



Intel® Thunderbolt™ Release Notes for Thunderbolt Windows DCH Software

Release Notes - NDA

June 2019

Revision 59.6

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Audience

This document intended for use by OEM software developers, test and validation engineers, and system integrators.



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Revision History

Revision Number	Description	Revision Date
1.0.2.6	Pre-Alpha release for ICL-U	March 2018
1.0.2.9	Engineering release for Thunderbolt Windows DCH SW	April 2018
1.0.2.12	Engineering release for Thunderbolt Windows DCH SW	April 2018
1.0.2.13	Engineering release for Thunderbolt Windows DCH SW	May 2018
1.0.2.19	Engineering release for Thunderbolt Windows DCH SW	June 2018
1.0.2.26	Engineering release for Thunderbolt Windows DCH SW	July 2018
1.0.2.31	Engineering release for Thunderbolt Windows DCH SW	July 2018
1.0.2.32	Production release for Thunderbolt Windows DCH SW	July 2018
1.0.2.36	Production release for Thunderbolt Windows DCH SW	August 2018
1.0.2.37	Production release for Thunderbolt Windows DCH SW	September 2018
1.0.2.38	Production release for Thunderbolt Windows DCH SW	September 2018
1.0.2.39	Production release for Thunderbolt Windows DCH SW	October 2018
1.0.2.40	Production release for Thunderbolt Windows DCH SW	October 2018
1.0.2.41	Production release for Thunderbolt Windows DCH SW	October 2018
1.0.2.42	Production release for Thunderbolt Windows DCH SW	October 2018
43	Production release for Thunderbolt Windows DCH SW	November 2018
44	Production release for Thunderbolt Windows DCH SW	November 2018
45	Production release for Thunderbolt Windows DCH SW	December 2018
46	Production release for Thunderbolt Windows DCH SW	December 2018
47	Production release for Thunderbolt Windows DCH SW	January 2019
48	Production release for Thunderbolt Windows DCH SW	January 2019
49	Production release for Thunderbolt Windows DCH SW	January 2019
50	Production release for Thunderbolt Windows DCH SW	February 2019
51	Production release for Thunderbolt Windows DCH SW	February 2019
52	Production release for Thunderbolt Windows DCH SW	February 2019
55	Production release for Thunderbolt Windows DCH SW	March 2019
56	Production release for Thunderbolt Windows DCH SW	March 2019
57	Production release for Thunderbolt Windows DCH SW	April 2019
58	Production release for Thunderbolt Windows DCH SW	April 2019
59	Production release for Thunderbolt Windows DCH SW	April 2019



59.1	Production release for Thunderbolt Windows DCH SW	April 2019
59.2	Production release for Thunderbolt Windows DCH SW	May 2019
59.3	Production release for Thunderbolt Windows DCH SW	May 2019
59.4	Production release for Thunderbolt Windows DCH SW	May 2019
59.5	Production release for Thunderbolt Windows DCH SW	June 2019
59.6	Production release for Thunderbolt Windows DCH SW	June 2019



1 Introduction

1.1 Scope of Document

This document is the release notes for the Thunderbolt™ Windows DCH Software.

1.2 Acronyms

Term	Description
TBT	Thunderbolt
HR	Host Router
EP	End Point
AIC	Add-In Card
PR	Port Ridge (Thunderbolt)
FR	Falcon Ridge (Thunderbolt 2)
AR	Alpine Ridge (Thunderbolt 3)
TR	Titan Ridge (Thunderbolt 3)
YFL	Yosemite Falls (Thunderbolt 3)
DP	Display Port
CM	Connection Manager
LC	Link Controller
P2P	Peer-to-Peer
TCC	Thunderbolt Control Center
THC	Thunderbolt Host Controller Driver (DCH driver)
iTBT	Integrated Thunderbolt

1.3 Supported Operating Systems

Windows® 10 64-bit 19H1	Base driver 19H1 signed Shared product ID: 1152921504607711794 Submission ID: 1152921504628074350 Extension 19H1 signed Shared product ID: 1152921504607711795 Submission ID: 1152921504628074351
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Windows® 10 64-bit RS5	Base driver RS5 signed
	Shared product ID: 1152921504607711044
	Submission ID: 1152921504628074086
	Extension RS5 signed
	Shared product ID: 1152921504607712186
	Submission ID: 1152921504628074352

1.4 Supported Thunderbolt Controllers

Ice Lake U/Y ES1

JHL6540/6340 Series - "Alpine Ridge"

JHL6240 Series - "Alpine Ridge LP"

JHL7540/7340 Series - "Titan Ridge"

1.5 Release Overview

The release can be downloaded from **Intel VIP** (<https://platformsw.intel.com/>).

Note: A username and password are required to access the website and to log in. The user must have an account created for access.

Note: For installation instructions and usage, refer to **Thunderbolt Windows DCH SW Quick Reference Guide** added to this release kit.

1.6 Versioning

Starting from release #42 the versioning structure has changed in order to decouple the driver version and the release version.

From now on, an incrementing number will define the release version. The release notes shall contain the versions of all ingredients.



