

# Intel<sup>®</sup> Optane<sup>™</sup> Memory Installation Guide

For Intel<sup>®</sup> Rapid Storage Technology Release Versions 15.5 and newer.

**Revision 2.0** 



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# **1** Intel<sup>®</sup> Optane<sup>™</sup> Memory

# 1.1 Overview

Intel® Optane<sup>™</sup> Memory is Intel<sup>®</sup> RST's latest system acceleration solution. It is a dual-media/disk solution (fast media for file and block caching + slow media for storage capacity) that is presented to the host OS as a single SSD. It utilizes PCIe NVMe SSDs that are based on Intel<sup>®</sup> Optane<sup>™</sup> technology.

# **1.2 Minimum Requirements**

#### 1.2.1 Hardware

The following platforms are supported at the time this document was created. Please visit <u>https://downloadcenter.intel.com/download/26979/Intel-Optane-Memory?v=t</u> for the latest available software and hardware.

Initial RS	T Release Version	Chipset Name	Platform / PCH / (Segment)	PCH SKU Details
15.8 / 15.9		Intel <sup>®</sup> 200 Series Chipset Family	Coffee Lake (CFL-S) PCH: Kaby Point (KBP-H) (Desktop)	- Z370
1	15.7	Intel <sup>®</sup> 200 Series Chipset Family	Basin Falls (w/ KBL-X, SKL-X CPU) PCH: KBP-H (HEDT)	- X299
		Intel <sup>®</sup> 8th Generation Core Processor Family Platform I/O SATA AHCI/RAID Controller	Kaby Lake Refresh (KBL-R) PCH: SPT-LP (Mobile-LP)	- Premium-U
	15.5	Intel <sup>®</sup> 100/C230 Series Chipset Family	Greenlow-Refresh (w/ KBL CPU) PCH: SPT PCH-H (WS)	- C236
		Intel <sup>®</sup> 200 Series Chipset Family	KBL PCH: KBP-H (Desktop)	- Q250 <sup>(0)</sup> - B250 <sup>(0)</sup> - Z270 - H270 - Q270
		Intel <sup>*</sup> 100/C230 Series Chipset Family	(w/ KBL CPU) PCH: SPT-H (Mobile Halo)	- HM175 - QM175 - CM238
		Intel <sup>®</sup> 7th Generation Core Processor Family Platform I/O SATA AHCI/RAID Controller	(w/ KBL CPU) PCH: SPT-LP (Mobile-LP)	- Premium-U

#### Supported Platform/Chipset SKUs

(A) This SKU of the chipset supports AHCI mode Only

<sup>(0)</sup> This SKU of the chipset supports both AHCI and Optane<sup>™</sup> modes Only (non-RAID)

- 1. The system should contain at least the minimum system memory required by the operating system. Consult the computer system and OS vendor for more details.
- 2. Fast media (cache device):Only one Intel<sup>®</sup> Optane<sup>™</sup> technology NVMe SSD/memory module
  - A M.2 connector is required for the Optane<sup>™</sup> memory module; it can be down on the motherboard or on a PCIe adapter card plugged into a remapped PCIe x2 or x4 slot.



- 3. Slow media (disk to be accelerated): Only a single pass-through disk that is the active system/boot drive can be accelerated. The acceleration of RAID volumes or other multiple disk configurations is not supported. Please see below for supported slow media options.
  - SATA HDD single pass-through
  - SATA SSD single pass-through
  - SSHD single pass-through
- 4. Optane<sup>™</sup> Memory volume
  - Only one Optane Memory volume per system. If more than one volume is detected during boot, the second volume will be placed offline.

#### 1.2.2 Software/Firmware

- 1. UEFI-compliant system BIOS that includes the Intel<sup>®</sup> RST pre-OS UEFI driver version **15.5.0.2875** release or later.
- 2. Intel BIOS SATA controller mode set to "Intel<sup>®</sup> RST..." with remapping enabled on the PCIe slot connecting the Intel<sup>®</sup> Optane<sup>™</sup> technology NVMe SSD/memory module
- 3. Intel<sup>®</sup> RST Windows runtime driver version **15.5.0.1051** release or later

## 1.2.3 **Operating System**

Microsoft Windows 10 x64 bit Editions or newer operating system installed to a GPT partition on a slow media device (SSD/SSHD/HDD)

- 1. Ensure the system BIOS is in UEFI mode with CSM disabled before installing the operating system.
- 2. When installing the Windows OS, make sure to leave an "Unallocated" space with a minimum of 5MB at the end of the disk (max LBA).

= = +   🔃   🚺	1 📰 🔎 🖾						
/olume	Layout	Type	File System	Status	Capacity	Free Spa	% Free
-	Simple	Basic		Healthy (R	450 MB	450 MB	100 %
	Simple	Basic		Healthy (E	100 MB	100 MB	100 %
(C:)	Simple	Basic	NTFS	Healthy (B	97.10 GB	85.46 GB	88 %
KINGSTON (E:)	Simple	Basic	FAT32	Healthy (P	7.21 GB	1.54 GB	21 %
NEW VOLUME	(D:) Simple	Basic	FAT32	Healthy (P	7.45 GB	4.06 GB	55 %
Disk 0 asic 11.77 GB Dnline	450 MB Healthy (Recov	ery Part H	00 MB lealthy (EFI Syst	(C:) 97.10 GB NTFS Healthy (Boot, Po	ige File, Crash	Dump, Prima	14.13 GB Unallocated
Disk 0 Basic 111.77 GB Dnline	450 MB Healthy (Recov	ery Part H	00 MB lealthy (EFI Syst	(C:) 97.10 GB NTFS Healthy (Boot, Pa	ige File, Crash	Dump, Prima	14.13 GB Unallocated
Disk 0 Basic 111.77 GB Online      ODisk 1 Juknown 14.91 GB Not Initialized	450 MB Healthy (Recov 14.91 GB Unallocated	ery Part	00 MB tealthy (EFI Syst	(C:) 97.10 GB NTFS Healthy (Boot, Pr	ige File, Crash	Dump, Prima	14.13 GB Unallocated
Disk 0 Basic 111.77 GB Online      ODisk 1 Unknown 14.91 GB Not Initialized      ODisk 2	450 MB Healthy (Recov 14.91 GB Unallocated	ery Part	00 MB lealthy (EFI Syst	(C:) 97.10 GB NTFS Healthy (Boot, Pi	ige File, Crash	Dump, Prima	14.13 GB Unallocated



# 2 Intel® Optane™ Memory SW/Driver Package

# 2.1 Intel® Optane<sup>™</sup> Memory UI

This section provides an overview of steps to configure Intel® Optane<sup>™</sup> memory with the Intel® Optane<sup>™</sup> memory application on a computer that already contains the Windows\* 10 Operating System. Some motherboards may require a BIOS update before the Intel® Optane<sup>™</sup> memory SW/driver package can be installed. Consult the Motherboard vendor's support website for the latest Intel® Optane<sup>™</sup> memory supported BIOS.

