Intel® Rapid Storage Technology (Intel® RST) 17.8.0.1065 – Production Version Release

23 December 2019

Intel Confidential

Supported Operating Systems
Microsoft Windows 10 19H2 x64*
Microsoft Windows Server 2016 x64 Edition*

Revision History

Date	Driver Revision	Build Number
23 December 2019	17.8.0.1065 Release	1065
12 December 2019	17.8.0.1058 Release	1058
27 November 2019	17.8.0.1054 Release	1054
06 November 2019	17.8.0.1050 Release	1050
04 October 2019	17.8.0.1041 Release	1041
03 October 2019	17.8.0.1037 Release	1037
30 August 2019	17.8.0.1032 Release	1032
13 August 2019	17.8.0.1028 release	1028
12 August 2019	17.8.0.1026 release	1026
03 July 2019	17.8.0.1022 release	1022
13 June 2019	17.8.0.1007 Pre Alpha release	1007

Notes:

- Known Issue is defined as a potential Intel® RST issue that has been replicated internally by the Intel® RST team but has not been root caused to be an Intel® RST defect.

- The RAID OROM & UEFI version for this release is 17.8.0.4507, the driver and user interface version are 17.8.0.1065. For Intel® RST Premium features (e.g. RAID, Intel® Optane™ memory, CPU Attached Storage), it is recommended that both the Intel® RST pre-OS and Intel® RST OS driver components are updated. Please contact your CE for further details.

  - Intel® Optane™ Memory and Storage Management (HSA) app is not a part of this driver package. It will be released separately.

- New features and updates:

  1. **Disable File Cache for Intel® Optane™ Memory H10**

     a) **Intel® Optane™ Memory and Storage Manage Status:** The Intel® Optane™ Memory and Storage Management Status Screen will display a message to inform the end user that pinning files/folders/applications is not available and how to re-enable Optane™ Pinning feature using the UI

     b) Re-enable Pinning feature by End user

     c) No impact to File Cache after RST driver Upgrade

  2. **Bandwidth Aggregation support for Intel® Optane™ Memory H10 in DC mode**

  3. **Improvement in Idle Cache cleanup for Intel® Optane™ Hybrid device**

  4. **NVMe IOCTL Pass through support in WinPE**

  5. **Unique RAID alternate ID per platform generation**

  6. **Intel® Optane™ Memory and Storage Management UI enhancements**

     a) Intel® Optane™ Memory and Storage Management application will support displaying limited system and storage related information when SATA Mode is set to AHCI.

     b) Intel® Optane™ Memory and Storage Management application will display both Serial Number and Controller Serial Number for NVME SSD. This feature required both the latest Intel® RST driver and Intel® Optane™ Memory and Storage Management UI.

- For more information on new features and supported hardware for RST 17.8, please refer to Intel® Rapid Storage Technology Release 17.8 Product Requirement Document (CDI # 612985)

- **Enabling Intel® Optane™ memory with H10 (Teton glacier) SSD recommendation**
     a) Intel® Optane™ Memory H10 must be enabled in AC mode.
     b) In addition, good practice is to match the Intel® RST driver version in Windows* PE manufacturing and the shipping image.
     c) For more details please refer technical advisory titled "Intel® Optane™ Memory H10 and Intel® RST Potential Black Screen or No Boot Device Detection" CDI # 612180.

- **Intel® Optane™ memory volume roaming:** Intel® Optane™ memory volume when moved from Intel® RST Premium with Intel® Optane System Acceleration (RAID Mode) to AHCI/non-Optane mode configuration and switched back to Intel® RST Premium with Intel® Optane System Acceleration (RAID Mode) can make the drive non-bootable.

- **RTD3:** If RTD3 is enabled, Windows can turn off disk for very short time (e.g. 20ms). The minimum off   time for some disks can be much longer (even 1s). If the disk is turned on too fast, it can hang in some undefined state. RTD3 should be disabled if the disk specification states longer minimum off time.

- For more information on these features, please refer to RST_OEM TechGuide_17.xx_Rev1.3.1_RST17.8.pdf or later.

