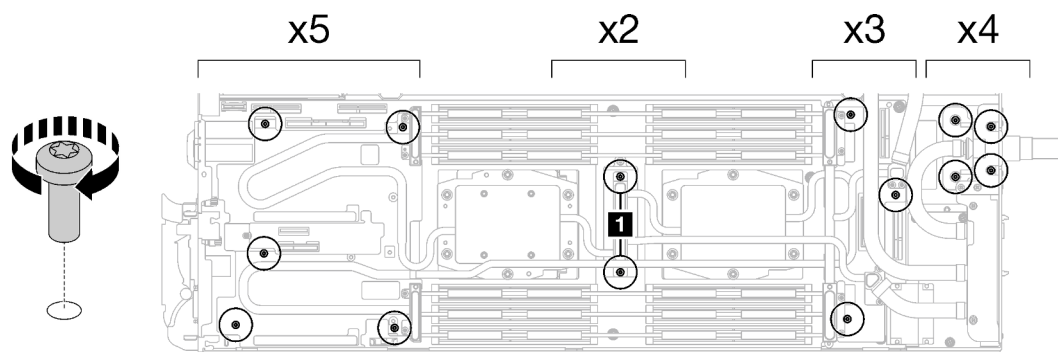


Figure 304. Water loop screws and quick connect screws installation

Step 11. Install the five Torx T10 screws to secure the quick connect.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



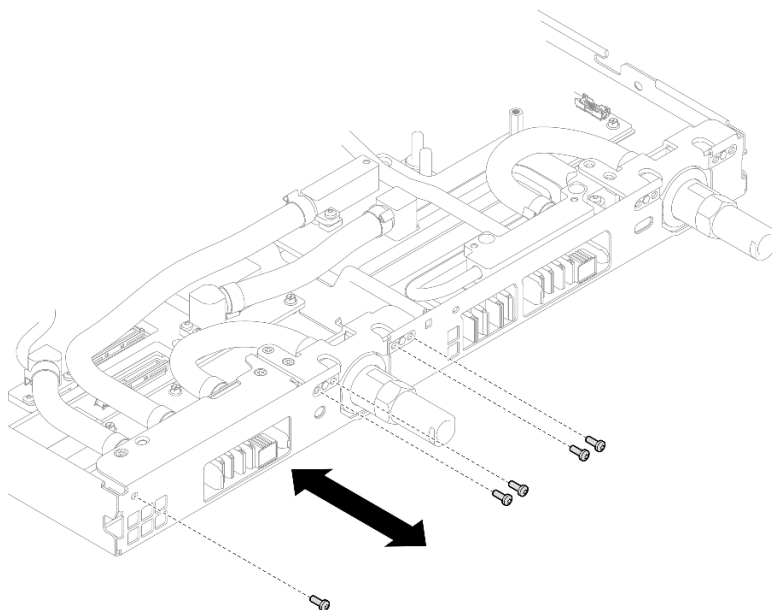


Figure 305. Quick connect screw installation (Compute node)

Step 12. Replace the putty pads on the top side and the bottom side of the OSFP module conduction plate.

**Attention: Putty pad cannot be reused. Whenever a component is removed, putty pads must be replaced with new ones before reinstalling the component.**

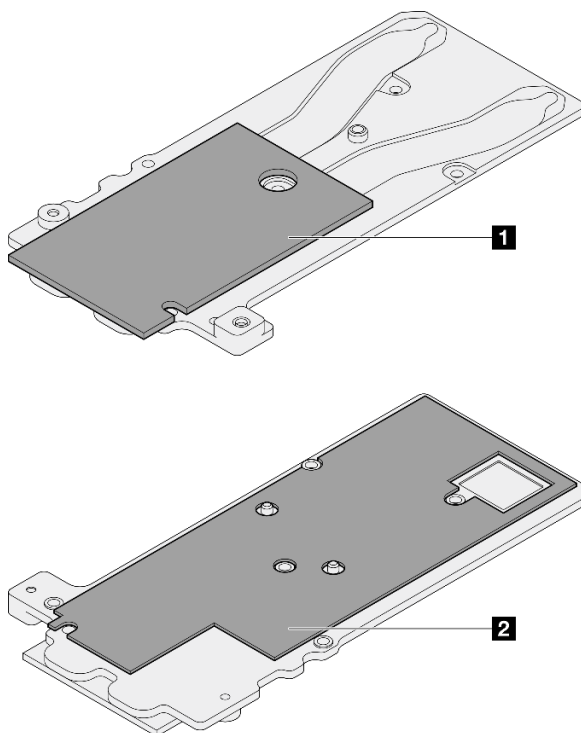


Figure 306. OSFP module conduction plate putty pads replacement

- 1** Conduction plate top putty pad
- 2** Conduction plate bottom putty pad

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 13. Install the OSFP module conduction plate onto the water loop.

Screw Type	Screwdriver Type
<b>1</b> M3x5 screw (x3)	Phillips #1 head screwdriver
<b>2</b> M3 screw (x2)	T10 screwdriver

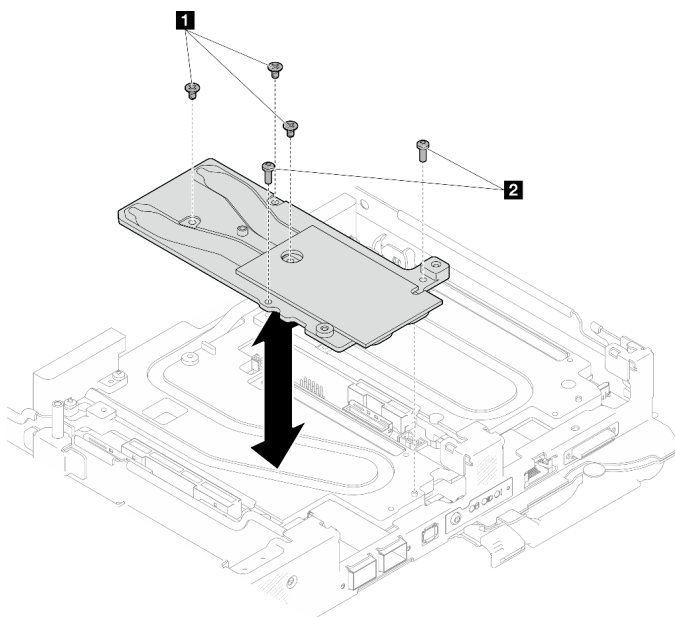


Figure 307. Installing the OSFP module conduction plate

Step 14. Install the two Hex screws to the OSFP module with a 4.5 mm hex head screwdriver.

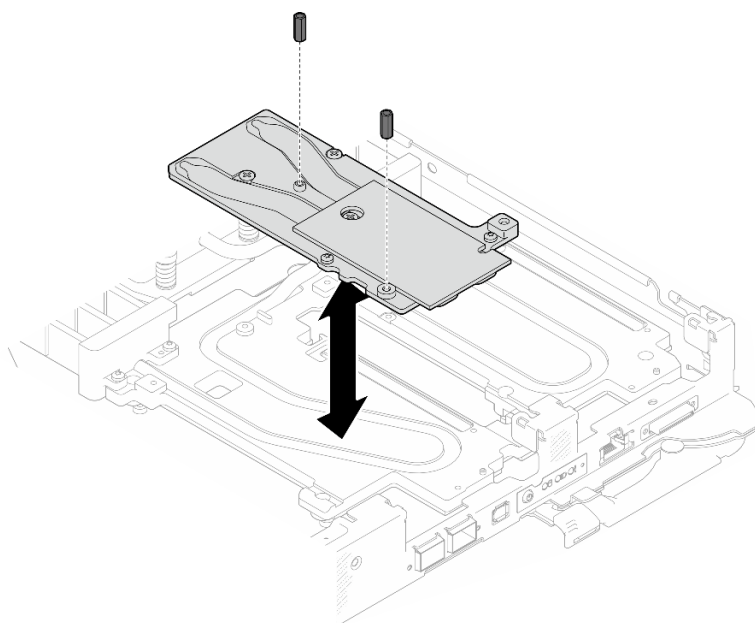


Figure 308. OSFP module conduction plate Hex screws installation

## After you finish

1. Install the OSFP module. See [“Install the OSFP module” on page 164](#).
2. Install the drive cage. See [“Install a drive cage assembly” on page 82](#).
3. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
4. Install the bus bar. See [“Install the bus bar” on page 267](#).
5. Install the M.2 backplane assembly. See [“Install the M.2 backplane assembly” on page 120](#).
6. Install the memory modules. See [“Install a memory module” on page 131](#).
7. Install the DIMM comb. See [“Install a DIMM comb” on page 72](#).
8. Install the cross braces. See [“Install the cross braces” on page 21](#).
9. Install the tray cover. See [“Install the tray cover” on page 18](#).
10. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
11. Connect all required external cables to the solution.

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

12. 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.

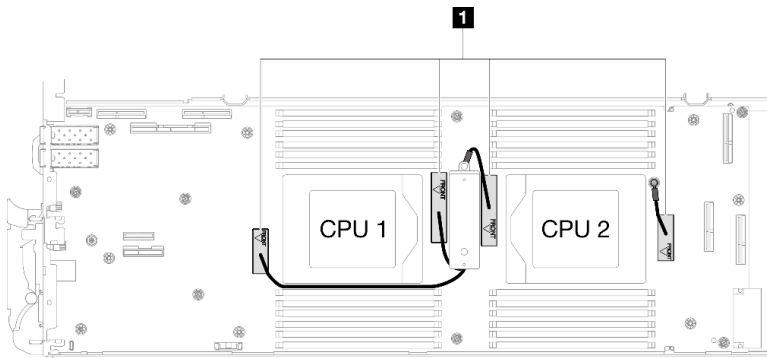
## System board replacement (trained technician only)

Follow instructions in this section to remove and install the system board.

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

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

3. **Make sure** that the dust cover is securely attached to the CPU socket assembly.
4. This task must be operated by trained technicians that are certified by Lenovo Service. Do no attempt to remove or install it without proper training and qualification
5. Before replacing a system board, go to [Service process for updating PSB fuse state](#) and do the following:
  - Check the current PSB fuse policy before replacement.
  - Ensure that the processor fuse status is expected without unexpected XCC event logs after replacement.
6. When removing the system board, **do not** remove the shielding cables (1) from the system board.



## Remove the system board

Use this information to remove the system board.

### About this task

**Important:** Before powering off the server, make sure to read the GPU power capping value following the instructions in “GPU power capping settings (trained technician only)” in *SD665-N V3 User Guide*.

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Compute node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 OSFP Putty Pad Kit
- VR 2.5 mm Putty Pad
- Shielding cables

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

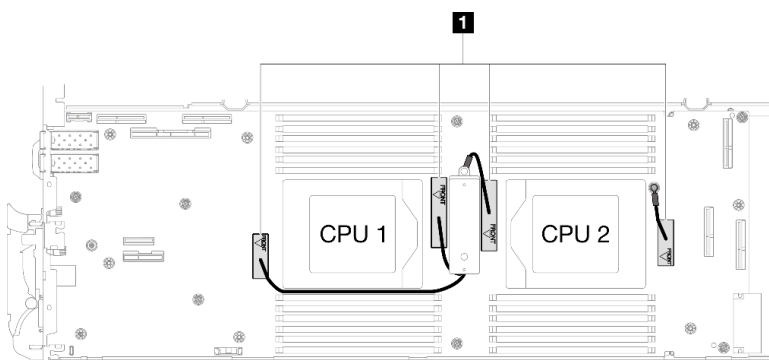
- Drive gap pad or putty pad kits according to the drives installed in the tray. See their respective replacement procedures for more information.
- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screwdriver Type	Screw Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Hex screw (OSFP module conduction plate)	4.5 mm hex head screwdriver
Torx T10 head screwdriver	Torx T10 screw
Torx T20 head screwdriver	Torx T20 screw
Phillips #1 head screwdriver	M3 screw
Phillips #2 head screwdriver	Phillips #2 screw
3/16" hex head screwdriver	M3 screw

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- When removing the system board, **do not** remove the shielding cables (1) from the system board.



## Procedure

Step 1. Make preparations for this task.

- Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- Remove the cross braces. See [“Remove the cross braces” on page 19](#).
- Remove the DIMM comb. See [“Remove a DIMM comb” on page 71](#).
- Remove memory modules. See [“Remove a memory module” on page 124](#).
- Remove the M.2 backplane assembly. See [“Remove the M.2 backplane assembly” on page 113](#).
- Remove the bus bar. See [“Remove the bus bar” on page 266](#).
- Remove the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).

- i. Remove the drive cage. See [“Remove a drive cage assembly” on page 74.](#)
  - j. Remove the OSFP module. See [“Remove the OSFP module” on page 139.](#)
- Step 2. Remove the processors, and carefully rotate the water loop so one half is sitting on top of the other half. See [“Remove a processor” on page 190.](#)
- Step 3. Remove the power distribution board. See [“Remove the power distribution board” on page 171.](#)
- Step 4. Remove the two KVM screws from the front of the node with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to fully tightened/removed is 1.3+/-0.5 lb-in, 0.15+/- 0.05 N-M.

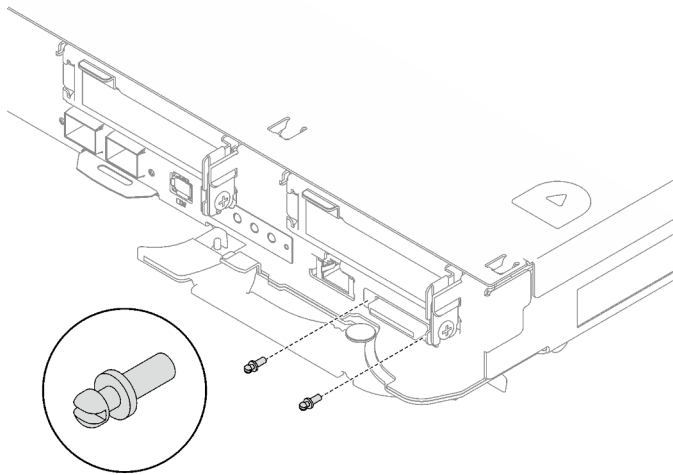


Figure 309. KVM screws removal

- Step 5. Remove the two M3 screws to remove the VR conduction plate out of the system board.

**Note:** Keep the VR conduction plate for future use.

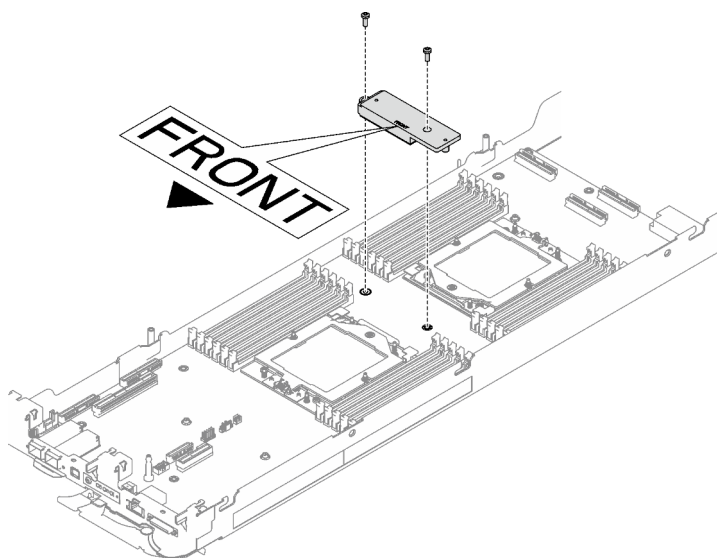


Figure 310. VR conduction plate removal

- Step 6. Remove eight M3 screws per node on the system board with a 3/16" hex head screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

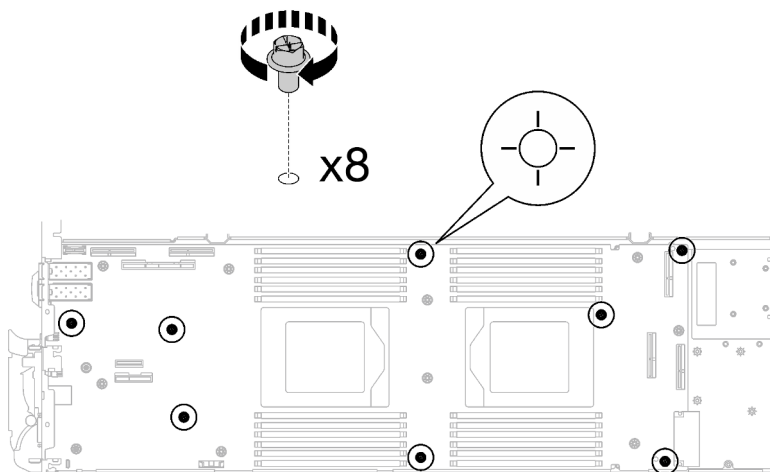


Figure 311. System board screws removal

- Step 7. Carefully hold the guide pin and tilt the system board at an angle; then, gently slide and lift the system board backwards to remove the system board from the node.

**Note:** Avoid touching the connectors on the system board. Be careful not to damage any surrounding components inside the node.

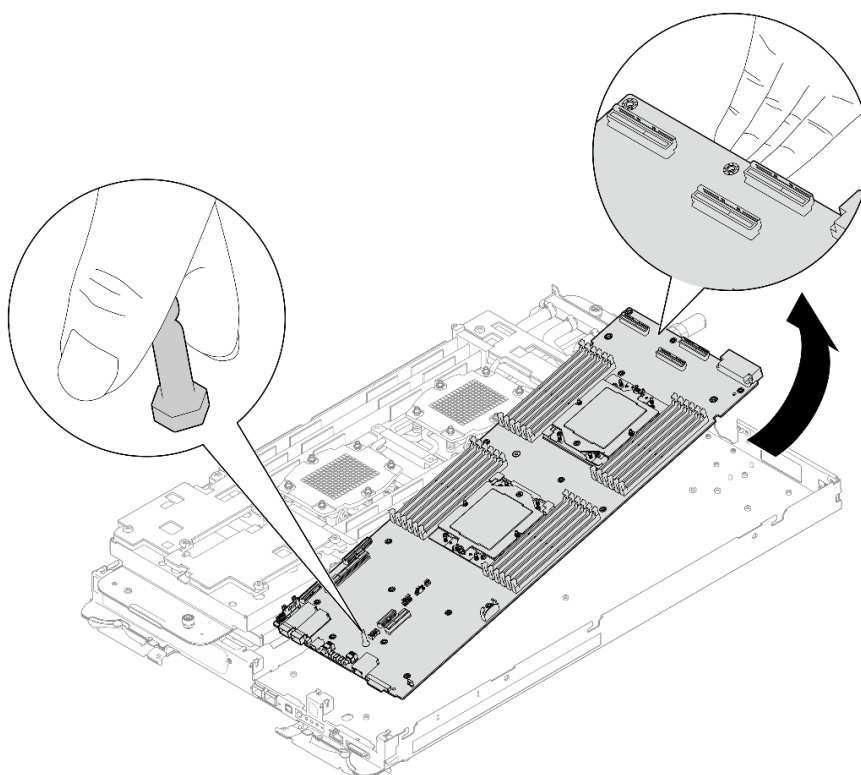


Figure 312. System board removal

## 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.

- For installing a new system board, see [“Install the system board” on page 237](#).
- For transferring the system board to another tray, see [“Transfer the system board” on page 251](#).

**Important:** Before you return the system board, make sure that you install the processor socket dust covers from the new system board. To replace a processor socket dust cover:

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

If you need to disassemble the system board, follow the instructions below:

**Attention:** You can only disassemble the system board for recycle. Do not disassemble it for any other purposes.

1. Remove the guide pin out of the system board.



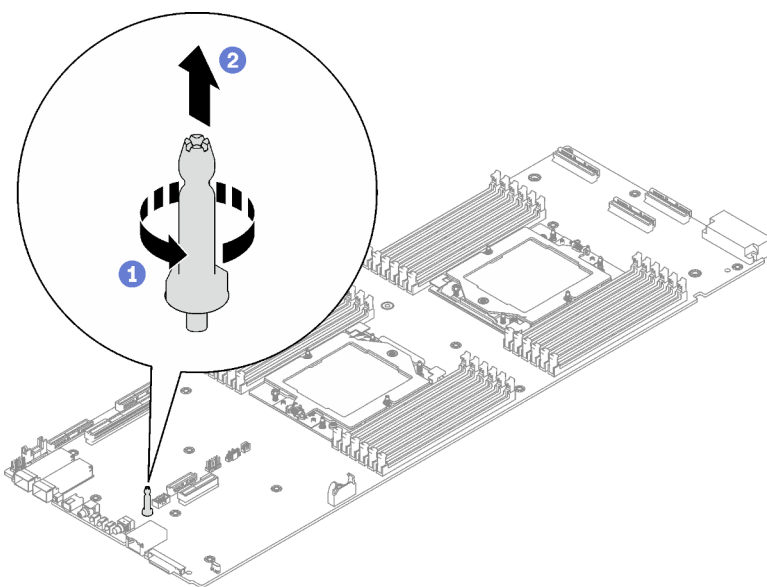


Figure 313. Guide pin removal

2. Recycle the unit in compliance with local regulations.

### Demo video

[Watch the procedure on YouTube](#)

## Install the system board

Use this information to install the system board.

### About this task

**Note:** If you are transferring the system board to another tray, see [“Transfer the system board” on page 251](#).

**Important:** After powering on the server, make sure to configure the GPU power capping value following the instructions in “GPU power capping settings (trained technician only)” in *SD665-N V3 User Guide*.

#### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- Compute node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 OSFP Putty Pad Kit
- VR 2.5 mm Putty Pad
- Shielding cables

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Drive gap pad or putty pad kits according to the drives installed in the tray. See their respective replacement procedures for more information.
- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screwdriver Type	Screw Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Hex screw (OSFP module conduction plate)	4.5 mm hex head screwdriver
Torx T10 head screwdriver	Torx T10 screw
Torx T20 head screwdriver	Torx T20 screw
Phillips #1 head screwdriver	M3 screw
Phillips #2 head screwdriver	Phillips #2 screw
3/16" hex head screwdriver	M3 screw

#### Attention:

- Read “[Installation Guidelines](#)” on page 3 and “[Safety inspection checklist](#)” on page 4 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

**Note:** After XCC and UEFI firmware updates, more than one system reboot cycles are to be expected. Times of reboot cycle depends on firmware update revision. Do not shut down the system until entering UEFI setup menu or the operating system.

## Procedure

#### Notes:

- Depending on the model, your solution might look slightly different from the illustration.

- If you are transferring the system board to another tray, see [“Transfer the system board” on page 251](#).

Step 1. Replace the VR conduction plate putty pad. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

- a. ❶ With an alcohol cleaning pad, remove the residual putty pad from the VR conduction plate removed previously. The putty pads are on the bottom side of the VR conduction plate.
- b. ❷ Paste the VR 2.5 mm Putty Pad to the bottom side of the VR conduction plate.

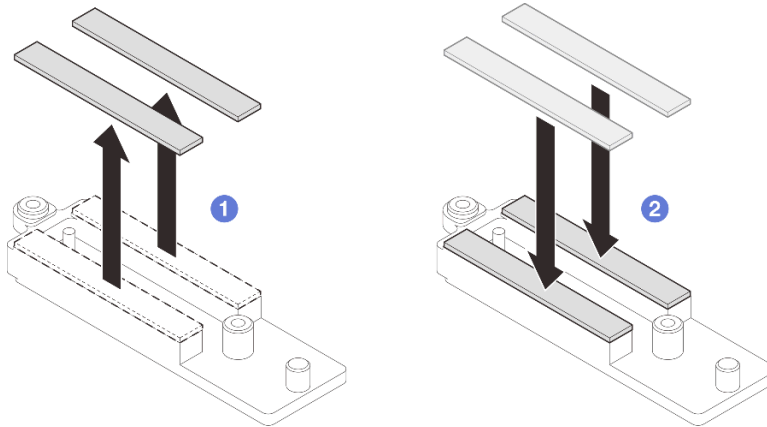


Figure 314. Replacing the VR conduction plate putty pads

Step 2. Install the system board.

- a. Carefully hold the front guide pin and tilt the system board at an angle.
- b. Align the connectors with the corresponding holes on the front of the node; then, gently slide the system board forward.

**Note:** Avoid touching the connectors on the system board. Be careful not to damage any surrounding components inside the node.

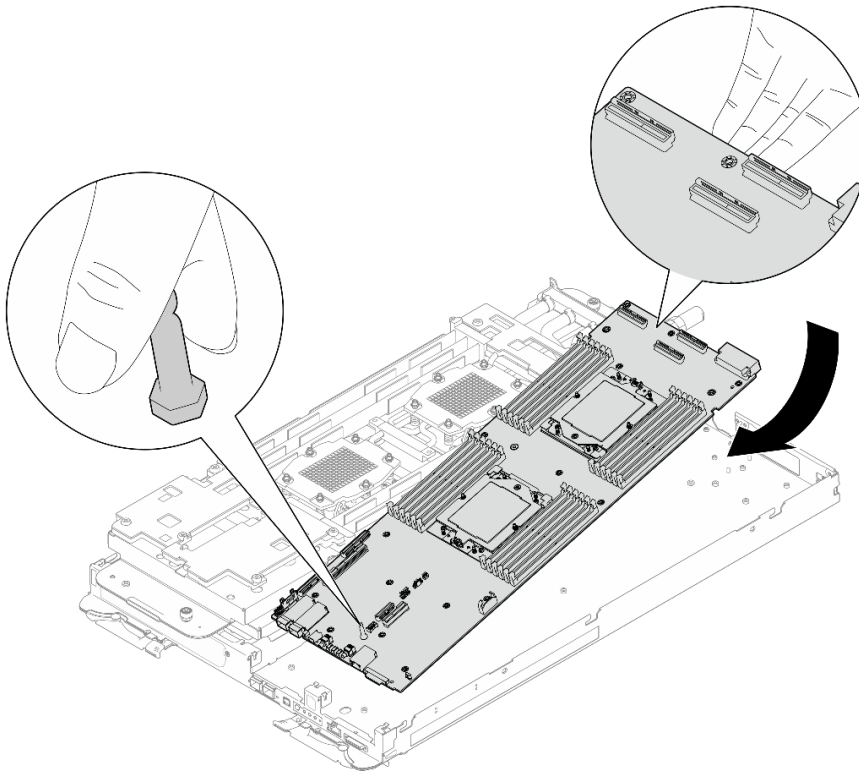


Figure 315. System board installation

## Install the shielding cables

Step 3. Identify the shielding cables.

Shielding cable
<b>1</b> Shielding cable 1 (connected with shielding cable 2 by Y cable)
<b>2</b> Shielding cable 2 (connected with shielding cable 1 by Y cable)
<b>3</b> Shielding cable 3
<b>4</b> Shielding cable 4 (attached shielding cage is smaller than shielding cable 3)

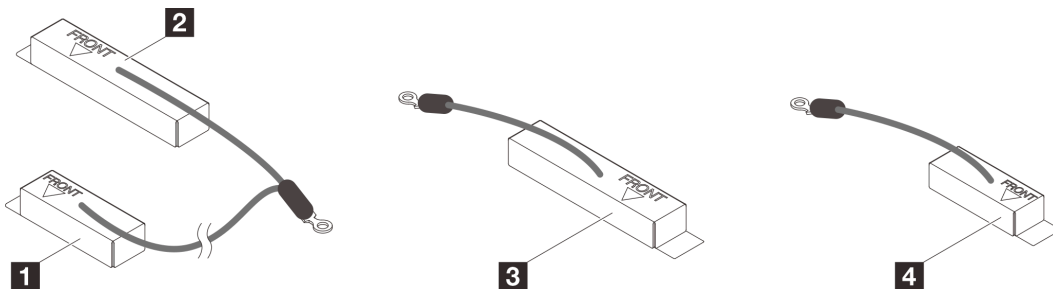


Figure 316. shielding cable 1/2, 3, and 4

Step 4. Place shielding cable 1/2 and shielding cable 3 on top of the screw holes on system board.

- a. Locate the screw holes for shielding cable 1/2 and shielding cable 3.

**1** Screw hole for shielding cable 1/2

**2** Screw hole for shielding cable 3

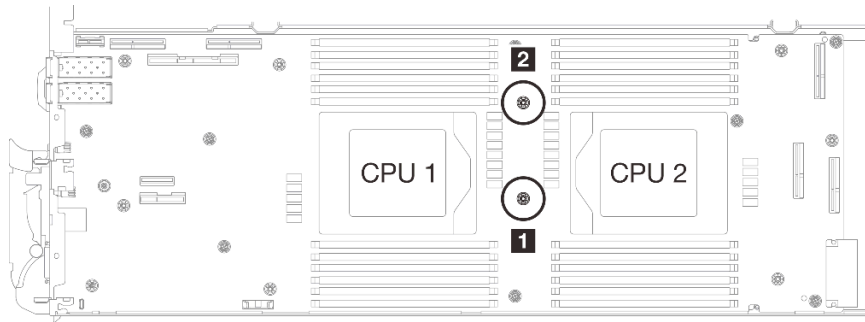


Figure 317. Location of screw holes of shielding cable 1/2 and 3

- b. Align shielding cable 1/2 and shielding cable 3 to the screw holes on system board. **Make sure the ring terminals of the cable are placed in the angle shown below.**

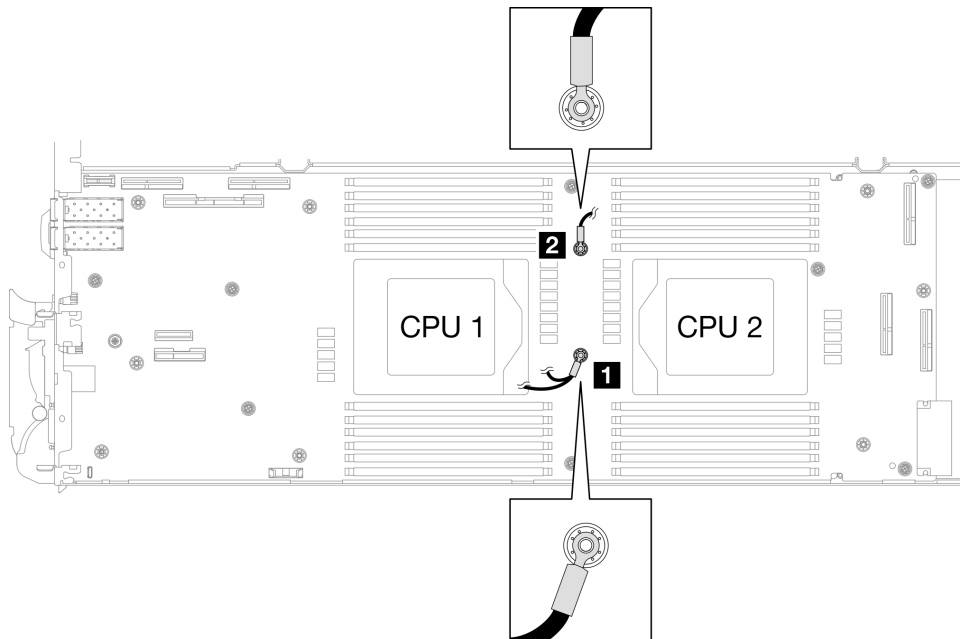


Figure 318. Aligning shielding cable 1/2 and shielding cable 3 with screw holes

Step 5. Install shielding cable 1/2 and 3.

- a. **1** Keep the FRONT marking on the VR conduction plate pointing the front of the tray. Then, place the VR conduction plate on top of the two cable ring terminals.

**Note:** A putty pad is attached to the bottom side of the VR conduction plate. Carefully hold the VR conduction plate to avoid damaging the putty pad.

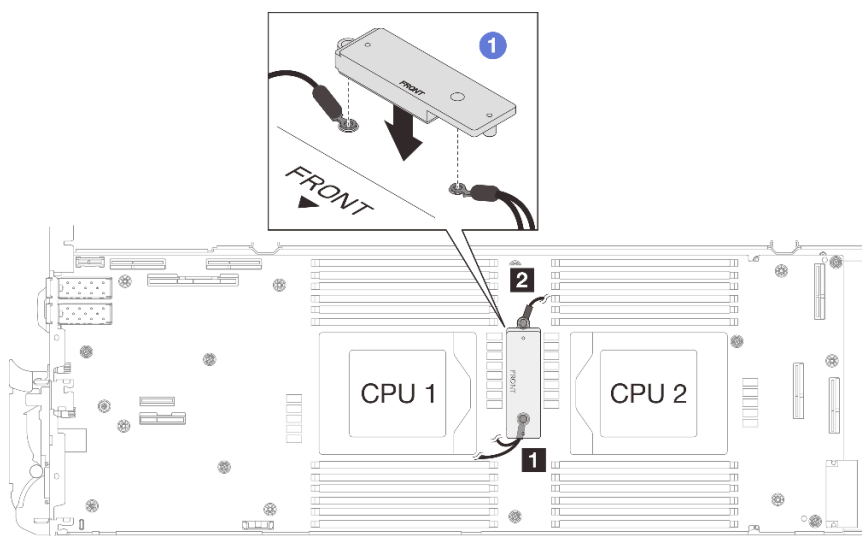


Figure 319. Aligning VR conduction plate, shielding cables, and system board screw holes

- b. 2 Slightly press down the VR conduction plate.

**Attention:** The following items will be secured by screw. Make sure they are aligned and do not block each other.

- Screw hole on the system board
- The hole on the ring terminal of the shielding cage cable
- Screw hole on the VR conduction plate

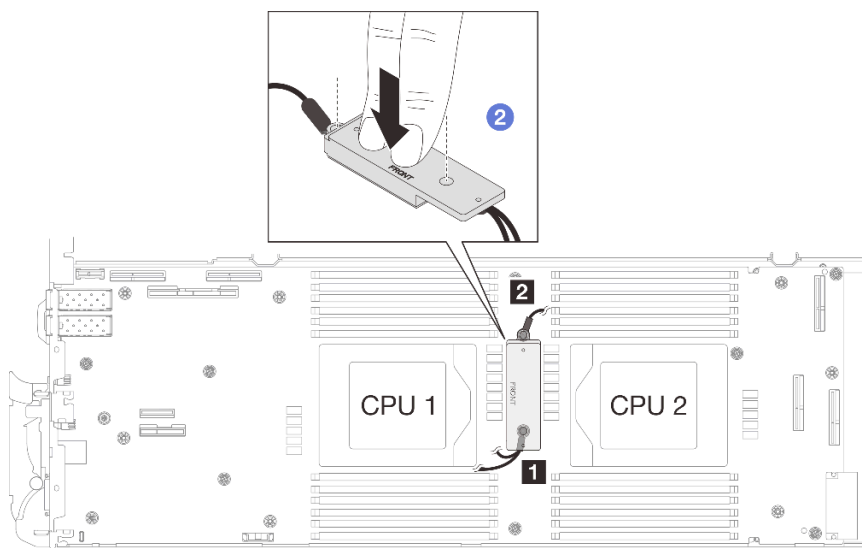


Figure 320. Pressing on the VR conduction plate

- c. 3 While pressing down the VR conduction plate, place the screws into the two screw holes on the VR conduction plate. Then, fasten the two screws to secure the cables to the system board. **DO NOT fasten the screws until both screws are placed into the VR conduction plate.**

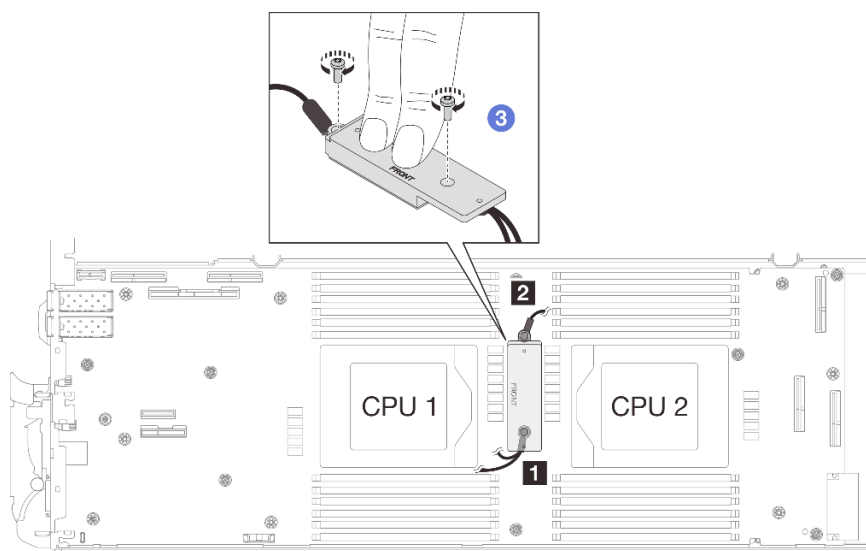


Figure 321. Installing shielding cable 1/2 and 3

Step 6. Locate the screw hole for braided cable 4. Then, align shielding cable 4 to the screw holes on system board as shown below. **Make sure the ring terminal of the cable is placed in the angle shown below.** Fasten the screw to secure the shielding cable to the system board.

**1** Screw hole for shielding cable 4

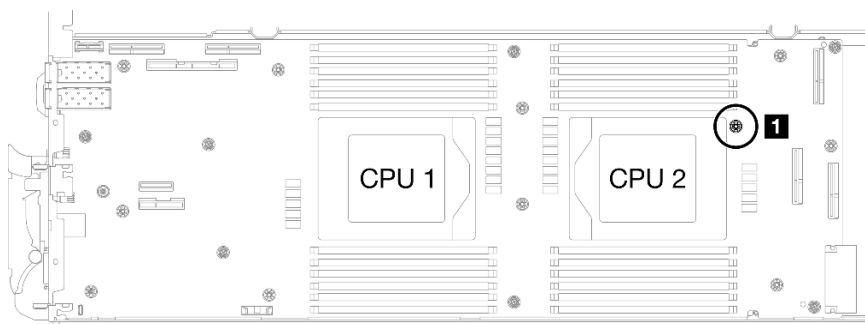


Figure 322. Location of screw hole of shielding cable 4

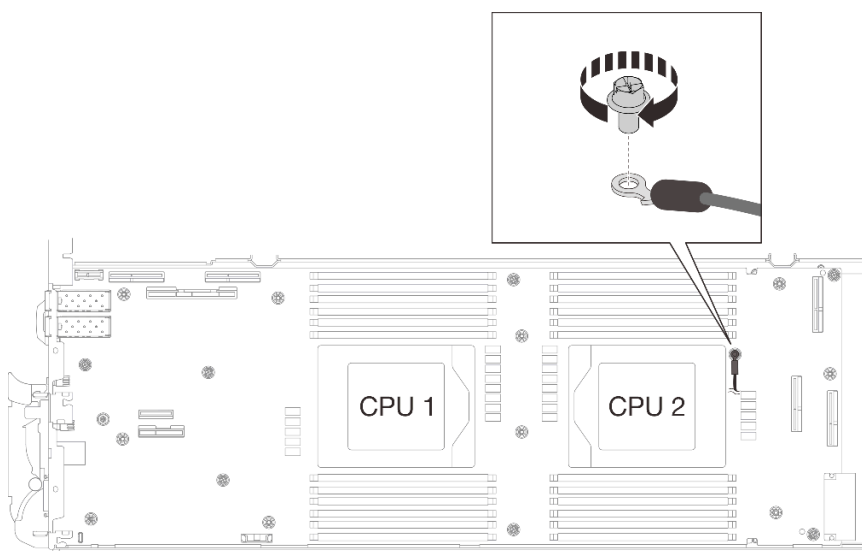


Figure 323. Installing shielding cable 4

- Step 7. There are labels attached to shielding cable 1, 3, and 4. Roll the label around the cable all the way through to prevent label interfering with system connectors and water loop.

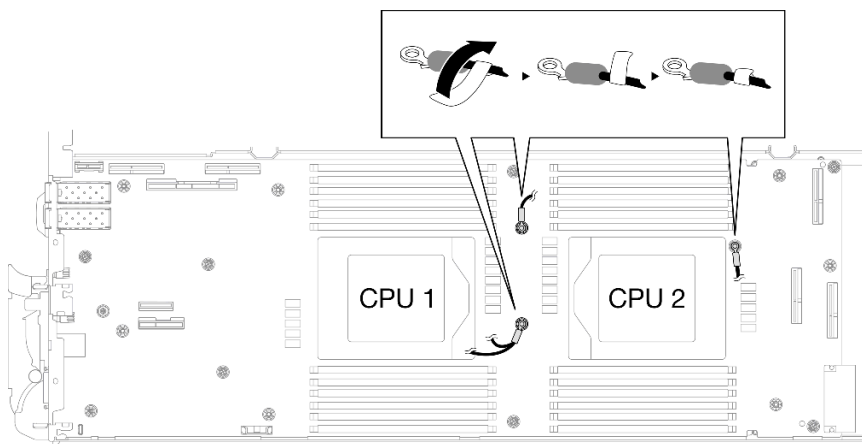


Figure 324. Rolling label around the shielding cable

- Step 8. From the inside of the shielding cages, hold the tab and peel off the adhesive tapes. Complete the step for all four shielding cages.

**1** Adhesive tape tab



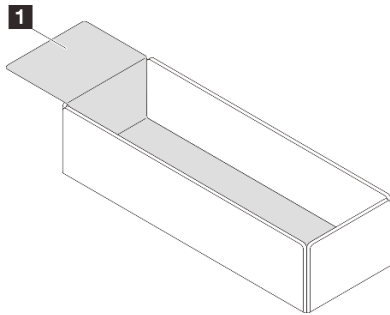


Figure 325. Peeling off the adhesive tape

- Step 9. Cover the inductors on system board with shielding cages.
- Follow the inductors and shielding cable mapping table below.

Table 13. Shielding cage and inductors mapping table

Shielding cage (attached to the shielding cable)	Inductor on the system board to be covered by the shielding cage
Shielding cable <b>1</b> (connected with shielding cable <b>2</b> by Y cable)	<b>A</b>
Shielding cable <b>2</b> (connected with shielding cable <b>1</b> by Y cable)	<b>B</b>
Shielding cable <b>3</b>	<b>C</b>
Shielding cable <b>4</b> (attached shielding cage is smaller than shielding cable <b>3</b> )	<b>D</b>

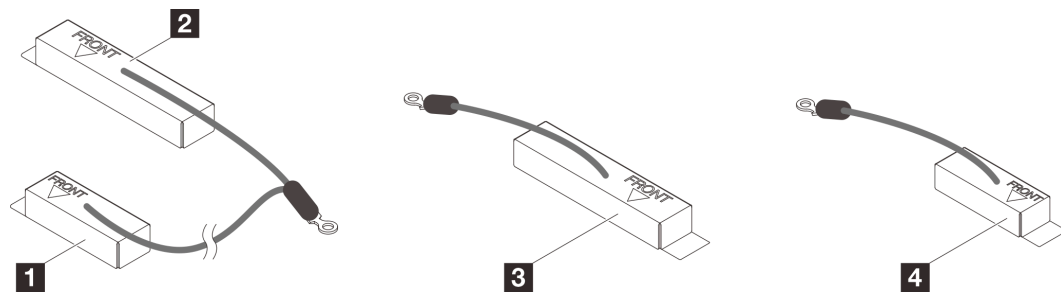


Figure 326. shielding cable 1/2, 3, and 4

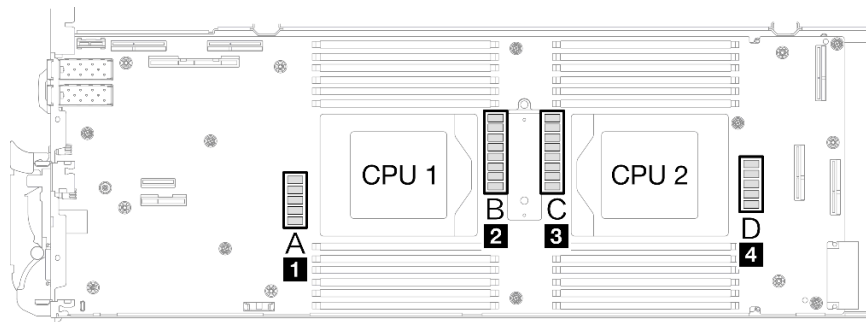


Figure 327. Inductors locations on the system board

- b. Before covering the inductors with shielding cages, make sure the FRONT marking on the shielding cage points at the front of the tray.

**Attention:** After covering the inductors with shielding cages, **DO NOT** remove the shielding cages from the system board to avoid system board damages.

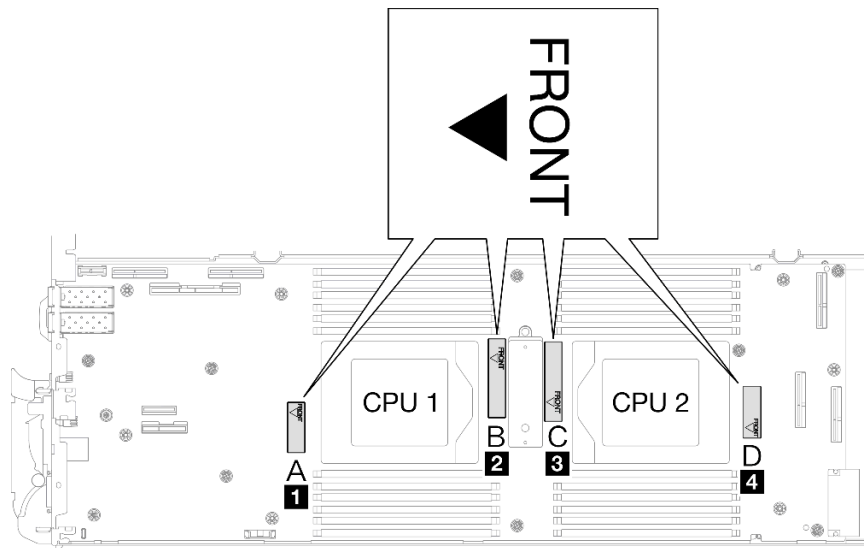


Figure 328. Front marking on the cage pointing at the front

- c. Attach the inside of the shielding cage to the **inductor attaching point**. In the graphic below, the dotted lines specify the inductor attaching points for the inside of the cage. The inductor attaching point is where the inside of the cage and the inductors attach to each other seamlessly without any gap.

**Notes:**

- Shielding cage 1 and 4: **one** attaching point
- Shielding cage 2 and 3: **two** attaching points
- For the non-attaching-point side of cage 1 and 4, balance the gap between the inside of the cage and inductors.

<b>1</b> Shielding cage
<b>2</b> Inductor
<b>3</b> Inductor attaching point

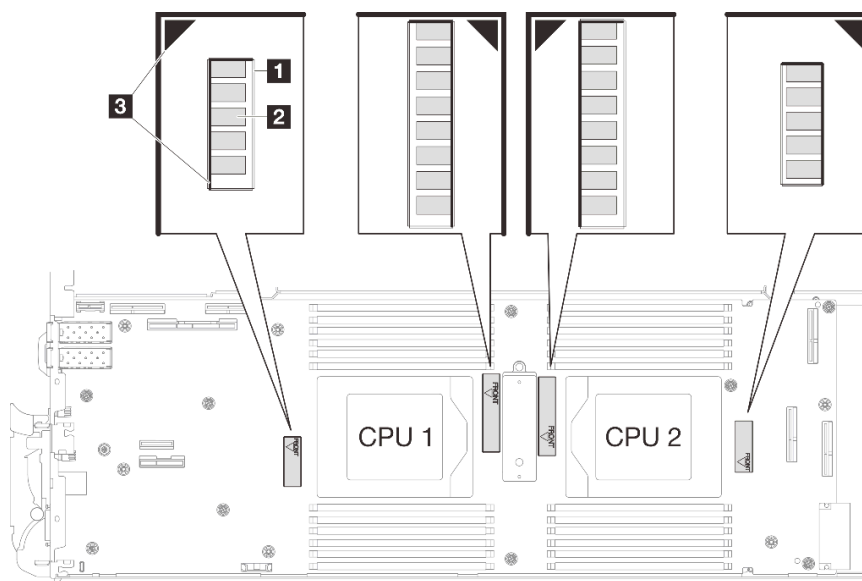


Figure 329. Inductor attaching points

- d. Keep the shielding cage attached to the inductor attaching point and make sure the inductors are completely covered; then, lower the cage into the system board.

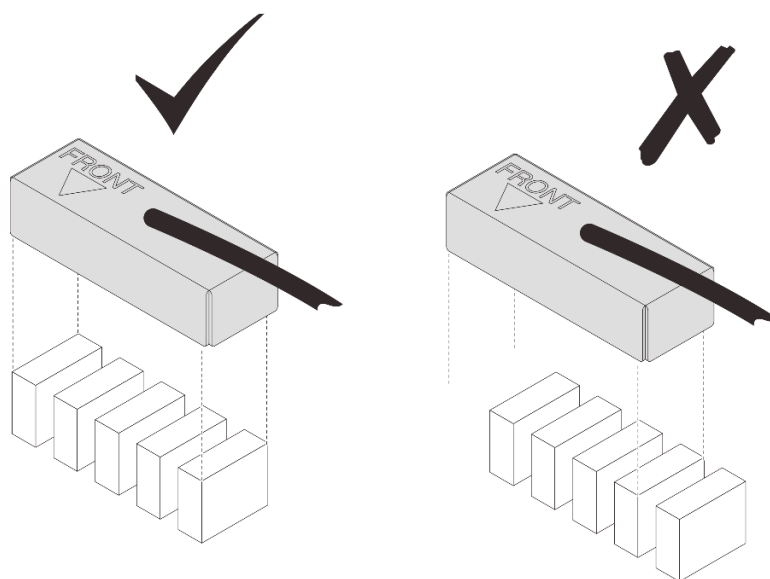


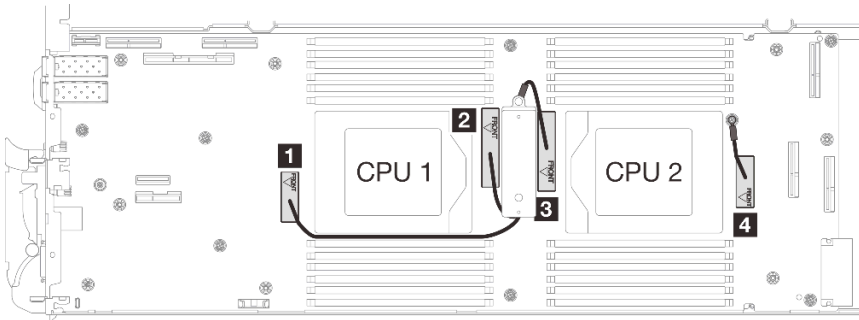
Figure 330. Covering the inductors with the shielding cage

- e. Gently press the top of the shielding cage for three seconds to secure the shielding cage to the inductor. To make sure it is secured to the system board, try to gently pull the cage. If it is not moved, then the shielding cage is successfully installed.

Step 10. Route the shielding cable 1 between CPU 1 socket and the DIMM slots. Make sure all shielding cable are cleared from CPU sockets, DIMM slots, and other system board connectors.

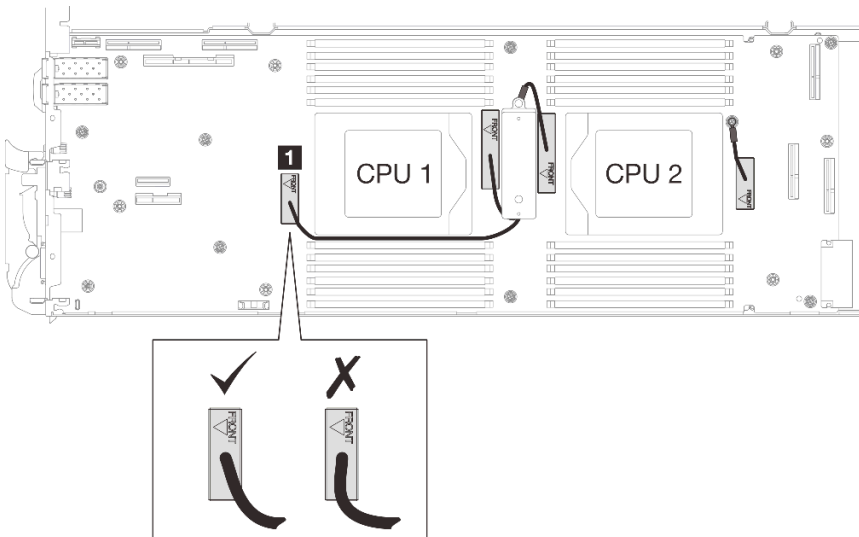
**Note:** Make sure the FRONT marking on the cage points at the front of the tray.

<b>Shielding cable</b>
<b>1</b> Shielding cable 1 (connected with shielding cable 2 by Y cable)
<b>2</b> Shielding cable 2 (connected with shielding cable 1 by Y cable)
<b>3</b> Shielding cable 3
<b>4</b> Shielding cable 4 (attached shielding cage is smaller than shielding cable 3)

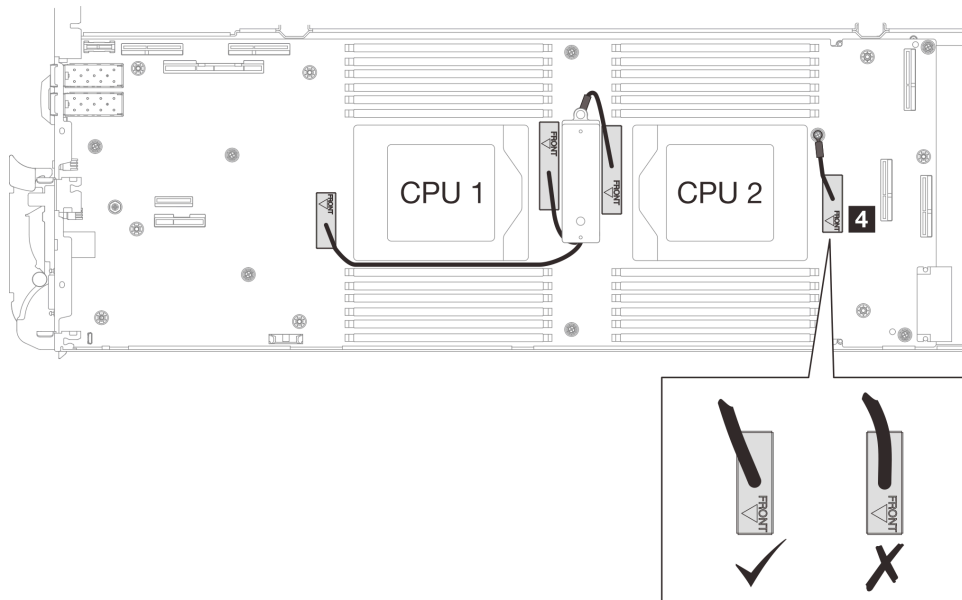


*Figure 331. Cable routing for shielding cages*

The shielding cable 1 should be angled toward CPU 1.



The shielding cable 4 cable should be angled toward the CPU 2.



Step 11. Install and tighten seven M3 screws per node on the system board with a 3/16" hex head screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

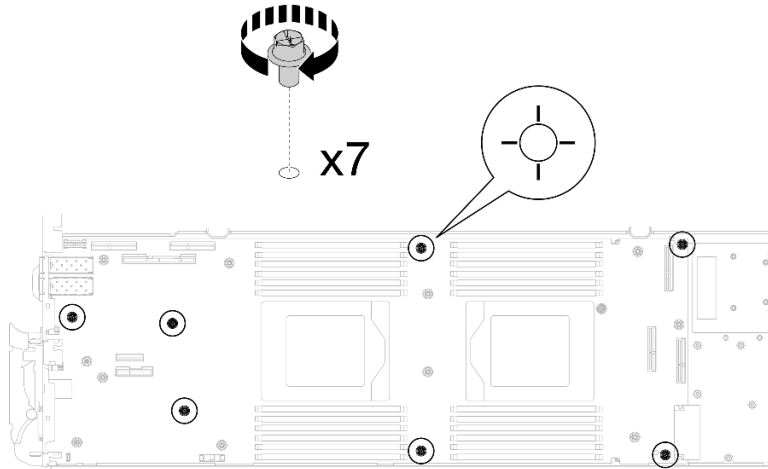


Figure 332. System board screws installation

Step 12. Install the two KVM screws to the front of the node with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to fully tightened/removed is 1.3+/-0.5 lb-in, 0.15+/- 0.05 N-M.

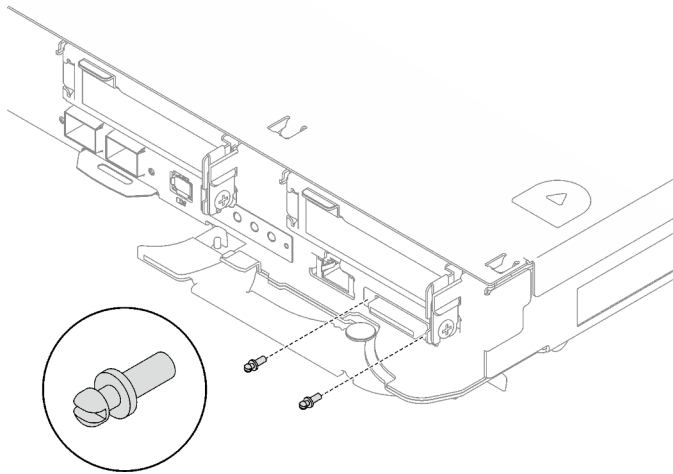


Figure 333. KVM screws installation

## After you finish

1. Install the power distribution board. See [“Install the power distribution board” on page 179](#).
2. Install the processor. See [“Install a processor” on page 200](#).
3. Install the OSFP module. See [“Install the OSFP module” on page 164](#).
4. Install the drive cage. See [“Install a drive cage assembly” on page 82](#).
5. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
6. Install the bus bar. See [“Install the bus bar” on page 267](#).
7. Install the M.2 backplane assembly. See [“Install the M.2 backplane assembly” on page 120](#).
8. Install the memory modules. See [“Install a memory module” on page 131](#).
9. Install the DIMM comb. See [“Install a DIMM comb” on page 72](#).
10. Install the cross braces. See [“Install the cross braces” on page 21](#).
11. Install the tray cover. See [“Install the tray cover” on page 18](#).
12. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
13. Connect all required external cables to the solution.

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

14. 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.
15. Update the vital product data (VPD). See [“Update the Vital Product Data \(VPD\)” on page 261](#).

Machine type number and serial number can be found on the ID label, see [“Identify the solution and access to the Lenovo XClarity Controller” in User Guide or System Configuration Guide](#).

16. Enable TPM/TCM. See [“Enable TPM” in User Guide or System Configuration Guide](#).
17. If hiding TPM or updating TPM firmware is needed, see [“Hide/observe TPM” on page 264](#) or [“Update the TPM firmware” on page 265](#).
18. Optionally, enable UEFI Secure Boot. See [“Enable UEFI Secure Boot” in User Guide or System Configuration Guide](#).

19. Configure the GPU power capping value following the instructions in “GPU power capping settings (trained technician only)” in *SD665-N V3 User Guide*.

### Demo video

[Watch the procedure on YouTube](#)

## Transfer the system board

Use this information to transfer the system board to another tray.

**Note:** If you are installing a new system board to another tray, see [“Install the system board” on page 237](#).

## About this task

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- SD665-N V3 Water Loop Service Kit (The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 OSFP Putty Pad Kit
- VR 1.5mm Putty Pad
- VR 2.5 mm Putty Pad

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Drive gap pad or putty pad kits according to the drives installed in the tray. See their respective replacement procedures for more information.
- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screwdriver Type	Screw Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Hex screw (OSFP module conduction plate)	4.5 mm hex head screwdriver
Torx T10 head screwdriver	Torx T10 screw
Torx T20 head screwdriver	Torx T20 screw
Phillips #1 head screwdriver	M3 screw

Screwdriver Type	Screw Type
Phillips #2 head screwdriver	Phillips #2 screw
3/16" hex head screwdriver	M3 screw

### Attention:

- Read “[Installation Guidelines](#)” on page 3 and “[Safety inspection checklist](#)” on page 4 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

**Note:** After XCC and UEFI firmware updates, more than one system reboot cycles are to be expected. Times of reboot cycle depends on firmware update revision. Do not shut down the system until entering UEFI setup menu or the operating system.

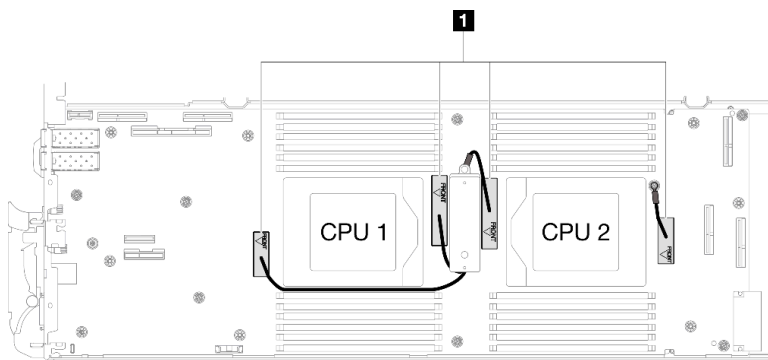
## Procedure

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

Step 1. Reinstall the system board to the tray.

- If the system board is **with** shielding cables, follow the procedures in [Transferring system board with shielding cables](#).
- If the system board is **without** shielding cables, follow the procedures in [Transferring system board without shielding cables](#).

### 1 Shielding cables

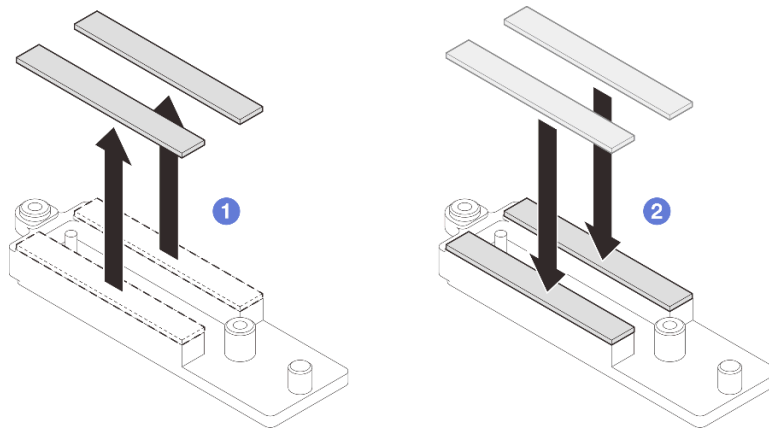


### Transferring system board with shielding cables

Step 2. Replace the VR conduction plate putty pads. Make sure to follow [Gap pad/putty pad replacement guidelines](#).