If the system BIOS supports SATA mode switching, the installer will automatically switch the system from AHCI to 'Intel® RST Premium and System Acceleration with Intel® Optane<sup>™</sup> Technology'. If the system BIOS does not support this, there will be error indicating the system BIOS is unsupported.

#### Warning: Once the installer changes the SATA controller mode to `Intel® RST Premium and System Acceleration with Intel® Optane<sup>™</sup> Technology' mode, DO NOT change the SATA controller mode back to `AHCI'. Doing so, will prevent Intel® Optane<sup>™</sup> memory from functioning properly.

#### 2.1.1 Platforms starting in AHCI mode

1. Go to <u>https://downloadcenter.intel.com/download/26979/Intel-Optane-Memory?v=t</u>, and select the most recent Intel® Rapid Storage Technology 15.5 or later driver available.

2. Run the executable SetupOptaneMemory.exe from the downloaded package. The window pictured below will appear.

Intel® Installation Framework	×
Intel® Optane™ Memory Welcome	intel
You are about to install the following product:	
Intel® Optane™ Memory	
It is strongly recommended that you exit all programs before continui Click Next to continue, or click Cancel to exit the setup program.	ng.
Intel Corporation < Bac	ck Next > Cancel



3. This window shows that the installer has discovered the system SATA controller is configured in 'AHCI' mode. This screen notifies the user that it will be automatically switching the SATA controller to RST Premium Mode. Click Next to continue.

Intel® Installation Framework	×	
Intel® Optane™ Memory Warning	(intel)	
The Intel® Optane™ memory driver you are about to install may be used to contr this computer boots from or to control a drive that contains important data. To pro data, you will not be able to uninstall this driver in its entirety after installation. No components may be uninstalled including the Intel® Optane™ memory application shortcuts.	ol the drive that otect system n-critical and program	
To enable Intel® Optane™ memory your system's SATA controller mode must be s RST and System Acceleration with Intel® Optane™ Technology or Intel® RST Pre System Acceleration with Intel® Optane™ Technology.	et to Intel® mium and	
Click Next to switch your system's SATA controller mode and continue the installation process, or click Cancel to exit the setup program.		
Intel Corporation <back next=""></back>	> Cancel	

4. This window requires the user to read and accept the License agreement. The user must check the "I accept..." box in order to click 'Next' and continue.





5. This window provides the user with information about the Rapid Storage Technology software that is going to be loaded on the system. The user must click next to continue the install.

Intel® Installation Framework			>
Intel® Optane™ Memory Readme File Information		Ú	ntel
Installation Readme for Installation Readme for Intel(R) Rapid Storage Technology (Intel(R) RST): - Intel(R) Optane(TM) Memory System Acceleration^ - Intel(R) Smart Response Technology^^ ^ ^ NOTE: Support for this feature is determined by "This document makes references to products developed restrictions on how these products may be used, and w others. Please read the Disclaimer section at the bottom your Intel field representative if you would like more inf	your hardware of d by Intel. There hat information of this docume formation.	configuration are some may be disclose nt, and contact	ed to t
* Intel is making no daims of usability, efficacy or warran * AGREEMENT contained herein completely defines the lic	ty. The INTEL SO tense and use of	OFTWARE LICE this software.	NSE
ntel Corporation	< Back	Next >	Cancel

6. This window allows the user to select where the software files will be loaded on the system. The user can either navigate to a location using the "Change..." button, or use the default provided. The user must click 'Next' to continue the installation.





7. This window tells the user that the Intel® Optane<sup>™</sup> Memory installation is about to begin. The user still has the option to go back to the previous page, or cancel out of the installation at this point. Once the Next button is clicked, the software installation will begin.

Intel® Installation Framework	×
Intel® Optane™ Memory Confirmation	(intel)
You are about to install the following components: - Intel® Optane™ Memory	
Intel Corporation	< Back Next > Cancel

8. This window shows the user the progress of the installation.





9. At this point in the installation process, the system will need to restart. During this time, the system will boot into "Safe Mode" in order to change the system from AHCI to RST Premium mode.

Intel® Installation Framework	×
Intel® Optane™ Memory Progress	intel
Please restart your PC to continue the installation process in sa	e mode.
Would you like to restart your PC now?	
• Yes, I want to restart this computer now.	
○ No, I will restart this computer later.	
Click here to open log file location.	
Intel Corporation	< Back Next > Finish

10. After the system restarts, the installation will continue in safe mode with the window below appearing on the screen. Once the installation has completed, the system will automatically restart.



11. At this time, the system will boot back into the Windows OS and the Optane<sup>™</sup> Memory application will launch. This may take several minutes to launch, or the user may launch it manually by searching for "Intel® Optane<sup>™</sup> Memory" in the Windows file search. At this point, the user must click 'Yes' in order to finish enabling Optane<sup>™</sup> Memory.





#### 2.1.2 Platforms starting in RST Premium Mode

- 1. Go to <u>https://downloadcenter.intel.com/download/26979/Intel-Optane-Memory?v=t</u>, and select the most recent Intel® Rapid Storage Technology 15.5 or later driver available.
- 2. Run the executable SetupOptaneMemory.exe from the downloaded package. The window pictured below will appear. Click 'Next' to continue.

Intel® Installation Framework	×
Intel® Optane™ Memory Welcome	(intel)
You are about to install the following product:	
Intel® Optane™ Memory	
It is strongly recommended that you exit all programs before continuing. Click Next to continue, or click Cancel to exit the setup program.	
Intel Corporation < Back Next	> Cancel

3. This screen informs the user that the driver may be used to control which drive the computer boots from. The user must click next to continue.





4. This screen requires the user to read and accept the License agreement. The user must check the "I accept..." box in order to click 'Next' and continue.

