# GPU Card Installation

This chapter contains the following topics:

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- GPU Card Configuration Rules, on page 2
- Requirement For All GPUs: Memory-Mapped I/O Greater Than 4 GB, on page 4
- Installing a Double-Wide GPU Card, on page 5
- Replacing a Heatsink, on page 8
- Replacing the GPU Air Blocker, on page 12
- Installing GRID Licenses From the NVIDIA Licensing Portal to the License Server, on page 18

## Server Firmware Requirements

The following table lists the minimum server firmware versions for the supported GPU cards.

| GPU Card | Cisco IMC/BIOS Minimum Version Required |
|---|---|
| Intel Flex 140 PCIe, 75W, Gen4 x8 | 4.1(3) |
| Intel Flex 170 PCIe, 150W, Gen4 x16 | 4.1(3) |
| NVIDIA Tesla A100, 80GB, 300W, Passive (UCSC-GPUA100-80-D or HX-GPU-A100-80-D) | 4.1(3) |
| NVIDIA Tesla A40 RTX, 48GB, 300 W, Passive (UCSC-GPU-A40-D) | 4.1(3) |
| NVIDIA Tesla A30, 24GB, 180 W, Passive (UCSC-GPU-A30-D) | 4.1(3) |
| NVIDIA A16 PCIe, 250W, 64GB (4x16GB), (UCSC-GPU-A16-D) | 4.1(3) |
| NVIDIA H100 PCIe, 350W, Gen 5 x16, (UCSC-GPU-H100-D) | 4.1(3) |
| NVIDIA L4 PCIe, 72W, Gen 4 x16, (UCSC-GPU-L4-D) | 4.1(3) |

| GPU Card | Cisco IMC/BIOS Minimum Version Required |
|---|---|
| NVIDIA L40 PCIe, 300W, Gen 4 x16, (UCSC-GPU-L40-D) | 4.1(3) |

# GPU Card Configuration Rules

Note the following rules when populating a server with GPU cards.

- The UCSC-C240-M7SX and UCSC-C240-M7SN servers support a GPU Ready configuration which presets the server to accept a GPU at a later date.

  This configuration sets the server with a with low-profile heatsink (UCSC-HSLP-C220M7) and GPU air blocker that installs in the middle slot of some individual risers (Riser 2 slot 4, and Riser 3 slot 8) (UCSC-RISAB-24XM7). The GPU air blocker is a double width part that blocks the slot in which it is installed, plus the slot above, to properly control airflow and ventilation.

  The GPU air blocker is pre-installed in the GPU Ready configuration so that only the GPU is required when you choose to expand the server's compute power. The GPU Ready config has the following considerations:

  - The server must follow the same temperature limits as a server with a GPU installed, even if the server does not currently have a GPU installed. By following the temperature limits even when the GPU is not present, you ensure correct operation when the GPU is installed later.
  - This configuration requires a low-profile heatsink and a GPU air blocker. If you are ordering the GPU Ready configuration, you must select the GPU air blocker PID to enable GPU ready configuration when ordering the server through the Cisco online ordering and configuration tool. Follow the additional rules displayed in the tool.
  - Two versions of air blocker exist. One is for systems with Sapphire Rapids CPUs and servers that have GPUs that are rated less than 75W of power consumption. One is for servers that have Emerald Rapids CPUs and one or more GPUs that are rated greater than 75W power consumption. For information about these GPU air blockers, see Replacing the GPU Air Blocker, on page 12.

- The GPU air blocker is required in any empty GPU slots in a GPU-configured server or a GPU-ready server.

  - In these servers, the GPU air blocker is installed at the factory where needed.
  - However, if you remove a NIC or GPU from the GPU slot, the air blocker must be installed to ensure proper airflow.

- All GPU cards must be procured from Cisco because of a unique SBIOS ID that is required by CIMC and UCSM.
- Do not mix different brands or models of GPU cards in the server.
- GPUs are not supported in Riser 1B or Riser 3B. Riser 3B cannot mechanically accept a GPU.
- The UCSC-C240M7SX and UCSC-C240M7SN servers support one full-height, full-length, double-wide GPU (PCIe slot 7 only) in Riser 3C up to 300W & PCIe Gen4 speeds.

Both Riser 1A and 2A can support full-height, full-length, double-wide GPUs of up to 300W & PCIe Gen4 speeds.

Risers 1C and 2C can support full-height, full-length, double-wide GPU of up to 350W & PCIe Gen5 speeds.

- The following table shows additional details for the different supported GPUs.

| GPU | GPU Information | Riser and Installation Notes |
|---|---|---|
| Intel Flex 140 | HHHL, 75W, PCIe Gen 4 x8 | Both Gen 4 or Gen 5 Risers, maximum of 5 GPUs supported<br>• In Gen 4 risers, GPU is supported in slots 2, 3, 5,6, and 7 (Riser 3C)<br>• In Gen 5 risers, GPU is supported in slots 1, 2, 4, and 5 (Risers 1C and 2C). Also, slot 7 (Gen 4 Riser 3C) |
| Intel Flex 170 | FHFL, single wide GPU, 150W, PCIe Gen 4 x16 | Both Gen 4 risers (maximum of 5 GPUs supported) or Gen 5 risers (maximum of 3 GPUs supported).<br>• In Gen 4 risers, GPU is supported in slots 2, 5, and 7 (Riser 3C)<br>• In Gen 5 risers, GPU is supported in slots 2 and 5 (Risers 1C and 2C). Also, slot 7 (Gen 4 Riser 3C)<br>Requires power cable (UCS-M10CBL-C240M5) |
| Nvidia H100 | FHFL, double wide GPU, 350W, PCIe Gen 5 x16 | Gen 5 risers only, maximum of 2 GPUs supported in slots 2 and 5.<br>Requires power cable (UCS-G5GPU-C240M7) |
| Nvidia L4 | HHHL, 72W, PCIe Gen 4 x16 | Both Gen 4 risers (maximum of 8 GPUs supported) or Gen 5 risers (maximum of 5 GPUs supported).<br>• In Gen 4 risers, GPU is supported in all slots (Riser 1A, 2A, and 3A)<br>• In Gen 5 risers, GPU is supported in slots 1, 2, 4, and 5 (Risers 1C and 2C). Also, slot 7 (Gen 4 Riser 3C) |

| GPU | GPU Information | Riser and Installation Notes |
|---|---|---|
| Nvidia L40 | FHFL, double wide GPU, 300W, PCIe Gen 4 x16 | Both Gen 4 risers (maximum of 3 GPUs supported) or Gen 5 risers (maximum of 3 GPUs supported as 2 GPUs in Gen 5 risers plus 1 in Gen 4 Riser 3).<br>• In Gen 4 risers, GPU is supported in slots 2, 5, and 7.<br>• In Gen 5 risers, GPU is supported in slots 2, 5, and 7.<br>Requires power cable (CBL-L40GPU-C240M7) |

- Use the UCS power calculator at the following link to determine the power needed based on your server configuration: http://ucspowercalc.cisco.com

# Requirement For All GPUs: Memory-Mapped I/O Greater Than 4 GB

All supported GPU cards require enablement of the BIOS setting that allows greater than 4 GB of memory-mapped I/O (MMIO).

