NVIDIA DGX B200 Firmware Update Guide

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Contents

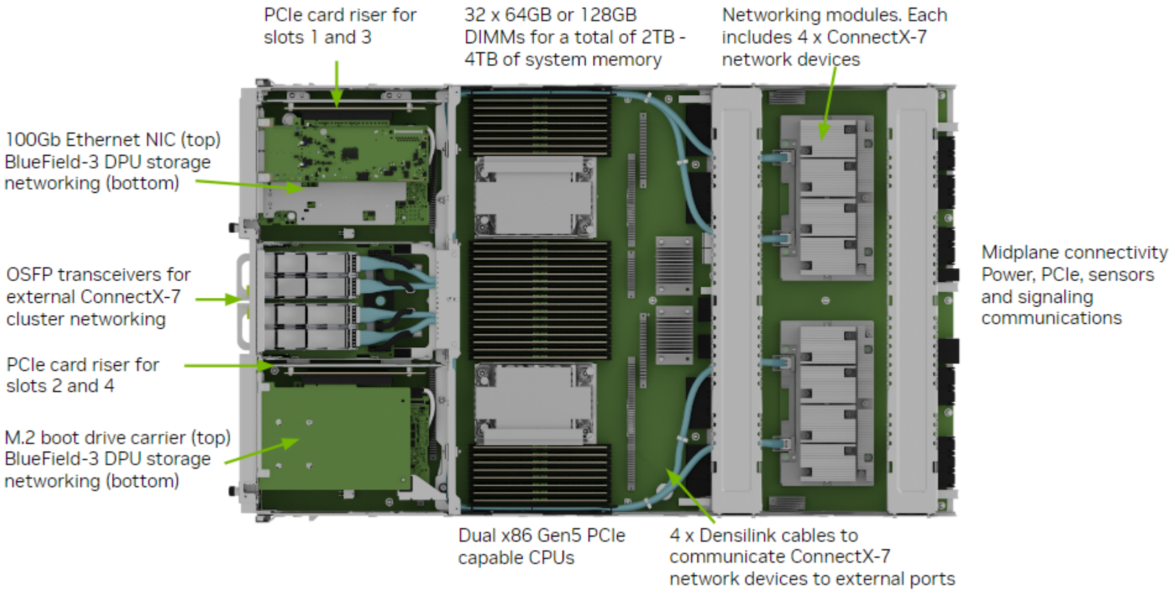
Chapter 1. About Firmware Updates

This topic provides an overview of firmware updates on the NVIDIA DGX™ B200 system.

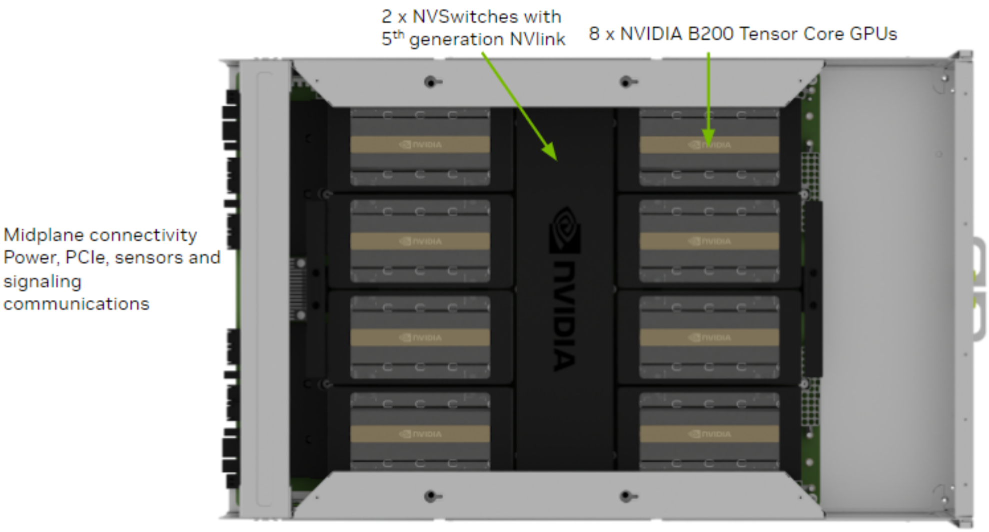
1.1. Firmware Updatable Components

The NVIDIA DGX™ B200 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:


PCIe card riser for slots 1 and 3
32 x 64GB or 128GB DIMMs for a total of 2TB - 4TB of system memory
Networking modules. Each includes 4 x ConnectX-7 network devices
100Gb Ethernet NIC (top) BlueField-3 DPU storage networking (bottom)
OSFP transceivers for external ConnectX-7 cluster networking
PCIe card riser for slots 2 and 4
M.2 boot drive carrier (top) BlueField-3 DPU storage networking (bottom)
Midplane connectivity Power, PCIe, sensors and signaling communications
Dual x86 Gen5 PCIe capable CPUs
4 x Densilink cables to communicate ConnectX-7 network devices to external ports

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



You can update the firmware on the NVIDIA DGX B200 system components out-of-band (OOB) by using Redfish APIs or from the host operating system by using the command-line interface (CLI) commands.

1.2. Firmware Update Prerequisites

- You can download firmware packages from the NVIDIA Enterprise Support Portal.
- 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 using the `nvfwupd` command. You can download the executable from the NVIDIA Enterprise Support Portal.

- For more information about the command, refer to *About the nvfwupd Command*.
- For best practice when updating the firmware, follow the instructions in *Firmware Update Steps*.

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 *Platform-Agnostic Firmware Updates* 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 B200 System 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 2.0.5

Usage: nvfwupd [ global options ] <command>

Global options:
    -t --target ip=<BMC IP> user=<BMC login id> password=<BMC password> servertype=
↪<Type of server>
           BMC target comprising BMC IP address and BMC login credentials. The
↪servertype sub-option is optional.
           Valid value for servertype is one of [DGX, HGX, MGX, GH200, NVOS, HGXB100,
↪GB200, MGX-NVL, GB200Switch].

    -c --config Path for config file (optional).
           Configure tool behavior.

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

Commands:
     help       Show tool help.
```

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```
    version    Show tool version.

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

    unpack [ options... ]
        -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.
        -j  --json                   Show output in JSON.

    <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.
        -d  --details                Show update progress in table format.
        -j  --json                   Show output in JSON. Must be paired with the -b
                                     background option, and always bypasses update
↪confirmation prompt.

    <Global options...> activate_fw [ options... ]
        -c  --cmd                    Activation command name.
                                     List of supported commands ['PWR_STATUS', 'PWR_
↪OFF', 'PWR_ON',
                                     'PWR_CYCLE', 'RESET_COLD', 'RESET_WARM', 'NVUE_
↪PWR_CYCLE',
                                     'RF_AUX_PWR_CYCLE'].

    <Global options...> force_update [ options... ]
        enable|disable|status        Enable, disable, or check current force update
↪value on target.
        -j  --json                   Show output in JSON.

    <Global options...> show_update_progress [ options... ]
        -i  --id                     List of Task IDs delimited by space.
        -j  --json                   Show output in JSON.

    <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 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
   ```

   > **Note**
   >
   > If the `Platform dgxhxxx not supported` error appears, choose either of the following methods to resolve the unidentified platform issue:
   >
   > - Update the `nvfwupd` tool to version 2.0.4 or later for automatic DGX platform detection.
   > - Specify the `servertype=DGX` sub-option with the `--target` option and try again. For example,
   >
   > ```
   > nvfwupd -t ip=<bmc-ip-address> user=<bmc-user-id> password=<bmc-password>
   >  ↪\
   > servertype=DGX update_fw -p <firmware-package-file> -y -s parameters.json
   > ```

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. DGX B200 System Firmware Update Guide Version 25.02.5

3.1. Highlights

3.1.1. Added Support

- Introduces support for the NVIDIA DGX™ B200 System.