Intel® Installation Framework	×
Intel® Optane™ Memory License Agreement	þ
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User) IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING. Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software. Please Also Note: * If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies; * If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT, applies. For OEMs, IHVs, and ISVs: LICENSE. This Software is licensed for use only in conjunction with Intel component products.	*
I accept the terms in the License Agreement.	_
Intel Corporation < Back Next > Can	cel

5. This window provides the user with information about the Rapid Storage Technology software that is going to be loaded on the system. The user must click next to continue the install.





6. This window allows the user to select where the software files will be loaded on the system. The user can either navigate to a location using the "Change..." button, or use the default provided. The user must click 'Next' to continue the installation.



7. This window tells the user that the Intel® Optane<sup>™</sup> Memory installation is about to begin. The user still has the option to go back to the previous page, or cancel out of the installation at this point. Once the Next button is clicked, the software installation will begin.





8. This window shows the user the progress of the installation.



9. At this point in the installation process, the system will need to restart.



10. Once the system has completed the reboot and has entered the OS, the user will be prompted to complete the Optane<sup>™</sup> installation process. This may take several minutes to launch. Click "Yes" to continue.





# 2.1.3 Enabling Optane<sup>™</sup> with the Intel® Optane<sup>™</sup> Memory UI

1. When the user chooses to continue the setup process, the window below will appear at the startup of the Optane<sup>™</sup> Application UI. This may take several seconds to appear. If the user clicked 'No' to enable Optane<sup>™</sup> at a later time, they can choose to open the UI to start the same process.



2. Once the UI opens, click on the "Setup" tab on the left side to view the status. To continue enabling Optane<sup>™</sup>, click on the Enable button.

Intel® Optane™ №	1emory (intel) – ×
🔅 Setup	Status
Z Statistics	Intel <sup>®</sup> Optane <sup>™</sup> memory is disabled.
1 About	



3. This window will allow the user to start the Optane<sup>™</sup> volume creation. Please note that all data that is on the Optane<sup>™</sup> drive will be deleted at this time if the user clicks 'Yes' to proceed.

Intel® Optane™ M	1emory (intel) – ×
🔅 Setup	Warning
✓ Statistics	This process will erase all data on Intel® Optane™ memory module. Do you want to proceed?
1 About	Yes No

4. This window shows that the volume creation process has started.





5. Once the volume creation has finished, the system will require a restart to complete. The user can click restart in either the UI or the tray icon.

Intel® Optane"	Memory (intel - ×	
<ul> <li>Setup</li> <li>Statistics</li> <li>About</li> </ul>	Intel® Optane™ Memory Was Successfully Enabled Please restart your computer to complete the process. Restart	
	Intel® Optane" Me Operation complet Please restart your com	emory X ed nputer to complete the process. Restart

6. Once the system has restarted into the OS, the user can open the Setup page of the Optane<sup>™</sup> UI and now see that Optane<sup>™</sup> Memory is enabled on the system. The enablement process is now complete.





#### **2.1.4 Disabling Optane<sup>™</sup> with the Intel® Optane<sup>™</sup> Memory UI**

 Select the "Setup" tab on the left side of the Optane<sup>™</sup> UI. Click on the "Disable" button to continue disabling Optane<sup>™</sup>.



2. Once the process to disable Optane<sup>™</sup> has started, the progress will appear in the UI window.

Intel® Optane™ Me	mory (intel) – ×
🔅 Setup	
Statistics	
About	85 % Step 1 of 3: Preparing system



3. To complete the disabling process, the user must restart the system.

Intel® Optane™ Me	mory (intel) – ×
🔅 Setup	Intel® Optane™ Memory Was Successfully Disabled
✓ Statistics	Please restart your computer to complete the process.
1 About	Restart

4. Once the system has been rebooted into the OS, the user can open the Optane<sup>™</sup> UI Setup page to verify that the memory volume is no longer enabled.

Intel® Optane™ M	emory (intel) – ×
🔅 Setup	Status
Z Statistics	Intel® Optane™ memory is disabled.
1 About	



## 2.1.5 Uninstalling the Intel® Optane<sup>™</sup> Memory UI.

1. Verify that  $Optane^{M}$  has been disabled before uninstalling the UI.

Intel® Optane™ I	Memory (intel) – ×
🔅 Setup	Status
M Statistics	Intel® Optane™ memory is disabled.
1 About	

2. Search for 'Control Panel' using the Windows Start Menu





3. Select the 'Uninstall a program' link, located under "Programs' in the Control Panel

Control Panel				· · · · · · · · · · · · · · · · · · ·	×
<ul> <li>Control Panel</li> <li>Adjust your computer's settings</li> <li>Adjust your computer's settings</li> <li>System and Security Review your computer's status Save backup copies of your files with File History Backup and Restore (Windows 7) Find and fix problems</li> <li>Network and Internet Connect to the Internet View network status and tasks Choose homegroup and sharing options</li> <li>Hardware and Sound View devices and printers</li> </ul>		V User Accounts Change account type Appearance and Person Change the theme Adjust screen resolution Clock, Language, and Re	v ত fiew by: Category ▼ alization	Search Control Panel	م
Save backup copies of your hile with Hile History Backup and Restore (Windows 7) Find and fix problems Network and Internet Connect to the Internet View network status and tasks Choose homegroup and sharing options Hardware and Sound View devices and printers Add a device Programs Uninstall a program	Add a language Change input methods Change date, time, or number t Ease of Access Let Windows suggest settings Optimize visual display	formats			

4. Highlight the `Intel® Optane<sup>™</sup> Memory' driver from the list. Click the uninstall option.

Programs and Features		-	$\Box$ ×
← → × ↑ 🗖 > Control P	Panel > Programs > Programs and Features	✓ ひ Search Programs and Fe	eatures 🔎
Control Panel Home	Uninstall or change a program		
View installed updates	To uninstall a program, select it from the list and the	n click Uninstall, Change, or Repair.	
Turn Windows features on or off	Organize 🔻 Uninstall	8	= • <b>?</b>
	Name	Publisher	Installed O
	😹 Intel(R) Optane(TM) Memory	Intel Corporation	8/17/2017
	C Microsoft OneDrive	Microsoft Corporation	8/17/2017
	1		
	Intel Corporation Product version: 15.5.	0.1051	



5. After clicking the option to uninstall in control panel, the Optane<sup>™</sup> Memory window below will appear. Click next to continue with uninstalling the Optane<sup>™</sup> Memory UI.

