NVIDIA DGX H100/H200 Service Manual

NVIDIA Corporation

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The *NVIDIA DGX H100/H200 Service Manual* is also available as a PDF.

Chapter 1. Introduction

This topic contains instructions for replacing the NVIDIA DGX™ H100/H200 system components. Make sure to familiarize yourself with the NVIDIA Terms and Conditions documents before attempting to perform any modification or repair to the DGX H100/H200 system. These Terms and Conditions for the DGX H100/H200 system can be found through the NVIDIA DGX Systems Support page.

Contact NVIDIA Enterprise Support to obtain an RMA number for any system or component that needs to be returned for repair or replacement. When replacing a component, use **only** the replacement supplied to you by NVIDIA.

1.1. Customer-replaceable Components

List of customer-replaceable components in the DGX H100/H200 system.

Be sure to familiarize yourself with the NVIDIA Terms & Conditions documents before attempting to perform any modification or repair to the DGX H100/H200 system. These Terms & Conditions for the DGX H100/H200 system can be found through the NVIDIA DGX Systems Support page.

Customer Replaceable Units

Contact NVIDIA Enterprise Support to obtain an RMA number for any system or component that needs to be returned for repair or replacement. When replacing a component, use only the replacement supplied to you by NVIDIA.

You can obtain the following components for replacement in your data center.

- Bezel
- Locking power cords
- Power supply
- Fan module
- Front Console Board
- U.2 data drive
- M.2 boot (OS) storage drive
- Riser assembly with 2 M.2 drives
- ConnectX-7 PCI card (Storage Network)
- 50 Gb Ethernet NIC replacement

- DIMMs
- Rackmount kit
- Trusted Platform Module
- Battery

Contact NVIDIA Enterprise Support for replacement instructions and guidance for specific components if those instructions are not included in this document.

1.2. Recommended Tools

Here are the tools that are required for the procedures outlined in the presentation. Each procedure will indicate which tool is needed for the different actions.

Important: Hearing protection is mandatory when working with or in the vicinity of this equipment

- Laptop
- USB key with tools and drivers
- USB key imaged with the DGX Server OS ISO
- Screwdrivers
  - Phillips #1
  - Phillips #2
  - Torx T15
  - Torx T10
- KVM Crash Cart
- Electro Static Discharge strap and/or mat
- Masking tape or label maker
- Tie wraps or VELCRO® Brand for cable management
- Box cutter
- Black Permanent Marker or Labels/labeler for cable identification
- Packing materials

1.3. Customer Support

Contact NVIDIA Enterprise Support for assistance in reporting, troubleshooting, or diagnosing problems with your DGX H100/H200 system. Also contact NVIDIA Enterprise Support for assistance in installing or moving the DGX H100/H200 system.

For details on how to obtain support, visit the NVIDIA Enterprise Support web site (https://www.nvidia.com/en-us/support/enterprise/).

1.4. Running the Pre-flight Test

Instructions for running the DGX stress test.

NVIDIA recommends running the pre-flight stress test before putting a system into a production environment or after servicing. You can specify running the test on the GPUs, CPU, memory, and storage, and also specify the duration of the tests.

To run the tests, use NVSM.

Syntax:

```
sudo nvsm stress-test [--usage] [--force] [--no-prompt] [<test>...] [DURATION]
```

For help on running the test, issue the following.

```
sudo nvsm stress-test --usage
```

Recommended Command

The following command runs the test on all supported components (GPU, CPU, memory, and storage), and takes approximately 20 minutes.

```
sudo nvsm stress-test --force
```

Chapter 2. Front Fan Module Replacement

2.1. Front Fan Module Replacement Overview

This is a high-level overview of the steps needed to replace the front fan modules.

1. Identify failed front fan module through BMC or with the fan module LED and submit a service ticket
2. Get replacement from NVIDIA Enterprise Support
3. Remove failed fan module
4. Insert new fan module
5. Confirm new fan module is working correctly through BMC or the operating system tools
6. Return/ship the failed unit to NVIDIA Enterprise Support using the packaging provided

2.2. Identifying a Failed Fan Module

You can identify a failed fan module using any of the following methods:

- Remove the system bezel and visually inspect the fan module LEDs.
- Run the `nvsm show fans` command and view the command output.
- Access the BMC web user interface and view the sensor data from the fans. If a fan is running at an abnormal speed, then that fan needs to be replaced.

Viewing the Fan Module LEDs

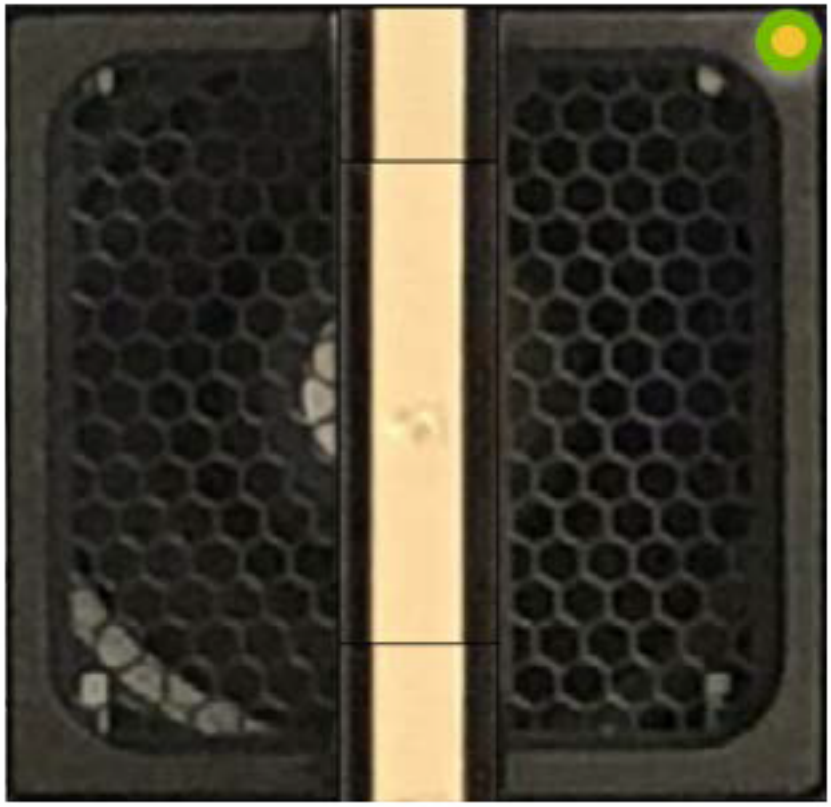
1. *Removing and Attaching the Bezel* to expose the fan modules.

   After you remove the bezel, the system looks like the following figure.

2. Identify the failed fan using the fan module fault LED as shown in the following figure.

3. Look for the lit fault LED on the upper right corner of the faulty fan module as shown in the

following figure.



Running the Show Fans command

- From the operating system, run:

```
sudo nvsm show fans
```

  View the command output for any alerts, failures, or an `unhealthy` status.

Viewing Fan Modules from the BMC web user interface

1. Identify the faulty fan module using the BMC dashboard.
2. Log on to the BMC.
3. Click **Sensor** from the left navigation menu.
4. Review the **Normal Sensors** section.
5. Look for abnormal fan speeds in the right column.

SPD_FAN_SYS10_F	5220 Rpm
SPD_FAN_SYS10_R	4582 Rpm
SPD_FAN_SYS11_F	5220 Rpm
SPD_FAN_SYS11_R	4640 Rpm
SPD_FAN_SYS12_F	5220 Rpm
SPD_FAN_SYS12_R	4640 Rpm
SPD_FAN_SYS1_F	5162 Rpm
SPD_FAN_SYS1_R	4640 Rpm
SPD_FAN_SYS2_F	5220 Rpm
SPD_FAN_SYS2_R	4640 Rpm
SPD_FAN_SYS3_F	5220 Rpm
SPD_FAN_SYS3_R	4640 Rpm
SPD_FAN_SYS4_F	5220 Rpm
SPD_FAN_SYS4_R	4640 Rpm
SPD_FAN_SYS5_F	5220 Rpm
SPD_FAN_SYS5_R	4582 Rpm
SPD_FAN_SYS6_F	5220 Rpm
SPD_FAN_SYS6_R	4640 Rpm
SPD_FAN_SYS7_F	5162 Rpm
SPD_FAN_SYS7_R	4582 Rpm
SPD_FAN_SYS8_F	5220 Rpm
SPD_FAN_SYS8_R	4640 Rpm
SPD_FAN_SYS9_F	5220 Rpm
SPD_FAN_SYS9_R	4640 Rpm

There are two fans in the fan module, identified by `SPD_FAN_SYSn_F` and `SPD_FAN_SYSn_R`, where `n` is the module ID. If either fan fails, then the entire module must be replaced.

6. Use the `nvsm` command to confirm the fan issue.

```
sudo nvsm show fans
```

View the output and confirm that the status is `unhealthy` for the same fan.

2.3. Replacing and Returning the Front Fan Module

1. Remove the new fan module from its packaging and be ready to install it.

   Important: Replace the old fan with the new one within 30 seconds to avoid overheating of the system components.

2. Refer to *Removing and Attaching the Bezel* to expose the fan modules.
3. Unlock the fan module by pressing the release button, as shown in the following figure.

4. Replace the failed fan module with the new one.

5. Confirm that the fan module is healthy working properly by performing the following actions:
   - Using the BMC web user interface
   - Verifying that the amber LED on the fan module is extinguished
   - Running the `sudo nvsm show fans` command
   - Install the bezel as described in the bezel section

Chapter 3. Power Supply Replacement

This topic describes how to replace the power supplies (PSUs) of the NVIDIA DGX™ H100/H200 system.

3.1. Power Supply Replacement Overview

This is a high-level overview of the steps needed to replace a power supply.

1. Identify the broken power supply either by the amber color LED or by the power supply number
2. Request a replacement from NVIDIA Enterprise Support.
3. Remove the locking power cord from the power supply
4. Replace the power supply
5. Install the locking power cord
6. Confirm that both LEDs light up green on the power supply
7. Make sure the BMC reports no power supply failures
8. If requested, ship back the failed unit to NVIDIA Enterprise Support using the packaging provided

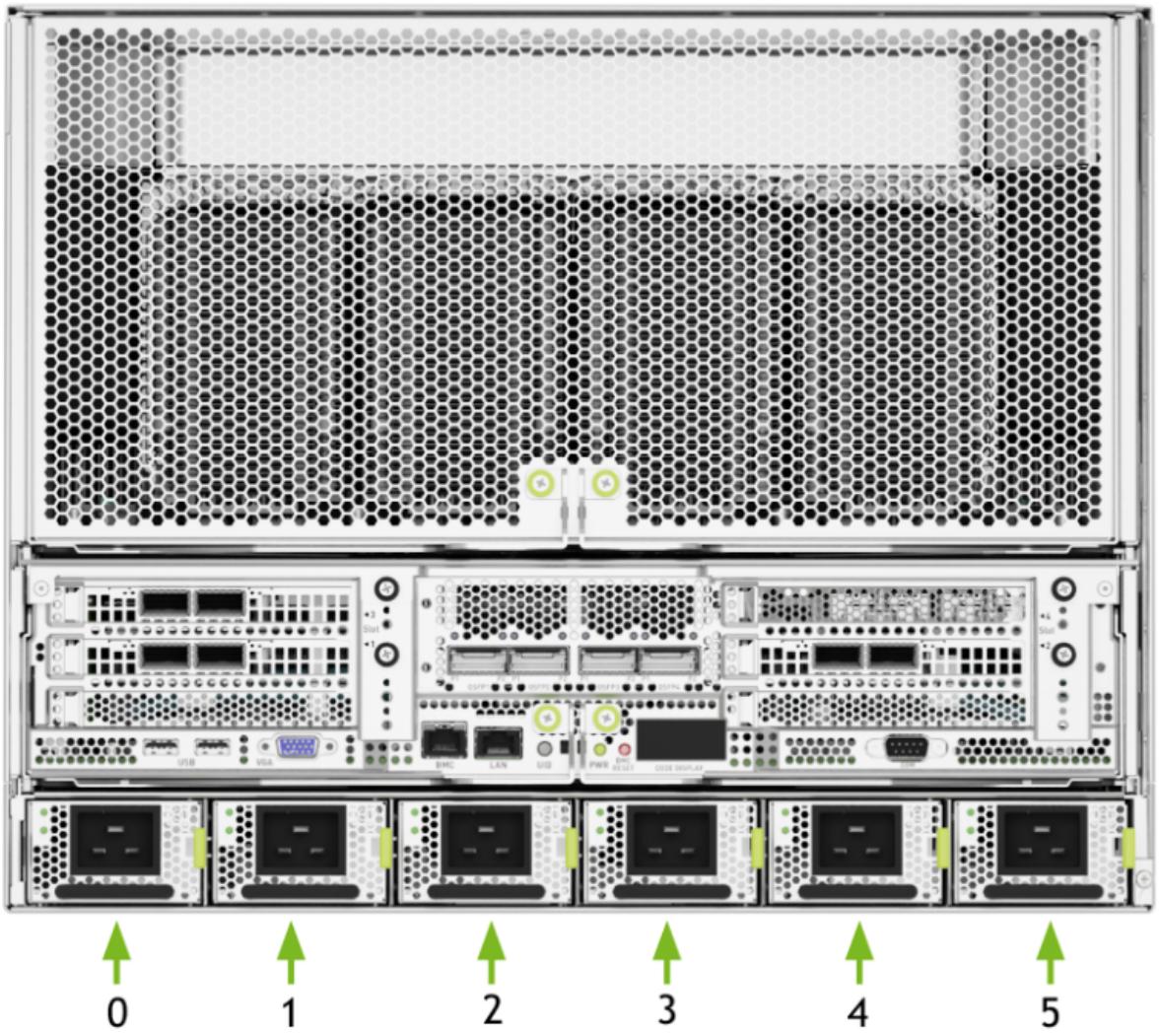
3.2. Identifying the Failed Power Supply

You can identify a failed power supply using any of the following methods:

- Visually inspect the the LEDs on the power supplies from the rear of the system when the system is powered on.
- Run the `nvsm show psus` command and view the command output.
- Access the BMC web user interface and view the sensor data.

NVIDIA Enterprise Support might ask for this or similar information to confirm the power supply needs to be replaced.

The `nvsm` command output and the BMC web user interface identify each power supply as PSUx, where *x* is `0` to 5. The following diagram shows the physical location of each PSU.



Viewing the Power Supply LEDs

- Access the rear of the system and view the status LEDs while the system is powered on.

Both LEDs are solid green if the PSU is good. If either of the LEDs are not green or they blink, contact NVIDIA Enterprise Support to troubleshoot the issue.

Running the Show PSUs Command

- Run the following command to display information about the PSUs:

```
sudo nvsm show psus
```

The output shows information for each PSU. Look for any that do not report `Status_Health=OK`.

Viewing PSUs from the BMC web user interface

1. Access the BMC web user interface and select **Sensors** from the left hand column.
   - Confirm PSU presence:

STATUS_PSU0	Presence Detected
STATUS_PSU1	Presence Detected
STATUS_PSU2	Presence Detected
STATUS_PSU3	Presence Detected
STATUS_PSU4	Presence Detected
STATUS_PSU5	Presence Detected

   - Confirm power output:

PWR_PSU0	338 Watts
PWR_PSU1	273 Watts
PWR_PSU2	325 Watts
PWR_PSU3	286 Watts
PWR_PSU4	286 Watts
PWR_PSU5	286 Watts

   - Confirm fan speeds:

SPD_FAN_PSU0_F	7040 Rpm
SPD_FAN_PSU0_R	5500 Rpm
SPD_FAN_PSU1_F	6930 Rpm
SPD_FAN_PSU1_R	5280 Rpm
SPD_FAN_PSU2_F	7040 Rpm
SPD_FAN_PSU2_R	5610 Rpm
SPD_FAN_PSU3_F	7040 Rpm
SPD_FAN_PSU3_R	5390 Rpm
SPD_FAN_PSU4_F	7040 Rpm
SPD_FAN_PSU4_R	5060 Rpm
SPD_FAN_PSU5_F	7040 Rpm
SPD_FAN_PSU5_R	5060 Rpm

- Confirm the PSU temperature readings:

TEMP_PSU0	26 °C
TEMP_PSU1	27 °C
TEMP_PSU2	28 °C
TEMP_PSU3	28 °C
TEMP_PSU4	27 °C
TEMP_PSU5	27 °C

2. Run the `ipmitool` command to view information about the PSUs:

```
sudo ipmitool sdr | grep -i psu
```

Look for power supplies with no temperature reading or an output reading that is close to, or equal to, zero.

Determining the Manufacturer

Important: All PSUs in the system must be from the same manufacturer.

- Run the following `nvsm` command to determine the PSU manufacturer:

```
sudo nvsm show /chassis/localhost/power/PSUx
```

Replace *x* in the preceding command with the PSU identifier.

Example Output

The following output is for PSU0 and shows that the manufacturer is Delta.

```
/chassis/localhost/power/PSU0
Properties:
    FirmwareVersion = 02.02.02.01.02.02
    LastPowerOutputWatts = 0
    Manufacturer = Delta
    MemberId = PSU0
    Model = ECD16020137
    Name = PSU0
    Oem_PSU_Error = Presence detected| Power Supply AC Lost| AC Lost or out-of-
↪range
    PowerSupplyType = AC
    SerialNumber = DTHTCT2233078
    Status_Health = Critical
    Status_State = Present
Targets:
Verbs:
    cd
    show
```

Obtain the replacement PSU (of the same manufacturer) from NVIDIA Enterprise Support.

3.3. Preparing the Power Supply for Replacement

1. If the system is on, make sure at least 4 other power supplies are working by confirming the IN and OUT LEDs are lit green:

   Note: If insufficient PSUs are present and working, power off the system.

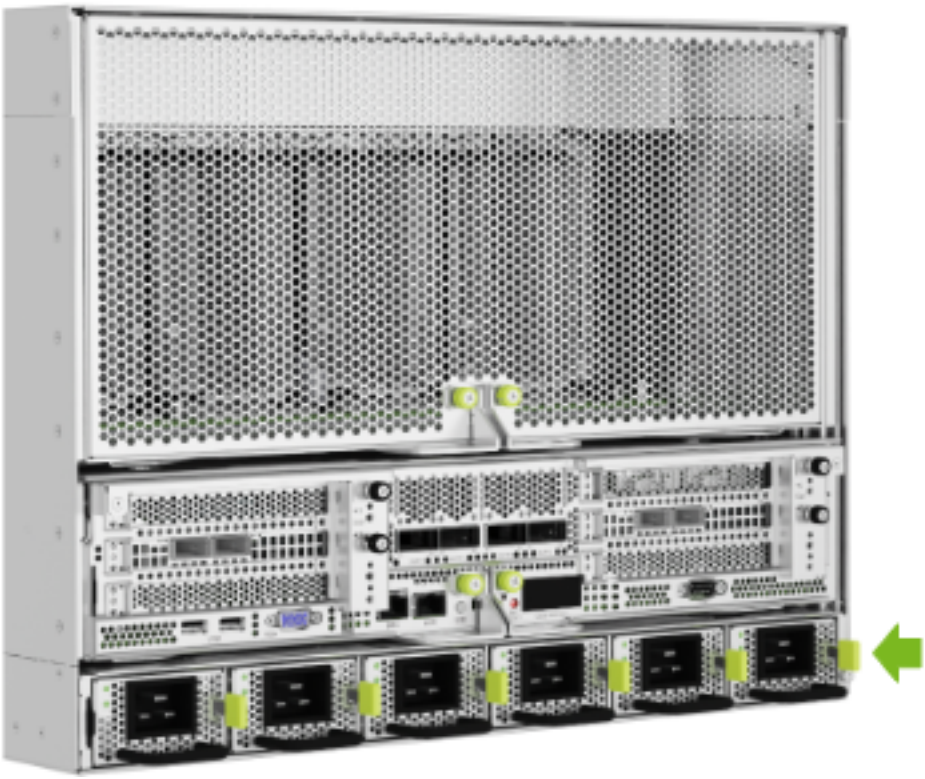
2. Unplug the power cord from the failed power supply. Refer to *Locking Power Cords* for more information.

After the new power supply arrives, look at the system and identify which one needs to be replaced. The system is capable of operating at full capacity with four fully working power supplies. If the system is on, make sure that at least four power supplies are fully functional.

3.4. Replacing the Power Supply

1. Remove the power supply by pressing the green tab to unlock the unit. Then pull on the black handle.

> **Caution:** Once the power supply is out of the chassis, replace it with the new power supply in less than 30 seconds to avoid airflow disruptions in the system - especially if it is up and running.



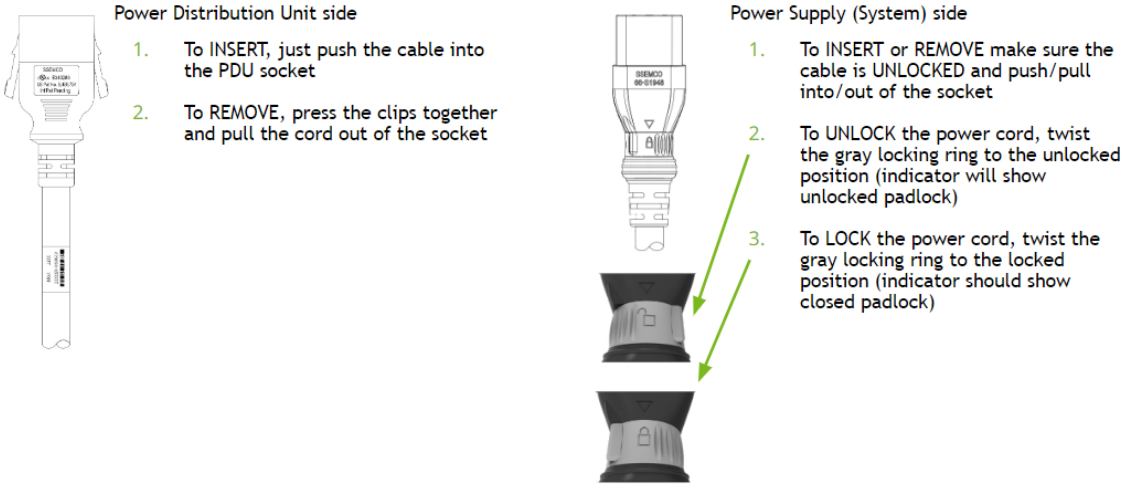
2. Replace the power supply with the new unit making sure the green tab locks into place.

3. After inserting the new power supply, plug in and lock the power cord and confirm that both the IN and OUT LEDs light up green on the new power supply.
4. From the BMC web user interface, confirm the power supply sensors are OK.
5. Run the `nvsm show health` command and confirm the output does not report any errors.
6. After the replacement is complete, return the broken power supply to NVIDIA Enterprise Support.

3.5. Locking Power Cords

How to use the twisting locking power cords that ship with the system.

1. To insert the PDU side of the power cord, insert the cable into the plug. To remove it, press the clips on both sides at the same time to unlock the power cord and pull it out of the plug.
2. On the power supply side, insert the cable by first making sure the cable's gray band or locking ring is set to unlock. Then, insert the cable to the power supply plug and then twist the locking ring to the locked position.



3. To remove the cable from the power supply, twist the locking ring to the unlocked position and pull the cable out of the plug.

Chapter 4. Motherboard Tray - Opening and Closing the IO door

You will need to completely remove the motherboard tray from the server in order to service the following components. If this is the case, please refer to the section that describes the procedure to remove the motherboard.

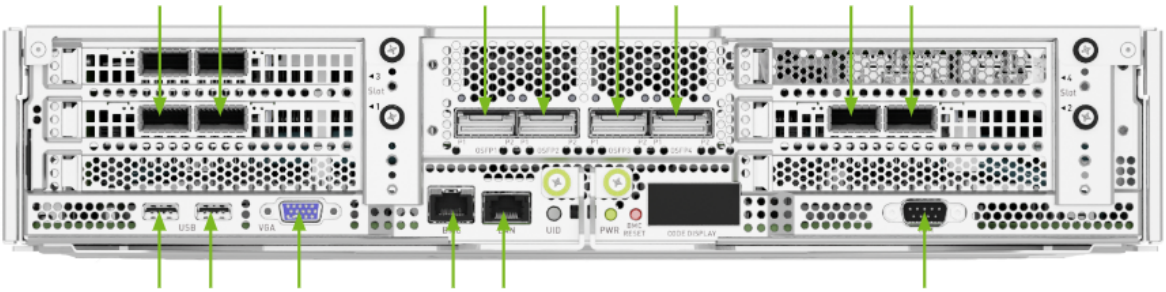
- DIMMs (either adding or replacing)
- Trusted Platform Module (TPM)

4.1. Preparing the Motherboard for Service

Before pulling the motherboard out of the system, the system must be shut down and cables must be removed from the system.

Caution: Wear an ESD strap during any procedure that involves touching electronic components.

