



DGX A100 System Firmware Update Container

Release Notes

Table of Contents

Chapter 1. DGX A100 System FW Update Container Overview.....	1
Chapter 2. Using the DGX A100 FW Update Utility.....	2
2.1. Using NVSM.....	2
2.2. Using docker run.....	3
2.3. Using the .run File.....	4
2.4. Command and Argument List.....	4
Chapter 3. Using the DGX A100 Firmware Update ISO.....	7
3.1. About the Firmware Update Menu.....	7
3.2. Booting to the Firmware Update ISO from a USB Flash Drive.....	8
3.3. Booting to the Firmware Update ISO by PXE Boot.....	9
Chapter 4. DGX A100 System Firmware Update Container Version 21.05.7.....	11
4.1. Special Instructions for Red Hat Enterprise Linux.....	13
4.2. Instructions for Updating Firmware.....	14
4.3. Known Issues.....	17
4.3.1. BMC UI May not be Accessible from Mac OS.....	17
4.3.2. Boot Order in the SBIOS Reverts to the Default.....	18
4.3.3. Unable to Launch BMC Dashboard under Firefox.....	18
4.3.4. The system starts the POST process several times during boot after updating the SBIOS.....	18
Chapter 5. DGX A100 System Firmware Update Container Version 21.03.6.....	19
5.1. Special Instructions for Red Hat Enterprise Linux.....	21
5.2. Instructions for Updating Firmware.....	22
5.3. Known Issues.....	24
5.3.1. BMC UI May not be Accessible from Mac OS.....	25
5.3.2. Boot Order in the SBIOS Reverts to the Default.....	25
5.3.3. Unable to Launch BMC Dashboard under Firefox.....	25
5.3.4. The system starts the POST process several times during boot after updating the SBIOS.....	26
Chapter 6. DGX A100 System Firmware Update Container Version 20.12.3.3.....	27
6.1. Special Instructions for Red Hat Enterprise Linux.....	28
6.2. Instructions for Updating Firmware.....	29
6.3. Known Issues.....	32
6.3.1. BMC UI May not be Accessible from Mac OS.....	33
6.3.2. Update Timeout Reported for Motherboard CEC.....	33
6.3.3. Boot Order in the SBIOS Reverts to the Default.....	34

Chapter 7. DGX A100 System Firmware Update Container Version 20.12.3.....	35
7.1. Instructions for Updating Firmware.....	36
7.2. Known Issues.....	38
7.2.1. BMC UI May not be Accessible from Mac OS.....	38
7.2.2. Update Timeout Reported for Motherboard CEC.....	39
7.2.3. Boot Order in the SBIOS Reverts to the Default.....	39
Chapter 8. DGX A100 System Firmware Update Container Version 20.11.3.....	40
8.1. Instructions for Updating Firmware.....	42
8.2. Known Issues.....	43
8.2.1. Firmware Update Log File Size Impacts nvsm dump health.....	44
8.2.2. BMC UI May not be Accessible from Mac OS.....	44
8.2.3. Update Timeout Reported for Motherboard CEC.....	44
8.2.4. Boot Order in the SBIOS Reverts to the Default.....	45
Chapter 9. DGX A100 System Firmware Update Container Version 20.05.12.3.....	46
9.1. Updating Firmware on DGX Systems Installed with DGX OS Release 5.0 or Later.....	47
9.2. Instructions for Updating Firmware.....	47
Chapter 10. DGX A100 System Firmware Update Container Version 20.05.12.2.....	50
10.1. Instructions for Updating Firmware.....	51
Chapter 11. DGX A100 System Firmware Update Container Version 20.05.12.....	54
11.1. Instructions for Updating Firmware.....	56
Chapter 12. DGX A100 System Firmware Changes.....	58
12.1. DGX A100 BMC Changes.....	58
12.2. DGX A100 SBIOS Changes.....	59
12.3. DGX A100 Broadcom 88096 PCIe Switchboard Changes.....	60
12.4. DGX A100 Broadcom 880xx Retimer Changes.....	60
12.5. A100 VBIOS Changes.....	60
12.6. DGX A100 BMC CEC Changes.....	61
12.7. DGX A100 CEC1712 SPI Changes.....	61
12.8. DGX A100 NVSwitch Firmware Changes.....	61
12.9. DGX A100 FPGA Release Notes.....	61
12.10. DGX A100 Delta PSU Release Notes.....	62
Appendix A. DGX A100 Firmware Update Process.....	63

Chapter 1. DGX A100 System FW Update Container Overview

The NVIDIA DGX™ A100 System Firmware Update container is the preferred method for updating firmware on DGX A100 system. 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 A100 system firmware, such as the system BIOS and BMC.
- ▶ 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 A100 FW Update Utility

The NVIDIA DGX A100 System Firmware Update utility is provided in a tarball and also as a .run file. Copy the files to the DGX A100 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.
- ▶ 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.



Note: 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 A100 system software includes Docker software required to run the container.

1. Copy the tarball to a location on the DGX system.

- From the directory where you copied the tarball, enter the following command to load the container image.

```
$ sudo docker load -i nvfw-dgxa100_21.05.7_210519.tar.gz
```

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

```
$ sudo docker images
```

```
REPOSITORY    TAG
nvfw-dgxa100  21.05.7
```

- 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-dgxa100:21.05.7
```

- Run the command.

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

2.2. Using docker run

The NVIDIA DGX A100 system software includes Docker software required to run the container.

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

```
$ sudo docker load -i nvfw-dgxa100_21.05.7_210519.tar.gz
```

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

```
$ sudo docker images
```

```
REPOSITORY    TAG
nvfw-dgxa100  21.05.7
```

- Use the following syntax to run the container image.

```
$ sudo docker run --rm --privileged -ti -v /:/hostfs nvfw-dgxa100:21.05.7
<command> <[arg1] [arg2] ... [argn]
```

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



Note: If you do not have the tarball file, but you do have the .run file, you can extract the tarball from the .run file by issuing the following:

```
sudo nvfw-dgxa100_21.05.7_210519.run -x
```

2.3. Using the .run File

The update container is also available as a .run file. The .run file uses the Docker software if it is installed on the system, but can also be run without Docker installed.

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

```
$ chmod +x nvfw-dgxa100_21.05.7_210519.run
```

2. Use the following syntax to run the container image.

```
$ sudo ./nvfw-dgxa100_21.05.7_210519.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 List

Common Commands and Arguments

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-dgxa100:21.05.7 show_fw_manifest
- ▶ .run File Example: \$ **sudo ./nvfw-dgxa100_21.05.7_210519.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-dgxa100:21.05.7 show_version
- ▶ .run File Example: \$ **sudo ./nvfw-dgxa100_21.05.7_210519.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-dgxa100:21.05.7 update_fw all

- ▶ .run File Example: \$ **sudo ./nvfw-dgxa100_21.05.7_210519.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-dgxa100:21.05.7 update_fw BMC SBIOS
 - ▶ .run File Example: \$ **sudo ./nvfw-dgxa100_21.05.7_210519.run update_fw BMC SBIOS**

List of Arguments

```
Update flags:
Updates all, a specified combination, or an individual firmware component
if the image currently on the device is prior to the available version.
syntax:
  update_fw < firmware_components >
  update_fw < component [ -f | --force ] [ component options ] >

Update flag Definitions :
--force  bypass the checks and upgrade regardless of the version.
all      Update firmware on all components.
syntax:  update_fw all

SBIOS    Update the System BIOS firmware.
syntax:  update_fw SBIOS [ -a | --active]
          [ -i | --inactive]

BMC      Update the firmware on all, or a specified Baseboard Management
          Controller.
syntax:  update_fw BMC [ -a | --active]
          [ -i | --inactive]
          [ -b | --bmc-access-path <BMC IP:login_id:password> ]
          [ -m | --intermediate-fw ]
          [ -t | --target-bmc <target BMC> ]
where:
  --bmc-access-path <val>  Non-default access parameters to the BMC

SSD      Update firmware on all, or a specified Solid State Drive.
syntax:  update_fw SSD [ -s | --select-ssd <SSD target> ]
where:
  --select-ssd <target>  Name of the specific drive to update

PSU      Update the firmware on all, or a specified Power Supply
syntax:  update_fw PSU [ -s | --select-psu <PSU number> ] [ -S | --
select-slot <PSU slot> }
where:
  --select-psu <target>  Name of the specific PSU to update.
  --select-slot <slot>  Name of the specific PSU slot to update

VBIOS    Update the Video BIOS firmware on all detected GPUs.
          It is not currently possible to update individual GPU devices.
syntax:  update_fw VBIOS

FPGA     Update firmware on the FPGA devices on lower and upper GPU trays.
```

```
    syntax: update_fw FPGA

SWITCH  Update firmware on one, specific set, or all switch devices.
        syntax: update_fw SWITCH [ -s | --select-switch <switch-model[:BDF]> ]

CEC     Update firmware on one or multiple CEC
        syntax: update_fw CEC [ -s | --select-cec [ MB_CEC | Delta_CEC ]

CPLD    Update MB CPLD / MID CPLD firmware
        syntax: update_fw CPLD [ -s | --select-cpld [ MB_CPLD | MID_CPLD ]
```

Chapter 3. Using the DGX A100 Firmware Update ISO

This section describes how to use the DGX A100 firmware update ISO to efficiently update the firmware in a large fleet of DGX A100 systems.

3.1. About the Firmware Update Menu

Once the system boots up to the firmware update ISO, it sets up the environment and launches a firmware update menu. The menu can be used in the following three different modes:

- ▶ **Interactive**

This displays a text-based UI with the following choices of actions to take:

- ▶ **Start the firmware update container**

This runs the firmware update container using the `update_fw all` option.

- ▶ **Start the firmware update container with custom options**

This runs the firmware update container using custom arguments that you enter into a text box. Separate multiple arguments by a space. Example

```
update_fw BMC -f
```

See [List of Arguments](#) for available arguments.

- ▶ **Set up connection for automation and Exit**

This sets up an SSH connection (default user name is `fwui` and default password is `fw_update`).so you can run automation scripts from a different system. For example, this lets you use Ansible automation.

- ▶ **Exit**

- ▶ **Non-interactive**

This reads reads the argument from kernel parameter (`/proc/cmdline`) and then runs the firmware update container automatically. See [Updating the Firmware Automatically](#).

- ▶ **Automation**

This sets up an SSH connection. The default user name is `fwui` and default password is `fw_update`. From there you can use automation scripts (for example, Ansible) to perform the firmware update.

3.2. Booting to the Firmware Update ISO from a USB Flash Drive

This section describes how to boot to the DGX A100 firmware update ISO from a USB flash drive.

Basic Process

Download the ISO image and create a bootable USB drive that contains the ISO image.



Important: Do not use the virtual media from the BMC as the BMC will be reset during the update.

Updating the Firmware Automatically

To set up the firmware to update automatically when the system boots up,

1. Edit the GRUB menu parameters within the ISO at `BOOT/GRUB/GRUB.CGF` as follows.

Set `fwuc-mode=noninteractive`.

Set the following parameters as needed.

▶ `fwuc-update_args=<arg1>,<arg2> ...`

▶ `fwuc-extra_args=<extra-arg1> ...`

See [List of Arguments](#) for available arguments.

The following example boots the firmware update ISO in non-interactive mode and then updates the SBIOS without first checking the installed version, then reboots the system after the update.

```
menuentry "Start Firmware Update Environment (Non-interactive)" {
    linux /vmlinuz boot=live console=tty0 apparmor=0 elevator=noop nvme-
core.multipath=n nouveau.modeset=0 boot-live-env start-systemd-networkd fwuc-
mode=noninteractive fwuc-update_args=update_fw,SBIOS,-f fwuc-extra_args=reboot-
after-update
    initrd /initrd
}
```

2. Create a bootable USB drive that contains the updated ISO.
3. Boot to the USB drive.

3.3. Booting to the Firmware Update ISO by PXE Boot

This section describes how to PXE boot to the DGX A100 firmware update ISO.

1. Refer to the information in [Setting Up DGX OS 5.0 for PXE Boot](#) for guidance on setting up the DGX A100 to PXE boot.