1.7 Versions

Release #	Ingredient-Version
59.6	Driver: 1.41.648.5 Control Center (HSA): 1.0.16.0 SDK: 1.9 Install Scripts: 1.0.0.6
59.5	Driver: 1.41.648.4 Control Center (HSA): 1.0.16.0 SDK: 1.9 Install Scripts: 1.0.0.6
59.4	Driver: 1.41.648.4 Control Center (HSA): 1.0.14.0 SDK: 1.8 Install Scripts: 1.0.0.6
59.3	Driver: 1.41.648.3 Control Center (HSA): 1.0.14.0 SDK: 1.8 Install Scripts: 1.0.0.6
59.2	Driver: 1.41.648.2 Control Center (HSA): 1.0.14.0 SDK: 1.8 Install Scripts: 1.0.0.3
59.1	Driver: 1.41.648.1 Control Center (HSA): 1.0.14.0 SDK: 1.8 Install Scripts: 1.0.0.3
59	Driver: 1.41.648.0 Control Center (HSA): 1.0.14.0 SDK: 1.8 Install Scripts: 1.0.0.3
58	Driver: 1.41.645.0 Control Center (HSA): 1.0.14.0 SDK: 1.8 Install Scripts: 1.0.0.3
57	Driver: 1.41.644.0 Control Center (HSA): 1.0.13.0 SDK: 1.7 Install Scripts: 1.0.0.3
56	Driver: 1.41.636.0 Control Center (HSA): 1.0.13.0 SDK: 1.7 Install Scripts: 1.0.0.3



55	Driver: 1.41.631.0 Control Center (HSA): 1.0.13.0 SDK: 1.7 Install Scripts: 1.0.0.3
52	Driver: 1.41.613.1 Control Center (HSA): 1.0.13.0 SDK: 1.7 Install Scripts: 1.0.0.3
51	Driver: 1.41.613.0 Control Center (HSA): 1.0.13.0 SDK: 1.7 Install Scripts: 1.0.0.3
50	Driver: 1.41.592.0 Control Center (HSA): 1.0.12.0 SDK: 1.7 Install Scripts: 1.0.0.3
49	Driver: 1.41.592.0 Control Center (HSA): 1.0.10.0 SDK: 1.7 Install Scripts: 1.0.0.2
48	Driver: 1.41.592.0 Control Center (HSA): 1.0.9.0 SDK: 1.7 Install Scripts: 1.0.0.2
47	Driver: 1.41.587.0 Control Center (HSA): 1.0.8.0 SDK: 1.7 Install Scripts: 1.0.0.1
45	Driver: 1.41.565.0 Service: 1.41.536.0 Control Center (HSA): 1.0.6.0 SDK: 1.6 Install Scripts: 1.0.0.1
44	Driver: 1.41.536.0 Control Center: 1.0.6.0 SDK: 1.6 Install Scripts: 1.0.0.1
43	Driver: 1.41.513.0 Control Center (HSA): 1.0.6.0 SDK: 1.6 Install Scripts: 1.0.0.1



2 Features Supported

Supported = ✓ Limited Support = ⚠ Not Supported = ✗

Technology	Support
SW/Pre-Boot ACL	✓
Sx States	✓
RTD3	✓
Thunderbolt device connection	✓
Thunderbolt networking (P2P)	✓
Thunderbolt Security Level	✓
Thunderbolt Host Firmware update	✓
Thunderbolt Device Firmware update	✓
Command line installation procedure using HSA side loading	✓
Auto approve devices on native security enabled systems	✓

2.1 Best Known Configuration

For the latest Client Based Platforms Best Known Configuration (BKC), please contact your platform CE.



3 New Features—RCRs

RCR #	Change Info	Affected Component	Status
	Support Goshen Ridge NVM access and FW update	Thunderbolt Bus Driver	Implemented in driver version 1.41.648.3
	Expose correct number of ports for Ice Lake host controller (query enabled ports from BIOS)	Thunderbolt Bus Driver	Implemented in driver version 1.41.648.3
	Limit Ice Lake <i>GOTO</i> Sx wake dependency with BIOS to S4 only <ul style="list-style-type: none"> S3 Wake is controlled by the user (via PM tab, no change) S4 Wake is controlled by the user (via PM tab) only if S4 wake is enabled in BIOS. S5 is always no wake (no change). 	Thunderbolt Bus Driver	Implemented in driver version 1.41.645.0
	Support PoFX for Ice Lake	Thunderbolt Bus Driver	Implemented in driver version 1.41.644.0
	Support IMR valid ACPI method	Thunderbolt Bus Driver	Implemented in driver version 1.41.613.0
	Support iTBT Boot camp	Thunderbolt Bus Driver	Implemented in driver version 1.41.613.0
	Minimum driver version in HSA to be the latest driver version – 1.41.592.0	Thunderbolt Control Center	Implemented in TCC version 1.0.12.0
	Added support for multi-controller host	Thunderbolt Control Center	Implemented in TCC version 1.0.9.0
	Added security-level info in UWP app to reflect DMA Kernel Protection	Thunderbolt Control Center	Implemented in TCC version 1.0.9.0
	Updated samples to use the exceptions thrown from <i>FwUpdateDriverApi</i>	Firmware update SDK	Implemented in SDK version 1.7
	Provided exceptions class <i>FuDrvApiException</i> from the <i>FwUpdateDriverApi</i>	Firmware update SDK	Implemented in SDK version 1.7
	A new exception <i>UNSUPPORTED_OPERATION</i> is thrown when restricted methods are used on ICL.	Firmware update SDK	Implemented in SDK version 1.7
	Added support for ICL	Firmware update SDK	Implemented in SDK version 1.7
	Added logger and option to inject it to the closed driver API	Firmware update SDK	Implemented in SDK version 1.7
	Improved status progress update in host to include the time wait for power cycles	Firmware update SDK	Implemented in SDK version 1.7