- a. ① With an alcohol cleaning pad, remove the residual putty pad from the VR conduction plate removed previously. The putty pads are on the bottom side of the VR conduction plate.
- b. ② Paste the VR 2.5 mm Putty Pad to the bottom side of the VR conduction plate.



*Figure 334. Replacing the VR conduction plate putty pads*

**Step 3.** Install the system board.

- a. Carefully hold the front guide pin and tilt the system board at an angle.
- b. Align the connectors with the corresponding holes on the front of the node; then, gently slide the system board forward.

**Note:** Avoid touching the connectors on the system board. Be careful not to damage any surrounding components inside the node.

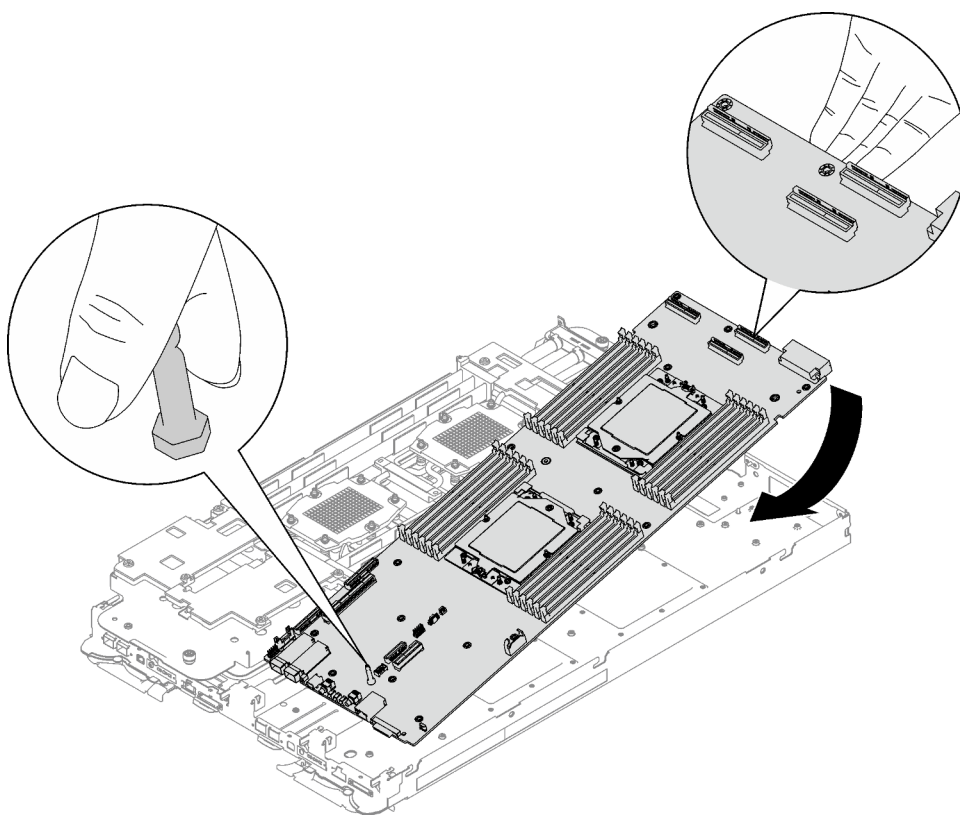


Figure 335. System board installation

Step 4. Install the VR conduction plate.

- a. 1 Keep the FRONT marking on the VR conduction plate pointing the front of the tray. Then, place the VR conduction plate on top of the two cable ring terminals.

**Note:** A putty pad is attached to the bottom side of the VR conduction plate. Carefully hold the VR conduction plate to avoid damaging the putty pad.

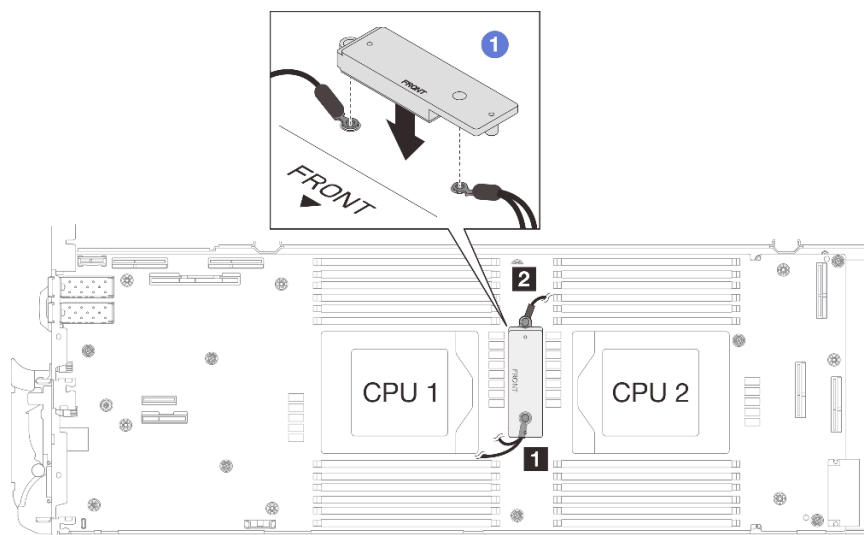


Figure 336. Aligning VR conduction plate, shielding cables, and system board screw holes

- b. ② Slightly press down the VR conduction plate.

**Attention:** The following items will be secured by screw. Make sure they are aligned and do not block each other.

- Screw hole on the system board
- The hole on the ring terminal of the shielding cage cable
- Screw hole on the VR conduction plate

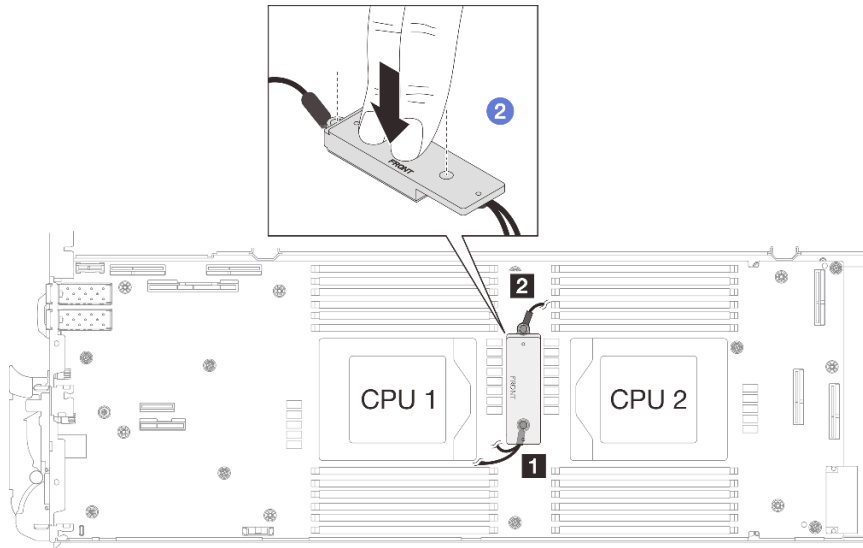


Figure 337. Pressing on the VR conduction plate

- c. ③ While pressing down the VR conduction plate, place the screws into the two screw holes on the VR conduction plate. Then, fasten the two screws to secure the cables to the system board. **DO NOT fasten the screws until both screws are placed into the VR conduction plate.**

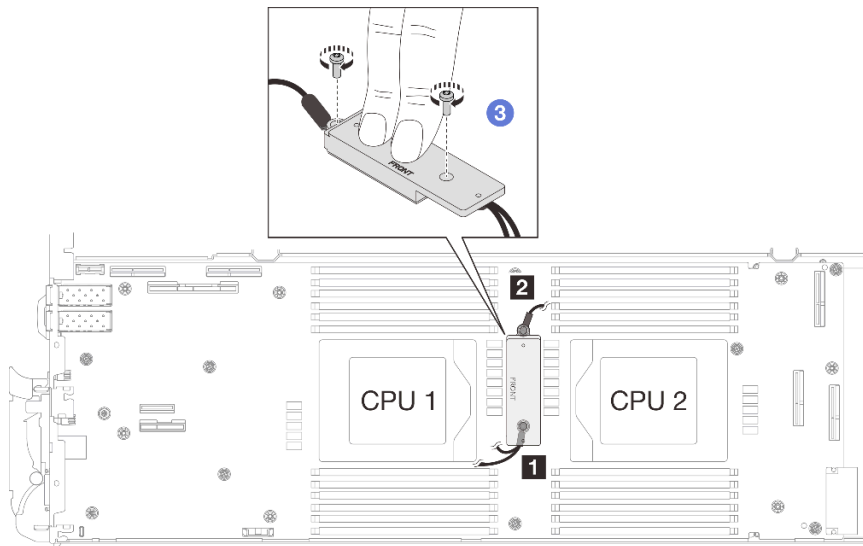


Figure 338. Installing shielding cable 1/2 and 3

- Step 5. Locate the screw hole for braided cable 4. Then, align shielding cable 4 to the screw holes on system board as shown below. **Make sure the ring terminal of the cable is placed in the angle shown below.** Fasten the screw to secure the shielding cable to the system board.

**1** Screw hole for shielding cable 4

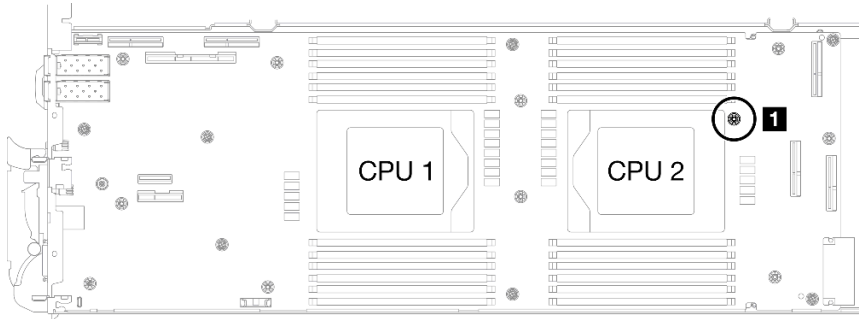


Figure 339. Location of screw hole of shielding cable 4

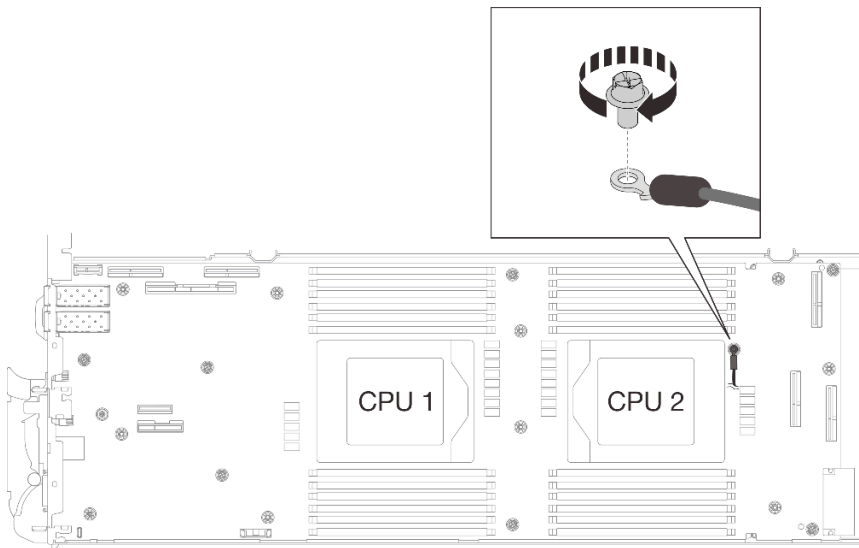


Figure 340. Installing shielding cable 4

- Step 6. There are labels attached to shielding cable 1, 3, and 4. Roll the label around the cable all the way through to prevent label interfering with system connectors and water loop.

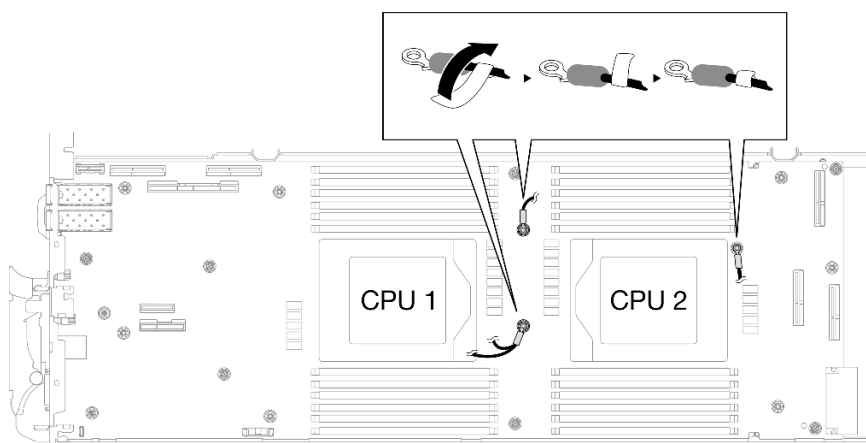


Figure 341. Rolling label around the shielding cable

- Step 7. Install and tighten seven M3 screws per node on the system board with a 3/16" hex head screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

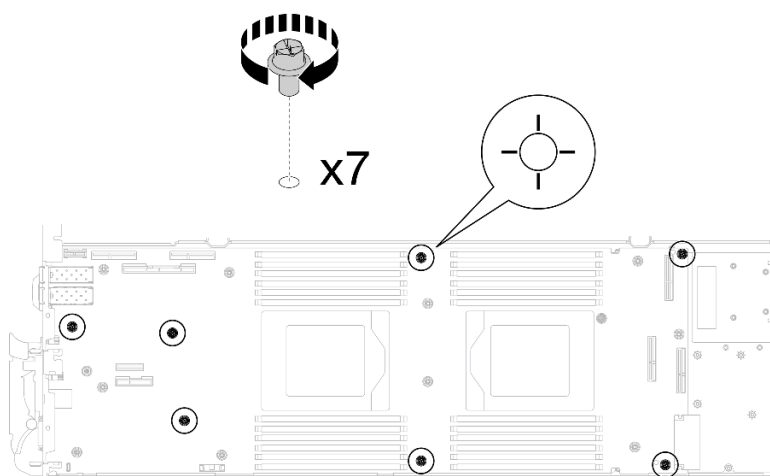


Figure 342. System board screws installation

- Step 8. Install the two KVM screws to the front of the node with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to fully tightened/removed is 1.3+/-0.5 lb-in, 0.15+/- 0.05 N-M.

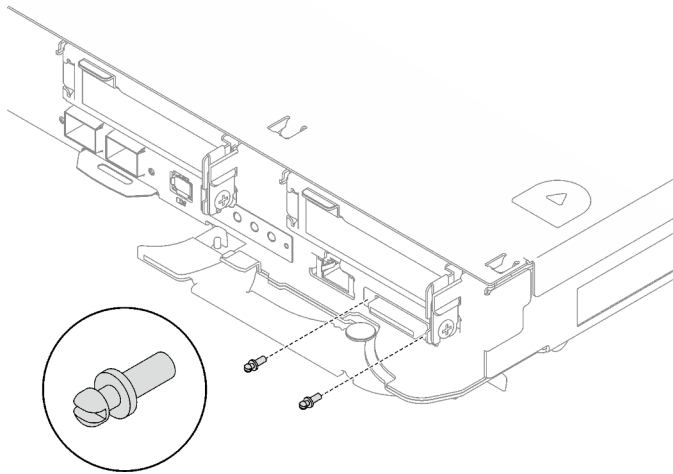


Figure 343. KVM screws installation

### Transferring system board without shielding cables

Step 9. Replace the VR conduction plate putty pads. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

- a. ① With an alcohol cleaning pad, remove the residual putty pad from the VR conduction plate removed previously. The putty pads are on the bottom side of the VR conduction plate.
- b. ② Paste the VR 1.5mm Putty Pad to the bottom side of the VR conduction plate.

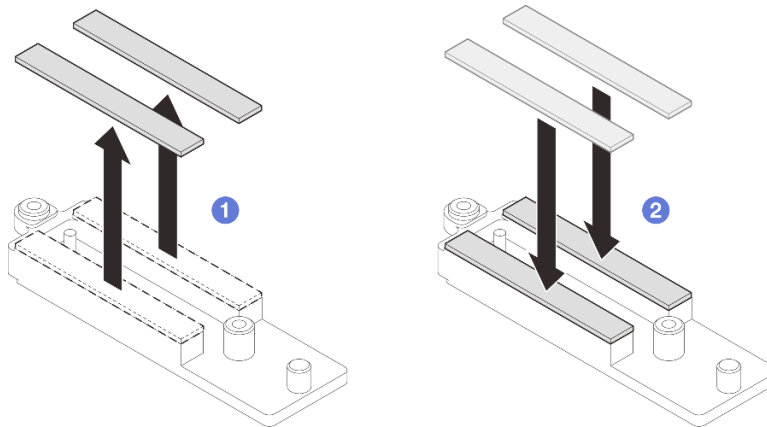


Figure 344. Replacing the VR conduction plate putty pads

Step 10. Align the VR conduction plate with the holes on the system board; then, fasten the two M3 screws (per node).

**Note:** A putty pad is attached to the bottom side of the VR conduction plate. Carefully hold the VR conduction plate to avoid damaging the putty pad.

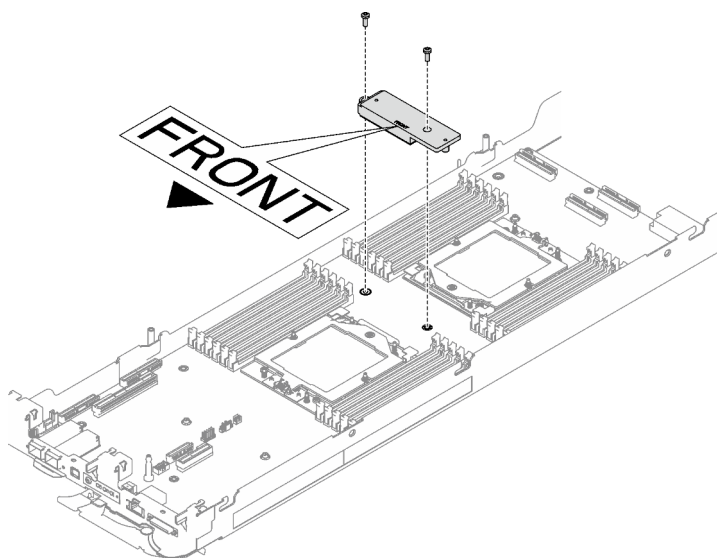


Figure 345. VR conduction plate installation

Step 11. Install and tighten eight M3 screws per node on the system board with a 3/16" hex head screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

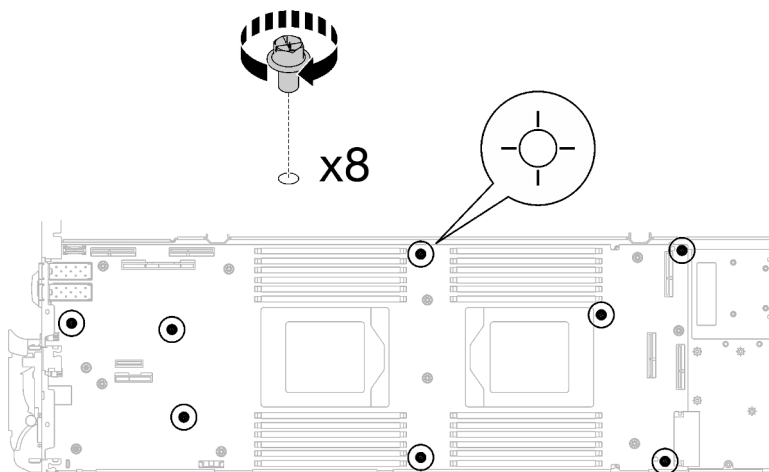


Figure 346. System board screws installation

Step 12. Install the two KVM screws to the front of the node with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to fully tightened/removed is 1.3+/-0.5 lb-in, 0.15+/- 0.05 N-M.

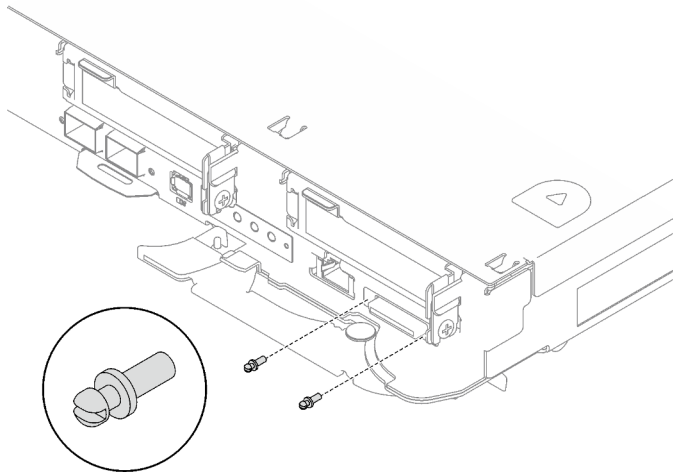


Figure 347. KVM screws installation

## After you finish

1. Install the power distribution board. See [“Install the power distribution board” on page 179](#).
2. Install the processor. See [“Install a processor” on page 200](#).
3. Install the OSFP module. See [“Install the OSFP module” on page 164](#).
4. Install the drive cage. See [“Install a drive cage assembly” on page 82](#).
5. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
6. Install the bus bar. See [“Install the bus bar” on page 267](#).
7. Install the M.2 backplane assembly. See [“Install the M.2 backplane assembly” on page 120](#).
8. Install the memory modules. See [“Install a memory module” on page 131](#).
9. Install the DIMM comb. See [“Install a DIMM comb” on page 72](#).
10. Install the cross braces. See [“Install the cross braces” on page 21](#).
11. Install the tray cover. See [“Install the tray cover” on page 18](#).
12. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
13. Connect all required external cables to the solution.

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

14. 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.
15. Update the vital product data (VPD). See [“Update the Vital Product Data \(VPD\)” on page 261](#).

Machine type number and serial number can be found on the ID label, see [“Identify the solution and access to the Lenovo XClarity Controller” in User Guide or System Configuration Guide](#).

16. Enable TPM/TCM. See [“Enable TPM” in User Guide or System Configuration Guide](#).
17. If hiding TPM or updating TPM firmware is needed, see [“Hide/observe TPM” on page 264](#) or [“Update the TPM firmware” on page 265](#).
18. Optionally, enable UEFI Secure Boot. See [“Enable UEFI Secure Boot” in User Guide or System Configuration Guide](#).



19. Configure the GPU power capping value following the instructions in “GPU power capping settings (trained technician only)” in *SD665-N V3 User Guide*.

## Update the Vital Product Data (VPD)

Use this topic to update the Vital Product Data (VPD).


- **(Required)** Machine type
- **(Required)** Serial number
- **(Required)** System model
- (Optional) Asset tag
- (Optional) UUID

### Recommended tools:

- Lenovo XClarity Provisioning Manager
- Lenovo XClarity Essentials OneCLI commands

### Using Lenovo XClarity Provisioning Manager

#### Steps:

1. Start the server and press the key according to the on-screen instructions. The Lenovo XClarity Provisioning Manager interface is displayed by default.
2. Click  on the top right corner of the Lenovo XClarity Provisioning Manager main interface.
3. Click **Update VPD**; then, follow on-screen instructions to update the VPD.

### Using Lenovo XClarity Essentials OneCLI commands

- Updating **machine type**  
`onecli config set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model> [access_method]`
- Updating **serial number**  
`onecli config set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n> [access_method]`
- Updating **system model**  
  
`onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifier <system model> [access_method]`
- Updating **asset tag**  
`onecli config set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag> [access_method]`
- Updating **UUID**  
`onecli config createuuid SYSTEM_PROD_DATA.SysInfoUUID [access_method]`

Variable	Description
<m/t_model>	The server machine type and model number. Type xxxxyyyyyy, where xxxx is the machine type and yyyyyy is the server model number.
<s/n>	The serial number on the server. Type zzzzzzzz (length 8-10 characters), where zzzzzzzz is the serial number.
<system model>	The system model on the server. Type system yyyyyyyy, where yyyyyyyy is the product identifier.

<code>&lt;asset_tag&gt;</code>	<p>The server asset tag number.</p> <p>Type aaaaaaaaaaaaaaaaaaaaaaaaaaaaaa, where aaaaaaaaaaaaaaaaaaaaaaaaaaaaaa is the asset tag number.</p>
<code>[access_method]</code>	<p>The access method that you select to access the target server.</p> <ul style="list-style-type: none"> <li>Online KCS (unauthenticated and user restricted): You can directly delete <code>[access_method]</code> from the command.</li> <li>Online authenticated LAN: In this case, specify below LAN account information at the end of the OneCLI command: --bmc-username <code>&lt;user_id&gt;</code> --bmc-password <code>&lt;password&gt;</code></li> <li>Remote WAN/LAN: In this case, specify below XCC account information and IP address at the end of the OneCLI command: --bmc <code>&lt;bmc_user_id&gt;:&lt;bmc_password&gt;@&lt;bmc_external_IP&gt;</code></li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>-- <code>&lt;bmc_user_id&gt;</code> The BMC account name (1 of 12 accounts). The default value is USERID.</li> <li>-- <code>&lt;bmc_password&gt;</code> The BMC account password (1 of 12 accounts).</li> </ul>

## Enable TPM

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

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

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

### CAUTION:

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

### Set the TPM policy

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

There are two methods available to set the TPM policy:

- From Lenovo XClarity Provisioning Manager

To set the TPM policy from Lenovo XClarity Provisioning Manager:

1. Start the server and press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.)
2. If the power-on Administrator password is required, enter the password.
3. From the System Summary page, click **Update VPD**.
4. Set the policy to one of the following settings.
  - **NationZ TPM 2.0 enabled - China only.** Customers in the Chinese Mainland should choose this setting if a NationZ TPM 2.0 adapter is installed.

- **TPM enabled - ROW.** Customers outside of the Chinese Mainland should choose this setting.
- **Permanently disabled.** Customers in the Chinese Mainland should use this setting if no TPM adapter is installed.

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

- From Lenovo XClarity Essentials OneCLI

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

To set the TPM policy from Lenovo XClarity Essentials OneCLI:

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

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

2. Configure the TPM\_TCM\_POLICY into XCC:

- For customers in Chinese Mainland with no TPM, or customers that require to disable TPM:  
`OneCli.exe config set imm.TpmTcmPolicy "NeitherTpmNorTcm" --override --imm <userid>:<password>@<ip_address>`
- For customers in Chinese Mainland that require to enable TPM:  
`OneCli.exe config set imm.TpmTcmPolicy "NationZTPM20Only" --override --imm <userid>:<password>@<ip_address>`
- For customers outside Chinese Mainland that require to enable TPM:  
`OneCli.exe config set imm.TpmTcmPolicy "TpmOnly" --override --imm <userid>:<password>@<ip_address>`

3. Issue reset command to reset system:

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

4. Read back the value to check whether the change has been accepted:

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

#### Notes:

- If the read back value is matched it means the TPM\_TCM\_POLICY has been set correctly.

imm.TpmTcmPolicy is defined as below:

- Value 0 use string "Undefined", which means UNDEFINED policy.
- Value 1 use string "NeitherTpmNorTcm", which means TPM\_PERM\_DISABLED.
- Value 2 use string "TpmOnly", which means TPM\_ALLOWED.
- Value 4 use string "NationZTPM20Only", which means NationZ\_TPM20\_ALLOWED.
- Below 4 steps must also be used to 'lock' the TPM\_TCM\_POLICY when using OneCli/ASU commands:

5. Read TpmTcmPolicyLock to check whether the TPM\_TCM\_POLICY has been locked, command as below:

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

The value must be 'Disabled', it means TPM\_TCM\_POLICY is NOT locked and must be set.

6. Lock the TPM\_TCM\_POLICY:

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

7. Issue reset command to reset system, command as below:

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

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

**Note:** The valid values for imm.TpmTcmPolicy include 'NeitherTpmNorTcm', 'TpmOnly', and 'NationZTPM20Only'.

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

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

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

imm.TpmTcmPolicyLock is defined as below:

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

### Hide/observe TPM

TPM is enabled by default to encrypt data transfer for system operation. Optionally, you can disable TPM using Unified Extensible Firmware Interface (UEFI) or Lenovo XClarity Essentials OneCLI.

### Using UEFI

For details, see "Hide TPM from OS" in *UEFI User Guide* at <https://pubs.lenovo.com/uefi-overview/>.

### Using Lenovo XClarity Essentials OneCLI

To disable TPM, do the following:

1. Download and install Lenovo XClarity Essentials OneCLI.

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

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

2. Run the following command:

```
OneCli.exe config set TrustedComputingGroup.HideTPMfromOS "Yes" -bmc <userid>:<password>@<ip_address>
```

where:

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

Example:

```
D:\onecli>OneCli.exe config set UEFI.TrustedComputingGroup.TPMDevice "Disabled" --bmc USERID:PASSWORD@10.245.38.64
[Is]Certificate check finished [100%][=====]>]
Start to connect BMC at 10.245.38.64 to apply config set
Invoking SET command...
UEFI.TrustedComputingGroup.TPMDevice=Disabled
Changes completed successfully, but these changes will not take effect until next reboot.
Succeed.
```

3. Reboot the system.

If you want to enable TPM again, run the following command and reboot the system:

```
OneCli.exe config set TrustedComputingGroup.HideTPMfromOS "No" -bmc <userid>:<password>@<ip_address>
```

Example:

```
D:\onecli>OneCli.exe config set UEFI.TrustedComputingGroup_TPMDevice "Enabled" --bmc USERID:PASSWORD@10.245.38.64
[IsCertificate check finished [100%]][=====>]
Start to connect BMC at 10.245.38.64 to apply config set
Invoking SET command ...
UEFI.TrustedComputingGroup_TPMDevice=Enabled
Changes completed successfully, but these changes will not take effect until next reboot.
Succeed.
```

## Update the TPM firmware

Optionally, you can update the TPM firmware using Lenovo XClarity Essentials OneCLI.

**Note:** TPM firmware update is irreversible. After update, the TPM firmware cannot be downgraded to earlier versions.

## TPM firmware version

Follow the procedure below to see the TPM firmware version:

From Lenovo XClarity Provisioning Manager

1. Start the server and press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at <https://pubs.lenovo.com/lxpm-overview/>.)
2. If the power-on Administrator password is required, enter the password.
3. From the UEFI Setup page, click **System Settings** → **Security** → **Trusted Platform Module** → **TPM 2.0** → **TPM Firmware Version**.

## Update the TPM firmware

To update the TPM firmware, do the following:

1. Download and install Lenovo XClarity Essentials OneCLI.

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

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

2. Run the following command:

```
OneCli.exe config set TrustedComputingGroup.DeviceOperation "Update to TPM 2.0 firmware version <x.x.x.x>" --bmc
<userid>:<password>@<ip_address>
```

where:

- <x.x.x.x> is the target TPM version.

e.g. TPM 2.0 (7.2.1.0) -> TPM 2.0 (7.2.2.0):

```
OneCli.exe config set TrustedComputingGroup.DeviceOperation "Update to TPM 2.0 firmware version 7.2.2.0" --bmc
<userid>:<password>@<ip_address>
```

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

## Enable UEFI Secure Boot

Optionally, you can enable UEFI Secure Boot.

There are two methods available to enable UEFI Secure Boot:

- From Lenovo XClarity Provisioning Manager

To enable UEFI Secure Boot from Lenovo XClarity Provisioning Manager:

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

**Note:** If disabling UEFI secure boot is needed, select Disable in step 4.

- From Lenovo XClarity Essentials OneCLI

To enable UEFI Secure Boot from Lenovo XClarity Essentials OneCLI:

1. Download and install Lenovo XClarity Essentials OneCLI.

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

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

2. Run the following command to enable Secure Boot:

```
OneCli.exe config set UEFI.SecureBootConfiguration_SecureBootSetting Enabled --bmc  
<userid>:<password>@<ip_address>
```

where:

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

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

[https://pubs.lenovo.com/lxce-onecli/onecli\\_r\\_set\\_command](https://pubs.lenovo.com/lxce-onecli/onecli_r_set_command)

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

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

---

## Replace components in the GPU node (trained technician only)

Use the following information to remove and install Intel GPU node components.

### Bus bar replacement

Use the following procedures to remove and install the bus bar.

#### Remove the bus bar

Use this information to remove the bus bar.

#### About this task

##### Attention:

- Read “[Installation Guidelines](#)” on page 3 and “[Safety inspection checklist](#)” on page 4 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

## Procedure

Step 1. Make preparations for this task.

- Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14.](#)
- Remove the tray cover. See [“Remove the tray cover” on page 17.](#)
- Remove the cross braces. See [“Remove the cross braces” on page 19.](#)

Step 2. Remove the screw and lift the bus bar from the tray.

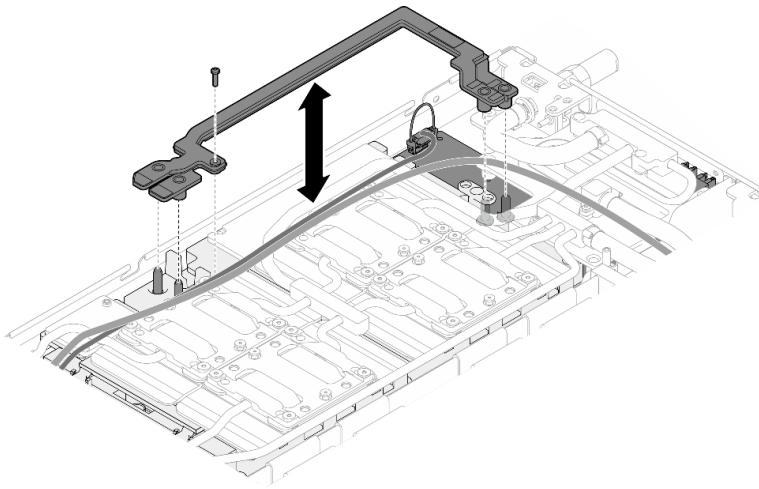


Figure 348. Bus bar removal

## 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 bus bar

Use this information to install the bus bar.

## About this task

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

## Procedure

- Step 1. Make sure that the carrier board power cable and the MCIO cable are routed properly.
- Make sure the two cables are clear off the middle part of the bus bar. There should not be any cables between the bus bar and the GPU board.
  - Make sure the two cables are routed underneath the rear end of the bus bar.

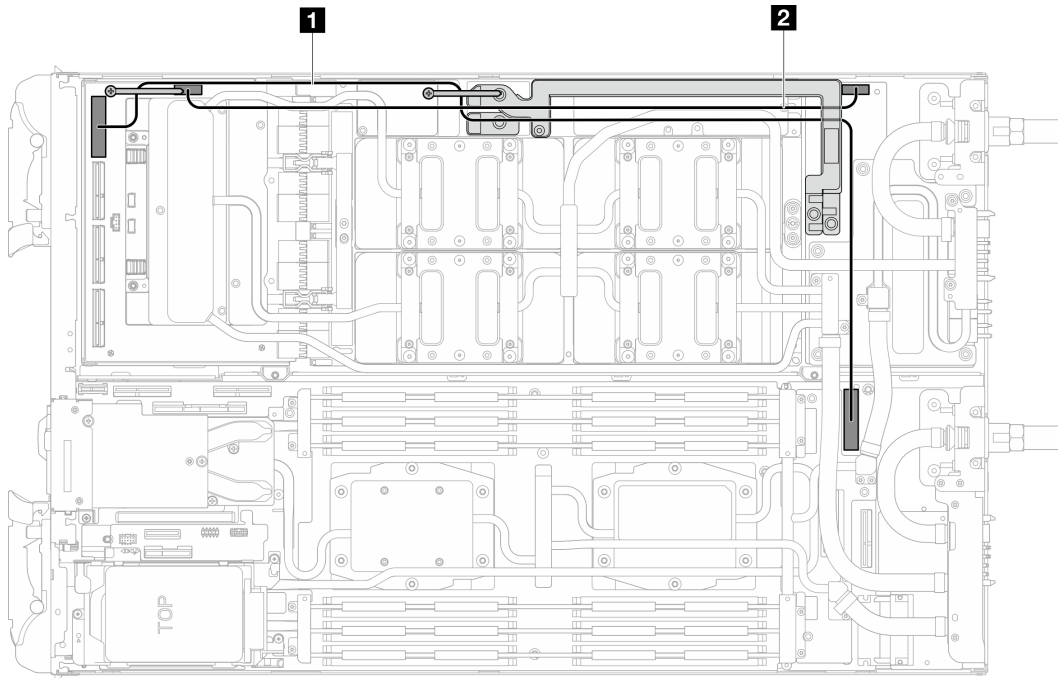


Figure 349. Routing carrier board power cable and MCIO 1 cable

**1** MCIO 1 cable (Two-processor configuration only.)

**2** Carrier board power cable

- Step 2. Align the bus bar with the guide pins on the GPU board while placing it to the GPU board. Then, fasten the screw to secure the bus bar to the GPU board.



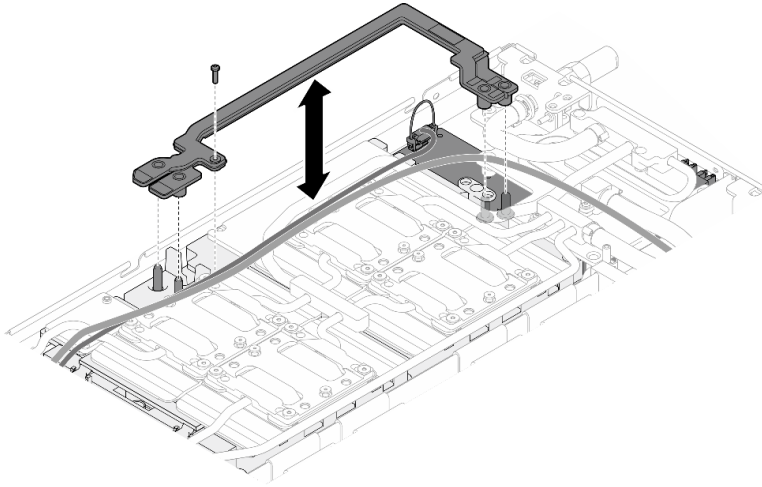


Figure 350. Bus bar installation

## After you finish

1. Install the cross braces. See [“Install the cross braces” on page 21](#).
2. Install the tray cover. See [“Install the tray cover” on page 18](#).
3. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
4. Connect all required external cables to the solution.

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

5. 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](#)

## Carrier board replacement

Use the following procedures to remove and install the carrier board.

### Remove the carrier board

Use this information to remove the carrier board.

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

**Attention:**

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

**Procedure**

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- c. Remove the cross braces. See [“Remove the cross braces” on page 19](#).
- d. Remove the bus bar. See [“Remove the bus bar” on page 266](#).
- e. Remove the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
- f. Remove the network board. See [“Remove the network board” on page 371](#).

Step 2. Remove the carrier board power cable from the GPU node.

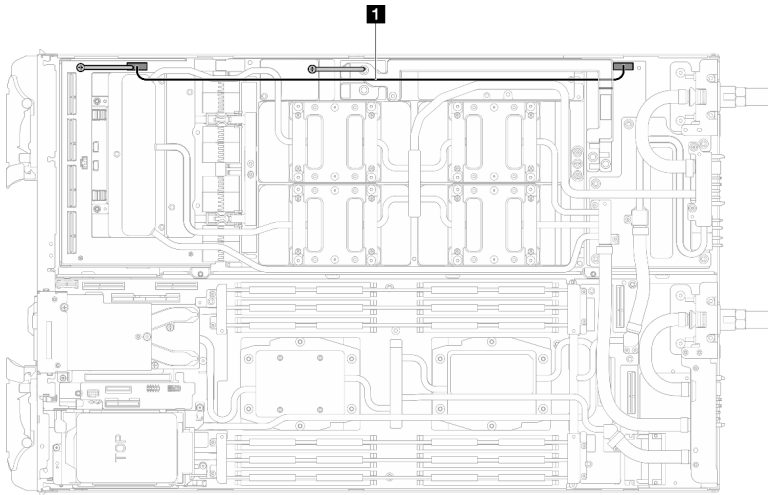


Figure 351. Carrier board power cable removal

Cable	From (carrier board)	To (GPU node power distribution board)
<b>1</b> Carrier board power cable	Power and side band connector	Power connector

Step 3. Remove the two standoffs from the carrier board.

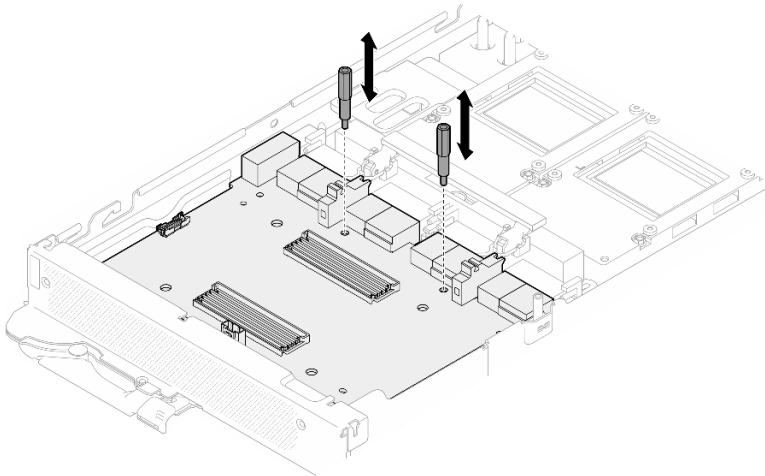


Figure 352. Carrier board standoffs removal

Step 4. Remove the carrier board from the node.

- a. **1** Rotate the GPU board handle towards the carrier board.
- b. **2** Release the GPU board retention clips and rotate them towards the GPU board.
- c. **3** Pull the carrier board towards the front of the server to disconnect it from the GPU board. Hold the carrier board at an angle and remove it from the tray.

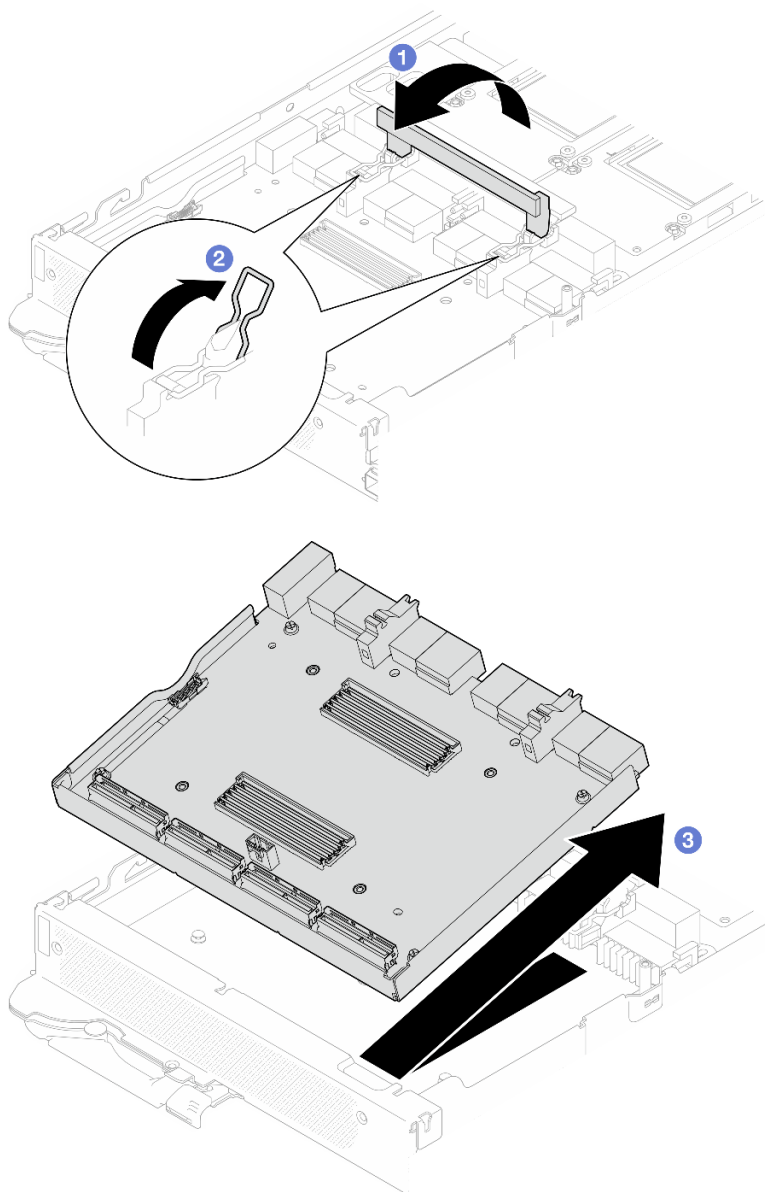


Figure 353. Carrier board removal

## 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 carrier board

Use this information to install the carrier board.

## About this task

**Important: Gap pad/putty pad replacement guidelines**

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - “Gap pad/Putty pad identification and location” on page 8
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

**Required tools**

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

**Attention:**

- Read “Installation Guidelines” on page 3 and “Safety inspection checklist” on page 4 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.

- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

## Procedure

Step 1. Rotate the GPU board retention clips and handle towards the GPU board.

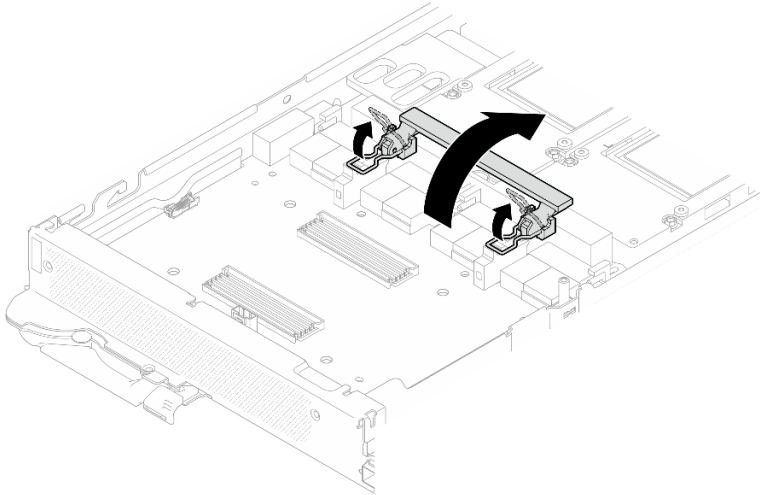


Figure 354. GPU board retention clips and handles rotation

Step 2. Install the carrier board.

- 1 Hold the carrier board at an angle and align it with the guide pins on the tray; then, install the carrier board to the tray.
- 2 Push the carrier board towards the GPU board to connect it to the GPU board.

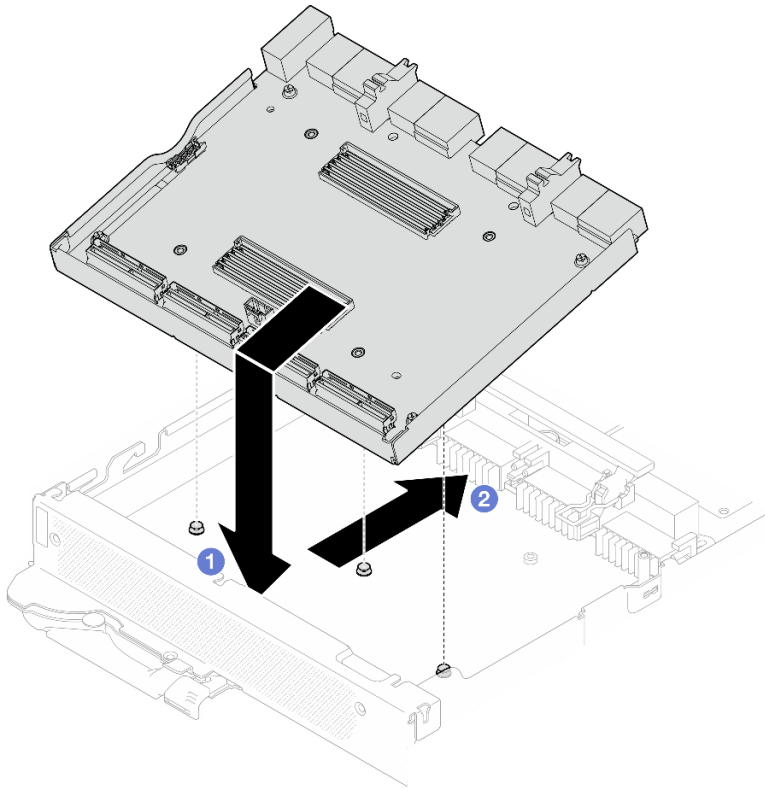


Figure 355. Carrier board installation

- Step 3. Secure the carrier board to the GPU board.
- a. ① Insert the GPU board retention clips into the slots on the carrier board.
  - b. ② Rotate the GPU board handle toward the GPU board, and press it down to lock the carrier board in place.

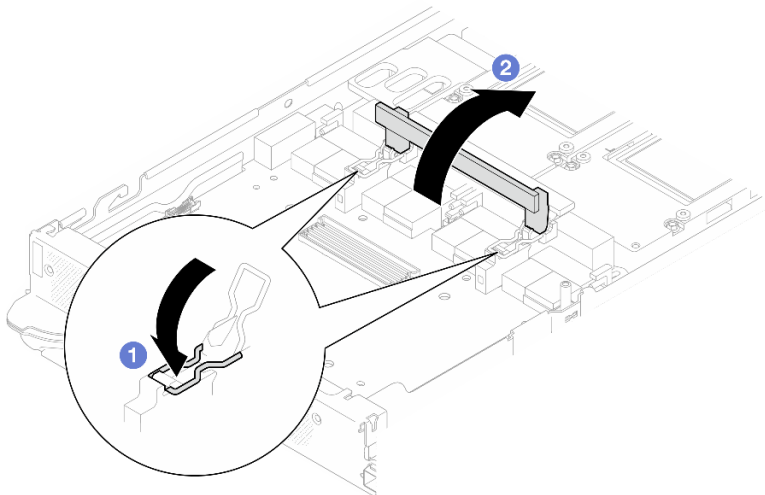


Figure 356. Securing the carrier board to the GPU board

- Step 4. Install the two standoffs to the carrier board.

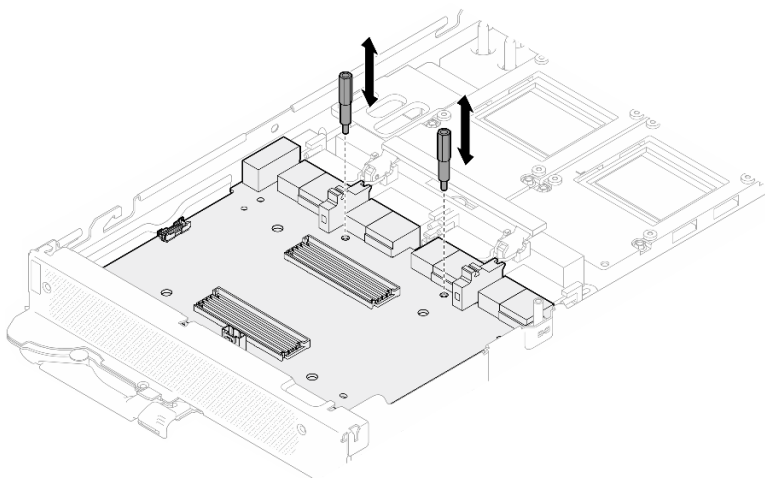


Figure 357. Installing carrier board standoffs

Step 5. Connect the carrier board power cable.

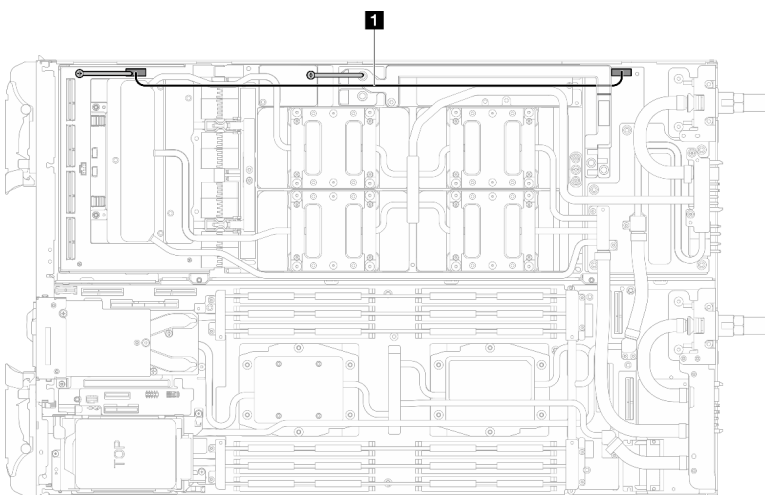


Figure 358. Connecting carrier board power cable

Cable	From (carrier board)	To (GPU node power distribution board)
1 Carrier board power cable	Power and side band connector	Power connector

## After you finish

1. Install the network board. See [“Install the network board” on page 380](#).
2. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
3. Install the bus bar. See [“Install the bus bar” on page 267](#).
4. Install the cross braces. See [“Install the cross braces” on page 21](#).
5. Install the tray cover. See [“Install the tray cover” on page 18](#).
6. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).



7. Connect all required external cables to the solution.

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

8. 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](#)

## GPU replacement (trained technician only)

Use the following procedures to remove and install a GPU.

### Remove a GPU (trained technician only)

Use this information to remove a GPU.

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screwdriver Type	Screw Type
Hex screwdriver	6 mm hex head screwdriver
Torx T10 head screwdriver	Torx T10 screw
Phillips #1 head screwdriver	Phillips #1 screw
Phillips #2 head screwdriver	Phillips #2 screw

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

The following illustration shows the GPU numbering.

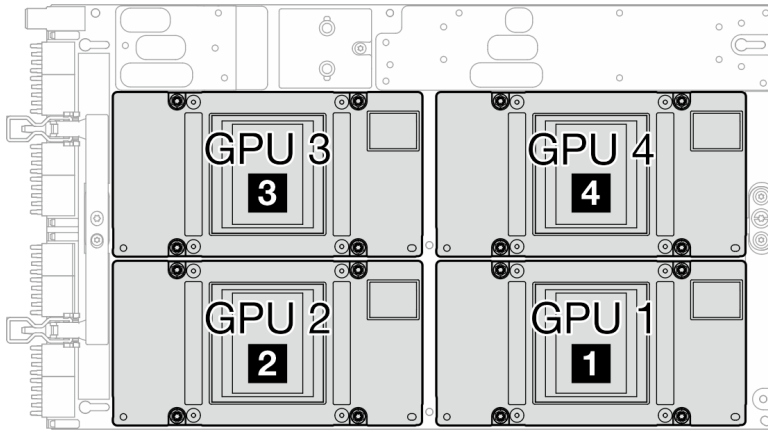


Figure 359. GPU numbering

## Procedure

Step 1. Make preparations for this task.

- Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14.](#)
- Remove the tray cover. See [“Remove the tray cover” on page 17.](#)
- Remove the cross braces. See [“Remove the cross braces” on page 19.](#)
- Remove the bus bar. See [“Remove the bus bar” on page 266.](#)
- Remove the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401.](#)

Step 2. Remove the carrier board power cable from the GPU node.

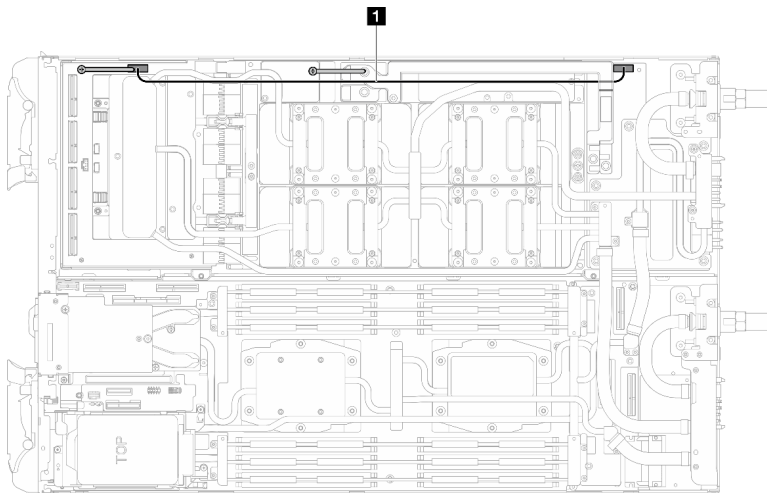


Figure 360. Carrier board power cable removal

Cable	From (carrier board)	To (GPU node power distribution board)
1 Carrier board power cable	Power and side band connector	Power connector

Step 3. Remove cable tie from the GPU board.

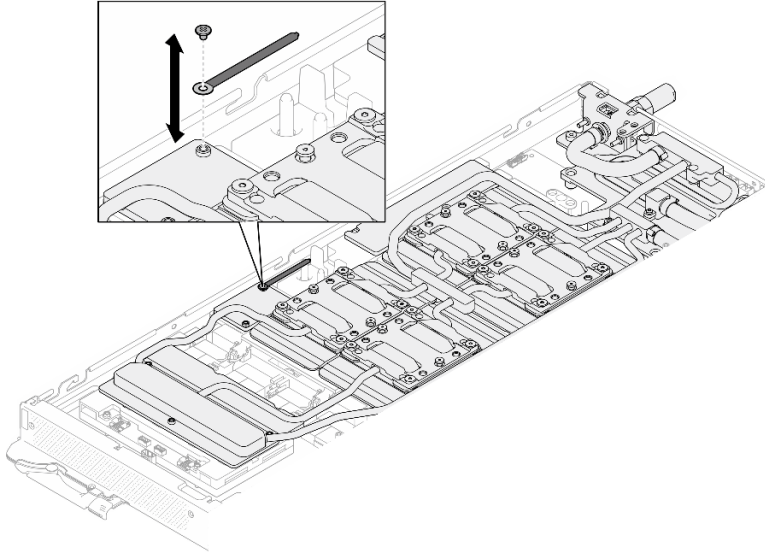


Figure 361. Cable tie removal

Step 4. Remove the Hex screw (x1) and the PH1 screws (x3) from the water loop with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

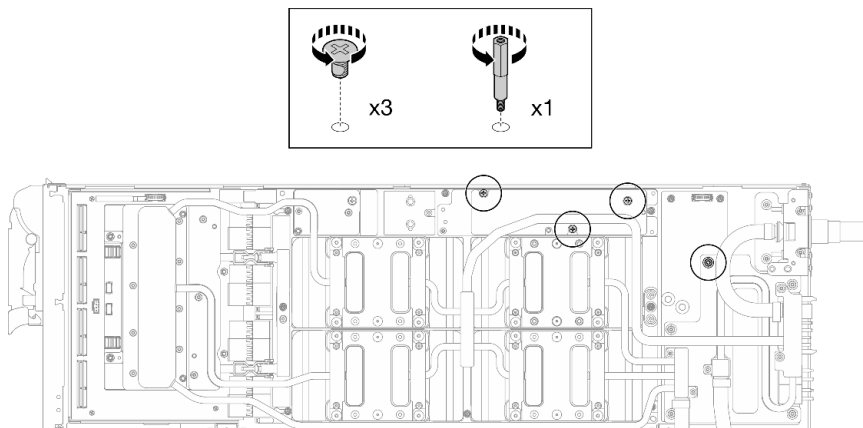


Figure 362. Water loop Hex and PH1 screws removal (GPU node)

Step 5. Remove water loop screws and quick connect screws (x13 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

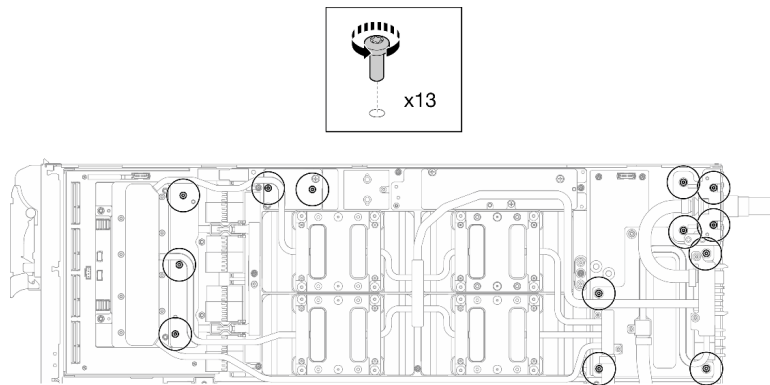


Figure 363. Water loop Torx T10 screws removal (GPU node)

Step 6. Remove the quick connect screws (x4 Torx T10) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

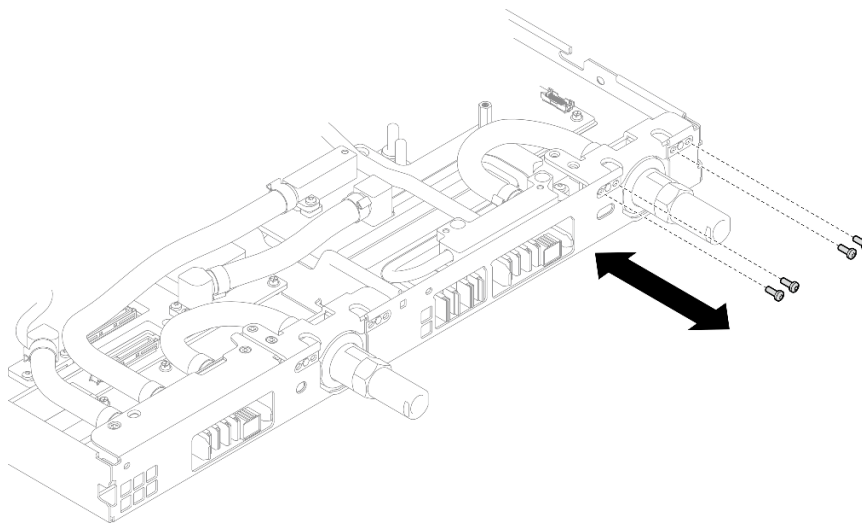


Figure 364. Quick connect screw removal (GPU node)

Step 7. Follow the screw removal sequence specified on the network board label, and remove network cold plate screws (x8 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

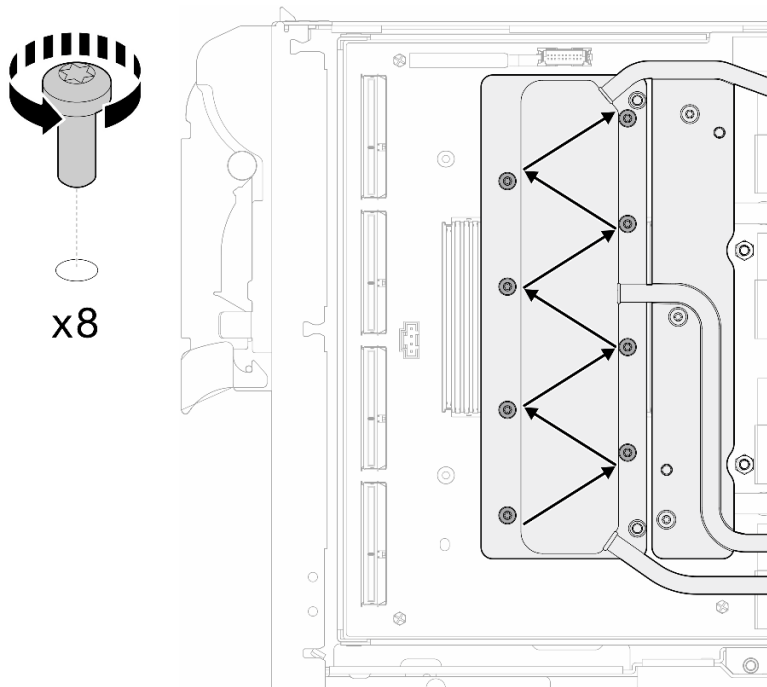


Figure 365. Network card screw removal

- Step 8. Loosen GPU cold plate screws (x16 Torx T10 screws) in the diagonal pattern with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/loosened is 3.5 +/- 0.5 lb-in (0.4 +/- 0.06 N-m).

