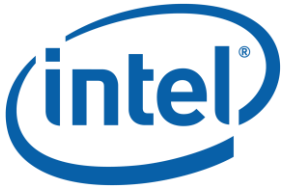


Intel® Optane™ Memory Installation Guide

For Intel® Rapid Storage Technology Release Versions 15.5 and newer.

Revision 2.0

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL® PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER, AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. Intel products are not intended for use in medical, lifesaving, or life sustaining applications.

Intel may make changes to specifications and product descriptions at any time, without notice.

Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined." Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them.

The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

Intel and the Intel logo are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

*Other names and brands may be claimed as the property of others.

Copyright © 2017, Intel Corporation. All rights reserved.

Contents

1 Intel® Optane™ Memory 4
1.1 Overview 4
1.2 Minimum Requirements 4
1.2.1 Hardware 4
1.2.2 Software/Firmware 5
1.2.3 Operating System 5

2 Intel® Optane™ Memory SW/Driver Package 6
2.1 Intel® Optane™ Memory UI 6
2.1.1 Platforms starting in AHCI mode 6
2.1.2 Platforms starting in RST Premium Mode 11
2.1.3 Enabling Optane™ with the Intel® Optane™ Memory UI 15
2.1.4 Disabling Optane™ with the Intel® Optane™ Memory UI 18
2.1.5 Uninstalling the Intel® Optane™ Memory UI. 20
2.2 RST UI 24
2.2.1 Enabling Optane™ with the RST Legacy UI 28
2.2.2 Disabling Optane™ with the RST Legacy UI 31
2.2.3 Uninstalling the UI 33

3 Troubleshooting 37
3.1 Optane™ UI Installation Failures 37
3.1.1 Unsupported CPU 37
3.1.2 Unsupported Chipset 38
3.1.3 Unsupported Operating System 38
3.1.4 Unsupported BIOS 39
3.1.5 Unsupported System Drive 40
3.1.6 Error Checking System Compatibility 41
3.1.7 Intel® Rapid Storage Technology is Already Installed 43
3.1.8 Intel® Optane™ Memory is Currently Enabled 43
3.2 Hardware Failure 44
3.2.1 Fast Media Missing At Boot 44
3.2.2 Slow Media Missing At Boot 44
3.2.3 Slow Media Failure and Recovery Options 45
3.2.4 Optane™ Memory Module Failure and Recovery Options 45

4 Windows Recovery Environment 47
4.1 Post-factory Built Systems 47
4.2 Preparing the Windows* 10 OS Recovery (Advanced) 48

1 Intel® Optane™ Memory

1.1 Overview

Intel® Optane™ Memory is Intel® 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® Optane™ technology.

1.2 Minimum Requirements

1.2.1 Hardware

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

Supported Platform/Chipset SKUs

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

(A) This SKU of the chipset supports AHCI mode Only
(O) This SKU of the chipset supports both AHCI and Optane™ 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® Optane™ technology NVMe SSD/memory module
   - A M.2 connector is required for the Optane™ 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™ 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.

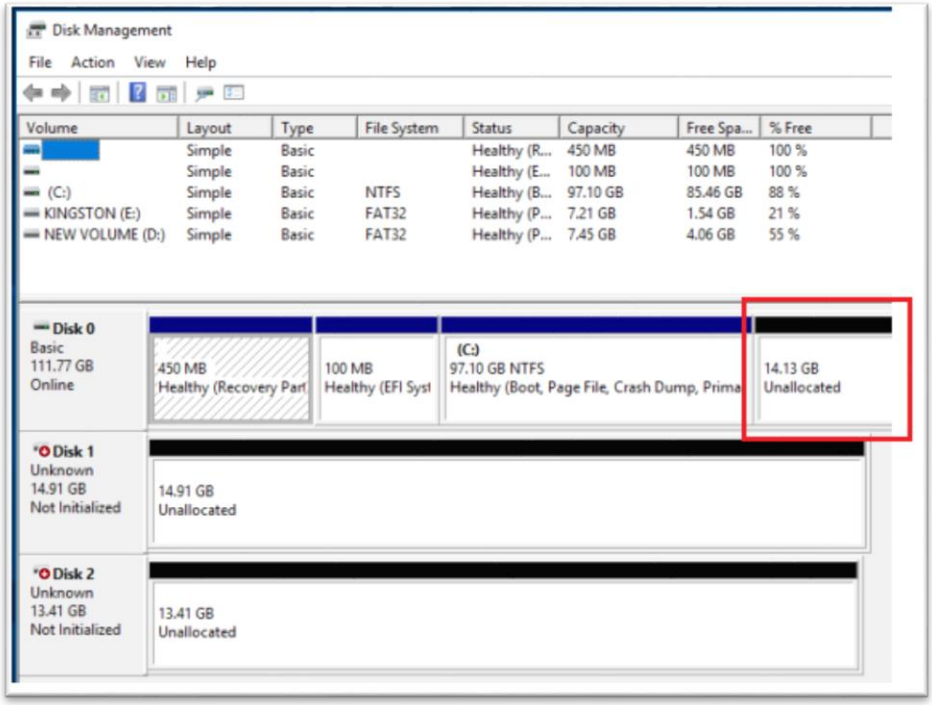
1.2.2 Software/Firmware

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



2 Intel® Optane™ Memory SW/Driver Package

2.1 Intel® Optane™ Memory UI

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

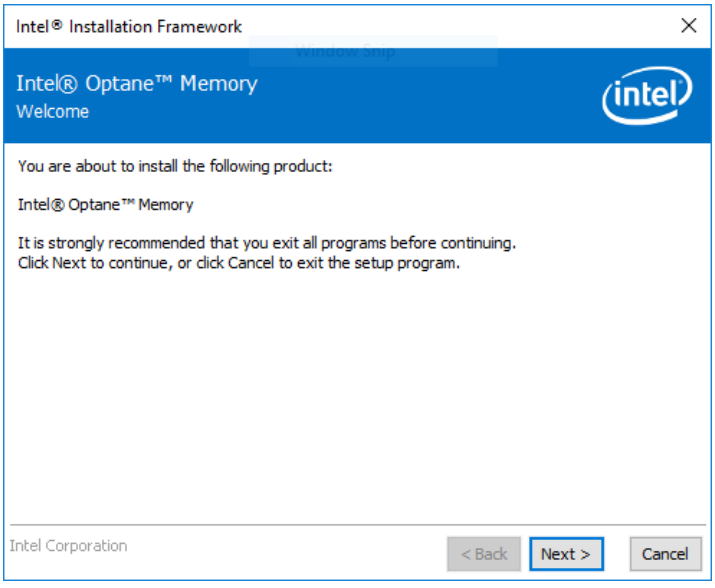
If the system BIOS supports SATA mode switching, the installer will automatically switch the system from AHCI to 'Intel® RST Premium and System Acceleration with Intel® Optane™ Technology'. If the system BIOS does not support this, there will be error indicating the system BIOS is unsupported.

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

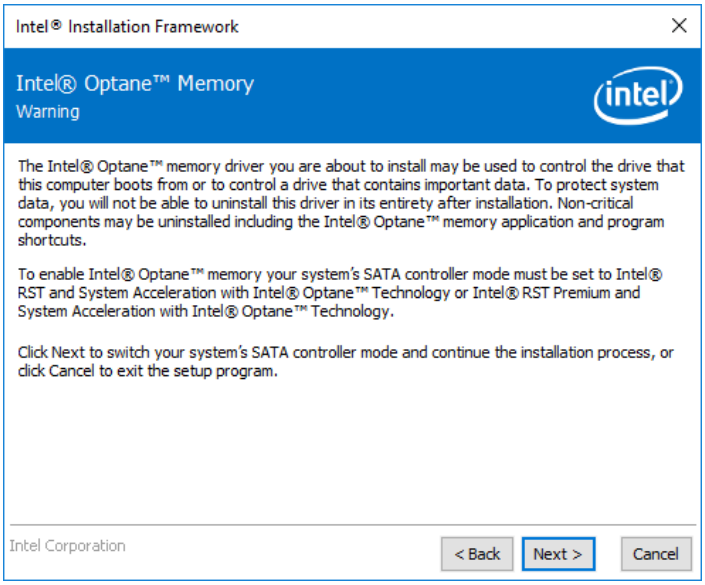
2.1.1 Platforms starting in AHCI mode

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

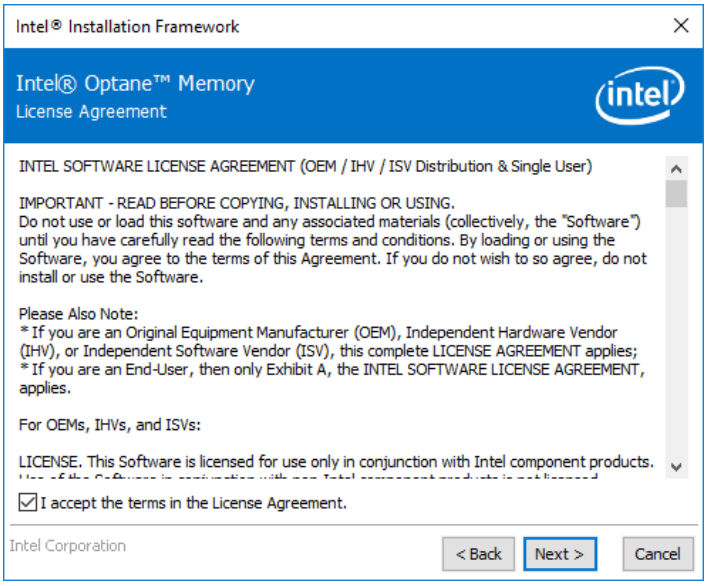
2. Run the executable SetupOptaneMemory.exe from the downloaded package. The window pictured below will appear.



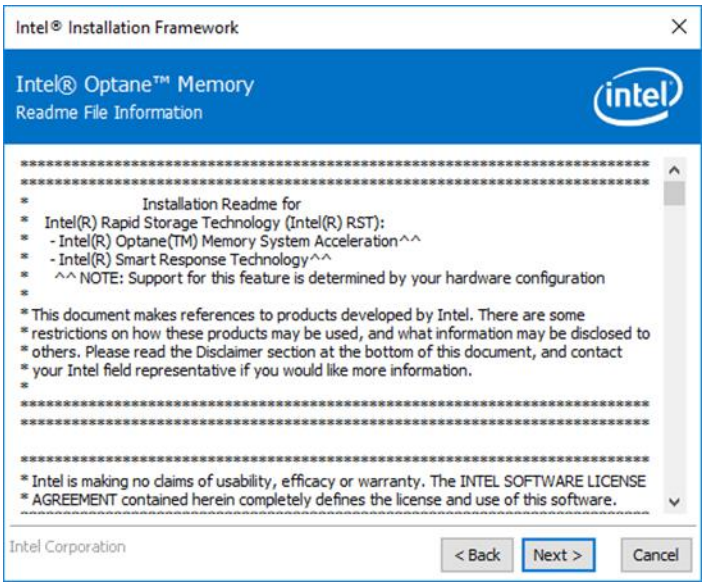
3. This window shows that the installer has discovered the system SATA controller is configured in 'AHCI' mode. This screen notifies the user that it will be automatically switching the SATA controller to RST Premium Mode. Click Next to continue.



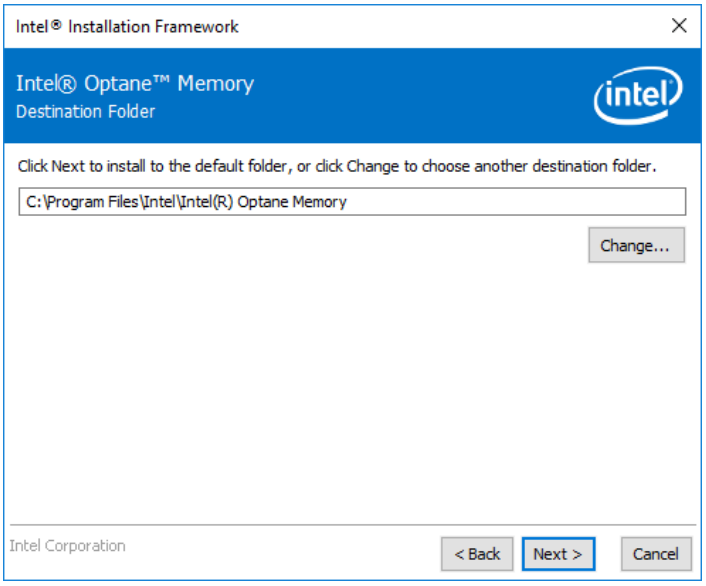
4. This window requires the user to read and accept the License agreement. The user must check the "I accept..." box in order to click 'Next' and continue.



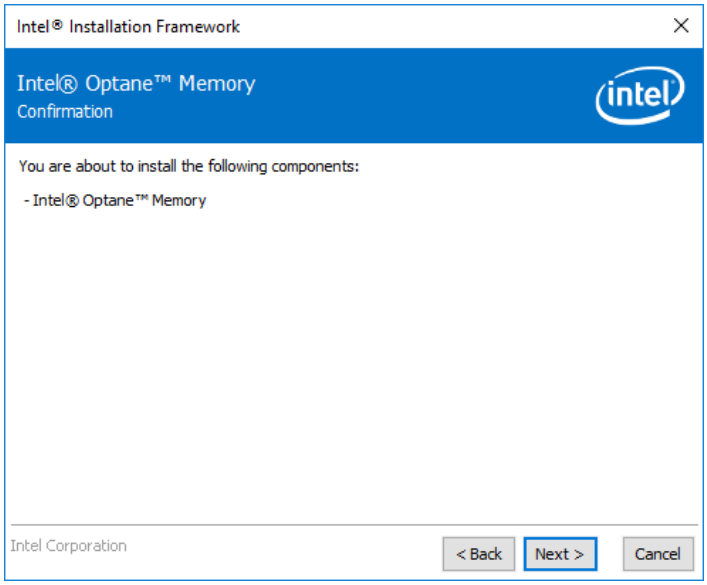
5. This window provides the user with information about the Rapid Storage Technology software that is going to be loaded on the system. The user must click next to continue the install.



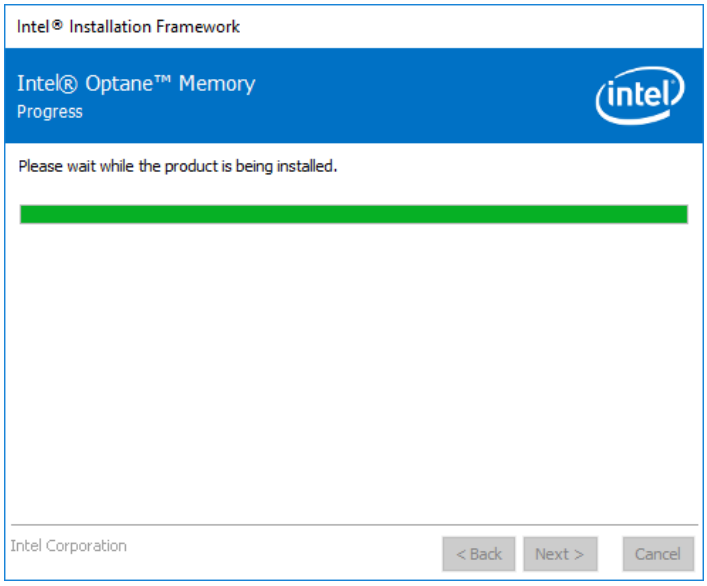
6. This window allows the user to select where the software files will be loaded on the system. The user can either navigate to a location using the "Change..." button, or use the default provided. The user must click 'Next' to continue the installation.



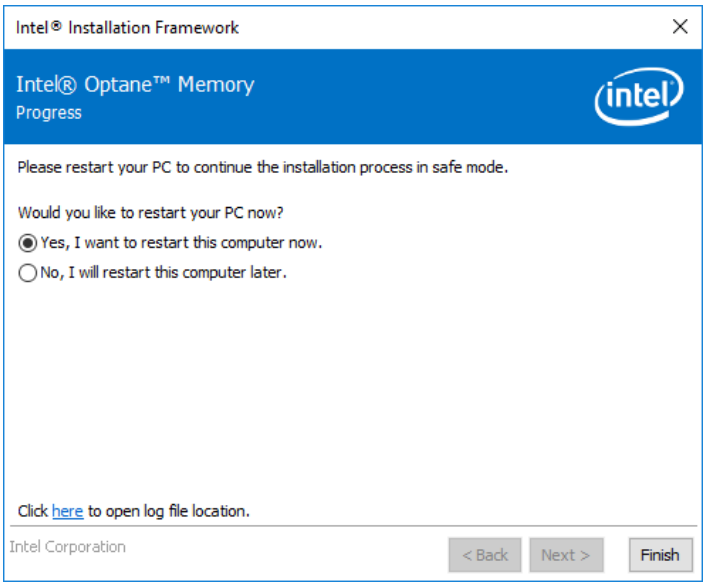
7. This window tells the user that the Intel® Optane™ Memory installation is about to begin. The user still has the option to go back to the previous page, or cancel out of the installation at this point. Once the Next button is clicked, the software installation will begin.



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

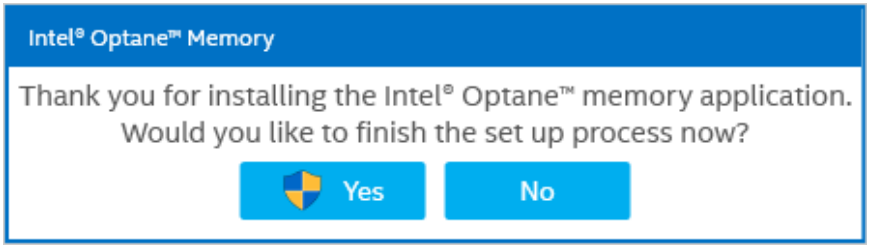


9. At this point in the installation process, the system will need to restart. During this time, the system will boot into “Safe Mode” in order to change the system from AHCI to RST Premium mode.



