



Intel® Thunderbolt™ Release Notes for Thunderbolt Windows DCH Software

Release Notes - NDA

April 2021

Revision 82

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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
60	Production release for Thunderbolt Windows DCH SW	August 2019
61	Production release for Thunderbolt Windows DCH SW	August 2019
62	Production release for Thunderbolt Windows DCH SW	September 2019
63	Production release for Thunderbolt Windows DCH SW	November 2019
64	Production release for Thunderbolt Windows DCH SW	November 2019
65	Production release for Thunderbolt Windows DCH SW	December 2019
66	Production release for Thunderbolt Windows DCH SW	December 2019
67	Production release for Thunderbolt Windows DCH SW	January 2020
68	Production release for Thunderbolt Windows DCH SW	January 2020
69	Production release for Thunderbolt Windows DCH SW	March 2020
70	Production release for Thunderbolt Windows DCH SW	March 2020
71	Production release for Thunderbolt Windows DCH SW	April 2020
72	Production release for Thunderbolt Windows DCH SW	June 2020
73	Production release for Thunderbolt Windows DCH SW	June 2020
74	Production release for Thunderbolt Windows DCH SW	June 2020
75	Production release for Thunderbolt Windows DCH SW	July 2020
76	Production release for Thunderbolt Windows DCH SW	September 2020
77	Production release for Thunderbolt Windows DCH SW	September 2020
78	Production release for Thunderbolt Windows DCH SW	September 2020
79	Production release for Thunderbolt Windows DCH SW	October 2020
80	Production release for Thunderbolt Windows DCH SW	December 2020
81	Production release for Thunderbolt Windows DCH SW	February 2021
82	Production release for Thunderbolt Windows DCH SW	March 2021

1 Introduction

1.1 Scope of Document

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

1.2 Acronyms

Term	Description
HR	Host Router
EP	End Point
AR	Alpine Ridge (Thunderbolt 3)
TR	Titan Ridge (Thunderbolt 3)
MR	Maple Ridge (Thunderbolt 4)
YFL	Yosemite Falls (Thunderbolt 3)
TGL	Yosemite Falls (Thunderbolt 4)
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
TGL	Tiger Lake
ADL	Alder Lake
MTL	Meteor Lake

1.3 Supported Operating Systems

Windows® 10 64-bit 20H2	Base driver
Windows® 10 64-bit 20H1	
Windows® 10 64-bit 19H2	Shared product ID: 400525475
Windows® 10 64-bit 19H1	Submission ID: 1152921505693292682
Windows® 10 64-bit RS5	Extension
Windows® 10 64-bit RS4	Shared product ID: 400525632

	Submission ID: 1152921505693292406
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1.4 Supported Thunderbolt Controllers

Maple Ridge

Tiger Lake H/U/Y

Ice Lake U/Y

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: Use **Thunderbolt (TM) Software Installer.exe** to install, upgrade or uninstall the driver.

Note: For installation instructions and usage, refer to **Installation instructions.txt** added to this release kit.

Important note: Existing FW update applications need to be updated to use the new SDK 1.17 to be able to perform FW update through the TBT DCH driver in this release rev 82.