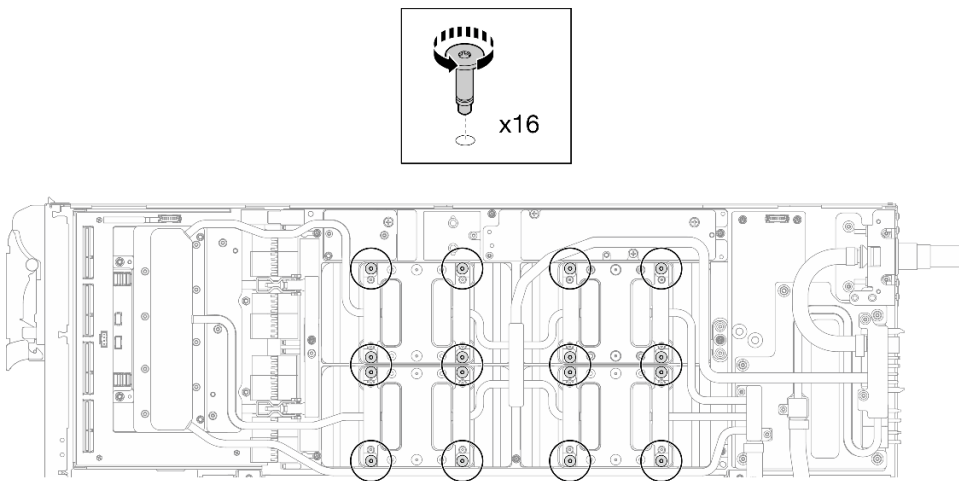


Figure 366. Loosening GPU cold plate screw

- Step 9. Release the front and rear MISC conduction plates of the water loop from the GPU board.
- 1 Insert a flat head screwdriver into the gaps between the MISC conduction plates (front and rear) and the GPU board. Then, slightly rotate the flat head screwdriver.

**Note:** Locations of the gaps for inserting flat head screwdriver is shown in the illustration below.

- b. ② The front and rear MISC conduction plates release from the GPU board slightly.

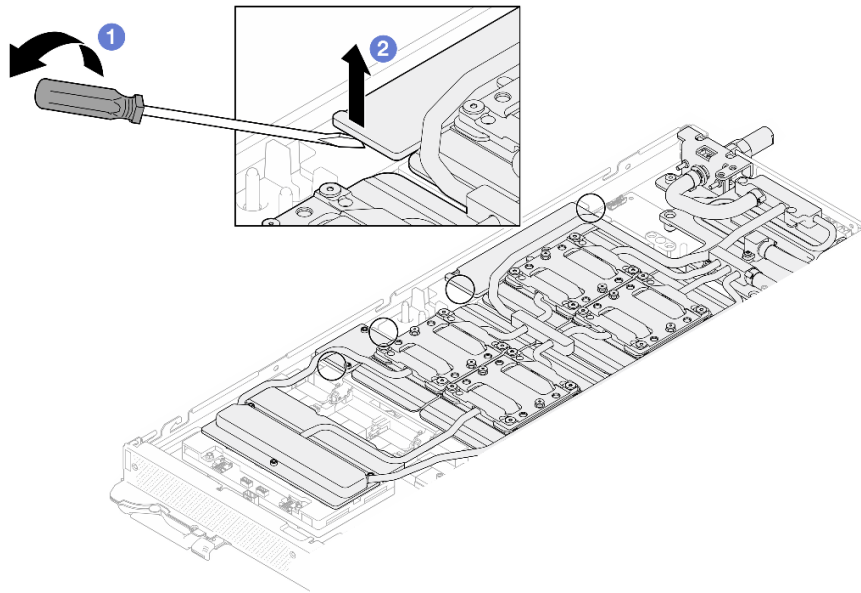


Figure 367. Releasing the front and rear MISC conduction plates release from the GPU board

Step 10. Release the GPU cold plates from the GPUs.

- a. There are notches on the sides of the GPU cold plates for inserting a flat head screwdriver. The locations of the notches are shown in the illustration below.

**Attention:** Inserting the flat head screwdriver **ONLY** to the notches circled in the illustration below. Otherwise, the screwdriver may damage the GPUs.

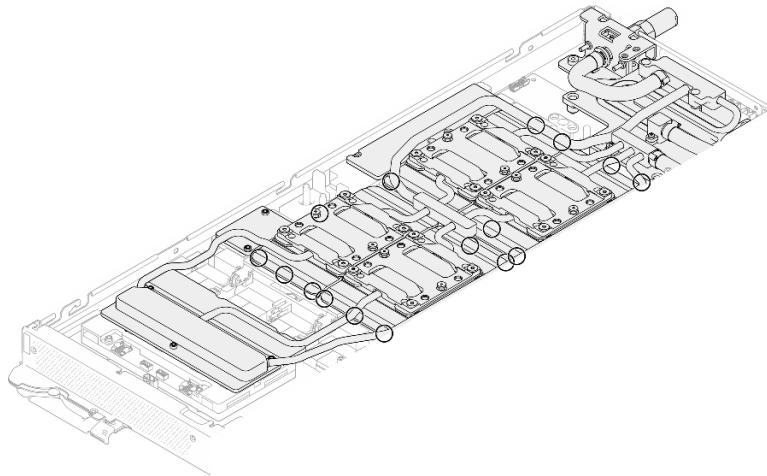
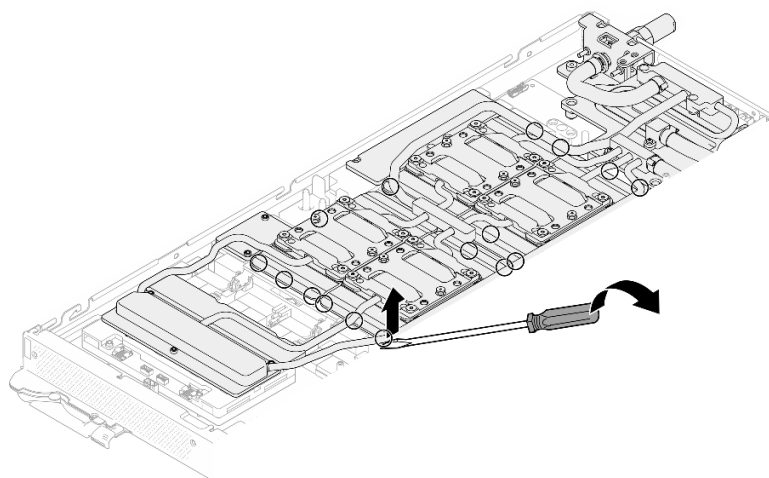


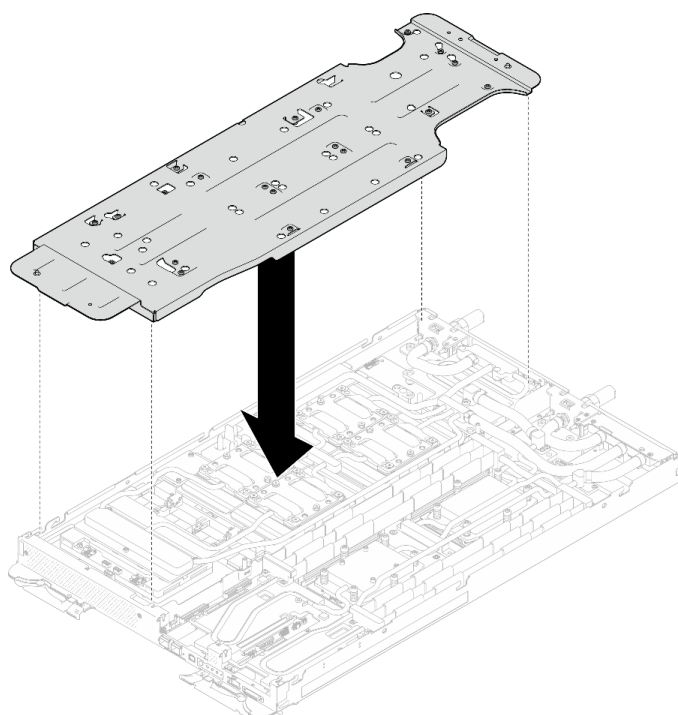
Figure 368. Notches for releasing GPU cold plates

- b. Insert a flat screwdriver into all the notches shown in the illustration; then, slightly rotate the screwdriver to release the GPU cold plates from the GPUs.



*Figure 369. Releasing the GPU cold plate from the GPU*

Step 11. Gently put the water loop carrier down onto the water loop and ensure it is seated firmly on the water loop.



*Figure 370. Water loop carrier installation (GPU node)*

Step 12. Tighten water loop carrier screws (x20 Phillips #2 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

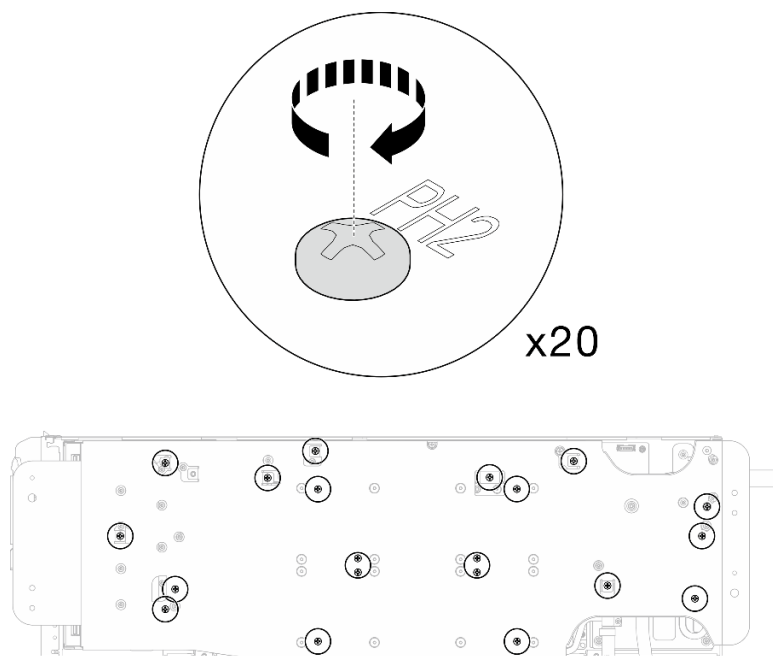


Figure 371. Water loop screw and quick connect screw removal (GPU node)

Step 13. Carefully rotate the GPU node side water loop so that it is sitting on top of the Compute node side water loop.

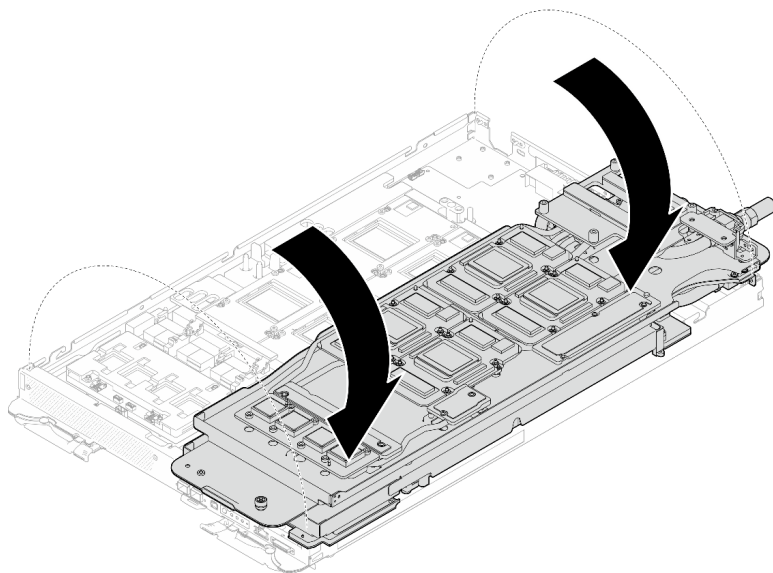


Figure 372. Folding the GPU node side water loop onto the Compute node side water loop

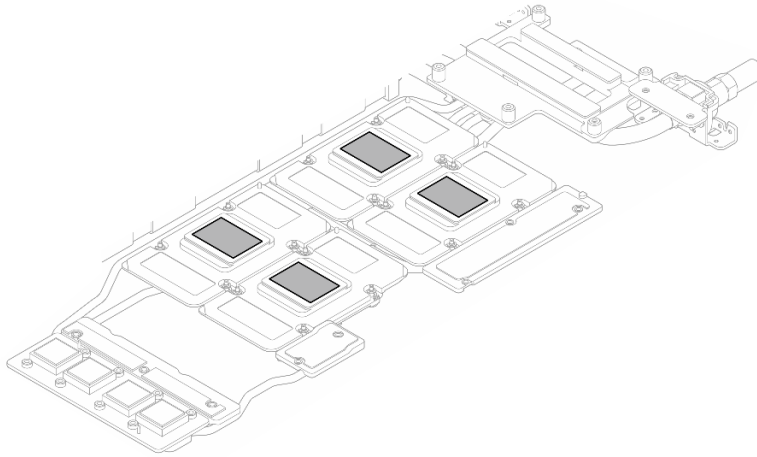
Step 14. **Immediately** clean the PCM off all the GPUs with alcohol cleaning pads. **Gently** clean the PCM to avoid GPU damages.

**Attention:**

- It is recommended to clean the PCM while it is in liquid state.

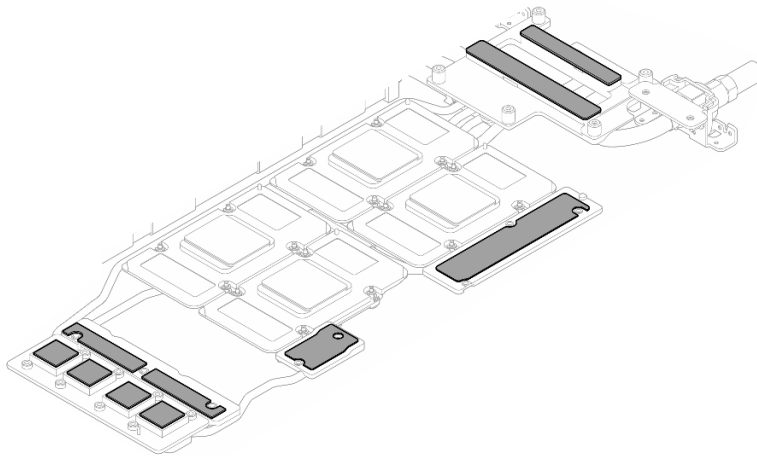


- The electrical components around the die on the GPUs are extremely delicate. When removing the PCM and cleaning the GPU die, avoid touching the electrical components to prevent damages.



*Figure 373. Cleaning PCM off from all GPUs*

Step 15. With alcohol cleaning pads, wipe off any remaining putty pad and PCMs from the water loop and components in the GPU node.



*Figure 374. Cleaning putty pads from water loop*

Step 16. Locate the GPU to be removed. Then, remove the four Torx T15 screws in the sequence shown in the illustration below with a torque screwdriver set to the proper torque. Then, carefully remove the GPU out of the GPU board.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 0.45-0.56 N-m, 4.0-5.0 in-lbf.

Screw installation sequence: 1 → 2 → 3 → 4

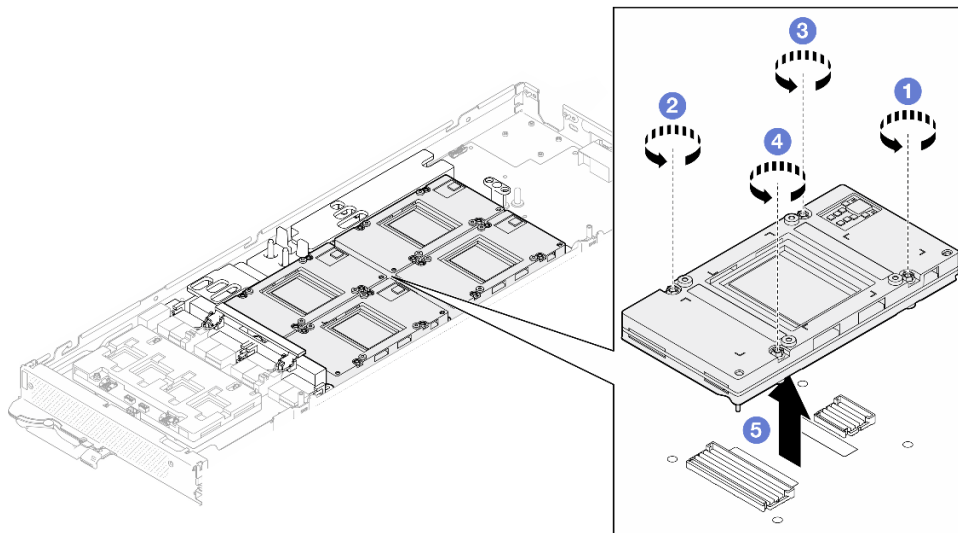


Figure 375. GPU removal

## 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 a GPU (trained technician only)

Use this information to install a GPU.

## About this task

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

## Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit

- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screwdriver Type	Screw Type
Hex screwdriver	6 mm hex head screwdriver
Torx T10 head screwdriver	Torx T10 screw
Phillips #1 head screwdriver	Phillips #1 screw
Phillips #2 head screwdriver	Phillips #2 screw

#### Attention:

- Read “[Installation Guidelines](#)” on page 3 and “[Safety inspection checklist](#)” on page 4 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

The following illustration shows the GPU numbering.

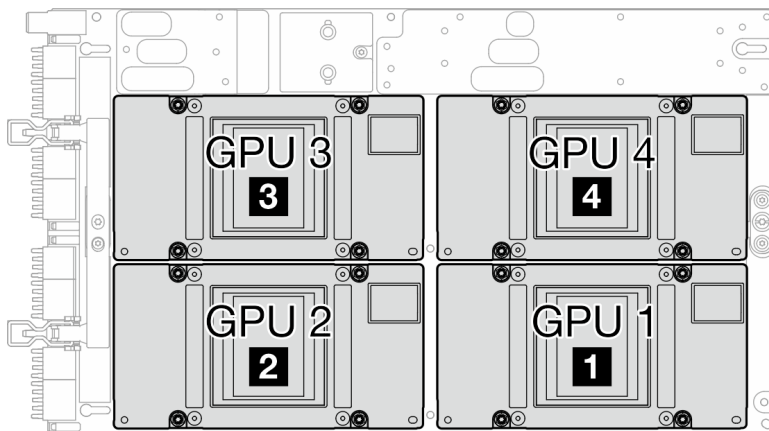


Figure 376. GPU numbering

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.

- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

## Procedure

**Note:** Make sure to inspect the connectors and sockets on the GPU and the GPU board. Do not use the GPU or the GPU board if its connectors are damaged or missing, or if there are debris in the sockets. Replace the GPU or the GPU board with a new one before continuing the installation procedure.

Step 1. Gently place the GPU down on the GPU board; then, install the four Torx T15 screws with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 0.45-0.56 N-m, 4.0-5.0 in-lbf.

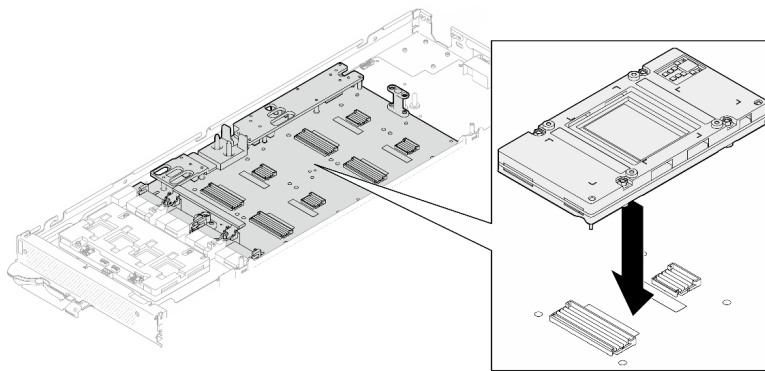


Figure 377. GPU installation

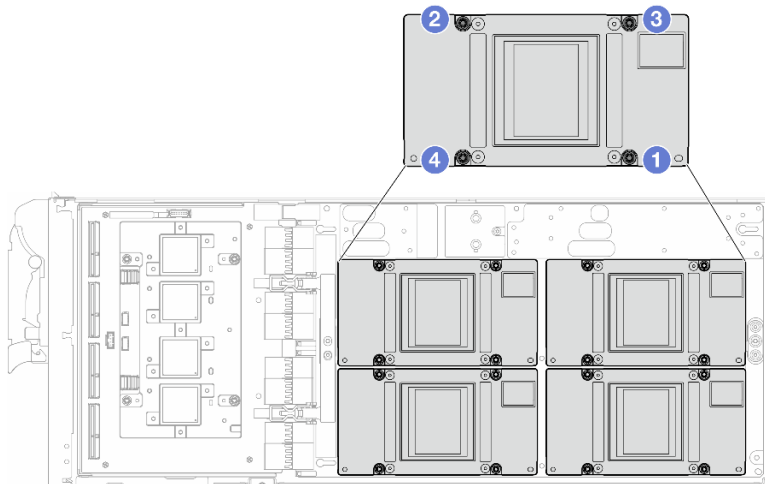


Figure 378. GPU screw tightening sequence

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 2. Replace the Phase Change Material (PCM) and putty pads on the GPU node water loop with new ones.

- 1 Install the PCM jig on the GPU cold plate.
- 2 Attach the PCM to the square opening of the jig.
- c. Repeat to replace the PCM of all four GPU cold plates.

**Attention:**

- PCM cannot be reused. PCM must be replaced with new ones every time the water loop is removed.
- After PCM is replaced, there is an expected short duration of throttling before the GPU returns to normal operation. This is due to the PCM requiring a break-in period after being replaced.
- After replacing the GPU PCM and putty pads, servicers must perform the H100/H200 GPU PCM TIM melting procedure to monitor the GPU until the PCM Thermal Interface Material (TIM) has melted.
  - When performing the melting H100/H200 GPU PCM TIM procedures, the minimum water temperature is 35°C (95°F). Do not operate the melting process with water temperature lower than 35°C (95°F).
  - See [PCM TIM Melt Procedure for Neptune Water Cooled Servers with Nvidia H100 H200 GPUs](#) (trained technicians only).

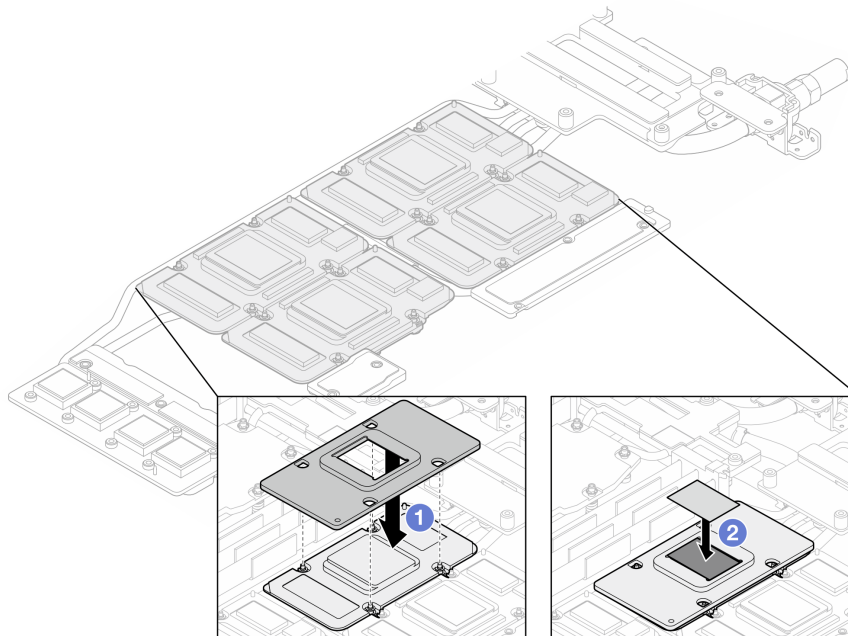
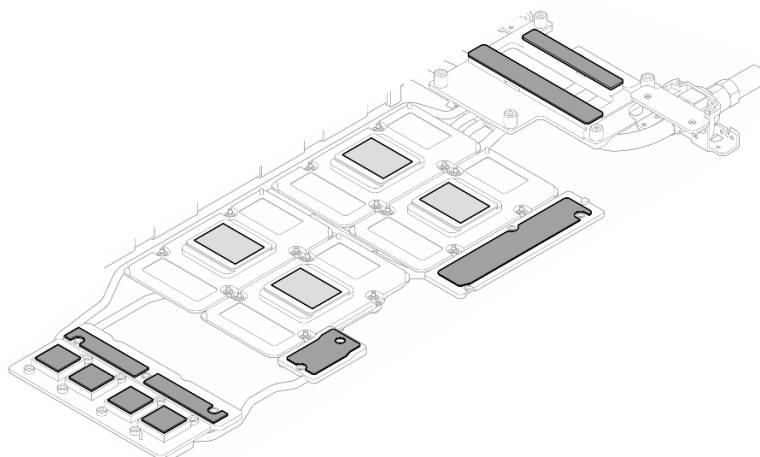


Figure 379. Water loop GPU cold plate PCM replacement (GPU node)

- d. Replace the putty pads on the GPU node water loop.

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**



*Figure 380. Water loop putty pads replacement (GPU node)*

- e. Replace the putty pads (x5) on the GPU. Make sure to align the putty pads to the GPU VR (1) and the markings on GPU. Repeat to replace all putty pads on the four GPUs.

<b>1</b> GPU VR (Cover the GPU VR with putty pad)
---

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

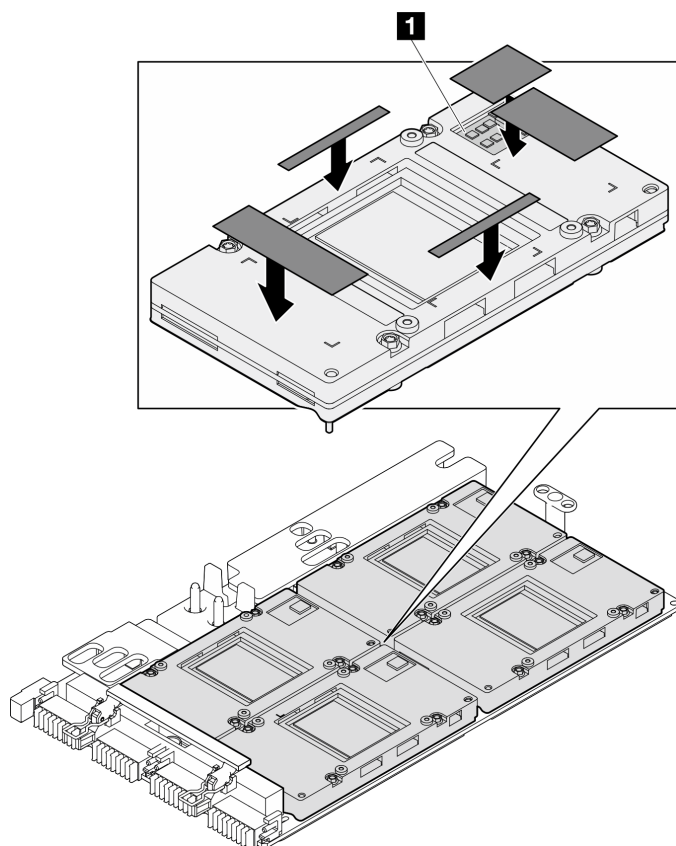


Figure 381. GPU putty pads replacement

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 3. Unfold the water loop and place it onto the GPU node.

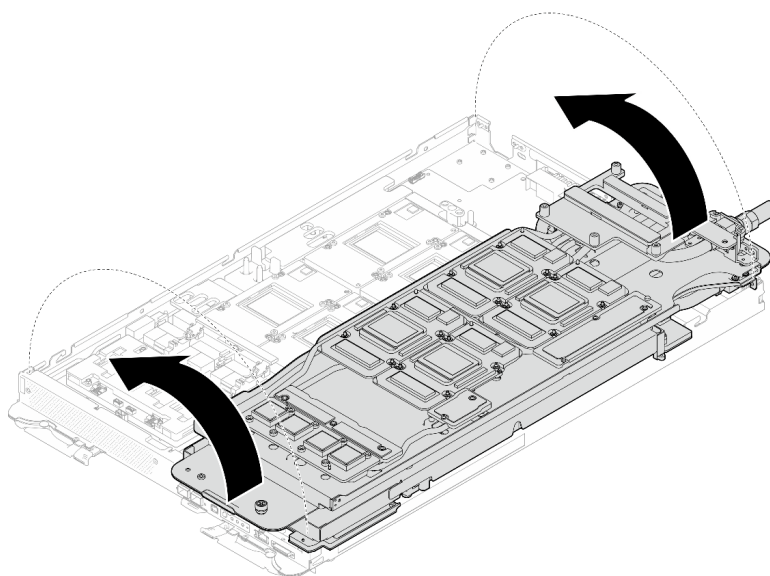


Figure 382. Unfolding the water loop to GPU node

Step 4. Loosen water loop carrier screws (x20 Phillips #2 screws).

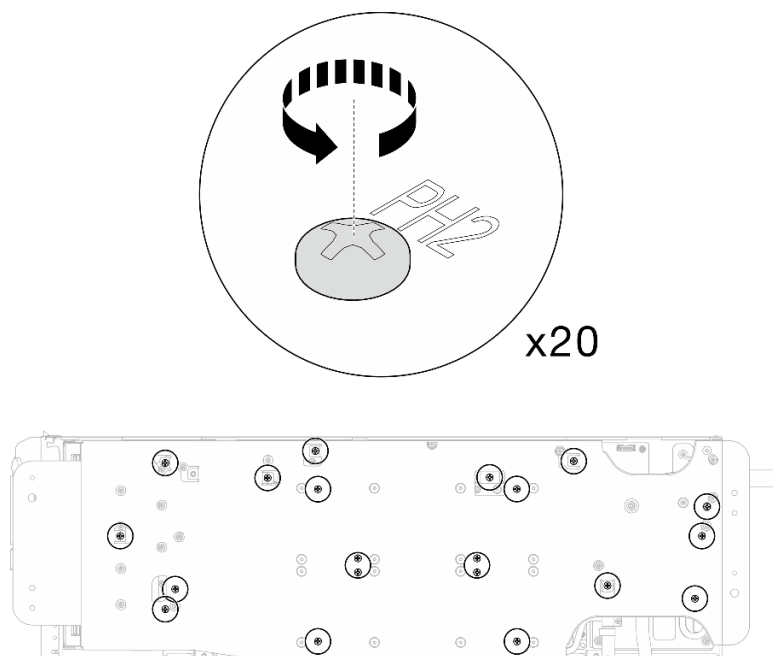


Figure 383. Water loop screws and quick connect screws installation (GPU node)

Step 5. Remove the water loop carrier from the GPU node.

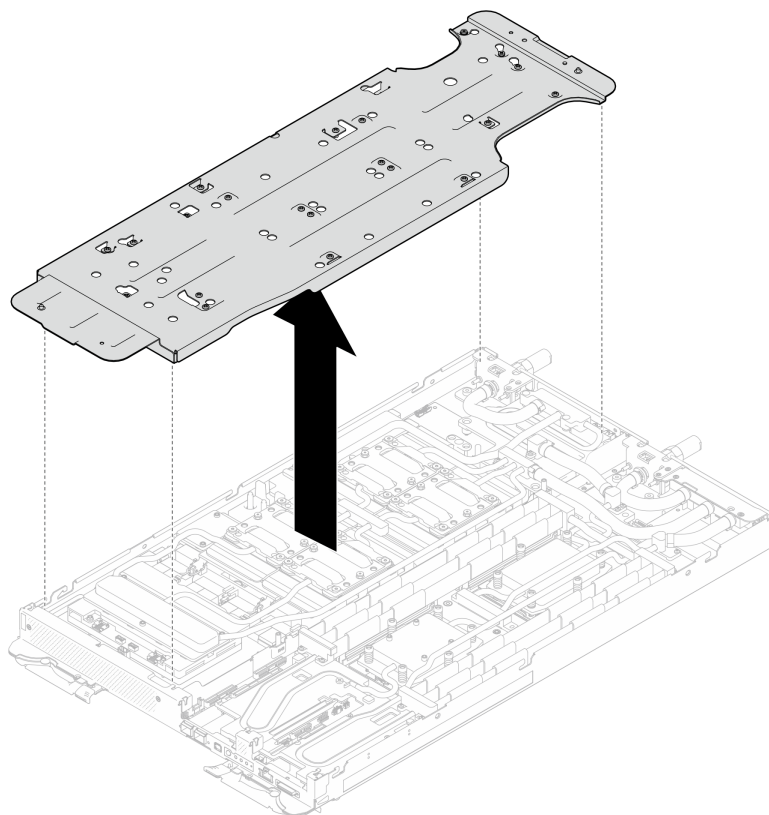


Figure 384. Water loop carrier removal (GPU node)



Step 6. Install GPU cold plate screws (x16 T10 screws).

- a. Install GPU cold plate screws following the GPU cold plates installation sequence: **GPU 2 → GPU 4 → GPU 1 → GPU 3**

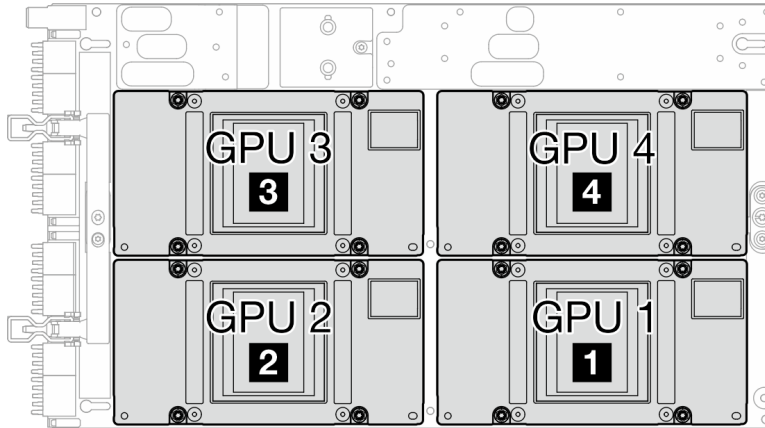


Figure 385. GPU numbering

- b. Set the torque screwdriver to 1.5 +/- 0.5 lb-In (0.1 +/- 0.06 N-m); then, fasten the GPU cold plate screws.
- c. Set the torque screwdriver to 4 +/- 0.5 lb-In (0.45 +/- 0.06 N-m); then, fasten the GPU cold plate screws.
- d. Set the torque screwdriver to 4 +/- 0.5 lb-In (0.45 +/- 0.06 N-m); then, fasten the GPU cold plate screws until all screws are fully tightened.

**Note:** Make sure to follow the screw sequence on the GPU cold plate label: ① → ② → ③ → ④

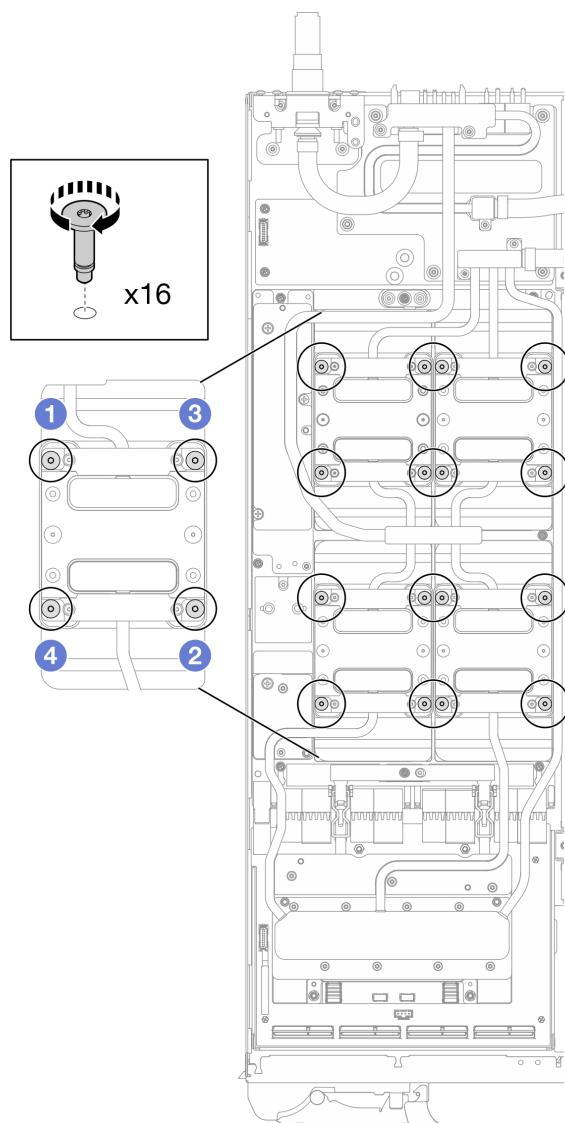


Figure 386. GPU cold plate screw installation

Step 7. Follow the screw installation sequence specified on the network board label, and install network cold plate screws (x8 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

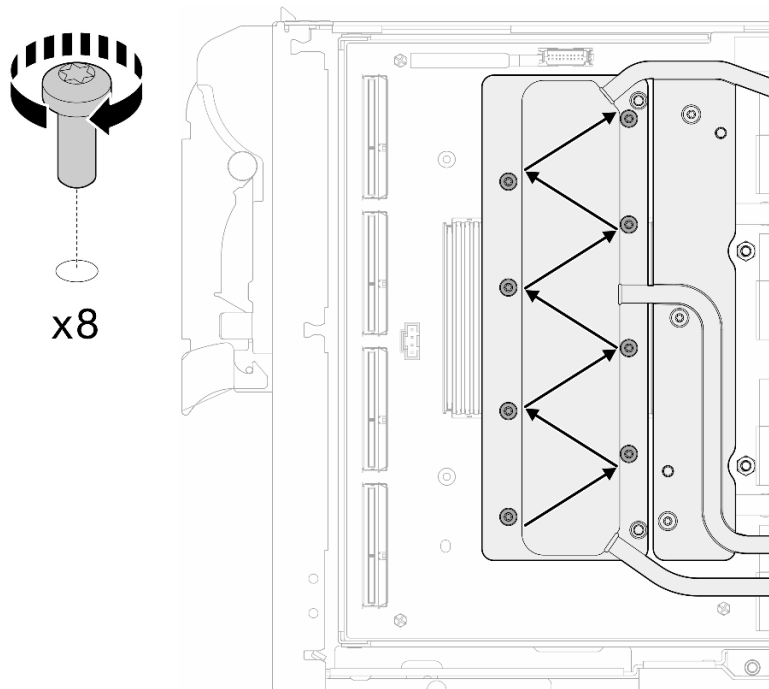


Figure 387. Network card screw installation

Step 8. Install the quick connect screws (x4 Torx T10) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

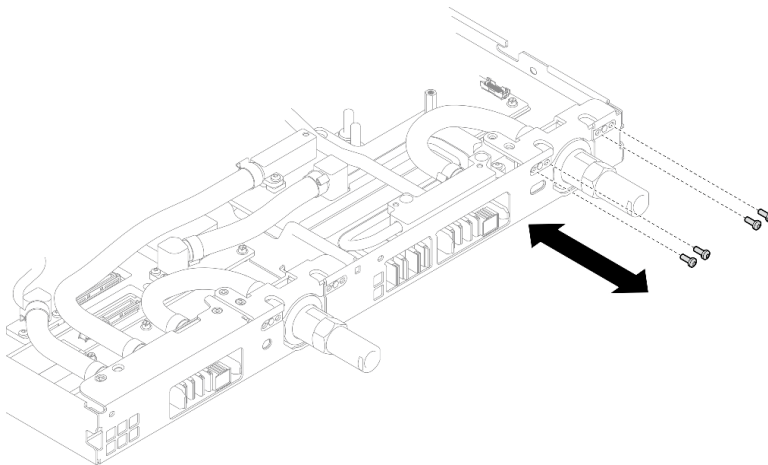
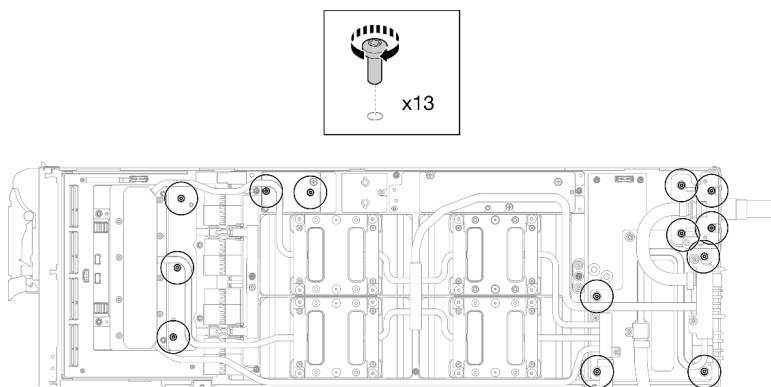


Figure 388. Quick connect screw installation (GPU node)

Step 9. Install water loop screws and quick connect screws (x13 Torx T10 screws) with a torque screwdriver set to the proper torque.

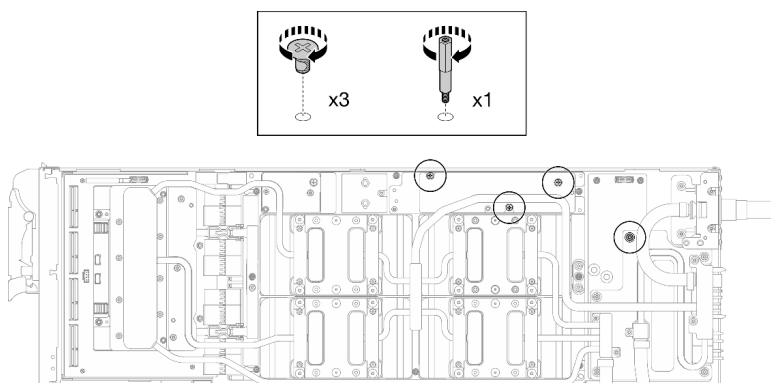
**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



*Figure 389. Water loop Torx T10 screws installation (GPU node)*

Step 10. Install the Hex screw (x1) and the PH1 screws (x3).

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



*Figure 390. Water loop Hex and PH1 screws installation (GPU node)*

Step 11. Install the cable tie to the GPU board.

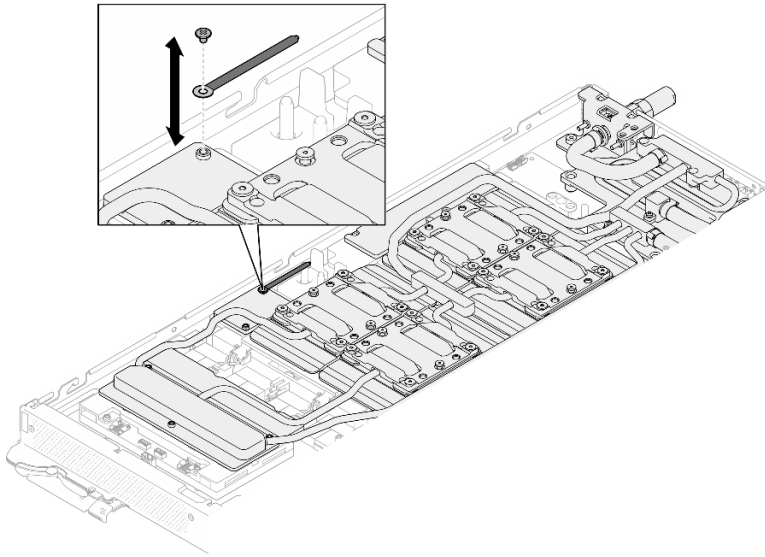


Figure 391. Installing the cable tie

Step 12. Connect the carrier board power cable.

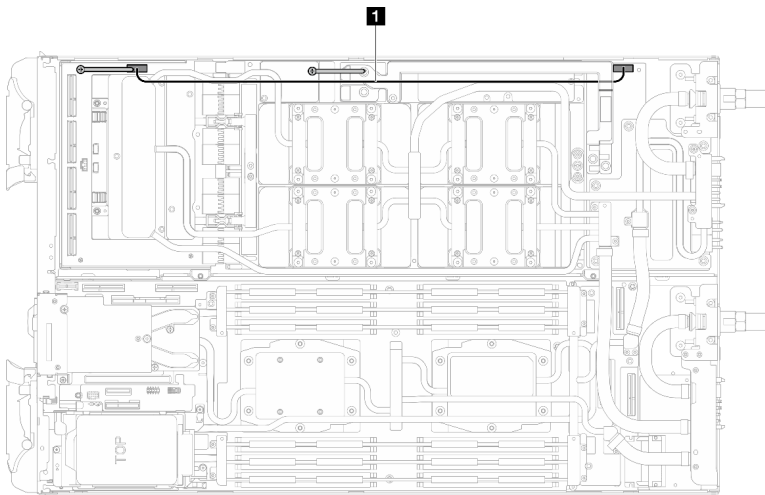


Figure 392. Connecting carrier board power cable

Cable	From (carrier board)	To (GPU node power distribution board)
<b>1</b> Carrier board power cable	Power and side band connector	Power connector

## After you finish

1. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
2. Install the bus bar. See [“Install the bus bar” on page 267](#).
3. Install the cross braces. See [“Install the cross braces” on page 21](#).
4. Install the tray cover. See [“Install the tray cover” on page 18](#).
5. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).

6. Connect all required external cables to the solution.

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

7. 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](#)

## GPU board (trained technician only)

Use the following procedures to remove and install the GPU board.

### Remove the GPU board (trained technician only)

Use this information to remove a GPU.

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
M3 screw	M3 screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

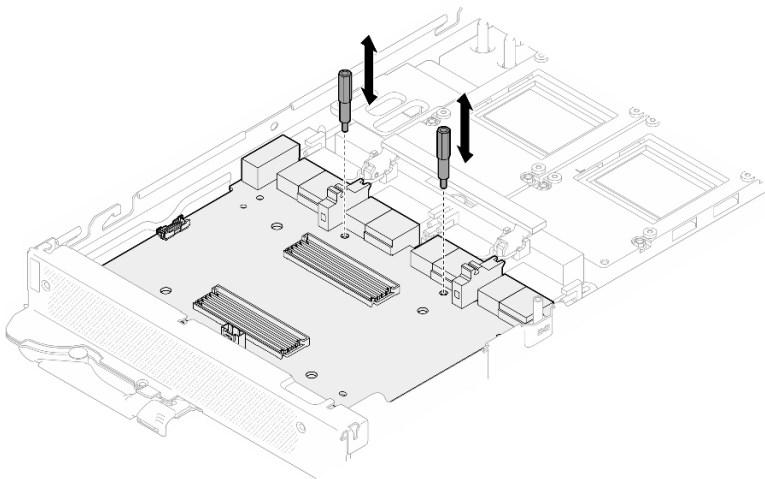
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

## Procedure

Step 1. Make preparations for this task.

- Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14.](#)
- Remove the tray cover. See [“Remove the tray cover” on page 17.](#)
- Remove the cross braces. See [“Remove the cross braces” on page 19.](#)
- Remove the bus bar. See [“Remove the bus bar” on page 266.](#)
- Remove the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401.](#)
- Remove the GPUs from the GPU board. See [“Remove a GPU \(trained technician only\)” on page 277.](#)
- Remove the network board. See [“Remove the network board” on page 371.](#)

Step 2. Remove the two standoffs from the carrier board.



*Figure 393. Carrier board standoffs removal*

Step 3. Release the carrier board from the GPU board.

- ① Rotate the GPU board handle towards the carrier board.
- ② Release the GPU board retention clips and rotate them towards the GPU board.

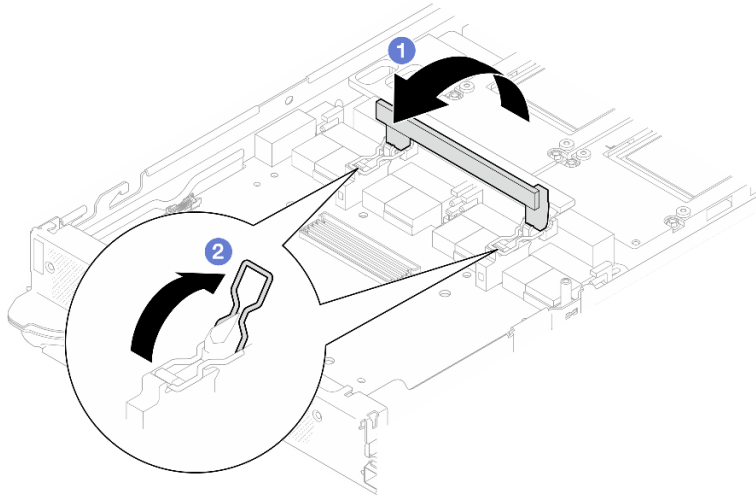


Figure 394. Releasing the carrier board

Step 4. Disconnect the carrier board from the GPU board.

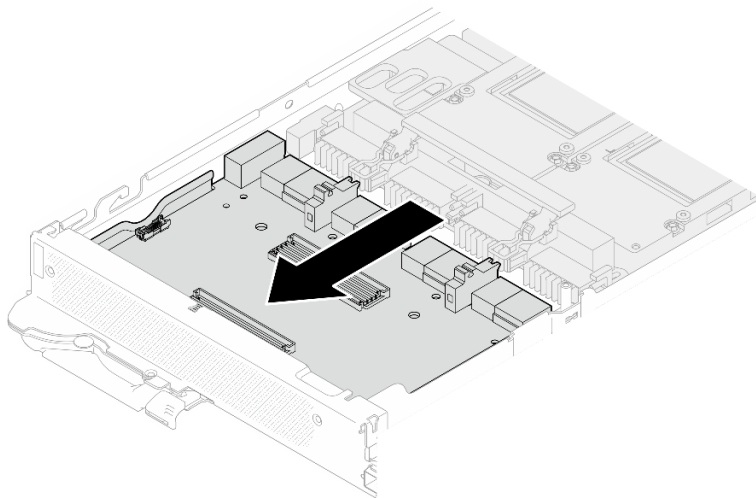


Figure 395. Disconnecting the carrier board from the GPU board

Step 5. Remove M3 screws (x7) from the GPU board.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



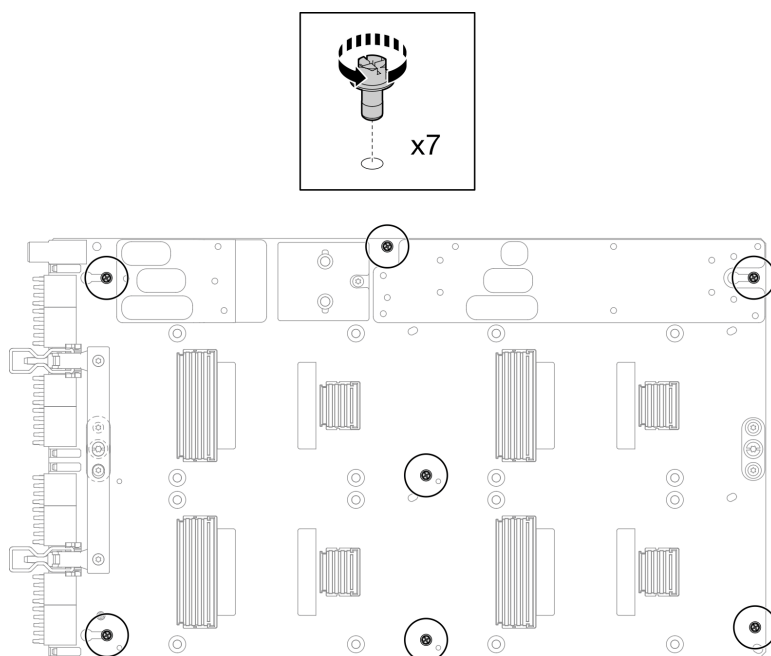


Figure 396. GPU board M3 screws removal

Step 6. Remove T15 screws (x2) from the GPU board.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 0.6 N-m, 5.3 in-lbf, torque tolerance is +/- 4%.

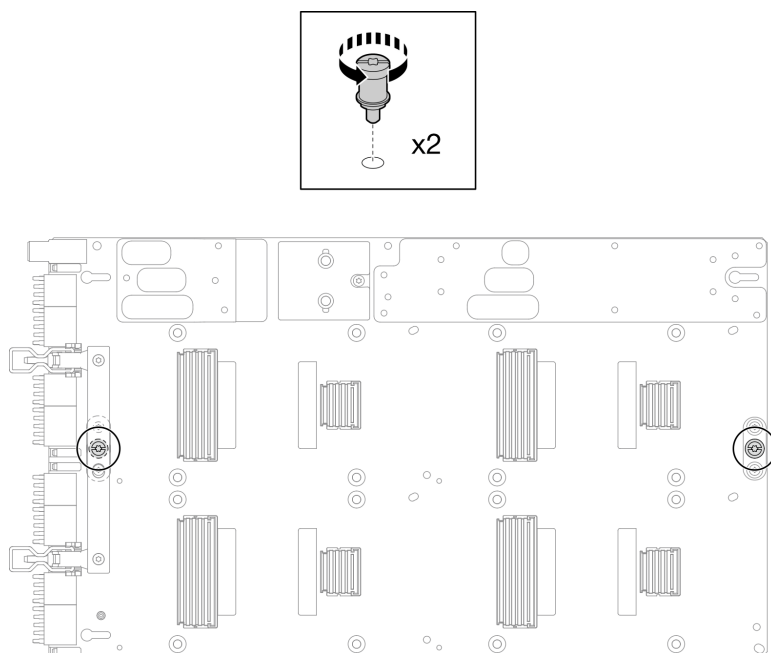
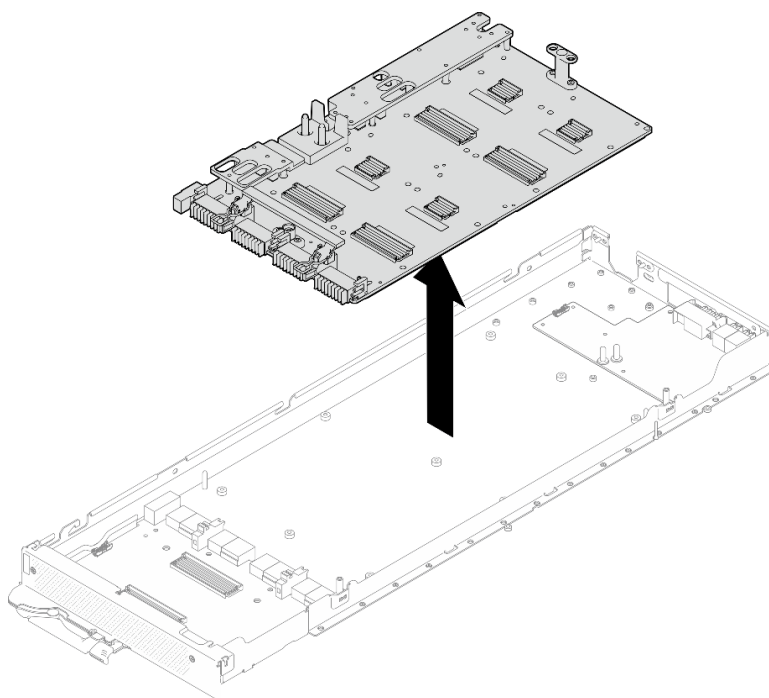


Figure 397. GPU board T15 screws removal

Step 7. Remove the GPU board from the tray.

Figure 398. GPU board 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 GPU board (trained technician only)

Use this information to install the GPU board.

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
M3 screw	M3 screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

**Attention:**

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.
- Hold the long sides of the GPU board with two hands while removing the new GPU board from the package box.

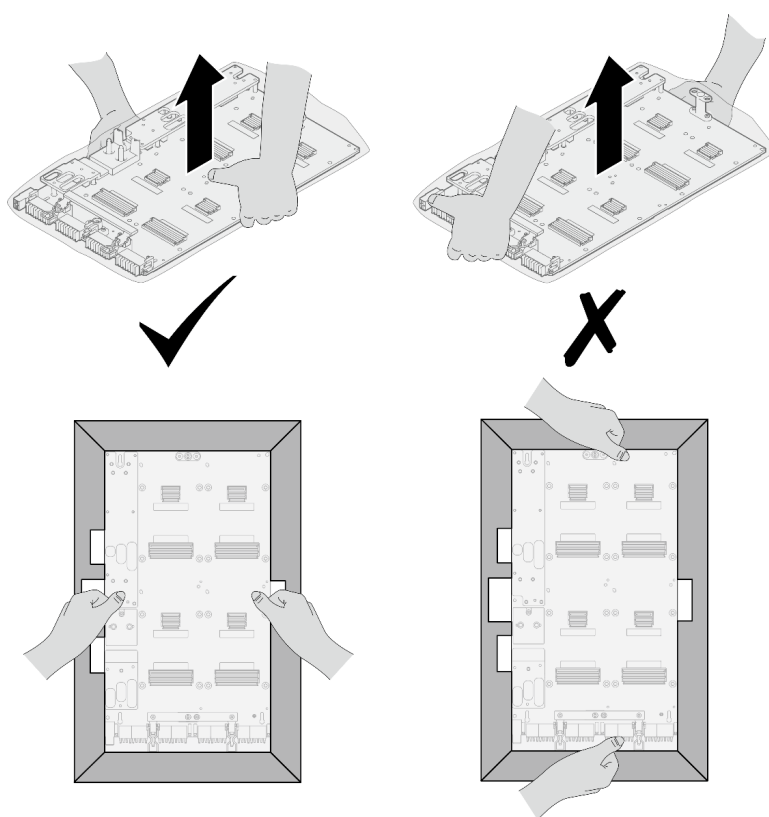


Figure 399. Removing GPU board from the package box

- Once the GPU board is removed from the plastic protective bag, hold two handles with both hands to move the GPU board.

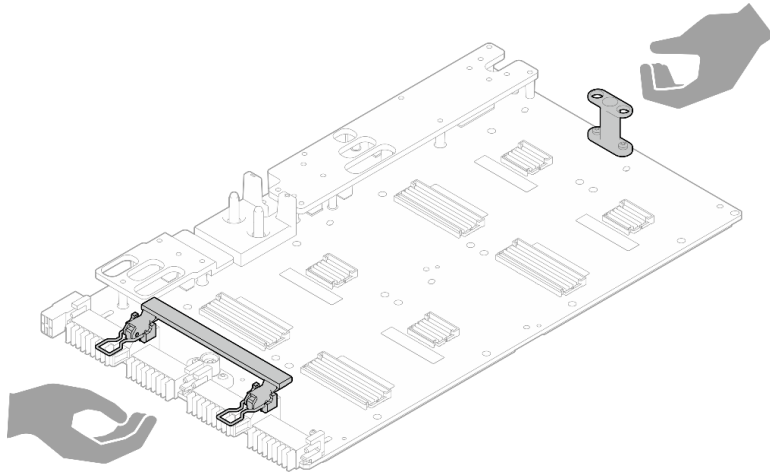


Figure 400. Removing GPU board from the package box

**Important: Gap pad/putty pad replacement guidelines**

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

**Procedure**

**Note:** Make sure to inspect the connectors and sockets on the GPU and the GPU board. Do not use the GPU or the GPU board if its connectors are damaged or missing, or if there are debris in the sockets. Replace the GPU or the GPU board with a new one before continuing the installation procedure.

Step 1. Align the GPU board with the two guide pins on the tray; then, gently lower down the GPU board to the node.