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.

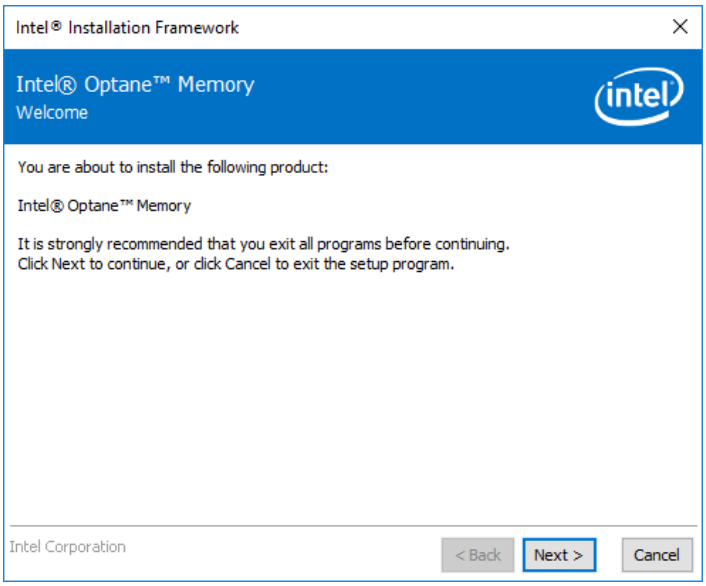
11. At this time, the system will boot back into the Windows OS and the Optane™ Memory application will launch. This may take several minutes to launch, or the user may launch it manually by searching for “Intel® Optane™ Memory” in the Windows file search. At this point, the user must click ‘Yes’ in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



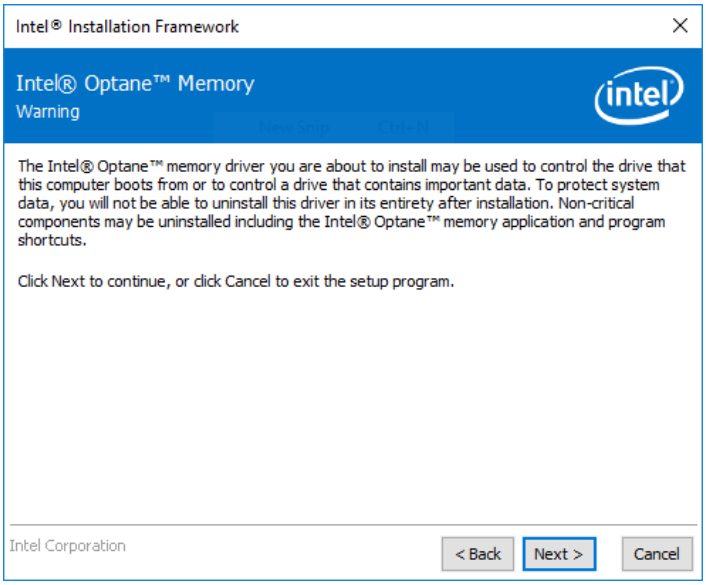
2.1.2 Platforms starting in RST Premium Mode

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

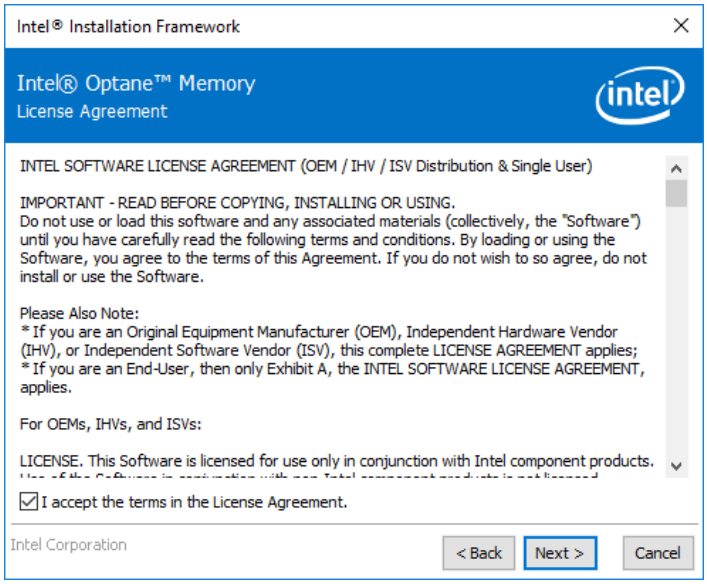
2. Run the executable SetupOptaneMemory.exe from the downloaded package. The window pictured below will appear. Click 'Next' to continue.



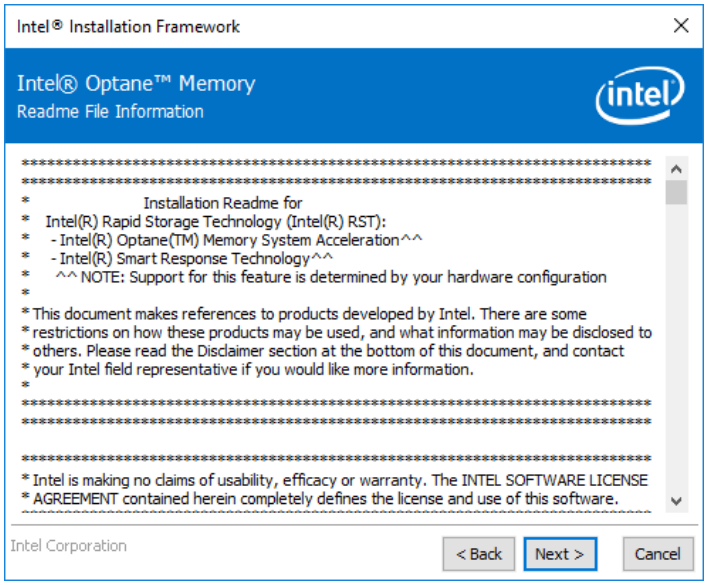
3. This screen informs the user that the driver may be used to control which drive the computer boots from. The user must click next to continue.



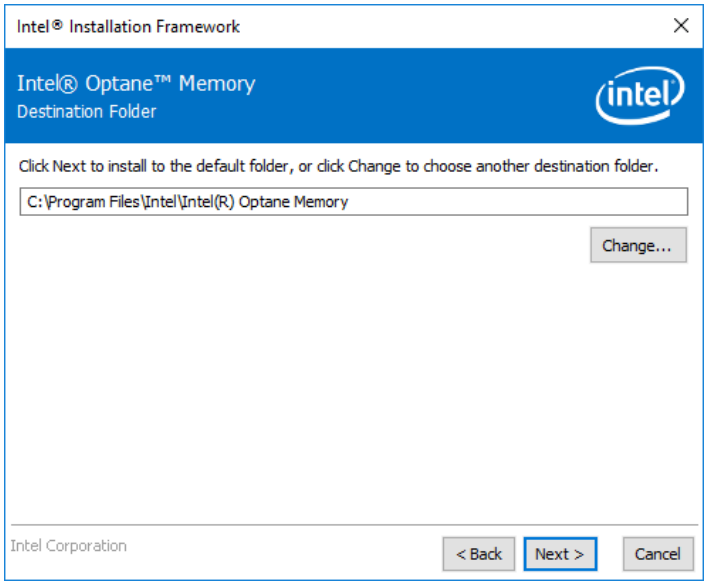
4. This screen requires the user to read and accept the License agreement. The user must check the "I accept..." box in order to click 'Next' and continue.



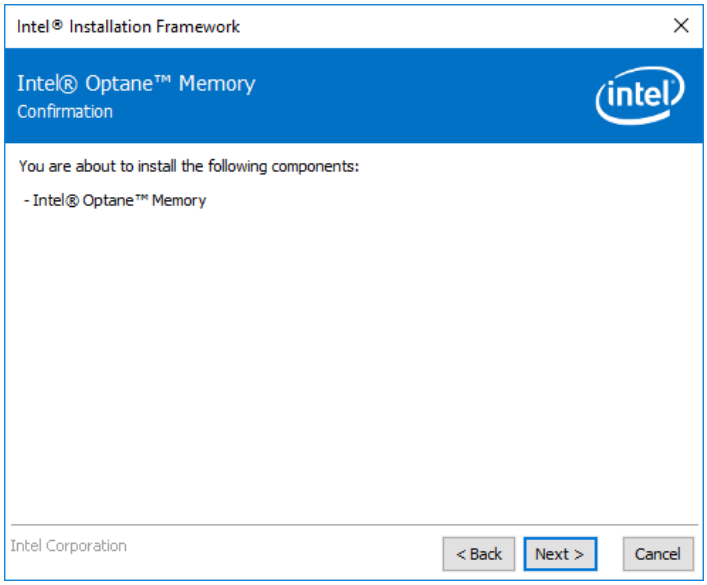
5. This window provides the user with information about the Rapid Storage Technology software that is going to be loaded on the system. The user must click next to continue the install.



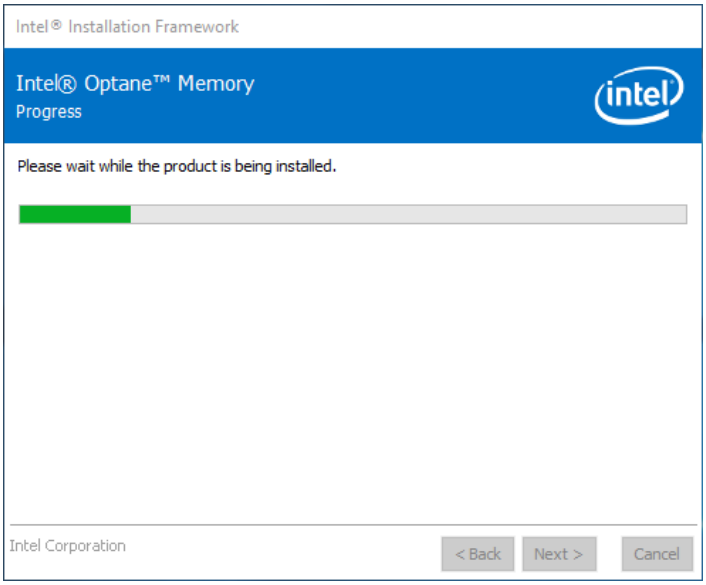
6. This window allows the user to select where the software files will be loaded on the system. The user can either navigate to a location using the "Change..." button, or use the default provided. The user must click 'Next' to continue the installation.



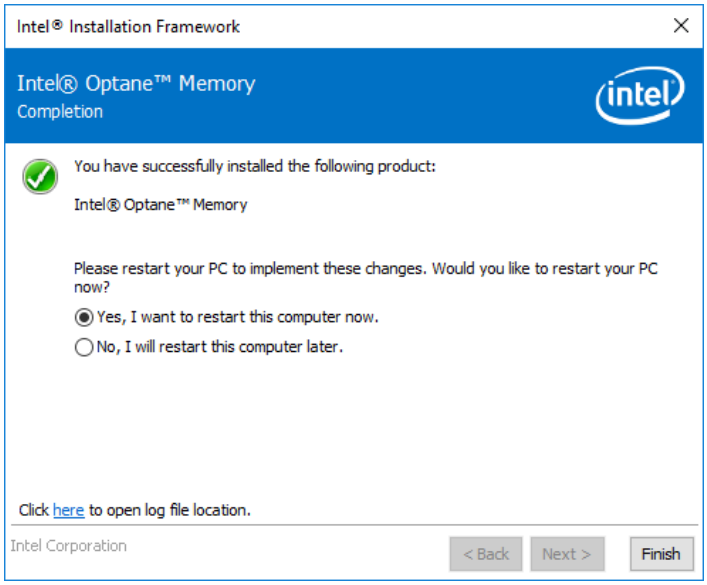
7. This window tells the user that the Intel® Optane™ Memory installation is about to begin. The user still has the option to go back to the previous page, or cancel out of the installation at this point. Once the Next button is clicked, the software installation will begin.



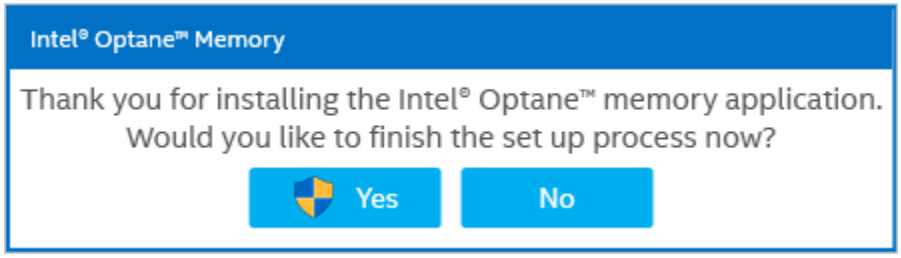
8. This window shows the user the progress of the installation.



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

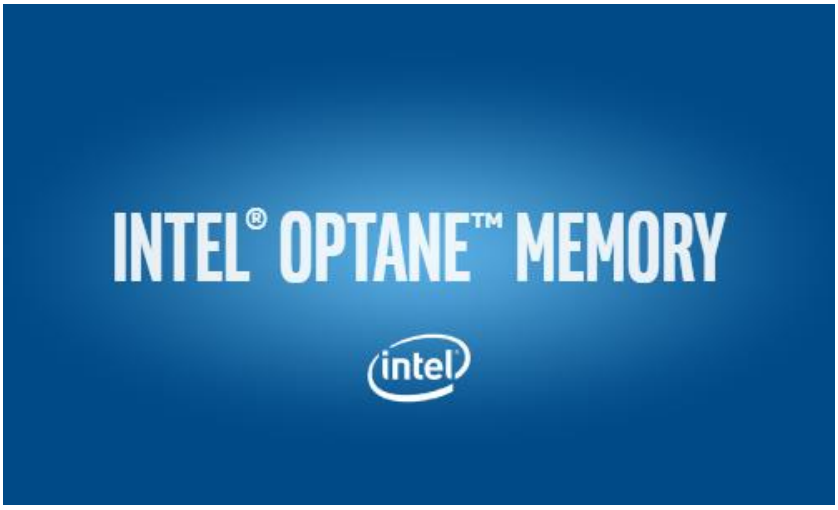


10. Once the system has completed the reboot and has entered the OS, the user will be prompted to complete the Optane™ installation process. This may take several minutes to launch. Click "Yes" to continue.

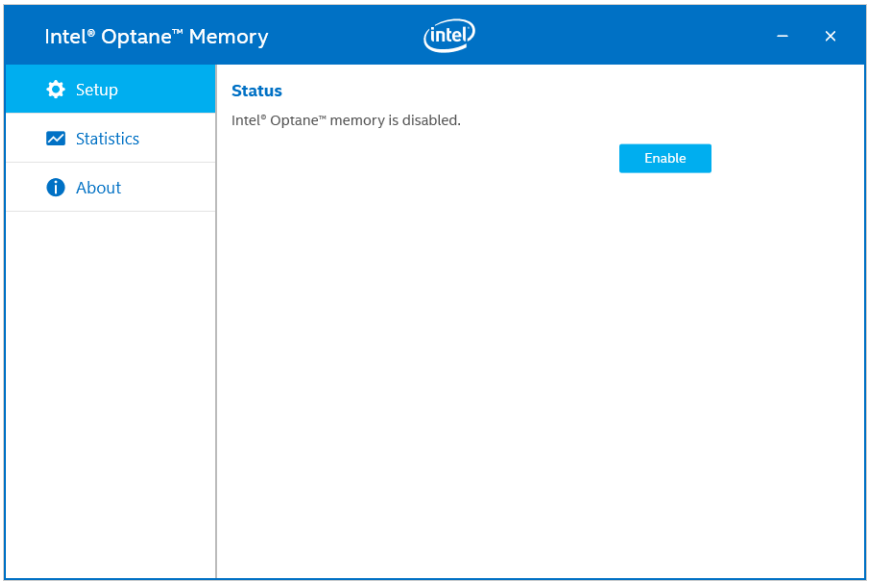


2.1.3 Enabling Optane™ with the Intel® Optane™ Memory UI

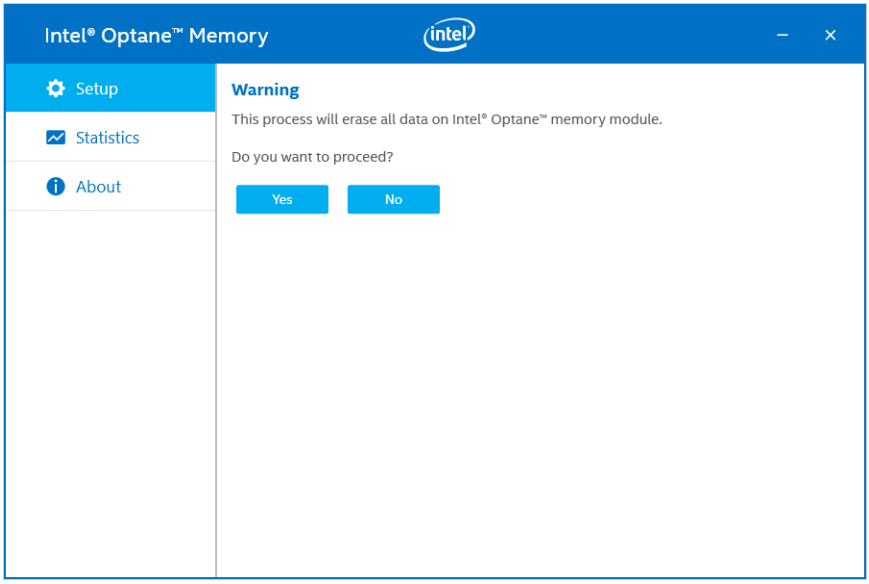
1. When the user chooses to continue the setup process, the window below will appear at the startup of the Optane™ Application UI. This may take several seconds to appear. If the user clicked 'No' to enable Optane™ at a later time, they can choose to open the UI to start the same process.



