



Hewlett Packard
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Cray XD Platform Firmware Update Tool User Guide

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Overview

The Cray XD Platform Firmware Update Tool (PFUT) provides a mechanism to quickly update BMC and BIOS components of HPE Cray XD Server nodes, whether individually or many at a time. It has support for the Cray XD225v, XD220v, XD295v, XD665, and XD670 models. This Python-based tool can be executed from either Linux or Windows management or administrator nodes to update the BIOS and BMC only. This tool can also be used to create firmware inventory reports for HPC cluster nodes. It is necessary to install a full Python environment and other prerequisites on the management workstation as it is a Python script-based tool.

Supported operating systems

The tool supports execution from either a Linux or Windows console.

Prerequisites

- Python 3 (Version 3.6.13 and above) <https://www.python.org/downloads/>
- Pandas module for Python (Version 1.1.5) <https://pypi.org/project/pandas/1.1.5/>
- Redfish module for Python (Version 3.1.6) <https://pypi.org/project/redfish/3.1.6/>
- Jinja2 module for Python <https://pypi.org/project/Jinja2/>
- pysqlitecipher module for Python (Version 0.22) (pip install pysqlitecipher==0.22)

Supported Target Platforms for Updates

- Cray XD225v, XD295v – Inventec using ASPEED/AMI BMC firmware
- Cray XD220v - Inventec using ASPEED/AMI BMC firmware
- Cray XD670 – Gigabyte using Aspeed/AMI BMC firmware
- Cray XD665 – Inventec using Aspeed/AMI BMC firmware

Downloading and Installing PFUT

- Download the Platform Firmware Update Tool (PFUT) from the <**HPE Support Centre**>. Install PFUT by unzipping the Platform_Firmware_Update_Tool_V_XX.zip package into the Management Workstation, from which the user chooses to deploy the firmware. We can also download PFUT by cloning this repository: https://github.com/HewlettPackard/CrayXD_PFUT.
- **Note:**
 - IP refers to IP addresses, which can be host names or FQDNs of the systems.
 - For Cray XD665 models, PFUT v3.1 is supported only when BMC firmware is v1.03 or less.
 - HostName should be enabled on the Cray XD systems mandatorily to use PFUT even if systems are accessed using IP addresses through PFUT. Although there is no issue if FQDN is not set on the Cray XD systems.
 - To access the nodes using Hostnames or FQDNs, hosts file should be configured as C:\Windows\System32\drivers\etc\hosts for Windows and /etc/hosts for Linux with the following contents:

# IPv4 address	FQDN	Hostname
----------------	------	----------



10.93.17.73	vp2-node1.cray.hpe.com	vp2-node1
10.93.17.223	node2.cray.hpe.com	node2

- IPV6 addresses are not supported with the current PFUT.

Note: IP addresses refer to IPv4 only and not IPv6.

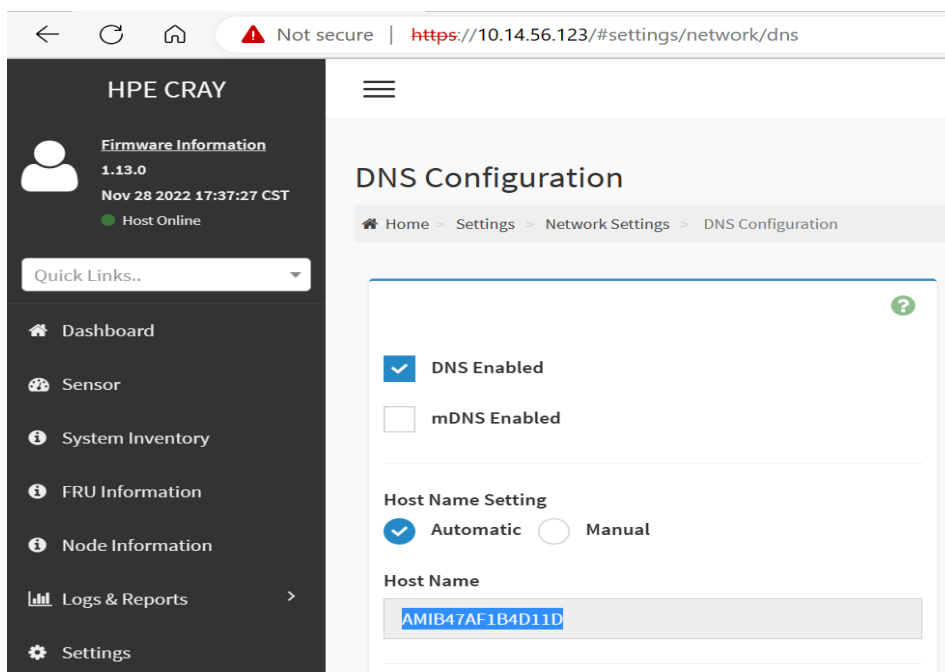
- The unzipped folder contains:
 - `Platform_Firmware_Update_Tool.py` – The main Python executable file, which is responsible for flashing and report generation.
 - `list.txt` – It contains one or more IP, host names, FQDNs and their credentials for performing BMC or BIOS firmware updates or generating reports.
 - `FirmwareToDeploy.txt` – It contains BMC or BIOS firmware details to be flashed.
 - `Helper Python Scripts` – Other Python scripts that are required by the main Python scripts.

Firmware files

- Download the latest BMC and BIOS firmware packs from the [<HPE Support Centre>](#).
- To configure firmware packs to use with PFUT, perform the following instructions:
 - Only HPM applications or octet-stream files can be used to flash BMC and BIOS.
 - The files used for updating are to be placed in the same directory as the script files used for flashing.
 - The `FirmwareToDeploy.txt` file present in the extracted directory along with the binary files should contain details of the BMC or BIOS firmware to be updated.

Host Names of the systems

- While running PFUT, the hostnames of the systems should be DNS-configured. Host names can be found in the GUI here. Changing the hostname will change the FQDN.



Command-Line options digest

The following parameter help shows up using `--help` or when invalid parameters are found as input:

-h --help

Display this help message and exit.