3.1.2. BMC Fixes

- No BMC fixes for the initial release.

3.1.3. SBIOS Fixes

- No SBIOS fixes for the initial release.

3.1.4. The nvfwupd Command Updates

- Added support for parallel firmware updates through the YAML configuration file.
- Added the `--json` option to the `update_fw`, `show_update_progress`, and `force_update` commands.
- Added IPv6 support.
- Deprecated the `targets` sub-option for multi-target input. Use `config.yaml` input instead.

3.2. Firmware Package Details

This firmware release supports the following systems:

- NVIDIA DGX B200

This firmware release supports the following operating systems:

- NVIDIA DGX OS 7.0.1 and higher

For more information about the operating systems, refer to the NVIDIA Base OS documentation.

You can download firmware packages from the NVIDIA Enterprise Support Portal.

The following table shows the firmware package files:

Components	Sample File Name
Combined archive	`DGXB200_25.02.5.tar.gz` The combined archive includes the firmware for the system components and the firmware for the GPU tray.
▶ Motherboard tray package ▶ GPU tray transition package ▶ GPU tray latest package	▶ `nvfw_DGX_250212.1.1.fwpkg` ▶ `nvfw_DGX-HGX-B100-B200x8_250114.1.0.fwpkg` ▶ `nvfw_DGX-HGX-B100-B200x8_250124.1.3.fwpkg`

The following table shows the information about component firmware versions.

Component	Version
Host BMC	25.02.12
Host BMC ERoT	04.0058
SBIOS ERoT	04.0058
SBIOS	1.6.6
Motherboard CPLD	0.2.1.9
Midplane CPLD	0.2.1.3
PSU (Delta ECD16020137)	Primary 0204 Secondary 0201 Community 0204
LiteOn	0.5.0.5
Broadcom Gen5 PCIe Switch (PEX89072-B01)	Switch 0: 0.0.7 Switch 1: 1.0.7
Astera Labs Gen5 PCIe Retimer (PT5161L)	2.07.19
Network (Cluster) Card - ConnectX-7	28.43.2026
Network (Storage) Card - ConnectX-7	28.43.2026
Network Card - BlueField-3	32.43.2024
VBIOS	97.00.7F.00.01
NVSwitch (GPU Tray)	35.2014.1638
ERoT (GPU Tray)	02.0192
HMC (GPU Tray)	HGX-24.11-1-rc57
FPGA (GPU Tray)	1.61
PCIe Switch (GPU Tray)	1.9.5F
Astera Labs Gen5 PCIe Retimer (GPU Tray) (PT5161L)	2.7.20
Intel 10G Ethernet	v3.60
Intel Ethernet Network Adapter (E810-C-Q2)	v4.50

3.3. Firmware Update Procedure

Refer to *Firmware Update Steps*.

Chapter 4. Firmware Changes for NVIDIA DGX B200 Systems

4.1. BMC Changes for DGX B200 Systems

4.1.1. Changes in 25.02.12

- The initial BMC firmware version.

4.2. SBIOS Changes for DGX B200 Systems

4.2.1. Changes in 1.6.6

- The initial SBIOS firmware version.

4.3. nvfwupd Command Changes

4.3.1. Changes in 2.0.5

- Added support for parallel firmware updates through the YAML configuration file.
- Added the `--json` option to the `update_fw`, `show_update_progress`, and `force_update` commands.
- Added IPv6 support.
- Deprecated the `targets` sub-option for multi-target input. Use `config.yaml` input instead.

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 predetermined 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 Steps

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

   ```
   nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password> \
     show_version -p nvfw_DGX_250114.1.0.fwpkg \
     nvfw_DGX-HGX-B100-B200x8_250212.1.1.fwpkg
   ```

2. Update the BMC.

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

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

   2. Run the following command to update the BMC:

      ```
      nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password>
      ↪update_fw \
        -p nvfw_DGX_250212.1.1.fwpkg -y -s update_bmc.json
      ```

3. Reboot the BMC.

   - Use the shell on the system:

     ```
     $ ipmitool mc reset cold

     # Wait a couple of minutes and confirm the BMC is back online.
     $ ipmitool mc info
     ```

   - Alternatively, you can use the Web UI through a browser.

4. Update the components on the motherboard tray.

   For a one-shot firmware update, the BMC will perform a firmware update on all components in the provided bundle, for example, `nvfw_DGX_xxxxxx.x.x.fwpkg`, which includes the Host BMC (if the `force_update` option is specified), Host BIOS, EROT, PCIe Retimer, PCIe Switch, PSU, Motherboard CPLD, and Midplane CPLD.

   1. Create a file, such as `mb_tray.json`, with empty braces:

      ```
      {}
      ```

   2. Update the firmware:

      ```
      nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password>
      ↪update_fw \
        -p nvfw_DGX_250212.1.1.fwpkg -y -s mb_tray.json
      ```

5. Update the GPU tray to the **intermediate** firmware version using the transition GPU package.

   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_DGX-HGX-B100-B200x8_250114.1.0.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.

   3. Verify that the background copy has been completed successfully by looking for `"BackgroundCopyStatus": "Completed"` in the following command output:

      ```
      curl -s -k -u <bmc-user>:<bmc-password> -H content-type:application/json \
           -X GET https://<bmc-ip-address>/redfish/v1/Chassis/HGX_ERoT_BMC_0 | jq
      ```

   4. Perform a cold reset to restart the system:

      ```
      ipmitool chassis power cycle
      ```

6. Update the GPU tray to the **latest** firmware version.

   1. Repeat the firmware update step for the GPU tray using the latest GPU package:

```
nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password>
↪update_fw \
  -p nvfw_DGX-HGX-B100-B200x8_250124.1.3.fwpkg -y -s gpu_tray.json
```

2. Perform a DC power cycle on the system and confirm that it boots completely.

   Execute a poweroff on the command line in the OS or from the BMC, followed by powering on from the BMC.

7. Confirm the firmware update is complete by viewing the installed versions again.

   After the system is operational again, repeat the following command to confirm all firmware has been updated:

```
nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password> \
  show_version -p nvfw_DGX_250212.1.1.fwpkg \
  nvfw_DGX-HGX-B100-B200x8_250124.1.3.fwpkg
```

8. Execute background copy commands for the BMC and the system BIOS.

   1. BMC:

      Background copy Redfish API request:

```
curl -k -u <bmc-user>:<password> --request POST --location 'https://<bmc-ip-
↪address>/redfish/v1/UpdateService/Actions/Oem/NvidiaUpdateService.
↪CommitImage' \
     --header 'Content-Type: application/json' \
     --data '{
             "Targets": ["/redfish/v1/UpdateService/FirmwareInventory/HostBMC_
↪0"]
             }'
```

      Example response:

```
{
   "@odata.type":"#UpdateService.v1_11_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":"ActivateFirmware Action is initiated.",
         "MessageId":"UpdateService.1.0.StartActivateFirmware",
         "Resolution":"None",
         "Severity":"OK"
      }
   ]
}
```

      Query the update status using the task ID, which is 1, as shown in the output response:

```
nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password>
↪show_update_progress -i 1
```

When the status indicates 100% complete, proceed with the next step.

2. SBIOS:

   Background copy Redfish API request:

   ```
   curl -k -u <bmc-user>:<password> --request POST --location 'https://<bmc-ip-
   ↪address>/redfish/v1/UpdateService/Actions/Oem/NvidiaUpdateService.
   ↪CommitImage' \
       --header 'Content-Type: application/json' \
       --data '{
                "Targets": ["/redfish/v1/UpdateService/FirmwareInventory/
   ↪HostBIOS_0"]
                }'
   ```

   Find the task ID from the response, which is usually 2, to query the update status:

   ```
   nvfwupd -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password>
   ↪show_update_progress -i 2
   ```

   When the status indicates 100% complete, proceed with the next step.