Resolved Issues

Resolved Issues In 17.8.0.1065 – Release

ID	Title	Operating System
1608128202	Observing failure while running RCmpSata.efi in EFI shell with TG	windows.10_rs5.x64
1808093966	Intel® RST Application Crashes with System Power off and Power On	windows.19h1.x64
2209514465	The warning message for "Confirm Disabling Intel Optane Memory" is truncated in Intel® Optane™ Memory and Storage Management UI	Windows.19h1.x64
1808377743	Wrong wording in Performance Mode Note in Intel® Optane™ Memory and Storage Management UI	Windows.19h1.x64
1507336243	NCQ field shows different value than Intel® RST UI	Windows.19h1.x64
1808972948	Intel® Optane™ Memory and Storage Management does not recognize events from older Intel® RST driver	Windows.19h1.x64
1808940871	Most recent published date is not included in copyright information in Intel® Optane™ Memory and Storage Management UI	Windows.19h1.x64
14010223132	Intel® Optane™ Memory and Storage Management UI license interface show English on Norwegian language system.	Windows.19h1.x64
1809086933	Failure to unlock auto-unlock Opal/Pyrite drive at S3 resume using SSC_PPI	N/A
1807979198	Admin Revert command fails on 3rd party SSD when user skips password during first reboot after enabling OPAL	N/A
1806773541	RAID Volume reports status Degraded after correct password input	N/A
1809281451	Spinning donut after resume from dirty shutdown and system cannot boot	N/A

Resolved Issues In 17.8.0.1058 – Release

ID	Title	Operating System
1809169468	BSOD or disk operation hang with RST 17.8 driver under WinPE after Optane Memory volume created (HDD + SB2)	windows.19h1.x64
1809136431	Intermittent DRIVER_POWER_STATE_FAILURE during Restart/Shutdown flow.	N/A

1808945042	OBE system operation response very slowly (EMMC Storage w/ SATA interface)	windows.19h1.x64
1809173089	Creating RRT volume does not properly warn the user about data lost	windows.19h1.x64

Resolved Issues In 17.8.0.1054 – Release		
ID	**Title**	**Operating System**
1808889159	After dirty shutdown, Intel® Optane™ Memory volume creation not finish - still in "Finalizing the process" then to disable state	windows.10_rs5.x64
1808319355	Show Incomplete Optane™ volume in HII when use "-M -Z --no-sync" to clear metadata.	windows.19h1.x64
1808854188	Minidump does not contain Intel® RST driver ETW traces	N/A

Resolved Issues In 17.8.0.1050 – Release		
ID	**Title**	**Operating System**
1306878563	0x9F BSOD during S3/S4 with Intel® Optane™ Memory is enabled	windows.19h1.x64
1808692809	Intermittent 0x9F BSOD with SW remapped devices when S3/S4 cycles performed	windows.19h1.x64
1808506053	Intermittent 7B BSOD upon reboot when HDD enters D3 state with HDD+SB2	windows.19h1.x64
1306745335	RST middleware interface verification does not handle major version change	N/A
1808475986	Transition from the D0 to the D3 during the Modern Standby session occurs too often	N/A

Resolved Issues In 17.8.0.1041 – Release		
ID	**Title**	**Operating System**
1808524319	Intel® Optane™ Memory and storage management service crash while enabling Optane on system with RAID0 volume	N/A
1807513712	Kernel memory dumps are not created or corrupted while Crashdump Support Test (LOGO)	windows.19h1.x64, windows.10_rs5.x64

ID	Title	Operating System
1808506678	Intel® Optane™ Memory and storage management lists dynamic disk as compatible drives to be accelerated by Optane	N/A
1808449404	Unpinned items come back as pinned if migration triggered after unpin action	N/A
1808437111	Intermittent BSOD 7E observed as system exception is handled incorrectly.	N/A

Resolved Issues In 17.8.0.1037 – Release

ID	Title	Operating System
1306751083	Controller information print output is not correct	N/A
1808457792	RTD3 doesn't work for RAID0 volume	N/A
1807290841	Intermittent 0x133 BSOD on system configured with RAID volume experiencing high streaming activity	N/A
1808277548	Description fields for: OptaneEventLogMsg.dll and RSTMwEventLogMsg.dll files are empty	N/A
1808343477	Multiple sessions opened in print method og RSTCli	N/A