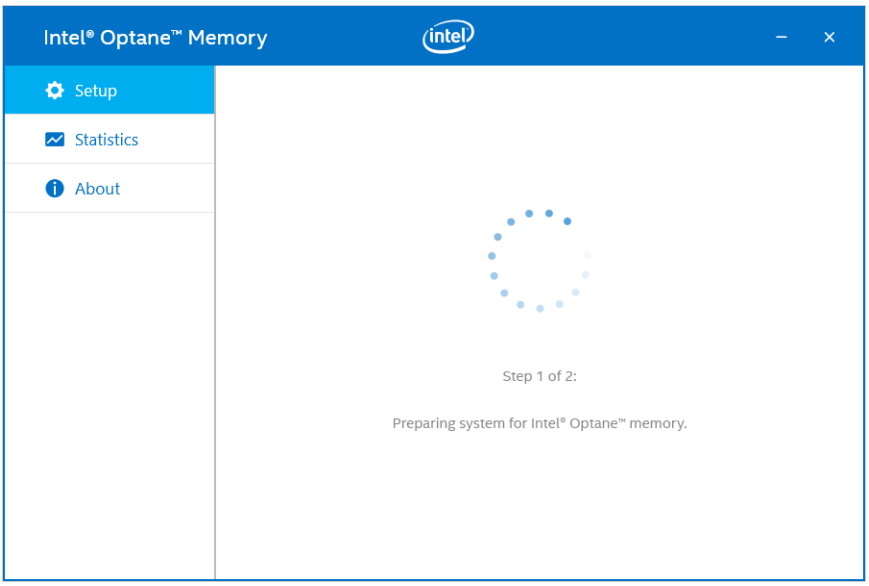
2. Once the UI opens, click on the "Setup" tab on the left side to view the status. To continue enabling Optane™, click on the Enable button.



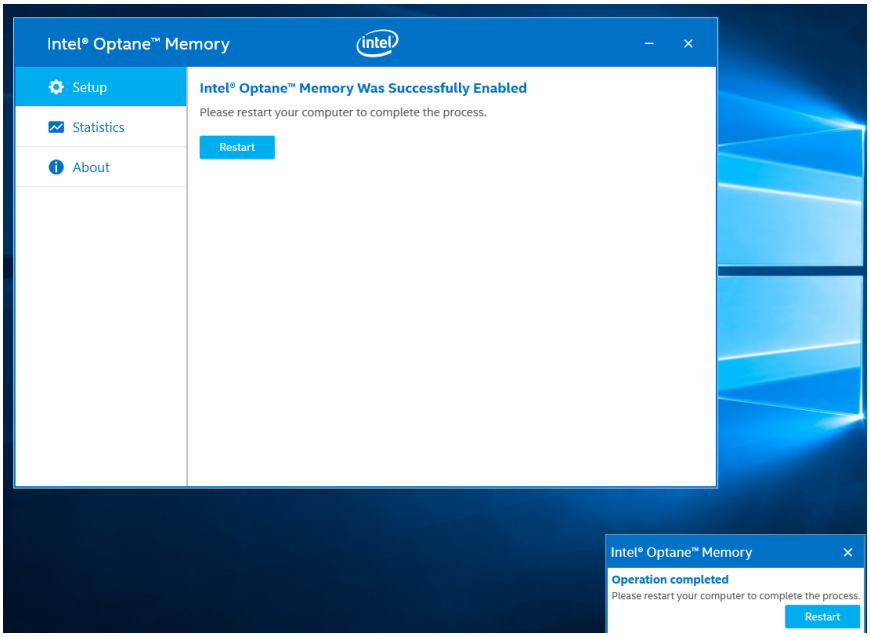
3. This window will allow the user to start the Optane™ volume creation. Please note that all data that is on the Optane™ drive will be deleted at this time if the user clicks 'Yes' to proceed.



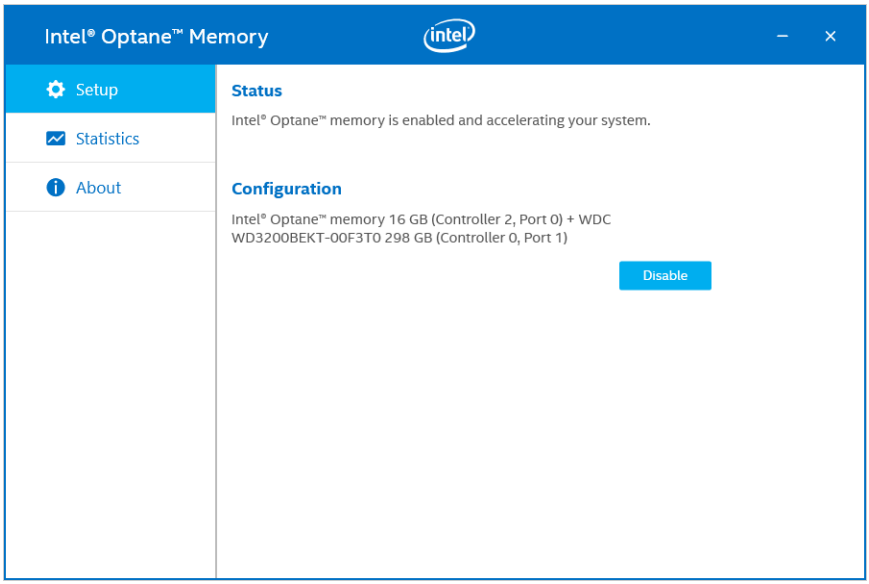
4. This window shows that the volume creation process has started.



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.

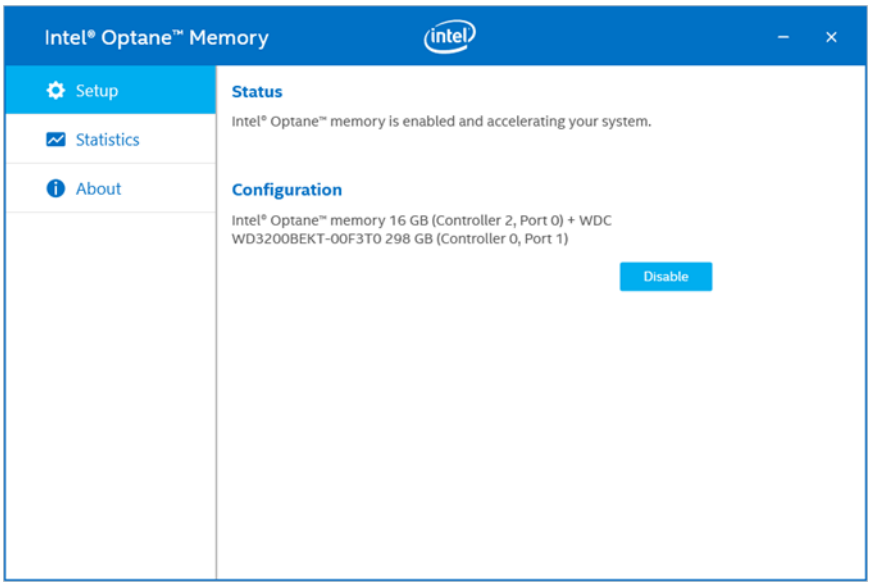


6. Once the system has restarted into the OS, the user can open the Setup page of the Optane™ UI and now see that Optane™ Memory is enabled on the system. The enablement process is now complete.

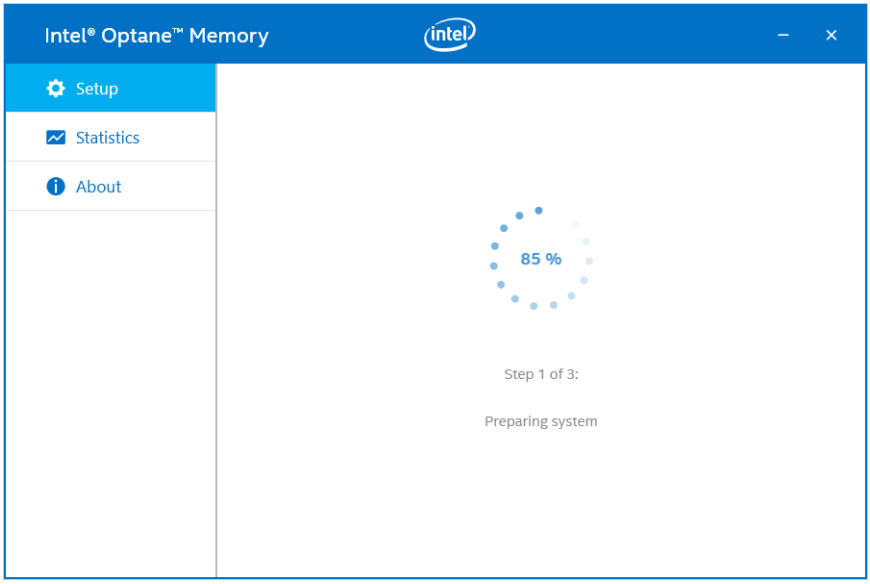


2.1.4 Disabling Optane™ with the Intel® Optane™ Memory UI

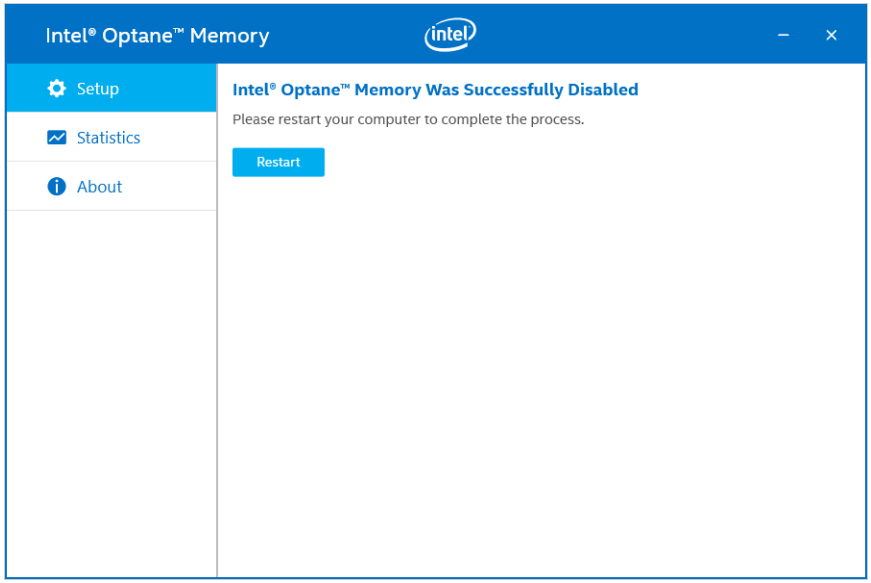
1. Select the "Setup" tab on the left side of the Optane™ UI. Click on the "Disable" button to continue disabling Optane™.



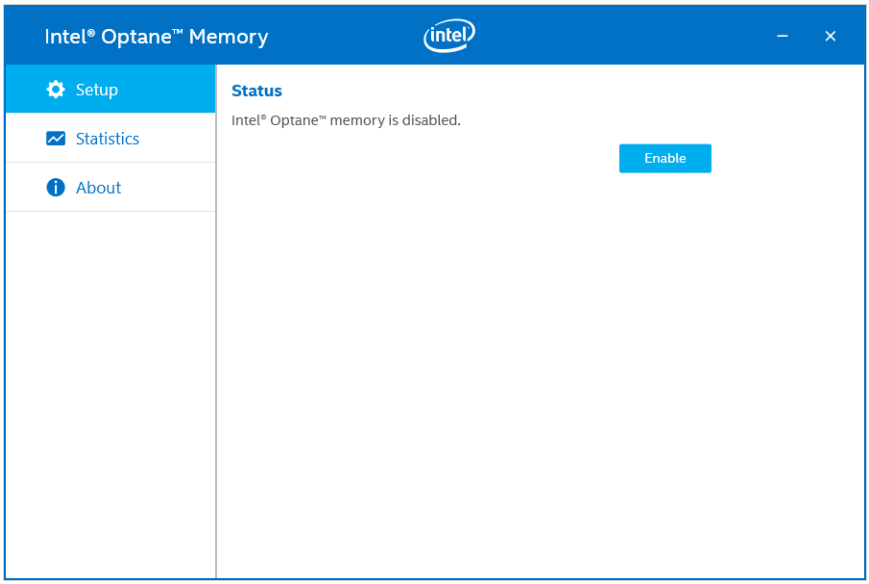
2. Once the process to disable Optane™ has started, the progress will appear in the UI window.



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

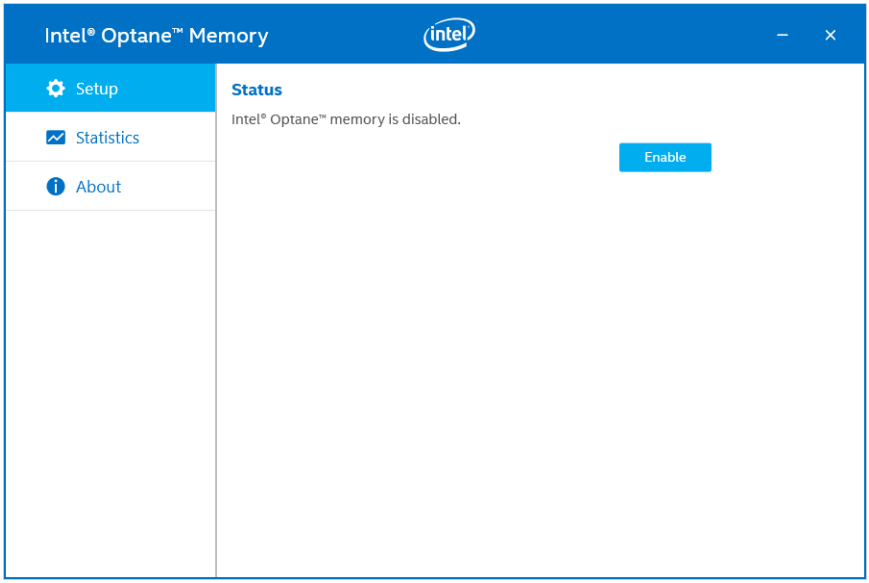


4. Once the system has been rebooted into the OS, the user can open the Optane™ UI Setup page to verify that the memory volume is no longer enabled.

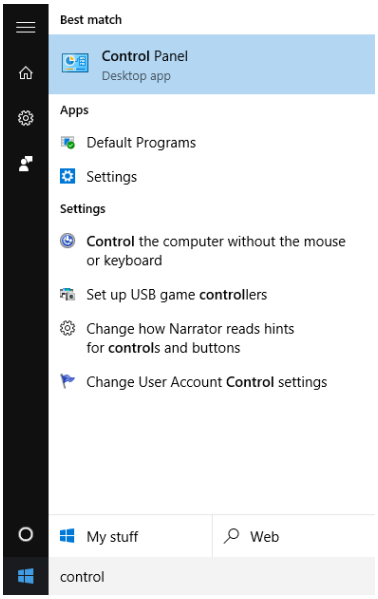


2.1.5 Uninstalling the Intel® Optane™ Memory UI.

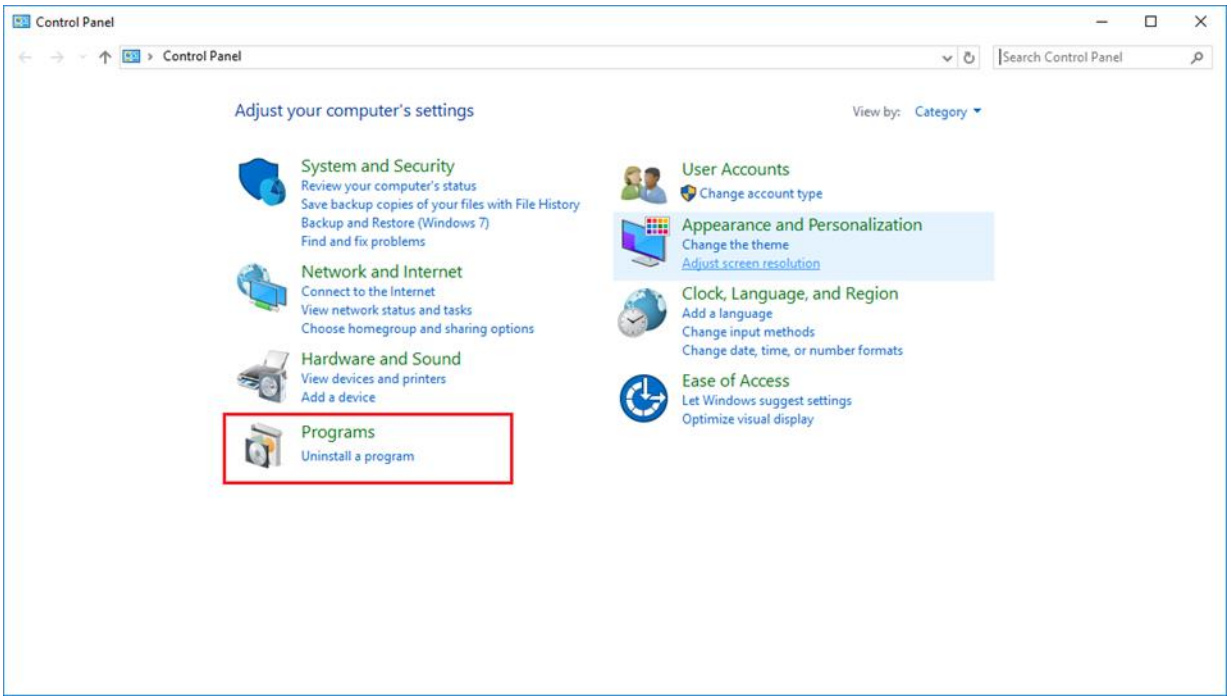
1. Verify that Optane™ has been disabled before uninstalling the UI.



