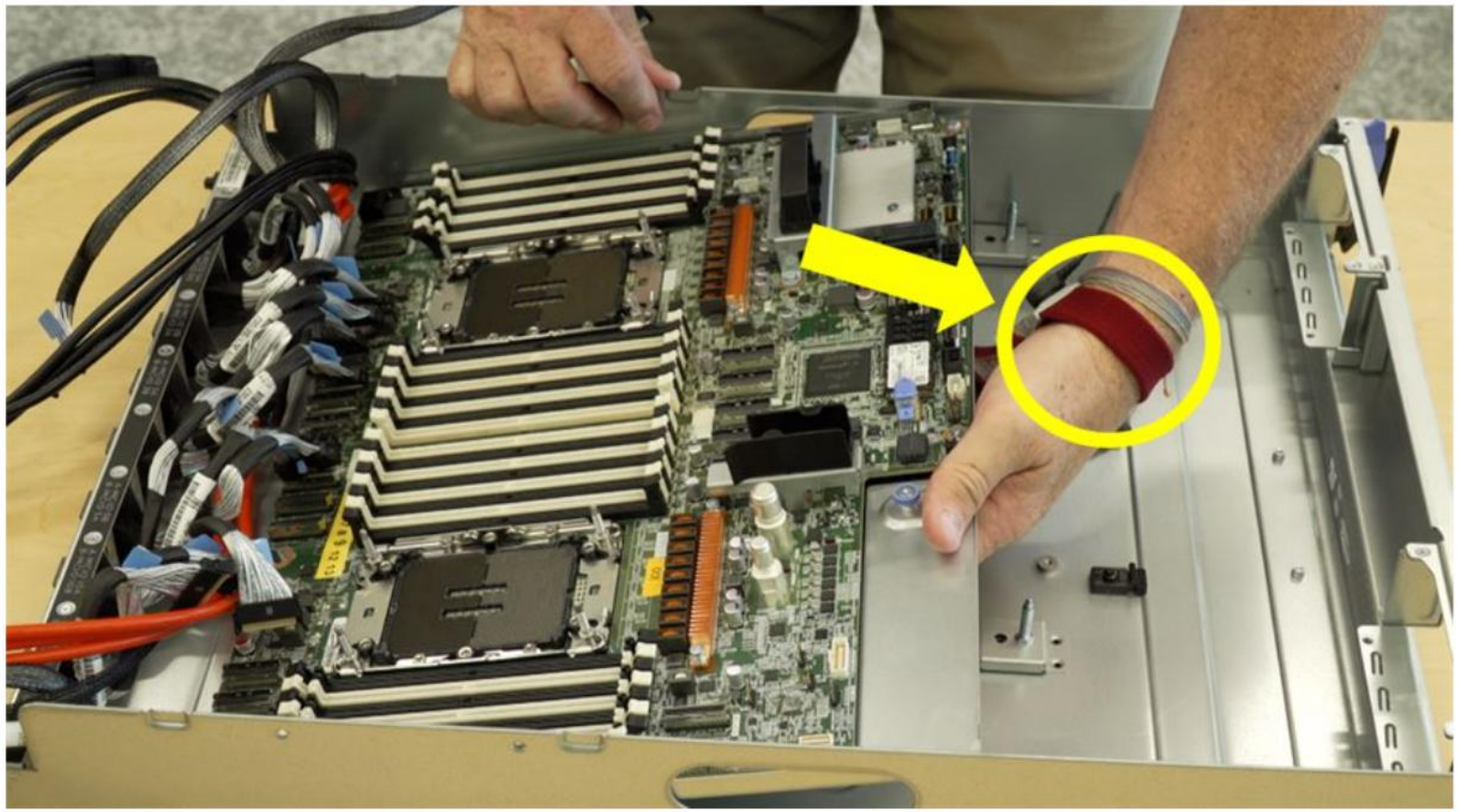
Hardware replacement tips

Part replacement highlights

Lenovo

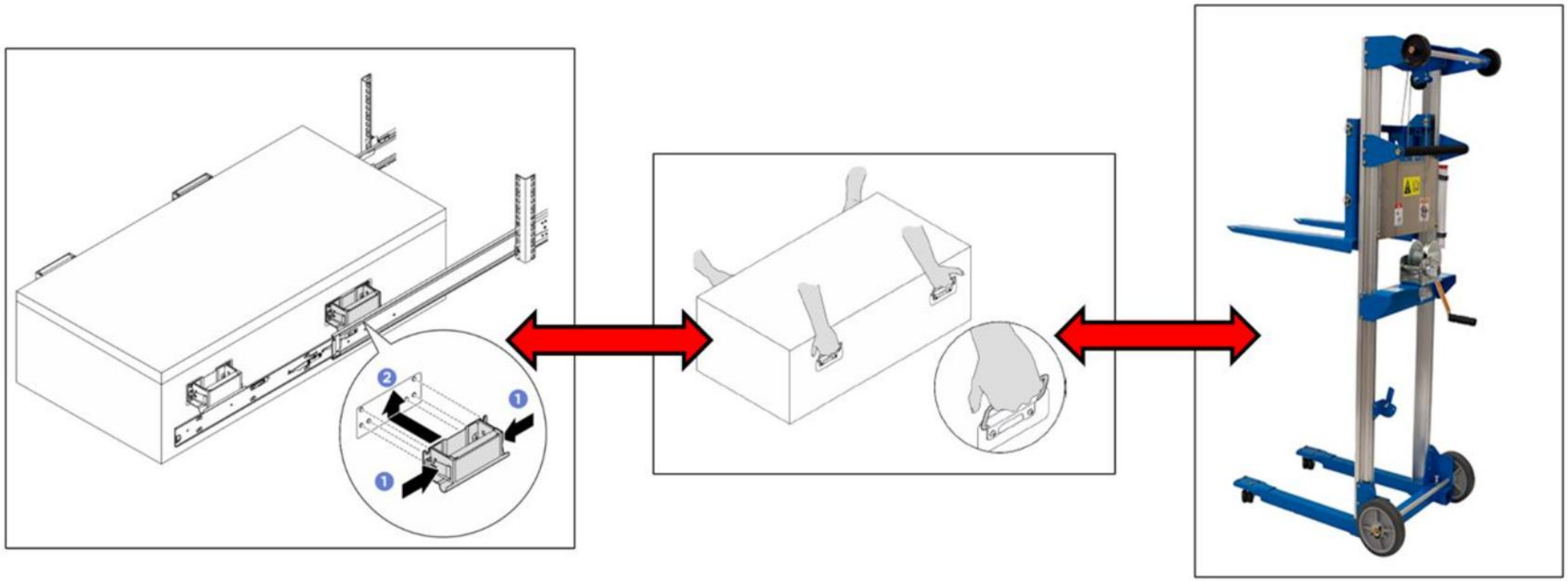
ESD wrist strap

The GPUs, switch board, and system board in the system are extremely sensitive to ESD. Make sure you wear an ESD wrist strap when replacing any components in the system.



Removing the server from rack

To remove the SR780a V3 from the rack, two people are required to install and hold the four handles on the sides of the server. Then, the server should be placed on a lift tool. If the customer does not have a lift tool, Lenovo offers the Genie GL-8 lift tool (machine type model: 7D5YCTO1WW) as a configurable option that customers can order.



Replacing parts in a GPU water loop

- This task must be carried out by trained technicians
- Make sure you have the required tools to properly replace the component
- Identify the module component and its location
- Follow the putty pad and phase change material (PCM) replacement guidelines
- The PCM and putty pads must be replaced every time the water loop is removed
- Ensure the hoses are in the correct hose holders
- After replacing the H100/H200 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.

NVSwitch cold plate module replacement (trained technician only)
Follow instructions in this section to remove and install the NVSwitch cold plate module.

Front GPU cold plate module replacement (trained technician only)
Follow instructions in this section to remove and install the front GPU cold plate module.

Rear GPU cold plate module replacement (trained technician only)
Follow instructions in this section to remove or install the rear GPU cold plate module.

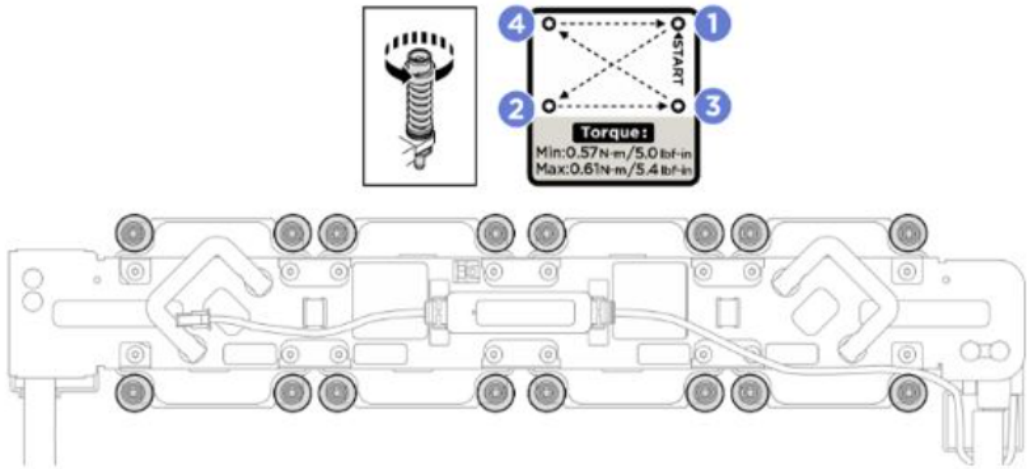
Front GPU replacement (trained technician only)
Follow instructions in this section to remove or install a front GPU.