- Standalone Server: If the server is used in standalone mode, this BIOS setting is enabled by default:

  `Advanced > PCI Configuration > Memory Mapped I/O Above 4 GB [`**`Enabled`**`]`

  If you need to change this setting, enter the BIOS Setup Utility by pressing **F2** when prompted during bootup.

- If the server is integrated with Cisco UCS Manager and is controlled by a service profile, this setting is enabled by default in the service profile when a GPU is present.

  To change this setting manually, use the following procedure.

**Step 1** Refer to the Cisco UCS Manager configuration guide (GUI or CLI) for your release for instructions on configuring service profiles:

Cisco UCS Manager Configuration Guides

**Step 2** Refer to the chapter on Configuring Server-Related Policies > Configuring BIOS Settings.

**Step 3** In the section of your profile for PCI Configuration BIOS Settings, set `Memory Mapped IO Above 4GB Config` to one of the following:

- **Disabled**—Does not map 64-bit PCI devices to 64 GB or greater address space.
- **Enabled**—Maps I/O of 64-bit PCI devices to 64 GB or greater address space.
- **Platform Default**—The policy uses the value for this attribute contained in the BIOS defaults for the server. Use this only if you know that the server BIOS is set to use the default enabled setting for this item.

**Step 4** Reboot the server.

**Note** Cisco UCS Manager pushes BIOS configuration changes through a BIOS policy or default BIOS settings to the Cisco Integrated Management Controller (CIMC) buffer. These changes remain in the buffer and do not take effect until the server is rebooted.

# Installing a Double-Wide GPU Card

Use the following procedure to install or replace an NVIDIA Double-Wide GPU.

With Cisco IMC version 4.3(1) and later, the server can support up to three NVIDIA GPUs. For a list of supported GPUs, see Server Firmware Requirements, on page 1.

The following table shows the ambient temperature thresholds for servers with PCIe HDDs and SSDs.

*Table 1: PCIe Server Ambient Temperature*

| SKU Details | Storage Hardware Options | |
|---|---|---|
| | **All NVMe or All SAS Storage** | **All NVME or All SAS Plus 4 Rear HDDs** |
| XCC, 350 W, Gen 4 or Gen 5 | 35 C normal ambient T | 30 C normal ambient T |
| MCC, 300 W Gen 4 or Gen 5 | | |

The following table shows the ambient temperature threshold for a server with PCIe SSDs and GPUs.

*Table 2: GPU Server Ambient Temperature*

| SKU Details | Storage Hardware Options | |
|---|---|---|
| | **All NVMe Storage plus GPUs** | **Four NVMe SSDs Plus 20 SAS HDDs Plus GPUs** |
| XCC, 350 W, Gen 4 or Gen 5 | 30 C normal ambient T | 30 C normal ambient T |
| MCC, 300 W Gen 4 or Gen 5 | | |

The NVIDIA GPU card might be shipped with two power cables: a straight cable and a Y-cable. The straight cable is used for connecting power to the GPU card in this server; do not use the Y-cable, which is used for connecting the GPU card in external devices only.

⚠

**Caution** A GPU air blocker must be installed in any empty GPU slot in a GPU-configured or GPU-ready server! Do not operate the server with an empty GPU slot!

The supported NVIDIA GPU requires a C240 M5 NVIDIA Cable (UCS-P100CBL-240M5).

**Step 1** Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server.

**Step 2** Slide the server out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

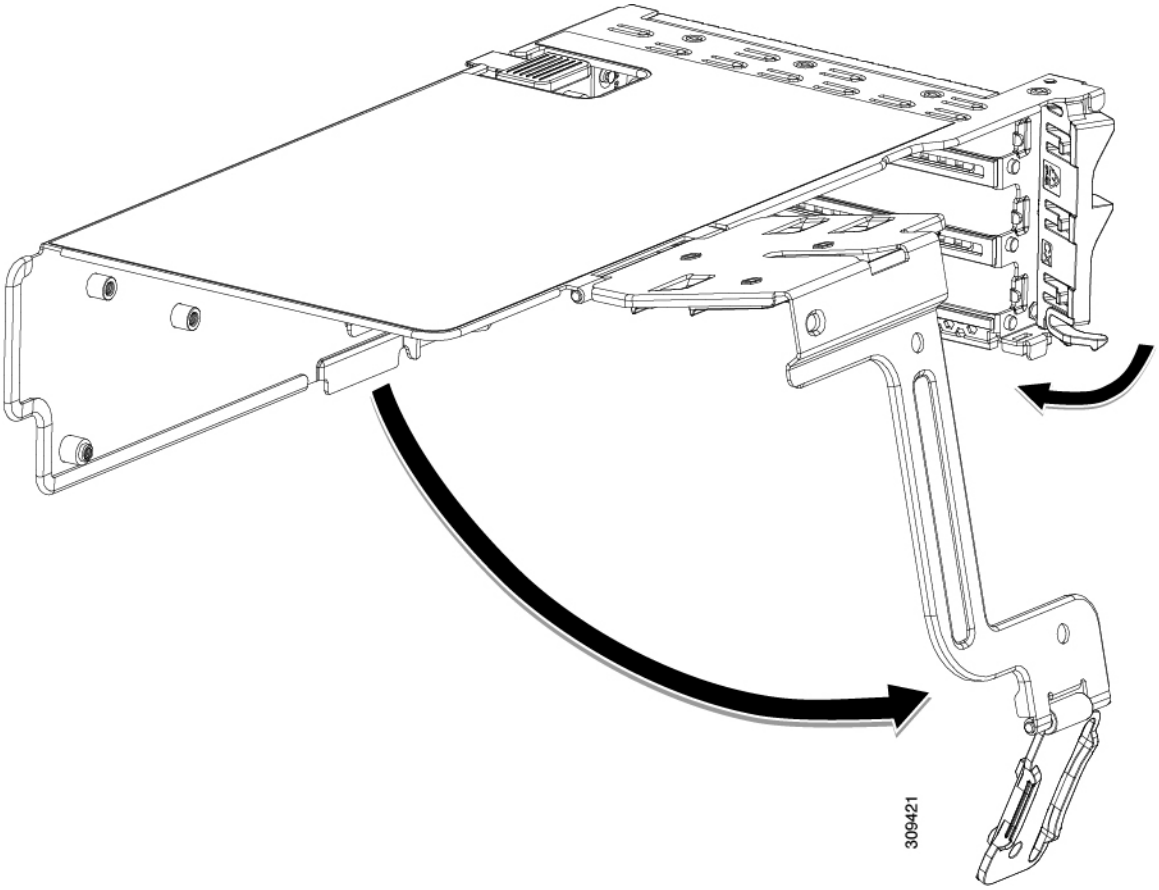
**Caution** If you cannot safely view and access the component, remove the server from the rack.