3. 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.

9. Update firmware on the network cards and NVMe drives.

Note

During the update, the `mlxfwmanager` command will report the ConnectX-7 device identified as `/dev/mst/mt4129_pciconf0` cannot be updated as shown in the following error message:

```
-E- Failed to query /dev/mst/mt4129_pciconf0 device, error : MFE_ICMD_BAD_PARAM
```

This behavior is expected because this device is not one of the networking cards used to cluster the system, but a bridge device used internally and updated using a separate process.

1. To update the ConnectX®-7 cards and NVIDIA® BlueField®-3 cards, navigate to the `network` directory and run the `mlxfwmanager` command:

   ```
   cd network
   sudo mlxfwmanager -u -D .
   ```

   When prompted to update all 10 ConnectX-7 cards and BlueField-3 cards, type Y to confirm.

2. For firmware update on the Intel E810-C Ethernet Network Adapters, refer to *Updating the Intel NIC Firmware*.

3. For firmware update on the NVMe drives, refer to *Updating the NVMe Firmware*.

Chapter 6. Known Issues

6.1. Functional Issues

- You cannot update firmware of the individual components of the DGX B200 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 B200 GPU tray.
- Firmware download is not automatic. You must download the firmware manually from the NVIDIA Enterprise Support Portal.

6.2. VBIOS Incompatibility Issue

6.2.1. Issue

Updating directly from a version earlier than 97.00.5E.00.XX to a version later than 97.00.7C.00.XX might fail. When using the Redfish method, you might see an error similar to the following:

```
{
  "@odata.type": "#MessageRegistry.v1_4_1.MessageRegistry",
  "Message": "Verification of image '97.00.7C.00.05' at HGX_FW_GPU_SXM_4' failed.
  "MessageArgs": [
        "97.00.7C.00.05",
        "HGX_FW_GPU_SXM_4"
      ],
```

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```
  "MessageID": "Update.1.0.VerificationFailed",
  "Resolution": "None.".
  "Severity": "Critical"
}
```

6.2.2. Explanation

VBIOS firmware data structures in versions earlier than 97.00.5E.00.XX and versions later than 97.00.7C.00.XX are incompatible.

6.2.3. Workaround

If your current VBIOS version is:

- 97.00.5E.00.XX or later:

  Update to the latest VBIOS version directly.

- Earlier than 97.00.5E.00.XX:

  Follow these steps:

  1. Update to a version between 97.00.5E.00.XX and 97.00.7C.00.XX.
  2. Then, update to the latest version.

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. Firmware Inventory Can Be Invalid During Boot

6.4.1. 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.

6.4.2. Workaround

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

6.5. BMC Slow Startup After AC Power Cycle

6.5.1. 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.

6.5.2. Workaround

No workaround is available.

6.6. Temperature Sensors Can Report No Reading

6.6.1. Issue

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

- TEMP_PSU4
- TEMP_PSU5
- PWR_PSU5
- SPD_FAN_PSU5_R
- SPD_FAN_PSU5_R
- STATUS_PSU0
- STATUS_PSU1
- STATUS_PSU2
- STATUS_PSU3
- STATUS_PSU4
- STATUS_PSU5
- STATUS_HMC
- TEMP_PCIE_SW_1
- 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

6.6.2. Workaround

Polling the sensors again can resolve the issue.

Chapter 7. Getting Started with nvdebug

The NVIDIA® NVDebug tool, `nvdebug`, runs on server platforms or from remote client machines. This binary tool, which is available for x86_64 or arm64-SBSA architecture systems, collects the following information:

- Out-of-band (OOB) BMC logs and information for troubleshooting server issues
- Logs from the host

7.1. Requirements

Table 1: Requirements for Client Host and Server Host

Requirement	Client Host	Server Host
Linux-based operating system: Linux kernel 4.4 or later supported (version 4.15 or later recommended)	X	X
GNU C Library glibc-2.7 or later	X	X
OS: Ubuntu 18.04 or later supported (Ubuntu 22.04 recommended)	X	X
Python 3.10	X	X
`ipmitool` 1.8.18 or later	X	X
The `sshpass` command	X	X
A server device under test (DUT) accessible by the BMC from the client host using Redfish and IPMI-over-LAN.	X	X
The `nvme-cli` tool		X
BMC Management and Server Host Management networks are in the same subnet.		X

NVSwitch tray host requires NVOS version 2.

7.2. The nvdebug Command-Line Interface

The high-level syntax of the `nvdebug` command supports the collection of debug logs over OOB.

You can run the tool in either of the following ways:

- From a remote machine with access to the BMC and host.
- Directly on the host machine if the host can access the BMC.

If the host IP is passed through the configuration file or the command-line interface (CLI) using `-I/ --hostip`, `nvdebug` assumes the tool runs on a remote machine. Otherwise, `nvdebug` assumes the tool runs on the host and collects the host logs locally.

7.2.1. Syntax

```
$ nvdebug -i <BMCIP> -u <BMCUSER> -p <BMCPASS> -t <PLATFORM>

Mandatory options:
    -i/--ip is the BMC IP address.
    -u/--user is BMC username with administrative privileges.
    -p/--password is BMC administrative user password.
    -t/--platform is the platform type of the DUT, and it accepts DGX, HGX-HMC, arm64,
↪ x86_64, and NVSwitch.

Additional credentials:
    -r/--sshuser is BMC SSH username.
    -w/--sshpass is BMC SSH password.
    -R/--rfuser is BMC Redfish username.
    -W/--rfpass is BMC Redfish password.

Host options:
    -I/--hostip is the Host IP Address.
     If the IP address is not provided, the tool assumes it is running on the host
↪machine.
    -U/--hostuser is the Host username with administrative privileges.
    -H/--hostpass is the Host password.

Additional options:
    -b/--baseboard <baseboard> is the baseboard type, such as Hopper-HGX-8-GPU and
↪Blackwell-HGX-8-GPU.
    -C/--config <file path> is the path to the config file. The default is ./config.
↪yaml.
    -d/--dutconfig <dut config path> is the path to the DUT specific config file.
     The default path is ./dut_config.yaml.
    -c/--common collects the common logs using the included common.json file.
    -v/--verbose displays the detailed output and error messages.
    -o/--outdir <output dir> the output directory where the output is generated.
     The default location is /tmp.
    -P/--port <fw_port> is the port number that will be used for forwarding.
     The --port variable applies only to HGX-Baseboard based platforms,
     and the default value is 18888.
    --local enables Local Execution mode.
    -z/--skipzip skips zipping individual DUT folders.


Log collection options:
    -S/--cids CID [CID ...] runs the log collectors that correspond to the CIDs that
↪were passed.
    -g/--loggroup <Redfish|IPMI|SSH|Host|HealthCheck> runs all log collectors of a
↪specific type
     that is supported on the current platform.
     Only one collector group can be specified.
    -j/--vendor_file <vendor.json> is a vendor-defined JSON file that uses
↪proprietary methods
     and tools as defined by the user.
     The -S and −g options cannot be used together.

Utility options:
    -h/--help and --version are standalone options, and −l/--list requires the
↪platform
```

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```
     type to be specified using −t/--platform.
    --parse <log dump> parses an nvdebug log dump and decodes the binary data.
    -h/--help provides information about tool usage.
    --version displays the current version of the tool.
    -l/--list [Redfish|IPMI|SSH|Host|HealthCheck] lists log collectors that are
↪supported by platform
     with their collector IDs (CID). If a type is passed, it will only list log
↪collectors
     of that type. The -l/--list options require the target platform type to be
↪specified with −t/--platform.

    By default, if option -c is not included, the nvdebug tool will collect logs
↪based on the common.json
    and platform_xyz.json files. At the end of the run, the tool will generate the
↪output log xyz.zip
    file in the directory specified by the −o option. If no directory is provided,
↪the log
    will be generated in the /tmp directory.
```

7.2.2. The Configuration Files

The NVDebug tool has two configuration files in the same folder as the executable:

- The DUT configuration file: The default is `dut_config.yaml`.
- The NVDebug-specific configuration file: The default is `config.yaml`.

