

Intel® Rapid Storage Technology (Intel® RST) 17.0.0.1056 - Release

3 December 2018

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Supported Operating Systems

Microsoft Windows 10 Redstone5 x64*

Microsoft Windows Server 2016 x64 Edition*

Revision History

Date	Driver Revision	Build Number
3 December 2018	17.0.0.1056 release	1056
1 November 2018	17.0.0.1054 release	1054
10 October 2018	17.0.0.1051 release	1051
5 October 2018	17.0.0.1048_Beta	1048
13 September 2018	17.0.0.1043_Alpha	1043

Notes:

1. 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.
2. The RAID OROM & UEFI version for this release is 17.0.0.3720, the driver and user interface version is 17.0.0.1056 and HSA driver version 17.0.1007.0. 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.
3. 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.

Limitations: It is not recommended to use clear metadata function as a part of the HSA combined UI as it may result in non-bootable OS due to an issue with the function. It will be fixed in later version of Intel® RST 17.0.

SPECIAL INSTALLATION INSTRUCTIONS

Note 1: Installation/Configuration of the System under Test (SUT) for Beta Testing of the Intel® Optane™ Memory and Storage Management UI (Intel® RST_HSA UI)

Note that the following instructions assume that your computer meets all the requirements for supporting all the premium features of the 17.0 SW stack that you wish to test. Also, these instructions are valid as of the 17.0.0.1056 release version. Subsequent release versions may render any part or all of these instructions invalid.

1. Before you start:

- a) Download the latest Intel® RST driver version 17.0 release SW kit as downloaded from the Intel® VIP site that supports the Intel® RST HSA_UI. You will need the following files from the 17.0 kit:
 - 1) \F6\f6flpy-64.zip
 - 2) \HSA\
 - i. RstHSA_17.x.x.0_x64.appxbundle
 - ii. Dependencies\x64\Microsoft.VCLibs.appx
 - 3) Working Internet Connection
- b) Install the HW that you require to do the testing that you plan to do (e.g. if you plan to test RAID functionality be sure that you have the proper number of drives required for the RAID levels you wish to test, etc.)

2. OS Installation and setup:

- a) Install Windows x64 RS4/RS5 OS; make whatever settings you like
 - 1) Set OS to 'Sideload mode'.
 - 2) Once the OS is installed, you will need to set the OS to 'Sideload mode':
 - i. Go to 'Start' Menu and click on 'Settings'.
 - ii. In 'Settings' click on 'Update & Security'.
 - iii. In 'Update & Security' click on 'For developers' and set the computer to 'Sideload mode'.

3. Install Intel® RST_HSA UI Pre-PV Dependencies:

From the Intel® RST 17.0 package you will need to install the HSA dependent package for the Intel® RST_HSA UI to launch.

- a) Go to Intel® RST 17.0 kit and install the following:
 - i. /HSA/ Dependencies\x64\Microsoft.VCLibs.appx

4. Intel® RST Driver 17.0

From the Intel® RST 17.0 package you will need to install the Intel® RST 17.0 driver (this will install the necessary service for the Intel® RST_HSA UI to run (**RstMwService**; this service must be running in order for the UI to launch).

- a) Go to Intel® RST 17.0 kit and expand the following zip:
[\F6\f6flpy-64.zip](#)
 - b) Install the Intel® RST driver using the right click method on the driver INF file: **iaStorAC.inf** (right click on the file and select 'Install' from the drop-down menu).
 - c) Restart the system.
5. If you are planning to support file pinning on the system, "Intel® Optane Pinning Explorer Extensions" can be installed. The purpose of the "Intel® Optane Pinning Explorer Extensions" is to enable pinning through file explorer.
- a) Go to Intel® RST 17.0 kit and expand the following zip:
[\F6\f6flpy-64.zip](#)
 - b) Click on the "ShellPackage.msi" to install the shell extensions.
 - c) The Shell Extension will appear in the "Apps & Features" section in the settings as a separate application.

Note: You can only see the Shell Extensions Application in explorer menu when Intel® Optane Memory is enabled.

6. Install Intel® RST HSA UI (Intel® Optane™ Memory and Storage Management) Installation:

Note: The Intel® RST_HSA UI package does not contain the necessary Intel® RST driver so be sure to follow the instructions in section 3 above to install the Intel® RST driver version 17.0 before proceeding to step 4.a below:

- a) Go to RST 17.0 kit and install the following
[/HSA/RstHsaBridge_17.0.1007.0_x64.appxbundle](#)
- b) Connect to the Internet and launch the app.
Note: The internet connection is required for first launch only. However, you might need internet connection for support and online help.
- c) Make sure that you have dependencies resolved before proceeding with the installation otherwise you'll get a prompt

This completes the Intel® RST 17.0.0.1056 installation and setup instructions. Any releases of the Intel® RST 17.0.x SW will likely change from these instructions. For any issues please contact the RST Customer Engineering team.