Rear GPU replacement (trained technician only)
Follow instructions in this section to remove or install a rear GPU.

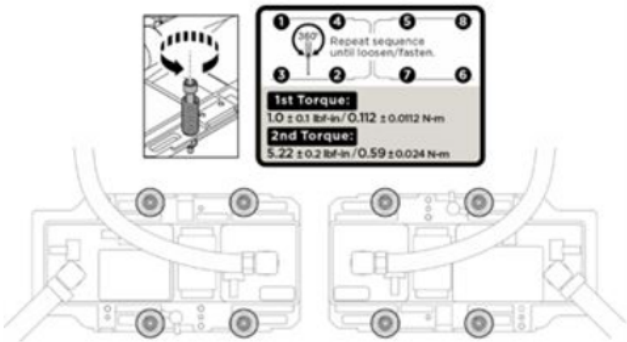
Replacing an NVSwitch cold plate module

The H100/H200/B200 NVSwitch cold plate module replacement procedure requires a Torx T15 torque screwdriver. Follow the screw sequence instructions and torque settings shown on the NVSwitch cold plate label to remove or install an NVSwitch cold plate module. Refer to the GPU water loop replacement section of the *SR780a V3 User Guide* on Lenovo Docs or the videos on the course landing page.

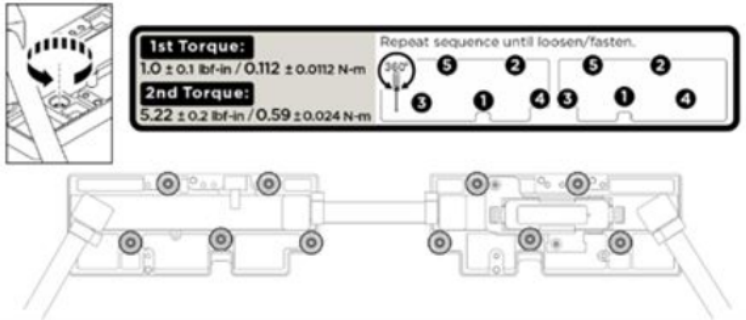
H100/H200 NVSwitch cold plate label



B200 NVSwitch cold plate label

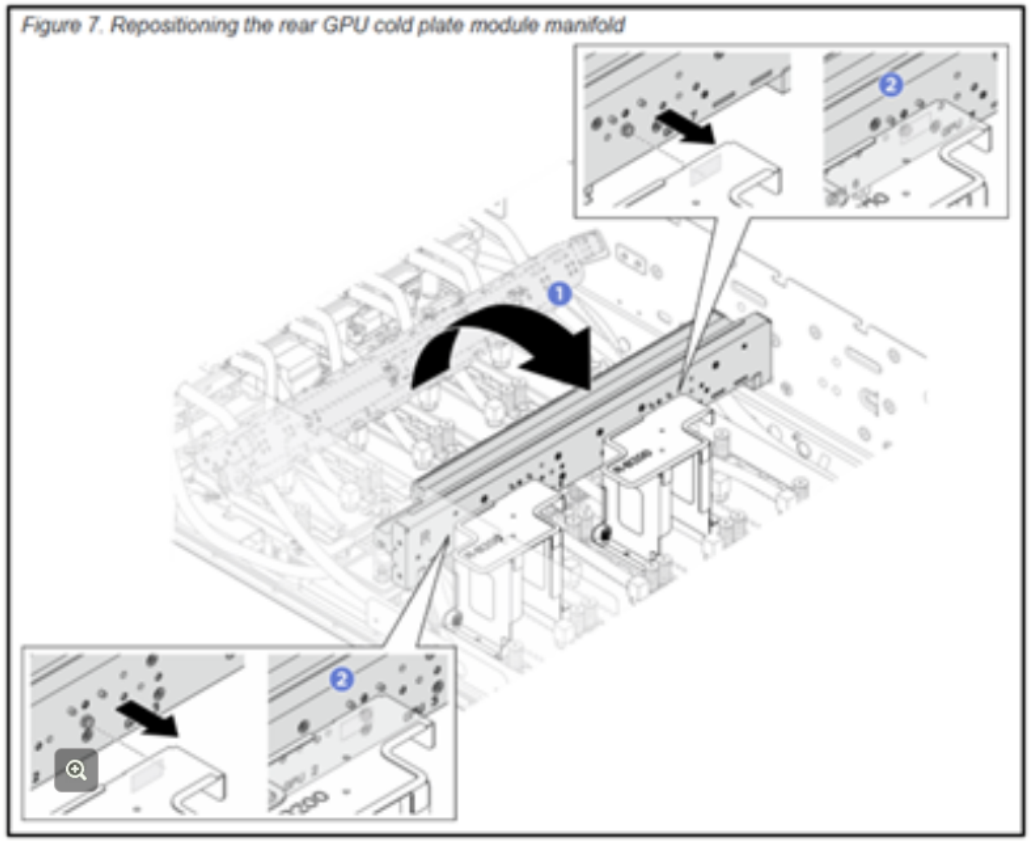


B200 retimer cold plate label



Replacing a GPU cold plate module

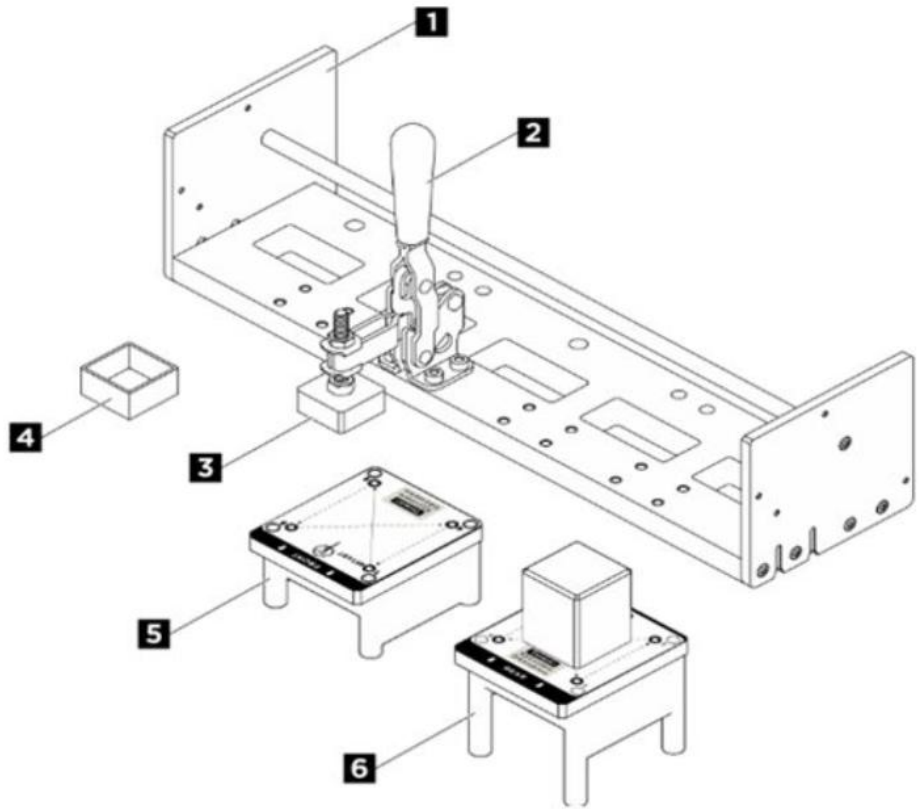
- Before attempting to replace the component, make sure you have the required tools.
- The PCM and putty pads must be replaced every time the water loop is removed.
- Follow the front/rear GPU cold plate replacement instructions and the screwdriver torque setting.
- To replace the front H100/H200 GPU cold plate, the rear GPU cold plate must be removed. To replace the front B200 GPU cold plate, the rear GPU cold plate only needs to be repositioned.
- Use the front/rear shipping bracket to replace GPU cold plates.
- Special tools for H100/H200 GPU cold plate installation



For the complete GPU cold plate module replacement procedures, refer to the GPU water loop replacement section of the *SR780a V3 User Guide* on Lenovo Docs.