**Step 3** Remove the top cover from the server as described in Removing the Server Top Cover.

**Step 4** Remove an existing GPU card:

a) Disconnect any existing cable from the GPU card.
b) Use two hands to grasp the metal bracket of the PCIe riser and lift straight up to disengage its connector from the socket on the motherboard. Set the riser on an antistatic surface.
c) On the bottom of the riser, press down on the clip that holds the securing plate.
d) Swing open the hinged securing plate to provide access.
e) Open the hinged plastic retainer that secures the rear-panel tab of the card.
f) Disconnect the GPU card's power cable from the power connector on the PCIe riser.
g) Pull evenly on both ends of the GPU card to remove it from the socket on the PCIe riser.

***Figure 1: PCIe Riser Card Securing Mechanisms***



| | | | |
|---|---|---|---|
| **1** | Release latch on hinged securing plate | **3** | Hinged card-tab retainer |

| | | | |
|---|---|---|---|
| 2 | Hinged securing plate | - | |

**Step 5** Install a new GPU card:

**Note** Observe the configuration rules for this server, as described in GPU Card Configuration Rules, on page 2.

a) Align the GPU card with the socket on the riser, and then gently push the card’s edge connector into the socket. Press evenly on both corners of the card to avoid damaging the connector.

b) Connect the GPU power cable. The straight power cable connectors are color-coded. Connect the cable's black connector into the black connector on the GPU card and the cable's white connector into the white GPU POWER connector on the PCIe riser.

**Caution** Do not reverse the straight power cable. Connect the *black* connector on the cable to the *black* connector on the GPU card. Connect the *white* connector on the cable to the *white* connector on the PCIe riser.

c) Close the card-tab retainer over the end of the card.

d) Swing the hinged securing plate closed on the bottom of the riser. Ensure that the clip on the plate clicks into the locked position.

e) Position the PCIe riser over its socket on the motherboard and over the chassis alignment channels.

f) Carefully push down on both ends of the PCIe riser to fully engage its connector with the sockets on the motherboard.

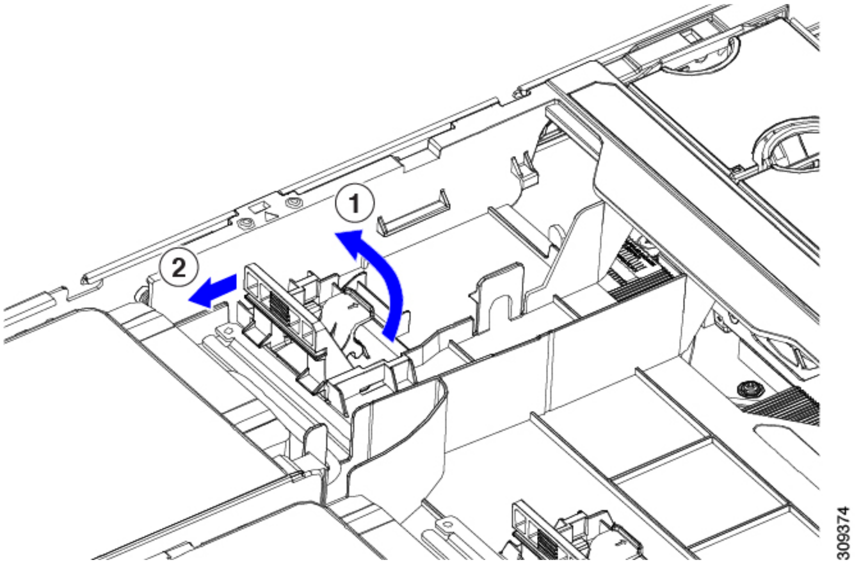
At the same time, align the GPU front support bracket (on the front end of the GPU card) with the securing latch that is on the server's air baffle.

**Step 6** Insert the GPU front support bracket into the latch that is on the air baffle:

a) Pinch the latch release tab and hinge the latch toward the front of the server.

b) Hinge the latch back down so that its lip closes over the edge of the GPU front support bracket.

c) Ensure that the latch release tab clicks and locks the latch in place.



**Step 7** Replace the top cover to the server.

**Step 8** Replace the server in the rack, replace power and network cables, and then fully power on the server by pressing the Power button.

**Step 9** Optional: Continue with Installing Drivers to Support the GPU Cards, on page 22.

# Replacing a Heatsink

For GPUs, the correct heatsink is the low-profile heatsink (UCSC-HSLP-C220M7), which has 4 T30 Torx screws on the main heatsink, and 2 Phillips-head screws on the extended heatsink. High profile heatsinks (UCSC-HSHP-C240M7) cannot be used on a GPU.

Use the following procedures to replace the heatsink on a GPU.

- Removing a Heat Sink, on page 8
- Installing a Heatsink, on page 10

## Removing a Heat Sink

Use this procedure to remove a low-profile heatsink (UCSC-HSLP-C220M7) from a GPU.

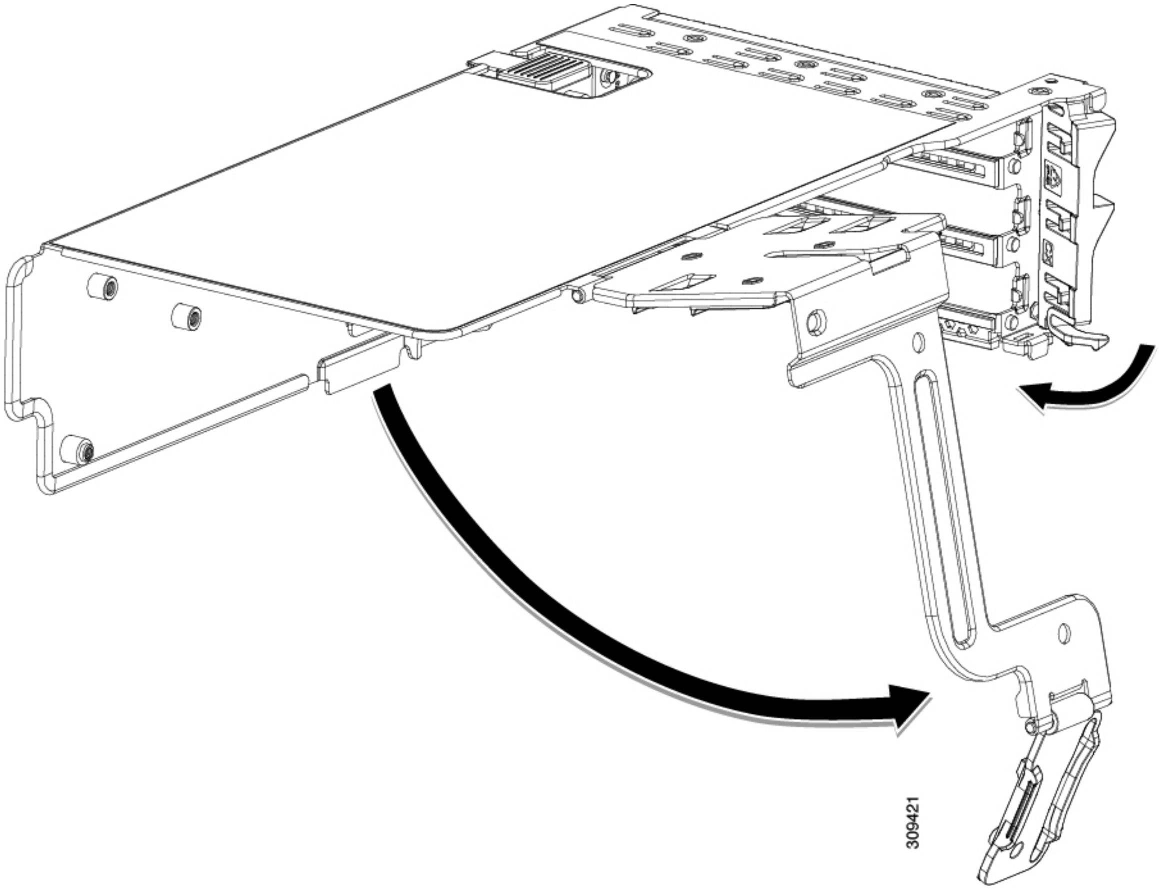
**Step 1** Remove the server top cover.

