



DGX-2 System Firmware Update Container

Release Notes

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Chapter 1. DGX-2 System FW Update Container Overview

The NVIDIA® DGX-2 System Firmware Update container is the preferred method for updating firmware on DGX-2 and DGX-2H Systems. It provides an easy method for updating the firmware to the latest released versions, and uses the standard method for running Docker containers.

This document describes firmware components that can be updated, any known issues, and how to run this container.

Features

- ▶ Automates firmware (FW) update for DGX-2/2H System firmware, such as the system BIOS, BMC, and power supplies.
- ▶ Provides flexibility to update individual or all FW components
- ▶ Embeds the following
 - ▶ Qualified FW binaries for supported components
 - ▶ Flash update utilities and supporting dependencies
 - ▶ Manifest file which lists
 - ▶ Target platform and firmware version numbers
 - ▶ Sequence in which FW update should be applied
 - ▶ “On-Error” policy for every FW component
- ▶ Supports interactive and non-interactive firmware update

Chapter 2. Using the DGX-2 FW Update Utility

The NVIDIA DGX-2 System Firmware Update utility is provided in a tar ball file and also as a .run file. Copy the files to the DGX-2 system, then update the firmware using one of the following three methods:

- ▶ **NVSM** provides convenient commands to update the firmware using the firmware update container
- ▶ **Using Docker** to run the firmware update container
- ▶ **Using the .run file** which is a self-extracting package embedding the firmware update container tarball



CAUTION: Stop all unnecessary system activities before attempting to update firmware, and do not add additional processing loads while an update is in progress. A high workload can disrupt the firmware update process and result in an incapacitated component.

When initiating an 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 the warning is encountered, you are strongly advised to take action to reduce the workload before proceeding with the update.

Fan speeds may increase while updating the BMC firmware. This is a normal part of the BMC firmware update process.

2.1. Using NVSM

The NVIDIA DGX-2 system software includes Docker software required to run the container.

1. Copy the tar ball to a location on the DGX system.
2. From the directory where you copied the tarball file, enter the following command to load the container image.

```
$ sudo docker load -i nvfw-dgx2_21.06.7_210616.tar.gz
```

3. To verify that the container image is loaded, enter the following.

```
$ sudo docker images
```

```
REPOSITORY    TAG
nvfw-dg2      21.06.7
```

- Using NVSM interactive mode, enter the firmware update module.

```
$ sudo nvsm
nvsm-> cd systems/localhost/firmware/install
```

- Set the flags corresponding to the action you want to take.

```
$ nvsm(/system/localhost/firmware/install)-> set Flags=<option>
```

See the [Command and Argument Summary](#) section below for the list of common flags.

- Set the container image to run.

```
$ nvsm(/system/localhost/firmware/install)-> set DockerImageRef=nvfw-dgx2:21.06.7
```

- Run the command.

```
$ nvsm(/system/localhost/firmware/install)-> start
```

2.2. Using docker run

The NVIDIA DGX-2 system software includes Docker software required to run the container.

- Copy the tar ball to a location on the DGX system.
- From the directory where you copied the tarball file, enter the following command to load the container image.

```
$ sudo docker load -i nvfw-dgx2_21.06.7_210616.tar.gz
```

- To verify that the container image is loaded, enter the following.

```
$ sudo docker images
```

```
REPOSITORY      TAG
nvfw-dg2        21.06.7
```

- Use the following syntax to run the container image.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7 <command>
<[arg1] [arg2] ... [argn]
```

See the [Command and Argument Summary](#) section below for the list of common commands and arguments.

2.3. Using the .run File

The update container is also available as a run file that does not require a Docker installation.

- After obtaining the .run file, make the file executable.

```
$ chmod +x nvfw-dgx2_21.06.7_210616.run
```

- Use the following syntax to run the container image.

```
$ sudo nvfw-dgx2_21.06.7_210616.run <command> <[arg1] [arg2] ... [argn]
```

See the [Command and Argument Summary](#) section below for the list of common commands and arguments.

2.4. Command and Argument Summary

The following are common commands and arguments.

- ▶ Show the manifest

```
show_fw_manifest
```

- ▶ NVSM Example: `$ nvsm(/system/localhost/firmware/install)-> set
Flags=show_fw_manifest`
- ▶ Docker Run Example: `$ sudo docker run --rm --privileged -ti -v /:/hostfs
nvfw-dg2:21.06.7 show_fw_manifest`
- ▶ .run File Example: `$ sudo ./nvfw-dg2_21.06.7_210616.run show_fw_manifest`

- ▶ Show version information

```
show_version
```

- ▶ NVSM Example: `$ nvsm(/system/localhost/firmware/install)-> set
Flags=show_version`
- ▶ Docker Run Example: `$ sudo docker run --rm --privileged -ti -v /:/hostfs
nvfw-dg2:21.06.7 show_version`
- ▶ .run File Example: `$ sudo ./nvfw-dg2_21.06.7_210616.run show_version`

- ▶ Check the onboard firmware against the manifest and update all down-level firmware.

```
update_fw all
```

- ▶ NVSM Example: `$ nvsm(/system/localhost/firmware/install)-> set
Flags=update_fw\ all`
For NVSM, an escape is needed before blank spaces when setting the flags.
- ▶ Docker Run Example: `$ sudo docker run --rm --privileged -ti -v /:/hostfs
nvfw-dg2:21.06.7 update_fw all`
- ▶ .run File Example: `$ sudo ./nvfw-dg2_21.06.7_210616.run update_fw all`

- ▶ Check the specified onboard firmware against the manifest and update if down-level.

```
update_fw [fw]
```

Where [fw] corresponds to the specific firmware as listed in the manifest. Multiple components can be listed within the same command. The following are examples of updating the BMC and SBIOS.

- ▶ NVSM Example: `$ nvsm(/system/localhost/firmware/install)-> set
Flags=update_fw\ BMC\ SBIOS`
For NVSM, an escape is needed before blank spaces when setting the flags.
- ▶ Docker Run Example: `$ sudo docker run --rm --privileged -ti -v /:/hostfs
nvfw-dg2:21.06.7 update_fw BMC SBIOS`
- ▶ .run File Example: `$ sudo ./nvfw-dg2_21.06.7_210616.run update_fw BMC SBIOS`

Chapter 3. DGX-2 System Firmware Update Container Version 21.06.7

The DGX Firmware Update container version 21.06.7 is available.

- ▶ Package name: `nvfw-dgx2_21.06.7_210616.tar.gz`
- ▶ Run file name: `nvfw-dgx2_21.06.7_210616.run`
- ▶ Image name: `nvfw-dgx2:21.06.7`





Important: NVIDIA strongly advises updating the BMC if the installed BMC is version 01.05.07

Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
 - ▶ DGX OS 4.7 or later
 - ▶ EL7-21.01 or later
 - ▶ EL8-20.11 or later
- ▶ The container now checks the Intel Management Engine (ME) firmware version and ME Setting version to determine when to update the ME firmware. The ME version is now included in the `show_fw_manifest` output.
- ▶ Utilizes `m1nx-fw-updater` package to update the ConnectX cards. If the `m1nx-fw-updater` package is installed, then the ConnectX card firmware will be updated during `update_fw all` to ensure that all cards' firmware are updated to the same level as the newest installed firmware.
- ▶ GPU driver is now prevented from inadvertently interfering with VBIOS updates.
- ▶ NVIDIA services no longer need to be manually stopped before updating firmware on systems installed with DGX OS 5 or later.

Contents of the DGX-2 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table.

Component	Version	Key Changes
BMC	1.07.02  Note: Refer to the instructions in section Special Instructions to determine applicable actions to take.	See DGX-2 BMC Changes
SBIOS	0.29	See DGX-2 SBIOS Changes
M.2 NVMe (Samsung PM963)	CXV8601Q	No change
U.2 SSD (Micron)	101008S0	No change
VBIOS (DGX-2)	88.00.6B.00.01	No change
VBIOS (DGX-2H)	88.00.6B.00.08	No change
PSU	3.1  Note: Refer to the instructions in section Special Instructions to determine applicable actions to take.	No change
FPGA	3.1	No change Note: There are two FPGA images - Image-1:Rescue and Image-2:Primary. The Firmware Update Container updates the Primary FPGA image only.

Change to the Update Process

Originally, only certain firmware components, such as the SBIOS, required power cycling the system after performing the update. In order to ensure that all DGX-2 services continue running, you must power cycle the DGX-2 after any firmware update for any component or group of components.

This results in the need to run `update fw all` twice when updating all firmware components. Refer to [Instructions for Updating Firmware](#) for detailed instructions.

Updating Components with Secondary Images

Some firmware components provide a secondary image as backup. The following is the policy when updating those components:

- ▶ **SBIOS:** Only the primary image is updated. To update both images, follow the instructions at [Special Instructions for PSU, SBIOS, and BMC Firmware Updates](#).
- ▶ **BMC:** Only the primary image is updated. To update the secondary (backup) image, include the `--inactive` option in the update command.
- ▶ **FPGA:** Only the primary image is updated.

Enabling SNMP RO/RW Strings

The SNMP RO/RW strings are disabled by default. The following table provides the `ipmitool` arguments for enabling the strings. After enabling, disabling, or setting the RO/RW strings, either issue the `restart SNMP Server` command or reset the BMC for the changes to go into effect.

LUN	Cmd	Requested Data	
		Offset	Description
3Ch/00h	26h	1	00h: Enable RO string 01h: Enable RW string 02h: Disable RO string 03h: Disable RW string 04h: Set RO string 05h: Set RW string 06h: Start SNMP Server 07h: Stop SNMP Server 08h: Restart SNMP Server
		2:21	Community string in ASCII code. Maximum string length is 20 characters. If request byte is set to 0x4 or 0x5, but empty from byte 2 to byte 21, then the corresponding community string will be cleared.

For example, to enable the RO String, set the Community to "test", and then restart the SNMP service on the BMC as follows:

1. Enable RO.

```
$ sudo ipmitool raw 0x3c 0x26 0x00
```

2. Set the RO string to "test".

```
$ sudo ipmitool raw 0x3c 0x26 0x04 0x74 0x65 0x73 0x74
```

3. Restart the SNMP service on the BMC.

```
$ sudo ipmitool raw 0x3c 0x26 0x08
```

3.1. Special Instructions for PSU, SBIOS, and BMC Firmware Updates

- ▶ Before updating the PSU, SBIOS, or the BMC, refer to the following special instructions for guidance to ensure the updates are successful.

PSU Updates

- ▶ If the BMC version is older than 01.00.01, then the BMC must be updated first before updating the PSU. See [Updating the BMC from Versions older than 01.00.01](#).

SBIOS Updates

- ▶ If the current BMC is version 1.05.7, then update the BMC first before updating the SBIOS.
- ▶ To update both primary and secondary SBIOS (after updating the BMC) using the container, do the following (assumes the primary SBIOS is the current, active SBIOS).

1. Refer to [Special Instructions for all Updates](#) to see if services need to be stopped and how to do it.

2. Update the active SBIOS using the `update_fw SBIOS` argument from the firmware update container.

3. Designate booting from the secondary (inactive) SBIOS on the next boot.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7
  sbios_slot --switch-nextboot-slot
```

4. Power cycle the DGX-2 to switch to the secondary SBIOS.

```
$ sudo telinit 1
$ sudo umount /raid
$ sync
$ sudo ipmitool chassis power cycle
```

5. Update the secondary (now active) SBIOS.

6. Designate booting from the primary SBIOS on the next boot (to restore the primary SBIOS as the active SBIOS).

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7
  sbios_slot --switch-nextboot-slot
```

7. Power cycle the DGX-2 to switch back to the primary SBIOS.

```
$ sudo telinit 1
$ sudo umount /raid
$ sync
$ sudo ipmitool chassis power cycle
```

BMC Updates

- ▶ If the current BMC is older than 01.00.01, then follow the instructions at [Updating the BMC from Versions older than 01.00.01](#).
- ▶ If the current BMC is 01.00.01, then follow the instructions at [Updating the BMC from Version 01.00.01](#).

3.2. Instructions for Updating Firmware

This section provides a simple way to update the firmware on the system using the firmware update container. It includes instructions for performing a transitional update for systems that require it. The commands use the `.run` file, but you can also use any method described in [Using the DGX-2 FW Update Utility](#).



CAUTION:

- ▶ Stop all unnecessary system activities before attempting to update firmware.
- ▶ Stop all GPU activity, including accessing `nvidia-smi`, as this can prevent the VBIOS from updating.
- ▶ 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 initiating an 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 the warning is encountered, you are strongly advised to take action to reduce the workload before proceeding with the update.

1. Check if updates are needed by checking the installed versions.

```
$ sudo ./nvfw-dgx2_21.06.7_210616.run show_version
```

- ▶ If there is "no" in any up-to-date column for updatable firmware, then continue with the next step.
- ▶ If all up-to-date column entries are "yes", then no updates are needed and no further action is necessary.

2. Begin the process of updating all the firmware supported by the container.

```
$ sudo ./nvfw-dgx2_21.06.7_210616.run update_fw all
```

You will be prompted to power cycle the server.

3. Power cycle the server.

```
$ sudo ipmitool chassis power cycle
```

4. After power cycling the system, perform another `update_fw all` to update other firmware.

5. Perform another power cycle.