Multiple modes of target

-t IP_HostName_FQDN,prompt

Requests IP Username and Password.

-t promptall

All IP addresses from list.txt are prompted for a username and password.

-t IP_HostName_FQDN,Username,Password

To specify a single target.

-t prompt

Prompts for one target's IP_HostName_FQDN, username, and password.

Two modes of component

-c BIOS

To choose BIOS update.

-c BMC

To choose BMC update.

-bi --backup_image

Flashes the backup image of the respective selected component BMC or BIOS only for Cray XD670 models, as they have dual BIOS and dual BMC. Skips for Cray XD220v, XD225v, XD295v, and XD665 models.

-db --database

If the credentials of IP addresses, hostnames, or FQDNs in the input file need to be extracted from the database, this option should be set.

-f --file

Name of file with IP, Hostnames, FQDNs, and credentials. Defaults to list.txt.

-z --update

perform the required flash operations for a BMC or BIOS update. Only BMC and BIOS update is supported by this tool.

-d --discovery

The Node Discovery Report displays the HPC cluster's IP Address, Host Name, FQDN, and Server Model.

-i --inventory

The IP address, Host Name, FQDN, server model, BIOS version, and BMC version of the HPC cluster are displayed in the node inventory report.

-F --Force

When the version to be updated is the same as the current version, installation is forced.

NOTE: The version should be the same as reported by the device via Redfish or PFUT inventory.

-P --Power

When updating, AC power cycles are applied; if not, the updates are not reflected. This is specifically necessary for the BIOS update. No AC power cycling is necessary for the BMC update.

-a --all

Displays the HPC cluster's firmware details.



-p --password

session password can be used when all nodes have a common password.

-u --username

session username can be used when all nodes have a common username.

-D, --Debug

It shows all the debug information while updating the firmware. There is no effect on the report's generation.

Update the database with the IP, Host Name, or FQDN and its credentials

Run the `database_update.py` file along with any input files, if any, to create `pysqlitecipher.db`. If no input file is specified as an argument to be imported, prompts for the IP address, Host Name, or FQDN and its credentials are displayed. The `-f` flag is used for updating databases with input files. If the database is already created, run the same command with the existing password to update the entries in the database or append a new entry. Currently, there are no options to update the database password. The IP, Host Name, or FQDN and its credentials are encrypted in the database. The format of the input file to be imported is the same as the input file mentioned in the ["IP Selection"](#) section.

Sample format for `demo_database_text.txt`

NOTE: The delimiter of .txt file should be ";"

```
#This is a comment line
#IP/Host Name/FQDN(Necessary);User Name(Optional);Password(Optional)
10.14.56.52;username;password
10.14.56.123;username;password
```

Sample format for `demo_database_text.csv`

NOTE: The column names of the .csv file should be `IP_HostName_FQDN`, `Username`, `Password` (case-sensitive), and the delimiter should be ","

```
#This is a comment line
IP_HostName_FQDN,Username>Password
10.14.56.52,username,password
10.15.2.1,username,password
vp2-amd-1-1-node1,username,password
```

Updating the database to add IP, Host Name, or FQDN entries with an imported file (.txt or .csv) using the add operation:

- `python3 database_update.py -f demo_database_text.txt -o add`

Please enter the database password

Password:

INFO: Before performing any database operation, Database is empty!!

INFO: Final `IP_HostName_FQDNs` entries in database are 10.14.56.52, 10.14.56.123

- `cat demo_database_text.txt`

```
#This is a comment line
10.14.56.52;username;password
10.14.56.72;username;password
10.14.56.123;username;password
```

- `python3 database_update.py -f demo_database_text.txt`

Enter the operation to be performed on the database, Choose A/a or B/b or C/c

A)Add B)Delete C)View

a

Please enter the database password

Password:

INFO: Table already exists, appending the data if any



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INFO: Before performing any database operation, IP_HostName_FQDNs entries in database are 10.14.56.52, 10.14.56.123

INFO: Given 10.14.56.52 is already in the database and will be updated with the latest credentials provided in input file.

INFO: Given 10.14.56.123 is already in the database and will be updated with the latest credentials provided in input file.

NOTE: The credentials of the following IP_HostName_FQDNs were updated successfully in the database: 10.14.56.52, 10.14.56.123

INFO: Final IP_HostName_FQDNs entries in database are 10.14.56.52, 10.14.56.123, 10.14.56.72

Using prompts to update the database by adding IP, Host Name, or FQDN entries using the add operation:

- python3 database_update.py

Enter the operation to be performed on the database, Choose A/a or B/b or C/c

A)Add B)Delete C)View

a

Please enter the database password

Password:

INFO: Table already exists, appending the data if any

INFO: Before performing any database operation, IP_HostName_FQDNs entries in database are 10.14.56.52, 10.14.56.123, 10.14.56.72

Enter IP_HostName_FQDNs to be added/updated to the database or Enter 'q' to quit
10.5.1.41

Enter 10.5.1.41 Username: username

Enter 10.5.1.41 Password:

Enter IP Address or Hostname to be added/updated to the database or Enter 'q' to quit

10.4.5.1

Enter 10.4.5.1 Username:

Enter 10.4.5.1 Password:

WARNING: Missing credentials for 10.4.5.1 will not be appended to database

Enter IP_HostName_FQDNs to be added/updated to the database or Enter 'q' to quit

q

INFO: Final IP_HostName_FQDNs entries in database are 10.14.56.52, 10.14.56.123, 10.14.56.72, 10.5.1.41

When the incorrect password is entered, an error message is displayed:

- python3 database_update.py

Please enter the database password

Password:

Traceback (most recent call last):

File "database_update.py", line 40, in <module>

obj = sqlitewrapper.SqliteCipher(dataBasePath="pysqlitecipher.db" , checkSameThread=False , password=database)

File "/usr/lib/python3.6/site-packages/pysqlitecipher/sqlitewrapper.py", line 100, in __init__

raise RuntimeError("password does not match to password used to create data base")

RuntimeError: password does not match to password used to create data base

Updating the existing IP, Host Name, or FQDN entries in the database with new credentials using the add operation:

- python3 database_update.py

Enter the operation to be performed on the database, Choose A/a or B/b or C/c

A)Add B)Delete C)View

a

Please enter the database password



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Password:

INFO: Table already exists, appending the data if any

INFO: Before performing any database operation, IP_HostName_FQDNs entries in database are 10.14.56.52, 10.14.56.123, 10.14.56.72, 10.5.1.41

Enter IP_HostName_FQDNs to be added/updated to the database or Enter 'q' to quit
10.14.56.123

INFO: Given 10.14.56.123 is already in the database and will be updated with the following given latest credentials.