RCR #	Change Info	Affected Component	Status
1305945253	Removed unmanaged code usage from SDK	Firmware update SDK	Implemented in SDK version 1.7
	Enabled YFL NVM read access	YFL based platforms (Ice Lake)	Implemented in version #44
	Driver supports CM RTD3 Veto	iTBT platform with FW that support CM RTD3 Veto	Implemented in version #44
	Limit drivers to Windows 10 RS4 and above	Thunderbolt Drivers (host controller, host controller extension & NDIS P2P)	Implemented in version #43
	Compile the Firmware update SDK using .Net 4.5.2	Firmware update SDK	Implemented in SDK version 1.5
	Firmware update SDK, to provide the API as a sample. The sample utilizes a new interface – <i>FwUpdateDriverApi</i> to connect to the DCH driver.	Firmware update SDK	Implemented in version 1.0.2.39
	YFL Restoring DMA registers after sleep	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.39
	Setting default GOTO Sx to WAKE (YFL only)	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.39
	Setting default GOTO Sx to no wake (YFL only)	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.38
	Adding more YFL device ID's (ICL, TGL and ADL) to host controller driver	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.37
	Introducing auto connect feature.	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.36
	Adding support for GOTO SX (YFL only).	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.36
	Service unregisters com server when stopped.	Thunderbolt Service	Implemented in version 1.0.2.36
	Block host controller FW update when there is another application connected to the driver.	FW update SDK Thunderbolt Host Controller Driver	Implemented in version 1.0.2.36
	Added 2 new exceptions (0x22A, 0x22B).	FW update SDK	Implemented in version 1.0.2.36
	All SDK components will be marked with the same version equal to the SDK version.	FW update SDK	Implemented in version 1.0.2.36
	Enhanced error-handling policy.	FW update SDK	Implemented in version 1.0.2.32
	HSA deployment via MSFT store readiness.	Thunderbolt Host controller driver Thunderbolt Control center	Implemented in version 1.0.2.32
	Enabled plug event delay for AR and TR before FW update power cycles.	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.31
	Add w/a for firmware update for native OS.	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.30
	RTD3 workaround for YFL.	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.30



RCR #	Change Info	Affected Component	Status
	Adding IOCTL_DBG_QUERY_DEBUG_INFO for Ten Lira (solve finding BAR when device is in RTD3)	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.30
	Production signed with EDSS certificate	Thunderbolt Control Center	Implemented in version 1.0.2.30
	New MSFT Signed SCCD	Thunderbolt Control Center	Implemented in version 1.0.2.30
	Changed PFN due to use of EDSS certificate	Thunderbolt Control Center	Implemented in version 1.0.2.30
	Localization strings update	Thunderbolt Control Center	Implemented in version 1.0.2.30
	Event queues acquire/release flow update	Thunderbolt Control Center	Implemented in version 1.0.2.30
	Deleting dangling inter domain shortcuts	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.29
	Refined RC files for service and com server	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.29
	Add workaround for YFL E1 BSOD (avoiding interrupt lock when RX ring is empty).	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.28
	Adding support for device I2C and read NVM	Thunderbolt Control Center	Implemented in version 1.0.2.27
	Blocked driver dump for the official release (SDL requirement).	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.26
	Opened read NVM, I2C access for the official release (TCM/SDK requirement)	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.26
	Modified CRC32 to match FW CRC32	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.24
	Disabled Debug interfaces for release configuration as a part of SDL	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.23
	Moved from test to formal custom capability, sccd, and PFN.	Thunderbolt Control Center	Implemented in version 1.0.2.21
	Implemented changes needed to support new driver handling of event queues.	Thunderbolt Control Center	Implemented in version 1.0.2.21
	Opened the driver for multiple applications while limiting the events queue for a single application at a time.	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.21
	Added safe-mode event which gets fired when the driver detects that CM is in safe mode	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.19
	Added support for multi-message firmware event	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.19



RCR #	Change Info	Affected Component	Status
	Added support for sending a device-connected toast if upstream is rejected	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.19
	Added localized string tables	Thunderbolt Control Center	Implemented in version 1.0.2.19
	Added consideration for safe mode, toast, and notification, on TCC	Thunderbolt Control Center	Implemented in version 1.0.2.19
	Added P2P icon to attached devices page on TCC	Thunderbolt Control Center	Implemented in version 1.0.2.19
	Added SL2, SL3 and SL4 support for PCI device end	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.18
	Added SDK support (I2C access, Read NVM)	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.18
	Removed support for device FW Update (limited to AR / TR), which was a feature supported through Thunderbolt Control Application	Thunderbolt Control Center	Implemented in version 1.0.2.18
	App name changed from Thunderbolt Control Application to Thunderbolt Control center along with the User Interface	Thunderbolt Control Center	Implemented in version 1.0.2.18
	Added support for reading NVM (for SDK)	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.17
	Added Localization support on Thunderbolt Control Application	Thunderbolt Control Center	Implemented in version 1.0.2.17
	Added support to host controller FW update	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.14
	Added firmware update support for TBT older generations (1 & 2) endpoint devices	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.14
	Changed Toast notification message and display time: - The notification is now: "New Thunderbolt™ device has been connected. Click here to approve the device." - Changed persistence time to 25 sec	Thunderbolt Control Center	Implemented in version 1.0.2.13
	Added more info to the "About" section of the settings page of Thunderbolt Control Application: Driver Version, Driver build date and time, FW version (currently supported only for TR)	Thunderbolt Control Center	Implemented in version 1.0.2.13
	Added option to remove all devices from ACL with a button click in Thunderbolt Control Application	Thunderbolt Control Center	Implemented in version 1.0.2.13