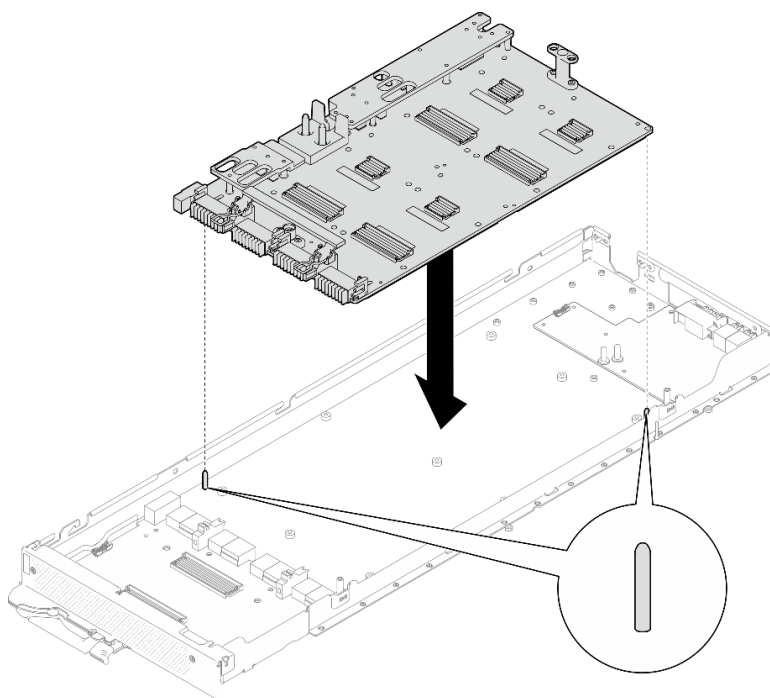


Figure 401. Installing the GPU board

Step 2. Install the M3 screws (x7) on the GPU board.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

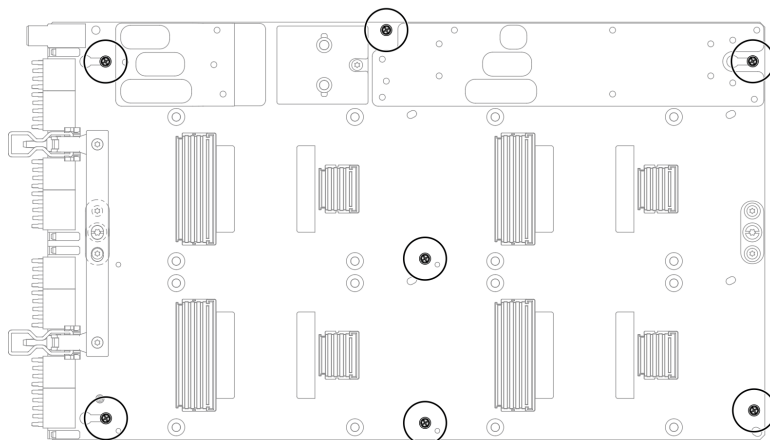
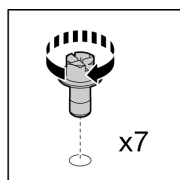
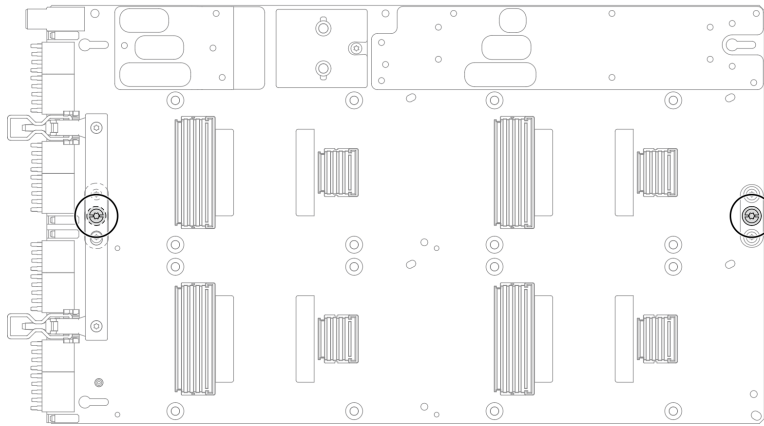
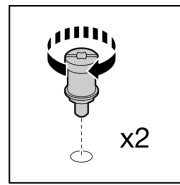


Figure 402. Installing the M3 screws on the GPU board

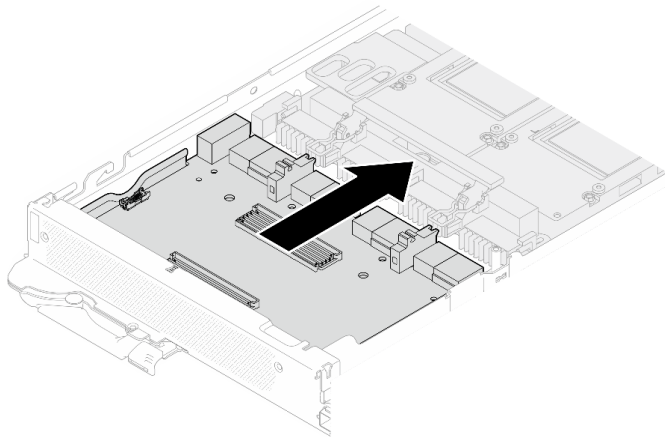
Step 3. Install the T15 screws (x2) on the GPU board.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 0.6 N-m, 5.3 in-lbf, torque tolerance is +/- 4%.



*Figure 403. Installing the T15 screw on the GPU board*

Step 4. Push the carrier board to connect it to the GPU board.



*Figure 404. Connecting the carrier board to the GPU board.*

Step 5. Secure the carrier board to the GPU board.

- a. ① Insert the GPU board retention clips into the slots on the carrier board.
- b. ② Rotate the GPU board handle toward the GPU board, and press it down to lock the carrier board in place.

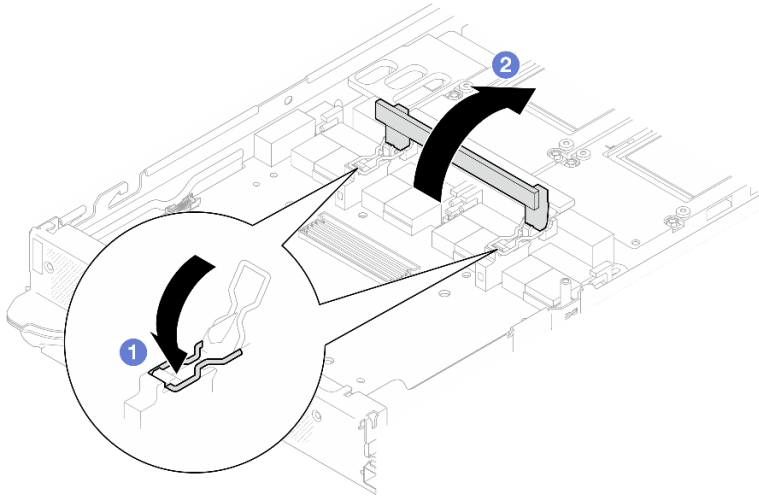


Figure 405. Securing the carrier board to the GPU board

Step 6. Install the two standoffs to the carrier board.

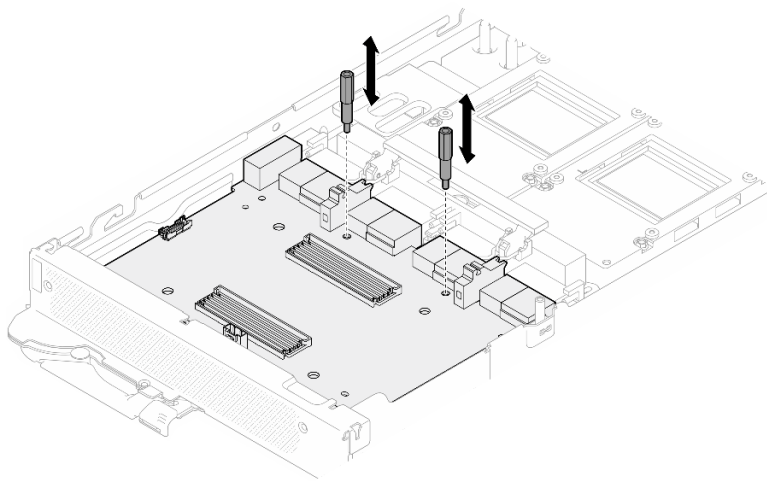


Figure 406. Installing carrier board standoffs

## After you finish

1. Install the network board. See [“Install the network board” on page 380](#).
2. Install the GPUs to the GPU board. See [“Install a GPU \(trained technician only\)” on page 286](#).
3. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
4. Install the bus bar. See [“Install the bus bar” on page 267](#).
5. Install the cross braces. See [“Install the cross braces” on page 21](#).
6. Install the tray cover. See [“Install the tray cover” on page 18](#).
7. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
8. Connect all required external cables to the solution.

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

9. 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](#)

## GPU board assembly replacement (trained technician only)

Use the following procedures to remove and install the GPU board assembly.

### Remove the GPU board assembly (trained technician only)

Use this information to remove the GPU board assembly.

### About this task

#### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Hex screw	6 mm hex screwdriver
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
M3 screw	M3 screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.



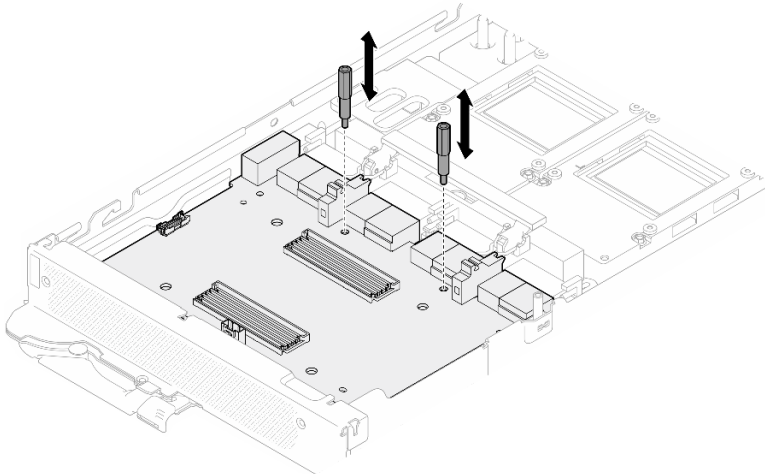
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

## Procedure

Step 1. Make preparations for this task.

- Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14.](#)
- Remove the tray cover. See [“Remove the tray cover” on page 17.](#)
- Remove the cross braces. See [“Remove the cross braces” on page 19.](#)
- Remove the bus bar. See [“Remove the bus bar” on page 266.](#)
- Remove the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401.](#)
- Remove the network board. See [“Remove the network board” on page 371.](#)

Step 2. Remove the two standoffs from the carrier board.



*Figure 407. Carrier board standoffs removal*

Step 3. Release the carrier board from the GPU board.

- 1 Rotate the GPU board handle towards the carrier board.
- 2 Release the GPU board retention clips and rotate them towards the GPU board.

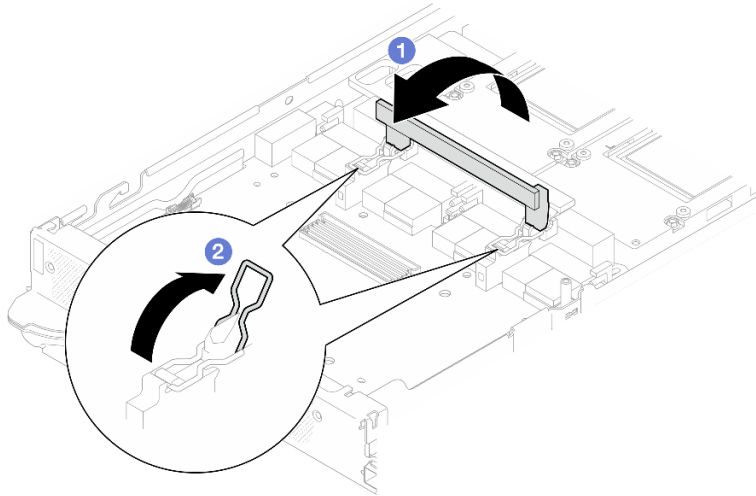


Figure 408. Releasing the carrier board

Step 4. Disconnect the carrier board from the GPU board.

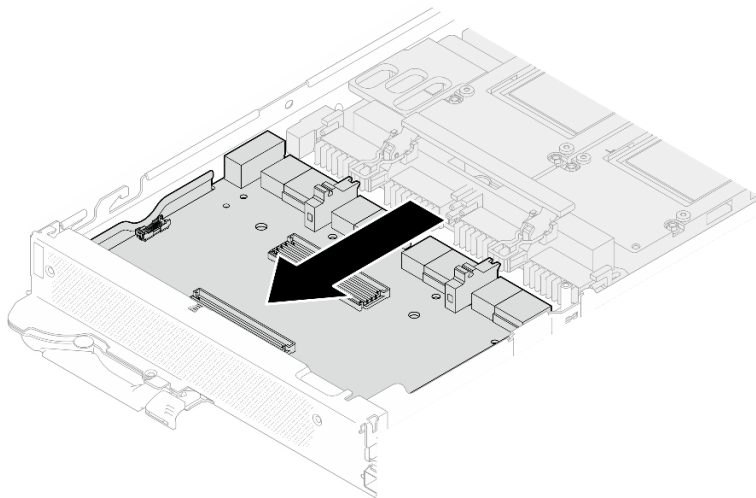


Figure 409. Disconnecting the carrier board from the GPU board

Step 5. Remove M3 screws (x7) from the GPU board assembly.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

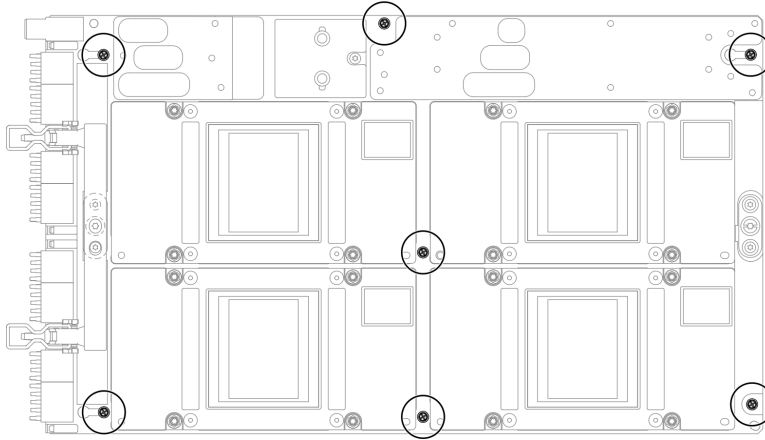
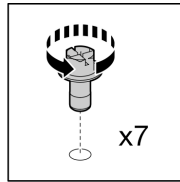


Figure 410. GPU board assembly M3 screws removal

Step 6. Remove T15 screws (x2) from the GPU board assembly.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 0.6 N-m, 5.3 in-lbf, torque tolerance is +/- 4%.

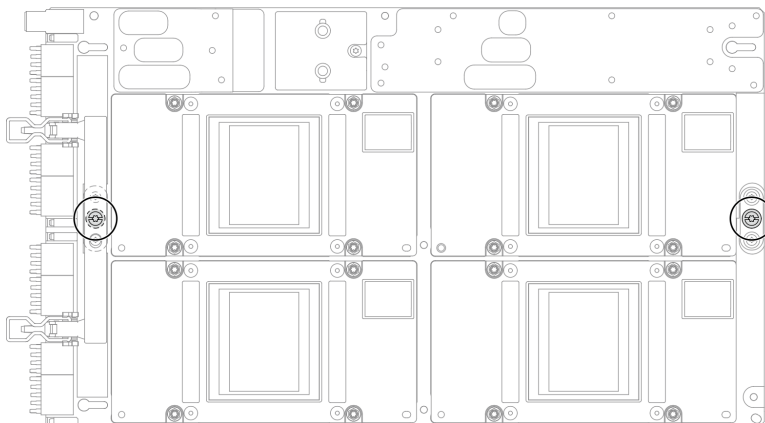
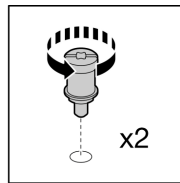
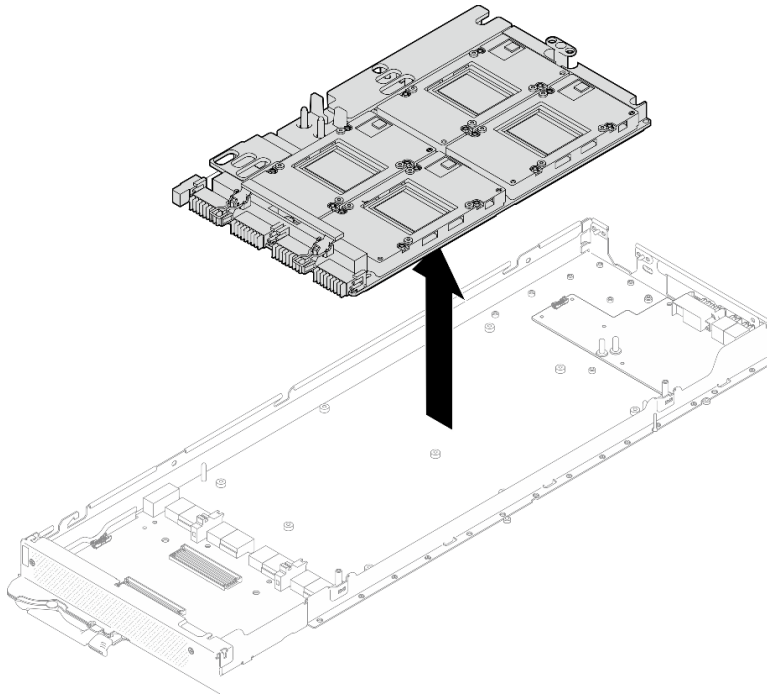


Figure 411. GPU board assembly T15 screws removal

Step 7. Remove the GPU board assembly from the node.



## 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 GPU board assembly (trained technician only)

Use this information to install the GPU board assembly.

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Hex screw	6 mm hex screwdriver
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
M3 screw	M3 screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

**Attention:**

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.
- Hold the long sides of the GPU board assembly with two hands while removing the new GPU board assembly from the package box.

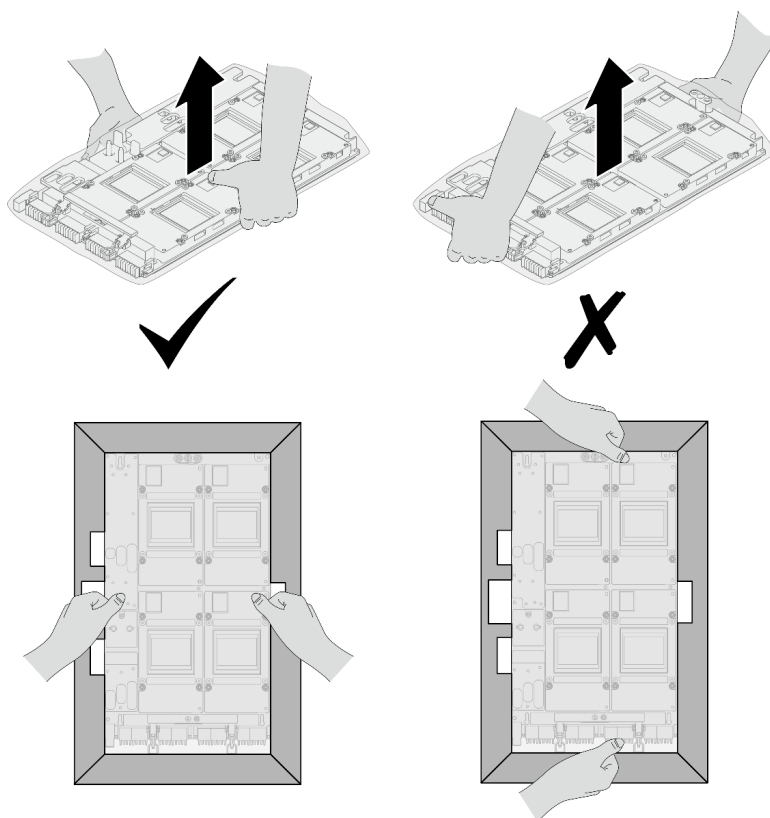


Figure 412. Removing GPU board assembly from the package box

- Once the GPU board is removed from the plastic protective bag, hold two handles with both hands to move the GPU board.

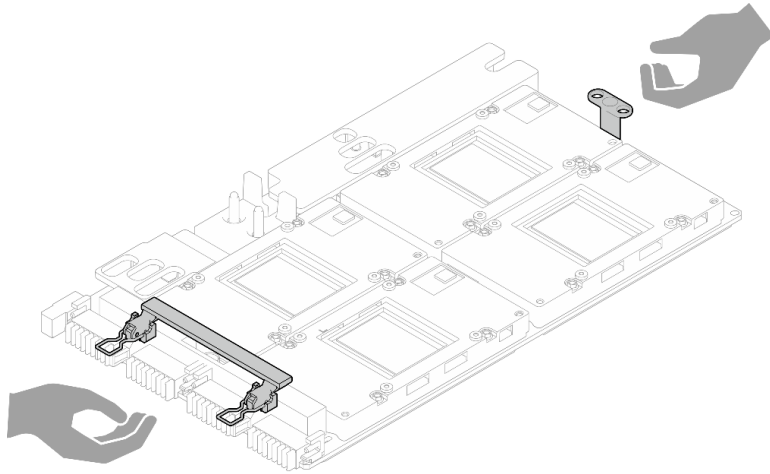


Figure 413. Removing GPU board assembly from the package box

**Important: Gap pad/putty pad replacement guidelines**

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

**Procedure**

- Step 1. Align the GPU board assembly with the two guide pins on the tray; then, gently lower down the GPU board assembly to the tray.

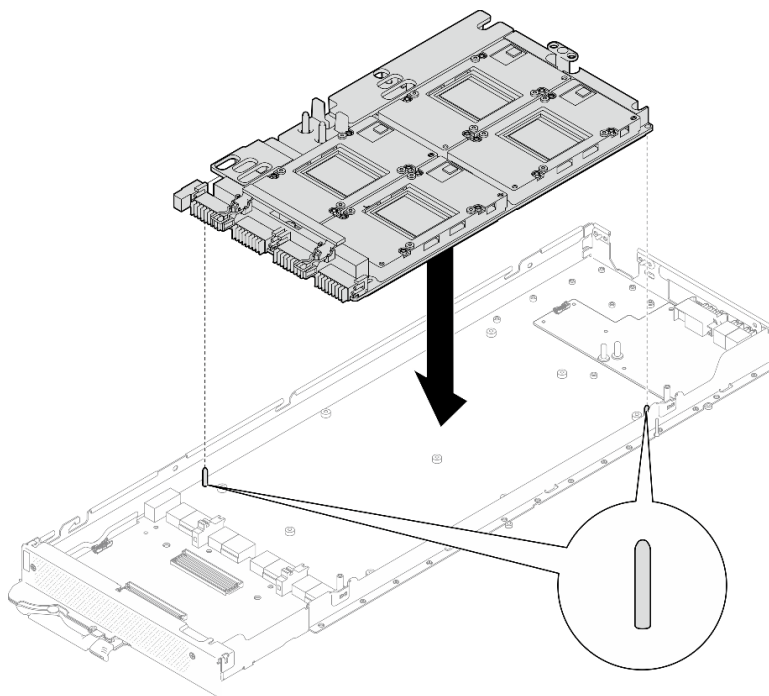


Figure 414. Installing the GPU board assembly to the node

Step 2. Install the M3 screws (x7) on the GPU board assembly.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

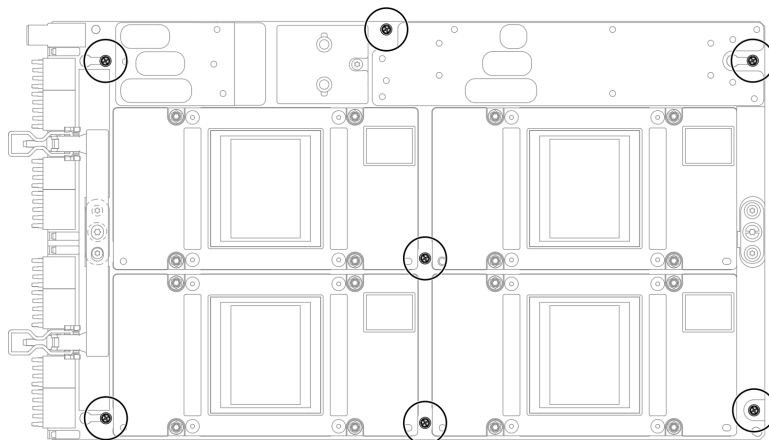
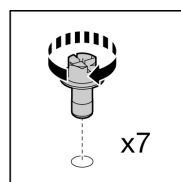


Figure 415. Installing the M3 screws on the GPU board assembly

Step 3. Install the T15 screws (x2) on the GPU board assembly.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 0.6 N-m, 5.3 in-lbf, torque tolerance is +/- 4%.

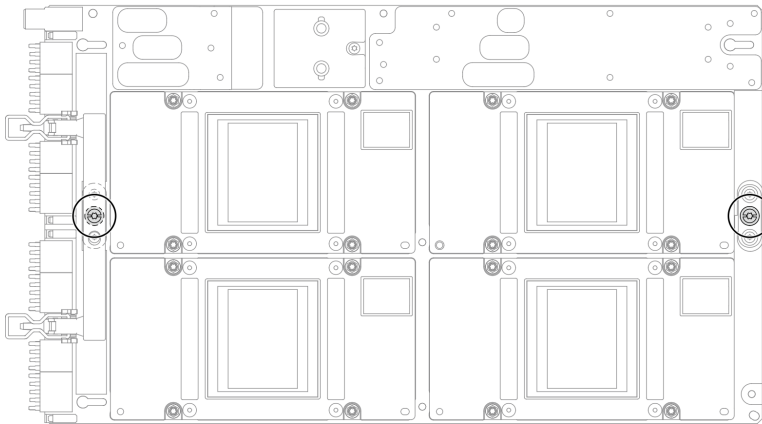
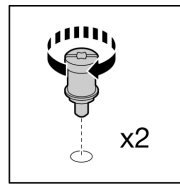


Figure 416. Installing the T15 screws on the GPU board assembly

Step 4. Push the carrier board to connect it to the GPU board.

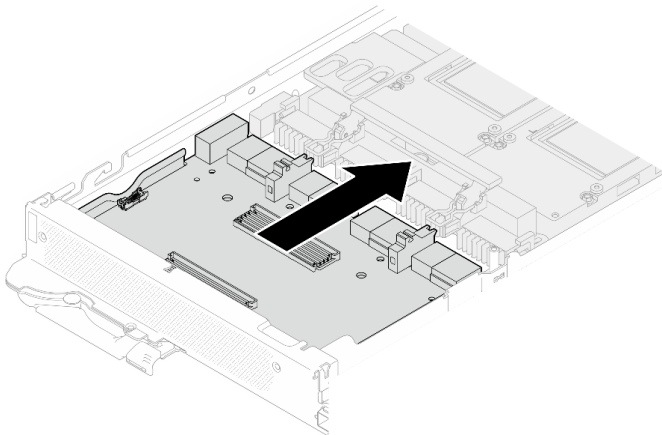


Figure 417. Connecting the carrier board to the GPU board.

Step 5. Secure the carrier board to the GPU board.

- a. ① Insert the GPU board retention clips into the slots on the carrier board.
- b. ② Rotate the GPU board handle toward the GPU board, and press it down to lock the carrier board in place.



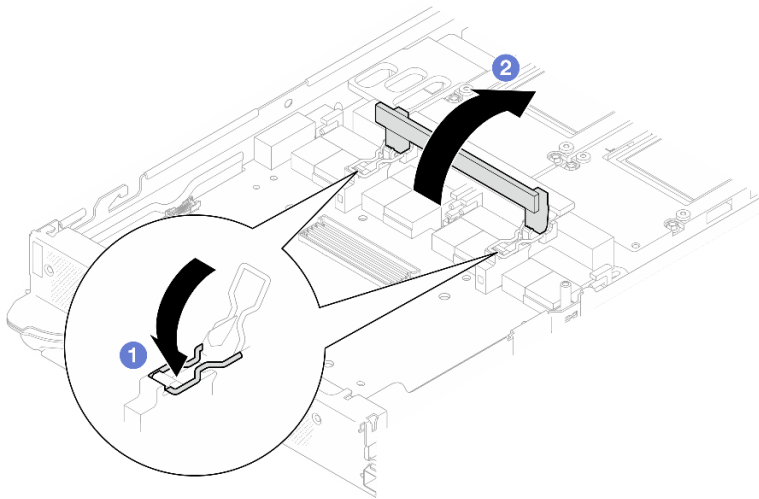


Figure 418. Securing the carrier board to the GPU board

Step 6. Install the two standoffs to the carrier board.

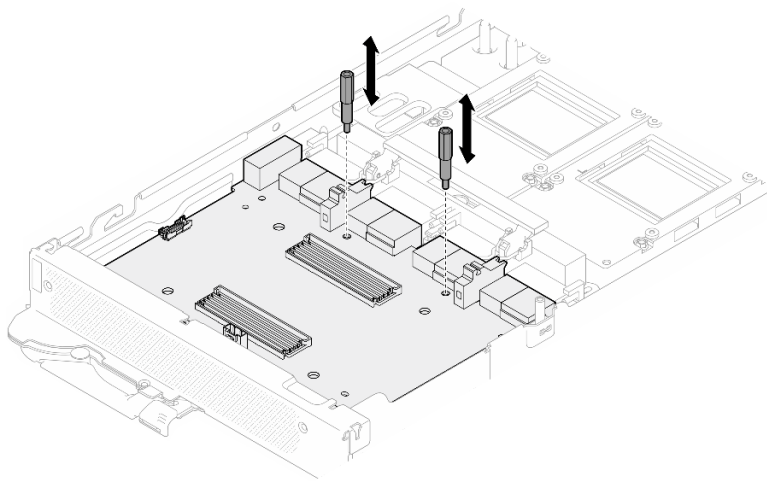


Figure 419. Installing carrier board standoffs

## After you finish

1. Install the network board. See [“Install the network board” on page 380](#).
2. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
3. Install the bus bar. See [“Install the bus bar” on page 267](#).
4. Install the cross braces. See [“Install the cross braces” on page 21](#).
5. Install the tray cover. See [“Install the tray cover” on page 18](#).
6. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
7. Connect all required external cables to the solution.

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

8. 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](#)

## GPU power distribution board replacement (trained technician only)

Use the following procedures to remove and install the GPU power distribution board.

### Remove the GPU power distribution board (trained technician only)

Use this information to remove the GPU power distribution board.

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Hex screw (OSFP module conduction plate)	4.5 mm hex head screwdriver
Torx T10 screw	Torx T10 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

### CAUTION:

**SD665-N V3 GPU power distribution board handling guidelines**When handling the GPU power distribution board, **MAKE SURE** to follow the following guidelines:

- Gently handle the power distribution board with care; do not apply extra force to the board.
- Place the GPU power distribution board *upside down* on a flat surface when you are not holding it.
- Discard any GPU power distribution board that has been dropped.
- **MAKE SURE** to hold the power connectors and the power cable connectors when handling the GPU power distribution board, as shown below. **DO NOT** touch anywhere else of the power distribution board.

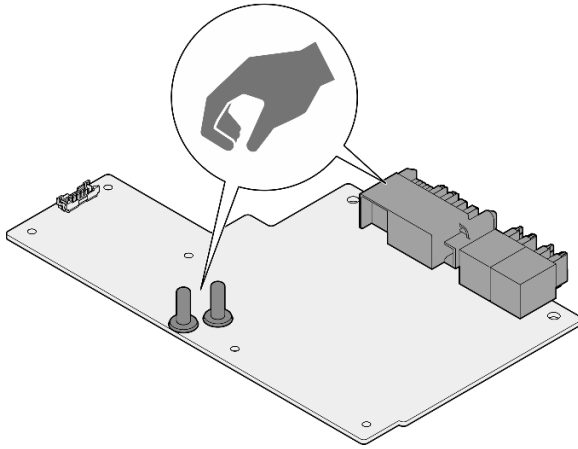


Figure 420. SD665-N V3 GPU power distribution board touch points

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

#### Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- c. Remove the cross braces. See [“Remove the cross braces” on page 19](#).
- d. Remove the bus bar. See [“Remove the bus bar” on page 266](#).
- e. Remove the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).

Step 2. Remove the carrier board power cable from the GPU node.

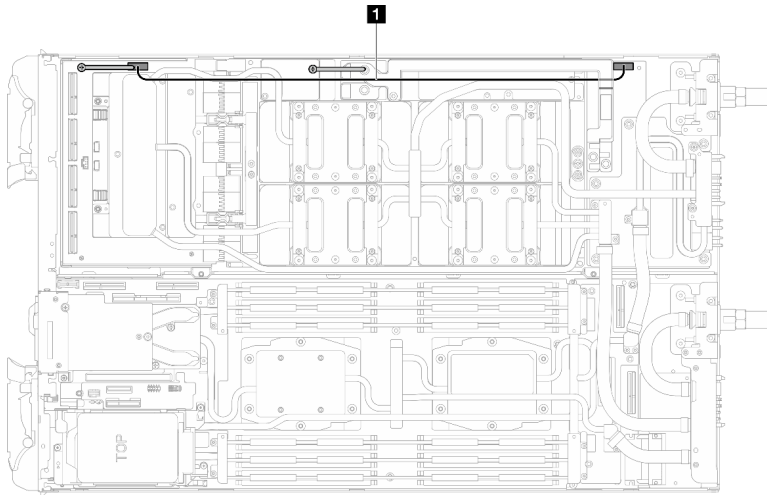


Figure 421. Carrier board power cable removal

Cable	From (carrier board)	To (GPU node power distribution board)
<b>1</b> Carrier board power cable	Power and side band connector	Power connector

Step 3. Remove cable tie from the GPU board.

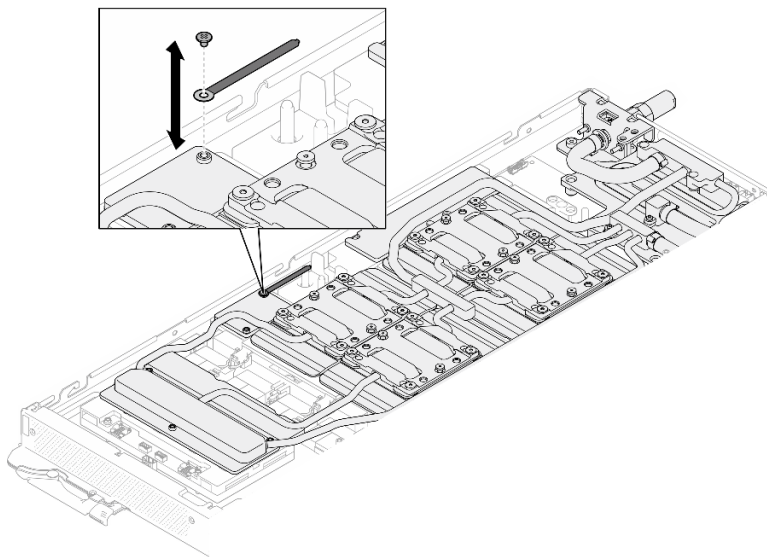


Figure 422. Cable tie removal

Step 4. Remove the Hex screw (x1) and the PH1 screws (x3) from the water loop with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

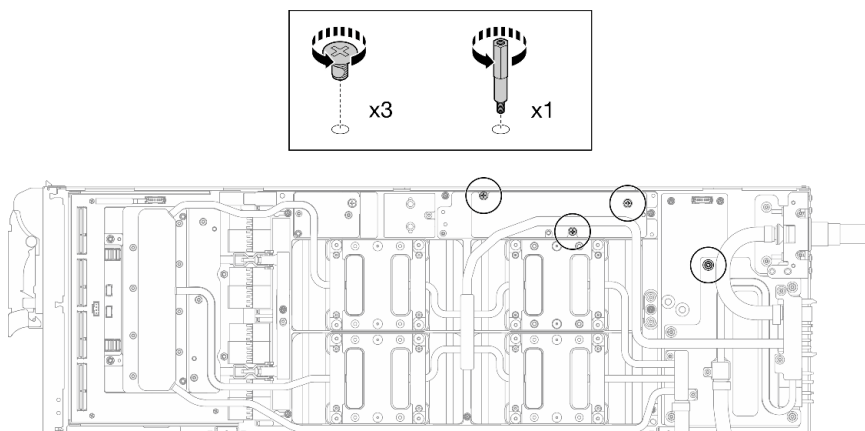


Figure 423. Water loop Hex and PH1 screws removal (GPU node)

Step 5. Remove water loop screws and quick connect screws (x13 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

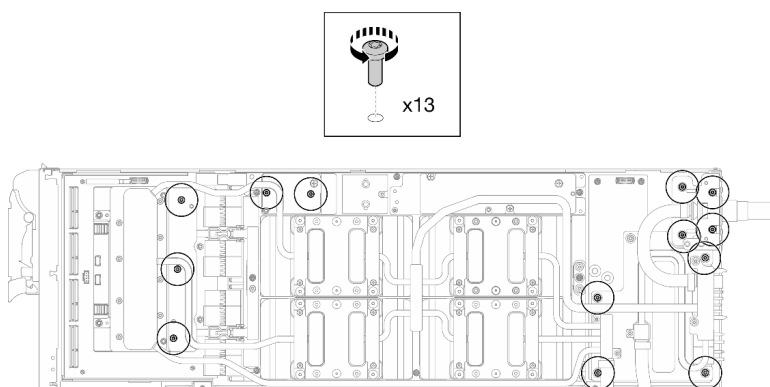


Figure 424. Water loop Torx T10 screws removal (GPU node)

Step 6. Remove the quick connect screws (x4 Torx T10) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

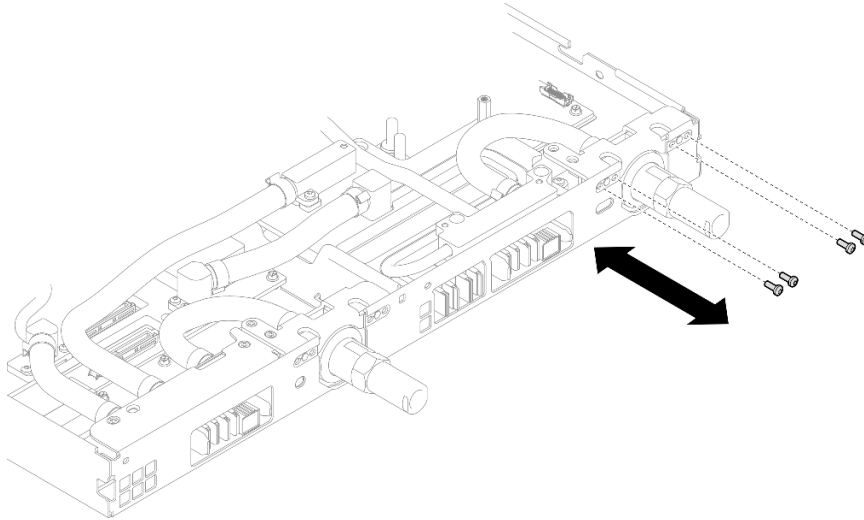


Figure 425. Quick connect screw removal (GPU node)

- Step 7. Follow the screw removal sequence specified on the network board label, and remove network cold plate screws (x8 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

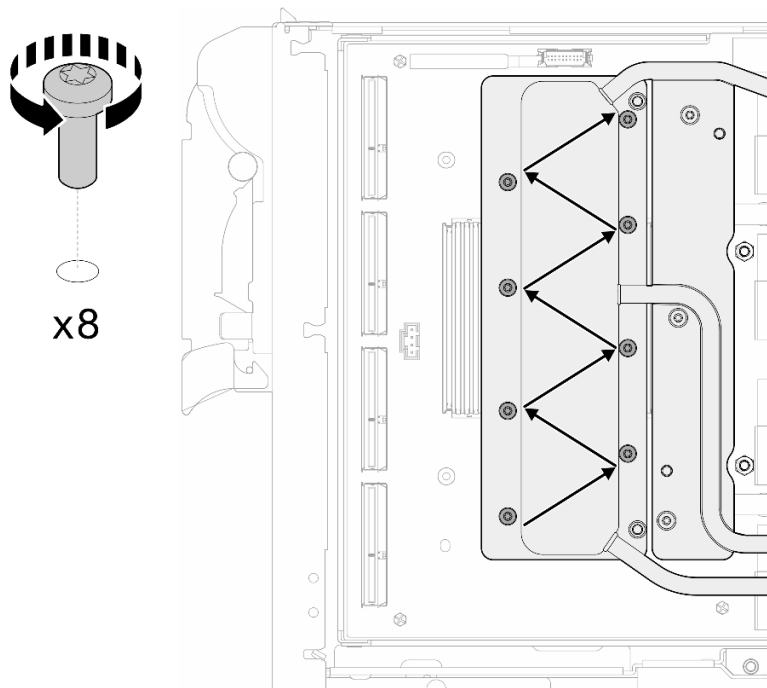


Figure 426. Network card screw removal

- Step 8. Loosen GPU cold plate screws (x16 Torx T10 screws) in the diagonal pattern with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/loosened is 3.5 +/- 0.5 lb-in (0.4 +/- 0.06 N-m).

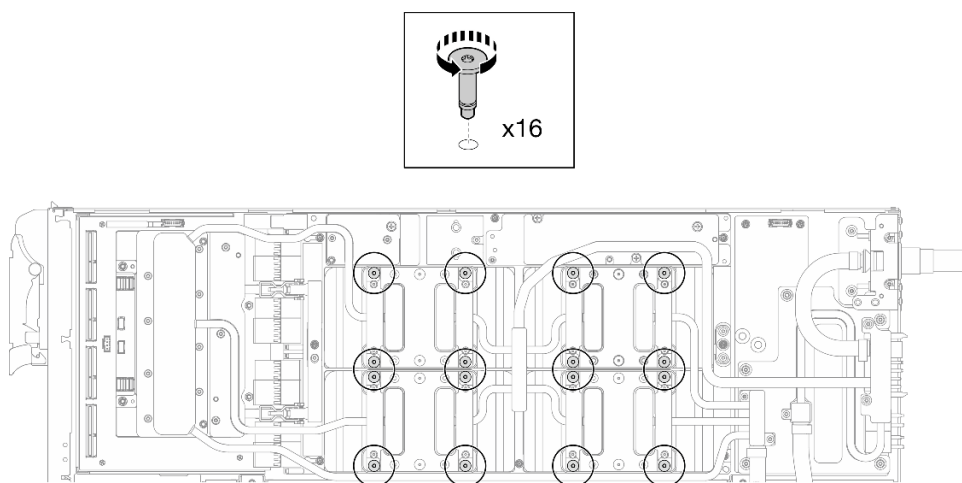


Figure 427. Loosening GPU cold plate screw

Step 9. Release the front and rear MISC conduction plates of the water loop from the GPU board.

- a. ① Insert a flat head screwdriver into the gaps between the MISC conduction plates (front and rear) and the GPU board. Then, slightly rotate the flat head screwdriver.

**Note:** Locations of the gaps for inserting flat head screwdriver is shown in the illustration below.

- b. ② The front and rear MISC conduction plates release from the GPU board slightly.

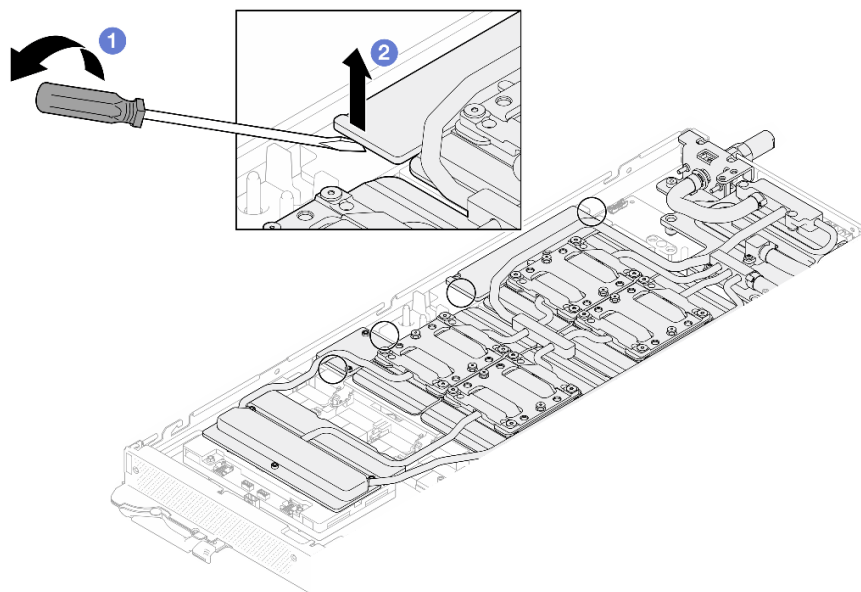
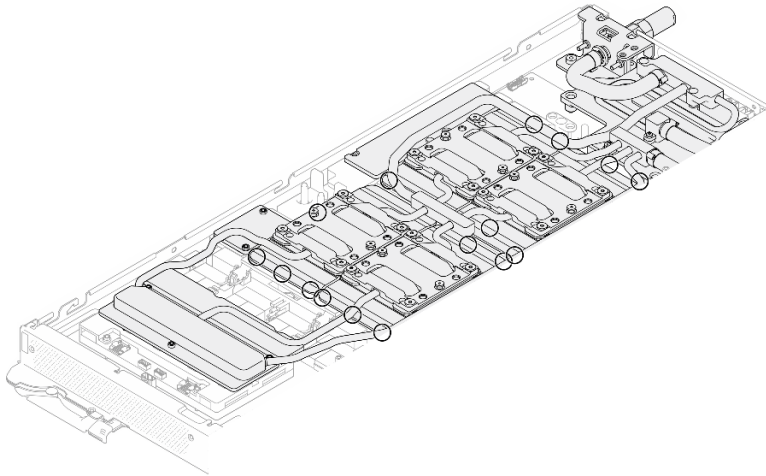


Figure 428. Releasing the front and rear MISC conduction plates release from the GPU board

Step 10. Release the GPU cold plates from the GPUs.

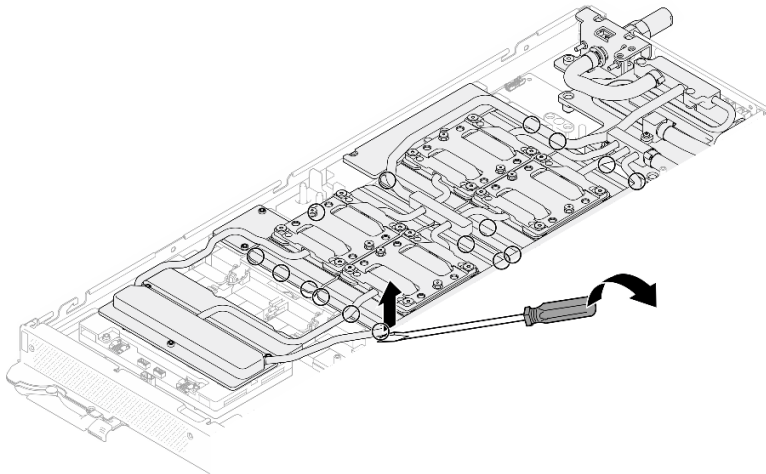
- a. There are notches on the sides of the GPU cold plates for inserting a flat head screwdriver. The locations of the notches are shown in the illustration below.

**Attention:** Inserting the flat head screwdriver **ONLY** to the notches circled in the illustration below. Otherwise, the screwdriver may damage the GPUs.



*Figure 429. Notches for releasing GPU cold plates*

- b. Insert a flat screwdriver into all the notches shown in the illustration; then, slightly rotate the screwdriver to release the GPU cold plates from the GPUs.



*Figure 430. Releasing the GPU cold plate from the GPU*

Step 11. Gently put the water loop carrier down onto the water loop and ensure it is seated firmly on the water loop.



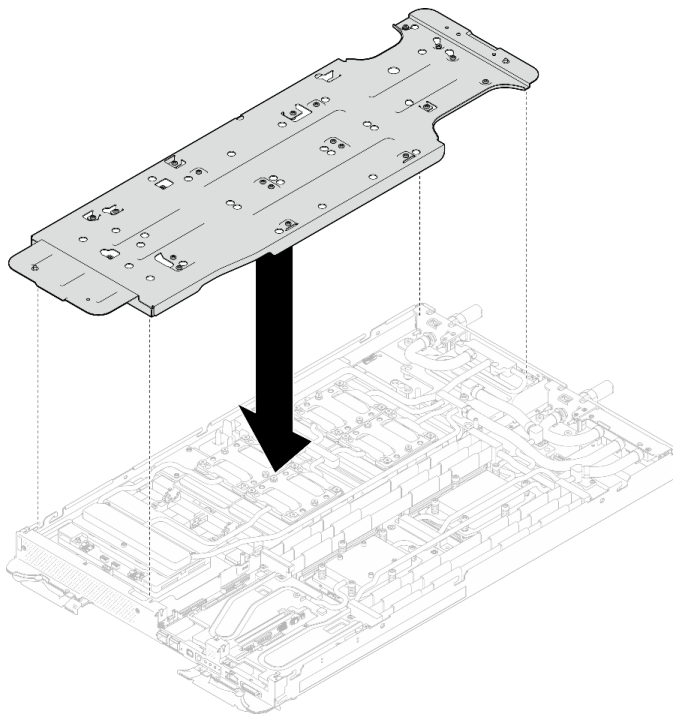


Figure 431. Water loop carrier installation (GPU node)

Step 12. Tighten water loop carrier screws (x20 Phillips #2 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

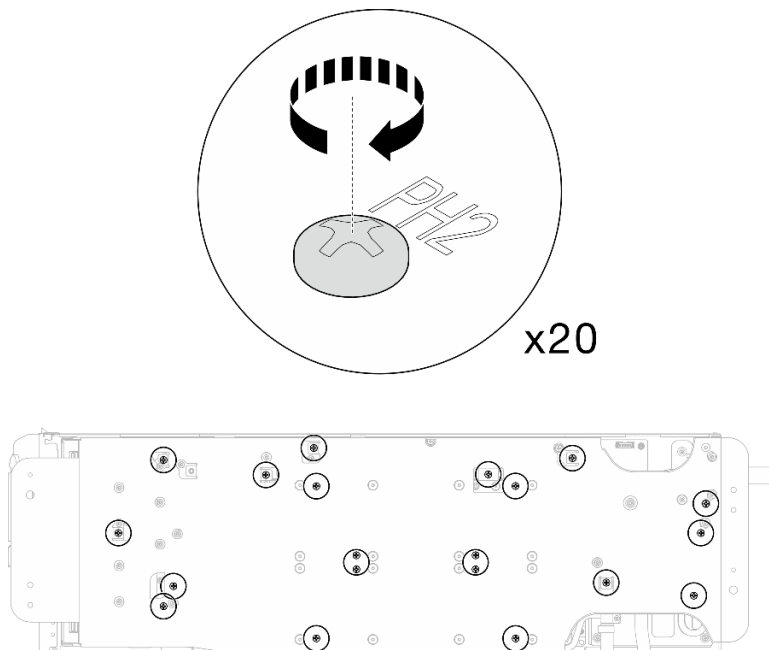


Figure 432. Water loop screw and quick connect screw removal (GPU node)

Step 13. Carefully rotate the water loop so one half is sitting on top of the other half.

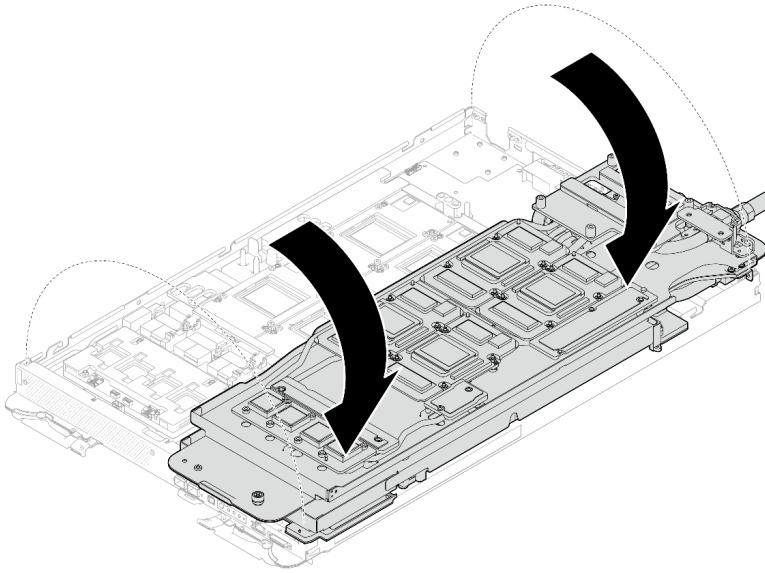


Figure 433. Folding the GPU node side water loop onto the Compute node side water loop

Step 14. **Immediately** clean the PCM off all the GPUs with alcohol cleaning pads. **Gently** clean the PCM to avoid GPU damages.

**Attention:**

- It is recommended to clean the PCM while it is in liquid state.
- The electrical components around the die on the GPUs are extremely delicate. When removing the PCM and cleaning the GPU die, avoid touching the electrical components to prevent damages.

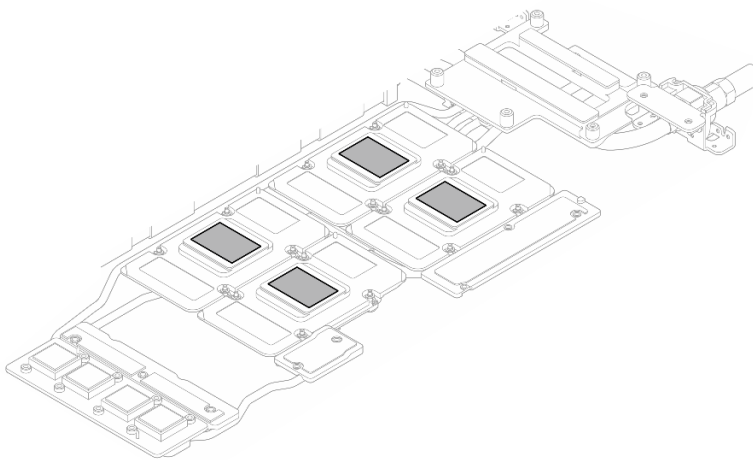
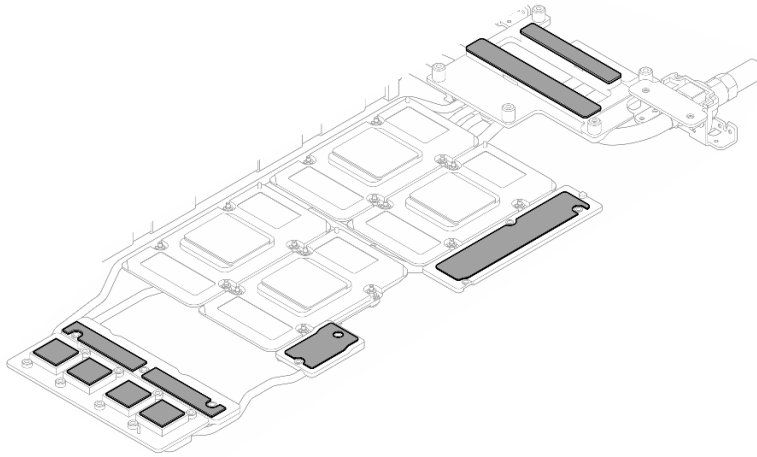


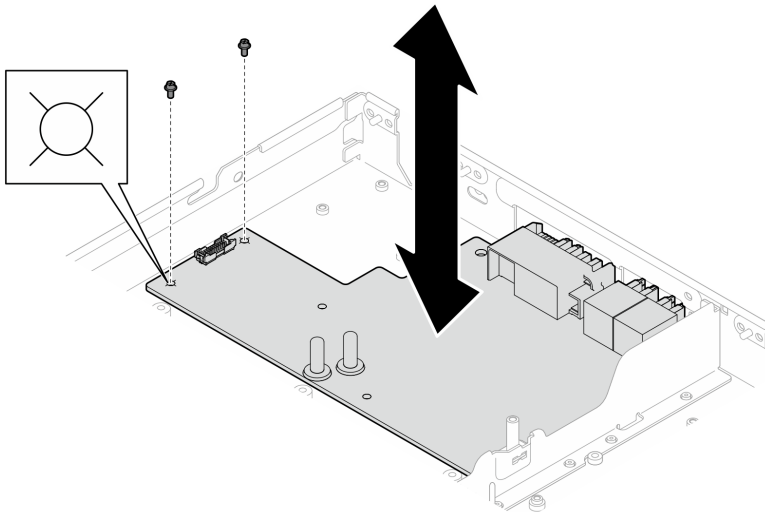
Figure 434. Cleaning PCM off from all GPUs

Step 15. With alcohol cleaning pads, wipe off any remaining putty pad and PCMs from the water loop and components in the GPU node.



*Figure 435. Cleaning putty pads from water loop*

Step 16. Remove the two screws from the GPU power distribution board.



*Figure 436. GPU power distribution board screw removal*

Step 17. Remove the GPU power distribution board out of the node.

**Note:** When handling the GPU power distribution board, make sure to follow [SD665-N V3 GPU power distribution board handling guidelines](#).

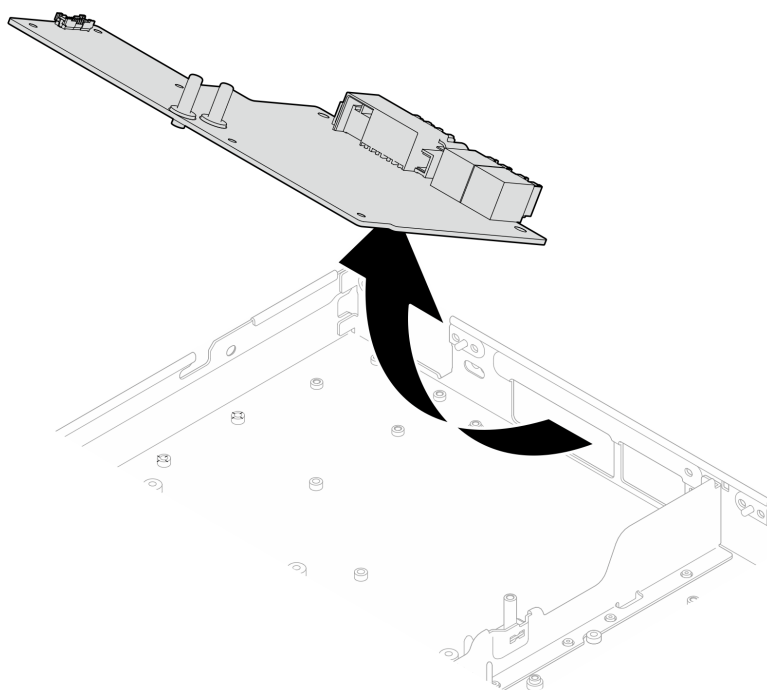


Figure 437. Removing the GPU power distribution board

## 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 GPU power distribution board (trained technician only)

Use this information to install the GPU power distribution board.

## About this task

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

## Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Hex screw (OSFP module conduction plate)	4.5 mm hex head screwdriver
Torx T10 screw	Torx T10 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

#### CAUTION:

**SD665-N V3 GPU power distribution board handling guidelines**When handling the GPU power distribution board, **MAKE SURE** to follow the following guidelines:

- Gently handle the power distribution board with care; do not apply extra force to the board.
- Place the GPU power distribution board *upside down* on a flat surface when you are not holding it.
- Discard any GPU power distribution board that has been dropped.
- **MAKE SURE** to hold the power connectors and the power cable connectors when handling the GPU power distribution board, as shown below. **DO NOT** touch anywhere else of the power distribution board.

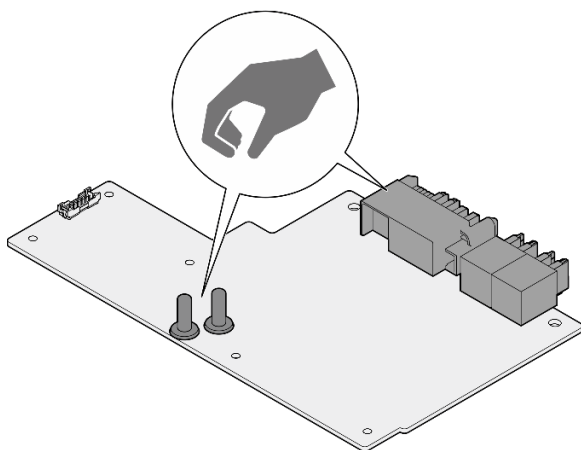


Figure 438. SD665-N V3 GPU power distribution board touch points

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

### Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-D4fKTKLpU5zyMpptJvubYm>.

### Procedure

**Note:** When handling the GPU power distribution board, make sure to follow [SD665-N V3 GPU power distribution board handling guidelines](#).

Step 1. Align the connector with the slot and place the GPU power distribution board into the node.

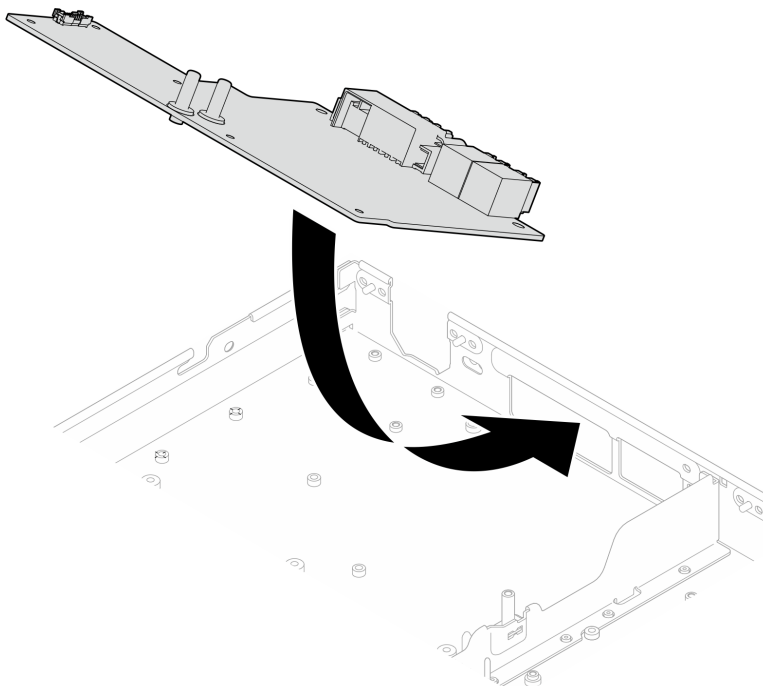


Figure 439. GPU power distribution board installation

Step 2. Fasten the two screws to secure the GPU power distribution board with the node.

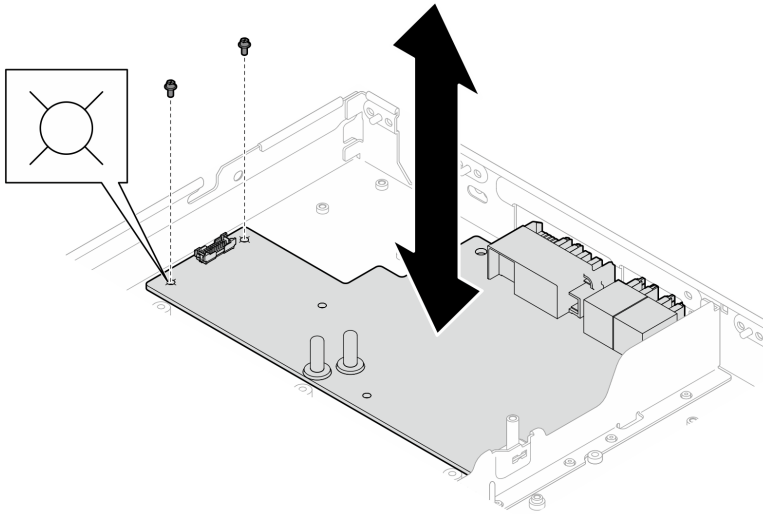


Figure 440. GPU power distribution board screw installation

Step 3. Replace the Phase Change Material (PCM) and putty pads on the GPU node water loop with new ones.

- a. ❶ Install the PCM jig on the GPU cold plate.
- b. ❷ Attach the PCM to the square opening of the jig.
- c. Repeat to replace the PCM of all four GPU cold plates.