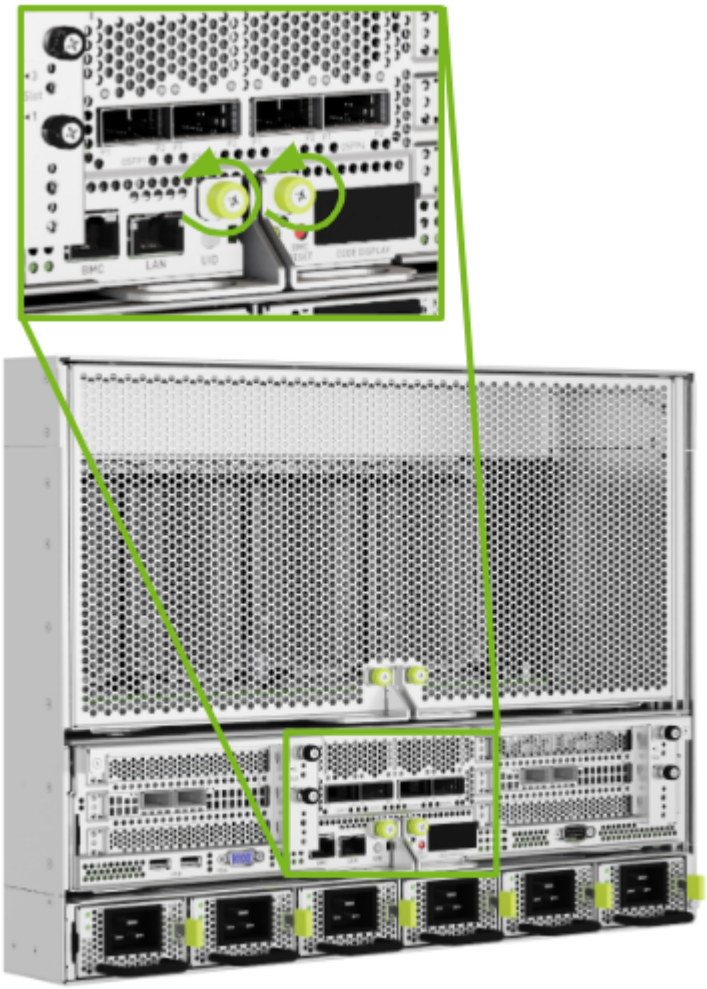
1. Shut down the system
2. To avoid misconfigurations, label all the cables before unplugging them.
   - Label all network, monitor and USB cables



   - Unplug all power cords
   - Unplug all network, monitor and USB cables

4.2. Release the Motherboard

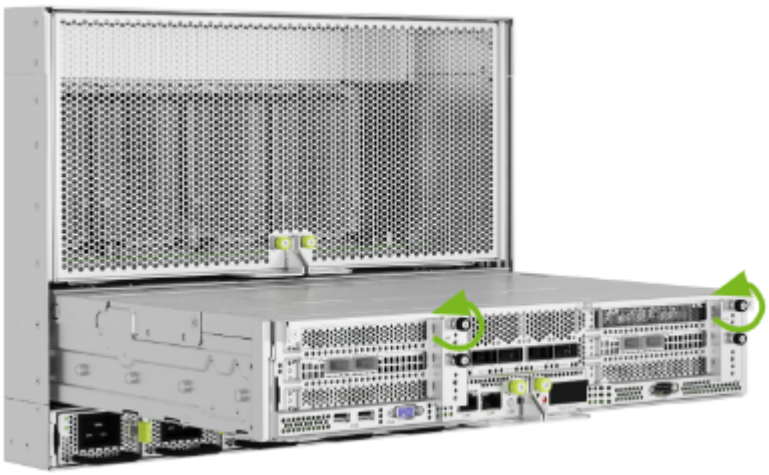
1. Unlock the motherboard by loosening the captive screws that hold the ejection levers in place:



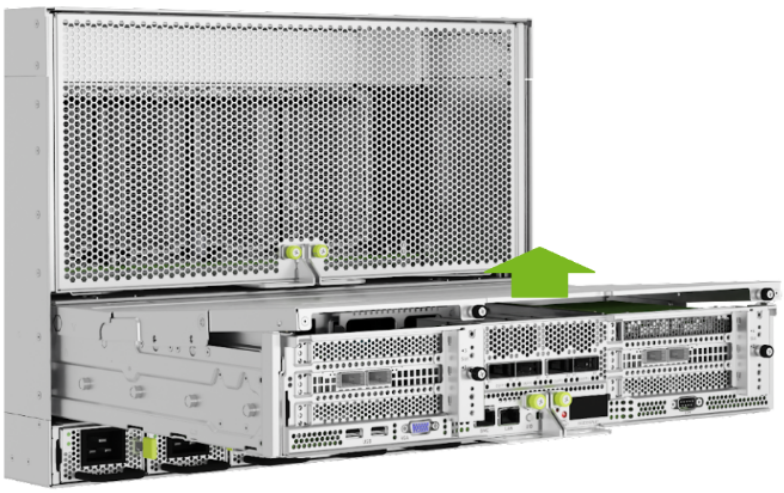
2. Pull the ejection levers to disengage the midplane connectors:

4.3. Pull Motherboard from Chassis

1. Pull the motherboard out until the locking mechanism in the lid engages and prevents further movement.
2. Unscrew the thumb screws indicated by the green arrows in the following figure to release lid from the the motherboard tray:



3. Lift the lid IO section so that it can be folded:



4.4. Open the Motherboard IO Door

1. Fold the lid IO opening section as shown in the following figure:

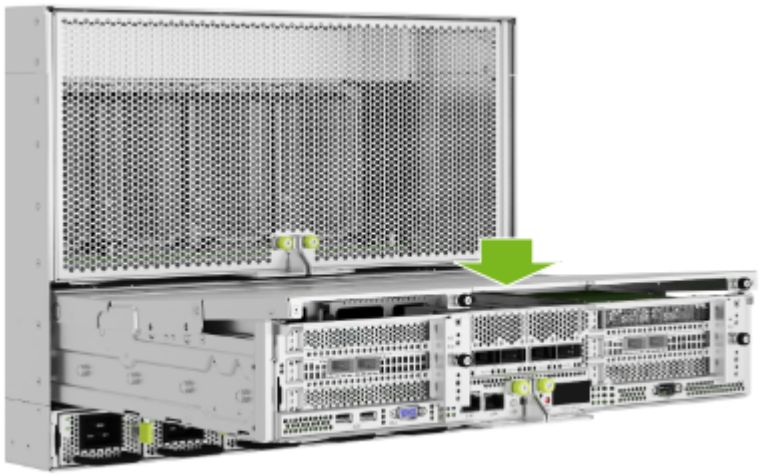
2. Secure the folding section until it stays in place so you can work on the IO section of the motherboard:

4.5. Close the Motherboard IO Door

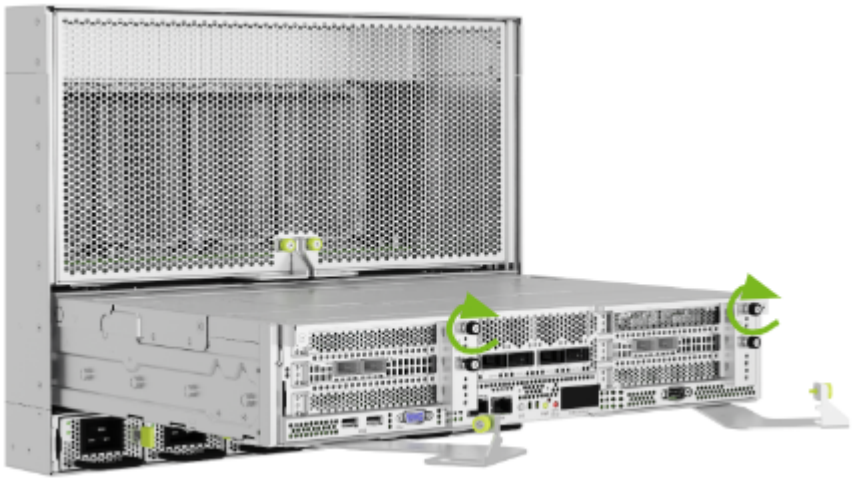
1. Before closing the lid, make sure all components are properly installed and that nothing is blocking the lid.
2. Slide the lid as shown in the following figure to close the motherboard IO section:

4.6. Lock the Motherboard Lid

1. Close the lid so that you can lock it in place:



2. Use the thumb screws indicated in the following figure to secure the lid to the motherboard tray. Open the tray levers:

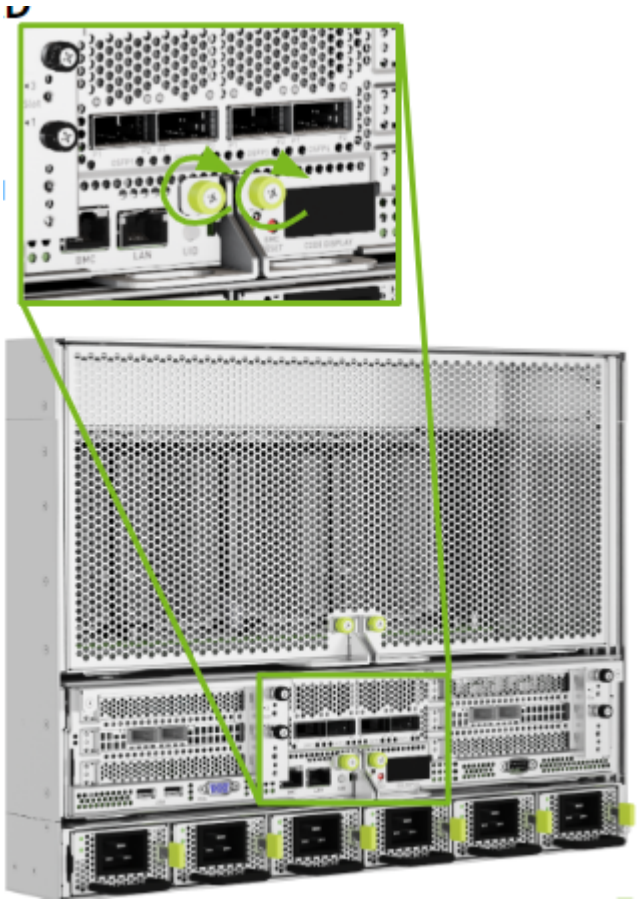


3. Push the motherboard tray into the system chassis until the levers on both sides engage with the sides.

4.7. Insert the Motherboard

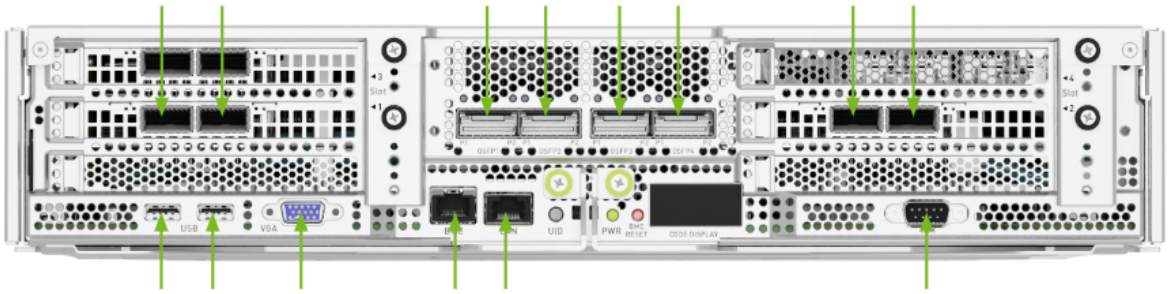
1. Use the levers to engage the midplane connectors:

2. After the levers are fully closed, tighten the green thumbscrews to hold the ejection levers in place:



4.8. Finalize Motherboard Closing

- Use the labels on the cables to reconnect them to the correct ports. After all cables are installed, plug the locking power cables in and power the system on.



Chapter 5. Motherboard Tray - Removal and Installation

You will need to completely remove the motherboard tray from the server in order to service the following components. If this is the case, please refer to the section that describes the procedure to remove the motherboard.

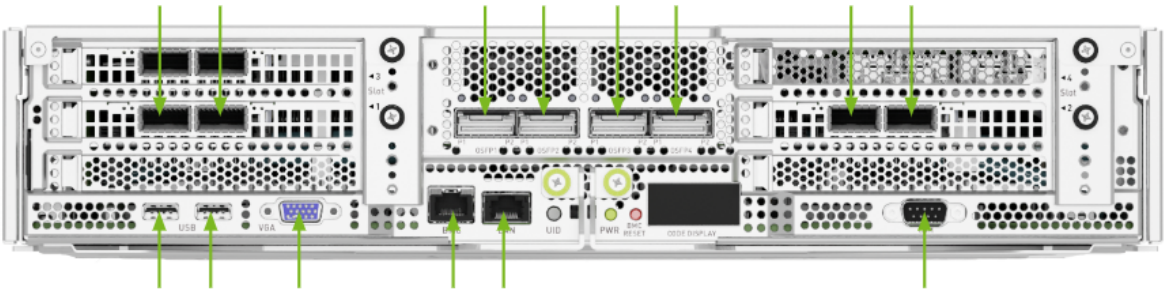
- DIMMs (either adding or replacing)
- Trusted Platform Module (TPM)

5.1. Preparing the Motherboard for Service

Before pulling the motherboard out of the system, the system must be shut down and cables must be removed from the system.

Caution: Wear an ESD strap during any procedure that involves touching electronic components.

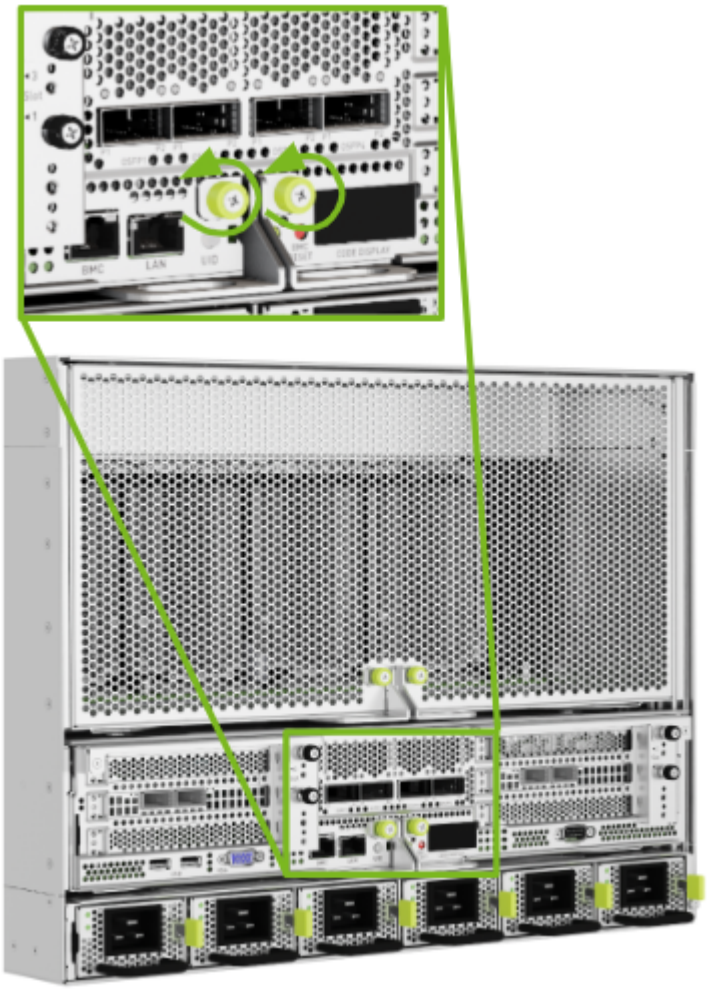
1. Shut down the system
2. To avoid misconfigurations, label all the cables before unplugging them.
   - Label all network, monitor and USB cables



   - Unplug all power cords
   - Unplug all network, monitor and USB cables

5.2. Release the Motherboard

1. Unlock the motherboard by loosening the captive screws that hold the ejection levers in place:

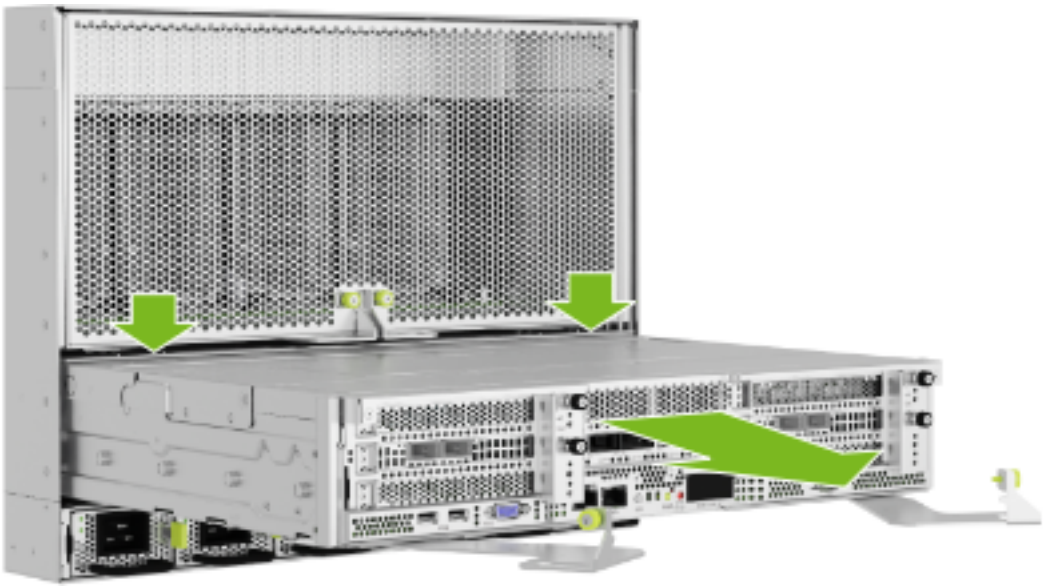


2. Pull the ejection levers to disengage the midplane connectors:

5.3. Pull Motherboard from Chassis

Make sure that you have a solid flat surface where you can rest the motherboard tray.

1. Pull the motherboard tray out until the locking mechanism in the lid engages and prevents further movement.
2. Push down on the buttons identified in the following figure to release the motherboard tray:



3. Pull the motherboard tray out of the chassis completely:

- Do not hold the motherboard tray by the ejection handles. The handles can bend or break.
- Be careful with the connectors at the back of the module to prevent damage.

4. Place the motherboard tray on a solid, flat surface.

5.4. Remove the Motherboard Tray Lid

1. Loosen the two screws on the port side of the motherboard tray, as shown in the following figure:

2. Loosen the two screws on the connector side of the motherboard tray, as shown in the following figure:

3. To remove the tray lid, perform the following motions:
   - Lift on the connector side of the tray lid so that you can push it forward to release it from the tray.

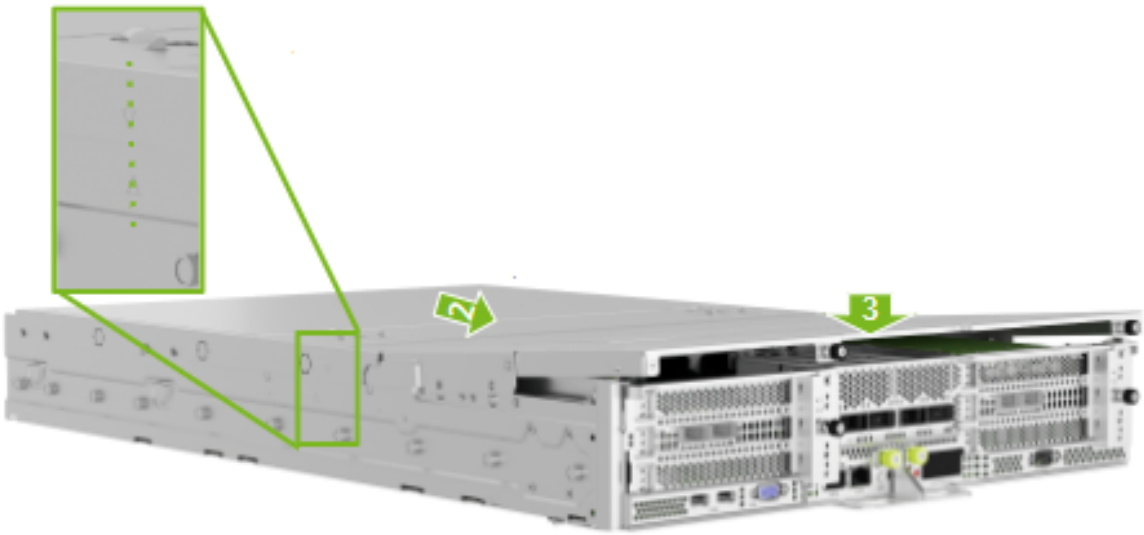
- After the triangular markers align, lift the tray lid to remove it.

4. Optional: Depending on the procedure that you need to perform, remove the air baffles from the motherboard.

5.5. Close the Motherboard Tray Lid

Before you perform the following steps, ensure that all components are installed correctly so that they do not interfere with the air baffles or tray lid.

1. Insert the motherboard tray baffles and then place the tray lid over the motherboard tray.
2. To close the tray lid, perform the following motions:
   - Position the tray lid correctly by aligning the markers as shown in the following figure.
   - Push the tray lid toward the IO section of the tray until the folding section is flush.
   - Press the folding section down so that the thumbscrews align with the screw holes.



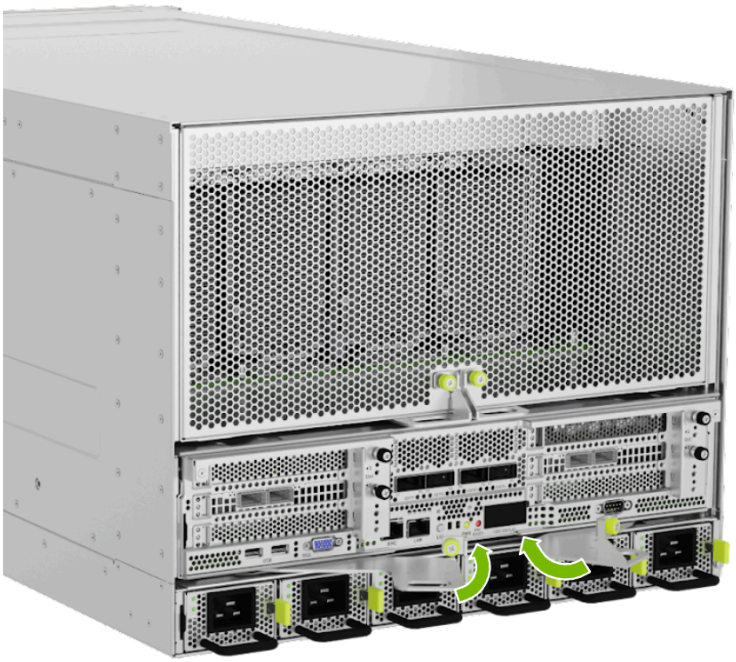
3. Tighten the two lid screws on the port side of the motherboard tray, as shown in the following figure:

4. Tighten the two lid screws on the connector side of the motherboard tray, as shown in the following figure:

5.6. Insert the Motherboard Tray into the Chassis

1. Insert the motherboard tray into the chassis partially. Open the ejection levers before you insert the motherboard tray into the chassis:

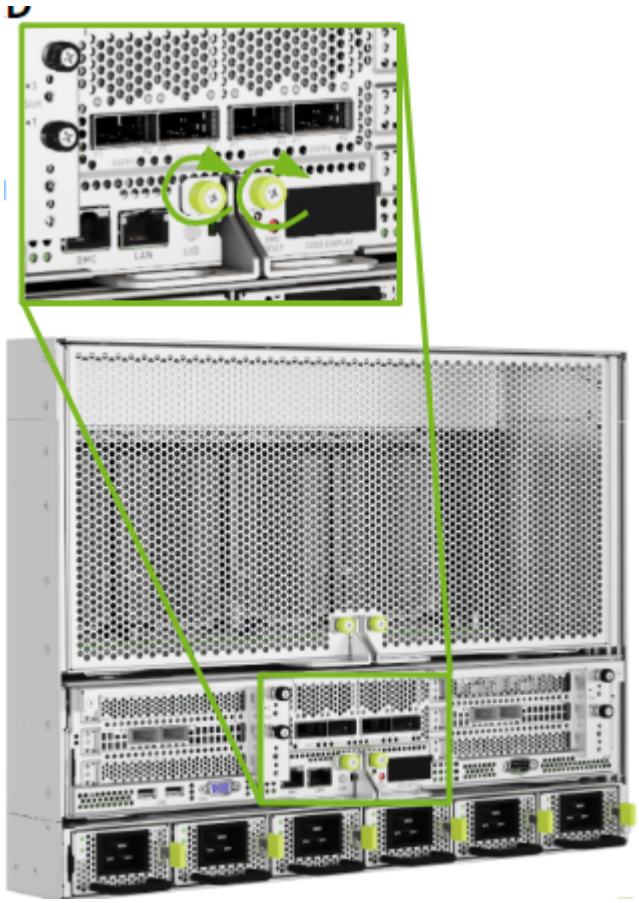
2. Push the motherboard tray into the chassis until the levers on both sides engage with the sides:



5.7. Insert the Motherboard

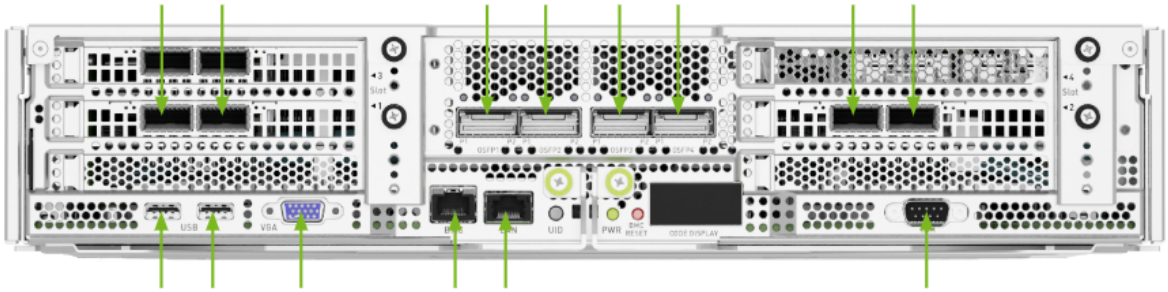
1. Use the levers to engage the midplane connectors:

2. After the levers are fully closed, tighten the green thumbscrews to hold the ejection levers in place:



5.8. Finalize Motherboard Closing

- Use the labels on the cables to reconnect them to the correct ports. After all cables are installed, plug the locking power cables in and power the system on.



Chapter 6. U.2 NVMe Cache Drive Replacement

6.1. U.2 NVMe Cache Drive Replacement Overview

This is a high-level overview of the procedure to replace a cache Non-Volatile Memory Express (NVMe) drive.

1. Identify failed SSD
2. Get replacement SSD from NVIDIA Enterprise Support
3. Power off the system
4. Remove failed SSD identified earlier
5. Insert new SSD
6. Power on the system
7. Rebuild the RAID volume and mount the filesystem
8. Ship back the failed unit to NVIDIA Enterprise Support using the packaging provided

6.2. Identifying the Failed U.2 NVMe SSD

Identifying the Failed NVMe from the Front

If physical access to the system is available, you can identify a failed drive by the illuminated amber LED.

Identifying the Failed NVMe from the Console

- To identify the failed data drive, you can use the `nvsm` command:

```
sudo nvsm show health
```

  View the command output and look for drive alerts to identity the failed drive.

Alternatively, you can use the BMC web user interface to access the **Sensor** screen, the **IPMI event log**, and the **System log** to identify issues with the U.2 drives.

6.3. Identifying the NVMe Manufacturer and Model

- Use the `nvsm` command to display the drive information:

```
sudo nvsm show /systems/localhost/storage/drives/nvmeXn1
```

  Replace *X* in the preceding command with the number that corresponds to the Linux device name for the failed drive.

  Example Output

```
/systems/localhost/storage/drives/nvme5n1
Properties:
    PhysicalLocation_Info = SlotU.2_Slot3
    BlockSizeBytes = 512
    SerialNumber = 22L0A01WT2N8
    Model = KCM6DRUL3T84
    Revision = 0107
    Manufacturer = KIOXIA Corporation
    Status_State = Enabled
    Status_Health = OK
    Name = nvme5n1
    MediaType = SSD
    EncryptionStatus = Unlocked
    CapacityBytes = 3840755982336
    Id = nvme5n1
Targets:
Verbs:
    cd
    set
    show
```

  Refer to the `Manufacturer` and `Model` fields in the output. Request a replacement NVMe from NVIDIA Enterprise Support, specifying this information.

6.4. Replacing the U.2 NVMe Drive

1. Make sure that you requested and obtained the replacement drive from NVIDIA Enterprise Support.
2. Back up any critical data to a network shared volume or some other means of backup.
3. Power off the system using the power button.
4. Remove the bezel. Refer to *Removing and Attaching the Bezel* for more information.
5. After the system powers off, use the following figure to identify the drive to replace on the chassis.

   The figures in the following procedures show replacing drive number 7 at PCI address ae.

6. Remove the NVMe drive.
   1. Press the tab on the right side of the drive to release the lever:

   2. Pull the drive out by using the lever:

3. Remove the drive:

6.5. Insert the U.2 NVMe Drive

1. Open the lever on the drive and insert the replacement drive in the same slot:

2. Close the lever and secure it in place:

3. Confirm the drive is flush with the system:

4. Install the bezel after the drive replacement is complete.
5. Power on the system.

6.6. Next Steps

- *U.2 NVMe Cache Drive Post-Installation Tasks*.

Chapter 7. U.2 NVMe Cache Drive Post-Installation Tasks

This section describes the tasks that you typically need to perform after replacing a U.2 NVMe drive.

7.1. Re-creating the RAID Array

1. Power on the system and log in.
2. Confirm that all installed drives are visible by using the `nvme` command:

   ```
   sudo nvme list
   ```

   The output can indicate two boot drives and eight cache drives, depending on how many are installed in the system.

   Example Output

   ```
   Node             SN                   Model
   ↪Namespace Usage                      Format           FW Rev
   ---------------- -------------------- ---------------------------------------- ---
   ↪------ -------------------------- ---------------- --------
   /dev/nvme0n1     S4YPNE0N200093       SAMSUNG MZWLJ3T8HBLS-00007               1
   ↪         3.84  TB /   3.84  TB    512   B +  0 B   EPK9CB5Q
   /dev/nvme1n1     S4YPNE0N200040       SAMSUNG MZWLJ3T8HBLS-00007               1
   ↪         3.84  TB /   3.84  TB    512   B +  0 B   EPK9CB5Q
   /dev/nvme2n1     S436NA0N106764       SAMSUNG MZ1LB1T9HALS-00007               1
   ↪        44.44  GB /   1.92  TB    512   B +  0 B   EDA7602Q
   /dev/nvme3n1     S436NA0N106850       SAMSUNG MZ1LB1T9HALS-00007               1
   ↪        45.18  GB /   1.92  TB    512   B +  0 B   EDA7602Q
   ...
   ```

3. If the cache volume was encrypted with an access key, disable the encryption before re-creating the RAID volume:

   ```
   sudo nv-disk-encrypt disable
   ```

   The disk encryption packages must be installed on the system. For more information, refer to the Managing Self-Encrypting Drives topic in the *NVIDIA DGX OS 6 User Guide*.

