DGX-2 SYSTEM FIRMWARE UPDATE CONTAINER

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Release Notes
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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

**How to Use**

The NVIDIA DGX-2 System software includes Docker software required to run the container.
See the NVIDIA DGX-2 System User Guide for instructions on updating the system firmware using this container.

**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.
Chapter 2.
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.
<table>
<thead>
<tr>
<th>Component</th>
<th>Version</th>
<th>Key Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMC</td>
<td>1.05.12</td>
<td>Refer to the instructions in section Special Instructions to determine applicable actions to take. See <a href="#">BMC Release Notes</a> for the list of changes.</td>
</tr>
<tr>
<td>SBIOS</td>
<td>0.24</td>
<td>No change</td>
</tr>
<tr>
<td>M.2 NVMe (Samsung PM963)</td>
<td>CXV8601Q</td>
<td>No change</td>
</tr>
<tr>
<td>U.2 SSD (Micron)</td>
<td>101008R0</td>
<td>No change</td>
</tr>
<tr>
<td>VBIOS (DGX-2)</td>
<td>88.00.6B.00.01</td>
<td>No change</td>
</tr>
<tr>
<td>VBIOS (DGX-2H)</td>
<td>88.00.6B.00.08</td>
<td>No change</td>
</tr>
<tr>
<td>PSU</td>
<td>2.7</td>
<td>No change</td>
</tr>
<tr>
<td>FPGA</td>
<td>3.1</td>
<td>No change</td>
</tr>
</tbody>
</table>

**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.

2.1. 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.

2.1.1. 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. 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

4. 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.

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

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

6. Locate and select the `conf.bak` file downloaded in step 1 and then click **Save**.

7. Now you can update the PSU firmware.

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

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

### 2.1.2. 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. Update the BMC.
   a) Update to the intermediate version.

   ```bash
   $ 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
```

### 2.2. Known Issues

#### 2.2.1. 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.

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

### 2.2.2. 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

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

and then viewing the output for the error message.

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.

   ```bash
   $ 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.

   ```bash
   $ 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.

   ```bash
   $ sudo ./nvfw-dgx2_20.01.25_200207.run sbios_slot --switch-nextboot-slot
   $ telinit 1
   $ umount /raid
   $ sync
   ```
4. Switch the **NextBoot slot** again and reboot to return to the original SBIOS.

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

### 2.2.3. 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" -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.

### 2.2.4. 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>
```

### 2.2.5. 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 3.
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.
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<th>Version</th>
<th>Key Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMC</td>
<td>01.05.10</td>
<td>Refer to the instructions in section Special Instructions to determine applicable actions to take. See BMC Release Notes for the list of changes.</td>
</tr>
<tr>
<td>SBIOS</td>
<td>0.24</td>
<td>See SBIOS Release Notes for the list of changes.</td>
</tr>
<tr>
<td>M.2 NVMe (Samsung PM963)</td>
<td>CXV8601Q</td>
<td>No change</td>
</tr>
<tr>
<td>M.2 NVMe (Samsung PM983)</td>
<td>EDA7202Q</td>
<td>Removed</td>
</tr>
<tr>
<td>U.2 SSD (Micron)</td>
<td>101008R0</td>
<td>No change</td>
</tr>
<tr>
<td>U.2 SSD (Samsung)</td>
<td>EDA5202Q</td>
<td>Removed</td>
</tr>
<tr>
<td>VBIOS (DGX-2)</td>
<td>88.00.6B.00.01</td>
<td>No change</td>
</tr>
<tr>
<td>VBIOS (DGX-2H)</td>
<td>88.00.6B.00.08</td>
<td>No change</td>
</tr>
<tr>
<td>PSU</td>
<td>2.7</td>
<td>Refer to the instructions in section Special Instructions to determine applicable actions to take. No change</td>
</tr>
<tr>
<td>FPGA</td>
<td>3.1</td>
<td>No change</td>
</tr>
</tbody>
</table>

**Change to the Update Process**

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

*Note*: There are two FPGA images - Image-1: Rescue and Image-2: Primary. The Firmware Update Container updates the Primary FPGA image only.
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.

### 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 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.

### 3.1.1. 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. 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
   ```

4. Update to the latest BMC firmware version.
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
```

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

6. Locate and select the `conf.bak` file downloaded in step 1 and then click **Save**.

7. 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
```

### 3.1.2. 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. Update the BMC.
   a) Update to the intermediate version.
DGX-2 System Firmware Update Container Version 19.12.1

```bash
$ 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.

```bash
$ 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.

```bash
$ 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.

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

3.2. Known Issues

3.2.1. 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:

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

and then viewing the output for the error message.

話し

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.
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.

  ```bash
  $ 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.

  ```bash
  $ 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.

  ```bash
  $ 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.

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

### 3.2.2. 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.

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

   ```bash
   {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.

3.2.3. 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.

3.2.4. 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.
3.2.5. 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.
3.2.6. 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>
```

3.2.7. 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 4.
DGX-2 SYSTEM FIRMWARE UPDATE CONTAINER VERSION 19.09.3

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).
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.