Resolved Issues In 17.8.0.1032 – Release

ID	Title	Operating System
1808230912	Invalid Optane™ config information for hybrid drives in UI	N/A
1808120882	BSOD 0x133_DPC observed with Intel® RST driver	N/A
1808138484	Error code-1073741819 returned randomly while running Intel® RST CLI tool	N/A
1807969793	BSOD 0x9F Black screen without backlight when run S3 loop stress (1s shutdown)	windows.19h1.x64
1807707264	BSOD 0xA0 Bug check occurred during Optane™ memory migration process	N/A

Resolved Issues In 17.8.0.1026 – Release

ID	Title	Operating System
1807969784	Pin option in right click menu will not display if the name is in Chinese characters; Rename	windows.19h1.x64

	name to English characters, it displays normally.	
1807698941	RstCli doesn't works with WinPE when Optane disks are locked by Opal/Pyrite (do not input password before WinPE start for unlocking)	N/A
1807641473	Intel® RST Optane™ Driver Does Not Implement Control Flow Guard (CFG)	N/A
1807196196	Info about pinned files is missing after update from an older RST® driver	N/A
1807694354	0xA0 INTERNAL_POWER_ERROR caused by iaStorAC.sys while entering S4	N/A

Resolved Issues In 17.8.0.1022 – Release		
ID	**Title**	**Operating System**
1807076620	S3 resume fail when INTEL RST on + Remapped on	windows.10_rs5.x64
1807864789	System BSOD when resume from S3 with RAID1 + HDD password with RST driver	windows.19h1.x64
1807075716	Intel® RST UEFI driver reports garbage names of some ODD	windows.10_rs3.x64
1806855776	Unit can't boot to OS and show error message "Default Boot Device Missing or Boot Failed" after disable Optane in BIOS RST HII menu.	windows.10_rs5.x64

Resolved Issues In 17.8.0.1007 – Release		
ID	**Title**	**Operating System**
1807362826	Intel® RST GUI will show error if install Optane™ SSD on PEG x16 slot with remapping disable	windows.10_rs3.x64
1807356618	Windows cannot boot when CPUa disk is present in system	NA

Known Issues

Known Issues In 17.8.0.1065 – Release		
ID	**Title**	**Operating System**
2209931334	SW drips is 0% and HW drip not generated on TG SKU	windows.19h1.x64
1809264606	Intel® RST PreOS Is Not Showing All devices in BIOS Page When Plugged H10 device.	windows.19h1.x64

2209998548	BIOS Recovery failure when SATA mode is set to RST and the recovery image size is more than 32MB.	N/A
1808766918	Enabling Optane™ fails with error 0xA0070015 when system has a drive connected in Ronin mode	N/A
1808631115	Less bandwidth on TG disk after updating Intel® RST driver to 17.8.0.1022 and later with PCMark8*	N/A
1808882565	System configured with TG - unable to boot or stuck in a boot loop/report bad system config very sporadically, while performing dirty shutdown during extensive IO stress tests. (**workaround**: Doing a cold reboot will recover the system in case the system is stuck in boot loop)	N/A
1808580383	Intel® RSTCLI returned incorrect code. Expected: Success Actual: InvalidParameters	windows.10_rs5.x64
1807748617	NVMe is not listed in Boot Manager when disable CPU Attached feature in BCFS	N/A
1805874759	Volume failed to go into Normal or Rebuilding state after trying to recover from failed volume state	N/A
1808514252	No name and automation Id in 'What's new window' toggle switch	N/A
1809261024	Intel® Optane™ Memory and storage management app new added option "What's new window is:" localization missing on this text in the settings tab.	windows.19h1.x64
1809380987	Intel® Optane™ Memory and storage management UI interface doesn't change mode to RTL (Arabic family languages)	N/A
1809390944	Intel® Optane™ Memory and storage management app localization - Missing Chinese translation Optane™ options	N/A
1807684084	CLI shows Roaming Supported when feature is disabled in the driver	N/A
2209998548	Intel® RST driver v17.8: The ReadBlock in RstPeim32.efi does not support to read >= 32MB block	windows.19h1.x64