2. Download the ISO image and then mount it.

```
$ sudo mount -o loop ~/DGXA100_FWUI-21.03.6-2021-03-23-22-03-47.iso /mnt
```

3. Copy the `filesystem.squashfs`, `initrd`, and `vmlinuz` files to the `http` directory.

```
$ sudo mkdir -p /local/http/firmware-update/
$ sudo cp /mnt/live/filesystem.squashfs /local/http/firmware-update/
$ sudo cp /mnt/{initrd,vmlinuz} /local/http/firmware-update/
$ umount /mnt
```

The new `/local/http` folder structure should look like this:

```
/local/http/
├── dgxbaseos-5.x.y
│   ├── base_os_5.x.y.iso
│   ├── initrd
│   └── vmlinuz
└── firmware-update
    ├── filesystem.squashfs
    ├── initrd
    └── vmlinuz
```

4. Edit the `/local/syslinux/efi64/pxelinux.cfg/default` file to add the following menu option content for the Firmware Update OS.

```
label Firmware Update Container
  menu label Firmware Update Container
  kernel http://${SERVER_IP}/firmware-update/vmlinuz
  initrd http://${SERVER_IP}/firmware-update/initrd
  append vga=788 initrd=initrd boot=live console=tty0 console=ttyS1,115200n8
  apparmor=0 elevator=noop nvme-core.multipath=nouveau.modeset=0 boot-
  live-env start-systemd-networkd fetch=http://${SERVER_IP}/firmware-update/
  filesystem.squashfs
```



Important: If the system is booting from the LAN port connection (`enp226s0`), connections to slot 4 (`enp225s0f0` and `enp225s0f1`) must be on the same domain as the LAN port. If they are not on the same domain, then add `live-netdev=enp226s0` to the `append` line.

Example:

```
append vga=788 initrd=initrd boot=live console=tty0 apparmor=0 live-
netdev=enp226s0 elevator=noop nvme-core.multipath=n nouveau.modeset=0
  boot-live-env start-systemd-networkd fetch=http://${SERVER_IP}/
  filesystem.squashfs
```

5. (Optional) To set up the boot configuration to run the container automatically when booting, edit the following parameters at `pxelinux.cfg/default`:

Set `fwuc-mode=noninteractive`.

Set the following parameters as needed.

- ▶ `fwuc-update_args=<arg1>,<arg2> ...`
- ▶ `fwuc-extra_args=<extra-arg1> ...`

See [List of Arguments](#) for available arguments.

The following example boots the package in non-interactive mode and updates the SBIOS without first checking the installed version, then reboots the system after the update.

```
append vga=788 initrd=initrd boot=live console=tty0 apparmor=0 elevator=noop
nvme-core.multipath=n nouveau.modeset=0 fwuc-mode=noninteractive fwuc-
update_args=update_fw,SBIOS,-f fwuc-extra_args=reboot-after-updateboot-live-env
start-systemd-networkd fetch=http://${SERVER_IP}/filesystem.squashfs
```

6. Change permissions on `/local`.

```
$ sudo chmod 755 -R /local
```

7. PXE boot by restarting the system using `ipmitool`.

```
$ ipmitool -I lanplus -H <DGX-BMC-IP> -U <username> -P <password> chassis bootdev
pxe options=efiboot
$ ipmitool -I lanplus -H <DGX-BMC-IP> -U <username> -P <password> chassis power
reset
```

When the system PXE menu comes up, choose the Firmware Update Container option. The firmware is updated automatically once the system has booted. If not set to update automatically, then follow the instructions to update the firmware.

Chapter 4. DGX A100 System Firmware Update Container Version 21.05.7

The DGX Firmware Update container version 21.05.7 is available.

- ▶ Package name: `nvfw-dgxa100_21.05.7_210519.tar.gz`
- ▶ Run file name: `nvfw-dgxa100_21.05.7_210519.run`
- ▶ Image name: `nvfw-dgxa100:21.05.7`
- ▶ ISO image: `DGXA100_FWUI-21.05.7-2021-05-19-07-26-16.iso`
- ▶ PXE netboot: `pxeboot-dgxa100-21.05.7.tgz`

Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
 - ▶ DGX OS 5.0 or later



Important: This firmware update container does not support DGX OS 4.99.xx. To use the container on DGX A100 servers, update to DGX OS 5.0 or later.

- ▶ EL7-21.01 or later (See [Special Instructions for Red Hat Enterprise Linux](#))
- ▶ EL8-20.11 or later
- ▶ Eliminated the need for the workaround when updating the CEC 1712 SPI from 3.5 to 3.9.
- ▶ Fixed 0W reporting issue with Delta PSU.

Contents of the DGX A100 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table. The update time for each component is provided for reference. Total update time if all components are updated is approximately 2 hours and 20 minutes.

Component	Version	Key Changes	Update Time
BMC (via CEC)	00.14.17	See DGX A100 BMC Changes	25 minutes
SBIOS	0.34	No change	7 minutes
Broadcom 88096 PCIe switch board	0.2.0	No change	8 minutes
BMC CEC SPI	v3.28	No change	8 minutes
PEX88064 Retimer	1.2f	No change	7 minutes
PEX88080 Retimer	1.2f	No change	7 minutes
NvSwitch BIOS	92.10.18.00.01	No change	8 minutes
VBIOS (A100 40GB)	92.00.36.00.04	No change	7 minutes
VBIOS (A100 80GB)	92.00.36.00.01	No change	
U.2 NVMe (Samsung)	EPK99B5Q	No change	6 minutes
U.2 NVMe (Kioxia)	0105	No change	
M.2 NVMe (Samsung)	EDA7602Q	No change	3 minutes
FPGA (GPU sled)	2.A5	No change	40 minutes
CEC1712 SPI (GPU sled)	3.9	No change	7 minutes
PSU (Delta)	Primary 1.6 / Secondary 1.6 / Community 1.7	Added to container	90 minutes

Updating Components with Secondary Images

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

- ▶ **SBIOS:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. When using `update_fw all`, the update container updates both active and inactive images.
- ▶ **BMC:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. The update container can only update the inactive image, and will update it only if the *active* image needs to be updated. After the update is completed, the updated inactive image becomes the active image. Because the active image is now updated, subsequent `update_fw all` commands will not update the inactive image. To update the inactive image in this case, use `update_fw BMC --inactive`.

Updating the PSU FW

If one of the PSU firmware slots (primary, secondary, or community) is corrupted, updating the PSU firmware will fail if attempts are made to update other slots.

- ▶ If you know the slot that is corrupted, then update that slot as follows (where <psu> is 0, 1, 2, 3, 4, or 5; <Slot> is Primary, Secondary, or Community);

```
$ sudo ./nvfw-dgxa100_21.05.7_210519.run update_fw PSU -s <psu> -S <Slot> -f
```

- ▶ If you do not know which slot is corrupted, then use the SKIP_FAIL flag to update all three slots.

```
$ sudo ./nvfw-dgxa100_21.05.7_210519.run set_flags SKIP_FAIL=1 update_fw PSU -s <psu> -f
```

The FWUC may display a message about the PSU update failing in the non-corrupted slots, but the PSU should actually be recovered because the corrupted slot is successfully updated.

DO NOT UPDATE DGX A100 CPLD FIRMWARE UNLESS INSTRUCTED

When updating DGX A100 firmware using the Firmware Update Container, do not update the CPLD firmware unless the DGX A100 system is being upgraded from 320GB to 640GB.

The current DGX A100 Firmware Update Container will not automatically update the CPLD firmware (for example, when running `update_fw all`). It is possible to update the CPLD firmware using `update_fw CPLD`; however, it is strongly recommended that the CPLD firmware not be updated manually unless specifically instructed by [NVIDIA Enterprise Support](#) (or email enterprisesupport@nvidia.com). If the DGX A100 is upgraded from 320GB to 640GB, the CPLD firmware update should be performed as instructed.

4.1. Special Instructions for Red Hat Enterprise Linux

This section describes the actions that must be taken before updating firmware on DGX A100 systems installed with Red Hat Enterprise Linux. There are two options for meeting these requirements.

Option 1: Update to EL7-21.01 or later

Refer to the [DGX Software for Red Hat Enterprise Linux 7 Release Notes](#) for more information.



Important: Updating the DGX software for Red Hat Enterprise Linux will update the Red Hat Enterprise Linux installation to 7.9 or later. If you do not want to update your Red Hat Enterprise Linux 7 installation, then choose Option 2.

Option 2: Install mpt3sas 31.101.01.00-0

These instructions apply if

- ▶ You do not want to update your Red Hat Enterprise Linux installation, and
- ▶ Your system is currently installed with Red Hat Enterprise Linux 7.7 or later.

If your system is installed with Red Hat Enterprise Linux 7.6 or earlier, contact NVIDIA Enterprise Support for assistance.

1. Perform this step if your system is no longer pointing to the NVIDIA DGX software repository.

- a). On Red Hat Enterprise Linux, run the following commands to enable additional repositories required by the DGX software.

```
sudo subscription-manager repos --enable=rhel-7-server-extras-rpms
sudo subscription-manager repos --enable=rhel-7-server-optional-rpms
```

- b). Run the following command to install the DGX software installation package and enable the NVIDIA DGX software repository.



ATTENTION: By running these commands you are confirming that you have read and agree to be bound by the [DGX Software License Agreement](#). You are also confirming that you understand that any pre-release software and materials available that you elect to install in a DGX may not be fully functional, may contain errors or design flaws, and may have reduced or different security, privacy, availability, and reliability standards relative to commercial versions of NVIDIA software and materials, and that you use pre-release versions at your risk.

```
yum install -y \
https://international.download.nvidia.com/dgx/repos/rhel-files/dgx-repo-
setup-20.03-1.el7.x86_64.rpm
```

2. Install mpt3sas 31.101.01.00-0.

```
sudo yum install mpt3sas-dkms
```

3. Load the mpt3sas driver into the Red Hat Enterprise Linux kernel.

```
sudo modprobe mpt3sas
```

You can verify the correct mpt3sas version is installed by issuing the following.

```
yum list installed
```

4.2. 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 A100 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-dgxa100:21.05.7_210519.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. Perform the update for all firmware supported by the container.

```
$ sudo ./nvfw-dgxa100:21.05.7_210519.run update_fw all
```

Depending on the firmware that is updated, you may be prompted to either reboot the system or power cycle the system.

- ▶ If you are prompted to reboot, issue

```
$ sudo reboot
```

- ▶ If you are prompted to power cycle, you can issue the following two commands (there is no output with the first command).

```
$ sudo ipmitool raw 0x3c 0x04
$ sudo ipmitool chassis power cycle
```

3. After rebooting or power cycling the system, you may need to perform another `update_fw all` to update other firmware.

- ▶ Either repeat Step 1 to check if updates are needed and then perform Step 2 if needed, or
- ▶ Repeat Step 2 just in case updates are needed.

If you perform another `update_fw all`, you may be prompted again to either reboot the system or power cycle the system.

See [DGX A100 Firmware Update Process](#) for more information about the update process.

You can verify the update by issuing the following.

```
$ sudo ./nvfw-dgxa100:21.05.7_210519.run show_version
```

