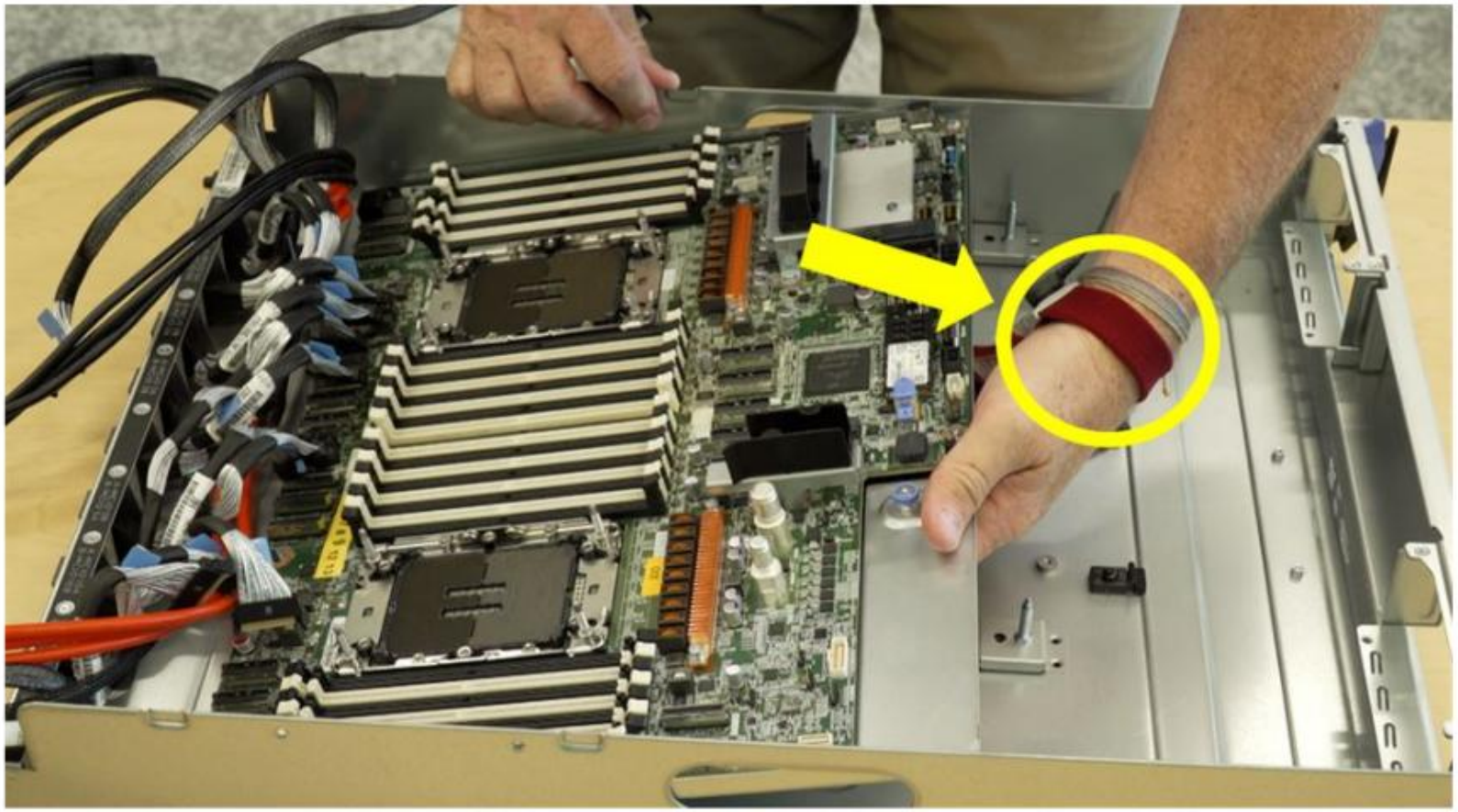
Hardware replacement tips

Part replacement highlights

Lenovo

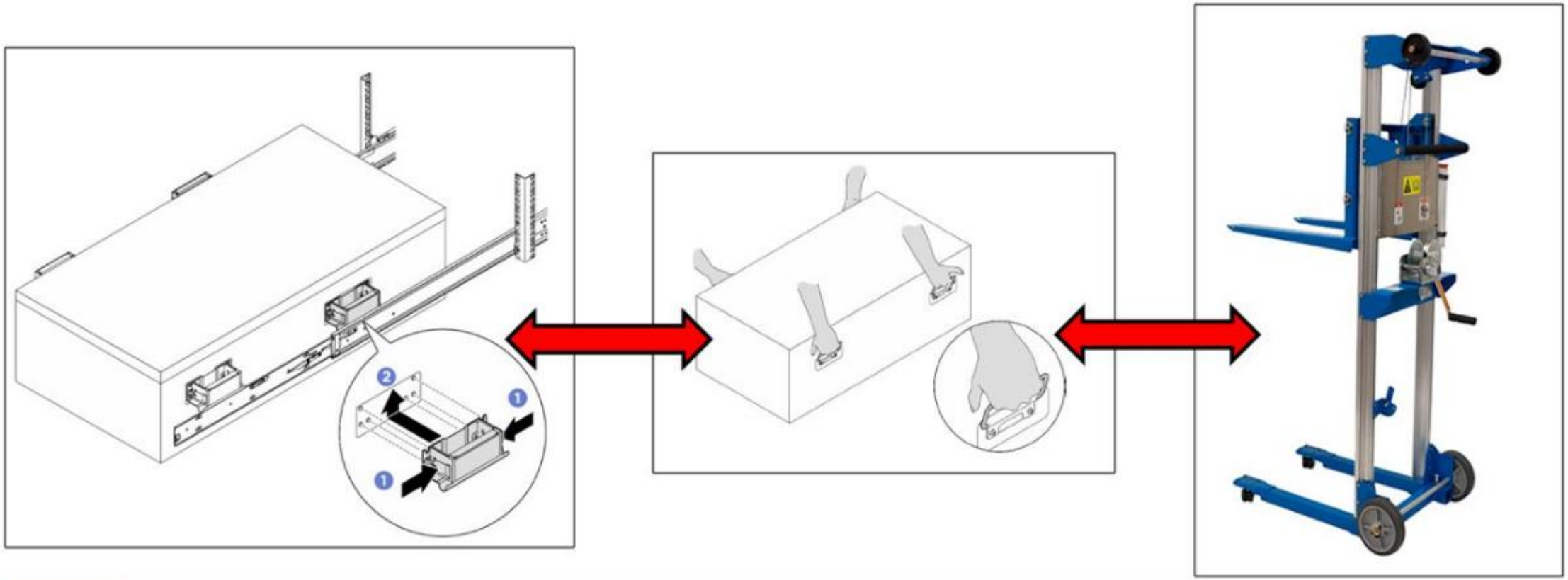
ESD wrist strap

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.

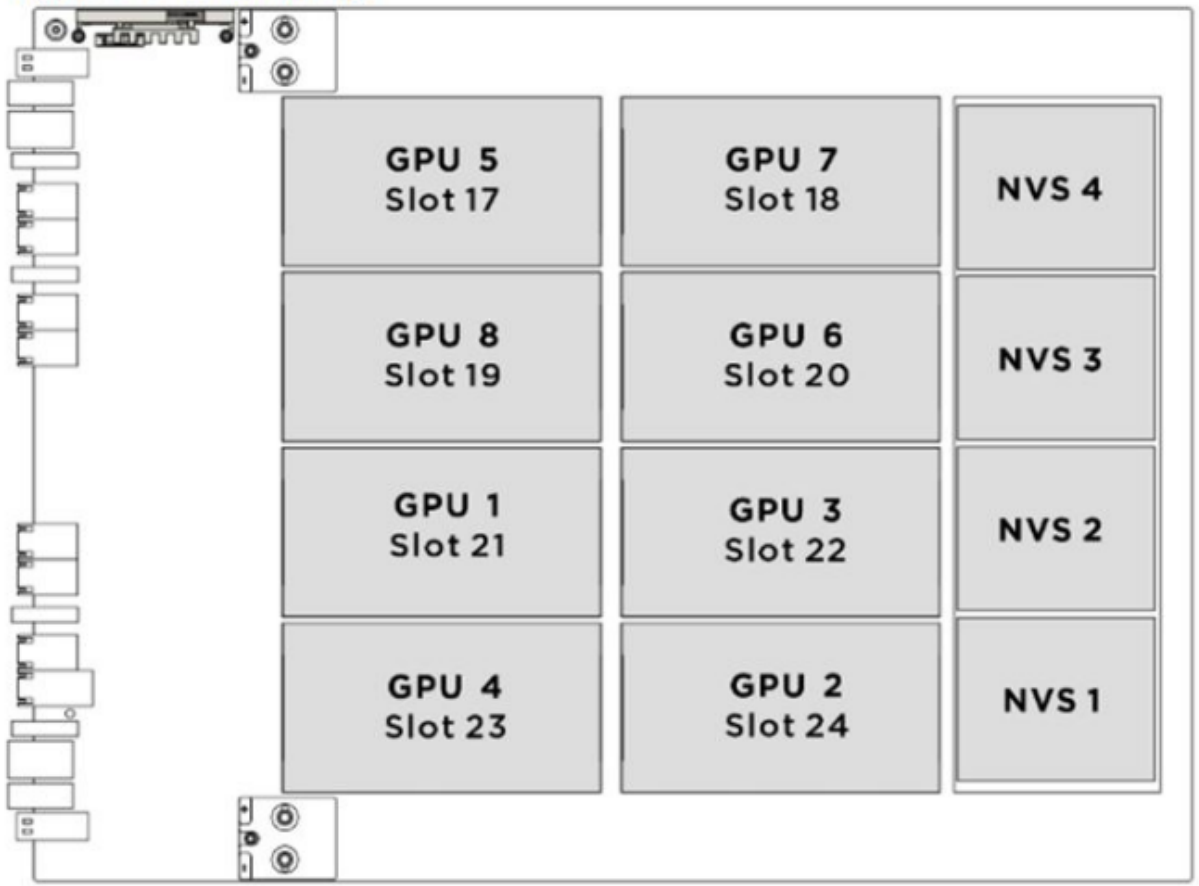


Replacing parts in a GPU water loop

- This task must be carried out by trained technicians
- A T15 head torque screwdriver is required
- Identify the module component and location before replacement
- Follow the putty pad and phase change material (PCM) replacement guidelines
- It is recommended to clean the PCM while it is in a liquid state
- PCM and putty pads cannot be reused
- PCM and putty pads must be replaced every time the water loop is removed

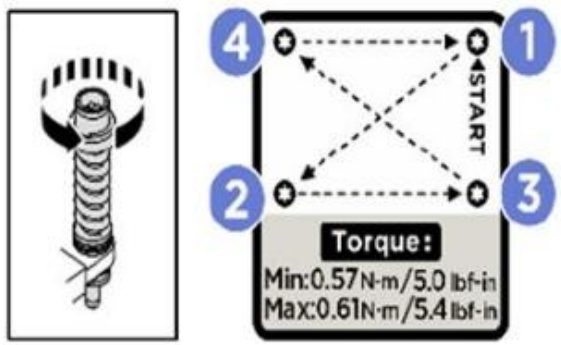
The following illustration shows the GPU numbering and corresponding slot numbering in XCC.

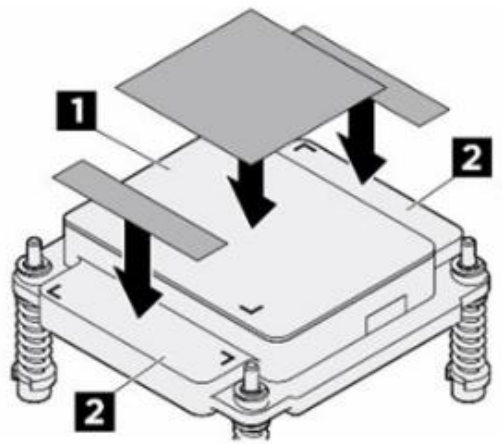
Figure 1. GPU numbering



Replacing the NVSwitch cold plate module

- Follow the screw sequence and torque setting specified on the label to fully loosen or tighten the Torx screws
- Align the PCM with the area marked **1** on the bottom of the cold plate, and then press and hold for 3 to 5 seconds until it is firmly attached. Then, align the putty pad with the areas marked **2**, and attach them to the cold plate





The following illustration shows the components for NVSwitch cold plate module

Figure 2. NVSwitch cold plate module components identification

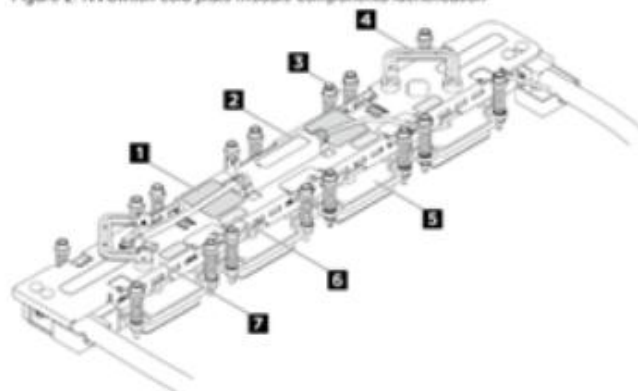
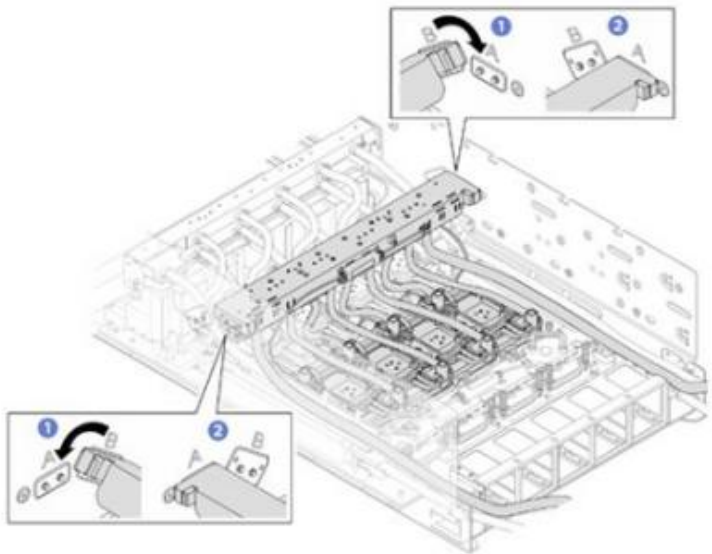