Terminology

Common Terms and Acronyms	Definition
AEN	Asynchronous Event Notification
AHCI	Advanced Host Controller Interface
ATA	Advanced Technology Attachment
ATAPI	Advanced Technology Attachment Packet Interface
BIOS	Basic Input / Output System
BUS PROTOCOL GROUP	A bus protocol group represents a set of bus protocols with similar performance characteristics. Bus Protocol Groups are listed here in descending order of speed: 1- PCIe* 2- SATA
Chipset	A term used to define a collection of The PNHCI components required to make a PC function.
CSMI	OEM Common Storage Management Interface for reporting RAID configurations and SMP, SSP, STP pass through.
DEVSLP	Serial ATA Device Sleep
DMA	Direct Memory Access
DOS	Disk Operating System
DIPM	Device Initiated Power Management
Disk's Write Cache	A memory device within a hard drive, which is allocated for the temporary storage of data before that data is copied to its permanent storage location.
GB	Giga-byte = 1024^3 bytes
HDD	Hard Disk Drive
HIPM	Host Initiated Power Management
Hot Plug	A term used to describe the removal or insertion of a SATA disk while the system is powered on.
HSA	Hardware Supported App
ICH	Input / Output Controller Hub
InstantGo*	Microsoft Windows* 8.1 connected standby low-power state that features extremely low power consumption while maintaining Internet connectivity.
KB	Kilo-byte = 1024bytes
LPM	Link Power Management
M.2	Specification for internally mounted computer expansion cards and associated connectors. It replaces the mSATA standard. Formerly known as the Next Generation Form Factor (NGFF)
MB	Mega-bytes = 1024^2 bytes

MEMORY GROUP	A memory group represents a set of backend storage media types with similar performance characteristics. Memory Groups are listed here in ascending order of speed:
	    1- Spindle Device (HDD)
	    2- NAND Spindle Hybrid Device
	    3- PCH SATA NAND Device (SSD)
	    4- PCIe* NAND Device (SSD)
	    5- PCIe* NAND Device (SXP)

mSATA	Computer bus interface that connects host bus adapters to mass storage devices such as hard disk drives and optical drives. Uses PCI Express Mini Card-like connector that is electrically SATA.
NAI	Notification Area Icon
NTFS	NT File System
NVC	Non-Volatile Cache
NVMe*	Non-Volatile Memory Express: Non-Volatile Memory Host Controller Interface Specification (NVMHCI), is a specification for accessing solid-state drives (SSDs) attached through the PCI Express (PCIe*) bus
OEM	Original Equipment Manufacturer
ODD	Optical Disk Drive
OROM	Option ROM
OS	Operating System
PCH	Platform Controller Hub
PCIe*	PCI Express (Peripheral Component Interconnect Express): is a high-speed serial computer expansion bus standard
Port	The point at which a SATA drive physically connects to the SATA controller.
PRD	Product Requirements Document
PUIS	Power Up In Standby - Drive feature that allows a spindle device to be powered up in standby mode without spinning the disk up.
RAID	Redundant Array of Independent Disks Matrix RAID: A configuration supporting two RAID levels by having two volumes in a single RAID array that use Intel® RST
RTD3	Runtime D3
RS2	Redstone2
SATA	Serial ATA
SIPM	Software Initiated Power Management
S.M.A.R.T.	Self-Monitoring, Analysis and Reporting Technology: an open standard for developing hard drives and software systems that automatically monitors a hard drive's health and reports potential problems.
SED	Self-Encrypting Drive
SRT	Intel® Smart Response Technology. Intel® RST's premium feature to use caching technology that enables caching of a device or volume using a faster device
SSD	Solid State Drive – non volatile memory used as storage media
SSHD	Solid-State Hybrid Drive
TB	Tera-byte = 1024^4 bytes

UEFI	UEFI pre-OS driver
UI	User Interface
VC	Validation Candidate
ZPODD	Zero Power Optical Disk Drive