4. Re-create the cache volume and the `/raid` filesystem:

```
configure_raid_array.py -c -f
```

At the prompt, enter y to confirm the rebuild action.

5. (Optional) To encrypt the volume with an access key, refer to the Managing Self-Encrypting Drives topic in the *NVIDIA DGX OS 6 User Guide*.
6. Confirm the volume is healthy:

```
sudo nvsm show volumes
```

Send the old drive to NVIDIA Enterprise Support using the packaging from the new drive.

Chapter 8. M.2 NVMe Boot Drive Replacement

Caution: Static Sensitive Devices: Be sure to observe best practices for electrostatic discharge (ESD) protection. This includes making sure personnel and equipment are connected to a common ground, such as by wearing a wrist strap connected to the chassis ground, and placing components on static-free work surfaces.

8.1. M.2 NVMe Boot Drive Replacement Overview

This is a high-level overview of the procedure to replace a boot drive.

1. Determine which M.2 device needs to be replaced with the help of NVIDIA Enterprise Support
2. Get a replacement M.2 disk from NVIDIA Enterprise Support
3. Make sure the system is shut down
4. If cables don't reach, label all cables and unplug them from the motherboard tray
5. Slide motherboard out until it locks in place
6. Open rear compartment
7. Pull out the M.2 riser card with both M.2 disks attached
8. Replace the failed M.2 device on the riser card
9. Install the M.2 riser card with both M.2 disks
10. Close the rear motherboard compartment
11. Slide the motherboard back into the system
12. Plug in all cables using the labels as a reference
13. Power on the system
14. Confirm the M.2 RAID 1 mirror is synchronizing
15. Ship back the failed unit to NVIDIA Enterprise Support using the packaging provided

8.2. Identify the Failed M.2 NVMe

The NVIDIA DGX™ H100/H200 system automatically sets the failed M.2 drive offline when it detects the failure. The boot drives are mirrored, so the `mdadm` command-line utility can identify the drive to replace.

1. Determine which drive failed:

   ```
   sudo nvsm show health
   ```

   The command output indicates the drive name, `nvme0n1` or `nvme1n1`.

2. Confirm the drive name by using the `mdadm` command:

   ```
   sudo mdadm -D /dev/md0
   ```

   The command output indicates the drive names and the drive state.

3. Contact NVIDIA Enterprise Support to request a replacement M.2 drive.
4. When the new drive arrives, you must remove the failed drive from the RAID volume. Run the following commands to mark the drive as failed and to remove the drive from the array.
   1. Mark the disk as failed, if it is not already marked as failed:

      ```
      sudo mdadm --manage /dev/md0 --fail /dev/nvmeXn1
      ```

   2. Remove the failed disk from the array:

      ```
      sudo mdadm --manage /dev/md0 --remove /dev/nvmeXn1
      ```

   Replace *X* in the preceding commands with the ID of the failed drive.
5. Back up any critical data to a network shared volume or some other means of backup.
6. Power down the system.

8.3. Remove the M.2 Boot Drive Carrier

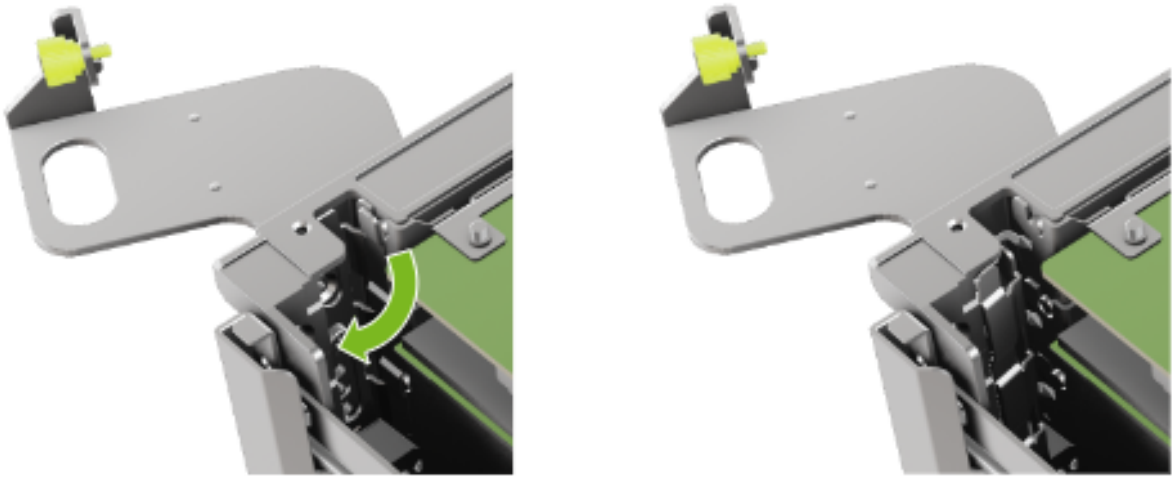
Before attempting to remove M.2 boot drive carrier, make sure that you performed the following prerequisites:

- Label all network, monitor, and USB cables connected to the motherboard tray for easy identification when reconnecting.
- Unplug all power cords, and all network, monitor, and USB cables.

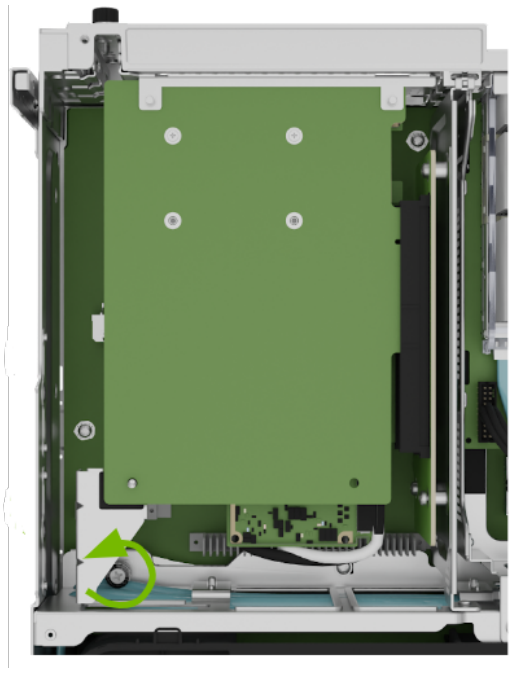
Refer to *Motherboard Tray - Opening and Closing the IO door* for more information.

1. After the IO section of the motherboard is open, unlock the M.2 drive carrier by loosening the PCI card locking mechanism by loosening the black captive thumbscrew on the right side of the motherboard:

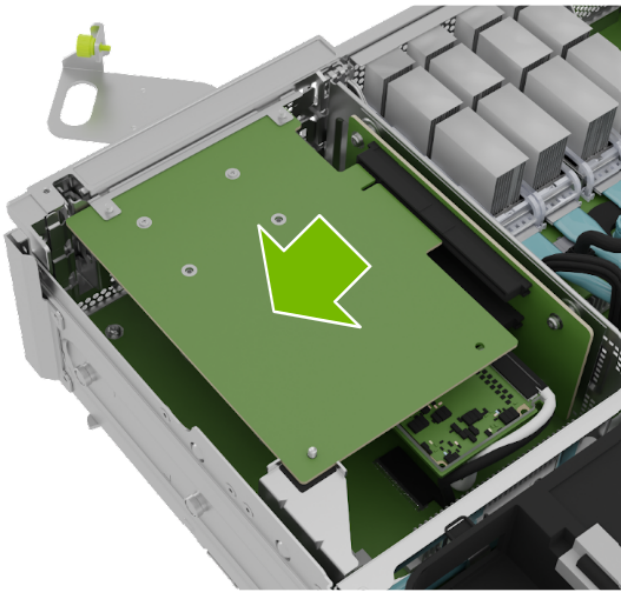
2. Rotate the locking mechanism for the PCI carrier out of the way:



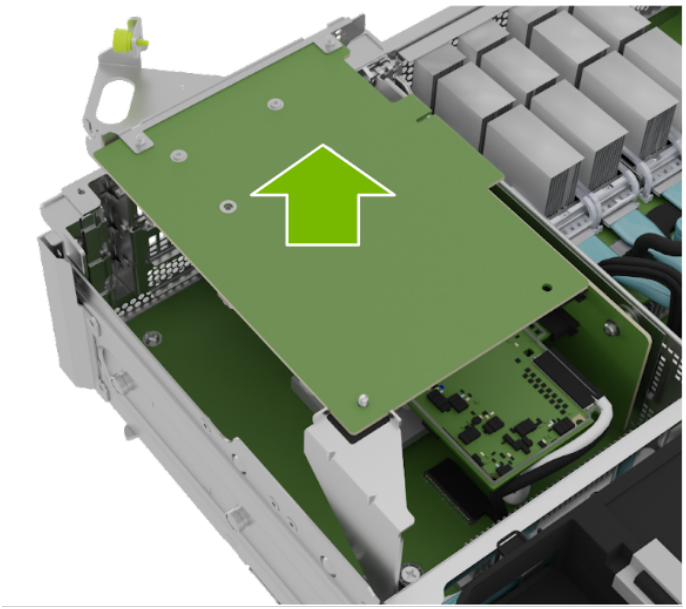
3. Lossen the captive screw on the support bracket of the M.2 riser card:



4. Pull the M.2 riser card from the slot:



5. Lift the M.2 riser card to remove it from the system:

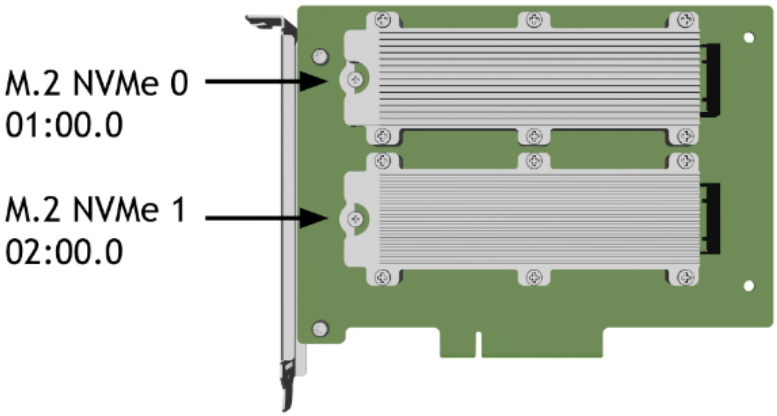


8.4. Remove the M.2 Drive

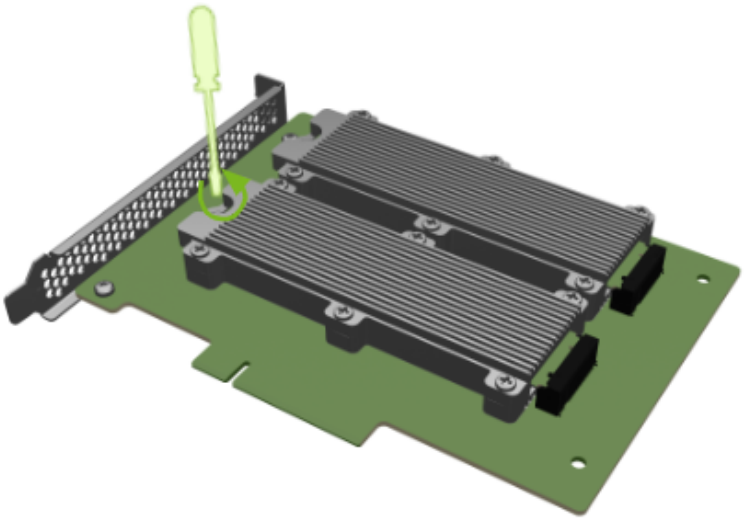
Before attempting to remove one of the M.2 NVMe drives, make sure that you performed the following prerequisites:

- Determined the location ID of the faulty M.2 drive.
- Obtained the replacement M.2 drive and have saved the packaging for use when returning the faulty drive.

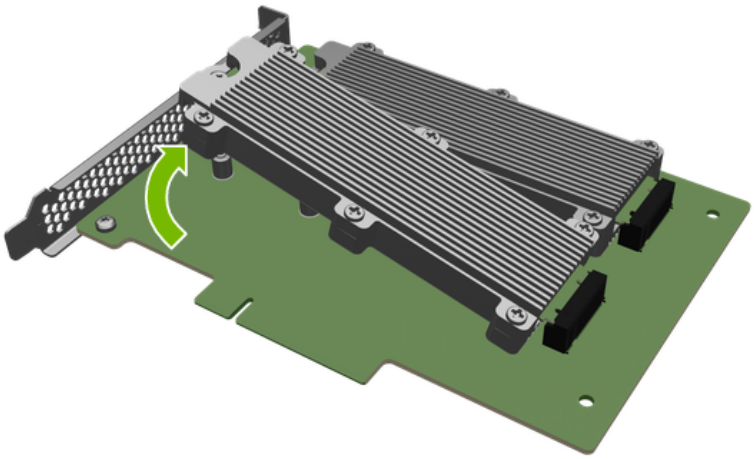
1. Identify the M.2 NVMe that needs to be replaced:



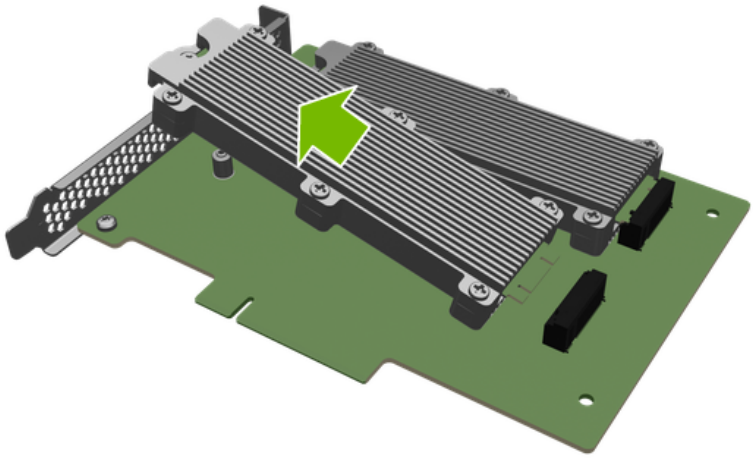
2. Loosen the screw of the identified M.2 drive:



3. Pull the left end of the M.2 drive up about 30˚:

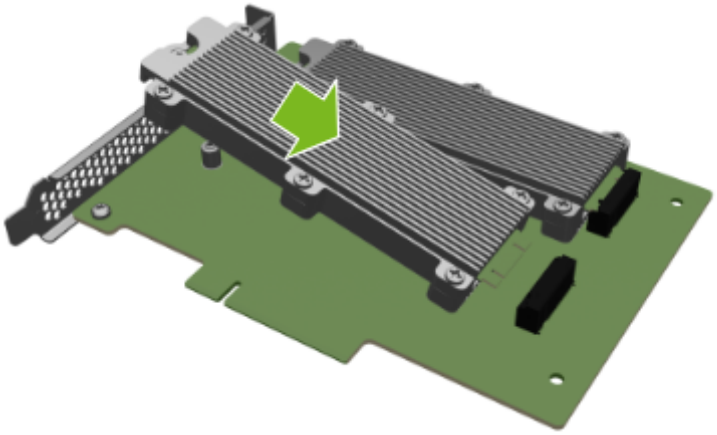


4. To pull the M.2 out, raise it slightly, up to 30˚ and pull the drive off the socket as shown in the following figure:

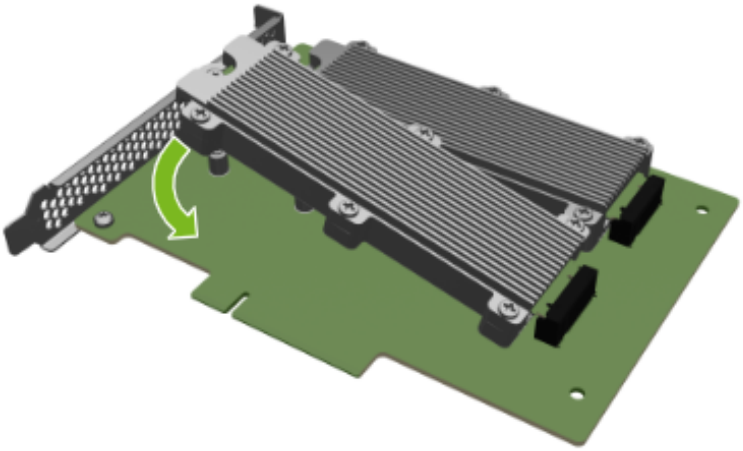


8.5. Replace the M.2 Drive

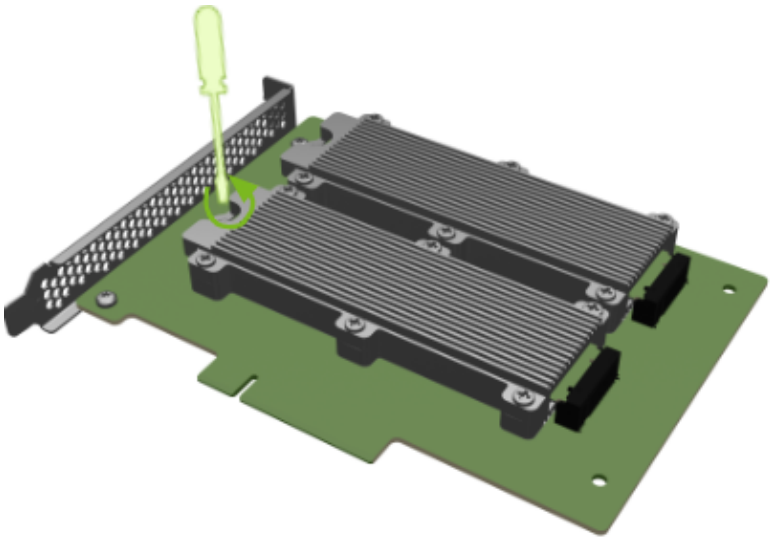
1. To insert the M.2 drive, set it at an angle and insert it into the connector:



2. Lower the M.2 drive and align it with the screw post:

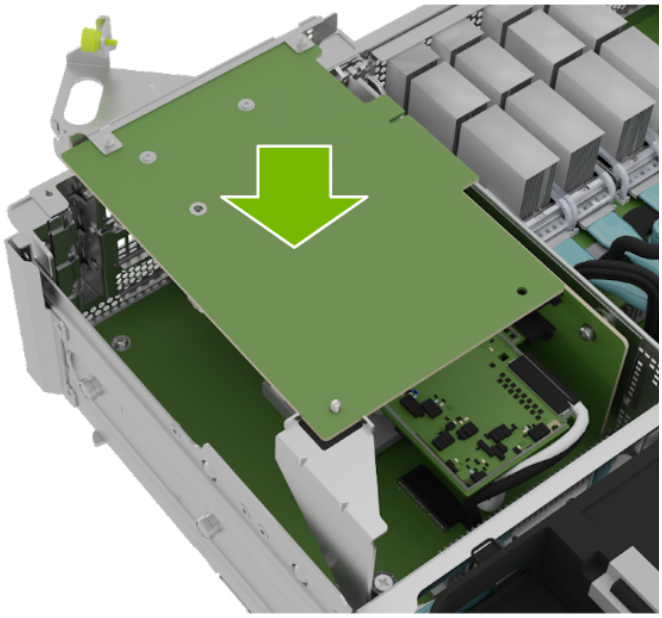


3. Install and tighten the screw to secure the drive to the riser:

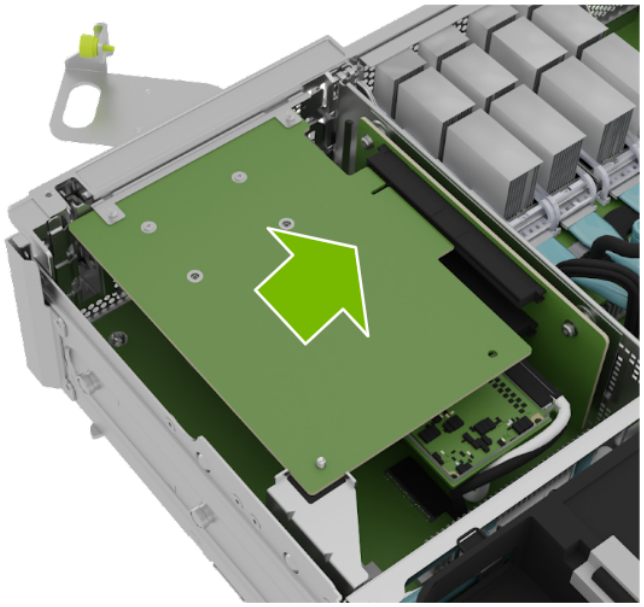


8.6. Install the M.2 Boot Drive Carrier and Close the System

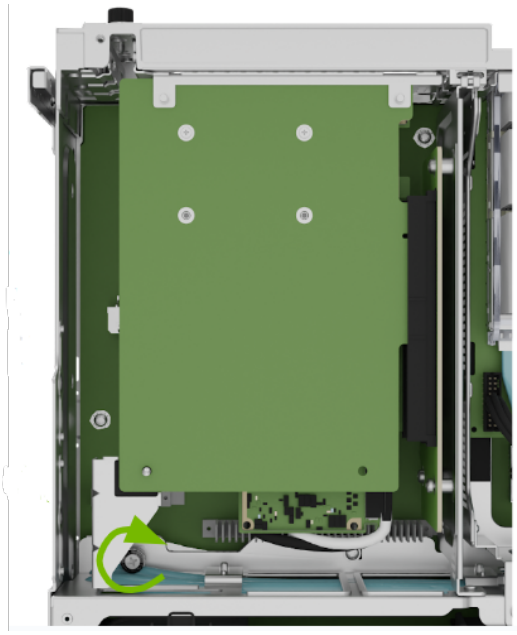
1. Position the M.2 riser card into the system:



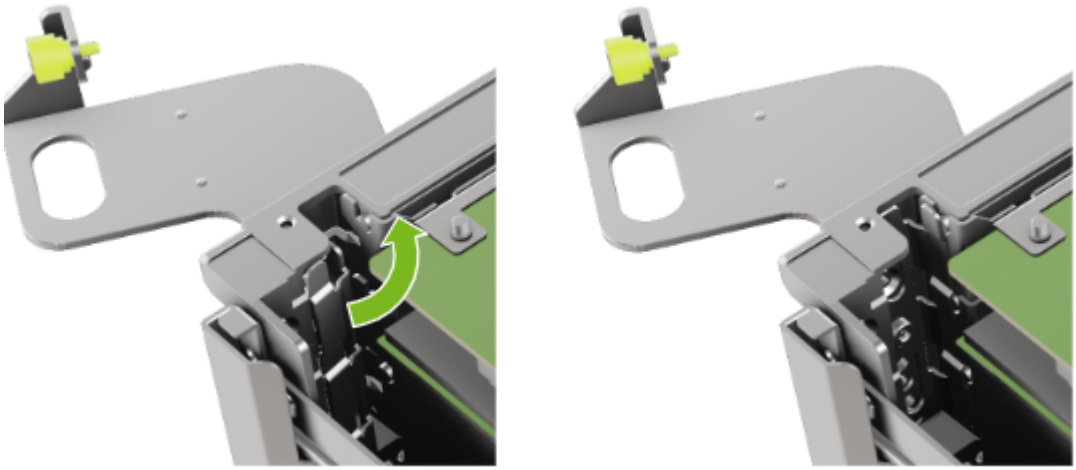
2. Install the M.2 carrier card into the PCI riser by aligning it with the slot and then pressing it against the riser:



3. Tighten the captive screw on the support bracket of the M.2 riser card:



4. Close the latch to secure the M.2 carrier and secure it in place:



5. Tighten the thumb screw to make sure the locking mechanism stays in place:

8.7. Integrate the New Drive and Complete Installation

1. Return the motherboard to its regular position and power on the system.

   Refer to *Motherboard Tray - Opening and Closing the IO door* for more information.
2. Boot the Operating System.
3. Run the following command to rebuild the boot drive mirror:

```
sudo nvsm start /systems/localhost/storage/volumes/md0/rebuild/
```

4. At the `Type of volume rebuild` prompt, enter `raid-1` and press `Enter`:

```
PROMPT: In order to rebuild volume, volume type is required. Please
     specify the volume type to rebuild from options below.
     raid-0: create raid-0 data volume
     raid-1: rebuild OS boot and root volumes
     esp:    find and replicate an empty EFI system partition

Type of volume rebuild (CTRL-C to cancel): raid-1
```

5. At the `Name of spare drive` prompt, enter the replacement drive name, `nvme0n1` or `nvme1n1`, and press `Enter`:

```
PROMPT: In order to rebuild this volume, a spare drive
     is required. Please specify the spare drive to
     use to rebuild RAID-1.

Name of spare drive for RAID-1 rebuild (CTRL-C to cancel): nvmeXn1
```

6. At the warning prompt, enter `y` and press `Enter`:

```
WARNING: Once the volume rebuild process is started, the process cannot be
↪stopped.
Start RAID-1 rebuild on md0? [y/n] y
```

Example Output

```
Initializing rebuild ...
```

7. Monitor the progress. After approximately `30` seconds, the following message appears:

```
/systems/localhost/storage/volumes/md0/rebuild started at 2018-10-12
          15:27:26.525187
Rebuilding RAID-1 rebuild on volume md0…
31.0% [=============/ ]
```

If this message remains at `Initiating RAID-1 rebuild` for more than `30` seconds, then there is a problem with the rebuild process. In this case, make sure the name of the replacement drive is correct and try again.

8. Use the packaging from the new drive to ship back the failed drive back to NVIDIA Enterprise Support

Note: If your organization purchased a media retention policy, you might be able to keep failed drives for destruction. Check with NVIDIA Enterprise Support on the status of the policy for specifics.

Chapter 9. M.2 Boot Drive Assembly Replacement

This section applies when you must replace both M.2 operating system drives. In this case, a replacement assembly—which includes both M.2 NVMe drives—should be ordered.

9.1. M.2 Boot Drive Riser Assembly Replacement Overview

This is a high-level overview of the procedure to replace the boot drive riser assembly.

Note: If your organization purchased a media retention policy, you might be able to keep failed drives for destruction. Check with NVIDIA Enterprise Support on the status of the policy for specifics.

1. Get a replacement M.2 boot drive assembly from NVIDIA Enterprise Support
2. Make sure the system is shut down
3. If cables don't reach, label all cables and unplug them from the motherboard tray
4. Slide motherboard out until it locks in place
5. Open rear compartment
6. Pull out the M.2 riser card with both M.2 disks attached
7. Install the M.2 riser card with both M.2 disks
8. Close the rear motherboard compartment
9. Slide the motherboard back into the system
10. Plug in all cables using the labels as a reference
11. Power on the system
12. Re-install using the latest DGX Operating System
13. Ship back the failed unit to NVIDIA Enterprise Support using the packaging provide

9.2. Preparing the System for Replacement

This failure is hard to diagnose because the system won't boot, as both boot drives are unavailable.

After the replacement part arrives from NVIDIA, shut down the system from the front power button or from the BMC user interface and proceed by opening the IO door of the motherboard. Refer to *Motherboard Tray - Opening and Closing the IO door* to get access to the M.2 boot drive carrier.

9.3. Remove the M.2 Boot Drive Carrier

Before attempting to remove M.2 boot drive carrier, make sure that you performed the following prerequisites:

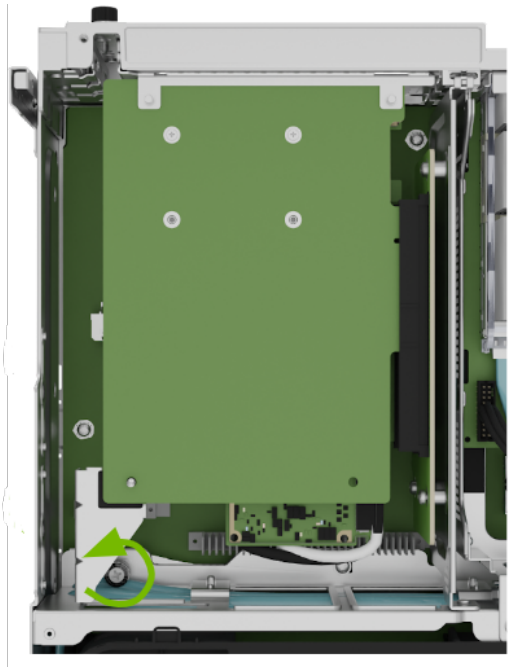
- Label all network, monitor, and USB cables connected to the motherboard tray for easy identification when reconnecting.
- Unplug all power cords, and all network, monitor, and USB cables.