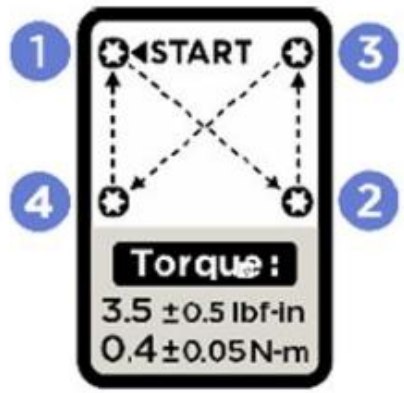
Table 1. NVSwitch cold plate module components

1 NVSwitch cold plate torque label	2 Leakage detection sensor module
3 Hose tie	4 Handle
5 NVSwitch cold plate	6 NVSwitch slot number label
7 Manifold	

Replacing the front and rear GPU cold plate modules -1

- Reposition the rear H100/H200 GPU cold plate module to create space for the front H100/H200 GPU cold plate module
- Follow the screw sequence and torque setting specified on the label to fully loosen or tighten the Torx screws
- Use the shipping brackets for cold plate module replacement





The following illustration shows the components for front H100/H200 GPU cold plate module

Figure 2. Front H100/H200 GPU cold plate module components identification

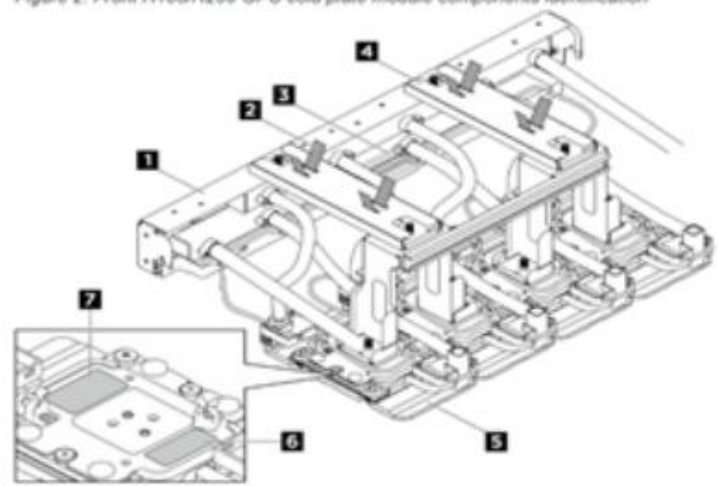
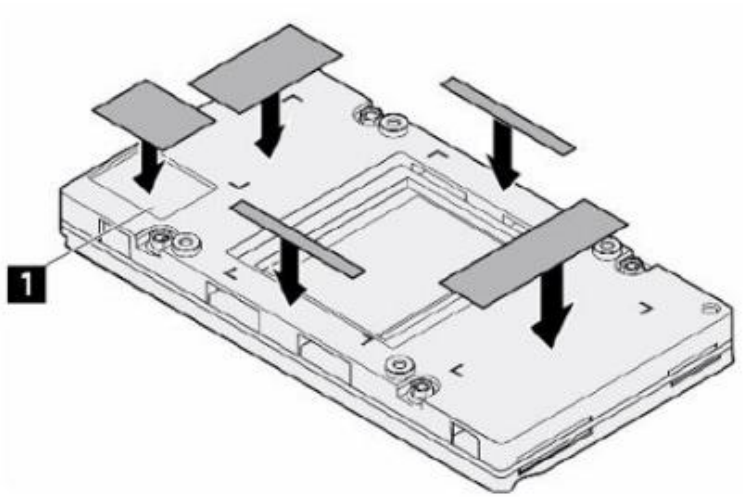


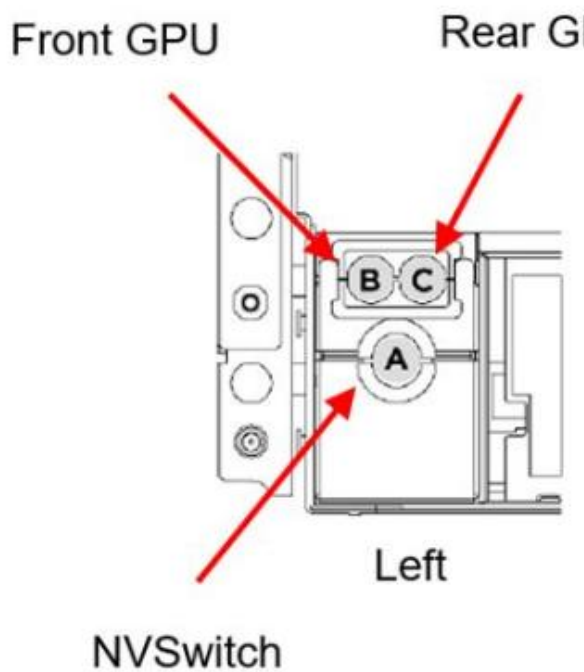
Table 1. Front H100/H200 GPU cold plate module components

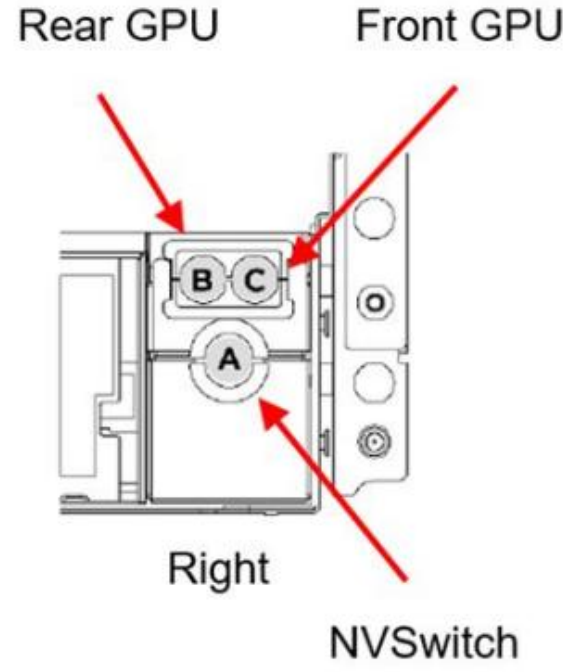
1 Manifold	2 Hose tie
3 Leakage detection sensor module	4 Shipping bracket
5 GPU cold plate	6 GPU slot number label
7 GPU cold plate screw torque label	

Replacing the front and rear GPU cold plate modules -2

- During removal, reposition the rear H100/H200 GPU cold plate module by moving the guide pins from B to A, and then A to B during installation
- It is recommended that you clean the PCM while it is in a liquid state
- Replace the five putty pads on the GPU, aligning them with the GPU VR (shown as **1** below) and the markings
- Ensure the hoses are in the correct hose holders

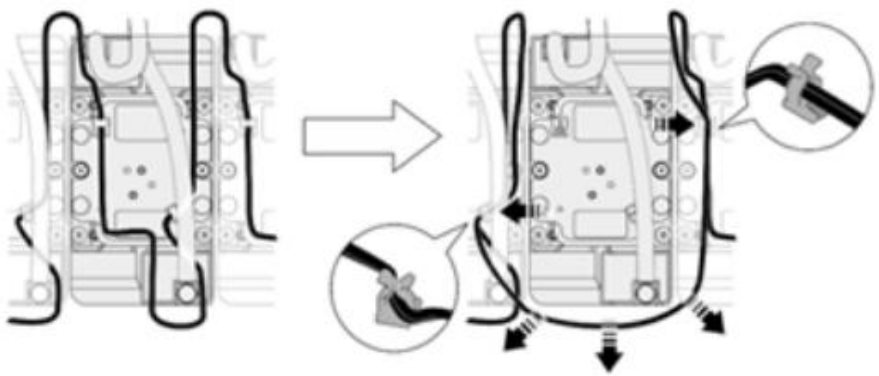


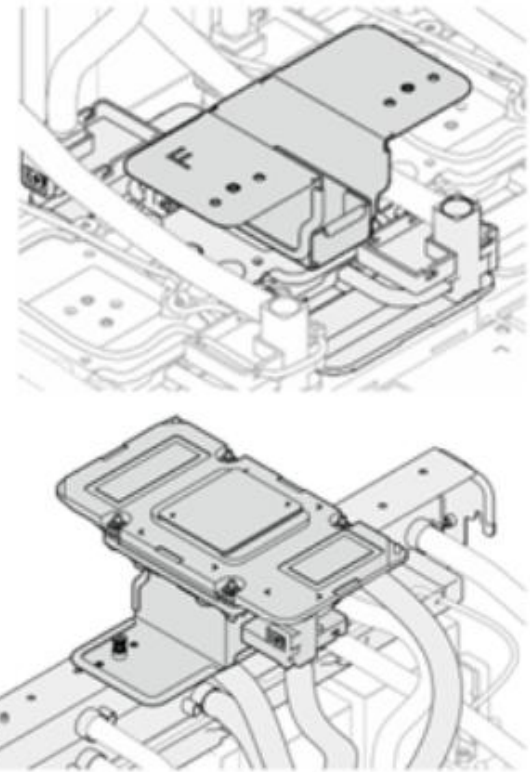


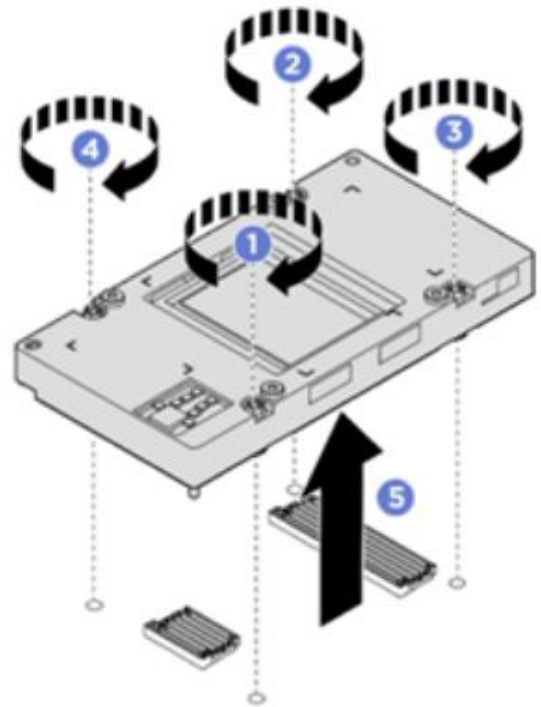


Replacing the front and rear GPUs -1

- Remove the leakage detection sensor module cable from the cable clips, route it away from the cold plate, and reinstall it in the cable clips adjacent to the cold plate
- Use the service brackets to remove the GPU cold plate or place it onto the H100/H200 GPU
- Follow the sequence to loosen or tighten the screws with a torque screwdriver set to 0.45 to 0.56 Newton-meters (4.0 to 5.0 inch-pounds)

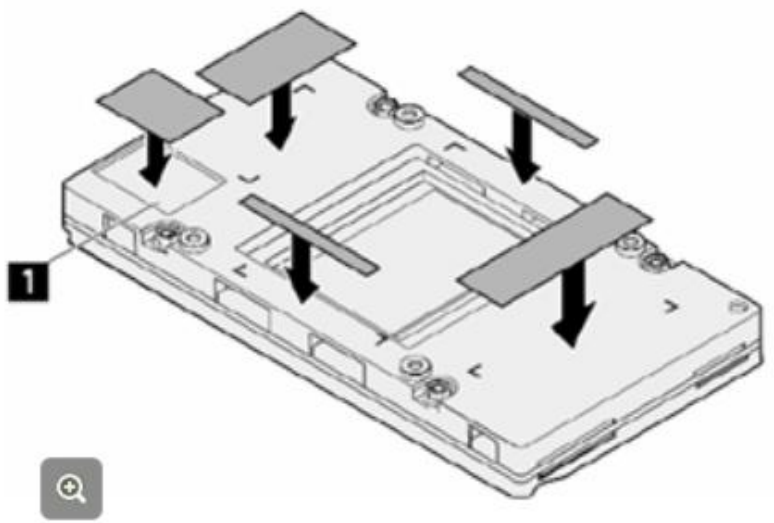


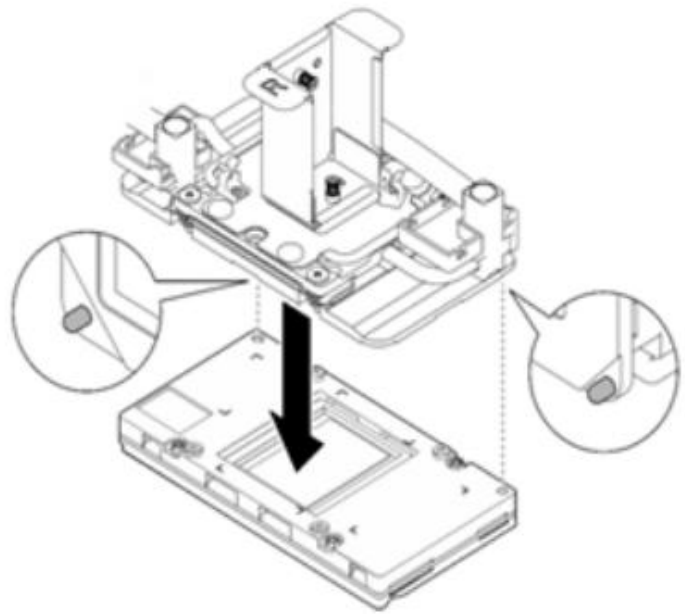


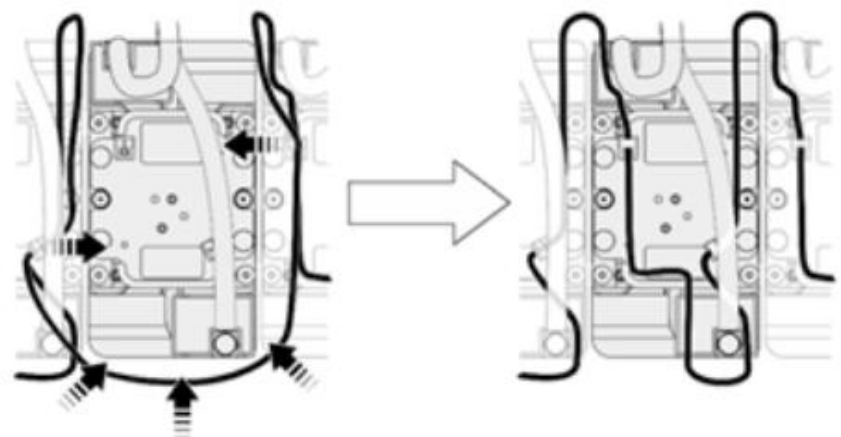


Replacing the front and rear GPUs -2

- Replace the five putty pads on the GPU, aligning them with the GPU VR (shown as **1** below) and the markings
- Reinstall the leakage detection sensor module cable on the GPU cold plate
- During removal, reposition the rear H100/H200 GPU cold plate module by moving the guide pins from B to A, and then A to B during installation

