Technical Whitepaper

HP PC Commercial BIOS (UEFI) Setup

Administration Guide

For Commercial Platforms using HP BIOSphere Gen 3-5
2016 -2019

June 2019
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1 Abstract

HP redesigned the 2015 and later generations of BIOS to support the requirements of the latest microprocessors and operating systems. HP took this opportunity to create a new BIOS architecture based on the UEFI specification version 2.4, with a common set of core modules and capable of supporting both notebook and desktop models. Now HP notebooks and HP desktops models using this generation of the BIOS will have a similar look and feel for the (F10) setup menu, more shared WMI strings, and more shared features.

2 Introduction

This whitepaper provides detailed information about features adjusted through the F10 BIOS setup menu. The section on computer notifications provides an explanation for the LED blink codes and screen messages that may occur.

For decades, HP has provided an industry-leading level of built-in customer value through an internally developed Read Only Memory Basic Input/Output System (ROM BIOS), a set of routines that enable a PC to load the operating system and communicate with various devices such as storage drives, keyboard, display, slots, and ports. The BIOS also exposes and provides the interfaces required to use unique firmware and hardware-based HP professional innovations such as HP Sure Start, HP Sure Run, and HP Sure Recover, and HP Client Security Manager.

To help users understand the new features, the description of each feature includes a reference to the name and location of that feature from the previous year, if it is different from the current year.

This document has been updated to reflect new and updated features in the R family of BIOS, introduced in 2019. An R family BIOS is a version that begins with the letter R. For example, R01 Ver. 02.01.00 12/12/2017. Previous generations of commercial PCs had BIOS family designations of Q (2017-2018), P (2016), and N (2015) which are also covered by this whitepaper. Some of the features in the later platforms are not be supported in earlier models. Many of the features and settings are dependent on specific hardware or design elements that are not present on every model. Therefore, note that this document describes the superset of BIOS settings across the product portfolio, not all current generation products support all the BIOS features described here.

2.1 Supported models

This document applies to HP commercial-grade PC products. That is, it applies to products designed to meet the demanding security and manageability requirements of national, regional, and local government agencies, schools, the military, international financial institutions and retail sales companies.

This document applies to 2015 and later models only. For reference, the following table shows the year associated with models in the following feature documentation.

Table 1 Notebook Generations

Platforms		**2015** **N** **Family**	**2016** **P** **Family**	**2017** **Q** **Family**	**2018** **Q** **Family**	**2019** **R** **Family**
HP EliteBook Folio	9480m					
HP EliteBook Folio	1040	G3				
HP EliteBook Folio	1020					
HP ZBook	17	G3	G4		G5	
HP ZBook	15	G3	G4		G5	
HP ZBook	15u	G3	G4		G5	
HP EliteBook	1050				G1	
HP EliteBook	850	G3	G4		G5	G6
UEFI Specification supported:		2.4	2.5	2.5	2.6	2.6
HP EliteBook	840	G3	G4		G5	G6

Platforms		2015 N Family	2016 P Family	2017 Q Family	2018 Q Family	2019 R Family
HP EliteBook	820 / 830	G3	G4		G5	G6
HP EliteBook	755	G3	G4			
HP EliteBook	745	G3	G4		G5	G6
HP EliteBook	725 / 735	G3	G4		G5	G6
HP ProBook	470	G3	G4	G5		
HP ProBook	450	G3	G4	G5		
HP ProBook	440	G3	G4	G5		
HP ProBook	430	G3	G4	G5		
HP ProBook	445	G3		G5		G6
HP EliteFolio	940					
HP EliteBook Folio		G3				
HP EliteBook	Revolve 810	G3				
HP EliteBook	Revolve 840				G4	
HP ProBook		G2				
HP ZBook Studio		G3	G4		G5	
HP ProBook	455		G4		G5	G6
HP ProBook	640		G3		G4	G5
HP ProBook	645		G3		G4	
HP ProBook	650		G3		G4	G5
HP ProBook	655		G3		G4	
HP ProBook	x360 440				G1	
HP Pro	x2 612		G2			
HP Zbook	x2		G4		G5	
HP ZHAN	66 Pro				G1	G2
HP EliteBook	x360 1020		G2			
HP EliteBook	x360 1030		G2		G3	
HP EliteBook	X360 1040				G5	
HP Elite	x2 1012		G2		G3	
HP Mobile Thin Client mt21					X	
HP Mobile Thin Client mt44					X	

Table 2 Desktop Generations

Platforms		2015	2016	2017	2018	2019
HP EliteDesk	1000 AiO			G1	G2	
HP EliteDesk	800 TWR	G2	G3		G4	G5
HP EliteDesk	880 TWR	G2	G3		G4	G5
HP EliteDesk	800 SFF	G2	G3		G4	G5
HP EliteDesk	800 DM	G2	G3		G4	G5
HP EliteOne	800 AiO	G2	G3		G4	G5
HP EliteDesk	705 MT	G2	G3		G4	
HP EliteDesk	705 SFF	G2	G3		G4	
HP EliteDesk	705 DM	G2	G3		G4	
HP ProDesk	600 MT	G2	G3		G4	G5
HP ProDesk	680 MT	G2	G3		G4	G5
HP ProDesk	600 SFF	G2	G3		G4	G5
HP ProDesk	600 DM	G2	G3		G4	G5
HP ProOne	600 AiO	G2	G3		G4	G5
HP ProDesk	400 SFF	G2.5	G4		G5	G6
HP ProDesk	400 MT	G3	G4		G5	G6
HP ProDesk	480 MT	G3	G4		G5	G6
HP ProDesk	490 MT	G3				
HP ProDesk	498 MT	G3				
HP ProDesk	400 DM	G2	G3		G4	G5
HP ProOne	400 AiO	G2	G3		G4	G5
HP ProOne	460/480 AiO	G2	G3			
HP Retail	RP9	X				
HP Retail	RP1		X			
HP Retail	Engage Flex Pro				X	
HP Elite Slice			G1		G2	
HP Thin Client t530			X			

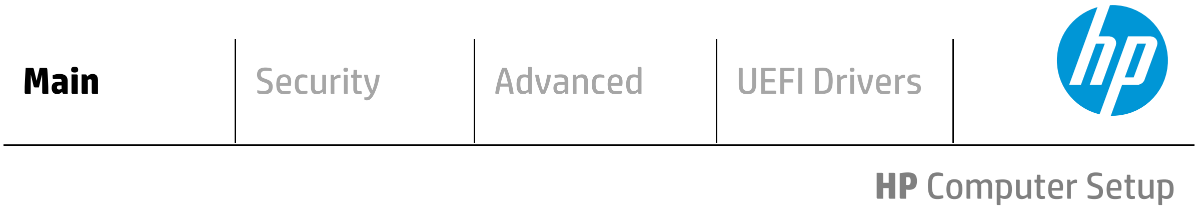
2.2 New in 2019

This is a sampling of the new features and functionalities introduced in 2019 with special reference to 2018 features:

- HP Sure Start ME firmware recovery (Intel systems)
- DMA protection

NOTE: Some features are platform dependent.

3 F10 Main Menu



Organization of the F10 section:
The hierarchy of the table of contents matches the sequence of the menus found in the F10 Setup menu, currently three levels deep.

The top-level tabs are: Main, Security, Advanced, and UEFI Drivers.

The next level are the menus found under these tabs.

At the beginning of each major section is a diagram of the submenu items for each tab.

A table provides a list of features for each menu.

At the top of the table is a breadcrumb trail that describes the menu relationship in the hierarchy.

Advanced ->Port Options Continued...				
Feature	Type	Description	Default	Notes

The table has columns for feature, type, description, default, and notes.

Feature
This is the name of the feature as it appears in the Setup menu. An underlined feature or one prefaced with a box shows how it appears in the menu.

Type
Features can be settings, actions, another menu, or display-only settings. Most of the features by far are settings. A setting is system value that you can modify, using a check box, a drop-down menu, or a text box.

Description
If the feature is a setting with a drop-down box, then all possible values are displayed. If the feature is new or has changed its name or location from the 2014 notebooks or desktops, then the description references or includes its previous name and location. The notation to describe the location indicates the menus that the user must navigate through to access the feature. For example: Menu 1 > Menu 2 > Feature X indicates that to access Feature X, the user navigates through Menu 1 to Menu 2.

Default
For features that are settings, this column provides the factory default setting.

Notes
Some features are not available for all types of models. The notes describe when a feature is Intel only, AMD only, notebook only, or desktop only.

Some actions require a reboot or physical presence. Physical presence is a menu that requires a human response to validate that a person is physically present before the action is completed. Actions that require physical presence are security-sensitive changes.

Main	Security	Advanced	UEFI Drivers

HP Computer Setup

- ⇨ **System Information**
- ⇨ **System Diagnostics**
- ⇨ **BIOS Event Log**
- ⇨ **Update System BIOS**
- ⇨ **Change Date and Time**
- ⇨ **System IDs**

- ⇨ **Replicated Setup**
- ⇨ **Save Custom Defaults**
- ⇨ **Apply Custom Defaults and Exit**
- ⇨ **Apply Factory Defaults and Exit**
- ⇨ **Ignore Changes and Exit**
- ⇨ **Save Changes and Exit**

3.1 Main Menu

The following table describes the features in the Main menu.

Table 3 Main Menu features

Feature	**Type**	**Description**	**Default**	**Notes**
System Information	Menu	System information, such as serial number, model number, CPU type, and memory configuration.		
System Diagnostics	Menu	Application to run diagnostic tests on your system, such as start-up test, run-in test, memory test, and hard disk test.		
BIOS Event Log	Menu	Allows displaying, saving, and clearing the Event Log.		
Update System BIOS	Menu	Update system firmware from FAT 32 partition on the hard drive, a USB disk-on-key, or the network.		
Change Date and Time	Menu	Configure the system Date and Time settings.		
System IDs	Menu	Identification strings that assigned by an enterprise to track the system.		
Replicated Setup	Action	Save your current BIOS settings, and later restore your setting from this file.		
Save Custom Defaults	Action	As an alternative to factory default settings, create custom default values for all but the security settings. It is not possible to create custom default values for security settings.		Reboot required
Apply Custom Defaults and Exit	Action	Set all but the security settings to your custom default values **NOTE**. Now it is possible to restore to custom defaults or the factory defaults.		
Apply Factory Defaults and Exit	Action	Set all but the security settings to factory values. See *Security Menu* to set security settings to factory values.		
Ignore Changes and Exit	Action	Exits F10 Setup without saving any changes made during current session.		
Save Changes and Exit	Action	Exits F10 Setup and saves all changes made during current session.		

3.2 BIOS Event Log Menu

This submenu under the Main menu manages the saved log of select BIOS events and alerts.

View BIOS Event Log	Action	Immediately displays a list of events, alerts, or warnings that have been logged since the log was last cleared.		
Export to USB Key	Action	Immediately saves a file named BiosEventLog.txt containing the log entries to an inserted USB storage device.		
☐ Clear BIOS Event Log on Next Boot	Setting	When checked, the BIOS clears the event log on Save and Exit.	Unchecked	

3.3 Update System BIOS Menu

This submenu under the Main menu provides information about the current system firmware, settings, these control updates, the ability to check for updates over the internet or on the local network, and the ability to update system firmware from a FAT 32 partition on the hard drive, or a USB disk-on-key.

For the BIOS flash to succeed, do not remove power or turn off the system during any phase of the process. The following description of the BIOS flash phases helps you avoid interrupting the process. The BIOS flash proceeds in four phases:

1. The system displays a progress bar. When progress is 100%, the system reboots. This is the initial BIOS flash. Because the system must reset power completely, there might be a delay of between 10 and 15 seconds before power returns to the system.

2. The screen may be black initially and an LED may be and blink. This will occur only if the boot block needs to be updated. On some models, video cannot be displayed during this phase, so the beep/blink code indicates that the system BIOS is flashing normally. Other models may display 'Step 2 of the BIOS update is in progress' during this phase. The computer will reboot again, and this might also take 10 to 15 seconds to complete.

3. The message "Final step of the BIOS update is in progress" is displayed.

4. The screen is black for a short period, and then the OS starts. The BIOS update is now complete.

Table 4 Update System BIOS Menu features

Feature	Type	Description	Default	Notes
Current System BIOS Version	Display Only			
Current BIOS Release Date	Display Only			
Installation Date of Current BIOS	Display Only			
Most Recent Update Check	Display Only			
Check the Network for BIOS Updates (or) Check HP.com for BIOS Updates	Action	Updates the system BIOS by using an image stored on hp.com or another source defined in the BIOS Update Preferences menu. When BIOS source is HP.com, then the feature appears as Check HP.com for BIOS Updates.		Reboot required
□ Lock BIOS version	Setting	When checked, disallows BIOS updates.	Unchecked	
BIOS Rollback Policy	Setting	Behavior when attempting to roll back to a previous BIOS version. The setting can be set to Unrestricted Rollback to older BIOS or Restricted Rollback to older BIOS.	Unrestricted Rollback to older BIOS	
Minimum BIOS version	Setting	Displays Minimum BIOS version required for optimal operation.		
□ Allow BIOS Update using a Network	Setting	When checked, automatic BIOS updates through the network in a scheduled basis.	Checked	

BIOS Update Preferences	Menu	Menu with network BIOS update settings such as source, actions when an update is available, and the frequency to check for updates.		
Network Configuration Settings	Menu	Configure the network connection to the server that is the host for your system firmware updates.		
Update System and Supported Device Firmware Using Local Media	Action	Updates the system BIOS by using files stored on local media such as the hard drive or a USB drive formatted as FAT32 or EFI system partition. The files needed to update the system can be saved to the hard drive or USB device using the HP Firmware Update & Recovery app.		Reboot required

3.4 BIOS Update Preferences Menu

The Update System BIOS submenu provides options for updating to the latest system firmware as well as configuring where to check for system firmware updates, what to do when an update is available, and the frequency to check for them.