Special tools for H100/H200 GPU cold plate installation

When replacing a GPU cold plate or GPU, you need to order the H100/H200 GPU service fixture kit (part number: 03NY897) to complete the replacement. This GPU service fixture kit includes:

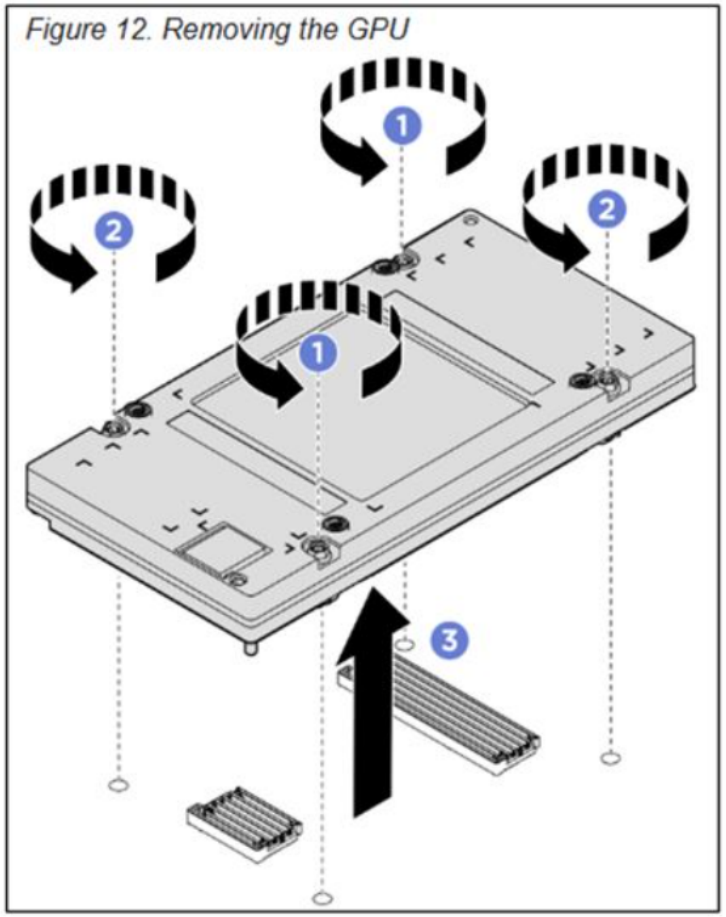


Item	Description
1	H100/H200 GPU service fixture
2	Handle
3	Clamp head
4	Spacer
5	Table for rear GPU cold plate
6	Table for front GPU cold plate

Replacing a GPU

- Before attempting to replace the component, make sure you have the required tools.
- The PCM and putty pads must be replaced every time the water loop is removed.
- Follow the front/rear GPU replacement instructions and the screwdriver torque setting.
- To replace the front GPU, the rear GPU cold plate module manifold must be repositioned.
- To replace the GPU, use the front/rear service bracket.
- To replace a B200 GPU, the two diagonal screws must be simultaneously loosened and fastened.

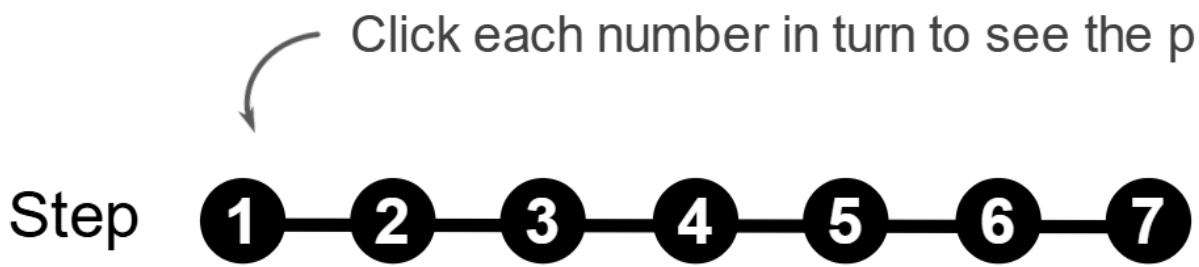
For the complete GPU module replacement procedures, refer to the GPU water loop replacement section of the *SR780a V3 User Guide* on Lenovo Docs.



B200 GPU

H100/H200 GPU PCM TIM melting procedure

After replacing the GPU PCM and putty pads, servicers must use the stress tool to perform the H100/H200 GPU PCM TIM melting procedure to monitor the GPU until the PCM Thermal Interface Material (TIM) has melted. This will protect the GPUs from damage.



H100/H200 GPU PCM TIM melting procedure

The stress tool is an OS image file. Go to the following internal tip link to download the image file.
https://datacentersupport.lenovo.com/us/en/solutions/tt2773

Copy the image file to a USB key. Follow the instructions in the internal tip to create a bootable USB, and then insert the USB key into the system.

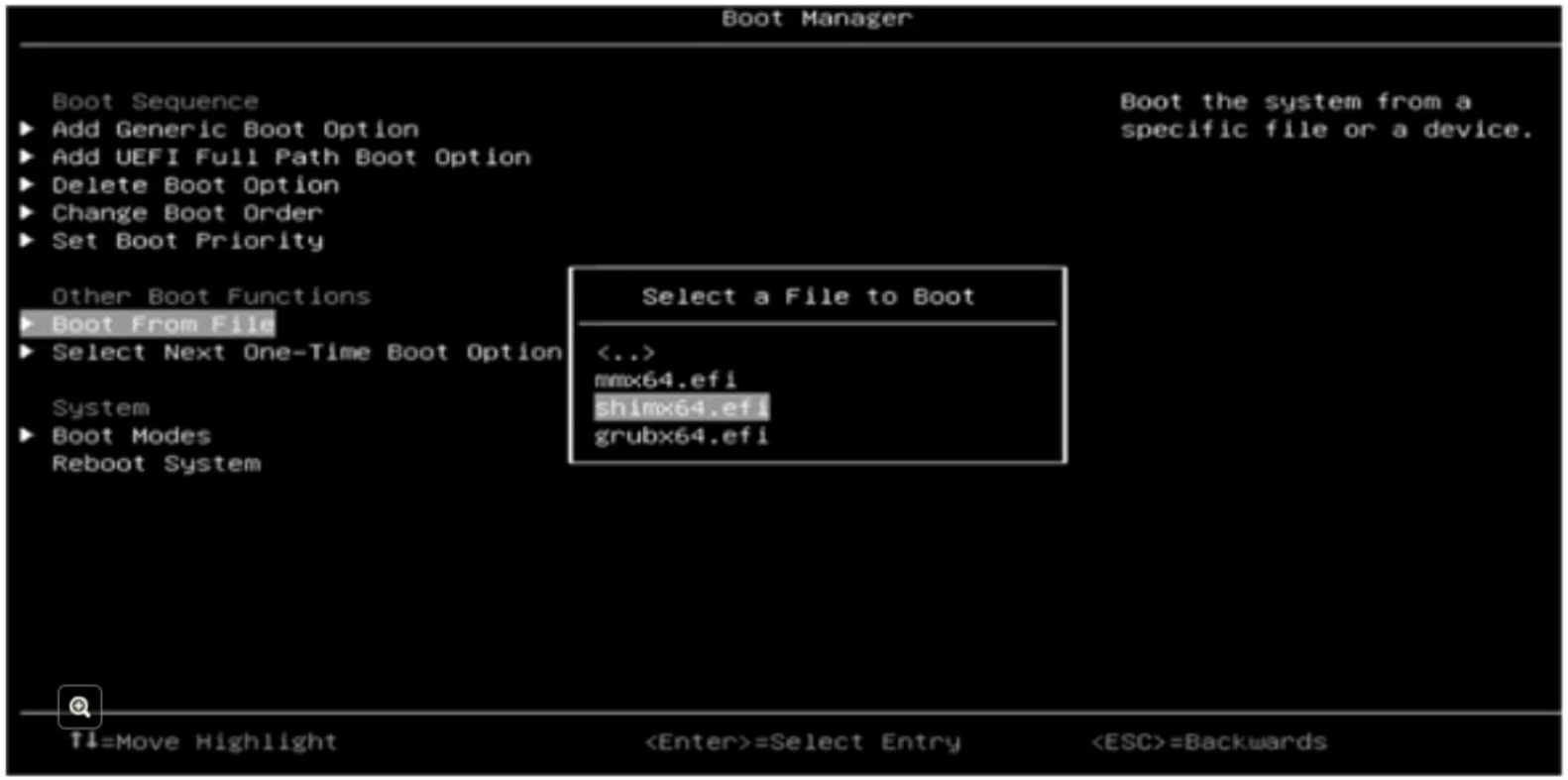
H100/H200 GPU PCM TIM melting procedure

In UEFI Setup, select **Boot Manager** and then **Boot From File**.
Select the **PciRoot(0x0) / pci(0x14,0x0) / USB(0x12,0x0) / HD(1,gpt, …)** file system.