Intel® Installation Framework	×
Intel® Optane™ Memory Welcome	(intel)
You are about to uninstall the following product:	
Intel® Optane™ Memory	
It is strongly recommended that you exit all programs before continuing. Click Next to continue, or click Cancel to exit the setup program.	
Intel Corporation < Back	Next > Cancel

6. This window provides information about what the Optane<sup>™</sup> Memory driver controls on the system. Click 'Next' to continue uninstalling the Optane<sup>™</sup> Memory UI.





7. The progress bar shows the status of the uninstall.

Intel® Installation Framework		
Intel® Optane™ Memory Progress	(	(intel)
Please wait while the product is being uninstalled.		
Intel Corporation	< Back Next >	Cancel

10. A reboot is required to complete the process of uninstalling the Optane<sup>™</sup> Memory UI from the platform. Please click 'Finish' to continue and reboot the system.





# 2.2 RST UI

1. Go to downloadcenter.intel.com, and select the most recent Intel® Rapid Storage Technology 15.5 or later driver available.

2. Run the executable SetupRST.exe from the downloaded package. The window pictured below will appear. Click 'Next' to continue.

Intel® Installation Framework	×
Intel® Rapid Storage Technology Welcome	(intel)
You are about to install the following product:	
Intel® Rapid Storage Technology	
It is strongly recommended that you exit all programs before continuing. Click Next to continue, or click Cancel to exit the setup program.	
Intel Corporation < Back Next :	> Cancel

3. This window provides a brief caution to the user that the driver itself will not be able to be uninstalled after installation completes. The user can click 'Next' to continue the process

Intel® Installation Framework	×
Intel® Rapid Storage Technology Warning	(intel)
The Intel® Rapid Storage Technology driver you are about hard drive that this computer boots from or to control a har Therefore, you will not be able to uninstall this driver after i to uninstall the non-critical components of this software suc Service, and program shortcuts.	to install may be used to control the d drive that contains important data. installation. However, you will be able d as the User Interface, Event Monitor
Click Next to continue, or click Cancel to exit the setup prog	gram.
Intel Corporation	< Back Next > Cancel



4. This window informs the user of the License Agreement for this product. The user must check the box before clicking 'Next' to continue.

Intel® Installation Framework	×	
Intel® Rapid Storage Technology License Agreement	D	
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)	^	
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING. Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.		
Please Also Note: * If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies; * If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT, applies.		
For OEMs, IHVs, and ISVs:		
LICENSE. This Software is licensed for use only in conjunction with Intel component products.	~	
☑ I accept the terms in the License Agreement.		
Intel Corporation <back next=""> Can</back>	cel	

5. This window provides the ReadMe information regarding the options of the SetupRST.exe. The user can click 'Next' to continue with the install.

Intel® Installation Framework	×
Intel® Rapid Storage Technology Readme File Information	P
<ul> <li>Installation Readme for</li> <li>Intel(R) Rapid Storage Technology (Intel(R) RST):         <ul> <li>Intel(R) Optane(TM) Memory System Acceleration ^^</li> <li>Intel(R) Smart Response Technology ^^</li> <li>^NOTE: Support for this feature is determined by your hardware configuration</li> </ul> </li> <li>This document makes references to products developed by Intel. There are some         <ul> <li>restrictions on how these products may be used, and what information may be disclosed to             <ul></ul></li></ul></li></ul>	<
Intel Corporation < Back Next > Can	cel



6. This window shows the location where the RST files will be saved to. The user can change the location by clicking on the 'Change' button, or continue the install by clicking 'Next'.

Intel® Installation Framework	×
Intel® Rapid Storage Technology Destination Folder	(intel)
Click Next to install to the default folder, or dick Change to o	choose another destination folder.
	Change
Intel Corporation	< Back Next > Cancel

7. This window informs the user for a final time that the software is about to be installed. The user can choose to go 'Back', 'Cancel' out the installation or click 'Next' to continue.





8. The next window will show the progress of the installation. No user input is required.

Intel® Installation Framework	
Intel® Rapid Storage Technology Progress	(intel)
Please wait while the product is being installed.	
Intel Corporation < Back	Next > Cancel

9. The installation process has been successful. The system will need to be rebooted in order to complete the installation process. The user can choose to do the reboot at this point, or decide to do it at a later time. Click 'Finish' to either close the window or reboot the system.

Intel®	Installation Framework	×
Intek Comp	® Rapid Storage Technology	tel
0	You have successfully installed the following product: Intel® Rapid Storage Technology	
	Please restart your PC to implement these changes. Would you like to restart you now?	r PC
	• Yes, I want to restart this computer now.	
	○ No, I will restart this computer later.	
Click h	nere to open log file location.	
Intel Co	orporation < Back Next >	Finish



## 2.2.1 Enabling Optane<sup>™</sup> with the RST Legacy UI

1. Ensure that the UI shows the Optane module and slow media. If system is correctly configured, there will be an option to "Enable" on the Status page.



2. The option to "Enable" will also be available on the "Intel Optane™ Memory page.





3. If multiple Optane<sup>™</sup> modules are installed on the system, use the drop down menu to select the desired device to use for acceleration.

😢 Intel® Rapid Storage Technology		- 🗆 ×
Status Manage Intel® Optane <sup>™</sup> Memory Performance	Preferences Help	(intel)
Status         Manage         Intel® Optane** Memory         Performance           Intel® Optane** memory status: disabled.         Enable         Enable         Enable	Preferences       Heip         Enable Intel ® Optane <sup>™</sup> memory <pre></pre>	Intel® Optane" Memory View

4. If the Optane<sup>M</sup> module is 32GB or larger, a progress bar will appear during the Optane<sup>M</sup> creation process.