```
$ sudo ipmitool chassis power cycle
```

See [DGX-2 Firmware Update Process](#) for more information about the update process.

You can verify the update by issuing the following.

```
$ sudo ./nvfw-dgx2_21.06.7_210616.run show_version
```

3.3. Known Issues

3.3.1. EEPROM Checksum Mismatch

Issue

BMC version 1.05.7 introduced an issue that could cause corruption in the BMC EEPROM. This is indicated by an `EEPROM checksum mismatch` error message when attempting to update any firmware.

You can also verify EEPROM corruption by issuing the following

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7 show_version
```

and then viewing the output for the error message.



Note: This error may be reported if a corrupt SBIOS produces a watchdog timeout during boot. In this case, the error message is erroneous. See the section [Watchdog Timeout Due to Corrupt SBIOS](#) for instructions on confirming and then resolving the SBIOS corruption.

Resolution

The DGX-2 Firmware Update Container version 21.06.7 includes logic to detect and repair the corruption. Perform the following steps to repair the EEPROM corruption.

1. If the BMC is not already updated, then update the BMC.

Refer to [Special Instructions for all Updates](#) to see if services need to be stopped and how to do it.

2. Review the "current" and "next" boot SBIOS by issuing the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7 sbios_slot --get-nextboot-slot
```

3. Perform actions based on the NextBoot and Currently Booted from slots

- ▶ If the **NextBoot slot** and **Currently Booted From slot** are different, then reboot the system using `ipmitool`.

```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

- ▶ If the **NextBoot slot** and **Currently Booted From slot** are the same, then switch the NextBoot slot and then reboot as follows.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7
sbios_slot --switch-nextboot-slot
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

4. Switch the **NextBoot slot** again and reboot to return to the original SBIOS.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7 sbios_slot
--switch-nextboot-slot
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

5. Verify the version strings in the primary and secondary slots are restored to their correct values.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7
show_version
```

3.3.2. Watchdog Timeout Due to Corrupt SBIOS

Issue

If an SBIOS is corrupt, the system will not be able to boot from it. In this case, when attempting to boot from the corrupt SBIOS, a watchdog timeout occurs and then the system boots from the alternate SBIOS. If the system is then rebooted, the system will attempt to boot from the original SBIOS, timeout again, then boot from the alternate SBIOS.

To confirm that a watchdog timeout has occurred,

1. Issue the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:20.10.7
show_version
$ sudo cat /var/log/nvidia-fw.log | grep "EEPROM detection status 1" -n1
```

2. Inspect byte 14 from the last EEPROM struct entry in the output.

If byte 14 (bold-italicized in the following example) is 01, then a watchdog timeout has occurred.

```
{EEPROM struct :00 00 16 00 00 18 00 01 03 01 03 01 22 01 01 a5}
```

Resolution

If the SBIOS is corrupted, you can re-flash the SBIOS from the BMC dashboard. See [Updating the SBIOS from the BMC Dashboard](#) for instructions.

3.3.3. VBIOS Not Updated on DGX KVM Host

Issue

On a DGX-2 System that has been converted to a DGX KVM host, the VBIOS will not get updated if the GPU is being used by a guest GPU VM.

Explanation

All guest GPU VMs must be stopped before running the container to update the VBIOS. To stop the VMs, run the following from the KVM host for each guest GPU VM.

```
virsh shutdown <vm-domain>
```

Chapter 4. DGX-2 System Firmware Update Container Version 20.10.7.2

The DGX Firmware Update container version 20.10.7.2 is available.

- ▶ Package name: `nvfw-dgx2_20.10.7.2_201205.tar.gz`
- ▶ Run file name: `nvfw-dgx2_20.10.7.2_201205.run`
- ▶ Image name: `nvfw-dgx2:20.10.7.2`



Important: NVIDIA strongly advises updating the BMC if the installed BMC is version 01.05.07


Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
 - ▶ DGX OS 4.6 or later
Before using the container to update firmware on DGX OS 5.0 or later, first stop certain NVIDIA services. See [Special Instructions for all Updates](#).
 - ▶ EL7-20.09 or later
- ▶ Added support for the using the .run file on systems running Red Hat Enterprise Linux 8.


Contents of the DGX-2 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table.

Component	Version	Key Changes
BMC	1.06.06	No change



Note: Refer to the instructions in section [Special Instructions](#) to

Component	Version	Key Changes
	determine applicable actions to take.	
SBIOS	0.26	No change
M.2 NVMe (Samsung PM963)	CXV8601Q	No change
U.2 SSD (Micron)	101008S0	No change
VBIOS (DGX-2)	88.00.6B.00.01	No change
VBIOS (DGX-2H)	88.00.6B.00.08	No change
PSU	3.1  Note: Refer to the instructions in section Special Instructions to determine applicable actions to take.	No change
FPGA	3.1	No change Note: There are two FPGA images - Image-1:Rescue and Image-2:Primary. The Firmware Update Container updates the Primary FPGA image only.

Change to the Update Process

Originally, only certain firmware components, such as the SBIOS, required rebooting the system after performing the update.

In order to ensure that all DGX-2 services continue running, you must reboot the DGX-2 after any firmware update for any component or group of components.

Updating Components with Secondary Images

Some firmware components provide a secondary image as backup. The following is the policy when updating those components:

- ▶ **SBIOS:** Only the primary image is updated. To update both images, follow the instructions at [Special Instructions for PSU, SBIOS, and BMC Firmware Updates](#).
- ▶ **BMC:** Only the primary image is updated. To update the secondary (backup) image, include the `--update-backup-bmc` option in the update command.
- ▶ **FPGA:** Only the primary image is updated.

Enabling SNMP RO/RW Strings

The SNMP RO/RW strings are disabled by default. The following table provides the ipmitool arguments for enabling the strings. After enabling, disabling, or setting the RO/RW strings, either issue the restart SNMP Server command or reset the BMC for the changes to go into effect.

LUN	Cmd	Requested Data	
		Offset	Description
3Ch/00h	26h	1	00h: Enable RO string 01h: Enable RW string 02h: Disable RO string 03h: Disable RW string 04h: Set RO string 05h: Set RW string 06h: Start SNMP Server 07h: Stop SNMP Server 08h: Restart SNMP Server
		2:21	Community string in ASCII code. Maximum string length is 20 characters. If request byte is set to 0x4 or 0x5, but empty from byte 2 to byte 21, then the corresponding community string will be cleared.

For example, to enable the RO String, set the Community to "test", and then restart the SNMP service on the BMC as follows:

1. Enable RO.

```
$ sudo ipmitool raw 0x3c 0x26 0x00
```

2. Set the RO string to "test".

```
$ sudo ipmitool raw 0x3c 0x26 0x04 0x74 0x65 0x73 0x74
```

3. Restart the SNMP service on the BMC.

```
$ sudo ipmitool raw 0x3c 0x26 0x08
```

4.1. Special Instructions for all Updates

Updating Firmware on DGX Systems Installed with DGX OS Release Later than 4.99.x

You need to stop certain NVIDIA services before using the container to update firmware on systems installed with DGX OS later than 4.99.x.

- ▶ If you run the container using either the `docker run` or `.run` file method, then stop services first by issuing the following.

```
$ sudo systemctl stop nvsm dcmg nvidia-fabricmanager nvidia-persistenced.service
```

- ▶ If you run the container using NVSM CLI, then stop services first by issuing the following (does not include stopping nvsm).

```
$ sudo systemctl stop dcmg nvidia-fabricmanager nvidia-persistenced.service
```

4.2. Special Instructions for PSU, SBIOS, and BMC Firmware Updates

- ▶ Before updating the PSU, SBIOS, or the BMC, refer to the following special instructions for guidance to ensure the updates are successful.

PSU Updates

- ▶ If the BMC version is older than 01.00.01, then the BMC must be updated first before updating the PSU. See [Updating the BMC from Versions older than 01.00.01](#).

SBIOS Updates

- ▶ If the current BMC is version 1.05.7, then update the BMC first before updating the SBIOS.
- ▶ To update both primary and secondary SBIOS (after updating the BMC) using the container, do the following (assumes the primary SBIOS is the current, active SBIOS).

1. Refer to [Special Instructions for all Updates](#) to see if services need to be stopped and how to do it.
2. Update the active SBIOS using the `update_fw SBIOS` argument from the firmware update container.
3. Designate booting from the secondary (inactive) SBIOS on the next boot.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:20.08.8
  sbios_slot --switch-nextboot-slot
```

4. Reboot the DGX-2 to switch to the secondary SBIOS.

```
$ sudo telinit 1
$ sudo umount /raid
$ sync
$ sudo ipmitool chassis power cycle
```

5. Update the secondary (now active) SBIOS.

- Designate booting from the primary SBIOS on the next boot (to restore the primary SBIOS as the active SBIOS).

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:20.08.8
sbios_slot --switch-nextboot-slot
```

- Reboot the DGX-2 to switch back to the primary SBIOS.

```
$ sudo telinit 1
$ sudo umount /raid
$ sync
$ sudo ipmitool chassis power cycle
```

BMC Updates

- ▶ If the current BMC is older than 01.00.01, then follow the instructions at [Updating the BMC from Versions older than 01.00.01](#).
- ▶ If the current BMC is 01.00.01, then follow the instructions at [Updating the BMC from Version 01.00.01](#).

4.3. Known Issues

4.3.1. SBIOS Intel ME Setting Version Does Not Get Updated

Issue

The Intel ME firmware has changed since SBIOS 0.17, but updating the SBIOS from 0.17 does not update the ME firmware.

Resolution

To update the Intel ME firmware, do not update the SBIOS using the firmware update container. Instead, use the BMC dashboard. See [Updating the SBIOS from the BMC Dashboard for instructions](#) for instructions.

After updating the SBIOS, verify that the Intel ME setting version has been updated by issuing the following.

```
# sudo dmidecode --type 11

//output
Getting SMBIOS data from sysfs.
SMBIOS 3.0.0 present.

Handle 0x0055, DMI type 11, 5 bytes
OEM Strings
  String 1: 4.0.4.313.1
```

Verify that the last digit in `string 1` is "1" as in the example output.



Note: The Intel ME setting version is stored in the SBIOS, and available for viewing, only with SBIOS version 0.24 and later.

4.3.2. EEPROM Checksum Mismatch

Issue

BMC version 1.05.7 introduced an issue that could cause corruption in the BMC EEPROM. This is indicated by an `EEPROM checksum mismatch` error message when attempting to update any firmware.

You can also verify EEPROM corruption by issuing the following

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7 show_version
```

and then viewing the output for the error message.



Note: This error may be reported if a corrupt SBIOS produces a watchdog timeout during boot. In this case, the error message is erroneous. See the section [Watchdog Timeout Due to Corrupt SBIOS](#) for instructions on confirming and then resolving the SBIOS corruption.

Resolution

The DGX-2 Firmware Update Container version 21.06.7 includes logic to detect and repair the corruption. Perform the following steps to repair the EEPROM corruption.

1. If the BMC is not already updated, then update the BMC.

Refer to [Special Instructions for all Updates](#) to see if services need to be stopped and how to do it.

2. Review the "current" and "next" boot SBIOS by issuing the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7 sbios_slot --get-nextboot-slot
```

3. Perform actions based on the NextBoot and Currently Booted from slots

- ▶ If the **NextBoot slot** and **Currently Booted From slot** are different, then reboot the system using `ipmitool`.

```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

- ▶ If the **NextBoot slot** and **Currently Booted From slot** are the same, then switch the NextBoot slot and then reboot as follows.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7 sbios_slot --switch-nextboot-slot
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

- Switch the **NextBoot slot** again and reboot to return to the original SBIOS.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7 sbios_slot
--switch-nextboot-slot
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

- Verify the version strings in the primary and secondary slots are restored to their correct values.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7
show_version
```

4.3.3. Watchdog Timeout Due to Corrupt SBIOS

Issue

If an SBIOS is corrupt, the system will not be able to boot from it. In this case, when attempting to boot from the corrupt SBIOS, a watchdog timeout occurs and then the system boots from the alternate SBIOS. If the system is then rebooted, the system will attempt to boot from the original SBIOS, timeout again, then boot from the alternate SBIOS.

To confirm that a watchdog timeout has occurred,

- Issue the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:20.10.7
show_version
$ sudo cat /var/log/nvidia-fw.log | grep "EEPROM detection status 1" -n1
```

- Inspect byte 14 from the last EEPROM struct entry in the output.

If byte 14 (bold-italicized in the following example) is 01, then a watchdog timeout has occurred.

```
{EEPROM struct :00 00 16 00 00 18 00 01 03 01 03 01 22 01 01 a5}
```

Resolution

If the SBIOS is corrupted, you can re-flash the SBIOS from the BMC dashboard. See [Updating the SBIOS from the BMC Dashboard](#) for instructions.

4.3.4. VBIOS Not Updated on DGX KVM Host

Issue

On a DGX-2 System that has been converted to a DGX KVM host, the VBIOS will not get updated if the GPU is being used by a guest GPU VM.

Explanation

All guest GPU VMs must be stopped before running the container to update the VBIOS. To stop the VMs, run the following from the KVM host for each guest GPU VM.