Table 5 BIOS Update Preferences Menu features

Feature	**Type**	**Description**	**Default**	**Notes**
☐ Check for Update on Next Reboot	Action	When checked, check if an updated BIOS is available during the next boot. This feature is only necessary from a WMI call. From the F10 Setup menu, use the feature Main > Update System BIOS > Check the Network for BIOS Updates that checks for updates without a reboot.	Unchecked	Reboot required
BIOS Source	Setting	Select the source URL for BIOS updates • HP.com • Custom URL	HP.com	
Edit Custom URL	Setting	When not using HP.com, define the custom URL here.		
Automatic BIOS Update Setting	Setting	Defines how automatic updates behave. The following settings are possible: • Do not update • Check for BIOS updates automatically, but let me decide whether to install them • Download and install normal BIOS update automatically • Download and install important BIOS updates automatically	Do Not Update	
BIOS Update Frequency	Setting	Sets the frequency of checks to the BIOS update server. If a newer version of BIOS has been made available on the network server, the system will prompt to update the BIOS. • Daily • Weekly • Monthly	Monthly	

3.5 Network Configuration Settings Menu

The "System BIOS submenu configures the network connection to the server that is the host for the system firmware updates.

Table 6 Network Configuration Settings Menu features

Feature	Type	Description	Default	Notes
□ Proxy Server	Setting	When checked, enables the use of a proxy server.	Unchecked	
Edit Proxy Server	Setting	Specify the Proxy Server Address and the Port Number through the common-used <server>:<port> notation.		
Test Network Connection	Action	Check the network connection using current BIOS update configuration.		
IPv4 Configuration	Setting	The following settings are configurable: • Automatic • Manual	Automatic	
IPv4 Address	Setting	When IPv4 settings are manual, setup for static IPv4 address.		
IPv4 Subnet Mask	Setting	When IPv4 settings are manual, configure a valid IPv4 address for subnet mask.		
IPv4 Gateway	Setting	When IPv4 settings are manual, configure a valid IPv4 address for gateway.		
DNS Configuration	Setting	Configure a list of DNS addresses. The following settings are possible: • Automatic • Manual	Automatic	
DNS Addresses	Setting	When DNS configuration is manual, configure a comma-separated list of DNS addresses.		
Data Transfer Timeout	Setting	Set data transfer timeout in seconds. Do not use values less than 15 seconds.	100	
□ Force HTTP No Cache	Setting	When checked, disables HTTP caching. This means that caching in upstream proxies is disabled as well, which guarantees that the BIOS goes all the way to the content source for any updated BIN files or catalog files but might slow down downloads slightly.	Unchecked	

3.6 Change Date and Time

Allows the system current Date and Time settings to be configured.

Feature	Type	Description	Default	Notes
Set Date (MM/DD/YYYY)	Action	Set the current date using MM/DD/YYYY format.		
Set Time (HH:MM)	Action	Set the current time using HH:MM (24 hour) format.		

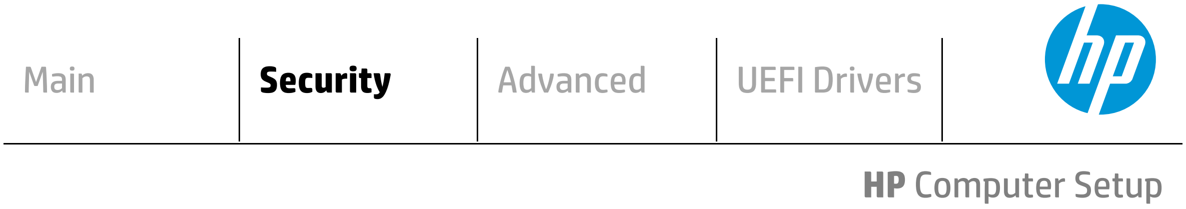
3.7 System IDs Menu

This submenu provides identification strings assigned by an enterprise to track the system.

Table 7 System IDs Menu features

Level	Feature	Type	Description	Default	Notes
2	Asset Tracking Number	Setting	Allows custom configuration of an asset tag (up to 80 characters).	Serial Number	
2	Ownership Tag	Setting	Allows custom configuration of an ownership tag (up to 80 characters).	Blank	

4 Security Menu



Administrator Tools

⇨ **Create/Change BIOS Administration Password**

⇨ **Create/Change POST Power-On Password**

⇨ **Password Policies**

⇨ **Administrator Authentication Policies**

⇨ **Fingerprint Reset on Reboot (select products only)**

Security Configuration

⇨ **TPM Embedded Security**

⇨ BIOS Sure Start (select products only)

⇨ Secure Platform Management (SPM) (select products only)

☐ **Physical Presence Interface**

⇨ **Smart Cover (select products only)**

☐ **Trusted Execution Technology (TXT)** (select products only)
TXT cannot be enabled unless VTx, VTd and TPM are enabled first
Intel Software Guard Extensions (SGX) (select products only)

Utilities

⇨ **Hard Drive Utilities**

Absolute® Persistence Module Current State

⇨ **Activation Status : Inactive/Active**

⇨ **Absolute® Persistence Module Permanent Disable : No/Yes**

☐ **System Management Command (SMC)**

⇨ **Restore Security Settings to Factory Defaults**

Table 8 Security Menu features

Feature	Type	Description	Default	Notes
Create BIOS Administrator Password Or Change BIOS Administrator Password	Setting	The administrator password controls access to the setup menu (F10), 3rd Party Option ROM Management (F3), Update System ROM, WMI commands that change system settings, and the BIOS Configuration Utility (BCU). When no administrator password is set, anyone can change the system settings, add 3rd Party Option ROM, or update the system ROM. When the power-on password is set, use the administrator password as an alternative to power-on the system. Recommendation: Set an administrator password when a power-on password is set. When a power-on password is forgotten, an administrator can reset the power-on password by using Restore Security Settings to Factory Defaults.		
Create POST Power-On Password Or Change POST Power-On Password	Setting	Password required to power-on the PC, independent of the OS password. When no password is set, anyone can turn on the PC. In addition to the administrator password, there is only one power-on password. Recommendation: Set an administrator password when a power-on password is set. When a power-on password is forgotten, an administrator can reset the power-on password by using Restore Security Settings to Factory Defaults.		
Password Policies	Menu	Allows the administrator to set password requirements for BIOS administration and power-on regarding the use of symbols, numbers, case, and spaces.		
Administrator Authentication Policies	Menu	Allows the administrator to determine whether the administrator password is required to access various boot menus through hot keys at boot time, or to update the firmware through Windows Update. NOTE: the settings in this menu were previously located in the Password Policies menu.		
□ Fingerprint Reset on Reboot	Action	When checked, resets the fingerprint on the next reboot. After reboot, this will be unchecked again.	Unchecked	
TPM Embedded Security	Menu	The Trusted Platform Module (TPM) is a dedicated microprocessor that provides security functions for secure communication and software and hardware integrity. The TPM hardware solution is more secure than a software only solution.		
BIOS Sure Start	Menu	Settings that control the behavior of HP Sure Start. HP Sure Start is a built-in hardware security system that protects your BIOS from accidental or malicious corruption by (1) detecting BIOS corruption and then (2) automatically restoring the BIOS to its last installed HP-certified version. Some platforms in 2019 have the capability to recover Intel ME as well.		

Feature	**Type**	**Description**	**Default**	**Notes**
Secure Platform Management (SPM)	Menu	Options for managing HP Sure Run and HP Sure Recover		
□ Physical Presence Interface		Enable or disable the local prompt to confirm that a sensitive setting change was requested by the user.	Checked	
Smart Cover	Menu	Controls settings for Cover Lock and Cover Sensor on desktop models.		Desktop
□ Trusted Execution Technology (TXT)	Setting	When checked, enables Trusted Execution Technology on select Intel-based systems. NOTE: Enabling this feature disables OS management of Embedded Security Device, prevents a reset of the Embedded Security Device, and constrains the configuration of VTx, VTd, and Embedded Security Device	Unchecked	Intel Only Reboot Required
Intel Software Guard Extensions (SGX)	Setting	Enables Intel Software Guard Extensions. The following settings are possible: • Disable • Enable • Software control (2016 or later)	Software control –or– Disable (non-vPro & 2015)	Intel Only
Hard Drive Utilities	Menu	Utilities to protect private information on individual hard drives: Drive Lock and Secure Erase.		
Absolute Persistence Module	Label	A subscription service that provides PC theft recovery, tracking and data delete solutions		
Activation Status	Display Only	The subscription status can be inactive, active, or permanently disabled.	Inactive	
Absolute Persistence Module Permanent Disable	Display Only	Shows current state of the Absolute Persistence module (Yes = disabled, No = available).	No	
□ System Management Command	Setting	When checked, allows authorized HP service personnel in possession of the PC to reset security settings in case of a customer service event. For customers that require more BIOS security, uncheck this to prevent this type of HP service command. NOTE: If BIOS password is lost and this option is disabled, HP authorized personnel cannot remove a lost password.	Checked	Reboot Required
Restore Security Settings to Default	Action	Apply factory defaults to all security settings. NOTE: Escaping (ESC) at the Reset Request screen will leave settings as they were except for the Administrator & Power-on passwords which are still cleared.		Reboot Required

4.1 Password Policies Menu

This submenu allows the administrator to set text requirements controlling the use of symbols, numbers, case, and spaces for the BIOS administrator password and the power-on password. To access this menu, a password must be already set. Changes to these policies do not apply retroactively to existing passwords.

Table 9 Password Policies Menu features

Feature	**Type**	**Description**	**Default**	**Notes**
Password Minimum Length	Setting	Allows the administrator to specify the minimum number of characters required for a password. • Minimum: 4 • Maximum: 32	8	
□ At least one symbol required in Administrator and User passwords	Setting	When checked, passwords require at least one symbol, such as $, %, ^, &, or #	Unchecked	
□ At least one number required in Administrator and User passwords	Setting	When checked, passwords require at least one number	Unchecked	
□ At least one upper-case character required in Administrator and User passwords	Setting	When checked, passwords require at least one upper case character	Unchecked	
□ At least one lower-case character required in Administrator and User passwords	Setting	When checked, passwords require at least one lowercase character	Unchecked	
□ Are spaces allowed in Admin and User passwords?	Setting	When checked, passwords can have one or more spaces	Unchecked	
Clear Password Jumper	Setting	On desktops, a jumper is available that, when removed, clears the Administrator and power-on passwords. Set this to *Ignore* to prevent someone from clearing your passwords with the jumper. • Honor • Ignore	Honor	Desktop Only
□ Prompt for Admin password on F9 (Boot Menu)	Setting	When checked, the administrator password is required to enter the boot menu. NOTE: moved to new menu in newer products	Unchecked	
□ Prompt for Admin password on F11 (System Recovery)	Setting	When checked, the administrator password is required to enter system recovery. NOTE: moved to new menu in newer products	Unchecked	
□ Prompt for Admin password on F12 (Network Boot)	Setting	When checked, the administrator password is required to enter the network boot menu. NOTE: moved to new menu in newer products	Unchecked	
□ Prompt for Admin password on Capsule Update	Setting	When checked, the administrator password is required to process a firmware capsule update. NOTE: moved to new menu in newer products	Unchecked	

4.2 Administrator Authentication Policies Menu

This submenu allows the administrator to set limitations to some boot features, such as administrator permissions, requiring the user to enter an administrator password. To access this menu, a password must be already set.

Table 10 Password Policies Menu features

Feature	Type	Description	Default	Notes
□ Prompt for Admin authentication on F9 (Boot Menu)	Setting	When checked, the administrator password is required to enter the boot menu.	Unchecked	
□ Prompt for Admin authentication on F11 (System Recovery)	Setting	When checked, the administrator password is required to enter system recovery.	Unchecked	
□ Prompt for Admin authentication on F12 (Network Boot)	Setting	When checked, the administrator password is required to enter the network boot menu.	Unchecked	
□ Prompt for Admin authentication on Capsule Update	Setting	When checked, the administrator password is required to process a firmware capsule update.	Unchecked	
□ BIOS Administrator visible at Power-on Authentication	Setting	When *not* checked, there is only a prompt for the Power-on password.	Checked	

4.3 Trusted Platform Module (TPM) Embedded Security Menu

This submenu for the Trusted Platform Module (TPM.) is a dedicated microprocessor that provides security functions for secure communication and software and hardware integrity. The built-in TPM hardware solution is more secure than a software-only solution.