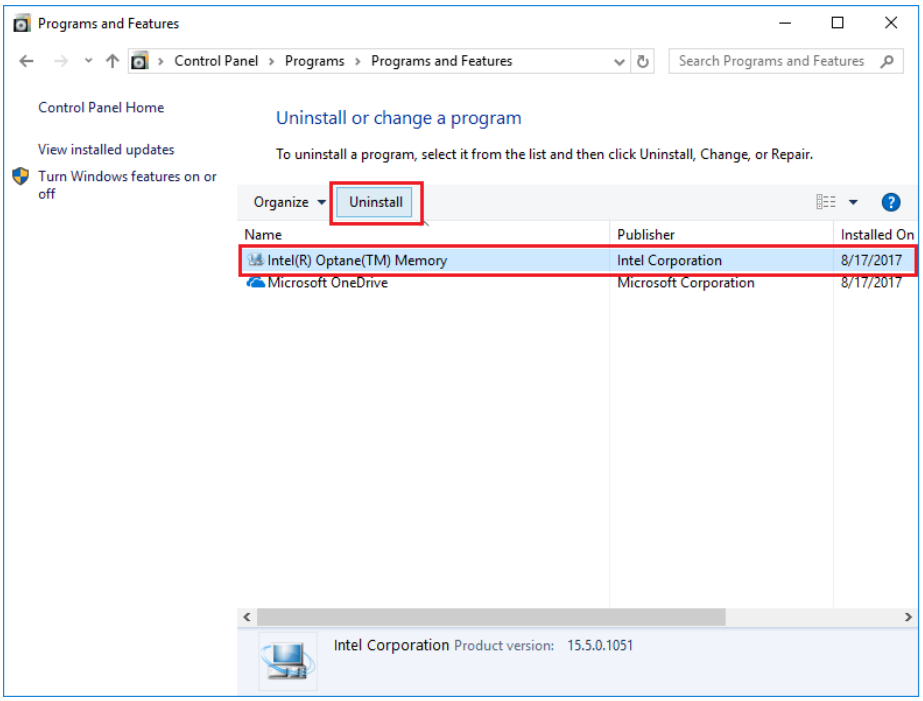
2. Search for 'Control Panel' using the Windows Start Menu



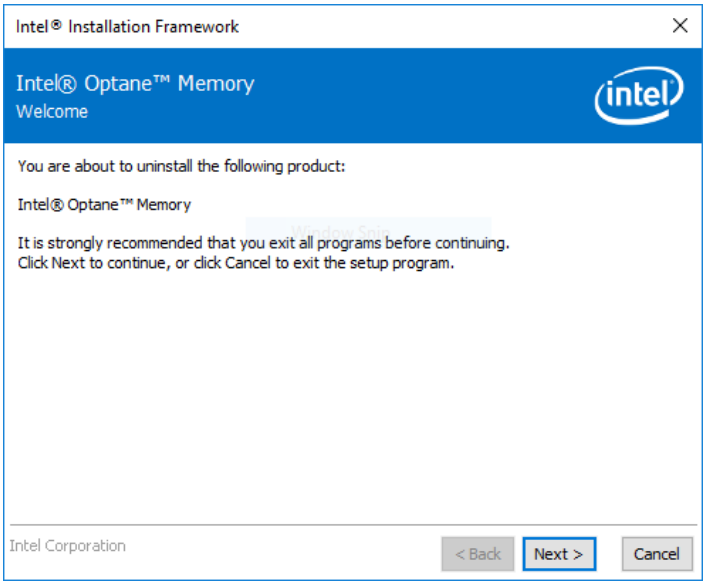
3. Select the 'Uninstall a program' link, located under "Programs' in the Control Panel



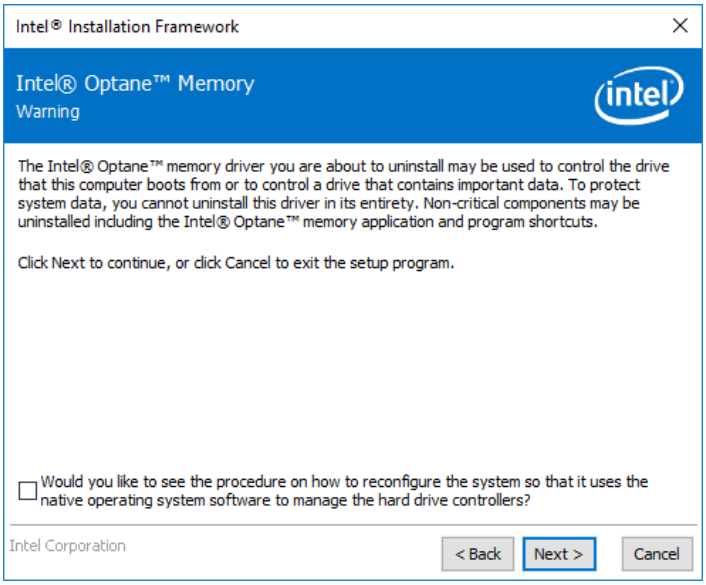
4. Highlight the 'Intel® Optane™ Memory' driver from the list. Click the uninstall option.



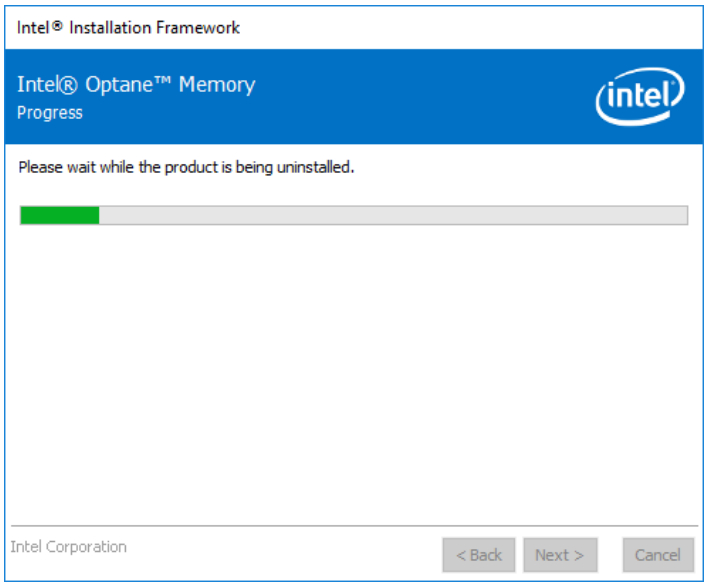
5. After clicking the option to uninstall in control panel, the Optane™ Memory window below will appear. Click next to continue with uninstalling the Optane™ Memory UI.



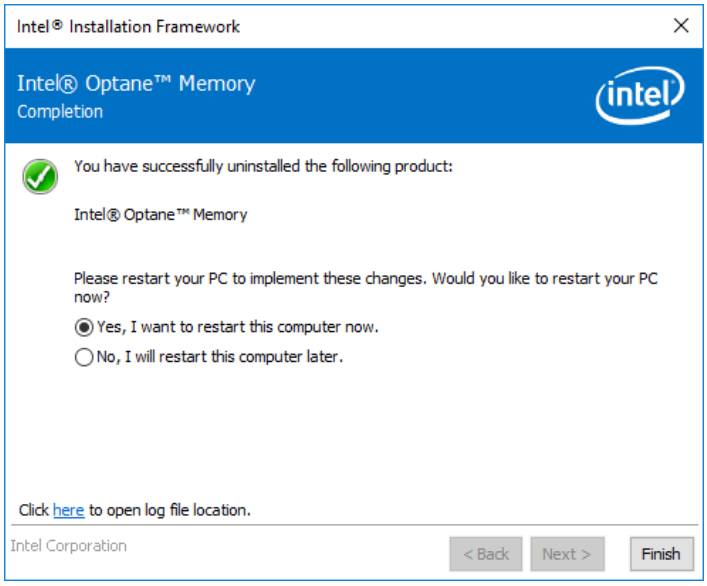
6. This window provides information about what the Optane™ Memory driver controls on the system. Click 'Next' to continue uninstalling the Optane™ Memory UI.



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



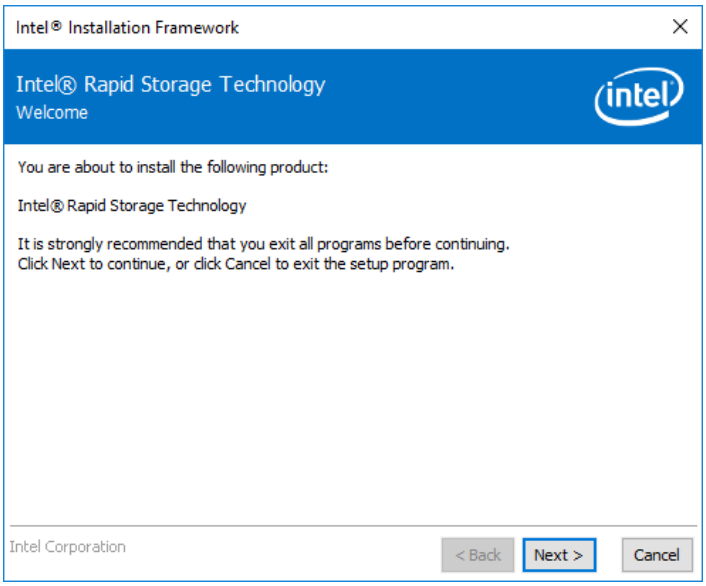
10. A reboot is required to complete the process of uninstalling the Optane™ Memory UI from the platform. Please click 'Finish' to continue and reboot the system.



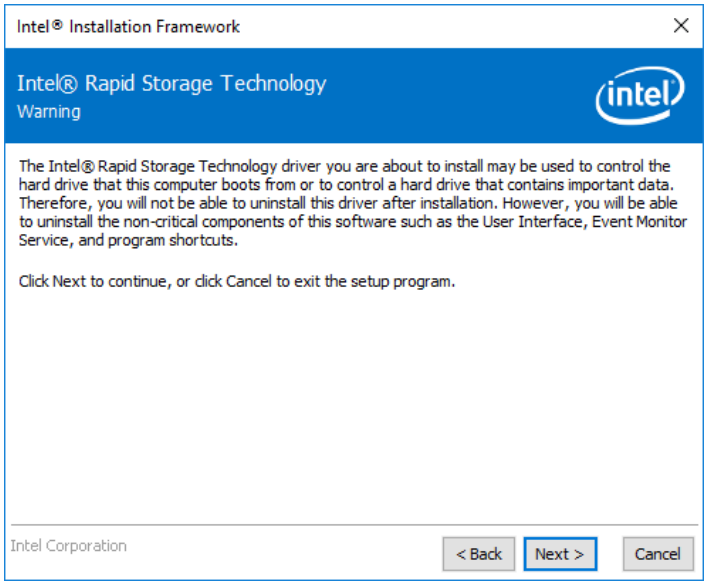
2.2 RST UI

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

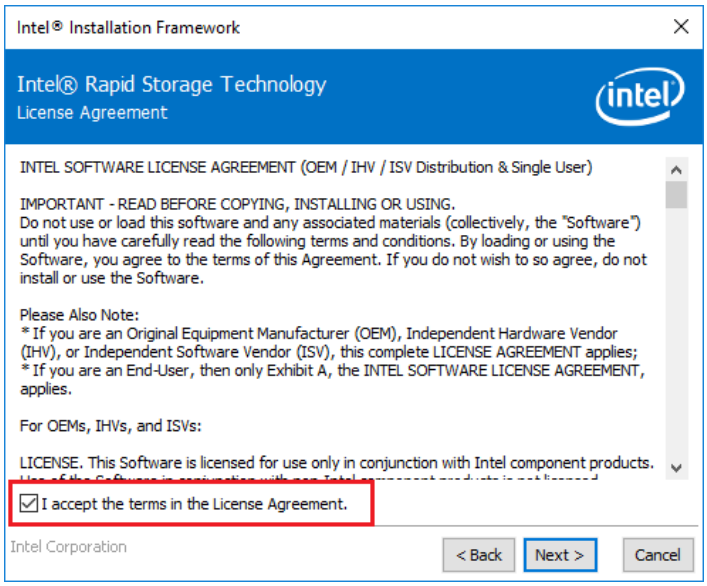
2. Run the executable SetupRST.exe from the downloaded package. The window pictured below will appear. Click 'Next' to continue.



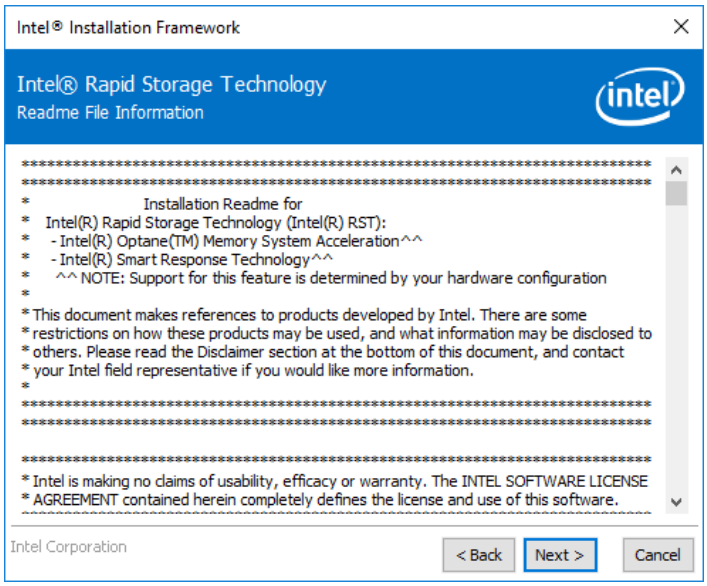
3. This window provides a brief caution to the user that the driver itself will not be able to be uninstalled after installation completes. The user can click 'Next' to continue the process



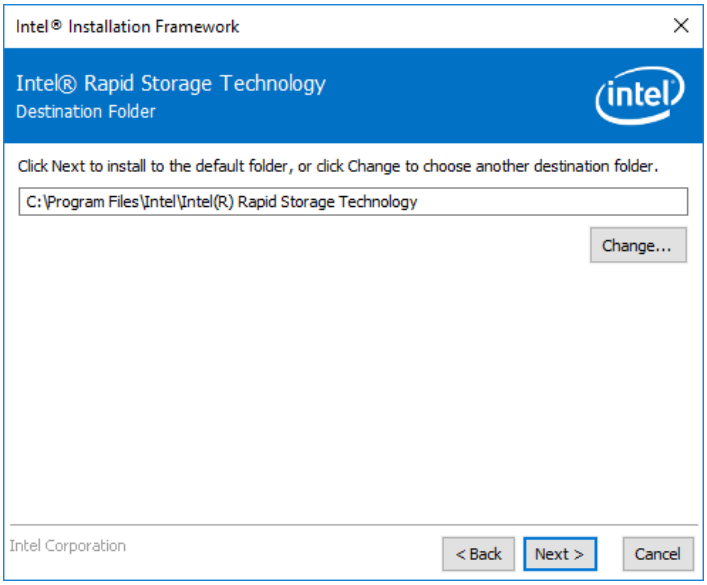
4. This window informs the user of the License Agreement for this product. The user must check the box before clicking 'Next' to continue.



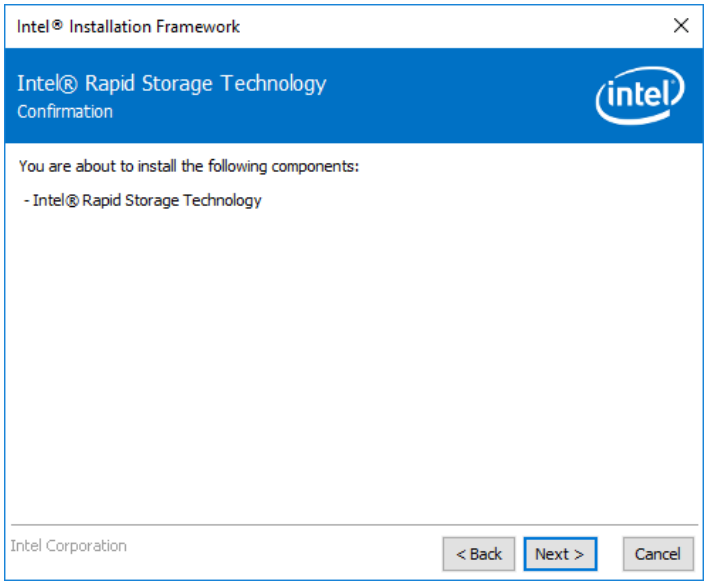
5. This window provides the ReadMe information regarding the options of the SetupRST.exe. The user can click 'Next' to continue with the install.