```
virsh shutdown <vm-domain>
```

Chapter 5. DGX-2 System Firmware Update Container Version 20.10.7

The DGX Firmware Update container version 20.10.7 is available.

- ▶ Package name: `nvfw-dgx2_20.10.7_201023.tar.gz`
- ▶ Run file name: `nvfw-dgx2_20.10.7_201023.run`
- ▶ Image name: `nvfw-dgx2:20.10.7`





Important: NVIDIA strongly advises updating the BMC if the installed BMC is version 01.05.07

Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
 - ▶ DGX OS 4.3 or later
Before using the container to update firmware on DGX OS later than 4.99.x, first stop certain NVIDIA services. See [Special Instructions for all Updates](#).
 - ▶ EL7-19.11 or later
- ▶ Incorporates security updates for the BMC.
See the [NVIDIA Security Bulletin 5010](#) for details.
- ▶ Incorporates updated component firmware.
See **Contents of the DGX-2 System Firmware Container** for the list of changes.

Contents of the DGX-2 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table.

Component	Version	Key Changes
BMC	1.06.06  Note: Refer to the instructions in section Special Instructions to determine applicable actions to take.	See BMC Release Notes for the list of changes.
SBIOS	0.26	Fixed boot issue that occurred when one NVMe drive was bad. See also SBIOS Release Notes for the list of other changes.
M.2 NVMe (Samsung PM963)	CXV8601Q	No change
U.2 SSD (Micron)	101008S0	See DGX-2 U.2 Firmware Release Notes for the list of changes
VBIOS (DGX-2)	88.00.6B.00.01	No change
VBIOS (DGX-2H)	88.00.6B.00.08	No change
PSU	3.1  Note: Refer to the instructions in section Special Instructions to determine applicable actions to take.	Fixed an issue that caused the MOSFET to fail.
FPGA	3.1	No change Note: There are two FPGA images - Image-1:Rescue and Image-2:Primary. The Firmware Update Container updates the Primary FPGA image only.

Change to the Update Process

Originally, only certain firmware components, such as the SBIOS, required rebooting the system after performing the update.

In order to ensure that all DGX-2 services continue running, you must reboot the DGX-2 after any firmware update for any component or group of components.

Updating Components with Secondary Images

Some firmware components provide a secondary image as backup. The following is the policy when updating those components:

- ▶ **SBIOS:** Only the primary image is updated. To update both images, follow the instructions at [Special Instructions for PSU, SBIOS, and BMC Firmware Updates](#).
- ▶ **BMC:** Only the primary image is updated. To update the secondary (backup) image, include the `--update-backup-bmc` option in the update command.
- ▶ **FPGA:** Only the primary image is updated.

Enabling SNMP RO/RW Strings

The SNMP RO/RW strings are disabled by default. The following table provides the ipmitool arguments for enabling the strings. After enabling, disabling, or setting the RO/RW strings, either issue the restart SNMP Server command or reset the BMC for the changes to go into effect.

LUN	Cmd	Requested Data	
		Offset	Description
3Ch/00h	26h	1	00h: Enable RO string 01h: Enable RW string 02h: Disable RO string 03h: Disable RW string 04h: Set RO string 05h: Set RW string 06h: Start SNMP Server 07h: Stop SNMP Server 08h: Restart SNMP Server
		2:21	Community string in ASCII code. Maximum string length is 20 characters. If request byte is set to 0x4 or 0x5, but empty from byte 2 to byte 21, then the corresponding community string will be cleared.

For example, to enable the RO String, set the Community to "test", and then restart the SNMP service on the BMC as follows:

1. Enable RO.

```
$ sudo ipmitool raw 0x3c 0x26 0x00
```

2. Set the RO string to "test".

```
$ sudo ipmitool raw 0x3c 0x26 0x04 0x74 0x65 0x73 0x74
```

3. Restart the SNMP service on the BMC.

```
$ sudo ipmitool raw 0x3c 0x26 0x08
```

5.1. Special Instructions for all Updates

Updating Firmware on DGX Systems Installed with DGX OS Release Later than 4.99.x

You need to stop certain NVIDIA services before using the container to update firmware on systems installed with DGX OS later than 4.99.x.

- ▶ If you run the container using either the `docker run` or `.run` file method, then stop services first by issuing the following.

```
$ sudo systemctl stop nvsm dcgm nvidia-fabricmanager nvidia-persistenced.service
```

- ▶ If you run the container using NVSM CLI, then stop services first by issuing the following (does not include stopping nvsm).

```
$ sudo systemctl stop dcgm nvidia-fabricmanager nvidia-persistenced.service
```

5.2. Special Instructions for PSU, SBIOS, and BMC Firmware Updates

- ▶ Before updating the PSU, SBIOS, or the BMC, refer to the following special instructions for guidance to ensure the updates are successful.

PSU Updates

- ▶ If the BMC version is older than 01.00.01, then the BMC must be updated first before updating the PSU. See [Updating the BMC from Versions older than 01.00.01](#).

SBIOS Updates

- ▶ If the current BMC is version 1.05.7, then update the BMC first before updating the SBIOS.
- ▶ To update both primary and secondary SBIOS (after updating the BMC) using the container, do the following (assumes the primary SBIOS is the current, active SBIOS).
 1. Refer to [Special Instructions for all Updates](#) to see if services need to be stopped and how to do it.
 2. Update the active SBIOS using the `update_fw SBIOS` argument from the firmware update container.
 3. Designate booting from the secondary (inactive) SBIOS on the next boot.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:20.08.8
sbios_slot --switch-nextboot-slot
```

4. Reboot the DGX-2 to switch to the secondary SBIOS.

```
$ sudo telinit 1
$ sudo umount /raid
$ sync
$ sudo ipmitool chassis power cycle
```

5. Update the secondary (now active) SBIOS.
6. Designate booting from the primary SBIOS on the next boot (to restore the primary SBIOS as the active SBIOS).

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:20.08.8
sbios_slot --switch-nextboot-slot
```

7. Reboot the DGX-2 to switch back to the primary SBIOS.

```
$ sudo telinit 1
$ sudo umount /raid
$ sync
$ sudo ipmitool chassis power cycle
```

BMC Updates

- ▶ If the current BMC is older than 01.00.01, then follow the instructions at [Updating the BMC from Versions older than 01.00.01](#).
- ▶ If the current BMC is 01.00.01, then follow the instructions at [Updating the BMC from Version 01.00.01](#).

5.3. Known Issues

5.3.1. SBIOS Intel ME Setting Version Does Not Get Updated

Issue

The Intel ME firmware has changed since SBIOS 0.17, but updating the SBIOS from 0.17 does not update the ME firmware.

Resolution

To update the Intel ME firmware, do not update the SBIOS using the firmware update container. Instead, use the BMC dashboard. See [Updating the SBIOS from the BMC Dashboard for instructions](#) for instructions.

After updating the SBIOS, verify that the Intel ME setting version has been updated by issuing the following.

```
# sudo dmidecode --type 11

//output
Getting SMBIOS data from sysfs.
```

```
SMBIOS 3.0.0 present.
Handle 0x0055, DMI type 11, 5 bytes
OEM Strings
  String 1: 4.0.4.313.1
```

Verify that the last digit in `string 1` is "1" as in the example output.



Note: The Intel ME setting version is stored in the SBIOS, and available for viewing, only with SBIOS version 0.24 and later.

5.3.2. EEPROM Checksum Mismatch

Issue

BMC version 1.05.7 introduced an issue that could cause corruption in the BMC EEPROM. This is indicated by an `EEPROM checksum mismatch` error message when attempting to update any firmware.

You can also verify EEPROM corruption by issuing the following

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7 show_version
```

and then viewing the output for the error message.



Note: This error may be reported if a corrupt SBIOS produces a watchdog timeout during boot. In this case, the error message is erroneous. See the section [Watchdog Timeout Due to Corrupt SBIOS](#) for instructions on confirming and then resolving the SBIOS corruption.

Resolution

The DGX-2 Firmware Update Container version 21.06.7 includes logic to detect and repair the corruption. Perform the following steps to repair the EEPROM corruption.

1. If the BMC is not already updated, then update the BMC.

Refer to [Special Instructions for all Updates](#) to see if services need to be stopped and how to do it.

2. Review the "current" and "next" boot SBIOS by issuing the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7 sbios_slot
--get-nextboot-slot
```

3. Perform actions based on the NextBoot and Currently Booted from slots

- ▶ If the **NextBoot slot** and **Currently Booted From slot** are different, then reboot the system using `ipmitool`.

```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

- ▶ If the **NextBoot slot** and **Currently Booted From slot** are the same, then switch the NextBoot slot and then reboot as follows.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7
sbios_slot --switch-nextboot-slot
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

4. Switch the **NextBoot slot** again and reboot to return to the original SBIOS.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7 sbios_slot
--switch-nextboot-slot
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

5. Verify the version strings in the primary and secondary slots are restored to their correct values.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:21.06.7
show_version
```

5.3.3. Watchdog Timeout Due to Corrupt SBIOS

Issue

If an SBIOS is corrupt, the system will not be able to boot from it. In this case, when attempting to boot from the corrupt SBIOS, a watchdog timeout occurs and then the system boots from the alternate SBIOS. If the system is then rebooted, the system will attempt to boot from the original SBIOS, timeout again, then boot from the alternate SBIOS.

To confirm that a watchdog timeout has occurred,

1. Issue the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dg2:20.10.7
show_version
$ sudo cat /var/log/nvidia-fw.log | grep "EEPROM detection status 1" -n1
```

2. Inspect byte 14 from the last EEPROM struct entry in the output.

If byte 14 (bold-italicized in the following example) is 01, then a watchdog timeout has occurred.

```
{EEPROM struct :00 00 16 00 00 18 00 01 03 01 03 01 22 01 01 a5}
```

Resolution

If the SBIOS is corrupted, you can re-flash the SBIOS from the BMC dashboard. See [Updating the SBIOS from the BMC Dashboard](#) for instructions.

5.3.4. VBIOS Not Updated on DGX KVM Host

Issue

On a DGX-2 System that has been converted to a DGX KVM host, the VBIOS will not get updated if the GPU is being used by a guest GPU VM.

Explanation

All guest GPU VMs must be stopped before running the container to update the VBIOS. To stop the VMs, run the following from the KVM host for each guest GPU VM.

```
virsh shutdown <vm-domain>
```

Chapter 6. DGX-2 System Firmware Update Container Version 20.01.25.6

The DGX Firmware Update container version 20.01.25.6 is available.

- ▶ Package name: `nvfw-dgx2_20.01.25.6_200619.tar.gz`
- ▶ Run file name: `nvfw-dgx2_20.01.25.6_200619.run`
- ▶ Image name: `nvfw-dgx2:20.01.25.6`





Important: NVIDIA strongly advises updating the BMC if the installed BMC is version 01.05.07

Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
 - ▶ DGX OS 4.3 or later
 - ▶ EL7-19.11 or later
- ▶ Implemented security hardening to the BMC - SNMP RO/RW strings now disabled by default.
- ▶ Added detection script to check for EEPROM corruption and recover if needed during BMC firmware update.
- ▶ Resolved issue where the BMC takes too long to recover from firmware update mode.
- ▶ See [DGX-2 System Firmware Changes](#) for the list of changes in individual components.

Contents of the DGX-2 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table.

Component	Version	Key Changes
BMC	1.05.20  Note: Refer to the instructions in section Special Instructions to determine applicable actions to take.	See BMC Release Notes for the list of changes.
SBIOS	0.24	No change
M.2 NVMe (Samsung PM963)	CXV8601Q	No change
U.2 SSD (Micron)	101008R0	No change
VBIOS (DGX-2)	88.00.6B.00.01	No change
VBIOS (DGX-2H)	88.00.6B.00.08	No change
PSU	2.7  Note: Refer to the instructions in section Special Instructions to determine applicable actions to take.	No change
FPGA	3.1	No change Note: There are two FPGA images - Image-1:Rescue and Image-2:Primary. The Firmware Update Container updates the Primary FPGA image only.

Change to the Update Process

Originally, only certain firmware components, such as the SBIOS, required rebooting the system after performing the update.

In order to ensure that all DGX-2 services continue running, you must reboot the DGX-2 after any firmware update for any component or group of components.

Updating Components with Secondary Images

Some firmware components provide a secondary image as backup. The following is the policy when updating those components:

- ▶ **SBIOS:** Only the primary image is updated. To update both images, follow the instructions at [Special Instructions for PSU, SBIOS, and BMC Firmware Updates](#).
- ▶ **BMC:** Only the primary image is updated. To update the secondary (backup) image, include the `--update-backup-bmc` option in the update command.
- ▶ **FPGA:** Only the primary image is updated.

Enabling SNMP RO/RW Strings

The SNMP RO/RW strings are disabled by default. The following table provides the ipmitool arguments for enabling the strings. After enabling, disabling, or setting the RO/RW strings, either issue the restart SNMP Server command or reset the BMC for the changes to go into effect.

LUN	Cmd	Requested Data	
		Offset	Description
3Ch/00h	26h	1	00h: Enable RO string 01h: Enable RW string 02h: Disable RO string 03h: Disable RW string 04h: Set RO string 05h: Set RW string 06h: Start SNMP Server 07h: Stop SNMP Server 08h: Restart SNMP Server
		2:21	Community string in ASCII code. Maximum string length is 20 characters. If request byte is set to 0x4 or 0x5, but empty from byte 2 to byte 21, then the corresponding community string will be cleared.

6.1. Special Instructions for PSU, SBIOS, and BMC Firmware Updates

Before updating the PSU, SBIOS, or the BMC, refer to the following special instructions for guidance to ensure the updates are successful.