These files can be used to provide additional (but optional) configuration data. If an argument is provided by both the CLI and the configuration file, the value provided through the CLI takes precedence.

7.3. HGX B200 8-GPU Example

To communicate with the HGX baseboard, you need the BMC SSH credentials to set up SSH tunneling through the BMC. By default, the SSH credentials are assumed to be the same as the BMC credentials. To use different credentials, specify the −r and −w CLI options for the SSH username and password, respectively.

```
nvdebug −i $BMCIP −u $BMCUSER −p $BMCPASS −r SSHUSER −w SSHPASS −t HGX-HMC −P port_num

Log directory created at /tmp/nvdebug_logs_30_09_2024_12_27_46
Starting a collection for DUT dut-1
hgx-b200-node2: [12:28:13] Identified system as Model: P2312-A04, Partno: 692-22312-
↪0001-000, Serialno:1324623011823
hgx-b200-node2: [12:28:13] User provided platform type: HGX-HMC
hgx-b200-node2: [12:28:13] BMC IP: XXXX

Log collection has started for dut-1
hgx-b200-node2: [12:45:43] Log collection is now complete
hgx-b200-node2: [12:45:43] Log collection took 17m 30.29s
DUT hgx-b200-node2 completed.
```

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```
The log zip file (:literal:`nvdebug_logs_30_09_2024_12_27_46.zip`) will be created in
↪the :literal:`/tmp` directory.
```

The SSH tunnel is set up automatically by the tool using the specified port, and the default value is 18888. To use an existing SSH tunnel, do not set up SSH tunnelling in the configuration file, as shown in the following `dut_config` file:

```
hgx-b200-node2:
  <<: *dut_defaults
  BMC_IP: "bmc_ip"
  BMC_USERNAME: "bmc_user"
  BMC_PASSWORD: "bmc_pass"
  BMC_SSH_USERNAME: "ssh_user"
  BMC_SSH_PASSWORD: "ssh_pass"
  TUNNEL_TCP_PORT: "port_num"

  SETUP_PORT_FORWARDING: false
```

After configuring the NVDebug tool, run the `nvdebug` command:

Note

The Host BMC needs to support port forwarding.

Example output:

```
$ nvdebug

Log directory created at /tmp/nvdebug_logs_30_09_2024_12_27_46
Starting a collection for DUT hgx-b200-node2
hgx-b200-node2: [12:28:13] Identified system as Model: P2312-A04, Partno: 692-22312-
↪0001-000, Serialno:1324623011823
hgx-b200-node2: [12:28:13] User provided platform type: HGX-HMC
hgx-b200-node2: [12:28:13] BMC IP: XXXX

Log collection has started for hgx-b200-node2
hgx-b200-node2: [12:45:43] Log collection is now complete
hgx-b200-node2: [12:45:43] Log collection took 17m 30.29s
DUT hgx-b200-node2 completed.

The log zip file (nvdebug_logs_30_09_2024_12_27_46.zip) will be created in the /tmp
↪directory.
```

7.4. DGX Platform Example

To list the collectors that are available on a DGX platform, specify the `-l` option and the `-t DGX` option for log collectors and the DGX platform, respectively:

```
$ nvdebug -l -t DGX
```

Example output:

```
Redfish
  CID    Collector Name                          Log Location
   R8    firmware_inventory                      Redfish_R8_firmware_inventory.json
   R9    firmware_inventory_expand_query         Redfish_R9_firmware_inventory_expand_
↪query.json
  R10    chassis_info                            Redfish_R10_chassis_info.json
  R11    chassis_expand_query                    Redfish_R11_chassis_expand_query.json
  R12    system_info                             Redfish_R12_system_info.json
  R13    system_expand_query                     Redfish_R13_system_expand_query.json
  R14    manager_info                            Redfish_R14_manager_info.json
  R15    manager_expand_query                    Redfish_R15_manager_expand_query.json
  R17    dgx_manager_oem_log_dump                Redfish_R17_dgx_oem_dump_{manager_id}
↪_{task_id}.tar.xz
  R18    telemetry_metric_reports                Redfish_R18_report_{metric_report}.
↪json
  R19    chassis_thermal_metrics                 Redfish_R19_chassis_{chassis}_
↪thermal_metrics.json
  R20    firmware_inventory_table                Redfish_R20_firmware_inventory_table.
↪txt
  R22    task_details                            Redfish_R22_task_{task_id}.json
  R23    nvlink_oob_logs                         Redfish_R23_NVLINK_OOB_Log_{id}.json
  R25    additional_oob_logs                     Redfish_R25_OOB_Log_{id}.json
  R26    chassis_certificates                    Redfish_R26_chassis_{chassis_id}_
↪certificate.json
  R29    background_copy_status                  Redfish_R29_{chassis_id}_copy_status.
↪json
  R30    software_inventory                      Redfish_R30_software_inventory
  R32    system_post_codes                       Redfish_R32_system_post_codes

IPMI
  CID    Collector Name                          Log Location
   I1    mc_info                                 IPMI_I1_mc_info.txt
   I2    lan_info                                IPMI_I2_lan_info.txt
   I3    session_info                            IPMI_I3_session_info.txt
   I4    fru_info                                IPMI_I4_fru_info.txt
   I5    sdr_info                                IPMI_I5_sdr_info.txt
   I6    sel_info                                IPMI_I6_sel_info.txt
   I7    sensor_list                             IPMI_I7_sensor_list.txt
   I8    sel_list                                IPMI_I8_sel_list.txt
   I9    sel_raw_dump                            IPMI_I9_sel_raw_dump.txt
  I10    chassis_status                          IPMI_I10_chassis_status.txt
  I11    chassis_restart_cause                   IPMI_I11_chassis_restart_cause.txt
  I12    user_list                               IPMI_I12_user_list.txt
  I13    channel_info                            IPMI_I13_channel_info.txt
  I14    sdr_elist                               IPMI_I14_sdr_elist.txt

SSH
  CID    Collector Name                          Log Location
   S2    bmc_dmesg                               BMC_SSH_S2_bmc_dmesg.txt
   S3    network_info                            BMC_SSH_S3_network_info/...
   S5    bmc_list_kernel_modules                 BMC_SSH_S5_bmc_list_kernel_modules.
↪txt
   S8    bmc_mem_cpu_utilization                 BMC_SSH_S8_bmc_mem_cpu_utilization/..
↪.
  S11    uptime                                  BMC_SSH_S11_uptime.txt
  S12    fpga_register_table                     BMC_SSH_S12_fpga_register_table.txt
  S13    hmc_boot_status                         BMC_SSH_S13_hmc_boot_status.txt
```

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```
  S15    bmc_power_status                        BMC_SSH_S15_bmc_power_status/...

Host
  CID    Collector Name                          Log Location
   H1    node_dmesg                              Host_H1_node_dmesg.tar.gz
   H2    node_lspci                              Host_H2_node_lspci*.txt
   H3    node_smbios                             Host_H3_dmidecode*.txt
   H4    node_lshw                               Host_H4_lshw*.txt
   H5    node_nvidia_smi                         Host_H5_nvidia-smi*.txt
   H6    node_kern_log                           Host_H6_node_kern_log.tar.gz
   H7    node_crash_dump                         Host_H7_node_crash_dump.tar.gz
   H8    node_nvme_list                          Host_H8_nvme_list_-v.txt
   H9    node_fabric_manager_log                 Host_H9_fabricmanager.log
  H10    node_nvflash_log                        Host_H10_nvflash_--check_-i_{num}.txt
  H11    nvidia_bug_report                       Host_H11_nvidia_bug_report_op.log.gz
  H15    node_subnet_manager                     Host_H15_node_subnet_manager/
  H16    one_diag_dump                           Host_H16_one_diag_dump/
  H17    node_nvme_log_dump                      Host_H17_nvos_tech_support_dump/

HealthCheck
  CID    Collector Name                          Log Location
   C1    out_of_band_health_check                HealthCheck_C1_out_of_band_health_
↪check.json
```