Example output for a DGX A100 320GB system

```
CEC
=====
MB_CEC (enabled)           Onboard Version  Manifest  up-to-date
Delta_CEC (enabled)       3.28          3.28      yes
BMC DGX                   3.09          3.09      yes
```

```

=====
Image Id          Status      Location      Onboard Version  Manifest  up_to_date
0:Active Boot      Online       Local           00.14.17    00.14.17    yes
1:Inactive Updatable  Local       00.14.17      00.14.17    yes

  SBIOS
=====
Image Id          Onboard Version  Manifest  up_to_date
0:Inactive Updatable  0.34           0.34     yes
1:Active Boot Updatable  0.34           0.34     yes

  Switches
=====
PCI Bus#          Model           Onboard Version Manifest  FUB Updated? up-to-
date
DGX - 0000:91:00.0 (U261)  88064_Retimer  1.2.0      1.2.0     N/A        yes
DGX - 0000:88:00.0 (U260)  88064_Retimer  1.2.0      1.2.0     N/A        yes
DGX - 0000:4f:00.0 (U262)  88064_Retimer  1.2.0      1.2.0     N/A        yes
DGX - 0000:48:00.0 (U225)  88080_Retimer  1.2.0      1.2.0     N/A        yes

DGX - 0000:01:00.0 (U1)    PEX88096       2.0        2.0       N/A        yes
DGX - 0000:b1:00.0 (U4)    PEX88096       2.0        2.0       N/A        yes
DGX - 0000:41:00.0 (U2)    PEX88096       2.0        2.0       N/A        yes
DGX - 0000:81:00.0 (U3)    PEX88096       2.0        2.0       N/A        yes

DGX - 0000:c4:00.0        LR10           92.10.18.00.01 92.10.18.00.01 yes      yes
DGX - 0000:c5:00.0        LR10           92.10.18.00.01 92.10.18.00.01 yes      yes
DGX - 0000:c8:00.0        LR10           92.10.18.00.01 92.10.18.00.01 yes      yes
DGX - 0000:c6:00.0        LR10           92.10.18.00.01 92.10.18.00.01 yes      yes
DGX - 0000:c9:00.0        LR10           92.10.18.00.01 92.10.18.00.01 yes      yes
DGX - 0000:c7:00.0        LR10           92.10.18.00.01 92.10.18.00.01 yes      yes

  Mass Storage
=====
Drive Name/Slot    Model Number      Onboard Version  Manifest  up-to-date
nvme0n1            Samsung MZWLJ3T8HBL5-00007 EPK99B5Q        EPK99B5Q    yes
nvme1n1            Samsung MZ1LB1T9HALS-00007 EDA7602Q        EDA7602Q    yes
nvme2n1            Samsung MZ1LB1T9HALS-00007 EDA7602Q        EDA7602Q    yes
nvme3n1            Samsung MZWLJ3T8HBL5-00007 EPK99B5Q        EPK99B5Q    yes
nvme4n1            Samsung MZWLJ3T8HBL5-00007 EPK99B5Q        EPK99B5Q    yes
nvme5n1            Samsung MZWLJ3T8HBL5-00007 EPK99B5Q        EPK99B5Q    yes

  Video BIOS
=====
Bus                Model              Onboard Version  Manifest  FUB Updated? up-to-
date
0000:07:00.0      A100-SXM4-40GB    92.00.36.00.04  92.00.36.00.04  yes      yes
0000:0f:00.0      A100-SXM4-40GB    92.00.36.00.04  92.00.36.00.04  yes      yes
0000:47:00.0      A100-SXM4-40GB    92.00.36.00.04  92.00.36.00.04  yes      yes
0000:4e:00.0      A100-SXM4-40GB    92.00.36.00.04  92.00.36.00.04  yes      yes
0000:87:00.0      A100-SXM4-40GB    92.00.36.00.04  92.00.36.00.04  yes      yes
0000:90:00.0      A100-SXM4-40GB    92.00.36.00.04  92.00.36.00.04  yes      yes
0000:b7:00.0      A100-SXM4-40GB    92.00.36.00.04  92.00.36.00.04  yes      yes
0000:bd:00.0      A100-SXM4-40GB    92.00.36.00.04  92.00.36.00.04  yes      yes

  FPGA
=====
Onboard version    Manifest  up-to-date
02.a5              02.a5     yes

  Power Supply
=====

```

ID	Vendor Model	MFR ID	Status	Onboard		up-to-date
				Version	Manifest	
PSU 0: Primary	Delta ECD16010092	Delta	ok	01.06	01.06	yes
PSU 0: Secondary	Delta ECD16010092	Delta	ok	01.06	01.06	yes
PSU 0: Community	Delta ECD16010092	Delta	ok	01.07	01.07	yes
PSU 1: Primary	Delta ECD16010092	Delta	ok	01.06	01.06	yes
PSU 1: Secondary	Delta ECD16010092	Delta	ok	01.06	01.06	yes
PSU 1: Community	Delta ECD16010092	Delta	ok	01.07	01.07	yes
PSU 2: Primary	Delta ECD16010092	Delta	ok	01.06	01.06	yes
PSU 2: Secondary	Delta ECD16010092	Delta	ok	01.06	01.06	yes
PSU 2: Community	Delta ECD16010092	Delta	ok	01.07	01.07	yes
PSU 3: Primary	Delta ECD16010092	Delta	ok	01.06	01.06	yes
PSU 3: Secondary	Delta ECD16010092	Delta	ok	01.06	01.06	yes
PSU 3: Community	Delta ECD16010092	Delta	ok	01.07	01.07	yes
PSU 4: Primary	Delta ECD16010092	Delta	ok	01.06	01.06	yes
PSU 4: Secondary	Delta ECD16010092	Delta	ok	01.06	01.06	yes
PSU 4: Community	Delta ECD16010092	Delta	ok	01.07	01.07	yes
PSU 5: Primary	Delta ECD16010092	Delta	ok	01.06	01.06	yes
PSU 5: Secondary	Delta ECD16010092	Delta	ok	01.06	01.06	yes
PSU 5: Community	Delta ECD16010092	Delta	ok	01.07	01.07	yes

CPLD			
	Onboard Version	Manifest	up-to-date
MID_CPLD	1.03	1.03	yes
MB_CPLD	1.03	1.03	yes

* CPLD won't be updated by default (`update_fw all`), use `update_fw CPLD` if it's needed

4.3. Known Issues

4.3.1. BMC UI May not be Accessible from Mac OS

Issue

When attempting to connect to the DGX A100 BMC from a system with Mac OS, a "Your connection is not private" message appears that prevents access to the BMC.

Explanation

BMC version 0.13.6 provides a self-signed certificate which Mac OS flags in the browser. Most browsers will let you either accept the risk and continue, or add the certificate to the keychain and continue. The Chrome and Opera browsers, however, do not provide these options and so Mac OS users will not be able to access the BMC from the Chrome or Opera browser.

To access the DGX A100 BMC, Mac OS users can use Safari or Firefox, which provide an access path.

4.3.2. Boot Order in the SBIOS Reverts to the Default

Issue

After updating the SBIOS, any changes in the boot order that you have made are not preserved and the boot order specified in the SBIOS reverts to the following.

```
Boot Option #1 [Hard Disk]
Boot Option #2 [NVME]
Boot Option #3 [USB CD/DVD]
Boot Option #4 [USB Hard Disk]
Boot Option #5 [USB Key]
Boot Option #6 [Network]
```

Explanation

You will need to prepare for the change when restarting the system, and then enter the SBIOS setup to edit the boot order as needed.

4.3.3. Unable to Launch BMC Dashboard under Firefox

Issue

After updating the BMC from to 0.13.16, attempts to access the BMC dashboard fails with a "Secure Connection Fail" message.

Explanation

To work around, update Firefox to version 84.01 or later.

4.3.4. The system starts the POST process several times during boot after updating the SBIOS.

Issue

After updating the SBIOS and rebooting the system, the NVIDIA splash screen appears and disappears several times before boot is completed.

Explanation

After updating the SBIOS, several component states are cleared and it takes 3-4 reboots to reset all the components. This is expected behavior.

Chapter 5. DGX A100 System Firmware Update Container Version 21.03.6

The DGX Firmware Update container version 21.03.6 is available.

- ▶ Package name: `nvfw-dgxa100_21.03.6_210321.tar.gz`
- ▶ Run file name: `nvfw-dgxa100_21.03.6_210321.run`
- ▶ Image name: `nvfw-dgxa100:21.03.6`
- ▶ ISO image: `DGXA100_FWUI-21.03.6-2021-03-23-22-03-47.iso`
- ▶ PXE netboot: `pxeboot-dgxa100-21.03.6.tgz`

Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
 - ▶ DGX OS 4.99.11
 - ▶ DGX OS 5.0 or later
 - ▶ EL7-21.01 or later (See [Special Instructions for Red Hat Enterprise Linux](#))
 - ▶ EL8-20.11 or later
- ▶ Added ISO and netboot package for efficiently updating multiple systems.
- ▶ Added code to prevent use of hardware that is being updated, such as NVIDIA GPUs.

Contents of the DGX A100 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table. The update time for each component is provided for reference. Total update time if all components are updated is approximately 2 hours and 20 minutes.

Component	Version	Key Changes	Update Time
BMC (via CEC)	00.14.16	See DGX A100 BMC Changes	25 minutes
SBIOS	0.34	See DGX A100 SBIOS Changes	7 minutes

Component	Version	Key Changes	Update Time
Broadcom 88096 PCIe switch board	0.2.0	See DGX A100 Broadcom 88096 PCIe Switchboard Changes	8 minutes
BMC CEC SPI	v3.28	See DGX A100 BMC CEC Changes	8 minutes
PEX88064 Retimer	1.2f	See DGX A100 Broadcom 880xx Retimer Changes	7 minutes
PEX88080 Retimer	1.2f	See DGX A100 Broadcom 880xx Retimer Changes	7 minutes
NvSwitch BIOS	92.10.18.00.01	See DGX A100 NVSwitch Firmware Changes	8 minutes
VBIOS (A100 40GB)	92.00.36.00.04	See A100 VBIOS Changes	7 minutes
VBIOS (A100 80GB)	92.00.36.00.01	No change	
U.2 NVMe (Samsung)	EPK99B5Q	No change	6 minutes
U.2 NVMe (Kioxia)	0105	Added to the container	
M.2 NVMe (Samsung)	EDA7602Q	Added to the container	3 minutes
FPGA (GPU sled)	2.A5	See DGX A100 FPGA Release Notes	40 minutes
CEC1712 SPI (GPU sled)	3.9	See DGX A100 CEC1712 SPI Changes	7 minutes

Updating Components with Secondary Images

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

- ▶ **SBIOS:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. When using `update_fw all`, the update container updates both active and inactive images.
- ▶ **BMC:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. The update container can only update the inactive image, and will update it only if the *active* image needs to be updated. After the update is completed, the updated inactive image becomes the active image. Because the active image is now updated, subsequent `update_fw all` commands will not update the inactive image. To update the inactive image in this case, use `update_fw BMC --inactive`.

Updating the CEC 1712 (Delta-CEC)

The firmware update container may fail to update the `Delta_CEC`. To work around, perform the following.

1. `sudo ./nvfw-dgxa100_21.03.6_210321.run update_fw CEC -s Delta_CEC -m`
2. `sudo ipmitool chassis power cycle`


```
3. sudo ./nvfw-dgxa100_21.03.6_210321.run update_fw all
```

DO NOT UPDATE DGX A100 CPLD FIRMWARE UNLESS INSTRUCTED

When updating DGX A100 firmware using the Firmware Update Container, do not update the CPLD firmware unless the DGX A100 system is being upgraded from 320GB to 640GB.

The current DGX A100 Firmware Update Container will not automatically update the CPLD firmware (for example, when running `update_fw all`). It is possible to update the CPLD firmware using `update_fw CPLD`; however, it is strongly recommended that the CPLD firmware not be updated manually unless specifically instructed by [NVIDIA Enterprise Support](#) (or email enterprisesupport@nvidia.com). If the DGX A100 is upgraded from 320GB to 640GB, the CPLD firmware update should be performed as instructed.

5.1. Special Instructions for Red Hat Enterprise Linux

This section describes the actions that must be taken before updating firmware on DGX A100 systems installed with Red Hat Enterprise Linux. There are two options for meeting these requirements.

Option 1: Update to EL7-21.01 or later

Refer to the [DGX Software for Red Hat Enterprise Linux 7 Release Notes](#) for more information.



Important: Updating the DGX software for Red Hat Enterprise Linux will update the Red Hat Enterprise Linux installation to 7.9 or later. If you do not want to update your Red Hat Enterprise Linux 7 installation, then choose Option 2.

Option 2: Install mpt3sas 31.101.01.00-0

These instructions apply if

- ▶ You do not want to update your Red Hat Enterprise Linux installation, and
- ▶ Your system is currently installed with Red Hat Enterprise Linux 7.7 or later.

If your system is installed with Red Hat Enterprise Linux 7.6 or earlier, contact NVIDIA Enterprise Support for assistance.

1. Perform this step if your system is no longer pointing to the NVIDIA DGX software repository.
 - a). On Red Hat Enterprise Linux, run the following commands to enable additional repositories required by the DGX software.

```
sudo subscription-manager repos --enable=rhel-7-server-extras-rpms
sudo subscription-manager repos --enable=rhel-7-server-optional-rpms
```

- b). Run the following command to install the DGX software installation package and enable the NVIDIA DGX software repository.

! **ATTENTION:** By running these commands you are confirming that you have read and agree to be bound by the [DGX Software License Agreement](#). You are also confirming that you understand that any pre-release software and materials available that you elect to install in a DGX may not be fully functional, may contain errors or design flaws, and may have reduced or different security, privacy, availability, and reliability standards relative to commercial versions of NVIDIA software and materials, and that you use pre-release versions at your risk.

```
yum install -y \
https://international.download.nvidia.com/dgx/repos/rhel-files/dgx-repo-
setup-20.03-1.el7.x86_64.rpm
```

2. Install mpt3sas 31.101.01.00-0.

```
sudo yum install mpt3sas-dkms
```

3. Load the mpt3sas driver into the Red Hat Enterprise Linux kernel.

```
sudo modprobe mpt3sas
```

You can verify the correct mpt3sas version is installed by issuing the following.

```
yum list installed
```

5.2. 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 A100 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-dgxa100:21.03.6_210321.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. Perform the update for all firmware supported by the container.

```
$ sudo ./nvfw-dgxa100:21.03.6_210321.run update_fw all
```

Depending on the firmware that is updated, you may be prompted to either reboot the system or power cycle the system.