**Step 2** Remove the air duct.

**Step 3** Remove the double-wide GPU.

a) Use two hands to grasp the metal bracket of the PCIe riser and lift straight up to disengage its connector from the socket on the motherboard. Set the riser on an antistatic surface.
b) On the bottom of the riser, press down on the clip that holds the securing plate.
c) Swing open the hinged securing plate to provide access.
d) Open the hinged plastic retainer that secures the rear-panel tab of the card.
e) Disconnect the GPU card's power cable from the power connector on the PCIe riser.
f) Pull evenly on both ends of the GPU card to remove it from the socket on the PCIe riser.

*Figure 2: PCIe Riser Card Securing Mechanisms*

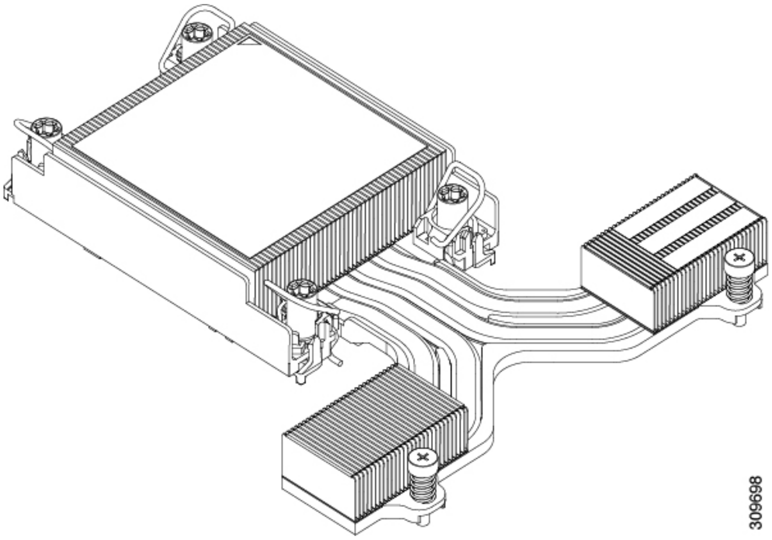


| | | | |
|---|---|---|---|
| **1** | Release latch on hinged securing plate | **3** | Hinged card-tab retainer |
| **2** | Hinged securing plate | - | |

**Step 4** Remove the CPU.

a) Using a #2 Phillips screwdriver, loosen the two Phillips head screws for the extended heatsink.

b) Using a T30 Torx driver, loosen the four Torx securing nuts.



c) Push the rotating wires towards each other to move them to the unlocked position.

**Caution** Make sure that the rotating wires are as far inward as possible. When fully unlocked, the bottom of the rotating wire disengages and allows the removal of the CPU assembly. If the rotating wires are not fully in the unlocked position, you can feel resistance when attempting to remove the CPU assembly.

d) Grasp the CPU and heatsink along the edge of the carrier and lift the CPU and heatsink off of the motherboard.

**Caution** While lifting the CPU assembly, make sure not to bend the heatsink fins. Also, if you feel any resistance when lifting the CPU assembly, verify that the rotating wires are completely in the unlocked position.

**Step 5** Remove the heatsink from the GPU.

### What to do next

Install a low profile heatsink (UCSC-HSLP-C220M7) onto the GPU. See Installing a Heatsink, on page 10.

## Installing a Heatsink

Use this procedure to install a low-profile heatsink (UCSC-HSLP-C220M7) on a GPU.

**Step 1** Apply new TIM, if needed.

**Note** The heatsink must have new TIM on the heatsink-to-CPU surface to ensure proper cooling and performance.

- If you are installing a new heatsink, it is shipped with a pre-applied pad of TIM. Go to step 2 below.
- If you are reusing a heatsink, you must remove the old TIM from the heatsink and then apply new TIM to the CPU surface from the supplied syringe. Continue with step **a** below.

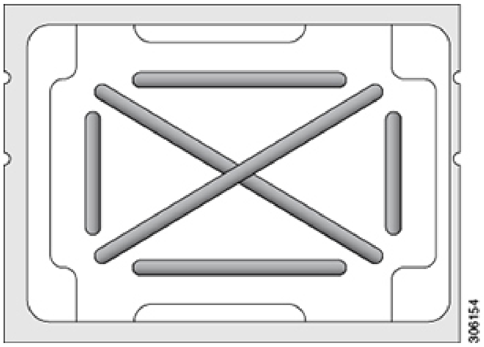
a) Apply the Bottle #1 cleaning solution that is included with the heatsink cleaning kit (UCSX-HSCK=), as well as the spare CPU package, to the old TIM on the heatsink and let it soak for a least 15 seconds.

b) Wipe all of the TIM off the heatsink using the soft cloth that is included with the heatsink cleaning kit. Be careful to avoid scratching the heatsink surface.

c) Completely clean the bottom surface of the heatsink using Bottle #2 to prepare the heatsink for installation.

d) Using the syringe of TIM provided with the new CPU (UCS-CPU-TIM=), apply 1.5 cubic centimeters (1.5 ml) of thermal interface material to the top of the CPU. Use the pattern shown in the following figure to ensure even coverage.

*Figure 3: Thermal Interface Material Application Pattern*



**Caution** Use only the correct heatsink. For GPU servers and GPU-ready servers, use UCSC-HSLP-C220M7.

**Step 2** Install the heatsink.

a) Push the rotating wires to the unlocked position so that they do not obstruct installation.

b) Grasp the heatsink by the fins, align the pin 1 location on the heatsink with the pin 1 location on the GPU (2 in the following image), then seat the heatsink onto the CPU socket.