PSU Updates

- ▶ If the BMC version is older than 01.00.01, then the BMC must be updated first before updating the PSU. See [Updating the BMC from Versions older than 01.00.01](#).

SBIOS Updates

- ▶ If the current BMC is version 1.05.7, then BMC should be updated before updating the SBIOS.
- ▶ If the current SBIOS is a version earlier than 0.22 (such as 0.13 or 0.17), then you need to update the SBIOS from the BMC dashboard. See [Updating the SBIOS Using the BMC Dashboard](#) for instructions.
- ▶ To update both primary and secondary SBIOS (after updating the BMC) using the container, do the following (assumes the primary SBIOS is the current, active SBIOS).

1. Update the active SBIOS using the firmware update container.

2. Designate booting from the secondary (inactive) SBIOS on the next boot.

```
$ sudo ./nvfw-dgx2_20.01.25.6_200619.run sbios_slot --switch-nextboot-slot
```

3. Reboot the DGX-2 to switch to the secondary SBIOS.

```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

4. Update the secondary (now active) SBIOS.

5. Designate booting from the primary SBIOS on the next boot (to restore the primary SBIOS as the active SBIOS).

```
$ sudo ./nvfw-dgx2_20.01.25.6_200619.run sbios_slot --switch-nextboot-slot
```

6. Reboot the DGX-2 to switch back to the primary SBIOS.

```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

BMC Updates

- ▶ If the current BMC is older than 01.00.01, then follow the instructions at [Updating the BMC from Versions older than 01.00.01](#).
- ▶ If the current BMC is 01.00.01, then follow the instructions at [Updating the BMC from Version 01.00.01](#).

6.2. Known Issues

6.2.1. SBIOS Intel ME Setting Version Does Not Get Updated

Issue

The Intel ME firmware has changed since SBIOS 0.17, but updating the SBIOS from 0.17 does not update the ME firmware.

Resolution

To update the Intel ME firmware, do not update the SBIOS using the firmware update container. Instead, use the BMC dashboard. See [Updating the SBIOS from the BMC Dashboard for instructions](#) for instructions.

After updating the SBIOS, verify that the Intel ME setting version has been updated by issuing the following.

```
# sudo dmidecode --type 11

//output
Getting SMBIOS data from sysfs.
SMBIOS 3.0.0 present.

Handle 0x0055, DMI type 11, 5 bytes
OEM Strings
  String 1: 4.0.4.313.1
```

Verify that the last digit in `string 1` is "1" as in the example output.



Note: The Intel ME setting version is stored in the SBIOS, and available for viewing, only with SBIOS version 0.24 and later.

6.2.2. EEPROM Checksum Mismatch

Issue

BMC version 1.05.7 introduced an issue that could cause corruption in the BMC EEPROM. This is indicated by an `EEPROM checksum mismatch` error message when attempting to update any firmware.

You can also verify EEPROM corruption by issuing the following

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run show_version
```

and then viewing the output for the error message.



Note: This error may be reported if a corrupt SBIOS produces a watchdog timeout during boot. In this case, the error message is erroneous. See the section [Watchdog Timeout Due to Corrupt SBIOS](#) for instructions on confirming and then resolving the SBIOS corruption.

Resolution

The DGX-2 Firmware Update Container version 20.01.25 includes logic to detect and repair the corruption. Perform the following steps to repair the EEPROM corruption.

1. If the BMC is not already updated, then update the BMC.
2. Review the "current" and "next" boot SBIOS by issuing the following.

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run sbios_slot --get-nextboot-slot
```

3. Perform actions based on the NextBoot and Currently Booted from slots

- ▶ If the **NextBoot slot** and **Currently Booted From slot** are different, then reboot the system using ipmitool.

```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

- ▶ If the **NextBoot slot** and **Currently Booted From slot** are the same, then switch the NextBoot slot and then reboot as follows.

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run sbios_slot --switch-nextboot-slot
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

4. Switch the **NextBoot slot** again and reboot to return to the original SBIOS.

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run sbios_slot --switch-nextboot-slot
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

5. Verify the version strings in the primary and secondary slots are restored to their correct values.

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run show_version
```

6.2.3. Watchdog Timeout Due to Corrupt SBIOS

Issue

If an SBIOS is corrupt, the system will not be able to boot from it. In this case, when attempting to boot from the corrupt SBIOS, a watchdog timeout occurs and then the system boots from the alternate SBIOS. If the system is then rebooted, the system will attempt to boot from the original SBIOS, timeout again, then boot from the alternate SBIOS.

To confirm that a watchdog timeout has occurred,

1. Issue the following.

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run show_version
$ sudo cat /var/log/nvidia-fw.log | grep "EEPROM detection status 1" -nl
```

2. Inspect byte 14 from the last EEPROM struct entry in the output.

If byte 14 (bold-italicized in the following example) is 01, then a watchdog timeout has occurred.

```
{EEPROM struct :00 00 16 00 00 18 00 01 03 01 03 01 22 01 01 a5}
```

Resolution

If the SBIOS is corrupted, you can re-flash the SBIOS from the BMC dashboard. See [Updating the SBIOS from the BMC Dashboard](#) for instructions.

6.2.4. VBIOS Not Updated on DGX KVM Host

Issue

On a DGX-2 System that has been converted to a DGX KVM host, the VBIOS will not get updated if the GPU is being used by a guest GPU VM.

Explanation

All guest GPU VMs must be stopped before running the container to update the VBIOS. To stop the VMs, run the following from the KVM host for each guest GPU VM.

```
virsh shutdown <vm-domain>
```

6.2.5. Backup SBIOS Version at 0.0

Issue

The BMC dashboard incorrectly reports the backup SBIOS version to be 0.0.

Explanation

Due to a limitation in the BMC software, the software does not know the version of the backup SBIOS since it has not been run.

Chapter 7. DGX-2 System Firmware Update Container Version 20.01.25

The DGX Firmware Update container version 20.01.25 is available.

- ▶ Package name: `nvfw-dgx2_20.01.25_200207.tar.gz`
- ▶ Run file name: `nvfw-dgx2_20.01.25_200207.run`
- ▶ Image name: `nvfw-dgx2:20.01.25`





Important: NVIDIA strongly advises updating the BMC if the installed BMC is version 01.05.07

Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
 - ▶ DGX OS 4.3 or later
 - ▶ EL7-19.11 or later
- ▶ Updated the BMC
 - ▶ Added LDAPS (secure LDAP) support.
 - ▶ Resolved network connection getting lost when connected to virtual media.
 - ▶ Resolved an issue where occasionally the BMC UI would stop responding.
- ▶ Fixed unnecessary string "Update status: Not Available" appearing after restoring PSU firmware.
- ▶ See [DGX-2 System Firmware Changes](#) for the list of changes in individual components.

Contents of the DGX-2 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table.

Component	Version	Key Changes
BMC	1.05.12  Note: Refer to the instructions in section Special Instructions to determine applicable actions to take.	See BMC Release Notes for the list of changes.
SBIOS	0.24	No change
M.2 NVMe (Samsung PM963)	CXV8601Q	No change
U.2 SSD (Micron)	101008R0	No change
VBIOS (DGX-2)	88.00.6B.00.01	No change
VBIOS (DGX-2H)	88.00.6B.00.08	No change
PSU	2.7  Note: Refer to the instructions in section Special Instructions to determine applicable actions to take.	No change
FPGA	3.1	No change Note: There are two FPGA images - Image-1:Rescue and Image-2:Primary. The Firmware Update Container updates the Primary FPGA image only.

Change to the Update Process

Originally, only certain firmware components, such as the SBIOS, required rebooting the system after performing the update.

In order to ensure that all DGX-2 services continue running, you must reboot the DGX-2 after any firmware update for any component or group of components.

Updating Components with Secondary Images

Some firmware components provide a secondary image as backup. The following is the policy when updating those components:

- ▶ **SBIOS:** Only the primary image is updated. To update both images, follow the instructions at [Special Instructions for PSU, SBIOS, and BMC Firmware Updates](#).
- ▶ **BMC:** Only the primary image is updated. To update the secondary (backup) image, include the `--update-backup-bmc` option in the update command.
- ▶ **FPGA:** Only the primary image is updated.

7.1. Special Instructions for PSU, SBIOS, and BMC Firmware Updates

Before updating the PSU, SBIOS, or the BMC, refer to the following special instructions for guidance to ensure the updates are successful.

PSU Updates

- ▶ If the BMC version is older than 01.00.01, then the BMC must be updated first before updating the PSU. See [Updating the BMC from Versions older than 01.00.01](#).

SBIOS Updates

- ▶ If the current BMC is version 1.05.7, then BMC should be updated before updating the SBIOS.
- ▶ If the current SBIOS is a version earlier than 0.22 (such as 0.13 or 0.17), then you need to update the SBIOS from the BMC dashboard. See [Updating the SBIOS Using the BMC Dashboard](#) for instructions.
- ▶ To update both primary and secondary SBIOS (after updating the BMC) using the container, do the following (assumes the primary SBIOS is the current, active SBIOS).

1. Update the active SBIOS using the firmware update container.
2. Designate booting from the secondary (inactive) SBIOS on the next boot.

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run sbios_slot --switch-nextboot-slot
```

3. Reboot the DGX-2 to switch to the secondary SBIOS.

```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

4. Update the secondary (now active) SBIOS.
5. Designate booting from the primary SBIOS on the next boot (to restore the primary SBIOS as the active SBIOS).

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run sbios_slot --switch-nextboot-slot
```

6. Reboot the DGX-2 to switch back to the primary SBIOS.

```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

BMC Updates

- ▶ If the current BMC is older than 01.00.01, then follow the instructions at [Updating the BMC from Versions older than 01.00.01](#).
- ▶ If the current BMC is 01.00.01, then follow the instructions at [Updating the BMC from Version 01.00.01](#).

7.2. Known Issues

7.2.1. SBIOS Intel ME Setting Version Does Not Get Updated

Issue

The Intel ME firmware has changed since SBIOS 0.17, but updating the SBIOS from 0.17 does not update the ME firmware.

Resolution

To update the Intel ME firmware, do not update the SBIOS using the firmware update container. Instead, use the BMC dashboard. See [Updating the SBIOS from the BMC Dashboard for instructions](#) for instructions.

After updating the SBIOS, verify that the Intel ME setting version has been updated by issuing the following.

```
# sudo dmidecode --type 11

//output
Getting SMBIOS data from sysfs.
SMBIOS 3.0.0 present.

Handle 0x0055, DMI type 11, 5 bytes
OEM Strings
    String 1: 4.0.4.313.1
```

Verify that the last digit in `String 1` is "1" as in the example output.



Note: The Intel ME setting version is stored in the SBIOS, and available for viewing, only with SBIOS version 0.24 and later.

7.2.2. EEPROM Checksum Mismatch

Issue

BMC version 1.05.7 introduced an issue that could cause corruption in the BMC EEPROM. This is indicated by an `EEPROM checksum mismatch` error message when attempting to update any firmware.

You can also verify EEPROM corruption by issuing the following

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run show_version
```

and then viewing the output for the error message.



Note: This error may be reported if a corrupt SBIOS produces a watchdog timeout during boot. In this case, the error message is erroneous. See the section [Watchdog Timeout Due to Corrupt SBIOS](#) for instructions on confirming and then resolving the SBIOS corruption.

Resolution

The DGX-2 Firmware Update Container version 20.01.25 includes logic to detect and repair the corruption. Perform the following steps to repair the EEPROM corruption.

1. If the BMC is not already updated, then update the BMC.
2. Review the "current" and "next" boot SBIOS by issuing the following.

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run sbios_slot --get-nextboot-slot
```

3. Perform actions based on the NextBoot and Currently Booted from slots

- ▶ If the **NextBoot slot** and **Currently Booted From slot** are different, then reboot the system using `ipmitool`.

```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

- ▶ If the **NextBoot slot** and **Currently Booted From slot** are the same, then switch the NextBoot slot and then reboot as follows.

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run sbios_slot --switch-nextboot-slot
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

4. Switch the **NextBoot slot** again and reboot to return to the original SBIOS.

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run sbios_slot --switch-nextboot-slot
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

5. Verify the version strings in the primary and secondary slots are restored to their correct values.

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run show_version
```

7.2.3. Watchdog Timeout Due to Corrupt SBIOS

Issue

If an SBIOS is corrupt, the system will not be able to boot from it. In this case, when attempting to boot from the corrupt SBIOS, a watchdog timeout occurs and then the system boots from the alternate SBIOS. If the system is then rebooted, the system will attempt to boot from the original SBIOS, timeout again, then boot from the alternate SBIOS.

To confirm that a watchdog timeout has occurred,

1. Issue the following.

```
$ sudo ./nvfw-dgx2_20.01.25_200207.run show_version
$ sudo cat /var/log/nvidia-fw.log | grep "EEPROM detection status 1" -nl
```

2. Inspect byte 14 from the last EEPROM struct entry in the output.

If byte 14 (bold-italicized in the following example) is 01, then a watchdog timeout has occurred.