RCR #	Change Info	Affected Component	Status
	Added support for device FW Update (limited to AR /TR), a feature supported through Thunderbolt Control Application	Thunderbolt Host Controller Driver And Thunderbolt Control Center	Implemented in version 1.0.2.13
	Modified app launch .com server to be WinRT	Thunderbolt Control Center	Implemented in version 1.0.2.9
	Removed toaster from the .com server and replaced it with a WinRT <i>AppServiceConnection</i> interface	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.9
	Added auto connection support for software ACL and Pre-Boot FW ACL	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.8
	Moved the component .inf to the host controller driver installation	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.8
	Driver signals the application launcher only when SL is greater than 0	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.8
	Added control application launcher service and .com server	Thunderbolt Control Center	Implemented in version 1.0.2.7
	Removed reset host interface for all platforms	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.6
	Refined D0 exit flow	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.6
	Added RTD3 support	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.4
	Changed D0 exit flow for Ice Lake only	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.2
	Changed force power flow	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.1
	Added support for Alpine Ridge controllers	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.0
	Added support for Sx states	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.0
	Added support for Ice Lake platform	Thunderbolt Host Controller Driver	Implemented in version 1.0.1.0
	Drivers support SL0 and SL1	Thunderbolt Host Controller Driver	Implemented in version 1.0.0.0
	Demo application supports approve/reject device (approve always is not supported)	Thunderbolt Control Center	Implemented in version 1.0.0.0
	P2P is partially supported (no handshake, therefore can only connect to DCH)	Thunderbolt Host Controller Driver	Implemented in version 1.0.0.0
	Added support for Titan Ridge controller	Thunderbolt Host Controller Driver	Implemented in version 1.0.0.0



4 *Issue Status Definitions*

This document provides sightings and bugs report for Intel® Thunderbolt Windows DCH SW. At the time of a milestone release, this report will be distributed with the Intel® Thunderbolt Release and will provide information on new issues and the status of old issues (replacing the Release Notes document).

Fixed Issues: This category will only display closed issues within the current Intel® Thunderbolt release. After each release, old issues will be dropped down to the "Archive" section and then new closed issues will take its place back up top for the next release. If an issue is posted in this section, it will indicate that the issue has been verified and fixed within the one that is being released.

Known Issues: This category will display all Known Issues since the initial release and will remain in this section until fixed or noted otherwise. "Known Issues" are still under investigation and may or may not be root caused.

Archive – Fixes in Previous releases: This category will display all closed issues that were closed in their respected release#. This section will serve as a history of fixed issues.

Sightings listed in this document apply to the Thunderbolt Windows DCH SW unless noted otherwise in this document or in the sightings tracking systems.



4.1 Fixed Issues in this Release

Issue Fixed in Release #	Title	Details
59.6	Intel Thunderbolt driver v1.41.648.1 has slow response to Tenlira connection	Sighting #: 1507239349 Affected Component: Thunderbolt Bus Driver Impact: Intel Thunderbolt driver v1.41.648.1 has slow response about 30 sec to Tenlira connection.



4.2 Known Issues—To Date

Issue Known in Release #	Title	Details
42	Issue with running other applications, which communicate with TBT DCH driver, while updating FW for Host	Sighting #: Affected Component: Impact: The Firmware Update SDK will throw an exception on Host firmware update, in case there is an application that concurrently communicates with the driver.
1.0.2.32	Pre-load HSA requires network connectivity in order to succeed in Windows® RS4	Sighting #: 1305833580 Affected Component: Thunderbolt™ Control Center Impact: This issue is in debug with Microsoft. VSO ID #18605410 may be referenced if needed.