Table 11 TPM Embedded Security Menu features

Feature	**Type**	**Description**	**Default**	**Notes**
TPM Specification Version	Display Only	The Trusted Computing Group (TCG) is an industry group that defines specifications for a TPM. As of this writing, possible TPM specification versions are 1.2 or 2.0. NOTE: Windows 10 requires TPM 2.0 capability.		
TPM Device	Setting	Makes the TPM available. The following settings are possible: • Available • Hidden	Available	Reboot, Physical Presence Required
□ TPM State	Setting	When checked, enables the ability for the OS to take ownership of the TPM (v1.2) or enables OS and application access to the various security capabilities of the TPM (v2.0).	Checked	Reboot, Physical Presence Required
Clear TPM	Action	When selected, clears the TPM on the next boot. After clearing the TPM, this resets to No. The following settings are possible: • No • On next boot	No	Reboot Required
TPM Activation Policy	Setting	This setting allows an administrator to choose between convenience and extra security. The extra security is to ensure that the user of the system will at least see that the TPM device upgraded its firmware (F1 to Boot), or at most the user has the ability to reject the upgrade of the TPM device (Allow user to reject.) These user prompts limit the impact of remote attacks on the system by requiring a user to be physically present for the upgrade. When security of the system is of less concern, the third option (No prompts) removes any requirement for a user to acknowledge the upgrade. This last option is the most convenient for remotely upgrading many systems at once. The following settings are possible: • F1 to Boot • Allow user to reject • No prompts	Allow user to reject	HP recommends an option that requires the physical presence of the user

4.4 BIOS Sure Start Menu

Settings menu for enhanced hardware-based assurance that only HP approved Embedded Controller firmware will run on the HP Embedded Controller and that only HP approved BIOS will run on the host CPU.

Table 12 BIOS Sure Start Menu features

Feature	Type	Description	Default	Notes
□ Verify Boot Block on Every Boot	Setting	When not checked, HP Sure Start verifies the integrity of HP firmware in the nonvolatile (flash) memory before resume from Sleep, Hibernate, or Off. When checked, HP Sure Start verifies the integrity of HP firmware in the nonvolatile (flash) memory across operating system restart (warm reset) in addition to resume from Sleep, Hibernate Off. This setting provides higher security assurance but could increase the time required to restart operating system.	Unchecked	Reboot Required
BIOS Data Recovery Policy	Setting	The following settings are possible for HP Sure Start–Recovery Policy: • Automatic • Manual Automatic: HP Sure Start automatically repairs any HP firmware integrity issues in the nonvolatile (flash) memory. Manual: HP Sure Start will not repair any HP firmware integrity issues in the nonvolatile (flash) memory until the Windows +Up Arrow+ Down Arrow keys are pressed. NOTE: Manual recovery is intended for use by the system administrator in the event forensic investigation is desired before HP Sure Start repairs the issue. It is not recommended for the typical user.	Automatic	Reboot Required
Network Controller Configuration Restore	Action	Network Controller Configuration Restore This action restores the network controller parameters to the factory state saved in the HP Sure Start Private nonvolatile (flash) memory. NOTE: This process can take up to 30 seconds. You need to restore this only when the Network Controller Configuration mismatch warning is set.		Reboot Required
□ Prompt on Network Controller Configuration Change	Setting	When enabled, HP Sure Start will monitor the network controller configuration and prompt the local user if any changes are detected compared to the factory configuration. The local user has the option to ignore the prompt or restore the network controller to the factory configuration when prompted.	Checked	Intel Only Reboot Physical Presence Required
□ Dynamic Runtime Scanning of Boot Block	Setting	When checked, allows HP Sure Start verifies the integrity of the HP firmware in the nonvolatile (flash) memory every 15 minutes while the system is on and the operating system is running.	Checked	
□ Sure Start BIOS Settings Protection	Setting	Protects critical BIOS Settings by saving a backup copy and restoring them if altered.	Unchecked	Not accessible with no Admin password set

Feature	Type	Description	Default	Notes
☐ Sure Start Secure Boot Keys Protection	Setting	Saves backup copy of Secure Boot Keys so that they can be recovered if someone attempts to alter them in an unauthorized manner.	Unchecked	
☐ Enhanced HP Firmware Runtime Intrusion Prevention and Detection	Setting	Monitors key areas of memory for corruption or attack, notifies user of attack (based on the settings in Sure Start Security Event Policy), and prevents the attack from taking place. NOTE: Only available on certain Intel systems.	Checked	
☐ HP Firmware Runtime Intrusion Detection	Setting	Monitors key areas of memory for corruption or attack and notifies user of attack (based on the settings in Sure Start Security Event Policy). NOTE: Only available on certain AMD chipset systems 2016 or later.	Checked	
Sure Start Security Event Policy	Setting	Determines how to respond to a detected event: • Log the event in the audit log. • Log the event in the audit log and prompt the user to acknowledge the event. • Log the event in the audit log and power off the system. Prior to 2016: Not available	Log Event and notify user	
Sure Start Security Event Boot Notification		Enable a warning message at boot screen if there is a Sure Start event (BIOS recovery, Memory intrusion, etc.)	Require Acknowledgment	

4.5 Smart Cover Menu (Desktop Only)

This submenu controls settings for Cover Lock and Cover Sensor.

Table 13 Smart Cover Menu features

Feature	Type	Description	Default	Notes
Cover Lock	Setting	The Smart Cover Lock is a software-controllable solenoid lock. This lock restricts unauthorized access to the system's internal components. The following settings are possible: • Lock • Unlock	Unlock	Desktop with Cover Lock Reboot Required
Cover Removal Sensor	Setting	The Cover Removal Sensor has the following settings: • Disabled • Notify the User: Displays warning message on next boot if opened. • Administrator Password (when password is set): Requires entering the administrator password before continuing to boot after the cover is opened.	Disable	Desktop with Cover Sensor Reboot Required

4.6 Secure Platform Management (SPM)

This submenu controls settings for Secure Platform Management that are used for secure enablement and management of the HP Sure Run and Sure Recover capabilities.

You cannot provision SPM and activate HP Sure Run directly from the BIOS Setup interface. You can provision SPM using HP Client Security Manager Software or the HP Manageability Integration Kit. When provisioned, the controls in this menu can be used to deprovision the system or deactivate HP Sure Run.

Table 14 Secure Platform Management Menu features

Feature	Type	Description	Default	Notes
HP Sure Run Current State	Setting (Display Only)	• Inactive • Active	Inactive	
Deactivate HP Sure Run	Action	This action deactivates HP Sure Run without deprovisioning SPM.		
SPM Current State	Setting (Display Only)	• Provisioned • Unprovisioned	Unprovisioned	
Unprovision SPM	Action	This action deprovisions SPM, which causes HP Sure Run to revert to the Inactive state and return HP Sure Recover to default settings.		

4.7 Enhanced BIOS Authentication Mode (EBAM)

This submenu allows the administrator to disable and unprovision the EBAM alternative authentication method and keys when this feature is fully enabled by associated software. Initialization and provisioning of the feature may be supported by future HP Manageability Integration Kit releases.

Table 15 Enhanced BIOS Authentication Mode (EBAM) Menu features

Feature	Type	Description	Default	Notes
EBAM Current State: Disabled	Setting (Display Only)			
Disable EBAM	Action	This action deactivates HP Enhanced BIOS Authentication Mode.		
Local Access Key: Not Present	Setting (Display Only)			
Clear EBAM Local Access Key(s) and Reboot	Action	This action deletes all currently established EBAM Local Access Keys.		

4.8 Hard Drive Utilities Menu

This submenu provides features that protect the data on individual hard drives, such as recovering the master boot record (MBR), preventing unauthorized access, and erasing data.

Table 16 Hard Drive Utilities Menu features

Feature	**Type**	**Description**	**Default**	**Notes**
□ Save/Restore MBR of the system hard drive	Setting	When checked, saves a baseline MBR that can be restored if a change is detected **NOTE:** Not applicable for UEFI boot modes	Unchecked	Reboot Required
□ Save/Restore GPT of System Hard Drive	Setting	When checked, saves a baseline GUID Partition Table that can be restored if a change is detected. **NOTE:** Not applicable for Legacy boot modes Prior to 2016: Did not exist	Unchecked	Reboot Required
Boot Sector (MBR/GPT) Recovery Policy	Setting	Allows selection of the default action when an MBR/GPT event occurs.	Local User Control	
DriveLock/Automatic DriveLock	Menu	DriveLock prevents unauthorized access to the contents of a selected hard drive.		
Secure Erase Select a Drive…	Action	Uses hardware-based methods to erase safely all data and personal information from a selected Hard Drive.		Reboot Required
□ Allow OPAL Hard Drive SID Authentication	Setting	Allows for higher security on self-encrypting drives that support SID Authentication. If enabled, 3rd parties (including some encryption software) are not allowed to perform certain drive activities.	Unchecked	Reboot Required

4.9 DriveLock/Automatic DriveLock Menu

DriveLock prevents unauthorized access to the contents of a selected hard drive. Enter a password to access the drive and the drive is accessible only when attached to a PC.

NOTE: DriveLock states cannot change after a warm reboot. Power off the system and then boot directly to the BIOS setup to access these menus. The DriveLock Master and User passwords cannot be changed if you enable Automatic DriveLock.

Table 17 DriveLock Menu features

Feature	Type	Description	Default	Notes
□ Automatic DriveLock	Setting	This feature is intended to prevent someone from accessing data on your drive after they have physically removed it from your system. A BIOS administrator password is required for this feature. When this feature is enabled, the BIOS sets a randomly generated user password, sets the master password with the BIOS administrator password, and marks the drive as a member of an Automatic DriveLock group. Thereafter, the BIOS automatically unlocks the drive while it is attached to the its host system. If the drive is physically removed from its host system and attached to another system, the user is prompted for the DriveLock password. The user must provide the BIOS administrator password from the original host system to access the drive.	Disable	Power cycle required. Not supported for M.2 NVMe drives.
Set DriveLock Master Password	Setting	Password to disable or access a hard drive with DriveLock protection.		Power cycle required. Not supported for M.2 NVMe drives.
Enable DriveLock	Setting	Enables DriveLock protection and creates a user password distinct from the master password that allows access to the hard drive	Disable	Power cycle required.
Change DriveLock User Password	Action	Displayed only if DriveLock is enabled and a valid password was supplied at the DriveLock POST prompt. Allows the user password to be changed when selected.		Power cycle required.
Change DriveLock Master Password	Action	Displayed only if DriveLock is enabled and a valid password was supplied at the DriveLock POST prompt. Allows the master password to be changed when selected.		Power cycle required. Not supported for M.2 NVMe drives.
Disable DriveLock	Setting	Displayed only if DriveLock is enabled and a valid password was supplied at the DriveLock POST prompt. Allows DriveLock to be disabled when it is enabled.		Power cycle required.

5 Advanced Menu

⇨ **Display Language**

⇨ **Scheduled Power-On**

⇨ **Boot Options**

⇨ **HP Sure Recover**

⇨ **Secure Boot Configuration**

⇨ **System Options**

⇨ **Built-In Device Options**

⇨ **Port Options**

⇨ **Option ROM Launch Policy**

⇨ **Power Management Options**

⇨ **Remote Management Options** (Intel Only)

⇨ **Electronic Labels** (Notebook & AiO Only)

⇨ **MAC Address Pass Through** (Notebook Only)

⇨ **Thunderbolt Options** (2019+ with TBT)

Remote HP PC Hardware Diagnostics

⇨ **Settings**

⇨ **Execute Remote HP PC Hardware Diagnostics**

5.1 Advanced Menu

For detailed information on the features in the advanced menu, see the following table:

Table 18 Advanced Menu features

Feature	Type	Description	Default	Notes
Display Language	Menu	Select the display language and the keyboard language. Choose between 15 languages. You can display the menu in English, French, German, Spanish, Italian, Dutch, Danish, Japanese, Norwegian, Portuguese, Swedish, Finnish, Chinese Traditional, Chinese Simplified, or Russian. NOTE: Affects the BIOS menus, not the OS nor the WMI commands. Russian language support is only available in the most recent product generations.		
Scheduled Power On	Menu	Choose days of the week and a single time of day for the system to turn on. This feature wakes the system up from a turned-off state.		
Boot Options	Menu	Settings that control the behavior of the system during boot up.		
HP Sure Recover	Menu	Settings that control when and how the BIOS should attempt to reinstall the operating system.		
Secure Boot Configuration	Menu	Starting with Windows 8, Secure Boot is a UEFI feature that helps resist attacks and infection from malware. From the factory, your system came with a list of keys that identify trusted hardware, firmware, and operating system loader code. Your system also has a list of keys to identify known malware.		
System Options	Menu	Settings that control the CPU, PCI, PCIe, the power button and function keys.		
Built in Device Options	Menu	Settings of other devices built-in to the PC.		
Port Options	Menu	Settings that enable or disable ports and interrupts on the system.		
Option ROM Launch Policy	Menu	Configure the Device Option ROMs that load at boot time.		
Power Management Options	Menu	Settings that control power saving features and the behavior of the system in low power modes.		
Remote Management Options	Menu	Settings that controls Intel Active Management technology that provides out-of-band remote management of the system.		Intel Only
Electronic Labels	Display Only	Mandatory certification marks, for example the Federal Communication Commission (FCC) Declaration of Conformity (Doc) and the CE marking for Europe.		Notebook and All-in-One Only
MAC Address Pass Through	Menu	Configure a custom Host Based MAC Address (HBMA) for the system as well as define the priority of Network Interface Cards (NIC).	Disable	Notebook Only
Remote HP PC Hardware diagnostics	Label	Remote HP PC Hardware diagnostics.		