- ▶ If you are prompted to reboot, issue
- ```
$ sudo reboot
```
- ▶ If you are prompted to power cycle, you can issue the following two commands (there is no output with the first command).

```
$ sudo ipmitool raw 0x3c 0x04
$ sudo ipmitool chassis power cycle
```

3. After rebooting or power cycling the system, you may need to perform another `update_fw all` to update other firmware.
  - ▶ Either repeat Step 1 to check if updates are needed and then perform Step 2 if needed, or
  - ▶ Repeat Step 2 just in case updates are needed.

If you perform another `update_fw all`, you may be prompted again to either reboot the system or power cycle the system.

See [DGX A100 Firmware Update Process](#) for more information about the update process.

You can verify the update by issuing the following.

```
$ sudo ./nvfw-dgxa100:21.03.6_210321.run show_version
```

Example output for a DGX A100 320GB system

```
CEC
=====
 Onboard Version Manifest up-to-date
MB_CEC(enabled) 3.28 3.28 yes
Delta_CEC(enabled) 3.09 3.09 yes

BMC DGX
=====
Image Id Status Location Onboard Version Manifest up_to_date
0:Active Boot Online 00.14.16 00.14.16 yes
1:Inactive Updatable Local 00.14.16 00.14.16 yes

SBIOS
=====
Image Id Onboard Version Manifest up_to_date
0:Inactive Updatable 0.34 0.34 yes
1:Active Boot Updatable 0.34 0.34 yes

Switches
=====
PCI Bus# Model Onboard Version Manifest FUB Updated? up-to-
date
DGX - 0000:91:00.0 (U261) 88064_Retimer 1.2f 1.2f N/A yes
DGX - 0000:88:00.0 (U260) 88064_Retimer 1.2f 1.2f N/A yes
DGX - 0000:4f:00.0 (U262) 88064_Retimer 1.2f 1.2f N/A yes
DGX - 0000:48:00.0 (U225) 88080_Retimer 1.2f 1.2f N/A yes

DGX - 0000:01:00.0 (U1) PEX88096 2.0 2.0 N/A yes
```

```
DGX - 0000:b1:00.0 (U4) PEX88096 2.0 2.0 N/A yes
DGX - 0000:41:00.0 (U2) PEX88096 2.0 2.0 N/A yes
DGX - 0000:81:00.0 (U3) PEX88096 2.0 2.0 N/A yes
```

```
DGX - 0000:c4:00.0 LR10 92.10.18.00.01 92.10.18.00.01 yes yes
DGX - 0000:c5:00.0 LR10 92.10.18.00.01 92.10.18.00.01 yes yes
DGX - 0000:c8:00.0 LR10 92.10.18.00.01 92.10.18.00.01 yes yes
DGX - 0000:c6:00.0 LR10 92.10.18.00.01 92.10.18.00.01 yes yes
DGX - 0000:c9:00.0 LR10 92.10.18.00.01 92.10.18.00.01 yes yes
DGX - 0000:c7:00.0 LR10 92.10.18.00.01 92.10.18.00.01 yes yes
```

Mass Storage

=====

| Drive Name/Slot | Model Number               | Onboard Version | Manifest | up-to-date |
|-----------------|----------------------------|-----------------|----------|------------|
| nvme0n1         | Samsung MZWLJ3T8HBL5-00007 | EPK99B5Q        | EPK99B5Q | yes        |
| nvme1n1         | Samsung MZ1LB1T9HALS-00007 | EDA7202Q        | EDA7202Q | yes        |
| nvme2n1         | Samsung MZ1LB1T9HALS-00007 | EDA7202Q        | EDA7202Q | yes        |
| nvme3n1         | Samsung MZWLJ3T8HBL5-00007 | EPK99B5Q        | EPK99B5Q | yes        |
| nvme4n1         | Samsung MZWLJ3T8HBL5-00007 | EPK99B5Q        | EPK99B5Q | yes        |
| nvme5n1         | Samsung MZWLJ3T8HBL5-00007 | EPK99B5Q        | EPK99B5Q | yes        |

Video BIOS

=====

| Bus          | Model          | Onboard Version | Manifest       | FUB Updated? | up-to-date |
|--------------|----------------|-----------------|----------------|--------------|------------|
| 0000:07:00.0 | A100-SXM4-40GB | 92.00.36.00.04  | 92.00.36.00.04 | yes          | yes        |
| 0000:0f:00.0 | A100-SXM4-40GB | 92.00.36.00.04  | 92.00.36.00.04 | yes          | yes        |
| 0000:47:00.0 | A100-SXM4-40GB | 92.00.36.00.04  | 92.00.36.00.04 | yes          | yes        |
| 0000:4e:00.0 | A100-SXM4-40GB | 92.00.36.00.04  | 92.00.36.00.04 | yes          | yes        |
| 0000:87:00.0 | A100-SXM4-40GB | 92.00.36.00.04  | 92.00.36.00.04 | yes          | yes        |
| 0000:90:00.0 | A100-SXM4-40GB | 92.00.36.00.04  | 92.00.36.00.04 | yes          | yes        |
| 0000:b7:00.0 | A100-SXM4-40GB | 92.00.36.00.04  | 92.00.36.00.04 | yes          | yes        |
| 0000:bd:00.0 | A100-SXM4-40GB | 92.00.36.00.04  | 92.00.36.00.04 | yes          | yes        |

FPGA

=====

| Onboard version | Manifest | up-to-date |
|-----------------|----------|------------|
| 02.A5           | 02.A5    | yes        |

CPLD

=====

|          | Onboard Version | Manifest | up-to-date |
|----------|-----------------|----------|------------|
| MID_CPLD | 1.05            | 1.05     | yes        |
| MB_CPLD  | 1.05            | 1.05     | yes        |

\* CPLD won't be updated by default (`update\_fw all`), use `update\_fw CPLD` if it's needed

## 5.3. Known Issues

## 5.3.1. BMC UI May not be Accessible from Mac OS

### Issue

When attempting to connect to the DGX A100 BMC from a system with Mac OS, a "Your connection is not private" message appears that prevents access to the BMC.

### Explanation

BMC version 0.13.6 provides a self-signed certificate which Mac OS flags in the browser. Most browsers will let you either accept the risk and continue, or add the certificate to the keychain and continue. The Chrome and Opera browsers, however, do not provide these options and so Mac OS users will not be able to access the BMC from the Chrome or Opera browser.

To access the DGX A100 BMC, Mac OS users can use Safari or Firefox, which provide an access path.

## 5.3.2. Boot Order in the SBIOS Reverts to the Default

### Issue

After updating the SBIOS, any changes in the boot order that you have made are not preserved and the boot order specified in the SBIOS reverts to the following.

```
Boot Option #1 [Hard Disk]
Boot Option #2 [NVME]
Boot Option #3 [USB CD/DVD]
Boot Option #4 [USB Hard Disk]
Boot Option #5 [USB Key]
Boot Option #6 [Network]
```

### Explanation

You will need to prepare for the change when restarting the system, and then enter the SBIOS setup to edit the boot order as needed.

## 5.3.3. Unable to Launch BMC Dashboard under Firefox

### Issue

After updating the BMC from to 0.13.16, attempts to access the BMC dashboard fails with a "Secure Connection Fail" message.

## Explanation

To work around, update Firefox to version 84.01 or later.

## 5.3.4. The system starts the POST process several times during boot after updating the SBIOS.

### Issue

After updating the SBIOS and rebooting the system, the NVIDIA splash screen appears and disappears several times before boot is completed.

### Explanation

After updating the SBIOS, several component states are cleared and it takes 3-4 reboots to reset all the components. This is expected behavior.

---

# Chapter 6. DGX A100 System Firmware Update Container Version 20.12.3.3

The DGX Firmware Update container version 20.12.3.3 is available.

- ▶ Package name: `nvfw-dgxa100_20.12.3.3_210205.tar.gz`
- ▶ Run file name: `nvfw-dgxa100_20.12.3.3_210205.run`
- ▶ Image name: `nvfw-dgxa100:20.12.3.3`

## Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
  - ▶ DGX OS 4.99.11
  - ▶ DGX OS 5.0 or later
  - ▶ EL7-21.01 or later (See [Special Instructions for Red Hat Enterprise Linux](#))
  - ▶ EL8-20.11 or later
- ▶ Fixed the mishandling of correctable PCIe errors.

## Contents of the DGX A100 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table. The update time for each component is provided for reference. Total update time if all components are updated is approximately 2 hours and 20 minutes.

| Component                        | Version         | Key Changes                                | Update Time |
|----------------------------------|-----------------|--------------------------------------------|-------------|
| BMC (via CEC)                    | <b>00.13.16</b> | No change                                  | 25 minutes  |
| SBIOS                            | <b>0.33</b>     | See <a href="#">DGX A100 SBIOS Changes</a> | 7 minutes   |
| Broadcom 88096 PCIe switch board | <b>0.1.8</b>    | No change                                  | 8 minutes   |
| BMC CEC SPI                      | <b>v3.25</b>    | No change                                  | 8 minutes   |

| Component              | Version               | Key Changes | Update Time |
|------------------------|-----------------------|-------------|-------------|
| PEX88064 Retimer       | <b>0.F.0</b>          | No change   | 7 minutes   |
| PEX88080 Retimer       | <b>0.F.0</b>          | No change   | 7 minutes   |
| NvSwitch BIOS          | <b>92.10.14.00.01</b> | No change   | 8 minutes   |
| VBIOS (A100 40GB)      | <b>92.00.19.00.10</b> | No change   | 7 minutes   |
| VBIOS (A100 80GB)      | <b>92.00.36.00.01</b> | No change   |             |
| U.2 NVMe (Samsung)     | <b>EPK99B5Q</b>       | No change   | 6 minutes   |
| FPGA (GPU sled)        | <b>2.9c</b>           | No change   | 40 minutes  |
| CEC1712 SPI (GPU sled) | <b>3.5</b>            | No change   | 7 minutes   |

## Updating Components with Secondary Images

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

- ▶ **SBIOS:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. When using `update_fw all`, the update container updates both active and inactive images.
- ▶ **BMC:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. The update container can only update the inactive image, and will update it only if the *active* image needs to be updated. After the update is completed, the updated inactive image becomes the active image. Because the active image is now updated, subsequent `update_fw all` commands will not update the inactive image. To update the inactive image in this case, use `update_fw BMC --inactive --force`.

## 6.1. Special Instructions for Red Hat Enterprise Linux

This section describes the actions that must be taken before updating firmware on DGX A100 systems installed with Red Hat Enterprise Linux. There are two options for meeting these requirements.



## Option 1: Update to EL7-21.01 or later

Refer to the [DGX Software for Red Hat Enterprise Linux 7 Release Notes](#) for more information.



**Important:** Updating the DGX software for Red Hat Enterprise Linux will update the Red Hat Enterprise Linux installation to 7.9 or later. If you do not want to update your Red Hat Enterprise Linux 7 installation, then choose Option 2.

## Option 2: Install mpt3sas 31.101.01.00-0

These instructions apply if

- ▶ You do not want to update your Red Hat Enterprise Linux installation, and
- ▶ Your system is currently installed with Red Hat Enterprise Linux 7.7 or later.

If your system is installed with Red Hat Enterprise Linux 7.6 or earlier, contact NVIDIA Enterprise Support for assistance.

1. Perform this step if your system is no longer pointing to the NVIDIA DGX software repository.

- a). On Red Hat Enterprise Linux, run the following commands to enable additional repositories required by the DGX software.

```
sudo subscription-manager repos --enable=rhel-7-server-extras-rpms
sudo subscription-manager repos --enable=rhel-7-server-optional-rpms
```

- b). Run the following command to install the DGX software installation package and enable the NVIDIA DGX software repository.



**ATTENTION:** By running these commands you are confirming that you have read and agree to be bound by the [DGX Software License Agreement](#). You are also confirming that you understand that any pre-release software and materials available that you elect to install in a DGX may not be fully functional, may contain errors or design flaws, and may have reduced or different security, privacy, availability, and reliability standards relative to commercial versions of NVIDIA software and materials, and that you use pre-release versions at your risk.

```
yum install -y \
https://international.download.nvidia.com/dgx/repos/rhel-files/dgx-repo-
setup-20.03-1.el7.x86_64.rpm
```

2. Install mpt3sas 31.101.01.00-0.

```
sudo yum install mpt3sas-dkms
```

3. Load the mpt3sas driver into the Red Hat Enterprise Linux kernel.

```
sudo modprobe mpt3sas
```

You can verify the correct mpt3sas version is installed by issuing the following.

```
yum list installed
```

## 6.2. 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 A100 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-dgxa100_20.12.3.3_210205.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. Perform the update for all firmware supported by the container.

```
$ sudo ./nvfw-dgxa100_20.12.3.3_210205.run update_fw all
```

Depending on the firmware that is updated, you may be prompted to either reboot the system or power cycle the system.