7.5. Redfish Collectors

To collect only specific collectors, specify the -S option for firmware inventory, system information, and ipmi manager information.

```
nvdebug -i <bmc_ip> -u <bmc_user> -p <bmc_pass> ... -t DGX -v -S R8 I1 R12
```

Example output:

```
Log directory created at /tmp/nvdebug_logs_06_11_2024_15_40_27
Starting a collection for DUT dut-1
dut-1: [15:40:34] All preflight checks passed
dut-1: [15:40:34] Identified system as Model: DGXB200, Partno: 965-24387-0002-003,
↪Serialno:1660224000069
dut-1: [15:40:34] User provided platform type: DGX
dut-1: [15:40:34] BMC IP: XXXX
Log collection has started for dut-1
dut-1: [15:40:34]
dut-1: [15:40:34] ####################################
dut-1: [15:40:34]
dut-1: [15:40:34] Collecting custom logs:
dut-1: [15:40:34]
dut-1: [15:40:34] Log collection was initiated for: r8_firmware_inventory
dut-1: [15:40:36] Log collection for r8_firmware_inventory took 0m 1.71s
dut-1: [15:40:36] Log collection was initiated for: r12_system_info
dut-1: [15:40:36] Log collection for r12_system_info took 0m 0.06s
dut-1: [15:40:36] Log collection was initiated for: i1_mc_info
dut-1: [15:40:36] Log collection for i1_mc_info took 0m 0.14s
dut-1: [15:40:36] Log collection is now complete
```

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```
dut-1: [15:40:36] Log collection took 0m 2.16s
DUT dut-1 completed.
Log zip created at /tmp/nvdebug_logs_06_11_2024_15_40_27.zip
```

To run the Redfish log collectors, specify the `-g` option for the `Redfish` log group:

```
$ nvdebug -i $BMC_IP -u $BMC_USER -p $BMC_PASS -t DGX -g Redfish
```

7.6. IPv6 Configuration

By default, the `nvdebug` tool uses IPv4. For IPv6, set `IP_NETWORK` to `ipv6` in the DUT configuration. When providing IPv6 addresses for the BMC/Host, do not use square brackets.

Chapter 8. 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 -t ip=<bmc-ip-address> user=<bmc-username> password=<bmc-password> \
  show_version -p nvfw_DGX_250212.1.1.fwpkg \
  nvfw_DGX-HGX-B100-B200x8_250124.1.3.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: DGXB200
Part number: xxx-xxxxx-xxxx-xxx
Serial number: xxxxxxxxxxxxx
BMC IP: 192.168.1.1

Firmware Devices:
AP Name                        Sys Version                    Pkg Version
↪          Up-To-Date
-------                        -----------                    -----------
↪          ----------
CPLDMB_0                       0.2.1.6                        0.2.1.6
↪            Yes
CPLDMID_0                      0.2.0.7                        0.2.0.7
↪            Yes
EROT_BIOS_0                    00.04.0011.0000_n00            00.04.0018.0000_n00
↪            No
EROT_BMC_0                     00.04.0011.0000_n00            00.04.0018.0000_n00
↪            No
HGX_FW_BMC_0                   HGX-22.10-1-rc31               HGX-23.03-09-rc01
```

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```
↪            No
HGX_FW_ERoT_BMC_0              00.02.0120.0000_n00            00.02.0114.0001_n00
↪            Yes
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
```

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```
↪            Yes
HGX_FW_PCIeRetimer_0           1.31.7                         1.31.7
↪            Yes
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
```

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```
↪            Yes
PSU_1                          0202.0201.0202                  0202.0201.0202
↪            Yes
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 9. 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_DGX_250212.1.1.fwpkg -y -s update_bmc.json
```

Example Output

```
FW recipe: ['nvfw_DGX_250212.1.1.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 B200 Firmware Update Document' on activation steps for new firmware
↪to take effect.
```

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

```
$ ipmitool mc reset cold

# Wait a couple of minutes and confirm the BMC is back online.
$ ipmitool mc info
```

4. Reboot the system.

Chapter 10. 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_DGX_250212.1.1.fwpkg -y -s mb_tray.json
   ```

   Example Output

   ```
   FW package: ['nvfw_DGX_250212.1.1.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 B200 Firmware Update Document' on activation steps for new firmware
↪to take effect.
----------------------------------------------------------------------------------
↪---------
```

Chapter 11. 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_DGX_250212.1.1.fwpkg -y -s updparameters.json
   ```

   Example Output

   ```
   FW recipe: ['nvfw_DGX_250212.1.1.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 B200 Firmware Update Document' on activation steps for new firmware
   ↪to take effect.
   ```

Chapter 12. 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_DGX_250212.1.1.fwpkg -y -s updparameters.json
```

Example Output

```
FW recipe: ['nvfw_DGX_250212.1.1.fwpkg.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 B200 Firmware Update Document' on activation steps for new firmware
↪to take effect.
```

Chapter 13. 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_DGX_250212.1.1.fwpkg -y -s updparameters.json
   ```

   Example Output

   ```
   FW recipe: [nvfw_DGX_250212.1.1.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
   ```

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```
 TaskStatus: OK
Firmware update successful!
 Overall Time Taken: 0:36:11
Refer to 'DGX B200 Firmware Update Document' on activation steps for new firmware
↪to take effect.
```

Chapter 14. 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_DGX_250212.1.1.fwpkg -y -s updparameters.json
```

Example Output

```
FW recipe: ['nvfw_DGX_250212.1.1.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 B200 Firmware Update Document' on activation steps for new firmware
↪to take effect.
```

Chapter 15. 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_DGX_250212.1.1.fwpkg -y -s updparameters.json
   ```

   Example Output

   ```
   FW recipe: ['nvfw_DGX_250212.1.1.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 B200 Firmware Update Document' on activation steps for new firmware
   ↪to take effect.
   ```

Chapter 16. 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 B200 systems.

1. List the devices and check the firmware versions.

   ```
   $ sudo nvme list

   Node             Generic      SN                 Model
   ↪Namespace Usage                        Format           FW Rev
   -------------- ------------ ---------------- ---------------------------- --------
   ↪- ------------------------- ---------------- --------
   /dev/nvme0n1   /dev/ng0n1   S666NN0X307344   SAMSUNG MZ1L21T9HCLS-00A07   0x1
   ↪  589.06  TB /   1.92  TB   512   B +  0 B   GDC7502Q
   /dev/nvme1n1   /dev/ng1n1   S666NN0X307345   SAMSUNG MZ1L21T9HCLS-00A07   0x1
   ↪  589.74  TB /   1.92  TB   512   B +  0 B   GDC7502Q
   /dev/nvme2n1   /dev/ng2n1   YEE0A0750LS3     KIOXIA KCMYDRUG3T84          0x1
   ↪  247.45  GB /   3.84  TB   512   B +  0 B   1UET7104
   /dev/nvme3n1   /dev/ng3n1   YEC0A0XS0LS3     KIOXIA KCMYDRUG3T84          0x1
   ↪  175.18  GB /   3.84  TB   512   B +  0 B   1UET7104
   /dev/nvme4n1   /dev/ng4n1   9EX0A0GU0LS3     KIOXIA KCMYDRUG3T84          0x1
   ↪  188.78  GB /   3.84  TB   512   B +  0 B   1UET7104
   /dev/nvme5n1   /dev/ng5n1   YEE0A0AL0LS3     KIOXIA KCMYDRUG3T84          0x1
   ↪  188.15  GB /   3.84  TB   512   B +  0 B   1UET7104
   /dev/nvme6n1   /dev/ng6n1   YEC0A0XC0LS3     KIOXIA KCMYDRUG3T84          0x1
   ↪  175.15  GB /   3.84  TB   512   B +  0 B   1UET7104
   /dev/nvme7n1   /dev/ng7n1   9ET0A04T0LS3     KIOXIA KCMYDRUG3T84          0x1
   ↪  188.78  GB /   3.84  TB   512   B +  0 B   1UET7104
   /dev/nvme8n1   /dev/ng8n1   9ET0A05B0LS3     KIOXIA KCMYDRUG3T84          0x1
   ↪  175.15  GB /   3.84  TB   512   B +  0 B   1UET7104
   /dev/nvme9n1   /dev/ng9n1   9ET0A04X0LS3     KIOXIA KCMYDRUG3T84          0x1
   ↪  175.22  GB /   3.84  TB   512   B +  0 B   1UET7104
   ```