Enter 10.14.56.123 Username: username

Enter 10.14.56.123 Password:

Enter IP_HostName_FQDNs to be added/updated to the database or Enter 'q' to quit
10.14.56.52

INFO: Given 10.14.56.52 is already in the database and will be updated with the following given latest credentials.

Enter 10.14.56.52 Username: username

Enter 10.14.56.52 Password:

Enter IP_HostName_FQDNs to be added/updated to the database or Enter 'q' to quit
q

NOTE: The credentials of the following IP_HostName_FQDNs were updated successfully in the database: 10.14.56.123, 10.14.56.52

INFO: Final IP_HostName_FQDNs entries in database are 10.14.56.52, 10.14.56.123, 10.14.56.72, 10.5.1.41

Using prompts to update the database by deleting some IP, Host Name, or FQDN entries using the delete operation:

- python3 database_update.py

Enter the operation to be performed on the database, Choose A/a or B/b or C/c

A)Add B)Delete C)View

b

Please enter the database password

Password:

INFO: Table already exists

INFO: Before performing any database operation, IP_HostName_FQDNs entries in database are 10.14.56.52, 10.14.56.72, 10.5.1.41

Enter the IP_HostName_FQDNs to be deleted or Enter 'q' to quit: 10.14.56.72

Enter the IP_HostName_FQDNs to be deleted or Enter 'q' to quit: 10.14.56.72

WARNING: Wrong input 10.14.56.72 is given or there is no given entry in database.. Please try again

Enter the IP_HostName_FQDNs to be deleted or Enter 'q' to quit: q

INFO: The following IP_HostName_FQDNs are deleted successfully from the database: 10.14.56.72

INFO: Final IP_HostName_FQDNs entries in database are 10.14.56.52, 10.5.1.41

Updating the database by deleting IP, Host Name, or FQDN entries with an imported file (.txt/.csv) using the delete operation:

NOTE: It is not mandatory to provide the credentials of IPs, Host Names, or FQDNs while deleting a list of IP, Host Names, or FQDNs using .txt or .csv files.

- cat demo_database.csv

IP_HostName_FQDN,Username,Password

10.14.56.52

10.3.2.1,username

10.34.1.35,username,password

10.42.13.3,



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- `python3 database_update.py -o delete -f demo_database.csv`

Please enter the database password

Password:

INFO: Table already exists

INFO: Before performing any database operation, IP_HostName_FQDNs entries in database are 10.55.2.1, 10.14.56.52, 10.14.56.123, 10.33.2.1, 10.34.1.35, 10.42.13.3

WARNING: Wrong input 10.3.2.1 is given or there is no given entry in database.. Please try again

INFO: The following IP_HostName_FQDNs are deleted successfully from the database: 10.14.56.52, 10.34.1.35, 10.42.13.3

WARNING: The following IP_HostName_FQDNs cannot be deleted from the database as there are no entries of these IP_HostName_FQDNs in the database: 10.3.2.1

INFO: Final IP_HostName_FQDNs entries in database are 10.55.2.1, 10.14.56.123, 10.33.2.1

Checking IP, Host Name, or FQDN entries in the database using the view operation:

- `python3 database_update.py -f demo_database.csv -o VIEW`

Invalid Input... exiting

INFO: VIEW operation does not need any input file

- `python3 database_update.py -f demo_database.csv`

Enter the operation to be performed on the database, Choose A/a or B/b or C/c

A)Update B)Delete C)View

c

Invalid Input... exiting

INFO: VIEW operation does not need any input file

- `python3 database_update.py -o View`

Please enter the database password

Password:

INFO: Table already exists

INFO: Final IP_HostName_FQDNs entries in database are 10.55.2.1, 10.14.56.123, 10.33.2.1

IP selection

Several forms of the target parameter -t cause the default list.txt credential file or file passed with the -f flag to be scanned to identify hosts and their corresponding credentials. (.csv) file can also be passed as an input file. The column headers to be given are IP_HostName_FQDN, Username, and Password. If no target parameter is passed, the credentials should be present in the files chosen as input.

An example of list.txt follows:

```
# list.txt
#
# This file may contain one or more IP or Host names and credentials.
# A '#' as the first character on a line makes it a comment line.
#
#IP/Host Name/FQDN(Necessary);User Name(Optional);Password(Optional)
#-----;-----;-----
10.12.23.123;username;password
Hostname1;myuser;mypass
FQDN1;myuser;mypass
```

There can be no blank lines in this file. A comment line starts with "#".



- A single IP address, hostname, or FQDN can be specified along with credentials on the command line. The `list.txt` file is not used in this case.

```
-t 192.168.1.5,username,password
-t Hostname1,username,password
-t FQDN1,username,password
```

- This form of the command does not require that USERNAME and PASSWORD be specified in the `list.txt` file, as it prompts for the credentials for each entry in the `list.txt` or any file passed as input:

```
-t promptall
```

- A single IP, host name, or FQDN is prompted for by using the “prompt” version of the targets command. IP or DNS, USERNAME, and PASSWORD are requested.

```
-t prompt
```

- A single IP, host name, or FQDN followed by “prompt” is used when the USERNAME and PASSWORD are to be obtained via prompts.

```
-t IP,prompt
-t 10.234.12.123,prompt
-t HostName,prompt
-t FQDN1,prompt
```

To select credentials from the database, choose DB mode. The tool scans the IP, Host Name, or FQDN in the input file and accesses the credentials from the database when the correct database password is passed as the prompt. An example of `list.txt` without credentials is as follows:

```
-db flag for Database.
```

```
# list.txt
#
# This file may contain one or more IP or Host names and credentials.
# A '#' as the first character on a line makes it a comment line.
#
#IP/Host Name/FQDN(Necessary);User Name(Optional);Password(Optional)
#-----
10.12.23.123
Hostname1
FQDN1
```

Running the Utility for Reports

Node Discovery Report

The tool allows the server administrator to generate a report that lists all the HPC nodes discovered by the tool.