Refer to *Motherboard Tray - Opening and Closing the IO door* for more information.

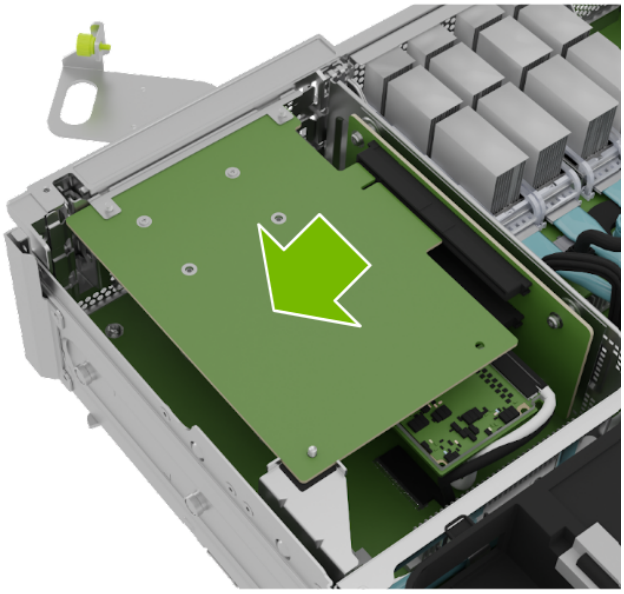
1. After the IO section of the motherboard is open, unlock the M.2 drive carrier by loosening the PCI card locking mechanism by loosening the black captive thumbscrew on the right side of the motherboard:

2. Rotate the locking mechanism for the PCI carrier out of the way:

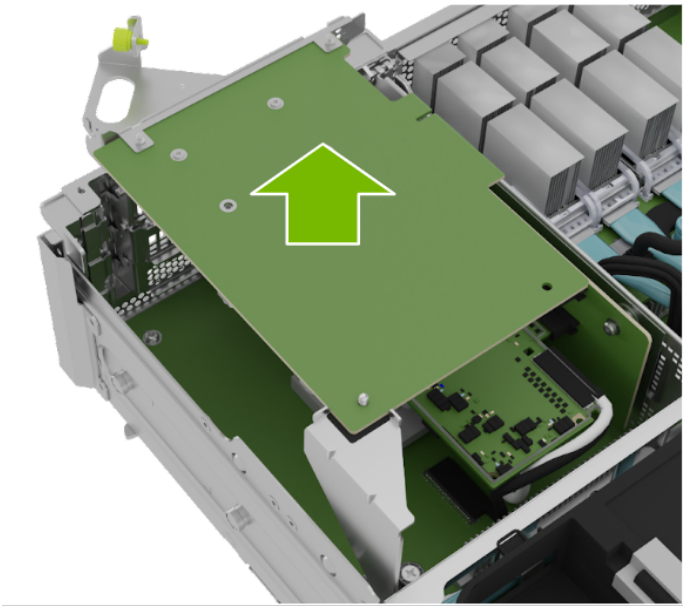
3. Lossen the captive screw on the support bracket of the M.2 riser card:



4. Pull the M.2 riser card from the slot:

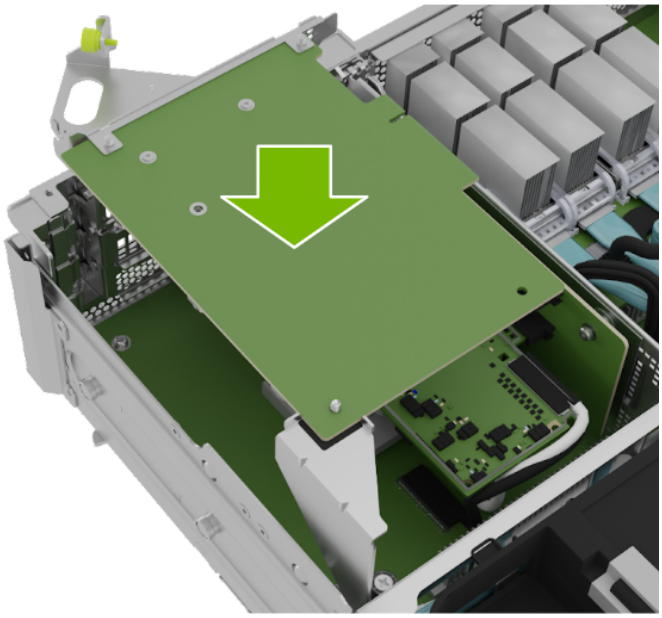


5. Lift the M.2 riser card to remove it from the system:

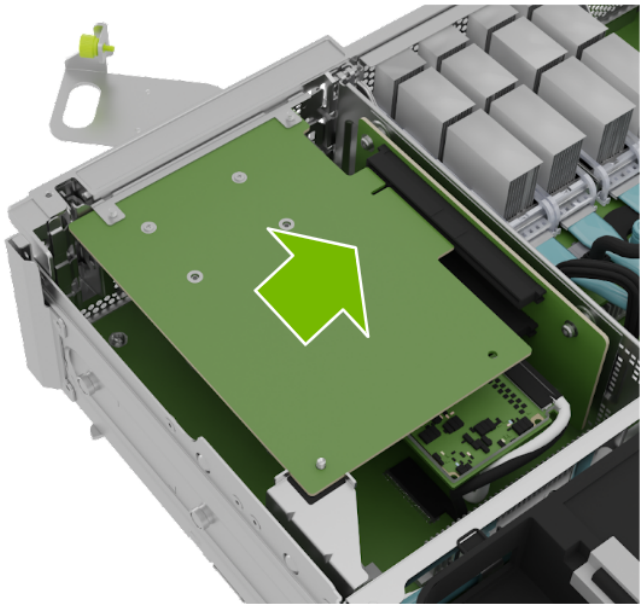


9.4. Install the M.2 Boot Drive Carrier and Close the System

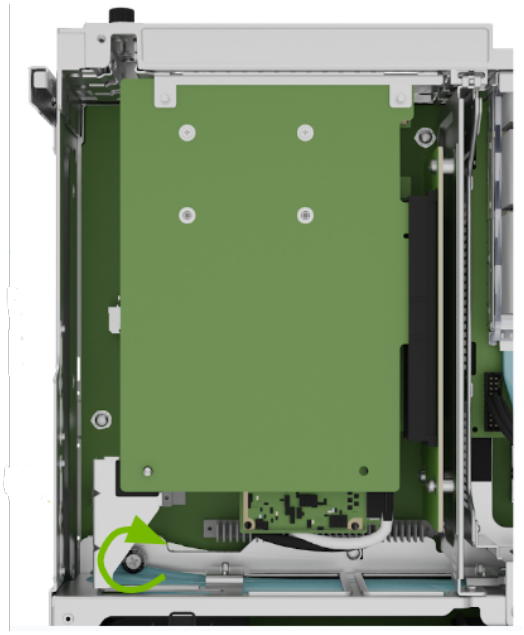
1. Position the M.2 riser card into the system:



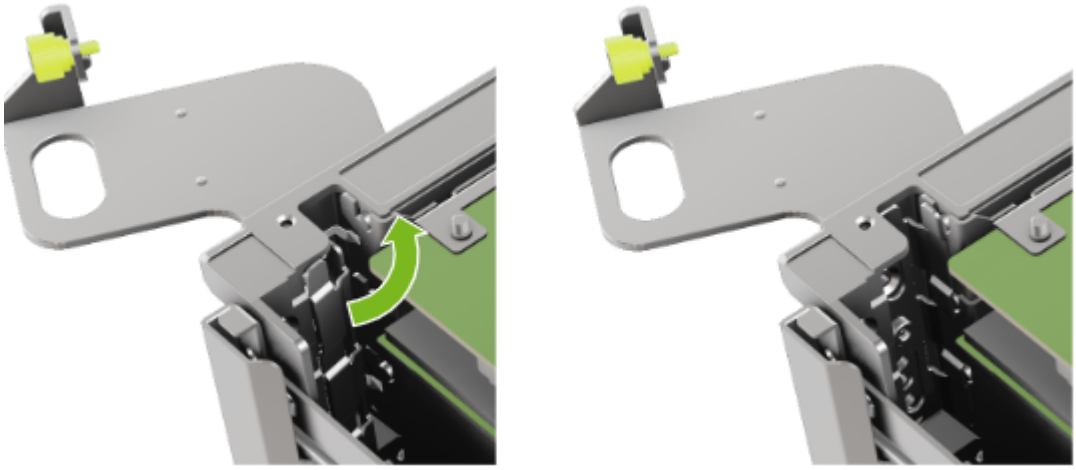
2. Install the M.2 carrier card into the PCI riser by aligning it with the slot and then pressing it against the riser:



3. Tighten the captive screw on the support bracket of the M.2 riser card:



4. Close the latch to secure the M.2 carrier and secure it in place:



5. Tighten the thumb screw to make sure the locking mechanism stays in place:

9.5. Re-Install the System and Complete the Procedure

1. Close the lid and insert the motherboard tray. Refer to *Motherboard Tray - Opening and Closing the IO door* for more information.
2. Reinstall the system following the instructions in the *DGX OS User Guide*.
3. Confirm the system is in working order by running:

```
sudo nvsm show health
```

4. Use the packaging from the new component to ship back the failed one back to NVIDIA Enterprise Support

Chapter 10. DIMM Replacement

Caution: Static Sensitive Devices: Be sure to observe best practices for electrostatic discharge (ESD) protection. This includes making sure personnel and equipment are connected to a common ground, such as by wearing a wrist strap connected to the chassis ground, and placing components on static-free work surfaces.

10.1. DIMM Replacement Overview

This is a high-level overview of the procedure to replace a dual inline memory module (DIMM) on the NVIDIA DGX™ H100/H200 system.

1. Use the `nvsm health` command to identify the failed DIMM
2. Get a replacement DIMM from NVIDIA Enterprise Support
3. Shut down the system
4. Label all motherboard tray cables and unplug them
5. Remove the motherboard tray and place on a solid flat surface
6. Remove the motherboard tray lid
7. Use the reference diagram on the lid of the motherboard tray to identify the failed DIMM
8. Replace the bad DIMM with the new one
9. Close the lid on the motherboard tray
10. Insert the motherboard tray into the system
11. Plug in all cables using the labels as a reference
12. Power on the system
13. Verify that all DIMMs are now healthy with nvsm health
14. Ship back the failed unit to NVIDIA Enterprise Support using the packaging provided

10.2. Identifying the Failed DIMM

1. From the console, run the following `nvsm` command to identify memory alerts:

```
sudo nvsm show health
```

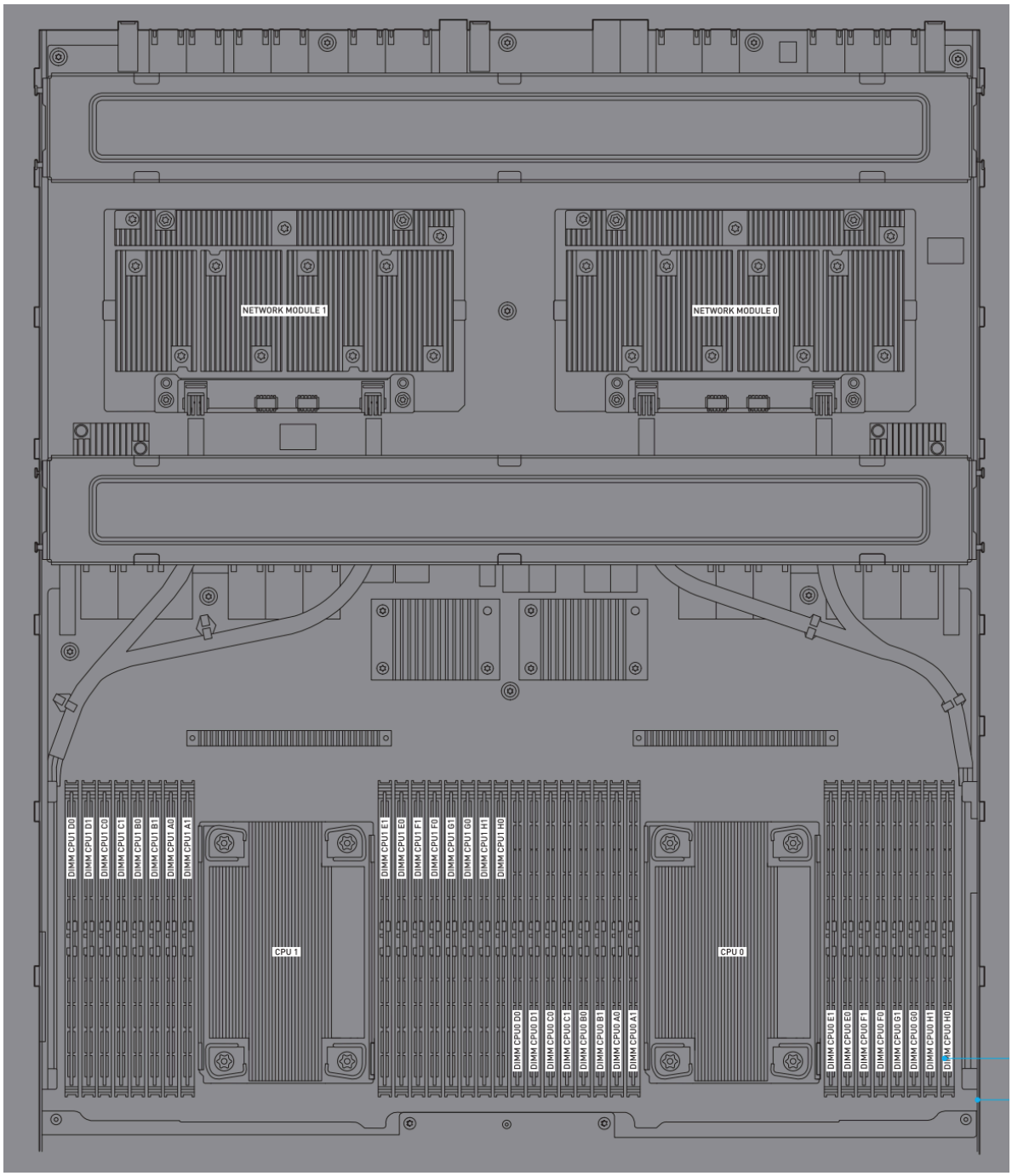
2. Determine the DIMM manufacturer.

```
sudo nvsm show memory
```

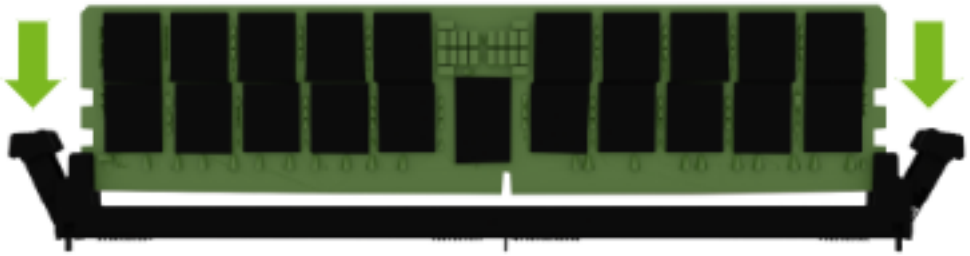
3. Request the replacement DIMM from NVIDIA Enterprise Support, specifying the manufacturer.

10.3. Replacing the DIMM

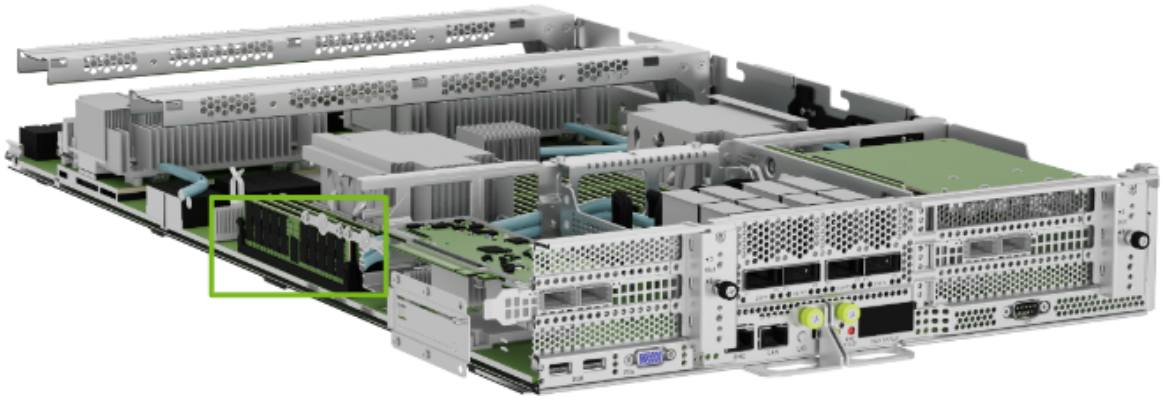
1. Power off the system.
2. Remove the motherboard tray. Refer to *Motherboard Tray - Removal and Installation* for more information.
3. Pull the motherboard out of the system and place it on a solid, flat surface and remove the lid and air baffles to expose the DIMMs.
4. Identify the failed DIMM on the motherboard. Use the label on the lid to identify the position of the DIMM to be replaced. The names of the DIMMs also include the CPU numbering for easier identification.



5. Remove the DIMM. Press down on the side latches at both ends of the DIMM socket to push them away from the DIMM. This should unseat the DIMM from the socket.

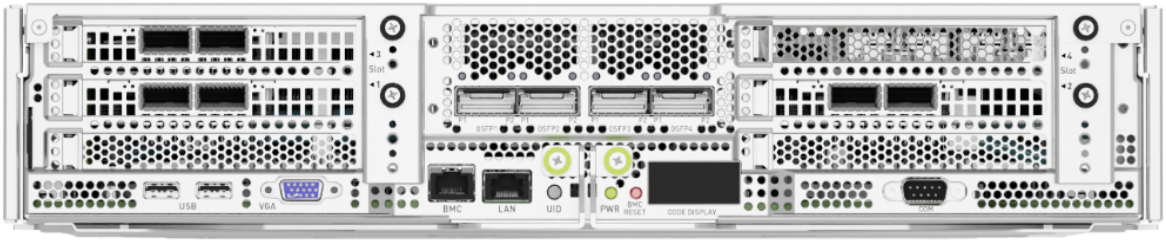


6. To install the DIMM, make sure both levers are in the open position. Make sure the DIMM is correctly aligned with the key in the right position and press down on the DIMM until it clicks in the socket and the levers close.



10.4. Finalize DIMM Replacement

1. Install the air baffles, close the motherboard, and install the tray in the chassis. Refer to *Motherboard Tray - Removal and Installation* for more information.
2. Plug in all cables.
3. Install all power cords.



4. Power on system.
5. Login and use the `nvsm` command to confirm the system is healthy:

```
sudo nvsm show health
```

6. Ship the bad DIMM back to NVIDIA Enterprise Support.

Chapter 11. Network Interface Card Replacement

11.1. Network Card Replacement Overview

This is a high-level overview of the procedure to replace one or more network cards on the NVIDIA DGX™ H100/H200 system.

1. Identify the failed card
2. Get a replacement Ethernet card from NVIDIA Enterprise Support
3. Make sure the system is shut down
4. If cables don't reach, label all cables and unplug them from the motherboard tray
5. Slide motherboard out until it locks in place
6. Open rear compartment
7. Pull out the bad Ethernet card
8. Install the new Ethernet card
9. Close the rear motherboard compartment
10. Slide the motherboard back into the system
11. Plug in all cables using the labels as a reference
12. Power on the system
13. Test the Ethernet card
14. Ship back the failed unit to NVIDIA Enterprise Support using the packaging provided

11.2. Prepare the System for Replacement

Usually, the issue with a network interface card for the following reasons:

1. The operating system does not detect the device.
2. The device does not transmit or receive data.

After you rule out external connectivity issues, contact NVIDIA Enterprise Support to receive a replacement card.

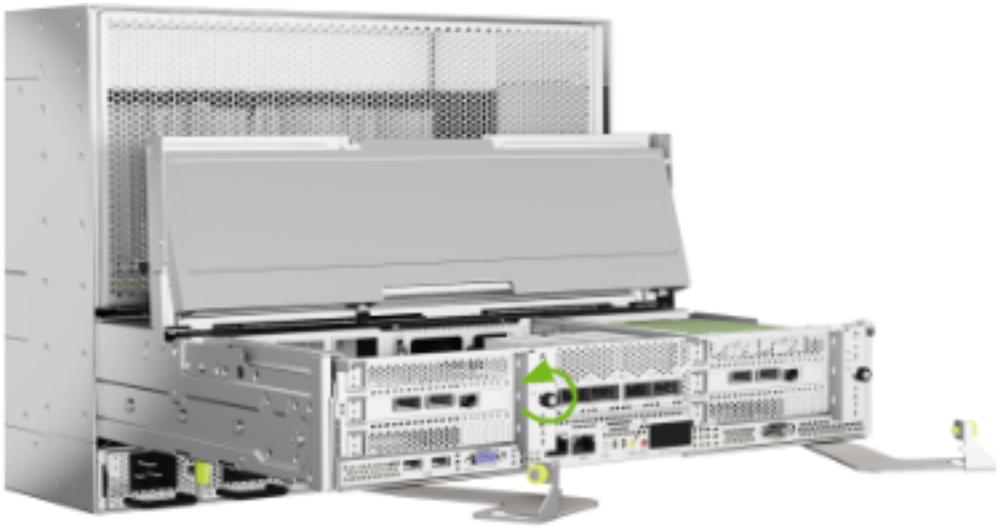
When you receive the card, begin the replacement by performing the following actions:

- Power off the system.
- Open the motherboard tray IO door to access the rear section of the motherboard. Refer to *Motherboard Tray - Opening and Closing the IO door* for more information.

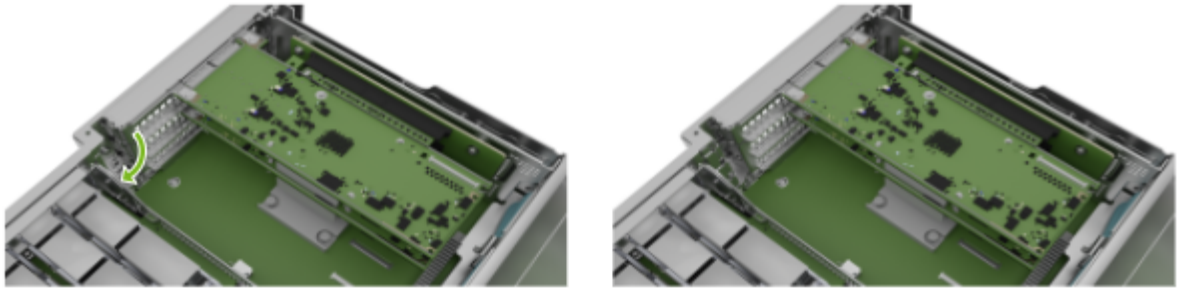
11.3. Remove the Non-Functional Card

First, turn the locking mechanism 90 degrees so the card can be extracted from the PCI slot:

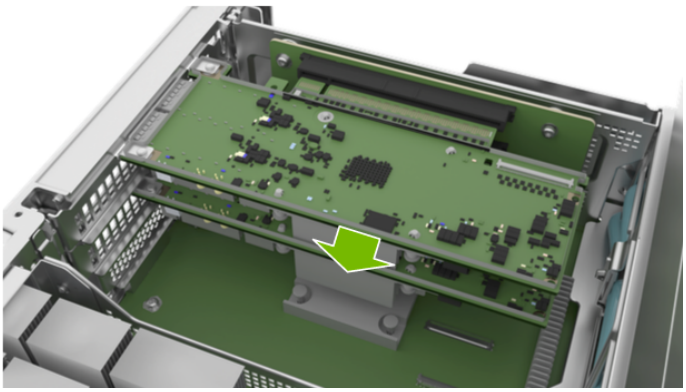
1. Confirm the motherboard tray service lid is open and loosen the thumb screw for the PCI card locking mechanism next to slots 1 and 3:



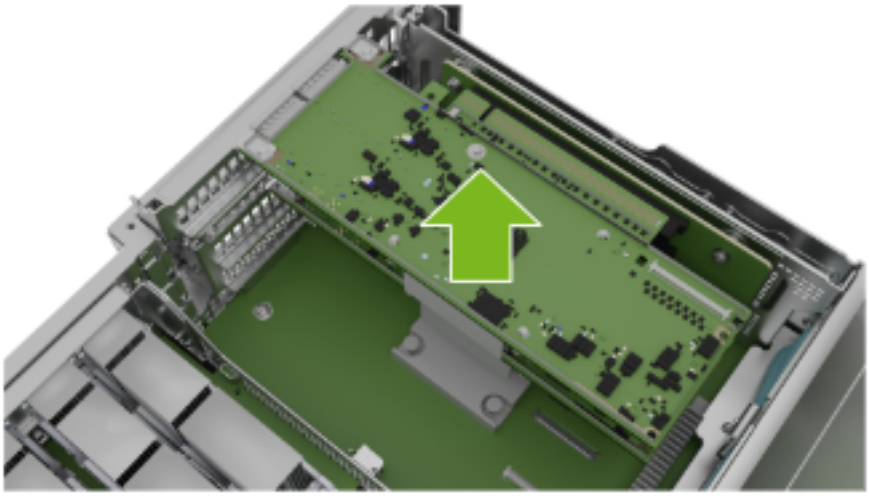
2. Rotate the locking mechanism to release the PCI cards, as shown in the following figure:



3. Pull the PCI Ethernet card from the slot in the riser:

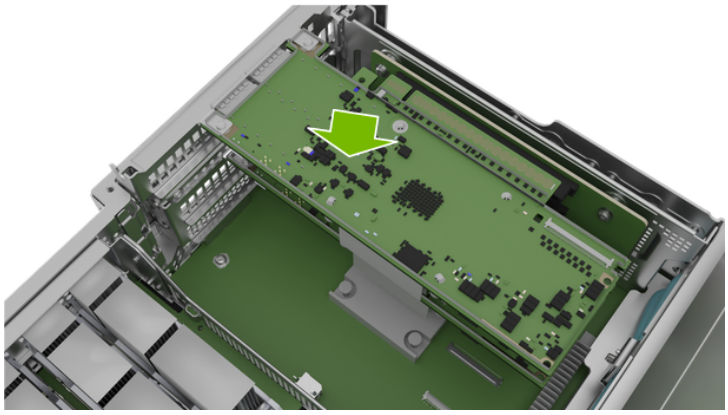


4. Remove the card from the system:

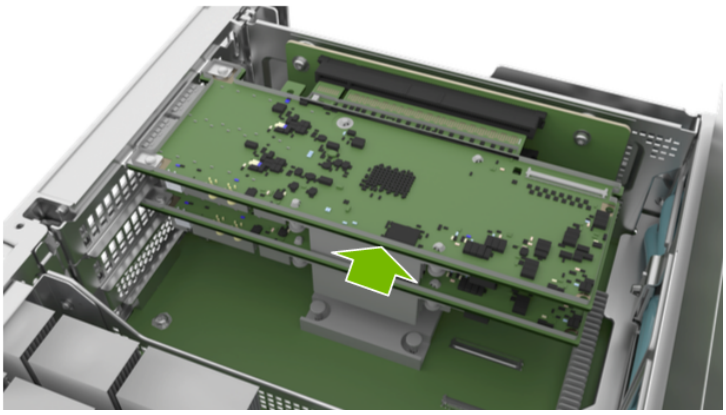


11.4. Install the New Card and Close the Lock

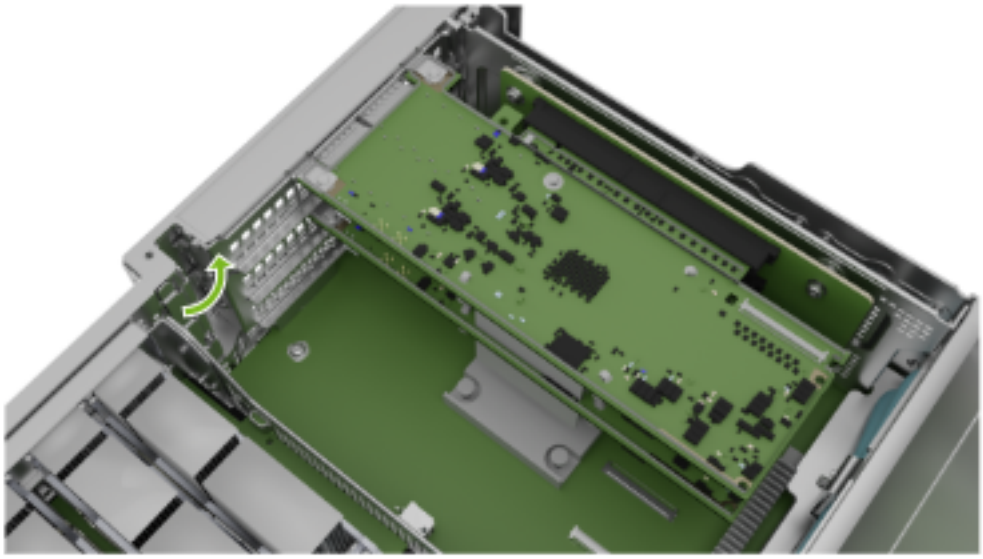
1. Position the PCI card in the system:



2. Push the card into the PCI slot:



3. Close the latch to lock the PCI cards in place:



4. Secure the locking mechanism by tightening the black thumb screw:

11.5. Finalize the Network Interface Card Replacement

Refer to *Motherboard Tray - Opening and Closing the IO door* for information about performing the following actions:

1. Close the motherboard tray IO door.
2. Lock the motherboard lid.
3. Insert the motherboard.
4. Reconnect cables to their ports.