- ▶ If you are prompted to reboot, issue
- ▶ If you are prompted to power cycle, you can issue the following two commands (there is no output with the first command).

```
$ sudo ipmitool raw 0x3c 0x04
$ sudo ipmitool chassis power cycle
```

3. After rebooting or power cycling the system, you may need to perform another `update_fw all` to update other firmware.

- ▶ Either repeat Step 1 to check if updates are needed and then perform Step 2 if needed, or
- ▶ Repeat Step 2 just in case updates are needed.

If you perform another `update_fw all`, you may be prompted again to either reboot the system or power cycle the system.

See [DGX A100 Firmware Update Process](#) for more information about the update process.

You can verify the update by issuing the following.

```
$ sudo ./nvfw-dgxa100_20.12.3.3_210205.run show_version
```

Example output for a DGX A100 320GB system

```
CEC
=====
 Onboard Version Manifest up-to-
date
MB_CEC(enabled) 3.25 3.25
 yes
Delta_CEC(enabled) 3.05 3.05
 yes

BMC DGX
=====
Image Id Status Location Onboard Version Manifest
up_to_date
0:Active Boot Online Local 00.13.16 00.13.16
 yes
1:Inactive Updatable Local 00.13.16 00.13.16
 yes

SBIOS
=====
Image Id Onboard Version Manifest up_to_date
0:Inactive Updatable 0.33 0.33 yes
1:Active Boot Updatable 0.33 0.33 yes

Switches
=====
PCI Bus# Model Onboard Version Manifest FUB
Updated? up-to-date
DGX - 0000:91:00.0 (U261) 88064_Retimer 0.F.0 0.F.0
 N/A yes
DGX - 0000:88:00.0 (U260) 88064_Retimer 0.F.0 0.F.0
 N/A yes
DGX - 0000:4f:00.0 (U262) 88064_Retimer 0.F.0 0.F.0
 N/A yes
DGX - 0000:48:00.0 (U225) 88080_Retimer 0.F.0 0.F.0
 N/A yes

DGX - 0000:01:00.0 (U1) PEX88096 1.8 1.8
 N/A yes
DGX - 0000:b1:00.0 (U4) PEX88096 1.8 1.8
 N/A yes
DGX - 0000:41:00.0 (U2) PEX88096 1.8 1.8
 N/A yes
DGX - 0000:81:00.0 (U3) PEX88096 1.8 1.8
 N/A yes

DGX - 0000:c4:00.0 LR10 92.10.14.00.01 92.10.14.00.01
 yes yes
DGX - 0000:c5:00.0 LR10 92.10.14.00.01 92.10.14.00.01
 yes yes
DGX - 0000:c8:00.0 LR10 92.10.14.00.01 92.10.14.00.01
 yes yes
DGX - 0000:c6:00.0 LR10 92.10.14.00.01 92.10.14.00.01
 yes yes
DGX - 0000:c9:00.0 LR10 92.10.14.00.01 92.10.14.00.01
 yes yes
DGX - 0000:c7:00.0 LR10 92.10.14.00.01 92.10.14.00.01
 yes yes
```

```

Mass Storage
=====
Drive Name/Slot Model Number Onboard Version Manifest up-
to-date
nvme0n1 Samsung MZWLJ3T8H EPK99B5Q EPK99B5Q
yes
nvme1n1 Samsung MZ1LB1T9H EDA7202Q EDA7202Q
yes
nvme2n1 Samsung MZ1LB1T9H EDA7202Q EDA7202Q
yes
nvme3n1 Samsung MZWLJ3T8H EPK99B5Q EPK99B5Q
yes
nvme4n1 Samsung MZWLJ3T8H EPK99B5Q EPK99B5Q
yes
nvme5n1 Samsung MZWLJ3T8H EPK99B5Q EPK99B5Q
yes

Video BIOS
=====
Bus Model Onboard Version Manifest FUB Updated? up-
to-date
0000:07:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
yes
0000:0f:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
yes
0000:47:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
yes
0000:4e:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
yes
0000:87:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
yes
0000:90:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
yes
0000:b7:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
yes
0000:bd:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
yes

FPGA
=====
Onboard version Manifest up-to-date
02.9c 02.9c yes

CPLD
=====
date Onboard Version Manifest up-to-
MID_CPLD 1.03 1.03
yes
MB_CPLD 1.03 1.03
yes

* CPLD won't be updated by default (`update_fw all`), use `update_fw CPLD` if it's
needed

```

## 6.3. Known Issues

## 6.3.1. BMC UI May not be Accessible from Mac OS

### Issue

When attempting to connect to the DGX A100 BMC from a system with Mac OS, a "Your connection is not private" message appears that prevents access to the BMC.

### Explanation

BMC version 0.13.6 provides a self-signed certificate which Mac OS flags in the browser. Most browsers will let you either accept the risk and continue, or add the certificate to the keychain and continue. The Chrome and Opera browsers, however, do not provide these options and so Mac OS users will not be able to access the BMC from the Chrome or Opera browser.

To access the DGX A100 BMC, Mac OS users can use Safari or Firefox, which provide an access path.

## 6.3.2. Update Timeout Reported for Motherboard CEC

### Issue

The update progress output reports "Update\_timeout" for the motherboard CEC (MB\_CEC) when using the .run file without Docker installed.

### Example

```
+-----+
|+-----+
	!!!!! Firmware Update In Progress !!!!!	
	Status: reflash BMC firmware	
+-----+		
Onboard Manifest Update Status		
MB_CEC 3.05 3.25 Update timeout		
```

### Explanation

This message can be ignored provided that the MB\_CEC update is successful.

Example success message:

```
Success:
 Installed firmware 3.25 on MB_CEC
```

## 6.3.3. Boot Order in the SBIOS Reverts to the Default

### Issue

After updating the SBIOS, any changes in the boot order that you have made are not preserved and the boot order specified in the SBIOS reverts to the following.

```
Boot Option #1 [Hard Disk]
Boot Option #2 [NVME]
Boot Option #3 [USB CD/DVD]
Boot Option #4 [USB Hard Disk]
Boot Option #5 [USB Key]
Boot Option #6 [Network]
```

### Explanation

You will need to prepare for the change when restarting the system, and then enter the SBIOS setup to edit the boot order as needed.

---

# Chapter 7. DGX A100 System Firmware Update Container Version 20.12.3

The DGX Firmware Update container version 20.12.3 is available.

- ▶ Package name: `nvfw-dgxa100_20.12.3_201209.tar.gz`
- ▶ Run file name: `nvfw-dgxa100_20.12.3_201209.run`
- ▶ Image name: `nvfw-dgxa100:20.12.3`

## Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
  - ▶ DGX OS 4.99.11
  - ▶ DGX OS 5.0 or later
- ▶ Fixed an issue where running the container generated an overly large log file.

## Contents of the DGX A100 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table. The update time for each component is provided for reference. Total update time if all components are updated is approximately 2 hours and 20 minutes.

| Component                        | Version         | Key Changes | Update Time |
|----------------------------------|-----------------|-------------|-------------|
| BMC (via CEC)                    | <b>00.13.16</b> | No change   | 25 minutes  |
| SBIOS                            | <b>0.30</b>     | No change   | 7 minutes   |
| Broadcom 88096 PCIe switch board | <b>0.1.8</b>    | No change   | 8 minutes   |
| BMC CEC SPI                      | <b>v3.25</b>    | No change   | 8 minutes   |
| PEX88064 Retimer                 | <b>0.F.0</b>    | No change   | 7 minutes   |
| PEX88080 Retimer                 | <b>0.F.0</b>    | No change   | 7 minutes   |

| Component              | Version               | Key Changes | Update Time |
|------------------------|-----------------------|-------------|-------------|
| NvSwitch BIOS          | <b>92.10.14.00.01</b> | No change   | 8 minutes   |
| VBIOS (A100 40GB)      | <b>92.00.19.00.10</b> | No change   | 7 minutes   |
| VBIOS (A100 80GB)      | <b>92.00.36.00.01</b> | No change   |             |
| U.2 NVMe (Samsung)     | <b>EPK99B5Q</b>       | No change   | 6 minutes   |
| FPGA (GPU sled)        | <b>2.9c</b>           | No change   | 40 minutes  |
| CEC1712 SPI (GPU sled) | <b>3.5</b>            | No change   | 7 minutes   |

## Updating Components with Secondary Images

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

- ▶ **SBIOS:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. When using `update_fw all`, the update container updates both active and inactive images.
- ▶ **BMC:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. The update container can only update the inactive image, and will update it only if the *active* image needs to be updated. After the update is completed, the updated inactive image becomes the active image. Because the active image is now updated, subsequent `update_fw all` commands will not update the inactive image. To update the inactive image in this case, use `update_fw BMC --inactive --force`.

## 7.1. 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 A100 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-dgxa100_20.12.3_201209.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. Perform the update for all firmware supported by the container.

```
$ sudo nvfw-dgxa100_20.12.3_201209.run update_fw all
```

Depending on the firmware that is updated, you may be prompted to either reboot the system or power cycle the system.

- ▶ If you are prompted to reboot, issue

```
$ sudo reboot
```

- ▶ If you are prompted to power cycle, you can issue the following two commands (there is no output with the first command).

```
$ sudo ipmitool raw 0x3c 0x04
$ sudo ipmitool chassis power cycle
```

3. After rebooting or power cycling the system, you may need to perform another `update_fw all` to update other firmware.

- ▶ Either repeat Step 1 to check if updates are needed and then perform Step 2 if needed, or
- ▶ Repeat Step 2 just in case updates are needed.

If you perform another `update_fw all`, you may be prompted again to either reboot the system or power cycle the system.

See [DGX A100 Firmware Update Process](#) for more information about the update process.

You can verify the update by issuing the following.

```
$ sudo nvfw-dgxa100_20.12.3_201209.run show_version
```

Example output for a DGX A100 320GB system

```
BMC DGX
=====
Image Id Status Location Onboard Version Manifest up_to_date
0:Active Boot Online 00.13.16 00.13.16 yes
1:Inactive Updatable Local 00.13.16 00.13.16 yes

CEC
=====
MB_CEC (enabled) Onboard Version Manifest up-to-date
 3.25 3.25 yes

SBIOS
=====
Image Id Method Onboard Version Manifest up_to_date
```

```

0:Inactive Updatabl afulnx 0.30 0.30 yes
1:Active Boot 0.30 0.30 yes

Video BIOS
=====
Bus Model Onboard Version Manifest up-to-date
0000:07:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:0f:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:47:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:4e:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:87:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:90:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:b7:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:bd:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes

Switches
=====
PCI Bus# Model Onboard Version Manifest up-to-date
DGX - 0000:91:00.0 (U261) 88064_Retimer 0.F.0 0.F.0 yes
DGX - 0000:88:00.0 (U260) 88064_Retimer 0.F.0 0.F.0 yes
DGX - 0000:4f:00.0 (U262) 88064_Retimer 0.F.0 0.F.0 yes

DGX - 0000:48:00.0 (U225) 88080_Retimer 0.F.0 0.F.0 yes

DGX - 0000:c4:00.0 LR10 92.10.14.00.01 92.10.14.00.01 yes
DGX - 0000:c5:00.0 LR10 92.10.14.00.01 92.10.14.00.01 yes
DGX - 0000:c2:00.0 LR10 92.10.14.00.01 92.10.14.00.01 yes
DGX - 0000:c6:00.0 LR10 92.10.14.00.01 92.10.14.00.01 yes
DGX - 0000:c3:00.0 LR10 92.10.14.00.01 92.10.14.00.01 yes
DGX - 0000:c7:00.0 LR10 92.10.14.00.01 92.10.14.00.01 yes

DGX - 0000:01:00.0 (U1) PEX88096 1.8 1.8 yes
DGX - 0000:81:00.0 (U3) PEX88096 1.8 1.8 yes
DGX - 0000:41:00.0 (U2) PEX88096 1.8 1.8 yes
DGX - 0000:b1:00.0 (U4) PEX88096 1.8 1.8 yes

```

## 7.2. Known Issues

### 7.2.1. BMC UI May not be Accessible from Mac OS

#### Issue

When attempting to connect to the DGX A100 BMC from a system with Mac OS, a "Your connection is not private" message appears that prevents access to the BMC.

#### Explanation

BMC version 0.13.6 provides a self-signed certificate which Mac OS flags in the browser. Most browsers will let you either accept the risk and continue, or add the certificate to the keychain and continue. The Chrome and Opera browsers, however, do not provide these options and so Mac OS users will not be able to access the BMC from the Chrome or Opera browser.