- An IP address, host name, or FQDN in addition to the target parameter.
- An input file (.csv or .text file) that contains a list of IP addresses, host names, or FQDNs and corresponding credentials in the same file or in a database.

In this report, the output generated is a list of the IP address, node hostname, node FQDN, and HPE Server model type, sorted by IP address.

The `-d` option generates a Node Discovery Report.

- `python3 Platform_Firmware_Update_Tool.py -d -f new_input_file.txt`



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INFO: No session password and session username common to all nodes was passed as arguments, Parsing the file HPE Node Discovery Report

08/22/23 03:28:25 AM

INFO: 5 items found

Sl No	IP Address	HostName	FQDN	Model
1	10.14.56.123	AMIB47AF1B4D11D	AMIB47AF1B4D11D.its.hpecorp.net	HPE Cray XD295v
2	10.14.59.226	AMIB47AF1B4A1D5	AMIB47AF1B4A1D5.its.hpecorp.net	HPE Cray XD220v
3	10.93.138.110	AMIB47AF1B464E5	AMIB47AF1B464E5.its.hpecorp.net	HPE Cray XD665
4	15.119.208.54	AMID85ED3E3F54D	NA	HPE Cray XD670
5	15.119.208.57	AMI74563C489455	NA	HPE Cray XD670

- INFO: Saved the 22_08_2023_032825NodeDiscoveryReport.csv in report
python3 Platform_Firmware_Update_Tool.py -d -t AMIB47AF1B4D11D,admin,superuser

INFO: Splitting IP_HostName_FQDN,Username,Password to extract credentials
HPE Node Discovery Report

04/12/23 12:17:55 PM

1 items found

Sl No	HostName	FQDN	IP Address	Model
1	AMIB47AF1B4D11D	AMIB47AF1B4D11D.its.hpecorp.net	10.14.56.123	HPE Cray XD295v

INFO: Saved the 12_04_2023_121755NodeDiscoveryReport.csv in report

Node Inventory Report

The tool allows the server administrator to generate a report that lists all the HPC nodes discovered by the tool.

- An IP address or host name in addition to the target parameter.
- An input file (.csv or .text file) that contains a list of IP addresses or host names and corresponding credentials in the same file or in a database.

In this report, the output generated is a list of the IP address, node hostname, node FQDN, server model, BMC version, and BIOS version of a compute node type sorted by IP address.

The -i option generates a Node Inventory Report

Example of a Node Inventory Report:

- python3 Platform_Firmware_Update_Tool.py -i -t 10.14.56.52,prompt

INFO: Prompts Username and Password for 10.14.56.52
Enter the Username: admin
Enter the Password:
HPE Node Inventory Report

09/26/23 11:47:32 AM

INFO: 1 items found

Sl No	IP Address	HostName	FQDN	BIOS Ver	BMC Ver
1	10.14.56.123	AMIB47AF1B4D11D	AMIB47AF1B4D11D.its.hpecorp.net	CA2K_5.27_v1.05	1.13.0

HPE Cray XD295v

INFO: Saved the 26_09_2023_114732NodeInventoryReport.csv in report



All Firmware Inventory Report

The tool allows the server administrator to generate a report that lists all the HPC nodes discovered by the tool.

- An IP address or host name in addition to the target parameter.
- An input file (.csv or .text file) that contains a list of IP addresses or host names and corresponding credentials in the same file or in a database.

In this report, the output generated is a list of the IP address, node hostname, node FQDN and server model, followed by various firmware version details for a compute node type sorted by IP address.

The -a option generates All firmware inventory report

Example of an All Firmware Inventory Report:

```
• cat list.txt

#IP/Host Name/FQDN(Necessary);User Name(Optional);Password(Optional)
10.14.59.226
10.93.138.110;admin;superuser

• python3 database_update.py -o view
Please enter the database password
Password:

INFO: Table already exists

INFO: Final IP_HostName_FQDNs entries in database are AMIB47AF1B4D11D, 10.14.59.226,
10.93.138.110, 15.119.208.57, 15.119.208.54, AMIB47AF1B464E5.its.hpecorp.net

• python3 Platform_Firmware_Update_Tool.py -a -db

INFO: Extracting Credentials from database for IP_HostName_FQDN in input text file
Enter the Database Password:
WARNING: Missing Credentials in database for 10.14.59.226
HPE All Firmware Inventory Report

08/24/23 00:02:09 AM
INFO: 1 items found

Sl No      IP Address      HostName      FQDN      BIOS Ver BMC Ver
HddbPIC Ver MainCPLD Ver PDBPIC Ver PFRCPD Ver      Model
1 10.14.56.123 AMIB47AF1B4D11D AMIB47AF1B4D11D.its.hpecorp.net CA2K_5.27_v1.05 1.12.0
00.00.0000 13.13.0000 00.00.0000 15.15.0000 HPE Cray XD295v

INFO: Saved the 24_08_2023_000209NodeAllFirmwareInventoryReport.csv in report
```

NOTE: All generated reports are saved in.csv format in the /report directory.



Running the Utility for BMC and BIOS Update

The tool allows the server administrator to update the BMC and BIOS firmware of the nodes using an IP address, host name, or FQDN in addition to the target parameter.

- An input file (.csv or .text file) that contains a list of IP addresses, host names, or FQDNs and corresponding credentials in the same file or in a database.
- The BMC or BIOS firmware details are to be populated in `FirmwareToDeploy.txt`.