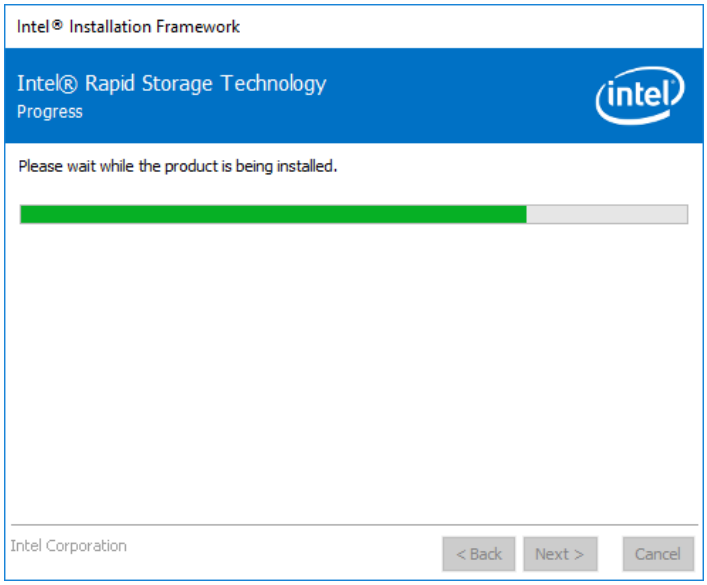
6. This window shows the location where the RST files will be saved to. The user can change the location by clicking on the ‘Change’ button, or continue the install by clicking ‘Next’.



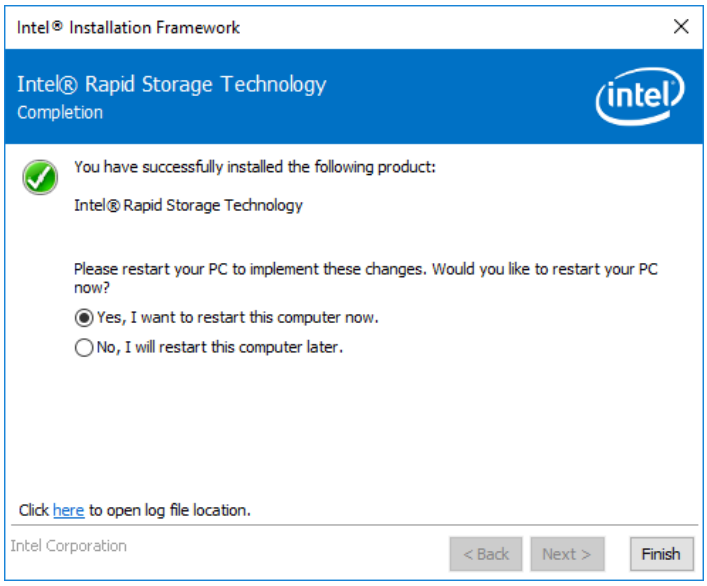
7. This window informs the user for a final time that the software is about to be installed. The user can choose to go ‘Back’, ‘Cancel’ out the installation or click ‘Next’ to continue.



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

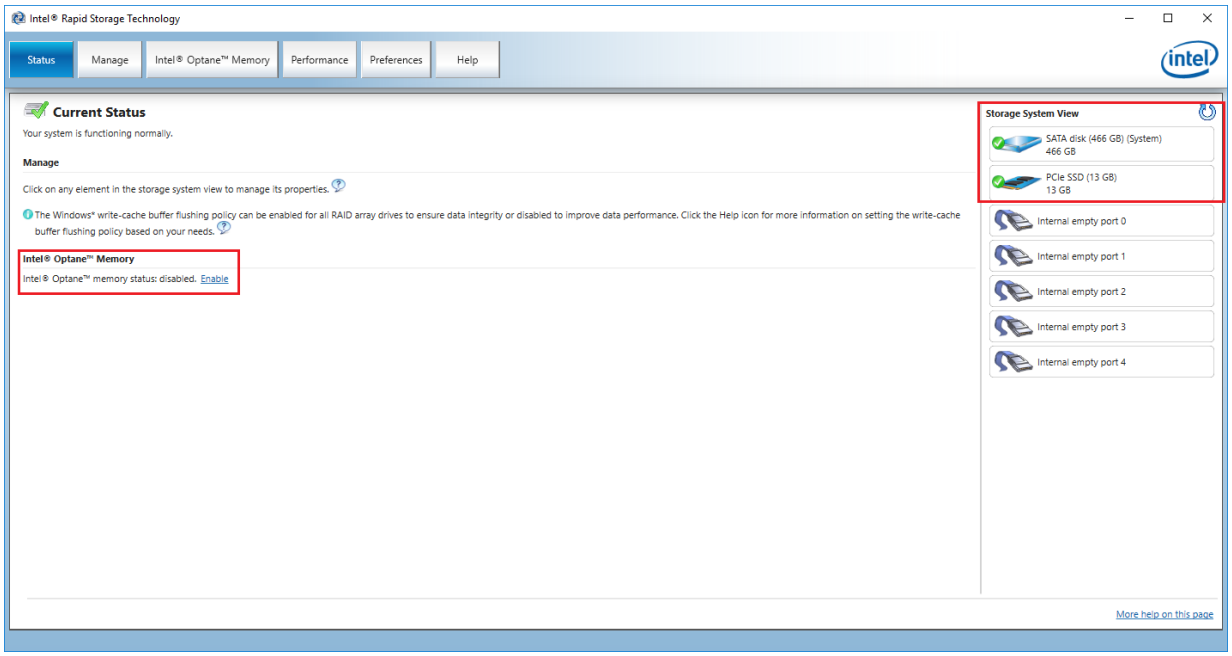


9. The installation process has been successful. The system will need to be rebooted in order to complete the installation process. The user can choose to do the reboot at this point, or decide to do it at a later time. Click 'Finish' to either close the window or reboot the system.

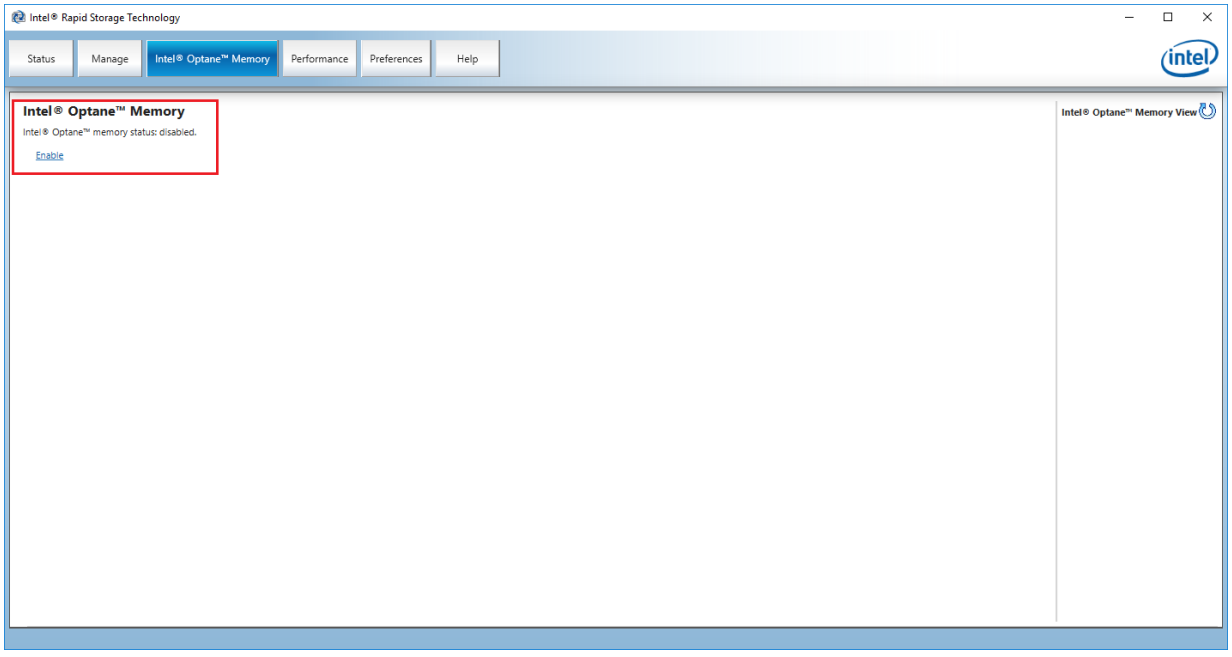


2.2.1 Enabling Optane™ with the RST Legacy UI

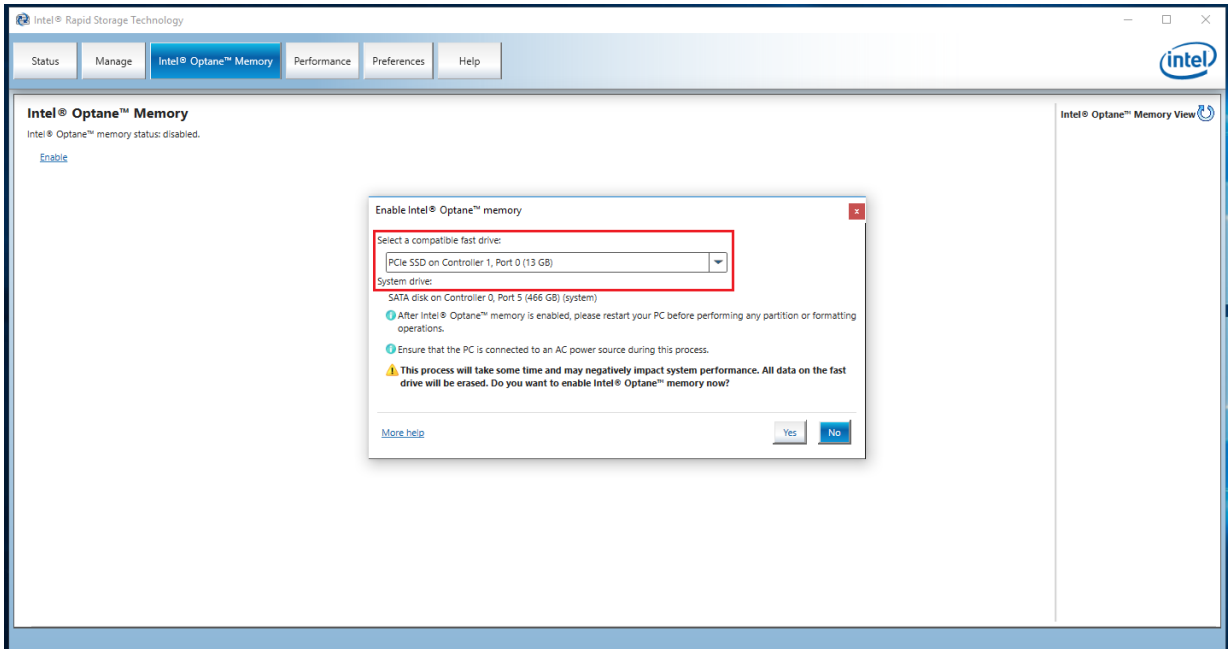
1. Ensure that the UI shows the Optane module and slow media. If system is correctly configured, there will be an option to "Enable" on the Status page.



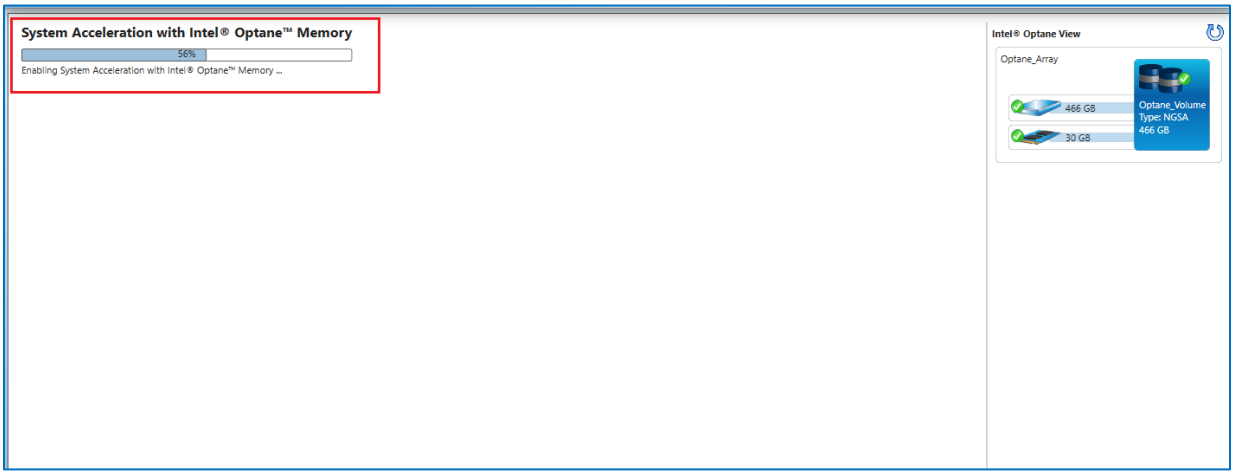
2. The option to "Enable" will also be available on the "Intel Optane™ Memory page.



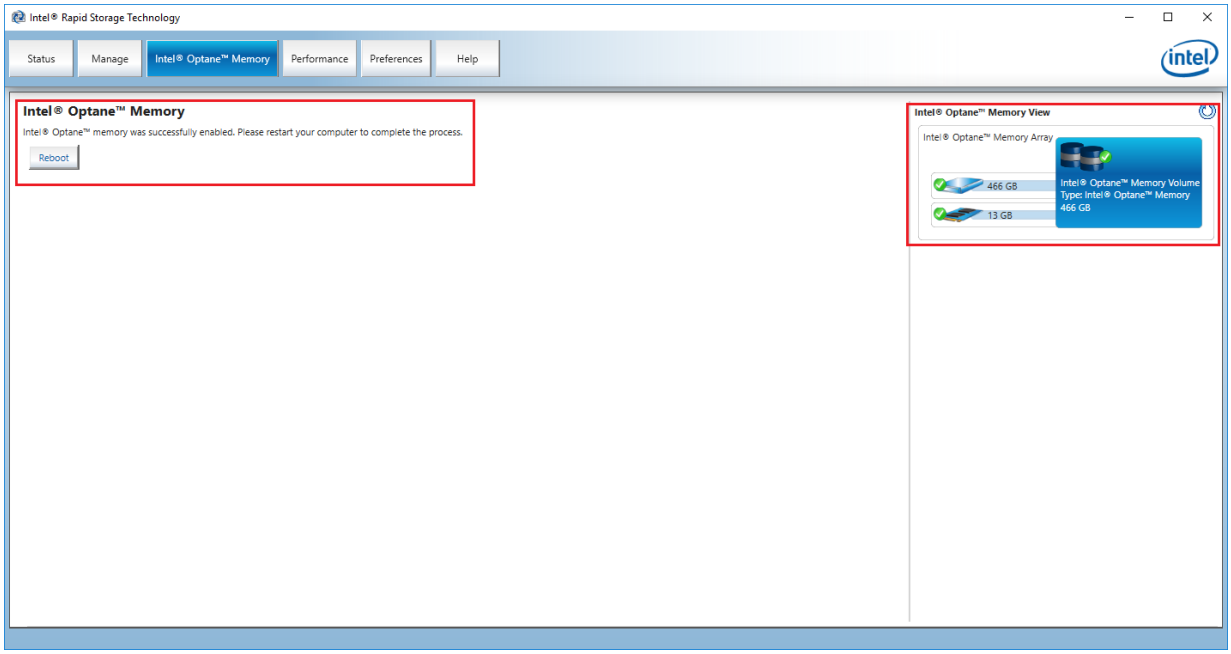
3. If multiple Optane™ modules are installed on the system, use the drop down menu to select the desired device to use for acceleration.



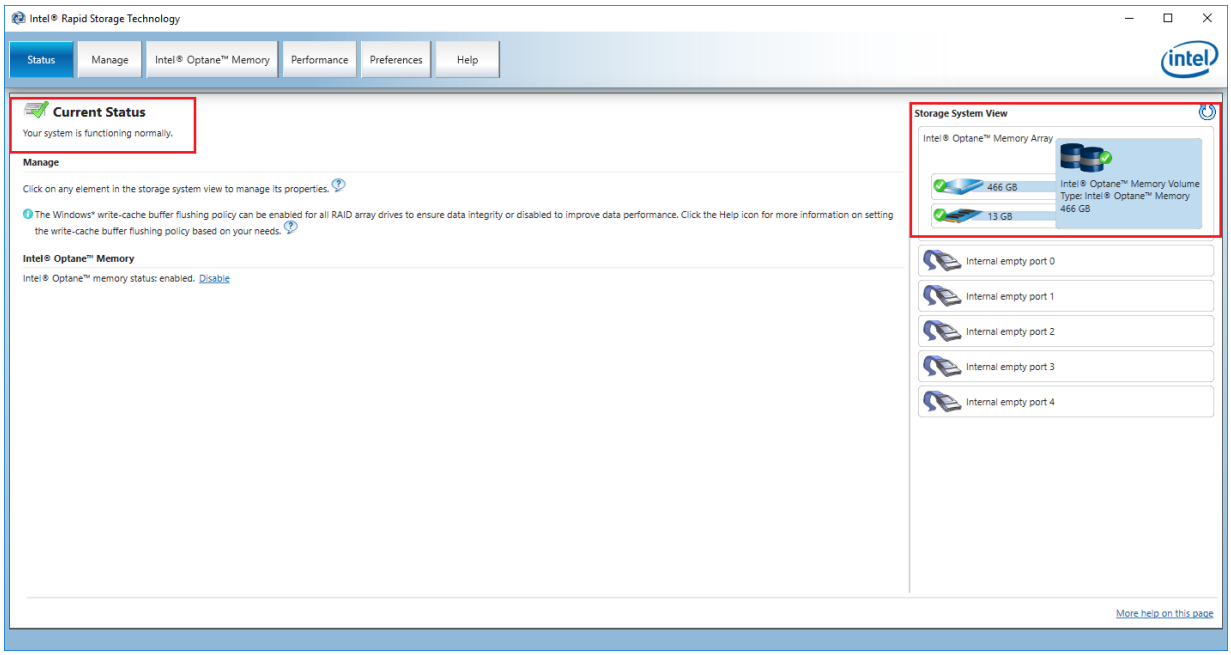
4. If the Optane™ module is 32GB or larger, a progress bar will appear during the Optane™ creation process.