```
{EEPROM struct :00 00 16 00 00 18 00 01 03 01 03 01 22 01 01 a5}
```

Resolution

If the SBIOS is corrupted, you can re-flash the SBIOS from the BMC dashboard. See [Updating the SBIOS from the BMC Dashboard](#) for instructions.

7.2.4. VBIOS Not Updated on DGX KVM Host

Issue

On a DGX-2 System that has been converted to a DGX KVM host, the VBIOS will not get updated if the GPU is being used by a guest GPU VM.

Explanation

All guest GPU VMs must be stopped before running the container to update the VBIOS. To stop the VMs, run the following from the KVM host for each guest GPU VM.

```
virsh shutdown <vm-domain>
```

7.2.5. Backup SBIOS Version at 0.0

Issue

The BMC dashboard incorrectly reports the backup SBIOS version to be 0.0.

Explanation

Due to a limitation in the BMC software, the software does not know the version of the backup SBIOS since it has not been run.

Chapter 8. DGX-2 System Firmware Update Container Version 19.12.1

The DGX Firmware Update container version 19.12.1 is available.

- ▶ Package name: `nvfw-dgx2_19.12.1_191204.tar.gz`
- ▶ Run file name: `nvfw-dgx2_19.12.1_191204.run`
- ▶ Image name: `nvfw-dgx2:19.12.1`



Important: NVIDIA strongly advises updating the BMC if the installed BMC is version 01.05.07

Highlights and Changes in this Release


- ▶ This release is supported with the following DGX OS software -
 - ▶ DGX OS 4.3 or later
 - ▶ EL7-19.11 or later
- ▶ Fixed VBIOS not getting updated during combination or forced update.
- ▶ Added " `--update-backup-bmc`" option for updating the secondary (backup) BMC image.
- ▶ See [DGX-2 Firmware Changes](#) for the list of changes in individual components.
- ▶ Removed the Samsung SSD second source firmware.

Contents of the DGX-2 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table.

Component	Version	Key Changes
BMC	01.05.10	See BMC Release Notes for the list of changes.

Note: Refer to the instructions in section

Component	Version	Key Changes
	Special Instructions to determine applicable actions to take.	
SBIOS	0.24	See SBIOS Release Notes for the list of changes.
M.2 NVMe (Samsung PM963)	CXV8601Q	No change
M.2 NVMe (Samsung PM983)	EDA7202Q	Removed
U.2 SSD (Micron)	101008R0	No change
U.2 SSD (Samsung)	EDA5202Q	Removed
VBIOS (DGX-2)	88.00.6B.00.01	No change
VBIOS (DGX-2H)	88.00.6B.00.08	No change
PSU	2.7	No change
	 Note: Refer to the instructions in section Special Instructions to determine applicable actions to take.	
FPGA	3.1	No change Note: There are two FPGA images - Image-1:Rescue and Image-2:Primary. The Firmware Update Container updates the Primary FPGA image only.

Change to the Update Process

Originally, only certain firmware components, such as the SBIOS, required rebooting the system after performing the update.

In order to ensure that all DGX-2 services continue running, you must reboot the DGX-2 after any firmware update for any component or group of components.

Updating Components with Secondary Images

Some firmware components provide a secondary image as backup. The following is the policy when updating those components:

- ▶ **SBIOS:** Only the primary image is updated. To update both images, follow the instructions at [Special Instructions for PSU, SBIOS, and BMC Firmware Updates](#).
- ▶ **BMC:** Only the primary image is updated. To update the secondary (backup) image, include the `--update-backup-bmc` option in the update command.
- ▶ **FPGA:** Only the primary image is updated.

8.1. Special Instructions for PSU, SBIOS, and BMC Firmware Updates

Before updating the PSU, SBIOS, or the BMC, refer to the following special instructions for guidance to ensure the updates are successful.

PSU Updates

- ▶ If the BMC version is older than 01.00.01, then the BMC must be updated first before updating the PSU. See [Updating the BMC from Versions older than 01.00.01](#).

SBIOS Updates

- ▶ If the current BMC is version 1.05.7, then BMC should be updated before updating the SBIOS.
- ▶ If the current SBIOS is a version earlier than 0.22 (such as 0.13 or 0.17), then you need to update the SBIOS from the BMC dashboard. See [Updating the SBIOS Using the BMC Dashboard](#) for instructions.
- ▶ To update both primary and secondary SBIOS (after updating the BMC) using the container, do the following (assumes the primary SBIOS is the current, active SBIOS).

1. Update the active SBIOS using the firmware update container.
2. Designate booting from the secondary (inactive) SBIOS on the next boot.

```
$ sudo ./nvfw-dgx2_19.12.1_191204.run sbios_slot --switch-nextboot-slot
```

3. Reboot the DGX-2 to switch to the secondary SBIOS.

```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

4. Update the secondary (now active) SBIOS.
5. Designate booting from the primary SBIOS on the next boot (to restore the primary SBIOS as the active SBIOS).

```
$ sudo ./nvfw-dgx2_19.12.1_191204.run sbios_slot --switch-nextboot-slot
```

6. Reboot the DGX-2 to switch back to the primary SBIOS.

```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

BMC Updates

- ▶ If the current BMC is older than 01.00.01, then follow the instructions at [Updating the BMC from Versions older than 01.00.01](#).
- ▶ If the current BMC is 01.00.01, then follow the instructions at [Updating the BMC from Version 01.00.01](#).

8.2. Known Issues

8.2.1. EEPROM Checksum Mismatch

Issue

BMC version 1.05.7 introduced an issue that could cause corruption in the BMC EEPROM. This is indicated by an `EEPROM checksum mismatch` error message when attempting to update any firmware.

You can also verify EEPROM corruption by issuing the following

```
$ sudo ./nvfw-dgx2_19.12.1_191204.run show_version
```

and then viewing the output for the error message.



Note: This error may be reported if a corrupt SBIOS produces a watchdog timeout during boot. In this case, the error message is erroneous. See the section [Watchdog Timeout Due to Corrupt SBIOS](#) for instructions on confirming and then resolving the SBIOS corruption.

Resolution

The DGX-2 Firmware Update Container version 19.12.1 includes logic to detect and repair the corruption. Perform the following steps to repair the EEPROM corruption.

1. If the BMC is not already updated, then update the BMC.
2. Review the "current" and "next" boot SBIOS by issuing the following.


```
$ sudo ./nvfw-dgx2_19.12.1_191204.run sbios_slot --get-nextboot-slot
```
3. Perform actions based on the NextBoot and Currently Booted from slots
 - ▶ If the **NextBoot slot** and **Currently Booted From slot** are different, then reboot the system using `ipmitool`.


```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```
 - ▶ If the **NextBoot slot** and **Currently Booted From slot** are the same, then switch the NextBoot slot and then reboot as follows.


```
$ sudo ./nvfw-dgx2_19.12.1_191204.run sbios_slot --switch-nextboot-slot
```

```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

4. Switch the **NextBoot slot** again and reboot to return to the original SBIOS.

```
$ sudo ./nvfw-dgx2_19.12.1_191204.run sbios_slot --switch-nextboot-slot
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power cycle
```

5. Verify the version strings in the primary and secondary slots are restored to their correct values.

```
$ sudo ./nvfw-dgx2_19.12.1_191204.run show_version
```

8.2.2. Watchdog Timeout Due to Corrupt SBIOS

Issue

If an SBIOS is corrupt, the system will not be able to boot from it. In this case, when attempting to boot from the corrupt SBIOS, a watchdog timeout occurs and then the system boots from the alternate SBIOS. If the system is then rebooted, the system will attempt to boot from the original SBIOS, timeout again, then boot from the alternate SBIOS.

To confirm that a watchdog timeout has occurred,

1. Issue the following.

```
$ sudo ./nvfw-dgx2_19.12.1_191204.run show_version
$ sudo cat /var/log/nvidia-fw.log | grep "EEPROM detection status 1" -nl
```

2. Inspect byte 14 from the last `EEPROM struct` entry in the output.

If byte 14 (bold-italicized in the following example) is 01, then a watchdog timeout has occurred.

```
{EEPROM struct :00 00 16 00 00 18 00 01 03 01 03 01 22 01 01 a5}
```

Resolution

If the SBIOS is corrupted, you can re-flash the SBIOS from the BMC dashboard. See [Updating the SBIOS from the BMC Dashboard](#) for instructions.

8.2.3. Network Connection May Get Lost When Connected to Virtual Media

Issue

After connecting to virtual media as follows,

1. Log in to BMC dashboard.
2. Click **Remote Control > Launch KVM**.
3. Connect to an ISO image and then click **Launch Media**.

while running a program from the virtual media, connection may get lost.

Resolution and Workaround

NVIDIA is currently investigating this issue for resolution in a later software release. To work around, connect with the software using a USB. Refer to the [DGX-2 System User Guide: Creating a Bootable Installation Medium](#) for instructions on creating a bootable USB.

8.2.4. NVSM Erroneously Reports PSUs and Fans as Unhealthy

Issue

After updating the BMC to version 1.05.07, output from `nvsm show health` reports PSUs and Fans as "unhealthy" and that they cannot be detected, even though they are fine as indicated when using `ipmitool`. This occurs with DGX OS versions 4.1.1 and earlier.

Explanation

The "unhealthy" status is erroneous and does not impact functionality. The issue will be resolved in the next DGX OS release subsequent to patch update 4.1.1.

8.2.5. BMC UI May Stop Responding

Issue

Occasionally, the BMC web interface will stop responding, as indicated by the spinning progress bar and "Processing" text. This can happen at the login screen and also after logging in.

Recovery

The system OS is not affected, and the BMC itself is responsive to `ipmitool` commands.

To recover, reset the BMC using any of the following methods.

- ▶ Via SSH connection to the system, with `sudo` access, enter the followings:

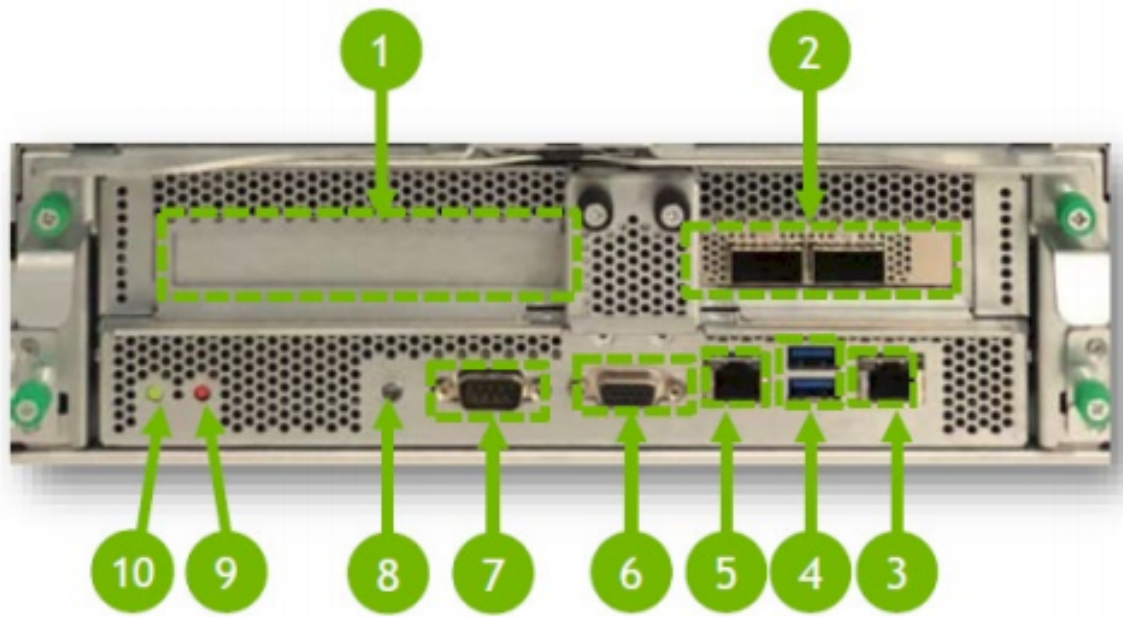
```
~$ sudo ipmitool mc reset cold
```

- ▶ Via IPMI over a network, enter the following:

```
~$ ipmitool -I lan -H <bmc-ip-address> -U <user> -P <password> mc reset cold
```

- ▶ If you have physical access to the system, press the BMC reset button.

Refer to item 9 in the following image of the back of the DGX-2 system for the location of the BMC reset button.



8.2.6. VBIOS Not Updated on DGX KVM Host

Issue

On a DGX-2 System that has been converted to a DGX KVM host, the VBIOS will not get updated if the GPU is being used by a guest GPU VM.

Explanation

All guest GPU VMs must be stopped before running the container to update the VBIOS. To stop the VMs, run the following from the KVM host for each guest GPU VM.