**Attention:**

- PCM cannot be reused. PCM must be replaced with new ones every time the water loop is removed.
- After PCM is replaced, there is an expected short duration of throttling before the GPU returns to normal operation. This is due to the PCM requiring a break-in period after being replaced.
- After replacing the GPU PCM and putty pads, servicers must perform the H100/H200 GPU PCM TIM melting procedure to monitor the GPU until the PCM Thermal Interface Material (TIM) has melted.
  - When performing the melting H100/H200 GPU PCM TIM procedures, the minimum water temperature is 35°C (95°F). Do not operate the melting process with water temperature lower than 35°C (95°F).
  - See [PCM TIM Melt Procedure for Neptune Water Cooled Servers with Nvidia H100 H200 GPUs](#) (trained technicians only).

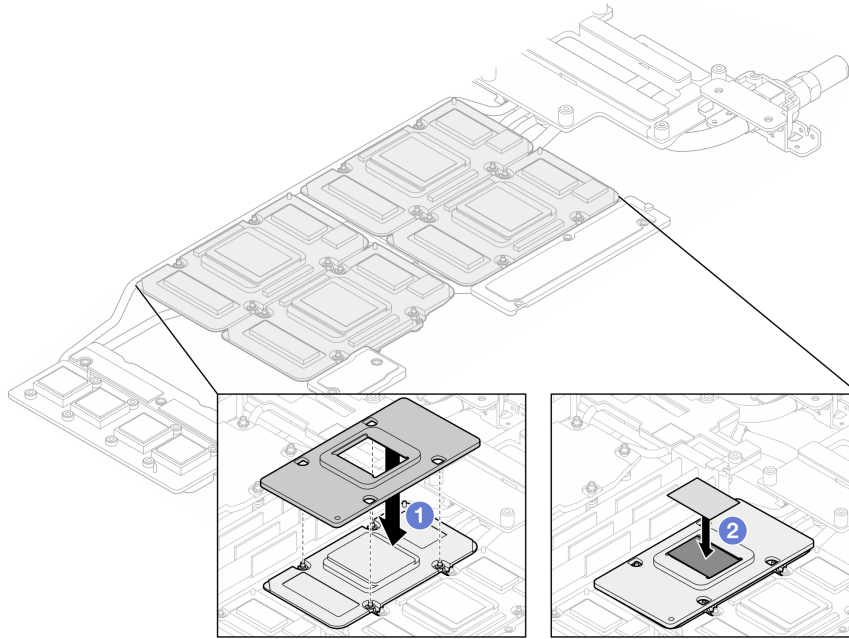


Figure 441. Water loop GPU cold plate PCM replacement (GPU node)

- d. Replace the putty pads on the GPU node water loop.

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

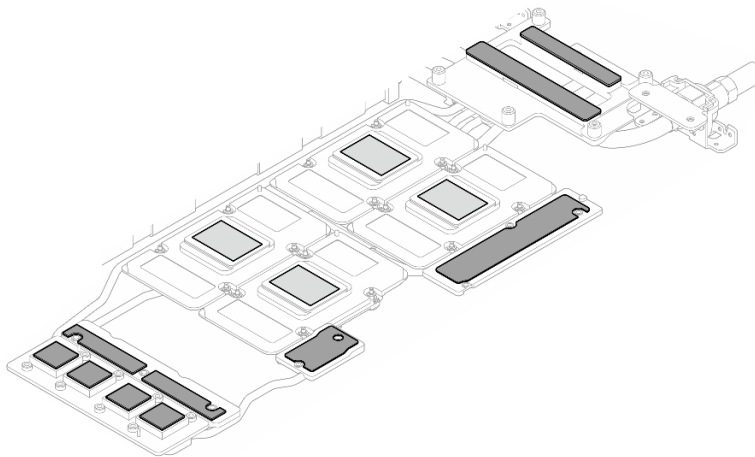


Figure 442. Water loop putty pads replacement (GPU node)

- e. Replace the putty pads (x5) on the GPU. Make sure to align the putty pads to the GPU VR (1) and the markings on GPU. Repeat to replace all putty pads on the four GPUs.

**1** GPU VR (Cover the GPU VR with putty pad)

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**



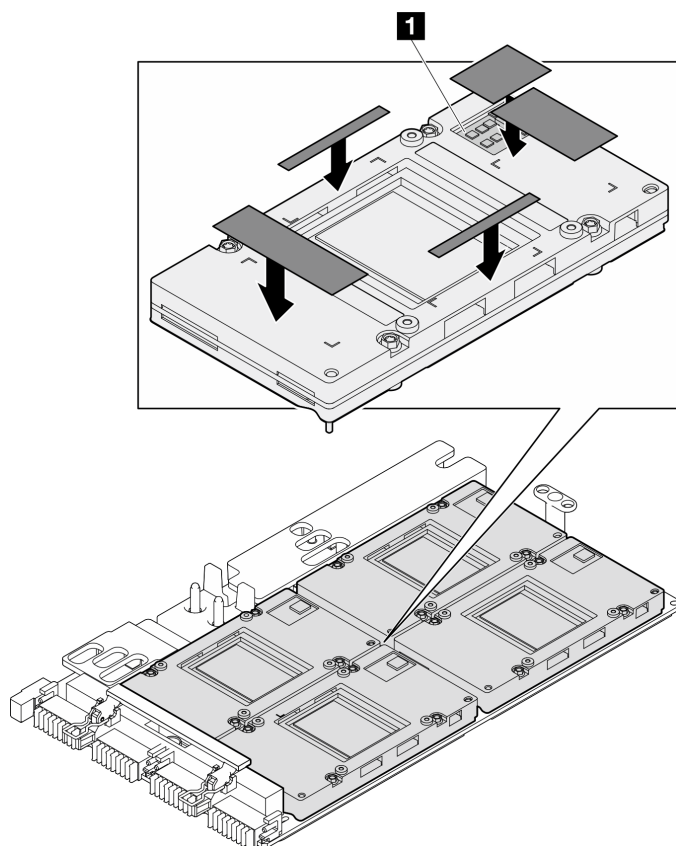


Figure 443. GPU putty pads replacement

Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 4. Unfold the water loop and place it onto the GPU node.

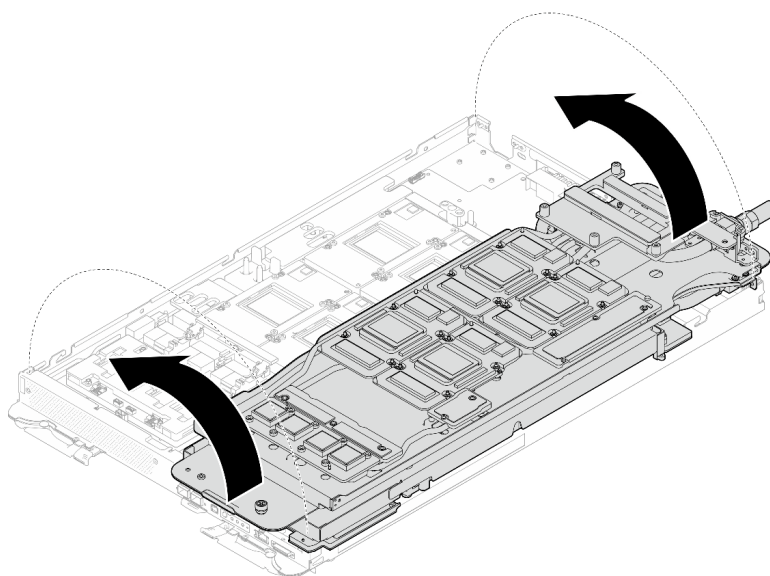


Figure 444. Unfolding the water loop to GPU node

Step 5. Loosen water loop carrier screws (x20 Phillips #2 screws).

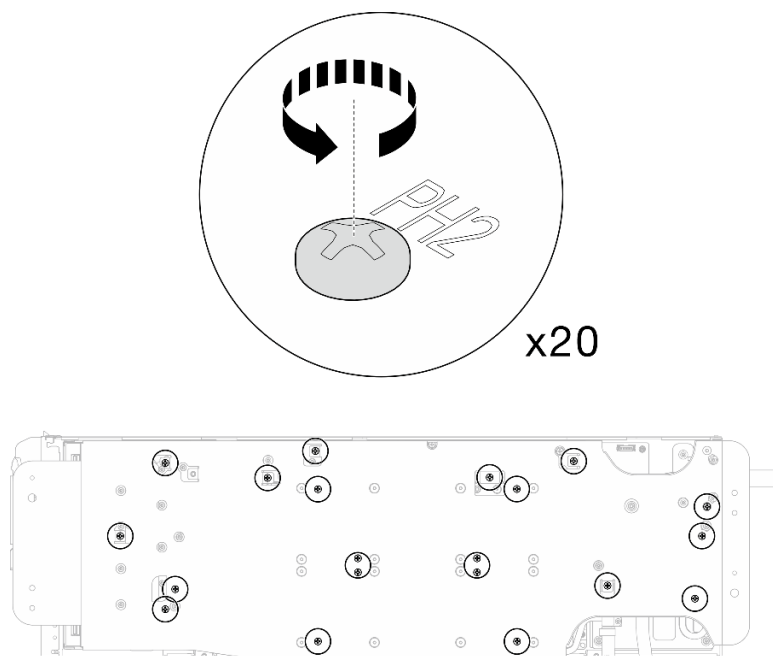


Figure 445. Water loop screws and quick connect screws installation (GPU node)

Step 6. Remove the water loop carrier from the GPU node.

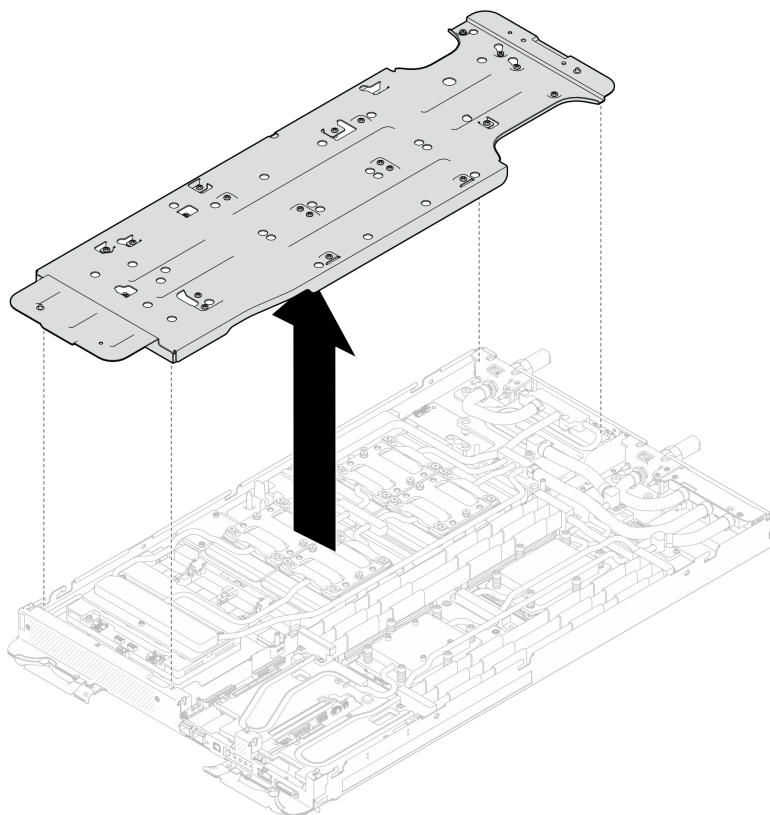


Figure 446. Water loop carrier removal (GPU node)

Step 7. Install GPU cold plate screws (x16 T10 screws).

- a. Install GPU cold plate screws following the GPU cold plates installation sequence: **GPU 2 → GPU 4 → GPU 1 → GPU 3**

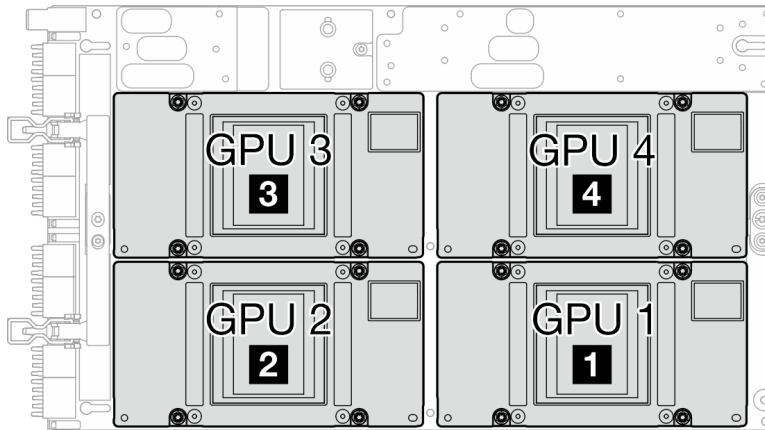


Figure 447. GPU numbering

- b. Set the torque screwdriver to 1.5 +/- 0.5 lb-In (0.1 +/- 0.06 N-m); then, fasten the GPU cold plate screws.
- c. Set the torque screwdriver to 4 +/- 0.5 lb-In (0.45 +/- 0.06 N-m); then, fasten the GPU cold plate screws.
- d. Set the torque screwdriver to 4 +/- 0.5 lb-In (0.45 +/- 0.06 N-m); then, fasten the GPU cold plate screws until all screws are fully tightened.

**Note:** Make sure to follow the screw sequence on the GPU cold plate label: ① → ② → ③ → ④

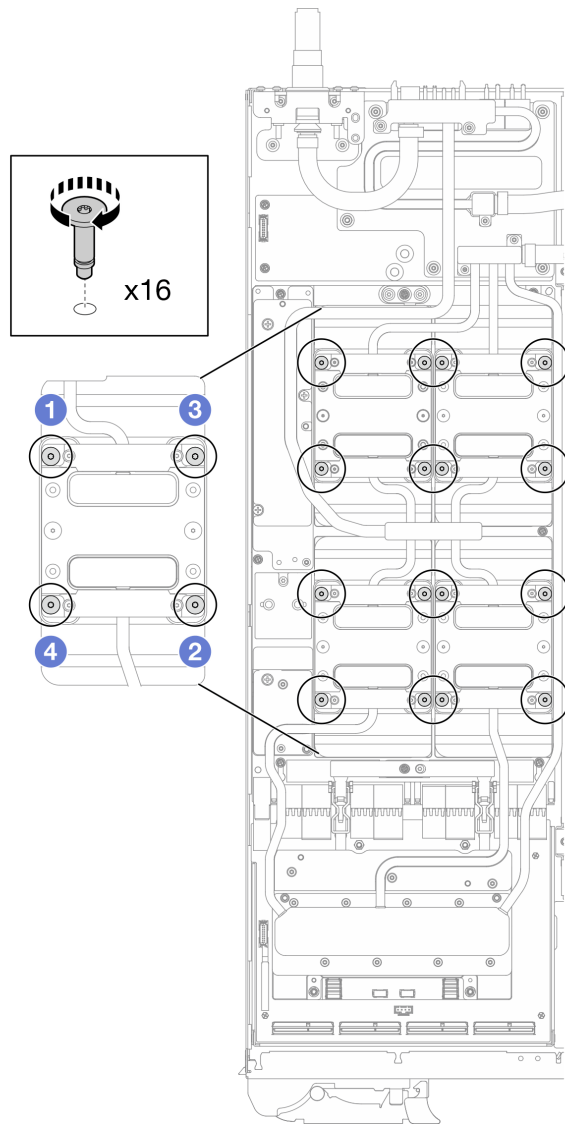


Figure 448. GPU cold plate screw installation

Step 8. Follow the screw installation sequence specified on the network board label, and install network cold plate screws (x8 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

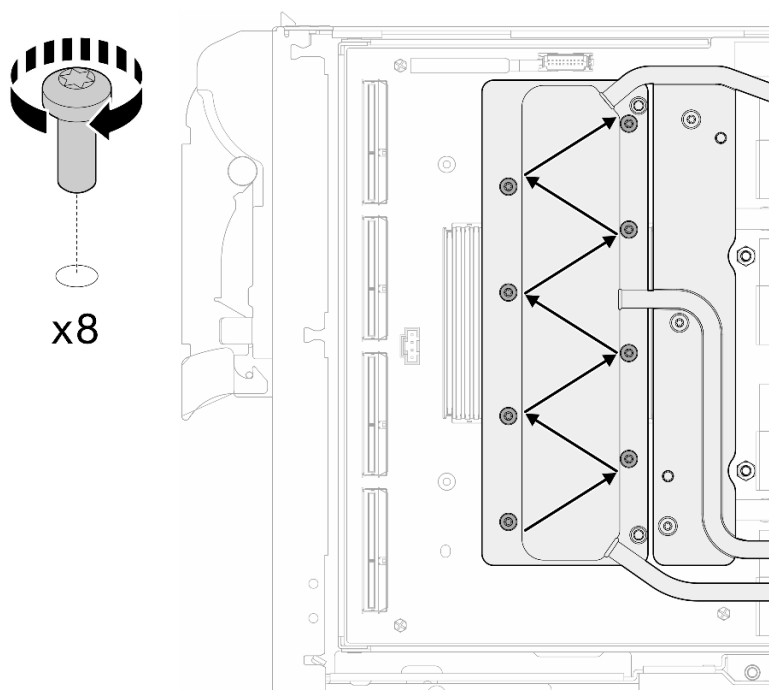


Figure 449. Network card screw installation

Step 9. Install the quick connect screws (x4 Torx T10) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

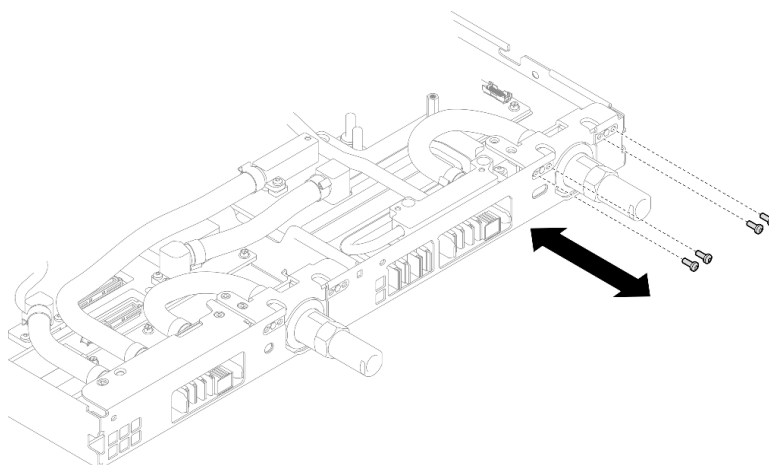
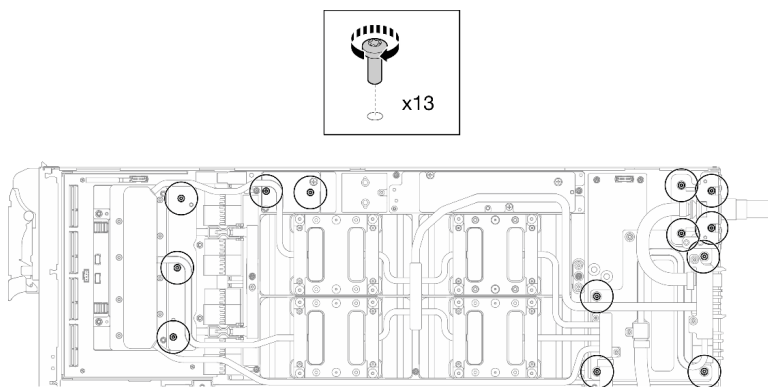


Figure 450. Quick connect screw installation (GPU node)

Step 10. Install water loop screws and quick connect screws (x13 Torx T10 screws) with a torque screwdriver set to the proper torque.

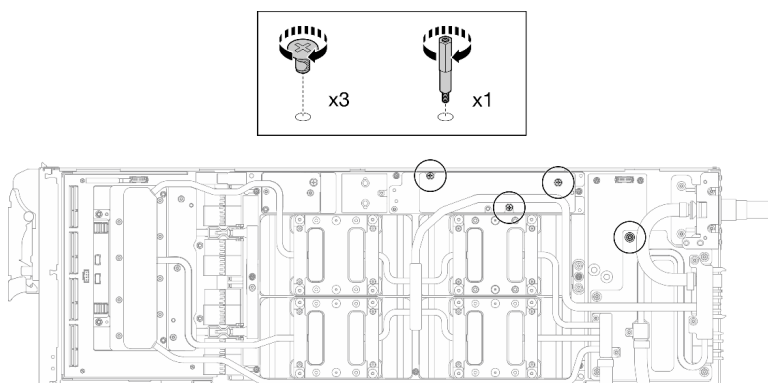
**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



*Figure 451. Water loop Torx T10 screws installation (GPU node)*

Step 11. Install the Hex screw (x1) and the PH1 screws (x3).

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



*Figure 452. Water loop Hex and PH1 screws installation (GPU node)*

Step 12. Install the cable tie to the GPU board.

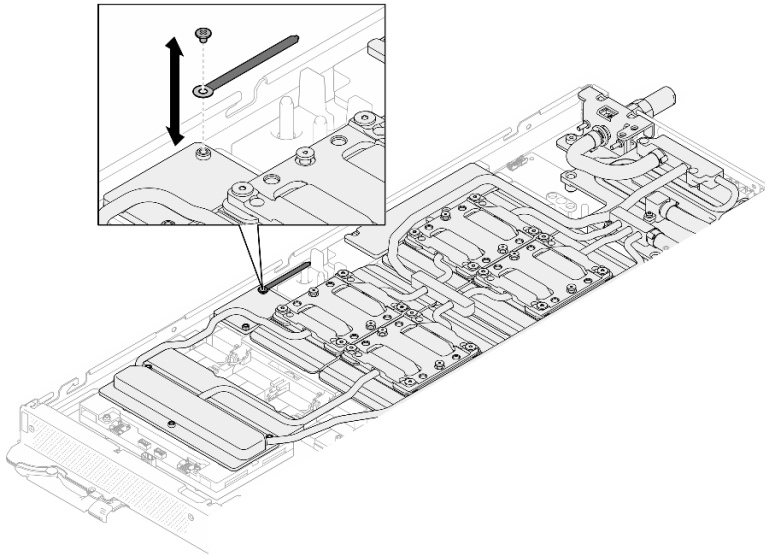


Figure 453. Installing the cable tie

Step 13. Connect the carrier board power cable.

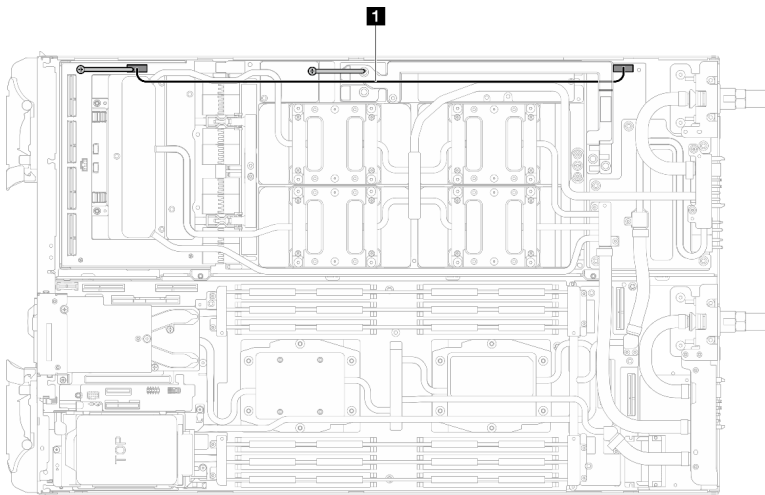


Figure 454. Connecting carrier board power cable

Cable	From (carrier board)	To (GPU node power distribution board)
<b>1</b> Carrier board power cable	Power and side band connector	Power connector

## After you finish

1. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
2. Install the bus bar. See [“Install the bus bar” on page 267](#).
3. Install the cross braces. See [“Install the cross braces” on page 21](#).
4. Install the tray cover. See [“Install the tray cover” on page 18](#).
5. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).

6. Connect all required external cables to the solution.

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

7. 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](#)

## Network board (trained technician only)

Use the following procedures to remove and install the network board.

If replacing the OSFP module and network board together, refer to [“OSFP module and network board replacement \(trained technician only\)” on page 365](#).

### Remove the network board (trained technician only)

Use this information to remove the network board.

If replacing the OSFP module and network board together, refer to [“OSFP module and network board replacement \(trained technician only\)” on page 365](#).

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Hex screwdriver	6 mm hex head screwdriver
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

### Attention:



- Read “[Installation Guidelines](#)” on page 3 and “[Safety inspection checklist](#)” on page 4 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

### Watch the procedure

A video of this procedure is available at YouTube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-D4fKTKLpU5zyMpptJvubYm>.

### Procedure

Step 1. Make preparations for this task.

- Remove the tray from the enclosure. See “[Remove a DWC tray from the enclosure](#)” on page 14.
- Remove the tray cover. See “[Remove the tray cover](#)” on page 17.
- Remove the cross braces. See “[Remove the cross braces](#)” on page 19.
- Remove the bus bar. See “[Remove the bus bar](#)” on page 266.
- Remove the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing”](#) on page 401.

Step 2. Disconnect the OSFP module cables from the network board on the GPU node.

#### CAUTION:

- **Hold the cable connector at 45 degree angle when inserting it into the port.**
- **Have extremely precaution when reseating the connectors that have a 45 degree label on them as they are fragile and will get damage if not installed in the correct 45 degree angle.**



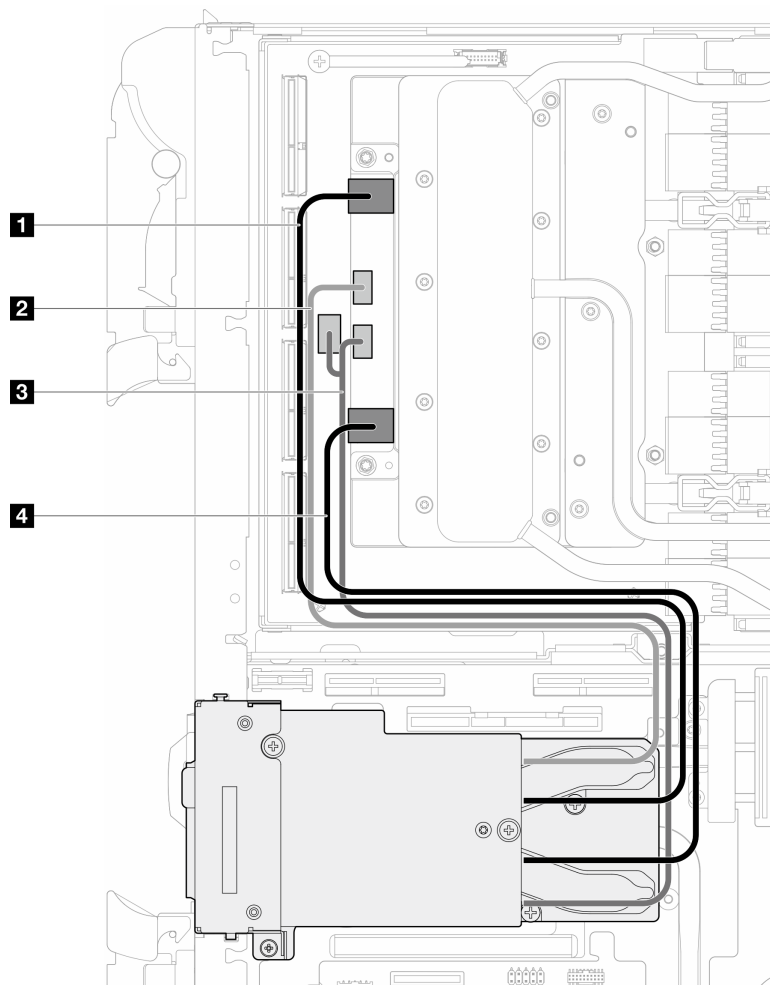


Figure 455. Disconnecting OSFP module cables from the network board

Cable	From OSFP module connectors	To Network board connectors
<b>1</b> Network cable (long)	Network connector (near GPU node)	Port 0
<b>2</b> Power cable	Power connector P1	OOB port 0
<b>3</b> Power cable	Power connector P2	OOB port 1 (on network board) and power connector (on carrier board)
<b>4</b> Network cable (short)	Network connector (near Compute node)	Port 1

Step 3. Remove the carrier board power cable from the GPU node.

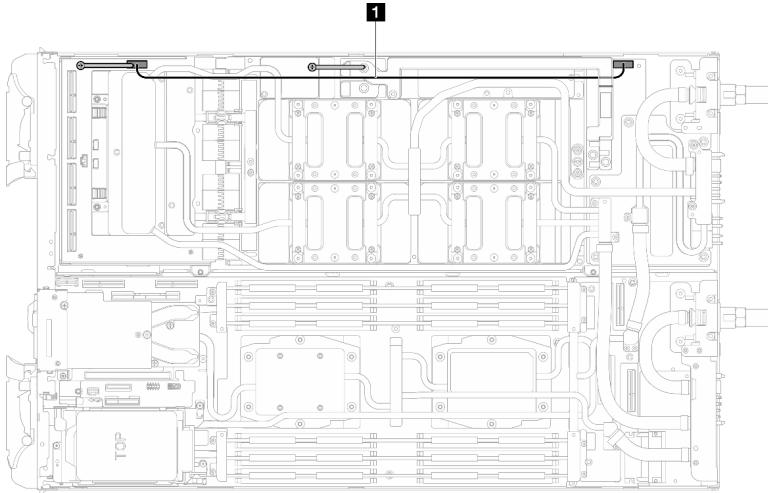


Figure 456. Carrier board power cable removal

Cable	From (carrier board)	To (GPU node power distribution board)
<b>1</b> Carrier board power cable	Power and side band connector	Power connector

Step 4. Remove cable tie from the GPU board.

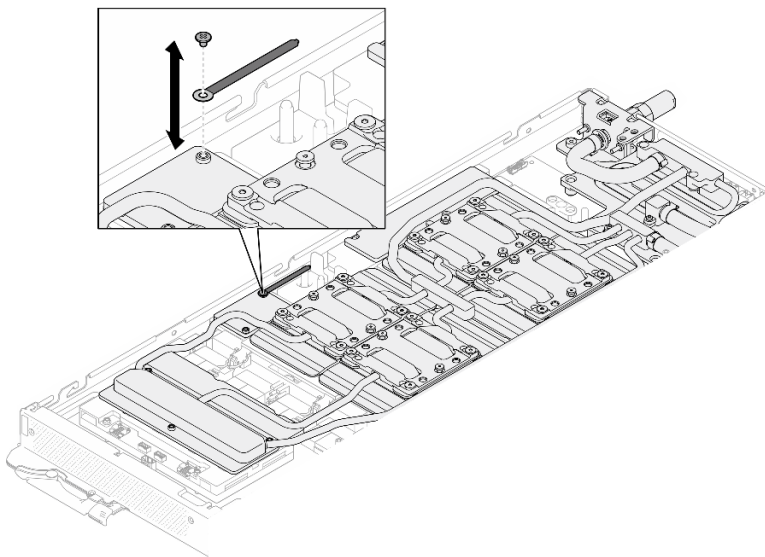


Figure 457. Cable tie removal

Step 5. Remove the Hex screw (x1) and the PH1 screws (x3) from the water loop with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

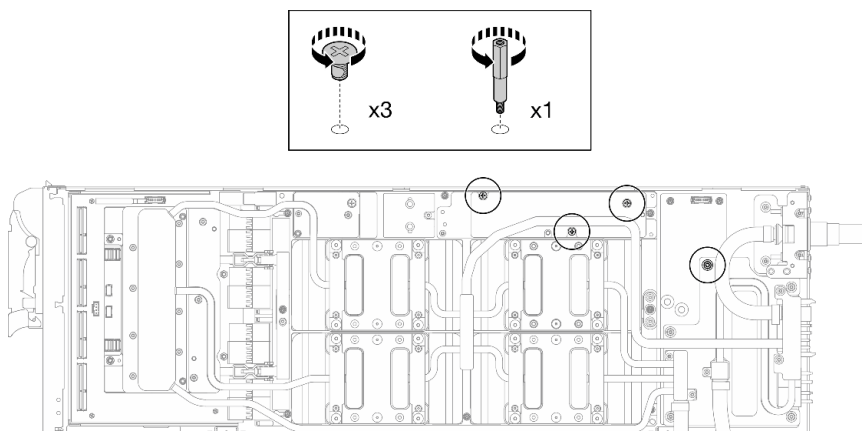


Figure 458. Water loop Hex and PH1 screws removal (GPU node)

Step 6. Remove water loop screws and quick connect screws (x13 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

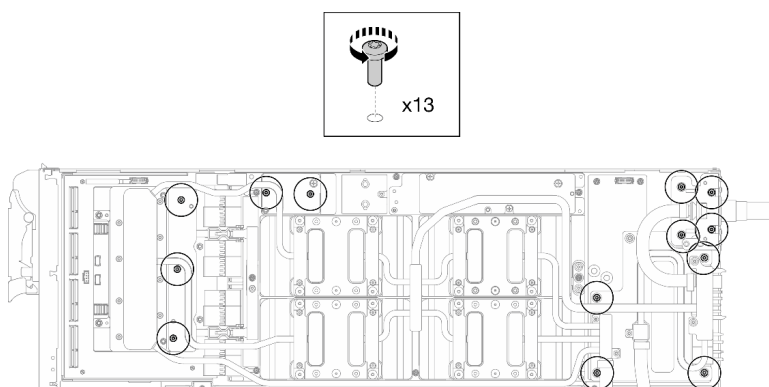


Figure 459. Water loop Torx T10 screws removal (GPU node)

Step 7. Remove the quick connect screws (x4 Torx T10) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

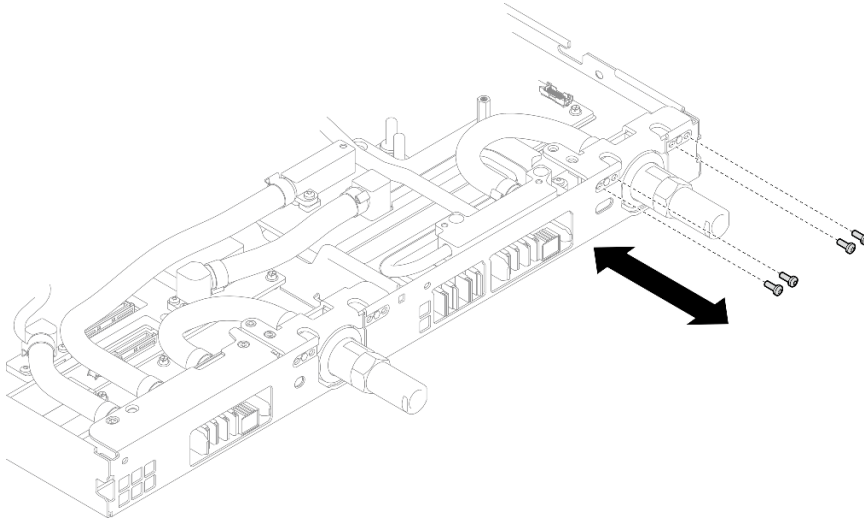


Figure 460. Quick connect screw removal (GPU node)

- Step 8. Follow the screw removal sequence specified on the network board label, and remove network cold plate screws (x8 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

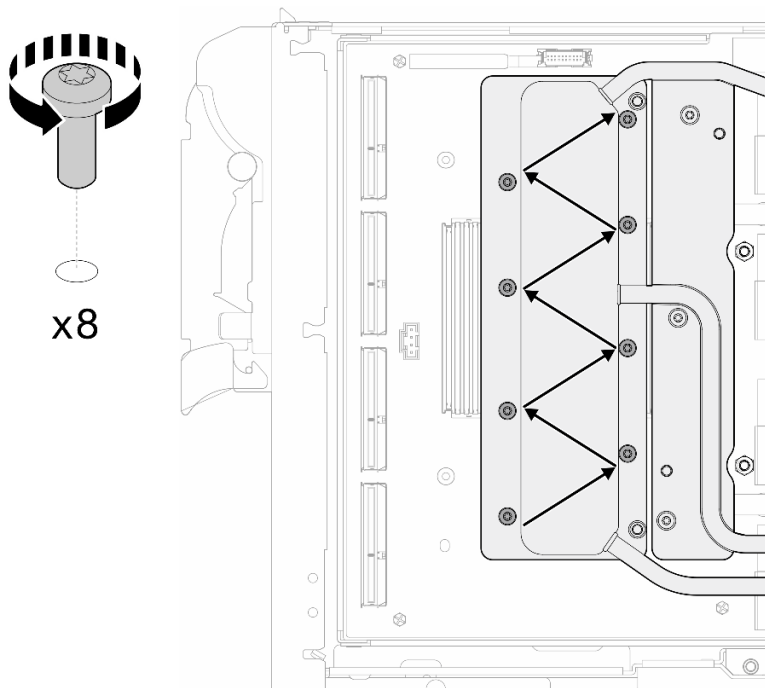


Figure 461. Network card screw removal

- Step 9. Loosen GPU cold plate screws (x16 Torx T10 screws) in the diagonal pattern with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/loosened is 3.5 +/- 0.5 lb-in (0.4 +/- 0.06 N-m).

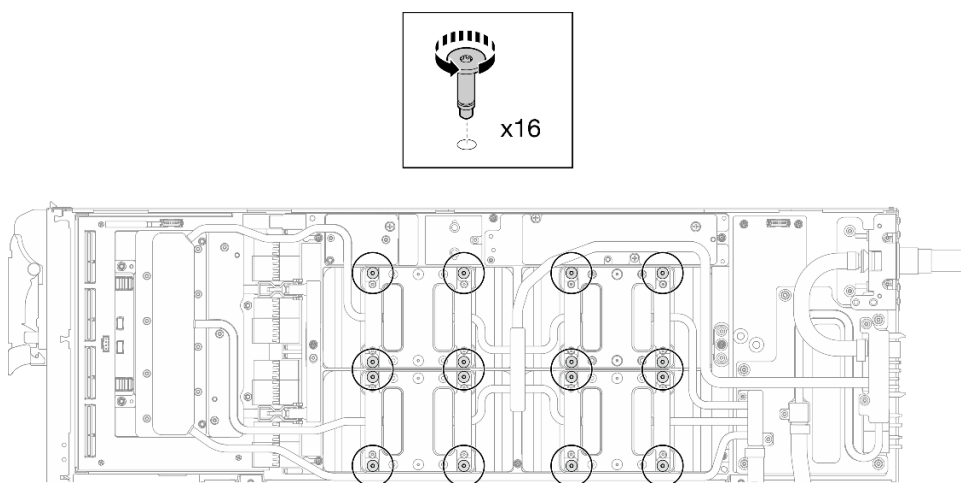


Figure 462. Loosening GPU cold plate screw

Step 10. Release the front and rear MISC conduction plates of the water loop from the GPU board.

- a. ❶ Insert a flat head screwdriver into the gaps between the MISC conduction plates (front and rear) and the GPU board. Then, slightly rotate the flat head screwdriver.

**Note:** Locations of the gaps for inserting flat head screwdriver is shown in the illustration below.

- b. ❷ The front and rear MISC conduction plates release from the GPU board slightly.

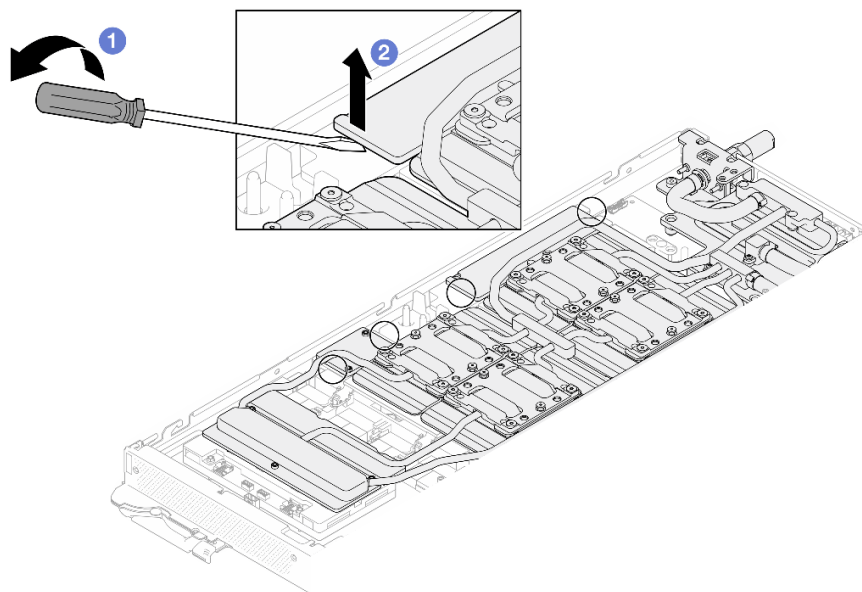


Figure 463. Releasing the front and rear MISC conduction plates release from the GPU board

Step 11. Release the GPU cold plates from the GPUs.

- a. There are notches on the sides of the GPU cold plates for inserting a flat head screwdriver. The locations of the notches are shown in the illustration below.

**Attention:** Inserting the flat head screwdriver **ONLY** to the notches circled in the illustration below. Otherwise, the screwdriver may damage the GPUs.

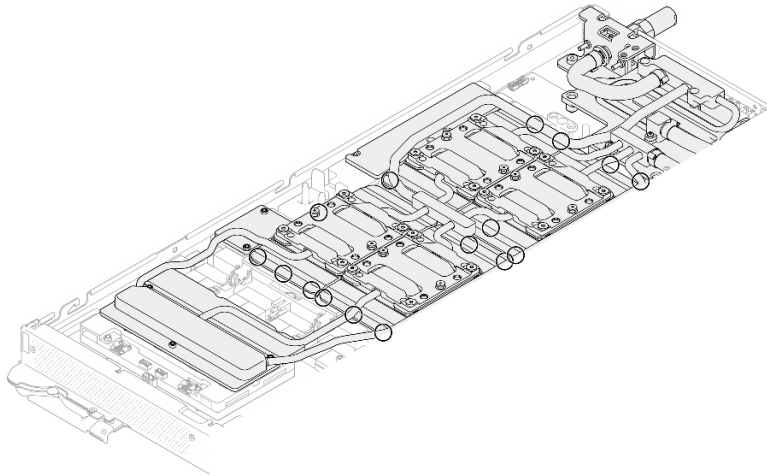


Figure 464. Notches for releasing GPU cold plates

- b. Insert a flat screwdriver into all the notches shown in the illustration; then, slightly rotate the screwdriver to release the GPU cold plates from the GPUs.

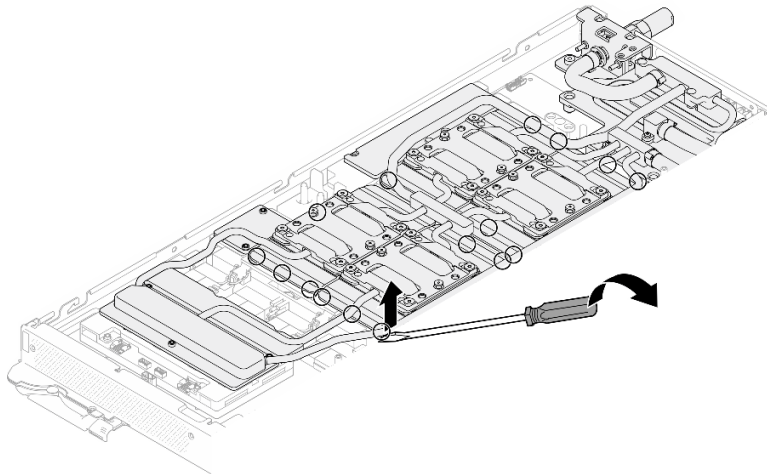


Figure 465. Releasing the GPU cold plate from the GPU

Step 12. Gently put the water loop carrier down onto the water loop and ensure it is seated firmly on the water loop.

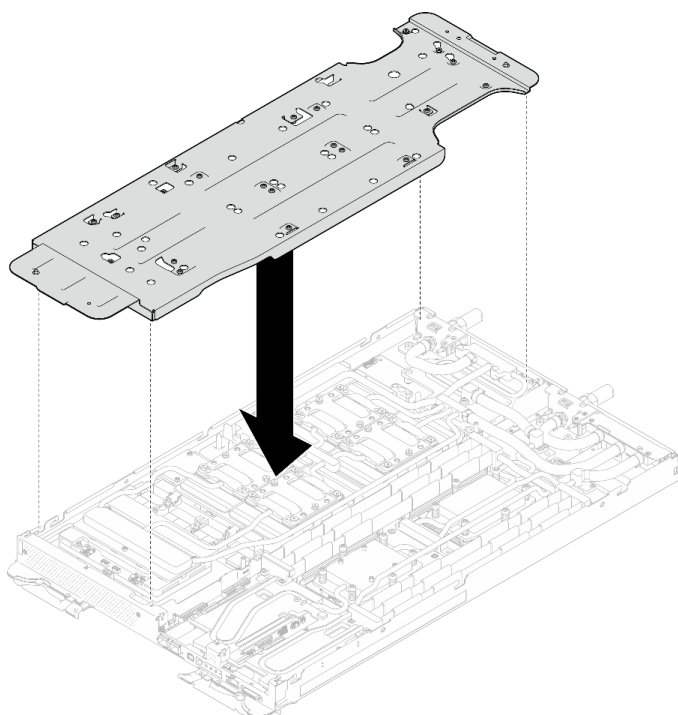


Figure 466. Water loop carrier installation (GPU node)

Step 13. Tighten water loop carrier screws (x20 Phillips #2 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

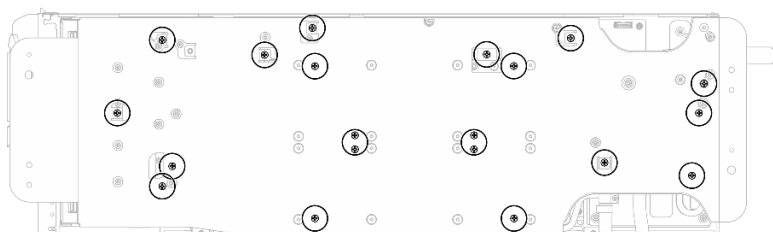
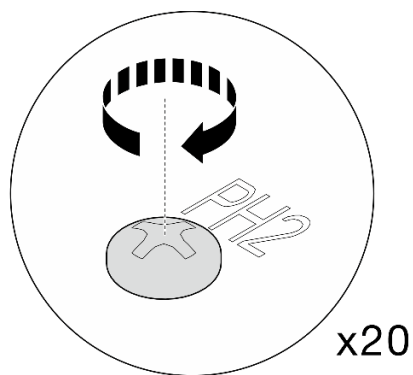


Figure 467. Water loop screw and quick connect screw removal (GPU node)



Step 14. Carefully rotate the GPU node side water loop so that it is sitting on top of the Compute node side water loop.

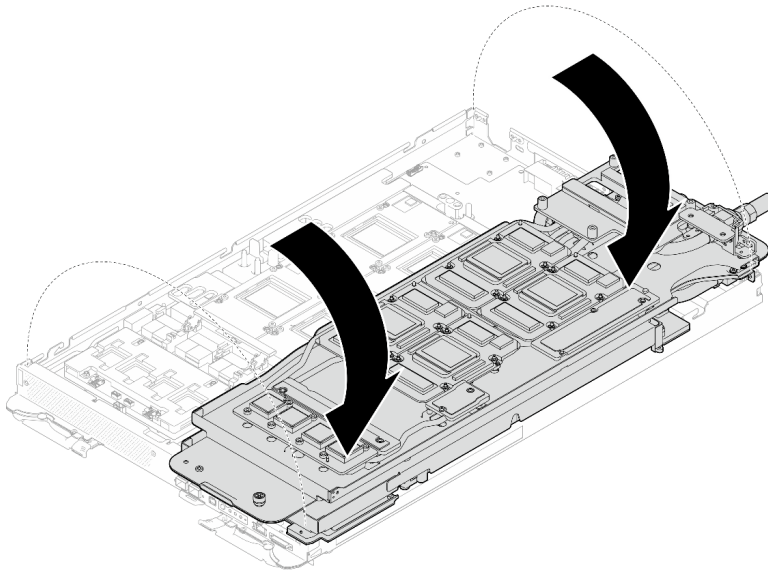


Figure 468. Folding the GPU node side water loop onto the Compute node side water loop

Step 15. **Immediately** clean the PCM off all the GPUs with alcohol cleaning pads. **Gently** clean the PCM to avoid GPU damages.

**Attention:**

- It is recommended to clean the PCM while it is in liquid state.
- The electrical components around the die on the GPUs are extremely delicate. When removing the PCM and cleaning the GPU die, avoid touching the electrical components to prevent damages.

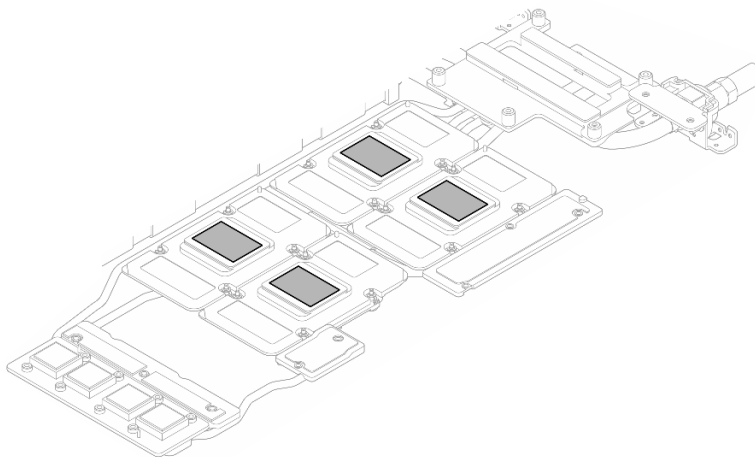


Figure 469. Cleaning PCM off from all GPUs

Step 16. With alcohol cleaning pads, wipe off any remaining putty pad and PCMs from the water loop and components in the GPU node.

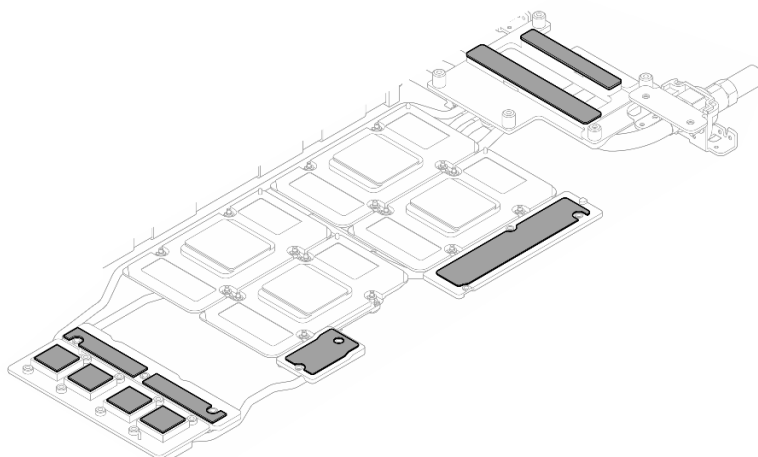


Figure 470. Cleaning putty pads from water loop

Step 17. Follow the sequence shown in the illustration below to remove the network board screws (x4 Torx T15 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 0.9 newton-meters, 7.96 inch-pounds.

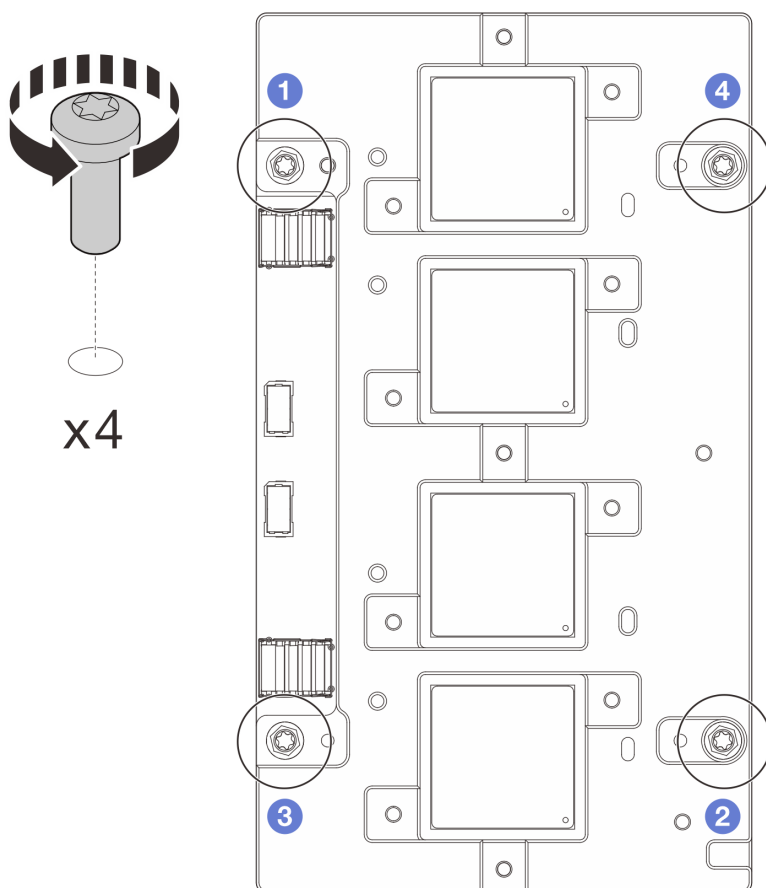


Figure 471. Network board screws removal

Step 18. Remove the network board from the GPU node.

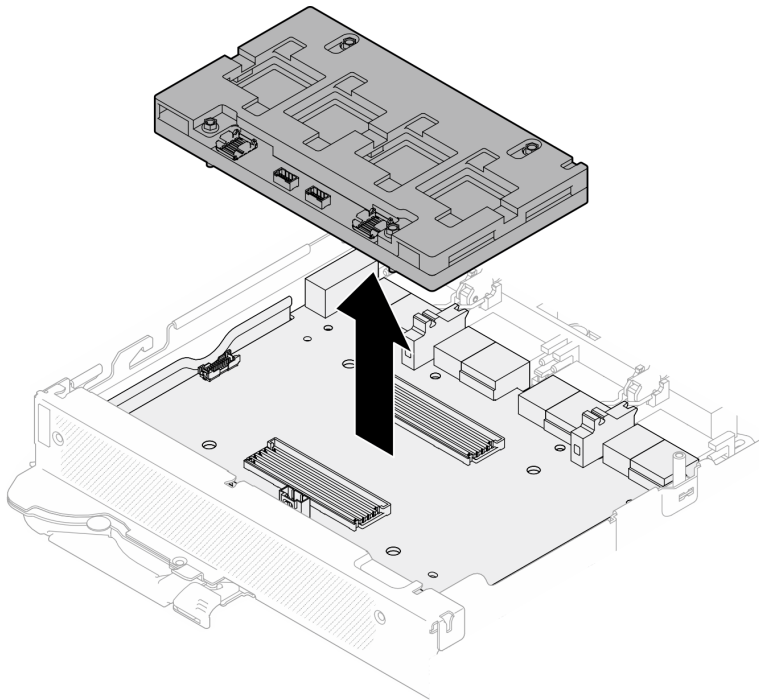


Figure 472. Removing the network board

## 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 network board (trained technician only)

Use this information to install the network board.

If replacing the OSFP module and network board together, refer to [“OSFP module and network board replacement \(trained technician only\)” on page 365](#).

## About this task

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

## Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screws and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Hex screwdriver	6 mm hex head screwdriver
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Hex screwdriver	6 mm hex head screwdriver
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

## Procedure

- Step 1. Align the network board to the guide holes on the carrier board; then, place the network board onto the carrier board.

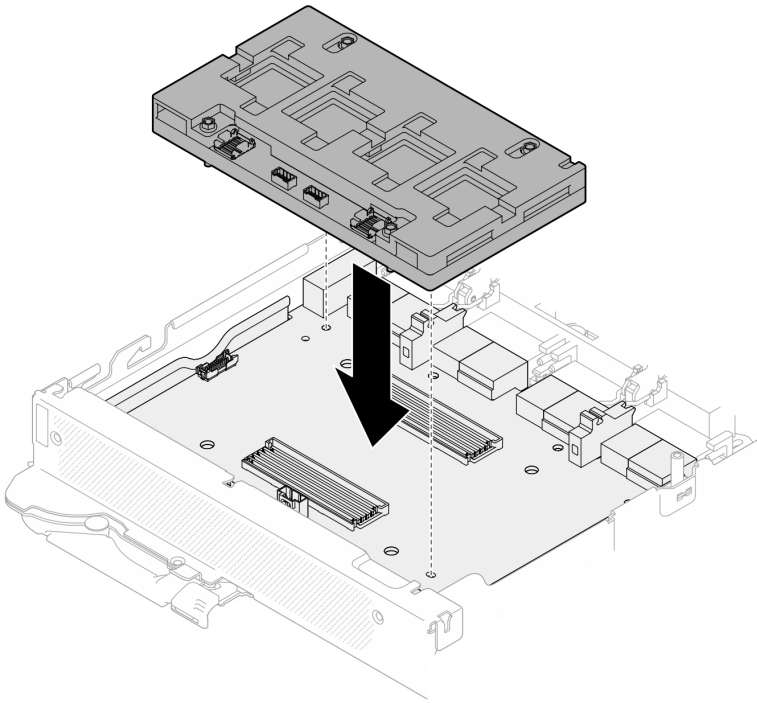


Figure 473. Installing the network board

- Step 2. Follow the sequence shown in the illustration below to fasten the network board screws (x4 Torx T15 screws) to the carrier board.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 0.9 newton-meters, 7.96 inch-pounds.

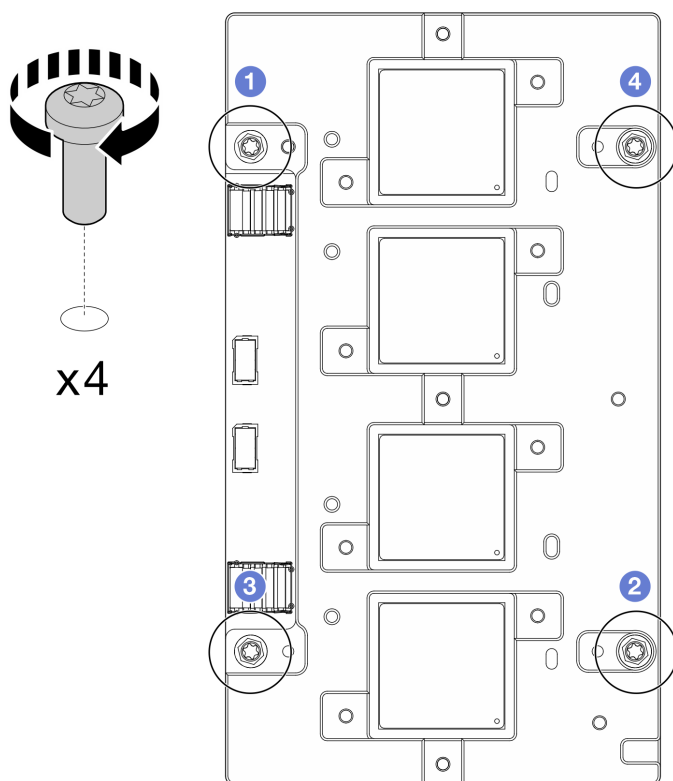


Figure 474. Network board screws installation

**GPU node** water loop gap pad/putty pad replacement. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 3. Replace the Phase Change Material (PCM) and putty pads on the GPU node water loop with new ones.

- 1 Install the PCM jig on the GPU cold plate.
- 2 Attach the PCM to the square opening of the jig.
- Repeat to replace the PCM of all four GPU cold plates.

**Attention:**

- PCM cannot be reused. PCM must be replaced with new ones every time the water loop is removed.
- After PCM is replaced, there is an expected short duration of throttling before the GPU returns to normal operation. This is due to the PCM requiring a break-in period after being replaced.
- After replacing the GPU PCM and putty pads, servicers must perform the H100/H200 GPU PCM TIM melting procedure to monitor the GPU until the PCM Thermal Interface Material (TIM) has melted.
  - When performing the melting H100/H200 GPU PCM TIM procedures, the minimum water temperature is 35°C (95°F). Do not operate the melting process with water temperature lower than 35°C (95°F).
  - See [PCM TIM Melt Procedure for Neptune Water Cooled Servers with Nvidia H100 H200 GPUs](#) (trained technicians only).

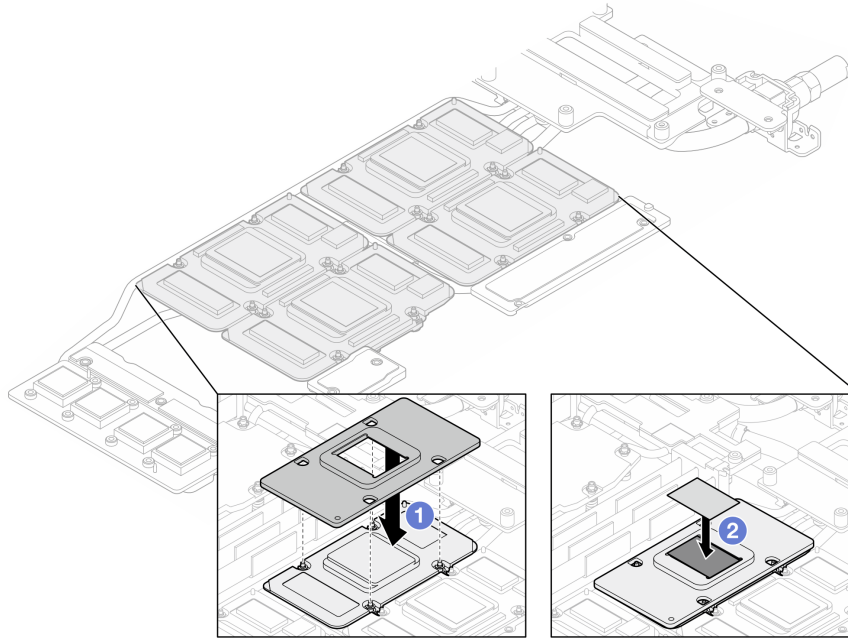


Figure 475. Water loop GPU cold plate PCM replacement (GPU node)

- d. Replace the putty pads on the GPU node water loop.