To access the DGX A100 BMC, Mac OS users can use Safari or Firefox, which provide an access path.

## 7.2.2. Update Timeout Reported for Motherboard CEC

### Issue

The update progress output reports "Update\_timeout" for the motherboard CEC (MB\_CEC) when using the .run file without Docker installed.

### Example

```
+-----+
|+-----+
	!!!!! Firmware Update In Progress !!!!!	
	Status: reflash BMC firmware	
	-----+	
Onboard Manifest Update Status		
MB_CEC 3.05 3.25 Update timeout		
```

### Explanation

This message can be ignored provided that the MB\_CEC update is successful.

Example success message:

```
Success:
 Installed firmware 3.25 on MB_CEC
```

## 7.2.3. Boot Order in the SBIOS Reverts to the Default

### Issue

After updating the SBIOS, any changes in the boot order that you have made are not preserved and the boot order specified in the SBIOS reverts to the following.

```
Boot Option #1 [Hard Disk]
Boot Option #2 [NVME]
Boot Option #3 [USB CD/DVD]
Boot Option #4 [USB Hard Disk]
Boot Option #5 [USB Key]
Boot Option #6 [Network]
```

### Explanation

You will need to prepare for the change when restarting the system, and then enter the SBIOS setup to edit the boot order as needed.

---

# Chapter 8. DGX A100 System Firmware Update Container Version 20.11.3

The DGX Firmware Update container version 20.11.3 is available.

- ▶ Package name: `nvfw-dgxa100_20.11.3_201124.tar.gz`
- ▶ Run file name: `nvfw-dgxa100_20.11.3_201124.run`
- ▶ Image name: `nvfw-dgxa100:20.11.3`

## Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
  - ▶ DGX OS 4.99.11
  - ▶ DGX OS 5.0 or later
- ▶ Includes firmware updates to resolve PCIe advanced error reporting (AER) issues.
- ▶ The BMC update includes software security enhancements.  
See the [NVIDIA Security Bulletin 5010](#) for details.
- ▶ Changed the policy for updating the active/inactive BMC images. See **Updating Components with Secondary Images**.
- ▶ Removed the need to manually stop certain services before updating on DGX OS 5.0.
- ▶ See [DGX A100 System Firmware Changes](#) for the list of changes in individual components.

## Contents of the DGX A100 System Firmware Container

This container includes the firmware binaries and update utilities for the firmware listed in the following table. The update time for each component is provided for reference. Total update time if all components are updated is approximately 2 hours and 20 minutes.

| Component                        | Version               | Key Changes                                                                                                                       | Update Time |
|----------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------|
| BMC (via CEC)                    | <b>00.13.16</b>       | The BMC update includes software security enhancements.<br><br>See the <a href="#">NVIDIA Security Bulletin 5010</a> for details. | 25 minutes  |
| SBIOS                            | <b>0.30</b>           | See <a href="#">SBIOS Release Notes</a>                                                                                           | 7 minutes   |
| Broadcom 88096 PCIe switch board | <b>0.1.8</b>          | Updated preset values to address PCIe advanced error reporting (AER) issues.                                                      | 8 minutes   |
| BMC CEC SPI                      | <b>v3.25</b>          | Improved BMC update time and reliability.                                                                                         | 8 minutes   |
| PEX88064 Retimer                 | <b>0.F.0</b>          | Improved error handling of downstream switches.                                                                                   | 7 minutes   |
| PEX88080 Retimer                 | <b>0.F.0</b>          | Improved error handling of downstream switches.                                                                                   | 7 minutes   |
| NvSwitch BIOS                    | <b>92.10.14.00.01</b> | Added support for a new out-of-band SMBPBI query to retrieve FUB revocation status.                                               | 8 minutes   |
| VBIOS (A100 40GB)                | <b>92.00.19.00.10</b> | Improved VBIOS compatibility.                                                                                                     | 7 minutes   |
| VBIOS (A100 80GB)                | <b>92.00.36.00.01</b> | New addition to the container.                                                                                                    |             |
| U.2 NVMe (Samsung)               | <b>EPK99B5Q</b>       | Enabled Relaxed Ordering.                                                                                                         | 6 minutes   |
| FPGA (GPU sled)                  | <b>2.9c</b>           | Added to the container. Implements miscellaneous bug fixes.                                                                       | 40 minutes  |
| CEC1712 SPI (GPU sled)           | <b>3.5</b>            | Added to the container. Improved update time and reliability.                                                                     | 7 minutes   |

## Updating Components with Secondary Images

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

- ▶ **SBIOS:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. When using `update_fw all`, the update container updates both active and inactive images.
- ▶ **BMC:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. The update container can only update the inactive image, and will update it only if the *active* image needs to be updated. After the update is completed, the updated inactive image becomes the active image. Because the active image is now updated, subsequent `update_fw all` commands will not update the inactive image. To update the inactive image in this case, use `update_fw BMC --inactive --force`.

## 8.1. 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 A100 FW Update Utility](#).



**CAUTION:** Stop all unnecessary system activities before attempting to update firmware, and do not add additional loads on the system (such as Kubernetes jobs or other user jobs or diagnostics) while an update is in progress. A high GPU workload can disrupt the firmware update process and result in an unusable component.

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

```
$ sudo nvfw-dgxa100_20.11.3_201124.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. Perform the update for all firmware supported by the container.

```
$ sudo nvfw-dgxa100_20.11.3_201124.run update_fw all
```

Depending on the firmware that is updated, you may be prompted to either reboot the system or power cycle the system.

- ▶ If you are prompted to reboot, issue

```
$ sudo reboot
```

- ▶ If you are prompted to power cycle, you can issue the following two commands (there is no output with the first command).

```
$ sudo ipmitool raw 0x3c 0x04
$ sudo ipmitool chassis power cycle
```

3. After rebooting or power cycling the system, you may need to perform another `update_fw all` to update other firmware.

- ▶ Either repeat Step 1 to check if updates are needed and then perform Step 2 if needed, or
- ▶ Repeat Step 2 just in case updates are needed.

If you perform another `update_fw all`, you may be prompted again to either reboot the system or power cycle the system.

See [DGX A100 Firmware Update Process](#) for more information about the update process.

4. Rename the firmware update log file (the update generates `/var/log/nvidia-fw.log` which you should rename).

### Example:

```
$ sudo mv /var/log/nvidia-fw.log /var/log/nvidia-fw-large.log
```

Refer to [Firmware Update Log File Size Impacts nvsm dump health](#) for more information.

You can verify the update by issuing the following.

```
$ sudo nvfw-dgxa100_20.11.3_201124.run show_version
```

Example output for a DGX A100 320GB system

```

BMC DGX
=====
Image Id Status Location Onboard Version Manifest up_to_date
0:Active Boot Online Local 00.13.16 00.13.16 yes
1:Inactive Updatable Local 00.13.16 00.13.16 yes

CEC
=====
MB_CEC(enabled) Onboard Version Manifest up-to-date
 3.25 3.25 yes

SBIOS
=====
Image Id Method Onboard Version Manifest up_to_date
0:Inactive Updatabl afulnx 0.30 0.30 yes
1:Active Boot 0.30 0.30 0.30 yes

Video BIOS
=====
Bus Model Onboard Version Manifest up-to-date
0000:07:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:0f:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:47:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:4e:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:87:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:90:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:b7:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes
0000:bd:00.0 A100-SXM4-40GB 92.00.19.00.10 92.00.19.00.10 yes

Switches
=====
PCI Bus# Model Onboard Version Manifest up-to-date
DGX - 0000:91:00.0 (U261) 88064_Retimer 0.F.0 0.F.0 yes
DGX - 0000:88:00.0 (U260) 88064_Retimer 0.F.0 0.F.0 yes
DGX - 0000:4f:00.0 (U262) 88064_Retimer 0.F.0 0.F.0 yes

DGX - 0000:48:00.0 (U225) 88080_Retimer 0.F.0 0.F.0 yes

DGX - 0000:c4:00.0 LR10 92.10.14.00.01 92.10.14.00.01 yes
DGX - 0000:c5:00.0 LR10 92.10.14.00.01 92.10.14.00.01 yes
DGX - 0000:c2:00.0 LR10 92.10.14.00.01 92.10.14.00.01 yes
DGX - 0000:c6:00.0 LR10 92.10.14.00.01 92.10.14.00.01 yes
DGX - 0000:c3:00.0 LR10 92.10.14.00.01 92.10.14.00.01 yes
DGX - 0000:c7:00.0 LR10 92.10.14.00.01 92.10.14.00.01 yes

DGX - 0000:01:00.0 (U1) PEX88096 1.8 1.8 yes
DGX - 0000:81:00.0 (U3) PEX88096 1.8 1.8 yes
DGX - 0000:41:00.0 (U2) PEX88096 1.8 1.8 yes
DGX - 0000:b1:00.0 (U4) PEX88096 1.8 1.8 yes

```

## 8.2. Known Issues

## 8.2.1. Firmware Update Log File Size Impacts `nvsmdump health`

### Issue

After running the container, the generated log file (`/var/log/nvidia-fw.log`) can grow to up to tens of gigabytes in size, depending on the firmware that gets updated. If, at a later time, you run `nvsmdump health`, the command might time out and fail if the file size is too large.

### Explanation

To avoid problems running `nvsmdump health`, rename the generated firmware update log file after updating the firmware.

### Example:

```
$ sudo mv /var/log/nvidia-fw.log /var/log/nvidia-fw-large.log
```

## 8.2.2. BMC UI May not be Accessible from Mac OS

### Issue

When attempting to connect to the DGX A100 BMC from a system with Mac OS, a "Your connection is not private" message appears that prevents access to the BMC.

### Explanation

BMC version 0.13.6 provides a self-signed certificate which Mac OS flags in the browser. Most browsers will let you either accept the risk and continue, or add the certificate to the keychain and continue. The Chrome and Opera browsers, however, do not provide these options and so Mac OS users will not be able to access the BMC from the Chrome or Opera browser.

To access the DGX A100 BMC, Mac OS users can use Safari or Firefox, which provide an access path.

## 8.2.3. Update Timeout Reported for Motherboard CEC

### Issue

The update progress output reports "update\_timeout" for the motherboard CEC (MB\_CEC) when using the `.run` file without Docker installed.

### Example

```
+-----+
|+-----+|
```



```

|| !!!!! Firmware Update In Progress !!!!! ||
|| Status: reflash BMC firmware ||
|+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Onboard Manifest Update Status |
|MB_CEC 3.05 3.25 Update timeout |

```

### Explanation

This message can be ignored provided that the MB\_CEC update is successful.

Example success message:

```

Success:
 Installed firmware 3.25 on MB_CEC

```

## 8.2.4. Boot Order in the SBIOS Reverts to the Default

### Issue

After updating the SBIOS, any changes in the boot order that you have made are not preserved and the boot order specified in the SBIOS reverts to the following.

```

Boot Option #1 [Hard Disk]
Boot Option #2 [NVME]
Boot Option #3 [USB CD/DVD]
Boot Option #4 [USB Hard Disk]
Boot Option #5 [USB Key]
Boot Option #6 [Network]

```

### Explanation

You will need to prepare for the change when restarting the system, and then enter the SBIOS setup to edit the boot order as needed.

---

# Chapter 9. DGX A100 System Firmware Update Container Version 20.05.12.3

The DGX Firmware Update container version 20.05.12.3 is available.

- ▶ Package name: `nvfw-dgxa100_20.05.12.3_200716.tar.gz`
- ▶ Run file name: `nvfw-dgxa100_20.05.12.3_200716.run`
- ▶ Image name: `nvfw-dgxa100:20.05.12.3`

## Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
  - ▶ DGX OS 4.99.9 or later
  - ▶ DGX OS 5.0.x

Before using the container to update firmware on DGX OS 5.0.x or later, first stop certain NVIDIA services. See [Updating Firmware on DGX Systems Installed with DGX OS Release 5.0 or Later](#).

- ▶ Fixed an issue where the DGX A100 fans would run at high speed when the optional dual-port network card was not installed.

## Contents of the DGX A100 System Firmware Container

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

| Component                        | Version  | Key Changes               | Update Time |
|----------------------------------|----------|---------------------------|-------------|
| BMC (via CEC)                    | 00.12.06 | Fixed high fan speed bug. | 31 minutes  |
| SBIOS                            | 0.25     | No change                 | 7 minutes   |
| Broadcom 88096 PCIe switch board | 1.3      | No change                 | 8 minutes   |

| Component        | Version        | Key Changes | Update Time |
|------------------|----------------|-------------|-------------|
| BMC CEC SPI      | v3.05          | No change   | 8 minutes   |
| PEX88064 Retimer | 0.13.0         | No change   | 7 minutes   |
| PEX88080 Retimer | 0.13.0         | No change   | 7 minutes   |
| NvSwitch BIOS    | 92.10.12.00.01 | No change   | 8 minutes   |
| VBIOS            | 92.00.19.00.01 | No change   | 7 minutes   |

## Updating Components with Secondary Images

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

- ▶ **SBIOS:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. The update container can only update the inactive image. After reboot, the updated image becomes the active image. You can perform the update again to update the current inactive image so that both images are updated.
- ▶ **BMC:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. The update container can only update the inactive image. After the update is completed, the updated image becomes the active image. You can perform the update again to update the current inactive image so that both images are updated.

## 9.1. Updating Firmware on DGX Systems Installed with DGX OS Release 5.0 or Later

You need to stop certain NVIDIA services before using the container to update firmware on systems installed with DGX OS 5.0.x or later

- ▶ 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 dcfgm 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 dcfgm nvidia-fabricmanager nvidia-persistenced.service
```

## 9.2. 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 A100 FW Update Utility](#).



**CAUTION:** Stop all unnecessary system activities before attempting to update firmware, and do not add additional loads on the system (such as Kubernetes jobs or other user jobs or diagnostics) while an update is in progress. A high GPU workload can disrupt the firmware update process and result in an unusable component.

