Technical white paper

HP Firmware Installer for Docks

User Guide

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Overview

Firmware updates to external devices create a challenge in managing devices. Since devices cannot be updated unless they are connected to the host system at the time the update occurs, this package allows for multiple installation options to fit customer needs.

In addition, firmware updates can be time consuming and disruptive to an end user. The user may see the monitor flicker, hear audio clicks, the internet connection may be intermittent, and the mouse and the keyboard could become unresponsive until the installation is complete.

HP Firmware Installer for Docks allows for two different installation options using the same package. HP Firmware Installer includes all firmware updates for a dock and provides installation options for different operating system deployment or update scenarios. This document explains the different scenarios and options.

Caution
Disconnection during a firmware update can cause damage to the device. Precaution must be taken to ensure that a user does not disconnect a dock from its host machine during firmware installation.

Terms and definitions

Table 1. Terms and definitions

Term	Definition
Host System	The computer that a supported dock is connected to.
CongMgr	Microsoft System Center Configuration Manager, a software solution to manage PCs, servers and mobile devices
Dock firmware package version	The version of the whole firmware package applied to a dock
Device firmware version	The firmware version of a device on a dock

Update options

The following two installation options are available with further customization of each option:

1. Stage the firmware to the host, and the firmware will be installed when the dock is connected to the host (later). This is the default and recommended option.
2. Install all the applicable firmware to the dock immediately.

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Stage the firmware to the host

This solution is used to deploy firmware updates to devices that may or may not be connected to the host at the time of installation of the package. HP Firmware Installer will be installed onto the host platform via Windows Installer in the same manner as any other software deliverable. The software installed will also contain the latest firmware binaries. When a supported dock is connected and the user is logged onto the host system, the software will determine if a firmware update is needed. To prevent disconnection of the device, the user must first consent to the firmware update. When the firmware update is run, a UI is displayed to the active user informing them of what to expect from the firmware update, as well as giving them the option to postpone.

Instructions
Use Install.cmd. This will detect the operating system architecture and run the appropriate HP Firmware Installer msi file. Once installed, the software will be triggered when the device is connected to the host unit. If the device firmware is out of date, a user interface will inform the active user and get permission to perform the firmware update.

Triggers
The following events will trigger the software to check the firmware version and start an update if necessary:

1. The dock is connected during an active session
2. After user logs in while the dock is already connected

Firmware updates will never run without an active session and user permission.

Command line arguments
Standard MSI arguments can be used to stage the firmware, for example, Install.cmd /qn for silent installation

To add configuration options below to the command, specify the argument and value like this:

```
Install.cmd <MSI_OPTIONS> POSTPONE_TIME=60 POSTPONE_MAX=2
```

Configuration options
There are several configuration options that can be used to tailor the firmware update experience for users on host machines. The following configuration options can be added as command line arguments to install, or they can be set in the registry after installation:

Registry Key: HKLM\SOFTWARE\HP\HP Firmware Installer\DEVICE_NAME

- Postpone Duration

Description: The amount of time that passes between a user hitting postpone and the UI notification popping up again (amount in minutes)
Default: 60
Allowed Range: 2 mins to 1440 mins (24 hours)
Command Line Arg: POSTPONE_TIME
Registry Value: PostponeTime

- Postpone Max

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Description: The total number of times the user can hit the postpone button
Default: Infinity (-1). Use -1 in registry or command line to set as infinity
Allowed Range: 0 (no postpones) to Infinity
Command Line Arg: POSTPONE_MAX
Registry Value: PostponeMax

- Disable firmware checks after successful firmware update

Description: HP Firmware Installer will only update the first device it encounters. Once the firmware update is successful, or if the device is already up to date, it will stop checking firmware versions until a new firmware version is staged onto the host platform. If it is desired for the same host platform to update multiple devices, setting this will cause the software to always check the firmware version of compatible devices it encounters, and will prompt the user to start the firmware update.
Default: 0 (False – Checks version anytime dock is connected)
Command Line Arg: FLASH_DISABLE_ON_SUCCESS
Registry Value: FlashDisableOnSuccess

- Disable firmware checks after failed firmware update

Description: HP Firmware Installer will stop attempting to update firmware after a set number of attempts (set in a different configuration option). Once the max number of attempts have been made, it will stop checking firmware versions until a new firmware version is staged onto the host platform.
Default: 1 (True - Disable checks after max failed attempts)
Command Line Arg: FLASH_DISABLE_ON_FAIL
Registry Value: FlashDisableOnFail

- Max failed attempts

Description: HP Firmware Installer will stop attempting to update firmware after a set number of attempts (set in a different configuration option). Once the max number of attempts have been made, it will stop checking firmware versions until a new firmware version is staged onto the host platform.
Default: 2
Command Line Arg: FLASH_ATTEMPT_MAX
Registry Value: FlashAttemptMax