4.3 Archive—Fixes in Previous Releases

Issue Fixed in Release #	Title	Details
59.5	Application Interfaces in TBT Application disappears after immediately Screen ON operation	Sighting #: 2207270278 Affected Component: Thunderbolt Control Center Impact: No info is displayed after Screen ON operation. Fix: The fix is to not stop communication with the driver and not to clean the UI on the enter background event.
59.5	Missing device information when restoring HSA from task bar	Sighting #: 1306435866 Affected Component: Thunderbolt Control Center Impact: Under the device information in the Thunderbolt devices menu, the attached device is not selected (marked) and the device information is not displayed.
59.5	Thunderbolt Control Center presents incorrect Security Level	Sighting #: 1306461318 Affected Component: Thunderbolt Control Center Impact: Thunderbolt Control center presents incorrect Security Level -No security instead of Kernel DMA Protection
59.5	Thunderbolt Controller disappears from the "Details" menu after waking from S3 state	Sighting #: 1306448128 Affected Component: Thunderbolt Control Center Impact: Thunderbolt Controller disappears from the "Details" menu after waking from S3 state.
59.5	Timeout message during FW update with 2 or more devices connected	Sighting #: 1306420947 Affected Component: Thunderbolt Firmware update SDK Impact: An exception is thrown during HR firmware update, if more than one device is connected.
59.5	SDK_UNKNOWN_CHIP Error 0x211 observed during GR device FW update	Sighting #: 1507161532 Affected Component: Thunderbolt Firmware update SDK Impact: An exception is thrown on attempt to update NVM for GoshenRidge.
59.5	FWU tool status string description does not fit the app frame	Sighting #: 1306436141 Affected Component: Thunderbolt Firmware update SDK Impact: In case of long error message on firmware update it does not fit the application frame.
59.4	Sporadically P2P enumeration is not established while <i>hot plugging</i> during Sx cycles/Warm Reset.	Sighting #: 1607207544 Affected Component: Thunderbolt Peer to Peer. Impact: Sporadically fails to connect. Therefore, P2P enumeration is not established in the device manager while <i>hot plugging</i> during the Sx cycles /Warm Reset.
59.4	P2P connection sporadically fails to enumerate after Sx cycles & Warm Reset.	Sighting #: 1607096526 Affected Component: Thunderbolt Peer to Peer. Impact: Sporadically fails to connect. Therefore, P2P enumeration is not established in the device manager <i>after Sx cycles and Warm Reset</i> .
59.4	Thunderbolt Control Center (TCC) displays incorrect Security Level	Sighting #: 1306461318 Affected Component: Thunderbolt Bus Driver, TCC Impact: Wrong security level is displayed in the Thunderbolt Control Center– It displays <i>No security</i> instead of <i>Kernel DMA Protection</i> .



Issue Fixed in Release #	Title	Details
59.3	Read NVM of GR device returns "zero"	Sighting #: 1807470898 Affected Component: Thunderbolt Bus Driver. Impact: Cannot access GR NVM for the read.
59.3	<i>uninstall.bat</i> in DCH SW release package cannot uninstall TBT driver correctly with OS RS5 Chinese version.	Sighting #: 1507176725 Affected Component: Thunderbolt Bus Driver. Impact: Cannot uninstall driver correctly on RS5 Chinese version. Fix: The uninstall script is updated to work on RS5 Chinese version.
59.2	SUT hangs with SYSTEM_THREAD_EXCEPTION_NOT_HANDLED (7e) pointing to <i>TbtBusDrv</i> while running S4 cycle sporadically	Sighting #: 1607168137 Affected Component: Thunderbolt Bus Driver. Impact: BSOD is observed on S3 cycles. Sporadically the SUT hangs with SYSTEM_THREAD_EXCEPTION_NOT_HANDLED (7e) pointing to TBT kernel mode driver, <i>TbtBusDrv</i> while running S4 cycle.
59.2	BSOD 0x50 (PAGE-FAULT-IN-NONPAGED-AREA) occurs after ME commit in the factory process	Sighting #: 1507180730 Affected Component: Thunderbolt Bus Driver. Impact: BSOD 0x50 during NVM read (device or host controller).
59.1	Yellow bang observed sporadically in HID Sensor Collection V2 while running S4 cycle.	Sighting #: 1607156100 Affected Component: HID sensor devices Impact: Thunderbolt driver yellow bang causes HID filter drivers to crash.
59	System hangs during S4 cycle	Sighting #: 1607168137 Affected Component: HSA Impact: ICL SUT gets hang sporadically at PC:00CS pointing to Thunderbolt bus driver while running S4 cycle.
58	HSA minimum driver version fixed to be 1.41.484.0	Sighting #: 2207210101 Affected Component: HSA Impact: : HSA could not install drivers from MS store for driver versions upto 1.41.587.0
58	HSA sideload installation failure	Sighting #: 1409237293 Affected Component: HSA Impact: HSA fails to install in sideload mode and issues an error " <i>Microsoft.NET.Native.Framework.2.1 not found</i> " Fix: Updated the directory with necessary dependencies.
58	SDK running on x64 failure	Sighting #: 2207210814 Affected Component: SDK Impact: SDK runtime failure when running on x64 forced system.
58	SDK NVM version format issue	Sighting #: 1306371107 Affected Component: SDK Impact: Incompatibility with certain OEM tools. It displays incorrect FW version.