Chapter 12. Updating the ConnectX-7 Firmware

After replacing or installing the ConnectX-7 cards, make sure the firmware on the cards is up to date. Refer to the *NVIDIA DGX H100/H200 Firmware Update Guide* to find the most recent firmware version.

1. Download the firmware from https://network.nvidia.com/support/firmware/connectx7ib/.

   Download the firmware for both OPN options.

2. Transfer the firmware ZIP file to the DGX system and extract the archive.
3. Update the firmware on the cards that are used for cluster communication:

```
sudo mstflint -d /sys/bus/pci/devices/0000:5e:00.0/config -i fw-ConnectX7-rel-28_
↪39_3560-MCX750500B-0D00_Ax-UEFI-14.32.17-FlexBoot-3.7.300.signed.bin  b
sudo mstflint -d /sys/bus/pci/devices/0000:dc:00.0/config -i fw-ConnectX7-rel-28_
↪39_3560-MCX750500B-0D00_Ax-UEFI-14.32.17-FlexBoot-3.7.300.signed.bin  b
sudo mstflint -d /sys/bus/pci/devices/0000:c0:00.0/config -i fw-ConnectX7-rel-28_
↪39_3560-MCX750500B-0D00_Ax-UEFI-14.32.17-FlexBoot-3.7.300.signed.bin  b
sudo mstflint -d /sys/bus/pci/devices/0000:18:00.0/config -i fw-ConnectX7-rel-28_
↪39_3560-MCX750500B-0D00_Ax-UEFI-14.32.17-FlexBoot-3.7.300.signed.bin  b
sudo mstflint -d /sys/bus/pci/devices/0000:40:00.0/config -i fw-ConnectX7-rel-28_
↪39_3560-MCX750500B-0D00_Ax-UEFI-14.32.17-FlexBoot-3.7.300.signed.bin  b
sudo mstflint -d /sys/bus/pci/devices/0000:4f:00.0/config -i fw-ConnectX7-rel-28_
↪39_3560-MCX750500B-0D00_Ax-UEFI-14.32.17-FlexBoot-3.7.300.signed.bin  b
sudo mstflint -d /sys/bus/pci/devices/0000:ce:00.0/config -i fw-ConnectX7-rel-28_
↪39_3560-MCX750500B-0D00_Ax-UEFI-14.32.17-FlexBoot-3.7.300.signed.bin  b
sudo mstflint -d /sys/bus/pci/devices/0000:9a:00.0/config -i fw-ConnectX7-rel-28_
↪39_3560-MCX750500B-0D00_Ax-UEFI-14.32.17-FlexBoot-3.7.300.signed.bin  b
```

4. Update the firmware on the cards that are used for storage communication:

```
sudo mstflint -d /sys/bus/pci/devices/0000:aa:00.0/config -i fw-ConnectX7-rel-28_
↪39_3560-MCX755206AS-NEA_Ax-UEFI-14.32.17-FlexBoot-3.7.300.signed.bin  b
sudo mstflint -d /sys/bus/pci/devices/0000:29:00.0/config -i fw-ConnectX7-rel-28_
↪39_3560-MCX755206AS-NEA_Ax-UEFI-14.32.17-FlexBoot-3.7.300.signed.bin  b
```

5. Perform an AC power cycle on the system for the firmware update to take effect.

   Wait for the operating system to boot.

6. After the system starts, log in and confirm the firmware versions are all the same:

```
$ cat /sys/class/infiniband/mlx5_*/fw_ver
```

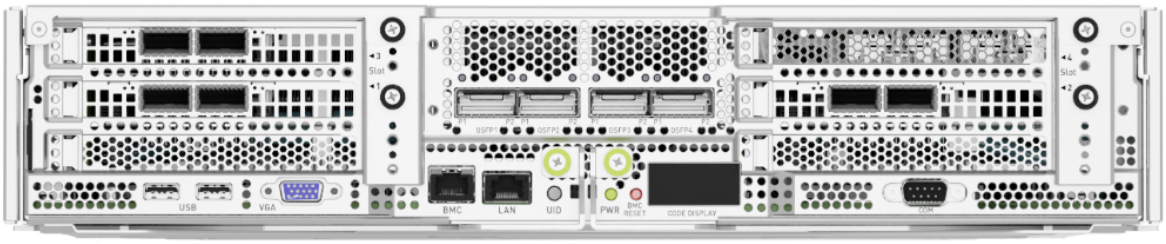
Chapter 13. ConnectX-7 I/O Replacement

13.1. ConnectX-7 I/O Card Replacement Overview

1. Identify the failed card
2. Get a replacement ConnectX-7 IO card from NVIDIA Enterprise Support
3. Make sure the system is shut down
4. If cables don't reach, label all cables and unplug them from the motherboard tray
5. Slide motherboard out until it locks in place
6. Open rear compartment
7. Pull out the card directly above the failed ConnectX-7 to make room for the procedure
8. Pull out the ConnectX-7 IO card
9. Remove the IPEX cables from the old card
10. Install the IPEX cables to the new card
11. Install the new ConnectX-7 IO card
12. Install the card that goes over the ConnectX-7 card
13. Close the rear motherboard compartment
14. Slide the motherboard back into the system
15. Plug in all cables using the labels as a reference
16. Power on the system
17. Update the firmware if necessary and test the ConnectX-7 IO card
18. Ship back the failed unit to NVIDIA Enterprise Support using the packaging provided

13.2. Prepare the System for Replacement

1. First, identify which IO card to replace. Use the `nvsm` command or network tools to determine which card failed. After you have this information, contact NVIDIA Enterprise Support to get a replacement.
2. When the card arrives, power off the system.
3. Based on the output from `nvsm`, identify which card needs to be replaced, the card in slot 1 or in slot 2



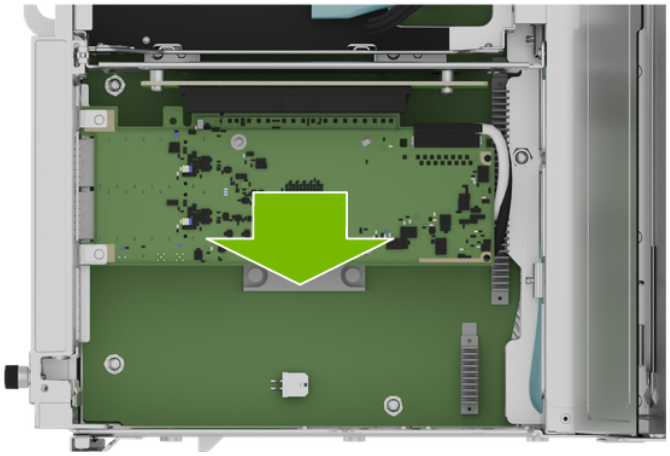
13.3. Remove the I/O Card above the ConnectX Card to be replaced

1. Pull out the motherboard tray and access the IO door. Refer to *Motherboard Tray - Opening and Closing the IO door* for information about accessing the IO door.
2. Remove the I/O card that is above the ConnectX card. The card can be the M.2 boot drive assembly or a network interface card.
   - Refer to *M.2 Boot Drive Assembly Replacement* to remove the M.2 boot drive carrier.

     The images at the preceding link show how to remove the boot drive carrier on the right, above the ConnectX card in slot 2. If you need to replace the ConnectX card in slot 2, follow the instructions, but use the thumbscrew on the left side of the motherboard tray.
   - Refer to *Network Interface Card Replacement* to remove the Ethernet NIC.

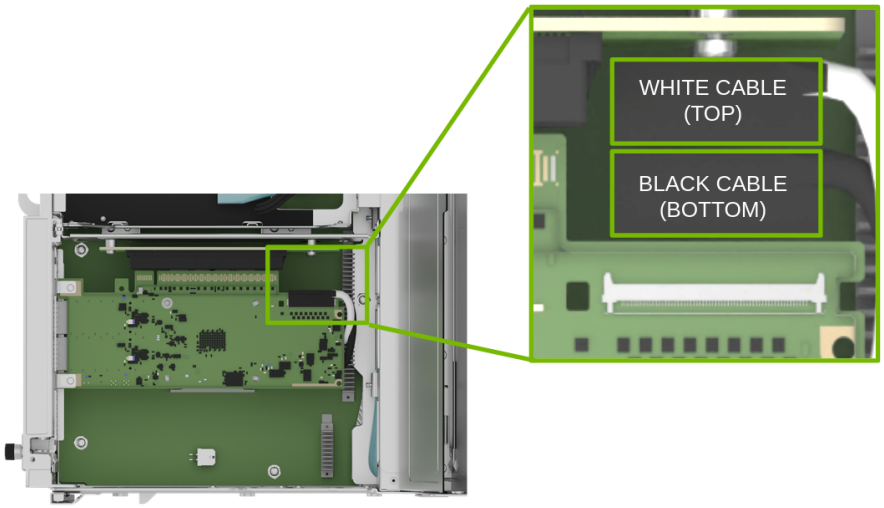
13.4. Remove the ConnectX Card

1. Pull the card out of the slot:



2. Before you pull the card too far, remove the white and black IPEX cables from the card.

   The white cable connects on top of the card and the black cable connects on the bottom (heatsink) of the card:

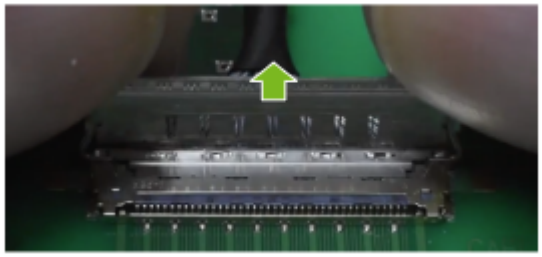


3. Follow the instructions in the next steps to remove and insert the IPEX connectors.

13.5. Remove an IPEX Cable

Repeat this process for both white and black cables.

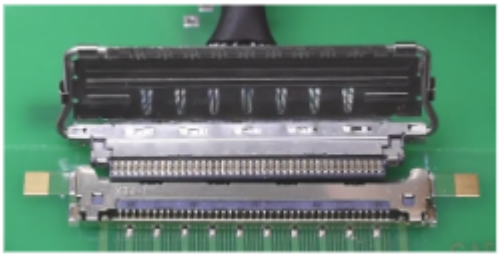
1. Lift the locking door:



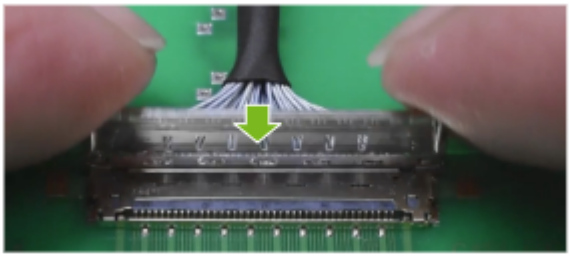
2. Push the cable away from the connector:

13.6. Insert an IPEX Cable

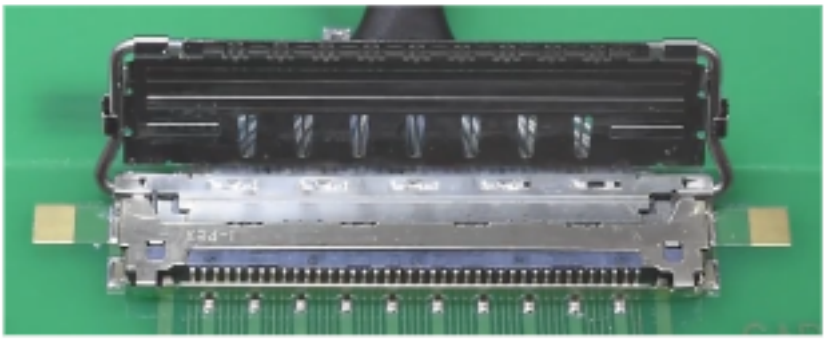
1. Align the IPEX cable to the connector:



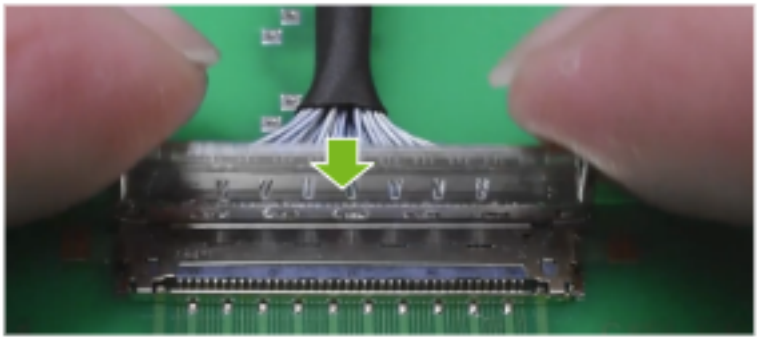
2. Press the cable into the connector:



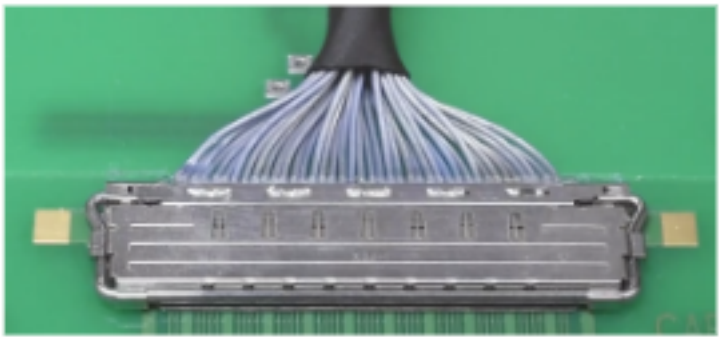
3. Confirm the cable is in the connector:



4. Close the latching mechanism:

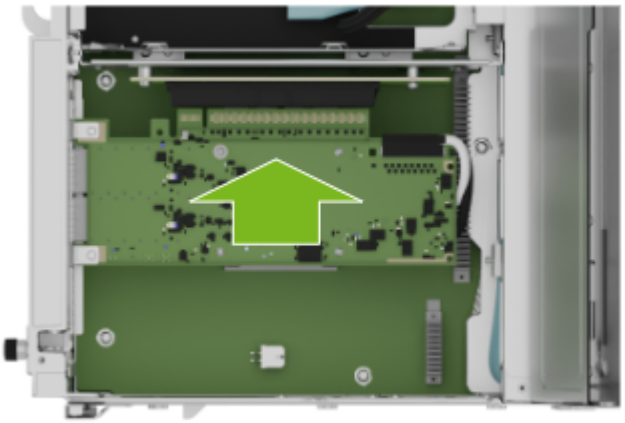


5. Make sure the cable is locked to the connector on the board:

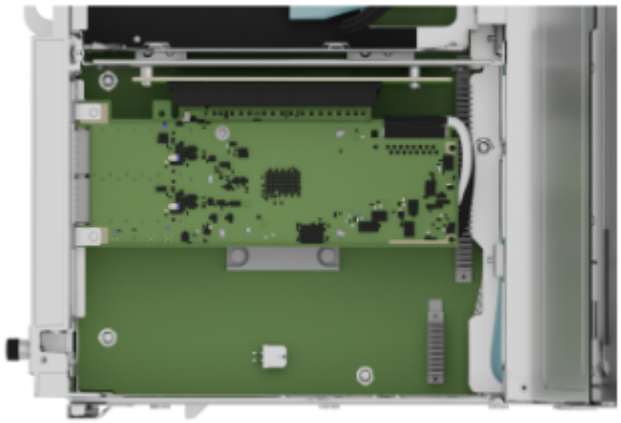


13.7. Install ConnectX Card

1. After you connect the IPEX cables, install the new card in the slot:



2. Confirm the card is in place and that the cables are connected:



13.8. Install the I/O Card above the ConnectX Card

1. Reinstall the I/O card that is above the ConnectX card. Refer to one of the two following procedures:
   - M.2 boot driver carrier. Refer to *M.2 Boot Drive Assembly Replacement* for more information.
   - Ethernet NIC. Refer to *Network Interface Card Replacement* for more information.
2. Close the motherboard tray IO door and insert the motherboard tray. Refer to *Motherboard Tray - Opening and Closing the IO door* for more information.

13.9. Power on the System and Confirm the Replacement

1. Power on and boot the system.
2. Update the firmware on the card. Refer to the *NVIDIA ConnectX-7 User Guide*.
3. Use the `nvsm` command to confirm that the system working correctly:

   ```
   sudo nvsm show health
   ```

4. Use the packaging from the new component to ship the failed one back to NVIDIA Enterprise Support.

Chapter 14. Front Console Board Replacement

14.1. Front Console Board Replacement Overview

This is a high-level overview of the procedure to replace the front console board on the NVIDIA DGX™ H100/H200 system.

1. Unpack the new front console board
2. Shut down the system
3. Remove the bezel
4. Use a Philips #2 screwdriver to loosen the captive screws on the front console board and pull the front console board out of the system
5. Insert the new front console board
6. Tighten the screws
7. Power on the system and confirm the ports work
8. Install the bezel
9. Once done, ship the failed component back to NVIDIA Enterprise Support

14.2. Front Console Board Replacement

You can diagnose a front console board malfunction using the following methods:

- No display or connectivity occurring after plugging in a keyboard and monitor to the front of the system
- The USB ports do not work
- The front temperature sensor does not provide a temperature reading

Contact NVIDIA Enterprise Services to request a replacement.

When the new board arrives, unpack it and keep the packaging to use for sending back the old board.

Caution: Static Sensitive Devices: Be sure to observe best practices for electrostatic discharge (ESD) protection. This includes making sure personnel and equipment are connected to a common ground, such as by wearing a wrist strap connected to the chassis ground, and placing components on static-free work surfaces.

1. Power down the system.
2. Remove the bezel. Refer to *Removing and Attaching the Bezel* for more information.
3. Replace the front console board.
   a. Using a Phillips #2 screwdriver, loosen the two captive screws that secure the front console board:

   b. Replace the front console board:

c. Tighten the screws:

4. Confirm functionality:
   - Power on the system and confirm the ports work
   - Run `sudo nvsm show health` to confirm the temperature sensor is working properly
   - Replace the bezel
5. Ship back the failed unit to NVIDIA Enterprise Support using the packaging provided.

Chapter 15. Motherboard Tray Battery Replacement

Caution: Static Sensitive Devices: Be sure to observe best practices for electrostatic discharge (ESD) protection. This includes making sure personnel and equipment are connected to a common ground, such as by wearing a wrist strap connected to the chassis ground, and placing components on static-free work surfaces.

15.1. Motherboard Tray Battery Replacement Overview

You can replace the motherboard tray battery of the NVIDIA DGX™ H100/H200 system by performing the following high-level steps:

1. Get a replacement battery - type CR2032.
2. Shut down the system.
3. Label all motherboard cables and unplug them.
4. Slide out the motherboard tray.
5. Open the motherboard tray IO compartment.
6. Pull out the M.2 riser card with both M.2 disks attached.
7. Pull out the dual port Mellanox card (slot 4).
8. Replace the battery on the motherboard.
9. Install the dual port Mellanox card (slot 4).
10. Install the M.2 riser card with both M.2 disks attached.
11. Close the lid IO compartment on the motherboard tray.
12. Slide the motherboard tray into the system.
13. Plug in all cables using the labels as a reference.
14. Power on the system.
15. Confirm the system is healthy by running `nvsm show health`.

15.2. Identify a Failed Battery

When the battery fails, some of these symptoms may occur:

- `Invalid configuration` will appear on your screen
- Setup appears on your screen before booting
- `Press F1 to continue` appears on the console
- A Clock Error or Clock Message appears on your screen
- The system clock loses time and date

Call NVIDIA Enterprise Support to confirm that the battery is the right component to replace.

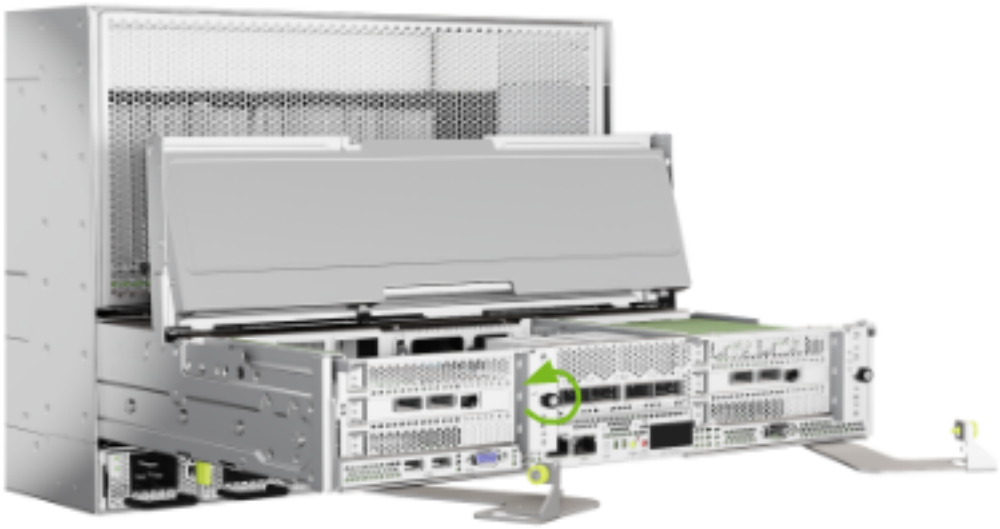
Note: The CR2032 battery is not provided by NVIDIA, but it is easy to find at a convenience store. After you purchase a battery, perform the following procedures.

15.3. Prepare the System for Replacement

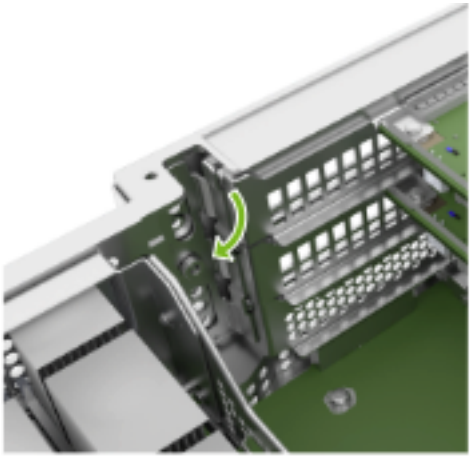
1. Power off the system.
2. Open the motherboard tray IO door. Refer to *Motherboard Tray - Opening and Closing the IO door* for more information.

