

HPE Cray EX HPC Firmware Pack Installation Guide

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1 Copyright and Version

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2 Release Information

2.1 Overview

This document uses the terms “install”, “update”, and “upgrade” interchangeably as the HFP procedure is the same in each scenario.

When installing the HPC Firmware Pack (HFP) on a system managed by Cray System Management (CSM), refer to the [HPE Cray EX System Software Stack Installation and Upgrade Guide for CSM](#) for a high-level overview of the installation and upgrade workflow for all products. It also includes the software and hardware compatibility matrix, third-party product documentation links, and cross-product dependencies.

Installing HFP is primarily accomplished by executing Install and Upgrade Framework (IUF) commands as documented in the *Cray System Management* documentation and described in this guide in sections [Install or Upgrade HPC Firmware Pack](#) and [IUF Stage Details for HFP](#).

2.2 Product Details

The HPE Cray EX HPC Firmware Pack (HFP) provides firmware packages for HPE Cray EX system hardware. The HFP product distribution tar.gz file includes a NOTES.txt file which lists the recommended firmware packages to install.

NOTE: Firmware packages for certain hardware components are not included in HFP and must be acquired from the hardware vendor, for example Dell and Mellanox network switch firmware.

2.3 Firmware Details

This is a list of firmware files that are part of the HPC Firmware Pack.

Firmware Group	Firmware Product	Current Version	Updatable Via FAS
Cc Nc	mtn-ccnc-firmware-1.9.5.39- 20240714022451_2e62b6a8f5f0.x86_64.rpm	1.9.5-39	Yes
EX255a	mtn-ex255a-bios-1.3.0- 20240927215950_53e59933d03b.x86_64.rpm	1.3.0	Yes
EX254n	ex254n.bios-2.0.4- 20240717135525_9178f60.x86_64.rpm	2.0.4(B)	Yes
EX254n.EROT	EX254n.erot-1.3.136- 20240815061718_636f31ad96b5.x86_64.rpm	01.03.0136.0000_n01	Yes
EX254n.VBIOS	EX254n.vbios-150.172.3- 20240809103617_548981ac7f56.x86_64.rpm	96.00.AC.00.03	Yes
XD224 BMC	XD224.BMC-01.17.00.1001- 20240814162333_15a6f1e742a6.x86_64.rpm	01.17.00.1001	Yes
XD224 SBIOS	XD224.SBIOS-25.01- 20240814164944_d699e78545d1.x86_64.rpm	25.01	Yes
GIGABYTE	sh-svr-1264up-bios-23.08.00- 20230818172157_56b85f3.x86_64.rpm	C38(Semantic Version 23.08.00)	Yes
	sh-svr-3264-bios-23.08.00- 20230818172157_56b85f3.x86_64.rpm	C38(Semantic Version 23.08.00)	Yes
	sh-svr-5264-gpu-bios-23.08.00- 20230818172157_56b85f3.x86_64.rpm	C38(Semantic Version 23.08.00)	Yes
EX235n	mtn-ex235n-bios-1.5.1- 20241007153237_a81a6e1219c2.x86_64.rpm	1.5.1	Yes
EX425	mtn-ex425-bios-1.7.6- 20241004162353_6fccdd901078.x86_64.rpm	1.7.6	Yes
EX4252	mtn-ex4252-bios-2.0.0- 20240927184118_1d2f956e3cbd.x86_64.rpm	2.0.0	Yes
EX235a	mtn-ex235a-bios-2.0.0- 20241008160020_7ed283572e72.x86_64.rpm	2.0.0	Yes
AMD MI200 AccVbios	AMD_MI200-2.0.0- 20220810115835_94954b0.x86_64.rpm	113-D65201-046- 609321	Yes