- Force Downgrade

Description: Used to force HP Firmware Installer to downgrade devices that are newer than the deployed version, as well as still upgrade old devices. When force is set to 1 (on), any connected devices that are not the exact version as the one deployed will cause the install process to begin. When force is set to zero (off), HP Firmware will only upgrade devices, and will leave devices with a newer version than the one deployed as is.
Default: 0 (Force is off)
Command Line Arg: FORCE
Registry Value: Force

- Install Log Path

Description: Output the log file to a specified path. If not specified, the log is generated to the default location (%TEMP%). This parameter can be a file name or a directory. If only a directory is specified, the log file name will be 'HPFirmwareInstaller.log.'
Default: Blank or Not Specified = %TEMP%\HPFirmwareInstaller.log

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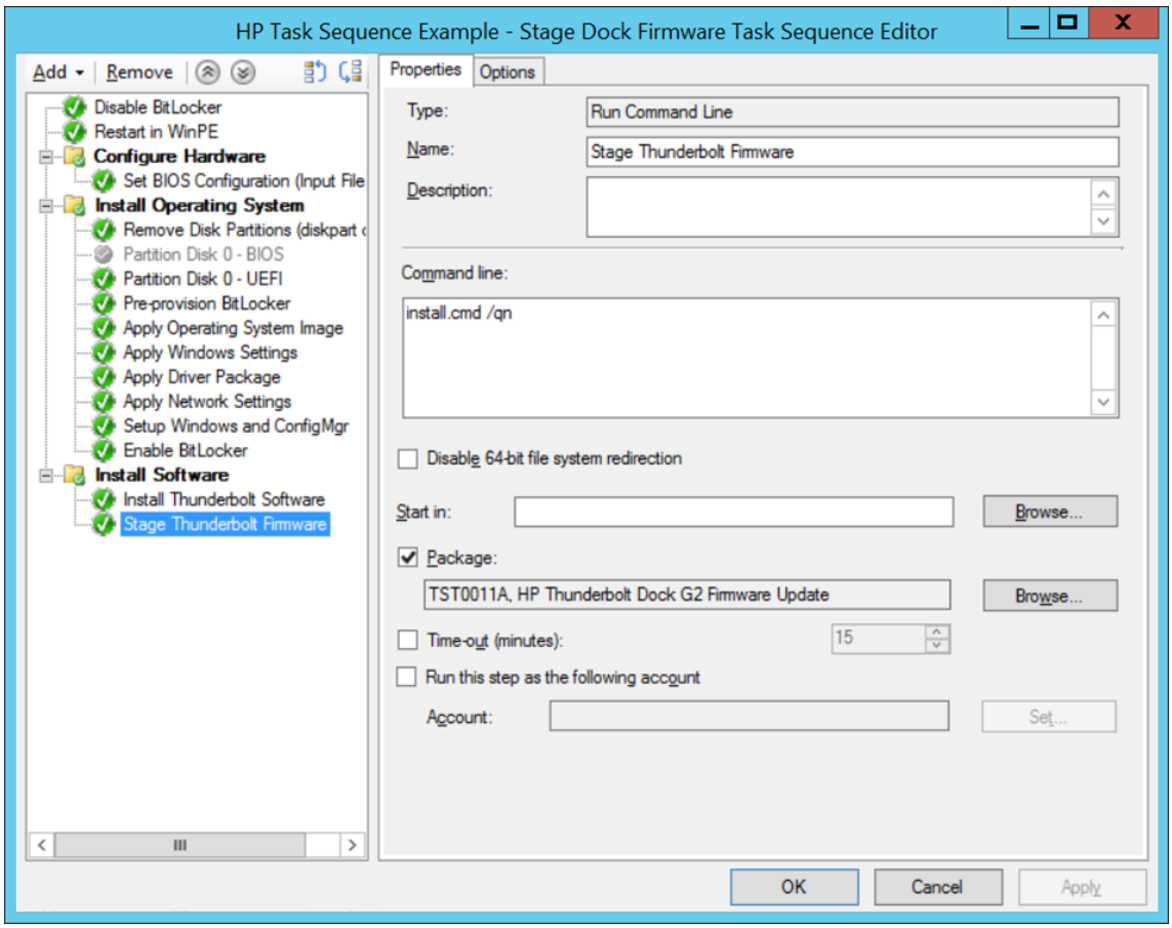
Command Line Arg: INSTALL_LOG_PATH
Registry Value: InstallLogPath

Example usage

The following example will demonstrate how to install Thunderbolt software first, and then set up Firmware Installer to trigger a firmware update.

Figure 1. HP Task Sequence Example



The firmware upgrade will be triggered on different events specified in Triggers section.