1. Perform a transitional update if needed.

Depending on the BMC and MB\_CEC versions on the system, you may need to perform a transitional update before updating the BMC and SBIOS to the latest versions.

- a). Check if the transitional update is needed.

```
$ sudo nvfw-dgxa100_20.05.12.3_200716.run run_script --command "fw_transition.py show_version"
```

The following message appears if a transition update is needed.

```
BMC/MB_CEC firmware needs update to Active/Inactive, secure boot mode
This is a one-time update required for DGXA100. All future updates require BMC
in this mode
```

- ▶ If the one-time update is required, continue with the next step to perform the transitional update.
  - ▶ If the one-time update is not required, then skip to step 2.
- b). Refer to [Updating Firmware on DGX Systems Installed with DGX OS Release 5.0 or Later](#) to see if services need to be stopped and how to do it.
  - c). Perform the transitional update.

```
$ sudo nvfw-dgxa100_20.05.12.3_200716.run run_script --command "fw_transition.py update_fw"
$ sudo reboot
```

- d). Verify that BMC (both images) and the MB\_CEC are up to date.

```
$ sudo nvfw-dgxa100_20.05.12.3_200716.run run_script --command "fw_transition.py show_version"
```

2. Check if other updates are needed by checking the installed versions.

```
$ sudo nvfw-dgxa100_20.05.12.3_200716.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.

3. Perform the final update for all firmware supported by the container and reboot the system.

- a). Refer to [Updating Firmware on DGX Systems Installed with DGX OS Release 5.0 or Later](#) to see if services need to be stopped and how to do it.

- b). Perform the update.

```
$ sudo nvfw-dgxa100_20.05.12.3_200716.run update_fw all
```

```
$ sudo reboot
```



**Note:** The `update_fw all` command updates the inactive BMC and SBIOS images only. After rebooting the system, the updated images become "active". You can then update the inactive images using `nvfw-dgxa100_20.05.12.3_200716.run update_fw [BMC] [SBIOS]` as needed.

You can verify the update by issuing the following.

```
$ sudo nvfw-dgxa100_20.05.12.3_200716.run show_version
```

Expected output.

```
BMC DGX
=====
Image Id Status Location Onboard Version Manifest up_to_date
0:Active Boot Online Local 00.12.06 00.12.06 yes
1:Inactive Updatable Local 00.12.06 00.12.06 yes

CEC
=====
MB_CEC(enabled) Onboard Version Manifest up-to-date
 3.05 3.05 yes

SBIOS
=====
Image Id Method Onboard Version Manifest up_to_date
0:Inactive Updatabl afulnx 0.25 0.25 yes
1:Active Boot 0.25 0.25 yes

Video BIOS
=====
Bus Model Onboard Version Manifest up-to-date
0000:07:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:0f:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:47:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:4e:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:87:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:90:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:b7:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:bd:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes

Switches
=====
PCI Bus# Model Onboard Version Manifest up-to-date
DGX - 0000:91:00.0 (U261) 88064_Retimer 0.13.0 0.13.0 yes
DGX - 0000:88:00.0 (U260) 88064_Retimer 0.13.0 0.13.0 yes
DGX - 0000:4f:00.0 (U262) 88064_Retimer 0.13.0 0.13.0 yes
DGX - 0000:48:00.0 (U225) 88080_Retimer 0.13.0 0.13.0 yes
DGX - 0000:c4:00.0 LR10 92.10.12.00.01 92.10.12.00.01 yes
DGX - 0000:c5:00.0 LR10 92.10.12.00.01 92.10.12.00.01 yes
DGX - 0000:c2:00.0 LR10 92.10.12.00.01 92.10.12.00.01 yes
DGX - 0000:c6:00.0 LR10 92.10.12.00.01 92.10.12.00.01 yes
DGX - 0000:c3:00.0 LR10 92.10.12.00.01 92.10.12.00.01 yes
DGX - 0000:c7:00.0 LR10 92.10.12.00.01 92.10.12.00.01 yes
DGX - 0000:01:00.0 (U1) PEX88096 1.3 1.3 yes
DGX - 0000:81:00.0 (U3) PEX88096 1.3 1.3 yes
DGX - 0000:41:00.0 (U2) PEX88096 1.3 1.3 yes
DGX - 0000:b1:00.0 (U4) PEX88096 1.3 1.3 yes
```

---

# Chapter 10. DGX A100 System Firmware Update Container Version 20.05.12.2

The DGX Firmware Update container version 20.05.12.2 is available.

- ▶ Package name: `nvfw-dgxa100_20.05.12.2_200630.tar.gz`
- ▶ Run file name: `nvfw-dgxa100_20.05.12.2_200630.run`
- ▶ Image name: `nvfw-dgxa100:20.05.12.2`

## Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
  - ▶ DGX OS 4.99.9 or later
- ▶ Restored ability to view hidden options in the SBIOS setup screens.

## Contents of the DGX A100 System Firmware Container

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

| Component                        | Version        | Key Changes               | Update Time |
|----------------------------------|----------------|---------------------------|-------------|
| BMC (via CEC)                    | 00.12.05       | No change.                | 31 minutes  |
| SBIOS                            | 0.25           | ▶ Restored Hidden Options | 7 minutes   |
| Broadcom 88096 PCIe switch board | 1.3            | No change                 | 8 minutes   |
| BMC CEC SPI                      | v3.05          | No change                 | 8 minutes   |
| PEX88064 Retimer                 | 0.13.0         | No change                 | 7 minutes   |
| PEX88080 Retimer                 | 0.13.0         | No change                 | 7 minutes   |
| NvSwitch BIOS                    | 92.10.12.00.01 | No change                 | 8 minutes   |

| Component | Version        | Key Changes | Update Time |
|-----------|----------------|-------------|-------------|
| VBIOS     | 92.00.19.00.01 | No change   | 7 minutes   |

## Updating Components with Secondary Images

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

- ▶ **SBIOS:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. The update container can only update the inactive image. After reboot, the updated image becomes the active image. You can perform the update again to update the current inactive image so that both images are updated.
- ▶ **BMC:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. The update container can only update the inactive image. After the update is completed, the updated image becomes the active image. You can perform the update again to update the current inactive image so that both images are updated.

## 10.1. 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 the container image directly.

1. Perform a transitional update if needed.

Depending on the BMC and MB\_CEC versions on the system, you may need to perform a transitional update before updating the BMC and SBIOS to the latest versions.

- a). Check if the transitional update is needed.

```
$ sudo nvfw-dgxa100_20.05.12.2_200630.run run_script --command "fw_transition.py show_version"
```

The following message appears if a transition update is needed.

```
BMC/MB_CEC firmware needs update to Active/Inactive, secure boot mode
This is a one-time update required for DGXA100. All future updates require BMC
in this mode
```

- ▶ If the one-time update is required, continue with the next step to perform the transitional update.
- ▶ If the one-time update is not required, then skip to step 2.

- b). Perform the transitional update.

```
$ sudo nvfw-dgxa100_20.05.12.2_200630.run run_script --command "fw_transition.py update_fw"
$ sudo reboot
```

- c). Verify that BMC (both images) and the MB\_CEC are up to date.

```
$ sudo nvfw-dgxa100_20.05.12.2_200630.run run_script --command "fw_transition.py show_version"
```

2. Check if other updates are needed.

```
$ sudo nvfw-dgxa100_20.05.12.2_200630.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.

3. Perform the final update for all firmware supported by the container and reboot the system.

```
$ sudo nvfw-dgxa100_20.05.12.2_200630.run update_fw all
```

```
$ sudo reboot
```

**Note:** The `update_fw all` command updates the inactive BMC and SBIOS images only. After rebooting the system, the updated images become "active". You can then update the inactive images using `nvfw-dgxa100_20.05.12.2_200630.run update_fw [BMC] [SBIOS] --inactive as needed`.

You can verify the update by issuing the following.

```
$ sudo nvfw-dgxa100_20.05.12.2_200630.run show_version
```

Expected output.

```

BMC DGX
=====
Image Id Status Location Onboard Version Manifest up_to_date
0:Active Boot Online Local 00.12.05 00.12.05 yes
1:Inactive Updatable Local 00.12.05 00.12.05 00.12.05 yes

CEC
=====
MB_CEC(enabled) Onboard Version Manifest up-to-date
 3.05 3.05 yes

SBIOS
=====
Image Id Method Onboard Version Manifest up_to_date
0:Inactive Updatabl afulnx 0.25 0.25 yes
1:Active Boot 0.25 0.25 0.25 yes

Video BIOS
=====
Bus Model Onboard Version Manifest up-to-date
0000:07:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:0f:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:47:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:4e:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:87:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:90:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:b7:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:bd:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes

Switches
=====
PCI Bus# Model Onboard Version Manifest up-to-date
DGX - 0000:91:00.0 (U261) 88064_Retimer 0.13.0 0.13.0 yes
DGX - 0000:88:00.0 (U260) 88064_Retimer 0.13.0 0.13.0 yes

```



|                           |               |                |                |     |
|---------------------------|---------------|----------------|----------------|-----|
| DGX - 0000:4f:00.0 (U262) | 88064_Retimer | 0.13.0         | 0.13.0         | yes |
| DGX - 0000:48:00.0 (U225) | 88080_Retimer | 0.13.0         | 0.13.0         | yes |
| DGX - 0000:c4:00.0        | LR10          | 92.10.12.00.01 | 92.10.12.00.01 | yes |
| DGX - 0000:c5:00.0        | LR10          | 92.10.12.00.01 | 92.10.12.00.01 | yes |
| DGX - 0000:c2:00.0        | LR10          | 92.10.12.00.01 | 92.10.12.00.01 | yes |
| DGX - 0000:c6:00.0        | LR10          | 92.10.12.00.01 | 92.10.12.00.01 | yes |
| DGX - 0000:c3:00.0        | LR10          | 92.10.12.00.01 | 92.10.12.00.01 | yes |
| DGX - 0000:c7:00.0        | LR10          | 92.10.12.00.01 | 92.10.12.00.01 | yes |
| DGX - 0000:01:00.0 (U1)   | PEX88096      | 1.3            | 1.3            | yes |
| DGX - 0000:81:00.0 (U3)   | PEX88096      | 1.3            | 1.3            | yes |
| DGX - 0000:41:00.0 (U2)   | PEX88096      | 1.3            | 1.3            | yes |
| DGX - 0000:b1:00.0 (U4)   | PEX88096      | 1.3            | 1.3            | yes |

---

# Chapter 11. DGX A100 System Firmware Update Container Version 20.05.12

The DGX Firmware Update container version 20.05.12 is available.