5. Once the volume creation is complete, the system will need to be rebooted.

Rapid Storage Technology	- 🗆 X
Status Manage Intel® Optane™ Memory Performance Preferences Help	(intel)
Intel® Optane™ Memory Intel® Optane™ Memory Intel® Optane™ memory was successfully enabled. Please restart your computer to complete the process. Report	Intel® Optane" Memory View C Intel® Optane" Memory Array 466 GB 13 GB

6. After the system has rebooted, reopen the UI to verify that the Optane<sup>m</sup> volume is functioning normally.





#### 2.2.2 Disabling Optane<sup>™</sup> with the RST Legacy UI

1. On the status page, click on the 'Disable' link.

🕼 Intel® Rapid Storage Technology		- 🗆 X
Status Manage Intel® Optane <sup>™</sup> Memory Performance Preferences Help		(intel)
Turrent Status	Storage System View	U
Your system is functioning normally. Manage	Intel® Optane <sup>tte</sup> Memory Array	
Click on any element in the storage system view to manage its properties.	冬 🛹 149 GB	Intel® Optane <sup>™</sup> Memory Volume Type: Intel® Optane <sup>™</sup> Memory
The Windows' write-cache buffer flushing policy can be enabled for all RAID array drives to ensure data integrity or disabled to improve data performance. Click the Heip icon for more information on setting the write-cache buffer flushing policy based on your needs.	13 G8	149 GB
Intel® Optane® Memory	Internal empty port 1	
Intel <sup>®</sup> Optane <sup>™</sup> memory status enabled. <u>Disable</u>	Internal empty port 2	
	Internal empty port 3	

2. A pop up will appear to confirm if the user wants to disable. Click 'Yes' to continue.

🛃 Intel® Rapid Storage Technology		- 🗆 ×
Status Manage Intel® Optane™ Memory Perfo	rmance Preferences Help	(intel)
Current Status Your system is functioning normally. Manage		Storage System View 🕐
Click on any element in the storage system view to manage its propert The Windows <sup>4</sup> write-cache buffer flushing policy can be enabled for the write-cache buffer flushing policy based on your needs. Intel® Optane <sup>44</sup> Memory	ties 🎐	149 G8 Intel® Optane® Memory Volume Type Intel® Optane® Memory 149 G8 Intel® Optane® Memory
intel® Optane <sup>™</sup> memory status: enabled. <u>Disable</u>	Intel <sup>®</sup> Rapid Storage Technology Disabling Intel <sup>®</sup> Optane <sup>™</sup> memory will take some time and negatively impact system performance. No data will be lott during this process. Do you want to disable Intel <sup>®</sup> Optane <sup>™</sup> memory now?	Internal empty port 2     Internal empty port 3
	More help Yes No	

3. Once the volume is disabled, the user will be asked to reboot the system.

🛤 Intel® Rapid Storage Technology	-	□ ×
Status Manage Intel® Optane <sup>™</sup> Memory Performance Preferences Help		(intel)
I Current Status	Storage System View	U
Your system is functioning normally.	SATA disk (149 GB) (System 149 GB	n)
Manage Click on any element in the storage system view to manage its properties.	PCIe SSD (13 GB) 13 GB	
The Windows* write-cache buffer flushing policy can be enabled for all RAID array drives to ensure data integrity or disabled to improve data performance. Click the Heip Icon for more information on setting the write-cache buffer flushing policy based on your needs.	Internal empty port 1	
Intel® Optane <sup>™</sup> Memory	Internal empty port 2	
Intel® Optane™ memory status: disabled. Please reboot your computer now.	Internal empty port 3	



4. If using the 'Intel <sup>®</sup> Optane<sup>™</sup> Memory page, a 'reboot' button will appear once the Optane<sup>™</sup> volume is disabled.

j# Intel® Rapid Storage Technology	x
Status Manage Intel® Optane <sup>™</sup> Memory Performance Preferences Help	(intel)
Intel® Optane™ Memory	Intel® Optane <sup>™</sup> Memory View 🖒
Intel® Optane™ memory was successfully disabled. Please restart your computer to complete the process.	
Reboot	

5. After rebooting, UI will show both disks in a normal state and have the option to 'Enable' Optane<sup>™</sup> available.





## 2.2.3 Uninstalling the UI

1. Verify that Optane<sup>™</sup> has been disabled before uninstalling the UI.



2. Search for 'Control Panel' using the Windows Start Menu





3. Select the 'Uninstall a program' link, located under "Programs' in the Control Panel

😰 Control Panel				-	×
$\leftarrow \rightarrow \ \lor \ \bigstar$ Control Panel			√ Ū	Search Control Panel	P
Adjust your computer's	settings	View by: Cate	egory 🔻		
System and Set Review your comput Save backup copies	ter's status of your files with File History	Ser Accounts			
Backup and Restore Find and fix problem	(Windows 7) Is	Appearance and Personalization Change the theme			
Network and In Connect to the Inter View network status Choose homegroup	ternet of tasks and sharing options	Clock, Language, and Region Add a language Change input methods			
Hardware and S View devices and pri Add a device	Sound	Change date, time, or number formats Ease of Access Let Windows suggest settings			
Programs Uninstall a program		Optimize visual display			

4. If the Legacy UI is loaded on the system, highlight the `Intel® Rapid Storage Technology' driver from the list. Click the uninstall option.

Programs and Features					– 🗆 X
← → → ↑ 👩 > Control Panel → Programs → Programs and Features				✓ Č Search Progr	ams and Features $~ ho$
Control Panel Home View installed updates	Uninstall or change a program To uninstall a program, select it from the list a	nd then click Uninstall, Change, or R	epair.		
off	Organize 🔻 Uninstall				== - ?
	Name	Publisher	Installed On Size	Version	
	3 Intel(R) Rapid Storage Technology	Intel Corporation	4/25/2017	15.5.0.1051	
	📀 Intel(R) Zero Power ODD Tool	Intel Corporation	4/20/2017	15.5.0.1051	
	Intel Corporation Product version:	15.5.0.1051			



5. At this point, the RST installer will begin the uninstallation process. Click 'Next' to continue.

Intel® Installation Framework	×
Intel® Rapid Storage Technology Welcome	intel
You are about to uninstall the following product:	
It is strongly recommended that you exit all programs before contin Click Next to continue, or click Cancel to exit the setup program.	uing.
Intel Corporation < B	Back Next > Cancel

6. Click 'Next' to continue uninstalling. Check the box if the user would like to see the process on reconfiguring the system to use the native operating system software. Most uninstalls do not require this step.





7. The next window will show a progress bar of the driver being uninstalled.

Intel® Installation Framework		
Intel® Rapid Storage Technology Progress		(intel)
Please wait while the product is being uninstalled.		
Intel Corporation	< Back Ne	xt > Cancel

8. Once prompted, click the 'Finish' button to complete the uninstallation process. This will cause the system to reboot.





# 3 Troubleshooting

This chapter includes examples of errors that could occur during installation of the Intel® Optane<sup>™</sup> memory SW/driver package. For more information and help on these errors, please contact Intel Customer Support at <u>www.intel.com/support/optane-memory.</u> Please also refer to the error code and message article for more details: <u>https://www.intel.com/content/www/us/en/support/memory-and-storage/intel-optane-memory/000024113.html</u>

# 3.1 Optane<sup>™</sup> UI Installation Failures

#### 3.1.1 Unsupported CPU

This window will appear if the installation package is used on a system with an unsupported CPU. Please check the minimum requirements provided in section 1.2 of this document for further details.

