



# **NVIDIA DGX H100 Firmware Update Guide**

**NVIDIA Corporation**

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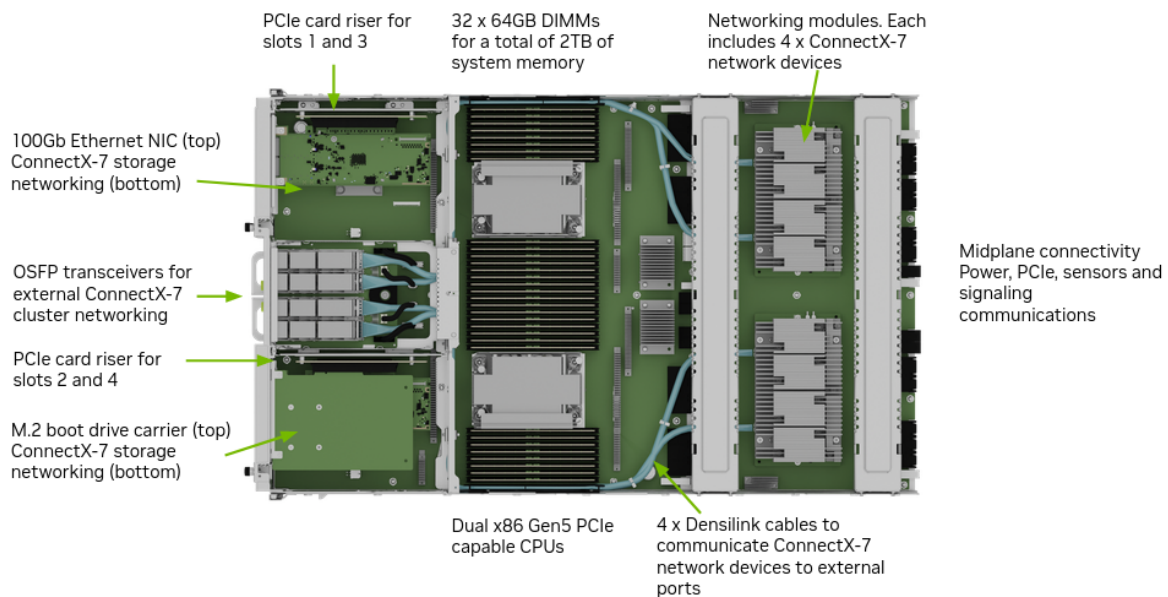
# Chapter 1. About Firmware Updates

- ▶ *Firmware Updatable Components*
- ▶ *Firmware Update Prerequisites*
- ▶ *Firmware Update Methods*
- ▶ *Firmware Update Activation*

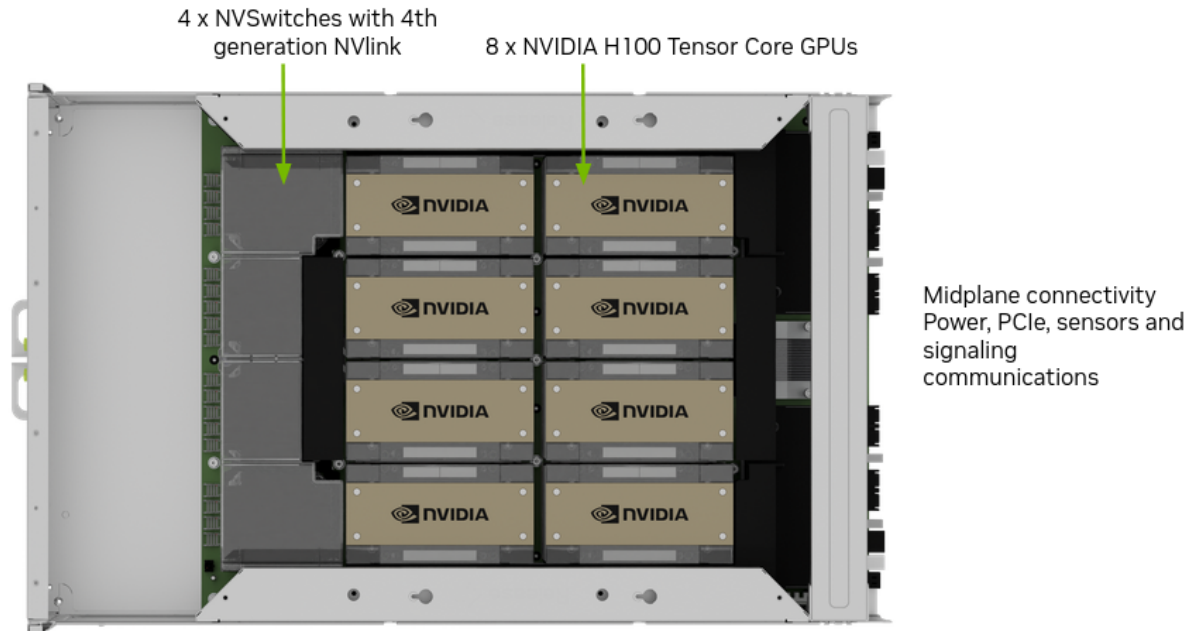
## 1.1. Firmware Updatable Components

An NVIDIA DGX H100 System has several firmware updatable components. Some of the components are on the following two trays in the system:

- ▶ The motherboard tray has components, such as the CPUs, PCH, BMC as shown in the following figure:



- ▶ The GPU tray has components, such as the GPUs, NVSwitches, HMC as shown in the following figure:



You can update the firmware on NVIDIA DGX H100 System components out-of-band (OOB) by using Redfish APIs or from the host operating system by using command-line interface (CLI) commands.

## 1.2. Firmware Update Prerequisites

- ▶ You can download firmware packages from the NVIDIA Enterprise Support Portal at <https://enterprise-support.nvidia.com/s/>.
- ▶ You must know the BMC IP address, a user name, and a password. The sample commands in this document show `admin` for both the user name and the password.
- ▶ You must have the `nvfwupd` executable or know how to use the Redfish API.

## 1.3. Firmware Update Methods

Most of the sample commands in this document show how to update firmware by using the `nvfwupd` command. You can download the executable from the NVIDIA Enterprise Support Portal. Refer to [About the `nvfwupd` Command](#) for more information about the command.

You can run the `nvfwupd` command interactively to update systems. Most command examples in this document show this interactive approach. If you have several systems to update, you can create a JSON file that identifies the systems to update. Refer to [Updating Multiple Systems](#) for more information.

An alternative to the `nvfwupd` command is to update firmware by using the Redfish API. The BMC network interface provides remote management with Redfish APIs.

The [Known Issues](#) for updating firmware and the [firmware update steps](#) still apply when you use the Redfish API.



Refer to [Redfish APIs Support](#) in the *NVIDIA DGX H100 User Guide* for more information and sample commands. The sample commands show how to update firmware with the `curl` command.

## 1.4. Firmware Update Activation

After the firmware update, you must perform one or more of the following tasks to activate the firmware update, depending on the components being updated:

- ▶ BMC component

Reset the BMC by running the following command:

```
sudo ipmitool mc reset cold
```

- ▶ PCIe Switch, PCIe Retimer, BIOS, and HGX (GPU Tray) components

Perform a cold reset on the system using the following command:

```
sudo ipmitool chassis power cycle
```

- ▶ EROT and CPLD components

Perform an AC power cycle on the system by unplugging all the power supplies and then reconnecting them either manually or through an external PDU device.

---

**Note:** The AC power cycle will activate firmware for all updated components.

---



---

# Chapter 2. About the nvfwupd Command

## 2.1. Requirements

The nvfwupd executable runs on the Linux operating system and is available for x86\_64 or arm64 architecture machines. You can run the x86\_64 executable locally on the DGX system or use a remote Linux system.

If you run nvfwupd locally on the DGX system, instead of connecting to the BMC IP address, as shown in the sample commands, you can connect to the host Redfish interface IP address.

To download the latest version of the nvfwupd executable, log in to the [NVIDIA Enterprise Support Portal](#).

## 2.2. Syntax

```
nvfwupd version 1.1.3

Usage: nvfwupd [ global options ] <command>

Global options:
  -t --target ip=<BMC IP> user=<BMC login id> password=<BMC password> port=<port
↳num for port forwarding> | targets=<JSON>
      BMC target comprising BMC IP address and BMC login credentials

  -v --verbose Chosen path for logfile (optional). Default path is current working
↳directory.
      Increase verbosity

Commands:
  help          Show tool help.

  version      Show tool version.

  show_pkg_content [ options... ]
      -p --package PLDM firmware package

  unpack [ options... ]
```

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```

    -p --package          PLDM firmware package
    -o --outdir          Directory path to save unpacked firmware files
↪(optional).
                        Default path is current working directory of tool.

