Intel® Rapid Storage Technology (Intel® RST) 17.11.0.1000 – Production Version Release

14 October 2021

Intel Confidential

Supported Operating Systems
Microsoft Windows 10 20H2 x64*

Revision History

Date	Driver Revision	Build Number
13 October 2021	17.11.0.1000 PV	1000
7 October 2021	17.11.0.1000 PC	1000
5 March 2021	17.9.6.1019	1019
2 March 2021	17.9.1.1009.5 Release with installer update	1009
13 July 2020	17.9.1.1009 19H1/19H2/20H1 Release	1009
19 June 2020	17.9.1.1009	1009
12 May 2020	17.9.0.1007	1007
31 March 2020	17.9.0.1004	1004

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 17.8.0.4507, the driver and user interface version are 17.11.0.1000 and Intel® Optane™ Memory and Storage Management App version is 17.9.1008.0. 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. **Security update:** Intel® RST 17.9.6.1019 has been updated to include SqLite DLL version 3.32.3, which includes functional and security updates. Users recommended to update to the latest Intel® RST version. (SqLite DLL is used to maintain the database for storing file related information by the NGSA service which is used for File caching).
   - **Configuration Impacted**: Intel® Optane Memory volume – 32 GB and higher.

4. New features and updates in 17.9.0.1007:

   a) 20H1 OS support

   b) End-of-Life of Intel® RST User Interface (UI) and Intel® Optane™ Memory UI

   c) Intel® Optane™ Memory and Storage Management Application Improvement –

   - Windows* Narrator Support

   - Enhancing Visual Presentation of Intel® Hybrid SSD

   d) Intel® RST driver package Updates –

   - Added new extension files for HSA (ExtensionHSA) and Pinning (ExtensionPinning) to meet DCH compliance requirements.
     a. Shellpackage.msi will no longer be provided and the same functionality will be provided through extension inf (ExtensionPinning).
     b. *iaStorHsa_Ext.inf, iaStorHsa_Ext.cat, iaStorHsaComponent.inf, iaStorHsaComponent.inf* : Required for HSA installation through driver inf and the same extension is used by installer to invoke HSA installation.

   - Installer package update – New SetupRST.exe installer will install the appropriate Intel® RST driver in the system and the Intel® Optane™ Memory and Storage Management application . During the installation process,
     a. If the end-user chooses to install the Intel® Optane™ Memory and Storage Management application, the installer will initiate the request for Windows* Store to install the application at the next system reboot.
     b. If the end-user chooses NOT to install the Intel® Optane™ Memory and Storage Management application, they can still directly go to Windows* Store and install the application later.

5. Intel® Optane™ Memory Pinning Extension missing after Windows* OS upgrade issue:

   - There was a known issue related to "Intel® Optane™ memory pinning extensions dll missing pop-up" upon OS upgrade which is addressed in the Intel technical support article titled "How to Resolve Intel® Optane™ Memory Pinning Error: 'Unable to load DLL 'iaStorAfsServiceApi.dll'' Encountered".
     o Customer will still be able to pin the files and maintain their pinning files through the multiple Intel® RST UI's.

   - Configurations impacted: Systems updated through Intel® RST/Optane installer packages from Intel® RST version 16.3.x – 17.2.x to Intel® RST 17.5.x - 17.8 prior to OS upgrade.

- A system with factory installed (fresh OS installation) of Intel RST drivers between 17.5.x-17.9.x are not affected by this issue.
- Recommend updating to Intel® RST 17.9.1.1009 driver to prevent the issue from happening before upgrading to Windows* OS 20H1.

6. For more information on these features, please refer to RST_OEM TechGuide_17.xx_Rev1.3.11_RST17.9/or later or the latest RST MoM CDI#571459 .

Resolved Issues

Resolved Issues In 17.11.0.1000 – Release		
ID	**Title**	**Operating System**
18016991417	BSOD KERNEL_MODE_HEAP_CORRUPTION (13a) observed during CS Cycling	Windows 11 x64

Resolved Issues In 17.9.6.1019 – Release		
ID	**Title**	**Operating System**
N/A	Sqlite security update (see notes section)	N/A
18011332230	20H1 HKL - Connect Standby IO Stress test failed on SATA SSD intermittently	windows.19h1.x64
1809575911	Intel® Optane™ Memory H10 with SSD CDMv6 Seq Write performance can't meet spec intermittently	windows.19h1.x64, windows.19h2_vanadium.x64
18011907306	Intermittent Windows hang during IOMeter workload	windows.19h2_vanadium.x64
18014750358	System will occur black screen/BSOD and can't enter OS after resume from S4 & set wrong password for HDD.	windows.19h2_vanadium.x64
18011984387	Intel® Optane™ Memory cannot be enabled with Win10 20H1 build intermittently	windows.20h1_vibranium.x64
18012147233	System gives black screen sporadically with BSOD 0x139 dump during reboot stress testing.	Windows.19h1.x64