Feature	Type	Description	Default	Notes
Settings	Menu	Settings for Remote HP PC Hardware diagnostics.		
Execute Remote HP PC Hardware Diagnostics	Action	When selected, will download and run HP Remote Diagnostics.		

5.2 Display Language Menu

This submenu allows for selection of the display language and the keyboard language. For each setting, choose from the following languages:

- English
- Deutsch
- Español
- Italiano
- Français
- 日本語
- Português
- Danske
- Svenska
- Nederlands
- Norsk
- Suomi
- 简体中文
- 繁體中文
- Русский

NOTE: Affects the BIOS menus, not the OS nor the WMI commands.

Table 19 Display Language Menu features

Feature	Type	Description	Default	Notes
Select Language	Setting	Language used by BIOS setup menus.	English	
Select Keyboard Layout	Setting	Language of the keyboard layout used by BIOS setup menus.	English	

5.3 Scheduled Power-On Menu

This submenu controls the days of the week and a single time of day for the system to turn on the computer. This feature wakes the system up from a powered off state.

Table 20 Scheduled Power-On Menu features

Feature	Type	Description	Default	Notes
□ Sunday □ Monday □ Tuesday □ Wednesday □ Thursday □ Friday □ Saturday	Setting	Days of the week selection.		Reboot Required
Hour	Setting	Time selection.	0	Reboot Required
Minute	Setting	Hour: 0 – 23, Minute: 0 – 59.	0	Reboot Required

5.4 Boot Options Menu

This submenu controls the behavior of the system during boot up.

Table 21 Boot Options Menu features

Feature	Type	Description	Default	Notes
Startup Delay (sec.)	Setting	Select the number of seconds (0 – 60) to pause the boot before starting the OS. Increasing the delay gives more time to press a key that accesses one of the startup options, such as BIOS Setup (F10).	0	
□ Fast Boot	Setting	When checked, reduces boot up time by bypassing boot to USB, CD-ROM, and PXE. This skips some preboot initialization steps. **NOTE:** When a power-on password, other security features, or default boot order have been modified, Fast Boot is ignored.	Checked	
□ CD-ROM Boot	Setting	When checked, allows system to boot from CD-ROM.	Checked	
□ USB Storage Boot	Setting	When checked, allows system to boot from USB.	Checked	
□ Network PXE Boot	Setting	When checked, allows system to boot from a network card if it supports PXE or UEFI network boot capability.	Checked	
After Power Loss	Setting	Specifies the desktop state after power loss. The following settings are possible: • Power Off • Power On • Previous State	Power Off	Desktop Only
□ Power On When AC Detected	Setting	When checked, the notebook will turn on when it is off, when AC power has not been available and then becomes available.	Unchecked	Notebook Only

Feature	Type	Description	Default	Notes
□ Power On When Lid is Open	Setting	When checked, the system turns on when the lid opens.	Unchecked	Notebook Only
□ Prompt on Battery Errors	Setting	When checked, the system pauses during system boot to warn about battery errors.	Checked	Notebook Only
□ Audio Alerts during boot	Setting	When checked, errors trigger audible beeps during POST.	Checked	
□ Prompt on Memory Size Change	Setting	When checked, notify the user during the boot process when a memory size change has been detected.	Checked	
□ Prompt on Fixed Storage Change	Setting	When checked, notify the user during the boot process when a fixed storage change has been detected. NOTE: This feature will not report a change within a RAID configuration.	Unchecked	
Audio Alerts During Boot	Setting	When checked, errors trigger audible beeps during POST.	Checked	
Numlock on at Boot	Setting	Set the keyboard Num Lock control to be on or off when system is booted.	Unchecked	
□ UEFI Boot Order		When checked, allows the system to boot from UEFI devices. When Legacy Boot is Disabled, the check boxes for UEFI Boot Order and Legacy Boot Order will be disabled, because only UEFI devices can boot in this mode. When UEFI Boot Order is enabled, the system attempts to boot from all UEFI devices before any non-UEFI devices. Arrange the boot order from the UEFI devices found. By default, the system will arrange the boot order by device type using the following precedence: 1. USB 2. SATA DVD (Desktop Only) 3. SATA Hard Drives 4. M.2 devices 5. Network Boot Highlight the list and press **Enter** to adjust the order of the boot entries. If a new bootable device is added to the system, it appears at the bottom of the list, unless it is a USB device that uses the order of the USB placeholder already in the list.	Checked	

Feature	Type	Description	Default	Notes
□ Legacy Boot Order	Setting	When checked, allows the system to boot from non-UEFI devices. Requires Legacy Boot Enable and Secure Boot Disable. See Secure Boot Configuration > Configure Legacy Support and Secure Boot. When Legacy Boot is Disabled, the check boxes for UEFI Boot Order and Legacy Boot Order are disabled, because only UEFI devices can boot in this mode. When enabling the UEFI Boot Order, the system attempts to boot from all UEFI devices before any non-UEFI devices. Arrange the boot order from the non-UEFI devices found. By default, the system arranges the boot order by device type using the following precedence: 1. USB 2. SATA DVD (Desktop Only) 3. SATA Hard Drives 4. M.2 devices 5. Network Boot **NOTE:** No boot devices are shown if Legacy Support is off.	Checked	

5.5 HP Sure Recover

Table 22 HP Sure Recover

Feature	Type	Description	Default	Notes
HP Sure Recover	Setting	If this setting is enabled and HP Sure Recover is launched, the system firmware honors local and remote requests to reinstall the OS. If it is disabled, all requests to reinstall the OS are ignored.	Checked	
Recover from Network	Setting	If this is enabled, the system firmware obtains the recovery agent from the network. Otherwise, the system firmware obtains the recovery agent from a local drive.	Unchecked	Assuming Windows 10 is preinstalled.
Recover after Boot Failure	Setting	If this setting is enabled and no bootable UEFI OS is found, the system firmware launches HP Sure Recover.	Unchecked	Assuming Windows 10 is preinstalled.
Prompt before Boot Failure Recovery	Setting	If this setting is enabled and HP Sure Recover is launched because of a boot failure, the user is notified of the boot failure and asked to choose whether to start or cancel HP Sure Recover.	Checked	Not shown if Recover after Boot Failure is unchecked.
Recovery Agent	Label			Not shown unless Recover from Network checked.
URL:		Location of the current recovery agent URL.		Not shown unless Recover from Network checked.
Username:		User name (optional) to access the recovery agent.		Not shown unless Recover from Network checked.

Feature	Type	Description	Default	Notes
Provisioning Version:		Version of the recovery agent's provisioning data. This value will be 0 until a scheduled download occurs after a change is made to the recovery agent URL.		Not shown unless Recover from Network checked.
Recovery Image	Label			Not shown unless Recover from Network checked.
URL:		Location of the current recovery image URL.		Not shown unless Recover from Network checked.
Username:		Username (optional) to access the recovery image.		Not shown unless Recover from Network checked.
Provisioning Version:		Version of the recovery image's provisioning data. This value will be 0 until a scheduled download occurs after a change is made to the recovery image URL.		Not shown unless Recover from Network checked.

5.6 Secure Boot Configuration Menu

This submenu allows the user to configure boot mode and Secure Boot. Starting with Windows 8, Secure Boot is a UEFI feature that helps resist attacks and infection from malware. From the factory, your system came with a list of keys that identify trusted hardware, firmware, and an operating system loader code. It also created a list of keys to identify known malware.

Table 23 Secure Boot Configurations Menu features

Feature	Type	Description	Default	Notes
Configure Legacy Support and Secure Boot	Setting	Legacy Support has the ability to boot from a non-UEFI device. Only UEFI devices can support Secure Boot. The following settings are possible: • Legacy Support Enable and Secure Boot Disable • Legacy Support Disable and Secure Boot Enable • Legacy Support Disable and Secure Boot Disable	OS Dependent	
☐ Import Custom Secure Boot keys	Setting	When checked and system is rebooted, custom secure boot keys are imported from the EFI\HP directory from the hard drive or USB device. The custom keys consist of PK, KEK, DB, and Dbx .bin files. When import succeeds or fails, a preboot prompt shows the results of each key bin file.	Unchecked	Reboot Required
☐ Clear Secure Boot Keys	One Time Action	When checked, clears the Secure Boot keys one time on next save and exit. This setting will be unchecked again when you return from exit. This action is not available when Legacy Support is enabled or when no imported keys are present.	Unchecked	
☐ Reset Secure Boot Keys to Factory Defaults	One Time Action	When checked, restores secure boot keys to factory defaults one time on next save and exit. This setting will be unchecked again, when you return from exit.	Unchecked	
☐ Enable MS UEFI CA key	Setting	When checked, the Microsoft (MS) UEFI Certificate Authority (CA) key is trusted by Secure Boot NOTE: Uncheck this to support Windows 10 Device Guard feature	Checked	

Ready BIOS for Device Guard Use	Action	Ready BIOS for Device Guard Use includes a drop-down box that automatically configures the BIOS settings that Windows requires to enable Device Guar, or to change the configuration back to the configuration before Device Guard was enabled. Device Guard is a Windows feature that enables higher security around drivers and BIOS behavior. The following settings are possible: • Configure on Next Boot • Clear Configuration on Next Boot When set to Configure on Next Boot, the BIOS changes the following settings to the states required by Device Guard after saving changes and exit. • Virtualization features are enabled. • Removable and network boot devices are disabled (for example, USB boot, CD-ROM boot, Thunderbolt boot, etc.). • MS UEFI CA Key is disabled. When set to Clear Configuration on Next Boot, the BIOS sets the listed features to their Custom Default state if custom defaults have been saved. If custom defaults have not been saved, the BIOS restores the listed features to their factory default states.		

5.7 System Options Menu

Table 24 System Options Menu features

Feature	**Type**	**Description**	**Default**	**Notes**
□ Configure Storage Controller for RAID	Setting	When checked, configures SATA Controller for RAID mode.	Unchecked	Select products only
□ POST Prompt for RAID Configuration	Setting	When checked, prompts for RAID Configuration utility.	Checked	Desktop Only
□Configure Storage Controller for Intel Optane	Setting	UEFI only. Enables driver support for NVMe Intel® Optane® storage module. Requires additional configuration by Intel Rapid Storage Technology software application. IMPORTANT: After Optane is initialized in the OS, do not boot with this setting disabled or with the Option ROM Launch Policy set to Legacy Only. The OS may become corrupted unless Optane is unconfigured first.	Unchecked	Intel Only
Limit PCIe Speed	Setting	Allows you to restrict the maximum speed of the PCI Express devices to previous generations. The following settings are possible: • Auto • Gen 1 (2.5Gbps) • Gen 2 (5Gbps) • Gen 3 (8Gbps)	Auto	Desktop Workstations Only

Feature	Type	Description	Default	Notes
☐ Turbo Boost	Setting	When checked, enables Intel Turbo Boost Technology to improve performance when operation conditions allow.	Checked	Intel Only
☐ Hyper-threading (Intel® HT)	Setting	When checked, enables hyperthreading capability on Intel processors Intel HT Technology (HT) is designed to improve performance of multithreaded software products and requires a computer system with a processor supporting HT and an HT-enabled chipset, BIOS and OS. Contact your software provider to determine compatibility. Not all customers or software applications will benefit from the use of HT. See http://www.intel.com/info/hyperthreading for more information.	Checked	Intel CPU with Hyper-Threading Only
☐ Multi-processor	Setting	When checked, enables BIOS to report multiple processor cores to the OS.	Checked	
☐ Virtualization Technology (VTx)	Setting	When checked, enables VT on Intel-based systems.	Checked	Intel Only
☐ Virtualization Technology for Directed I/O (VTd)	Setting	When checked, grants virtual machines direct access to peripheral devices on select Intel-based systems.	Checked	Intel Only
☐ SVM CPU Virtualization	Setting	When checked, enables Virtualization on AMD-based systems.	Unchecked	AMD Only
☐ DMA Protection	Setting	When checked, enables DMA redirection using IOMMU for enhanced security. NOTE: Requires Legacy Support disabled and VTd enabled.	Checked	Intel 2019+
☐ PCI Express x16 Slot 1	Setting	When checked, the PCI Express x16 slot is available for an expansion card. When unchecked, slot is disabled.	Checked	Desktop Only
☐ PCI Express x1 Slot 1 (2) (3)	Setting	When checked, the PCI Express x1 slot is available.	Checked	Desktop Only
☐ PCI Express x4 Slot 1 (2)	Setting	When checked, the PCI Express x4 slot is available.	Checked	Desktop Only
☐ PCI Slot 1 (2) (3)	Setting	When checked, the PCI slot is available.	Checked	Select products only
☐ M.2 SSD (1) (2)	Setting	When checked, the M.2 slot typically used for NVMe storage modules is available.	Checked	Desktop Only
☐ M.2 WLAN/BT	Setting	When checked, the M.2 slot typically used for the WLAN module is available.	Checked	Desktop Only
☐ Allow PCIe/PCI SERR# Interrupt	Setting	When checked, enables a PCI device which asserts SERR# (System Error) to generate an interrupt (NMI). This legacy feature is rarely used.	Checked	Select products only
Optical Disk Drive	Setting	When checked, the Optical Disk Drive module on Slice is available.	Checked	HP Elite Slice Only

