

Intel® Rapid Storage Technology (Intel® RST) 17.0.0.1072 Production Version Release

03 January 2019

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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
03 January 2019	17.0.0.1072 release	1072
12 December 2018	17.0.0.1063 release	1063
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 17.0.0.1072 and Intel® Optane™ Memory and Storage Management (HSA) driver version 17.0.1010.0. 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. New features and updates added for this release:
 - Support for Intel® Optane™ Memory H10 (Teton Glacier).
 - Updated Combined Intel® RST and Intel® Optane™ Memory User Interface.

Note: Intel® Optane™ Memory M15 (Carson Beach) Support is for evaluation purposes only. This release is not recommended to be used for production with this feature.

4. Hybrid file caching (HFC) is disabled by default starting with Intel® RST driver version 17.0.0.1072 release and is expected to be enabled in a later Intel® RST release. Prior Intel® RST pre-production 17.0 releases have it enabled by default. Intel® recommends to use Intel® RST driver version 17.0.0.1072.
5. Intel® Optane™ Memory and Storage Management (HSA) UI is supported only in Intel® RST Premium with Intel® Optane System Acceleration (RAID Mode). It is not supported in AHCI mode.
6. **Issue:** Teton Glacier 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.
7. 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.
8. For more information on these features, please refer to RST_OEM Tech Guide 17.0-rev.0.9.pdf or later.

Supported Hardware

Initial RST Release Version		Chipset Name	Platform / PCH / (Segment)	PCH SKU Details
17.0/16.x		Intel® 300/240 Series Chipset Family	Cannon Lake (CNL)/Coffee Lake (CFL) PCH: Cannon Point-H (CNP-H) (DT, HEDT)	- H310 ^(A) - B360 - B365 - H370 - Z390 - Q370 - H310C
			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)
N - 1				
	15.8 / 15.9	Intel® 200 Series Chipset Family	Coffee Lake (CFL-S, 8+2) PCH: Kaby Point (KBP-H) (Desktop)	- Z370***
		Intel® 200 Series Chipset Family	Basin Falls (w/ KBL-X) PCH: KBP-H (HEDT)	- X299
	15.7	Intel® 8th Generation Core Processor Family Platform I/O SATA AHCI/RAID Controller	Kaby Lake Refresh (KBL-R) PCH: SPT-LP (Mobile-LP)	- Base-U - Premium-U - Premium-Y
		Intel® 100/C230 Series Chipset Family	Greenlow-Refresh (w/ KBL CPU) PCH: SPT PCH-H (WS)	- C236
	15.2	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
	15.0	Intel® 7th Generation Core Processor Family Platform I/O SATA AHCI/RAID Controller	(w/ KBL CPU) PCH: SPT-LP (Mobile-LP)	- Base-U ^(A) - Premium-U - Premium-Y

^(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 17.0.0.1072 – Release

ID	Title	Operating System
1806763882	Fixed an improper reference, due to incorrect pointer being accessed	N/A
1806668675	Add HfcDisableService.exe service to run DISM tool	N/A
1806693419	The Intel® Optane™ Memory UI should display Intel® RST driver version instead of the UI version.	N/A

Resolved Issues In 17.0.0.1063 – Release

ID	Title	Operating System
1806522815	During Optane enabling to dirty shutdown, after reboot to OS the Optane enabling feature is grayed out	windows.10_rs4.x64
1306030452	RstMwService is not removed or turned off on Intel® RST uninstall/downgrade	
1806453403	RAID volume keep flicker (rescan) in HSA GUI	windows.10_rs4.x64
2206194002	It automatically jumps to default option (RAID0) after select RAID1 option in "Intel Optane Memory and Storage Management" UI ->Create Volume -> Select volume type.	windows.10_rs5.x64
1806665705 1806668881	Driver issue with Intel Optane memory enabled systems with Intel Rapid Storage Technology (RST) driver v.16.0.x, 16.5.x, or 16.7.x may potentially cause the loss of end user data or render a system inoperable TA CDI #604382	windows.10_rs4.x64,
1806674645	High power in CMS and no slp_s0 due to NVME controller stopped	

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
1806536312	PCIe 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
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
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
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	Intel® Optane™ Memory Volume Incomplete (Teton Glacier) during Reboot cycles. Cannot recover.	windows.10_rs5.x64

Known Issues

Known Issues In 17.0.0.1072 – Release

ID	Title	Operating System
1408768829	No notification pop up on right corner when enabling/disable Intel® Optane™ Memory.	windows.10_rs4.x64, windows.10_rs5.x64
1506861122	Cannot uninstall Intel® RST driver using Programs & Features overlap in Windows	windows.10_rs5.x64
1806700362	BSOD DRIVER_VERIFIER_DETECTED_VIOLATION with BUGCHECK C4 is observed after enabling driver verifier with system restart	windows.10_rs5.x64

1806777896	Intel® RST - Have some weird ^^ mark in the readme file when install RST.	windows.10_rs5.x64
1806577430	3 Intel® NVME SSD in AHCI mode cannot open Intel Rapid Storage Technology	windows.10_rs5.x64
1806534491	BSOD with CS: 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 95% for monitor MS by PHM for at least 4 hours.	windows.10_rs4.x64
1806427491	[BSOD] after upgrade from Intel® RST version 16.7.4.1015 to 17.0.0.1045 - inaccessible boot device with Teton Glacier disk	windows.10_rs4.x64
1407662287	[TG]Optane Volume Enumeration issue during S4 (Hibernate cycles).	windows.10_rs3.x64
1806514730	Intel® RST - When run S3 or shutdown, the system will black screen/BSOD with certain PCIE M.2. HMB SSD	windows.10_rs4.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