```
virsh shutdown <vm-domain>
```

8.2.7. Backup SBIOS Version at 0.0

Issue

The BMC dashboard incorrectly reports the backup SBIOS version to be 0.0.

Explanation

Due to a limitation in the BMC software, the software does not know the version of the backup SBIOS since it has not been run.

Chapter 9. DGX-2 System Firmware Update Container Version 19.09.3



Note: NVIDIA DGX-2 19.09.03 FW Update Container has been withdrawn due to an issue with the 1.05.07 BMC FW. The issue could result in the DGX-2 system failing to start after a shutdown. For the latest status, resolution, and instructions, see the NVIDIA Enterprise Support article [NVIDIA Has Identified an Issue with the 1.05.07 BMC FW](#) (requires login).

Chapter 10. DGX-2 System Firmware Update Container Version 19.03.1


The DGX Firmware Update container version 19.03.1 is available.


- ▶ Package name: `nvfw-dgx2_19.03.1.tar.gz`
- ▶ Image name: `nvfw-dgx2:19.03.1`
- ▶ Run file name: `nvfw-dgx2_19.03.1.run`

Obtain the files from the NVIDIA Enterprise Support announcement [DGX-2 System Firmware Update Container Version 19.03.1](#) (requires login).

Contents of the DGX-2 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table.

Component	Version	Key Changes
BMC	01.04.03 <div> Note: If updating from versions earlier than 1.00.01, you must download and use the <code>conf.bak</code> file as explained in Special Instructions to complete the update.</div>	Added support for DGX-2H. Added support for MaxQ/MaxP power settings. Added option to not preserve the sensor data record when updating to a later version. This fixes an erroneous battery sensor error after previous updates. See BMC Release Notes for the list of changes.
SBIOS	0.22	See SBIOS Release Notes for the list of changes.

Component	Version	Key Changes
M.2 NVMe (Samsung PM963)	CXV8601Q	No change
M.2 NVMe (Samsung PM983)	EDA7202Q	New (supports second-source component)
U.2 SSD (Micron)	101008R0	No change
U.2 SSD (Samsung)	EDA5202Q	New (supports second-source component)
VBIOS (DGX-2)	88.00.6B.00.01	No change
VBIOS (DGX-2H)	88.00.6B.00.08	New (supports DGX-2H VBIOS)
PSU	2.7	See PSU Release Notes for the list of changes.
	<div style="background-color: #e0e0e0; padding: 5px; border: 1px solid #ccc;">  Note: If also updating the BMC from a version earlier than 1.00.01, then before updating the PSU firmware, be sure to first follow the steps provided under Special Instructions. </div>	
FPGA	3.1	New (added FPGA to container) Note: There are two FPGA images - Image-1:Rescue and Image-2:Primary. The Firmware Update Container updates the Primary FPGA image only.

Changes in this Release

- ▶ See [DGX-2 FW Release Notes](#) for the list of changes in individual components.
- ▶ Added integration with NVSM (requires DGX OS Server 4.0.5 or later).

This allows firmware to be updated using a .run file that simplifies the steps needed. See the [DGX-2 User Guide](#) for instructions on obtaining and using the .run file.

Updating Components with Secondary Images

Some firmware components provide a secondary image as backup. The following is the policy when updating those components:

- ▶ **SBIOS:** Only the primary image is updated.
- ▶ **BMC:** Both primary and secondary (backup) images are updated.
- ▶ **FPGA:** Only the primary image is updated.

10.1. Special Instructions for PSU and BMC Firmware Updates

In order to update the PSU firmware, the BMC firmware must be updated first and then a configuration file added to the BMC. The configuration file is needed to support PSU firmware updates, otherwise the PSU update will fail.

These instructions are not needed before updating other firmware, such as the SBIOS, SSDs, or VBIOS.

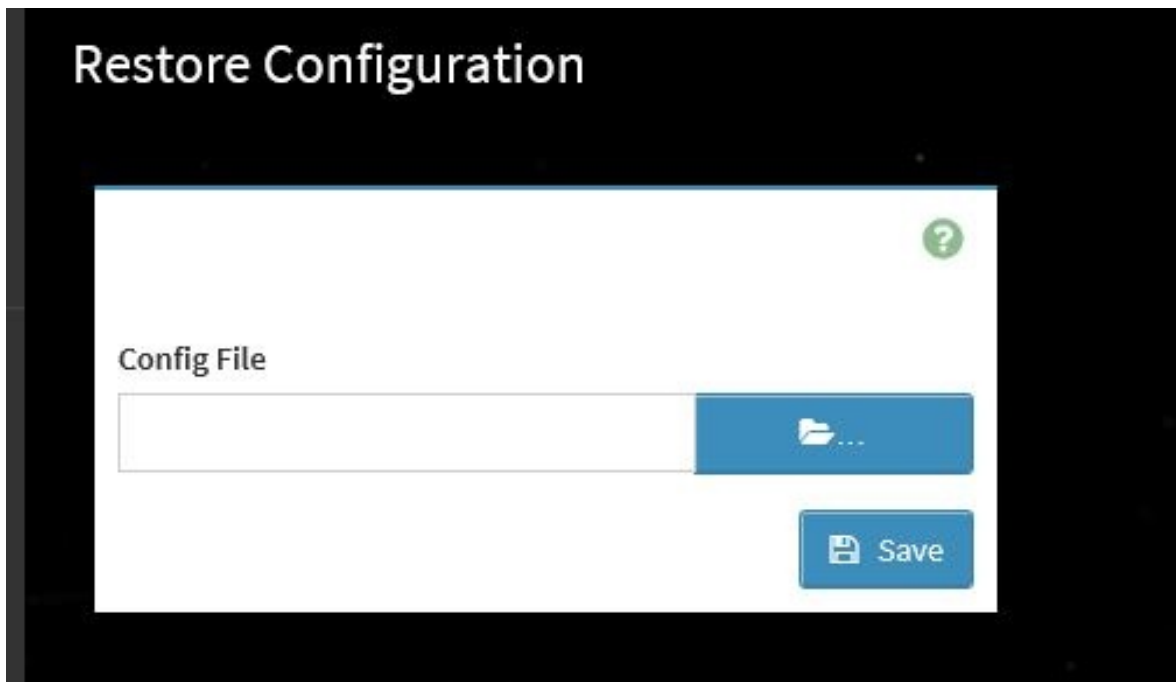
1. In addition to downloading the `nvfw-dgx2_19.03.1.tar.gz` container, download the `conf.bak` file from the NVIDIA Enterprise Support announcement [DGX-2 System Firmware Update Container Version 19.03.1](#) (requires login).
2. Refer to the DGX-2 User Guide "Updating Firmware" chapter for complete instructions on using the container.

Perform the following steps before updating PSU firmware.

3. Using the firmware update container, update the BMC only.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dgx2:19.03.1 update_fw BMC
```

4. As the administrator, log in to the BMC dashboard, then navigate to Maintenance->Restore Configuration.



5. Locate and select the `conf.bak` file downloaded in step 1 and then click **Save**.
6. Now you can update other firmware.

For example, to update all the downlevel firmware, issue the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dgx2:19.03.1 update_fw all
```

10.2. Known Issues

10.2.1. Battery Thresholds are not Reset After BMC Upgrade

Issue

As of v1.04.03, the BMC includes updated, correct, battery thresholds. However, the new thresholds are not reset upon upgrading the BMC, resulting in a sensor monitoring alert appearing in the BMC dashboard for the 3V battery, errors in the BMC system event log, or the front panel power LED flashing.

Workaround

Resetting the BMC settings will update the battery voltage threshold. To reset the BMC, log in to the BMC dashboard, select **Maintenance** from the side menu and then select **Restore Factory Defaults**.

10.2.2. VBIOS Not Updated During Combination Update

Issue

The VBIOS does not get updated when updating the VBIOS in conjunction with another component, for example by using the following options:

```
update_fw -f all
```

or

```
update_fw VBIOS [other]
```

Workaround

Update the VBIOS by itself.

```
$ sudo nvidia-docker run --privileged -ti -v /:/hostfs <container-name> update_fw VBIOS
```

10.2.3. PSU May not Get Powered On

Issue

When connecting AC input power to an individual PSU, the PSU may not get powered on. This is indicated by the green LEDs on the PSU not lighting.

Action to Take

Unplug the power supply, wait for more than 60 seconds, then reconnect AC power. If there is still a failure, proceed with RMA.

10.2.4. VBIOS Not Updated on DGX KVM Host

Issue

On a DGX-2 System that has been converted to a DGX KVM host, the VBIOS will not get updated if the GPU is being used by a guest GPU VM.

Explanation

All guest GPU VMs must be stopped before running the container to update the VBIOS. To stop the VMs, run the following from the KVM host for each guest GPU VM.

```
virsh shutdown <vm-domain>
```

10.2.5. Backup SBIOS Version at 0.0

Issue

The BMC dashboard incorrectly reports the backup SBIOS version to be 0.0.

Explanation

Due to a limitation in the BMC software, the software does not know the version of the backup SBIOS since it has not been run.



Chapter 11. DGX-2 System Firmware Update Container Version 18.10.2

The DGX Firmware Update container version 18.10.2 is available.

- ▶ Package name: `nvfw-dgx2_18.10.2.tar.gz`
- ▶ Image name: `nvfw-dgx2_18.10.2`

Contents of the DGX-2 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table.

Component	Version	Key Changes
BMC	01.00.01  Note: To complete the update, you must download and use the <code>conf.bak</code> file as explained in Special Instructions .	See BMC Release Notes for the list of changes.
SBIOS	0.17	See SBIOS Release Notes for the list of changes.
M.2 SSD (Samsung)	CXV8601Q	No change
U.2 SSD (Micron)	101008R0	No change
VBIOS	88.00.6B.00.01	No change
PSU	2.5  Note: Before updating the PSU firmware, be sure	See PSU Release Notes

Component	Version	Key Changes
	to first follow the steps provided under Special Instructions .	

Changes in this Release

- ▶ Added resiliency to the PSU firmware update
- ▶ Added the ability to update firmware for individual PSU or NVMe units.

11.1. Special Instructions for PSU and BMC Firmware Updates

In order to update the PSU firmware, the BMC firmware must be updated first and then a configuration file added to the BMC. The configuration file is needed to support PSU firmware updates, otherwise the PSU update will fail.

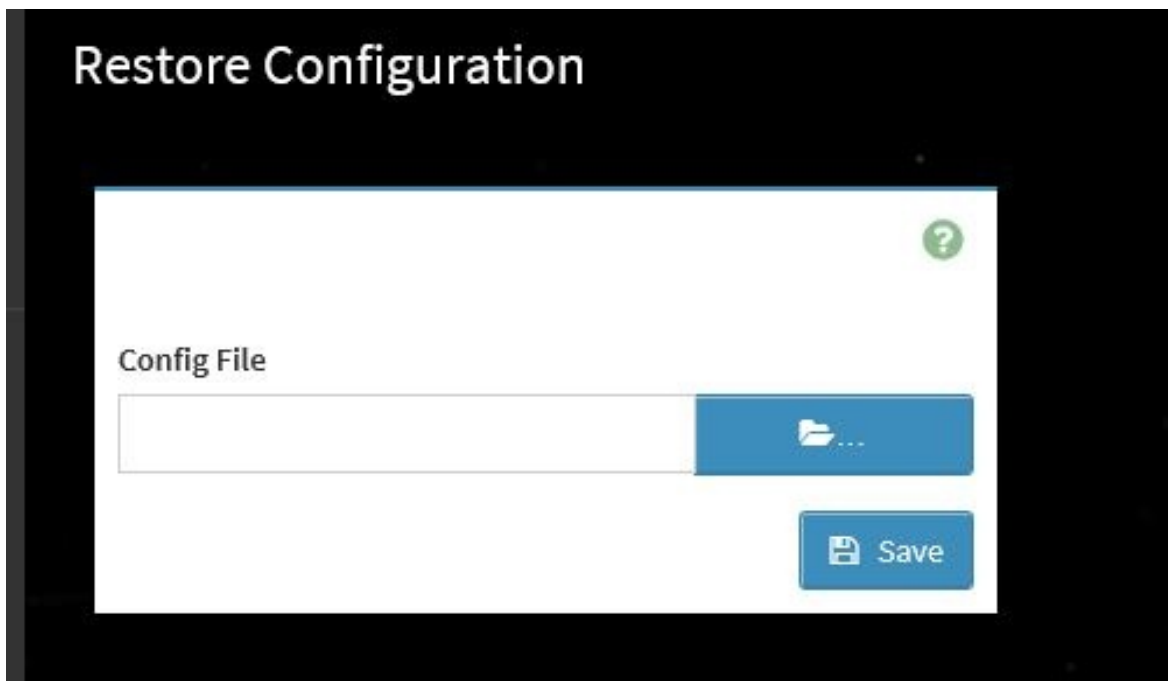
These instructions are not needed before updating other firmware, such as the SBIOS, SSDs, or VBIOS.

1. In addition to downloading the `nvfw-dgx2_18.10.2.tar.gz` container, download the `conf.bak` file from the NVIDIA Enterprise Support portal.
2. Refer to the DGX-2 User Guide "Updating Firmware" chapter for complete instructions on using the container.

Perform the following steps before updating PSU firmware.

3. Using the firmware update container, update the BMC only.


```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dgx2_18.10.2 update_fw BMC
```
4. As the administrator, log in to the BMC dashboard, then navigate to Maintenance->Restore Configuration.



5. Locate and select the `conf.bak` file downloaded in step 1 and then click **Save**.
6. Now you can update other firmware.

For example, to update all the downlevel firmware, issue the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dgx2_18.10.2 update_fw all
```

11.2. Known Issues

11.2.1. PSU May not Get Powered On

Issue

When connecting AC input power to an individual PSU, the PSU may not get powered on. This is indicated by the green LEDs on the PSU not lighting.

Action to Take

Unplug the power supply, wait for more than 60 seconds, then reconnect AC power. If there is still a failure, proceed with RMA.

11.2.2. BMC Update Timeout

Issue

The container update may hang and report a BMC update timeout.