Firmware Group	Firmware Product	Current Version	Updatable Via FAS
		(HFP internal/Semantic Version 2.0.0)	
AMD MI200 GPU RM	MI200RM-010-3.16.0-20221205015449_d187d03.x86_64.rpm	3.16.0	Yes
EX420	mtn-ex420-bios-1.4.0-20240821163753_1700a87e3ce9.x86_64.rpm	1.4.0	Yes
GPU	MI100_D3431500-100-1-0.x86_64.rpm	D3431500-100	No
NIC	wnc.i210-2.1.1-20240906105259_9d7e61cfbc59.x86_64.rpm	p2sn01	Yes
Aruba	ArubaOS-CX_6400-6300_10_13_1040.swi	10.13.1040	No
	ArubaOS-CX_8320_10_13_1040.swi	10.13.1040	No
	ArubaOS-CX_8325_10_13_1040.swi	10.13.1040	No
	ArubaOS-CX_8360-8100_10_13_1040.swi	10.13.1040	No
Apollo 6500	FAS-BIOS-HPE_XL645d-Gen10Plus-3.20-1.x86_64.rpm	3.20_08-07-2024	Yes
	A48_3.20_08_07_2024.fwpkg	3.20_08-07-2024	No
Apollo 6500 Gen10 Plus	FAS-BIOS-HPE_XL675d-Gen10Plus-3.20-1.x86_64.rpm	3.20_08-07-2024	Yes
	A47_3.20_08_07_2024.fwpkg	3.20_08-07-2024	No
DL325 Gen10 Plus	FAS-BIOS-HPE_DL325-3.20-1.x86_64.rpm	3.20_08-07-2024	Yes
	A43_3.20_08_07_2024.fwpkg	3.20_08-07-2024	No
DL385 Gen10 Plus	FAS-BIOS-HPE_DL385-3.20-1.x86_64.rpm	3.20_08-07-2024	Yes
	A42_3.20_08_07_2024.fwpkg	3.20_08-07-2024	No
iLO 5	iLO5_FW_LNXSC_278-firmware-ilo5-2.78-1.1.x86_64.rpm	2.78	No
	FAS-HPE_ILO5-2.78-3.x86_64.rpm	2.78	Yes
	iLO5_FW_LNXSC_307-firmware-ilo5-3.07-1.1.x86_64.rpm	3.07	No
	FAS-HPE_ILO5-3.07-1.x86_64.rpm	3.07	Yes
DL360 Gen10 Plus, DL380 Gen10 Plus	FAS-BIOS-HPE_DL360_DL380_Gen10_Plus-2.20-1.x86_64.rpm	2.20_08-07-2024	Yes
	U46_2.20_08_07_2024.fwpkg	2.20_08-07-2024	No
DL360 Gen11, DL380 Gen11	FAS-BIOS-HPE_DL360_DL380_Gen11-2.22-1.x86_64.rpm	2.22_06-19-2024	Yes
	U54_2.22_06_19_2024.fwpkg	2.22_06-19-2024	No
DL385 Gen11, DL365 Gen11	FAS-BIOS-HPE_DL365_DL385_Gen11-1.66-1.x86_64.rpm	1.66_07-11-2024	Yes
	A55_1.66_07_11_2024.fwpkg	1.66_07-11-2024	No
DL325 Gen11, DL345 Gen11	FAS-BIOS-HPE_DL325_DL345_Gen11-1.66-1.x86_64.rpm	1.66_07-11-2024	Yes
	A56_1.66_07_11_2024.fwpkg	1.66_07-11-2024	No
iLO 6	iLO6_FW_LNXSC_162-firmware-ilo6-1.62-1.1.x86_64.rpm	1.62	No
	FAS-HPE_ILO6-1.62-1.x86_64.rpm	1.62	Yes
NVIDIA Acc FPGA	NVIDIA.HGX.A100.4.GPU.40-2.7.3-20231030115132_d3ab9f3df485.x86_64.rpm	2.71	Yes
Redstone FW (NVIDIA 4 GPU)	NVIDIA_HGX_A100_x4_SXM4_40GB_AirCooled_GPU-92.00.36.00.04-0.x86_64.rpm	92.00.36.00.04	No
	NVIDIA_HGX_A100_x4_SXM4_40GB_LiquidCooled_GPU-92.00.36.00.05-0.x86_64.rpm	92.00.36.00.05	No
	NVIDIA_HGX_A100_x4_SXM4_80GB_Air-Cooled_GPU-92.00.94.00.0A-92.00.94.00.04.scexe	92.00.94.00.0A-92.00.94.00.04-rev1	No
	NVIDIA_HGX_A100_x4_SXM4_80GB_Liquid-Cooled_GPU-92.00.94.00.0B-92.00.94.00.05.scexe	92.00.94.00.0B-92.00.94.00.05-rev1	No
Delta FW (NVIDIA 8 GPU)	NVIDIA_HGX_A100_x8_SXM4_40GB_Air-Cooled_GPU-92.00.45.00.03-0.x86_64.rpm	92.00.45.00.03	No

Firmware Group	Firmware Product	Current Version	Updatable Via FAS
	NVIDIA_HGX_A100_x8_SXM4_40GB_Liquid-Cooled_GPU-92.00.45.00.04-0.x86_64.rpm	92.00.45.00.04	No
	NVIDIA_HGX_A100_x8_SXM4_80GB_Air-Cooled_GPU-92.00.9E.00.01_92.00.9E.00.03.scex	92.00.9E.00.01-92.00.9E.00.03-Rev1	No
	NVIDIA_HGX_A100_x8_SXM4_80GB_Liquid-Cooled_GPU-92.00.45.00.06-0.x86_64.rpm	92.00.45.00.06	No