Issue Fixed in Release #	Title	Details
58	Thunderbolt DCH SW installation script failure during setup new driver on top of previous driver	Sighting #: 1306366539 Affected Component: Installer Impact: Failure to install Thunderbolt DCH SW driver version-57 on top of previous driver.
57	Bugcheck 0x9f on restart flow when disabling YFLO/1 while P2P connected	Sighting #: 1306336659 Affected Component: Thunderbolt bus driver Impact: Failure to disable the driver when P2P is connected, which leads to BSOD 0x9F when resetting the machine.
57	Sporadic failure to connect P2P with GR device	Sighting #: 1306292285 Affected Component: P2P connection on Goshen Ridge Impact: Sporadic failure to connect P2P with GR device and no "disconnect_im_connection" notification is observed after disconnect P2P.
57	P2P connection fails after hard reset	Sighting #: 1606838693 Affected Component: P2P Impact: In P2P scenario after Hard Reset, the connection is not established in one SUT and neither is the connection enumerated in the Device manager.
56	Symbols mismatch or not found	Sighting #: 2206560785 Affected Component: Thunderbolt symbols Impact: Symbols for ThunderboltService.exe and TbtFilterDrv.dll are mismatched or not found during symbols check.
55	BSOD during CS cycle	Sighting #: 1607036882 Affected Component: Thunderbolt Bus Driver Fix: Sporadic BSOD <i>DRIVER_POWER_STATE_FAILURE</i> is observed during CS cycle
55	Observing BSOD on port swapping in P2P during Sx	Sighting #: 1607041098 Affected Component: Thunderbolt Bus Driver Impact: After port swapping in P2P Scenario, BSOD "System thread exceptional handling" is observed during Sx states
55	Safely Remove Hardware and Eject Media show TBT Controller	Sighting #: 2206719792, 1507048524 Affected Component: Thunderbolt Bus Driver Impact: Thunderbolt host controller appears in the Safely Remove Hardware list even when no TBT device is present
52	INF declarative check is getting failed for TBT driver	Sighting #: 1606876492 Affected Component: HSA Component INF Impact: TBT driver failed to pass INF Verification tool check.
51	Thunderbolt controller App shows an error pop up while performing restart with TBT devices connected as an endpoint device.	Sighting #: 1606900087, 1306139244 Affected Component: Service and Toast launcher Impact: Error popup is shown to the user while performing restart with TBT devices connected as an endpoint device.



Issue Fixed in Release #	Title	Details
51	No enumeration of AR/FR device with TBT UWD driver rev44 on SL2	Sighting #: 1506993764 Affected Component: Thunderbolt Bus Driver Impact: On SL2, AR/FR devices are not able to connect.
51	TBT Peer-to-Peer auto re-connect is not happening after restart cycles	Sighting #: 1606925250, 1507008673 Affected Component: Thunderbolt Bus Driver Impact: TBT peer to peer auto re-connect is not happening after restart
51	Sporadically, TBT3 devices are not enumerating after restart	Sighting #: 1606886060 Affected Component: Thunderbolt Bus Driver Impact: Devices might not be connected after restart
51	Symbols are not included for <i>TbtControlCenter</i> , <i>ToastLauncher</i> and <i>ThunderboltService</i>	Sighting #: 2206560785 Affected Component: Drivers, Service and Toast launcher Fix: Missing <i>TbtControlCenter</i> , <i>ToastLauncher</i> and <i>ThunderboltService</i> is fixed.
51	NVM FW version shows "unknown" in <i>Thunderbolt controller App</i> after wake from Sx	Sighting #: 1306174429 Affected Component: Thunderbolt Control Center Fix: The NVM FW version displays "unknown" in the <i>About</i> window in <i>Thunderbolt controller App</i> after wake from sleep.
51	No "user approval and notes" information needed in SL3/SL4.	Sighting #: 1306186096 Affected Component: Thunderbolt Control Center Impact: Redundant note appears for SL3/SL4 in the "Approve Devices" window.
50	Close application on driver down	Sighting #: 2206604473 Affected Component: Thunderbolt Control Center Impact: On non-RTD3 platforms, keeping control center open may cause driver yellow bang Introduced in 1.0.9.0
50	Managed Approved Devices window doesn't refresh upon device(s) plug/unplug	Sighting #: 1306174448 Affected Component: Thunderbolt Control Center Impact: User experience
50	Device connected in HSA but not approved prevents D3 entry	Sighting #: 1306186095 Affected Component: Thunderbolt Control Center Impact: No D3 entry when a device is connected but not approved.
50	No user approval information needed for SL3, SL4.	Sighting #: 1306186096 Affected Component: Thunderbolt Control Center Impact: Users might be misled to thinking that they can approve devices on these levels.
50	"Do not connect" option doesn't block all devices further the chain from being added to ACL list	Sighting #: 1306171558 Affected Component: Thunderbolt Control Center Impact: Users might be misled to thinking that if they changed parent to not approve, this cancel other downstream approvals.



Issue Fixed in Release #	Title	Details
50	Fix pre-boot ACL issue	Sighting #: 1507033134 Affected Component: Thunderbolt Control Center Impact: The user choice of a device to <i>always approve</i> is not saved through G3.
49	App refresh issue on device disconnect	Sighting #: 1306165489 Affected Component: Thunderbolt Control Center Impact: App isn't refreshing device info section after device disconnection
49	App missing P2P info	Sighting #: 1306165493 Affected Component: Thunderbolt Control Center Impact: Missing connected peer info/title in app while P2P is established
49	App issue with multiple device connect	Sighting #: 1306168007 Affected Component: Thunderbolt Control Center Impact: App prevents connecting more than one device at once.
49	App issue with saving device connection type	Sighting #: 1306168048 Affected Component: Thunderbolt Control Center Impact: Swapping between device connection types saves only the first selection.
49	App crash on device connect with VT-d disabled	Sighting #: 1306168130 Affected Component: Thunderbolt Control Center Impact: App crashes upon device connection with VT-d disabled
49	App refresh issue on device plug/unplug	Sighting #: 1306168133 Affected Component: Thunderbolt Control Center Impact: App display does not refresh upon device plug/unplug
48	Symbols missing	Sighting #: 2206560785 Affected Component: Service & Toast Launcher Impact: Symbols were missing in TBT DCH Rev 44 for <i>TbtAppLauncherComServer</i> and <i>ThunderboltService</i>
48	No popup in SL2 host implementation	Sighting #: NA Affected Component: Thunderbolt Toast Launcher, Thunderbolt Control Center Impact: No toast when user connects SL1/SL0 end- point to SL2 host.
47	Shutdown from command line resulting CATERR	Sighting #: 1306144770 Affected Component: iTBT based platform Impact: CATERR in shutdown (S5) from command line. YFL based system may enter cat error when shutdown from command line
47	Application crashes	Sighting #: 1306136852 Affected Component: Thunderbolt Control Center Impact: Application crashes ~20 seconds after plugging of 12 devices.
47	UWP app not refreshing issue	Sighting #: NA Affected Component: Thunderbolt Control Center Impact: UWP app isn't refreshing upon plug/unplug affecting user experience.