Workaround

If the container does not recover, stop the container as follows:

1. From another terminal session, find the CONTAINER ID of the firmware container instance.

```
# sudo docker ps | grep nvfw-dgx2
```

Example output:

CONTAINER ID	IMAGE	COMMAND	CREATED
2e76a51fd85b	nvfw-dgx2_08.19.1	"/usr/bin/python /sr\u2026"	5 seconds ago
	Up 4 seconds		

2. Using the CONTAINER ID, terminate the instance.

```
# sudo docker kill <container-id>
```

Example:

```
# sudo docker kill 2e76a51fd85b
```

3. Determine whether the updates were performed by querying the currently installed firmware using the `show_version` option.

```
# sudo docker run --privileged -v /:/hostfs <image-name> show_version
```

4. If the BMC is still downlevel, then force the BMC update by using the `-f` option.

```
# sudo docker run --rm --privileged -ti -v /:/hostfs <image-name> update_fw -f BMC
```

5. If the issue still occurs, then reboot the system and try to perform the update.
6. If the issue still occurs, then run `nvsm dump health` and submit the log files to NVIDIA Enterprise Support.

11.2.3. VBIOS Not Updated on DGX KVM Host

Issue

On a DGX-2 System that has been converted to a DGX KVM host, the VBIOS will not get updated if the GPU is being used by a guest GPU VM.

Explanation

All guest GPU VMs must be stopped before running the container to update the VBIOS. To stop the VMs, run the following from the KVM host for each guest GPU VM.

```
virsh shutdown <vm-domain>
```

Chapter 12. DGX-2 System Firmware Update Container Version 18.09.4

The DGX Firmware Update container version 18.09.4 is available.

- ▶ Package name: `nvfw-dgx2_18.09.4.tar.gz`
- ▶ Image name: `nvfw-dgx2_18.09.4`

Contents of the DGX-2 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table.

Component	Version
BMC	0.97.01
SBIOS	0.14
M.2 SSD (Samsung)	CXV8601Q
U.2 SSD (Micron)	101008R0
VBIOS	88.00.6B.00.01

12.1. Known Issues

12.1.1. BMC Update Timeout

Issue

The container update may hang and report a BMC update timeout.

Workaround

If the container does not recover, stop the container as follows:

1. From another terminal session, find the CONTAINER ID of the firmware container instance.

```
# sudo docker ps | grep nvfw-dgx2
```

Example output:

CONTAINER ID	IMAGE	COMMAND	CREATED
2e76a51fd85b	nvfw-dgx2_08.19.1	"/usr/bin/python /sr\u2026"	5 seconds ago
	Up 4 seconds		

2. Using the CONTAINER ID, terminate the instance.

```
# sudo docker kill <container-id>
```

Example:

```
# sudo docker kill 2e76a51fd85b
```

3. Determine whether the updates were performed by querying the currently installed firmware using the `show_version` option.

```
# sudo docker run --privileged -v /:/hostfs <image-name> show_version
```

4. If the BMC is still downlevel, then force the BMC update by using the `-f` option.

```
# sudo docker run --rm --privileged -ti -v /:/hostfs <image-name> update_fw -f BMC
```

5. If the issue still occurs, then reboot the system and try to perform the update.
6. If the issue still occurs, then run `nvsm dump health` and submit the log files to NVIDIA Enterprise Support.

12.1.2. VBIOS Not Updated on DGX KVM Host

Issue

On a DGX-2 System that has been converted to a DGX KVM host, the VBIOS will not get updated if the GPU is being used by a guest GPU VM.

Explanation

All guest GPU VMs must be stopped before running the container to update the VBIOS. To stop the VMs, run the following from the KVM host for each guest GPU VM.

```
virsh shutdown <vm-domain>
```

Chapter 13. Updating the BMC from Versions Older than 01.00.01

In order to update the PSU firmware when the BMC firmware is older than 01.00.01, the BMC firmware must be updated first and then a configuration file added to the BMC. The configuration file is needed to support PSU firmware updates, otherwise the PSU update will fail.

These instructions are not needed before updating other firmware, such as the SBIOS, SSDs, or VBIOS.

1. In addition to downloading the firmware update container image, download the `conf.bak` file from the NVIDIA Enterprise Support announcement.
2. Refer to the DGX-2 User Guide "Updating Firmware" chapter for complete instructions on using the container.

Perform the following steps before updating PSU firmware.

3. Refer to [Special Instructions for all Updates](#) to see if services need to be stopped and how to do it.
4. Using the firmware update container, update the BMC only to the intermediate version.

Attempting to update directly to the latest BMC version will return an error message; this is to avoid an issue where configuration settings in the BMC are lost when updating to the latest BMC version from version 01.00.01 or older.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs <image-name> update_fw BMC --intermediate-fw
```

To update the secondary BMC image, issue the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs <image-name> update_fw BMC --intermediate-fw --update-backup-bmc
```

5. Update to the latest BMC firmware version.

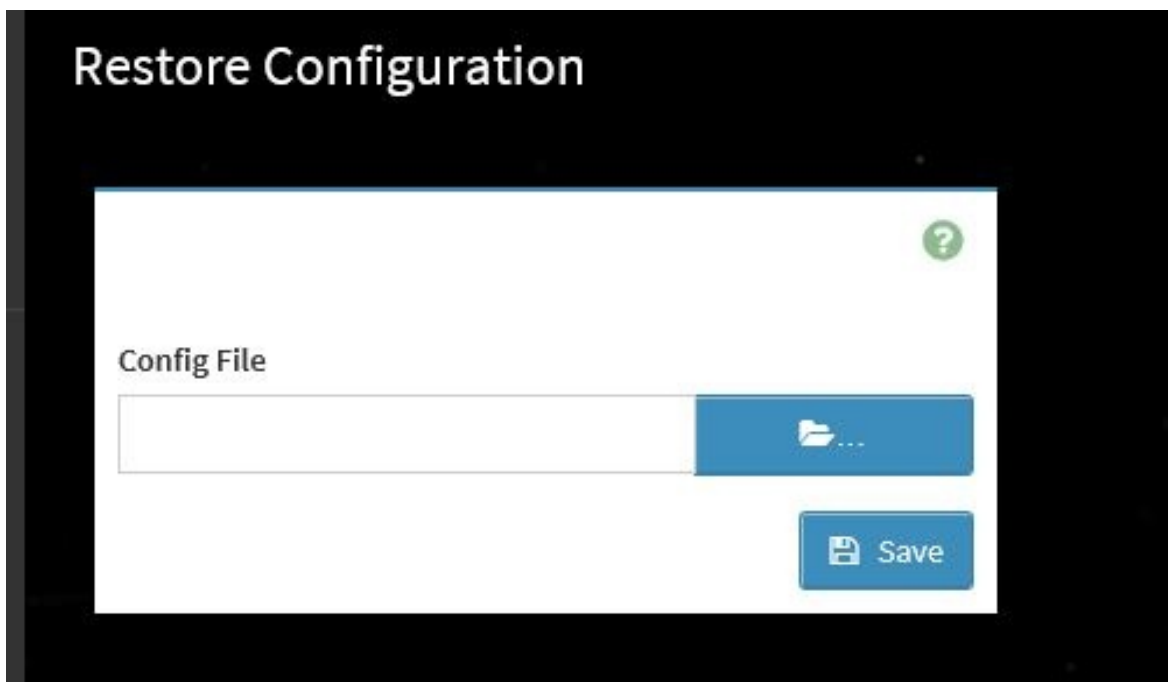
```
$ sudo docker run --rm --privileged -ti -v /:/hostfs <image-name> update_fw BMC
```

Follow any prompts.

To update the secondary BMC image, issue the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs <image-name> update_fw BMC --update-backup-bmc
```

6. As the administrator, log in to the BMC dashboard, then navigate to Maintenance->Restore Configuration.



7. Locate and select the `conf.bak` file downloaded in step 1 and then click **Save**.
8. Now you can update the PSU firmware.

For example, to update all the downlevel firmware, issue the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs <image-name> update_fw all
```

Chapter 14. Updating the BMC from Version 01.00.01

In order to update the BMC firmware from version 01.00.01, the BMC firmware must be updated to an intermediate version first. Attempting to update directly to the latest BMC version will return an error message; this is to avoid an issue where configuration settings in the BMC are lost when updating to the latest BMC version from version 01.00.01.

1. Refer to the DGX-2 User Guide "Updating Firmware" chapter for complete instructions on using the firmware update container.
2. Refer to [Special Instructions for all Updates](#) to see if services need to be stopped and how to do it.
3. Update the BMC.

- a). Update to the intermediate version.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs <image-name> update_fw BMC --  
intermediate-fw
```

Follow any prompts.

To update the secondary BMC image, issue the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs <image-name> update_fw BMC --  
intermediate-fw --update-backup-bmc
```

- b). Update to the latest BMC firmware version.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs <image-name> update_fw BMC
```

Follow any prompts.

To update the secondary BMC image, issue the following.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs <image-name> update_fw BMC --  
update-backup-bmc
```

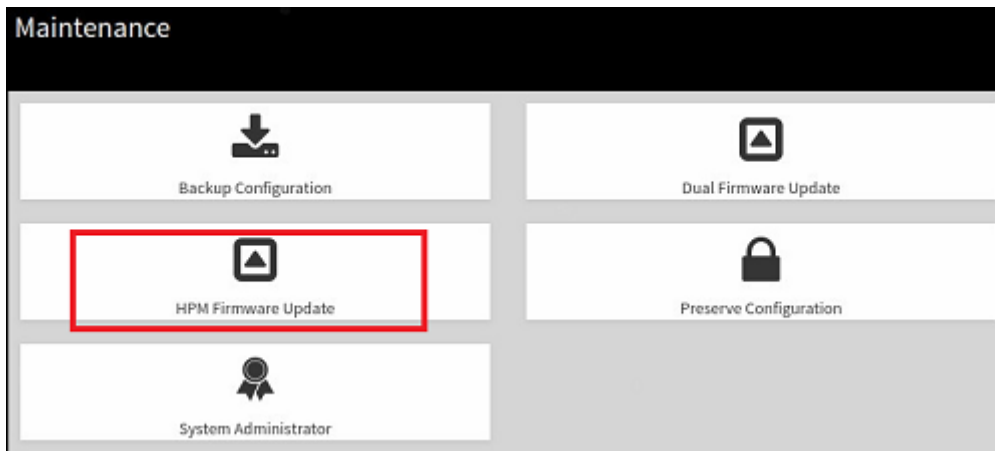
Chapter 15. Updating the SBIOS from the BMC Dashboard

These instructions describe how to update the SBIOS from the BMC dashboard. **These instructions should be followed only under special circumstances**, such as

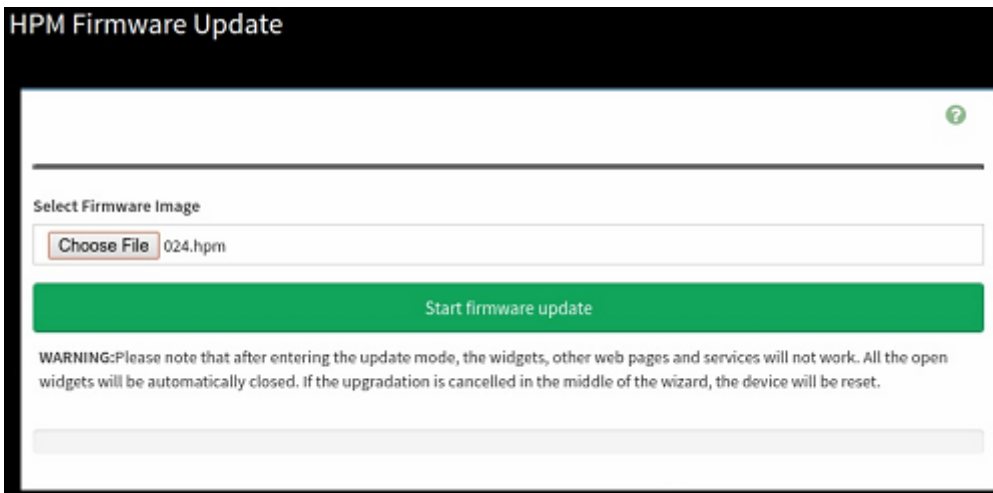
- ▶ When updating from SBIOS version 0.13 or 0.17
- ▶ When the SBIOS is corrupted and cannot be flashed using the firmware update container.

This process should take less than ten minutes, and updates the inactive SBIOS.