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 #	Driver Version	Control Center (HSA) Version	SDK Version	Install Scripts Version	Installer Version
82	1.41.1134.0	1.0.31.0	1.17	1.0.0.7	1.45.0.0
81	1.41.1094.0	1.0.30.0	1.17	1.0.0.7	1.44.6.0
80	1.41.1054.0	1.0.30.0	1.16	1.0.0.7	1.43.1.0
79	1.41.1030.0	1.0.29.0	1.15	1.0.0.7	1.42.0.0
78	1.41.1030.0	1.0.28.0	1.15	1.0.0.7	1.41.1030.0
77	1.41.1020.0	1.0.28.0	1.15	1.0.0.7	1.41.1020.0
76	1.41.1015.0	1.0.28.0	1.14	1.0.0.7	1.41.1015.0
75	1.41.987.0	1.0.26.0	1.13	1.0.0.6	1.41.987.0
74	1.41.957.0	1.0.26.0	1.12	1.0.0.6	1.41.957.0
73	1.41.950.0	1.0.26.0	1.12	1.0.0.6	1.41.950.0
72	1.41.914.0	1.0.25.0	1.12	1.0.0.6	-
71	1.41.890.0	1.0.24.0	1.12	1.0.0.6	-
70	1.41.873.0	1.0.23.0	1.12	1.0.0.6	-
69	1.41.848.0	1.0.22.0	1.12	1.0.0.6	-
68	1.41.823.0	1.0.22.0	1.11	1.0.0.6	-
67	1.41.803.0	1.0.20.0	1.11	1.0.0.6	-
66	1.41.789.0	1.0.20.0	1.11	1.0.0.6	-
65	1.41.780.0	1.0.20.0	1.11	1.0.0.6	-
64	1.41.769.0	1.0.18.0	1.11	1.0.0.6	-
63	1.41.767.0	1.0.18.0	1.11	1.0.0.6	-
62	1.41.750.0	1.0.18.0	1.11	1.0.0.6	-
61	1.41.733.0	1.0.18.0	1.9	1.0.0.6	-
60	1.41.729.0	1.0.18.0	1.9	1.0.0.6	-
59.6	1.41.648.5	1.0.16.0	1.8	1.0.0.6	-
59.5	1.41.648.4	1.0.16.0	1.8	1.0.0.6	-
59.4	1.41.648.4	1.0.14.0	1.8	1.0.0.6	-
59.3	1.41.648.3	1.0.14.0	1.8	1.0.0.6	-
59.2	1.41.648.2	1.0.14.0	1.8	1.0.0.3	-
59.1	1.41.648.1	1.0.14.0	1.8	1.0.0.3	-
59	1.41.648.0	1.0.14.0	1.7	1.0.0.3	-
58	1.41.645.0	1.0.14.0	1.7	1.0.0.3	-
57	1.41.644.0	1.0.13.0	1.7	1.0.0.3	-
56	1.41.636.0	1.0.13.0	1.7	1.0.0.3	-
55	1.41.631.0	1.0.13.0	1.7	1.0.0.3	-
52	1.41.613.1	1.0.13.0	1.7	1.0.0.3	-
51	1.41.613.0	1.0.13.0	1.7	1.0.0.3	-
50	1.41.592.0	1.0.12.0	1.7	1.0.0.3	-
49	1.41.592.0	1.0.10.0	1.7	1.0.0.2	-
48	1.41.592.0	1.0.09.0	1.6	1.0.0.2	-
47	1.41.587.0	1.0.08.0	1.6	1.0.0.1	-
45	1.41.565.0	1.0.06.0	1.6	1.0.0.1	-
44	1.41.536.0	1.0.06.0	1.1	1.0.0.1	-



43	1.41.513.0	1.0.06.0	1.1	1.0.0.1	-
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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
22011940577	Add support of switching from SW CM to FM CM	Thunderbolt Bus Driver	Implemented in driver version 1.41.1134.0
1308500143	Add support of Device ID for MTL	Thunderbolt Bus Driver	Implemented in driver version 1.41.1134.0
1308060770	Add support of Device ID for MR single port	Thunderbolt Bus Driver	Implemented in driver version 1.41.1094.0
1307894354 1308196839	Reduce IDLE timeout to 5s for MR, TGL and ADL	Thunderbolt Bus Driver	Implemented in driver version 1.41.1094.0
1307999976	Allow OEMs to control the authenticate command	Thunderbolt Bus Driver and Thunderbolt Firmware update SDK	Implemented in driver version 1.41.1054.0 and in SDK 1.16
1307954899	DCH driver vPro in S5 support by default	Thunderbolt Bus Driver	Implemented in driver version 1.41.1030.0
1307952967	Thunderbolt DCH SW should not support Directed FX feature in Windows OS 19H2 builds and down.	Thunderbolt Bus Driver	Implemented in driver version 1.41.1030.0
1306998108	GR re-timers NVM update	Thunderbolt Firmware update SDK.	Implemented in SDK version 1.14 and driver version 1.41.1015.0
1307961038	In DCH firmware update SDK, in case of TGL need to choose firmware update method to be USB3.x	Thunderbolt Firmware update SDK	Implemented in SDK version 1.14
1307895693	Disable/Enable U2 while performing FW update through USB3.x to GR.	Thunderbolt Firmware update SDK	Implemented in SDK version 1.14
1307895683	Implement an option to update FW for on board re-timer only.	Thunderbolt Firmware update SDK	Implemented in SDK version 1.14
14011953863	App shows Thunderbolt3 controller generation on TGL	Thunderbolt Bus Driver	Implemented in driver version 1.41.1015.0
1307855377	Installer need to require restart after installation completion	Thunderbolt One Click installer	Implemented in release 76.