An example of `FirmwareToDeploy.txt` as follows:

```
#FirmwareToDeploy.txt
#
# This file may contain one or more Server Model detail along with BMC/BIOS Firmware details to
be flashed.
# A '#' as the first character on a line makes it a comment line.
#
# Model;Firmware Type;Firmware Version;HPM file name
#-----
HPE Cray XD670;BMC;1.07.00;XD670_BMC_v1.07.hpm
#HPE Cray XD670;BMC;1.08.00;XD670_BMC_v1.08_backup.hpm
#HPE Cray XD670;BIOS;0.08;CUXD670_5.29_v0.08.hpm
#HPE Cray XD670;BIOS;0.09;CUXD670_5.29_v0.09.hpm
HPE Cray XD670;BIOS;0.11;CUXD670_5.29_v0.11.hpm
#HPE Cray XD670;BIOS;1.10; CUXD670_5.29_v1.10_backup_signed.bin.hpm
#There cannot be any blank lines in this file. A line must be a comment line starting with "#"
```

In `FirmwareToDeploy.txt`, the following details are to be specified, separated by “;” in the same order:

Model Name: The name of the model reported by Redfish.

Firmware Type: It should be BMC- or BIOS-based, depending on the component to be updated.

Firmware Version: Version to be updated as reported by device via Redfish.

HPM file name: Name of the HPM binary file.

Note: If BMC/BIOS backup images are to be flashed for Cray XD670 model systems, then only backup files should be mentioned under the HPM file name. And if there are any other systems apart from Cray XD670 model systems in the database or input txt or csv files, those will be skipped, allowing only Cray XD670 model systems to get their respective backup firmware updated. And there should not be more than one entry for a particular model.

To comment, “#” can be used, and no blank spaces are to be given in this text file.

The -z can be used for updating, along with the -c for choosing either BMC or BIOS to be updated. Based on the choice, all the BMC or BIOS components of the different server models mentioned in `FirmwareToDeploy.txt` will be updated. If component is not passed as a parameter, the prompt for component is displayed. It should be noted that only one firmware type (either BMC or BIOS) will be updated at a time. By default, all the active BMC or BIOS firmware’s get updated. The flag -bi or -backup_image should be used along with -z and the component flag to update the backup BMC or BIOS firmware of Cray XD670 models. After flashing, a report on the update’s status is displayed. A .csv file generated based on the status is saved in the update directory. The -P flag must be set to perform an AC power cycle, which is required to reflect BIOS changes. Power-cycling will be performed, and subsequent reports will be generated based on this choice. By default, the existing version and the new version, if they are the same, will not be updated; however, a force update can be performed using the ‘-F’ flag.

Note: No AC power cycling is necessary for BMC.

Sample firmware update commands are mentioned below:

```
Python3 Platform_Firmware_Update_Tool.py -z -c BIOS -P
```

Note: Here, it updates the nodes mentioned in the default file `list.txt` with the power argument set to do AC power cycling.

```
Python3 Platform_Firmware_Update_Tool.py -z -f newfile.txt -c BMC -F
```



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Note: Here, it updates the nodes mentioned in the file passed as an argument with the force install argument.

```
Python3 Platform_Firmware_Update_Tool.py -t ip,username,password -z -c BMC
```

Note: Here, it updates only one node mentioned in the target parameter.

```
Python3 Platform_Firmware_Update_Tool.py -z -f newfile.txt -c BMC -db
```

Note: Here it updates the nodes mentioned in the file passed as an argument, and the credentials for them are in DB. The DB password is to be entered as a prompt.

An example of a BMC update without Force when updating the same version.

```
• python3 Platform_Firmware_Update_Tool.py -z -c bmc -t 10.93.138.110,admin,superuser
INFO: Splitting IP_HostName_FQDN,Username,Password to extract credentials
HPE Firmware Update
```

```
INFO: BMC Update is Selected
****INFO: BMC Update Proceeding for: 1 Cray XD665 models
WARNING: Update is halted because Force argument is not set, as the version is same as suggested
for the cluster having IP: 10.93.138.110, Hostname: AMIB47AF1B464E5 and FQDN:
AMIB47AF1B464E5.its.hpecorp.net
****INFO: BMC Update Proceeding for: 0 Cray XD665 models
INFO: No update was done
```

An example of a BMC update with Force when updating the same version.

```
• python3 Platform_Firmware_Update_Tool.py -z -c bmc -t 10.93.138.110,admin,superuser -F
INFO: Splitting IP_HostName_FQDN,Username,Password to extract credentials
HPE Firmware Update
```

```
INFO: BMC Update is Selected
****INFO: BMC Update Proceeding for: 1 Cray XD665 models
INFO: BMC Update v3.1 Proceeding for 10.93.138.110 and Firmware is preparing now, Do not cancel
process ****
**** INFO: Following setups have successfully completed the BMC update: 10.93.138.110
**** INFO: Total 1 done ****
INFO: Please wait for reports to know the status of firmware update.
INFO: Sleeping for 5 minutes to let BMC reset to happen in the background
HPE Firmware Update Status Report
08/23/23 14:21:41 PM
INFO: 1 items found, 1 success, 0 failure
```

Sl No	IP Address	HostName	FQDN	Status	Pre-Ver	Post-Ver
Model						
1	10.93.138.110	AMIB47AF1B464E5	AMIB47AF1B464E5.its.hpecorp.net	Success	1.03.0	1.03.0

HPE Cray XD665

```
INFO: Saved the 23_08_2023_142141UpdateStatusReport_BMC.csv in update
```

An example of a BMC update with -D flag:

```
• cat list.txt
#IP/Host Name/FQDN(Necessary);User Name(Optional);Password(Optional)
10.14.56.123;admin;superuser
15.119.208.57;admin;superuser
10.93.138.110;admin;superuser

• cat FirmwareToDeploy.txt
#Model Name(Necessary);Firmware Type(Necessary);Firmware Version(Necessary);File Name(Necessary)
HPE Cray XD670;BMC;1.12.00;XD670_BMC_v1.12_signed.bin.hpm
HPE Cray XD665;BMC;1.00.0;C665_ABMC_134_v1.00.hpm
HPE Cray XD220v;BMC;1.12.0;BMC_13.2_Signed_v1.12.hpm
HPE Cray XD295v;BMC;1.12.0;BMC_13.2_Signed_v1.12.hpm
HPE Cray XD670;BIOS;CUXD670_5.29_v1.00;CUXD670_5.29_v1.00.hpm
HPE Cray XD665;BIOS;CA65_5.27_v0.59;CA65_5.27_v0.59_05252023_signed.hpm
HPE Cray XD220v;BIOS;CU2K_5.29_v1.11;CU2K_5.29_v1.01_11242022_signed.bin.hpm
```