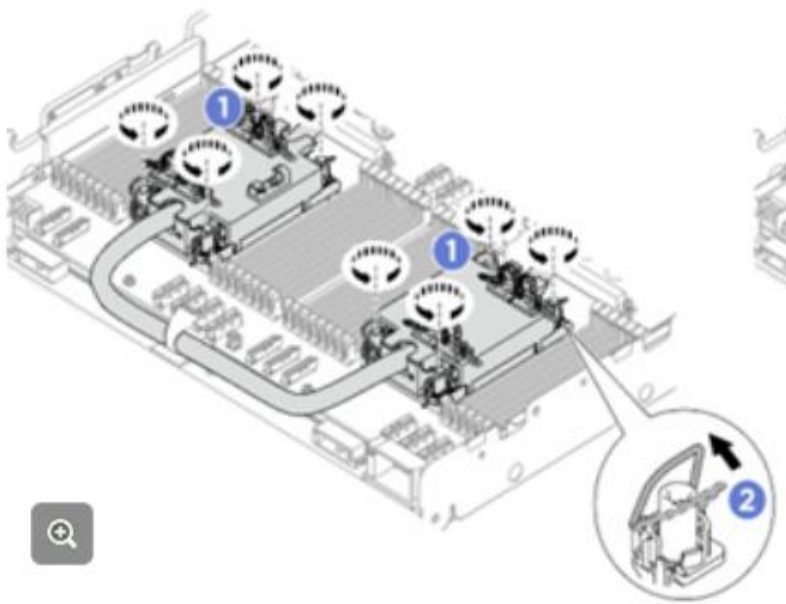


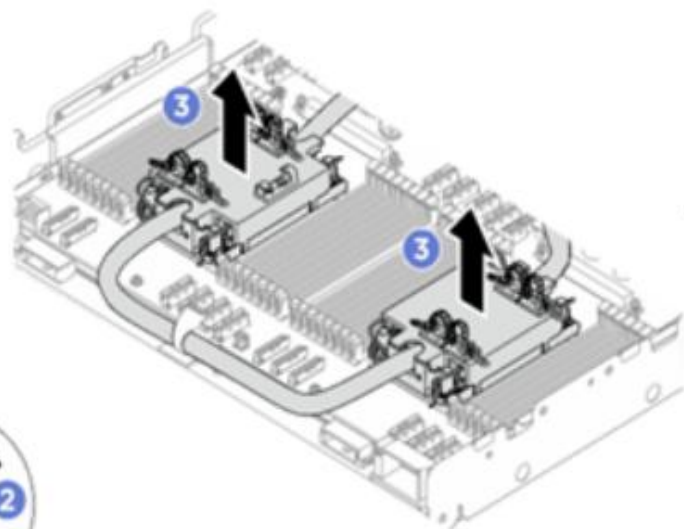


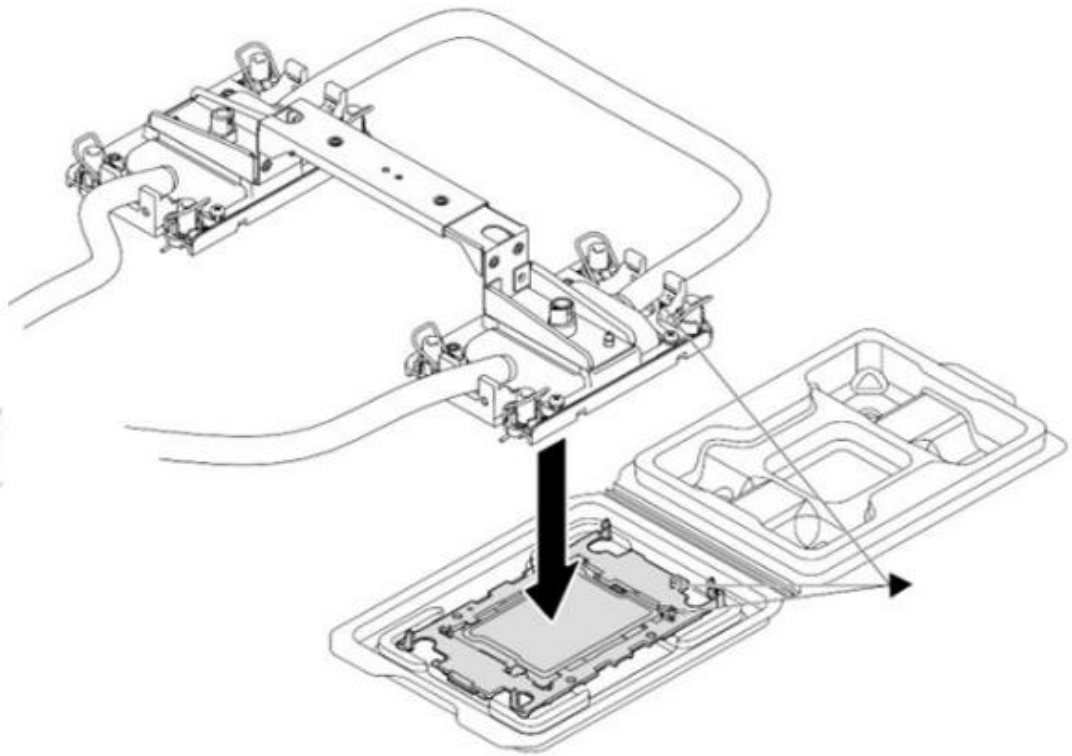


Replacing a processor Direct Water Cooling Module

The SR780a V3 processor Direct Water Cooling Module (DWCM) replacement procedure requires a Torx T30 torque screwdriver. Follow the removal or installation sequence shown on the cold plate assembly to loosen or tighten the Torx T30 nuts. (The torque required to fully loosen or tighten the nuts is 1.1 Newton-meters +/- 0.2 Newton-meters, 10 inch-pounds +/- 2.0 inch-pounds.)



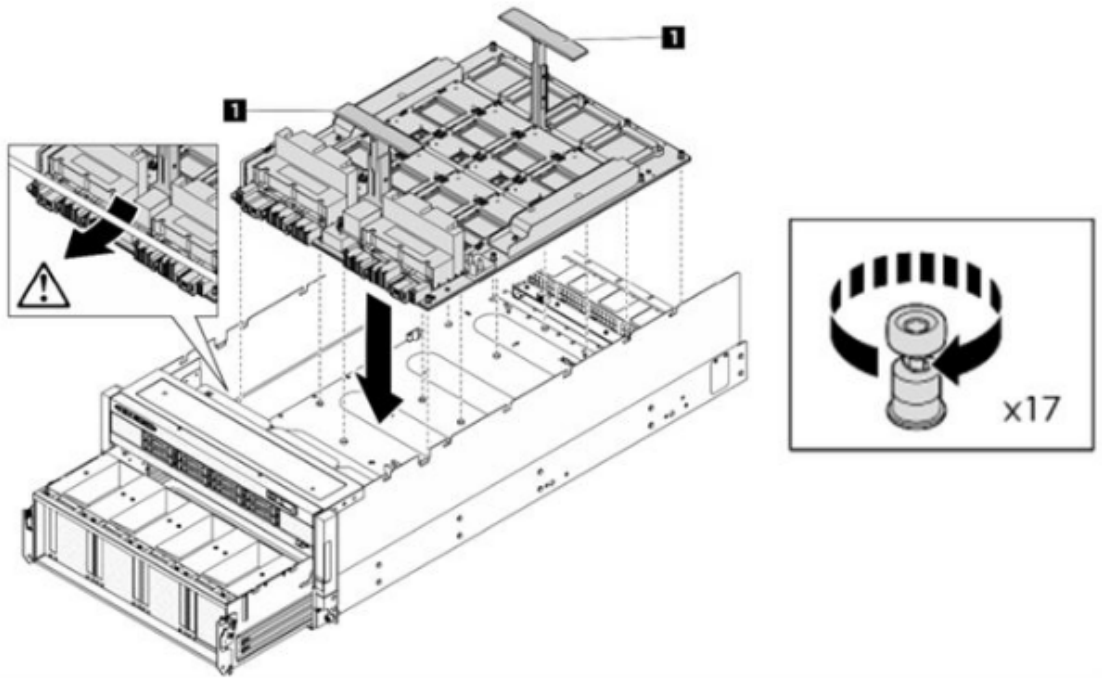


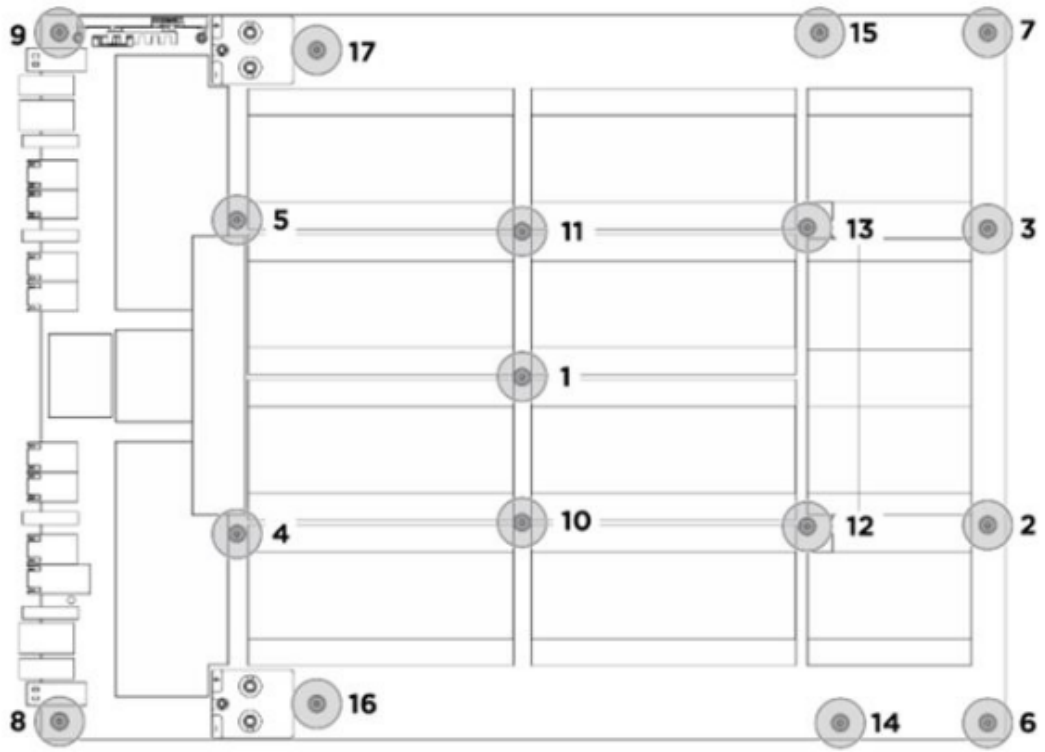


Assembling the processor with a DWCM

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 (the torque required for the screws to be fully loosened or tightened is 0.6 Newton-meters, 5.3 inch-pounds)
- Follow the sequence to fasten the 17 Torx T15 captive screws to secure the GPU baseboard