Intel® Installation Framework	×
Intel® Optane™ Memory Failure	(intel)
Unsupported CPU	
Intel® Optane™ memory requires a 7th Gen Intel® Core™ processor (or be enabled.	later) to
Visit <u>Intel.com/OptaneMemory</u> for more information.	
Cirk here to open log file location	
A Rext	> Finish



#### 3.1.2 Unsupported Chipset

This windows will appear if the installation package is run on a system with an unsupported chipset. Please check the minimum requirements provided in section 1.2 of this document for further details.

	Intel <sup>®</sup> Installation Framework	×
Intek Failure	® Optane™ Memory e	(intel)
	Unsupported Chipset	
	Intel® Optane™ memory requires a motherboard with a supported Intel® 2 Series Chipset (or later) to be enabled.	00
	Visit Intel.com/OptaneMemory for more information.	
Click	acre to open les fils lesstion	
Intel Co	orporation < Back Next >	Finish

#### 3.1.3 Unsupported Operating System

This window will appear if the installation package is run on a system with an unsupported OS. Please check the minimum requirements provided in section 1.2 of this document for further details.

_	Intel® Installation Framework	×
Intel Failure	® Optane™ Memory e	(intel)
	Unsupported Operating System	
	Intel® Optane™ memory requires Windows® 10 64 bit (or later).	
	To continue, please upgrade your operating system and restart the insta process. Visit <u>Intel.com/OptaneMemory</u> for more information.	illation
Click h	nere to open log file location.	
Intel Co	orporation < Back Nex	t > Finish



### 3.1.4 Unsupported BIOS

This window will appear if the installation is run on a system with an unsupported BIOS. This could be caused by the following:

Check the motherboard vendor website for possible BIOS updates or other procedures.

	Intel® Installation Framework	×
Intek Failure	® Optane™ Memory	(intel)
8	Unsupported BIOS	
	Your system BIOS is not compatible with Intel® Optane™ memory.	
	Please update your system BIOS and restart the installation process. Visi <u>OptaneMemory</u> for a list of BIOS updates by vendor, more information ar this problem persists.	t <u>Intel.com/</u> Id support if
Click <u>h</u>	ere to open log file location.	
Intel Co	rporation < Back Nex	t > Finish

This window will appear if the installation is on a system in Legacy mode, which is an unsupported BIOS mode for Optane<sup>™</sup>. To resolve this issue, a BIOS update may be required. Consult the Motherboard vender's support website for the latest Intel® Optane<sup>™</sup> memory supported BIOS. Visit <u>https://www.intel.com/content/www/us/en/support/memory-and-storage/intel-optane-memory/000024020.html</u> for more information.

	Intel <sup>®</sup> Installation Fram	nework ×
Intel® Op Failure	tane™ Memory	(intel)
Visit I	Ipported BIOS Mode system BIOS configuration is not compatible with ntel.com/OptaneMemory for more information.	h Intel® Optane™ memory.
Click <u>here</u> to a	open log file location.	
Intel Corporati	nc	< Back Next > Finish



#### 3.1.5 Unsupported System Drive

This window will appear if the installation is attempted on a system that has an unsupported MBR system drive partition table. To resolve this issue, the drive partition table will need to be changed to GPT and the operating system reinstalled. Consult the platform vender's User Manual for instructions on how to complete this process.

Intel® Installation Framework	×
Intel® Optane™ Memory Failure	(intel)
Unsupported System Drive Intel® Optane™ memory does not support MBR system drive partition	table.
Visit Intel.com/OptaneMemory for more information.	
Click <u>here</u> to open log file location.	
Intel Corporation < Back Ne	ext > Finish

This window will appear if the installation is run on a system where the last partition cannot be resized, because it is blocked for resizing. Please refer to the following link for more details: <a href="https://www.intel.com/content/www/us/en/support/memory-and-storage/intel-optane-memory/000024253.html">https://www.intel.com/content/www/us/en/support/memory-and-storage/intel-optane-memory/000024253.html</a>

_	Intel® Installation Fran	nework ×
Intel Failure	® Optane™ Memory	(intel)
8	Unsupported System Drive The last partition on your system drive cannot be re Intel® Optane™ memory.	esized, which is required to enable
	Visit <u>Intel.com/OptaneMemory</u> for more information.	L
Click h	ere to open log file location. orporation	< Back Next > Finish



This window will appear if the installation is run on a system where the last partition cannot be resized, because it does not have enough free space.

	Intel <sup>®</sup> Installation Framework	×
Intek Failure	l® Optane™ Memory e	(intel)
	Unsupported System Drive Last Partition	
	The last partition on your system drive cannot be resized, wh Intel® Optane™ memory.	ich is required to enable
	Please ensure the last partition on your system drive is at least 20 MB with 10 MB of continuous free space.	
	Visit Intel.com/OptaneMemory for more information.	
Click <u>here</u> to open log file location.		
Intel Co	orporation < Ba	ack Next > Finish

#### 3.1.6 Error Checking System Compatibility

This window will appear if installer has a failure while checking the platform for chipset compatibility.





This window will appear if the installation package is run and fails to check system for drive partition table.

	Intel <sup>®</sup> Installation Framework	×
Intel Failur	® Optane™ Memory	(intel)
	Error Checking System Compatibility	
	The Installer ran into a problem while checking system drive partition table compatibility.	
	Visit Intel.com/OptaneMemory for more information.	
Click	ere to open log file location.	
Intel C	< Back Next	> Finish

This window will appear if the installation package is run and fails to check the available space on the last partition of the system drive. Please refer to the following link for more details: <a href="https://www.intel.com/content/www/us/en/support/memory-and-storage/intel-optane-memory/000024253.html">https://www.intel.com/content/www/us/en/support/memory-and-storage/intel-optane-memory/000024253.html</a>

	Intel <sup>®</sup> Installation Frame	ework ×	
Intek Failure	Optane <sup>™</sup> Memory	(intel)	
8	Error Checking System Compatibility The Installer ran into a problem while checking for syst Visit Intel.com/OptaneMemory for more information.	tem drive available space.	
Click h	ere to open log file location.		
Intel Co	rporation	<back next=""> Finish</back>	1



#### 3.1.7 Intel® Rapid Storage Technology is Already Installed

This window will appear if the installation package runs on a system that already has a version of the Intel® Rapid Storage Technology user interface installed. To continue, uninstall the loaded Intel® Rapid Storage Technology user interface and then install the new Intel® Optane<sup>™</sup> memory application.