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HPE Cray XD295v;BIOS;CA2K_5.27_v1.10;CA2K_5.27_v1.10_10272022_signed.bin.hpm

```
• python3 Platform_Firmware_Update_Tool.py -z -c bmc -D
INFO: No session password and session username common to all nodes was passed as arguments,
Parsing the file
HPE Firmware Update

INFO: BMC Update is Selected
****INFO: BMC Update Proceeding for: 2 Cray XD295v_XD220v_XD225v models, 1 Cray XD670 models, 1
Cray XD665 models
INFO: BMC Update v3.1 Proceeding for 10.14.59.226 and Firmware is preparing now, Do not cancel
process ****
DEBUG: 10.14.59.226 Preparing
INFO: BMC Update v3.1 Proceeding for 10.93.138.110 and Firmware is preparing now, Do not cancel
process ****
INFO: BMC Update v3.1 Proceeding for 10.14.56.123 and Firmware is preparing now, Do not cancel
process ****
DEBUG: 10.14.56.123 Preparing
DEBUG: 10.93.138.110 Preparing
DEBUG: 10.14.59.226 Downloading
DEBUG: 10.14.56.123 Downloading
DEBUG: 10.93.138.110 Downloading
DEBUG: 10.93.138.110 Firmware is flashing now
DEBUG: 10.14.59.226 Firmware is flashing now
DEBUG: 10.14.56.123 Firmware is flashing now
INFO: BMC Update v3.1 Proceeding for 15.119.208.57 and Firmware is preparing now, Do not cancel
process ****
DEBUG: 15.119.208.57 Preparing
DEBUG: 15.119.208.57 Downloading
DEBUG: 15.119.208.57 Firmware is flashing now
INFO: Cray XD665: 1 Done with Flashing 100% Completed
DEBUG: 10.93.138.110 BMC update completed.
**** INFO: Following setups have successfully completed the BMC update: 10.93.138.110
INFO: Cray XD295v_XD220v_XD225v: 1 Done with Flashing 100% Completed
INFO: Cray XD295v_XD220v_XD225v: 2 Done with Flashing 100% Completed
DEBUG: 10.14.56.123 BMC update completed.
**** INFO: Following setups have successfully completed the BMC update: 10.93.138.110,
10.14.56.123
DEBUG: 10.14.59.226 BMC update completed.
**** INFO: Following setups have successfully completed the BMC update: 10.93.138.110,
10.14.56.123, 10.14.59.226
INFO: Cray XD670: 1 Done with Flashing 100% Completed
DEBUG: 15.119.208.57 BMC update completed.
**** INFO: Following setups have successfully completed the BMC update: 10.93.138.110,
10.14.56.123, 10.14.59.226, 15.119.208.57
**** INFO: Total 4 done ****
INFO: Please wait for reports to know the status of firmware update.
INFO: Sleeping for 5 minutes to let BMC reset to happen in the background
ERROR: Error opening session to 15.119.208.57 WARNING: Unable to access 15.119.208.57
WARNING: BMCImage1 update may have likely failed and has hanged the system, wait for sometime and
try resetting the Setup
HPE Firmware Update Status Report
08/23/23 15:10:09 PM
INFO: 3 items found, 3 success, 0 failure
```

Sl No	IP Address	HostName	FQDN	Status	Pre-Ver	Post-Ver
Model						
1	10.14.56.123	AMIB47AF1B4D11D	AMIB47AF1B4D11D.its.hpecorp.net	Success	1.13.0	1.12.0
HPE Cray XD295v						
2	10.14.59.226	AMIB47AF1B4A1D5	AMIB47AF1B4A1D5.its.hpecorp.net	Success	1.13.0	1.12.0
HPE Cray XD220v						
3	10.93.138.110	AMIB47AF1B464E5	AMIB47AF1B464E5.its.hpecorp.net	Success	1.03.0	1.00.0

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HPE Cray XD665

INFO: Saved the 23_08_2023_151010UpdateStatusReport_BMC.csv in update

An example of a BMC backup firmware update of a Cray XD670 model system with -D flag:

```
• cat FirmwareToDeploy.txt
  #Model Name(Necessary);Firmware Type(Necessary);Firmware Version(Necessary);File
  Name(Necessary)
  #HPE Cray XD670;BMC;1.12.00;XD670_BMC_v1.12_signed.bin.hpm
  HPE Cray XD670;BMC;1.12.00;XD670_BMC_v1.12_backup_signed.bin.hpm

• python3 Platform_Firmware_Update_Tool.py -z -c bmc -bi -D -t 15.119.208.57,admin,superuser
INFO: No session password and session username common to all nodes was passed as arguments,
Parsing the file
HPE Firmware Update

INFO: BMC Update is Selected
****INFO: BMC Update Proceeding for: 1 Cray XD670 models
INFO: BMCImage2 Update v3.1 Proceeding for 15.119.208.57 and Firmware is preparing now, Do not
cancel process ****
DEBUG: 15.119.208.57 Preparing
DEBUG: 15.119.208.57 Downloading
DEBUG: 15.119.208.57 Firmware is flashing now
INFO: Cray XD670: 1 Done with Flashing 100% Completed
DEBUG: 15.119.208.57 BMC update completed.
**** INFO: Following setups have successfully completed the BMC update: 15.119.208.57
**** INFO: Total 1 done ****
INFO: Please wait for reports to know the status of firmware update.
INFO: Sleeping for 5 minutes to let BMC reset to happen in the background
HPE Firmware Update Status Report
08/19/23 02:41:51 AM
INFO: 1 items found, 1 success, 0 failure
```

Sl No	IP Address	HostName	FQDN	Status	Pre-Ver	Post-Ver	Model
1	15.119.208.57	AMI74563C489455	NA	Success	1.11.00	1.12.00	HPE Cray XD670