2.4 Differences from Prior Release

Some previously omitted NVIDIA firmware was updated and is now included in this version of the HFP. Firmware available in this HFP includes:

- Nvidia A100 GPU (4 and 8 GPU models)
- NVIDIA Acc FPGA

Other NVIDIA firmware is still omitted from this HFP release and includes the following components. The omitted packages include:

- Tesla_A100_92.00.25.00.08.x86_64.rpm
- delta-cecv3.5-ota.bin.hpepkg.signed.ilo-3.5-1.fwpkg
- CEC-Enabled-fpga3v00-ota.bin.hpepkg.signed-3.00-1.fwpkg
- NVSwitch_92.10.18.00.01.scexe
- PEX88000_v3.0f.scexe
- NVIDIA_Tesla_V100_PCIE_32GB_88.00.7E.00.03.scexe
- Quadro_RTX6000_90.02.4A.00.02-1-0.x86_64.rpm

These components will be updated in a future release of HFP.

2.5 Performing Firmware Upgrades

HFP provides the firmware packages for HPE Cray EX systems, but **HFP does not perform firmware upgrades**. There are two methods to upgrade firmware: with and without the Firmware Action Service (FAS) which is only present on systems managed by CSM. The method used to install HFP depends on whether FAS is installed and operational, as described in the following subsections.

2.5.1 Updating BMC Firmware and BIOS for ncn-m001

Refer to this section in the *Cray System Management Documentation*, [Updating BMC Firmware and BIOS for m001](#).

2.5.2 Upgrading Firmware With FAS

Systems managed by CSM most often perform firmware upgrades using FAS. The [Install or Upgrade HPC Firmware Pack](#) section of this document describes how to install HFP on a CSM-managed system with FAS installed and operational. The [Install HPC Firmware Pack from PIT or LiveCD](#) section of this document describes how to install HFP on a CSM-managed system booted into the Pre-Install Toolkit (PIT) or LiveCD environments (typically only the case when the system is being installed for the first time).

FAS details can be found in the [Update Firmware with FAS](#) section of the *Cray System Management Documentation*.

2.5.3 Upgrading Firmware Without FAS

On systems without FAS, firmware provided by HPF can be installed by following the instructions included in the directory of the HFP product distribution tar.gz file that contains the firmware package.

Each hardware product directory includes firmware packages (fwpkg, rpm, ...) as well as a DOC directory with vendor documentation, including installation instructions. The following are example directory listings for HPE_XL675d-Gen10P1us (HPE ProLiant XL675d) and GB_SVR_1264UP_C17_C21 (Gigabyte 1264UP) hardware:

```

HPE_XL675d-Gen10Plus/
  A47_2.40_02_23_2021.fwpkg
  DOC/
    HPCM-Firmware-Flash_v2021.03.04.pdf
    INSTALL.txt
    README.txt
    FAS-BIOS-HPE_XL675d-Gen10Plus-2.40-1-sles15sp1.x86_64.rpm

GB_SVR_1264UP_C17_C21/
  DOC/
    BMCFirmwareUpdate.txt
    Gigabyte-Shasta-Firmware-Update.pdf
    README.txt
    Relnotes_MZ32-AR0-YF_C17_F01.pdf
    Relnotes_MZ32-AR0-YF_C17_Rome.pdf
    Relnotes_MZ32-AR0-YF_Naples.pdf
    sh-svr-1264up-bios-21.00.00-20210325025941_8df4708.x86_64.rpm

```

Focusing on the HPE_XL675d-Gen10Plus directory listing:

- The directory name HPE_XL675d-Gen10Plus reflects the type of hardware the firmware is for.
- The A47_2.40_02_23_2021.fwpkg file is used for manual installation without FAS.
- The DOC directory contains documentation files, including release and installation details.
- The FAS-BIOS-HPE_XL675d-Gen10Plus-2.40-1-sles15sp1.x86_64.rpm file is used for installation with FAS.

2.5.3.1 iLO Information

Documentation in some, but not all, of the DOC directories states that [HPE Integrated Lights Out \(iLO\)](#) server management software can be used to install the firmware. In those cases, the following documentation provides additional details on how to use iLO and may be of interest.

- [HPE iLO 5 2.55 User Guide](#)
 - The “Viewing and managing firmware and software” section documents how to use the iLO web interface to install firmware.
- [RESTful Interface Tool 1.50 User Guide](#)
 - The “Firmware update command” topic in the “iLO Commands” section documents how to install firmware using the [RESTful Interface Tool](#).

NOTE

* iLO and BIOS firmware are only provided by HFP. Download remaining drivers and firmware from the [Service Pack for ProLiant \(SPP\) and Apollo Servers](#).