	Intel® Installation Framework	×
Intel( Failure	® Optane™ Memory	ntel
8	Intel® Rapid Storage Technology is Already Installed The Intel® Optane™ memory application cannot be installed together with Intel® Rapid Storage Technology.	B
	installation process. Visit <u>Intel.com/OptaneMemory</u> for more information.	
Click he	ere to open log file location.	
Intel Co	rporation < Back Next >	Finish

#### **3.1.8** Intel® Optane<sup>™</sup> Memory is Currently Enabled

This window will appear if the user tries to uninstall the Intel® Optane<sup>TM</sup> memory application while Intel® Optane<sup>TM</sup> memory is enabled. Intel® Optane<sup>TM</sup> memory must be disabled before the Intel® Optane<sup>TM</sup> memory application can be uninstalled.

Intel® Installation Framework	×
Intel® Optane™ Memory Failure	(intel)
Intel® Optane™ Memory is Currently Enabled         The Intel® Optane™ memory application cannot be uninstalled while Intel         Optane™ memory is enabled.         To continue, please open the Intel® Optane™ memory application, disab         Optane™ memory and restart the uninstallation process. Visit Intel.com/         OptaneMemory         for more information.	® le Intel®
Click <u>here</u> to open log file location.	
Intel Corporation < Back Next	> Finish



# **3.2 Hardware Failure**

#### **3.2.1 Fast Media Missing At Boot**

If the system boots and the Optane<sup>™</sup> module is not detected by the RST UEFI driver, the RST UEFI driver will protect the current data on the slow media by disabling it and not exposing it to the boot manager. This allows the user the opportunity to locate and reinsert the missing fast media (or try additional reboots) to allow the UEFI driver additional opportunity to detect and pair the slow media and fast media and return the Optane<sup>™</sup> volume to a normal state

In this state, the system is not bootable and the slow media will be set to a 'Disabled' state in the UEFI/BIOS. It is recommended that the end user power down the platform and try the following to resolve this issue.

- 1. If the module has become unattached from its port, reattach the missing Optane<sup>™</sup> Memory module and ensure that it is correctly installed into the system.
- 2. If the Optane<sup>™</sup> Memory module is not missing or disconnected, attempt the following:
  - a. Check that the M.2 connector is not damaged on the board or on the Intel Optane<sup>™</sup> Memory Module.
  - b. Disconnect the slow media and boot into the BIOS menu. Enter the RST HII UI and confirm if the Optane<sup>™</sup> Memory module can be seen. If the module cannot be seen, exit the RST menu and confirm that the SATA controller remapping function is enabled on the port that the Optane<sup>™</sup> Memory module is connected to.
  - c. Confirm that the Optane<sup>™</sup> Memory module is not damaged. Damage on the module may cause it to not be detected correctly.

#### 3.2.2 Slow Media Missing At Boot

If the system boots and the slow media device is not detected by the RST UEFI driver, the RST UEFI driver will protect the current data on the Optane<sup>™</sup> Memory module by disabling it and not exposing it to the boot manager. This allows the user the opportunity to locate and reinsert the missing slow media (or try additional reboots) to allow the UEFI driver additional opportunity to detect and pair the slow media and fast media and return the Optane<sup>™</sup> volume to a normal state.

In this state, the system is not bootable and the fast media will be set to a 'Disabled' state in the UEFI/BIOS. It is recommended that the end user power down the platform and try one or all of the following to resolve this issue.

- 1. Check the cabling for the drive. If the slow media has become unattached from its port, reattach the missing device and ensure that it is correctly installed into the system.
- 2. Confirm that the slow media is not damaged. Damage to the drive may cause it to not be detected correctly.
- 3. If available, connect a different slow media device into the same port/cabling to confirm that the cables are not damaged.



#### **3.2.3** Slow Media Failure and Recovery Options

No Intel® RST data recovery tools are available for a drive that has experienced mechanical or electrical failure and is considered 'inoperable'. If the system encounters an unrecoverable catastrophic failure of the slow media, there is no recovery/repair available. There may be third party tools available; However, Intel has no recommendations regarding third party data recovery tools.

To replace the inoperable slow media device, and pair the Optane<sup>™</sup> Memory module with a replacement slow media, the Optane<sup>™</sup> module must be disassociated. This is required in order to reuse it to enable Optane<sup>™</sup> with the slow media replacement.

# Note: Disassociation removes the Optane<sup>™</sup> configuration information from the Optane<sup>™</sup> module and deletes all data (data which is unusable cached data from the inoperable OS disk that is being replaced). Once this disassociation is completed the module can again be used to enable Optane<sup>™</sup>.

- 1. Boot into the system BIOS
- 2. Enter the Intel® Rapid Storage Technology pre-OS UI (Note: consult the computer manufacturer for the location of this UI in the system BIOS)
- The fast media (Intel® Optane<sup>™</sup> memory module) should be displayed on the main page,
   A. Highlight it and hit <Enter> to go to the "Reset to non-Optane" page
  - B. Under 'Disk Actions' highlight the action 'Reset to non-Optane' and hit <Enter>
  - C. Highlight 'Yes' and hit <Enter>
  - 4. The disk can now be used to enable System Acceleration with Intel® Optane<sup>™</sup> Memory

At this point the operating system can be reinstalled to the system:

- 1. Install the new slow media (SATA HDD, SSD, or SSHD)
- 2. Install the Windows 10 OS
- 3. Re-enable Intel<sup>®</sup> Optane<sup>™</sup> Memory
- 4. Complete any customizations or application installs

#### **3.2.4 Optane™ Memory Module Failure and Recovery Options**

This section documents support for Intel® Optane<sup>™</sup> memory module upgrades or replacements for systems that already have Intel® Optane<sup>™</sup> Memory enabled. Whether upgrading the memory module or replacing a faulty memory module, the following steps will apply:

#### **3.2.4.1 Disable Optane<sup>™</sup> Memory:**

- 1. Launch the Intel® Optane<sup>™</sup> Memory UI or launch the Intel® RST UI
- Click the 'Setup' tab for the Optane<sup>™</sup> UI, the Intel Optane<sup>™</sup> memory tab for the Intel® RST UI
- 3. Click Disable to start the disabling process.
- 4. Once the UI has completed all tasks for disabling Optane<sup>™</sup> and any necessary file migration has completed(after the progress indicator reaches 100%), a reboot option will be displayed
- 5. Reboot the system and complete the disablement process



#### **3.2.4.2** Replace the Intel® Optane<sup>™</sup> memory module:

- 1. Power down the computer
- Open the computer and locate the old or faulty Optane<sup>™</sup> memory module to be replaced.
   Note: Consult the computer manufacturer for the location of the slot for the Optane<sup>™</sup> memory module and instructions to remove/insert the M.2 module.
- 3. Remove the old or faulty module and insert the new module.
- 4. Close the computer and power it on.
- 5. Boot into the Windows OS.