INFO: Saved the 19_08_2023_024152UpdateStatusReport_BMC.csv in update

An example of a BIOS update with -P, which will perform an AC power cycle, which is required for a BIOS update:

```
• python3 Platform_Firmware_Update_Tool.py -z -c Bios -P
WARNING: list.txt has Duplicate entries for AMI74563C48945F.asiapacific.hpqcorp.net
INFO: Only one entry for a cluster is sufficient for the firmware updation
WARNING: list.txt has Duplicate entries for 10.14.56.52
INFO: Only one entry for a cluster is sufficient for the firmware updation
INFO: No session password and session username common to all nodes was passed as arguments,
Parsing the file
HPE Firmware Update

INFO: BIOS Update Selected
****INFO: BIOS Update Proceeding for: 1 HPE Cray XD295v_XD220v_XD225v models, 1 HPE Cray XD670
models
INFO: BIOS Update may take upto 20-25 minutes as it includes AC Power Cycling and Update Status
Display
INFO: 10.14.56.52 and AMIB47AF1B4A1D5 must be of a single cluster only
INFO: 15.119.206.20 and AMI74563C48945F must be of a single cluster only
INFO: BIOS Update v3.1 proceeding for 10.14.56.52 and Firmware is preparing now, Do not cancel
process ****
INFO: BIOS Update v3.1 proceeding for 15.119.206.20 and Firmware is preparing now, Do not cancel
process ****
INFO: Cray XD295v_XD220v_XD225v: 1 Done with Flashing 100% Completed
```



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```
INFO: Following setups have successfully completed the BIOS update: 10.14.56.52
INFO: Cray XD670: 1 Done with Flashing 100% Completed
INFO: Following setups have successfully completed the BIOS update: 10.14.56.52, 15.119.206.20
**** INFO: Total 2 done ****
INFO: Please wait for reports to know the status of firmware update.
INFO: Sleeping for 5 minutes, working on BIOS Update in the Background
INFO: Performing System Reset in background. Please wait for some time to know the status of
System Reset.
INFO: Performing Chassis Reset in background. Please wait for some time to know the status of
Chassis Reset.
**** INFO: System reset SUCCESS for 10.14.56.52, 15.119.206.20
**** INFO: Chassis reset SUCCESS for 10.14.56.52, 15.119.206.20
INFO: Sleeping for 5 minutes. Allowing power_Cycle.py to complete and Update to Reflect
HPE Firmware Update Status Report
04/04/23 14:42:50 PM
2 items found, 2 success, 0 failure
```

Sl No	IP Address	HostName	FQDN	Status
Pre-Ver	Post-Ver	Model		
1	10.14.56.52	AMIB47AF1B4A1D5	AMIB47AF1B4A1D5.its.hpecorp.net	Success
CU2K_5.29_v1.00	CU2K_5.29_v1.30	HPE Cray XD220v		
2	15.119.206.20	AMI74563C48945F	AMI74563C48945F.asiapacific.hpqcorp.net	Success
CUXD670_5.29_v0.11	CUXD670_5.29_v1.00	HPE Cray XD670		

```
INFO: Saved the 04_04_2023_144250UpdateStatusReport_BIOS.csv in update
```

An example of a BIOS update without -P and no -c:

```
• python3 Platform_Firmware_Update_Tool.py -db -z
INFO: Extracting Credentials from database for IP_HostName_FQDN in input text file
Enter the Database Password:
HPE Firmware Update

Choose the type of firmware for Update (A/a or B/b)?
A)BMC B)BIOS
b
INFO: BIOS Update Selected
INFO: AC Power Cycling is not chosen for BIOS Update
****INFO: BIOS Update Proceeding for: 1 Cray XD295v_XD220v_XD225v models
INFO: BIOS Update v3.1 proceeding for 10.14.56.123 and Firmware is preparing now, Do not cancel
process ****
INFO: Cray XD295v_XD220v_XD225v: 1 Done with Flashing 100% Completed
**** INFO: Following setups have successfully completed the BIOS update: 10.14.56.123
**** INFO: Total 1 done ****
INFO: Please wait for reports to know the status of firmware update.
INFO: The version changes for BIOS will not be reflected unless we complete a Chassis reset and
System reset
INFO: Please use the -P or --Power for the BIOS version change. It may take around few minutes for
version to reflect
INFO: Perform Inventory report to know the status
INFO: Exiting...
```

AC power cycling for a setup can be done in the Power Control section of the GUI obtained using the BMC IP ([https:// BMC_IP /#login](https://BMC_IP/#login)).

Choose the “power cycle” option or use the following set of POST Redfish commands for AC power cycling:

```
/redfish/v1/Systems/Self/Actions/ComputerSystem.Reset
/redfish/v1/Chassis/Self/Actions/Chassis.Reset
```

The body for the POST call is {"ResetType": "ForceRestart"}.

An example of a BIOS update without and with -F flag:



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```
• cat FirmwareToDeploy.txt
#This a Comment Line
#Model Name(Necessary) ;Firmware Type(Necessary) ;Firmware Version(Necessary) ;File
Name(Necessary)
HPE Cray XD295v;BIOS;CA2K_5.27_v1.05;CA2K_5.27_v1.05_10192022_signed.bin.hpm

• python3 Platform_Firmware_Update_Tool.py -z -c BIOS -P -t
  AMIB47AF1B4D11D,admin,superuser -D
INFO: Splitting IP_HostName_FQDN,Username>Password to extract credentials
HPE Firmware Update

INFO: BIOS Update Selected
INFO: BIOS Update may take upto 20-25 minutes as it includes AC Power Cycling and Update Status
Display
****INFO: BIOS Update Proceeding for: 1 Cray XD295v_XD220v_XD225v models
WARNING: Update is halted because Force argument is not set, as the version is same as suggested
for the cluster having IP: 10.14.56.123, Hostname: AMIB47AF1B4D11D and FQDN:
AMIB47AF1B4D11D.its.hpecorp.net
****INFO: BIOS Update Proceeding for: 0 Cray XD295v_XD220v_XD225v models
INFO: No update was done
• python3 Platform_Firmware_Update_Tool.py -z -c BIOS -P -F -D -t AMIB47AF1B4D11D,admin,superuser
INFO: Splitting IP_HostName_FQDN,Username>Password to extract credentials
HPE Firmware Update

INFO: BIOS Update Selected
INFO: BIOS Update may take upto 20-25 minutes as it includes AC Power Cycling and Update Status
Display
****INFO: BIOS Update Proceeding for: 1 Cray XD295v_XD220v_XD225v models
INFO: BIOS Update v3.1 proceeding for AMIB47AF1B4D11D and Firmware is preparing now, Do not cancel
process ****
DEBUG: AMIB47AF1B4D11D Preparing
DEBUG: AMIB47AF1B4D11D Firmware is flashing now
INFO: Cray XD295v_XD220v_XD225v: 1 Done with Flashing 100% Completed
DEBUG: AMIB47AF1B4D11D BIOS update completed.
**** INFO: Following setups have successfully completed the BIOS update: AMIB47AF1B4D11D
**** INFO: Total 1 done ****
INFO: Please wait for reports to know the status of firmware update.
INFO: Sleeping for 5 minutes, working on BIOS Update in the Background
INFO: Performing System Reset in background. Please wait for some time to know the status of
System Reset.
DEBUG: System Reset successful for AMIB47AF1B4D11D
INFO: Performing Chassis Reset in background. Please wait for some time to know the status of
Chassis Reset.
DEBUG: Chassis Reset successful for AMIB47AF1B4D11D
**** INFO: System reset SUCCESS for AMIB47AF1B4D11D
**** INFO: Chassis reset SUCCESS for AMIB47AF1B4D11D
INFO: Sleeping for 5 minutes. Allowing Power_Cycle.py to complete and Update to Reflect
HPE Firmware Update Status Report
08/23/23 16:03:25 PM
INFO: 1 items found, 1 success, 0 failure

Sl No      HostName      IP Address      FQDN      Status      Pre-Ver
Post-Ver      Model
1  AMIB47AF1B4D11D  10.14.56.123  AMIB47AF1B4D11D.its.hpecorp.net  Success  CA2K_5.27_v1.05
CA2K_5.27_v1.05  HPE Cray XD295v

INFO: Saved the 23_08_2023_160325UpdateStatusReport_BIOS.csv in update
```

NOTE: Here, we are trying to update the same version as the existing version.



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An example of a BIOS backup firmware for a Cray XD670 model system with the -D flag:

```
• python3 Platform_Firmware_Update_Tool.py -a -t 15.119.208.54,admin,superuser
INFO: Splitting IP_HostName_FQDN,Username,Password to extract credentials
HPE All Firmware Inventory Report

08/22/23 13:51:05 PM
INFO: 1 items found

Sl No      IP Address      HostName FQDN      BIOS Backup Ver      BIOS Ver
BMC Ver    BMC Backup Ver  BPB_CPLD1 Ver  BPB_CPLD2 Ver  MB_CPLD1 Ver  RAID_BRCM_CONTROLLER Ver  SCM_CPLD1
Ver
      1  15.119.208.54  AMID85ED3E3F54D   NA  MSB3-G40-HP0  CUXD670_5.29_v1.00  CUXD670_5.29_v1.11
1.12.00      1.12.00      04      32      16      NA
06  HPE Cray XD670

INFO: Saved the 22_08_2023_135106NodeAllFirmwareInventoryReport.csv in report

• python3 Platform_Firmware_Update_Tool.py -z -bi -P -D -t
  15.119.208.54,admin,superuser
INFO: Splitting IP_HostName_FQDN,Username,Password to extract credentials
HPE Firmware Update

Choose the type of firmware for Update (A/a or B/b)?
A)BMC B)BIOS
b
INFO: BIOS Update Selected
****INFO: BIOS Update Proceeding for: 1 Cray XD670 models
INFO: BIOS Update may take upto 20-25 minutes as it includes AC Power Cycling and Update Status
Display
INFO: BIOSImage2 Update v3.1 proceeding for 15.119.208.54 and Firmware is preparing now, Do not
cancel process ****
DEBUG: 15.119.208.54 Preparing
DEBUG: 15.119.208.54 Downloading
DEBUG: 15.119.208.54 Firmware is flashing now
INFO: Cray XD670: 1 Done with Flashing 100% Completed
DEBUG: 15.119.208.54 BIOS update completed.
**** INFO: Following setups have successfully completed the BIOS update: 15.119.208.54
**** INFO: Total 1 done ****
INFO: Please wait for reports to know the status of firmware update.
INFO: Sleeping for 5 minutes, working on BIOS Update in the Background
INFO: Performing System Reset in background. Please wait for some time to know the status of
System Reset.
DEBUG: System Reset successful for 15.119.208.54
INFO: Performing Chassis Reset in background. Please wait for some time to know the status of
Chassis Reset.
DEBUG: Chassis Reset successful for 15.119.208.54
**** INFO: System reset SUCCESS for 15.119.208.54
**** INFO: Chassis reset SUCCESS for 15.119.208.54
INFO: Sleeping for 5 minutes. Allowing Power_Cycle.py to complete and Update to Reflect
HPE Firmware Update Status Report
08/22/23 14:15:38 PM
INFO: 1 items found, 1 success, 0 failure

Sl No      IP Address      HostName FQDN      Status      Pre-Ver
Post-Ver    Model
      1  15.119.208.54  AMID85ED3E3F54D   NA  Success  MSB3-G40-HP0  CUXD670_5.29_v1.00  MSB3-G40-
HP0 CUXD670_5.29_v1.10  HPE Cray XD670

INFO: Saved the 22_08_2023_141538UpdateStatusReport_BIOS.csv in update
```

Scaling

BMC or BIOS firmware is one component of the firmware installation tool. The firmware installation tool permits simultaneous node updates. At most, 64 nodes can be simultaneously updated. Only 64 nodes can be updated at a time, and if the file containing the IP and its credentials contains more than 64 nodes, only the first 64 nodes will be processed.

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