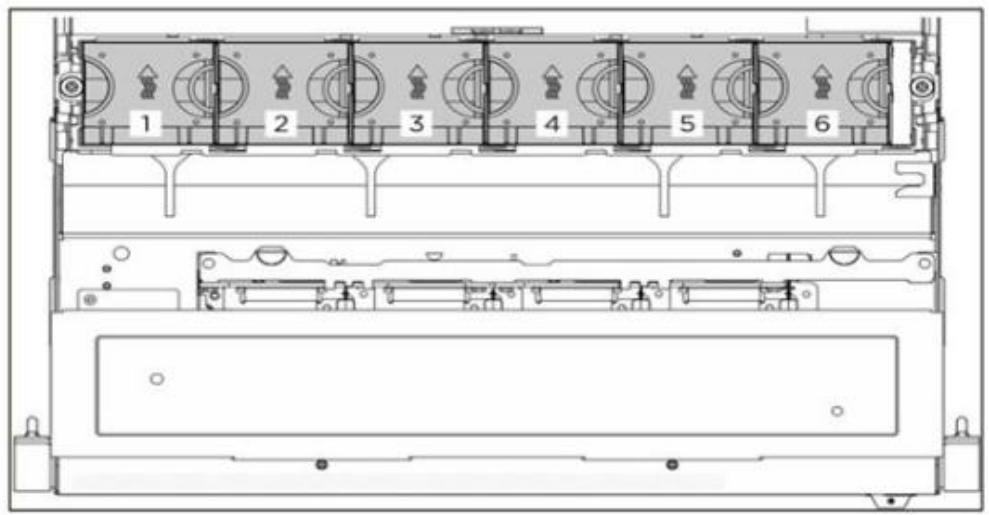




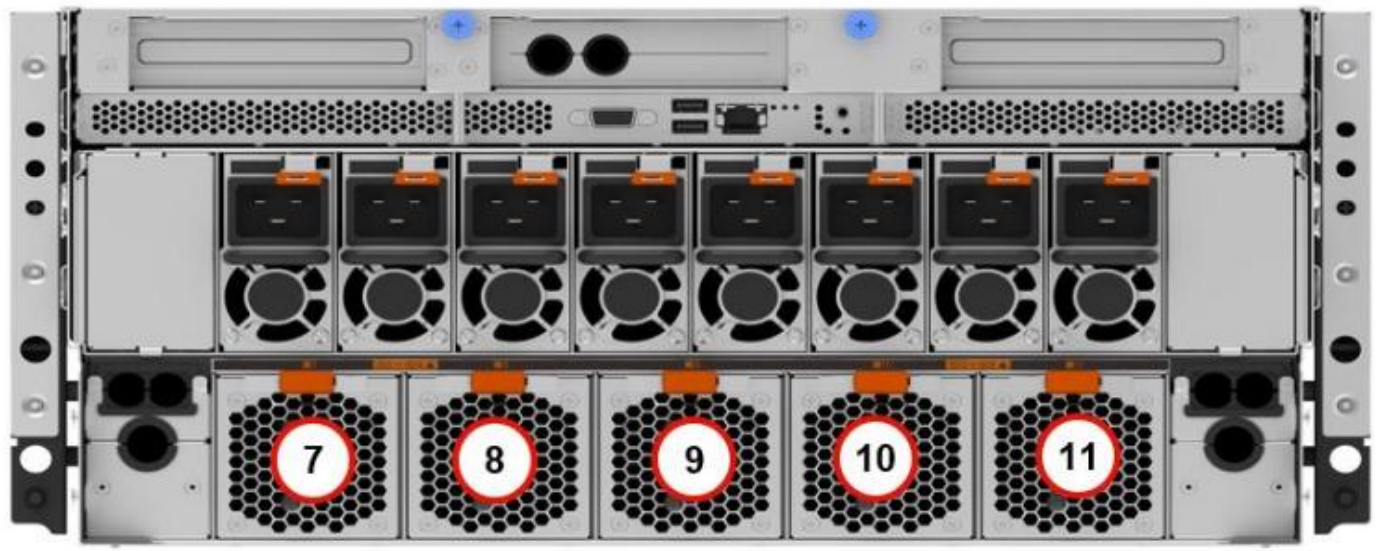
Screw installation sequence

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

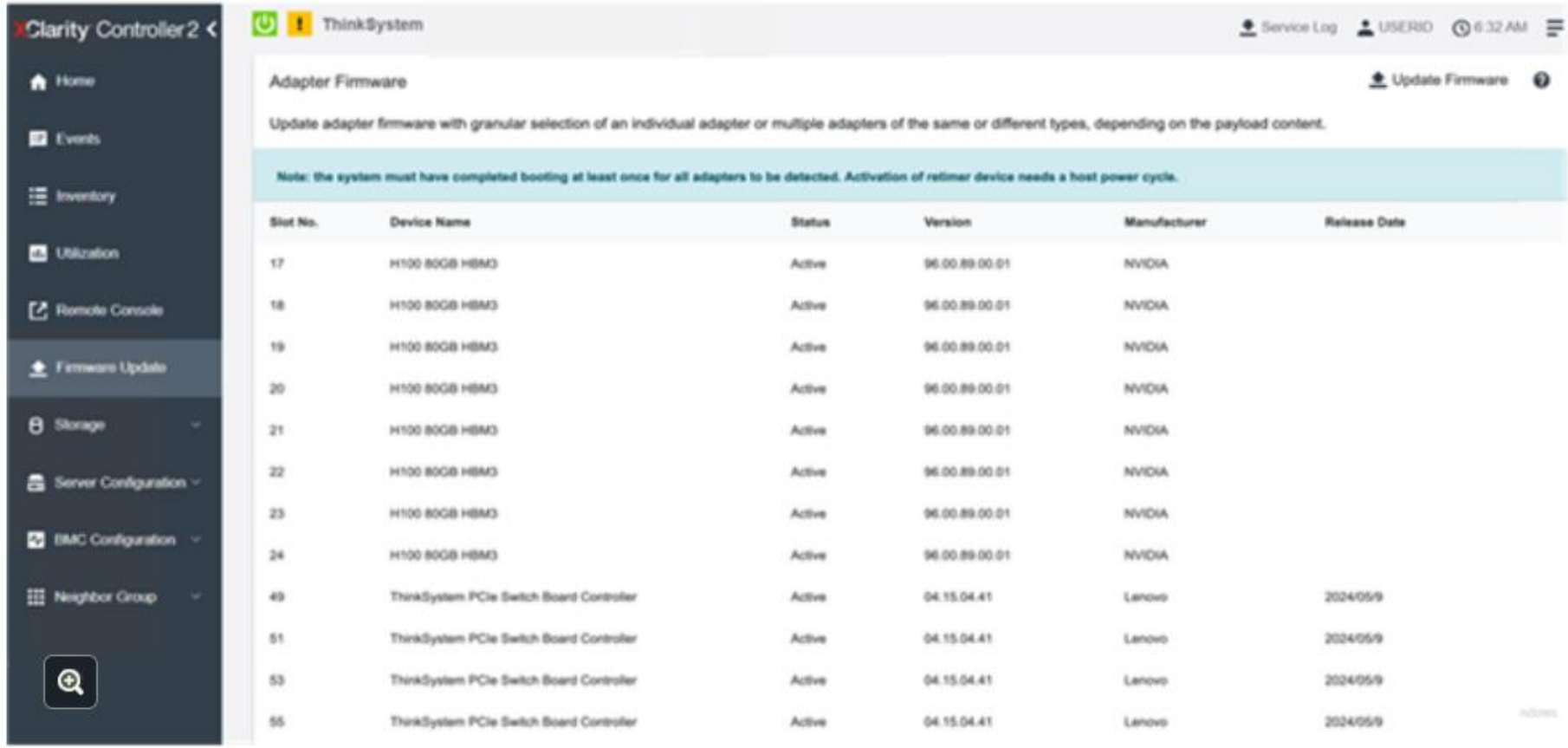
Updating the VPD

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

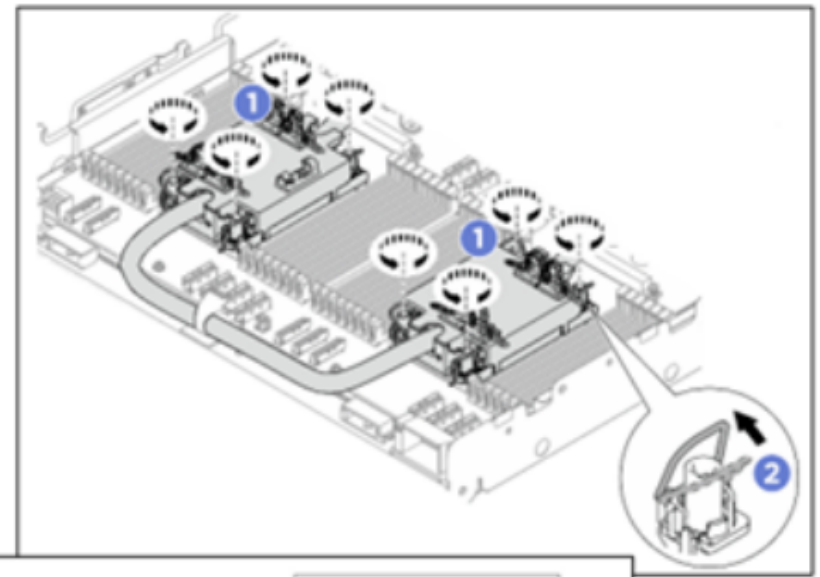
There is a single firmware package for all GPU-related components. (This applies to NVIDIA GPUs.) Use XCC / OneCLI to perform the task. You do not need to use any specific NVIDIA tools to perform a GPU or GPU board firmware update on an SR780a V3.

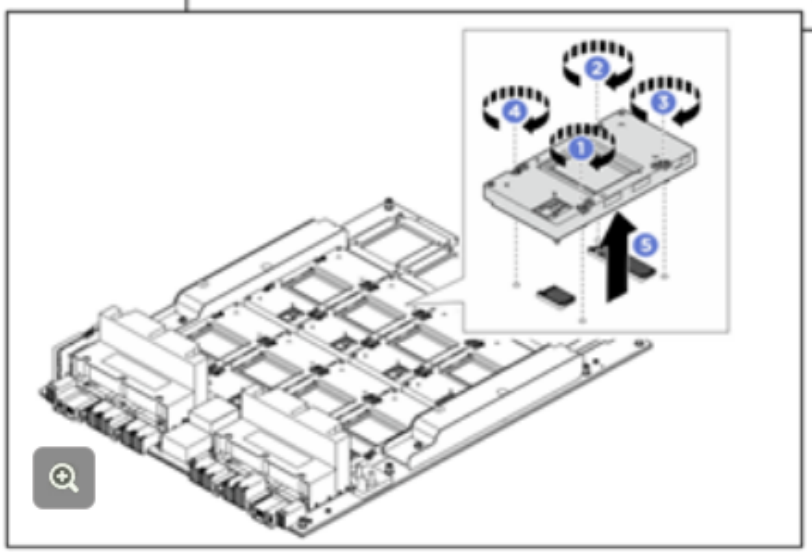


Replacing parts with a torque screwdriver

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

- 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.

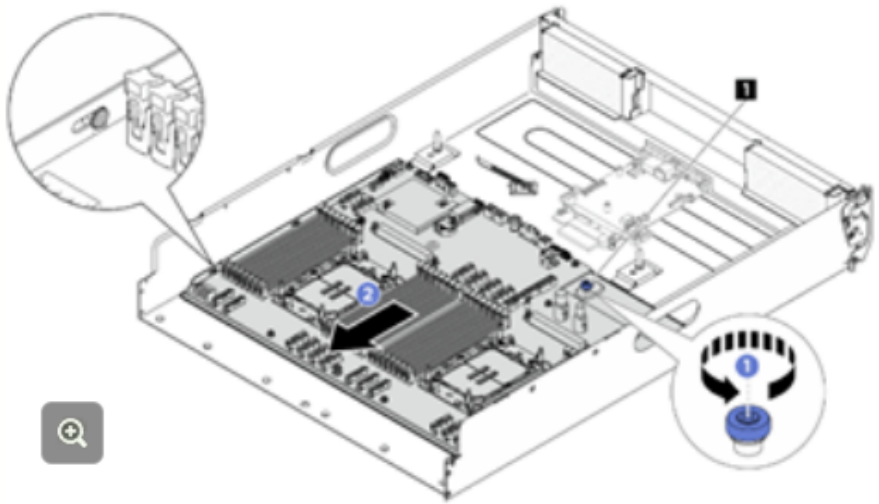
Note: Replacing a part with the wrong torque setting might damage the part.

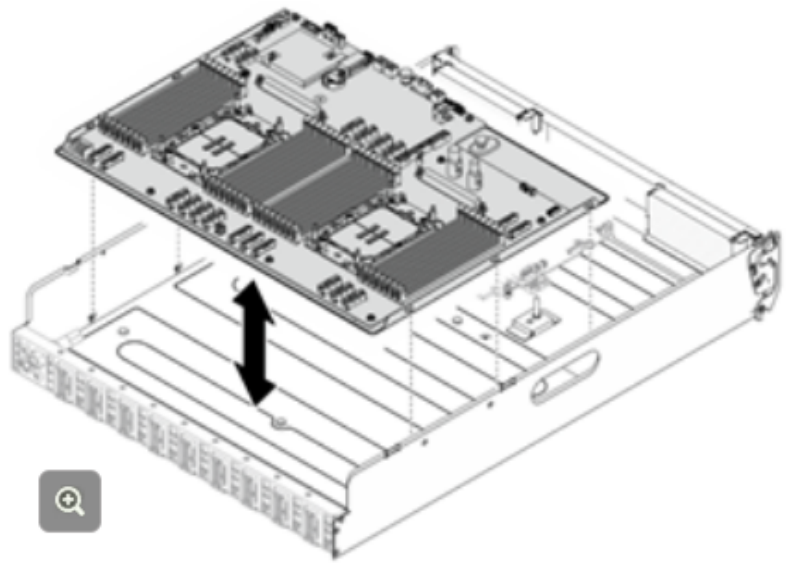
Replacing a processor board or system I/O board

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
- Processor and DWCM assembly
- 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.

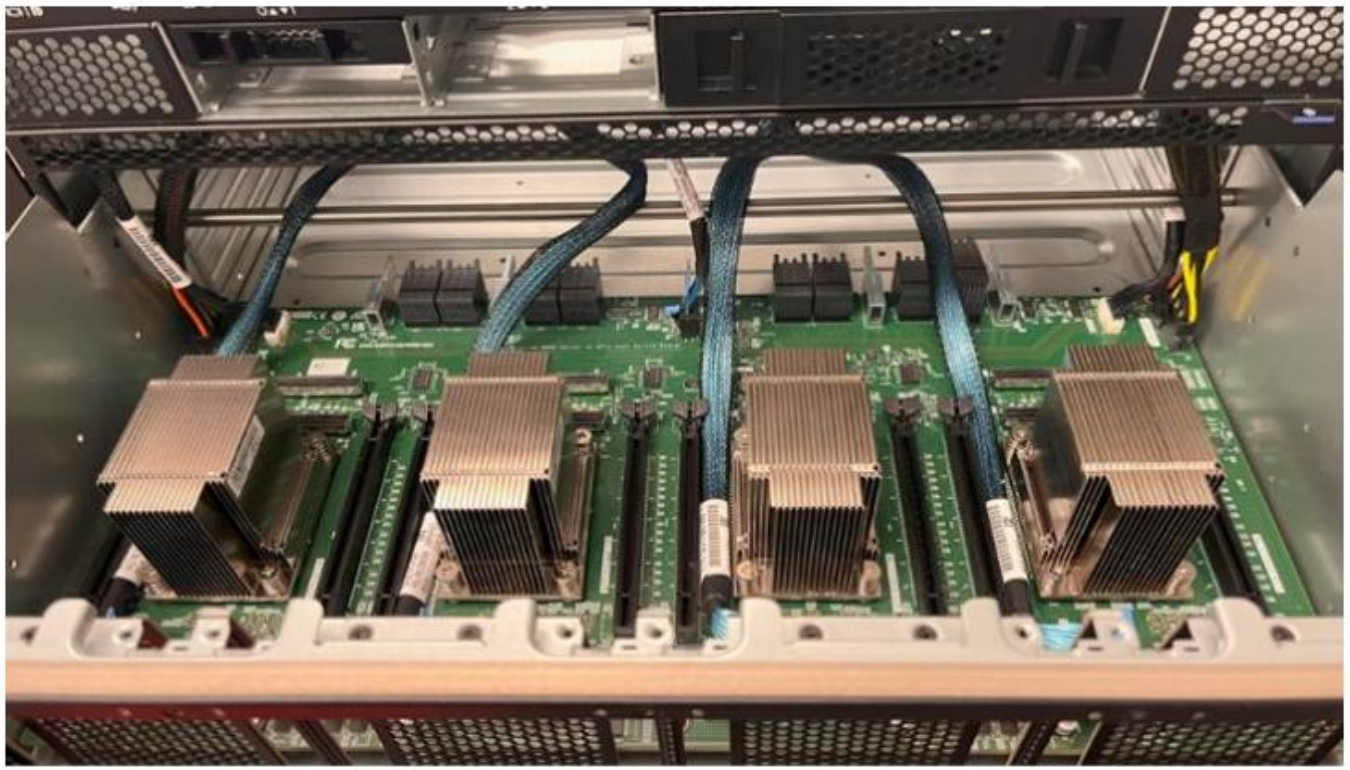


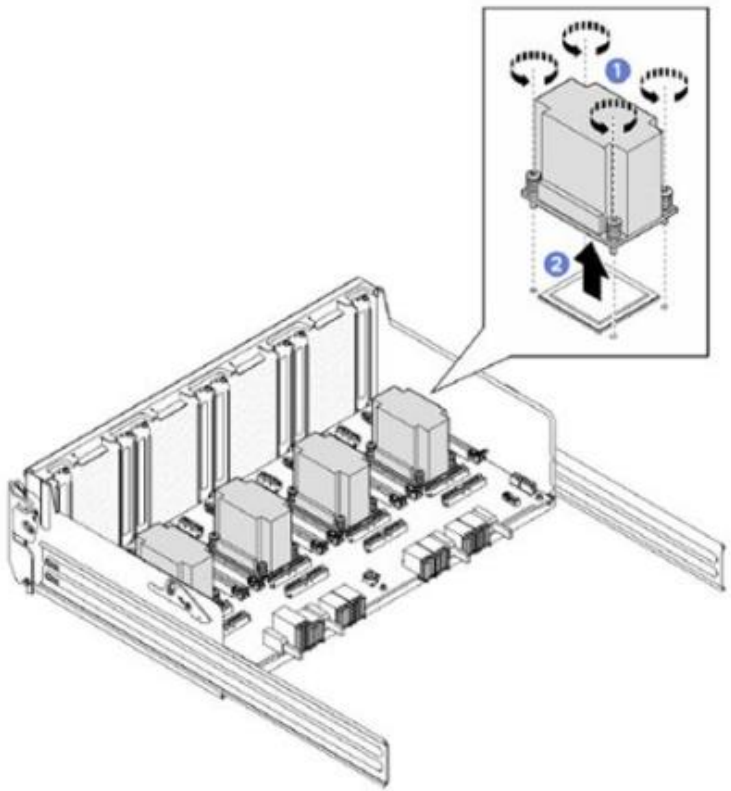


For the complete system board assembly replacement procedures, refer to the *Hardware replacement procedures* section of the *SR780a V3 User Guide* on Lenovo Docs.