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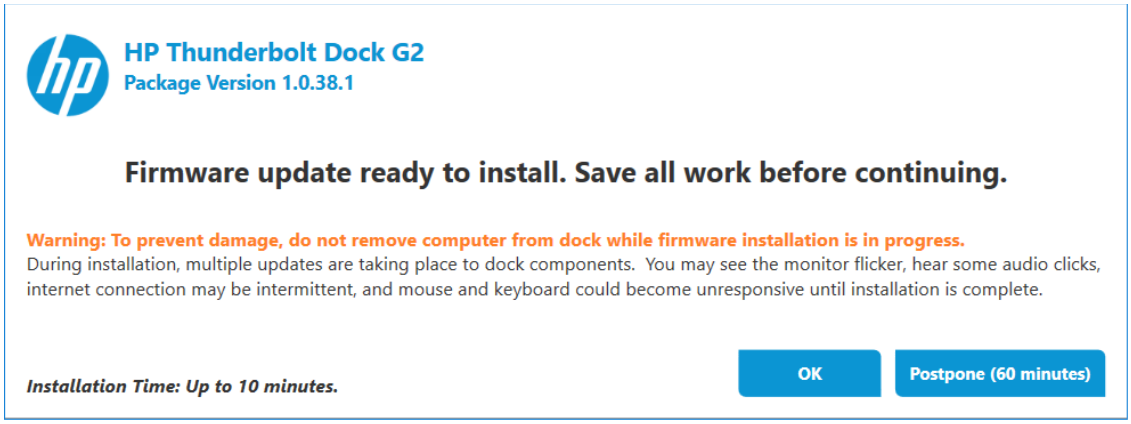
End-user experience

When the staging software determines that firmware update is required, a notification will be displayed to the active user. The firmware update will not start until the user has agreed, however they cannot close or minimize the notification. They only have the option to postpone; the number of postpones and the time of postponement is configurable.

Figure 2. End-user update notification



If the user chooses to postpone, the same dialog box will be presented after the displayed time elapses.

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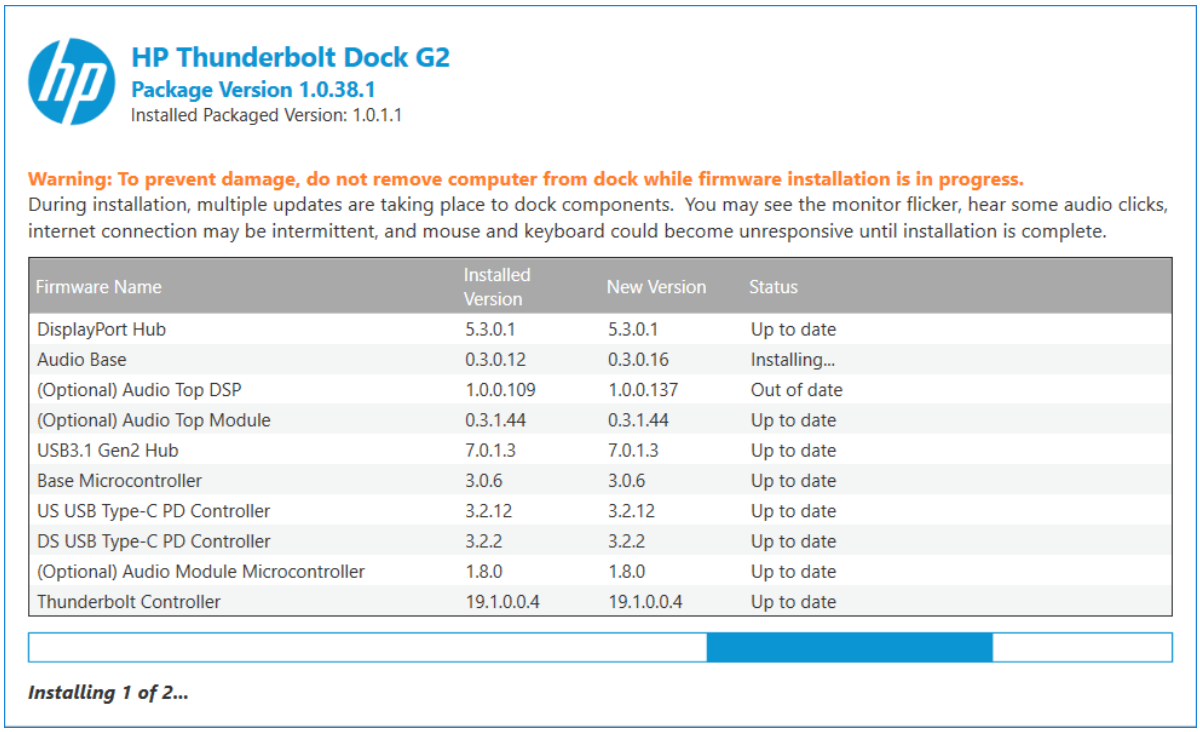
If the user clicks OK to continue with the update, the following dialog box will be shown:

Figure 3. Update in progress dialog box



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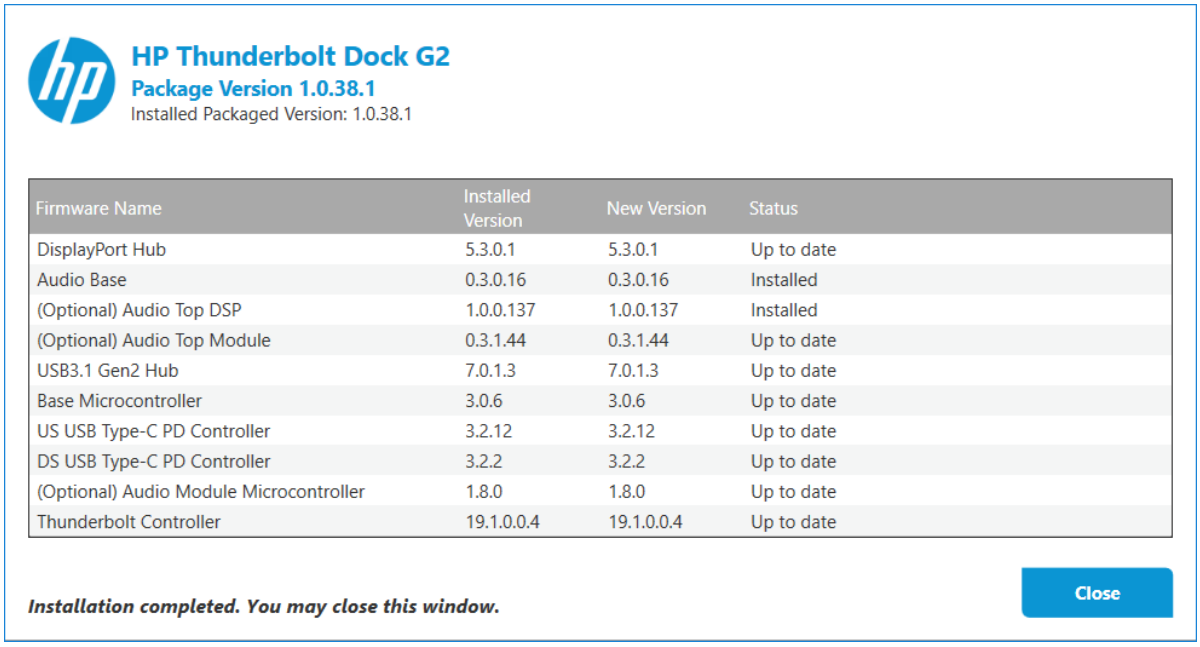
When the update completes, the end user will see the installation status of each firmware.

Figure 4. Firmware update status dialog box



Installing the firmware immediately

This solution requires the device to be connected to the host platform when the installer is executed and must stay connected throughout the installation. HP Firmware installer will determine which firmware on the device is out of date and will update to the latest version. This method can be run silently, loud, or non-interactively, which shows the user interface (UI) to the user but does not require any action from the end user.

Command line parameters

The following table provides the parameters for `HPFirmwareInstaller.exe`

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Table 2. Command line parameters

Parameter	Description
`-noninteractive` or `-ni`	Runs the installer without any user interaction, but still displays the UI.
`-silent` or `-s`	Runs the installer in silent mode.
`-force` or `-f`	Forces the installer to flash each firmware piece to the version included in the package, whether that is an upgrade, downgrade, or a re-flash of the same version.
`-installLogPath:<file path>`	Specify the path of the log file generated during installation.

Behavior

Users can double click HPFirmwareInstaller.exe to run it interactively. Each individual device (on the dock) and the corresponding device firmware version is shown to the user. The status of each device is updated during the installation process demonstrated in the screenshot below (Figure 5).

Note

When the program is run with the noninteractive or silent command line parameter while attempting the immediate firmware installation method, it will return an error code. Please see the Return Codes section on page for more details.

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Figure 5. Listing of devices and corresponding firmware version