Issue Fixed in Release #	Title	Details
47	No popup in SL2 host implementation	Sighting #: NA Affected Component: Thunderbolt Toast Launcher, Thunderbolt Control Center Impact: No toast when user connects SL1/SL0 end- point to SL2 host.
46	TBT App toast not showing up in system without VC++ components	Sighting #: 2206346043 Affected Component: Thunderbolt Toast Launcher Impact: No toasts when installed on clean system (without VC++ redistributables). The issue is addressed by C++ base service & toast launcher com server replaced with C# service and toast launcher utility.
46	Warm reset on YFL causing CATERR	Sighting #: 1305951801 Affected Component: Thunderbolt Bus Driver Impact: CATERR "PKGC_WATCHDOG_HANG_C2R_DN_WT_IOSF_BLOCK MCA" observed during warm reset on YFL host controllers.
45	Fix end-point enumeration after S4	Sighting #: 1606821485 Affected Component: Thunderbolt Bus Driver Impact: End points don't enumerate after S4
44	Fix for sporadic Thunderbolt bus driver BSOD during reboot	Sighting #: 2206284057, 1506942689 Affected Component: Thunderbolt Bus Driver Impact: Sporadic BSOD was observed during reboot without TBT device connected.
43	Fix interrupt storm on ICL platform	Sighting #: 1606748765, 1606747811 Affected Component: Thunderbolt Bus Driver Impact: Ice Lake platform suffered from sporadic interrupt storm when exiting D3 that eventually led to DPC watchdog BSOD.
43	Fix CATERR in Ice Lake restart flow when host controller is in RTD3	Sighting #: Affected Component: Ice Lake platform Impact: When machine was restarted while the host controller was in RTD3, a catastrophic error occurred.
43	Fix BSOD in device add flow.	Sighting #: 2206165421 Affected Component: Thunderbolt™ Driver Impact: Driver causes a BSOD if device add flow fails (seen in stress tests).
43	Fix missing legacy Thunderbolt Peer to Peer shortcut	Sighting #: 2007564044 Affected Component: Legacy Thunderbolt Software Impact: Legacy thunderbolt software did not show the P2P shortcut when connected to a universal thunderbolt software.
43	Fix UWP HSA – Always show port titles	Sighting #: Affected Component: Thunderbolt™ Control Center Impact: In the approve devices view, the port titles appeared only in case there are devices under it.



Issue Fixed in Release #	Title	Details
1.0.2.41	iTBT auto-wake in S5 fix	Sighting #: Affected Component: Impact: Fixed iTBT auto-wake in S5
1.0.2.40	Disable D3-hot for iTBT	Sighting #: Affected Component: Impact: iTBT platform experience CATERROR in reset flow when the thunderbolt controller is in D3.
1.0.2.39	SDK future driver API version support	Sighting #: Affected Component: Impact: The SDK will be compatible with future driver API versions.
1.0.2.39	Changed <i>GOTO_Sx</i> default configuration to wake	Sighting #: Affected Component: Impact: <i>GOTO_Sx</i> default configuration is reverted to <i>WAKE</i> .
1.0.2.39	TenLira hardware access fix	Sighting #: Affected Component: Impact: Fixed TenLira enabled hardware access flow that was broken in version 38.
1.0.2.39	iTBT NVM access in the driver	Sighting #: Affected Component: Impact: NVM access is now enabled in iTBT CM FW, so the driver can access it.
1.0.2.39	Installation fixes	Sighting #: Affected Component: Impact: <ol style="list-style-type: none"> 1. Certification is installed if required. 2. The driver is installed only in case its version is greater than the one currently installed on the machine. 3. Add support for MUP.
1.0.2.38	Changed <i>GOTO_Sx</i> default configuration to <i>NO_WAKE</i>	Sighting #: 1305909590, 1305910808, 1305754013, 1305864588 Affected Component: Impact: <i>GOTO_Sx</i> is set to <i>NO_WAKE</i> to fix the following HSD's: <ol style="list-style-type: none"> 1. 1305910808 / 1305909590 - System throws CATERROR (Force_PG_POK) on Sx Entry with TBT2 devices. 2. 1305754013 - System wake from Sx after unplugging TR device. 3. 1305864588 - TBT link is reset after fast bring up the flow as driver always sent <i>WAKE</i>.
1.0.2.37	Bus driver debug info fix	Sighting #: 1305914578 Affected Component: Impact: Bus driver failed debug info <i>IOCTL</i> query even if debug interfaces enabled.