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

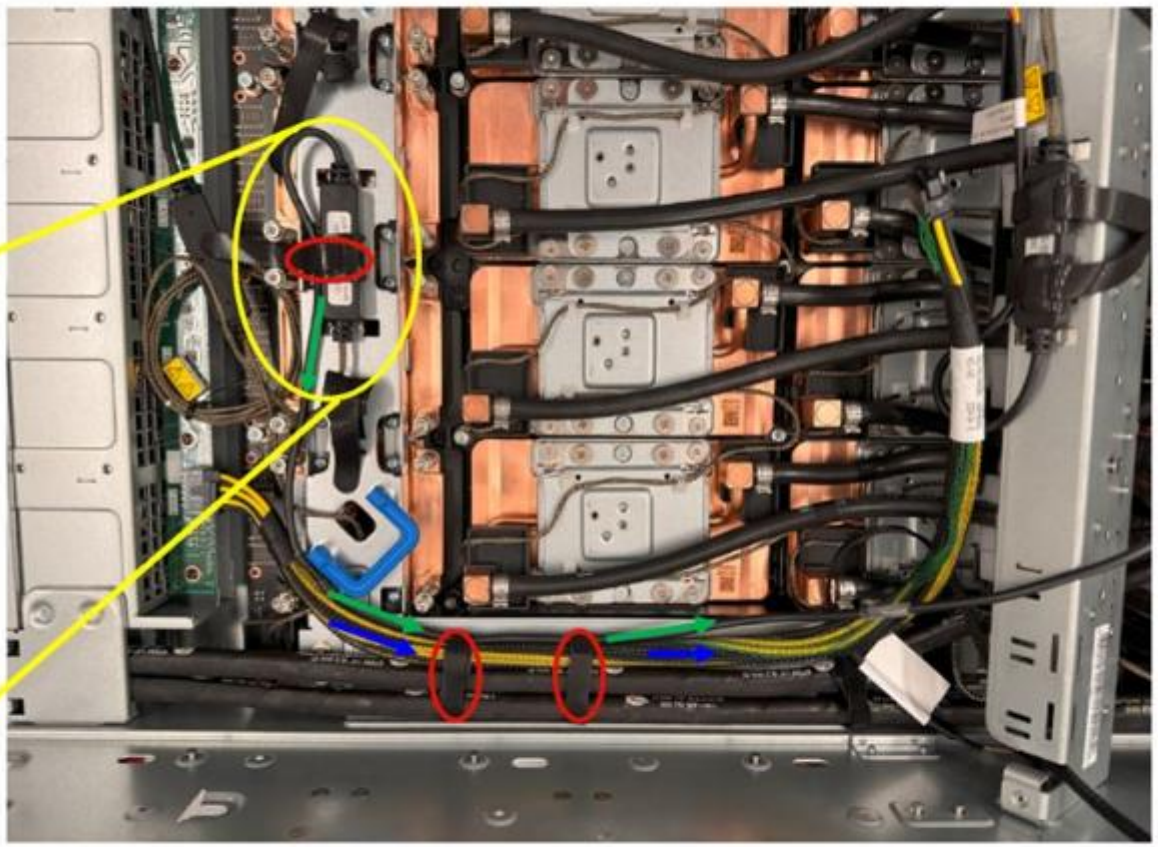
Click the following links see internal cable routing views of the SR780a V3.

- 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

Rear fan and NVSwitch leakage sensor cables

Cable routing path:

- Rear fan cable
- NVSwitch leakage sensor cable
- Velcro tape



Front of the server

Note: All cables should be routed to the side of the hoses and cannot be routed over or under the hoses.

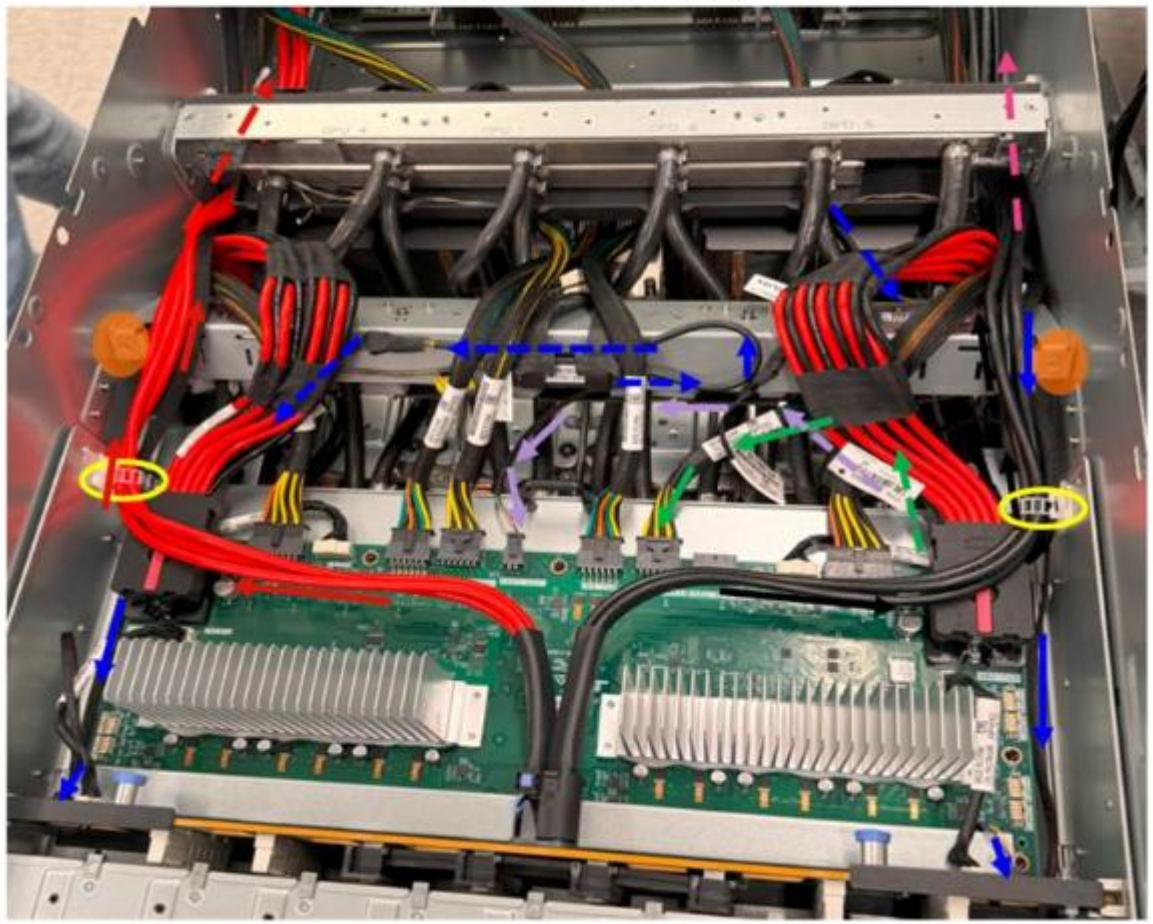
GPU leakage sensor and power cables

Cable routing path:

- Two GPU leakage sensor cables
- GND cable (-)
- High voltage power cable (+)
- Rear fan cable
- NVSwitch leakage sensor cable
- Cable ties
- Cables cannot be routed over the metal steps

Note: A dotted line represents a cable running underneath.

Front of the server



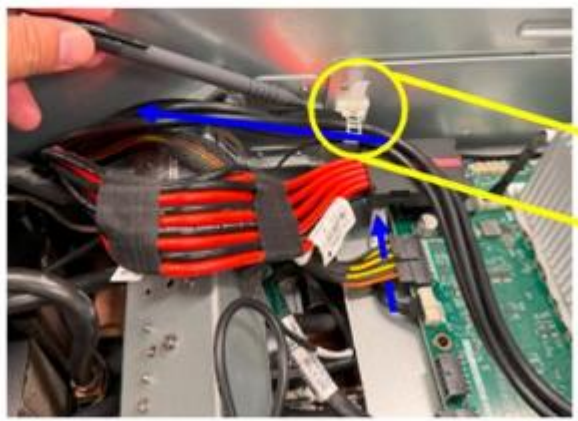
Lenovo

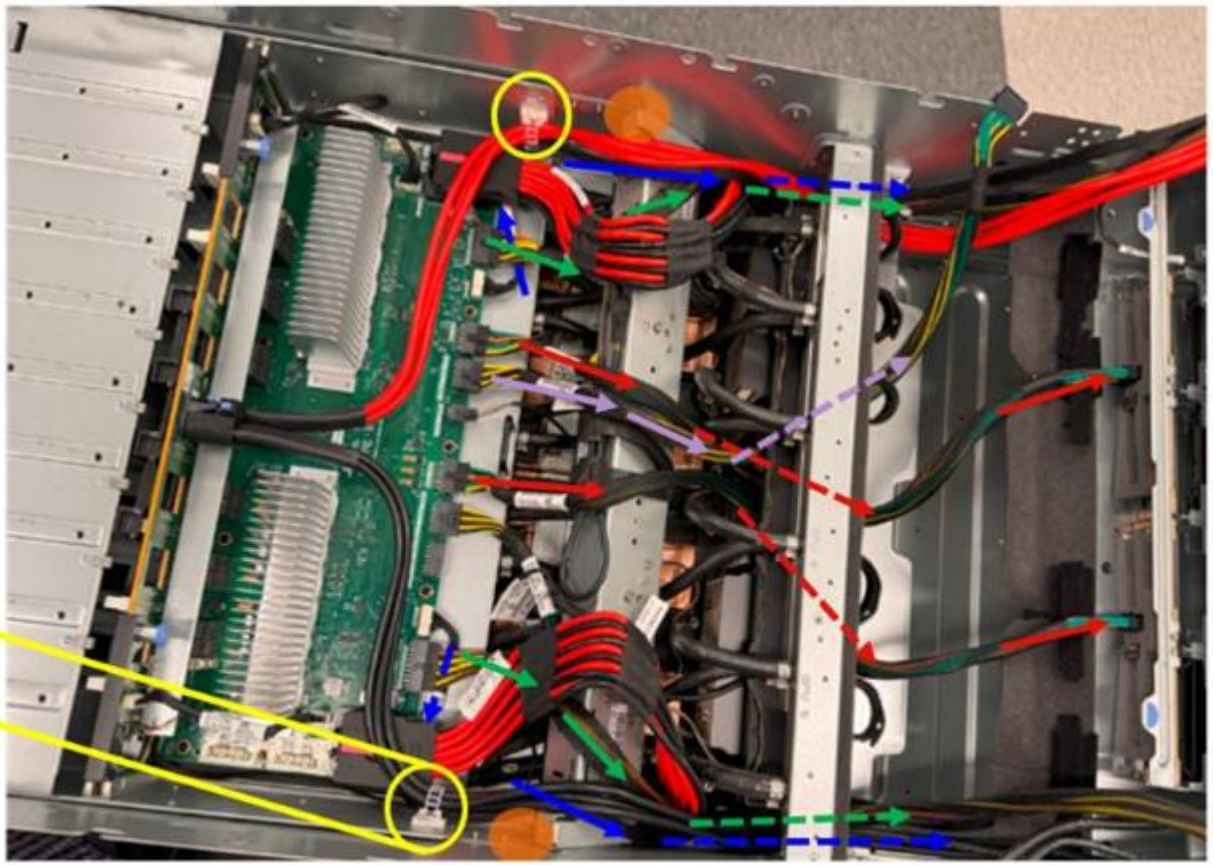
Sideband and power cables -1

Cable routing path:

- Two PCIe switch board sideband cables
- Two PCIe switch board power cables
- HDD backplane power cable
- Front fan power cable
- Cable ties
- Cables cannot be routed over the metal steps

Note: A dotted line represents a cable running underneath.