Resolved Issues In 17.9.1.1009.5 – Release		
ID	**Title**	**Operating System**
INTEL-TA-00545	Intel® RST Installer Advisory Doc ID 634912 Installer version updated to 17.9.0.34	N/A

Resolved Issues In 17.9.1.1009 – Release		
ID	**Title**	**Operating System**
N/A	Intel® Optane™ Memory Pinning Extension missing after Windows* OS upgrade issue (Refer Notes section bullet 4 for more details)	N/A

ID	Title	Operating System
18011380524	Intel® Optane™ Memory and Storage Management UI show random code in AR image	N/A
18011399810	Intel® Optane™ Memory and Storage Management fails to launch – error: can't find root window page	N/A
18011010166	No "Rebuild to another disk" for degraded RAID volume in Intel® Optane™ Memory and Storage Management	N/A
18011380949	Error message pops up when choose "Responsiveness mode" to enable Intel® Optane™ Memory H10.	windows.20h1_vibranium.x64
1507913304	Disable SATA APST to workaround ICL PCH-LP SATA Controller with Automatic Partial to Slumber Transitions during S4 entry Sighting Alert CDI # 618820	N/A
18011600940	SUT show blue screen during BTOA/WBT download process under WinPE environment	windows.20h1_vibranium.x64
1808450221	Intermittent BSOD 9F seen during S3/S4 power cycles	windows.19h1.x64
18011342849	Intel Optane Memory Status fail with older version of Intel® Optane™ Memory and Storage Management	Windows.19h1.x64
18010990692	SSD is not located in diskpart during Factory process	Windows.19h1.x64
18011385598	Switch marked as normal does not reset SMART event from RSTCLI	N/A
18010989925	SSD Unsafe shutdown count will increase after S4 or S5.	windows.19h1.x64

Resolved Issues In 17.9.0.1007 – Release		
ID	**Title**	**Operating System**
18010932182	Disabling Optane™ hangs on 100% due to incorrectly handled time out event	N/A
18010860708	No license files found for Intel® Rapid Storage driver in Middleware	N/A
1809303495	BSOD 0x7B observed intermittently when FW is updated and Sx cycles performed	N/A
18010987097	RAID volume operation notifications displayed multiple times	N/A
18011295475	Intel Optane Memory Enabled displayed with Double colon in the UI	windows.19h2.x64

Resolved Issues In 17.9.0.1004 – Release		
ID	**Title**	**Operating System**
1809270656	SW drips is 0% and HW drip not generated on TG SKU)	windows.10_rs5.x64
1807733920	System might intermittently observe A0 BSOD while enabling/disabling Intel® Optane Memory Volume	windows.19h2.x64

1507710493	Host still sent PMREQ_S in Modern Standby entry even host is configured HIPM disabled	windows.19h1.x64
1809657160	Intel® Optane™ memory drives disappeared in diskpart and RSTCLI64.exe shows "Unknown disk usage" after drvload Intel® RST 17.8 driver version under Pure WinPE environment	windows.10_rs5.x64
1809083529	Intel Optane Memory and Storage Management" cannot recognize certain ODD's serial number.	windows.19h1.x64
18010049009	[RST MW] Error occurred while creating RAID1 volume, auto-shrinking failed intermittently.	Windows.19h1.x64
1809657160	TG SB2 disappeared in diskpart and RSTCLI64.exe shows TG SB2 as "Unknown disk usage" after drvload 17.8 driver under Pure WinPE environment	Windows.19h1.x64

Known Issues

Known Issues In 17.11.0.1000 – Release		
ID	**Title**	**Operating System**
1809575911	Intel Optane Memory H10 with SSD(Teton Glacier) CDMv6 Seq Write performance fluctuating	N/A
18011439481	Error received DO_VERIFY_VOLUME when ODD returned 0x02 command during Read/Write operation	windows.19h1.x64
18010989925	CrystalDiskInfo - SSD Unsafe shutdown count will increase after S4 or S5.	windows.19h1.x64
1807707264	Intermittent BSOD 0xA0 observed during Optane Volume separation	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 |
| 1807684084 | CLI shows Roaming Supported when feature is disabled in the driver | N/A |

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 = 1024^2bytes

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 = 1024^4bytes

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