Feature	Type	Description	Default	Notes
Wireless Video Module	Setting	When checked, the Wireless Video module on Slice is available.	Checked	HP Elite Slice Only
Video Ingest Module	Setting	When checked, the Video Ingest module on Slice is available.	Checked	HP Elite Slice Only
Allow Expansion Modules	Setting	When unchecked, no expansion modules will be enabled.	Checked	HP Elite Slice Only
Suppress Module Configuration POST Errors	Setting	When checked, any configuration error messages (such as more than one video ingest module) will be suppressed. Configuration errors may still result in the extra modules being disabled.	Checked	HP Elite Slice Only
Fast Charge	Setting	When checked, battery charge rate is actively managed by the system using current battery and charger parameters. When unchecked, rate is fixed.	Checked	Notebook Only
Power Button Protection	Setting	Disables the power button while off or suspended and the lid is closed to prevent the system turning on when stored (for instance, when in a bag). The following settings are possible: • On Battery Only • Always • Never	On Battery Only	Select products only
Power Button Override	Setting	Sets the time required to hold the power button down for the desktop to turn off, overriding the power button behavior defined by the operating system. The following settings are possible: • Disable • 4 sec • 15 sec	4 sec	Desktop Only
□ Swap fn and ctrl (Keys)	Setting	When checked, switches functionality between fn and ctrl keys.	Unchecked	Notebook Only
□ Launch Hotkeys without fn keypress	Setting	When checked, allows the fn+fx hot key combinations to be activated by just pressing the fx key (for instance, f4 instead of fn+f4).	Unchecked	Notebook Only
□ Swap Arrow Up/Down and Page Up/Down Function	Setting	When checked, switches functionality between Up / Down and Page Up / Page Down for platforms with shared keys.	Unchecked	Select products only
□ Special Keys mapped to fn+key	Setting	fn+r → Break, fn+s → Sys Rq, fn+c → Scroll lock, fn+w → Pause, fn+e → Insert for systems without these legacy keys when this setting is checked.	Unchecked	Select products only
□ Enable Turbo Boost on DC (or) □ Max DC Performance (2019)	Setting	When checked, allows Intel Turbo Boost Technology to activate when a power adapter is not connected. Renamed for 2019, implementation also changed to incorporate additional performance and thermal features.	Unchecked	Intel Notebook Only

Feature	**Type**	**Description**	**Default**	**Notes**
Dynamic Platform and Thermal Framework (DPTF)	Setting	Manages power and thermal conditions to keep system from overheating.	Checked	Intel Notebook Only
Sanitization Mode Countdown Timer	Setting	Duration of sanitization mode: 15 – 300 (by 15) in seconds (max 255 for some)	120	Select products only
Pre-Sanitization Mode Countdown Timer	Setting	Delay before sanitization mode starts: 0 – 10 (by 1) in seconds	3	Select products only
USB Type-C Connector System Software Interface (UCSI)	Setting	When checked, allows UCSI to be exposed to the operating system (ACPI table)	Checked	Systems with USB type-C ports
□ HP Application Driver	Setting	Provides ACPI structure to enable HP common software application framework. The driver is provided in the latest HP support software which can be downloaded from the web.	Unchecked (through 2018) Checked (2019)	Device Manager shows alert if this is enabled without the HP application driver installed.
□ AMD DASH	Setting	AMD Remote system management capability.	Unchecked	AMD Only
□ Enable High Resolution mode when connected to a USB-C DP alt mode dock	Setting	Allocate more bandwidth to a USB-C dock to support the highest resolutions on a DisplayPort monitor attached to it,	Unchecked	Notebook Only
Top Cover Function	Setting	Uncheck to disable the top cover functionality for HP Elite Slice.	Checked	HP Elite Slice Only

5.8 Built-in Device Options Menu

This menu provides settings for built-in devices on the system.

Table 25 Built-in Device Options Menu features

Feature	**Type**	**Description**	**Default**	**Notes**
□ Embedded LAN Controller	Setting	When checked, enables the integrated network controller.	Checked	
Wake on LAN	Setting	Allows the system to wake via Local Area Network (LAN). The following settings are possible: • Disabled • Boot to Network • Boot to Hard Drive	Boot to Network	
□ LAN Controller Option (1) (2)	Setting	When checked, enables the integrated network controller in the designated rear option slot.	Checked	Select products only
□ Allow No Panel configuration	Setting	When checked, allows operation of the AiO 1000 base unit without a boot warning for no panel attached.	Checked	AiO 1000 only
□ Integrated Video	Setting	When unchecked, disables the integrated video device. When not using the integrated video, disabling the integrated video will free some system memory.	Checked	Desktop with discrete graphics card only
VGA Boot Device	Setting	The firmware can use only one graphics device when booting up; so when there are multiple graphics devices, this feature selects the graphics controller to use as the primary VGA device during boot-up. • Integrated graphics • Add-in graphics cards (select products only)	Add-in graphics is set as primary	Desktop with discrete graphics card only
Video Memory Size	Setting	System memory reserved for video before loading the OS. Settings vary by platform and generation. Examples: Intel: • 64 MB • 128 MB • 256 MB • 512 MB AMD: • 128 MB • 256 MB • 512 MB • Auto	**Intel**: 64 MB **AMD**: Auto	

Feature	Type	Description	Default	Notes
Graphics	Setting	Set the graphics adapter. The following settings are possible and depend on the model of notebook to determine which are present with the default setting: • Hybrid Graphics • UMA Graphic • Discrete Graphics • Auto (Let OS decide whether hybrid graphics is enabled or disabled).	Hybrid Graphics OR Auto (select products only)	Multiple Graphic Card Notebook Only
□ Integrated (Front) (Rear) Camera	Setting	When checked, enables the integrated webcams.	Checked	
□ Internal SD Storage	Setting	When checked, enables integrated SD card controller.	Checked	Select products only
□ Fingerprint Device	Setting	When checked, enables fingerprint reader.	Checked	Select products only
Touch Device	Setting	When checked, enables the touch screen.	Checked	Select products only
□ Audio Device	Setting	This setting provides a single point of control for the integrated microphone, the internal speakers, and the headphone out. When checked, the operating system visibility of each audio device below is controlled independently. When unchecked, hides all audio devices from the operating systems. The individual audio device settings below are also disabled.	Checked	
□ (Integrated) Microphone	Setting	When unchecked, disables the integrated microphone.	Checked	Notebook Only
□ Microphone	Setting	Set the microphone port state. Possible settings are: • Enable • Disable • Disable and Lock Disable and lock prevents the other audio ports from being remapped to the microphone function in the OS.	Enable	Desktop Only
□ Internal Speakers	Setting	When unchecked, disables the internal speakers. If errors occur during boot-up, the speaker still beeps. See Boot Options / Audio Alerts During Boot for more information.	Checked	
□ Headphone Output	Setting	When checked, enables the headphone jack.	Checked	Notebook Only
□ Wake on Voice (WOV)	Setting	When checked, enables the system to wake with voice command.	Checked	Select platforms only
□ Intel Smart Sound	Setting	When checked enables Intel Smart Sound.	Checked	Intel Notebook Only

Feature	Type	Description	Default	Notes
□ Lock Wireless Button	Setting	Prevent changes to the state of physical wireless enable/disable button.	Unchecked	Notebook Only
□ Wireless Network Device (WLAN)	Setting	When checked, enables integrated 802.11 device.	Checked	Notebook Only
□ Bluetooth	Setting	When checked, enables integrated Bluetooth® device.	Checked	Notebook Only
□ Mobile Network Device (WWAN)	Setting	When checked, enables integrated WWAN device.	Checked	Notebook Only
□ GPS device	Setting	When checked, enables integrated GPS device.	Checked	Notebook Only
□ Mobile Network Device (WWAN) and GPS Combo Device	Setting	When checked, enables integrated WWAN / GPS combo device.	Checked	Notebook Only
□ WWAN Quick Connect	Setting	Maintains power to WWAN device to enable faster connections.	Checked	Select products only
□ M.2 USB / Bluetooth	Setting	When checked, enables the USB connection to the M.2 WLAN slot (typically used by Bluetooth if present).	Checked	Desktop Only
HP LAN-Wireless Protection	Label			
□ LAN/WLAN Auto Switching	Setting	When checked, enables automatic switching between embedded WLAN device and embedded LAN controller; disables WLAN when LAN connection is detected.	Unchecked	
□ LAN/WWAN Auto Switching	Setting	When checked, enables automatic switching between embedded WWAN device and embedded LAN controller; disables WWAN when LAN connection is detected.	Unchecked	Notebook Only
□ Wake on WLAN	Setting	When checked, enables the system to wake via WLAN.	Unchecked	
□ Wake on Bluetooth	Setting	When checked, enables the notebook to wake via BT input devices. Requires Wake on USB to be enabled.	Unchecked	Notebook Only
□ Wake on WiGig	Setting	When checked, enables the notebook to wake via WiGig device.	Unchecked	Notebook Only
□ Collaboration Buttons	Setting	When checked, enables the capacitive controls for volume and connect or disconnect to function.	Checked	Select products only
Button Sensitivity	Setting	Controls the touch sensitivity of collaboration buttons. Possible settings are: • Low • Medium • High	Unchecked	Select products only
□ Hang-up Button Delay	Setting	When checked, hang-up button must be held at least 0.5 sec before activating.	Unchecked	Select products only
□ NFC	Setting	When checked, enable Near Field Communication functionality.	Checked	Select products only

Feature	**Type**	**Description**	**Default**	**Notes**
□ Wake on LAN in Battery Mode	Setting	When checked and powered by battery, enables the notebook to wake via LAN.	Unchecked	Notebook Only
□ Fan Always on while on AC Power	Setting	When checked, leaves the fan on while running on AC power.	Unchecked	Notebook Only
Increase Idle Fan Speed (%)	Setting	Controls the minimum fan speed during periods that the fan would normally be off under the control of the desktop thermal sensor. Choose a percentage of the maximum fan speed: 0 –100%.	0	Desktop Only
□ Boost Converter	Setting	When checked, the notebook draws power from the battery when the system is on AC to give the CPU a momentary performance gain by increasing the overall power available to the CPU.	Checked	Notebook Only
Backlit Keyboard Timeout	Setting	Specifies the timeout period for the keyboard's backlight LEDs. The following settings are possible: • 5 secs • 15 secs • 30 secs • 1 min • 5 min • Never	15 seconds	Notebook Only
□ Automatic Keyboard Backlit	Setting	When checked, keyboard backlight level is affected by ambient light level. The keyboard backlight will remain off while in bright environments to save power.	Checked	Select products only
□ Force enable HP Sure View	Setting	When checked, enables HP Sure View's privacy panel by changing the screen brightness	Unchecked	HP Sure View only
Disable Battery on next shut down	Action	When checked, the battery is put in storage mode when the system is next shut down. AC power is required to turn on the system afterwards.	Unchecked	Requires administrator password set
□ RFID	Setting	When checked, enables the RFID reader.	Checked	Select products only

5.9 Port Options Menu

The following table describes various setting options for Ports.