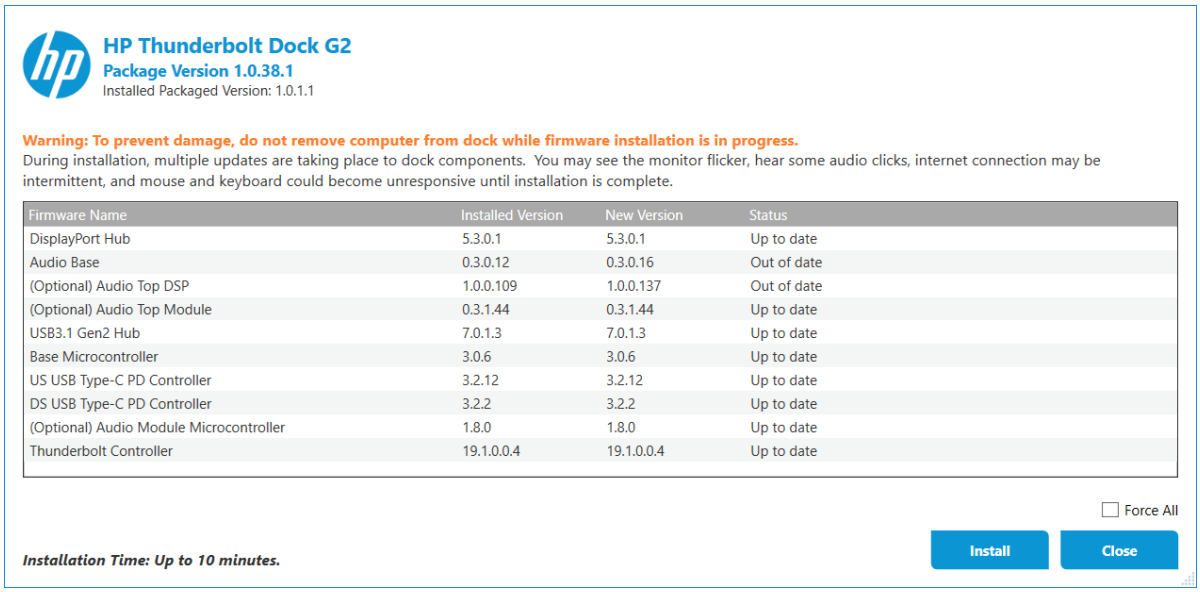

Figure 6. Installing the firmware immediately in progress

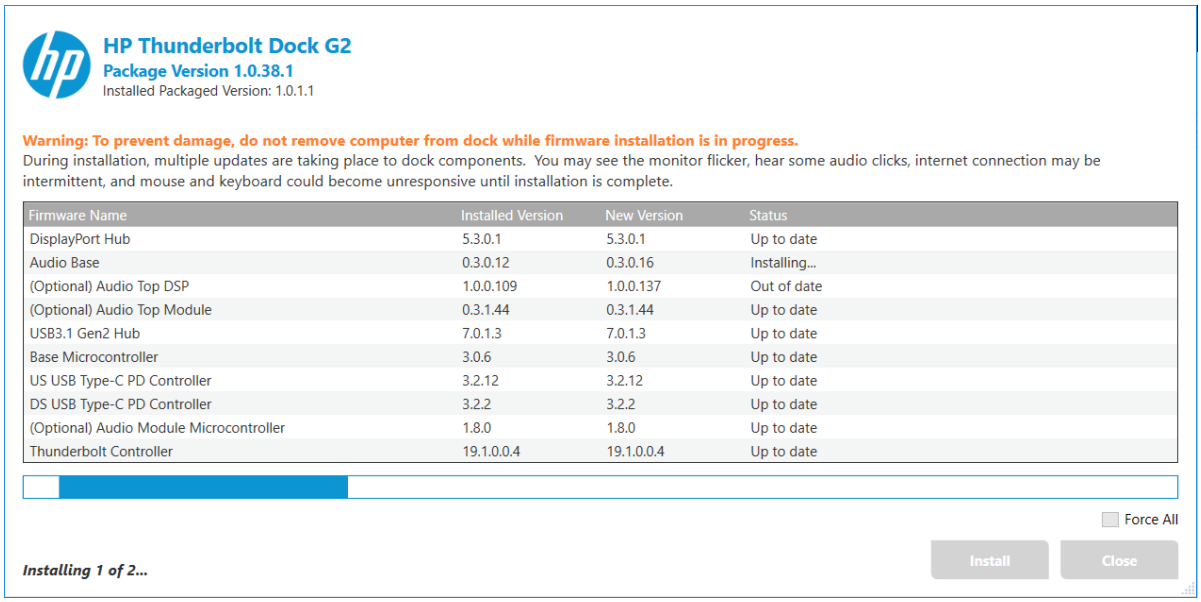

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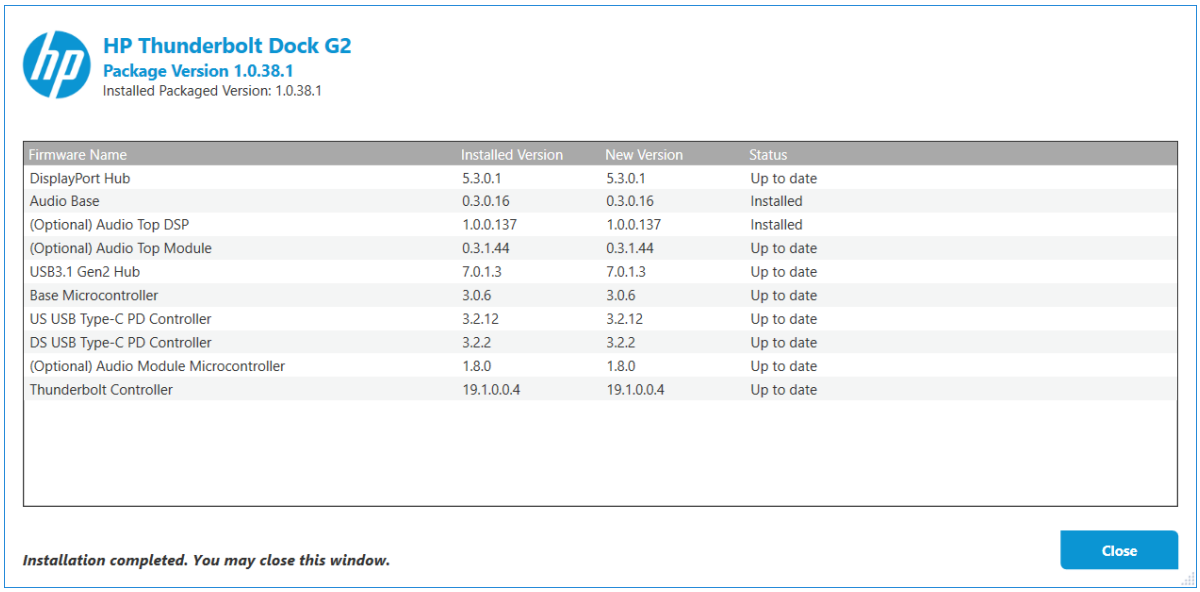
Figure 7. Installing the firmware immediately completed



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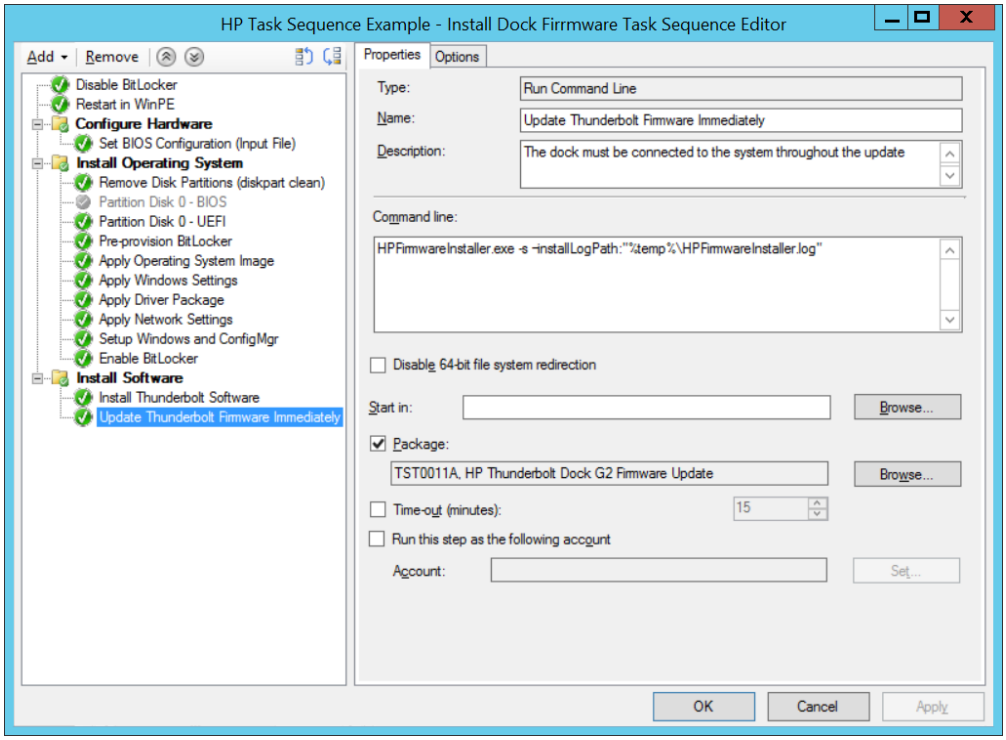
Example usage

The following screenshot shows an example deployment task sequence. The operating system deployment task sequence contains necessary steps to install the appropriate Thunderbolt software first, then call HP Firmware Installer to update the dock firmware immediately as the dock is connected throughout the time the task sequence runs.

Figure 8. Installing the firmware immediately deployment task sequence



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Return Codes

Table 3. Return codes

Code	Description
0	Success
101	Install failed. One or more firmware failed to install.
102	Configuration file failed to load. This occurs when the file cannot be found, or if it is not properly formatted.
103	One or more firmware packages specified in the configuration file could not be loaded.
104	No devices could be communicated with. This could be because the device was not connected, or necessary drivers are missing to detect the device.
105	Out-of-date firmware detected when running with 'check' flag.
106	An instance of HP Firmware Installer is already running.
107	Device not connected
108	Force option disabled. Firmware downgrade or re-flash not possible on this device.