<Global options...> show_version [ options... ]
    -p --package          PLDM firmware package

<Global options...> update_fw [ options... ]
    -p --package          PLDM firmware package
    -y --yes              Bypass firmware update confirmation prompt
    -b --background      Exit without waiting for the update process to
↪finish
    -t --timeout          API request timeout value in seconds
    -s --special          Special Update json file

<Global options...> force_update [ options... ]
    enable|disable|status Enable, disable, or check current force update
↪value on target.

<Global options...> show_update_progress [ options... ]
    -i --id              List of Task IDs delimited by space

<Global options...> perform_factory_reset

<Global options...> install_license

<Global options...> make_upd_targets [ options... ]
    -o --outdir          Directory path to create update target files
↪(optional).
                        Default path is current working directory of
↪tool.

```

## 2.3. Understanding Background Processing

By default, the `nvfwupd update_fw` command communicates with the Redfish API, prints the the firmware update progress to the console, and then exits when the command runs to completion.

Alternatively, you can specify the `--background` or `-b` argument so that the command communicates with the Redfish API, prints the task ID to the console, and then exits. In this case, you can periodically run the `nvfwupd show_update_progress` command with the task ID to monitor the update progress.

1. Create a component-specific `updparameters.json` file.
2. Update the firmware in the background:

```

nvfwupd -t ip=<bmc-ip-address> user=<bmc-user-id> password=<bmc-password> update_
↪fw \
    -p <firmware-package-file> -y -s updparameters.json -b

```

*Example Output*

```
FW recipe: ['<firmware-package-file>']  
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", ...}  
FW update started, Task Id: 1
```

3. Display the update progress for the task:

```
nvfwupd -t ip=<bmc-ip-address> user=<bmc-user-id> password=<bmc-password> show_  
→update_progress -i 1
```

*Example Output*

```
{'id': ['1']}  
Task Info for Id: 1  
StartTime: 2023-03-11T01:10:01-0000  
TaskState: Running  
PercentComplete: 58  
TaskStatus: OK  
EndTime: 2023-03-11T01:10:00+00:00  
TaskStatus: Task /redfish/v1/UpdateService/upload is running normally.
```

Eventually, the percent complete field reports 100 and the task state field reports Completed.

4. To activate the firmware update, refer to [Firmware Update Activation](#) for more information.



---

# Chapter 3. Version 1.1.3

## 3.1. Highlights

- ▶ Added support
  - ▶ Support for Gen5 NVME drives.
  - ▶ U.2 drive temperature sensor fix.
  - ▶ Updated power supply firmware.
  - ▶ Included the latest GPU tray firmware.
  - ▶ Included the latest network (cluster and storage) card firmware.
  - ▶ Added support for securing KCS.
- ▶ The `nvfwupd` command is updated with the following enhancements:
  - ▶ Support for abbreviated firmware update package names.
  - ▶ Enhanced the `show_update_progress` output to provide a full status report for Redfish.
  - ▶ Support for custom log file path.
  - ▶ The command exits with an error code 1 for any update failure or tool failure.

## 3.2. BMC Fixes

- ▶ Fixed where SEL logs might fill up for NVMe drives.
- ▶ Fixed low occurrence where HMC might not be visible in the BMC after BMC reboot.
- ▶ Added ability to control IPMI visibility for Host (Allow All, Limited Command, Hide).
- ▶ Higher resolution for CPU and GPU energy telemetry via Redfish.
- ▶ Improved reliability of Redfish inventory.
- ▶ Improved overall stability of telemetry collection and handling invalid/missing values.
- ▶ General improvements to WebUI.

## 3.3. Firmware Package Details

This firmware release supports the following hardware:

- ▶ NVIDIA DGX H100

This firmware release supports the following operating systems:

- ▶ NVIDIA DGX OS 6.1, 6.0.11, and higher
- ▶ NVIDIA DGX Software for EL9.2, 23.12 and 23.08
- ▶ NVIDIA DGX Software for EL8 23.08

Refer to the [NVIDIA Base OS](#) documentation for more information about the operating systems.

You can download firmware packages from the NVIDIA Enterprise Support Portal at <https://enterprise-support.nvidia.com/s/>.

Download two firmware package files:

Components	Sample File Name
<b>Combined Archive</b>	DGXH100_1.1.3.tar The combined archive includes the firmware for the system components, firmware for the GPU tray, and the <i>nvwupd</i> executable.
<b>Motherboard Tray</b>	nvw_DGXH100_231206.1.0.fwpkg
<b>GPU Tray</b>	nvw_HGX_DGXH100_231101.1.0.fwpkg

If you are updating from 1.1.1, the total update time is approximately

- ▶ 88 minutes for the CPU tray using sequential updates.
- ▶ 33 minutes for the CPU tray using parallel updates.
- ▶ 11 minutes for the GPU tray using parallel updates.

The following table shows the information about component firmware versions and update time breakdown.



Component	Version	Update time from 1.1.1 (minutes)
Host BMC	<b>24.01.05</b> Refer to <i>DGX H100 System BMC Changes</i> for the list of changes.	25
Host BMC EROT	04.0026	2
SBIOS EROT	04.0026	0
SBIOS	<b>v1.01.03</b> Refer to <i>DGX H100 System SBIOS Changes</i> for the list of changes.	7
Motherboard CPLD	0.2.1.8	18
Midplane CPLD	<b>0.2.1.1</b>	14
PSU (Delta ECD16020137)	Primary <b>2.4</b> Secondary <b>2.1</b> Community <b>2.2</b>	PSU_0: 2 PSU_1: 2 PSU_2: 2 PSU_3: 2 PSU_4: 2 PSU_5: 2
Broadcom Gen5 PCIe Switch (PEX89072-B01)	Switch 0: <b>v0.0.7</b> Switch 1: <b>v1.0.7</b>	Switch 0: 1 Switch 1: 1
Astera Labs Gen5 PCIe Retimer (PT5161L)	<b>v2.07.19</b>	Retimer 0: 3 Retimer 1: 3
Network (Cluster) Card - ConnectX-7	<b>v28.39.1002</b>	
Network (Storage) Card - ConnectX-7	<b>v28.39.1002</b>	
VBIOS (H100 80GB)	<b>96.00.89.00.01</b>	GPU Tray (total): 11
NVSwitch (GPU Tray)	<b>96.10.4A.00.01</b>	
EROT (GPU Tray)	<b>02.0150</b>	
HMC (GPU Tray)	<b>HGX-22.10-1-rc57</b>	
FPGA (GPU Tray)	<b>2.37</b>	
PCIe Switch (GPU Tray)	1.7.5F	
<b>3.3. Firmware Package Details</b> Astera Labs Gen5 PCIe Retimer (GPU Tray) (PT5161L)	<b>2.07.20</b>	<b>11</b>

## 3.4. Firmware Update Procedure

Refer to *Firmware Update Steps*.

---

# Chapter 4. NVIDIA DGX H100 System Firmware Changes

## 4.1. DGX H100 System BMC Changes

### 4.1.1. Changes in 24.01.05

- ▶ Fixed where SEL logs might fill up for NVMe drives
- ▶ Fixed low occurrence where HMC might not be visible in the BMC after BMC reboot
- ▶ Ability to control IPMI visibility for Host (Allow All, Limited Command, Hide)
- ▶ Higher resolution for CPU and GPU energy telemetry via Redfish
- ▶ Improved reliability of Redfish inventory
- ▶ Improved overall stability of telemetry collection and handling invalid/missing values
- ▶ General improvements to WebUI

### 4.1.2. Changes in 23.09.20

- ▶ WebUI enhancements
- ▶ Enabled GPU Info in WebUI
- ▶ Enabled NVRAM clear via Redfish
- ▶ Disabled RMCP / MD5 Auth Support after factory reset
- ▶ Enabled EROT background copy
- ▶ Enabled default SNMPv3 MIB
- ▶ The BMC update includes software security enhancements. Refer to the [NVIDIA DGX H100 - August 2023 Security Bulletin](#) for details.

## 4.2. DGX H100 System SBIOS Changes

### 4.2.1. Changes in v1.01.03

- ▶ Added support for securing KCS

### 4.2.2. Changes in v1.01.01

- ▶ Fixed Boot options labeling for NIC ports
- ▶ Fix for U.2 bay slot numbering
- ▶ Set RestoreROWritePerf option to expert mode only
- ▶ Expose TDX and IFS options in expert user mode only

## 4.3. nvfwupd Command Changes

### 4.3.1. Changes in v2.0.0

- ▶ Support for using a platform-agnostic configuration file.

### 4.3.2. Changes in v1.1.3

- ▶ Support for abbreviated firmware update package names.
- ▶ Enhanced the show\_update\_progress output to provide a full status report for Redfish.
- ▶ Support for custom log file path.
- ▶ The command exits with an error code 1 for any update failure or tool failure.

### 4.3.3. Changes in v1.1.1

- ▶ You can update all the system components on the motherboard tray at one time. Previously, you had to update the components individually.
- ▶ You can create a JSON file with network addresses and credentials for multiple systems and automatically update multiple systems serially. Refer to *Updating Multiple Systems* for more information.

---

# Chapter 5. Firmware Update Steps

## 5.1. Before You Begin

- ▶ Stop all unnecessary system activity before you begin the firmware update.
- ▶ Stop all GPU activity, including running the `nvidia-smi` command. GPU activity and running the command can prevent the VBIOS update.
- ▶ Do not add additional loads on the system, such as user jobs, diagnostics, or monitoring services, while an update is in progress. A high workload can disrupt the firmware update process and result in an unusable component.
- ▶ When you begin the firmware update, the update software assists in determining the activity state of the DGX system and provides a warning if it detects that activity levels are above a pre-determined threshold. If you encounter the warning, take action to reduce the workload before proceeding with the firmware update.
- ▶ Fan speeds can increase during the BMC firmware update. This increase in speed is a normal part of the BMC firmware update process.

## 5.2. Update Duration

Updating the firmware on the motherboard tray components and the GPU tray components requires approximately 90 minutes. Updating the firmware on the ConnectX-7 devices requires approximately 30 minutes.

## 5.3. Update Steps

1. View the installed versions compared with the newly available firmware:

```
nvwfupd --target ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password> \  
  show_version -p nvfw_DGXH100_231206.1.0.fwpkg \  
  nvfw_HGX_DGXH100_231101.1.0.fwpkg
```

2. Update the BMC.

Create a file, such as `update_bmc.json`, with the following contents:

```
{  
  "Targets" : [ "/redfish/v1/UpdateService/FirmwareInventory/HostBMC_0" ]  
}
```

Run the following command to update the BMC:

```
nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password> update_  
↪fw \  
-p nvfw_DGXH100_231206.1.0.fwpkg -y -s update_bmc.json
```

3. Reset the BMC so that it is used after the next reboot:

```
# If you have a shell on the system  
$ sudo ipmitool mc reset cold  
  
# If you are logged in to a different system  
$ ipmitool -H <bmc-ip-address> -I lanplus -U <bmc-username> -P <bmc-password> mc  
↪reset cold
```

4. Reboot the system.
5. Update the components on the motherboard tray.

For one-shot firmware update, the BMC will perform firmware update on all components in the provided bundle, for example, `nvfw_DGX-H100_0003_231110.1.0_custom_prod-signed.fwpkg`, which includes Host BMC, Host BIOS, EROT, PCIe Retimer, PCIe Switch, PSU, Motherboard CPLD, and Midplane CPLD.

Create a file, such as `mb_tray.json`, with the following contents:

```
{"Targets": []}
```

Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password> update_  
↪fw \  
-p nvfw_DGXH100_231206.1.0.fwpkg -y -s mb_tray.json
```

---

**Tip:** Update the BMC and BIOS firmware a second time, specifying the `force_update` argument. The second update ensures that the primary and backup copies of the firmware in NVRAM are both up to date.

When you specify the `force_update` argument, the `nvfwupd` command forces firmware update without checking the firmware version. If the version of the firmware available for the component is the same as the version currently installed on the component, the BMC will skip the update for that component.

---

6. Update the components in the GPU tray.

Create a `gpu_tray.json` file with the following contents:

```
{  
  "Targets" : [ "/redfish/v1/UpdateService/FirmwareInventory/HGX_0" ]  
}
```

Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password> update_
↪fw \
-p nvfw_HGX_DGXH100_231101.1.0.fwpkg -y -s gpu_tray.json
```

This step performs parallel updates on all the components contained in the GPU tray, such as VBIOS, NVSwitch, EROTs, and FPGA.

### 7. Update the firmware on the ConnectX-7 controllers.

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_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:dc:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:c0:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:18:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:40:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:4f:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:ce:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:9a:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
```

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_1002-MCX755206AS-NEA_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:29:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX755206AS-NEA_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
```

### 8. Perform an AC power cycle on the system by unplugging all the power supplies and then reconnecting them either manually or through an external PDU device.

Wait for the operating system to boot.

### 9. Confirm the firmware update is complete by viewing the installed versions again:

```
nvfwupd --target ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password> \
show_version -p nvfw_DGXH100_231206.1.0.fwpkg \
nvfw_HGX_DGXH100_231101.1.0.fwpkg
```





---

## Chapter 6. Known Issues

- ▶ *Functional Issues*
- ▶ *The ipmitool dcmi power reading Command Returns 0 Power Reading Value*
- ▶ *Misleading Messages During Firmware Update*
- ▶ *Sensors Endpoint for the Redfish API Does Not Support \$expand*
- ▶ *GPUs Show Exclamation Mark in BMC Web Interface*
- ▶ *Firmware Upgrade or Downgrade Can Fail*
- ▶ *BMC LDAP Fields Do Not Support Space or Slash Characters*
- ▶ *Firmware Inventory Can Be Invalid During Boot*
- ▶ *BMC Slow Startup After AC Power Cycle*
- ▶ *Temperature Sensors Can Report No Reading*
- ▶ *NVMe Information Not Visible in BCM Web Interface*

### 6.1. Functional Issues

- ▶ You can not update firmware of the individual components of the DGX H100 GPU tray. For example, you can not individually update the firmware for the GPU only. You must update the firmware by flashing the entire DGX H100 GPU tray.
- ▶ Firmware download is not automatic. You must download the firmware manually from the NVIDIA Enterprise Support Portal.
- ▶ For systems running DGX OS 6.0, the `nvfwupd` command-line utility that is shown in sample commands is not automatically installed. You must download the utility from the NVIDIA Enterprise Support Portal. For systems running DGX OS 6.1, the `nvfwupd` command-line utility is included with the operating system.

## 6.2. The ipmitool dcmi power reading Command Returns 0 Power Reading Value

### 6.2.1. Issue

When you use the `ipmitool dcmi power reading` command to report the power consumption data, the command reports 0 Watts for the power reading value as shown in the following example:

```
$ sudo ipmitool -I lanplus -H IPaddress -U user -P password dcmi power reading
Instantaneous power reading:          0 Watts
Minimum during sampling period:       0 Watts
Maximum during sampling period:       7852 Watts
Average power reading over sample period: 1885 Watts
IPMI timestamp:                       Jan 12 09:20:45 2024
Sampling period:                       00000005 Seconds
Power reading state is:                activated
```

No workaround is available at the time of the firmware update 1.1.3 release; however, this issue is expected to be resolved in a later release.

## 6.3. Misleading Messages During Firmware Update

### 6.3.1. Issue

During the process of the ConnectX-7 firmware update, upon completion of applying the update, a reboot is required as suggested by these messages: `To load new FW, run mlxfwreset or reboot machine.` and `Please reboot machine to load new configurations.` However, rebooting the system does not load the firmware update or new configurations properly for the ConnectX-7 firmware versions 28.36.1010 and later.

### 6.3.2. Workaround

For the firmware update and new configurations to load successfully, perform an AC power cycle on the system instead of rebooting.

## 6.4. Sensors Endpoint for the Redfish API Does Not Support \$expand

### 6.4.1. Issue

An HTTP GET request to the sensors endpoint with an \$expand argument like the following fails.