END OF SPECIAL INTALLATION INSTRUCTIONS

Supported Hardware

Initial RST Release Version		Chipset Name	Platform / PCH / (Segment)	PCH SKU Details
17.0		Intel® 9th Generation Core Processor Family Platform I/O SATA AHCI/RAID Controller	ICL PCH: ICP-LP (Mobile LP)	- Premium-Y - Premium-U - Base-U ^(A)
N – 1				
	16.x	Intel® 300/240 Series Chipset Family	Cannon Lake (CNL)/Coffee Lake (CFL) PCH: Cannon Point-H (CNP-H) (DT, HEDT)	- H310 ^(A) - H310C ^(A) - H370 - Z390 - Q370 - B360 ^(O)
			CNL/CFL PCH: CNP-H (WS)	- C246
			CNL/CFL PCH: CNP-H (Mobile Halo)	- QM370 - HM370 - CM246
		Intel® 8th Generation Core Processor Family Platform I/O SATA AHCI/RAID Controller	CNL PCH: CNP-LP (Mobile LP)	- Premium-U - Base-U ^(A)
			CFL PCH: Kaby Point (KBP)-H (KBP-R) (DT)	- Z370

^(A) This SKU of the chipset supports AHCI mode only

^(O) This SKU of the chipset supports both AHCI mode and Optane™ non-Premium mode (non-RAID)

Resolved Issues

Resolved Issues In 17.0.0.1056 – Release		
ID	Title	Operating System
1806593563	Raid0 Volume missing during window 10 RS5 RTM image install after loading Rapid storage driver	windows.10_rs4.x64, windows.10_rs5.x64
1806549091	In Winpe to drvload F6 Driver with TG Optane will cause BSOD when "Legacy Support" option is Disable	windows.10_rs5.x64
1806426523	The system occurred BSOD with bugcheck code 0x9F (DRIVER_POWER_STATE_FAILURE) during S3 aging.	windows.10_rs4.x64
1806514730	Intel® RST - When run S3 or shutdown, the system will black screen/BSOD with PCIE M.2 2230 SSD 128G.	windows.10_rs4.x64
1806536312	PCle Box is attached and unattached, disk device will be delayed to disappear in DM after un-plugging.	windows.10_rs5.x64

1806502232	Intel® RST - Blue screen occurs when Dirty shutdown during Optane Memory Volume Creation.	windows.10_rs5.x64
1806420500	OS DRIPS percentage is low when PSON is enabled on the system with OPTANE+HDD as boot media.	windows.10_rs5.x64
1806301478	RAID Volume have lost after load f6 driver during RS4 OS installation	windows.10_rs4.x64
1806343993	Standby performance test result in S3 suspend doesn't meet spec for certain platforms.	windows.10_rs4.x64
1806148650	System can't deconfig optane in WinPE RS1 if optane been configured.	windows.10_rs3.x64
1806420548	HSA UI setup screen only shows 60GB Optane even though using a 64GB module.	windows.10_rs4.x64
1806021177	[BSOD][Optane][KBL RVP7] BSOD DPC_WATCHDOG_VIOLATION (133) [in SATA] during S4 flow when Optane is enabled	windows.10_rs3.x64
1806426531	BSOD E6h - DRIVER_VERIFIER_DMA_VIOLATION while handling SCSI MODE SENSE request by nvtemp	windows.10_rs4.x64
1806265299	NVMe SSD cannot be detected after loading F6 driver when installing Win10 RS4 OS w/ RAID mode enabled.	windows.10_rs4.x64
1806416498	Uninstall "Intel® Optane™ Pinning Explorer Extensions" will cause Windows Explorer hang.	windows.10_rs4.x64
1806347440	Intel® RST 16.5.0.1030 will cause BSOD with NVMe drives with more than 32 MSI-X	windows.10_rs4.x64
1806301640	DPM install fail with 32 GB Intel® Optane™ Memory	windows.10_rs4.x64
1806301405	ODD serial number shows not available in Intel® RST UI	windows.10_rs3.x64
1806276358	Some character is not simplified Chinese character on Intel® Optane™ Memory	windows.10_rs4.x64
1805815700	Sporadically restart option is not shown after enabling/disabling Optane with one touch	windows.10_rs3.x64

1408248384	RST wakes up the slow drive in Optane after OS d0 wake-up request	windows.10_rs5.x64
1806598492	[TG]Miscompares found during data integrity test	
1506903268	When smart event occurs on Teton Glacier with Optane Enabled it becomes de-concatenated	
1408248213	Intel® RST driver is failing to put the slow drive of Teton Glacier to D3 in MS	windows.10_rs5.x64
1305911151	iaStorAfs service is not starting after Optane creation on Bitlocker encrypted drive	
1806021177	BSOD DPC_WATCHDOG_VIOLATION (133) [in SATA] during S4 flow when Optane is enabled	windows.10_rs3.x64
1806222548	RSTCLI returned incorrect code. Expected: Success Actual: 52 after disabling OPTANE	windows.10_rs4.x64
1806126751	New KW in WR 4	
1806406721	Intermittent D1 BSOD seen	
1806439431	Discrete NH can be used as backing store for NGSA - not supported in 17.0	
1806441715	[MwService] [HSA UI] MwService Stopped When RAID typ is changed from RAID0 to RAID1	
1806210950	[UI] Incorrect way of handling Pinning errors in RstUI	
1805898415	Some Intel® Optane™ Memory Acceleration feature enabled systems that were ever loaded with RST driver V16.0.x may experience unbootable failure after unexpected power cycling. The symptom could be BSOD, no boot device or get stuck in an endless OS auto-repair process	
1806349753	[ShellExtensions] Notify loop	