Step 1 2 3 4 5 6 7

H100/H200 GPU PCM TIM melting procedure

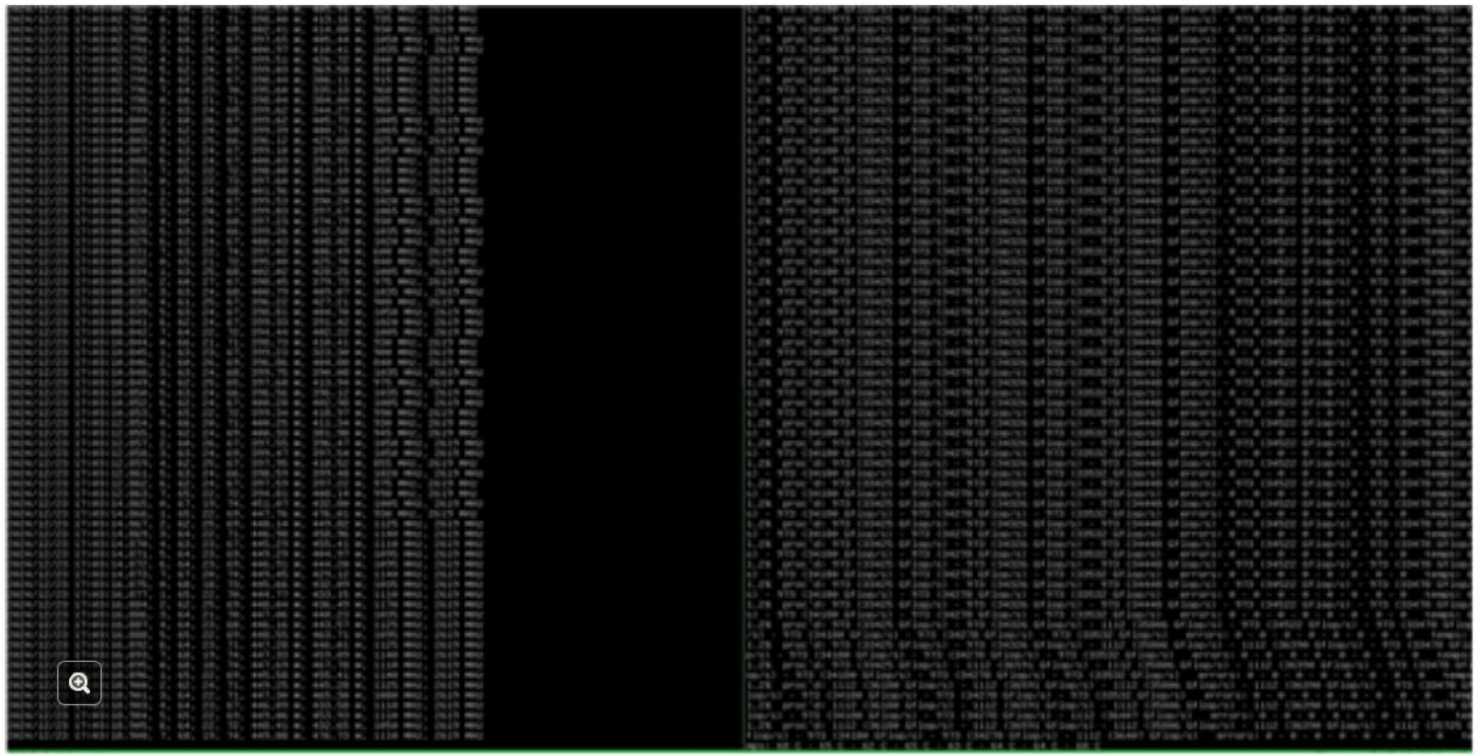
After selecting the file system, select **EFI** and then **ubuntu**.
Select the **shimix64** file.



Step 1 2 3 4 5 6 7

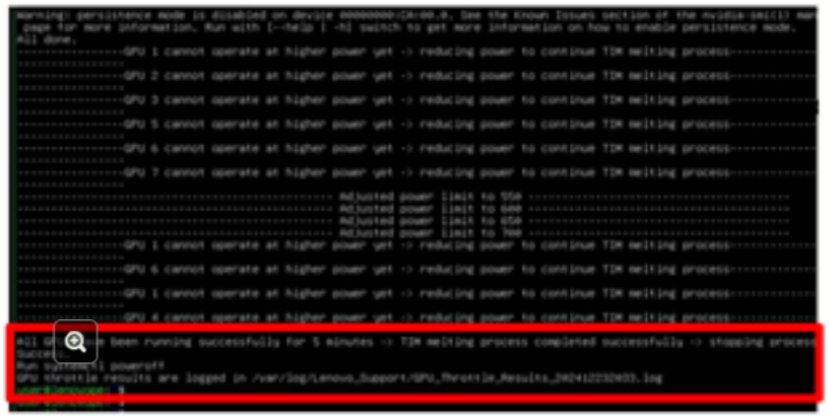
H100/H200 GPU PCM TIM melting procedure

After booting, the system will automatically log in and launch the throttleit script in a split-screen view.



H100/H200 GPU PCM TIM melting procedure

When the throttleit script has been successfully executed, a message stating **All GPUs running successfully for 5 minutes -> TIM melt process completed successfully** will be displayed.



H100/H200 GPU PCM TIM melting procedure

If the stress tool fails, the following messages might be displayed.

```
GPUs failed to reach target Power after 1 hour → TIM melting process failed →  check cold plate attachment
```

```
GPU 4 exceeded tlimit of 35 → TIM melting process stopped → check cold plate attachment
GPU 7 exceeded tlimit of 35 → TIM melting process stopped → check cold plate attachment
```

Actions:

- Collect the log file for further escalation. The logs will be saved here: */var/logs/Lenovo_support/GPU_throttle_results_<datestamp>.log*
- Power off the system and re-attach the water loop cold plates to the GPUs.

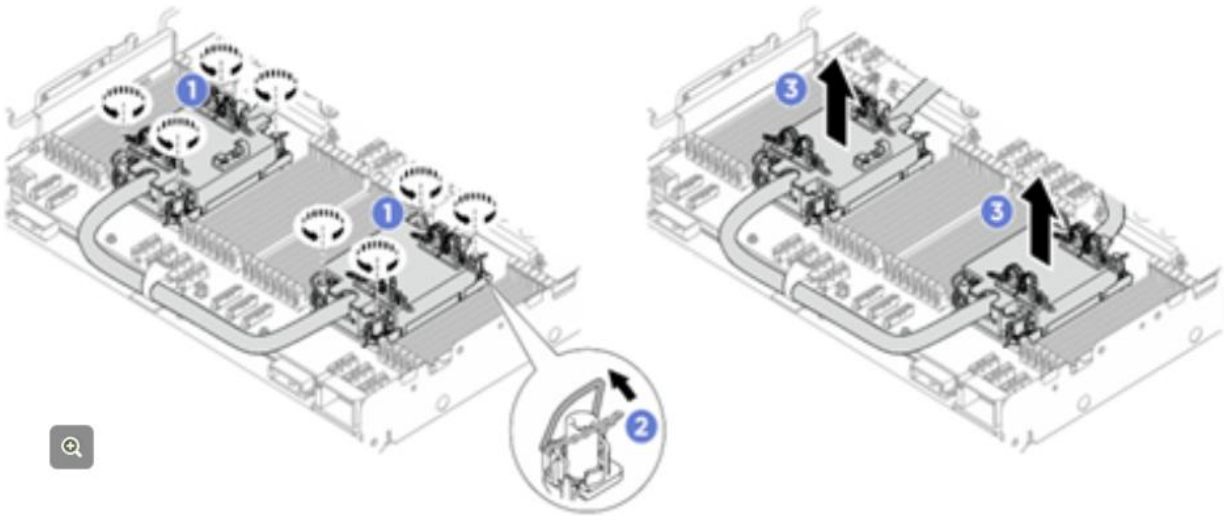
H100/H200 GPU PCM TIM melting procedure

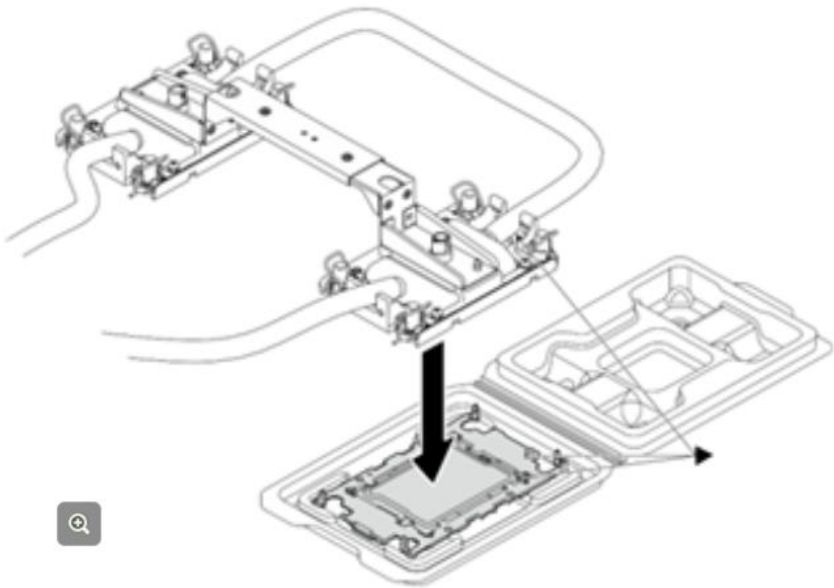
For the complete GPU PCM TIM melting procedure, refer to the following internal tip link:
https://datacentersupport.lenovo.com/us/en/solutions/tt2773

Note: The GPU PCM TIM melt procedure and bootable image are confidential. Do not share the file or tip documentation with customers.