Table 26 Port Options Menu features

Feature	Type	Description	Default	Notes
☐ USB Ports	Setting	Enable or disable all USB ports (legacy ports and type-C ports). Does not include Thunderbolt ports.	Checked	Notebook Only (before 2018)
☐ (Left) (Right) (Front) (Rear) (Top) (Bottom) USB Ports	Setting	Enable or disable all USB ports on one side of the system (legacy and Type-C).	Checked	
☐ (Left) (Right) (Front) (Rear) USB Port (1) (2) (3)	Setting	Enable or disable a specific USB port. NOTE: When looking at the ports (and in horizontal orientation for desktops), count ports from bottom to top, then left to right.	Checked	Desktop Only
☐ Docking USB Ports	Setting	When unchecked, disables USB ports connected through the docking connector.	Checked	Notebook Only
☐ USB Legacy Port Charging	Setting	When checked, enables the USB Type-A charging port to charge devices during hibernation or shutdown.	Checked	
Disable Charging Port in sleep/off if battery below (%)	Setting	Prevent charging port from providing power to external devices if the system itself is below a certain battery threshold. Possible settings are 10, 20, 30, 40, 50, 60, 70, 80, 90, 100.	10	Notebook Only
☐ (Front) (Rear) USB Type-C Downstream Charging	Setting	When unchecked, system will not power Type-C devices in the off states.	Checked	Desktop Only
☐ Thunderbolt Type-C Ports	Setting	When checked, enables integrated Thunderbolt™ ports. NOTE: Older systems included additional Thunderbolt settings in this menu. Starting in 2019 these options have moved to a separate Thunderbolt Options menu.	Checked	Select products only
☐ Accessory USB Port	Setting	When checked, enables the accessory USB port.	Checked	Desktop Workstations Only
☐ Option Port (1) (2) – HDMI 1.4 Mode	Setting	When checked, enables additional bandwidth for DisplayPort® over Type-C to support higher graphics resolutions.	Unchecked	Select products only
☐ Media Card Reader	Setting	When checked, enables the integrated media card reader.	Checked	Notebook & AiO Only
☐ Media Card Reader/SD_RDR USB	Setting	When checked, enables the media card reader connector (labeled SD_RDR typically) on a desktop.	Checked	Desktop Only
SATA (0) (1) (2) (3) (4) (5)	Setting	When checked, allows the system to access a device attached to the SATA port.	Checked	Desktop Only

Feature	Type	Description	Default	Notes
☐ Serial Port (A, B, C, D, C/D, E/F)	Setting	When checked, enables the specified serial ports.	Checked	Desktop Only
I/O Address (A) (B) (C) (D)	Setting	The following settings are possible: • Auto • 3F8 • 2F8 • 3E8 • 2E8 NOTE: You can set I/O Address only for legacy ports and is useful only in Legacy mode. Some serial ports are USB based and cannot assign these resources.	Auto	Desktop Only
Interrupt (A) (B) (C) (D)	Setting	The following settings are possible: • Auto • IRQ 3 • IRQ 4 • IRQ 5 • IRQ 10 NOTE: Interrupts are only settable for legacy ports and are useful only in Legacy mode. Some serial ports are USB based and cannot assign these resources.	Auto	Desktop Only
Serial Port Voltage (A) (B) (C) (D) (E) (F)	Setting	Powered Serial port voltage selection on RPOS units that include this feature. Possible settings are: • 0 Volts • 5 Volts • 12 Volts	0 Volts	Retail Point of Sale Systems Only
☐ Smart Card	Setting	When checked, enables integrated Smart Card slot.	Checked	Notebook Only
☐ Smart Card Power Savings	Setting	When checked, enables the power-saving feature of the Smart Card reader, thus not maintaining a session when the card is removed.	Checked	Notebook Only
Cash Drawer Port	Setting	On select Retail Point of Sale systems, this controls whether the cash drawer port can be activated or not.	Enable	Retail Point of Sale Systems Only
Restrict USB Devices	Setting	When some devices are restricted, the system disables the ports at boot-up where a restricted device is installed. That port is disabled until the next boot. Port configuration is *not* changed on insertion. The following settings are possible: • Allow all USB Devices • Allow only keyboard and mouse • Allow all but storage devices and hubs	Allow all USB Devices	Desktop Only

5.10 Option ROM Launch Policy Menu

This submenu configures the kind of device option ROM that can load at boot time.

Table 27 Option ROM Launch Policy Menu features

Feature	**Type**	**Description**	**Default**	**Notes**
Configure Option ROM Launch Policy	Setting	The following settings are possible: • All Legacy • All UEFI • All UEFI Except Video NOTE: This is set to All UEFI and not selectable if Legacy Support is not enabled (see Secure Boot Configuration).	All UEFI All Legacy	Units with Win10 preinstalled Units with Win 7 preinstalled

5.11 Power Management Options Menu

The following table describes various setting options for Power Management Options.

Table 28 Power Management Options Menu features

Feature	**Type**	**Description**	**Default**	**Notes**
☐ Runtime Power Management	Setting	When checked, enables the processor to run at lower frequencies (P-states) when higher performance is not needed. When unchecked the processor always runs at maximum frequency.	Checked	Select products only
☐ Extended Idle Power States	Setting	When checked, enables the processor to rest in lower power states (C-states) when idle.	Checked	Select products only
☐ S5 Maximum Power Savings	Setting	When checked, minimizes system power consumption while in the S5 (off) state. NOTE: Windows 10 with Fast Startup enabled powers off to the S4 (suspend to disk) state.	Unchecked	Desktop Only
☐ SATA Power Management	Setting	When checked, enables the SATA bus to enter low power states when idle.	Checked	Desktop Only
☐ Deep Sleep	Setting	When checked, reduces power consumption while in S3/S4/S5 to extend battery life. NOTE: Enabling deep sleep disables some wake events such as wake on USB without AC power.	Checked	Notebook Only
☐ PCI Express Power Management	Setting	When checked, enables PCI Express bus to enter low power states when idle.	Checked	Desktop Only
☐ PCIe Speed Power Policy (PSPP)	Setting	When checked, allows system to lower PCIe link speeds when not on AC to save battery power.	Checked	AMD Notebook Only
☐ Power On from Keyboard Ports	Setting	When checked, allows the desktop to turn on by pressing a key on the keyboard, when the keyboard is plugged in to a port marked with the keyboard symbol.	Unchecked	Desktop Only

Feature	Type	Description	Default	Notes
□ Unique Sleep State Blink Rates	Setting	When checked, when the desktop is in the S4 power state, the power LED periodically blinks four times with a pause. Unchecked, the desktop does not blink at all in S4 (the same as S5, power off) This also affects S3 blink behavior. When checked, the desktop power LED periodically blinks three times with a pause, unchecked it blinks once per period.	Unchecked	Desktop Only
□ Wake when Lid is Opened	Setting	When checked, opening the lid wakes the notebook from sleep mode	Unchecked	Notebook Only
□ Wake when AC is Detected	Setting	When checked, allows the system to resume from sleep when AC power is detected		Notebook Only
□ Wake on USB	Setting	When checked, allows the system to resume from sleep when a USB input device is triggered (such as mouse movement or keyboard key-press).	Checked	Notebook Only
□ Power Control	Setting	When checked, enables the notebook to support power management applications such as IPM+ that help enterprises reduce power costs by intelligently managing the battery usage of the notebook.	Unchecked	Notebook Only
□ Configure Battery Charge	Setting	When checked, enables support for HPPM 2.0	Unchecked	Select products only
Battery Health Manager	Setting	Sets charging policy based on optimizing for battery life or battery duration. The possible settings are: • Maximize my battery health • Let HP manage my battery duration • Maximize my battery duration	Maximize my battery duration	Notebook Only
□ Modern Standby	Setting	Low power standby mode. This mode replaces the traditional ACPI S3 sleep and S4 hibernation states.	Enable	Only supported on select notebooks

5.12 Remote Management Options Menu (Intel Only)

The following table describes various setting options for Remote Management Options.

Table 29 Remote Management Options Menu features

Feature	Type	Description	Default	Notes
□ Active Management Technology (AMT)	Setting	This setting controls the Intel Management Engine (ME) state. When checked, this enables all ME functionality including AMT, DAL, NFC, Protected Content Playback, Intel Identity Protection Technology, and Capability Licensing Service. When unchecked, none of these Intel ME provided capabilities are available.	Checked	Intel Only
□ USB Key Provisioning Support	Setting	When checked, enables AMT provisioning using a USB storage device.	Unchecked	Intel Only

Feature	Type	Description	Default	Notes
☐ USB Redirection Support	Setting	When checked, enables support for storage redirection through USB NOTE: Intel AMT must be correctly provisioned	Checked	Intel Only
Unconfigure AMT on Next Boot	One time action	When applied, reset AMT configuration options on next boot. The following actions are possible: • Do Not Apply • Apply	Do Not Apply	Intel Only
SOL Terminal Emulation Mode	Setting	Specifies the Serial Over Lan (SOL) terminal emulation mode. The following settings are possible: • ANSI • VT100	ANSI	Intel Only
☐ Show Unconfigure ME Confirmation Prompt	Setting	When checked, requires user confirmation when unconfiguring Intel Management Engine.	Checked	Intel Only
☐ Verbose Boot Messages	Setting	When checked, report additional information when a boot message is displayed. NOTE: Unavailable when AMT is disabled.	Unchecked	Intel Only
☐ Watchdog Timer	Setting	When checked, enables Watchdog Timers.	Checked	Intel Only
OS Watchdog Timer (min.)	Setting	Sets OS Watchdog Timer (minutes). Possible values are from 5 to 25.	5	Intel Only
BIOS Watchdog Timer (min.)	Setting	Sets BIOS Watchdog Timer (minutes). Possible values are from 5 to 25.	5	Intel Only
CIRA Timeout (min.)	Setting	Client Initiated Remote Access timeout. Possible values are from 1 to 4 minutes or never.	1	Intel Only

5.13 MAC Address Pass Through (Notebook Only)

The following table describes various settings for the Host-Based MAC Address menu.

Feature	Type	Description	Default	Notes
Host Based MAC Address	Setting	Can be set to Disabled, System, or Custom. Setting to System allows all HBMA settings to be modified except the custom MAC address. Setting to custom allows all settings including the custom MAC address to be modified.	Disable	Notebook Only (2016+)
MAC ADDRESS	Setting	Configure a custom MAC address. Shows the current factory and system MAC addresses as well.	Factory MAC Address	Notebook Only
Reuse Embedded LAN Address	Setting	When checked, enables the ability to reuse the embedded LAN address	Disable	Notebook Only

Feature	Type	Description	Default	Notes
□ Pre-boot HBMA Support	Setting	Set Host Based MAC Address (HBMA) support in the preboot environment such as PXE.	Checked but disabled until Host Based MAC Address is Enabled	Notebook Only
□ Windows HBMA Support	Setting	Set host-based MAC address (HBMA) support in the Windows OS environment.	Checked but greyed out until Host Based MAC Address is Enabled	Notebook Only
□ Single NIC Operation (Disable All Other NICs when HBMA is active on one NIC)	Setting	When within Windows OS, only one NIC will operate using Host Based MAC Address (HBMA). This feature does not apply to PXE environments.	Unchecked but greyed out until Host Based MAC Address is Enabled	Notebook Only
HBMA Priority List	Setting	Change the priority of USB and embedded Network Interface Cards (NICs) for the system.		Notebook Only

5.14 Thunderbolt Options

The following table describes various settings for configuring Thunderbolt ports, previously located in the Port Options menu. This menu organization is new in 2019 for platforms supporting Thunderbolt technology. There still remains a setting in Port Options to turn the Thunderbolt port on or off.

Feature	Type	Description	Default	Notes
□ Thunderbolt Mode	Setting	When checked, enables Thunderbolt connections on the Type-C port.	Checked	
□ Require BIOS PW to change Thunderbolt Security Level	Setting	When checked, Thunderbolt Security Level cannot be changed unless a BIOS administrator password has been created. This setting cannot be disabled if DMA Protection (System Options) is enabled.	Checked	

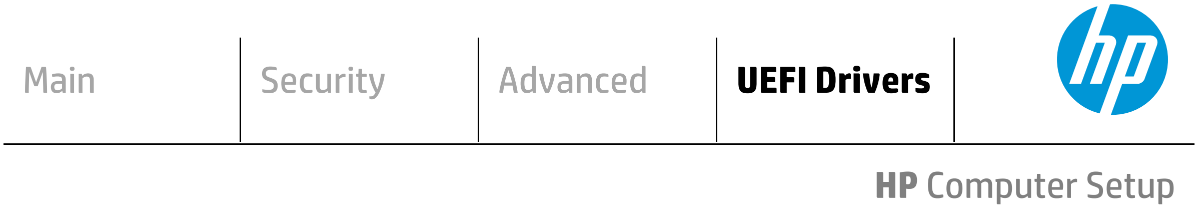
Feature	Type	Description	Default	Notes
Thunderbolt Security Level	Setting	The following settings are possible: • PCIe and DisplayPort – No Security Any Thunderbolt device detected that requests a PCI-express connection will be connected to the system's PCi-express bus without requiring any approval by the local user. • PCIe and DisplayPort – User Authorization Each Thunderbolt peripheral includes a unique identifier which is used to determine if the device has been previously connected. In the event the user has previously chosen Always Connect for that particular device, it will automatically be connected to the PCI-express bus when subsequently attached. • PCIe and DisplayPort – Secure Connect This option offers enhanced protection for authenticating a previously connected Thunderbolt device beyond relying on its identifier. The device is provisioned with a key when initially connected and on subsequent connections, a challenge-response is implemented to verify the device has the secret before it is automatically connected to the PCI-express bus. • DisplayPort only Only USB and Display Port functionality will be available via the Type-C Thunderbolt port. PCI-express will not be connected from the Thunderbolt device to the internal PCI-express interface, thus any Thunderbolt device that requires PCi-express will not function correctly.	PCIe and DisplayPort – User Authorization	
□ Native PCIe Hot Plug	Setting	When checked, enables hot plug support to the system's PCI-express bus.	Disabled	

5.15 Remote HP PC Hardware Diagnostics Settings

Table 30 Remote HP PC Hardware Diagnostics Features

Feature	Type	Description	Default	Notes
Diagnostic Download URL	Setting	HP / Custom URL.	HP	
Custom Download Address	Setting	Location of Remote Diagnostics, if not obtained from the HP server.		
Custom Upload Address	Setting	Custom location to upload Diagnostic logs.		
User Name	Setting	(Optional) User Name to access custom Diagnostic location.		
Password	Setting	(Optional) Password to access custom Diagnostic location.		
Scheduled Execution	Setting	Allow Remote HP PC Diagnostics to run on a set schedule: • Enable • Disable	Disabled	
Frequency	Setting	Select the frequency for scheduled execution of Remote HP PC Hardware Diagnostics: • Daily • Weekly • Monthly	Weekly	
Execute On Next Boot	Setting	Enable or disable the execution on next boot. The Flag will be disabled after the diagnostics have run: • Enable • Disable	Disabled	
Last execution Result	Action	Displays the result of the last Remote HP PC Diagnostics execution		

6 UEFI Drivers



This feature restarts the system into the 3rd Party Option ROM Management application. You can get to this application directly by pressing F3 during startup

⇨ **3rd Party Option ROM Management**

7 Features Not in F10 Menu

These features are BIOS controlled but do not have an option or setting in the F10 menu.