```
/redfish/v1/Chassis/DGX/Sensors?$expand=.$(levels=3)
```

### 6.4.2. Workaround

You can request sensor data from the Redfish API by requesting one sensor at a time. You can use the IPMI tool to request sensor data.

## 6.5. GPUs Show Exclamation Mark in BMC Web Interface

### 6.5.1. Issue

When you view the GPUs from the BMC web interface, the GPUs are shown with an exclamation mark ()

### 6.5.2. Explanation

The icon is a false positive. You can view the results of the `nvsml show health` command to confirm that the GPU status is healthy.

### 6.5.3. Fixed Release

This issue is fixed with the v1.1.1 firmware update.

## 6.6. Firmware Upgrade or Downgrade Can Fail

### 6.6.1. Issue

When you perform a firmware upgrade or downgrade, the change can fail with a message like the following example:

```
...  
[Sat 19 Aug 2023 08:20:50 AM CST] Firmware update task ended with state Exception,  
↪percentComplete: [98]  
[Sat 19 Aug 2023 08:20:50 AM CST] Update RC: 1  
[Sat 19 Aug 2023 08:20:50 AM CST] Collect RF task  
[Sat 19 Aug 2023 08:21:01 AM CST] Update failed with [nvfw_DGX-H100_0005_230615.1.0_  
↪dbg-signed.fwpkg]:[/redfish/v1/UpdateService/FirmwareInventory/EROT_BMC_0]
```

### 6.6.2. Workaround

Retry the firmware upgrade or downgrade.

## 6.7. BMC LDAP Fields Do Not Support Space or Slash Characters

### 6.7.1. Issue

The BMC LDAP settings do not support the space or slash characters as part of the bind DN or search base. The following DN results in a failure:

```
DC=Echo Studios,DC=com
```

### 6.7.2. Workaround

No workaround is available.

## 6.8. Firmware Inventory Can Be Invalid During Boot

### 6.8.1. Issue

In rare instances, polling the firmware inventory endpoint of the BMC Redfish API can report an inaccurate firmware versions for the HGX\_0 component.

### 6.8.2. Workaround

Query the firmware inventory after the system completes the boot sequence to retrieve the current firmware inventory.

## 6.9. BMC Slow Startup After AC Power Cycle

### 6.9.1. Issue

After an AC power cycle, the BMC can require approximately 10 minutes before it is available for communication. The BMC is typically available within three minutes.

### 6.9.2. Workaround

No workaround is available.

## 6.10. Temperature Sensors Can Report No Reading

### 6.10.1. Issue

The following sensors can report No Reading rather than a temperature value:

- ▶ TEMP\_Cedar\_OSFP0
- ▶ TEMP\_Cedar\_OSFP1
- ▶ TEMP\_Cedar\_OSFP2
- ▶ TEMP\_Cedar\_OSFP3
- ▶ TEMP\_PCIE\_CX7\_1

- ▶ TEMP\_PCIE\_CX7\_2
- ▶ TEMP\_CX7\_QSFP0
- ▶ TEMP\_CX7\_QSFP1
- ▶ TEMP\_CX7\_QSFP2
- ▶ TEMP\_CX7\_QSFP3
- ▶ TEMP\_Intel\_NIC
- ▶ TEMP\_NIC\_QSFP0
- ▶ TEMP\_NIC\_QSFP1

### 6.10.2. Workaround

No workaround is available.

## 6.11. NVMe Information Not Visible in BCM Web Interface

### 6.11.1. Issue

In some cases, the NVMe information is not visible in the BCM web interface.

### 6.11.2. Workaround

No workaround is available.

---

# Chapter 7. Viewing the Installed Firmware and Package Versions

Perform the following steps to view the firmware versions that are installed on the system and the versions in the firmware update packages.

- ▶ Compare the installed firmware versions with the versions available in the packages:

```
nvfwupd --target ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password> \  
  show_version -p nvfw_DGXH100_231206.1.0.fwpkg \  
  nvfw_HGX_DGXH100_231101.1.0.fwpkg
```

Replace the firmware package file names with the file names that you downloaded.

---

**Tip:** If you run the `nvfwupd show_version` command without any arguments, the command displays the currently installed firmware versions.

---

### Example Output

```
System Model: DGXH100  
Part number: xxx-xxxxx-xxxx-xxx  
Serial number: xxxxxxxxxxxxxxx  
BMC IP: 192.168.1.1  
  
Firmware Devices:  
AP Name          Up-To-Date      Sys Version      Pkg Version  
-----          -  
↔               ↔               ↔               ↔  
CPLDMB_0         Yes             0.2.1.6          0.2.1.6  
↔               ↔               ↔               ↔  
CPLDMID_0        Yes             0.2.0.7          0.2.0.7  
↔               ↔               ↔               ↔  
EROT_BIOS_0      No              00.04.0011.0000_n00  00.04.0018.0000_n00  
↔               ↔               ↔               ↔  
EROT_BMC_0       No              00.04.0011.0000_n00  00.04.0018.0000_n00  
↔               ↔               ↔               ↔  
HGX_FW_BMC_0     No              HGX-22.10-1-rc31    HGX-23.03-09-rc01  
↔               ↔               ↔               ↔  
HGX_FW_ERoT_BMC_0 No              00.02.0120.0000_n00  00.02.0114.0001_n00  
↔               ↔               ↔               ↔
```

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HGX_FW_ERoT_FPGA_0	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_GPU_SXM_1	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_GPU_SXM_2	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_GPU_SXM_3	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_GPU_SXM_4	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_GPU_SXM_5	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_GPU_SXM_6	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_GPU_SXM_7	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_GPU_SXM_8	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_NVSwitch_0	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_NVSwitch_1	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_NVSwitch_2	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_NVSwitch_3	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_ERoT_PCIESwitch_0	00.02.0120.0000_n00	00.02.0114.0001_n00
↪ Yes		
HGX_FW_FPGA_0	2.0D	2.09
↪ Yes		
HGX_FW_GPU_SXM_1	96.00.61.00.01	96.00.5E.00.00
↪ Yes		
HGX_FW_GPU_SXM_2	96.00.61.00.01	96.00.5E.00.00
↪ Yes		
HGX_FW_GPU_SXM_3	96.00.61.00.01	96.00.5E.00.00
↪ Yes		
HGX_FW_GPU_SXM_4	96.00.61.00.01	96.00.5E.00.00
↪ Yes		
HGX_FW_GPU_SXM_5	96.00.61.00.01	96.00.5E.00.00
↪ Yes		
HGX_FW_GPU_SXM_6	96.00.61.00.01	96.00.5E.00.00
↪ Yes		
HGX_FW_GPU_SXM_7	96.00.61.00.01	96.00.5E.00.00
↪ Yes		
HGX_FW_GPU_SXM_8	96.00.61.00.01	96.00.5E.00.00
↪ Yes		
HGX_FW_NVSwitch_0	96.10.35.00.02	96.10.2E.00.00
↪ Yes		
HGX_FW_NVSwitch_1	96.10.35.00.02	96.10.2E.00.00
↪ Yes		
HGX_FW_NVSwitch_2	96.10.35.00.02	96.10.2E.00.00
↪ Yes		
HGX_FW_NVSwitch_3	96.10.35.00.02	96.10.2E.00.00
↪ Yes		
HGX_FW_PCIERetimer_0	1.31.7	1.31.7
↪ Yes		

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HGX_FW_PCIERetimer_1	1.31.7	1.31.7
↔ Yes		
HGX_FW_PCIERetimer_2	1.31.7	1.31.7
↔ Yes		
HGX_FW_PCIERetimer_3	1.31.7	1.31.7
↔ Yes		
HGX_FW_PCIERetimer_4	1.31.7	1.31.7
↔ Yes		
HGX_FW_PCIERetimer_5	1.31.7	1.31.7
↔ Yes		
HGX_FW_PCIERetimer_6	1.31.7	1.31.7
↔ Yes		
HGX_FW_PCIERetimer_7	1.31.7	1.31.7
↔ Yes		
HGX_FW_PCIESwitch_0	1.7.5F	1.7.5F
↔ Yes		
HGX_InfoROM_GPU_SXM_1	G520.0200.00.01	N/A
↔ No		
HGX_InfoROM_GPU_SXM_2	G520.0200.00.01	N/A
↔ No		
HGX_InfoROM_GPU_SXM_3	G520.0200.00.01	N/A
↔ No		
HGX_InfoROM_GPU_SXM_4	G520.0200.00.01	N/A
↔ No		
HGX_InfoROM_GPU_SXM_5	G520.0200.00.01	N/A
↔ No		
HGX_InfoROM_GPU_SXM_6	G520.0200.00.01	N/A
↔ No		
HGX_InfoROM_GPU_SXM_7	G520.0200.00.01	N/A
↔ No		
HGX_InfoROM_GPU_SXM_8	G520.0200.00.01	N/A
↔ No		
HGX_InfoROM_NVSwitch_0	5612.0002.00.01	N/A
↔ No		
HGX_InfoROM_NVSwitch_1	5612.0002.00.01	N/A
↔ No		
HGX_InfoROM_NVSwitch_2	5612.0002.00.01	N/A
↔ No		
HGX_InfoROM_NVSwitch_3	5612.0002.00.01	N/A
↔ No		
HostBIOS_0	01.00.04	01.00.04
↔ Yes		
HostBMC_0	23.04.18	44.04.19
↔ No		
PCIERetimer_0	1.30.12	1.30.0
↔ Yes		
PCIERetimer_1	1.30.12	1.30.0
↔ Yes		
PCIESwitch_0	0.0.6	00.06.78
↔ No		
PCIESwitch_1	1.0.6	01.06.78
↔ No		
PSU_0	0202.0201.0202	0202.0201.0202
↔ Yes		
PSU_1	0202.0201.0202	0202.0201.0202
↔ Yes		

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PSU_2		0202.0201.0202	0202.0201.0202
↔	Yes		
PSU_3		0202.0201.0202	0202.0201.0202
↔	Yes		
PSU_4		0202.0201.0202	0202.0201.0202
↔	Yes		
PSU_5		0202.0201.0202	0202.0201.0202
↔	Yes		

HGX Firmware from the GPU tray reports the HGX\_InfoRom\_GPU\_SXM\_n and HGX\_InfoRom\_NVSwitch\_n in the firmware inventory Redfish output. As a result, it is included in the preceding output as N/A. In the Up-To-Date column, these entries show No because you cannot update them OOB from the GPU or NVSwitch firmware images respectively.

---

## Chapter 8. Updating the BMC

1. Create a `update_bmc.json` file with the following contents:

```
{
  "Targets" : ["/redfish/v1/UpdateService/FirmwareInventory/HostBMC_0"]
}
```

2. Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password> update_
↪fw \
  -p nvfw_DGXH100_231206.1.0.fwpkg -y -s update_bmc.json
```

### Example Output

```
FW recipe: ['nvfw_DGXH100_231206.1.0.fwpkg']
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", "Messages": [{"@odata.type
↪": "#Message.v1_0_8.Message", "Message": "A new task /redfish/v1/TaskService/
↪Tasks/2 was created.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/2"],
↪"MessageId": "Task.1.0.New", "Resolution": "None", "Severity": "OK"}, {"@odata.
↪type": "#Message.v1_0_8.Message", "Message": "The action UpdateService.
↪MultipartPush was submitted to do firmware update.", "MessageArgs": [
↪"UpdateService.MultipartPush"], "MessageId": "UpdateService.1.0.
↪StartFirmwareUpdate", "Resolution": "None", "Severity": "OK"}]}
FW update started, Task Id: 2
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
PercentageComplete: 6
TaskState: Running
PercentComplete: 6
TaskStatus: OK
...

PercentageComplete: 100
TaskState: Completed
PercentComplete: 100
TaskStatus: OK
```

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```
Firmware update successful!  
Overall Time Taken: 0:36:11  
Refer to 'DGX H100 Firmware Update Document' on activation steps for new firmware  
↪to take effect.
```

3. Reset the BMC so the BMC boots the new firmware:

```
# If you have a shell on the system  
$ sudo ipmitool mc reset cold  
  
# If you are logged in to a different system  
$ ipmitool -H <bmc-ip-address> -I lanplus -U <bmc-username> -P <bmc-password> mc  
↪reset cold
```

4. Reboot the system.

---

# Chapter 9. Firmware Update of Motherboard Tray: All Components

Perform the following steps to update the firmware on all the system components, such as CPLDs, PSUs, PCIe switches, and so on.

This procedure is an alternative to updating each component individually.

1. Create a `mb_tray.json` file with empty braces, like the following example:

```
{}
```

2. Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password> update_
↪fw \
  -p nvfw_DGXH100_231206.1.0.fwpkg -y -s mb_tray.json
```

### *Example Output*

```
FW package: ['nvfw_DGXH100_231206.1.0.fwpkg']
Ok to proceed with firmware update? <Y/N>
y
{"@odata.type": "#UpdateService.v1_11_0.UpdateService", "Messages": [{"@odata.type": "#Message.v1_0_8.Message", "Message": "A new task /redfish/v1/TaskService/Tasks/2 was created.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/2"], "MessageId": "Task.1.0.New", "Resolution": "None", "Severity": "OK"}, {"@odata.type": "#Message.v1_0_8.Message", "Message": "The action UpdateService.MultipartPush was submitted to do firmware update.", "MessageArgs": ["UpdateService.MultipartPush"], "MessageId": "UpdateService.1.0.StartFirmwareUpdate", "Resolution": "None", "Severity": "OK"}]}
FW update started, Task Id: 2
Wait for Firmware Update to Start...
TaskState: Running
PercentComplete: 1
TaskStatus: OK
TaskState: Running
PercentComplete: 20
TaskStatus: OK
TaskState: Running
PercentComplete: 40
TaskStatus: OK
```

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```
TaskState: Running
PercentComplete: 61
TaskStatus: OK
TaskState: Running
PercentComplete: 80
TaskStatus: OK
TaskState: Running
PercentComplete: 99
TaskStatus: OK
TaskState: Completed
PercentComplete: 100
TaskStatus: OK
Firmware update successful!
Overall Time Taken: 0:24:38
Refer to 'DGX H100 Firmware Update Document' on activation steps for new firmware
↳to take effect.
-----
↳-----
```

---

# Chapter 10. Updating BMC EROT on the Motherboard Tray

1. Create a `updparameters.json` file with the following contents:

```
{
  "Targets" : ["/redfish/v1/UpdateService/FirmwareInventory/EROT_BMC_0"]
}
```

2. Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=admin password=admin update_fw \
-p nvfw_DGXH100_231206.1.0.fwpkg -y -s updparameters.json
```

### *Example Output*

```
FW recipe: ['nvfw_DGXH100_231206.1.0.fwpkg']
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", "Messages": [{"@odata.type": "#Message.v1_0_8.Message", "Message": "A new task /redfish/v1/TaskService/Tasks/1 was created.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/1"], "MessageId": "Task.1.0.New", "Resolution": "None", "Severity": "OK"}, {"@odata.type": "#Message.v1_0_8.Message", "Message": "The action UpdateService.MultipartPush was submitted to do firmware update.", "MessageArgs": ["UpdateService.MultipartPush"], "MessageId": "UpdateService.1.0.StartFirmwareUpdate", "Resolution": "None", "Severity": "OK"}]}
FW update started, Task Id: 1
Wait for Firmware Update to Start...
Wait for Firmware Update to Start...
TaskState: Completed
PercentComplete: 100
TaskStatus: OK
Firmware update successful!
Overall Time Taken: 0:00:09
Refer to 'DGX H100 Firmware Update Document' on activation steps for new firmware
to take effect.
```





---

# Chapter 11. Updating SBIOS EROT on the Motherboard Tray

1. Create a `updparameters.json` file with the following contents:

```
{
  "Targets" : ["/redfish/v1/UpdateService/FirmwareInventory/EROT_BIOS_0"]
}
```

2. Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=admin password=admin update_fw \
-p nvfw_DGXH100_231206.1.0.fwpkg -y -s updparameters.json
```

### *Example Output*

```
FW recipe: ['nvfw_DGXH100_231206.1.0.fwpkg']
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", "Messages": [{"@odata.type": "#Message.v1_0_8.Message", "Message": "A new task /redfish/v1/TaskService/Tasks/2 was created.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/2"], "MessageId": "Task.1.0.New", "Resolution": "None", "Severity": "OK"}, {"@odata.type": "#Message.v1_0_8.Message", "Message": "The action UpdateService.MultipartPush was submitted to do firmware update.", "MessageArgs": ["UpdateService.MultipartPush"], "MessageId": "UpdateService.1.0.StartFirmwareUpdate", "Resolution": "None", "Severity": "OK"}]}
FW update started, Task Id: 2
Wait for Firmware Update to Start...
Wait for Firmware Update to Start...
TaskState: Completed
PercentComplete: 100
TaskStatus: OK
Firmware update successful!
Overall Time Taken: 0:00:10
Refer to 'DGX H100 Firmware Update Document' on activation steps for new firmware
to take effect.
```



---

# Chapter 12. Updating the BIOS on the Motherboard Tray

1. Create a `updparameters.json` file with the following contents:

```
{
  "Targets" : ["/redfish/v1/UpdateService/FirmwareInventory/HostBIOS_0"]
}
```

2. Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=admin password=admin update_fw \
-p nvfw_DGXH100_231206.1.0.fwpkg -y -s updparameters.json
```