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

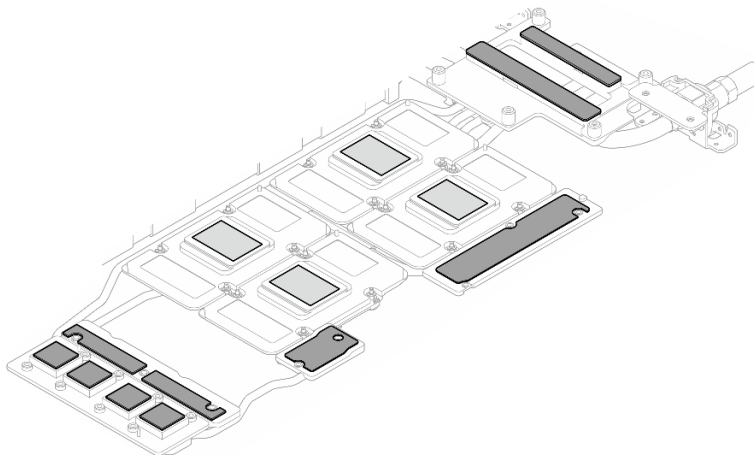


Figure 476. Water loop putty pads replacement (GPU node)

- e. Replace the putty pads (x5) on the GPU. Make sure to align the putty pads to the GPU VR (1) and the markings on GPU. Repeat to replace all putty pads on the four GPUs.

**1** GPU VR (Cover the GPU VR with putty pad)

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

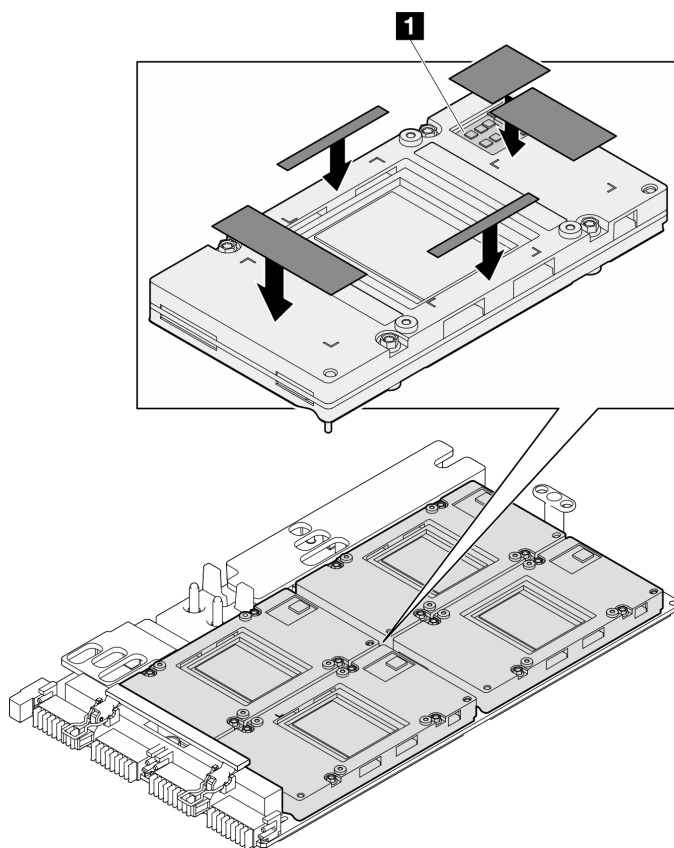


Figure 477. GPU putty pads replacement

Step 4. Unfold the water loop and place it onto the GPU node.

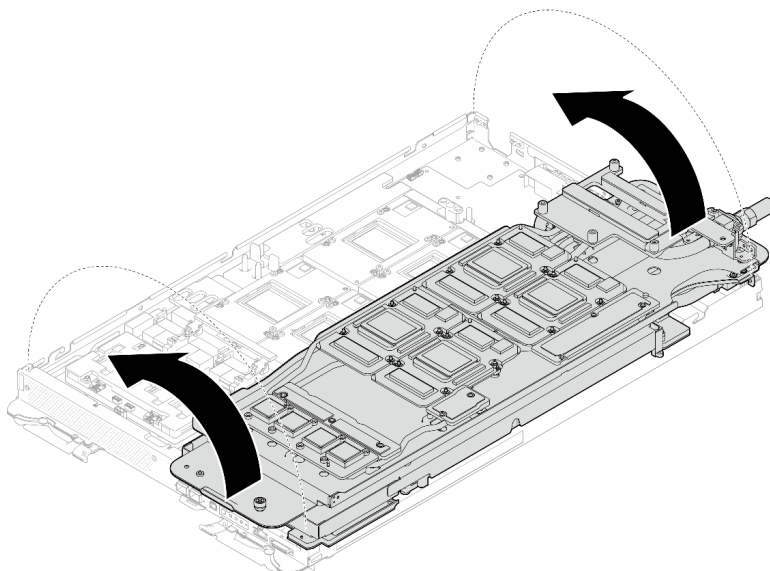


Figure 478. Unfolding the water loop to GPU node

Step 5. Loosen water loop carrier screws (x20 Phillips #2 screws).



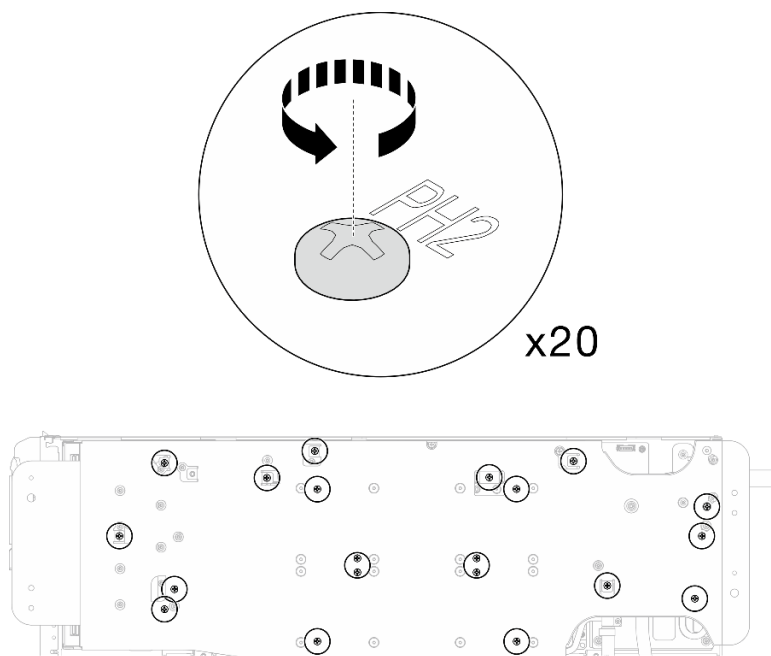


Figure 479. Water loop screws and quick connect screws installation (GPU node)

Step 6. Remove the water loop carrier from the GPU node.

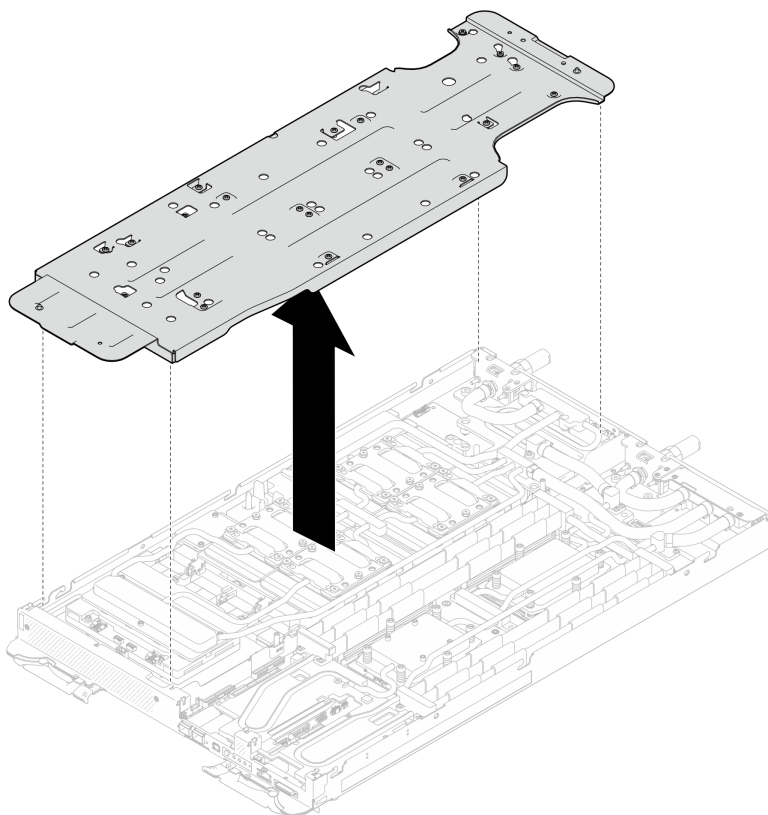


Figure 480. Water loop carrier removal (GPU node)

Step 7. Install GPU cold plate screws (x16 T10 screws).

- a. Install GPU cold plate screws following the GPU cold plates installation sequence: **GPU 2 → GPU 4 → GPU 1 → GPU 3**

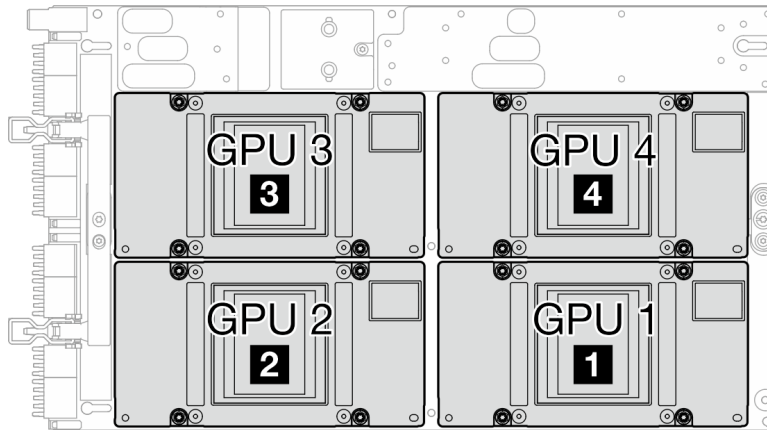


Figure 481. GPU numbering

- b. Set the torque screwdriver to 1.5 +/- 0.5 lb-In (0.1 +/- 0.06 N-m); then, fasten the GPU cold plate screws.
- c. Set the torque screwdriver to 4 +/- 0.5 lb-In (0.45 +/- 0.06 N-m); then, fasten the GPU cold plate screws.
- d. Set the torque screwdriver to 4 +/- 0.5 lb-In (0.45 +/- 0.06 N-m); then, fasten the GPU cold plate screws until all screws are fully tightened.

**Note:** Make sure to follow the screw sequence on the GPU cold plate label: ① → ② → ③ → ④

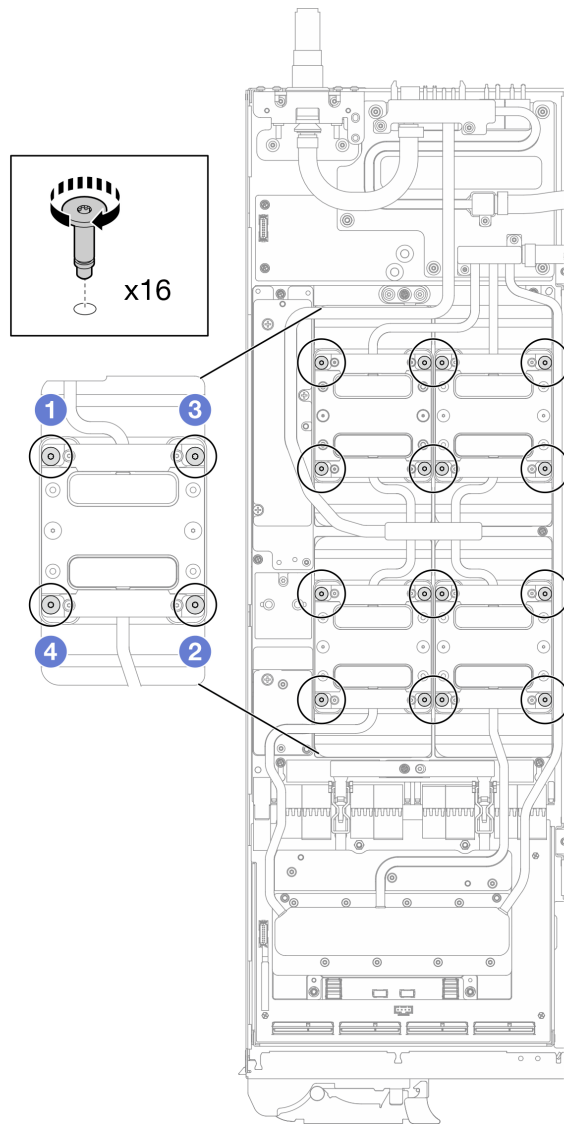


Figure 482. GPU cold plate screw installation

Step 8. Follow the screw installation sequence specified on the network board label, and install network cold plate screws (x8 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

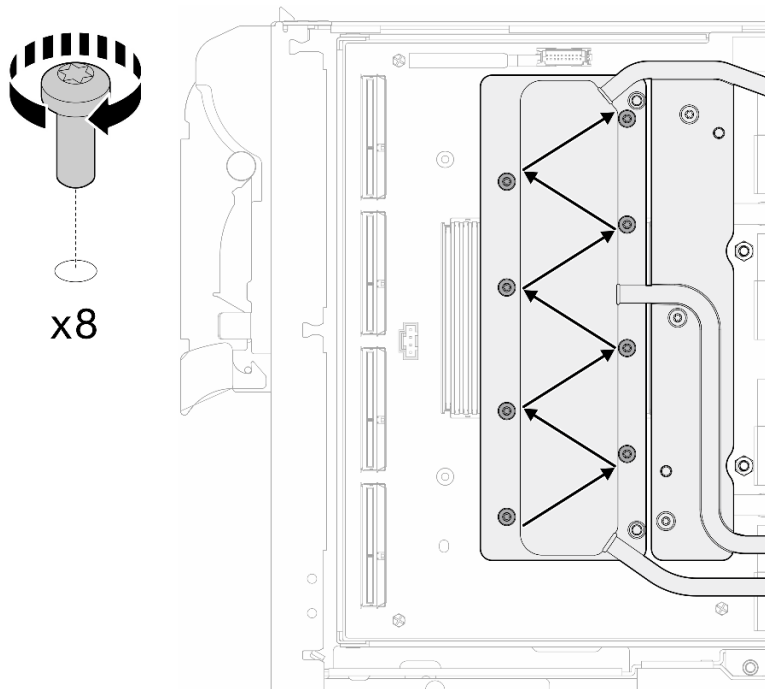


Figure 483. Network card screw installation

Step 9. Install the quick connect screws (x4 Torx T10) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

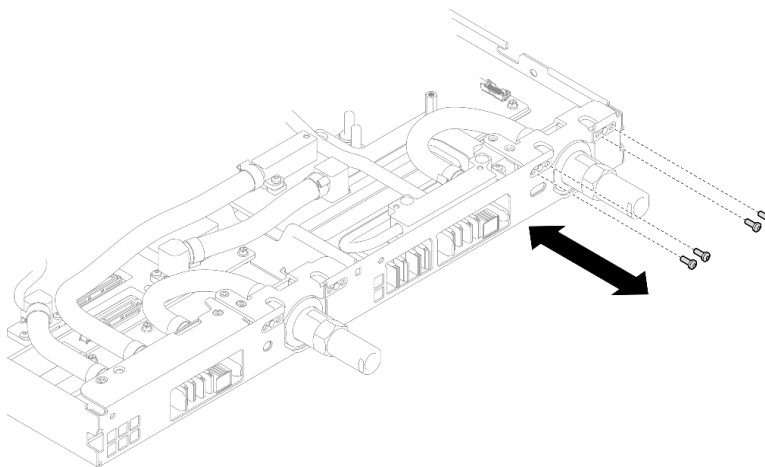
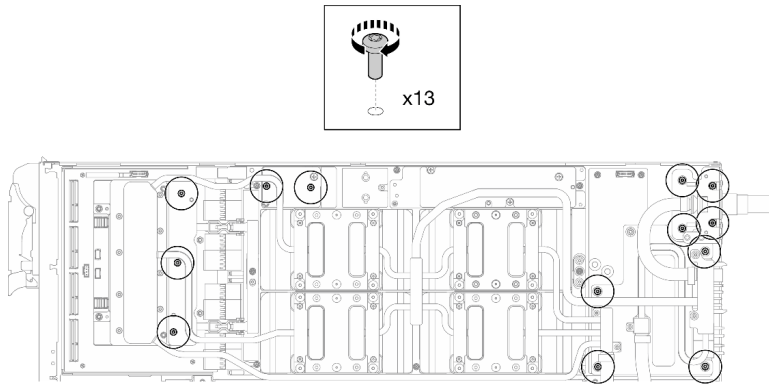


Figure 484. Quick connect screw installation (GPU node)

Step 10. Install water loop screws and quick connect screws (x13 Torx T10 screws) with a torque screwdriver set to the proper torque.

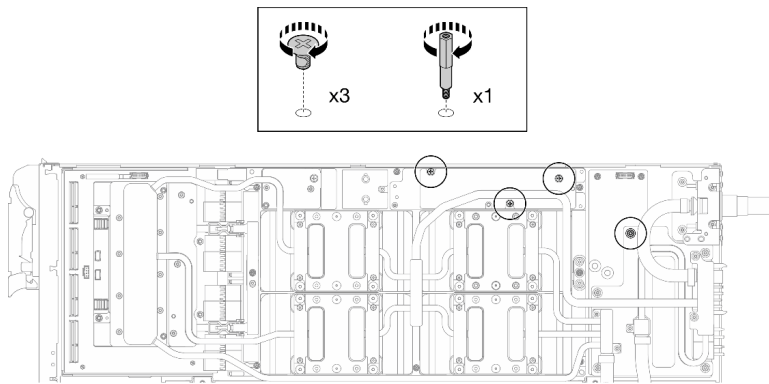
**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



*Figure 485. Water loop Torx T10 screws installation (GPU node)*

Step 11. Install the Hex screw (x1) and the PH1 screws (x3).

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



*Figure 486. Water loop Hex and PH1 screws installation (GPU node)*

Step 12. Install the cable tie to the GPU board.

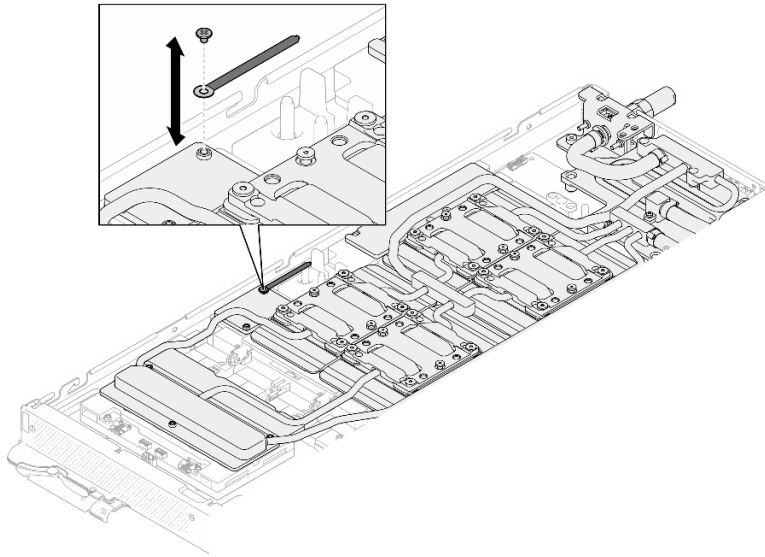


Figure 487. Installing the cable tie

Step 13. Connect the carrier board power cable.

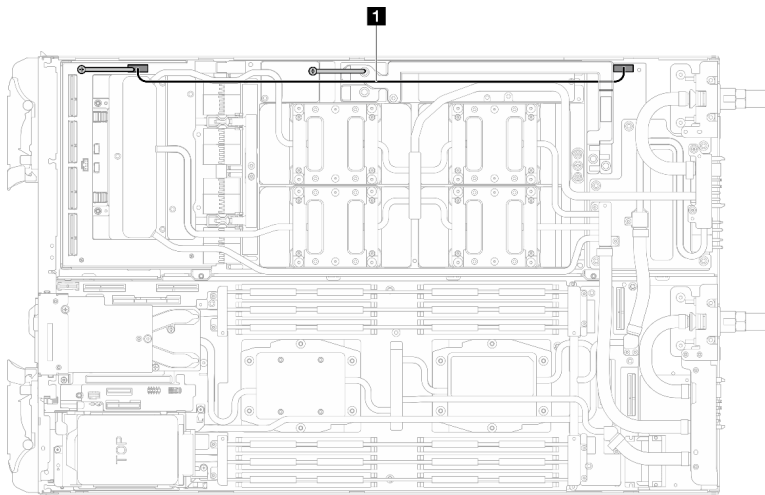


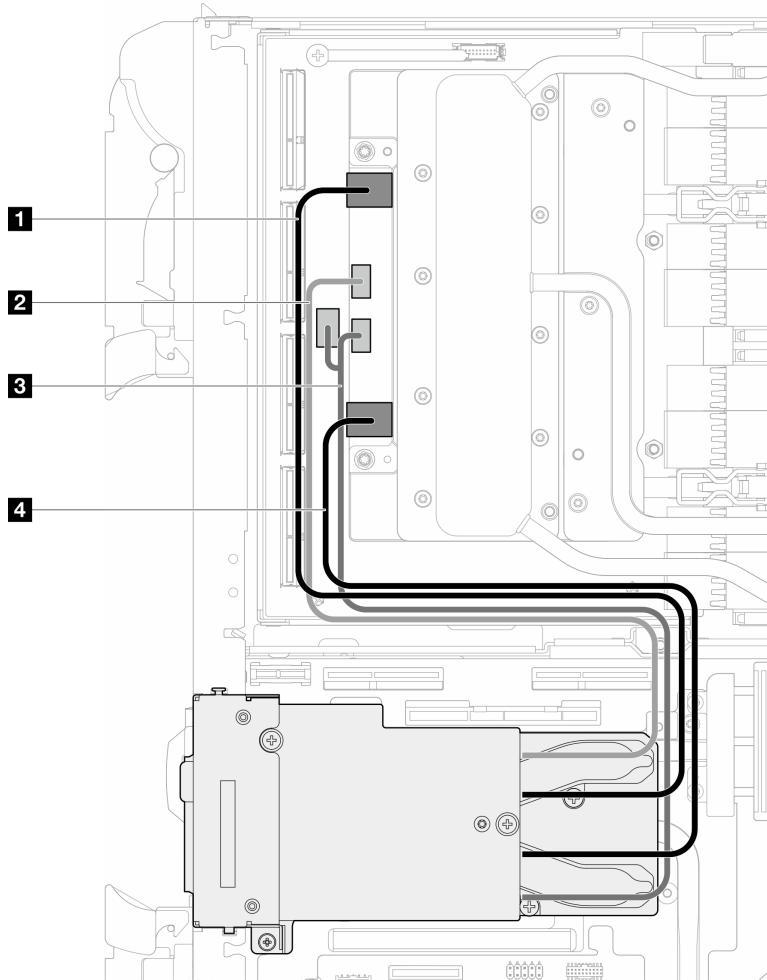
Figure 488. Connecting carrier board power cable

Cable	From (carrier board)	To (GPU node power distribution board)
<b>1</b> Carrier board power cable	Power and side band connector	Power connector

Step 14. Connect the OSFP module cables to the network board on the GPU node.

**CAUTION:**

- **Hold the cable connector at 45 degree angle when inserting it into the port.**
- **Have extremely precaution when reseating the connectors that have a 45 degree label on them as they are fragile and will get damage if not installed in the correct 45 degree angle.**



Cable	From OSFP module connectors	To Network board connectors
<b>1</b> Network cable (long)	Network connector (near GPU node)	Port 0
<b>2</b> Power cable	Power connector P1	OOB port 0
<b>3</b> Power cable	Power connector P2	OOB port 1 (on network board) and power connector (on carrier board)
<b>4</b> Network cable (short)	Network connector (near Compute node)	Port 1

Figure 489. Connecting the OSFP module cables to the network board

Step 15. Press the network cable connector to properly connect the cable plug to the connector. **Make sure** the latch is fully engaged to the connector.

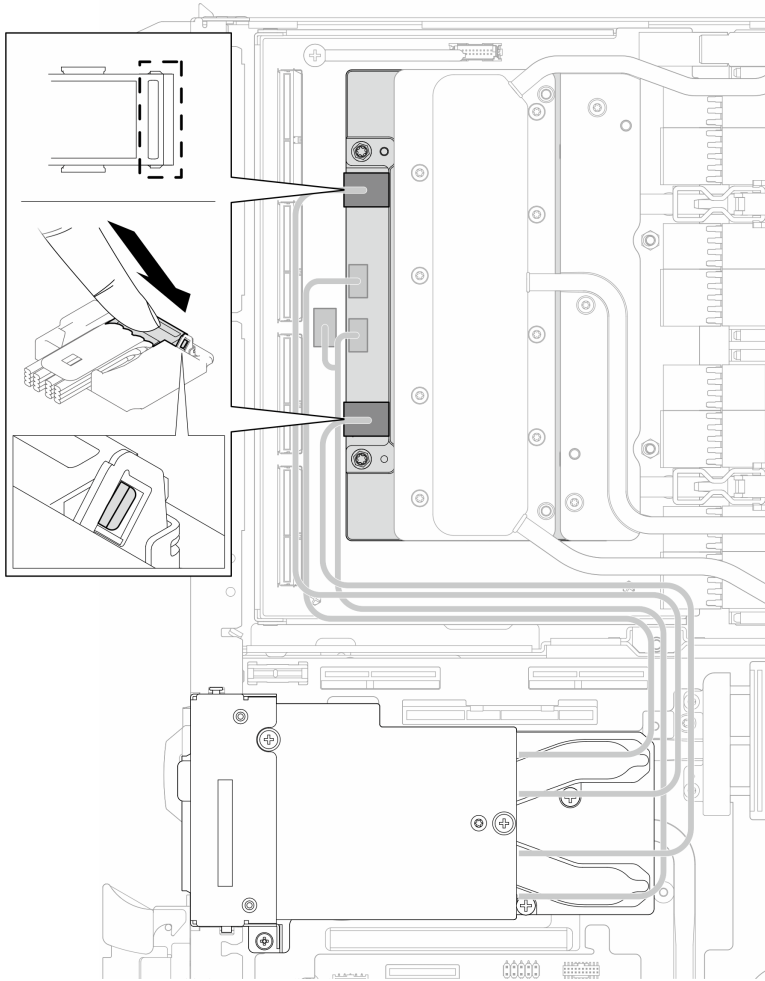


Figure 490. Pressing network cable plug

## After you finish

1. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
2. Install the bus bar. See [“Install the bus bar” on page 267](#).
3. Install the cross braces. See [“Install the cross braces” on page 21](#).
4. Install the tray cover. See [“Install the tray cover” on page 18](#).
5. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
6. Connect all required external cables to the solution.

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

7. 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](#)



## OSFP module and network board replacement (trained technician only)

Use the following procedures to remove and install the OSFP module and network board.

If replacing only the network board, refer to [“Network board \(trained technician only\)” on page 340](#).

### Remove the OSFP module and network board (trained technician only)

Use this information to remove the OSFP module and network board.

**Attention:** If replacing only the network board, refer to [“Network board \(trained technician only\)” on page 340](#).

### About this task

#### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)
- SD665-N V3 OSFP Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screw and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.  
Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type/Usage	Screwdriver Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Releasing OSFP module from conduction plate	Flat head screwdriver
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.

- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

## Remove the OSFP module

### Procedure

Step 1. Make preparations for this task.

- Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14.](#)
- Remove the tray cover. See [“Remove the tray cover” on page 17.](#)
- Remove the cross braces. See [“Remove the cross braces” on page 19.](#)
- Remove the bus bar. See [“Remove the bus bar” on page 266.](#)
- Remove the M.2 backplane assembly. See [“Remove the M.2 backplane assembly” on page 113.](#)

Step 2. Disconnect the drive cage cable.

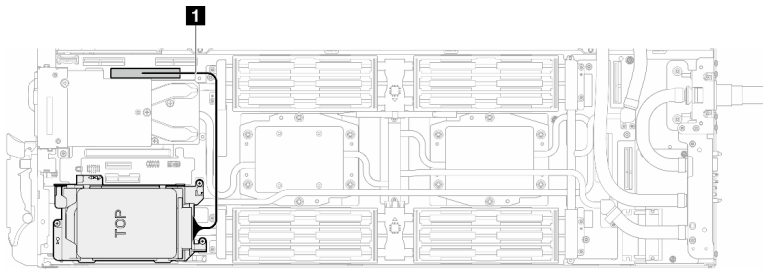


Figure 491. Disconnecting drive cable

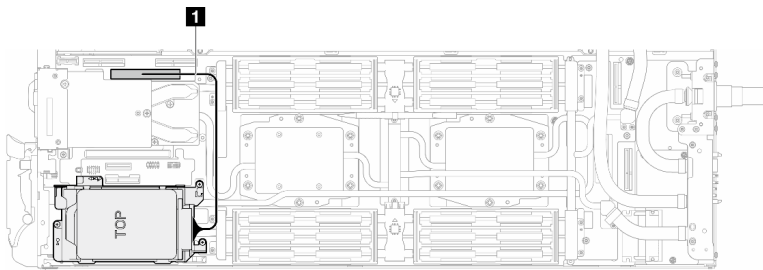


Figure 492. Disconnecting 7mm drive cable

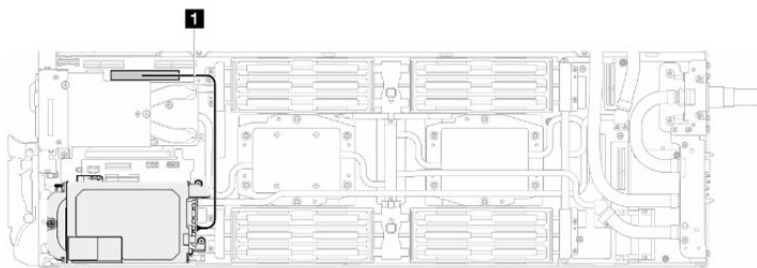


Figure 493. Disconnecting E3.S drive cable

Step 3. Disconnect MCIO cables from carrier board.

**One-processor configuration: disconnect all MCIO cables from the carrier board**

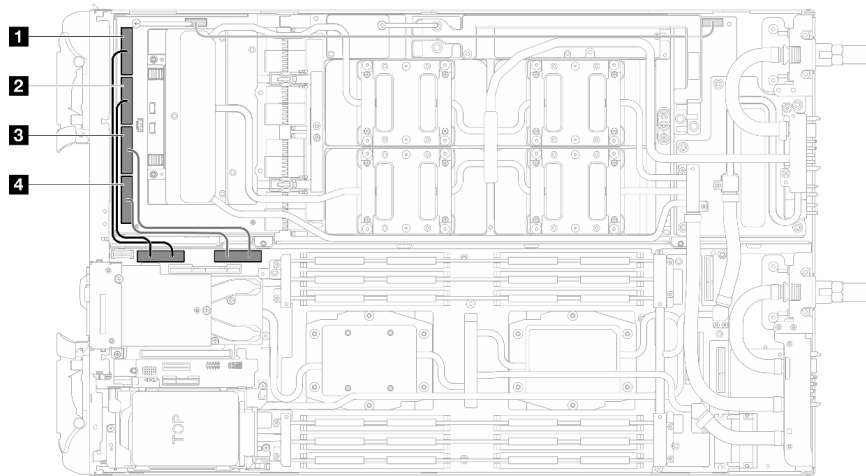


Figure 494. One-processor configuration—Disconnecting all MCIO cables

Cable index	From (carrier board in GPU node)	To (system board in compute node)
<b>1</b>	MCIO 1 cable	PCIe 4
<b>2</b>	MCIO 2 cable	
<b>3</b>	MCIO 3 cable	PCIe 3
<b>4</b>	MCIO 4 cable	

**Two-processors configuration: disconnect MCIO 2, MCIO 3, and MCIO 4 cables from the carrier board**

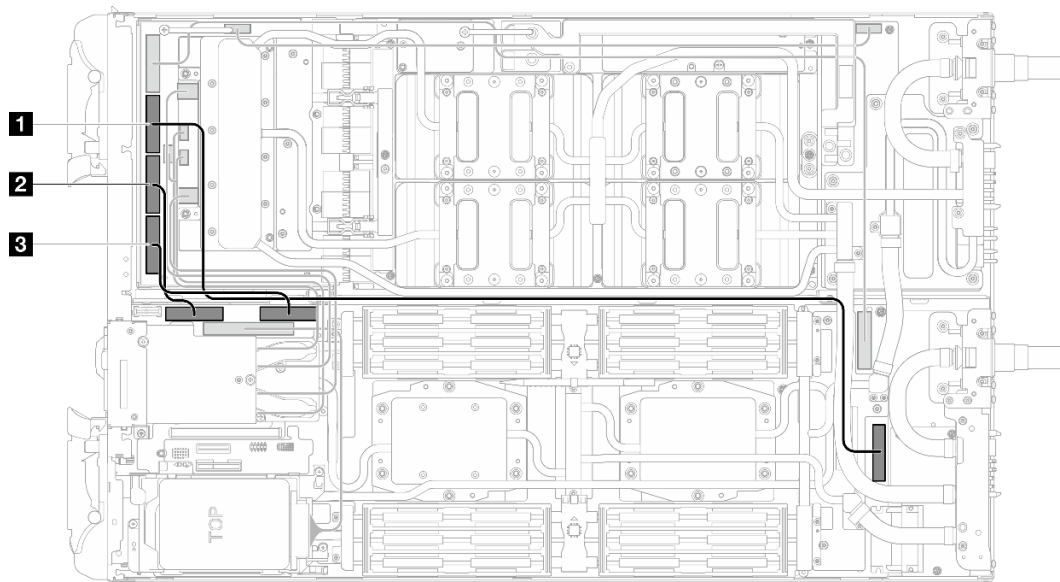


Figure 495. Two-processors configuration—Disconnecting MCIO 2, MCIO 3, and MCIO 4 cables

Cable index	From (carrier board in GPU node)	To (system board in compute node)
<b>1</b>	MCIO 2 cable	PCIe 5
<b>2</b>	MCIO 3 cable	PCIe 4
<b>3</b>	MCIO 4 cable	PCIe 3

Step 4. Disconnect the OSFP module cables from the network board on the GPU node.

**CAUTION:**

- Hold the cable connector at 45 degree angle when inserting it into the port.
- Have extremely precaution when reseating the connectors that have a 45 degree label on them as they are fragile and will get damage if not installed in the correct 45 degree angle.

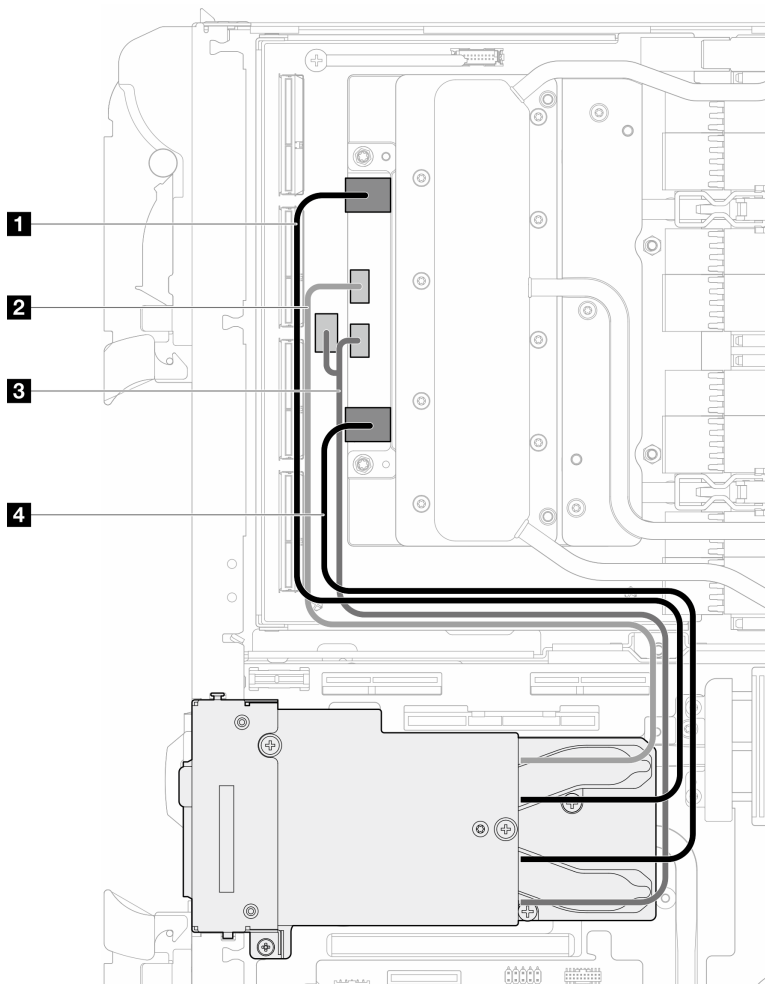


Figure 496. Disconnecting OSFP module cables from the network board

Cable	From OSFP module connectors	To Network board connectors
<b>1</b> Network cable (long)	Network connector (near GPU node)	Port 0
<b>2</b> Power cable	Power connector P1	OOB port 0
<b>3</b> Power cable	Power connector P2	OOB port 1 (on network board) and power connector (on carrier board)
<b>4</b> Network cable (short)	Network connector (near Compute node)	Port 1

Step 5. Remove the three screws from the OSFP module.

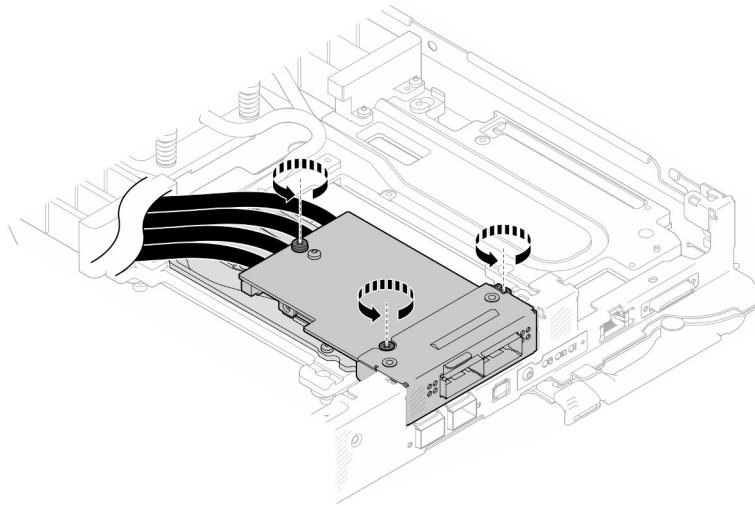


Figure 497. Removing the OSFP module

Step 6. Remove the OSFP module.

- a. **1** Insert a flat head screwdriver into the gap between the OSFP module and the OSFP module conduction plate; then, rotate the flat head screwdriver to release the OSFP module from the conduction plate.
- b. **2** Carefully hold the OSFP module by its edges and keep the OSFP module at an angle. Then, remove it from the compute node.

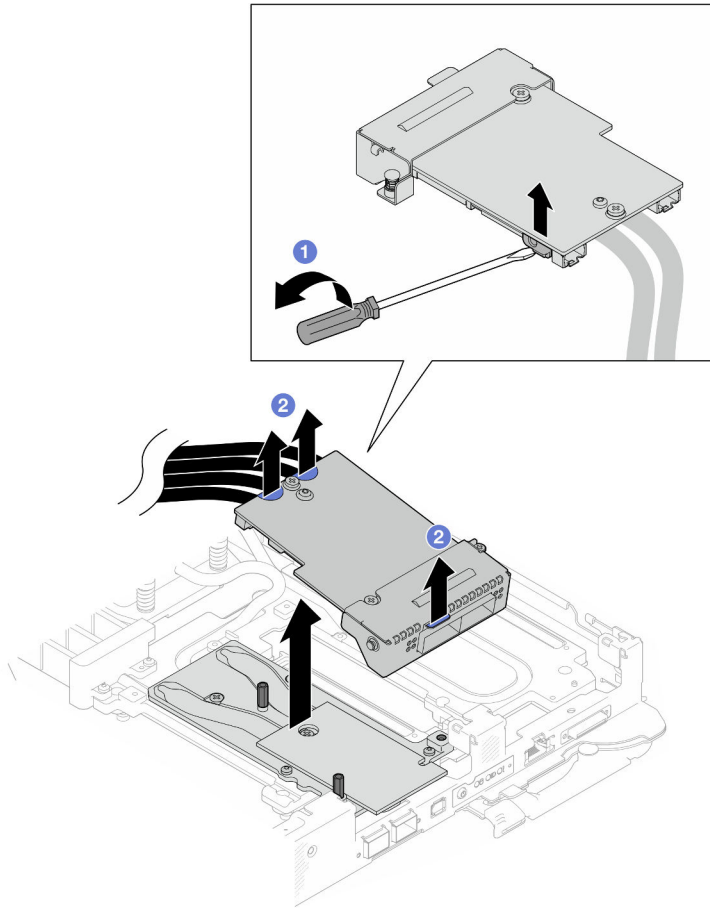


Figure 498. Removing the OSFP module

Step 7. Disconnect the power cables from the OSFP module.

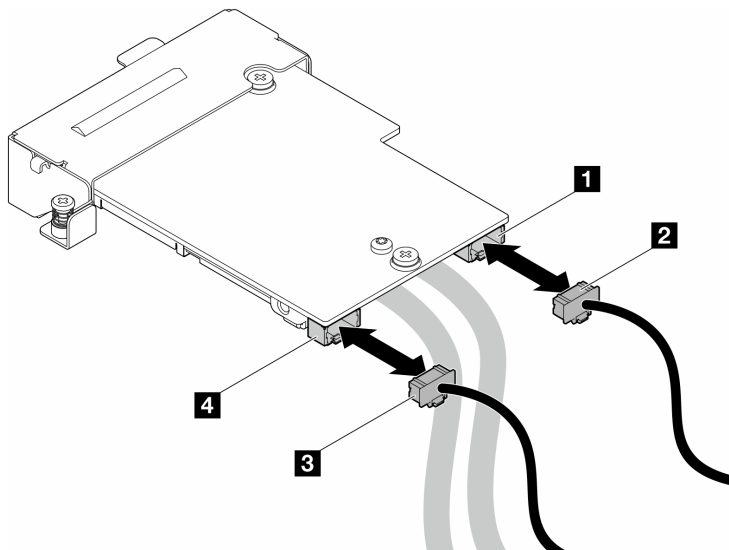


Figure 499. OSFP module power cables removal

## Remove the network board

Step 1. Remove the carrier board power cable from the GPU node.

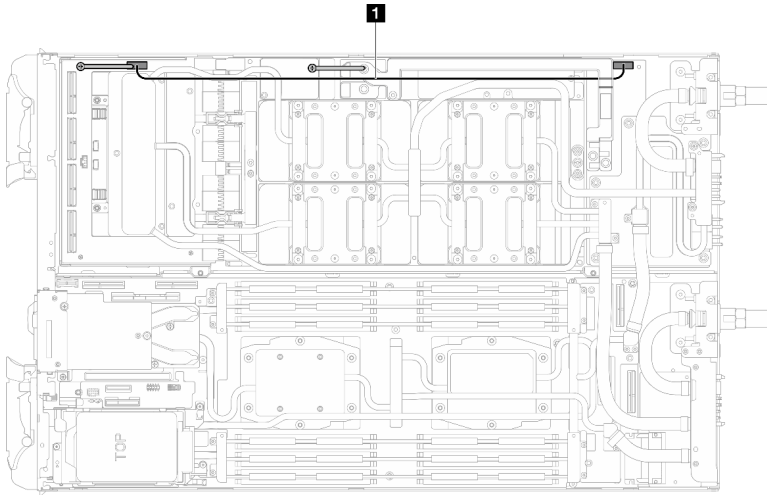


Figure 500. Carrier board power cable removal

Cable	From (carrier board)	To (GPU node power distribution board)
1 Carrier board power cable	Power and side band connector	Power connector

Step 2. Remove cable tie from the GPU board.

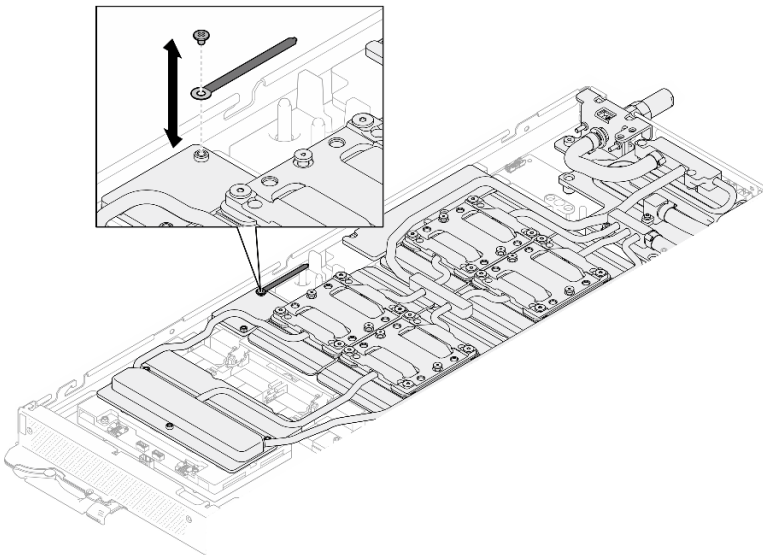


Figure 501. Cable tie removal

Step 3. Remove the Hex screw (x1) and the PH1 screws (x3) from the water loop with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

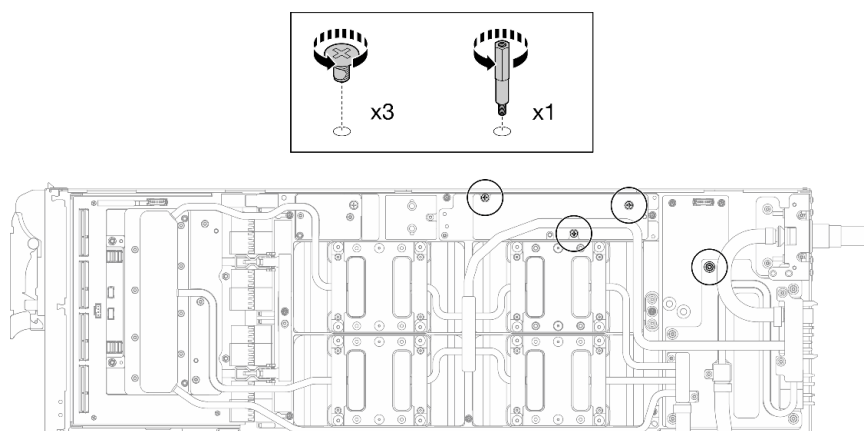


Figure 502. Water loop Hex and PH1 screws removal (GPU node)

- Step 4. Remove water loop screws and quick connect screws (x13 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

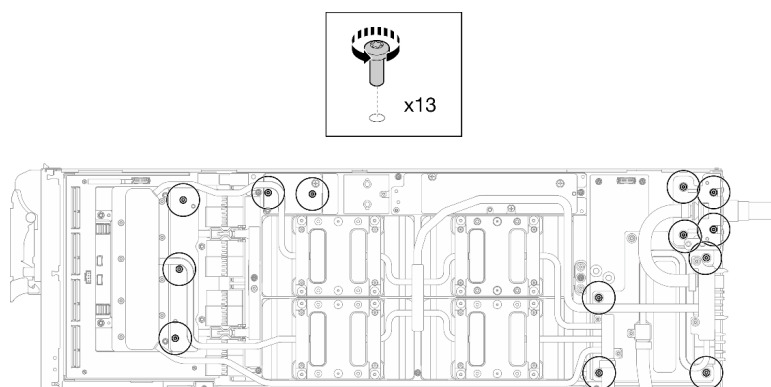


Figure 503. Water loop Torx T10 screws removal (GPU node)

- Step 5. Remove the quick connect screws (x4 Torx T10) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



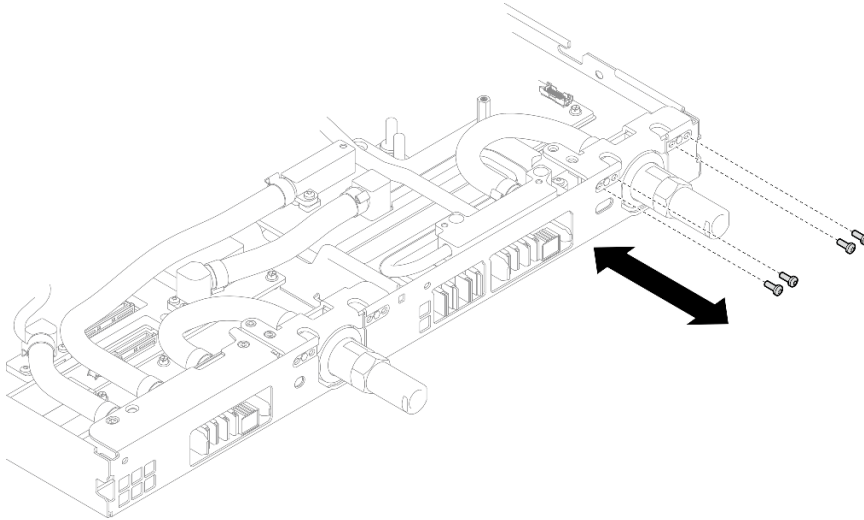


Figure 504. Quick connect screw removal (GPU node)

- Step 6. Follow the screw removal sequence specified on the network board label, and remove network cold plate screws (x8 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

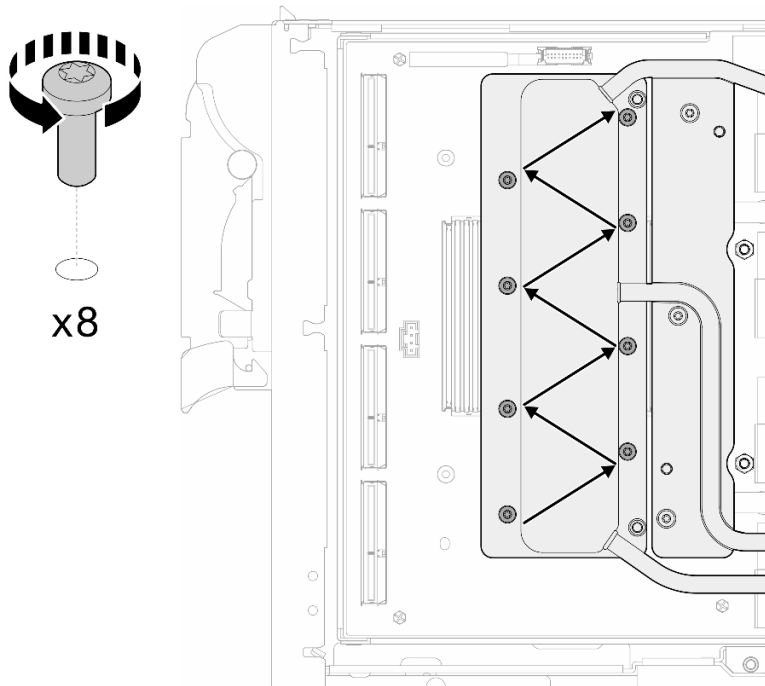


Figure 505. Network card screw removal

- Step 7. Loosen GPU cold plate screws (x16 Torx T10 screws) in the diagonal pattern with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/loosened is 3.5 +/- 0.5 lb-in (0.4 +/- 0.06 N-m).

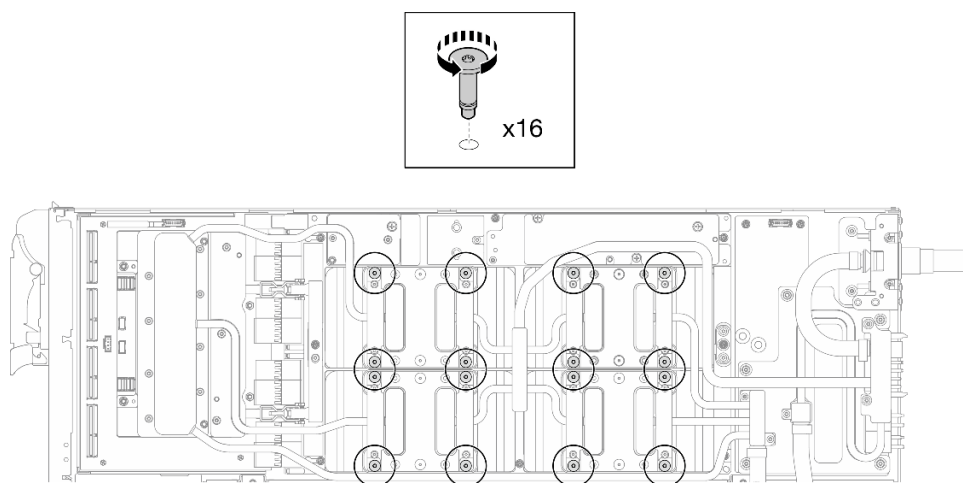


Figure 506. Loosening GPU cold plate screw

Step 8. Release the front and rear MISC conduction plates of the water loop from the GPU board.

- a. ❶ Insert a flat head screwdriver into the gaps between the MISC conduction plates (front and rear) and the GPU board. Then, slightly rotate the flat head screwdriver.

**Note:** Locations of the gaps for inserting flat head screwdriver is shown in the illustration below.

- b. ❷ The front and rear MISC conduction plates release from the GPU board slightly.

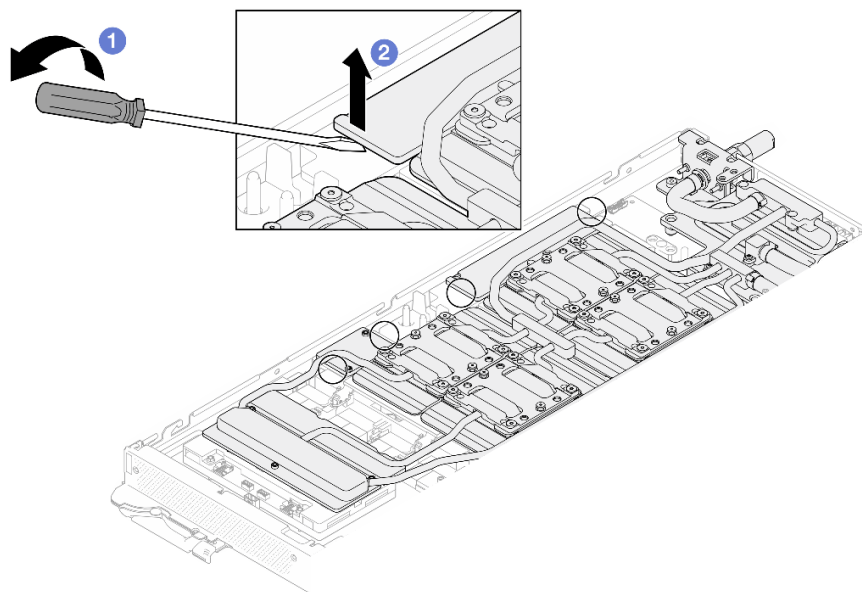


Figure 507. Releasing the front and rear MISC conduction plates release from the GPU board

Step 9. Release the GPU cold plates from the GPUs.

- a. There are notches on the sides of the GPU cold plates for inserting a flat head screwdriver. The locations of the notches are shown in the illustration below.

**Attention:** Inserting the flat head screwdriver **ONLY** to the notches circled in the illustration below. Otherwise, the screwdriver may damage the GPUs.

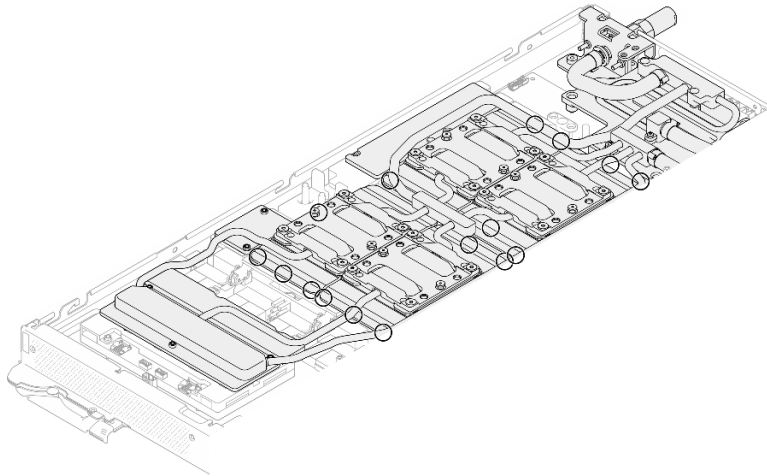


Figure 508. Notches for releasing GPU cold plates

- b. Insert a flat screwdriver into all the notches shown in the illustration; then, slightly rotate the screwdriver to release the GPU cold plates from the GPUs.

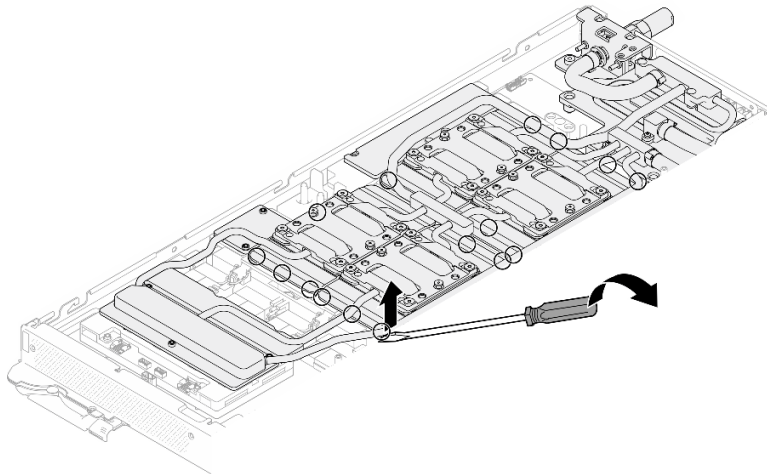


Figure 509. Releasing the GPU cold plate from the GPU

Step 10. Gently put the water loop carrier down onto the water loop and ensure it is seated firmly on the water loop.

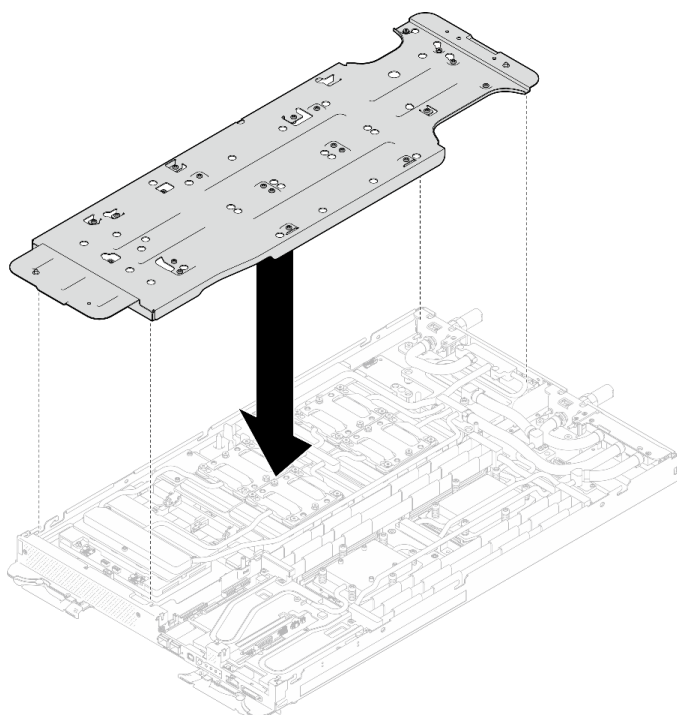


Figure 510. Water loop carrier installation (GPU node)

Step 11. Tighten water loop carrier screws (x20 Phillips #2 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

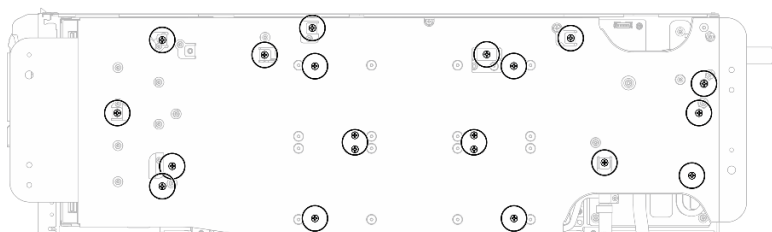
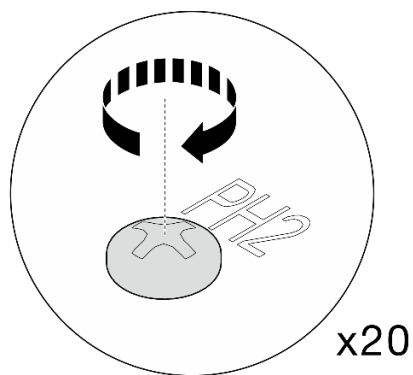


Figure 511. Water loop screw and quick connect screw removal (GPU node)

Step 12. Carefully rotate the GPU node side water loop so that it is sitting on top of the Compute node side water loop.

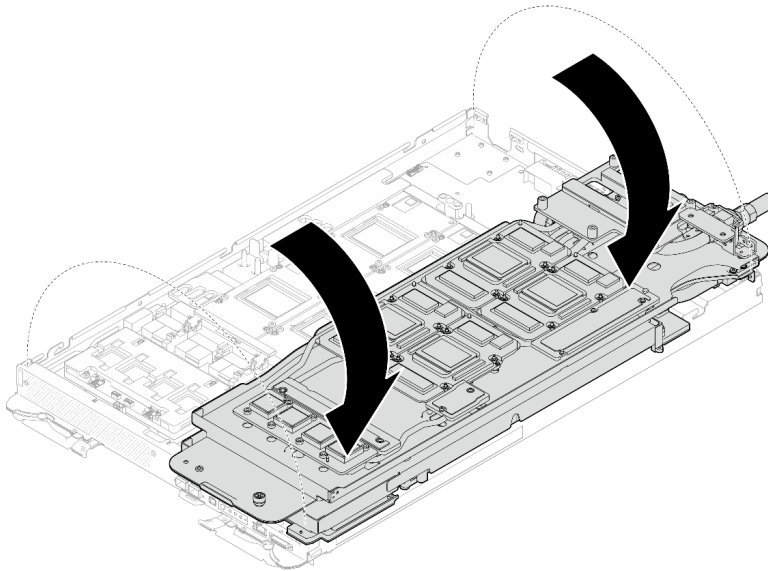


Figure 512. Folding the GPU node side water loop onto the Compute node side water loop

Step 13. **Immediately** clean the PCM off all the GPUs with alcohol cleaning pads. **Gently** clean the PCM to avoid GPU damages.

**Attention:**

- It is recommended to clean the PCM while it is in liquid state.
- The electrical components around the die on the GPUs are extremely delicate. When removing the PCM and cleaning the GPU die, avoid touching the electrical components to prevent damages.