Issue Fixed in Release #	Title	Details
1.0.2.36	TBT pop-up timing fix	Sighting #: 1605303853 Affected Component: Thunderbolt™ Host Controller Driver Impact: TBT2 device takes 55 seconds until bringing up TBT Pop-up.
1.0.2.36	TBT2 devices list	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Updated TBT2 missing supported devices list.
1.0.2.36	iTBT P2P	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed iTBT P2P connection issue.
1.0.2.36	Legacy device read NVM	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed read NVM for devices that do not support read NVM. Initially, it took a long time to read NVM for legacy TBT2 devices, due to timeouts.
1.0.2.36	Device info IOCTL in RTD3	Sighting #: Affected Component: Thunderbolt™ Control Center Impact: The TBT UWP Application was showing N/A in About window in case the driver was in RTD3. So, fixed the device info IOCTL when the driver is in RTD3
1.0.2.36	FW notification during host update	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: When the driver is updating host controller firmware, discard FW notifications. This is to fix the issue where while the device is connected, host firmware update was failing.
1.0.2.36	AR FW update timeout	Sighting #: Affected Component: Thunderbolt™ Firmware Update SDK Impact: Fixed FW update timeout in AR with FW that supports long plug event delay.
1.0.2.36	FW update timeout	Sighting #: Affected Component: Thunderbolt™ Firmware Update SDK Impact: Fixed timeout issues during FW update.
1.0.2.32	UpdateFirmware method limitations in SdkTbtController	Sighting #: Affected Component: Thunderbolt™ Firmware Update SDK Impact: 1. It will not throw any exception in case of Authentication failure. 2. After running the method, G3 must be performed.



Issue Fixed in Release #	Title	Details
1.0.2.32	Inability to close driver handles in SDK	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Driver is not responsive after FW update SDK keeps driver handles opened, effectively preventing driver unload
1.0.2.30	NVM read for non DWORD aligned offset	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed the issue with no SDK support to read non DWORD aligned NVM offset.
1.0.2.30	Release event queue issue	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: UI is not updated correctly on PM scenarios
1.0.2.30	Fix query firmware update for end point	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: no SDK support for TBT endpoints image update
1.0.2.30	Read_I2C command	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: No SDK support for <i>read_I2C</i> command for TBT endpoints
1.0.2.30	UI refresh fixes	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: UI is not refreshed correctly after on PM scenarios
1.0.2.29	Driver hang after FW command timeout	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Driver hang after device disconnect during device image update
1.0.2.29	Inter-domain shortcut redirection	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: UI shortcut to the remote machine doesn't work
1.0.2.27	Application launcher com server registration	Sighting #: Affected Component: Thunderbolt™ Control Center Impact: missing toast notifications
1.0.2.25	Fast shutdown toast bug fix	Sighting #: Affected Component: Impact: Fixed issue with no toast occurring after fast shutdown.
1.0.2.22	Event queue handling bug fix	Sighting #: Affected Component: Thunderbolt™ Control Center Impact: Fixed issue with new event queue handling.



Issue Fixed in Release #	Title	Details
1.0.2.22	D0 exit bug fix	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Inconsistency in commands send during D0 exit was fixed.
1.0.2.22	No toast bug fixes	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed a bug where there was no toast after reboot.
1.0.2.21	BIOS and platform RTD3 inconsistency fixes	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed driver not responsive issue when RTD3 was enabled in the platform but disabled in the BIOS.
1.0.2.20	Daisy chain intermittent issue fixes	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed intermittent issue when connecting a chain of six devices.
1.0.2.20	Stress BSOD fixes	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed the issue of stress BSOD when the device was connected during sleep/wake.
1.0.2.19	RTD3 Enter behavior	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed reject EP and approve after controller enters RTD3.
1.0.2.19	TCC scrollbars issue fixed	Sighting #: Affected Component: Thunderbolt™ Control Center Impact: Fixed scroll bars for all pages on TCC
1.0.2.19	TCC incorrect device connection issue	Sighting #: Affected Component: Thunderbolt™ Control Center Impact: Fixed attached devices page showing incorrect device connection status.
1.0.2.16	Inter-domain connection issue fix	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed inter domain connection issue when a peer is disabled or reset.
1.0.2.16	TenLira RTD3 related fix	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed TenLira disable HW on RTD3 enabled systems.



Issue Fixed in Release #	Title	Details
1.0.2.15	Approve multiple end-point issue fix	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed approve PCI end-point issues with more than one device.
1.0.2.14	P2P fixes for iTBT	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed broken P2P on Integrated Thunderbolt™.
1.0.2.13	Hang when sleep in D3	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed the issue of hang in host controller driver on sleep when the device is in RTD3.
1.0.2.12	Idle power state malfunction	Sighting #: 1604912287 Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed idle power state machine resumed to its idle state when it was not supposed to.
1.0.2.11	Intermittent endless device connection issue	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed intermittent endless "device connected" in service.
1.0.2.11	Service start issue	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed service start issues after reboot.
1.0.2.11	BSOD after resource rebalancing	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed BSOD when resource rebalancing occurs during FW command flow (usually get route string).
1.0.2.10	RTD3 entry issue	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed RTD3 entry flow (driver did not reset DMA).
1.0.2.5	RTD3 flow	Sighting #: Affected Component: Thunderbolt™ Host Controller Driver Impact: Fixed RTD3 flow issue.



5 *Related documentation*

- Thunderbolt™_Windows_DCH_SDK_Guide.pdf
- Thunderbolt™_Windows_DCH_SW_Quick_Reference_Guide.pdf