### Example Output

```
FW recipe: [nvfw_DGXH100_231206.1.0.fwpkg']
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", "Messages": [{"@odata.type": "#Message.v1_0_8.Message", "Message": "A new task /redfish/v1/TaskService/Tasks/2 was created.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/2"], "MessageId": "Task.1.0.New", "Resolution": "None", "Severity": "OK"}, {"@odata.type": "#Message.v1_0_8.Message", "Message": "The action UpdateService.MultipartPush was submitted to do firmware update.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/2"], "MessageId": "UpdateService.1.0.StartFirmwareUpdate", "Resolution": "None", "Severity": "OK"}]}
FW update started, Task Id: 2
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
Wait for FirmwareUpdateStarted in MessageId
PercentageComplete: 6
TaskState: Running
PercentComplete: 6
TaskStatus: OK
...
PercentageComplete: 100
TaskState: Completed
PercentComplete: 100
```

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```
TaskStatus: OK
Firmware update successful!
Overall Time Taken: 0:36:11
Refer to 'DGX H100 Firmware Update Document' on activation steps for new firmware
↔to take effect.
```

---

# Chapter 13. Updating the CPLDs on the Motherboard Tray

1. Create a `updparameters.json` file with the following contents:

```
{
  "Targets" : ["/redfish/v1/UpdateService/FirmwareInventory/CPLDMB_0"]
}
```

2. Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=admin password=admin update_fw \
-p nvfw_DGXH100_231206.1.0.fwpkg -y -s updparameters.json
```

### *Example Output*

```
FW recipe: ['nvfw_DGXH100_231206.1.0.fwpkg']
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", "Messages": [{"@odata.type": "#Message.v1_0_8.Message", "Message": "A new task /redfish/v1/TaskService/Tasks/4 was created.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/4"], "MessageId": "Task.1.0.New", "Resolution": "None", "Severity": "OK"}, {"@odata.type": "#Message.v1_0_8.Message", "Message": "The action UpdateService.MultipartPush was submitted to do firmware update.", "MessageArgs": ["UpdateService.MultipartPush"], "MessageId": "UpdateService.1.0.StartFirmwareUpdate", "Resolution": "None", "Severity": "OK"}]}
FW update started, Task Id: 4
Wait for Firmware Update to Start...
Wait for Firmware Update to Start...
TaskState: Completed
PercentComplete: 100
TaskStatus: OK
Firmware update successful!
Overall Time Taken: 0:00:08
Refer to 'DGX H100 Firmware Update Document' on activation steps for new firmware
to take effect.
```



---

# Chapter 14. Updating the Midplane CPLDs on the Motherboard Tray

1. Create a `updparameters.json` file with the following contents:

```
{
  "Targets" : ["/redfish/v1/UpdateService/FirmwareInventory/CPLDMID_0"]
}
```

2. Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=admin password=admin update_fw \
-p nvfw_DGXH100_231206.1.0.fwpkg -y -s updparameters.json
```

### Example Output

```
FW recipe: ['nvfw_DGXH100_231206.1.0.fwpkg']
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", "Messages": [{"@odata.type": "#Message.v1_0_8.Message", "Message": "A new task /redfish/v1/TaskService/Tasks/5 was created.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/5"], "MessageId": "Task.1.0.New", "Resolution": "None", "Severity": "OK"}, {"@odata.type": "#Message.v1_0_8.Message", "Message": "The action UpdateService.MultipartPush was submitted to do firmware update.", "MessageArgs": ["UpdateService.MultipartPush"], "MessageId": "UpdateService.1.0.StartFirmwareUpdate", "Resolution": "None", "Severity": "OK"}]}
FW update started, Task Id: 5
Wait for Firmware Update to Start...
Wait for Firmware Update to Start...
  TaskState: Completed
  PercentComplete: 100
  TaskStatus: OK
Firmware update successful!
  Overall Time Taken: 0:00:09
Refer to 'DGX H100 Firmware Update Document' on activation steps for new firmware
↳ to take effect.
```





---

# Chapter 15. Updating the NVMe Firmware

The following instructions describe how to update the firmware on an NVMe device using the NVME-CLI command-line interface. The `nvme-cli` tool is preinstalled on all DGX H100 systems.

1. List the devices and check the firmware versions.

```
$ sudo nvme list
```

Node	SN	Model	Namespace	Usage
	Format	FW Rev		
↔ /dev/nvme0n1	S666NE0T395778	SAMSUNG MZ1L21T9HCLS-00A07	1	1.18 TB
↔ /	1.92 TB	GDC7302Q		
↔ /dev/nvme1n1	S666NE0T395802	SAMSUNG MZ1L21T9HCLS-00A07	1	1.18 TB
↔ /	1.92 TB	GDC7302Q		
↔ /dev/nvme2n1	22L0A031T2N8	KCM6DRUL3T84	1	27.04 GB
↔ /	3.84 TB	0107		
↔ /dev/nvme3n1	22W0A02AT2N8	KCM6DRUL3T84	1	27.57 GB
↔ /	3.84 TB	0107		
↔ /dev/nvme4n1	22W0A02HT2N8	KCM6DRUL3T84	1	26.19 GB
↔ /	3.84 TB	0107		
↔ /dev/nvme5n1	22L0A01WT2N8	KCM6DRUL3T84	1	25.44 GB
↔ /	3.84 TB	0107		
↔ /dev/nvme6n1	22L0A025T2N8	KCM6DRUL3T84	1	24.91 GB
↔ /	3.84 TB	0107		
↔ /dev/nvme7n1	22L0A02CT2N8	KCM6DRUL3T84	1	25.17 GB
↔ /	3.84 TB	0107		
↔ /dev/nvme8n1	22L0A01FT2N8	KCM6DRUL3T84	1	24.65 GB
↔ /	3.84 TB	0107		
↔ /dev/nvme9n1	22L0A01YT2N8	KCM6DRUL3T84	1	24.37 GB
↔ /	3.84 TB	0107		

From the output, you can find the device names and firmware versions, such as `/dev/nvme0n1` and `GDC7302Q`.

2. Download the firmware you want to upgrade for the NVMe device.

```
$ nvme fw-download $DeviceName --fw=***(specify the firmware file for upgrade)
```

3. Commit and activate the downloaded firmware immediately without reset by setting the `action` argument to 3.

```
$ nvme fw-commit $DeviceName --action=3
```

4. Verify that the correct firmware version is updated.

```
$ nvme id-ctrl $DeviceName
```

---

# Chapter 16. Updating the Power Supply Units on the Motherboard Tray

1. Create a `updparameters.json` file with the following contents:

```
{
  "Targets" : ["/redfish/v1/UpdateService/FirmwareInventory/PSU_0"]
}
```

---

**Important:** Repeat this procedure for PSU\_1 through PSU\_5.

---

2. Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=admin password=admin update_fw \
-p nvfw_DGXH100_231206.1.0.fwpkg -y -s updparameters.json
```

### *Example Output*

```
FW recipe: ['nvfw_DGXH100_231206.1.0.fwpkg']
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", "Messages": [{"@odata.type": "#Message.v1_0_8.Message", "Message": "A new task /redfish/v1/TaskService/Tasks/6 was created.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/6"], "MessageId": "Task.1.0.New", "Resolution": "None", "Severity": "OK"}, {"@odata.type": "#Message.v1_0_8.Message", "Message": "The action UpdateService.MultipartPush was submitted to do firmware update.", "MessageArgs": ["UpdateService.MultipartPush"], "MessageId": "UpdateService.1.0.StartFirmwareUpdate", "Resolution": "None", "Severity": "OK"}]}
FW update started, Task Id: 6
Wait for Firmware Update to Start...
Wait for Firmware Update to Start...
TaskState: Completed
PercentComplete: 100
TaskStatus: OK
Firmware update successful!
Overall Time Taken: 0:00:08
Refer to 'DGX H100 Firmware Update Document' on activation steps for new firmware
to take effect.
```



---

# Chapter 17. Updating the PCIe Switches on the Motherboard Tray

1. Create a `updparameters.json` file with the following contents:

```
{
  "Targets" : ["/redfish/v1/UpdateService/FirmwareInventory/PCIESwitch_0"]
}
```

---

**Important:** Repeat this procedure for `PCIESwitch_1`.

---

2. Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=admin password=admin update_fw \
-p nvfw_DGXH100_231206.1.0.fwpkg -y -s updparameters.json
```

### *Example Output*