Feature	**Description**	**Default**	**Notes**
Privacy Panel	For privacy panel–equipped notebooks, press **fn**+**f2** to enable or disable privacy panel feature. Use **fn**+**f5** and **fn**+**f6** to decrease or increase the privacy panel brightness.	Disabled	For select privacy panel notebooks only.

8 Computer Notifications

8.1 Introduction

Platforms that support HP PC Commercial BIOS have various mechanisms to indicate errors that occur during Power-On-Self-Test (POST). The notifications can take several forms, such as:

- Blinks and Beeps
- On screen notifications that include the following:
  - Preboot messages (BIOS)
  - Pop-up messages within the OS

8.2 Blink and Beep Codes

Some system errors prevent the use of the video screen; instead, the system provides error information through blink codes using LED lights. The LED light used depends on the system type (notebook or desktop). The codes are presented in a sequence. For desktop, this means red blinks followed by white blinks. Audible long and short beeps accompany red or white blinks, respectively. Additional detail may be found in the system's Maintenance and Service Guide.

The following table describes the meaning of critical blink codes.

Table 31 Computer notifications

Notebook		**Desktop**		**Description**
CAP / NUM	**Battery LED**	**Red with long beeps**	**White with short beeps**	
2		2	2	The main area of BIOS has become corrupted, and there is no recovery binary image available.
8		2	3	The HP Endpoint Security Controller policy requires the user to enter a key sequence (Sure Start 2.0).
	White and Amber blinking	2	4	The HP Endpoint Security Controller is recovering the BIOS firmware. Because it takes some time to load the firmware image and enable video, this blink code is necessary. (Sure Start).
3		3	2	The HP Endpoint Security Controller has timed out waiting for BIOS to return from memory initialization (memory failure).
4		3	3	The HP Endpoint Security Controller has timed out waiting for BIOS to return from graphics initialization.
5		3	4	The system board displays a power failure (crowbar).
		3	5	The CPU is not detected or is unsupported.
		3	6	The CPU does not support an enabled feature (typically this applies only to TXT).
7	1	5	2	The HP Endpoint Security Controller cannot find valid firmware.

8.3 Pop-up Messages

Onscreen notification can involve pop-up (toaster) messages. These describe several events involving USB Type-C ports. Note that these messages within the OS require native support in the operating system or that HP notifications software be installed.

Table 32 Pop-up messages

Event	**Code**	**Message**	**Detail**
Power Adapter Accepted: Matches capabilities to charge while in S3, S4, or S5 power states.	1	Title: USB Type-C Connector Text: “For full performance, connect a higher capacity power adapter.”	A user plugs in a power adapter that is too small to operate the system while the device is turned on. The adapter could be used to charge in sleep mode or when the computer is turned off.
Power adapter rejected: Upstream power flow is not supported	2	Title: USB Type-C Connector Text: “Charging system via adapter plugged into the USB port is not supported.”	A user plugs in an adapter that requests power in which is not supported. (Cypress controller)
Connected device requests more power than can be supplied	3	Title: USB Type-C Connector Text: “USB device requesting more power than system can provide.” *Display system charging capability*	A user plugs in a device that requires more power than can be provided by the system.
Balance downstream power for charging from multiple USB ports	4, 5	Title: USB Type-C Connector Text: “Charging from multiple USB ports may have limited support.”	A user has plugged in an adapter to both a USB Type-A port and a USB Type-C port (or into two USB Type-C ports), and the system is not capable of charging both at full capacity while system is running.
The attached dock cable is inadequate to handle the needed power load	6	Title: USB Connector Text: “For full performance, connect higher capacity USB cable to dock.” *Display capabilities of the cable*	A user plugs a cable connecting the dock to the system that is inadequate to power the system and charge the battery simultaneously.
Power adapter rejected: Provider and consumer mismatch	7	Title: USB Connector Text: “The power adapter is not compatible with this system.”	The user has inserted an adapter that is not compatible with the HP system (from a 3rd party vendor that is not supported.)

9 Appendix A

9.1 What is UEFI?

Unified Extensible Firmware Interface (UEFI) defines the interface between the operating system and platform firmware during the boot, or start-up process. Compared to BIOS, UEFI supports advanced preboot user interfaces.

The UEFI network stack enables implementation on a richer network-based OS deployment environment while still supporting traditional PXE deployments. UEFI supports both IPv4 and IPv6 networks. In addition, features such as Secure Boot enable platform vendors to implement an OS-agnostic approach to securing systems in the preboot environment.

The HP ROM-Based Setup Utility (RBSU) functionality is available from the UEFI interface with additional configuration options.

9.2 Introduction

The HP UEFI System Utilities are embedded in the system ROM. The UEFI System Utilities enable a wide range of configuration activities, including:

- Configuring system devices and installed options
- Enabling and disabling system features
- Displaying system information
- Selecting the primary boot controller or partition
- Configuring memory options
- Launching other pre-boot environments, such as the Embedded UEFI Shell and Intelligent Provisioning

9.3 Benefits of UEFI

- Abstracts Platform from OS and Decouples development
- Includes modular driver model and CPU-independent option ROMs
- Modular and extensible and provides OS-neutral value add
- OS loader can keep the same as underlying hardware change
- Supports larger drives over 2 TB with GPT partition

9.4 Overview of UEFI Boot Process

The purpose of the UEFI interfaces is to define a common boot environment abstraction for use by loaded UEFI images, which include UEFI drivers, UEFI applications, and UEFI OS loaders. UEFI allows the extension of platform firmware by loading UEFI driver and UEFI application images. When UEFI drivers and UEFI applications are loaded they have access to all UEFI-defined runtime and boot services.

There are two sets of services in UEFI:

- Boot Services - UEFI applications (including OS loaders) must use boot services functions to access devices and allocate memory. These services are not available when the OS is running.
- Runtime Services - The primary purpose of runtime services is to abstract minor parts of the hardware implementation of the platform from the OS.

These services are present when OS is running.

9.5 The UEFI Forum

For more information contact the Unified Extensible Firmware Interface (UEFI) Forum, it is a world-class nonprofit industry standards body that works in partnership to enable the evolution of platform technologies.

The UEFI Forum champions firmware innovation through industry collaboration and the advocacy of a standardized interface that simplifies and secures platform initialization and firmware bootstrap operations. Both developed and supported by representatives from more than 200 industry-leading technology companies, UEFI specifications promote business and technological efficiency, improve performance and security, facilitate interoperability between devices, platforms and systems, and comply with next-generation technologies.

10 Appendix B

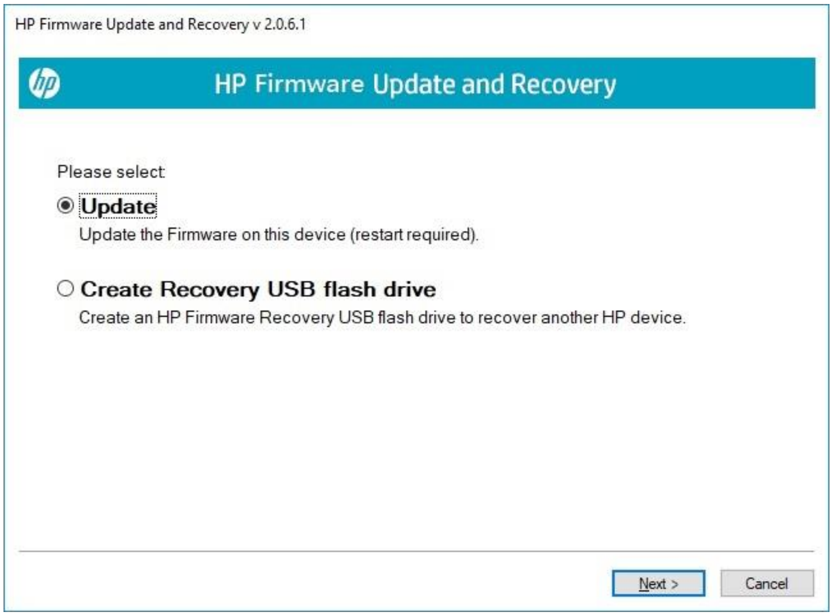
10.1 Updating System Firmware with the HP Firmware Update and Recovery Application (Windows Operating Systems only)

Current firmware updates for HP commercial platforms (2018 and later) include the HP Firmware Update and Recovery tool (HpFirmwareUpdRec.exe). This utility starts the firmware update process when run with the correct firmware source files for the target platform. Firmware types supported by this utility include the BIOS, the ME firmware (*Intel only*), and USB Type-C PD (power delivery) controller firmware. When the utility is run in Windows, it identifies the compatible firmware files in local storage and then invokes a series of flash updates after triggering a system reboot. Before 2018, the firmware update tool was HP BIOS Update and Recovery (HpBiosUpdRec.exe), which uses the specific BIOS binary included in the Softpaq as an input (for example, P70_010102.bin). Both tools operate in a similar fashion.

For 2018 and later systems, the firmware source files required for updating within BIOS Setup (F10) menus must be extracted from the .bin and .inf files included in the release Softpaq. The Firmware Update and Recovery application must be used to extract the various firmware binary files to use the Update System and Supported Device Firmware Using Local Media action in BIOS Setup. For earlier platforms, only the appropriate BIOS binary file from the Softpaq is required.

10.2 Using HP Firmware Update and Recovery

- Run the **HpFirmwareUpdRec** application. The HP Firmware Update and Recovery dialog is shown with the following options.



HP Firmware Update and Recovery v 2.0.6.1

HP Firmware Update and Recovery

Please select

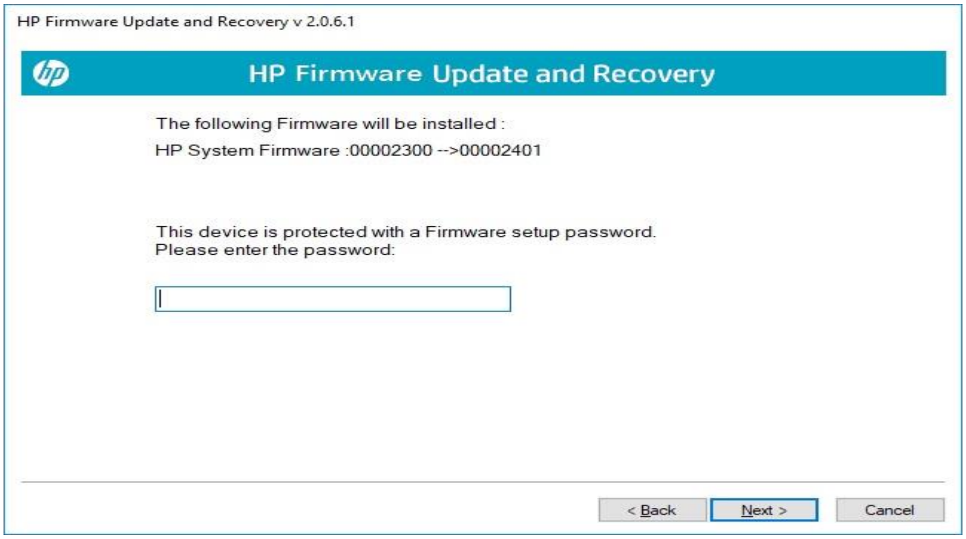
● **Update**
Update the Firmware on this device (restart required).

○ **Create Recovery USB flash drive**
Create an HP Firmware Recovery USB flash drive to recover another HP device.

- Select **Update** and then select **Next**.
- If Windows BitLocker Drive Encryption (BDE) is enabled on the system using TPM security, HpFirmwareUpdRec prompts the user and offers to suspend it. BDE automatically resumes when the update is finished and Windows is restarted. This is to prevent possible loss of the encryption key. Click **OK** or **Cancel** to suspend BDE manually and rerun the program later.

IMPORTANT: Updating BIOS without suspending BitLocker may cause the loss of access to the encrypted data. BitLocker protection automatically resumes the next time you restart your system.

- Suspending BitLocker can be done manually in the Control Panel or can be automated by executing HPBIOSUPDREC command line "HPBIOSUPDREC –b".
- The version of the firmware image in the update file and the firmware version of the current system are displayed. The user is notified that the firmware will be overwritten.
- Show password field if Bios has set an administrator password.