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

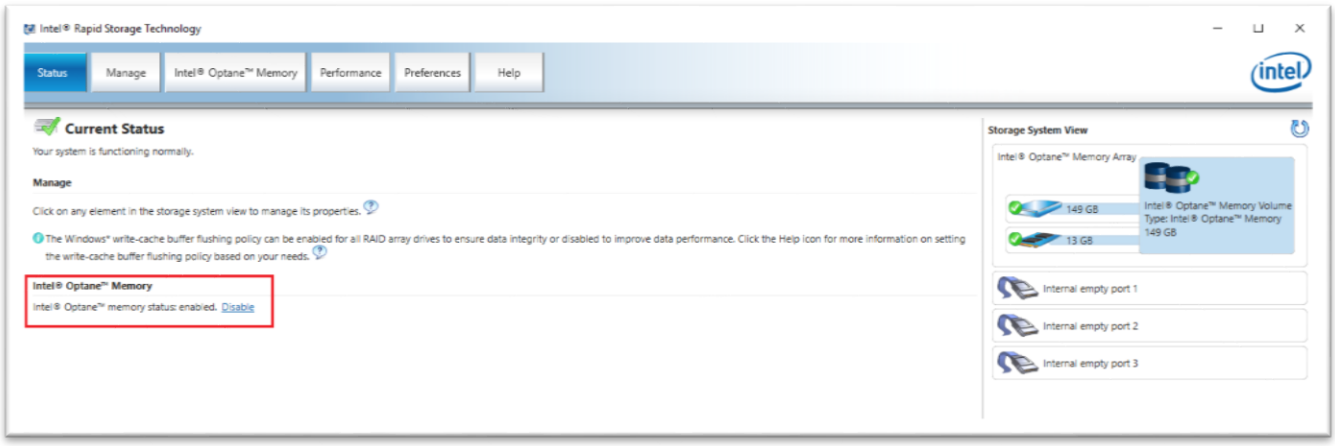


6. After the system has rebooted, reopen the UI to verify that the Optane™ volume is functioning normally.

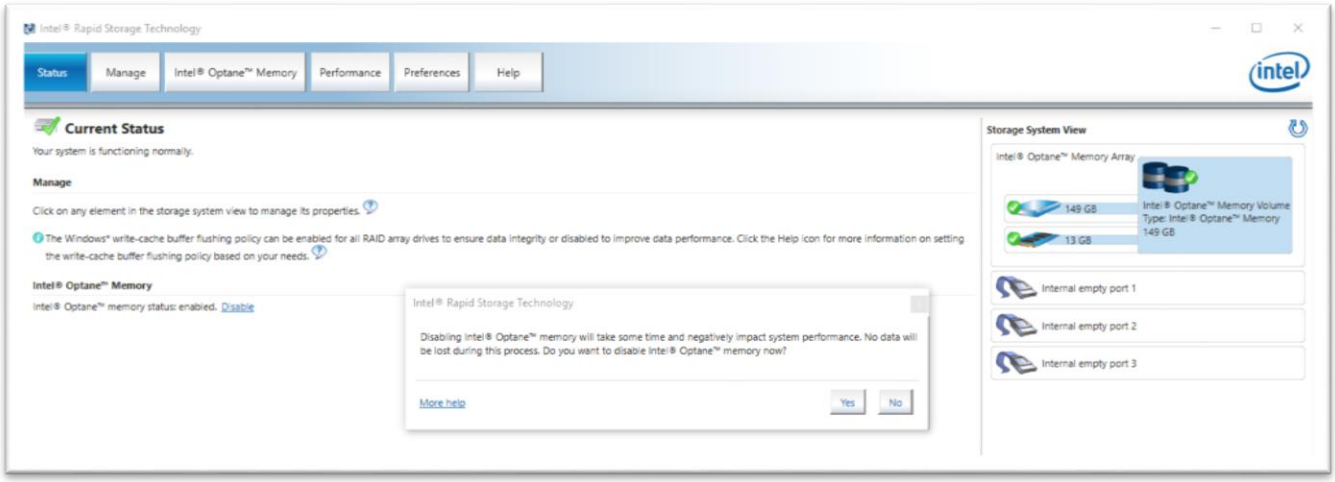


2.2.2 Disabling Optane™ with the RST Legacy UI

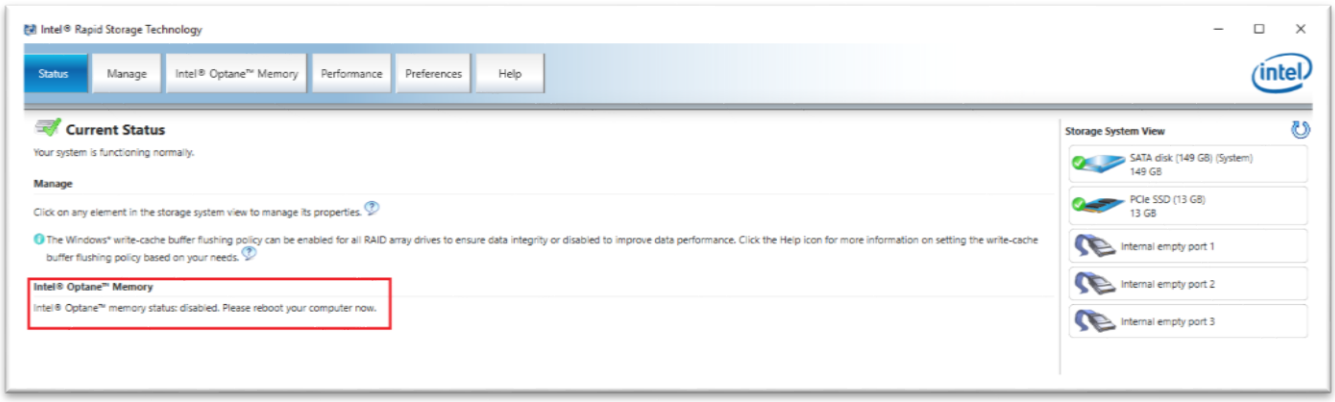
1. On the status page, click on the ‘Disable’ link.



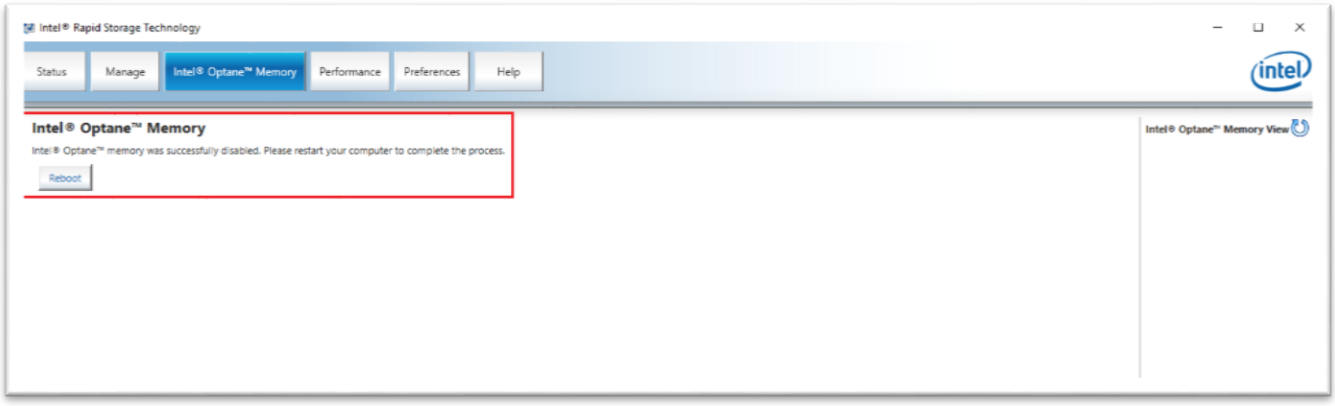
2. A pop up will appear to confirm if the user wants to disable. Click ‘Yes’ to continue.



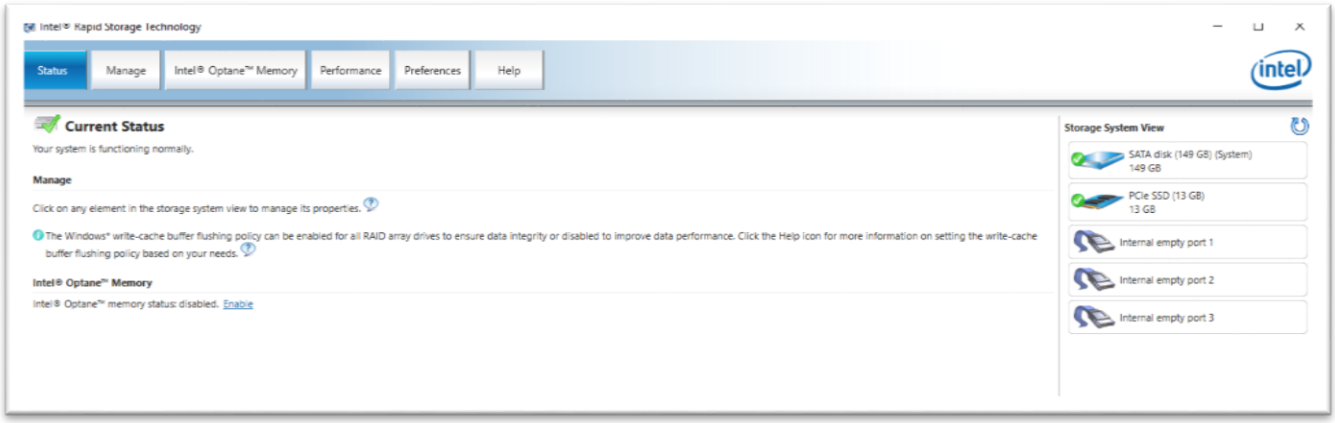
3. Once the volume is disabled, the user will be asked to reboot the system.



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

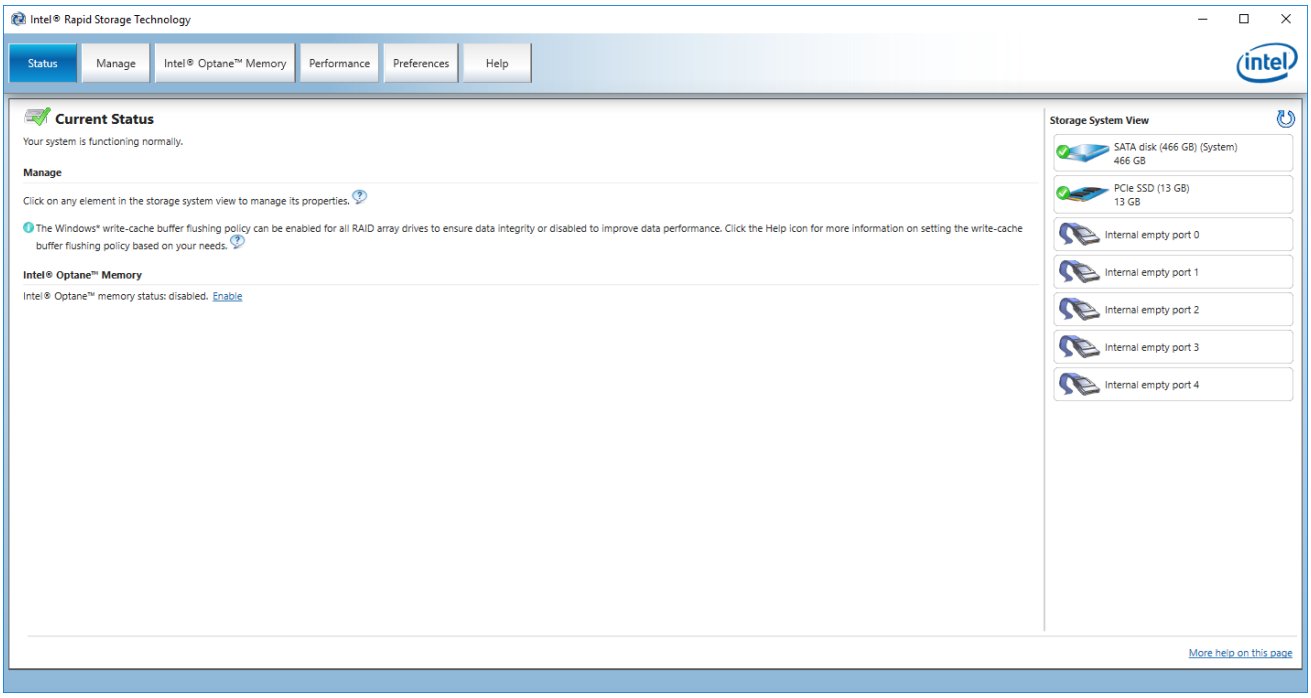


5. After rebooting, UI will show both disks in a normal state and have the option to 'Enable' Optane™ available.

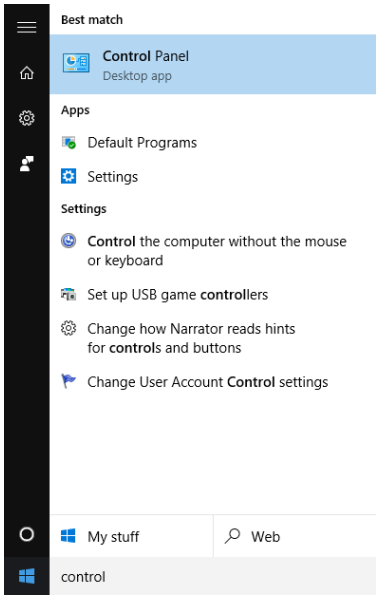


2.2.3 Uninstalling the UI

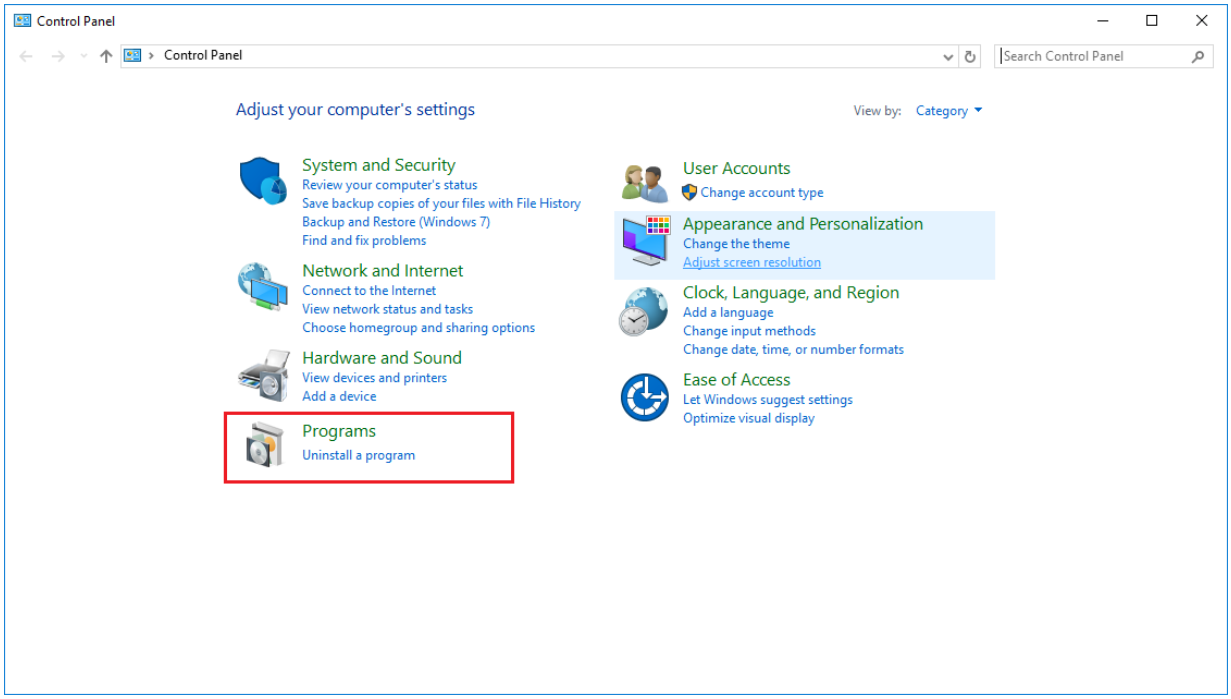
1. Verify that Optane™ has been disabled before uninstalling the UI.