```
FW recipe: ['nvfw_DGXH100_231206.1.0.fwpkg']
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", "Messages": [{"@odata.type": "#Message.v1_0_8.Message", "Message": "A new task /redfish/v1/TaskService/Tasks/7 was created.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/7"], "MessageId": "Task.1.0.New", "Resolution": "None", "Severity": "OK"}, {"@odata.type": "#Message.v1_0_8.Message", "Message": "The action UpdateService.MultipartPush was submitted to do firmware update.", "MessageArgs": ["UpdateService.MultipartPush"], "MessageId": "UpdateService.1.0.StartFirmwareUpdate", "Resolution": "None", "Severity": "OK"}]}
FW update started, Task Id: 7
Wait for Firmware Update to Start...
Wait for Firmware Update to Start...
TaskState: Completed
PercentComplete: 100
TaskStatus: OK
Firmware update successful!
Overall Time Taken: 0:00:09
Refer to 'DGX H100 Firmware Update Document' on activation steps for new firmware
to take effect.
```



---

## Chapter 18. Updating the PCIe Retimers on the Motherboard Tray

1. Create a `updparameters.json` file with the following contents:

```
{
  "Targets" : ["/redfish/v1/UpdateService/FirmwareInventory/PCIeRetimer_0"]
}
```

---

**Important:** Repeat this procedure for `PCIeRetimer_1`.

---

2. Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=admin password=admin update_fw \
-p nvfw_DGXH100_231206.1.0.fwpkg -y -s updparameters.json
```

### *Example Output*

```
FW recipe: ['nvfw_DGXH100_231206.1.0.fwpkg']
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", "Messages": [{"@odata.type": "#Message.v1_0_8.Message", "Message": "A new task /redfish/v1/TaskService/Tasks/8 was created.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/8"], "MessageId": "Task.1.0.New", "Resolution": "None", "Severity": "OK"}, {"@odata.type": "#Message.v1_0_8.Message", "Message": "The action UpdateService.MultipartPush was submitted to do firmware update.", "MessageArgs": ["UpdateService.MultipartPush"], "MessageId": "UpdateService.1.0.StartFirmwareUpdate", "Resolution": "None", "Severity": "OK"}]}
FW update started, Task Id:8
Wait for Firmware Update to Start...
Wait for Firmware Update to Start...
TaskState: Completed
PercentComplete: 100
TaskStatus: OK
Firmware update successful!
Overall Time Taken: 0:00:09
Refer to 'DGX H100 Firmware Update Document' on activation steps for new firmware
to take effect.
```





---

# Chapter 19. 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 [component firmware versions table](#) 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_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:dc:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:c0:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:18:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:40:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:4f:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:ce:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:9a:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX750500B-0D00_Ax-UEFI-14.32.12-FlexBoot-3.7.201.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_1002-MCX755206AS-NEA_Ax-UEFI-14.32.12-FlexBoot-3.7.201.signed.bin b
sudo mstflint -d /sys/bus/pci/devices/0000:29:00.0/config -i fw-ConnectX7-rel-28_
↪39_1002-MCX755206AS-NEA_Ax-UEFI-14.32.12-FlexBoot-3.7.201.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 20. Firmware Update of GPU Tray: All Components

Perform the following steps to update the firmware on all the components in the GPU tray, such as GPUs, NVSwitches, and so on.

1. Create a `gpu_tray.json` file with the following contents:

```
{
  "Targets" : ["/redfish/v1/UpdateService/FirmwareInventory/HGX_0"]
}
```

2. Update the firmware:

```
nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password> update_
↪fw \
  -p nvfw_HGX_DGXH100_231101.1.0.fwpkg -y -s gpu_tray.json
```

### Example Output

```
FW recipe: ['nvfw_HGX100x8_002_230705.1.1_prod-signed.fwpkg']
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", "Messages": [{"@odata.type": "#Message.v1_0_8.Message", "Message": "A new task /redfish/v1/TaskService/Tasks/3 was created.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/3"], "MessageId": "Task.1.0.New", "Resolution": "None", "Severity": "OK"}, {"@odata.type": "#Message.v1_0_8.Message", "Message": "The action UpdateService.MultipartPush was submitted to do firmware update.", "MessageArgs": ["/redfish/v1/UpdateService.MultipartPush"], "MessageId": "UpdateService.1.0.StartFirmwareUpdate", "Resolution": "None", "Severity": "OK"}]}
FW update started, Task Id: 3
Wait for Firmware Update to Start...
Wait for Firmware Update to Start...
Started Updating: HGX_0
TaskState: Running
PercentComplete: 20
TaskStatus: OK
TaskState: Running
PercentComplete: 40
TaskStatus: OK
TaskState: Completed
PercentComplete: 100
TaskStatus: OK
Firmware update successful!
Overall Time Taken: 0:09:14
Refer to
```



---

# Chapter 21. Updating Multiple Systems

## 21.1. About Updating Multiple Systems

You can use the `nvfwupd` command with the `-t targets=<json-file>` argument and a JSON file to update the firmware on multiple systems. The update is performed serially on the systems.

Refer to the following sample `targets.json` file:

```
[
  {"ip": "192.168.1.10", "user": "admin", "password": "admin"},
  {"ip": "192.168.1.20", "user": "admin", "password": "admin"},
  {"ip": "192.168.1.30", "user": "admin", "password": "admin"}
]
```

You can specify a host name instead of the IP address in the `ip` field.

When you specify the `-t targets=<json-file>` argument, the following arguments to the `nvfwupd` command are not supported:

- ▶ `--background`
- ▶ `show_update_progress`

## 21.2. Procedure

- ▶ Run the `nvfwupd` command and specify the `-t targets=<json-file>` argument:

```
$ nvfwupd -t targets=../targets.json update_fw -s updparams.json -y -p \
  nvfw_DGXH100_xxxx_xxxxxx.x.x.fwpkg
```

### Example Output

```
Updating ip address: ip=192.168.1.10

FW recipe: ['nvfw_DGXH100_xxxx_xxxxxx.x.x_custom_prod-signed.fwpkg']
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", "Messages": [
{"@odata.type": "#Message.v1_0_8.Message", "Message": "A new task
/redfish/v1/TaskService/Tasks/6 was created.", "MessageArgs":
[/redfish/v1/TaskService/Tasks/6], "MessageId": "Task.1.0.New",
"Resolution": "None", "Severity": "OK"}, {"@odata.type": "#Message.v1_0_8.Message
↵",
```

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```
"Message": "The action UpdateService.MultipartPush was submitted to do firmware
↪update.",
"MessageArgs": ["UpdateService.MultipartPush"],
"MessageId": "UpdateService.1.0.StartFirmwareUpdate", "Resolution": "None",
↪"Severity": "OK"}}}
FW update started, Task Id: 6
Wait for Firmware Update to Start...
Wait for Firmware Update to Start...
TaskState: Completed
PercentComplete: 100
TaskStatus: OK
Firmware update successful!
Overall Time Taken: 0:00:08
Refer to 'DGX H100 Firmware Update Document' on activation steps for new firmware
↪to take effect.
-----
↪-----

Updating ip address: ip=192.168.1.20
...
```

---

## Chapter 22. Performing a Factory Reset

- ▶ Reset the DGX system firmware to factory default values:

```
nvfwupd --target ip=<bmc-ip-address> user=admin password=admin perform_factory_
↪reset
```

### *Example Output*

```
Factory Reset request successful
Task State:
{"@odata.context": "/redfish/v1/$metadata#Task.Task", "@odata.id": "/redfish/v1/
↪TaskService/Tasks/2", "@odata.type": "#Task.v1_4_2.Task", "Description": "Task
↪for Manager ResetToDefaults", "Id": "2", "Name": "Manager ResetToDefaults",
↪"TaskState": "New"}
```





---

# Chapter 23. Forcing a Firmware Downgrade

## 23.1. Prerequisites

- ▶ Refer to *Viewing the Installed Firmware and Package Versions* to confirm that the firmware package has the firmware version that you want.

## 23.2. Procedure

1. Enable the ForceUpdate flag on the BMC:

```
nvfwupd --target ip=<bmc-ip-address> user=admin password=admin force_update enable
```

*Example Output*

```
ForceUpdate flag was successfully set True on the system.
```

2. Confirm the ForceUpdate flag status:

```
nvfwupd --target ip=<bmc-ip-address> user=admin password=admin force_update status
```

*Example Output*

```
ForceUpdate is set to True
```

3. Perform the firmware update.
4. Disable the ForceUpdate flag on the BMC:

```
nvfwupd --target ip=<bmc-ip-address> user=admin password=admin force_update  
↪disable
```

*Example Output*

```
ForceUpdate flag was successfully set False on the system.
```

5. Confirm the ForceUpdate flag status:

```
nvfwupd --target ip=<bmc-ip-address> user=admin password=admin force_update status
```

*Example Output*

```
ForceUpdate is set to False
```

---

# Chapter 24. Troubleshooting an Unsuccessful Firmware Update

## 24.1. No Devices Where Detected for Handle ID 0

When performing a firmware update with the Redfish API, the following output message indicates that the firmware file specified in the `-F UpdateFile=` argument is not the correct file for the component specified in the JSON file.