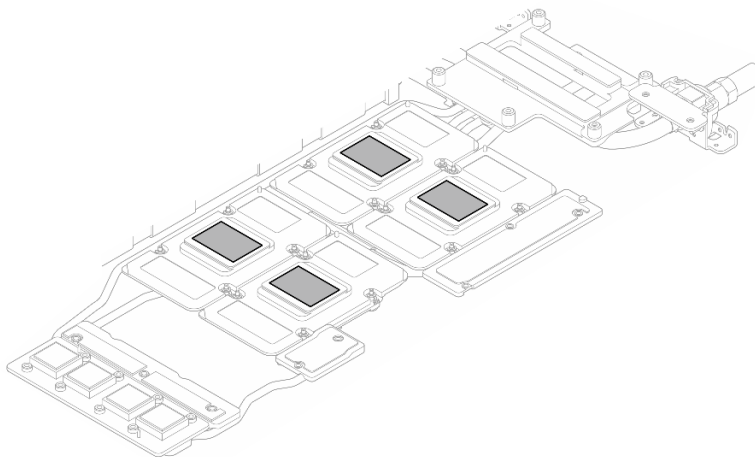


Figure 513. Cleaning PCM off from all GPUs

Step 14. With alcohol cleaning pads, wipe off any remaining putty pad and PCMs from the water loop and components in the GPU node.

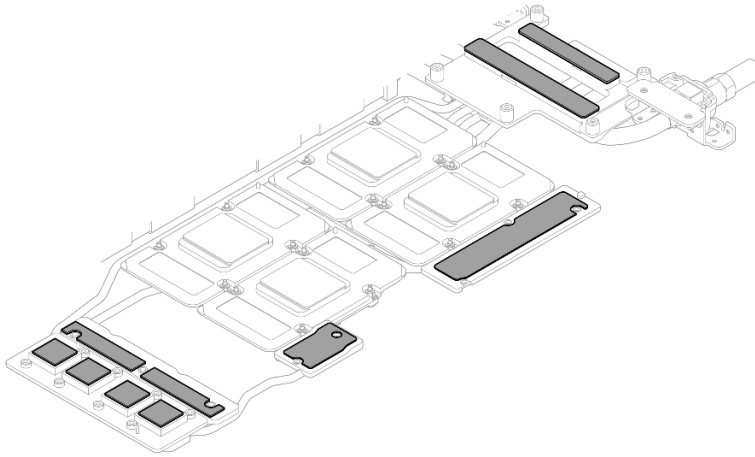


Figure 514. Cleaning putty pads from water loop

Step 15. Follow the sequence shown in the illustration below to remove the network board screws (x4 Torx T15 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 0.9 newton-meters, 7.96 inch-pounds.

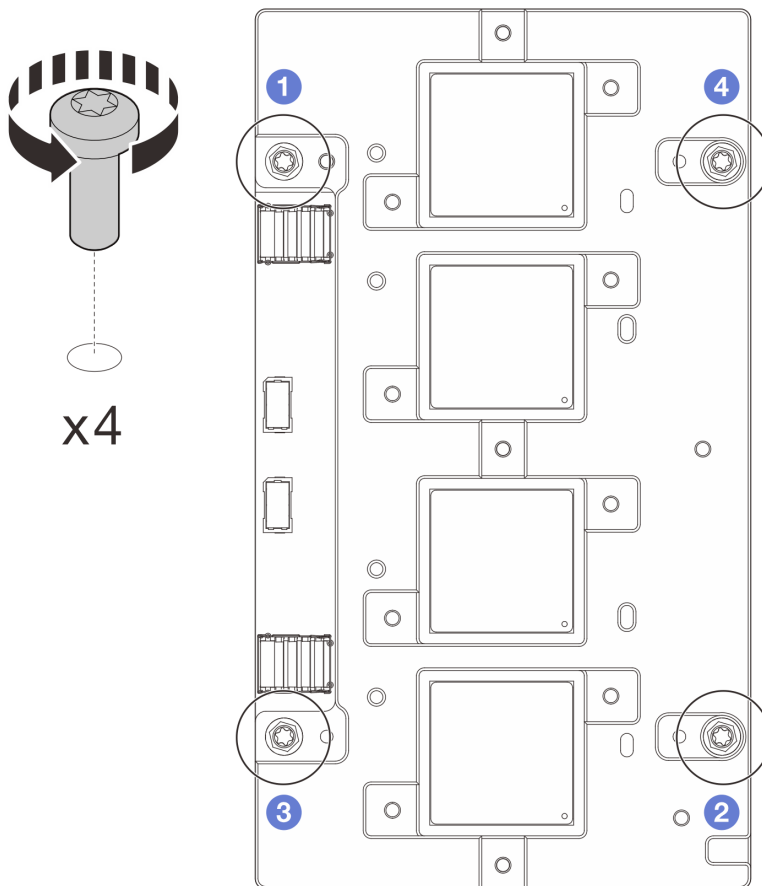


Figure 515. Network board screws removal

Step 16. Remove the network board from the GPU node.

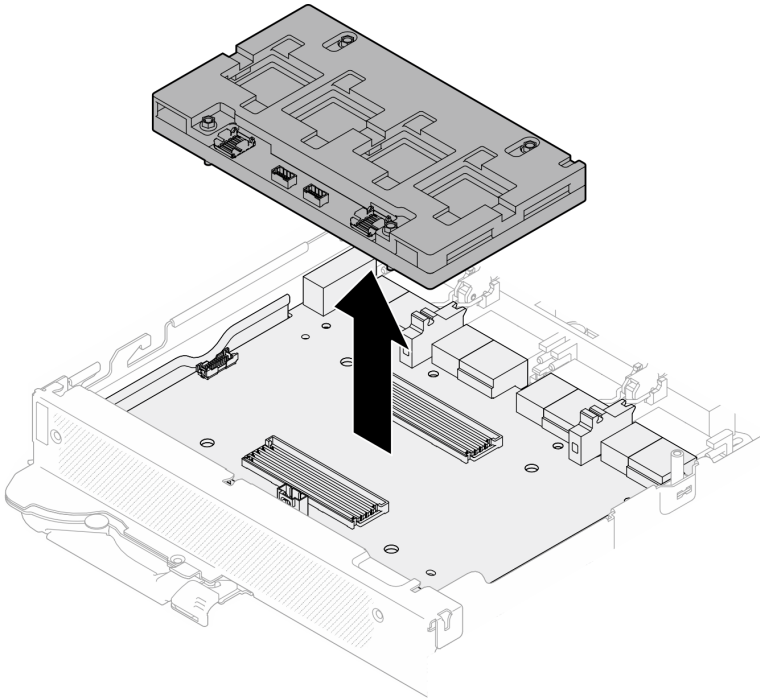


Figure 516. Removing the network board

## 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](#)

[Watch the procedure on YouTube](#)

## Install the OSFP module and the network board (trained technician only)

Use this information to install the OSFP module and network board.

**Attention:** If replacing only the network board, refer to [“Network board \(trained technician only\)” on page 340](#).

### Important: Gap pad/putty pad replacement guidelines

- To identify the gap pad/putty pad location and orientation, see:
  - *Required Tools* list in the following section.
  - [“Gap pad/Putty pad identification and location” on page 8](#)
- Before replacing the gap pad/putty pad, gently clean the interface plate or the hardware surface with an alcohol cleaning pad.
- Hold the gap pad/putty pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad/putty pad material.
- Do not use expired putty pad. Check the expiry date on putty pad package. If the putty pads are expired, acquire new ones to properly replace them.

## About this task

### Required tools

Make sure you have the required tools listed below in hand to properly replace the component.

- GPU node water loop carrier

(The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)

- SD665-N V3 Water Loop Gap Pad Kit
- SD665-N V3 Miscellaneous Parts Kit
- SD665-N V3 Water Loop Putty Pad Kit
- SD665-N V3 SXM5 PCM Fixture
- SXM5 PCM Kit (for removing PCM from GPU)
- SD665-N V3 OSFP Putty Pad Kit

**Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

- Screw and screwdrivers

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.  
Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type/Usage	Screwdriver Type
Hex screw (GPU node water loop)	6 mm hex head screwdriver
Releasing OSFP module from conduction plate	Flat head screwdriver
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.

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

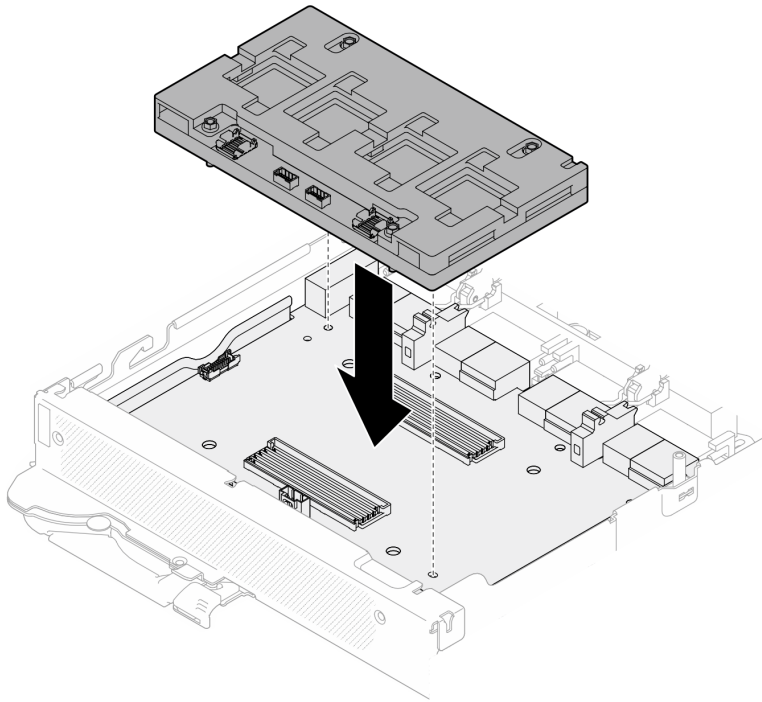
- Go to <https://datacentersupport.lenovo.com/products/servers/thinksystem/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

### Install the network board

#### Procedure

Step 1. Align the network board to the guide holes on the carrier board; then, place the network board onto the carrier board.





*Figure 517. Installing the network board*

- Step 2. Follow the sequence shown in the illustration below to fasten the network board screws (x4 Torx T15 screws) to the carrier board.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 0.9 newton-meters, 7.96 inch-pounds.

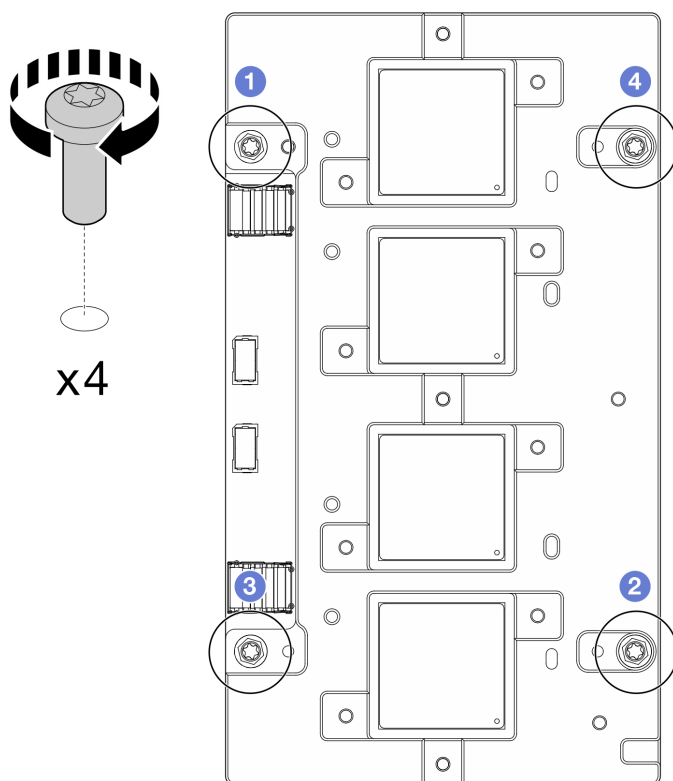


Figure 518. Network board screws installation

**GPU node** water loop gap pad/putty pad replacement. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

Step 3. Replace the Phase Change Material (PCM) and putty pads on the GPU node water loop with new ones.

- a. ① Install the PCM jig on the GPU cold plate.
- b. ② Attach the PCM to the square opening of the jig.
- c. Repeat to replace the PCM of all four GPU cold plates.

**Attention:**

- PCM cannot be reused. PCM must be replaced with new ones every time the water loop is removed.
- After PCM is replaced, there is an expected short duration of throttling before the GPU returns to normal operation. This is due to the PCM requiring a break-in period after being replaced.
- After replacing the GPU PCM and putty pads, servicers must perform the H100/H200 GPU PCM TIM melting procedure to monitor the GPU until the PCM Thermal Interface Material (TIM) has melted.
  - When performing the melting H100/H200 GPU PCM TIM procedures, the minimum water temperature is 35°C (95°F). Do not operate the melting process with water temperature lower than 35°C (95°F).
  - See [PCM TIM Melt Procedure for Neptune Water Cooled Servers with Nvidia H100 H200 GPUs](#) (trained technicians only).

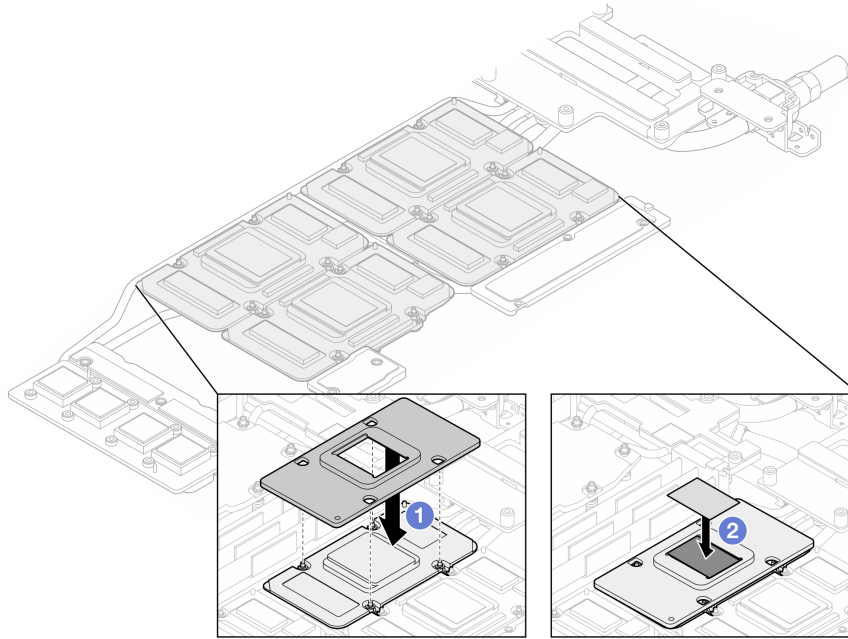


Figure 519. Water loop GPU cold plate PCM replacement (GPU node)

- d. Replace the putty pads on the GPU node water loop.

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

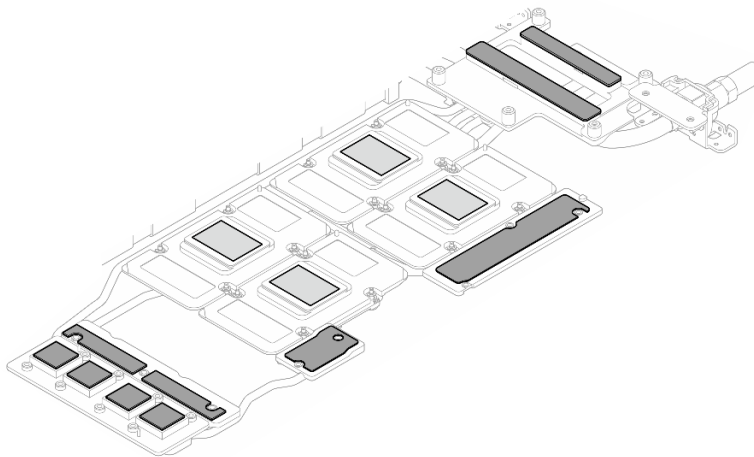


Figure 520. Water loop putty pads replacement (GPU node)

- e. Replace the putty pads (x5) on the GPU. Make sure to align the putty pads to the GPU VR (1) and the markings on GPU. Repeat to replace all putty pads on the four GPUs.

**1** GPU VR (Cover the GPU VR with putty pad)

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

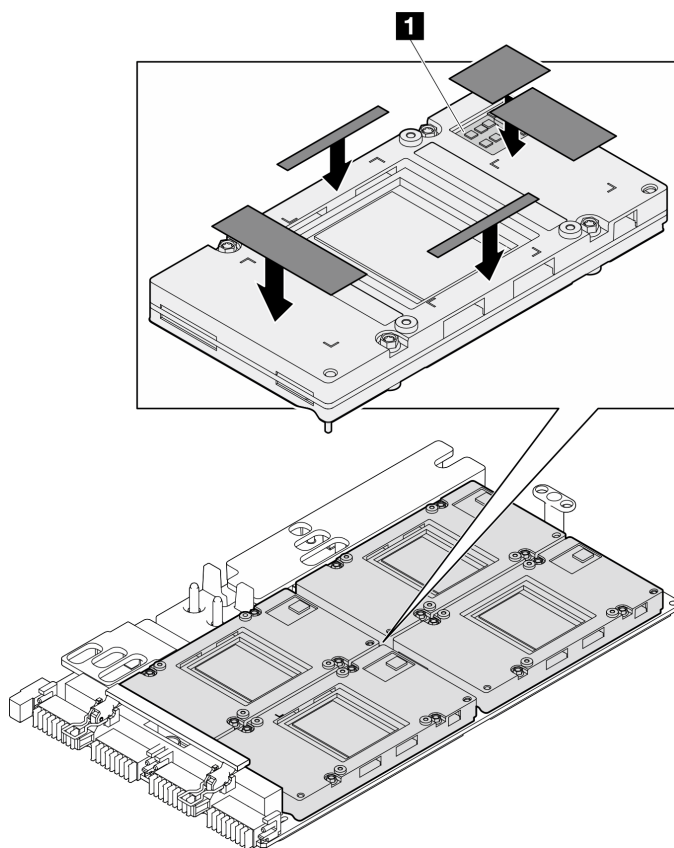


Figure 521. GPU putty pads replacement

Step 4. Unfold the water loop and place it onto the GPU node.

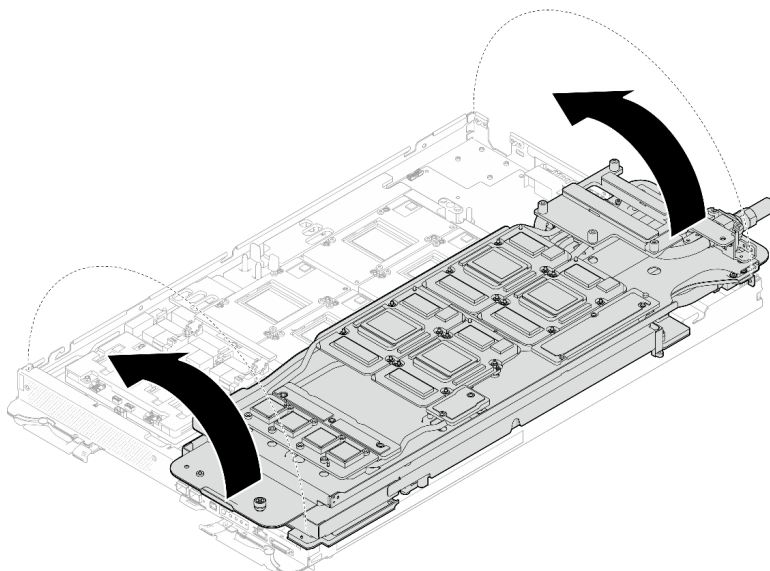


Figure 522. Unfolding the water loop to GPU node

Step 5. Loosen water loop carrier screws (x20 Phillips #2 screws).

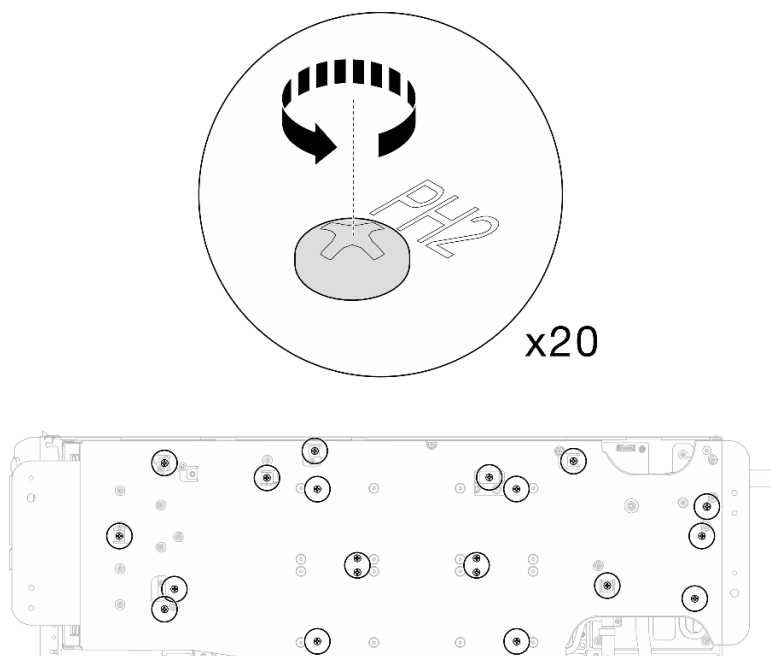


Figure 523. Water loop screws and quick connect screws installation (GPU node)

Step 6. Remove the water loop carrier from the GPU node.

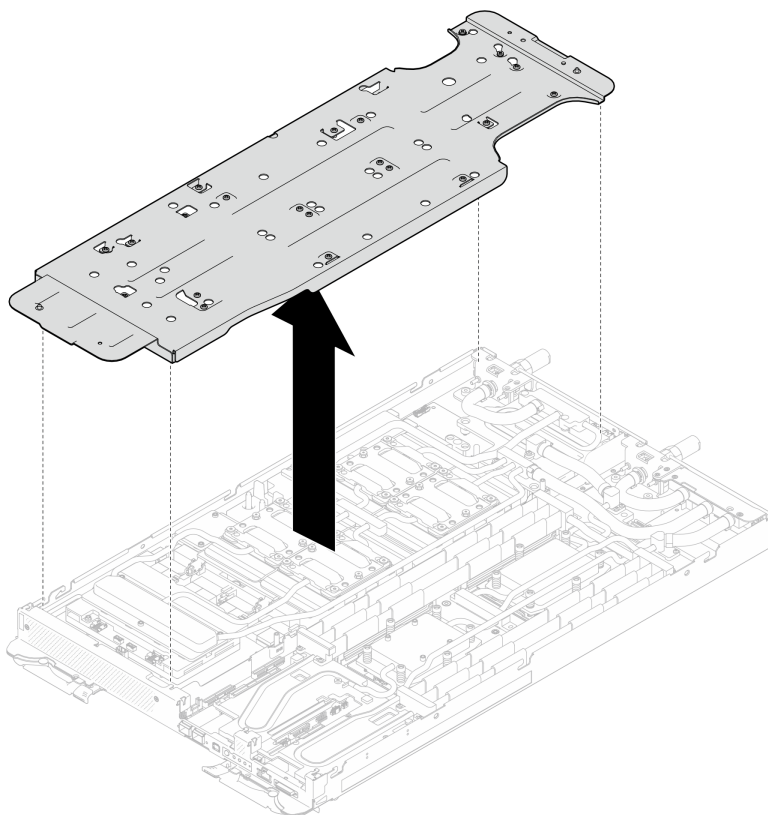


Figure 524. Water loop carrier removal (GPU node)

Step 7. Install GPU cold plate screws (x16 T10 screws).

- a. Install GPU cold plate screws following the GPU cold plates installation sequence: **GPU 2 → GPU 4 → GPU 1 → GPU 3**

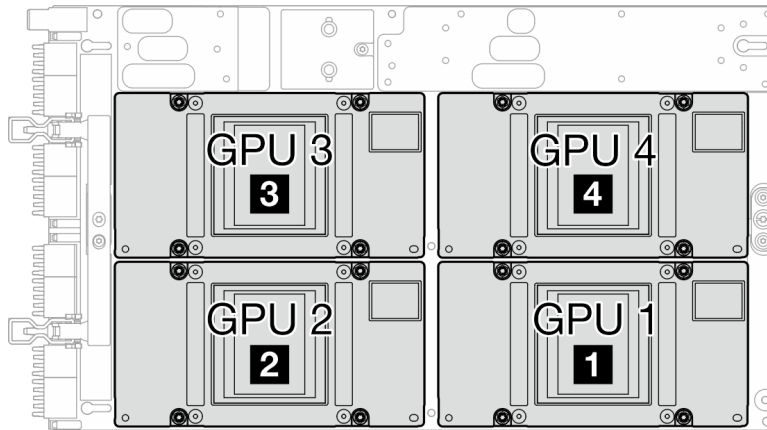


Figure 525. GPU numbering

- b. Set the torque screwdriver to 1.5 +/- 0.5 lb-In (0.1 +/- 0.06 N-m); then, fasten the GPU cold plate screws.
- c. Set the torque screwdriver to 4 +/- 0.5 lb-In (0.45 +/- 0.06 N-m); then, fasten the GPU cold plate screws.
- d. Set the torque screwdriver to 4 +/- 0.5 lb-In (0.45 +/- 0.06 N-m); then, fasten the GPU cold plate screws until all screws are fully tightened.

**Note:** Make sure to follow the screw sequence on the GPU cold plate label: ① → ② → ③ → ④

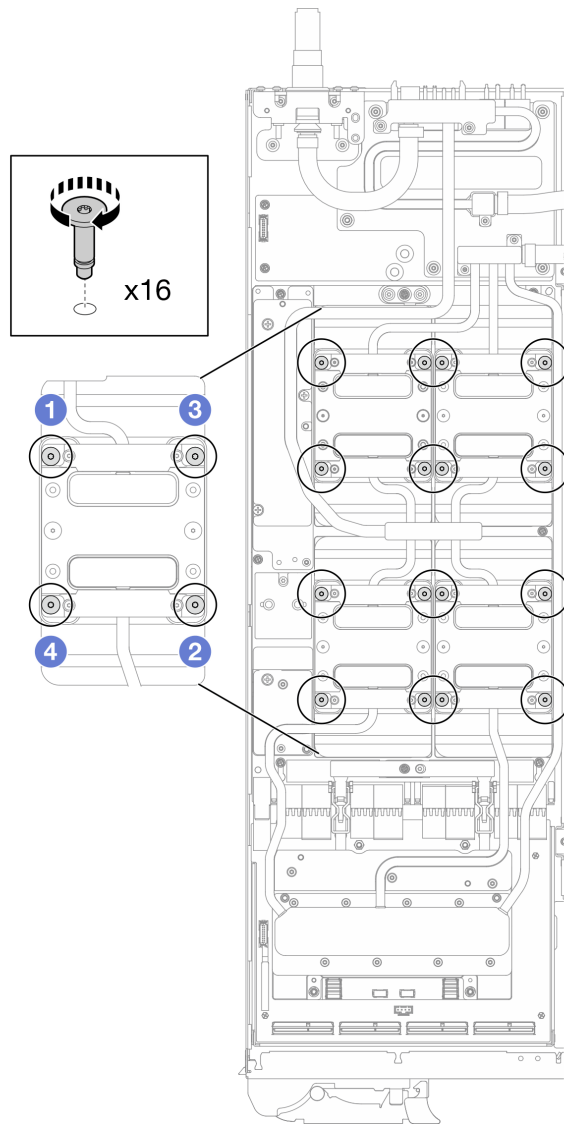


Figure 526. GPU cold plate screw installation

Step 8. Follow the screw installation sequence specified on the network board label, and install network cold plate screws (x8 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

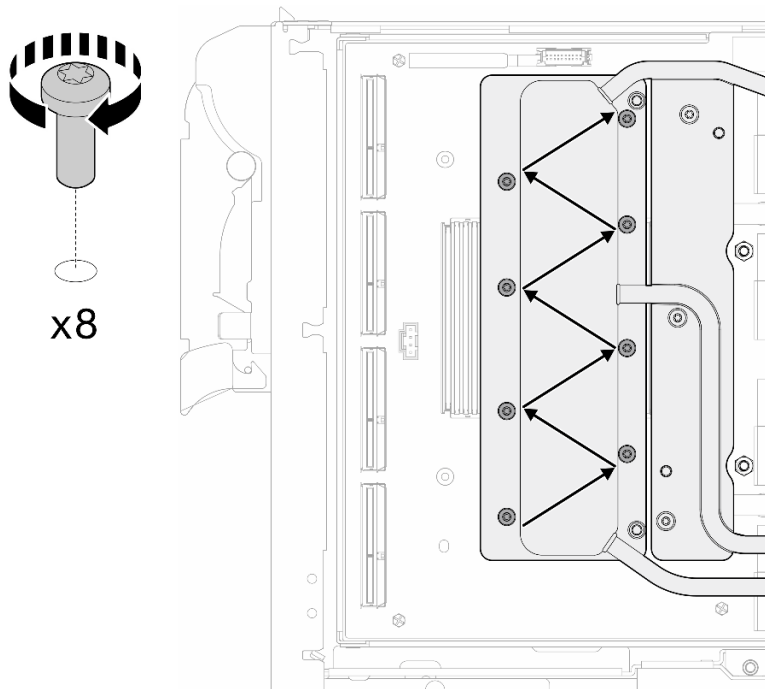


Figure 527. Network card screw installation

Step 9. Install the quick connect screws (x4 Torx T10) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

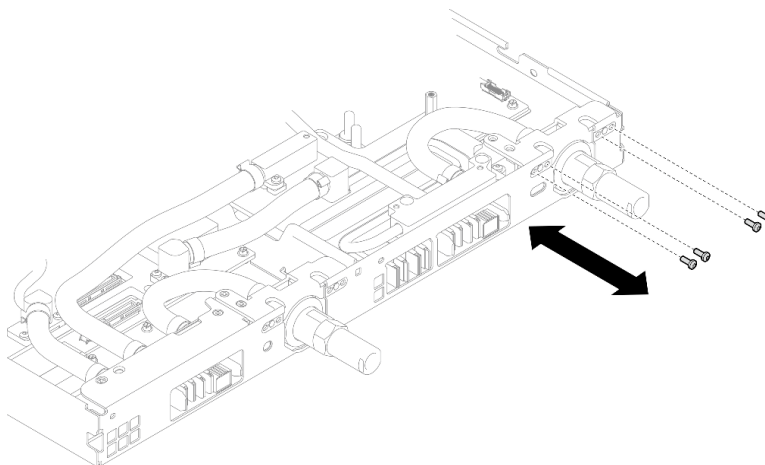
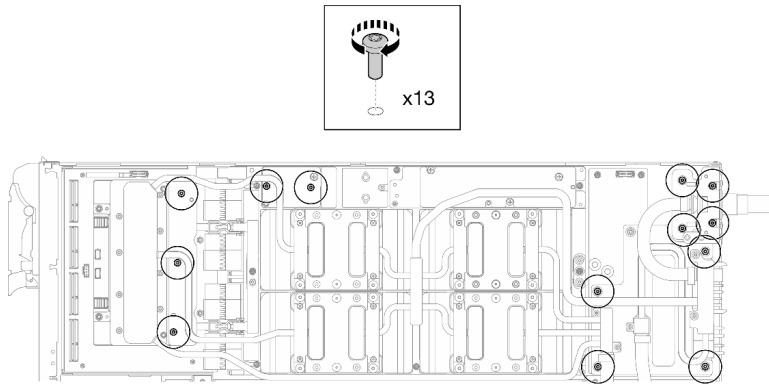


Figure 528. Quick connect screw installation (GPU node)

Step 10. Install water loop screws and quick connect screws (x13 Torx T10 screws) with a torque screwdriver set to the proper torque.

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

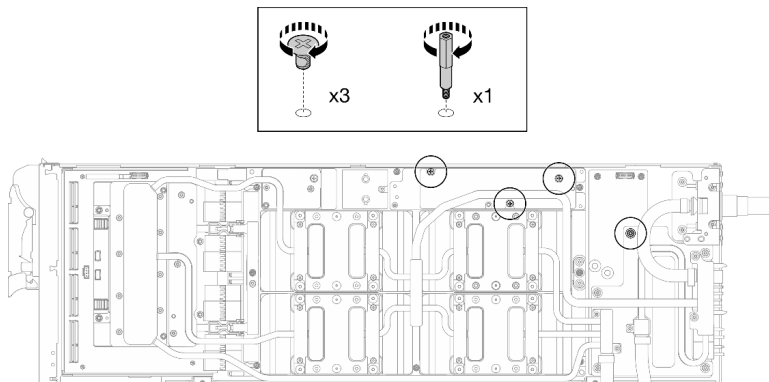




*Figure 529. Water loop Torx T10 screws installation (GPU node)*

Step 11. Install the Hex screw (x1) and the PH1 screws (x3).

**Note:** For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.



*Figure 530. Water loop Hex and PH1 screws installation (GPU node)*

Step 12. Install the cable tie to the GPU board.

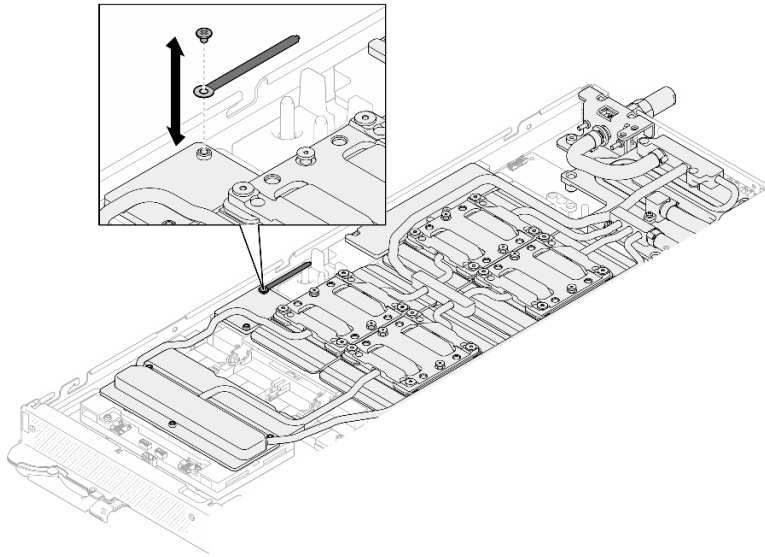


Figure 531. Installing the cable tie

Step 13. Connect the carrier board power cable.

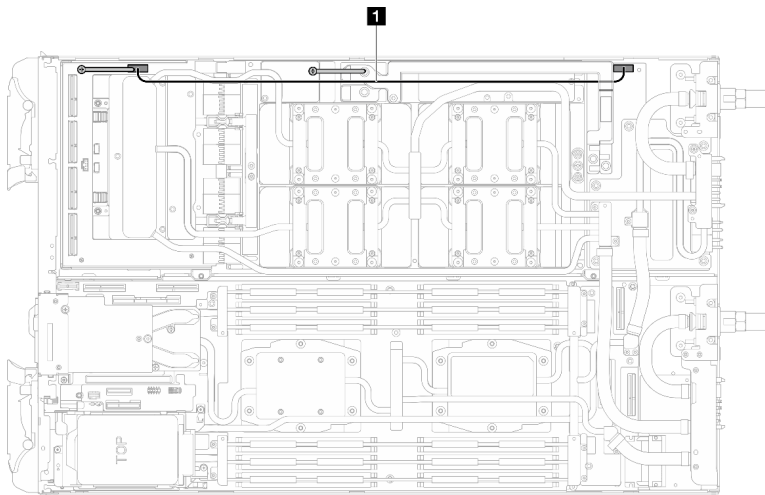


Figure 532. Connecting carrier board power cable

Cable	From (carrier board)	To (GPU node power distribution board)
<b>1</b> Carrier board power cable	Power and side band connector	Power connector

### Install the OSFP module

Step 1. Replace the putty pad on the OSFP module conduction plate with a new one. Make sure to follow [Gap pad/putty pad replacement guidelines](#).

**Attention: Putty pad cannot be reused. Whenever the water loop is removed, putty pads must be replaced with new ones before reinstalling the water loop.**

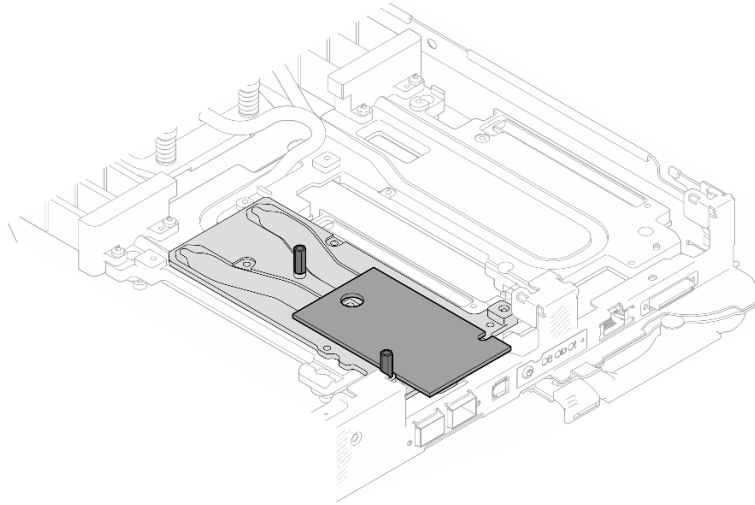


Figure 533. Replacing the putty pad on the OSFP module

Step 2. Connect the two OSFP module power cables. Connect power cable labeled as P1 to Power connector 1 on the OSFP module, and P2 to Power connector 2.

OSFP module	connects to	Power cable
<b>1</b> Power connector 1		<b>2</b> P1
<b>4</b> Power connector 2		<b>4</b> P2

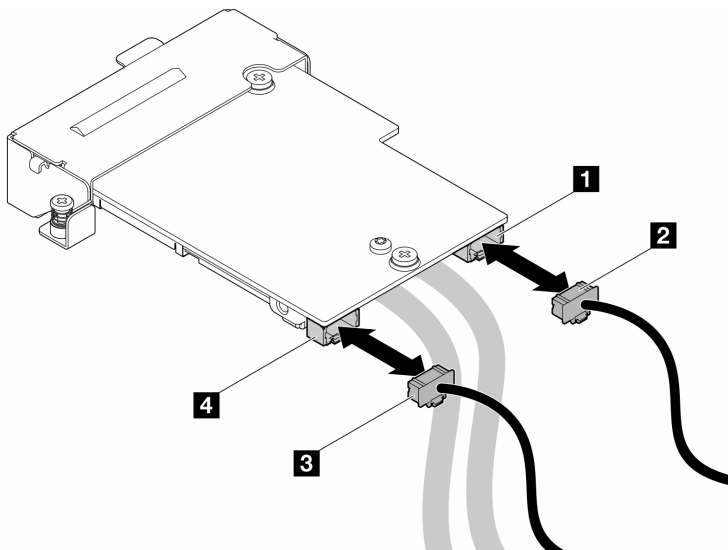


Figure 534. OSFP module power cables installation

Step 3. Install the OSFP module.

- a. **1** Align the OSFP module to the guide pins, and install the OSFP module to the compute node.
- b. **2** Tighten the three screws to secure the OSFP module to the compute node.

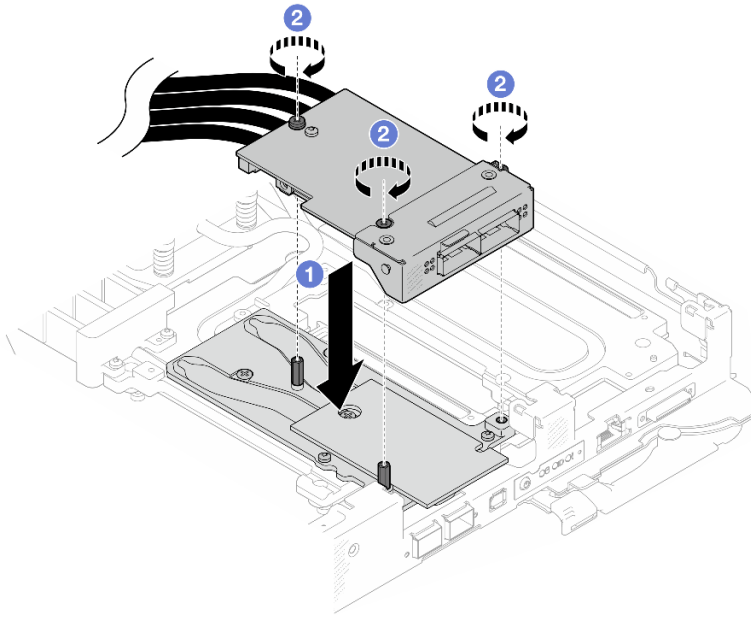


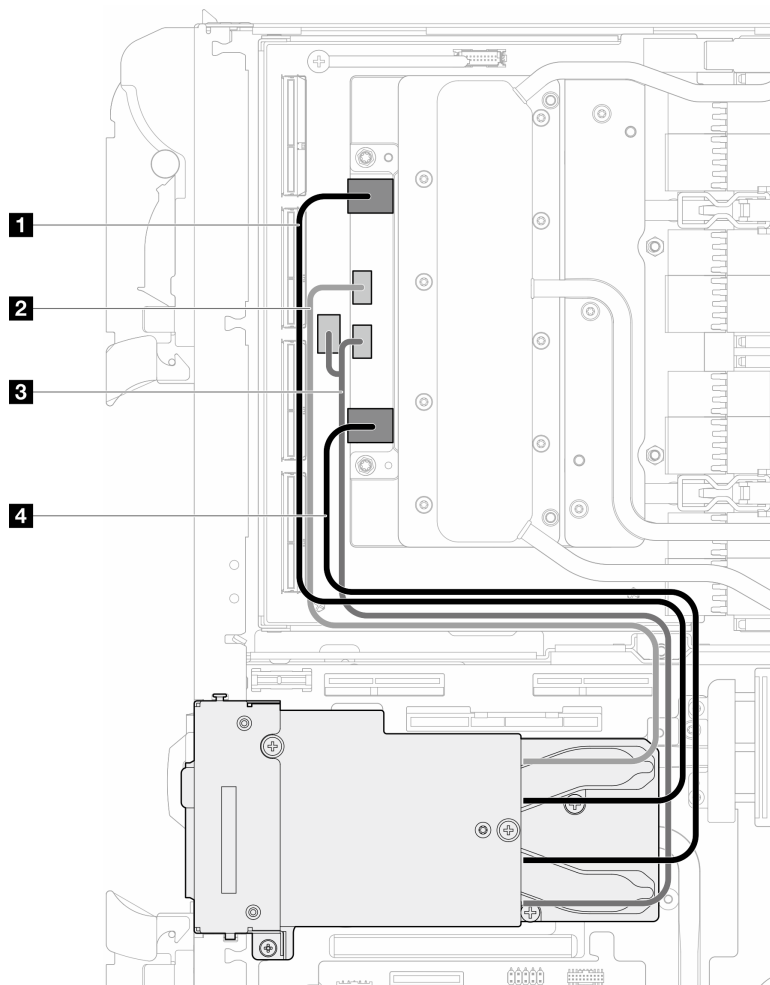
Figure 535. OSFP module installation

Step 4. Connect the OSFP module cables to the network board on the GPU node.

**CAUTION:**

- Hold the cable connector at 45 degree angle when inserting it into the port.
- Have extremely precaution when reseating the connectors that have a 45 degree label on them as they are fragile and will get damage if not installed in the correct 45 degree angle.

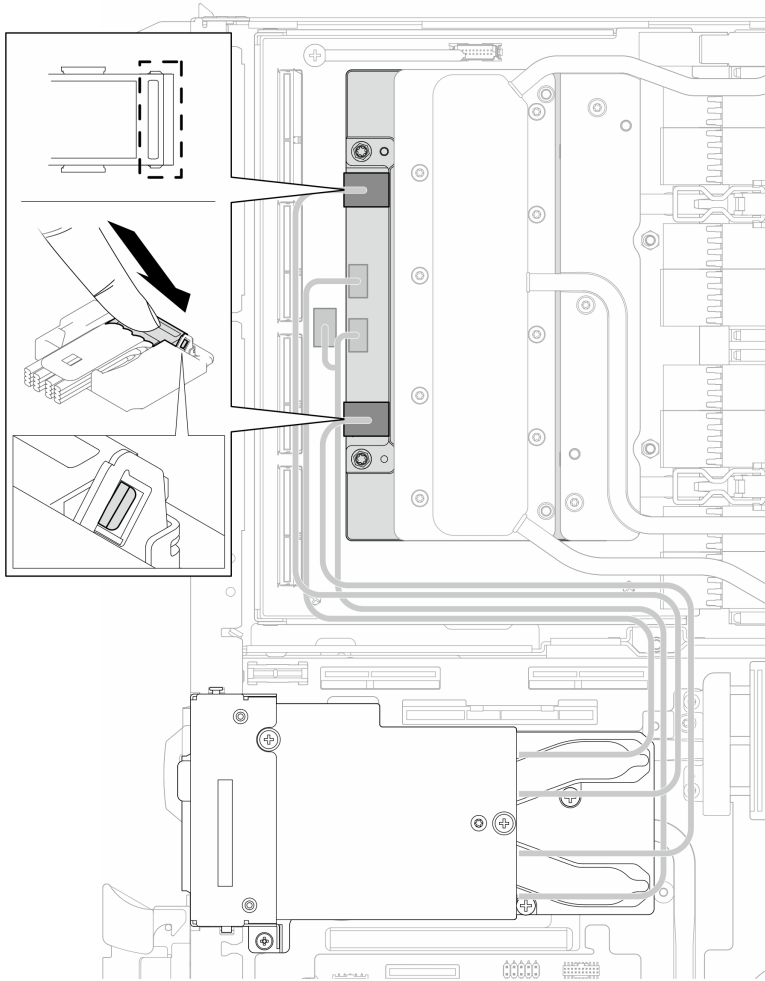




Cable	From OSFP module connectors	To Network board connectors
<b>1</b> Network cable (long)	Network connector (near GPU node)	Port 0
<b>2</b> Power cable	Power connector P1	OOB port 0
<b>3</b> Power cable	Power connector P2	OOB port 1 (on network board) and power connector (on carrier board)
<b>4</b> Network cable (short)	Network connector (near Compute node)	Port 1

Figure 536. Connecting the OSFP module cables to the network board

Step 5. Press the network cable connector to properly connect the cable plug to the connector. **Make sure** the latch is fully engaged to the connector.



*Figure 537. Pressing network cable plug*

- Step 6. Connect MCIO cables to the carrier board. Carrier board cable routing is different for one-processor configuration and two-processor configuration, see the following for details.

**One-processor configuration: connect all MCIO cables to the carrier board**

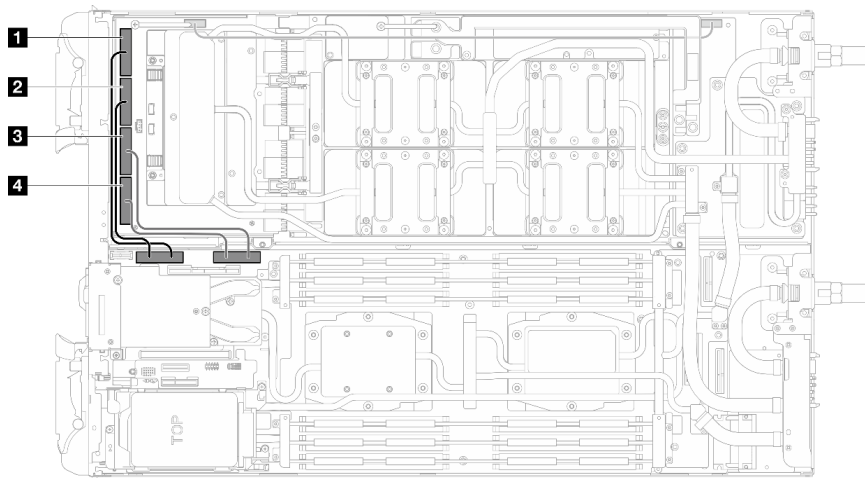


Figure 538. One-processor configuration—Connecting all MCIO cables to the carrier board

Cable index	From (carrier board in GPU node)	To (system board in compute node)
<b>1</b>	MCIO 1 cable	PCIe 4
<b>2</b>	MCIO 2 cable	
<b>3</b>	MCIO 3 cable	PCIe 3
<b>4</b>	MCIO 4 cable	

**Two-processors configuration: connect MCIO 1, MCIO 2, and MCIO 3 cables**

**Make sure** to follow the sequence **3** → **1** → **2**.

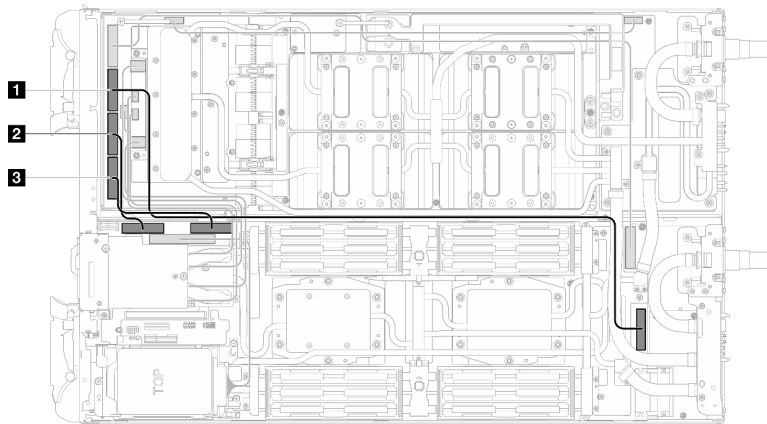


Figure 539. Two-processor configuration—Connecting MCIO 2, MCIO 3, and MCIO 4 cable to the GPU node

Cable index	From (carrier board in GPU node)	To (system board in compute node)
<b>1</b>	MCIO 2 cable	PCIe 5
<b>2</b>	MCIO 3 cable	PCIe 4
<b>3</b>	MCIO 4 cable	PCIe 3

Step 7. Connect the drive cable.

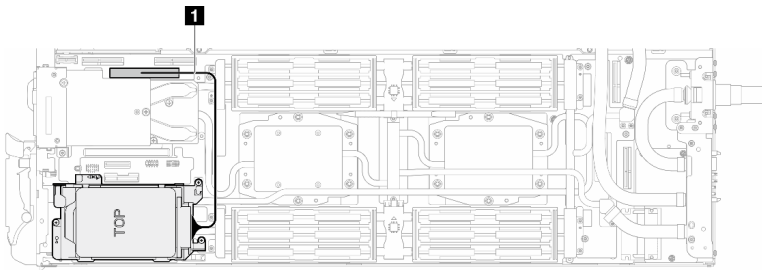


Figure 540. Connecting drive cage cables

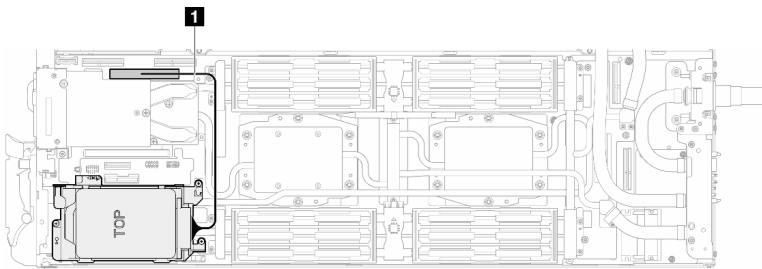


Figure 541. Connecting 7mm drive cage cables

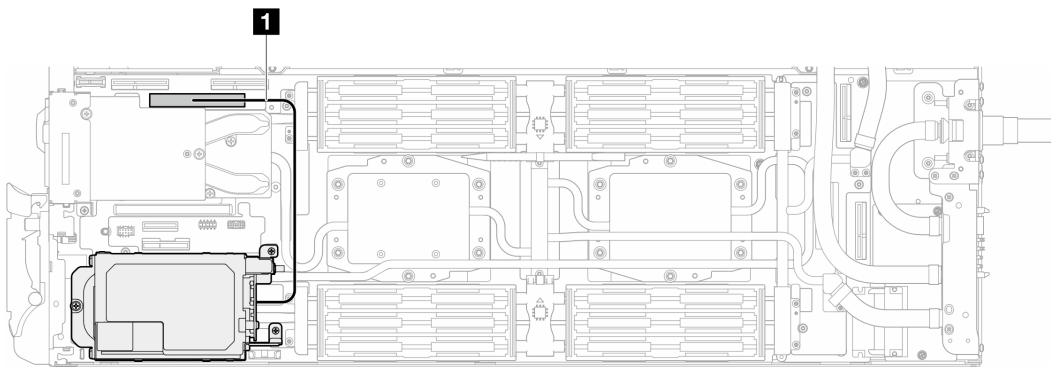


Figure 542. E3.S drives cable routing

## After you finish

1. Install the M.2 backplane assembly. See [“Install the M.2 backplane assembly” on page 120](#).
2. Install the bus bar. See [“Install the bus bar” on page 267](#).
3. Install the cross braces. See [“Install the cross braces” on page 21](#).
4. Install the tray cover. See [“Install the tray cover” on page 18](#).
5. Install the tray into the enclosure. See [“Install a DWC tray in the enclosure” on page 15](#).
6. Connect all required external cables to the solution.

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

7. 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](#)

[Watch the procedure on YouTube](#)

## Venting block replacement

Use the following procedures to remove and install the venting block.

### Remove the venting block

Use this information to remove the venting block.

### About this task

#### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

### Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See [“Remove a DWC tray from the enclosure” on page 14](#).
- b. Remove the tray cover. See [“Remove the tray cover” on page 17](#).
- c. Remove the cross braces. See [“Remove the cross braces” on page 19](#).
- d. Remove the bus bar. See [“Remove the bus bar” on page 266](#).
- e. Remove the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing” on page 401](#).
- f. Remove the network board. See [“Remove the network board” on page 371](#).

Step 2. Unfasten the two Phillips #1 screws to remove the venting block from the GPU node.

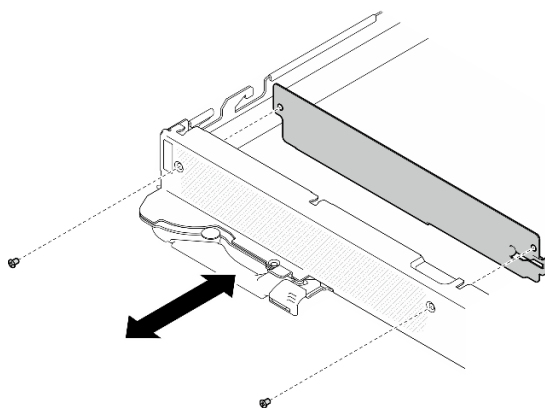


Figure 543. Venting block removal

## 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 venting block

Use this information to install the venting block.

## About this task

### Attention:

- Read [“Installation Guidelines” on page 3](#) and [“Safety inspection checklist” on page 4](#) 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.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

### Notes:

- Ensure you have SD665-N V3 Neptune DWC Water Loop Service Kit in hand to perform this task.
- The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.

Prepare the following screwdrivers to ensure you can install and remove corresponding screws properly.

Screw Type	Screwdriver Type
Torx T10 screw	Torx T10 head screwdriver
Torx T15 screw	Torx T15 head screwdriver

Screw Type	Screwdriver Type
Phillips #1 screw	Phillips #1 head screwdriver
Phillips #2 screw	Phillips #2 head screwdriver

**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/sd665nv3/7daz/downloads/driver-list/> to see the latest firmware and driver updates for your server.
- Go to “Update the firmware” in *User Guide* or *System Configuration Guide* for more information on firmware updating tools.

## Procedure

Step 1. Tighten the two Phillips #1 screws to install the venting block to the GPU node.

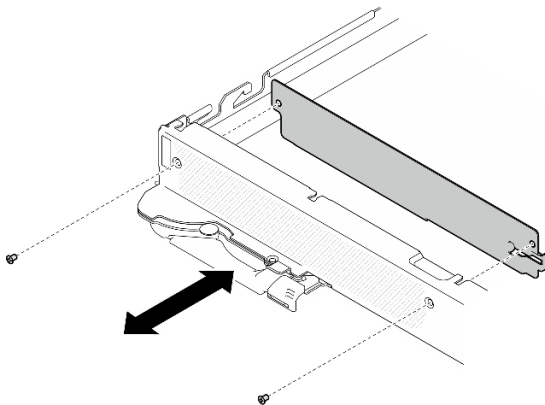


Figure 544. Venting block installation

## After you finish

1. Install the network board. See “[Install the network board](#)” on page 380.
2. Install the MCIO cables. Follow the guidance and routing information in [Chapter 3 “Internal cable routing”](#) on page 401.
3. Install the bus bar. See “[Install the bus bar](#)” on page 267.
4. Install the cross braces. See “[Install the cross braces](#)” on page 21.
5. Install the tray cover. See “[Install the tray cover](#)” on page 18.
6. Install the tray into the enclosure. See “[Install a DWC tray in the enclosure](#)” on page 15.
7. Connect all required external cables to the solution.

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

8. 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](#)

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## 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. If you have removed the tray cover, reinstall it. See [“Install the tray cover” on page 18](#).
4. Reconnect external cables and power cords to the solution.

**Attention:** To avoid component damage, connect the power cords last.

5. Power on the solution and any peripheral devices. See [“Power on the solution” on page 13](#).
6. Update the solution configuration.
  - Download and install the latest device drivers: <http://datacentersupport.lenovo.com>.
  - Update the system firmware. See “Update the firmware” in *User Guide* or *System Configuration Guide*.
  - Update the UEFI configuration. See <https://pubs.lenovo.com/uefi-overview/>.

For DW612S Enclosure User Guide, see [https://pubs.lenovo.com/dw612s\\_neptune\\_enclosure/](https://pubs.lenovo.com/dw612s_neptune_enclosure/).

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## Chapter 3. Internal cable routing

Use this information to route the cables for one-processor and two-processor configurations.

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

There are two cable ties on the GPU node. Unfasten the cable tie before removing the cables from the tray. After connecting the cables to the tray, bundle the cable tie to secure the cables.

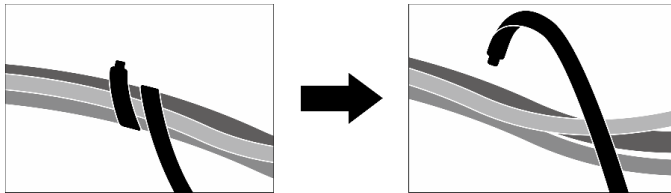


Figure 545. Unfastening the cable tie

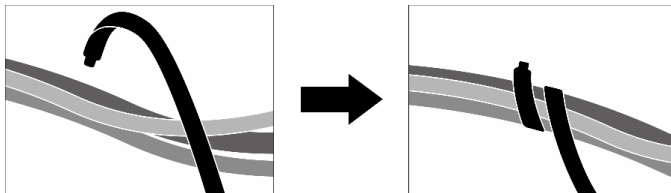


Figure 546. Bundling the cable tie

### Cable routing configurations

Follow the cable routing instruction below according the number of processors installed in the system.

- [“One-processor configuration cable routing” on page 401](#)
- [“Two-processor configuration cable routing” on page 403](#)

### One-processor configuration cable routing

Follow the cable routing below for one-processor configuration.

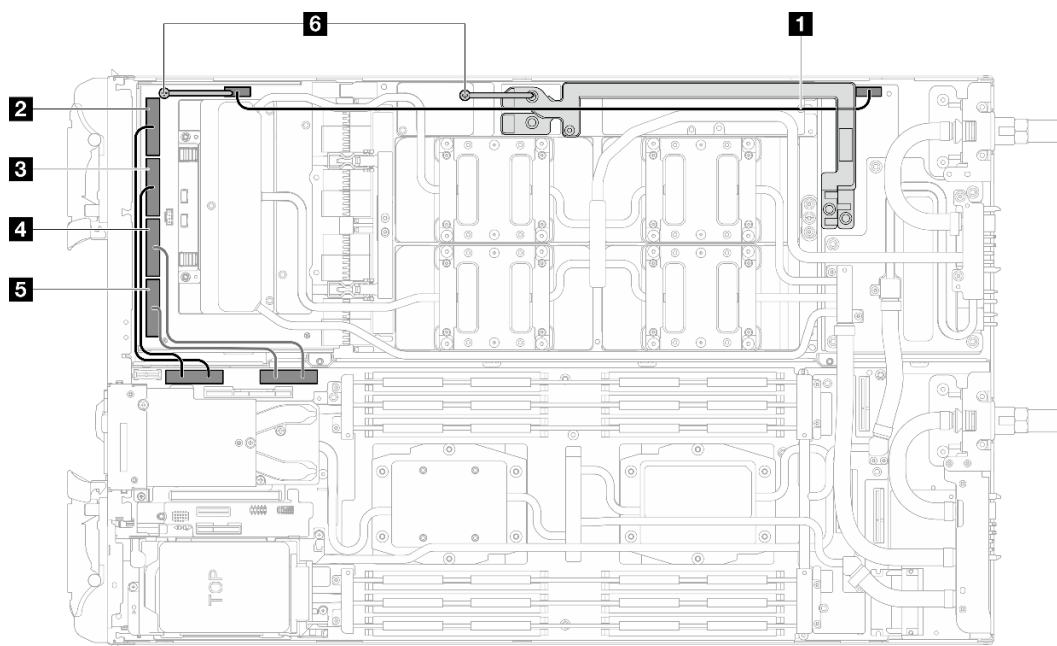


Figure 547. One-processor configuration cable routing

Table 14. One-processor configuration cable routing

Cable index	From (carrier board)	To
1	Power and side band connector	Power connector (on GPU node power distribution board)
2	MCIO 1	PCIe 4 (on system board in compute node)
3	MCIO 2	
4	MCIO 3	PCIe 3 (on system board in compute node)
5	MCIO 4	
6 Cable tie		

## Two-processor configuration cable routing

Follow the cable routing below for two-processor configuration.