#### **3.2.4.3 Re-enable Intel® Optane™ Memory:**

- 1. From Windows desktop, launch the Intel® Optane<sup>™</sup> Memory UI or launch the Intel® RST UI.
- 2. Click on the 'Setup' tab, or the Optane<sup>™</sup> Memory tab if using the Intel® RST UI.
- 3. Click 'Enable' to start the enabling process.
- 4. Select the fast media to use for 'enabling' and continue.
- Once the UI has completed all tasks for enabling Optane<sup>™</sup> and any necessary file migration has completed (after the progress indicator reaches 100%), the [Restart] or [Reboot] button will be displayed.
- 6. Reboot the system and complete the enablement process.



# 4 Windows Recovery Environment

# 4.1 **Post-factory Built Systems**

For systems built using the default Windows setup, the Windows Recovery Environment will most likely be configured using the in-box Windows storage driver. Since this driver does not support Intel® Optane<sup>™</sup> Memory volumes, the WinRE.wim file can be updated with an Optane<sup>™</sup> compatible driver in order to detect it. The following procedure updates the WinRE on a live system (while the Windows\* OS is running):

# Note: Not all recovery conditions will be successful 100% of the time, not even on nonOptane™ Memory enabled systems.

Open a command prompt on the desktop, and run the command: >\reagentc.exe /info

The output printed to screen will show where to find the WinRE.wim image file; the output is as follows:

Windows RE Location: \\?\GLOBALROOT\device\hard<mark>disk0</mark>\partition2\Recovery\WindowsRE

•disk0 : Indicates that the Winre.wim image file is on disk 0 (use diskpart list disk)
 •partition2 : Indicates that WinRE.wim is on partition 2 of disk 0 (diskpart select disk 0, select partition 2)

•Recovery \ WindowsRE : Indicates the directory where the image file is located

On the second partition of harddisk0 (also known as the "C:" drive), there will be a hidden "recovery" directory, with subdirectory "WindowsRE". The "winre.wim" is located here.

Place all the drivers to be injected into an easily accessible directory (Example: c:\ temp\drivers). After they have been moved into the directory, run the following commands:

```
>\diskpart
>\select disk 0
>\select partition 2
>\assign letter=R
>\exit
>\md c:\temp\mount\winre
>\md c:\temp\drivers
"copy RST 15.5 driver files to the c:\temp\drivers directory"
>\dism /mount-wim /WimFile:R:\recovery\WindowsRE\winre.wim /index:1
/mountdir:c:\temp\mount\winre
>\dism /image:c:\temp\mount\winre /add-driver /driver:C:\temp\drivers /recurse
>\dism /unmount-wim /mountdir:c:\temp
```



#### **4.2**

## Preparing the Windows\* 10 OS Recovery (Advanced)

This section walks through the process of preparing a Windows\* 10 OS image for Windows\* Recovery. By "Injecting" the Intel® RST driver into the OS Recovery Image/tools before OS installation allows possible recovery of a system in the event the OS image gets damaged.

#### **Requirements:**

Windows\* Assessment and Deployment Kit (ADK) installed

- Windows\* 10 64b ISO
- F6 Intel® Rapid Storage Technology 15.5 or later SW/driver package available from <u>downloadcenter.intel.com</u>.
- USB Key for installation

#### Steps:

1. Create a USB Bootable Key from the Windows\* 10 OS ISO Image

Note: Utilities such as Rufus\* with default options make this very easy

- 2. Create a temporary working directory on the local PC (Ex. C:\Win10USB)
- 3. In the working directory, create 3 sub directories named "windows", "winre" and "drivers"



4. Extract Intel® Rapid Storage Technology driver to the "drivers" subdirectory.





5. From the Windows\* 10 USB Install key, copy the "install.wim" file from the "sources" directory to the working directory C:\Win10USB



 Open a Command Prompt as Administrator, and change to the working directory (Ex. cd C:\Win10USB). Make sure that all folders and Windows\* explorer is closed before starting this process.



7. Based on the Windows\* 10 version, determine which index number to modify. Choose the index that matches the Windows\* 10 version being used.

To determine the index, run the command: dism /get-wiminfo /wimfile:install.wim

Example below modifies Index 2. Steps can be repeated to modify additional versions.





 Modify the "install.wim" file by running the following commands: Mount the Windows\* Image: dism /mount-image /imagefile:install.wim /index:2 /mountdir:windows



9. Add the Intel® Rapid Storage Technology drivers to the Windows\* Image:

dism /image:windows /add-driver /driver:drivers /forceunsigned /recurse



#### 10. Mount the Windows\* Recovery Image:

dism /mount-image /imagefile:c:\Win10USB\windows\windows\system32\recovery\winre.wim
/Index:1 /mountdir:winre



11. Add the Intel® Rapid Storage Technology driver to the Windows\* Recovery Image: dism /image:winre /add-driver /driver:drivers /forceunsigned /recurse





12. Un-mount the Windows\* Recovery Image: dism /unmount-wim /mountdir:winre /commit

c:\Win10USB>dism /unmount-wim /mountdir:winre /commit
Deployment Image Servicing and Management tool Version: 10.0.10586.0
Image File : c:\Win10USB\windows\windows\system32\recovery\winre.wim Image Index : 1 Saving image
[======================================
Unmounting image
[======================================
The operation completed successfully.

13. Un-Mount the Windows\* Image: dism /unmount-wim /mountdir:windows /commit

c:\Win10USB>dism /unmount-wim /mountdir:windows /commit
Deployment Image Servicing and Management tool Version: 10.0.10586.0
Image File : c:\Win10USB\install.wim
Image Index : 2
Saving image
[======================================
Unmounting image
[======================================
The operation completed successfully.

14. Copy the updated "install.wim" in the working directory back to the "sources" directory on the USB install key.