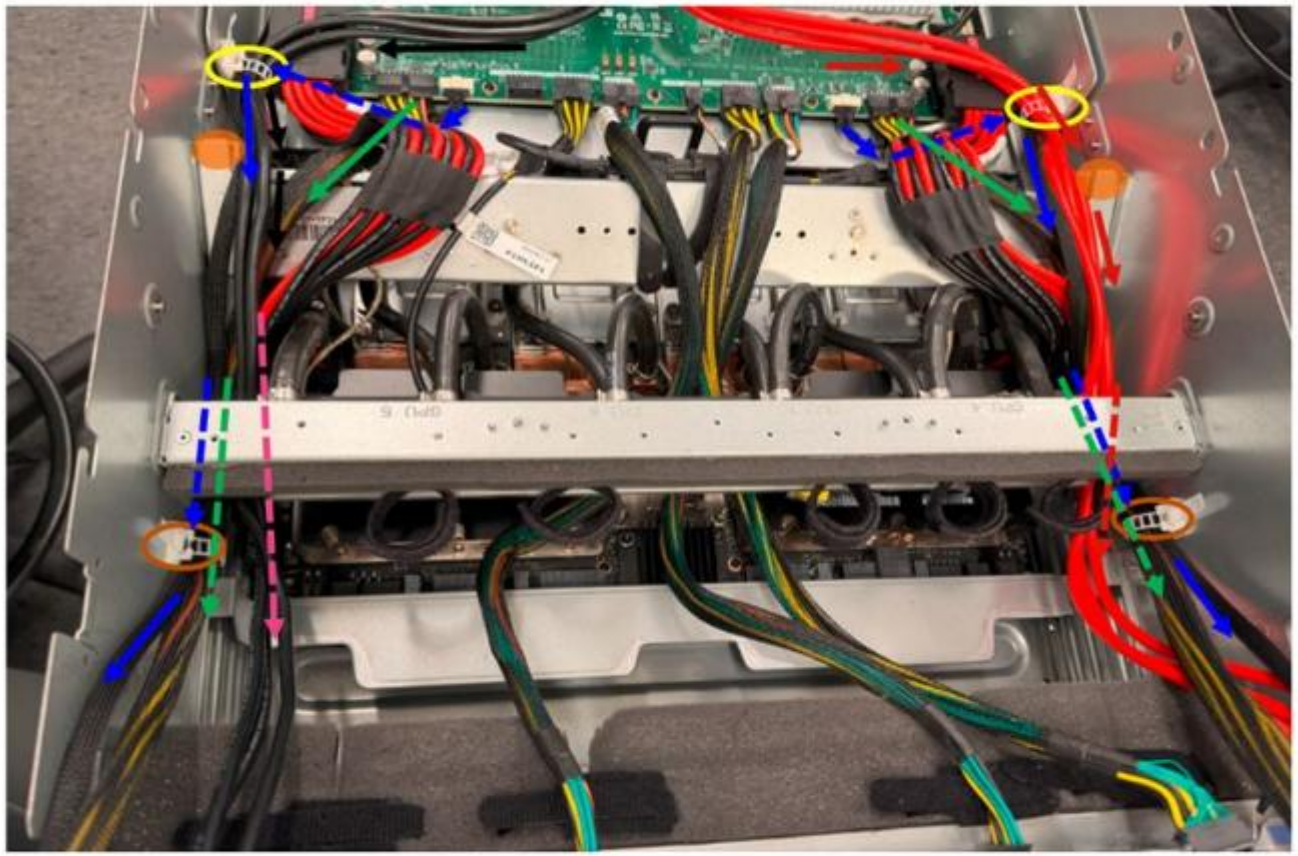
Front of the server

Sideband and power cables -2

Cable routing path:

- Two PCIe switch board sideband cables
- GND cable (-)
- High voltage power cable (+)
- Two PCIe switch board power cables
- NVSwitch leakage sensor cable
- Cable ties
- Cable ties
- Cables cannot be routed over the metal steps

Note: A dotted line represents a cable running underneath.



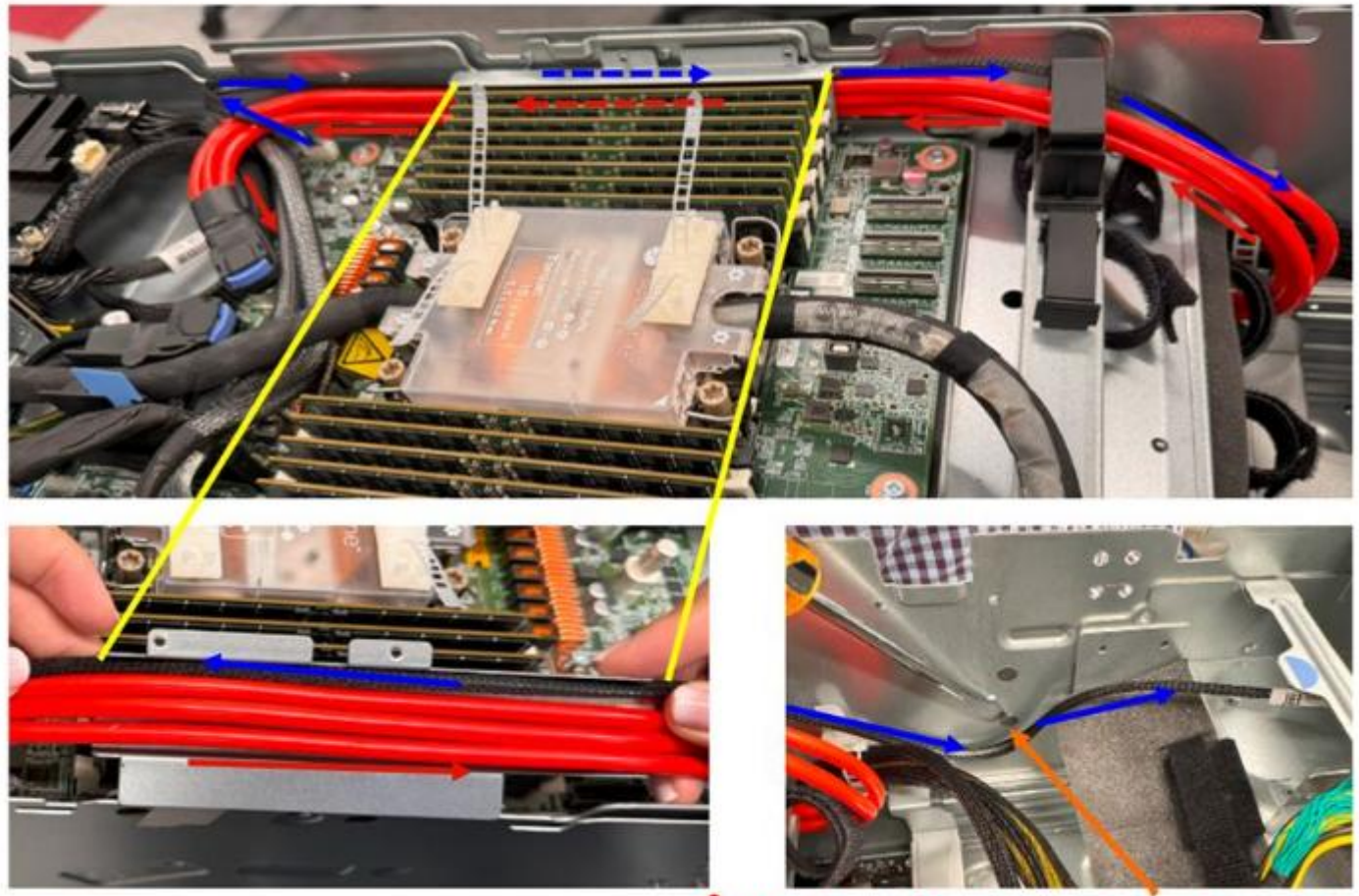
Front of the server

Power and integrated diagnostics panel cables

Cable routing path:

- High voltage power cable (+)
- Integrated diagnostics panel cable

Note: A dotted line represents a cable running underneath.

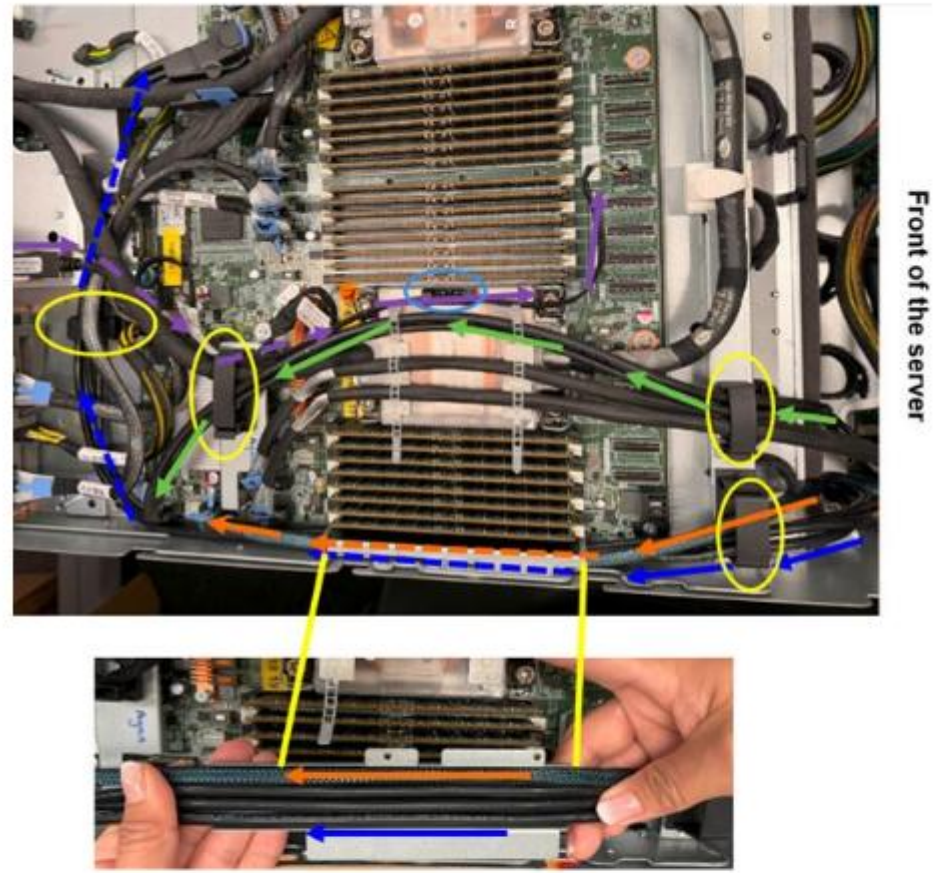


Attention: Route under the circle mark

CPU complex cables

Cable routing path:

- GND cable
- GPU management cable
- FIO (USB/Display cable)
- CPU leakage cable
- Cable ties
- Cable ties

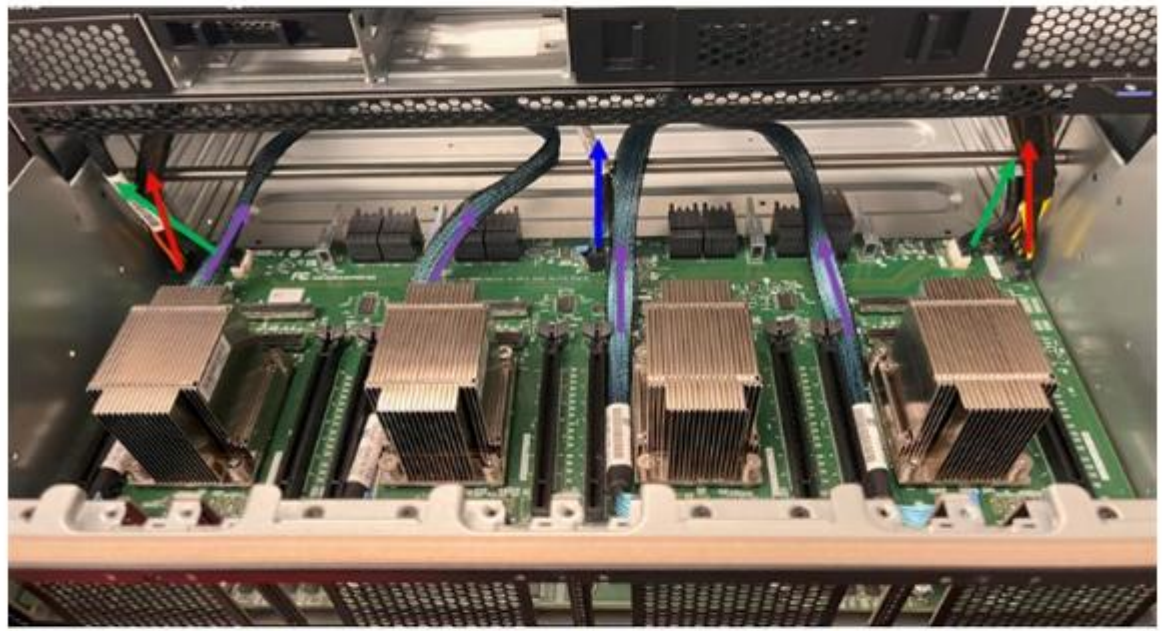


Note: A dotted line represents a cable running underneath.

NVMe cables

Cable routing path:

- GPU management cable
- PCIe switch board sideband cable
- PCIe switch board power cable
- NVMe HDD signal cables



All cables should be routed on top of the cross bar

All HDD signal cables need to be pushed down to the board

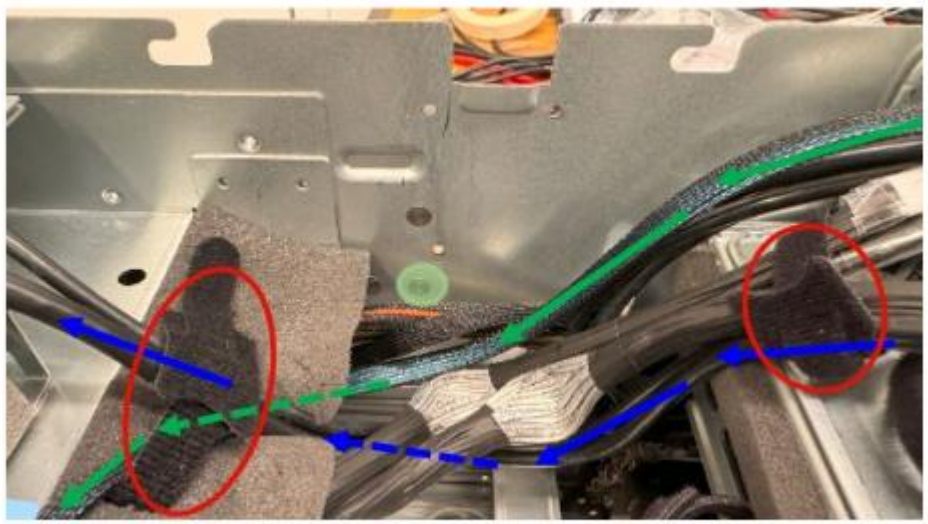
Lenovo

Other cables -1

Cable routing path:

- FIO (USB/Display cable)
- GPU management cable
- Integrated diagnostics panel cable
- Two HDD power cables
- Velcro tape

Note: A dotted line represents a cable running underneath.