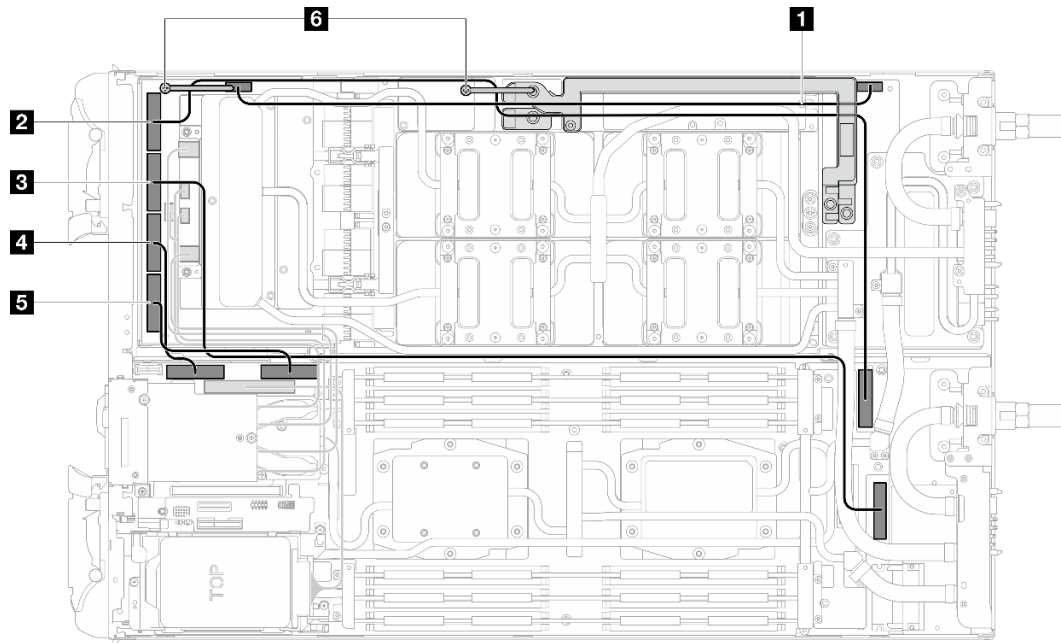


Figure 548. Two-processor configuration cable routing

**Attention:** Make sure to follow the cable installation sequence: **1** → **5** → **3** → **4** → **2**

Table 15. Two-processor configuration cable routing

Cable index	From (carrier board)	To
<b>1</b>	Power and side band connector	Power connector (on GPU node power distribution board)
<b>2</b>	MCIO 1	PCIe 6 (on system board in compute node)
<b>3</b>	MCIO 2	PCIe 5 (on system board in compute node)
<b>4</b>	MCIO 3	PCIe 4 (on system board in compute node)
<b>5</b>	MCIO 4	PCIe 3 (on system board in compute node)
<b>6</b> Cable tie		





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## Chapter 4. Problem determination

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

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

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

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

### 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 **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/sd665-n-v3/pdf\\_files](https://pubs.lenovo.com/sd665-n-v3/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 incoming	Chassis	Jan 30, 20

Figure 549. Lenovo XClarity Administrator event log

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

[https://pubs.lenovo.com/lxca/events\\_vieweventlog](https://pubs.lenovo.com/lxca/events_vieweventlog)

## 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 550. 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.

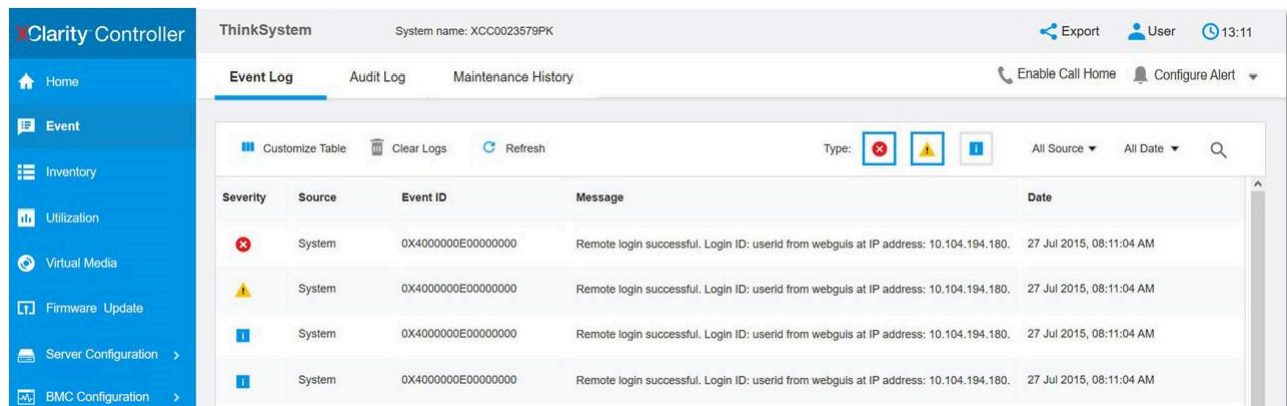


Figure 551. Lenovo XClarity Controller event log

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/>

## Specifications

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

### Notes:

- Up to six SD665-N V3 trays can be installed in the DW612S 6U enclosure. For more information on the number of trays in the enclosure, see [Chapter 1 “GPU power and maximum number of trays in the enclosure” on page 1](#).
- SD665-N V3 tray contains one compute node on the right and one GPU node on the left (when viewed from front of the DW612S enclosure)
- The GPU node contains the NVIDIA HGX H100 4-GPU board and the network board (4 Connect-X 7).

Refer to the below table for specifications categories and the content of each category.

Specification category	Technical specifications	Mechanical specifications	Environmental specifications
<b>Content</b>	<ul style="list-style-type: none"> <li>• Processor</li> <li>• Memory</li> <li>• Storage expansion</li> <li>• Graphics processing units (GPU)</li> <li>• Integrated functions and I/O connectors</li> <li>• Network</li> <li>• Electrical input</li> <li>• Minimal configuration for debugging</li> <li>• Operating systems</li> </ul>	<ul style="list-style-type: none"> <li>• Dimension</li> <li>• Weight</li> </ul>	<ul style="list-style-type: none"> <li>• Acoustical noise emissions</li> <li>• Environment</li> <li>• Water requirements</li> </ul>

## Technical specifications

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

### Notes:

- Up to six SD665-N V3 trays can be installed in the DW612S 6U enclosure. For more information on the number of trays in the enclosure, see [Chapter 1 “GPU power and maximum number of trays in the enclosure” on page 1](#).
- SD665-N V3 tray contains one compute node on the right and one GPU node on the left (when viewed from front of the DW612S enclosure)
- The GPU node contains the NVIDIA HGX H100 4-GPU board and the network board (4 Connect-X 7).

Processor
<b>Compute node</b> <ul style="list-style-type: none"> <li>• Supports up to two 4th Gen AMD® EPYC™ processors per node.</li> <li>• Supports up to two 5th Gen AMD® EPYC™ processors per node.</li> <li>• Supports processors with up to 96 cores, and configured TDP ratings up to 400W.</li> <li>• Up to 4 XGMI links at up to 32 GT/s</li> <li>• SP5 socket (LGA 6096)</li> </ul> <b>Notes:</b> <ol style="list-style-type: none"> <li>1. Use the Setup Utility to determine the type and speed of the processors in the node.</li> <li>2. For a list of supported processors, see <a href="https://serverproven.lenovo.com">https://serverproven.lenovo.com</a>.</li> </ol>

## Memory

See for detailed information about memory configuration and setup.

### Compute node:

- Slots:
    - 24 DIMM slots per node, 12 DIMMs per processor.
  - Type:
    - 4th Gen AMD® EPYC™ processors
      - Lenovo DDR5 at up to 4800 MT/s
    - 5th Gen AMD® EPYC™ processors
      - Lenovo DDR5 at up to 6000 MT/s
  - Protection:
    - ECC
  - Supports (depending on the model):
    - 16 GB, 32 GB, 64 GB, and 128 GB ECC RDIMM
    - 24GB, 48GB, and 96 GB ECC RDIMM
    - 128GB
- Note:** 128 GB RDIMM is supported with thermal limitation.
- Minimum:
    - 256 GB per node with sixteen 16 GB RDIMMs per node. (8 DIMMs per processor)
  - Maximum:
    - Up to 3 TB memory with twenty-four 128 GB RDIMMs per node. (12 DIMMs per processor)

### Important:

- The tray supports independent mode with the following configurations:
  - 8 DIMMs per processor, total of 16 DIMMs per node
  - 12 DIMMs per processor, total of 24 DIMMs per node
- Before installing 24 Gb DRAM RDIMMs, make sure to update the UEFI firmware to the latest version first, then remove all existing 16 Gb DRAM RDIMMs.
- Mixing DIMM speed is not supported.

## Storage expansion

### Compute node:

- Supports up to two 7 mm simple-swap NVMe solid-state drives (SSD) per compute node.
- Supports up to two E3.s 1T simple-swap NVMe solid-state drives (SSD) per compute node.
- Supports one M.2 drive per node. (Requires the M.2 interposer assembly)

For a list of supported M.2 drives, see <https://serverproven.lenovo.com>.

## Graphics processing unit (GPU)

NVIDIA HGX H100 4-GPU board

NVIDIA HGX H200 4-GPU board

## Integrated functions and I/O connectors

### Compute node:

- An OSFP module with either two 400Gb or two 800Gb OSFP ports, connecting to four ConnectX-7 chip sets on the network board.
- Lenovo XClarity Controller (XCC), which provides service processor control and monitoring functions, video controller, and remote keyboard, video, mouse, and remote drive capabilities.
  - 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/>.
- Front operator panel
- KVM breakout cable connector.

The KVM breakout cable includes VGA connector, serial port connector, and USB 3.0 (5 Gbps) / 2.0 connector. XCC mobile management is supported by USB connector on the KVM breakout cable.

For more information, see “KVM breakout cable” section in *User Guide* or *System Configuration Guide*.

- External LCD diagnostics handset connector
- One Gigabit RJ45 Ethernet port, shared between operating system and Lenovo XClarity Controller.
- Two 25Gb SFP28 ports. Port 1 is shared between operating system and Lenovo XClarity Controller.

**Note:** Lenovo XClarity Controller connection is mutually exclusive between RJ45 Ethernet connector and 25Gb SFP28 Port 1.

- Video controller (integrated into Lenovo XClarity Controller)
  - ASPEED
  - SVGA compatible video controller
  - Avocent Digital Video Compression
  - Video memory is not expandable

**Note:** Maximum video resolution is 1920 x 1200 at 60 Hz.

- Hot-swappable System Management Module 2 (SMM2)

**Note:** See [https://pubs.lenovo.com/mgt\\_tools\\_smm2/](https://pubs.lenovo.com/mgt_tools_smm2/) for more details about System Management Module.

## Network

### Compute node:

- An OSFP module with either two 400Gb or two 800Gb OSFP ports, connecting to four ConnectX-7 chip sets on the network board.
- One Gigabit Ethernet port with RJ45 connector, shared between operating system and Lenovo XClarity Controller.
- Two 25Gb SFP28 ports. Port 1 is shared between operating system and Lenovo XClarity Controller.

**Note:** Lenovo XClarity Controller connection is mutually exclusive between RJ45 Ethernet connector and 25Gb SFP28 Port 1.

## Electrical input

### SD665-N V3 tray installed in DW612S enclosure

- Supports nine hot-swap 2600W power supplies.
  - Sine-wave input (50-60 Hz) required
  - Input voltage for 2600W power supplies:
    - 200-208 Vac, 240 Vdc (output up to 2400W only)
    - 208-240 Vac, 240 Vdc
  - Nine power supplies: 8+1 without oversubscription
- Supports three hot-swap DWC 7200W power supplies.
  - Input voltage:
    - 200-208 Vac (work as 6900W, supports up to 4 trays in the enclosure)
    - 220-240 Vac, 240 Vdc (work as 7200W)
  - Three DWC PSUs: work as 8+1 without oversubscription

### CAUTION:

- **Power supplies and redundant power supplies in the enclosure must be with the same brand, power rating, wattage or efficiency level.**
- **Installing different DWC trays in the DW612S enclosure requires specific PSU configuration, see “Guidance on mixing trays configuration for the DW612S enclosure” in *User Guide*.**

### Notes:

- Refer to [https://pubs.lenovo.com/mgt\\_tools\\_smm2/c\\_overview](https://pubs.lenovo.com/mgt_tools_smm2/c_overview) for more details of solution power status.
- Mixing PSUs manufactured by different vendors is not supported.

## Minimal configuration for debugging

### SD665-N V3 tray installed in DW612S enclosure

- 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)

## Operating systems

Supported and certified operating systems:

- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server

References:

- Complete list of available operating systems: <https://lenovopress.lenovo.com/osig>.
- OS deployment instructions, see “Deploy the operating system” in *User Guide* or *System Configuration Guide*.

## Mechanical specifications

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

### Notes:

- Up to six SD665-N V3 trays can be installed in the DW612S 6U enclosure. For more information on the number of trays in the enclosure, see [Chapter 1 “GPU power and maximum number of trays in the enclosure” on page 1](#).
- SD665-N V3 tray contains one compute node on the right and one GPU node on the left (when viewed from front of the DW612S enclosure)
- The GPU node contains the NVIDIA HGX H100 4-GPU board and the network board (4 Connect-X 7).

Dimension
<ul style="list-style-type: none"><li>• Height: 41.0 mm (1.61 inches)</li><li>• Depth: 684 mm (26.92 inches)</li><li>• Width: 437.5 mm (17.22 inches)</li></ul>

Weight
<b>SD665-N V3 Tray:</b> <ul style="list-style-type: none"><li>• Weight estimation: 23.6 kg (52.0 lbs)</li><li>• DW612S enclosure with six SD665-N V3 trays and three DWC PSU: approximately 188.7 kg (416 lbs)</li></ul>

## Environmental specifications

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

### Notes:

- Up to six SD665-N V3 trays can be installed in the DW612S 6U enclosure. For more information on the number of trays in the enclosure, see [Chapter 1 “GPU power and maximum number of trays in the enclosure” on page 1](#).
- SD665-N V3 tray contains one compute node on the right and one GPU node on the left (when viewed from front of the DW612S enclosure)
- The GPU node contains the NVIDIA HGX H100 4-GPU board and the network board (4 Connect-X 7).



## Acoustical noise emissions

### SD665-N V3 Tray:

- Sound power level (LWAd):
  - Idle: 6.7 Bel
  - Operation: 9.0 Bel

#### Notes:

- These levels were measured in controlled acoustical environments according to procedures specified by ISO 7779, and are reported in accordance with ISO 9296.
- The declared acoustic noise levels are based on specified configurations with 9 air-cooling PSUs in the DW612S 6U enclosure, and may change depending on configuration/condition changes.
- Government regulations (such as those prescribed by OSHA or European Community Directives) may govern noise level exposure in the workplace and may apply to you and your server installation. The actual sound pressure levels in your installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room; the noise levels from other equipment; the room ambient temperature, and employee's location in relation to the equipment. Further, compliance with such government regulations depends on a variety of additional factors, including the duration of employees' exposure and whether employees wear hearing protection. Lenovo recommends that you consult with qualified experts in this field to determine whether you are in compliance with the applicable regulations.

## Environment

The water required to initially fill the system side cooling loop must be reasonably clean, bacteria-free water (<100 CFU/ml) such as de-mineralized water, reverse osmosis water, de-ionized water, or distilled water. The water must be filtered with an in-line 50 micron filter (approximately 288 mesh). The water must be treated with anti-biological and anti-corrosion measures. Environment quality must be maintain over the lifetime of the system to receive warranty and support on affecting components. For more information please see <https://lenovopress.lenovo.com/lp2018-lenovo-neptune-direct-water-cooling-standards>.

- Air temperature requirements:
  - Operating:
    - ASHRAE class A2: 10°C - 35°C (50°F - 95°F); when the altitude exceeds 900 m (2953 ft), the maximum ambient temperature value decreases by 1°C (1.8°F) with every 300 m (984 ft) of altitude increase.
  - Powered off: 5°C - 45°C (41°F - 113°F)
  - Shipping/storage: -40°C - 60°C (-40°F - 140°F)
- Relative humidity (non-condensing):
  - Operating: ASHRAE Class A2: 8% - 80%, maximum dew point : 21°C (70°F)
  - Shipment/storage: 8% - 90%
- Maximum altitude: 3048 m (10 000 ft)

**Note:** The solution is designed for standard data center environment and recommended to be placed in industrial data center.

## Water requirements

**Attention:** The water required to initially fill the system side cooling loop must be reasonably clean, bacteria-free water (<100 CFU/ml) such as de-mineralized water, reverse osmosis water, de-ionized water, or distilled water. The water must be filtered with an in-line 50 micron filter (approximately 288 mesh). The water must be treated with anti-biological and anti-corrosion measures. Environment quality must be maintain over the lifetime of the system to receive warranty and support on affecting components. For more information please see [Lenovo Neptune Direct Water-Cooling Standards](#).

### 6900W (200-208 Vac) DWC power supply

- Water temperature:
  - ASHRAE class W+: up to 50°C (122°F)
- Maximum pressure: 4.4 bars
- Minimum water flow rate: 1.0 liters per minute per power supply
  - For inlet water temperatures up to 45°C (113°F), 1.0 liters per minute per power supply
  - For inlet water temperatures between 45°C - 50°C (113°F - 122°F), 1.5 liters per minute per power supply

### 7200W (220-240 Vac and 240 Vdc) DWC power supply

- Water temperature:
  - ASHRAE class W+: up to 50°C (122°F)
- Maximum pressure: 4.4 bars
- Minimum water flow rate: 1.5 liters per minute per power supply
  - For inlet water temperatures up to 45°C (113°F), 1.5 liters per minute per power supply
  - For inlet water temperatures between 45°C - 50°C (113°F - 122°F), 2.0 liters per minute per power supply

SD665-N V3 tray and DW612S enclosure are supported in the following environment:

- Water requirements
  - Water temperature: up to 45°C (113°F), 5 lpm per tray
    - CPUs up to 400W TDP
    - DIMMs up to 96GB capacity
    - GPUs up to 700W TDP
    - NVIDIA network card up to 800Gb/sec
  - Water temperature: up to 40°C (104°F), 4 lpm per tray
    - CPUs up to 400W TDP
    - DIMMs up to 96GB capacity
    - GPUs up to 700W TDP
    - NVIDIA network card up to 800Gb/sec
- Water requirement exceptions:
  - Water temperature: ASHRAE W32, up to 32°C (89.6°F)
    - 128 GB DIMMs
  - Water temperature: up to 40°C (104°F) with 5 LPM with 4 trays
    - AMD® EPYC™ 9554 64C and 9554P 64C processors.
  - Water temperature: up to 35°C (95°F) with 5 LPM with 4 trays
    - AMD® EPYC™ 9374F 32C, 9274F 24C, 9174F 16C, and 9474F 48C processors.
- Maximum pressure: 4.4 bars
- Water flow rates:

### Water requirements

- Water flow rate for **45°C (113°F)**: **20** liters per minute (lpm) per enclosure, assuming **5.0** liters per tray with **4** trays per enclosure.
- Water flow rate for **40°C (104°F)**: **16** liters per minute (lpm) per enclosure, assuming **4.0** liters per tray with **4** trays per enclosure.
- Water flow rate for **35°C (95°F)**: **17.5** liters per minute (lpm) per enclosure, assuming **3.5** liters per tray with **5** trays per enclosure.
- Water flow rate for **35°C (95°F)**: **21** liters per minute (lpm) per enclosure, assuming **3.5** liters per tray with **6** trays per enclosure.

1 tray consists of 1 compute node and 1 GPU node.

### 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.

**Attention:** Environment quality must be maintain over the lifetime of the system to receive warranty and support on affecting components. For water quality requirement, see [Lenovo Neptune Direct Water-Cooling Standards](#).

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 16. 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 200 Angstroms per month (<math>\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour weight gain}</math>).<sup>2</sup></li> <li>The silver reactivity level shall be less than 200 Angstroms per month (<math>\text{\AA}/\text{month} \approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour weight gain}</math>).<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>

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

<sup>2</sup> The derivation of the equivalence between the rate of copper corrosion growth in the thickness of the corrosion product in  $\text{\AA}/\text{month}$  and the rate of weight gain assumes that  $\text{Cu}_2\text{S}$  and  $\text{Cu}_2\text{O}$  grow in equal proportions.

<sup>3</sup> The derivation of the equivalence between the rate of silver corrosion growth in the thickness of the corrosion product in  $\text{\AA}/\text{month}$  and the rate of weight gain assumes that  $\text{Ag}_2\text{S}$  is the only corrosion product.

<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.

<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.

## Troubleshooting by system LEDs and diagnostics display

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

### Front LEDs

The following illustration shows LEDs on the front of the solution. By viewing the status of LEDs, you can often identify the source of the error.

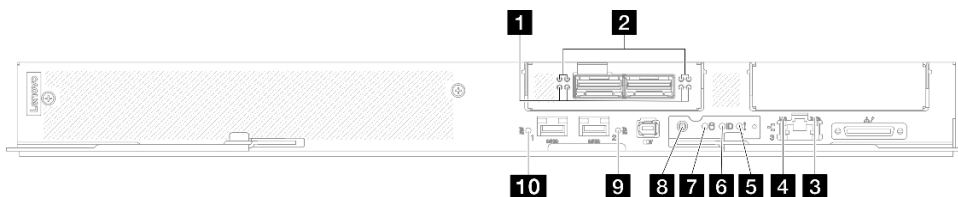


Figure 552. SD665-N V3 tray front LEDs

Table 17. Front LEDs

<b>1</b> Network board link activity LED (green) on the OSFP module	<b>6</b> Identification LED (blue)
<b>2</b> Network board link status LED (yellow) on the OSFP module	<b>7</b> Drive activity LED (green)
<b>3</b> 1 Gb Ethernet port activity LED (green)	<b>8</b> Node power button with LED (green)
<b>4</b> 1 Gb Ethernet port link LED (green)	<b>9</b> 25 Gb Ethernet port link and activity LED (right) (green)
<b>5</b> Check log LED (yellow)	<b>10</b> 25 Gb Ethernet port link and activity LED (left) (green)

**1 Network board link activity LED (green) on the OSFP module:** Use these green LEDs to distinguish the link activity of the four ConnectX-7 chip sets on the network board in the GPU node.

From left to right, these LEDs represent ConnectX-7 chip sets 1, 0, 3, and 2.

**Off:** Network is disconnected from switch.

**On:** The network link is connected.

**Blinking:** The network link is connected with active traffic.

**2 Network board link status LED (yellow) on the OSFP module:** Use these yellow LEDs to distinguish the link status of the four ConnectX-7 chip sets on the network board in the GPU node.

From left to right, these LEDs represent ConnectX-7 chip sets 1, 0, 3, and 2.

**Off:** Network is disconnected from switch.

**On:** The network is connected and active.

**Note:** Using command to light up locating LED is available when transceiver or cable is attached to the OSFP port.

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

**Off:** The ConnectX-7 chip sets link is disconnected.

**On:** The ConnectX-7 chip sets link is established.

**4 1 Gb Ethernet port link LED (green):** Use this green LED to distinguish the network status.

**Off:** The network link is disconnected.

**On:** The network link is established.

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

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

**7 Drive activity LED (green):** If the LED is lit, it indicates that the drive is powered, but not actively reading or writing data. If the LED is flashing, the drive is being accessed.

**8 Node power button with LED (green):** Press this button to turn the node on and off manually. The states of the power LED are as follows:

**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.

**9 10 25 Gb Ethernet port link and activity LED (green):** Use this green LED to distinguish the network status.

**Off:** The network is disconnected.

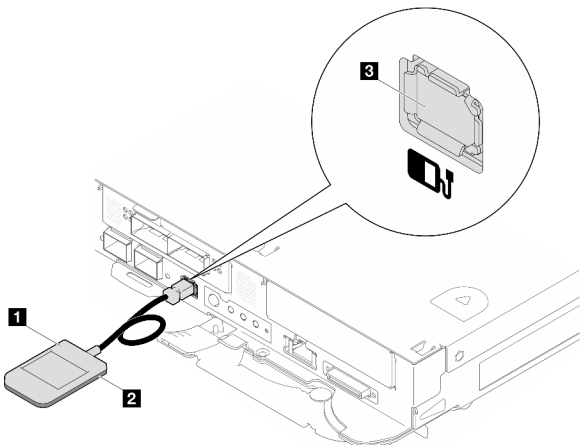
**Blinking:** The network is accessing.

**On:** The network is established.

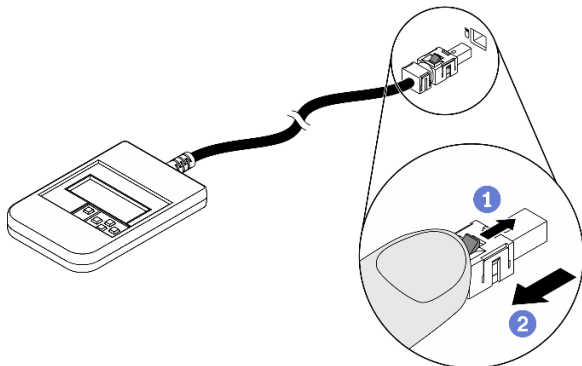
## External Diagnostics Handset

The External Diagnostics Handset is an external device that is connected to the server with a cable, and it allows quick access to system information such as errors, system status, firmware, network, and health information.

### Location of the External Diagnostics Handset

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

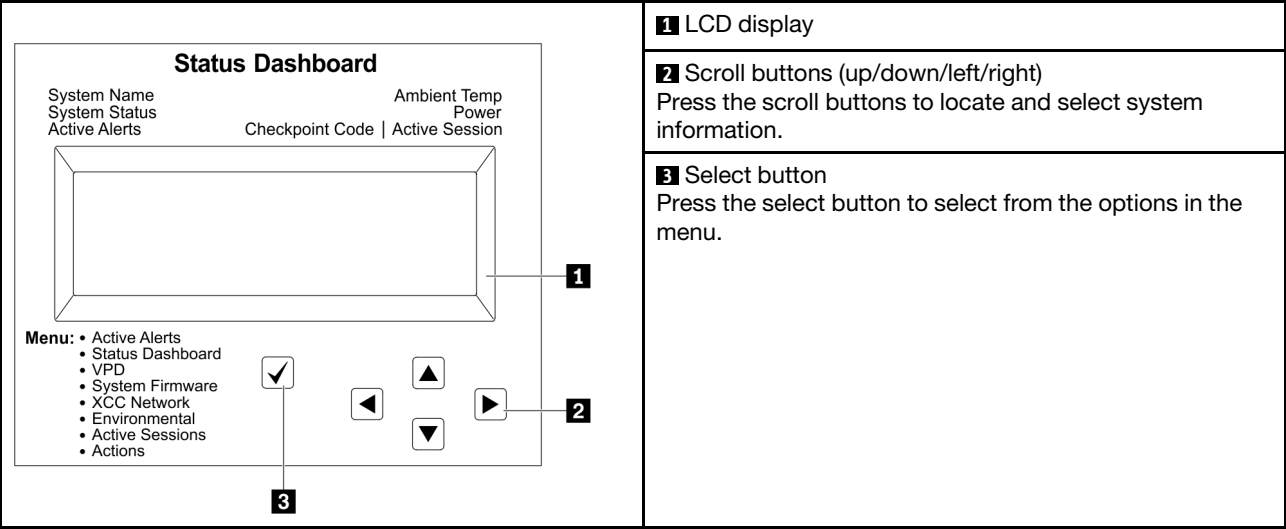
**Note:** When unplugging the External Diagnostics Handset, see the following instructions:



- 1 Press the plastic clip on the plug forward.
- 2 Hold the clip and remove the cable from the connector.

Display panel overview

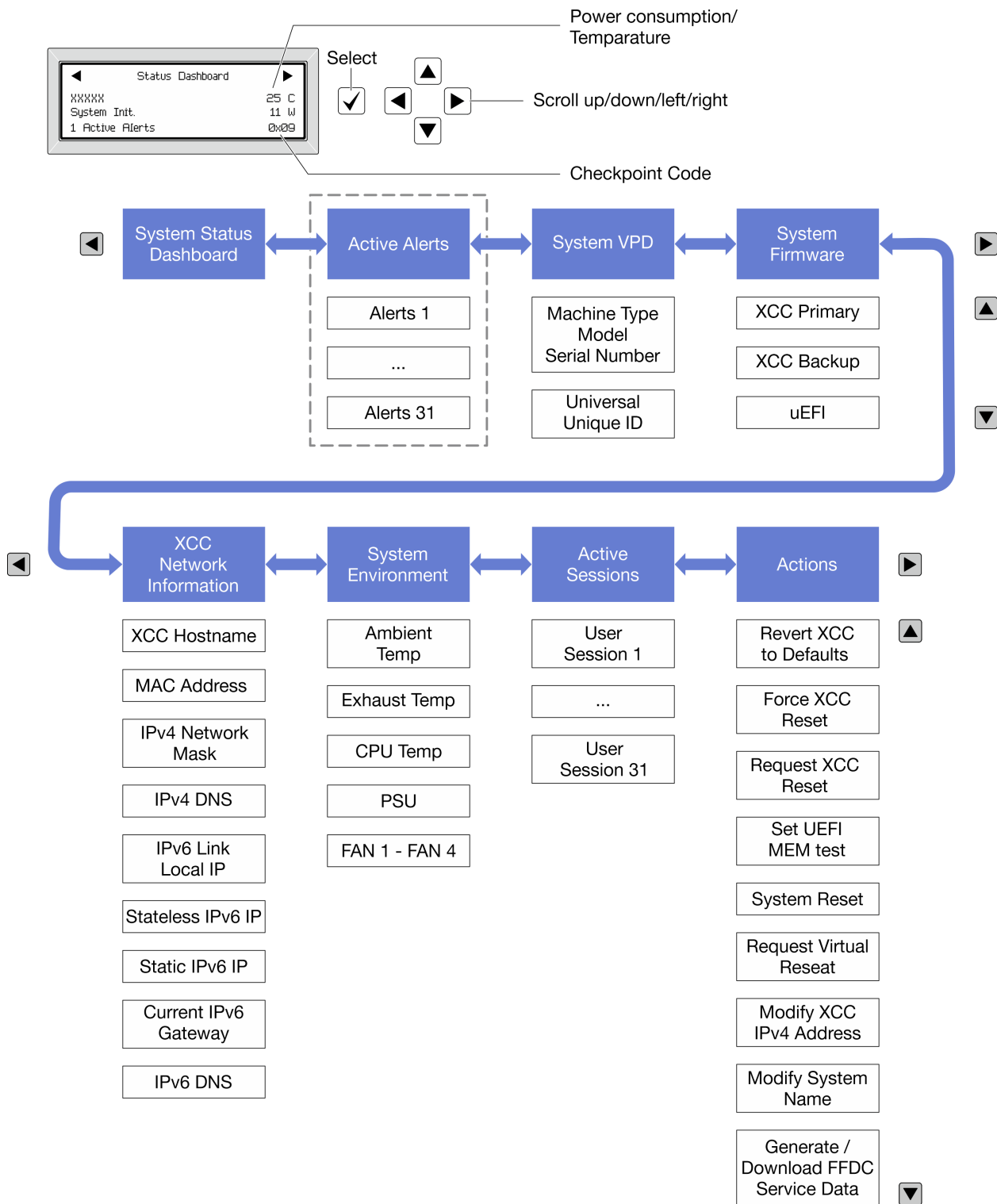
The diagnostics device consists of an LCD display and 5 navigation buttons.



Option flow diagram

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

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



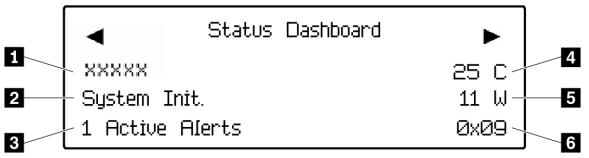
## Full menu list

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

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



## Home Menu (System Status Dashboard)

Home Menu	Example
<b>1</b> System name <b>2</b> System status <b>3</b> Active alert quantity <b>4</b> Temperature <b>5</b> Power consumption <b>6</b> Checkpoint code	 <p>The screenshot shows a 'Status Dashboard' with the following information: 'xxxxxx' (1), 'System Init.' (2), '1 Active Alerts' (3), '25 C' (4), '11 W' (5), and '0x09' (6).</p>

## Active Alerts

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

## System VPD Information

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

## System Firmware

Sub Menu	Example
XCC Primary <ul style="list-style-type: none"><li>Firmware level (status)</li><li>Build ID</li><li>Version number</li><li>Release date</li></ul>	XCC Primary (Active) Build: DVI399T Version: 4.07 Date: 2020-04-07
XCC Backup <ul style="list-style-type: none"><li>Firmware level (status)</li><li>Build ID</li><li>Version number</li><li>Release date</li></ul>	XCC Backup (Active) Build: D8BT05I Version: 1.00 Date: 2019-12-30
UEFI <ul style="list-style-type: none"><li>Firmware level (status)</li><li>Build ID</li><li>Version number</li><li>Release date</li></ul>	UEFI (Inactive) Build: D0E101P Version: 1.00 Date: 2019-12-26

## XCC Network Information

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

## System Environmental Information

Sub Menu	Example
<ul style="list-style-type: none"><li>• Ambient temperature</li><li>• Exhaust temperature</li><li>• CPU temperature</li><li>• PSU status</li><li>• Spinning speed of fans by RPM</li></ul>	Ambient Temp: 24 C Exhaust Temp: 30 C CPU1 Temp: 50 C PSU1: Vin= 213 w Inlet= 26 C FAN1 Front: 21000 RPM FAN2 Front: 21000 RPM FAN3 Front: 21000 RPM FAN4 Front: 21000 RPM

## Active Sessions

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

## Actions

Sub Menu	Example
Several quick actions are available: <ul style="list-style-type: none"><li>• Revert XCC to Defaults</li><li>• Force XCC Reset</li><li>• Request XCC Reset</li><li>• Set UEFI Memory Test</li><li>• Request Virtual Reseat</li><li>• Modify XCC Static IPv4 Address/Net mask/Gateway</li><li>• Modify System Name</li><li>• Generate/Download FFDC Service Data</li></ul>	Request XCC Reset? This will request the BMC to reboot itself. Hold √ for 3 seconds

## System Management Module 2 (SMM 2) LEDS

The following illustration shows the LEDs on the SMM2 module.

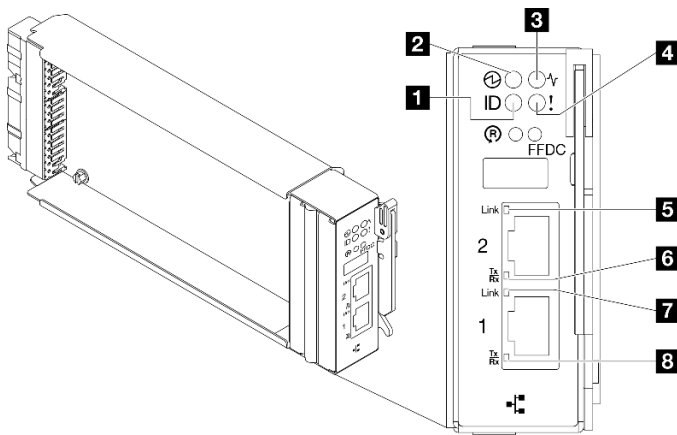


Figure 553. SMM2 LEDs

Table 18. 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)
<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.

The following minimal configuration is required for the solution to start:

- 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:

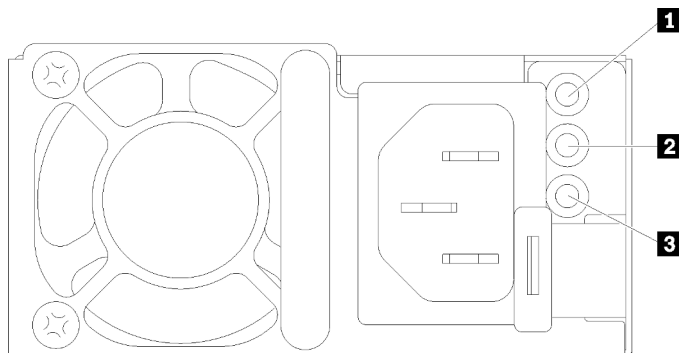


Figure 554. AC power supply LEDs

<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.

The following minimal configuration is required for the solution to start:

- 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:

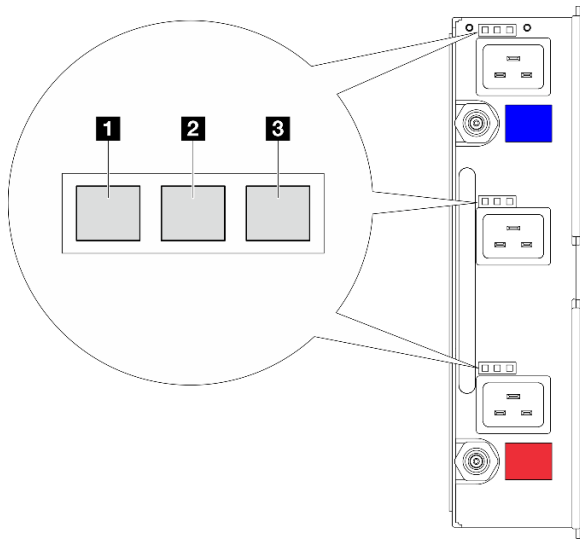


Figure 555. DWC power supply LEDs

<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.

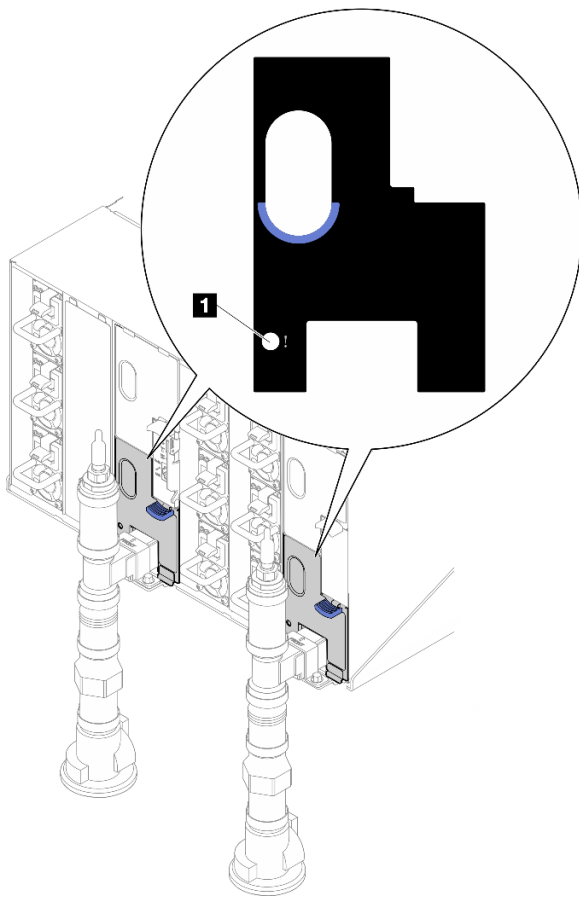


Figure 556. Drip sensor LED

Table 19. Drip sensor LED

<b>1</b> Drip sensor LED (yellow)
-----------------------------------

**1 Drip sensor LED:** When this LED is lit (yellow), it indicates that the drip sensor detects water in its respective catch basin.

## System-board LEDs

The following illustrations show the light-emitting diodes (LEDs) on the system board.

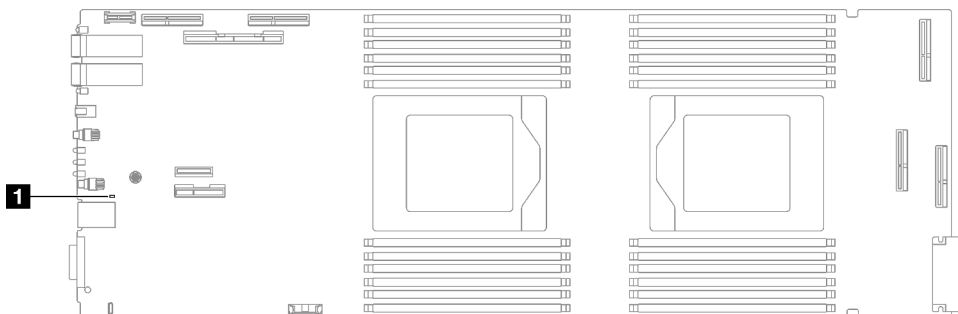


Figure 557. System-board LEDs



Table 20. System-board LEDs

<b>1</b> BMC (XCC heartbeat LED) (green)
--

**1 XCC heartbeat LED (green) behavior:**

**Blinking slowly:** XCC is functioning.

**Blinking rapidly and constantly:** XCC is initializing or malfunctioning.

**On:** XCC is malfunctioning.

**Off:** XCC is malfunctioning.

---

## 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.

To determine the minimal configuration for your server, see “Minimal configuration for debugging” in [“Technical specifications” on page 408](#):

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 405](#).

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” on page 408](#).
- Step 4. Reconnect all AC power cords and turn on the server. If the server starts successfully, reseal 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 416](#).

- 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 416](#).

- 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 405](#)).

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 455](#)).

## GPU problems

Use this information to resolve problems that are related to GPUs and the GPU board.

- [“Health check for GPUs and GPU board” on page 431](#)
- [“System fails to detect the GPU board” on page 432](#)
- [“System fails to detect a specific GPU” on page 432](#)
- [“XCC GPU sensor specifications” on page 433](#)

**Note:** Make sure to update GPU driver, which includes the `nvidia-smi` utility required for GPU problem determination. Latest driver can be found at <https://datacentersupport.lenovo.com/products/servers/thinksystem/sd665nv3/7daz/downloads/driver-list/>.

### Health check for GPUs and GPU board

The following sensor status by `ipmitool` indicates the GPUs and GPU board are in normal state.

```
$ ipmitool -I lanplus -H 192.168.70.125 -U USERID -P PASSWORD
sdr elist | grep GPU
GPU Board Power    | 8Ch | ok   | 21.4 | 250 Watts
GPU Board          | E9h | ok   | 11.8 | Transition to OK
GPU CPUs           | EAh | ok   | 11.9 | Transition to OK
```

The summary of `nvidia-smi` utility indicates 4 GPUs online.

NVIDIA-SMI 525.105.17 Driver Version: 525.105.17 CUDA Version: 12.0									
GPU	Name	Persistence-M	Bus-Id	Disp.A	Volatile	Uncorr. ECC			
Fan	Temp	Perf	Pwr:Usage/Cap	Memory-Usage	GPU-Util	Compute M.	MIG M.		
=====									
0	NVIDIA H100 80G...	Off	00000000:06:00.0	Off	0	Default	0		
N/A	59C P0	70W / 600W	9MiB / 81559MiB	0%	Disabled				
-----									
1	NVIDIA H100 80G...	Off	00000000:26:00.0	Off	0	Default	0		
N/A	44C P0	67W / 600W	9MiB / 81559MiB	0%	Disabled				
-----									
2	NVIDIA H100 80G...	Off	00000000:A6:00.0	Off	0	Default	0		
N/A	40C P0	68W / 600W	9MiB / 81559MiB	0%	Disabled				
-----									
3	NVIDIA H100 80G...	Off	00000000:C6:00.0	Off	0	Default	0		
N/A	53C P0	72W / 600W	9MiB / 81559MiB	0%	Disabled				
-----									
Processes:									
GPU	GI	CI	PID	Type	Process name	GPU Memory			
ID	ID	ID				Usage			
=====									
0	N/A	N/A	4816	G	/usr/lib/xorg/Xorg	4MiB			
0	N/A	N/A	5712	G	/usr/lib/xorg/Xorg	4MiB			
1	N/A	N/A	4816	G	/usr/lib/xorg/Xorg	4MiB			
1	N/A	N/A	5712	G	/usr/lib/xorg/Xorg	4MiB			
2	N/A	N/A	4816	G	/usr/lib/xorg/Xorg	4MiB			
2	N/A	N/A	5712	G	/usr/lib/xorg/Xorg	4MiB			
3	N/A	N/A	4816	G	/usr/lib/xorg/Xorg	4MiB			
3	N/A	N/A	5712	G	/usr/lib/xorg/Xorg	4MiB			
=====									

Figure 558. nvidia-smi

### System fails to detect the GPU board

When event Sensor GPU Board has transitioned to critical from a less severe state appears in the XCC web event log, it indicates the system fails to detect the GPU board. Go through the following steps to solve the problem.

1. Power cycle the system.
2. Check power input related events in XCC and SMM2 (see [https://pubs.lenovo.com/mgt\\_tools\\_smm2/c\\_power](https://pubs.lenovo.com/mgt_tools_smm2/c_power)).
3. Check the system temperature and water flow. Look for leakage, and disconnect then reconnect the water cooling system.
4. Reboot the system, and run ipmi health check (see “Health check for GPUs and GPU board” on page 431).
5. One of the following indicates the problem has been solved:
  - FQXSPUN0017I (Sensor GPU Board has transitioned to normal state) in XCC messages
  - Sensor GPU Board has transitioned to normal state in web log

However, if the problem persists, complete the following steps:

- a. Collect XCC service data (see “Collecting service data” on page 454).
- b. Contact Lenovo Service.

### System fails to detect a specific GPU

When the event Sensor GPU CPUs has transitioned to critical from a less severe state appears in the XCC web event log, it indicates the system fails to detect one or more specific GPUs. Go through the following steps to solve the problem.

1. Check if the retimer is over-temperature from XCC event, if yes, skip the next step.

2. Download the latest firmware from Data Center Support site (<https://datacentersupport.lenovo.com/products/servers/thinksystem/sd665nv3/7daz>), and update the firmware.
3. Reboot the system, and run ipmi health check (see “Health check for GPUs and GPU board” on page 431).
4. If the event Sensor GPU Board has transitioned to normal state appears in the XCC web event log, it indicates the problem has been solved.

However, if the problem persists, complete the following steps.

- a. Check XCC web event log to identify defective unit and problem type (see “XCC GPU sensor specifications” on page 433).
- b. Collect XCC service data (see “Collecting service data” on page 454).
- c. Run `nvidia-smi` for diagnosis (see <https://developer.nvidia.com/nvidia-system-management-interface> for details)

**Note:** Make sure to update GPU driver, which includes the `nvidia-smi` utility required for GPU problem determination. Latest driver can be found at <https://datacentersupport.lenovo.com/products/servers/thinksystem/sd665nv3/7daz/downloads/driver-list/>.

- d. Run `nvidia-bug-report.sh` (embedded tool in NVIDIA driver).
- e. Contact Lenovo Service.

### XCC GPU sensor specifications

When seeing an event in XCC web event log, refer to the following table to identify defective unit and problem type. For example:

6 | 01/08/2021 | 14:34:53 | 0x0020 | Add-in Card GPU Board | Transition to Critical from less severe | Asserted |0xA2F60F

Table 21. XCC GPU sensor specifications

Sensor Name			Data
GPU CPUs	Sensor Number	EAh	02h - Transition to Critical from less severe  Evt Data2:  B0h: Thermal alert BBh: Presence and Power status B1h: GPU interrupt info 21h: PCIe link status E0h: GPU count from SMBIOS  Evt Data3:  XXh: GPU CORE index, 01h: core 1 07h: core 3 + core 4
	Sensor Type	17h	
	Sensor Reading Type	07h	
	Entity ID	0Bh	
	Instance/Type	02h	
	SEL Logged Assertions	02h	
	SEL Logged De-assertions	02h	
	Thresholds De-assertions		
	LED 'ON' Request when Assertion	02h - F	
	F = Fault KED		
	LED 'OFF' Request when De-assertion	02h - F	
	F = Fault KED		

Table 21. XCC GPU sensor specifications (continued)

<b>GPU board</b>	Sensor Number	EAh	00h - Transition to OK
	Sensor Type	17h	02h - Transition to Critical from less severe
	Sensor Reading Type	07h	Evt Data2: F1h: GPU Thermaltrip (no evt3) F2h: PIB Thermaltrip (no evt3) F6h: GPU core thermal alert
	Entity ID	0Bh	
	Instance/Type	01h	
	SEL Logged Assertions	02h	Evt Data3: XXh: GPU CORE index, 01h: core 1 07h: core 3 + core 4 If Evt2: F4h, 01h: Overtemp flag asserted
	SEL Logged De-assertions	02h	
	Thresholds De-assertions	N/A	
	LED 'ON' Request when Assertion	00h - None 02h - F	
	F = Fault LED		
	LED 'OFF' Request when De-assertion	00h - None 02h - F	
	F = Fault LED		

## Intermittent problems

Use this information to solve intermittent problems.

- “Intermittent external device problems” on page 434
- “Intermittent KVM problems” on page 434
- “Intermittent unexpected reboots” on page 435

### 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 405 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 435
- “[Mouse does not work](#)” on page 435
- “[KVM switch problems](#)” on page 436
- “[USB-device does not work](#)” on page 436

### 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 436
- “Displayed system memory is less than installed physical memory” on page 437
- “Invalid memory population detected” on page 438

### **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 416](#).
  - 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” on page 6](#) 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 → Memory test → 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” on page 6](#) 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 438](#)
- [“Screen goes blank when you start some application programs” on page 438](#)
- [“The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted” on page 439](#)

### 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” in *User Guide* or *System Configuration Guide*.
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 (system board assembly)

### 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.

- [“Could not log in using LDAP account with SSL enabled” on page 439](#)

### **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 440](#)
- [“The server immediately displays the POST Event Viewer when it is turned on” on page 440](#)
- [“Server is unresponsive \(POST is complete and operating system is running\)” on page 440](#)
- [“Server is unresponsive \(POST failed and cannot start System Setup\)” on page 441](#)
- [“Voltage planar fault is displayed in the event log” on page 441](#)
- [“Unusual smell” on page 441](#)
- [“Server seems to be running hot” on page 441](#)
- [“Cracked parts or cracked chassis” on page 442](#)

## 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 and processor 2 are seated correctly
4. (Trained technician only) 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. See [“Specifications” on page 407](#) for the minimally required number of processors and DIMMs.
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, inlet water temperature, and flow rate are within the specified range (see [“Specifications” on page 407](#)).
2. Update the UEFI and XCC firmware to the latest versions.
3. Make sure that the fillers in the server are installed correctly (see [Chapter 2 “Hardware replacement procedures” on page 3](#) for detailed installation procedures).
4. 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.

## 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 442](#)
- [“A Lenovo optional device that was just installed does not work” on page 442](#)
- [“A Lenovo optional device that worked previously does not work now” on page 442](#)

### 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 443](#)
- [“Server does not power off” on page 444](#)

### Server does not power on

Complete the following steps until the problem is resolved:

**Note:** The power button will not function until approximately one to two minutes 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, reseat 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, reseat 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 425](#).

### **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 444](#)
- [“Serial device does not work” on page 444](#)

### **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 *User Guide* or *System Configuration Guide*).
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).

## 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.

## Storage drive problems

Use this information to resolve issues related to the storage drives.

- “[Server cannot recognize a drive](#)” on page 445

### Server cannot recognize a 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 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 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 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.

## 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 446](#)
- [“System Management Module 2 status LED is not flashing normally” on page 446](#)
- [“System Management Module 2 ping failure” on page 446](#)

### 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 423](#) 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.

## Water leak problems

Use this information to resolve issues related to water leaks.

The SD665 V3 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 [https://pubs.lenovo.com/dw612s\\_neptune\\_enclosure/messages\\_introduction](https://pubs.lenovo.com/dw612s_neptune_enclosure/messages_introduction) 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.

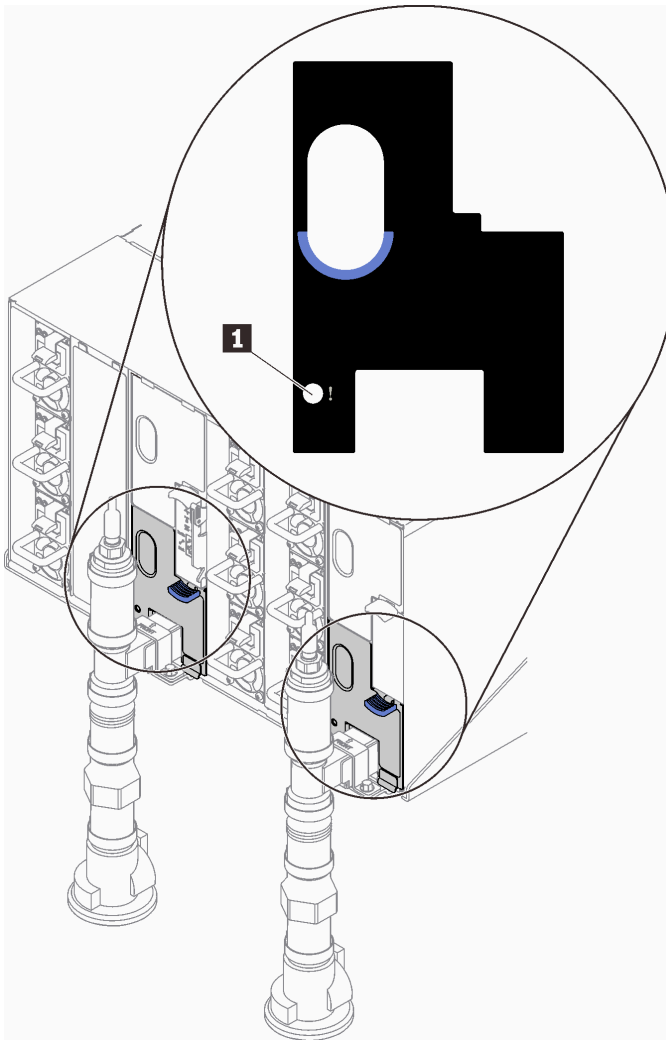
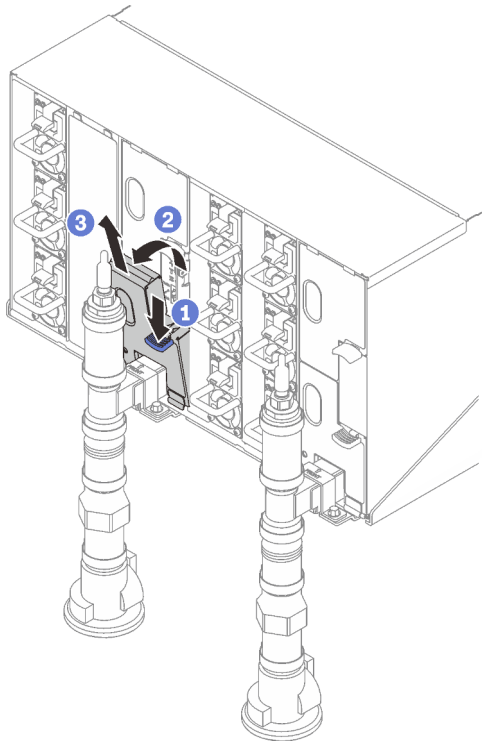


Figure 559. Drip sensor LED

Table 22. 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.

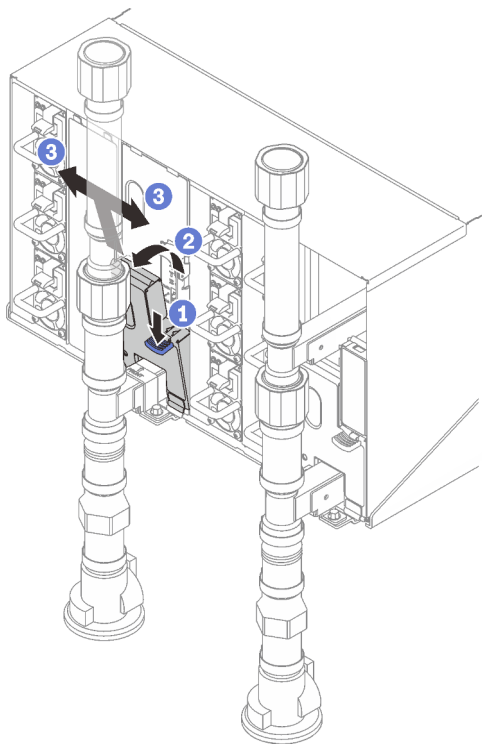
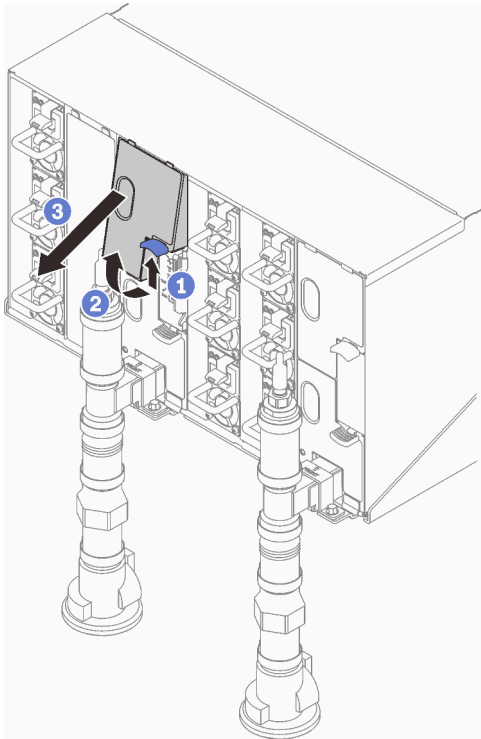
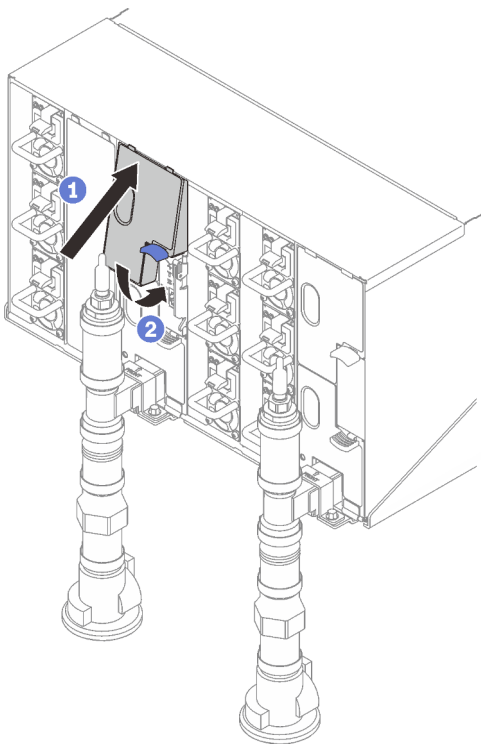


Figure 560. Lower EMC shield removal



*Figure 561. 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 562. Upper EMC shield installation*

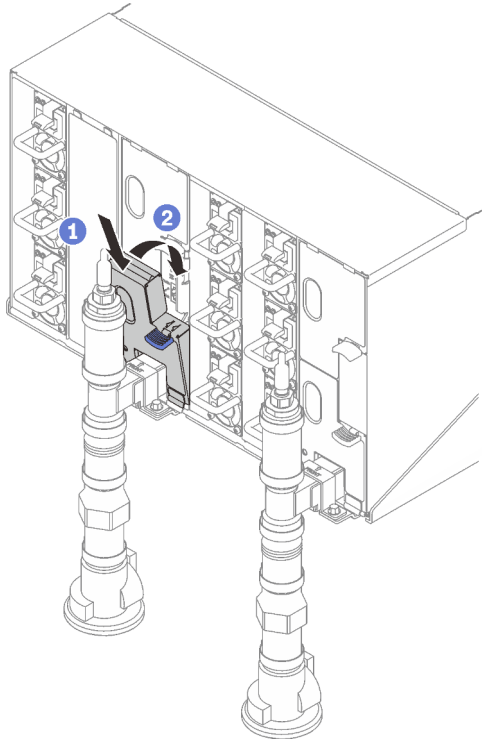


Figure 563. Lower EMC shield installation

- 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 (see [“Remove a DWC tray from the enclosure” on page 14](#)), place it on a stable work surface, remove the cover (see [“Remove the tray cover” on page 17](#)), and carefully inspect the entire water loop (both rubber and copper tubing) for any signs of moisture. Re-install the tray into enclosure (see [“Install a DWC tray in the enclosure” on page 15](#)).
  - 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 [“Water loop replacement ” on page 23](#)). 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/sd665nv3/7daz/downloads/driver-list/>
  - Operating system support center
    - <https://datacentersupport.lenovo.com/solutions/server-os>
  - Operating system installing instructions
    - <https://pubs.lenovo.com/thinksystem#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 4 “Problem determination” on page 405](#) 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 **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 *User Guide* or *System Configuration Guide*.
- 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 [https://pubs.lenovo.com/lxca/admin\\_setupcallhome](https://pubs.lenovo.com/lxca/admin_setupcallhome).

- **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/supportphonelist> 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.

#### Documents

Download the following product documentations at:

[https://pubs.lenovo.com/sd665-n-v3/pdf\\_files](https://pubs.lenovo.com/sd665-n-v3/pdf_files)

- **Rail Installation Guides**

- Rail Installation Guide for DW612S Enclosure

- **SD665-N V3 Neptune DWC Tray 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.

- **SD665-N V3 Message and Code Reference**

XClarity Controller, LXPM, and uEFI events

For SMM2 Messages, see **ThinkSystem DW612S Neptune DWC Enclosure SMM2 Messages and Codes Reference**.

- **UEFI Manual**

- UEFI setting introduction

**Notes:** SD665-N V3 tray can be installed in the DW612S 6U enclosure, which can be installed in the ThinkSystem Heavy Duty Full Depth Rack Cabinets. The documentations below are available for download:

- *DW612S Enclosure User Guide*
- *ThinkSystem Heavy Duty Full Depth Rack Cabinets User Guide*

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### Support websites

This section provides driver and firmware downloads and support resources.

#### Support and downloads

- Drivers and Software download website for ThinkSystem SD665-N V3
  - <https://datacentersupport.lenovo.com/products/servers/thinksystem/sd665nv3/7daz/downloads/driver-list/>
- 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 Data Center Support for ThinkSystem SD665-N V3
  - <https://datacentersupport.lenovo.com/products/servers/thinksystem/sd665nv3/7daz>

- Lenovo License Information Documents
  - <https://datacentersupport.lenovo.com/documents/lnvo-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/thinksystem#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

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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.

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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:



## Taiwan region BSMI RoHS declaration

單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (PB)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr <sup>6+</sup> )	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機架	○	○	○	○	○	○
外部蓋板	○	○	○	○	○	○
機械組零件	—	○	○	○	○	○
空氣傳動設備	—	○	○	○	○	○
冷卻組零件	—	○	○	○	○	○
內存模組	—	○	○	○	○	○
處理器模組	—	○	○	○	○	○
電纜組零件	—	○	○	○	○	○
儲備設備	—	○	○	○	○	○
印刷電路板	—	○	○	○	○	○
<p>備考1. “超出0.1 wt %” 及 “超出0.01 wt %” 係指限用物質之百分比含量超出百分比含量基準值。            Note1 : “exceeding 0.1wt%” and “exceeding 0.01 wt%” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.</p> <p>備考2. “○” 係指該項限用物質之百分比含量未超出百分比含量基準值。            Note2 : “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.</p> <p>備考3. “—” 係指該項限用物質為排除項目。            Note3 : The “-” indicates that the restricted substance corresponds to the exemption.</p>						

## 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  
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