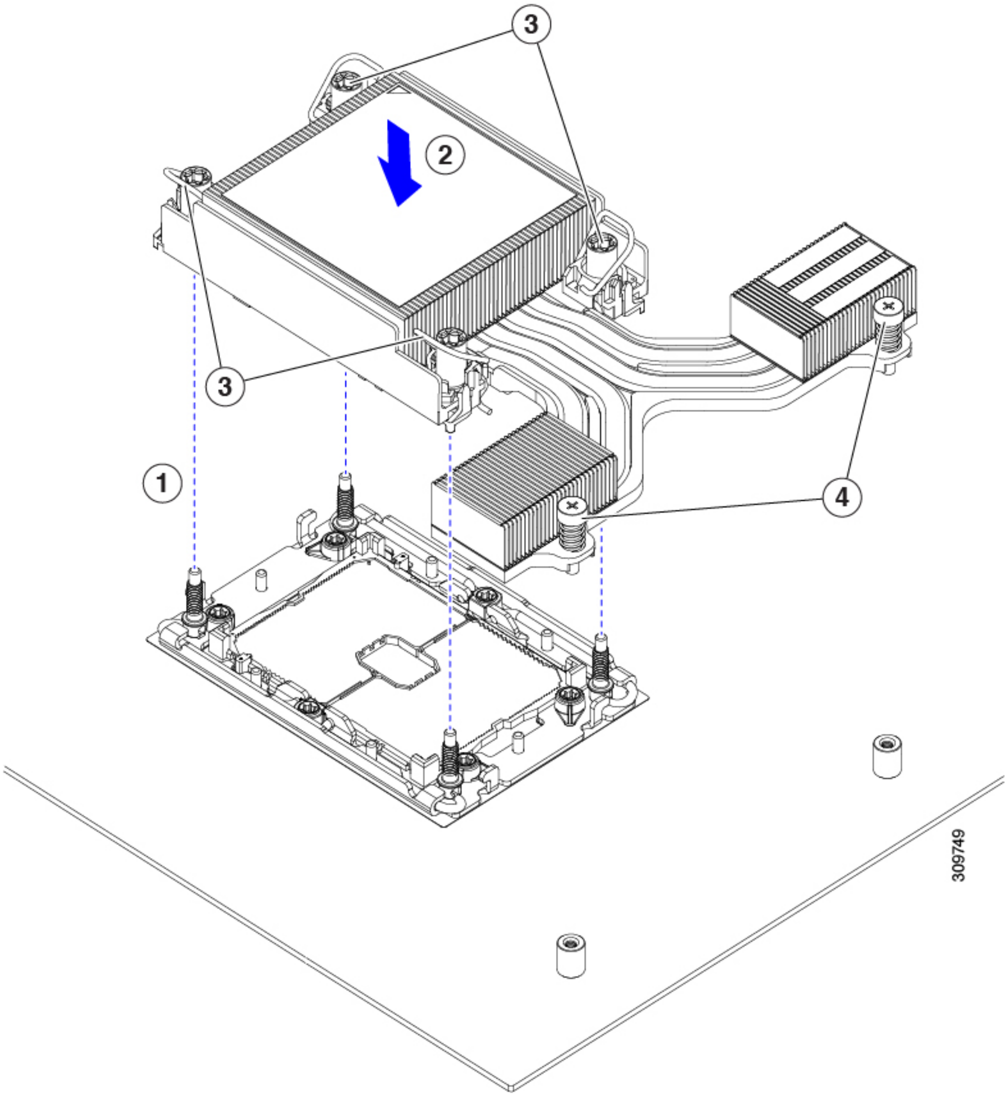
c) Holding the CPU assembly level, orient it as shown and lower it onto the CPU socket.

d) Push the rotating wires away from each other to lock the CPU assembly into the CPU socket.

**Caution** Make sure that you close the rotating wires completely before using the Torx driver to tighten the securing nuts.

e) Set the T30 Torx driver to 12 in-lb of torque and tighten the 4 securing nuts to secure the CPU to the motherboard (3) first.

f) Set the torque driver to 6 in-lb of torque and tighten the two Phillips head screws for the extended heatsink (4).



# Replacing the GPU Air Blocker

The GPU air blocker is a molded part that installs into the PCIe risers in slots 2, 5, or 7 and extends upward to cover the slot above it. The GPU air blocker provides proper airflow and reduces the levels of dust or other potential particulate contaminants.

For GPU-configured or GPU-ready servers, a GPU air blocker is installed where needed as part of the riser (UCSC-RISAB-24MX7). The air blocker is also available as a separately orderable part (UCSC-RISAB-24MX7=).

To replace the GPU air blockers, use the appropriate task:

**Note** Riser 1 does not accept a GPU air blocker. If you are performing service tasks, do not attempt to install an air blocker for Riser 1.

- Removing the Riser 2 GPU Air Blocker, on page 13
- Installing the Riser 2 GPU Air Blocker, on page 14
- Removing the Riser 3 GPU Air Blocker, on page 16
- Installing the Riser 3 GPU Air Blocker, on page 17

# Removing the Riser 2 GPU Air Blocker

The GPU air blocker is a molded part that installs into slot 5 in Riser 2 and extends upward to cover the slot above it (slot 6).

**Caution** In a GPU-configured or GPU-ready server, the GPU air blocker is required in any slot that does not contain a GPU! Do not operate the server with any empty GPU slot!

Use this procedure to remove the GPU air blocker.

**Step 1** Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server.

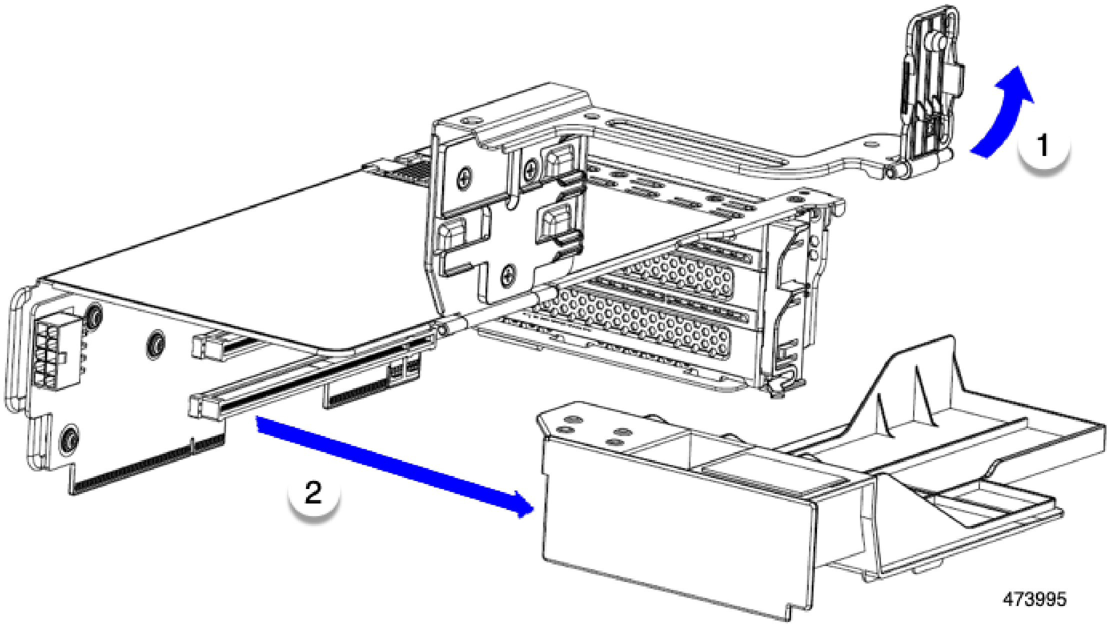
**Step 2** Slide the server out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

**Caution** If you cannot safely view and access the component, remove the server from the rack.

**Step 3** Remove the top cover from the server as described in Removing the Server Top Cover.

**Step 4** Remove the air blocker from the riser cage:

a) Use two hands to grasp the metal bracket of the PCIe riser and lift straight up to disengage its connector from the socket on the motherboard.
b) Set the riser on an antistatic surface.
c) On the bottom of the riser, press down on the clip that holds the securing plate.
d) Swing open the hinged securing plate to provide access.
e) Open the hinged plastic retainer that secures the rear-panel tab of the card.
f) Grasp the air blocker, and holding it level, pull it horizontally out of the riser cage.



| | | | |
|---|---|---|---|
| 1 | Release latch on hinged securing plate | 2 | GPU Air Blocker |

### What to do next

Choose the appropriate option.