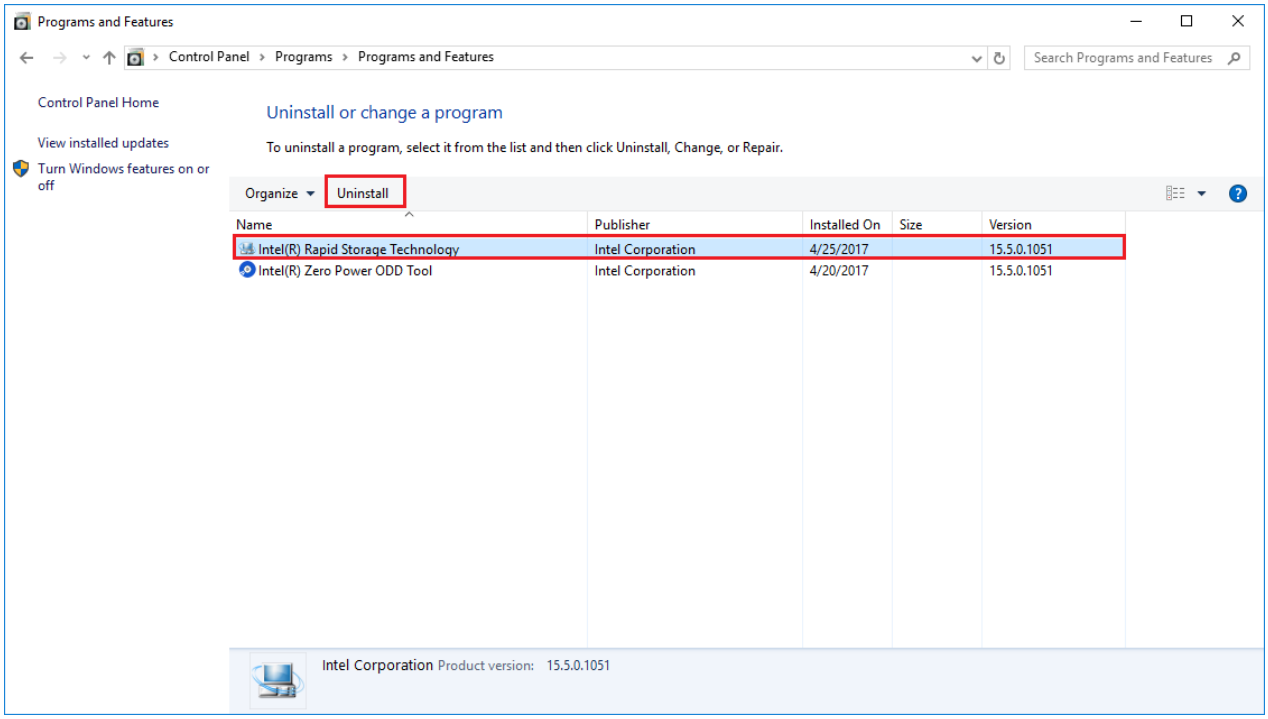
2. Search for 'Control Panel' using the Windows Start Menu



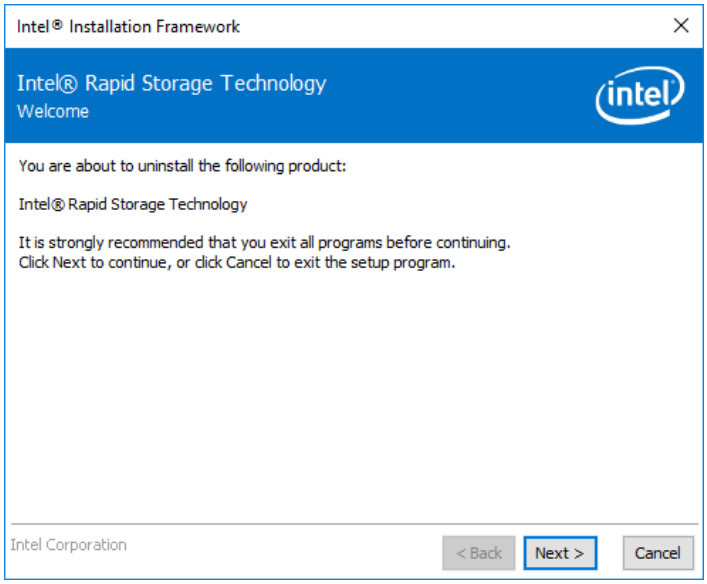
3. Select the ‘Uninstall a program’ link, located under “Programs’ in the Control Panel



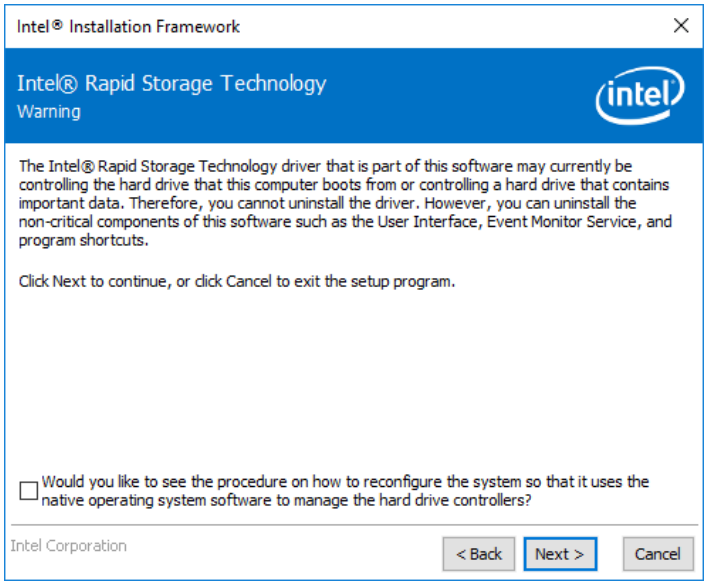
4. If the Legacy UI is loaded on the system, highlight the ‘Intel® Rapid Storage Technology’ driver from the list. Click the uninstall option.



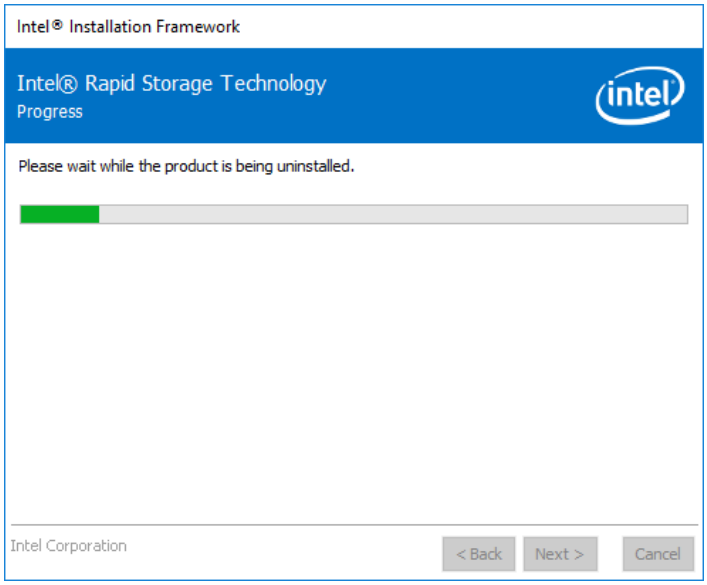
5. At this point, the RST installer will begin the uninstallation process. Click 'Next' to continue.



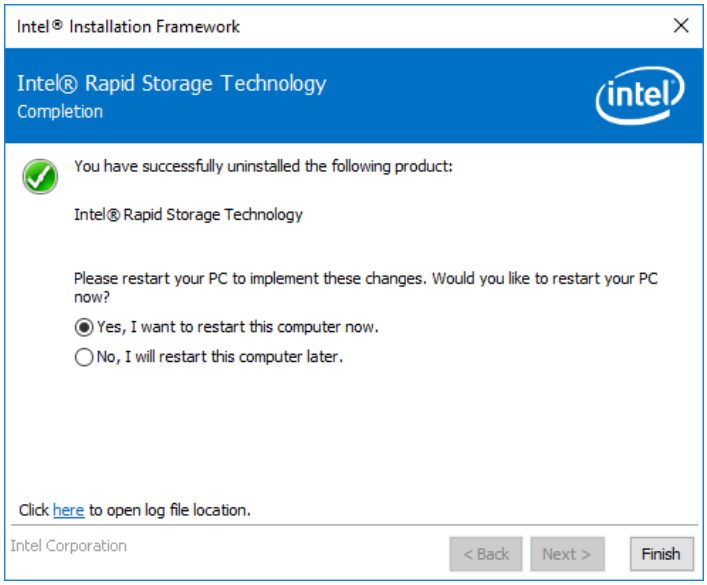
6. Click 'Next' to continue uninstalling. Check the box if the user would like to see the process on reconfiguring the system to use the native operating system software. Most uninstalls do not require this step.



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



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



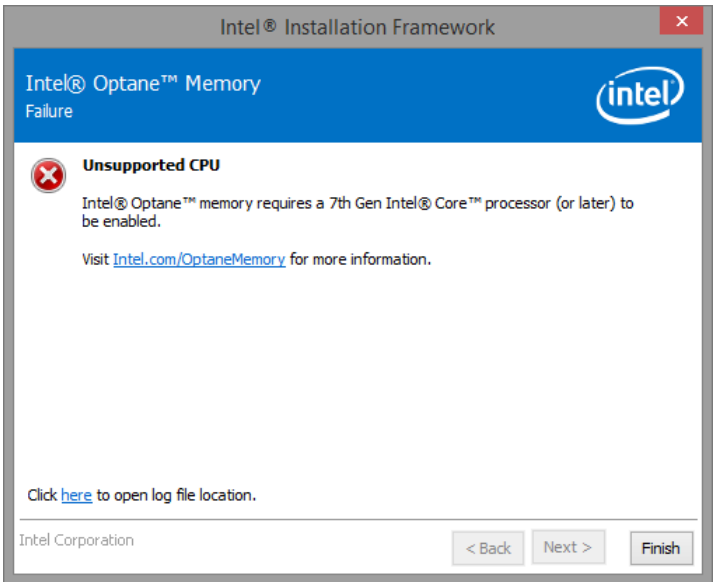
3 Troubleshooting

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

3.1 Optane™ UI Installation Failures

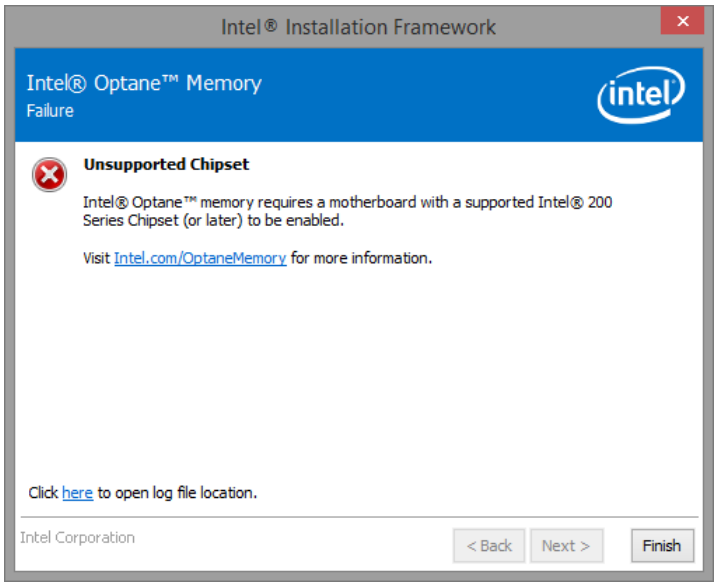
3.1.1 Unsupported CPU

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.



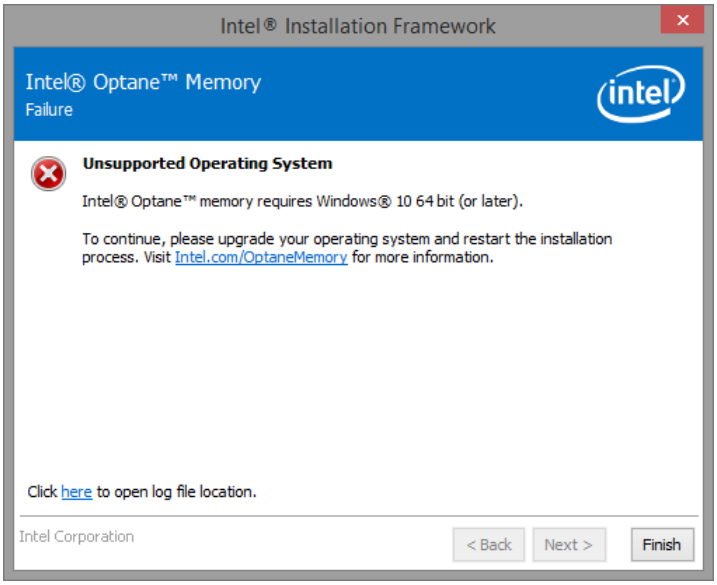
3.1.2 Unsupported Chipset

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.



3.1.3 Unsupported Operating System

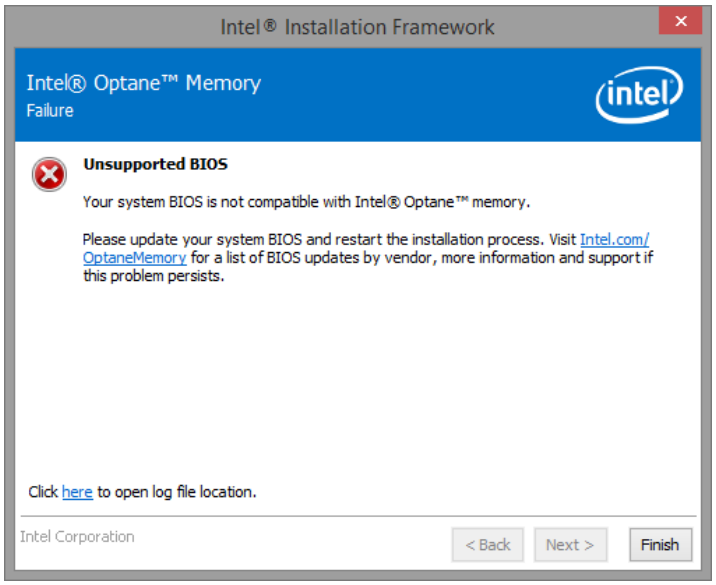
This window will appear if the installation package is run on a system with an unsupported OS. Please check the minimum requirements provided in section 1.2 of this document for further details.



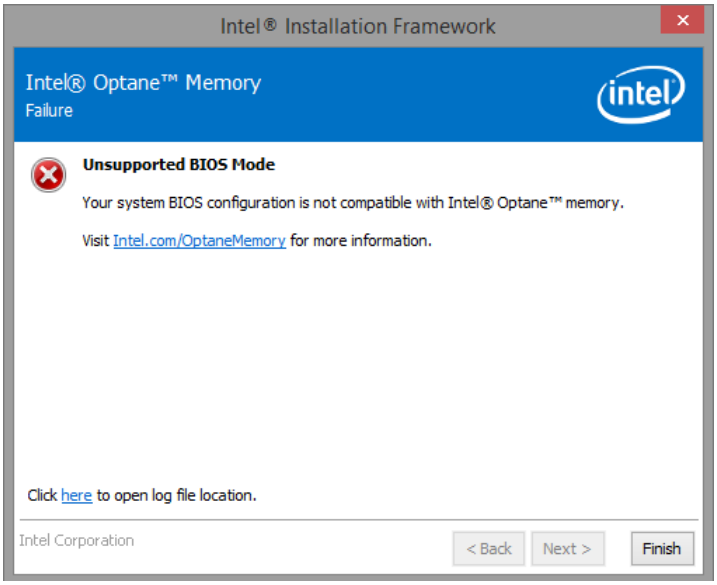
3.1.4 Unsupported BIOS

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.