RCR #	Change Info	Affected Component	Status
1307892304	Implement toggle HPD after authentication on GR on board re-timer FW update	Thunderbolt Bus Driver, Thunderbolt Firmware update SDK	Implemented in driver version 1.41.1015.0 and in SDK 1.14
1306963369	Add GR FW update through USB3 capability to SDK. Refer to SDK release notes for details.	Thunderbolt Firmware update SDK	Implemented in SDK version 1.13
1306796272	Define and implement pre-checks (GR image update, non-Intel USB4 device image update, and re-timer image update)	Thunderbolt Firmware update SDK	Implemented in SDK version 1.13
1307505325	Show a yellow bang when the driver is in an error state.	Thunderbolt Bus Driver	Implemented in driver version 1.41.950.0
1307236808	Add USB4 operations proxy interface to FW CM based USB4 platform	Thunderbolt Bus Driver	Implemented in driver version 1.41.890.0
1307490570	Support two-part ID (device ID, vendor ID) as HW ID for TBT driver for MR	Thunderbolt Bus Driver	Implemented in driver version 1.41.890.0
1307236686	CM FW to SW indication for USB4 devices	Thunderbolt Bus Driver	Implemented in driver version 1.41.873.0
1307234562	Non-powered S4 entry on TGL	Thunderbolt Bus Driver	Implemented in driver version 1.41.873.0
1306962856	Add a field to the closed driver API, to indicate if the NVM shared with PD	Thunderbolt Firmware update SDK	Implemented in SDK version 1.12
1307313906	Driver health indicator capabilities	Thunderbolt Bus Driver	Implemented in driver version 1.41.848.0
1306951840	vPro support during S5	Thunderbolt Bus Driver	Implemented in driver version 1.41.823.0
1306460668	The software configures NHI to not to clear its ISR on reads and uses Interrupt Status Cancel Register (ICS) to clear each Interrupt status individually	Thunderbolt Bus Driver	Implemented in driver version 1.41.823.0

RCR #	Change Info	Affected Component	Status
1306638777	Disable L1 on TR TBT upstream bridge if the networking driver data path is configured	Thunderbolt Bus Driver	Implemented in driver version 1.41.780.0
1306950488	Disable PCIe tunneling for USB4 systems	Thunderbolt Bus Driver, Thunderbolt Control Center	Implemented in driver version 1.41.780.0 And in 1.0.20.0 respectively.
1306995749	Change DCH logic for sending Go2SX command on apple boot camp configuration	Thunderbolt Bus Driver	Implemented in driver version 1.41.769.0
1306826635	[DCH] Driver should use NVM versions for hosts and devices from CM instead of reading it from NVM	Thunderbolt Bus Driver	Implemented in driver version 1.41.767.0
1306640261	DCH TBT SW: enable RTD3 flow on ICL based controllers for boot camp	Thunderbolt Bus Driver	Implemented in driver version 1.41.729.0
1306618728	Add DCH driver pre-checks for pre-boot ACL content retrieved from CM FW	Thunderbolt Bus Driver	Implemented in driver version 1.41.729.0
NA	Redesign P2P connection flows	Thunderbolt Bus Driver, Thunderbolt P2P NDIS Driver	Implemented in driver version 1.41.729.0
NA	Support Goshen Ridge NVM access and FW update	Thunderbolt Bus Driver	Implemented in driver version 1.41.648.3
NA	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
NA	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 the S4 wake is enabled in BIOS. S5 is always no wake (no change). 	Thunderbolt Bus Driver	Implemented in driver version 1.41.645.0
NA	Support PoFx for Ice Lake	Thunderbolt Bus Driver	Implemented in driver version 1.41.644.0
NA	Support IMR valid ACPI method	Thunderbolt Bus Driver	Implemented in driver version 1.41.613.0

RCR #	Change Info	Affected Component	Status
NA	Support iTBT Boot camp	Thunderbolt Bus Driver	Implemented in driver version 1.41.613.0
NA	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
NA	Added support for multi-controller host	Thunderbolt Control Center	Implemented in TCC version 1.0.9.0
NA	Added security-level info in UWP app to reflect DMA Kernel Protection	Thunderbolt Control Center	Implemented in TCC version 1.0.9.0
NA	Updated samples to use the exceptions thrown from <i>FwUpdateDriverApi</i>	Firmware update SDK	Implemented in SDK version 1.7
NA	Provided exceptions class <i>FuDrvApiException</i> from the <i>FwUpdateDriverApi</i>	Firmware update SDK	Implemented in SDK version 1.7
NA	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
NA	Added support for ICL	Firmware update SDK	Implemented in SDK version 1.7
NA	Added logger and option to inject it to the closed driver API	Firmware update SDK	Implemented in SDK version 1.7
NA	Improved status progress update in host to include the time wait for power cycles	Firmware update SDK	Implemented in SDK version 1.7
1305945253	Removed unmanaged code usage from SDK	Firmware update SDK	Implemented in SDK version 1.7
NA	Enabled YFL NVM read access	YFL based platforms (Ice Lake)	Implemented in version #44
NA	Driver supports CM RTD3 Veto	iTBT platform with FW that support CM RTD3 Veto	Implemented in version #44
NA	Limit drivers to Windows 10 RS4 and above	Thunderbolt Drivers (host controller, host controller extension & NDIS P2P)	Implemented in version #43
NA	Compile the Firmware update SDK using .Net 4.5.2	Firmware update SDK	Implemented in SDK version 1.5
NA	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
NA	YFL Restoring DMA registers after sleep	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.39