- Install a GPU. See Installing a Double-Wide GPU Card, on page 5.
- Install a GPU air blocker. See Installing the Riser 2 GPU Air Blocker, on page 14.

# Installing the Riser 2 GPU Air Blocker

After removing a GPU or a GPU air blocker, you must reinstall a GPU or air blocker. You cannot operate the GPU configured or GPU-enabled server with an empty GPU slot.

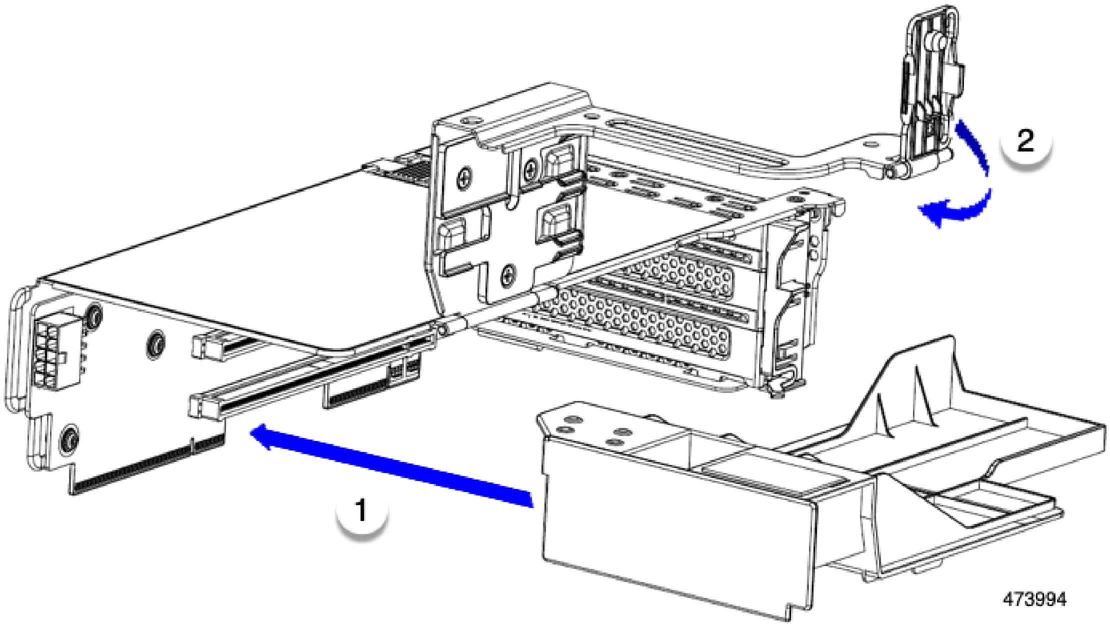
Use the following procedure to install the GPU air blocker in slot 5 of Riser 2.

**Step 1** Orient the part so that it will insert into the connector of slot 5.

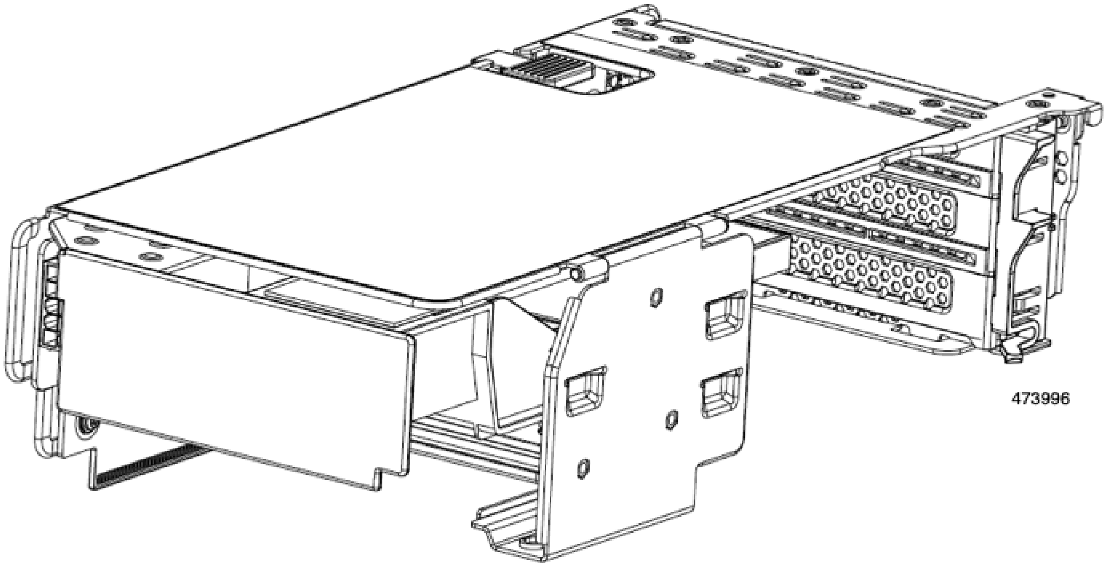
**Step 2** Holding the air blocker level, slide it into the riser cage and insert it into the riser cage connector.

When the air blocker is installed, the air blocker should fit snugly into the riser and cover slot 5 and slot 6.

**Step 3** Close and latch the hinged door on the riser cage.



When the GPU air blocker is correctly installed, the hinged door easily closes, the air blocker is seated level, and it fits securely in the riser cage.



**Step 4** Install the riser cage into the server.

### What to do next

If no other maintenance work is required, replace the top cover and return the server to operation. Otherwise, continue with the additional maintenance tasks.

# Removing the Riser 3 GPU Air Blocker

The GPU air blocker is a molded part that installs into slot 7 in Riser 3 and extends upward to cover the slot above it (slot 8).

⚠ **Caution** In a GPU-configured or GPU-ready server, the GPU air blocker is required in any slot that does not contain a GPU. Do not operate the server with any empty GPU slot!

Use this procedure to remove the GPU air blocker.