   From the output, you can find the device names and firmware versions, such as `/dev/nvme0n1` and `GDC7502Q`.

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

   Based on the command output in step 1, determine the firmware file using the following table and include the correct path to download the firmware:

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

This table lists the firmware file names for the supported Samsung and Kioxia models:

Manufacturer	Model Number	Firmware File
Samsung	MZ1L21T9HCLS-00A07	`General_PM9A3_M.2_GDC7502Q_Noformat.bin`
Samsung	MZWLO3T8HCLS-00A07	`General_PM1743_U.2_OPPA4B5Q.bin`
Kioxia	KCM6DRUL3T84	`CM6-SED-0107.std`
Kioxia	KCM7DRUL3T84	`CM6-SED-0107.std`

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

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

4. Verify that the correct firmware version is updated.

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

Chapter 17. 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_DGX_250212.1.1.fwpkg -y -s updparameters.json
```

Example Output

```
FW recipe: ['nvfw_DGX_250212.1.1.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 B200 Firmware Update Document' on activation steps for new firmware
↪to take effect.
```

Chapter 18. 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_DGX_250212.1.1.fwpkg -y -s updparameters.json
```

Example Output

```
FW recipe: ['nvfw_DGX_250212.1.1.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 B200 Firmware Update Document' on activation steps for new firmware
↪to take effect.
```

Chapter 19. 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_DGX_250212.1.1.fwpkg -y -s updparameters.json
   ```

   Example Output

   ```
   FW recipe: ['nvfw_DGX_250212.1.1.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 B200 Firmware Update Document' on activation steps for new firmware
   ↪to take effect.
   ```

Chapter 20. 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 mlxfwmanager -d /sys/bus/pci/devices/0000:5e:00.0/config -i fw-ConnectX7-rel-
   ↪28_43_2026-MCX750500B-0D00_Ax_Bx-UEFI-14.36.21-FlexBoot-3.7.500.signed.bin  b
   sudo mlxfwmanager -d /sys/bus/pci/devices/0000:dc:00.0/config -i fw-ConnectX7-rel-
   ↪28_43_2026-MCX750500B-0D00_Ax_Bx-UEFI-14.36.21-FlexBoot-3.7.500.signed.bin  b
   sudo mlxfwmanager -d /sys/bus/pci/devices/0000:c0:00.0/config -i fw-ConnectX7-rel-
   ↪28_43_2026-MCX750500B-0D00_Ax_Bx-UEFI-14.36.21-FlexBoot-3.7.500.signed.bin  b
   sudo mlxfwmanager -d /sys/bus/pci/devices/0000:18:00.0/config -i fw-ConnectX7-rel-
   ↪28_43_2026-MCX750500B-0D00_Ax_Bx-UEFI-14.36.21-FlexBoot-3.7.500.signed.bin  b
   sudo mlxfwmanager -d /sys/bus/pci/devices/0000:40:00.0/config -i fw-ConnectX7-rel-
   ↪28_43_2026-MCX750500B-0D00_Ax_Bx-UEFI-14.36.21-FlexBoot-3.7.500.signed.bin  b
   sudo mlxfwmanager -d /sys/bus/pci/devices/0000:4f:00.0/config -i fw-ConnectX7-rel-
   ↪28_43_2026-MCX750500B-0D00_Ax_Bx-UEFI-14.36.21-FlexBoot-3.7.500.signed.bin  b
   sudo mlxfwmanager -d /sys/bus/pci/devices/0000:ce:00.0/config -i fw-ConnectX7-rel-
   ↪28_43_2026-MCX750500B-0D00_Ax_Bx-UEFI-14.36.21-FlexBoot-3.7.500.signed.bin  b
   sudo mlxfwmanager -d /sys/bus/pci/devices/0000:9a:00.0/config -i fw-ConnectX7-rel-
   ↪28_43_2026-MCX750500B-0D00_Ax_Bx-UEFI-14.36.21-FlexBoot-3.7.500.signed.bin  b
   ```

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

   ```
   sudo mlxfwmanager -d /sys/bus/pci/devices/0000:aa:00.0/config -i fw-ConnectX7-rel-
   ↪28_43_2026-MCX755206AS-NEA_Ax-UEFI-14.36.21-FlexBoot-3.7.500.signed.bin  b
   sudo mlxfwmanager -d /sys/bus/pci/devices/0000:29:00.0/config -i fw-ConnectX7-rel-
   ↪28_43_2026-MCX755206AS-NEA_Ax-UEFI-14.36.21-FlexBoot-3.7.500.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 21. Updating the Intel NIC Firmware

The following instructions describe how to update the firmware on the Intel Ethernet Network Adapter E810-C using interactive mode.

1. Download the update package to a temporary directory.
2. Start the update by running the Intel Ethernet NVM Update Tool `nvmupdate64e`.

   ```
   sudo ./nvmupdate64e
   ```

3. Follow the prompts to update the NVM image on the network adapter.

   Example output:

   ```
   $ sudo ./nvmupdate64e

   Intel(R) Ethernet NVM Update Tool
   NVMUpdate version 1.41.3.3
   Copyright(C) 2013 - 2024 Intel Corporation.


   WARNING: To avoid damage to your device, do not stop the update or reboot or
   ↪power off the system during this update.
   Inventory in progress. Please wait [***.......]


   Num Description                          Ver.(hex)  DevId S:B    Status
   === ================================== ============ ===== ====== ==============
   01) Intel(R) Ethernet Controller          N/A(N/A)   1563 00:011 Update not
       X550-T2                                                      available
   02) Intel(R) Ethernet Network Adapter   2.80(2.50)   1592 00:130 Update
       E810-C-Q2                                                    available

   Options: Adapter Index List (comma-separated), [A]ll, e[X]it
   Enter selection: 02
   Would you like to back up the NVM images? [Y]es/[N]o: Y
   Update in progress. This operation may take several minutes.
   [*+........]


   Num Description                          Ver.(hex)  DevId S:B    Status
   === ================================== ============ ===== ====== ==============
   01) Intel(R) Ethernet Controller          N/A(N/A)   1563 00:011 Update not
   ```

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```
    X550-T2                                                      available
02) Intel(R) Ethernet Network Adapter   2.80(2.50)   1592 00:130 Update
    E810-C-Q2                                                    successful

A reboot is required to complete the update process.

Tool execution completed with the following status: All operations completed
↪successfully.
Press any key to exit.
```

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

   Wait for the operating system to boot.

Chapter 22. 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_DGX-HGX-B100-B200x8_250124.1.3.fwpkg -y -s gpu_tray.json
```

Example Output

```
FW recipe: ['HGX_DGXB100-B200x8_250124.1.3.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": [
↪"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 23. Platform-Agnostic Firmware Updates

Note

Deprecated feature: Starting with nvfwupd version 2.0.5, specfying the targets sub-option with a JSON file of multiple targets for multiple system updates is no longer supported.