RCR #	Change Info	Affected Component	Status
NA	Setting default GOTO Sx to WAKE (YFL only)	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.39
NA	Setting default GOTO Sx to no-wake (YFL only)	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.38
NA	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
NA	Introducing the auto connect feature.	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.36
NA	Adding support for GOTO SX (YFL only).	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.36
NA	Service unregisters com server when stopped.	Thunderbolt Service	Implemented in version 1.0.2.36
NA	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
NA	Added 2 new exceptions (0x22A, 0x22B).	FW update SDK	Implemented in version 1.0.2.36
NA	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
NA	Enhanced error-handling policy.	FW update SDK	Implemented in version 1.0.2.32
NA	HSA deployment via MSFT store readiness.	Thunderbolt Host controller driver Thunderbolt Control center	Implemented in version 1.0.2.32
NA	Enabled plug event delay for AR and TR before FW update power cycles.	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.31
NA	Add w/a for firmware update for the native OS.	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.30
NA	RTD3 workaround for YFL.	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.30
NA	Adding IOCTL_DBG_QUERY_DEBUG_INFO for Ten Lira (solve finding BAR when the device is in RTD3)	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.30
NA	Production signed with EDSS certificate	Thunderbolt Control Center	Implemented in version 1.0.2.30
NA	New MSFT Signed SCCD	Thunderbolt Control Center	Implemented in version 1.0.2.30
NA	Changed PFN due to use of EDSS certificate	Thunderbolt Control Center	Implemented in version 1.0.2.30

RCR #	Change Info	Affected Component	Status
NA	Localization strings update	Thunderbolt Control Center	Implemented in version 1.0.2.30
NA	Event queues acquire/release flow update	Thunderbolt Control Center	Implemented in version 1.0.2.30
NA	Deleting dangling inter-domain shortcuts	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.29
NA	Refined RC files for service and com server	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.29
NA	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
NA	Adding support for device I2C and read NVM	Thunderbolt Control Center	Implemented in version 1.0.2.27
NA	Blocked driver dump for the official release (SDL requirement).	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.26
NA	Opened read NVM, I2C access for the official release (TCM/SDK requirement)	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.26
NA	Modified CRC32 to match FW CRC32	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.24
NA	Disabled Debug interfaces for release configuration as a part of SDL	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.23
NA	Moved from test to formal custom capability, sccd, and PFN.	Thunderbolt Control Center	Implemented in version 1.0.2.21
NA	Implemented changes needed to support new driver handling of event queues.	Thunderbolt Control Center	Implemented in version 1.0.2.21
NA	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
NA	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
NA	Added support for multi-message firmware event	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.19
NA	Added support for sending a device-connected toast if upstream is rejected	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.19
NA	Added localized string tables	Thunderbolt Control Center	Implemented in version 1.0.2.19