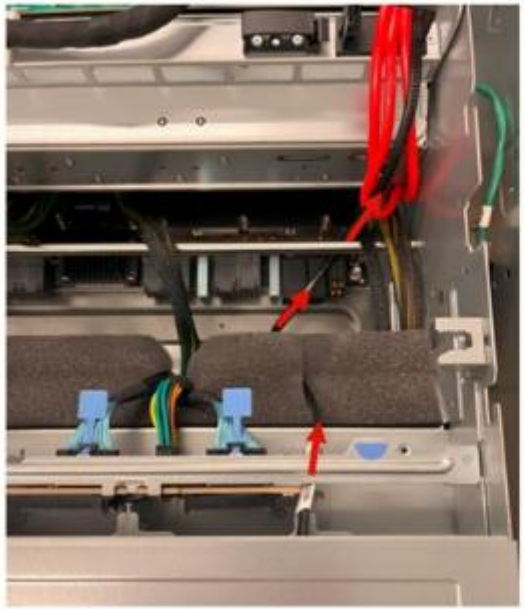


All cables should be routed under the circle marks

Other cables -2

Cable routing path:

- Integrated diagnostics panel cable
- GPU management cable
- FIO (USB/Display cable)



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.

MCIO cable pre-bending and routing tips

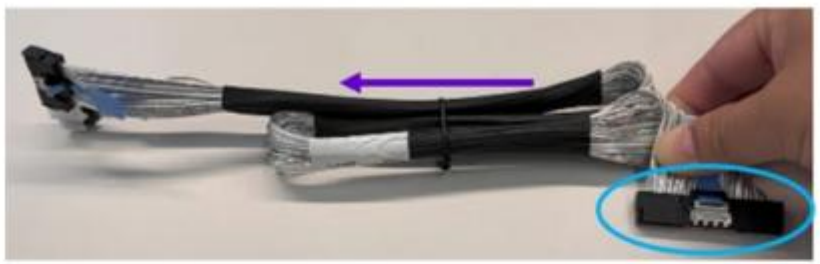
Click the follow links see MCIO cable pre-bending and routing views.

- Cable pre-bending preparation
- Cable pre-bending
- MCIO cable type
- Cable routing shape in the chassis
- MCIO cables
- MCIO cables from the processor board to the switch board -1
- MCIO cables from the processor board to the switch board -2
- MCIO cables in the CPU complex

Cable pre-bending preparation

Before cables are routed in the system, they should be pre-bent. There are no fixture requirements or specific bending angles. Cables might be pre-bent by the supplier, but if they are not, the following slides will show you how to bend them.

Pre-bend a

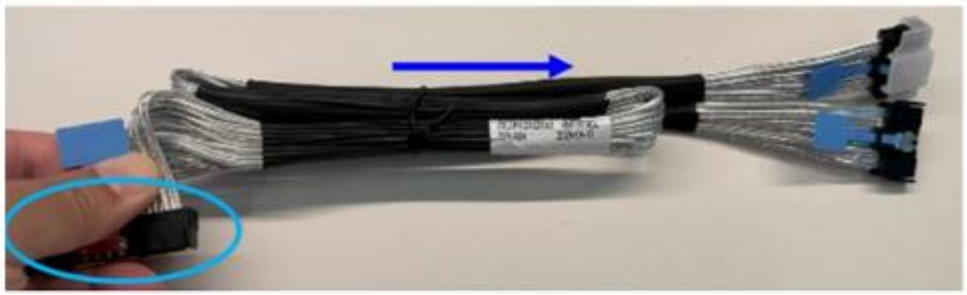


(Latch face top)

Bend the cable to the left

(Latch face top)

Pre-bend b

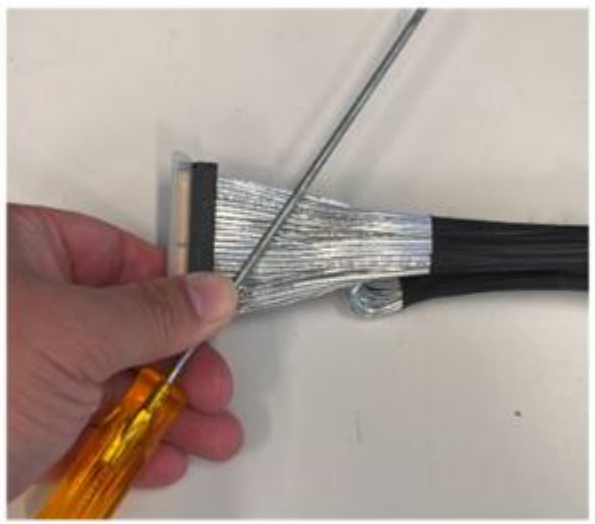


(Latch face top)

Bend the cable to the right

Cable pre-bending

Use any screwdriver with a diameter above 2.5 mm to bend the cable. In this example, a cable is bent to the right (Pre-bend b).



Lenovo

MCIO cable type

MICO cable (short)

MICO cable (long)

Eight MCIO cables connect the processor board to the PCIe switch board. MCIO cables 1, 3, 4, 5, 6, and 7 are short, while cables 2 and 8 are long.

Processor board side

PCIe switch board side

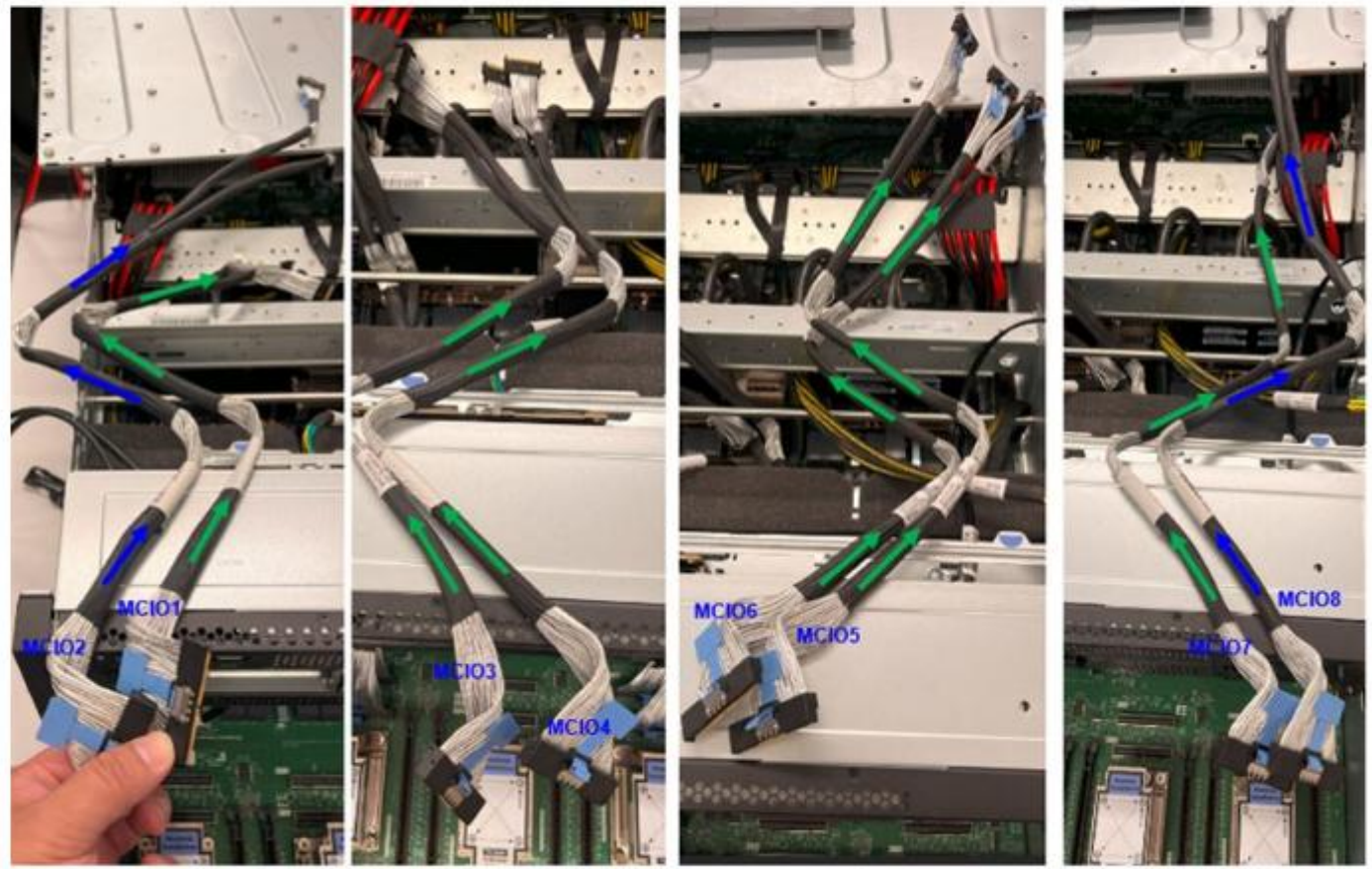
Cable routing shape in the chassis

MICO cable (short)

MICO cable (long)

Make sure the cables hold their pre-bent shape after they are installed in the chassis

Processor board side



PCIe switch board side

MCIO cables

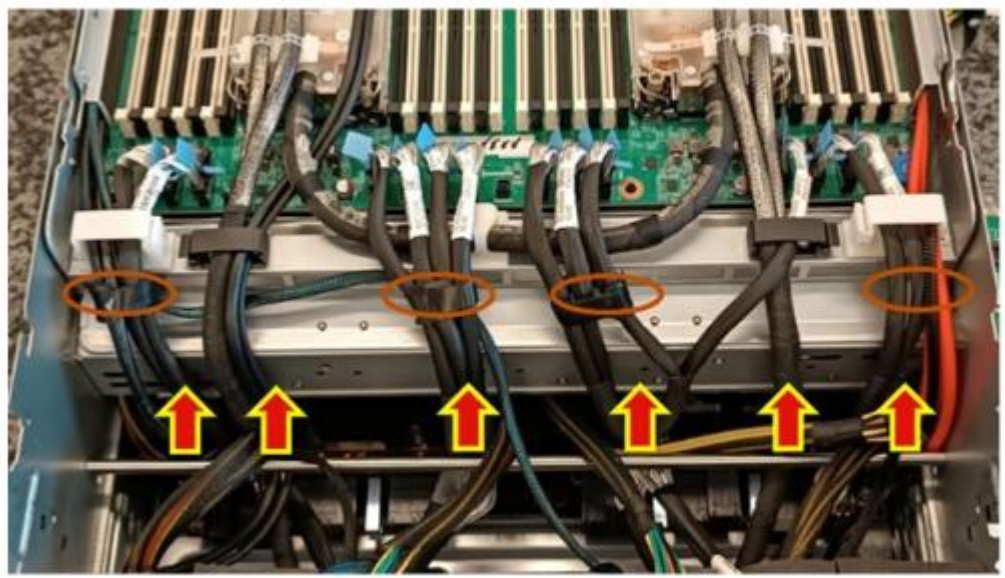
Cable routing path:

MCIO high speed cable

Velcro wrappings

The cables must follow this routing path

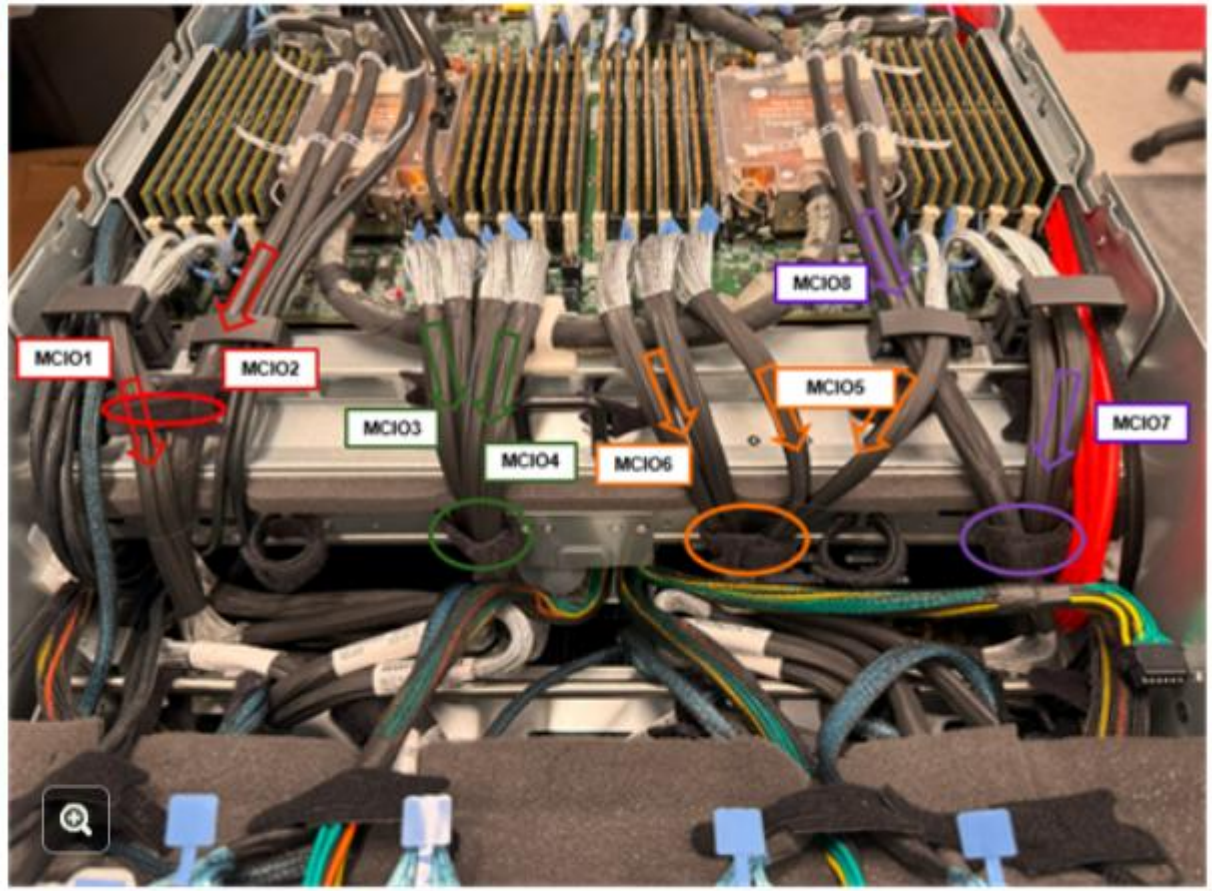
Press the cables against the vertical wall