- ▶ Package name: `nvfw-dgxa100_20.05.12_200603.tar.gz`
- ▶ Run file name: `nvfw-dgxa100_20.05.12_200603.run`
- ▶ Image name: `nvfw-dgxa100:20.05.12`

## Highlights and Changes in this Release

- ▶ This release is supported with the following DGX OS software -
  - ▶ DGX OS 4.99.8 or later
- ▶ Enabled BMC Secure Flash
- ▶ Enabled PCI-Compliant DPC and AER error propagation
- ▶ Implemented critical VBIOS fixes

## Contents of the DGX A100 System Firmware Container

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

| Component     | Version  | Key Changes                                                                                                                                                                                                                               | Update Time |
|---------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| BMC (via CEC) | 00.12.05 | <p>Added to container.</p> <ul style="list-style-type: none"><li>▶ BMC now recognizes the level of CEC installed, and enforces Secure Flash if the CEC supports it.</li><li>▶ Removed the ability to update the BMC via the UI.</li></ul> | 31 minutes  |

| Component                        | Version        | Key Changes                                                                                                                                                                                                                                                                                                             | Update Time |
|----------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|                                  |                | <ul style="list-style-type: none"> <li>▶ Added micro-controller assist (MCA) SEL, downloadable from the UI.</li> <li>▶ Added Logs &amp; Reports &gt; Debug Log &gt; Download Debug log control to BMC UI.</li> </ul>                                                                                                    |             |
| SBIOS                            | 0.23           | Added to container <ul style="list-style-type: none"> <li>▶ Removed Hidden Options and made TPM Configuration options visible</li> <li>▶ Fixed NVSM Show Health Errors related to DIMMs and DIMM population</li> <li>▶ Fixed system getting stuck at POST after enabling and then disabling drive encryption</li> </ul> | 7 minutes   |
| Broadcom 88096 PCIe switch board | 1.3            | Added to container <ul style="list-style-type: none"> <li>▶ Disabled hot-plug and hot-plug surprise capability</li> </ul>                                                                                                                                                                                               | 8 minutes   |
| BMC CEC SPI                      | v3.05          | Added to container                                                                                                                                                                                                                                                                                                      | 8 minutes   |
| PEX88064 Retimer                 | 0.13.0         | Updated                                                                                                                                                                                                                                                                                                                 | 7 minutes   |
| PEX88080 Retimer                 | 0.13.0         | Updated                                                                                                                                                                                                                                                                                                                 | 7 minutes   |
| NvSwitch BIOS                    | 92.10.12.00.01 | No change                                                                                                                                                                                                                                                                                                               | 8 minutes   |
| VBIOS                            | 92.00.19.00.01 | Updated <ul style="list-style-type: none"> <li>▶ Fixed Xid 64 (Row Remapper Error)</li> </ul>                                                                                                                                                                                                                           | 7 minutes   |

## Updating Components with Secondary Images

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

- ▶ **SBIOS:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. The update container can only update the inactive image. After reboot, the updated image becomes the active image. You can perform the update again to update the current inactive image so that both images are updated.
- ▶ **BMC:** The two images are referred to as active and inactive, where the active is the currently running image and the inactive is the backup image. The update container can only update the inactive image. After the update is completed, the updated image becomes the active image. You can perform the update again to update the current inactive image so that both images are updated.

## 11.1. 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 the container image directly.

1. Perform a transitional update if needed.

Depending on the BMC and MB\_CEC versions on the system, you may need to perform a transitional update before updating the BMC and SBIOS to the latest versions.

- a). Check if the transitional update is needed.

```
$ sudo nvfw-dgxa100_20.05.12_2006003.run run_script --command "fw_transition.py
show_version"
```

The following message appears if a transition update is needed.

```
BMC/MB_CEC firmware needs update to Active/Inactive, secure boot mode
This is a one-time update required for DGXA100. All future updates require BMC
in this mode
```

- ▶ If the one-time update is required, continue with the next step to perform the transitional update.
- ▶ If the one-time update is not required, then skip to step 2.

- b). Perform the transitional update.

```
$ sudo nvfw-dgxa100_20.05.12_2006003.run run_script --command "fw_transition.py
update_fw"
$ sudo reboot
```

- c). Verify that BMC (both images) and the MB\_CEC are up to date.

```
$ sudo nvfw-dgxa100_20.05.12_2006003.run run_script --command "fw_transition.py
show_version"
```

2. Check if other updates are needed.

```
$ sudo nvfw-dgxa100_20.05.12_2006003.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.

3. Perform the final update for all firmware supported by the container and reboot the system.

```
$ sudo nvfw-dgxa100_20.05.12_2006003.run update_fw all
```

```
$ sudo reboot
```



**Note:** The `update_fw all` command updates the inactive BMC and SBIOS images only. After rebooting the system, the updated images become "active". You can then update the inactive images using `nvfw-dgxa100_20.05.12_2006003.run update_fw [BMC] [SBIOS] --inactive as needed`.

You can verify the update by issuing the following.

```
$ sudo nvfw-dgxa100_20.05.12_2006003.run show_version
```

Expected output.

```

BMC DGX
=====
Image Id Status Location Onboard Version Manifest up_to_date
0:Active Boot Online Local 00.12.05 00.12.05 yes
1:Inactive Updatable Local 00.12.05 00.12.05 yes

CEC
=====
MB_CEC(enabled) Onboard Version Manifest up-to-date
 3.05 3.05 yes

SBIOS
=====
Image Id Method Onboard Version Manifest up_to_date
0:Inactive Updatabl afulnx 0.24 0.24 yes
1:Active Boot 0.24 0.24 yes

Video BIOS
=====
Bus Model Onboard Version Manifest up-to-date
0000:07:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:0f:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:47:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:4e:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:87:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:90:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:b7:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes
0000:bd:00.0 A100-SXM4-40GB 92.00.19.00.01 92.00.19.00.01 yes

Switches
=====
PCI Bus# Model Onboard Version Manifest up-to-date
DGX - 0000:91:00.0 (U261) 88064_Retimer 0.13.0 0.13.0 yes
DGX - 0000:88:00.0 (U260) 88064_Retimer 0.13.0 0.13.0 yes
DGX - 0000:4f:00.0 (U262) 88064_Retimer 0.13.0 0.13.0 yes

DGX - 0000:48:00.0 (U225) 88080_Retimer 0.13.0 0.13.0 yes

DGX - 0000:c4:00.0 LR10 92.10.12.00.01 92.10.12.00.01 yes
DGX - 0000:c5:00.0 LR10 92.10.12.00.01 92.10.12.00.01 yes
DGX - 0000:c2:00.0 LR10 92.10.12.00.01 92.10.12.00.01 yes
DGX - 0000:c6:00.0 LR10 92.10.12.00.01 92.10.12.00.01 yes
DGX - 0000:c3:00.0 LR10 92.10.12.00.01 92.10.12.00.01 yes
DGX - 0000:c7:00.0 LR10 92.10.12.00.01 92.10.12.00.01 yes

DGX - 0000:01:00.0 (U1) PEX88096 1.3 1.3 yes
DGX - 0000:81:00.0 (U3) PEX88096 1.3 1.3 yes
DGX - 0000:41:00.0 (U2) PEX88096 1.3 1.3 yes
DGX - 0000:b1:00.0 (U4) PEX88096 1.3 1.3 yes

```

---

# Chapter 12. DGX A100 System Firmware Changes

This chapter contains the list of changes for the following DGX A100 firmware components.

- ▶ [BMC](#)
- ▶ [System BIOS](#)
- ▶ [Broadcom 88096 Switchboard](#)
- ▶ [Broadcom 880xx Retimers](#)
- ▶ [A100 VBIOS Changes](#)
- ▶ [DGX A100 BMC CEC Changes](#)
- ▶ [DGX A100 CEC1712 SPI Changes](#)
- ▶ [DGX A100 NVSwitch Firmware Changes](#)
- ▶ [DGX A100 FPGA Release Notes](#)

## 12.1. DGX A100 BMC Changes

### Changes in 00.14.17

- ▶ Added support for second source SPI ROM (Winbond)

### Changes in 00.14.16

- ▶ Fixed an issue where a cold boot might put the BMC in a non-bootable state.
- ▶ Fixed BMC update failing with "Error flashing inactive image 2: rc = 0x-9" ,
- ▶ Fixed occasionally needing to log into the BMC WebUI twice.
- ▶ Fixed the BMC dashboard system event filter not working.
- ▶ Added ability to monitor Mellanox card transceiver temperatures and increase fan speeds.
- ▶ Fixed inability to update the BMC after unexpected interruption.
- ▶ Fixed missing memory, NIC and storage drive information.

### Changes in 00.13.16

- ▶ The BMC update includes software security enhancements.

See the [NVIDIA Security Bulletin 5010](#) for details.

### Changes in 00.13.04

- ▶ Resolved increased fan speed that occurred when optional components are not installed, even when system is idle.

## 12.2. DGX A100 SBIOS Changes

### Changes in 0.34

- ▶ Removed warning message that occurred when the system contained DIMMs from different vendors.

### Changes in 0.33

- ▶ Fixed mishandling of correctable PCIe errors.

### Changes in 0.30

- ▶ Added support for HTTP boot.
- ▶ Updated DSP/USP preset values to address PCIe advanced error reporting (AER) issues.
- ▶ Changed the following default settings.
  - ▶ Determinism Control > [Manual]
  - ▶ Determinism Slider > [Power]
  - ▶ cTDP Control > [Manual]
  - ▶ cTDP > [240]
  - ▶ Package Power Limit Control > [Manual]
  - ▶ Package Power Limit > [240]
  - ▶ DF Cstates > [Disabled]

## 12.3. DGX A100 Broadcom 88096 PCIe Switchboard Changes

### Changes in 0.2.0

- ▶ Fixed the incorrect setting of the switch's Upstream Port Number as Port 0.

### Changes in 1.8

- ▶ Implemented tuning to address PCIe advanced error reporting (AER) issues.

### Changes in 1.3

- ▶ Disabled hot-plug and hot-plug surprise capability.

## 12.4. DGX A100 Broadcom 880xx Retimer Changes

Release notes for the DGX A100 Broadcom 88080 and 88064 retimers.

### Changes in 1.2f

- ▶ Fixed an issue that caused NVQual to hang while loading the MODS driver.

### Changes in 0.F.0

- ▶ Improved error handling of downstream switches.

This change modifies the PCIe topology and mapping. Refer to the [DGX A100 User Guide](#) for PCIe mapping details.

### Changes in 0.13.0

- ▶ Fixed DPC Notification behavior for Firmware First Platform.

## 12.5. A100 VBIOS Changes

### Changes in 92.00.36.00.04

- ▶ Fixed an issue allocating the BAR1 size across resets.



- ▶ Fixed MIG capability not being reported correctly if the driver is not loaded; for example, if accessed out-of-band.

### Changes in 92.00.19.00.10

- ▶ Expanded support for potential alternate HBM sources.

### Changes in 92.00.19.00.01

- ▶ Fixed Xid 64 (Row Remapper Error)

## 12.6. DGX A100 BMC CEC Changes

### Changes in 3.28

- ▶ Fixed the update progress output reporting "Update\_timeout" for the motherboard CEC (MB\_CEC) when using the .run file without Docker installed.
- ▶ Fixed the the user's configuration getting lost if the BMC updated failed.

## 12.7. DGX A100 CEC1712 SPI Changes

### Changes in 3.9

- ▶ Fixed an issue that prevented a successful firmware update.

## 12.8. DGX A100 NVSwitch Firmware Changes

### Changes in 92.10.18.00.01

- ▶ Hardened the firmware for passthrough virtualization installations.

## 12.9. DGX A100 FPGA Release Notes

### Changes in 2.A5

- ▶ Fixed timing glitches that resulted in unexpected resets.
- ▶ Improved timeout counter code.

## 12.10. DGX A100 Delta PSU Release Notes

### Changes in 1.6/1.6/1.7

- ▶ Fixed 0W reporting issue.

---

# Appendix A. DGX A100 Firmware Update Process

This chapter provides an overview of the firmware update process when issuing `update_fw all`.

The following table shows the order in which the updates are performed, and whether a reboot or power cycle is required to complete the update. The table assumes that all firmware needs to be updated, and corresponds to the following sequence:

1. Issue `update_fw all`.
2. Power cycle the system.
3. Issue `update_fw all`.
4. Power cycle the system.
5. Issue `update_fw all`.

Table 1. Firmware Updated Upon Initial `update_fw all`

| Update Order | Component                | Reboot or Power Cycle Required |
|--------------|--------------------------|--------------------------------|
| 1            | BMC-CEC                  | None                           |
| 2            | BMC                      | None                           |
| 3            | SBIOS                    | Reboot                         |
| 4            | Switch PEX88080/PEX88064 | Reboot                         |
| 5            | Switch PEX88096 (U1~U3)  | Reboot                         |
| 6            | NVMe                     | None                           |
| 7            | GPU VBIOS and FUB        | Reboot                         |
| 8            | CEC1712 SPI              | DC Power Cycle                 |

Table 2. Firmware Updated Upon Second `update_fw all`

| Update Order | Component            | Reboot or Power Cycle Required |
|--------------|----------------------|--------------------------------|
| 1            | Switch PEX88096 (U4) | Reboot                         |
| 2            | FPGA                 | DC Power Cycle                 |

Table 3. Firmware Updated Upon Third `update_fw all`

| Update Order | Component | Reboot or Power Cycle Required |
|--------------|-----------|--------------------------------|
| 1            | NVSwitch  | Reboot                         |

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