<table>
<thead>
<tr>
<th>Component</th>
<th>Version</th>
<th>Key Changes</th>
</tr>
</thead>
</table>
| BMC       | 01.04.03 | 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. |

<table>
<thead>
<tr>
<th>Component</th>
<th>Version</th>
<th>Key Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- If updating from versions earlier than 1.00.01, you must download and use the `conf.bak` file as explained in Special Instructions to complete the update.
<table>
<thead>
<tr>
<th>Component</th>
<th>Version</th>
<th>Key Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.2 NVMe (Samsung</td>
<td>CXV8601Q</td>
<td>No change</td>
</tr>
<tr>
<td>PM963)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.2 NVMe (Samsung</td>
<td>EDA7202Q</td>
<td>New (supports second-source component)</td>
</tr>
<tr>
<td>PM983)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.2 SSD (Micron)</td>
<td>101008R0</td>
<td>No change</td>
</tr>
<tr>
<td>U.2 SSD (Samsung)</td>
<td>EDA5202Q</td>
<td>New (supports second-source component)</td>
</tr>
<tr>
<td>VBIOS (DGX-2)</td>
<td>88.00.6B.00.01</td>
<td>No change</td>
</tr>
<tr>
<td>VBIOS (DGX-2H)</td>
<td>88.00.6B.00.08</td>
<td>New (supports DGX-2H VBIOS)</td>
</tr>
<tr>
<td>PSU</td>
<td>2.7</td>
<td>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. See PSU Release Notes for the list of changes.</td>
</tr>
<tr>
<td>FPGA</td>
<td>3.1</td>
<td>New (added FPGA to container)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: There are two FPGA images - Image-1:Rescue and Image-2:Primary. The Firmware Update Container updates the Primary FPGA image only.</td>
</tr>
</tbody>
</table>

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.

### 5.1. 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.

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

5.2. Known Issues

5.2.1. 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**.

5.2.2. 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:

```bash
update_fw -f all
```

or

```bash
update_fw VBIOS [other]
```

**Workaround**

Update the VBIOS by itself.

```bash
$ sudo nvidia-docker run --privileged -ti -v /:/hostfs <container-name> update_fw VBIOS
```
5.2.3. 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.

5.2.4. 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>
```

5.2.5. 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 6.
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.

<table>
<thead>
<tr>
<th>Component</th>
<th>Version</th>
<th>Key Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMC</td>
<td>01.00.01</td>
<td>To complete the update, you must download and use the <code>conf.bak</code> file as explained in Special Instructions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See BMC Release Notes for the list of changes.</td>
</tr>
<tr>
<td>SBIOS</td>
<td>0.17</td>
<td>See SBIOS Release Notes for the list of changes.</td>
</tr>
<tr>
<td>M.2 SSD (Samsung)</td>
<td>CXV8601Q</td>
<td>No change</td>
</tr>
<tr>
<td>U.2 SSD (Micron)</td>
<td>101008R0</td>
<td>No change</td>
</tr>
<tr>
<td>VBIOS</td>
<td>88.00.06B.00.01</td>
<td>No change</td>
</tr>
</tbody>
</table>
Changes in this Release

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

6.1. 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.

   ```bash
   $ 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
   ```

### 6.2. Known Issues

#### 6.2.1. 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.

#### 6.2.2. 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:

<table>
<thead>
<tr>
<th>CONTAINER ID</th>
<th>IMAGE</th>
<th>COMMAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>2e76a51fd85b</td>
<td>nvfw-dgx2_08.19.1</td>
<td>&quot;/usr/bin/python /sr\u2026&quot;</td>
</tr>
<tr>
<td>seconds ago</td>
<td>Up 4 seconds</td>
<td></td>
</tr>
</tbody>
</table>

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.

6.2.3. 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>
```
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.

<table>
<thead>
<tr>
<th>Component</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMC</td>
<td>0.97.01</td>
</tr>
<tr>
<td>SBIOS</td>
<td>0.14</td>
</tr>
<tr>
<td>M.2 SSD (Samsung)</td>
<td>CXV8601Q</td>
</tr>
<tr>
<td>U.2 SSD (Micron)</td>
<td>101008R0</td>
</tr>
<tr>
<td>VBIOS</td>
<td>88.00.68.00.01</td>
</tr>
</tbody>
</table>

**7.1. Known Issues**

**7.1.1. 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:**

<table>
<thead>
<tr>
<th>CONTAINER ID</th>
<th>IMAGE</th>
<th>COMMAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>2e76a51fd85b</td>
<td>nvfw-dgx2_08.19.1</td>
<td>&quot;/usr/bin/python /sr\u2026&quot;</td>
</tr>
<tr>
<td>seconds ago</td>
<td>Up 4 seconds</td>
<td></td>
</tr>
</tbody>
</table>

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.

7.1.2. 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 8. 
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

8.1. DGX-2 BMC Changes

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-plugging 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 preserving 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.

8.2. DGX-2 SBIOS Changes

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 loggin) in SBIOS setup menu.
- Added support for changing boot order using standard IPMI interface.
8.3. 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.
Appendix A.
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 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.

   ```
s  $ 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.
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