Replacing a Lenovo Processor Neptune® Core Module

The SR780a V3 Lenovo Processor Neptune® Core Module replacement procedure requires a Torx T30 torque screwdriver. Follow the removal or installation sequence and the torque settings shown on the cold plate assembly to loosen or fasten the Torx T30 nuts. Refer to the Lenovo Processor Neptune® Core Module replacement section of the *SR780a V3 User Guide* on Lenovo Docs.

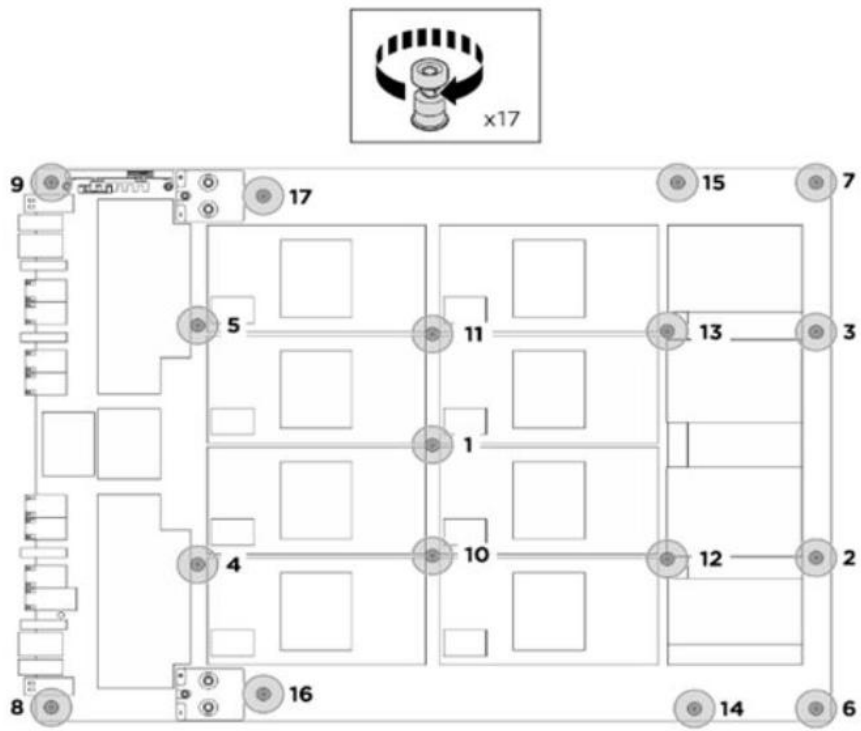




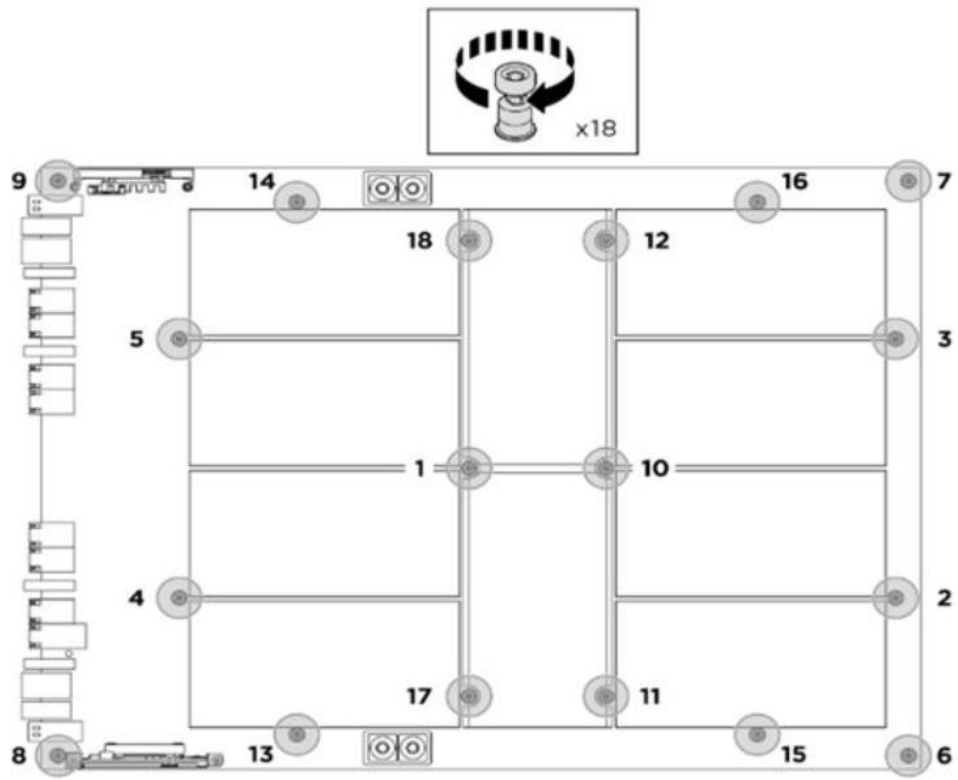
Assembling the processor with a DWCM

Replacing a GPU baseboard

Use the handles to lift the GPU complex for GPU baseboard replacement. The GPU baseboard replacement procedure requires a Torx T15 torque screwdriver. Follow the screw sequence instructions and torque settings shown in the user guide to fasten the Torx T15 captive screws to secure the GPU baseboard.



H100/H200 GPU baseboard
screw installation sequence

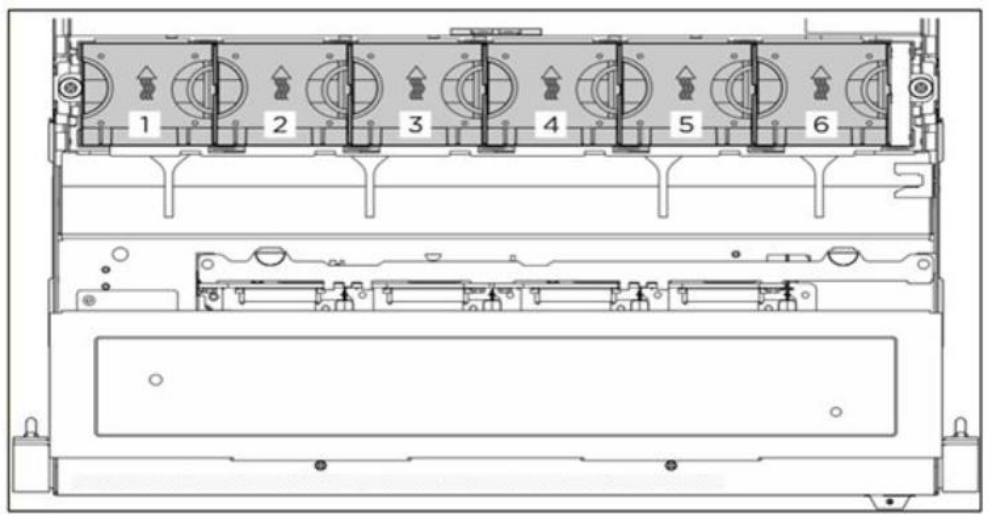


B200 GPU baseboard
screw installation sequence

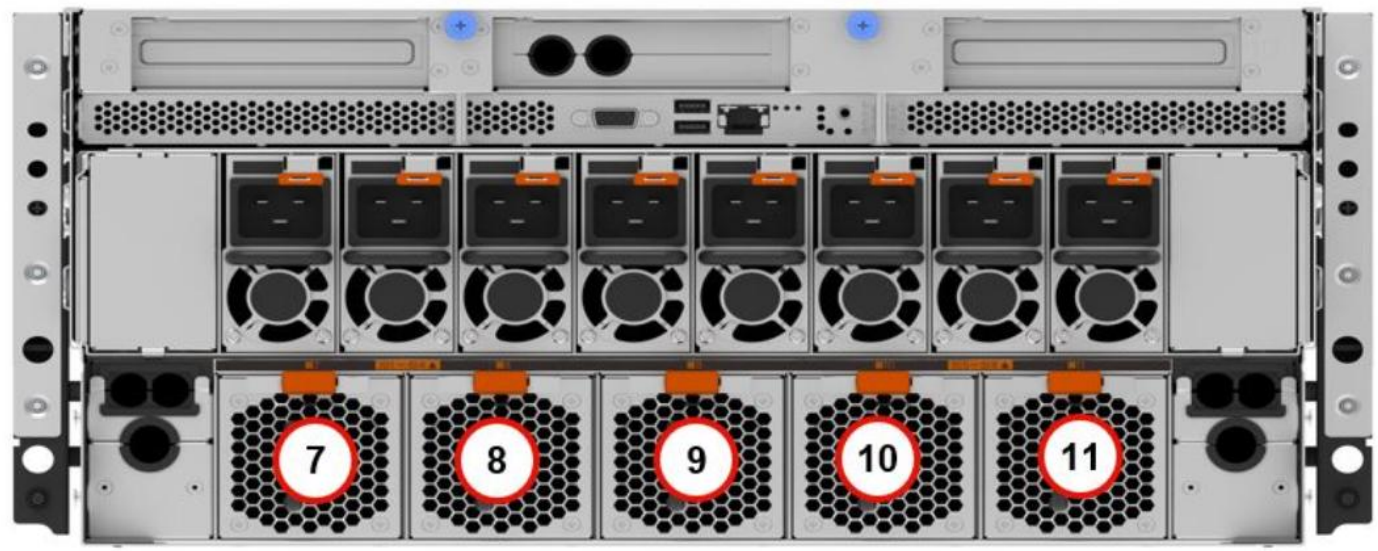
Lenovo

Replacing a fan

The SR780a V3 front (non-hot-swap) and rear (hot-swap) fans do not have status LEDs. Make sure to check the fan error messages in XCC and the label on the fan to cross check which fan needs to be replaced.