The nvfwupd versions 2.0.0 and later support input and platform-agnostic firmware updates through the YAML configuration file. You can customize update methods and the Redfish URIs used for the update.

23.1. Configuration Parameters

The tool supports various configuration parameters, of which BMC_IP, RF_USERNAME, and RF_PASSWORD are always mandatory. The following example YAML file explains each parameter:

```
# Define target platform as one of HGX / DGX / GH / NVOS / GH200
TargetPlatform: 'GH'
# Disable Sanitize Log, disabling Sanitize Log leads to print system IP and user
↪credential to the logs and screen
SANITIZE_LOG: False

# Provide full path of firmware file(s) to be used for firmware update. Value is a list
FWUpdateFilePath:
- "../packages/ nvfw_Grace-CPU-P5041_0003_240124.1.0_prod-signed.fwpkg"

# Define URI for MultipartHttpPushUri (Optional override).
# Default value is taken from UpdateService
MultipartHttpPushUri: '/redfish/v1/UpdateService/update-multipart'

# HttpPushUri for PLDM Firmware Update (Optional override).
# Default value "/redfish/v1/UpdateService"
HttpPushUri: '/redfish/v1/UpdateService'

# Change if TaskServiceUri is different from default value below
# Task id will always be taken from update response in update_fw or
# from -i input in show_update_progress
TaskServiceUri: '/redfish/v1/TaskService/Tasks/'
```

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```
# Define differnt update methods.
# Valid values {'MultipartHttpPushUri', 'HttpPushUri', 'NVOSRest'}
FwUpdateMethod: "MultipartHttpPushUri"

# Optional Parameter used with MultipartHttpPushUri update method
# used to define dict of parameters for multipart FW update
MultipartOptions:
- ForceUpdate: True

# Target IP address. BMC IP/NVOS Rest service IP/localhost for port forwarding
BMC_IP: "1.1.1.1"
RF_USERNAME: "user"
RF_PASSWORD: "password"
# Target port config if port forwarding is used.
TUNNEL_TCP_PORT: "14443"

# List of update targets. replaces -s/--special option input file. Value is list of
↪target URIs
# Use UpdateParametersTargets: {} for DGX empty JSON value used for full DGX update
# Use UpdateParametersTargets: [] for Oberon empty list used for BMC update
# Remove this parameter for GH full update
UpdateParametersTargets:
- "/redfish/v1/UpdateService/FirmwareInventory/CPLDMB_0"

# Config for reset BMC parameters. Value is a dict.
# Use ResetType: 'ResetAll' for DGX
# Use ResetToDefaultsType: 'ResetAll' for MGX or HGX
BMCResetParameters:
   ResetType: 'ResetAll'

# Multi target input. Value is list of dicts.
Targets:
- BMC_IP: "1.1.1.1"
  RF_USERNAME: "user"
  RF_PASSWORD: "password"
  TUNNEL_TCP_PORT: "14443"
- BMC_IP: "2.2.2.2"
  RF_USERNAME: "user"
  RF_PASSWORD: "password"
  TUNNEL_TCP_PORT: "14444"
```

23.2. Running nvfwupd Using the Configuration File

To use the tool and update a platform that supports MultipartHttpPushUri or HttpPushUri, but is not automatically identified by the tool or provides a platform that is not a supported error, a configuration file can be used to provide the input and customize the behavior.

Keep the following points in mind:

- Support for `show_version` on an unknown platform is limited.

If the `TargetPlatform` parameter is not in the configuration file, show_`version` will not match the firmware inventory to PLDM package contents. The **Pkg Version** and **Up-to-date** columns will show `N/A` and No, respectively.

- The `make_upd_targets` command is not supported because the resulting JSON files cannot be used with the configuration file.
- The configuration file takes update targets as a configuration parameter, and because the tool is supposed to be used with a platform that is not known to the tool, you must identify and verify the target list before providing it as input.

Examples:

```
$ cat config.yaml

TargetPlatform: 'GH'
FWUpdateFilePath:
- "../../packages/nvfw_P4764_0000_240103.1.2_dbg-signed.fwpkg"
MultipartHttpPushUri: '/redfish/v1/UpdateService/update-multipart'
FwUpdateMethod: "MultipartHttpPushUri"
BMC_IP: "1.1.1.1"
RF_USERNAME: "****"
RF_PASSWORD: "******"
UpdateParametersTargets:
- "/redfish/v1/Chassis/5B247A_Baseboard_0"
BMCResetParameters:
ResetToDefaultsType: 'ResetAll'
```

```
$ nvfwupd -c config.yaml update_fw

Updating ip address: ip=1.1.1.1
FW package: ['../../packages/nvfw_P4764_0000_240103.1.2_dbg-signed.fwpkg']
Ok to proceed with firmware update? <Y/N>
y
{
   "@odata.id": "/redfish/v1/TaskService/Tasks/5B247A_5",
   "@odata.type": "#Task.v1_4_3.Task",
   "Id": "5B247A_5",
   "TaskState": "Running",
   "TaskStatus": "OK"
}
FW update started, Task Id: 5B247A_5
Wait for Firmware Update to Start...
TaskState: Running
PercentComplete: 20
TaskStatus: OK
TaskState: Running
PercentComplete: 40
TaskStatus: OK
TaskState: Completed
PercentComplete: 100
TaskStatus: OK
Firmware update successful!
Overall Time Taken: 0:08:15
Update successful. Perform activation steps for new firmware to take effect.
--------------------------------------------------------------------------------------
↪-
Error Code: 0
```

```
$ nvfwupd -c oberon_config.yaml perform_factory_reset

BMC IP: ip=1.1.1.1
Factory Reset request successful
Task State:
{
   "@Message.ExtendedInfo": [
      {
         "@odata.type": "#Message.v1_1_1.Message",
         "Message": "The request completed successfully.",
         "MessageArgs": [],
         "MessageId": "Base.1.15.0.Success",
         "MessageSeverity": "OK",
         "Resolution": "None"
      }
   ]
}
--------------------------------------------------------------------------------------
↪-
```

```
$ nvfwupd -c config.yaml show_update_progress -i 0

Task Info for Id: 0
StartTime: 2024-01-20T02:46:15+00:00
TaskState: Completed
PercentComplete: 100
TaskStatus: OK
EndTime: 2024-01-20T02:46:17+00:00
Overall Time Taken: 0:00:02
Overall Task Status: {
   "@odata.id": "/redfish/v1/TaskService/Tasks/0",
   "@odata.type": "#Task.v1_4_3.Task",
   "EndTime": "2024-01-20T02:46:17+00:00",
   "Id": "0",
   "Messages": [
      {
            "@odata.type": "#Message.v1_0_0.Message",
            "Message": "The task with id 0 has started.",
            "MessageArgs": [
               "0"
            ],
            "MessageId": "TaskEvent.1.0.1.TaskStarted",
            "Resolution": "None.",
            "Severity": "OK"
      },
      {
            "@odata.type": "#Message.v1_0_0.Message",
            "Message": "The task with id 0 has changed to progress 100 percent
↪complete.",
            "MessageArgs": [
               "0",
               "100"
            ],
            "MessageId": "TaskEvent.1.0.1.TaskProgressChanged",
            "Resolution": "None.",
            "Severity": "OK"
      },
```

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```
      {
            "@odata.type": "#Message.v1_0_0.Message",
            "Message": "The task with id 0 has Completed.",
            "MessageArgs": [
               "0"
            ],
            "MessageId": "TaskEvent.1.0.1.TaskCompletedOK",
            "Resolution": "None.",
            "Severity": "OK"
      }
   ],
   "Name": "Task 0",
  "Payload": {
      "HttpHeaders": [
            "Host: 1.1.1.1",
            "User-Agent: python-requests/2.28.2",
            "Accept-Encoding: gzip, deflate",
            "Accept: */*",
            "Connection: keep-alive",
            "Content-Length: 109023143"
      ],
      "HttpOperation": "POST",
      "JsonBody": "null",
      "TargetUri": "/redfish/v1/UpdateService/update-multipart"
   },
   "PercentComplete": 100,
   "StartTime": "2024-01-20T02:46:15+00:00",
   "TaskMonitor": "/redfish/v1/TaskService/Tasks/0/Monitor",
   "TaskState": "Completed",
   "TaskStatus": "OK"
}
Update is successful.
-------------------------------------------------------------------------------------
 ↪-
```