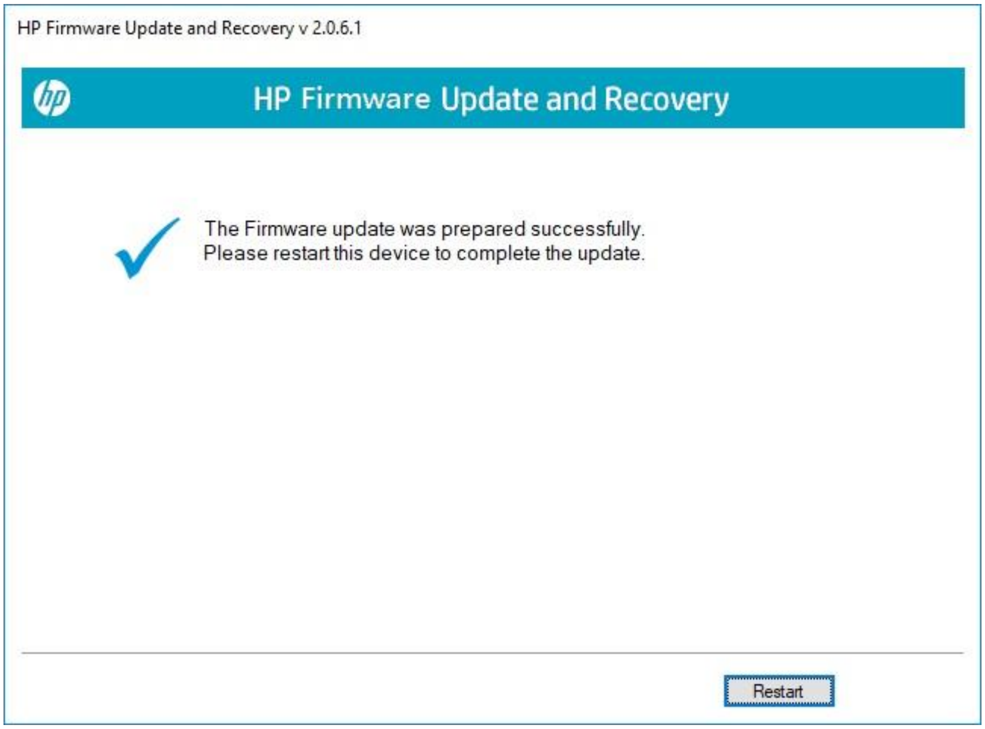

HP Firmware Update and Recovery v 2.0.6.1

HP Firmware Update and Recovery

The following Firmware will be installed :
HP System Firmware :00002300 -->00002401

This device is protected with a Firmware setup password.
Please enter the password:

- Upon completion, you see the message that the Firmware update preparation was successful. Select Restart.


HP Firmware Update and Recovery v 2.0.6.1

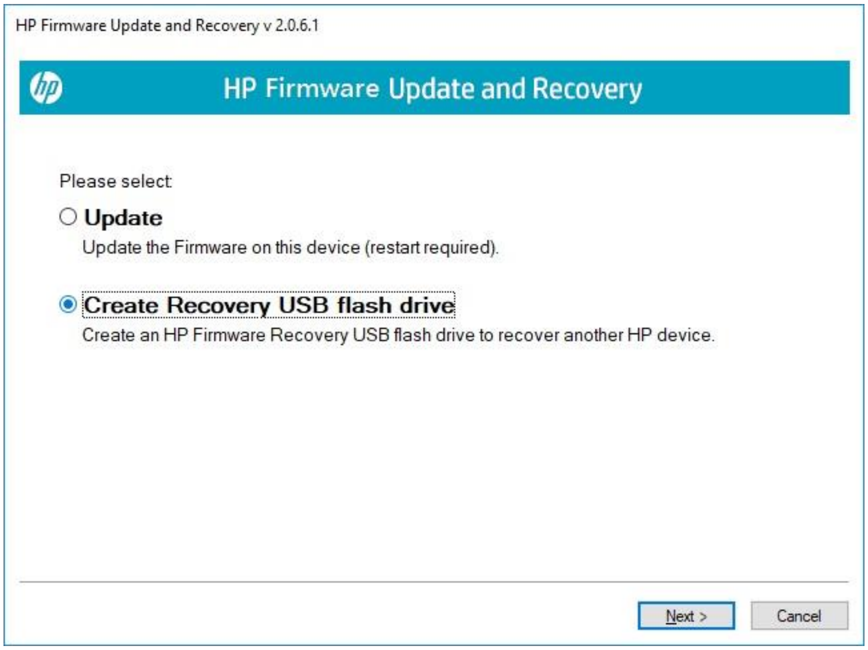
HP Firmware Update and Recovery

The Firmware update was prepared successfully.
Please restart this device to complete the update.

10.3 USB Recovery Key Creation

If the system BIOS has been corrupted and the device will not boot, another device can be used to create an HP Firmware Recovery USB Key that can be used to recover it. The device used to create the recovery key does not have to be compatible with the BIOS image.

- Run the **HpFirmwareUpdRec** or **HpBiosUpdRec** application. The main options menu is shown.
- Select **Create Recovery USB flash drive** and then select **Next**.



HP Firmware Update and Recovery v 2.0.6.1

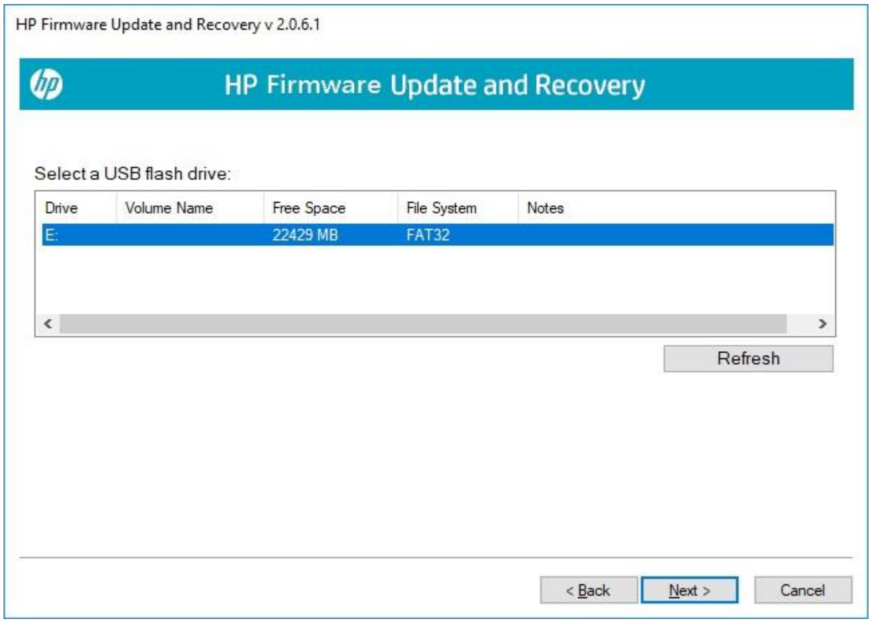
HP Firmware Update and Recovery

Please select:

○ **Update**
Update the Firmware on this device (restart required).

● **Create Recovery USB flash drive**
Create an HP Firmware Recovery USB flash drive to recover another HP device.

- The application prompts the user to insert a USB flash drive if the system does not see a USB flash drive.



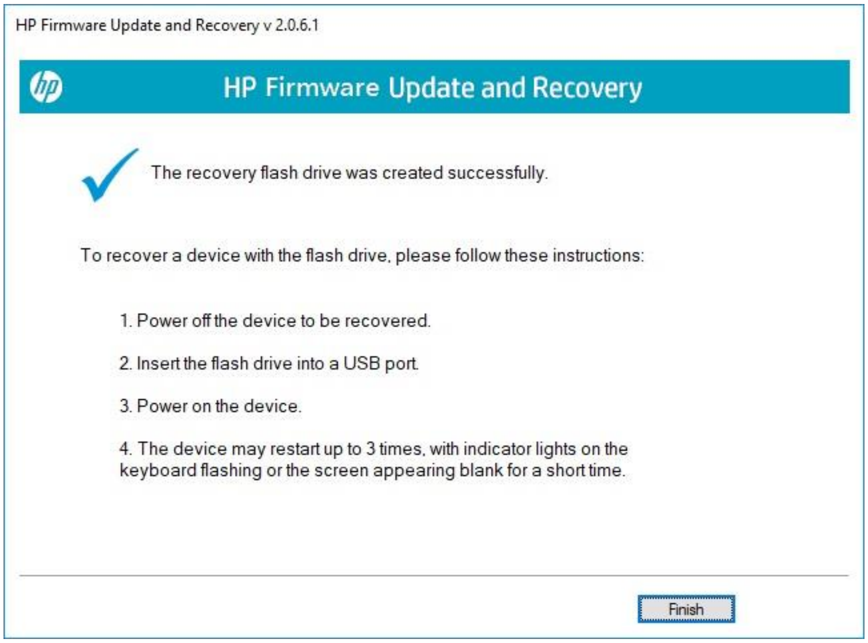
HP Firmware Update and Recovery v 2.0.6.1

HP Firmware Update and Recovery

Select a USB flash drive:

Drive	Volume Name	Free Space	File System	Notes
E:		22429 MB	FAT32	

- The USB drive must have FAT32 format.
- Select a USB flash drive and click **Next**. Upon completion, you see that the recovery flash drive was created successfully.


HP Firmware Update and Recovery v 2.0.6.1
HP Firmware Update and Recovery

The recovery flash drive was created successfully.

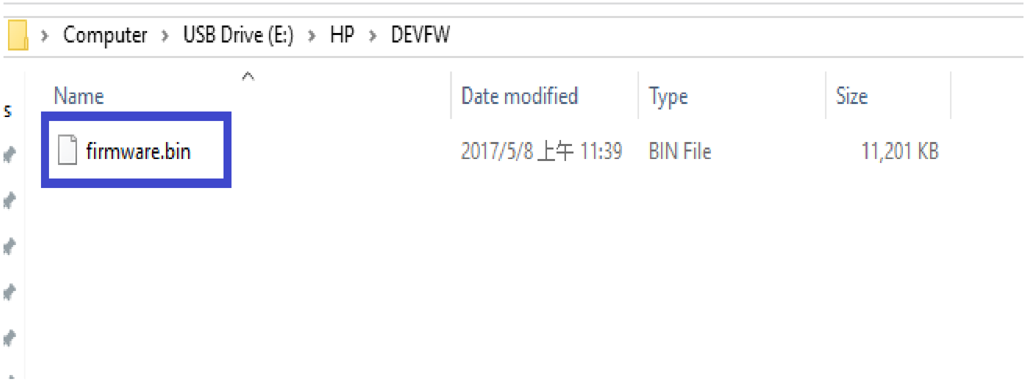
To recover a device with the flash drive, please follow these instructions:

1. Power off the device to be recovered.
2. Insert the flash drive into a USB port.
3. Power on the device.
4. The device may restart up to 3 times, with indicator lights on the keyboard flashing or the screen appearing blank for a short time.

- Click **Finish** to close the wizard.

The files can also be manually copied to the EFI partition of the hard drive to support emergency recovery. For 2018 and later the HpFirmwareUpdRec utility extracts the correct binaries from the .bin and .inf files and saves the individual components on the USB key in the HP\DEVFW folder, which can be copied into \EFI on the hard drive. For earlier platforms the BIOS binary file only is used, saved in the HP\BIOS\Current folder.

NOTE: To recover a device with the flash drive, connect AC power and follow the previous on-screen instructions.



Name	Date modified	Type	Size
firmware.bin	2017/5/8 上午 11:39	BIN File	11,201 KB

10.4 HpFirmwareUpdRec Log File

By default, a log file is created in the same folder with the executable file.

- If the –l command line option is used, the log file will be written to the supplied file path. If it is a relative path, it will be placed under that path.

- If the log file cannot be created in the executable folder, it will be created in the first available system temporary folder location, usually “C:\Users\(username)\AppData\Local\Temp” in Windows.

10.5 Custom Logo Support

NOTE: Operates in Silent Mode only, will not update firmware.

Installation:

- Command Line: HpFirmwareUpdRec.exe -e<logo filename>
- Custom Logo file will be written to BIOS. Check the log file for success or error.
- File must be JPEG format, maximum size 32k (32,768) bytes.
- If BIOS password is set, password file must be provided.
- Command-line option only, silent mode, not shown in usage display. Other options ignored.
- System will not be restarted.

Removal:

- Command Line: HpFirmwareUpdRec.exe -x
- Logo image will be removed from BIOS.
- If BIOS password is set, password file must be provided.
- Command line option only, silent mode, not shown in usage. Other options ignored.
- System will not be restarted.

Table 33 Custom logo support

Return Code	Name	Description
0	SUCCESS	No error
1	LOAD_ERROR	Error reading image file
2	INVALID_PARAMETER	File name missing
3	UNSUPPORTED	Not supported by BIOS
4	INVALID_FILE	File not found or invalid
26	SECURITY_VIOLATION	BIOS password not provided or incorrect
99	UNKNOWN	Unknown error occurred, see log file

10.5.1 Command-line Usage

Table 34 Custom logo support: command-line usage

Option	**Comments**
-f "folder path"	Specifies the folder containing firmware update files.
-p "password-file"	Specifies encrypted password file created with the HpqPswd utility. Valid with all other options.
-s	Silent mode. Runs without any user interaction or output.
-a	Eliminates version comparison when -s is present. It is ignored otherwise. There is no log entry or usage dialog if it appears without the silent option.
-h	Create HP_TOOLS partition if not present. On a GPT formatted system with native UEFI boot, this option is ignored. On MBR, the partition is not created if it already exists. If unable to create partition, exits with error code.
-b	If BitLocker with TPM is in use, automatically suspend it.
-r	Do not reboot automatically under silent mode (-s). The result code is SUCCESS_REBOOT (0xBC2) when this option is used.
-?	Show the same usage dialog that appears if an invalid command line is detected. This option overrides all other options, including -s.