Resolved Issues In 17.0.0.1054 – Release

ID	Title	Operating System
1806522228	Calling updateDiskPowerStates() from PowerAnalyzer impacts overall performance	
2205423385	[PERFORMANCE][NGSA] Sequential writes down ~25%	windows.10_rs4.x64
1407846711	Potential race condition writing block cache delta log	windows.10_rs4.x64
1806435883	[NVMe] Write to read only range error is not translated correctly	windows.10_rs4.x64
1806301640	Install DPM fail with 32G Intel® Optane Memory	windows.10_rs4.x64
1407942810	[TG] Remove serial number check on SB and NH pair.	
1806410840	WHL-U Optane Volume Incomplete (Teton Glacier) during Reboot cycles. Cannot recover.	windows.10_rs5.x64

Known Issues

Known Issues In 17.0.0.1056 – Release

ID	Title	Operating System
1806593750	System Event Viewer have an error log about Intel® Optane™ memory service after reboot SUT	windows.10_rs5.x64
1806593563	Raid0 Volume missing during window 10 RS5 RTM image install after loading Rapid storage driver	windows.10_rs4.x64,windows.10_rs5.x64
1806593524	TGF044K/E035: Meatgrinder: Spectrex360-15 WHL C: Miscompares (CSSD-9448)	N/A
1806582212	HMB BG3 - Stress_WB_System will BSOD (DPC_WATCHDOG_VIOLATION). (code:133)	windows.10_rs5.x64
1806577430	3 Intel® NVME SSD AHCI mode can not open Intel Rapid Storage Technology	windows.10_rs5.x64
1806549270	After installing One touch Intel® Optane memory, No compatible disk error observed in Optane UI.	windows.10_rs5.x64

1806549116	Can't enter in OS when reboot from stress test	windows.10_rs4.x64
1806549053	StorageSecuritCommandProtocol (provided by RST driver) always return EFI_NOT_READY and caused System BSOD when resuming from the second S3	windows.10_rs4.x64
1806534491	BSOD at SC:Driver IRQL Not Less Or Equal @ Bug check D1 pointing to IASTORAC.SYS during CS cycles.	windows.10_rs5.x64
1806518703	SLP_S0 residency can't meet HP Criteria 95% for monitor MS by PHM for at least 4 hours.	windows.10_rs4.x64
1806522815	During Optane enabling to dirty shutdown, after reboot to OS the Optane enabling feature is grayed out	windows.10_rs4.x64
1806201879	BSOD 0xef about "CRITICAL_PROCESS_DIED" occurred during do verify for created RAID0 after transfer RAID1 to RAID0 and create a RAID0.	windows.10_rs3.x64 windows.10_rs4.x64
1806447579	Intel® RST Installer show option "Create a Desktop Shortcut" when launch "SetupRST.exe -noservice -noIRSTGUI"	windows.10_rs4.x64
1806441587	Insert Intel® SSD and Intel TG SSD will hang at POST	windows.10_rs4.x64
1806427491	[BSOD] after upgrade from 16.7.4.1015 to 17.0.0.1045 - inaccessible boot device with Teton Glacier disk	windows.10_rs4.x64
1806264316	SUT is not booting to OS after concatenation of SATA HDD and Optane Memory	windows.10_rs3.x64
1806261860	DUT is not Taking Recovery image and also not entering to OS after clicking on System recovery image	windows.10_rs4.x64
1606682468	HDD Suite reports low performance score in PC Mark Vantage Tool with Optane Enabled.	windows.10_rs5.x64
1305911402	WHL-U TG low and inconsistent performance on Intel® RST 17.0	windows.10_rs5.x64
1305911397	Some character is not simplified Chinese at Intel® Optane Memory UI.	windows.10_rs4.x64

1407662287	Optane Volume Enumeration fails during S4 (Hibernate cycles).	windows.10_rs3.x64
1806315076	High failure rate at system boot up on Desktop PC (or Notebook PC) with Optane SKUs	windows.10_rs3.x64
1806301405	ODD serial number shows Not Available in IRST UI.	windows.10_rs3.x64
2202694004	Can't disable write caching on Optane accelerated volume	windows.10_rs3.x64
1806344489	Concurrency_GT3D_Memory_IOPSnoop_PM_S failed with bugcheck 133 due to IASTOR.SYS	windows.10_rs4.x64
1805815700	Sporadically restart option not showing, After enabling/disabling Optane with one touch	windows.10_rs3.x64
1805800222	[CPU attached] Issue observed after restart from OS	windows.10_rs3.x64
1805464013	Error event log ID7000/ID7009 (iaStorAfsService) show up after PBR reset/refresh.	windows.10_rs2.x64
1305482762	Volume label of ODD drive remain unchanged after ejected CD/DVD disc.	windows.10_rs3.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 = 1024 bytes
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