**Step 1** Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server.

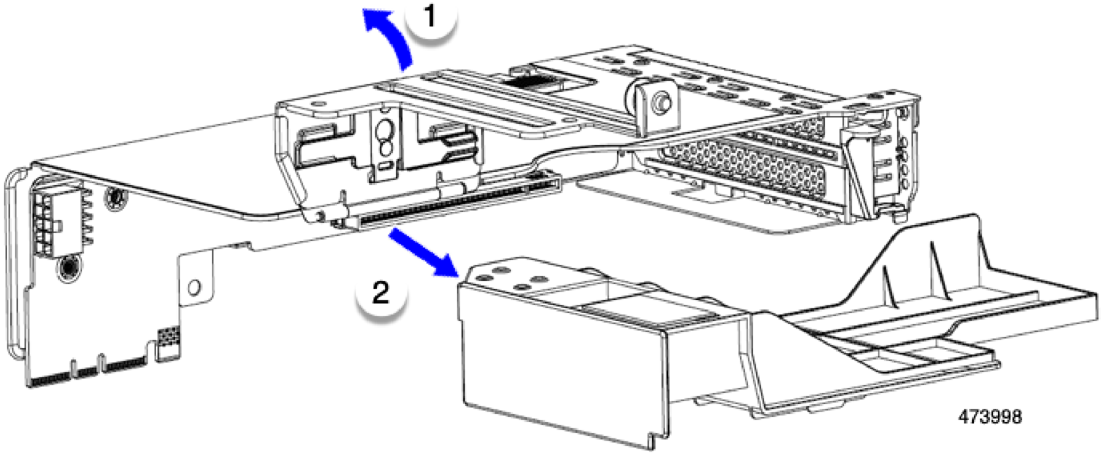
**Step 2** Slide the server out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

**Caution** If you cannot safely view and access the component, remove the server from the rack.

**Step 3** Remove the top cover from the server as described in Removing the Server Top Cover.

**Step 4** Remove the air blocker from the riser cage:

a) Use two hands to grasp the metal bracket of the PCIe riser and lift straight up to disengage its connector from the socket on the motherboard.
b) Set the riser on an antistatic surface.
c) On the bottom of the riser, press down on the clip that holds the securing plate.
d) Swing open the hinged securing plate to provide access.
e) Open the hinged plastic retainer that secures the rear-panel tab of the card.
f) Grasp the air blocker, and holding it level, pull it horizontally out of the riser cage.



| | | | |
|---|---|---|---|
| **1** | Release latch on hinged securing plate | **2** | GPU Air blocker |

### What to do next

Choose the appropriate option.

- Install a GPU. See Installing a Double-Wide GPU Card, on page 5.
- Install a GPU air blocker. See Installing the Riser 3 GPU Air Blocker, on page 17.

## Installing the Riser 3 GPU Air Blocker

After removing a GPU or a GPU air blocker, you must reinstall a GPU or air blocker. You cannot operate the GPU configured or GPU-enabled server with an empty GPU slot.

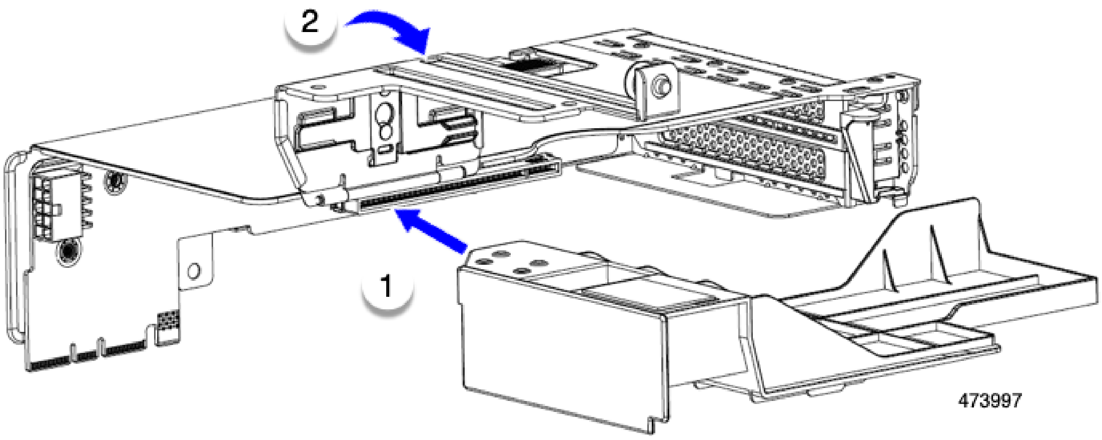
Use the following procedure to install the GPU air blocker in slot 7 of Riser 3.

**Step 1** Orient the part so that it will insert into the riser cage connector of slot 7.

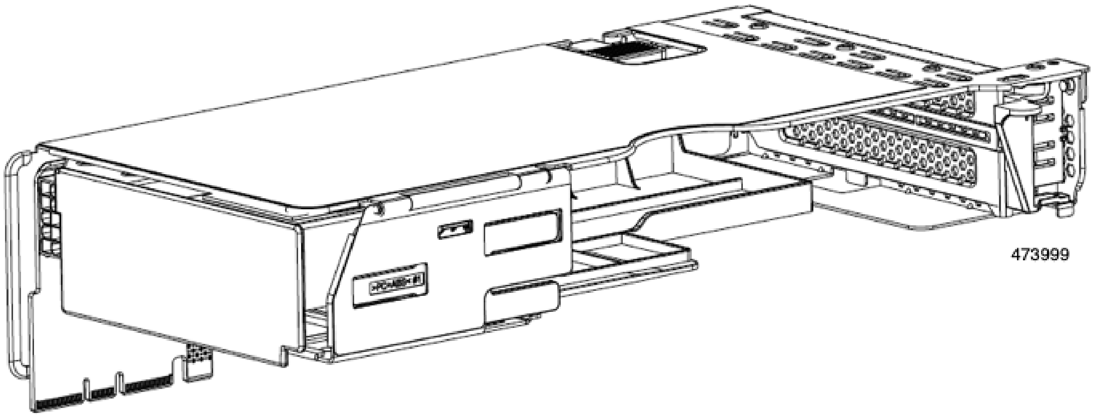
**Step 2** Holding the air blocker level, slide it into the riser cage.

When the air blocker is installed, the air blocker should fit snugly into the riser and cover slot 7 and slot 8.

**Step 3** Close the hinged door on the riser cage.



When the GPU air blocker is correctly installed, the hinged door easily closes, the air blocker is seated level, and it fits securely in the riser cage.



**Step 4** Install the riser cage into the server.

### What to do next

If no other maintenance work is required, replace the top cover and return the server to operation. Otherwise, continue with the additional maintenance tasks.

# Installing GRID Licenses From the NVIDIA Licensing Portal to the License Server

**Accessing the GRID License Server Management Interface**

Open a web browser on the License Server host and access the URL http://localhost:8080/licserver.

If you configured the License Server host’s firewall to permit remote access to the License Server, the management interface is accessible from remote machines at the URL http://hostname:8080/licserver

## Reading Your License Server’s MAC Address

Your License Server’s Ethernet MAC address is used as an identifier when registering the License Server with NVIDIA’s Licensing Portal.