Front fan numbering



Rear fan numbering

Replacing a system I/O board

After replacing a system I/O board (integrated RoT module), servicers must update the UEFI and LXPM firmware to the latest supported version before starting the system. If this does not happen, the system will not be able to recognize the correct firmware and will not start normally. As a result, the user will not be able to access the system OS.
Use one of the following methods to update the UEFI and LXPM firmware on the system after replacing the system I/O board:

- OneCLI commands
- A USB boot kit with UEFI firmware and LXPM firmware package
  - For more information on how to create a USB boot kit, refer to the following GLOSSE article: How to create USB boot kit with OneCLI for RoT replacement in the field

For the complete procedures, refer to the following GLOSSE tip page:
How to do RoT Module FW update on ThinkSystem V3 machines

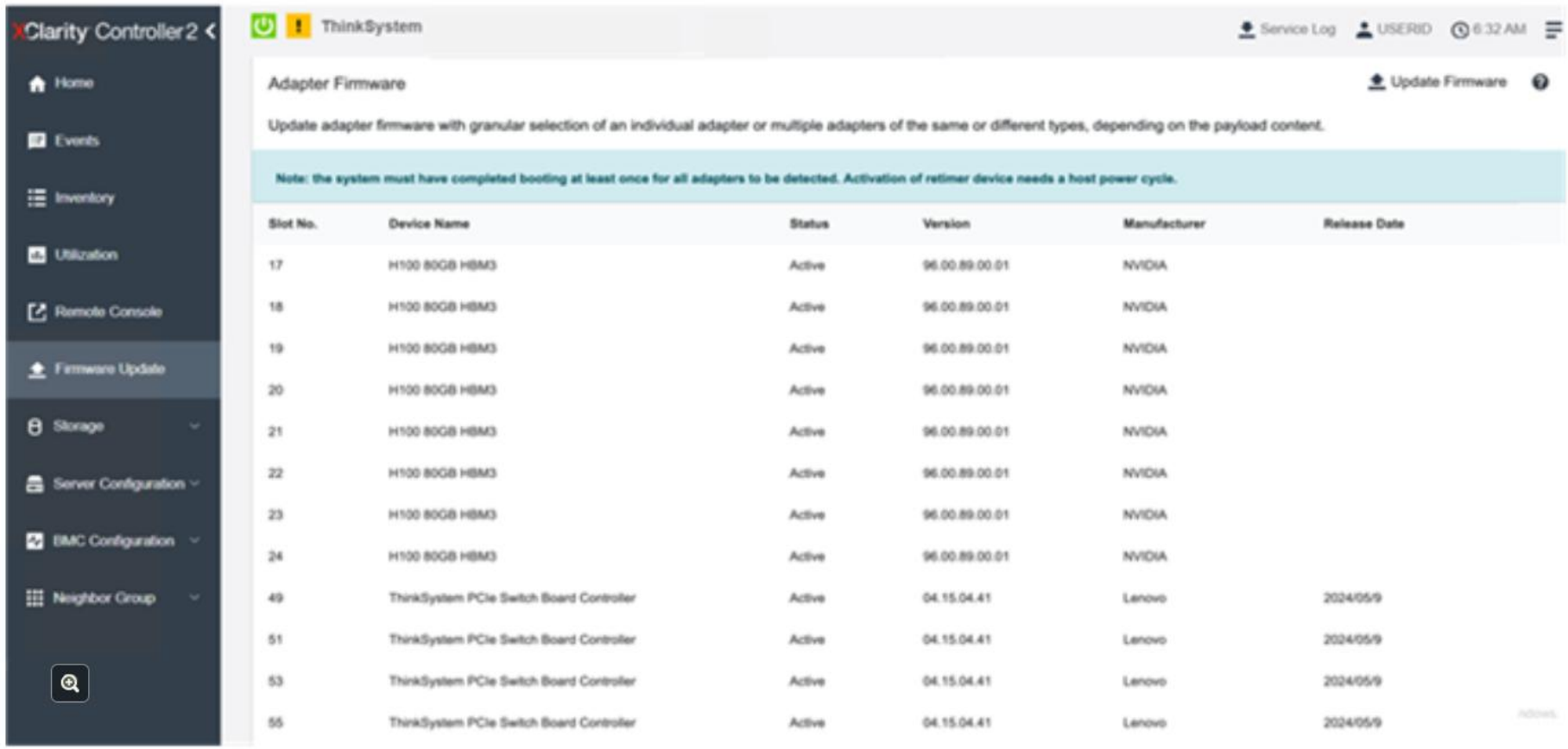
Updating the VPD

After replacing a processor board, service personnel must update the VPD (machine type and serial number) on the processor board. The SR780a V3 VPD update procedure is the same as that used with other ThinkSystem models (using the `onecli config set` OneCLI command).
Replacing a system I/O board does not require an update of the VPD.
Replacing an RoT module or system I/O board does not require an update of the VPD.

For more information, refer to the *LXCE OneCLI common task* section of course ES51757B Introducing ThinkSystem tools, or the *Update the Vital Product Data (VPD)* section of the *ThinkSystem SR780a V3 User Guide* on Lenovo Docs.

Updating the GPU or GPU board firmware

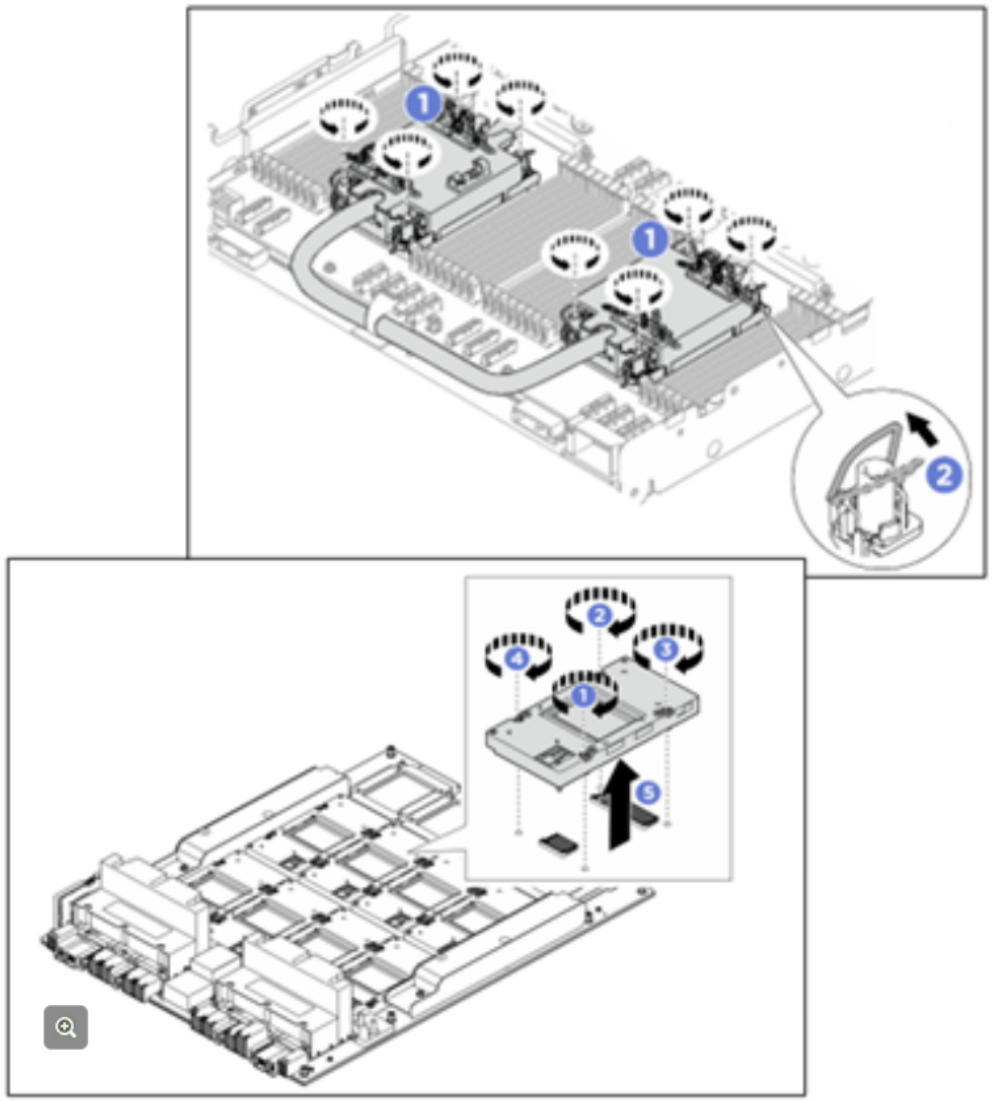
There is a single firmware package for all GPU-related components. (This applies to NVIDIA GPUs.) Use XCC / OneCLI to perform the task. You do not need to use any specific NVIDIA tools to perform a GPU or GPU board firmware update on an SR780a V3.