- Both iLO5 2.78 and iLO5 3.01 are included in this release. iLO5 firmware version 2.78 needs to be included in ALL releases that have an iLO5 version > 2.78 due to needing to update to 2.78 before updating to the later version. Please note iLO5 v2.78 is positioned to be the base version for future iLO5 upgrades considering that upcoming versions of iLO5 binary files are expected to be larger than 32MB in size. Previous versions of iLO5 (prior to 2.78) will only accept 32MB size binary files. This restriction has been removed in iLO5 v2.78. For more information, please refer to this FAS section, [Update iLO5 Firmware Above v2.78](#) in the *Cray System Management Documentation*.
- Models HPE EX254n and HPE EX255a are incompatible with the 1.8.X series of Cc/Nc firmware. While it is feasible to downgrade the Cc/Nc firmware from the current 1.9.X version to 1.8.X, it is crucial to note that the mentioned models will not be supported unless Cc/Nc is at version 1.9.X. **CAUTION** Exercise caution when proceeding with the downgrade to ensure compatibility with supported models.

3 Install or Upgrade HPC Firmware Pack

This section describes how to install HFP on a CSM-managed system with FAS installed and operational.

The Install and Upgrade Framework (IUF) provides commands which install, upgrade, and deploy products on systems managed by CSM. IUF capabilities are described in detail in the [IUF](#) Section of the [Cray System Management Documentation](#). The initial install and upgrade workflows described in the [HPE Cray EX System Software Stack Installation and Upgrade Guide for CSM \(S-8052\)](#) detail when and how to use IUF with a new release of HFP or other HPE Cray EX products.

Read the [Overview](#) section of this document to understand what is and is not executed as part of the HFP install process. See the [Upgrading Firmware Without FAS](#) section of this document for instructions on systems not managed by CSM.

3.1 Install and Upgrade Framework

IUF will perform the following tasks for a release of HFP.

- process-media stage
 - extracts release distributions
- pre-install-check stage
 - pre-flight checks for services:
 - * verify FAS is installed
 - * verify rpms and zip files are loaded into FAS
 - * removes the incompatible files from FAS and from s3 fw-bucket
- deliver-product stage:
 - Sets up Nexus with a product's blobstores and repositories
 - Uploads RPMs to repositories in Nexus
 - Uploads Docker images to the Docker registry in Nexus
 - Uploads images into the Artifacts (S3) service
 - Runs `post-install-test-nexus.sh` (to check that rpms are uploaded to Nexus)
 - Runs `post-install-test-fas.sh` (to check that the firmware is loaded in FAS)

3.2 IUF Stage Details for HFP

This section describes any HFP details that an administrator needs to be aware of before running IUF stages. Entries are prefixed with **Information** if no administrative action is required or **Action** if an administrator needs to perform tasks outside of IUF.

- pre-install-check

Information: pre-flight check stage displays versions of HFP installed, verifies if nexus, FAS, and S3 are running, displays current FAS version, displays rpms/zip files which will be loaded in the FAS

- deliver-product

Action: If the command `cray fas loader nexus create` fails during the `post-install-test-fas.sh` check (which checks that the firmware is loaded in FAS), the user must manually run the command. The failure occurs when `loaderStatus="$(cray fas loader list 2>&1 | grep loaderStatus)"` returns **busy** even after 200seconds of waiting for **ready** status.

Run the following command to check if the `cray fas loader` status is **ready** or **busy**.

```
ncn-mw# cray fas loader list --format json | grep loaderStatus
```

This will return a **ready** or **busy** status. Example: `loaderStatus = "ready"`

If it is busy, wait until fas loader status is ready by monitoring the status using the same command. When the `cray fas loader` status is ready, reinstall HFP or load the firmware directly from nexus using FAS commands. For more information, please refer to [Load Firmware from Nexus](#).

4 Documentation for Each Firmware Unit

The documentation is used for manually installing firmware when not using FAS on HPE Cray EX.

Documentation for each firmware unit is alongside the firmware in the overall package.

HPE_XL675d-Gen10Plus
is for

<----- Hardware type this firmware

```
A47_2.40_02_23_2021.fwpkg          <----- File used for manual
installation
DOC                                <----- Documentation
  INSTALL.txt
  README.txt
FAS-BIOS-HPE_XL675d-Gen10Plus-2.40-1-sles15sp1.x86_64.rpm.  <----- rpm used by FAS for update

GB_SVR_1264UP_C17_C21
DOC
  BMCFirmwareUpdate.txt
  Gigabyte-Shasta-Firmware-Update.pdf
  README.txt
  Relnotes_MZ32-ARO-YF_C17_F01.pdf
  Relnotes_MZ32-ARO-YF_C17_Rome.pdf
  Relnotes_MZ32-ARO-YF_Naples.pdf
sh-svr-1264up-bios-21.00.00-20210325025941_8df4708.x86_64.rpm
```