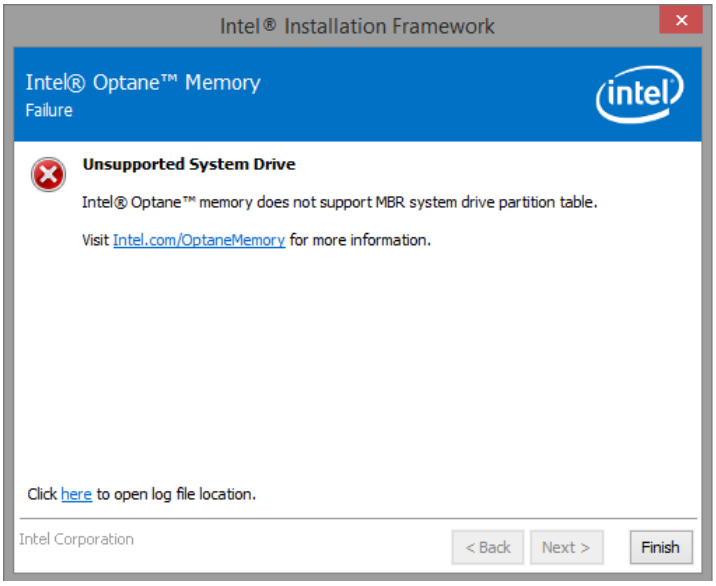


This window will appear if the installation is on a system in Legacy mode, which is an unsupported BIOS mode for Optane™. To resolve this issue, a BIOS update may be required. Consult the Motherboard vender's support website for the latest Intel® Optane™ memory supported BIOS. Visit https://www.intel.com/content/www/us/en/support/memory-and-storage/intel-optane-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

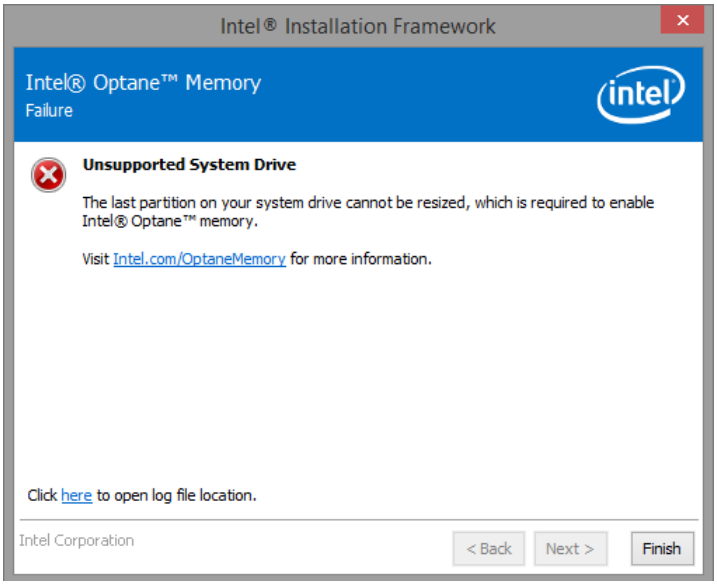


3.1.5 Unsupported System Drive

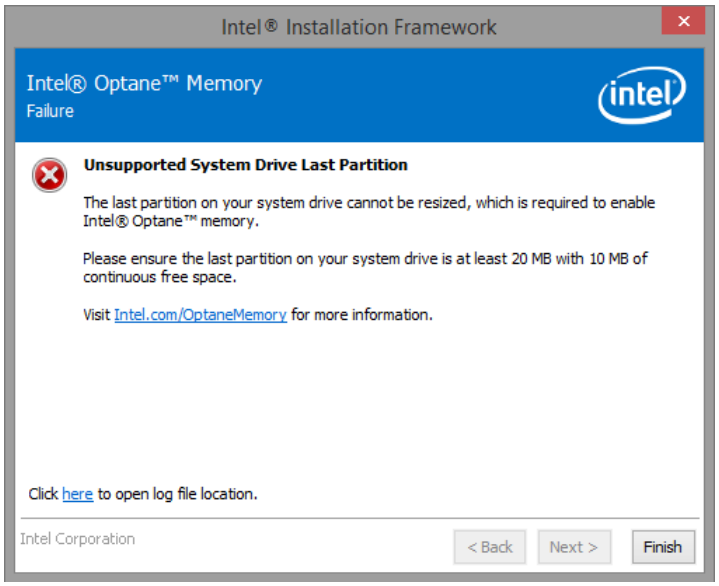
This window will appear if the installation is attempted on a system that has an unsupported MBR system drive partition table. To resolve this issue, the drive partition table will need to be changed to GPT and the operating system reinstalled. Consult the platform vender's User Manual for instructions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



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: https://www.intel.com/content/www/us/en/support/memory-and-storage/intel-optane-memory/000024253.html

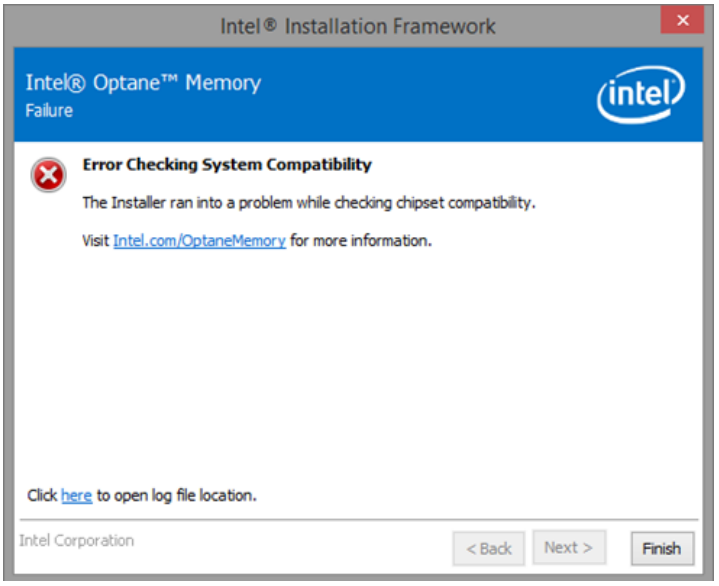


This window will appear if the installation is run on a system where the last partition cannot be resized, because it does not have enough free space.

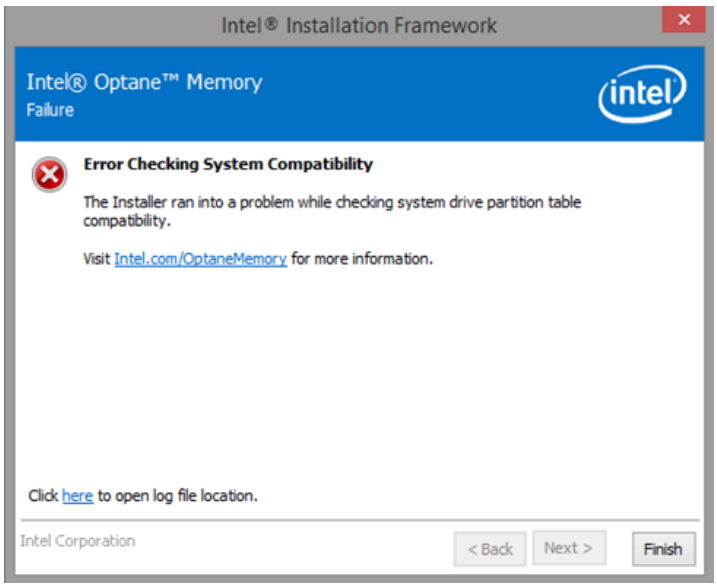


3.1.6 Error Checking System Compatibility

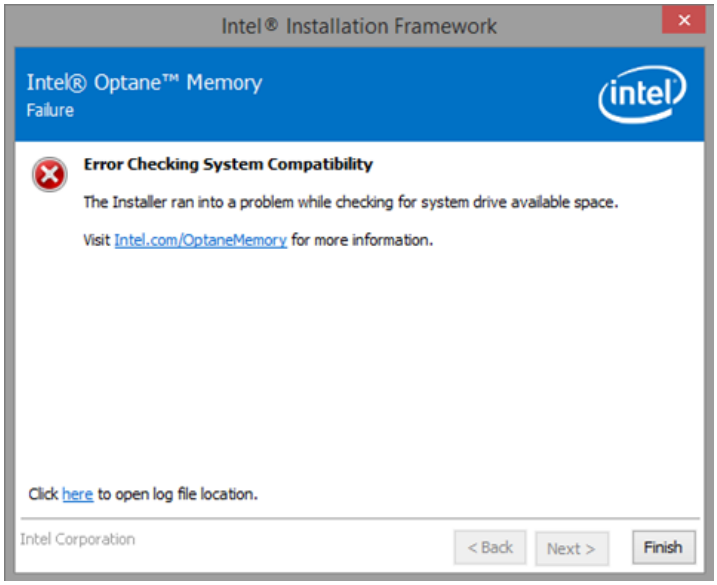
This window will appear if installer has a failure while checking the platform for chipset compatibility.



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

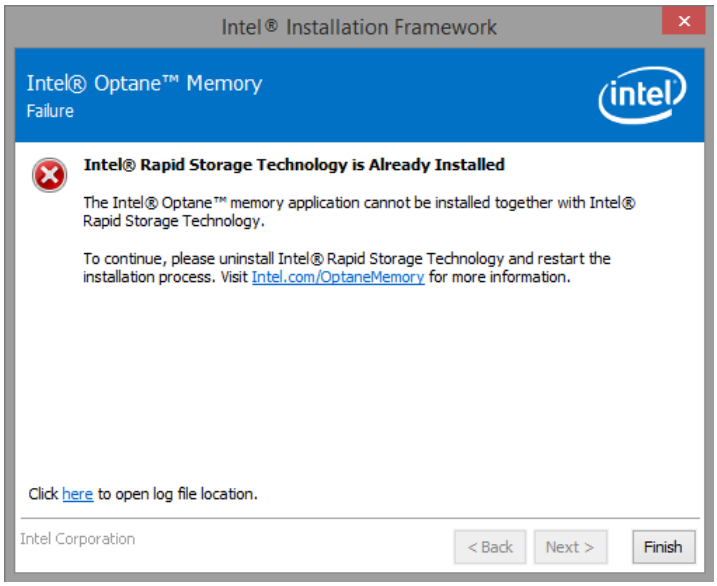


This window will appear if the installation package is run and fails to check the available space on the last partition of the system drive. Please refer to the following link for more details: https://www.intel.com/content/www/us/en/support/memory-and-storage/intel-optane-memory/000024253.html



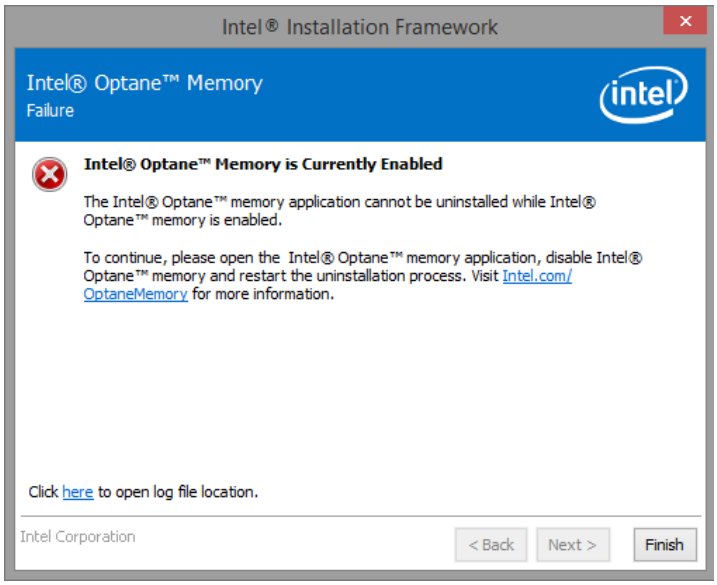
3.1.7 Intel® Rapid Storage Technology is Already Installed

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™ memory application.



3.1.8 Intel® Optane™ Memory is Currently Enabled

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



3.2 Hardware Failure

3.2.1 Fast Media Missing At Boot

If the system boots and the Optane™ 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™ 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™ Memory module and ensure that it is correctly installed into the system.
2. If the Optane™ 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™ Memory Module.
    b. Disconnect the slow media and boot into the BIOS menu. Enter the RST HII UI and confirm if the Optane™ 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™ Memory module is connected to.
    c. Confirm that the Optane™ 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™ 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™ 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™ Memory module with a replacement slow media, the Optane™ module must be disassociated. This is required in order to reuse it to enable Optane™ with the slow media replacement.

Note: Disassociation removes the Optane™ configuration information from the Optane™ 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™.

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)
3. The fast media (Intel® Optane™ 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™ 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® Optane™ 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™ memory module upgrades or replacements for systems that already have Intel® Optane™ Memory enabled. Whether upgrading the memory module or replacing a faulty memory module, the following steps will apply:

3.2.4.1 Disable Optane™ Memory:

1. Launch the Intel® Optane™ Memory UI or launch the Intel® RST UI
2. Click the 'Setup' tab for the Optane™ UI, the Intel Optane™ 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™ 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™ memory module:

1. Power down the computer
2. Open the computer and locate the old or faulty Optane™ memory module to be replaced.
   Note: Consult the computer manufacturer for the location of the slot for the Optane™ 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™ Memory UI or launch the Intel® RST UI.
2. Click on the 'Setup' tab, or the Optane™ 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.
5. Once the UI has completed all tasks for enabling Optane™ 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™ Memory volumes, the WinRE.wim file can be updated with an Optane™ 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\harddisk0\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

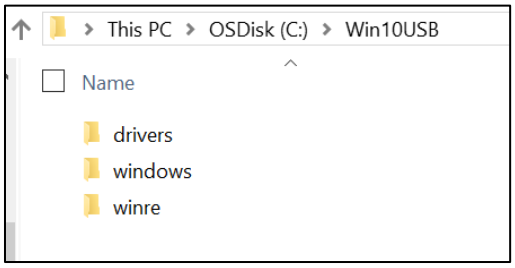
- Windows* 10 64b ISO
- F6 Intel® Rapid Storage Technology 15.5 or later SW/driver package available from downloadcenter.intel.com.
- USB Key for installation

Steps:

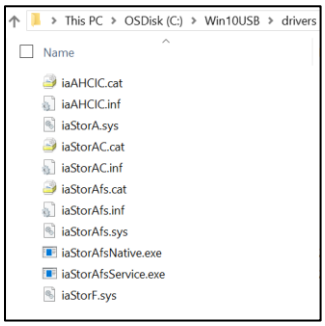
1. Create a USB Bootable Key from the Windows* 10 OS ISO Image

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

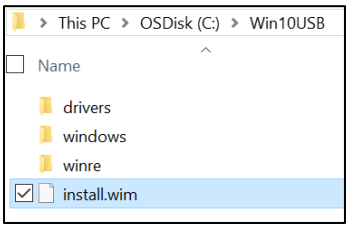
2. Create a temporary working directory on the local PC (Ex. C:\Win10USB)
3. In the working directory, create 3 sub directories named "windows", "winre" and "drivers"



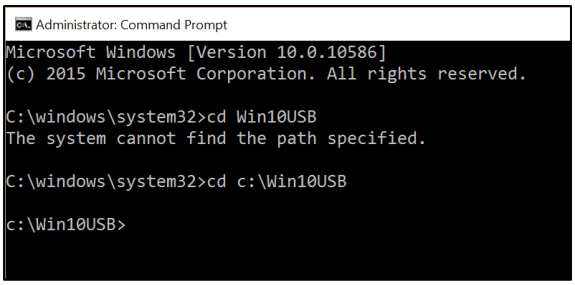
4. Extract Intel® Rapid Storage Technology driver to the "drivers" subdirectory.



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



6. 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.

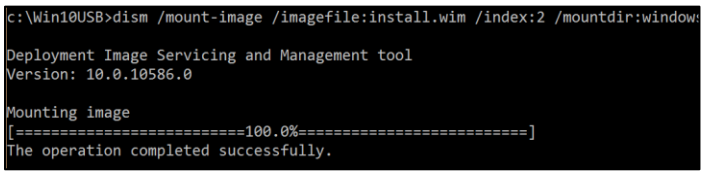
To determine the index, run the command: *dism /get-wiminfo /wimfile:install.wim*

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

```
c:\Win10USB>dism /get-wiminfo /wimfile:install.wim

Deployment Image Servicing and Management tool
Version: 10.0.10586.0

Details for image : install.wim

Index : 1
Name : Windows 10 Pro
Description : Windows 10 Pro
Size : 14,747,431,455 bytes

Index : 2
Name : Windows 10 Home
Description : Windows 10 Home
Size : 14,586,404,734 bytes

The operation completed successfully.

c:\Win10USB>
```

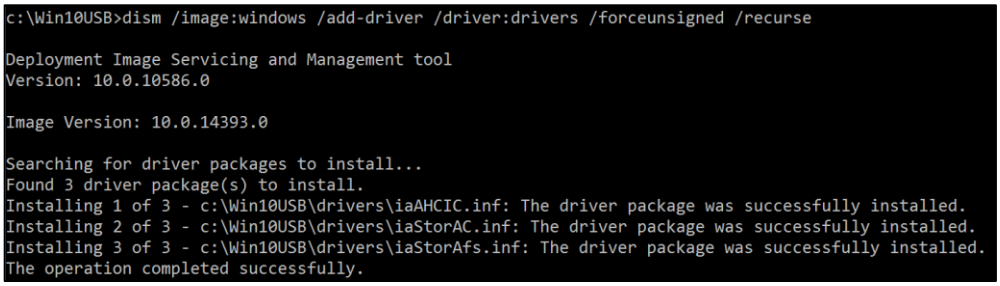
8. Modify the ”install.wim” file by running the following commands:
   Mount the Windows* Image:

```
dism /mount-image /imagefile:install.wim /index:2 /mountdir:windows
```



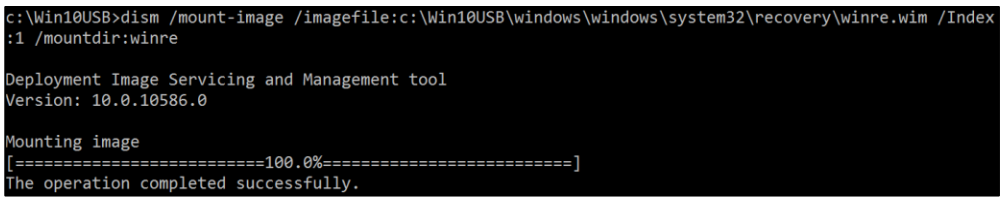
9. Add the Intel® Rapid Storage Technology drivers to the Windows* Image:

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



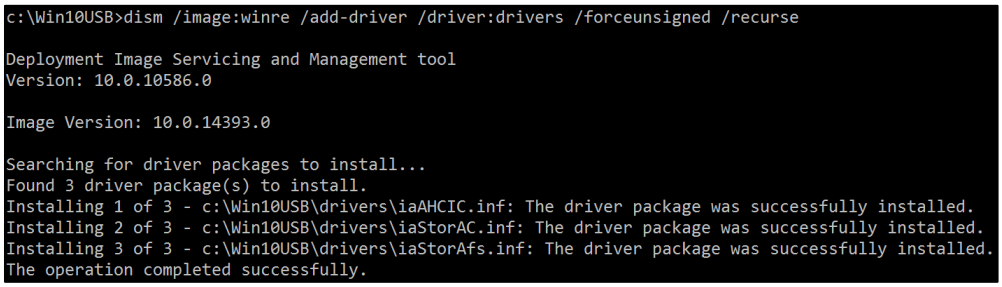
10. Mount the Windows* Recovery Image:

```
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
[==========================100.0%==========================]
Unmounting image
[==========================100.0%==========================]
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
[==========================100.0%==========================]
Unmounting image
[==========================100.0%==========================]
The operation completed successfully.
```

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