Inventory/Report

Dock firmware update information location

The result of firmware updates, including error codes and versions, are stored on the host platform for querying. Several values are stored in the registry:

Registry Key: *HKLM\SOFTWARE\HP\HP Firmware Installer\DEVICE_NAME*

- Available Package Version

Description: This is the version of the firmware package that has been staged on the system. It will be the same as the version that shows up for the installer in Add/Remove Programs.
Registry Value: AvailablePackageVersion

- Installed Package Version

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Description: This is the version that was installed or verified to be on the last connected device. This value will not be updated if the software has stopped checking firmware due to the configuration options above that may be set to disable after successful or failed updates.
Registry Value: InstalledPackageVersion

- Error Code

Description: The error code produced from the last firmware update attempt. This will come from one of the error codes listed in the Immediate Installation section above.
Registry Value: ErrorCode

- Last Time Firmware Installed

Description: The date and time of the last time a firmware update was performed.
Registry Value: LastInstalled

- Last Time Firmware Checked

Description: the date and time of the last firmware version check of a device.
Registry Value: LastChecked

ConfigMgr – Extend hardware inventory to include Thunderbolt dock firmware information

The dock firmware upgrade information in the registry can be collected to management systems. Below are the example steps to extend ConfigMgr to report

Extend configuration.mof to retrieve Thunderbolt dock firmware update information to ConfigMgr
On the site server, append the following to configuration.mof. The mof file can be found at C:\Program Files\Microsoft Configuration Manager\inboxes\clifiles.src\hinv. This will update the ConfigMgr client policy to get the Thunderbolt Dock G2 firmware information from the registry of HP clients back to ConfigMgr.

```
#pragma namespace ("\\\\.\\root\\cimv2")

#pragma deleteclass("HP_ThunderboltDockG2Firmware", NOFAIL)

[DYNPROPS]

Class HP_ThunderboltDockG2Firmware

{

       [key] string KeyName;

       String AvailablePackageVersion;

       String InstalledPackageVersion;

       Uint32 ErrorCode;

       String LastInstalled;
```

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```
        String LastChecked;
};


[DYNPROPS]
Instance of HP_ThunderboltDockG2Firmware
{
        KeyName="RegKeyToMOF";
        [PropertyContext("Local|HKEY_LOCAL_MACHINE\\SOFTWARE\\HP\\HP Firmware
        Installer\\HP Thunderbolt Dock
        G2|AvailablePackageVersion"),Dynamic,Provider("RegPropProv")]
        AvailablePackageVersion;
        [PropertyContext("Local|HKEY_LOCAL_MACHINE\\SOFTWARE\\HP\\HP Firmware
        Installer\\HP Thunderbolt Dock
        G2|InstalledPackageVersion"),Dynamic,Provider("RegPropProv")]
        InstalledPackageVersion;
        [PropertyContext("Local|HKEY_LOCAL_MACHINE\\SOFTWARE\\HP\\HP Firmware
        Installer\\HP Thunderbolt Dock
        G2|ErrorCode"),Dynamic,Provider("RegPropProv")] ErrorCode;
         [PropertyContext("Local|HKEY_LOCAL_MACHINE\\SOFTWARE\\HP\\HP
        Firmware Installer\\HP Thunderbolt Dock
        G2|LastInstalled"),Dynamic,Provider("RegPropProv")] LastInstalled;
        [PropertyContext("Local|HKEY_LOCAL_MACHINE\\SOFTWARE\\HP\\HP Firmware
        Installer\\HP Thunderbolt Dock
        G2|LastChecked"),Dynamic,Provider("RegPropProv")] LastChecked;
};
```

Add the dock firmware information to the reported hardware inventory classes

Save the text below to a text file, ThunderboltG2.HWInvExt.mof.

```
#pragma namespace ("\\\\.\\root\\cimv2\\SMS")
#pragma deleteclass("HP_ThunderboltDockG2Firmware", NOFAIL)
[SMS_Report(TRUE),SMS_Group_Name("HP_ThunderboltDockG2Firmware
"),SMS_Class_ID("HP_ThunderboltDockG2Firmware")]
Class HP_ThunderboltDockG2Firmware: SMS_Class_Template
{
```

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```
        [SMS_Report(TRUE),key] string KeyName;

        [SMS_Report(TRUE)] String AvailablePackageVersion;

        [SMS_Report(TRUE)] String InstalledPackageVersion;

        [SMS_Report(TRUE)] Uint32 ErrorCode;

        [SMS_Report(TRUE)] String LastInstalled;

         [SMS_Report(TRUE)] String LastChecked;

};
```

Follow these steps to report Thunderbolt Dock G2 firmware information in the hardware inventory for supported HP systems in ConfigMgr console.