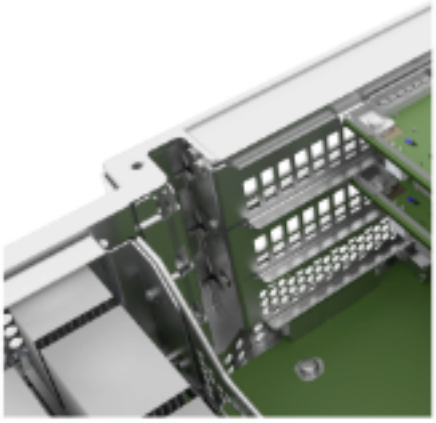
15.4. Remove the PCI Ethernet Card

1. Confirm the motherboard tray IO lid is open.
2. Loosen the thumb screw for the PCI card locking mechanism by loosening the captive black thumb screw that corresponds to the slot you need to work on:

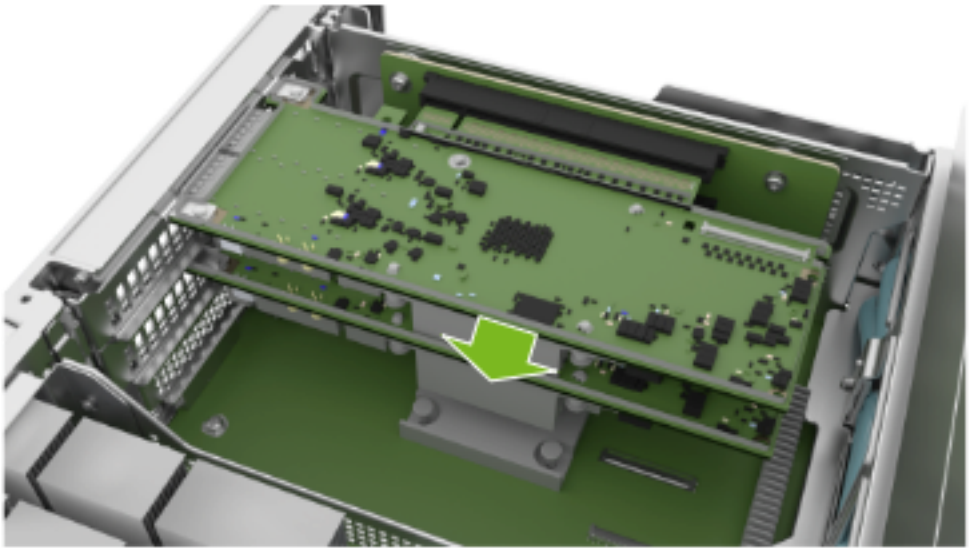


3. Rotate the locking mechanism for the PCI carrier out of the way:

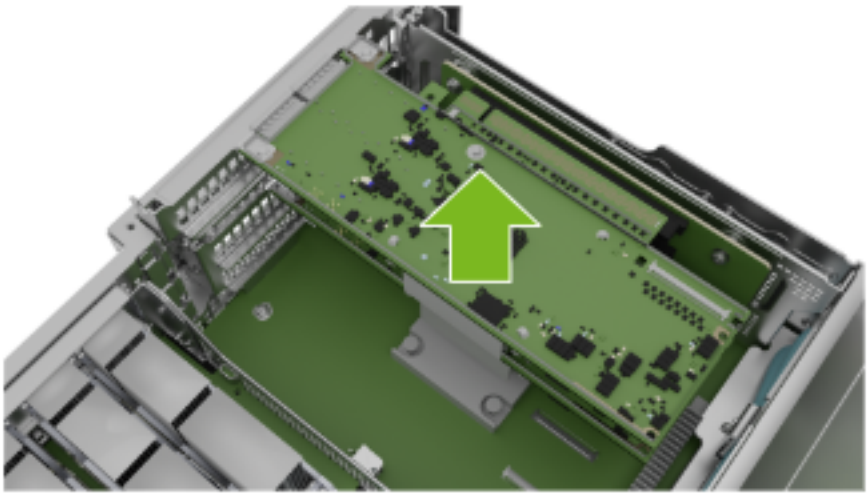




4. Pull the card out of the slot:

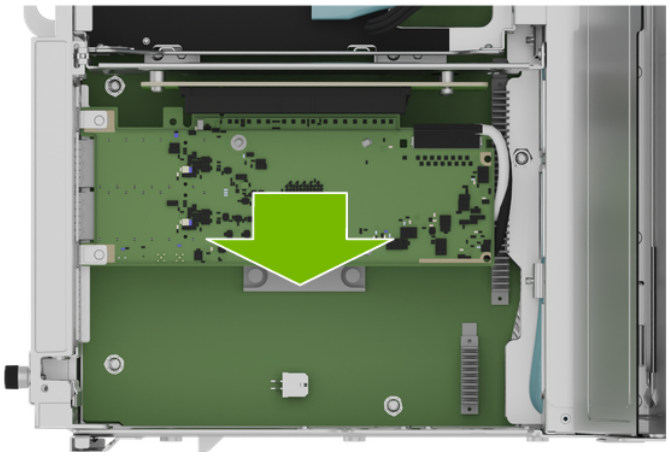


5. Remove the card:



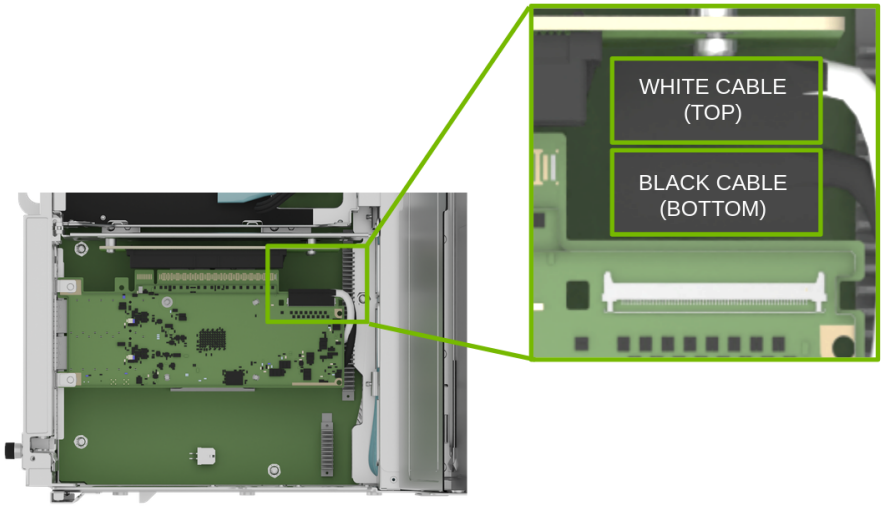
15.5. Remove the ConnectX Card

1. Pull the card out of the slot:



2. Before you pull the card too far, remove the white and black IPEX cables from the card.

   The white cable connects on top of the card and the black cable connects on the bottom (heatsink) of the card:

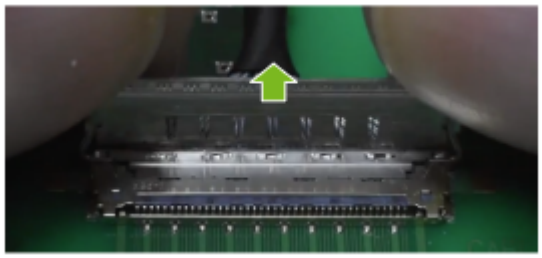


3. Follow the instructions in the next steps to remove and insert the IPEX connectors.

15.6. Remove an IPEX Cable

Repeat this process for both white and black cables.

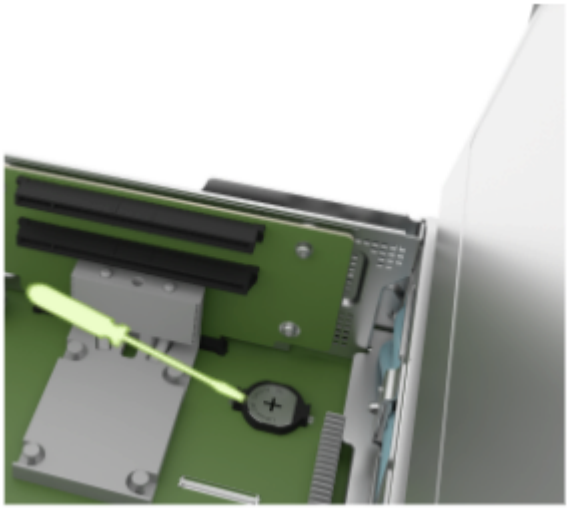
1. Lift the locking door:



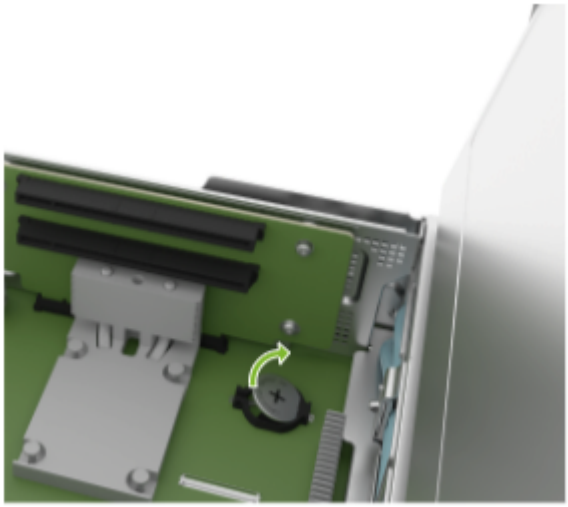
2. Push the cable away from the connector:

15.7. Replace the Battery

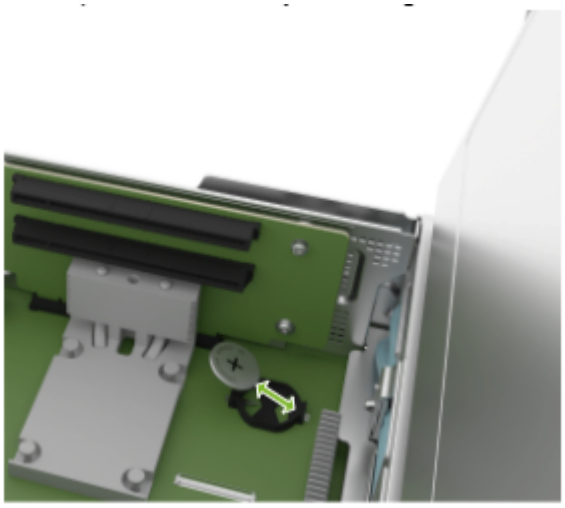
1. Use a thin tool to gently lift the battery from the battery holder:



2. Rotate the battery as shown in the following figure:

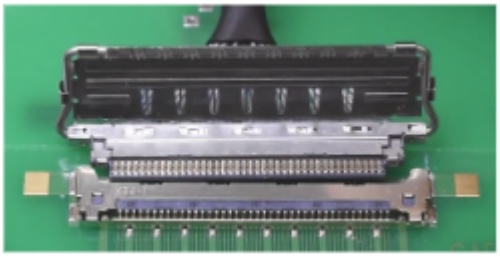


3. Replace the battery with a new CR2032, installing it in the battery holder. Make sure the positive side is on top:

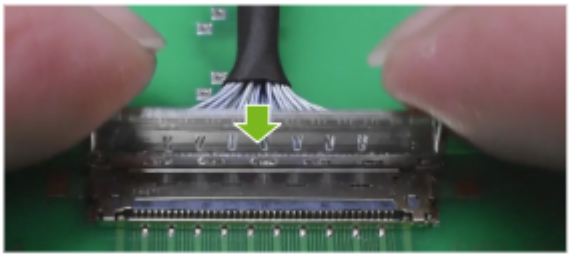


15.8. Insert an IPEX Cable

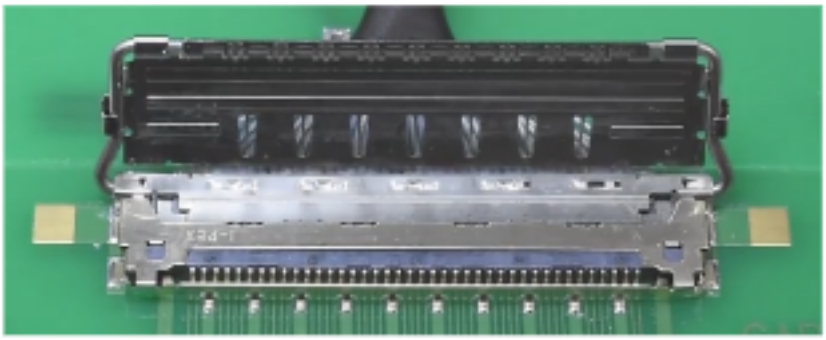
1. Align the IPEX cable to the connector:



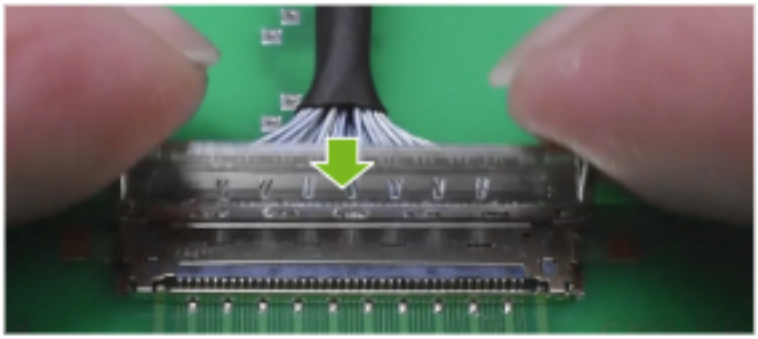
2. Press the cable into the connector:



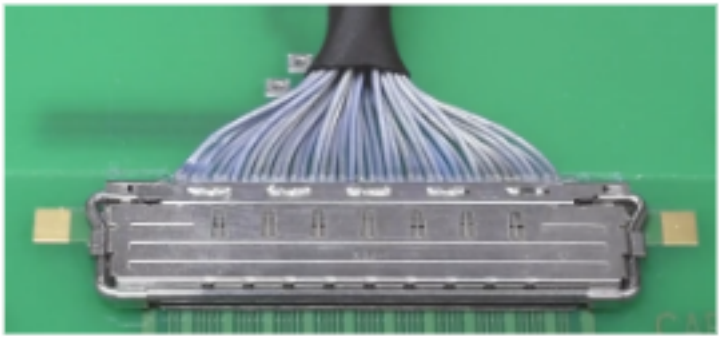
3. Confirm the cable is in the connector:



4. Close the latching mechanism:

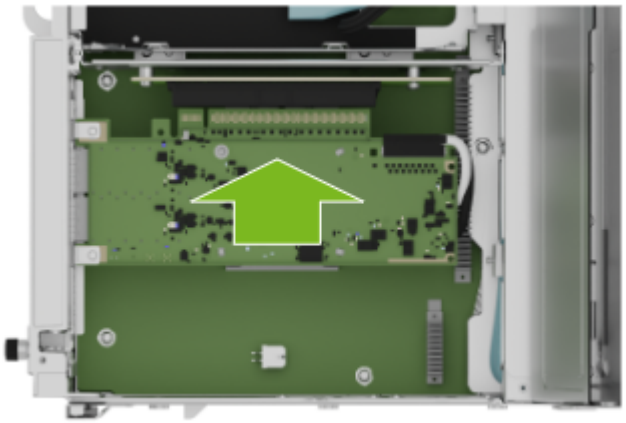


5. Make sure the cable is locked to the connector on the board:

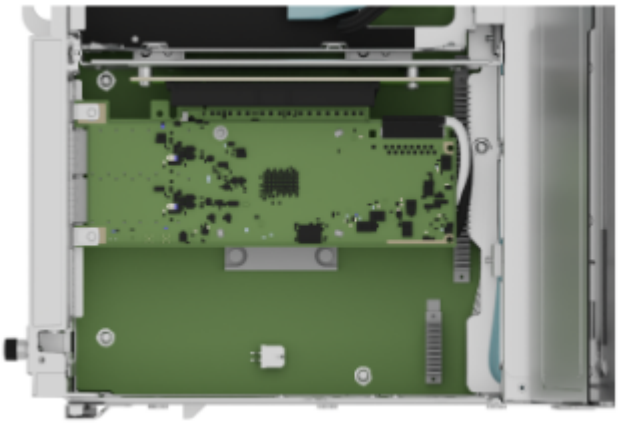


15.9. Install ConnectX Card

1. After you connect the IPEX cables, install the new card in the slot:

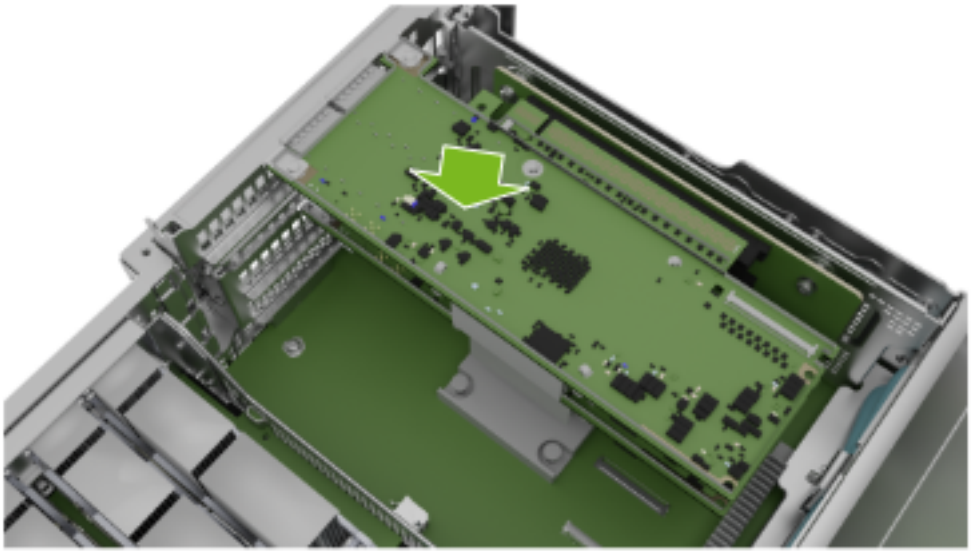


2. Confirm the card is in place and that the cables are connected:

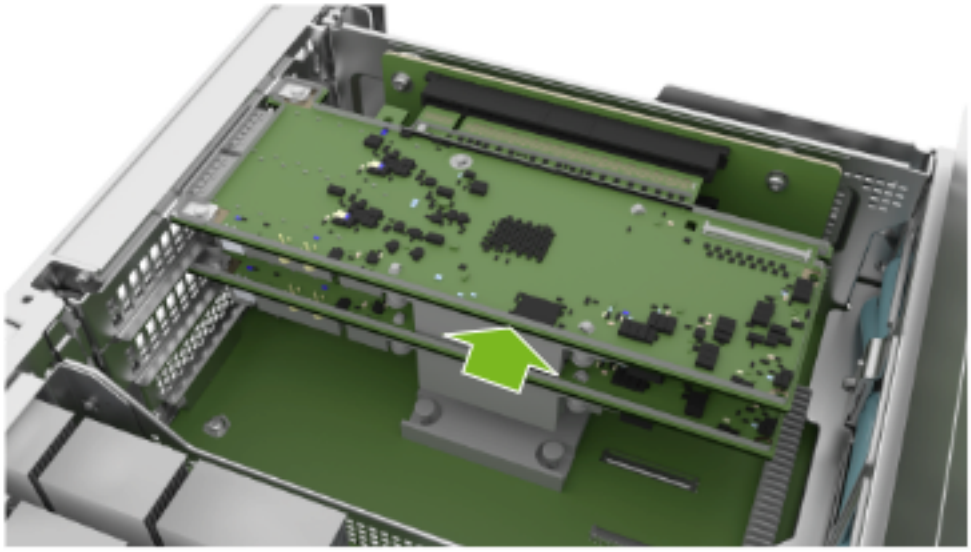


15.10. Install the PCI Ethernet Card

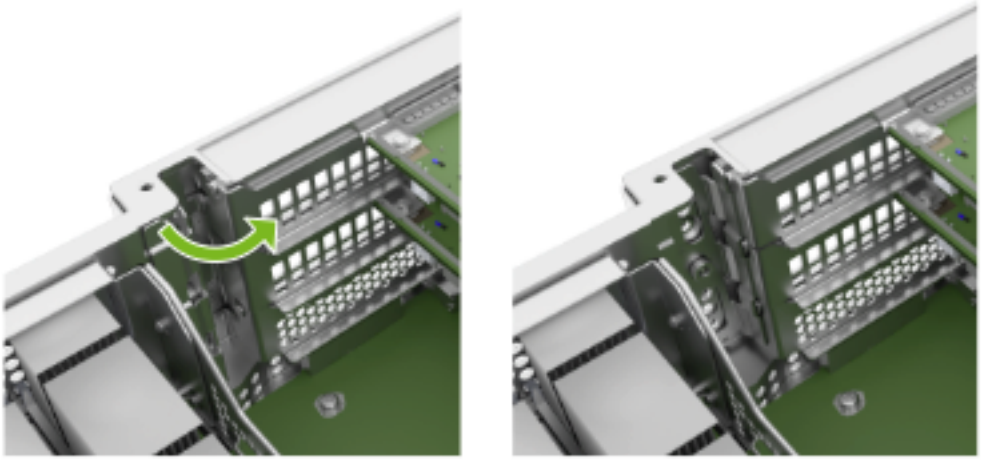
1. Position the card in the system:



2. Push the card into the PCI slot:



3. Close the latch to lock the PCI cards in place:



4. Tighten the thumbscrew to make sure the locking latch mechanism stays in place:

15.11. Power On the System and Confirm Replacement

1. Close the motherboard tray IO door and insert the motherboard tray. Refer to *Motherboard Tray - Opening and Closing the IO door* for more information.
2. Connect all the cables and power cords to the motherboard tray.
3. Apply power to the system and then log in.
4. Restore the date on the system. If you do not use network time protocol (NTP), perform the following steps to set the date manually.
   a. Set the date:

```
sudo date [MMDDhhmm[[CC]YY][.ss]]
```

b. Sync the date and time to the hardware real time clock:

```
sudo hwclock -w
```

c. Reset the BMC:

```
sudo ipmitool mc reset cold
```

5. Confirm that the time and date on the system are updated:

```
sudo nvsm show health
```

Chapter 16. Trusted Platform Module Replacement

Caution: Static Sensitive Devices: Be sure to observe best practices for electrostatic discharge (ESD) protection. This includes making sure personnel and equipment are connected to a common ground, such as by wearing a wrist strap connected to the chassis ground, and placing components on static-free work surfaces.

16.1. Trusted Platform Module Replacement Overview

This is a high-level overview of the procedure to replace the trusted platform module (TPM) on the NVIDIA DGX™ H100/H200 system.

1. If enabled, disable drive encryption.
2. Shut down the system.
3. Label all motherboard tray cables and unplug them.
4. Slide out the motherboard tray.
5. Remove the tray lid and the DIMM air baffle.
6. Lift the OSFP carrier module to access the TPM.
7. Replace the TPM on the motherboard.
8. Install the OSFP carrier module.
9. Install the DIMM air baffle and motherboard tray lid.
10. Slide the motherboard tray into the system.
11. Plug in all cables using the labels as a reference.
12. Power on the system.
13. If the data drives need to be protected, then enable encryption.

16.2. Prepare the System for Replacement

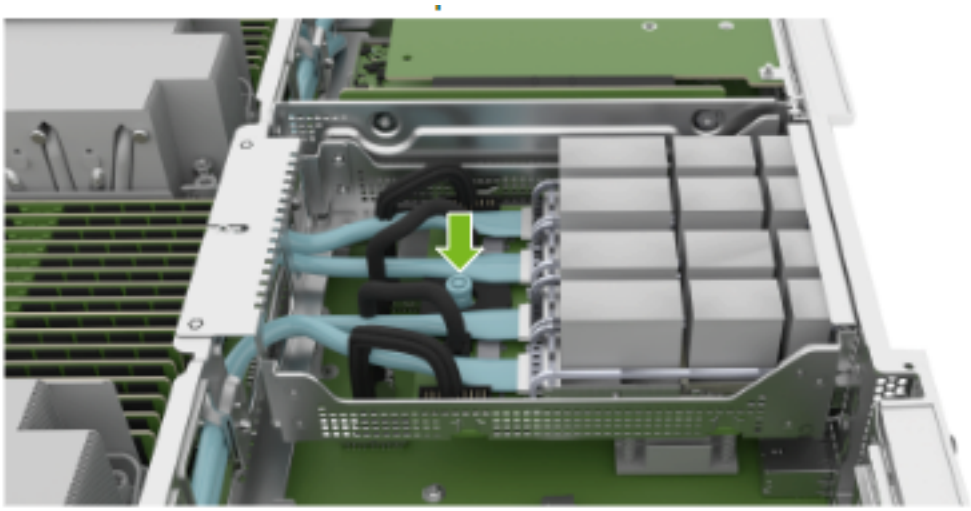
1. If data drives are encrypted, the tpm2 OS package is installed, and the TPM is enabled in SBIOS, disable encryption:

```
sudo nv-disk-encrypt disable
```

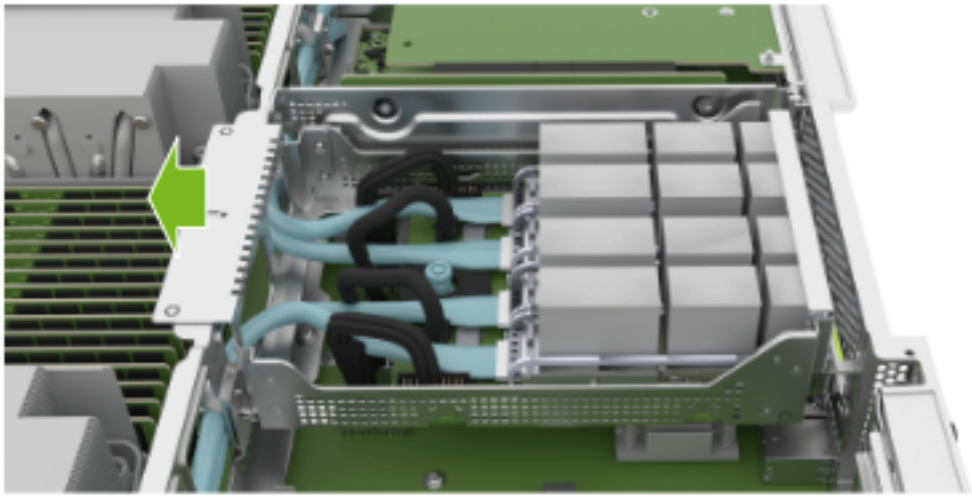
2. Power down the system.
3. Remove the motherboard tray. Refer to *Motherboard Tray - Removal and Installation* for more information.
4. Remove the DIMM air baffle.

16.3. Replace the TPM Module

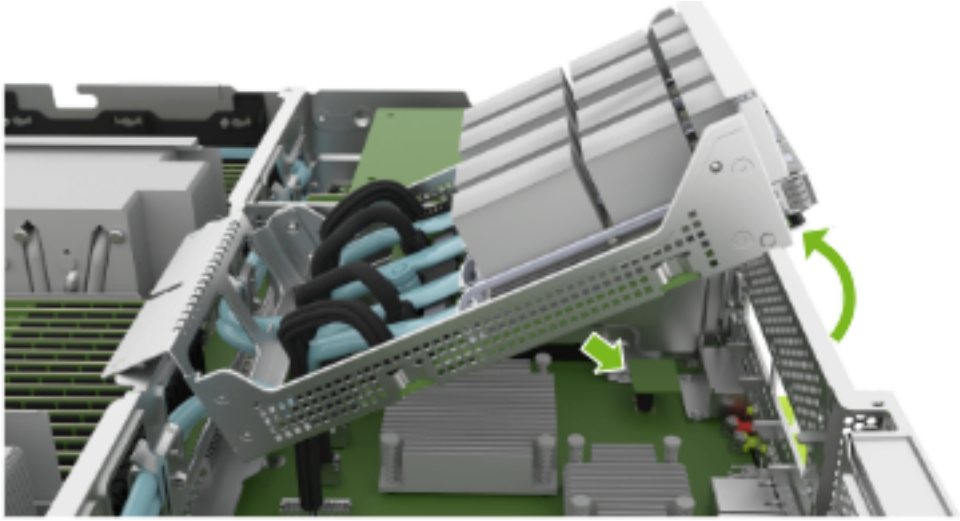
1. Locate the OSFP carrier module on the motherboard. Refer to the following figure:



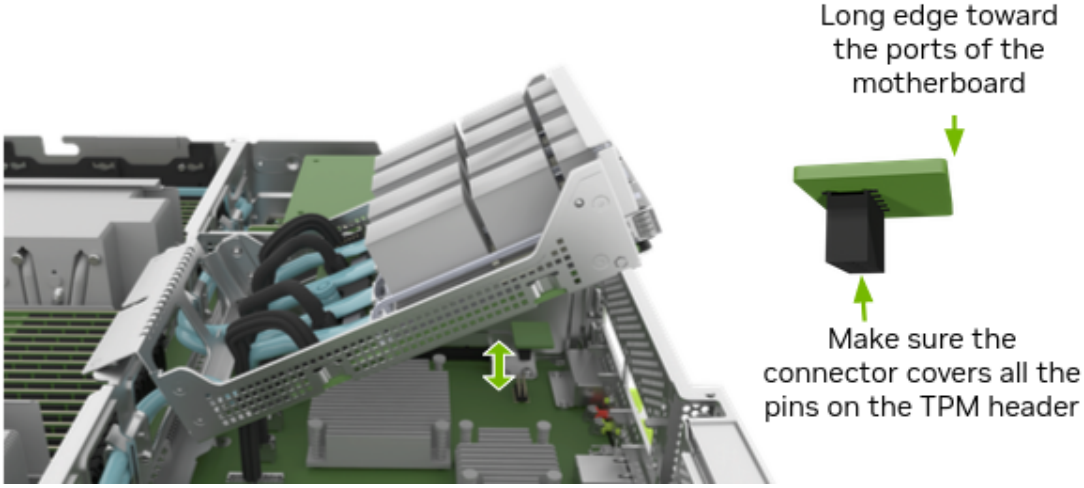
2. Move the OSFP carrier module toward the DIMMs, as shown in the following figure. Make sure the OSFP cages at the rear of the system do not interfere with the tray sheet metal before you tilt the carrier:



3. Rotate the OSFP carrier module to access the TPM, as shown in the following diagram:

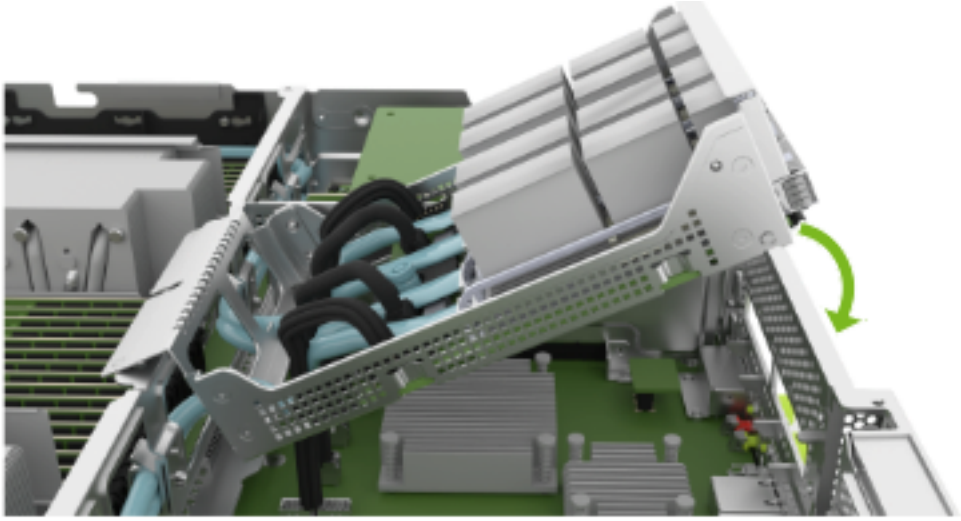


4. Replace the TPM. Make sure that you position the TPM in the same direction as the original.

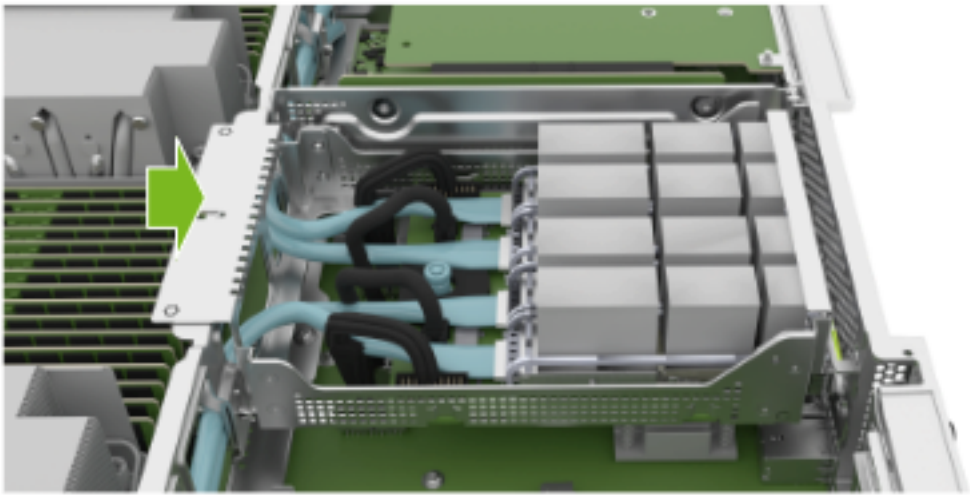


16.4. Install OSFP Carrier Module

1. Rotate the OSFP carrier module to return it to the original position. While you rotate the module, pull the module toward the DIMMs so that the ports do not interfere with the motherboard tray frame:



2. Move the OSFP carrier toward the outside of the tray so that the OSFP cages go through the openings in the motherboard tray frame:



16.5. Finalize TPM replacement

1. Install the air baffles, close the motherboard, and install the tray in the chassis. Refer to *Motherboard Tray - Removal and Installation* for more information.
2. Plug in all cables.
3. Install all power cords.
4. Power on the system.
5. If data drives were encrypted, the tpm2 OS package is installed, and the TPM was enabled in SBIOS before the replacement, enable encryption:

```
sudo nv-disk-encrypt init -g -r -k <your vault password>
```

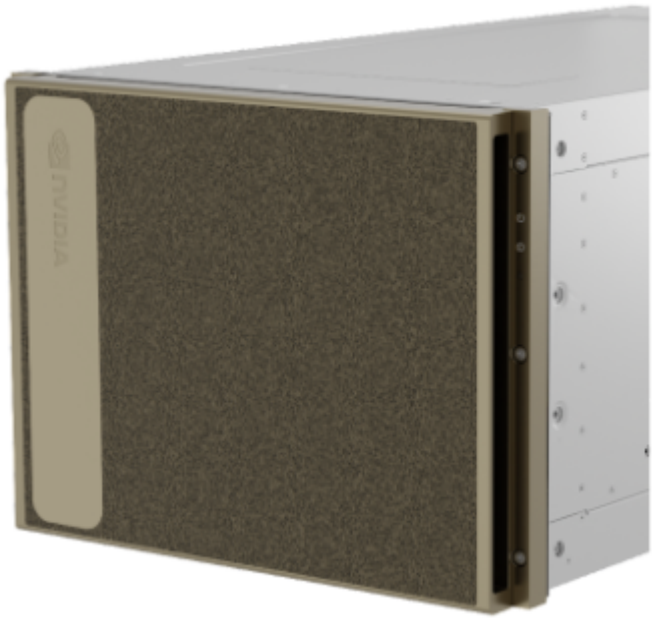
6. Use the `nvsm` command to confirm the system is healthy:

```
sudo nvsm show health
```

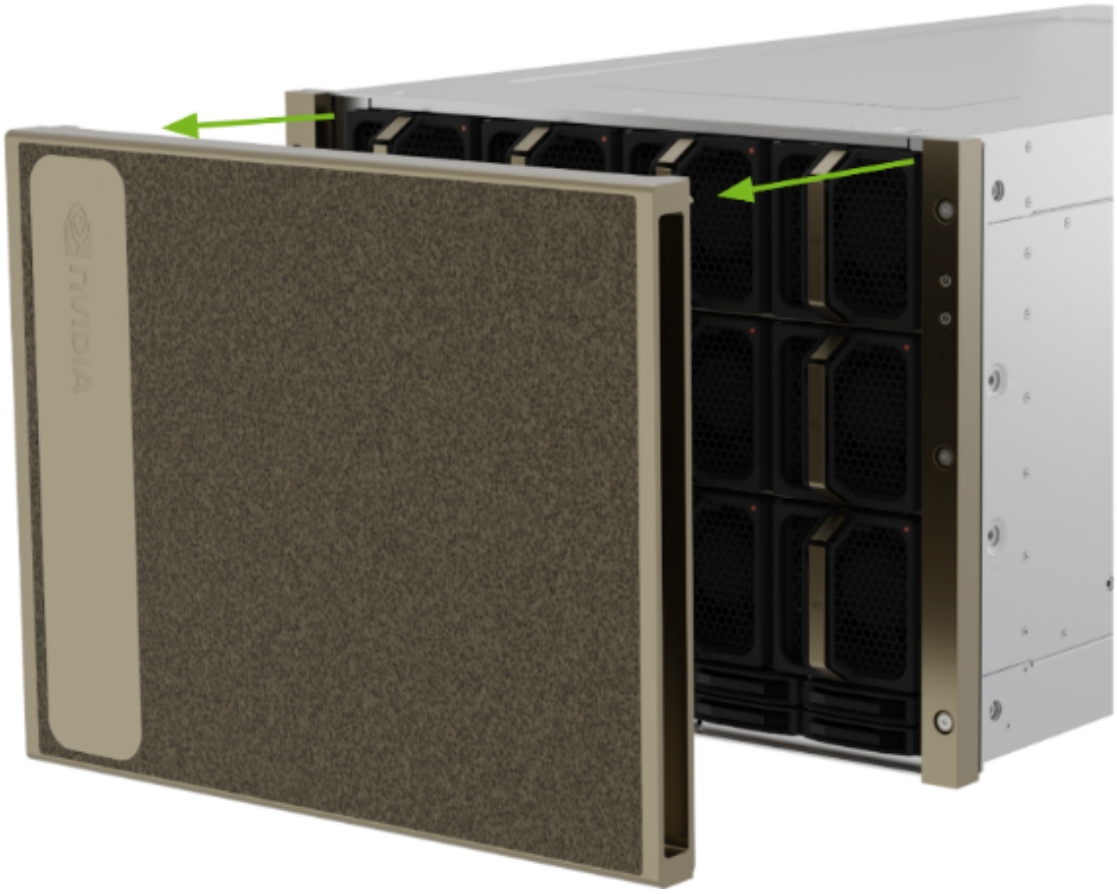
Chapter 17. Removing and Attaching the Bezel

17.1. Bezel Removal

1. Grab the bezel on both sides by the side handles.

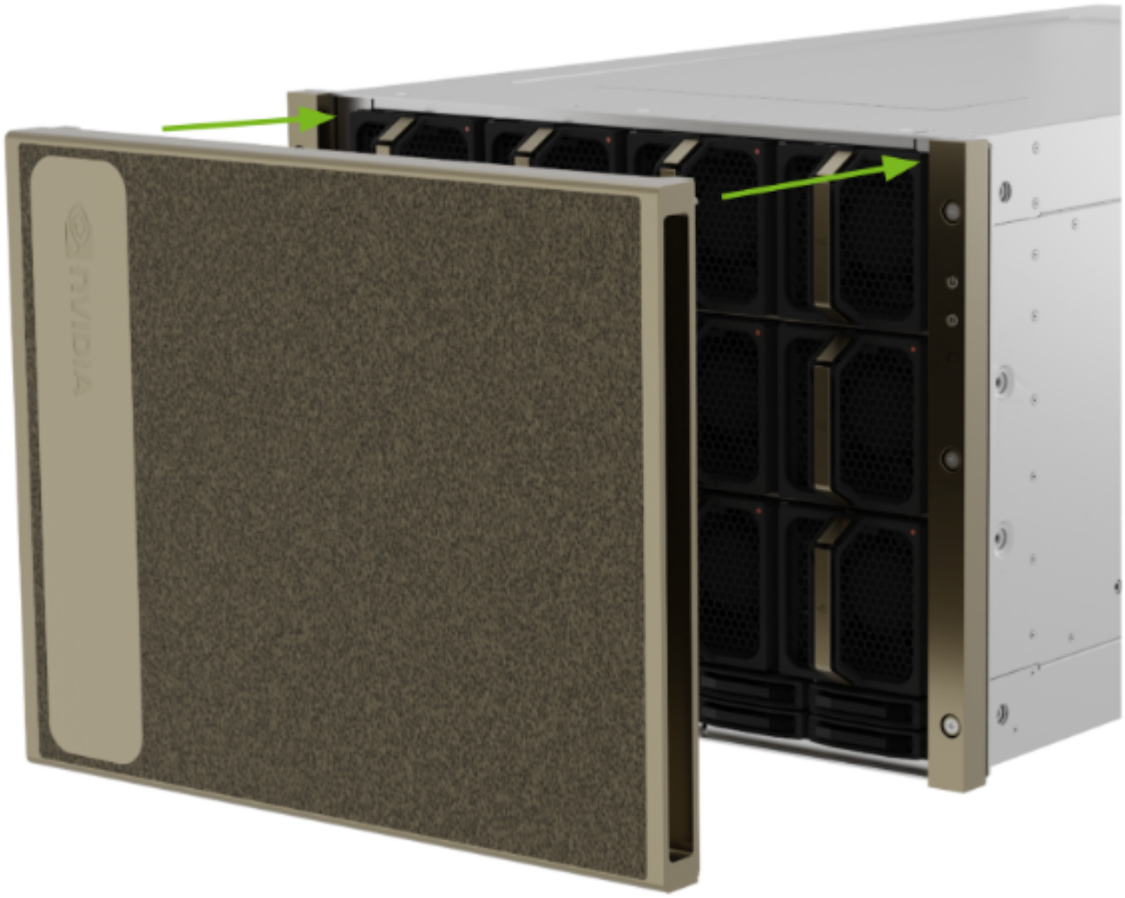


2. Pull the bezel away from the system with a horizontal motion to release it from the magnets that keep it in place.



17.2. Bezel Installation

1. Align the pins on the bezel to the notches on the system fascia.



2. Attach the bezel to the system making sure the pins fit in the notches and that the magnetic latch holds the bezel securely in place.

Chapter 18. Rack Mount Kit Replacement

1. Remove the two front screws and washers
2. Remove the two rear screws
3. Use the clips to release the front and rear from each side of the kit
4. Remove the cage nuts from the rack posts
5. Install on the new rack by using the clips to position the kit at the right height
6. Use the template to install the cage nuts in the right
7. Use the four screws and two washers to secure the rack mount kit in place

18.1. Rack Mount Kit Description

The rack mount kit acts as a shelf in the rack, it does not allow the system to be moved once installed. All components are serviceable from the front or rear.

This rack mount kit can extend lengthwise, and the distance between the posts can range from 29-35 in (.74m - 0.9m)

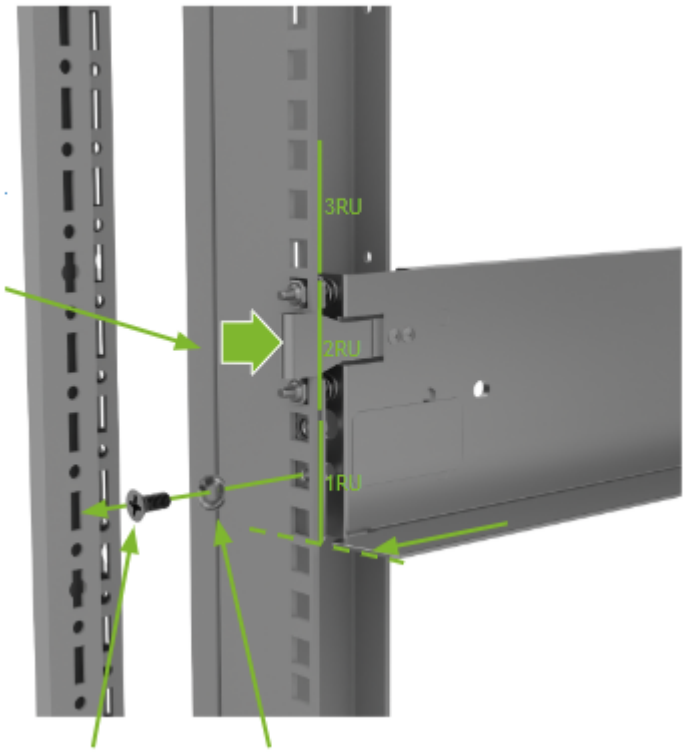
Note: the lip at the bottom will hold the bottom of the system

- These prongs enter the holes of the rack (square or round)
- Metal plates keep the rack kit in place
- Secure the rack mount kit to the rack with the provided screws
- Identify the front of the rackmount with the embossed labels

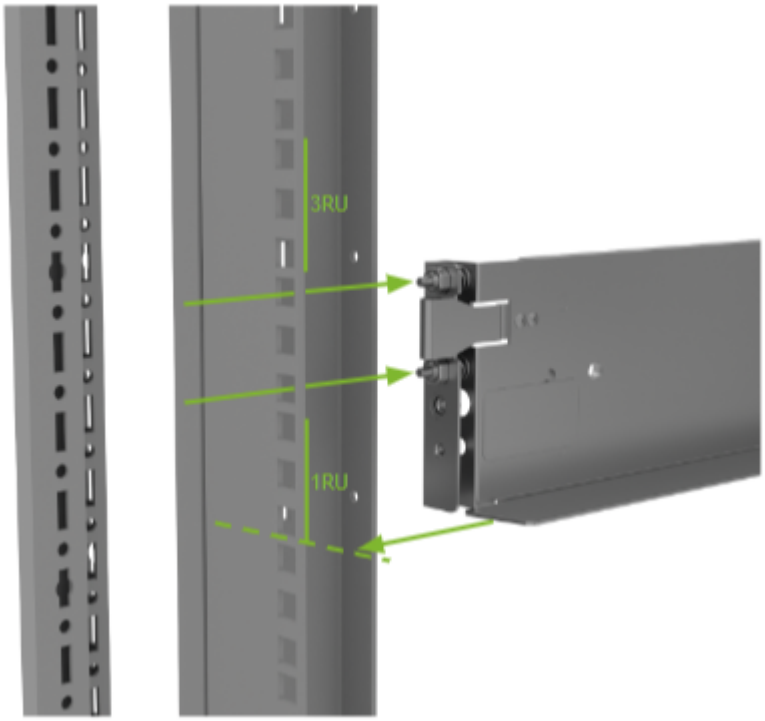
1. On the lower part, there is a lip, labeled ‘1’, that when installed in a rack, will hold the system in place as if it was a shelf.
2. On either end, and labeled ‘2’ on the diagram, there are spring loaded prongs that fit into the rack’s holes (either square or round.)
3. Together with the metal clips labeled ‘3’, they hold the rack mount kit in place for ease of installation.
4. Labeled with a number 4 are the holes where the screws that secure the rack kit in place must be installed.
5. The number ‘5’ identifies the location where that part of the rack mount kit should be installed in the rack

18.2. Remove Rack Mount Kit - Front Rack

1. To remove the rack mount kit, first remove the flat head screw and the countersunk washer, and keep in a safe place.
   - Push on the clip to release the rack mount kit rail from the post, and push it towards the back while holding the rail

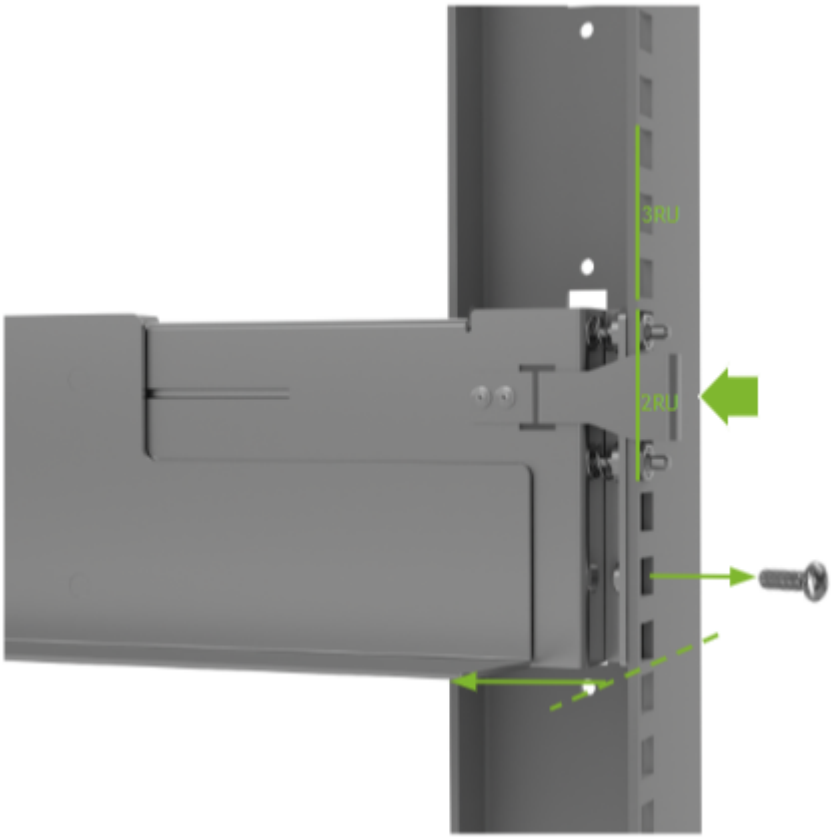


2. Next pull on the clip to release the rack mount kit from the post so it can slide back and so that the prongs can be released from the post.
   - Remove the rail from the front post and hold in place while the rear is released;
   - Remove all cage nuts from the rack posts so they can be used during installation

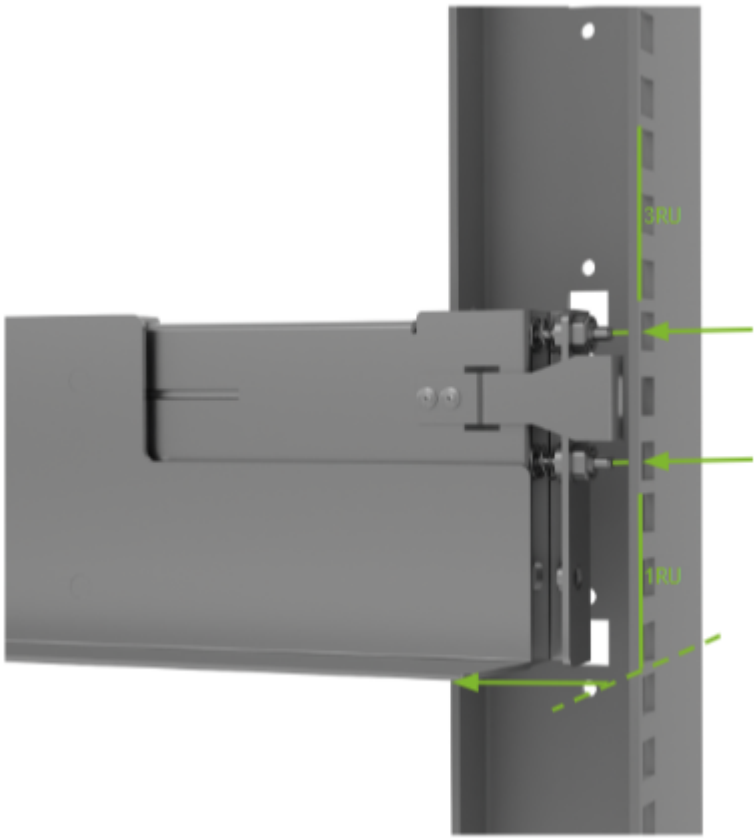


18.3. Remove Rack Mount Kit - Rear

1. To release the rear of the rack mount kit, remove the round head screw and keep next to the other screws and washers.



2. Pull on the metal clip and slide the rail away from the post so the progs are free from the rack.



18.4. Confirm Necessary Screws and Washers

These items are in the rack mount kit box with the rack mount kit All these components should have been removed from the previous installation

Note: front screws are different from the screws used for the back of the rack mount kit. If the correct screws are not used in the front, the server will not be flush when pushed against the rack and it will be difficult to secure the other eight captive screws.

Make sure all cage nuts are removed from the rack, as they will be needed to install the rack mount kit at its new location.

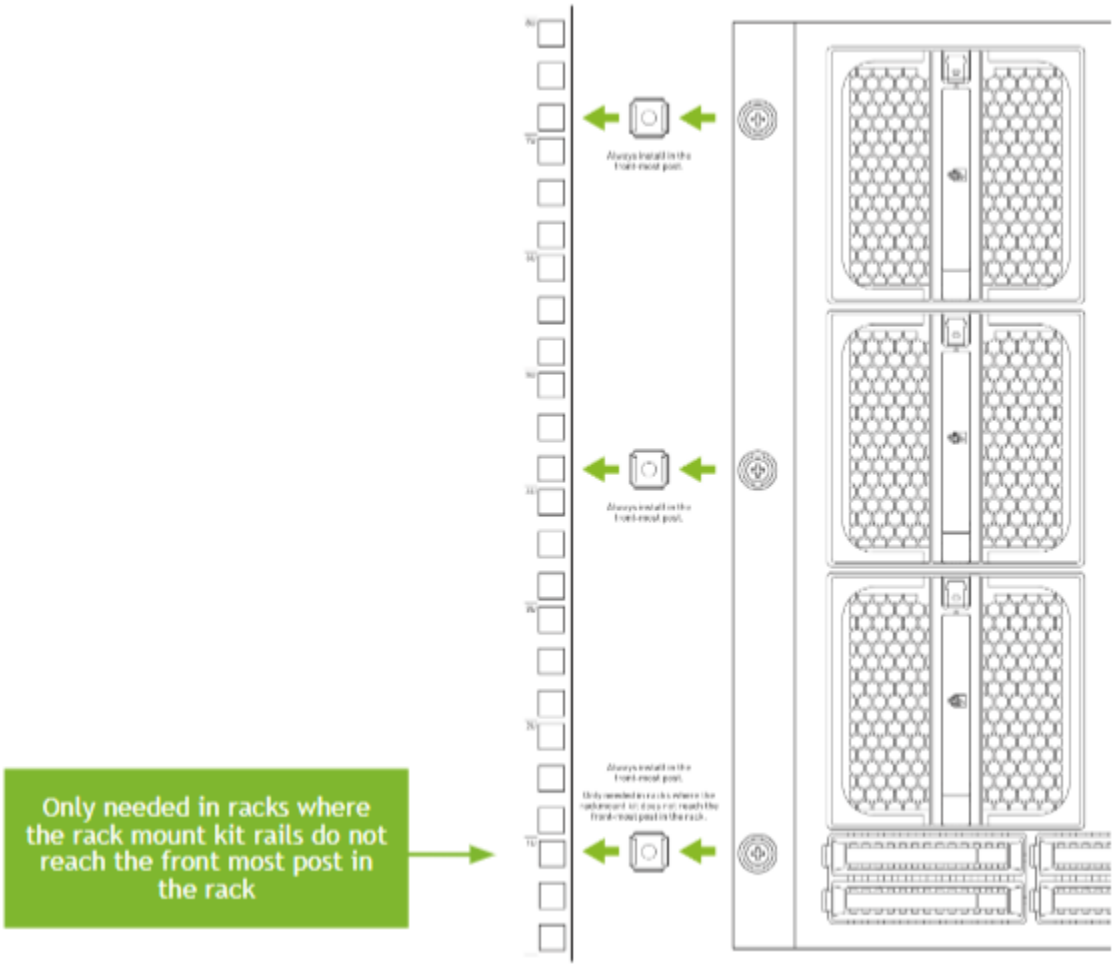
Front screws and washers

Screw kit bag

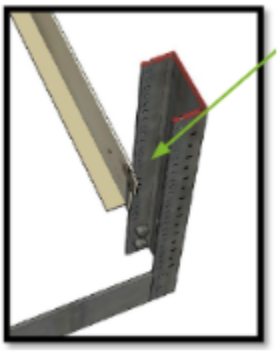
Rear screws

18.5. Install Cage Nuts Using Template

A printed copy of this template is included as part of the rack kit, and it should be used to align the desired location of the system to where the included cage nuts should be installed The template is double sided so it can be used as a reference on the left and right posts of the rack.

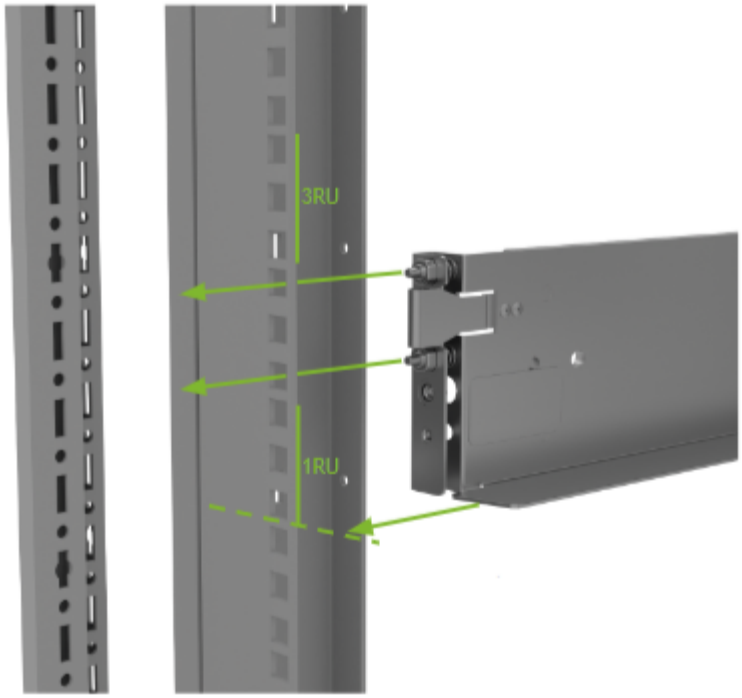


Note: RACKS WITH C-CHANNEL POSTS: They have an obstruction that prevents the rack mount kit from being installed in the front-most post - use a third pair of cage nuts so the bottom system screws have something to engage with.

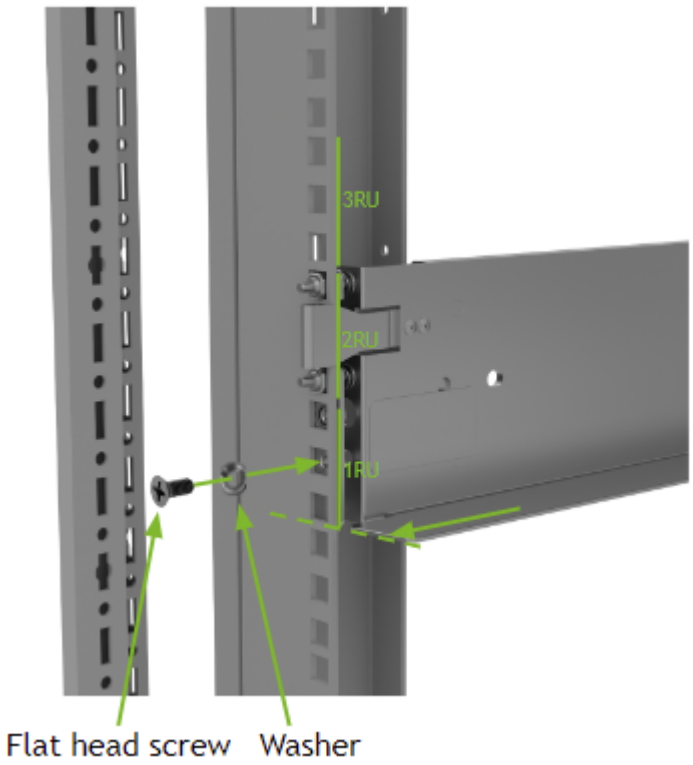


18.6. Install Rack Mount Kit - Front

1. To install the rack mount kit on the rack, start with either side. We will describe the installation of the left side.
2. The first step is to align the lip to the bottom of the rack unit where the system needs to be installed as shown in the diagram.
3. Insert the spring loaded prongs into the rack post's holes and open the clips to make sure the prongs are inserted as far as they will go.