**Step 1** Access the GRID License Server Management Interface in a browser.

**Step 2** In the left-side License Server panel, select **Configuration**.

The License Server Configuration panel opens. Next to **Server host ID**, a pull-down menu lists the possible Ethernet MAC addresses.

**Step 3** Select your License Server’s MAC address from the **Server host ID** pull-down.

**Note** It is important to use the same Ethernet ID consistently to identify the server when generating licenses on NVIDIA’s Licensing Portal. NVIDIA recommends that you select one entry for a primary, non-removable Ethernet interface on the platform.

## Installing Licenses From the Licensing Portal

**Step 1** Access the GRID License Server Management Interface in a browser.

**Step 2** In the left-side License Server panel, select **Configuration**.

The License Server Configuration panel opens.

**Step 3** Use the License Server Configuration menu to install the .bin file that you generated earlier.

a) Click **Choose File**.
b) Browse to the license .bin file that you want to install and click **Open**.
c) Click **Upload**.

The license file is installed on your License Server. When installation is complete, you see the confirmation message, “Successfully applied license file to license server.”

## Viewing Available GRID Licenses

Use the following procedure to view which licenses are installed and available, along with their properties.

**Step 1** Access the GRID License Server Management Interface in a browser.

**Step 2** In the left-side License Server panel, select **Licensed Feature Usage**.

**Step 3** Click on a feature in the **Feature** column to see detailed information about the current usage of that feature.

## Viewing Current License Usage

Use the following procedure to view information about which licenses are currently in-use and borrowed from the server.

**Step 1** Access the GRID License Server Management Interface in a browser.

**Step 2** In the left-side License Server panel, select **Licensed Clients**.

**Step 3** To view detailed information about a single licensed client, click on its **Client ID** in the list.

# Managing GRID Licenses

Features that require GRID licensing run at reduced capability until a GRID license is acquired.

## Acquiring a GRID License on Windows

**Step 1** Open the NVIDIA Control Panel using one of the following methods:

- Right-click on the Windows desktop and select **NVIDIA Control Panel** from the menu.
- Open Windows Control Panel and double-click the **NVIDIA Control Panel** icon.

**Step 2** In the NVIDIA Control Panel left-pane under Licensing, select **Manage License**.

The Manage License task pane opens and shows the current license edition being used. The GRID software automatically selects the license edition based on the features that you are using. The default is Tesla (unlicensed).

**Step 3** If you want to acquire a license for GRID Virtual Workstation, under License Edition, select **GRID Virtual Workstation**.

**Step 4** In the **License Server** field, enter the address of your local GRID License Server. The address can be a domain name or an IP address.

**Step 5** In the **Port Number** field, enter your port number of leave it set to the default used by the server, which is 7070.

**Step 6** Select **Apply**.

The system requests the appropriate license edition from your configured License Server. After a license is successfully acquired, the features of that license edition are enabled.

**Note** After you configure licensing settings in the NVIDIA Control Panel, the settings persist across reboots.

## Acquiring a GRID License on Linux

**Step 1** Edit the configuration file `/etc/nvidia/gridd.conf`:

```
sudo vi /etc/nvidia/gridd.conf
```

**Step 2** Edit the ServerUrl line with the address of your local GRID License Server.

The address can be a domain name or an IP address. See the example file below.

**Step 3** Append the port number (default 7070) to the end of the address with a colon. See the example file below.

**Step 4** Edit the FeatureType line with the integer for the license type. See the example file below.

- GRID vGPU = 1
- GRID Virtual Workstation = 2

**Step 5** Restart the nvidia-gridd service.

```
sudo service nvidia-gridd restart
```

The service automatically acquires the license edition that you specified in the FeatureType line. You can confirm this in /var/log/messages.

**Note** After you configure licensing settings in the NVIDIA Control Panel, the settings persist across reboots.

Sample configuration file:

```
# /etc/nvidia/gridd.conf - Configuration file for NVIDIA Grid Daemon
# Description: Set License Server URL
# Data type: string
# Format: "<address>:<port>"
ServerUrl=10.31.20.45:7070

# Description: Set Feature to be enabled
# Data type: integer
# Possible values:
# 1 => for GRID vGPU
# 2 => for GRID Virtual Workstation
FeatureType=2
```

# Using gpumodeswitch

The command line utility `gpumodeswitch` can be run in the following environments:

- Windows 64-bit command prompt (requires administrator permissions)
- Linux 32/64-bit shell (including Citrix XenServer dom0) (requires root permissions)

**Note** Consult NVIDIA product release notes for the latest information on compatibility with compute and graphic modes.

The gpumodeswitch utility supports the following commands:

- `--listgpumodes`

  Writes information to a log file named `listgpumodes.txt` in the current working directory.

- `--gpumode graphics`

  Switches to graphics mode. Switches mode of all supported GPUs in the server unless you specify otherwise when prompted.

- `--gpumode compute`

  Switches to compute mode. Switches mode of all supported GPUs in the server unless you specify otherwise when prompted.

**Note** After you switch GPU mode, reboot the server to ensure that the modified resources of the GPU are correctly accounted for by any OS or hypervisor running on the server.

# Installing Drivers to Support the GPU Cards

After you install the hardware, you must update to the correct level of server BIOS and then install GPU drivers and other software in this order:

1. Update the server BIOS.
2. Update the GPU drivers.

## 1. Updating the Server BIOS

Install the latest Cisco UCS C240 M4 server BIOS by using the Host Upgrade Utility for the Cisco UCS C240 M4 server.

**Note** You must do this procedure before you update the NVIDIA drivers.

**Step 1** Navigate to the following URL: http://www.cisco.com/cisco/software/navigator.html.

**Step 2** Click **Servers–Unified Computing** in the middle column.

**Step 3** Click **Cisco UCS C-Series Rack-Mount Standalone Server Software** in the right-hand column.

**Step 4** Click the name of your model of server in the right-hand column.

**Step 5** Click **Unified Computing System (UCS) Server Firmware**.

**Step 6** Click the release number.

**Step 7** Click **Download Now** to download the `ucs-`*`server platform`*`-huu-`*`version_number`*`.iso` file.

**Step 8** Verify the information on the next page, and then click **Proceed With Download**.

**Step 9** Continue through the subsequent screens to accept the license agreement and browse to a location where you want to save the file.

**Step 10** Use the Host Upgrade Utility to update the server BIOS.

The user guides for the Host Upgrade Utility are at Utility User Guides.

## 2. Updating the GPU Card Drivers

After you update the server BIOS, you can install GPU drivers to your hypervisor virtual machine.

**Step 1** Install your hypervisor software on a computer. Refer to your hypervisor documentation for the installation instructions.

**Step 2** Create a virtual machine in your hypervisor. Refer to your hypervisor documentation for instructions.

**Step 3** Install the GPU drivers to the virtual machine. Download the drivers from either:

- NVIDIA Enterprise Portal for GRID hypervisor downloads (requires NVIDIA login): https://nvidia.flexnetoperations.com/
- NVIDIA public driver area: http://www.nvidia.com/Download/index.aspx

**Step 4** Restart the server.

**Step 5** Check that the virtual machine is able to recognize the GPU card. In Windows, use the Device Manager and look under Display Adapters.