```
...
{
  "@odata.type": "#Message.v1_0_8.Message",
  "Message": "Given PLDMBundle Status Message : No devices where detected for handle
↪id 0.",
  "MessageArgs": [
    "No devices where detected for handle id 0"
  ],
  "MessageId": "UpdateService.1.0.FwUpdateStatusMessage",
  "Resolution": "None",
  "Severity": "Warning"
},
...
```

Retry the update and specify the firmware file that matches the component. Refer to [Version 1.1.3](#) for the firmware file names and components. Refer to [Redfish APIs Support](#) in the *NVIDIA DGX H100 System User Guide* for information about using the Redfish API.

## 24.2. Wait for Firmware Update Started ID

The output for an unsuccessful firmware update using the `nvfwupd` command can look like the following example:

```
FW recipe: ['nvfw_DGXH100_xxxx_xxxxxx.x.x.fwpkg']
{"@odata.type": "#UpdateService.v1_6_0.UpdateService", "Messages": [{"@odata.type": "#Message.v1_0_8.Message", "Message": "A new task /redfish/v1/TaskService/Tasks/4 was created.", "MessageArgs": ["/redfish/v1/TaskService/Tasks/4"], "MessageId": "Task.1.0.New", "Resolution": "None", "Severity": "OK"}, {"@odata.type": "#Message.v1_0_8.Message", "Message": "The action UpdateService.MultipartPush was submitted to do firmware update.", "MessageArgs": ["UpdateService.MultipartPush"], "MessageId": "UpdateService.1.0.StartFirmwareUpdate", "Resolution": "None", "Severity": "OK"}]}
FW update started, Task Id: 4

Wait for FirmwareUpdateStarted Id in Messages
Wait for FirmwareUpdateStarted Id in Messages
Task Message: Task /redfish/v1/UpdateService/upload has stopped due to an exception condition.
Firmware update failed, retry the firmware update
```

Retry the firmware update, as indicated in the command output.

---

# Chapter 25. Version 1.1.1

## 25.1. Features

- ▶ The `nvfwupd` command is updated with the following enhancements:
  - ▶ You can update all the system components on the motherboard tray at one time. Previously, you had to update the components individually.
  - ▶ You can create a JSON file with network addresses and credentials for multiple systems and automatically update multiple systems serially. Refer to [Updating Multiple Systems](#) for more information.
- ▶ Various performance enhancements.
- ▶ Enhancements to Redfish and new documentation to clear the BIOS and reset the BIOS to factory defaults. Refer to the [NVIDIA DGX H100 User Guide](#) for more information.
- ▶ Sensor enhancements
- ▶ SEL logging improvements
- ▶ Improved firmware update times
- ▶ KVM enhancements

## 25.2. BMC Fixes

- ▶ WebUI enhancements
- ▶ Enabled GPU Info in WebUI
- ▶ Enabled NVRAM clear via Redfish
- ▶ Disabled RMCP / MD5 Auth Support after factory reset
- ▶ Enabled EROT background copy
- ▶ Enabled default SNMPv3 MIB
- ▶ The BMC update includes software security enhancements. Refer to the [NVIDIA DGX H100 - August 2023 Security Bulletin](#) for details.

## 25.3. SBIOS Fixes

- ▶ Fixed Boot options labeling for NIC ports
- ▶ Fix for U.2 bay slot numbering
- ▶ Set RestoreROWritePerf option to expert mode only
- ▶ Expose TDX and IFS options in expert user mode only

## 25.4. Firmware Package Details

This firmware release supports the following hardware:

- ▶ NVIDIA DGX H100

This firmware release supports the following operating systems:

- ▶ NVIDIA DGX OS 6.0.11 and higher

You can download firmware packages from the NVIDIA Enterprise Support Portal at <https://enterprise-support.nvidia.com/s/>.

Download two firmware package files:

Components	Sample File Name
<b>Combined Archive</b>	DGXH100_1.1.1.tar The combined archive includes the firmware for the system components, firmware for the GPU tray, and the <i>nvfwupd</i> executable.
<b>Motherboard Tray</b>	nvfw_DGXH100_230920.1.0.fwpkg
<b>GPU Tray</b>	nvfw_HGX100x8_002_230705.1.1_prod-signed.fwpkg

Refer to the following table for information about component firmware versions:

Component	Version
Host BMC	23.09.20 Refer to <a href="#">DGX H100 System BMC Changes</a> for the list of changes.
Host BMC EROT	04.0026
SBIOS EROT	04.0026 Refer to <a href="#">DGX H100 System SBIOS Changes</a> for the list of changes.
SBIOS	v1.01.01
Motherboard CPLD	0.2.1.8
Midplane CPLD	0.2.1.0
PSU (Delta ECD16020137)	Primary 2.2 Secondary 2.1 Community 2.2
Broadcom Gen5 PCIe Switch (PEX89072-B01)	Switch 0: v0.0.6 Switch 1: v1.0.6
Astera Labs Gen5 PCIe Retimer (PT5161L)	v1.30.12
Network Controller	ConnectX-7 Package: 5.9-0.5.6.0.127 Firmware: v28.36.2050
VBIOS (H100 80GB)	96.00.74.00.01
NVSwitch (GPU Tray)	96.10.3F.00.01
EROT (GPU Tray)	02.0134
HMC (GPU Tray)	HGX-22.10-1-rc44
FPGA (GPU Tray)	2.2C
PCIe Switch (GPU Tray)	1.7.5F
Astera Labs PCIe Retimer (GPU Tray) (PT5161L)	2.7.9
Intel 10G Ethernet	v3.60
<b>25.4. Firmware Package Details</b>	
Intel 50G Ethernet	v2.5
M.2 NVMe	GDC7502Q

## 25.5. Firmware Update Procedure

Refer to *Firmware Update Steps*.



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# Chapter 26. Version 1.0.0

Version 1.0.0 is the initial firmware release for NVIDIA DGX H100 Systems.

## 26.1. Firmware Package Details

This firmware release supports the following hardware:

- ▶ NVIDIA DGX H100

This firmware release supports the following operating systems:

- ▶ NVIDIA DGX OS 6.0.11 and higher

You can download firmware packages from the NVIDIA Enterprise Support Portal at <https://enterprise-support.nvidia.com/s/>.

Download two firmware package files:

Components	Sample File Name
System Components	nvfw_DGX-H100_0003_230310.1.0_custom_prod-signed.fwpkg
GPU Tray	nvfw_DGX-HGX-H100x8_0000_230310.1.0_prod-signed.fwpkg

Refer to the following table for information about component firmware versions:

Component	Version
Host BMC	23.05.11
Host BMC EROT	04.0015
SBIOS EROT	04.0015
SBIOS	v1.00.07
Motherboard CPLD	0.2.1.6
Midplane CPLD	0.2.0.7
PSU (Delta ECD16020137)	Primary 2.2 Secondary 2.1 Community 2.2
Broadcom Gen5 PCIe Switch (PEX89072-B01)	Switch 0: v0.0.6 Switch 1: v1.0.6
Astera Labs Gen5 PCIe Retimer (PT5161L)	v1.30.12
Network Controller	ConnectX-7 Package: 5.9-0.5.6.0.113 Firmware: v28.36.2024
VBIOS (H100 80GB)	96.00.61.00.01
NVSwitch (GPU Tray)	96.10.35.00.01
EROT (GPU Tray)	02.0134
HMC (GPU Tray)	HGX-22.10-1-rc34
FPGA (GPU Tray)	2.11
PCIe Switch (GPU Tray)	1.7.5F
Astera Labs PCIe Retimer (GPU Tray) (PT5161L)	2.4.7
Intel 10G Ethernet	v3.60
Intel 50G Ethernet	v2.5
	GDC7302Q
M.2 NVMe (Samsung PM9A3)	
U.2 Kioxia CM6	1.0.7

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