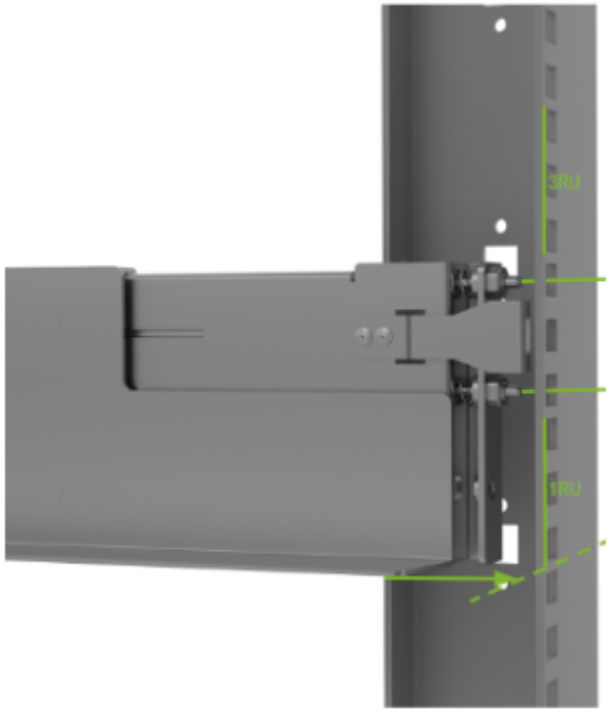


4. Close the clip and make sure the rack kit is securely attached to the rack.
5. Install the flat head screw and the countersunk washer in the bottom hole as pictured to secure the rack mount kit to the post.

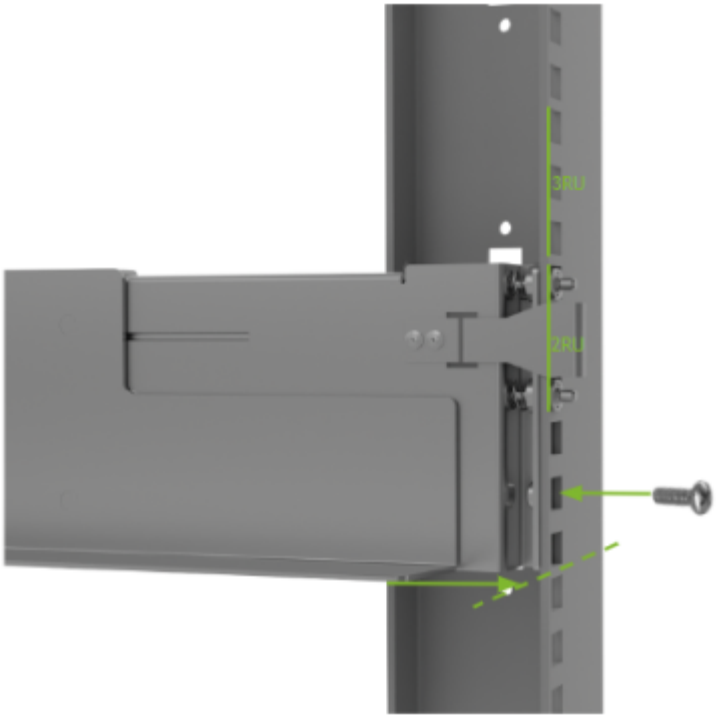


18.7. Install Rack Mount Kit - Rear

1. To install the rear section of the rack mount kit, follow the same steps to align the bottom lip to the bottom of where the system should be.
2. Pull open the clip and insert the prongs through the corresponding holes in the second rack unit. Make sure the prongs are fully extended. Release the clip so it locks the rack mount kit into place.
3. Install the round head screw in the rack mount kit to secure it to the post.



4. Repeat the procedure for the right side rack mount kit.



Chapter 19. Safety

This section provides information about how to safely use the NVIDIA DGX™ H100/H200 system.

19.1. Safety Information

To reduce the risk of bodily injury, electrical shock, fire, and equipment damage, read this document and observe all warnings and precautions in this guide before installing or maintaining your server product.

In the event of a conflict between the information in this document and information provided with the product or on the website for a particular product, the product documentation takes precedence.

Your server should be integrated and serviced only by technically qualified persons.

You must adhere to the guidelines in this guide and the assembly instructions in your server manuals to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products I components will void the UL Listing and other regulatory approvals of the product and may result in noncompliance with product regulations in the region(s) in which the product is sold.

19.2. Safety Warnings and Cautions

To avoid personal injury or property damage, before you begin installing the product, read, observe, and adhere to all of the following safety instructions and information.

The following safety symbols may be used throughout the documentation and may be marked on the product and the product packaging.

- CAUTION: Indicates the presence of a hazard that may cause minor personal injury or property damage if the CAUTION is ignored.
- WARNING: Indicates the presence of a hazard that may result in serious personal injury if the WARNING is ignored.

Indicates potential hazard if indicated information is ignored.

Indicates shock hazards that result in serious injury or death if safety instructions are not followed.

Indicates hot components or surfaces

Indicates do not touch fan blades, may result in injury.

Shock hazard: The product might be equipped with multiple power cords. - To remove all hazardous voltages, disconnect all power cords. - High leakage current ground (earth) connection to the Power Supply is essential before connecting the supply.

Recycle the battery.

The rail racks are designed to carry only the weight of the server system. Do not use rail-mounted equipment as a workspace. Do not place additional load onto any rail-mounted equipment.

19.3. Intended Application Uses

This product was evaluated as Information Technology Equipment (ITE), which may be installed in offices, schools, computer rooms, and similar commercial type locations.

The suitability of this product for other product categories and environments (such as medical, industrial, residential, alarm systems, and test equipment), other than an ITE application, may require further evaluation.

19.4. Site Selection

Choose a site that is:

- Clean, dry, and free of airborne particles (other than normal room dust).
- Well-ventilated and away from sources of heat including direct sunlight and radiators.
- Away from sources of vibration or physical shock.

- In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppressor and disconnect telecommunication lines to your modem during an electrical storm.
- Provided with a properly grounded wall outlet.
- Provided with sufficient space to access the power supply cord(s), because they serve as the product's main power disconnect.

19.5. Equipment Handling Practices

To reduce the risk of personal injury or equipment damage, do the following:

- Conform to local occupational health and safety requirements when moving and lifting equipment.
- Use mechanical assistance or other suitable assistance when moving and lifting equipment.

19.6. Electrical Precautions

19.6.1. Power and Electrical Warnings

Caution: The power button, indicated by the stand-by power marking, DOES NOT completely turn off the system AC power; standby power is active whenever the system is plugged in. To remove power from system, you must unplug the AC power cord from the wall outlet. Make sure all AC power cords are unplugged before you open the chassis, or add or remove any non hot-plug components.

Do not attempt to modify or use an AC power cord if it is not the exact type required. A separate AC cord is required for each system power supply.

Some power supplies in servers use Neutral Pole Fusing. To avoid risk of shock use caution when working with power supplies that use Neutral Pole Fusing.

The power supply in this product contains no user-serviceable parts. Do not open the power supply. Hazardous voltage, current and energy levels are present inside the power supply. Return to manufacturer for servicing.

When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing it from the server.

To avoid risk of electric shock, tum off the server and disconnect the power cords, telecommunications systems, networks, and modems attached to the server before opening it.

19.6.2. Power Cord Warnings

Caution: To avoid electrical shock or fire, check the power cord(s) that will be used with the product as follows:

- Do not attempt to modify or use the AC power cord(s) if they are not the exact type required to fit into the grounded electrical outlets.
- The power cord(s) must meet the following criteria:
  - The power cord must have an electrical rating that is greater than that of the electrical current rating marked on the product.
  - The power cord must have safety ground pin or contact that is suitable for the electrical outlet.
  - The power supply cord(s) is/ are the main disconnect device to AC power. The socket outlet(s) must be near the equipment and readily accessible for disconnection.
  - The power supply cord(s) must be plugged into socket-outlet(s) that is /are provided with a suitable earth ground.

19.7. System Access Warnings

To avoid personal injury or property damage, the following safety instructions apply whenever accessing the inside of the product:

- Turn off all peripheral devices connected to this product.
- Turn off the system by pressing the power button to off.
- Disconnect the AC power by unplugging all AC power cords from the system or wall outlet.
- Disconnect all cables and telecommunication lines that are connected to the system.
- Retain all screws or other fasteners when removing access cover(s). Upon completion of accessing inside the product, refasten access cover with original screws or fasteners.
- Do not access the inside of the power supply. There are no serviceable parts in the power supply.
- Return to manufacturer for servicing.
- Power down the server and disconnect all power cords before adding or replacing any non hot-plug component.
- When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing the power supply from the server.

Caution: If the server has been running, any installed processor(s) and heat sink(s) may be hot. Unless you are adding or removing a hot-plug component, allow the system to cool before opening the covers. To avoid the possibility of coming into contact with hot component(s) during a hot-plug installation, be careful when removing or installing the hot-plug component(s).

Caution: To avoid injury do not contact moving fan blades. Your system is supplied with a guard over the fan, do not operate the system without the fan guard in place.

19.8. Rack Mount Warnings

The following installation guidelines are required by UL to maintain safety compliance when installing your system into a rack.

The equipment rack must be anchored to an unmovable support to prevent it from tipping when a server or piece of equipment is extended from it. The equipment rack must be installed according to the rack manufacturer's instructions.

Install equipment in the rack from the bottom up with the heaviest equipment at the bottom of the rack.

Extend only one piece of equipment from the rack at a time.

You are responsible for installing a main power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit, not just to the server(s).

To avoid risk of potential electric shock, a proper safety ground must be implemented for the rack and each piece of equipment installed in it.

Elevated Operating Ambient- If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

Reduced Air Flow -Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Mechanical Loading- Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Circuit Overloading- Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Earthing- Reliable earthing of rack-mounted equipment should be maintained.

Particular attention should be given to supply connections other than direct connections to the branch circuit (for example, the use of power strips).

19.9. Electrostatic Discharge

Caution: ESD can damage drives, boards, and other parts. We recommend that you perform all procedures at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground (any unpainted metal surface) on your server when handling parts.

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

19.10. Other Hazards

19.10.1. CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Perchlorate Material - special handling may apply. See www.dtsc.ca.gov/perchlorate.

Perchlorate Material: Lithium battery (CR2032) contains perchlorate. Please follow instructions for disposal.

19.10.2. NICKEL

NVIDIA Bezel. The bezel's decorative metal foam contains some nickel. The metal foam is not intended for direct and prolonged skin contact. Please use the handles to remove, attach or carry the bezel. While nickel exposure is unlikely to be a problem, you should be aware of the possibility in case you are susceptible to nickel-related reactions.

19.10.3. Battery Replacement

Caution: There is the danger of explosion if the battery is incorrectly replaced. When replacing the battery, use only the battery recommended by the equipment manufacturer.

Dispose of batteries according to local ordinances and regulations. Do not attempt to recharge a battery.

Do not attempt to disassemble, puncture, or otherwise damage a battery.

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19.10.4. Cooling and Airflow

Caution: Carefully route cables as directed to minimize airflow blockage and cooling problems. For proper cooling and airflow, operate the system only with the chassis covers installed.

Operating the system without the covers in place can damage system parts. To install the covers:

- Check first to make sure you have not left loose tools or parts inside the system.
- Check that cables, add-in cards, and other components are properly installed.
- Attach the covers to the chassis according to the product instructions.

The equipment is intended for installation only in a Server Room/ Computer Room where both these conditions apply:

- Access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.
- Access is through the use of a TOOL or lock and key, or other means of security, and is controlled by the authority responsible for the location.

Chapter 20. Compliance

The NVIDIA DGX™ H100/H200 System is compliant with the regulations listed in this section.

20.1. United States

Federal Communications Commission (FCC) FCC Marking (Class A)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including any interference that may cause undesired operation of the device.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

California Department of Toxic Substances Control: Perchlorate Material - special handling may apply. See www.dtsc.ca.gov/perchlorate.

20.2. United States/Canada

TÜV Rheinland of North America is accredited as a Nationally Recognized Testing Laboratory (NRTL), by OSHA (The Occupational Safety and Health Administration) in the United States, and as a Product Certification Body by SCC (Standards Council of Canada) in Canada. Refer to https://www.tuv.com/usa/en/ctuvus-certification.html

cTUVus Mark

20.3. Canada

This device complies with Innovation, Science and Economic Development Canada (ISED) license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

20.4. EU

European Conformity; Conformité Européenne (CE)

This is a Class A product. In a domestic environment this product may cause radio frequency interference in which case the user may be required to take adequate measures.

This device bears the CE mark in accordance with Directive 2014/53/EU. This device complies with the following Directives:

- EMC Directive A, I.T.E Equipment.
- Low Voltage Directive for electrical safety.
- RoHS Directive for hazardous substances.
- Energy-related Products Directive (ErP).

The full text of EU declaration of conformity is available at the following URL: http://www.nvidia.com/support

A copy of the Declaration of Conformity to the essential requirements may be obtained directly from NVIDIA GmbH (Bavaria Towers – Blue Tower, Einsteinstrasse 172, D-81677 Munich, Germany).

20.5. Australia and New Zealand

Australian Communications and Media Authority

This product meets the applicable EMC requirements for Class A, I.T.E equipment.

20.6. Brazil

INMETRO

20.7. Japan

Voluntary Control Council for Interference (VCCI)

この装置は、クラスA機器です。この装置を住宅環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI ー A

この装置は、クラスA機器です。この装置を住宅環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI－A

This is a Class A product.

In a domestic environment this product may cause radio interference, in which case the user may be required to take corrective actions. VCCI-A.

2008年、日本における製品含有表示方法、JISC0950が公示さ れました。製造事業者は、2006年7月１日以降に販売さ れる電気・・・電子機器の特定化学物質の含有に付きまし て情報提供を義務付けら れまし た。製品の部材表示に付きまし ては、以下をご覧く ださい。¶

A·Japanese·regulatory·requirement,·defined·by·specification·JIS·C·0950,·2008,·mandates·that·manufacturers·provide·Material·Content·Declarations·for·certain·categories·of·electronic·products·offered·for·sale·after·July·1,·2006.¶

To·view·the·JIS·C·0950·material·declaration·for·this·product,·visit¶

¶

Japan RoHS Material Content Declaration

日本工業規格JIS·C¶
0950:2008により、2006年 7月 1日以降に販売される特定分野の電気および電子機器について、製造者による含有物質の表示が義務付けられます。¶

機器名称：リ バ

¶ 主な分類	特定化学物質記号					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
筐体	除外項目	0	0	0	0	0
プリント基板	除外項目	0	0	0	0	0
プロセッサー	除外項目	0	0	0	0	0
マザーボード	除外項目	0	0	0	0	0
電源	除外項目	0	0	0	0	0
システムメモリ	除外項目	0	0	0	0	0
ハードディスクドライブ	除外項目	0	0	0	0	0
機械部品（ファン、ヒートシンク、ベゼル¶..)	除外項目	0	0	0	0	0
ケーブル/コネクター	除外項目	0	0	0	0	0
はんだ付け材料	0	0	0	0	0	0
フラックス、クリームはんだ、ラベル、その他消耗品	0	0	0	0	0	0

注：¶

1.「0」は、特定化学物質の含有率が日本工業規格 JIS·C·0950:2008に記載されている含有率基準値より低いことを示します。¶

2.「除外項目」は、特定化学物質が含有マークの除外項目に該当するため、特定化学物質について、日本工業規格 JIS· C¶

0950:2008 に基づく含有マークの表示が不要であることを示します。¶

¶

3.「0.1wt%超」または「0.01wt%超」は、特定化学物質の含有率が日本工業規格JIS·C· 0950:2008 に記載されている含有率基準値を超えていることを示します。

A Japanese regulatory requirement, defined by specification JIS C 0950: 2008, mandates that manufacturers provide Material Content Declarations for certain categories of electronic products offered for sale after July 1, 2006.

Product Model Number: P3687 Server

Major Classification	Symbols of Specified Chemical Substance					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Chassis	Exempt	0	0	0	0	0
PCA	Exempt	0	0	0	0	0
Processor	Exempt	0	0	0	0	0
Motherboard	Exempt	0	0	0	0	0
Power supply	Exempt	0	0	0	0	0
System memory	Exempt	0	0	0	0	0
Hard drive	Exempt	0	0	0	0	0
Mechanical parts (fan, heat sink, bezel...)	Exempt	0	0	0	0	0
Cables/Connectors	Exempt	0	0	0	0	0
Soldering material	0	0	0	0	0	0
Flux, Solder Paste, label and other consumable materials	0	0	0	0	0	0

Notes:

1. "0" indicates that the level of the specified chemical substance is less than the threshold level specified in the standard, JIS C 0950:2008.
2. "Exempt" indicates that the specified chemical substance is exempt from marking and it is not required to display the marking for that specified chemical substance per the standard, JIS C 0950: 2008.
3. "Exceeding 0.1wt%" or "Exceeding 0.01wt%" is entered in the table if the level of the specified chemical substance exceeds the threshold level specified in the standard, JIS C 0950: 2008.

20.8. South Korea

Korean Agency for Technology and Standards (KATS)

R-R-WT1-P3687

A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Class A Equipment (Industrial Broadcasting & Communication Equipment). This equipment Industrial (Class A) electromagnetic wave suitability equipment and seller or user should take notice of it, and this equipment is to be used in the places except for home.

Korea RoHS Material Content Declaration

확인 및 평가 양식은 제품에 포함 된 유해 물질의 허용 기준의 준수에 관한				
문 준비	상호 :	엔비디아홍콩홀딩즈 리미티드(영업소)	법인등록번호	110181-0036373
	대표자성명	카렌테레사번즈	사업자등록번호:	120-84-06711
	주소	서울특별시 강남구 영동대로 511, 2101호 (삼성동,		
제품 내용				
제품의 종류	해당없음	제품명(규격)	해당없음	
세부모델명(번호):	해당없음	제품출시일	해당없음	
제품의 중량	해당없음	제조, 수입업자	엔비디아	
엔비디아의 그래픽 카드제품은 전기 전자제품 및 자동차의 자원순환에 관한 법률 시행령 제 11조 제 1항에 의거한 법 시행행규칙 제 3조에에따른 유해물질함유 기준을 확인 및 평가한 결과, 이를 준수하였음을 공표합니다.				
구비서류 : 없음 작성방법 ① 제품의 종류는 "전기.전자제품 및 자동차의 자원순환에관한 법률 시행령" 제 8조 제 1항 및 제 2항에 따른 품목별로 구분하여 기재합니다. ② 전기 전자 제품의 경우 모델명 (번호), 자동차의 경우, 제원관리번호를 기재합니다. ③ 해당제품의 제조업자 또는 수입업자를 기재합니다.				

Confirmation and Evaluation Form Concerning the Adherence to Acceptable Standards of Hazardous Materials Contained in Products				
Statement Prepared by	Company Name:	Nvidia HongKong Holding Ltd.Korea branch	Corporate Identification Number:	110181-0036373
	Name of Company Representative:	Karen Theresa Burns	Business Registration Number:	120-84-06711
	Address	2788 San Tomas Expressway, Santa Clara, CA 95051		
Product Information				
Product Category:	N/A	Name of Product:	N/A	
Detailed Product Model Name (Number):	N/A	Date of first market release:	N/A	
Weight of Product:	N/A	Manufacturer and/or Importer:	NVIDIA Corporation	
This for is publicly certify That NVIDIA Company has undergone the confirmation and evaluation procedures for the acceptable amounts of hazardous materials contained in graphic card according to the regulations stipulated in Article 3 of the 'Status on the Recycling of Electrical and Electronic Products, and Automobiles' and that company has graphic card adhered to the Enforcement Regulations of Article 11, Item 1 of the statute.				
Attachment: None * Preparing the Form ① Please indicate the product category according to the categories listed in Article 8, Items 1and 2 of the ' Enforcement Ordinance of the Statute on the Recycling of Electrical, Electronic and Automobile Materials' ② For electrical and electronic products, please indicate the Model Name (and number). For automobiles, please indicate the Vehicle Identification Number. ③ Please indicate the name of manufacturer and/or importer of the product.				

20.9. China

China Compulsory Certificate

No certification is needed for China. The NVIDIA DGX A100 is a server with power consumption greater than 1.3 kW.

China RoHS Material Content Declaration

产品中有害物质的名称及含量

The Table of Hazardous Substances and their Content

根据中国《电器电子产品有害物质限制使用管理办法》

as required by China's Management Methods for Restricted of Hazardous Substances Used in Electrical and Electronic Products

部件名称 Parts	有害物质 Hazardous Substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴联苯醚 (PBDE)
机箱 Chassis	X	O	O	O	O	O
印刷电路部件 PCA	X	O	O	O	O	O
处理器 Processor	X	O	O	O	O	O
主板 Motherboard	X	O	O	O	O	O
电源设备 Power supply	X	O	O	O	O	O
存储设备 System memory	X	O	O	O	O	O
硬盘驱动器 Hard drive	X	O	O	O	O	O
机械部件（风扇、散热器、面板等) Mechanical parts (fan, heat sink, bezel...)	X	O	O	O	O	O
线材/连接器 Cables/Connectors	X	O	O	O	O	O

焊接金属 Soldering material	0	0	0	0	0	0
助焊剂，锡膏，标签及其他耗材 Flux, Solder Paste, label and other consumable materials	0	0	0	0	0	0

本表格依据SJ/T 11364-2014 的规定编制
The table according to SJ/T 11364-2014

O：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572-2011 标准规定的限量要求以下。
O: Indicates that this hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572-2011.

X：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572-2011 标准规定的限量要求。
X: Indicates that this hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in GB/T 26572-2011.

此表中所有名称中含 "X" 的部件均符合欧盟 RoHS 立法。
All parts named in this table with an "X" are in compliance with the European Union's RoHS Legislation.

Note: The referenced Environmental Protection Use Period Marking was determined according to normal operating use conditions of the product such as temperature and humidity.

20.10. Taiwan

Bureau of Standards, Metrology & Inspection (BSMI)

R33088
RoHS

警告使用者:
此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策

報驗義務人:

香港商輝達香港控股有限公司台灣分公司· · 統一編號: 80022300

臺北市內湖區基湖路8號.

Taiwan RoHS Material Content Declaration

限用物質含有情況標示聲明書 Declaration of the presence condition of the Restricted Sustances Marking						
設備名稱：DGX 伺服器 Equipment Name: DGX Server						
單元 Parts	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 (Pb)	汞 (Hg)	鎘 (Cd)	六價鉻 (Cr(VI))	多溴聯苯 (PBB)	多溴二苯醚 (PBDE)
機箱 Chassis	-	O	O	O	O	O
印刷電路部件 PCA	-	O	O	O	O	O
處理器 Processor	-	O	O	O	O	O
主板 Motherboard	-	O	O	O	O	O
電源設備 Power supply	-	O	O	O	O	O
存儲設備 System memory	-	O	O	O	O	O
硬盤驅動器 Hard drive	-	O	O	O	O	O
機械部件 (風扇、散熱器、面板等) Mechanical parts (fan, heat sink, bezel...)	-	O	O	O	O	O
線材/連接器 Cables/Connectors	-	O	O	O	O	O
焊接金屬 Soldering material	O	O	O	O	O	O
助焊劑、錫膏、標籤及其他耗材 Flux, Solder Paste, label and other consumable materials	O	O	O	O	O	O

備考1：O：本指該限用物質未超出百分比含量基準值
Note 1 : O : indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.
備考2：- : 本指該限用物質为排外項目。
Note 2 : - : indicates that the restricted substance corresponds to the exemption.

此表中所有名稱中含 "-" 的部件均符合歐盟 RoHS 立法。
All parts named in this table with an "-" are in compliance with the European Union's RoHS Legislation.

注：環保使用期限的參考標識取決與產品正常工作的溫度和濕度等數件
Note: The referenced Environmental Protection Use Period Marking was determined according to normal operating use conditions of the product such as temperature and humidity.

20.11. Russia/Kazakhstan/Belarus

Customs Union Technical Regulations (CU TR)

This device complies with the technical regulations of the Customs Union (CU TR)

ТЕХНИЧЕСКИЙ РЕГЛАМЕНТ ТАМОЖЕННОГО СОЮЗА О безопасности низковольтного оборудования (ТР ТС 004/2011)

ТЕХНИЧЕСКИЙ РЕГЛАМЕНТ ТАМОЖЕННОГО СОЮЗА Электромагнитная совместимость технических средств (ТР ТС 020/2011)

Технический регламент Евразийского экономического союза “Об ограничении применения опасных веществ в изделиях электротехники и радиоэлектроники” (ТР ЕАЭС 037/2016)

Federal Agency of communication (FAC)

This device complies with the rules set forth by Federal Agency of Communications and the Ministry of Communications and Mass Media.

Federal Security Service notification has been filed.

20.12. Israel

SII

ודא שלמות ותקינות כבל החשמל והתקע אין להכניס או להוציא את התקע מרשת החשמל בידיים רטובות . אין לפתוח את המכשיר , במקרה של בעיה כלשהו יש לפנות למעבדת השירות הקרובה. יש להרחיק את המכשיר מנוזלים . במקרה של ריח מוזר, רעשים שמקורם במכשיר , יש לנתקו מיידית מרשת החשמל ולפנות למעבדת שירות המכשיר מיועד לשימוש בתוך המבנה , ולא לשימוש חיצוני ולא לשימוש בסביבה לחה. אין לחתוך, לשבור, ולעקם את הכבל החשמל. אין להניח חפצים על הכבל החשמל או להניח לו להתחמם יתר על המידה , שכן עלול לגרום לנזק ,דליקה או התחשמלות . יש להקפיד לחזק את התקן הניתוק במצב תפעולי מוכן לשימוש. אזהרה: אין להחליף את כבל הזינה בתחליפים לא מקוריים, חיבור לקוי עלול לגרום להתחשמלות המשתמש. בשימוש על כבל מאריך יש לוודא תקינות מוליך הארקה שבכבל .

20.13. India

Bureau of India Standards (BIS)

Authenticity may be verified by visiting the Bureau of Indian Standards website at http://www.bis.gov.in.

India RoHS Compliance Statement

This product, as well as its related consumables and spares, complies with the reduction in hazardous substances provisions of the “India E-waste (Management and Handling) Rule 2016”. It does not contain lead, mercury, hexavalent chromium, polybrominated biphenyls or polybrominated diphenyl ethers in concentrations exceeding 0.1 weight % and 0.01 weight % for cadmium, except for where allowed pursuant to the exemptions set in Schedule 2 of the Rule.

20.14. South Africa

South African Bureau of Standards (SABS)

This device complies with the following SABS Standards:

SANS 2332: 2017/CISPR 32:2015 SANS 2335:2018/ CISPR 35:2016

National Regulator of Compulsory Specification (NRCS)

This device complies with following standard under VC 8055:

SANS IEC 60950-1

20.15. Great Britain (England, Wales, and Scotland)

UK Conformity Assessed

This device complies with the following Regulations:

- SI 2016/1091: Electromagnetic Compatibility (EMC)
- SI 2016/1101: The Low Voltage Electrical Equipment (Safety)
- SI 2012/3032: The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (As Amended)

A copy of the Declaration of Conformity to the essential requirements may be obtained directly from NVIDIA Ltd. (100 Brook Drive, 3rd Floor Green Park, Reading RG2 6UJ, United Kingdom)

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