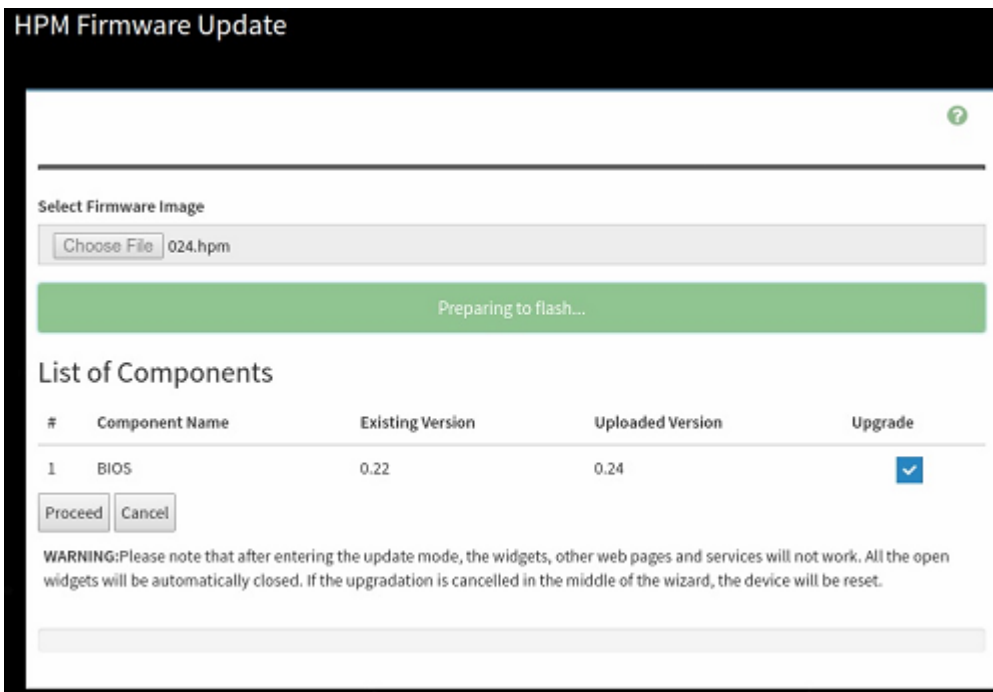
1. Obtain the SBIOS `.hpm` file from the NVIDIA Enterprise Support announcement and copy it to your local machine.
2. Remove the DGX-2 from production to ensure against corrupting the BMC.
3. Log in to the BMC dashboard from your local machine and select **Maintenance** from the left-side navigation pane.
4. Select the **HPM Firmware Update** card from the list.



5. Click **Choose File**, and then locate and select the `.hpm` file corresponding to the update version.



6. Click **Start firmware update**.
7. Under **List of Components**, confirm that the **Uploaded Version** is the intended version, then click **Proceed**.



8. Click **OK** at the confirmation dialog.
The progress bar shows the update progress.
9. Click **Cancel** at the **Firmware update completed** dialog box and perform a clean power cycle of the system as follows.
 - a). Issue the following on the OS command line to perform a clean shutdown.


```
$ telinit 1
$ umount /raid
$ sync
$ ipmitool chassis power off
```
 - b). After the shutdown, remove all AC cables from the DGX-2 and wait for ten minutes.

- c). Re-connect the AC cables, then push the power button to power on the DGX-2.
The system reboots to the now updated secondary SBIOS (assuming it originally booted from the primary SBIOS).
10. Log back in to the BMC dashboard and repeat the steps to update the primary SBIOS (assuming it originally booted from the primary SBIOS).
 11. To verify the state of each SBIOS, log in to the BMC dashboard, select **Maintenance**, then select **Firmware Information** and view the information under the BIOS section.



Chapter 16. DGX-2 Firmware Update Process

This chapter provides an overview of the firmware update process when issuing `update_fw all` and the installed SBIOS is older than 0.28.

You will need to power cycle the server a couple of times to update all the components. The following shows the order in which the updates are performed, and the components that are updated at each stage:

1. Issue `update_fw all`.
 - ▶ The BMC gets updated.
 - ▶ The SBIOS gets updated.
 - ▶ The ConnectX card gets updated (if `mlx-fw-updater` package is installed).

The following message appears:

```
Success:
  Installed firmware 0.29 on SBIOS.Active. Do power cycle for new firmware to
  take effect.
Note:
  Power Cycle is required for new firmware(s) to take effect:
  1. Gracefully shutdown the system (issue `shutdown` command)
  2. Use the WEB UI and use power controls to power on the system
  or from another system use ipmitool chassis power on command
  SBIOS.Active does not up-to-date. Please perform the above actions and update
  again.
Failures:
  None
```

2. Power cycle the system.
3. Issue `update_fw all`.
 - The Intel ME gets updated.
4. Power cycle the system.

Chapter 17. DGX-2 System Firmware Changes

This chapter contains the list of changes for the following DGX-2 firmware components.

- ▶ [BMC](#)
- ▶ [System BIOS](#)
- ▶ [Power Supply Units](#)
- ▶ [DGX-2 U.2 Firmware Release Notes](#)

17.1. DGX-2 BMC Changes

Changes in 01.07.2

- ▶ BMC SEL entries can now be saved to a remote syslog server..
- ▶ Fixed an issue where backup/restore function does not work.
- ▶ Fixed an issue where the MB CPLD, VBIOS, and PLX switch EEPROM versions are missing from the BMC web UI.
- ▶ Added ability to get status of Power supply redundancy via SNMP.
- ▶ Fixed an issue where resetting a BMC password (via the BMC web UI) to an 'easy' password results in an error.
- ▶ Fixed an issue where, if the BMC was updated without preserving all the settings, then updating the SBIOS would result in losing all SBIOS settings.

Changes in 01.06.6

- ▶ Fixed an issue that caused the nvsm health service to fail due to not being able to recognize the platform. Platform details were unpopulated with 'To be filled by O.E.M.'
- ▶ Added code to report when fans are increased to 80% and identify the sensor that triggers it.
- ▶ Added code to track GPU page retirements.

- ▶ The system now boots from the secondary BMC image if there is a problem booting from the primary image.
- ▶ Added CPLD Dump option to the BMC Web UI Maintenance > Diagnostic Dump Data page.
- ▶ Added CPU CATERR Dump option to the BMC Web UI Maintenance > Diagnostic Dump Data page.
- ▶ Added FAN DIAG Dump option to the BMC Web UI Maintenance > Diagnostic Dump Data page.
- ▶ Fixed BMC errors not getting sent to syslog facility (splunk).
- ▶ Improved robustness of BMC update.
- ▶ Implemented RESTful API to detect and restore EEPROM content during update.
- ▶ Fixed issue where a failed BMC update rendered the BMC unreachable.
- ▶ Fixed issue where a failed BMC update rendered the system unable to be powered on.
- ▶ Fixed issue where the BMC stops logging SEL events if it cannot receive a timestamp from the Intel Management Engine (ME).
- ▶ Fixed issue where updates from BMC version 1.05.07 fail, resulting in the system unable to boot.
- ▶ Fixed battery voltage lower thresholds.
- ▶ Fixed inability to change MaxQ/MaxP power mode.
- ▶ Fixed inability to configure the BMC event filter from the Web UI.
- ▶ Removed FQDN for LDAP in the Web UI.
- ▶ Fixed an issue where the BMC was not resetting the SBIOS-fail-safe flag after recovery from a boot failure.
- ▶ Fixed an issue where the system still booted when GPU fans from multiple fan zones are removed.
- ▶ Fixed missing interface name in Web UI Service Configuration page.
- ▶ Fixed missing NVSwitch temperature sensor readings.
- ▶ Fixed BMC occasionally disabling GPU temperature sensors.
- ▶ Fixed issue where SEL time-stamped after 9/21 shows "Pre-Init Time-stamp" instead of log info.
- ▶ Fixed an issue where the BMC erroneously reported the backup SBIOS version is 0.0.

Changes in 01.05.20

- ▶ SNMP RO/RW string now disabled by default.

Changes in 01.05.12

- ▶ Added LDAPS (secure LDAP) support.
- ▶ Resolved network connection getting lost when connected to virtual media.
- ▶ Resolved an issue where occasionally the BMC UI would stop responding.

Changes in 01.05.10

- ▶ Fixed an issue with BMC 01.05.07 that potentially affected SBIOS stability.
- ▶ Fixed BMC configuration settings not getting applied to both primary and secondary images.
- ▶ Fixed corrupted primary BMC failing to recover when primary and secondary images are different versions.
- ▶ Fixed issue recovering corrupted firmware on Delta PSU.
- ▶ Fixed BMC web UI reporting BIOS information incorrectly.
- ▶ Fixed BMC Web UI reporting backup BMC version incorrectly.
- ▶ Fixed cryptic BMC entries.
- ▶ Added BMC capture logs from CPLD/FPGA during power on.
- ▶ Added IPMI OEM command to GET and SET which image the SBIOS is pointing to (Change the PIN).
- ▶ Fixed MaxP/MaxQ System unable to boot after BMC-initiated shutdown with four or more PSU failures.
- ▶ Fixed SEL logs to indicate that a bad fan (or fan speed of zero) may have caused the system to shut down due to GPU overtemp.
- ▶ Fixed how the BMC responds when it cannot read a temperature sensor.
- ▶ Fixed the IPMI log event decoding through ipmitool to show the same events as the GUI.
- ▶ Fixed the BMC to provide more meaningful and useful SEL logs.
- ▶ Fixed the GPU sensor name on baseboard 2 to match the service label.
- ▶ Changed the naming of U.2 SSDs from "NVME" to "U.2".-
- ▶ Resolved BMC SNMP community string limitations.

Changes in 01.04.03

- ▶ Fixed BMC Update Timeout issue.
- ▶ Fixed BMC configuration backup/restore function not working properly.
- ▶ Fixed system not shutting down when all fans in Fan Zone 2 or 3 are not detected.
- ▶ Fixed system fans all running at 80% after hot-unplugging/hot-plugging a PSU.
- ▶ Fixed system fans running at 80% after hot-plugging an NVMe drive.
- ▶ Fixed system shutting down after hot-unplugging one of the fans.
- ▶ Fixed system unable to boot after updating BMC image while one BMC module is removed.
- ▶ Fixed incorrect SEL timestamp after executing ipmi mc reset cold.
- ▶ Fixed missing firmware information in the BMC dashboard. Information is available on the Maintenance->Firmware Information page.
- ▶ Fixed missing DIMM information in the BMC dashboard.

- ▶ Fixed blinking amber-colored power LED.
- ▶ Fixed BMC update freeze while updating using Yafuflash.
- ▶ Fixed issues responding to 3.3V/5V/12V sensors.
- ▶ Fixed incorrect responses to GPU temperature assertion - Fan Zone 1 goes to 80% and DIMM temperature reports 'device disabled'.
- ▶ The BMC now saves CPU MCA registers when it detects a fatal MCA error.

Changes in 01.00.01

- ▶ Fixed BMC update via dashboard erroneously perserving the configuration.
- ▶ Fixed Network Link Configuration and Network IP Settings pages on the BMC dashboard to reflect changes only when saved.
- ▶ Added dual FPGA image container update support.
- ▶ Added PSU firmware container update support.
- ▶ Enhanced SMBPBI support for GPU sensors, thermal polling and FAN control to avoid anomalous sensor reading for GPU sensors and corresponding thermal actions.
- ▶ Added support for FPGA update of Image #1 to the BMC dashboard.
- ▶ Added VLAN support to the BMC dashboard.

17.2. DGX-2 SBIOS Changes

Changes in 0.29

- ▶ Implemented updates to address vulnerabilities in the SSA option, Intel CSME, SPS, and TXE.
- ▶ Fixed an issue where updating the SBIOS via the BMC web UI resets the EFI varstore, which removes any changes made to use a signed bootloader.

Changes in 0.26

- ▶ Fixed issue where the system would not boot if one NVMe drive was bad.
- ▶ Fixed issue where each DGX-2 product UUID is not unique.

Changes in 0.24

- ▶ Fixed erroneous events getting logged after system cold reboot.
- ▶ Incorporated Intel microcode to mitigate new side channel attacks (Zombieland).
- ▶ Fixed boot failure when BMC Self Test Status is "Failed".
- ▶ Re-enabled Hyperthreading option in SBIOS.
- ▶ Fixed SMBIOS type 9 tables not filled in properly.

Changes in 0.22

- ▶ Fixed system failing to switch to backup SBIOS when initial boot fails.
- ▶ Fixed enp6s0 network disappearing after enabling M.2 module hot plug in the SBIOS settings.
- ▶ Fixed system unable to boot after replacing a DIMM.
- ▶ Updated the boot recovery process when BMC remains unresponsive during boot. If BMC reset fails, then boot to SBIOS setup menu.
- ▶ Fixed the default PCIe Corrected Error Threshold Counter setting to be enabled.

Changes in 0.17

- ▶ Added SBIOS support for recovering degraded PCIe link during system boot.
- ▶ Enhanced debug capability and support for faster resolution of customer cases via fully decoded MCA, Memory, POST and PCIe SEL events.
- ▶ Developed in-memory PCIe topology in SBIOS to avoid full PCIe scan in turn eliminating unexpected Unsupported requests (PCIe Correctable errors).
- ▶ Enable Error Logging options (enable or disable verbose logging) in SBIOS setup menu.
- ▶ Added support for changing boot order using standard IPMI interface.

17.3. DGX-2 PSU Changes

Changes in 2.7

- ▶ Fixed power-factor and load-balancing issues.
- ▶ Fixed PSU not getting powered on.

Changes in 2.5

- ▶ Fixed power load balancing issue at light loads.
- ▶ Fixed power factor on the PDU showing low value which affects outlet wattage.
- ▶ Fixed issue in COM firmware that may cause a bootloader failure while updating from older PSU FW. Fixed BMC Update Timeout issue.

17.4. DGX-2 U.2 Firmware Release Notes

Changes in 101008S0

- ▶ Increased robustness of host read error handling.

- ▶ Corrected adaptive tracking of NAND read thresholds.
- ▶ Corrected potential invalid media error reported to host during power cycling.
- ▶ Implemented general error handling and stability improvements.

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