Chapter 24. 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 25. Forcing a Firmware Downgrade

25.1. Prerequisites

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

25.2. 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 26. Troubleshooting an Unsuccessful Firmware Update

26.1. Firmware Update Terminates due to Component Not Found

When performing a firmware update of the GPU tray with the motherboard firmware package, the firmware update stops with the following output message:

```
...
{
  "@odata.type": "#Message.v1_0_8.Message",
  "Message": "Given PLDMBundle Status Message : Requested component was not found in
↪the firmware bundle.",
  "MessageArgs": [
    "Requested component was not found in the firmware bundle."
  ],
  "MessageId": "UpdateService.1.0.FwUpdateStatusMessage",
  "Resolution": "None",
  "Severity": "Warning"
},
...
```

The message indicates that the firmware file specified by the `-p` argument of the `nvfwupd` command is invalid. Retry the update and specify the firmware file that matches the component. For example, use the GPU firmware file, which contains the HGX string, for the GPU tray update. Refer to *Version 25.01.1* for the firmware file names and components.

26.2. 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 Redfish APIs Support in the *NVIDIA DGX B200 System User Guide* for information about using the Redfish API.

26.3. 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_DGXB200_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.

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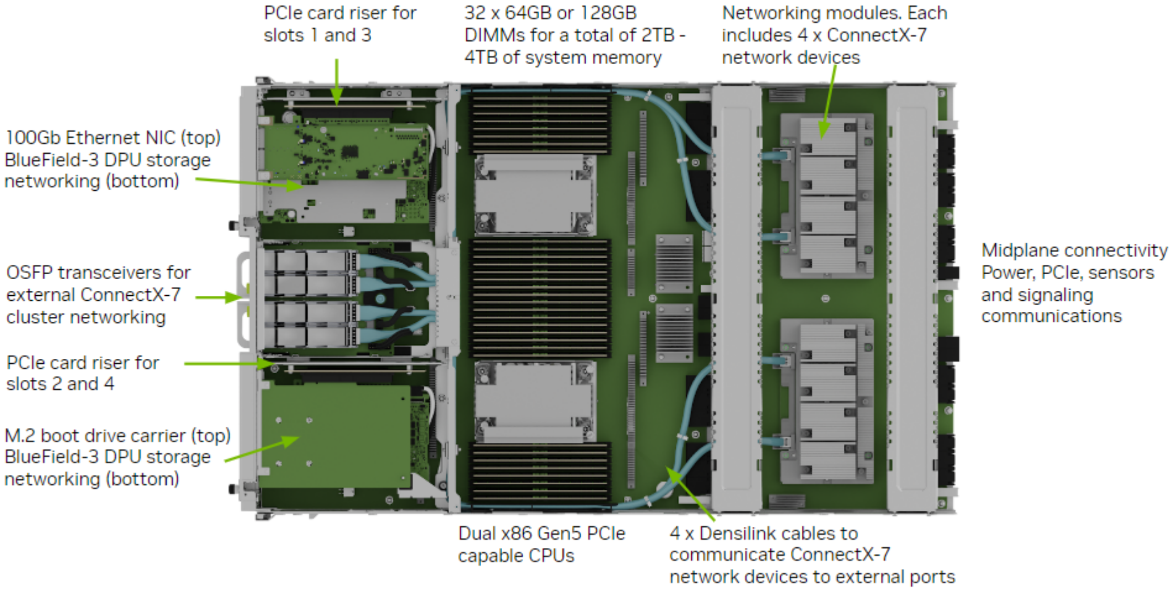
Chapter 29. About Firmware Updates

This topic provides an overview of firmware updates on the NVIDIA DGX™ B200 system.

29.1. Firmware Updatable Components

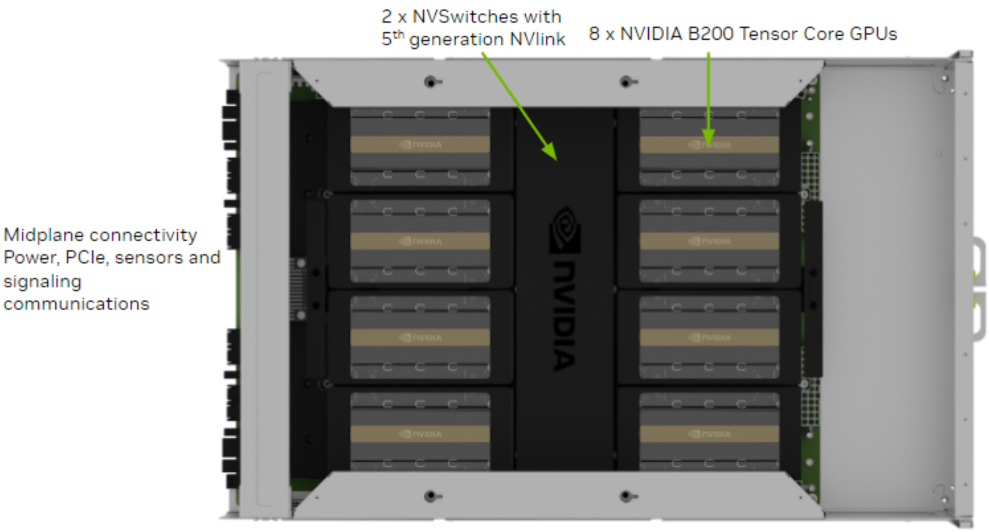
The NVIDIA DGX™ B200 system has several firmware updatable components. Some of the components are on the following two trays in the system:

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



PCIe card riser for slots 1 and 3
32 x 64GB or 128GB DIMMs for a total of 2TB - 4TB of system memory
Networking modules. Each includes 4 x ConnectX-7 network devices
100Gb Ethernet NIC (top) BlueField-3 DPU storage networking (bottom)
OSFP transceivers for external ConnectX-7 cluster networking
PCIe card riser for slots 2 and 4
M.2 boot drive carrier (top) BlueField-3 DPU storage networking (bottom)
Midplane connectivity Power, PCIe, sensors and signaling communications
Dual x86 Gen5 PCIe capable CPUs
4 x Densilink cables to communicate ConnectX-7 network devices to external ports

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


2 x NVSwitches with 5th generation NVlink
8 x NVIDIA B200 Tensor Core GPUs
Midplane connectivity Power, PCIe, sensors and signaling communications

You can update the firmware on the NVIDIA DGX B200 system components out-of-band (OOB) by using Redfish APIs or from the host operating system by using the command-line interface (CLI) commands.

29.2. Firmware Update Prerequisites

- You can download firmware packages from the NVIDIA Enterprise Support Portal.
- 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.

29.3. Firmware Update Methods

Most of the sample commands in this document show how to update firmware using the `nvfwupd` command. You can download the executable from the NVIDIA Enterprise Support Portal.

- For more information about the command, refer to *About the nvfwupd Command*.
- For best practice when updating the firmware, follow the instructions in *Firmware Update Steps*.

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 *Platform-Agnostic Firmware Updates* 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 B200 System User Guide* for more information and sample commands. The sample commands show how to update firmware with the `curl` command.

29.4. 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.

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