Replacing parts with a torque screwdriver

Replacement of the following parts requires a torque screwdriver with adjustable Newton-meter settings:

- Lenovo Processor Neptune® Core Module
- Processor Direct Water Cooling Module
- PCIe switch board heat sink
- GPU cold plate module
- NVSwitch cold plate module
- GPU complex
- GPU and GPU baseboard



For the newton-meter settings required to replace the above parts, refer to the *Hardware replacement procedures* section of the *SR780a V3 User Guide* on Lenovo Docs.

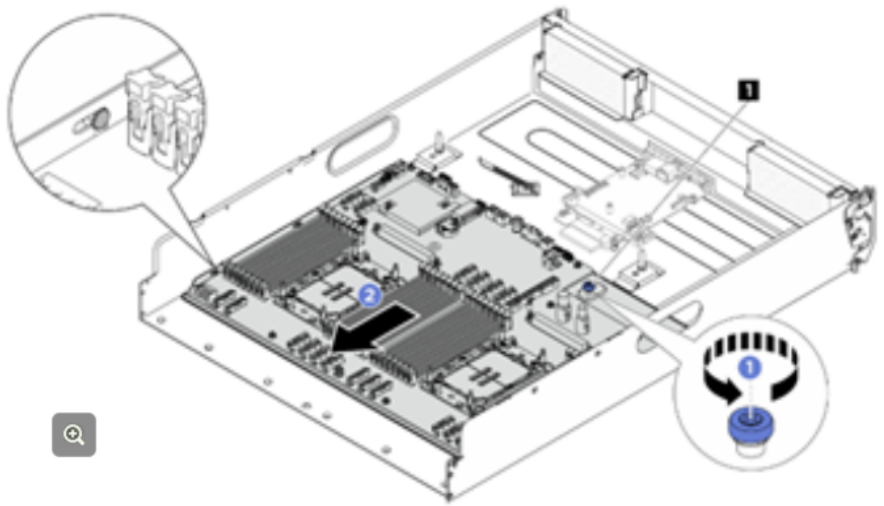
Note: Replacing a part with the wrong torque setting might damage the part.

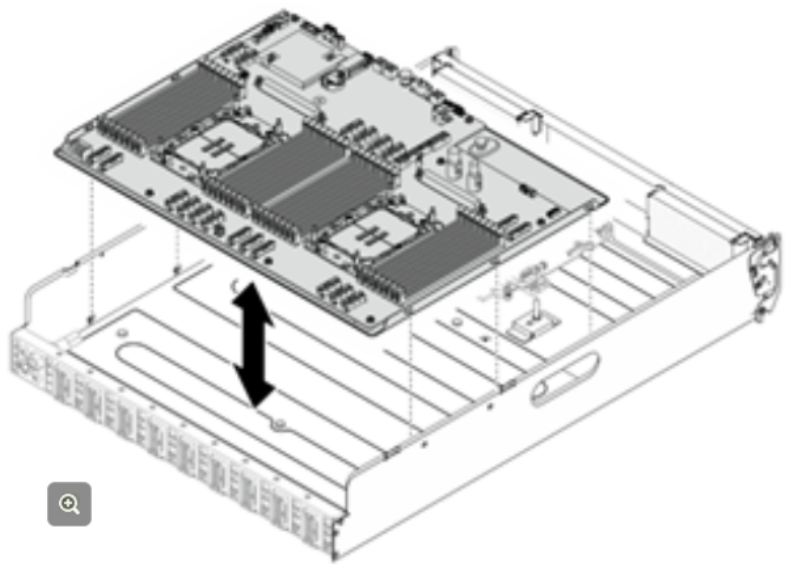
Replacing a processor board or system I/O board

To replace a processor board or system I/O board, servicers must first remove the compute complex from the chassis. Then, remove the following components:

- Processor air baffle
- Lenovo Processor Neptune® Core Module
- Memory modules
- PCIe riser assembly
- Rear drive cage
- Leak detection sensor module bracket
- System I/O board
- Two cable guides

Disconnect all the cables from the system board assembly. As you disconnect the cables, make a list of each cable and record the connectors the cables are connected to, and use the record as a cabling checklist after installing the new system board assembly.

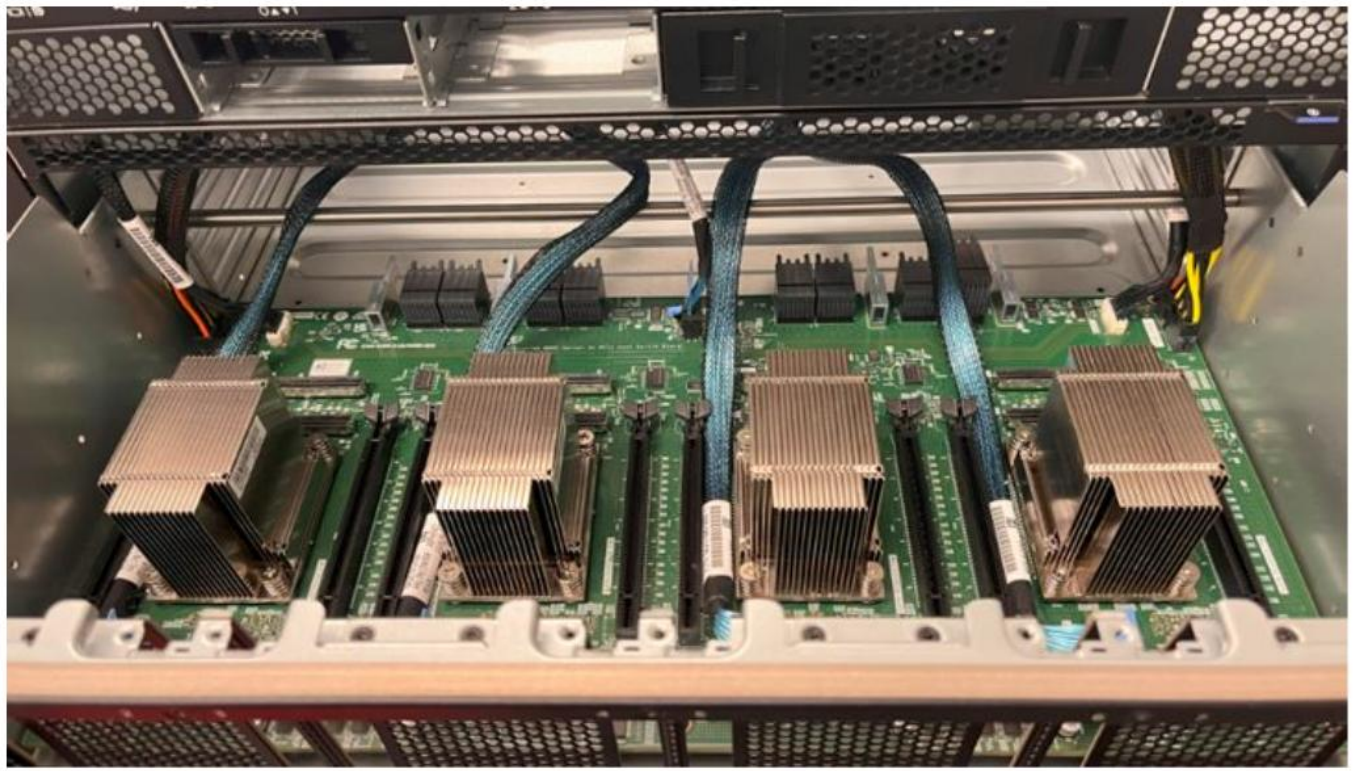


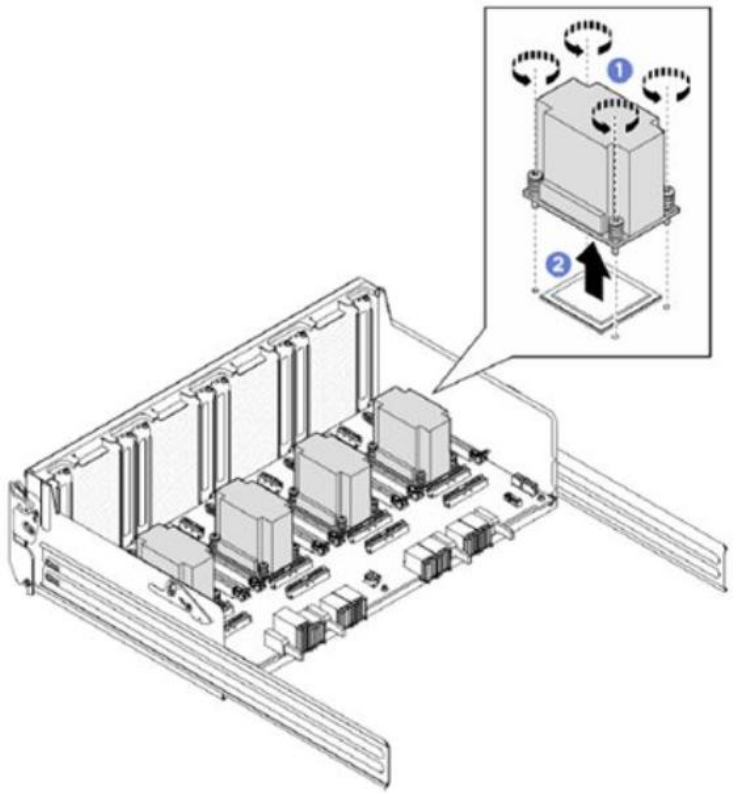


For the complete system board assembly replacement procedures, refer to the *Hardware replacement procedures* section of the *SR780a V3 User Guide* on Lenovo Docs.