Lenovo

MCIO cables from the processor board to the switch board -1

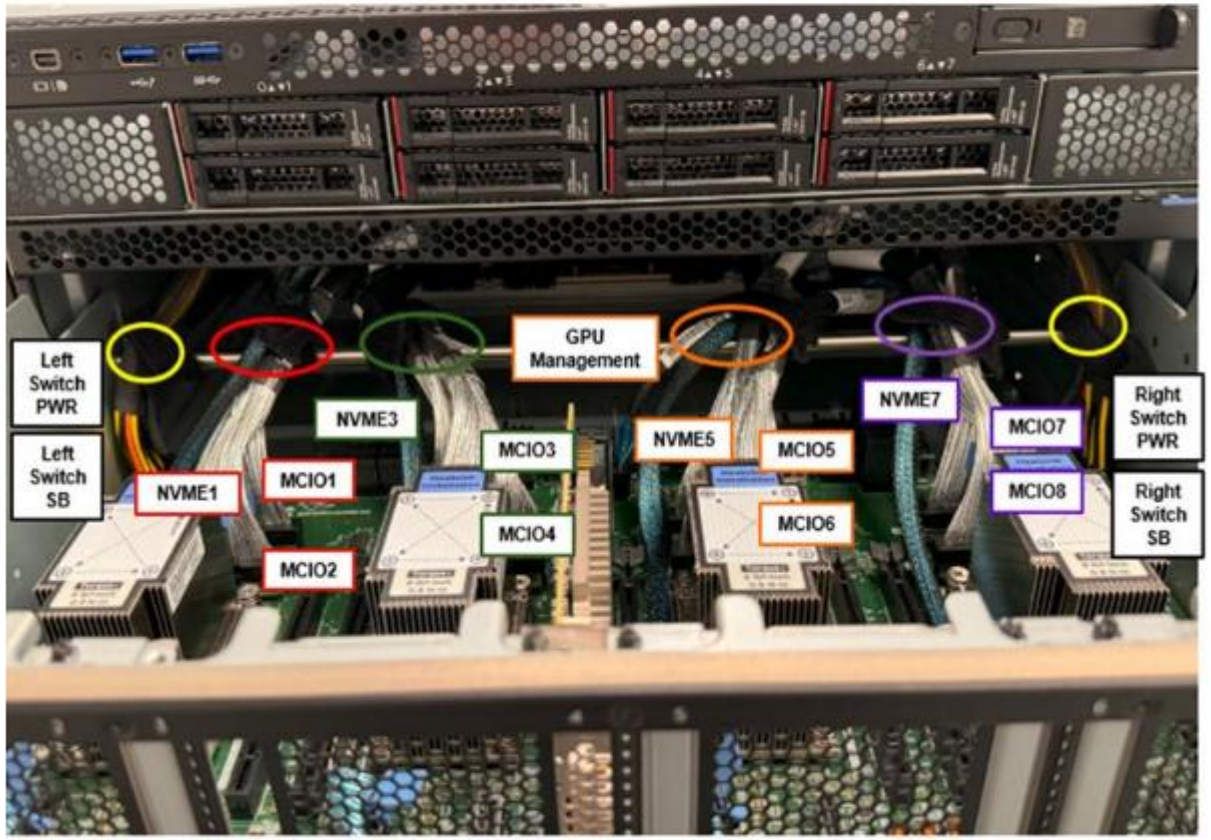
MCIO cables and group				
Type	Pre-bend b	Pre-bend a	Pre-bend b	Pre-bend a
Cables from the processor board to the switch Board	MCIO 1A/1B to MCIO 1	MCIO 2B/2A to MCIO 3	MCIO 5B/5A to MCIO 5	MCIO 6A/6B to MCIO 7
	MCIO 9A/9B to MCIO 2	MCIO 3A/3B to MCIO 4	MCIO 10A/10B to MCIO 6	MCIO 7B/7A to MCIO 8
Velcro cable wrapping				
Cable group	Group 1	Group 2	Group 3	Group 4
Note: Each set of two MCIO cables are tied together				



MCIO cables from the processor board to the switch board -2

MCIO cables and group				
Type	Pre-bend b	Pre-bend a	Pre-bend b	Pre-bend a
Cables	MCIO 1, MCIO 2, NVME 1	MCIO 3, MCIO 4. NVME 3	MCIO 5, MCIO 6, NVME 5	MCIO 7, MCIO 8, NVME 7
Velcro cable wrapping				
Cable Group	Group 1	Group 2	Group 3	Group 4
Note: Signal cables are tied together All cables should be tied to the crossbar				

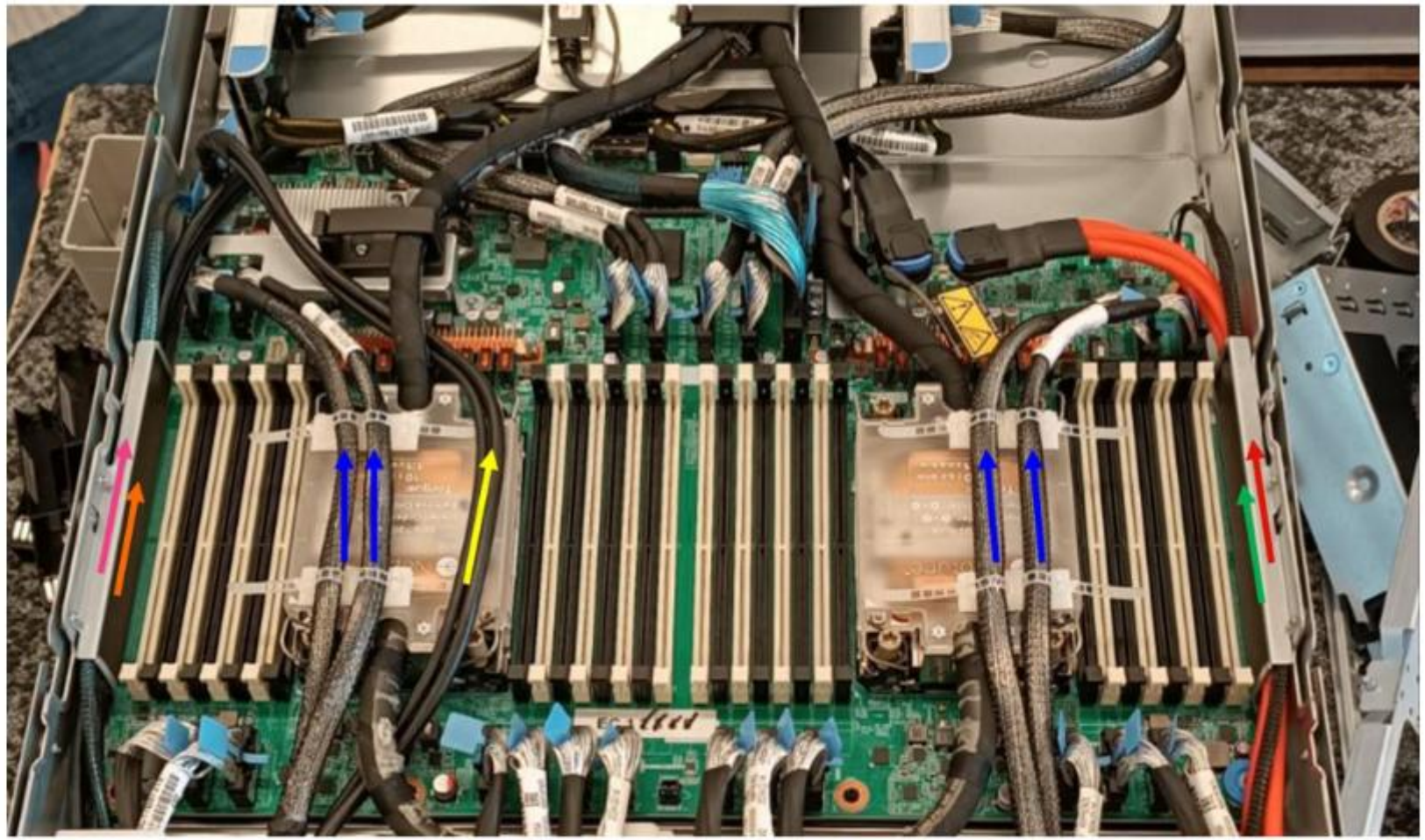
Velcro cable wrapping		
Cables	Left Switch Power, Left Switch Sideband	Right Switch Power, Right Switch Sideband
Note: Each set of two cables are tied together All cables should be tied to the crossbar		



MCIO cables in the CPU complex

Cable routing path:

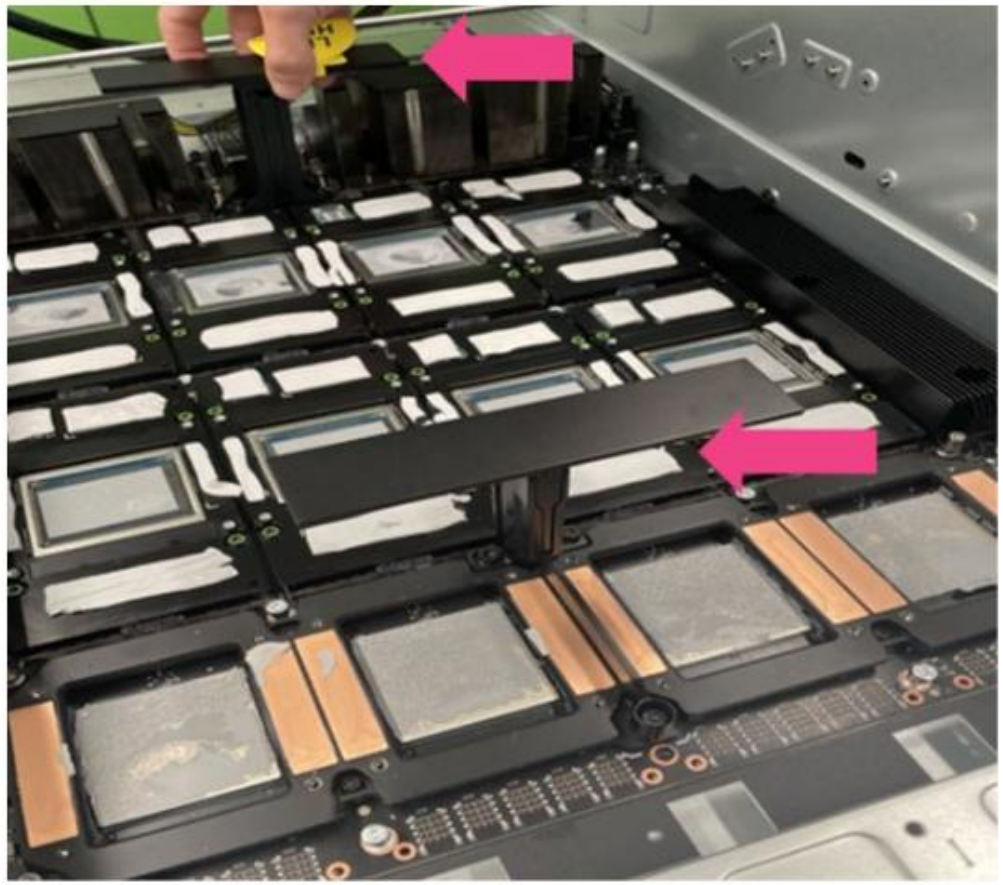
- MCIO cables
- GND cable (-)
- Hight voltage power cable (+)
- FIO cable (USB/Display)
- GPU management cable
- Integrated diagnostic panel cable

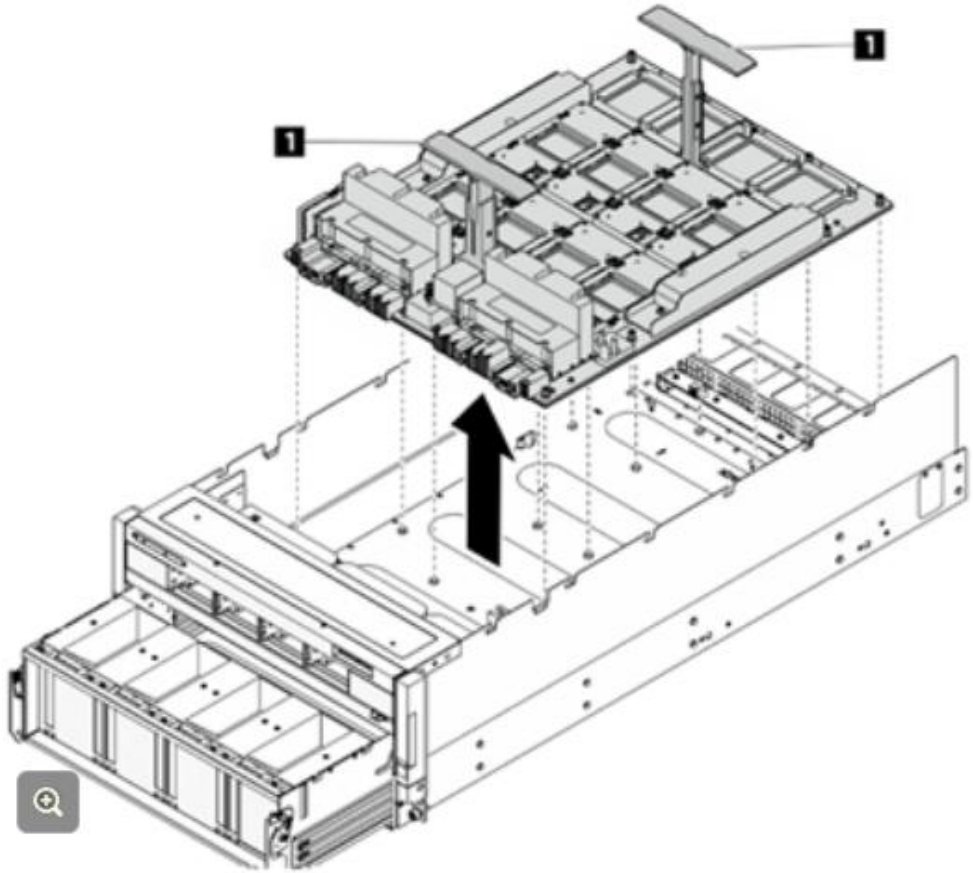


Lenovo

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

This course enabled you 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