Administration workspace > **Client Settings** > right click **Default Client Settings** > select **Properties** > **Default Settings** dialog box shows.

In **Default Settings** dialog box > click **Hardware Inventory** on the left pane > click **Set Classes** ... on the right pane > **Hardware Inventory Classes** dialog box shows.

In **Hardware Inventory Classes** dialog box, click **Import...** > In **Import** dialog box, browse to **ThunderboltG2.HWInvExt.mof** and click **Open**. HP_ThunderboltDockG2Firmware class should be added successfully in the **Import Summary**. Click **OK** to close all the opened dialog boxes.

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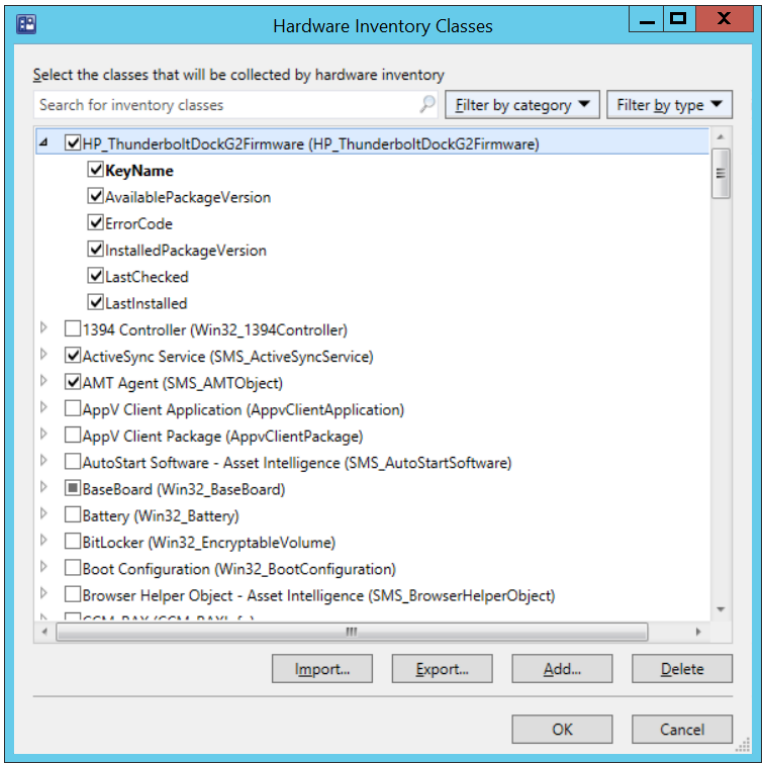
Figure 9. Hardware inventory classes



After the updated hardware inventory information from clients has been collected and processed in ConfigMgr, the device(s) That have firmware installation information will display the following in Resource Explorer:

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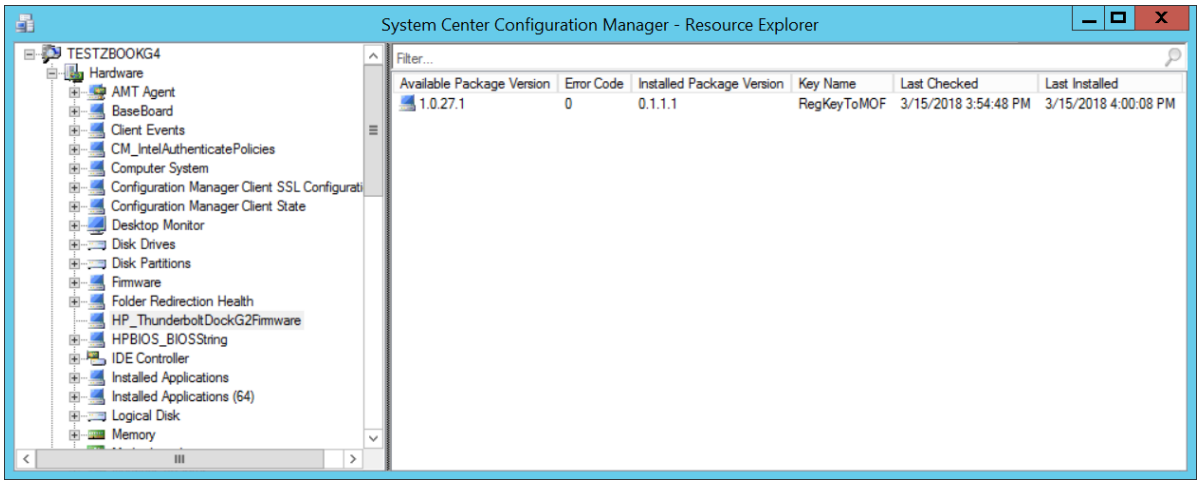
Figure 8. Resource explorer



For more information

Provide useful references and links.

HP Thunderbolt Dock G2 Specification

https://support.hp.com/us-en/document/c05913756

HP Client Management Solutions

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