PCIe switch board replacement tips

Before removing the PCIe switch board, the heat sinks on the board must be removed. The heat sinks are screwed into threaded holes in the switch drawer.





Note: For complete PCIe switch board replacement procedures, refer to the *Hardware replacement procedures* section of the *SR780a V3 User Guide* on Lenovo Docs.

Cable replacement tips

Cable routing on the SR780a V3 is more complex than on other systems. Although there are labels on cables and next to each connector, service engineers might still get confused when replacing cables.

When replacing a system board, GPU board, or switch board in the SR780a V3, it is recommended that you take pictures of the cable routing before disconnecting anything.

For more information about SR780a V3 cable routing, refer to the *Internal cable routing* section of the *SR780a V3 User Guide* on Lenovo Docs.

Internal cable routing view

Click the following links see internal cable routing views of the SR780a V3.

- Rear fan and NVSwitch leakage sensor cables
- GPU leakage sensor and power cables
- Sideband and power cables -1
- Sideband and power cables -2
- Power and integrated diagnostics panel cables
- CPU complex cables
- NVMe cables
- Other cables -1
- Other cables -2

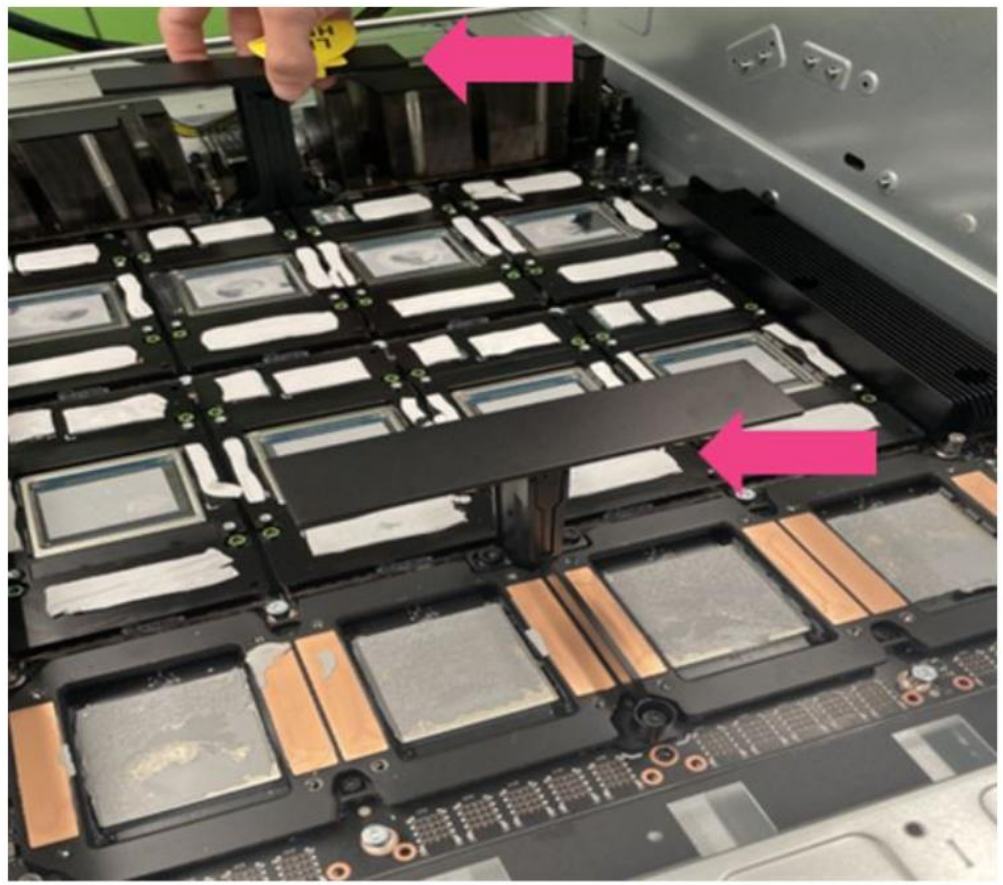
MCIO replacement tips

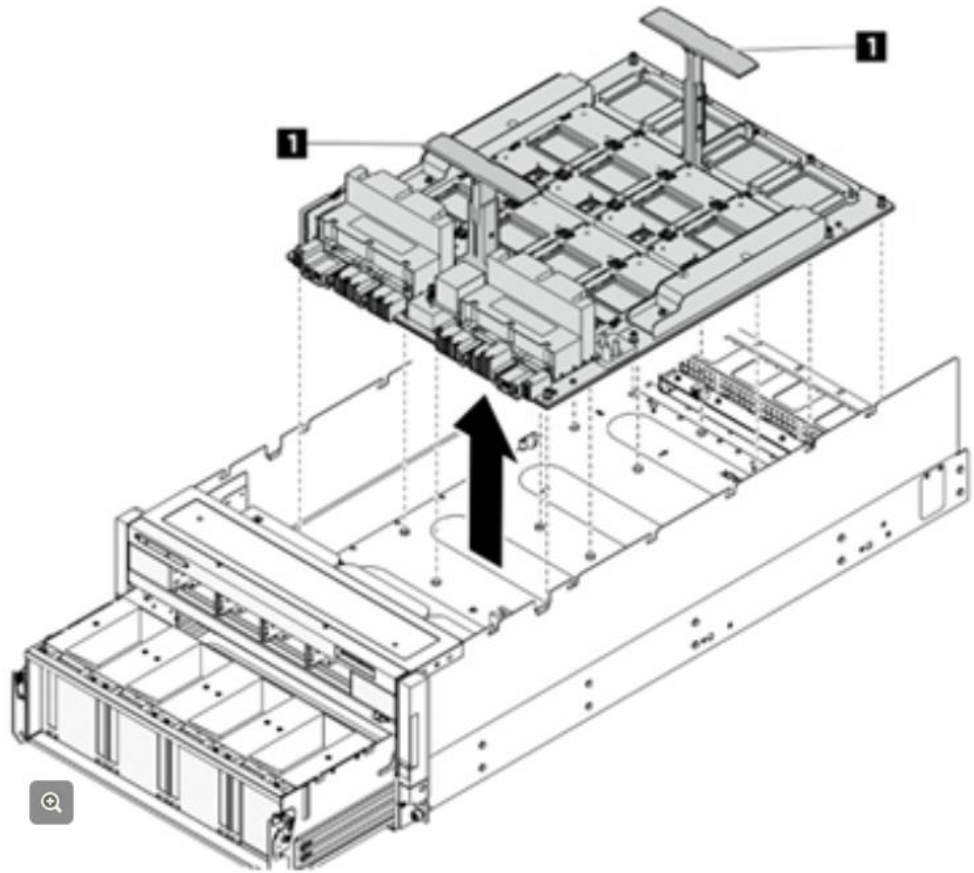
When replacing the MCIO cables from the processor board to the PCIe switch board, make sure to check whether the MCIO cable type is long or short, pre-bend a or pre-bend b, and what other cables it is bundled with. New MCIO cables (long or short) each have only one FRU number. The servicer should bend the MCIO cable to pre-bend a or pre-bend b as needed. If the cable is replaced and bundled incorrectly, it might affect servicing of the PCIe switch shuttle.

For more information about SR780a V3 processor board to PCIe switch board cable routing, refer to the *Internal cable routing* section of the *SR780a V3 User Guide* on Lenovo Docs.

GPU complex handles

To replace the NVIDIA GPU complex or GPU baseboard, unfasten the 17 Torx T15 captive screws on the GPU base plate. Install the handles and hold them when replacing the GPU complex. Do not hold the GPU complex by its edges.





Summary

After completing the course, you will be able to:

- Describe the ThinkSystem SR780a V3 and its components
- List the SR780a V3 specifications
- Describe the SR780a V3 configurations and block diagrams
- Describe the SR780a V3 management tools
- Describe the problem determination steps and explain how to troubleshoot issues with the SR780a V3