RCR #	Change Info	Affected Component	Status
NA	Added consideration for safe mode, toast, and notification, on TCC	Thunderbolt Control Center	Implemented in version 1.0.2.19
NA	Added P2P icon to attached devices page on TCC	Thunderbolt Control Center	Implemented in version 1.0.2.19
NA	Added SL2, SL3 and SL4 support for PCI device end	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.18
NA	Added SDK support (I2C access, Read NVM)	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.18
NA	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
NA	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
NA	Added support for reading NVM (for SDK)	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.17
NA	Added Localization support on Thunderbolt Control Application	Thunderbolt Control Center	Implemented in version 1.0.2.17
NA	Added support to host controller FW update	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.14
NA	Added firmware update support for TBT older generations (1 & 2) endpoint devices	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.14
NA	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
NA	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
NA	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
NA	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
NA	Modified app launch .com server to be WinRT	Thunderbolt Control Center	Implemented in version 1.0.2.9
NA	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
NA	Added auto connection support for software ACL and Pre-Boot FW ACL	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.8
NA	Moved the component .inf to the host controller driver installation	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.8
NA	Driver signals the application launcher only when SL is greater than 0	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.8
NA	Added control application launcher service and .com server	Thunderbolt Control Center	Implemented in version 1.0.2.7
NA	Removed reset host interface for all platforms	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.6
NA	Refined D0 exit flow	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.6
NA	Added RTD3 support	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.4
NA	Changed D0 exit flow for Ice Lake only	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.2
NA	Changed force power flow	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.1
NA	Added support for Alpine Ridge controllers	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.0
NA	Added support for Sx states	Thunderbolt Host Controller Driver	Implemented in version 1.0.2.0
NA	Added support for Ice Lake platform	Thunderbolt Host Controller Driver	Implemented in version 1.0.1.0
NA	Drivers support SL0 and SL1	Thunderbolt Host Controller Driver	Implemented in version 1.0.0.0
NA	Demo application supports approve/reject device (approve always is not supported)	Thunderbolt Control Center	Implemented in version 1.0.0.0
NA	P2P is partially supported (no handshake, therefore can only connect to DCH)	Thunderbolt Host Controller Driver	Implemented in version 1.0.0.0
NA	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 the sightings tracking systems.

4.1 Fixed Issues in this Release

Issue Fixed in Release#	Title	Details
82	Thunderbolt "TM" is missing in Thunderbolt application v1.0.29.0 in English language	Sighting #: 1508686597 Affected Component: Thunderbolt™ Control Center Impact: The title does not show as "Thunderbolt(TM)" in the Thunderbolt application v1.0.29.0. Fix: Display the "TM" string, to show the title as "Thunderbolt(TM)".
82	Thunderbolt Control Center Dark Theme	Sighting #: 14013580511 Affected Component: Thunderbolt™ Control Center Impact: Some of the text on the view is not readable in the dark theme. Fix: Force the Thunderbolt™ Control Center to launch in a light theme mode.
82	Language inconsistency in UI when system language is in French	Sighting #: 1508793803 Affected Component: Thunderbolt™ Control Center Impact: UI language is not entirely in French language. Fix: Add the French string.
82	The "Attached devices" and "About" page in TBT UI will show incomplete when the TBT application is opened.	Sighting #: 1508896407 Affected Component: Thunderbolt™ Control Center Impact: The "Attached devices" and "About" page in the TBT UI will show incomplete UI when the TBT application is opened. Fix: Add a lock to prevent a race condition.
82	When connect FR device to ADL-P, BSOD is observed	Sighting #: 18014872735 Affected Component: Thunderbolt Bus Driver Impact: When FR (Falcon Ridge) device is connected, CM will not give the NVM version, thus TBT bus driver accesses null pointer causing BSOD. Fix: Check for null to prevent BSOD condition.

Issue Fixed in Release#	Title	Details
82	DCH driver will refuse to connect to a P2P peer if "prtcrcvs" is not 1	Sighting #: 1308156123 Affected Component: Thunderbolt Bus Driver Impact: In case peers protocol revision is not 1, there will be no p2p connection. Fix: Allow to connect peers with any protocol revision.
82	When RTD3 is disabled, the driver enables it anyway	Sighting #: 1308464694 Affected Component: Thunderbolt Bus Driver Impact: Controller enters RTD3 when RTD3 is disabled. Fix: Disable RTD3.

Known Issues—To Date

Issue Known in Release #	Title	Details
80	Monitor connected behind port B in GR, after re-timer FW update, doesn't come back	<p>Sighting #: 1308219081 Affected Component: Thunderbolt DCH driver Impact: The problem is specific to driver in release 80 (1.41.1054.0). The bug in the driver is with missing IOCTL - Toggle HPD on re-timer. Preconditions: 1. FW update SDK ver 1.16+ 2. Driver installed is 1.41.1054.0. 3. Monitor is connected behind GR port B in Gatkex board with re-timer. 4. Re-timer FW update is performed. In such a scenario, the screen will turn blank until user unplugs it and plugs it back.</p>
80	ICL can't access P2P shortcut for up to 10s	<p>Sighting #: 1308209131 Affected Component: Thunderbolt DCH drivers Impact: After Interdomain (P2P) connection is established, a shortcut on user's desktop is created to access peer's shared files. This shortcut doesn't work for the first 5-10 seconds on ICL only.</p>
75	Firmware update for Intel's USB4 Goshen Ridge devices is broken on Vb and higher OS	<p>Sighting #: 1307624531 Affected Component: Thunderbolt Firmware Update SDK. Impact: No GR FW update through USB3 on 20H1 OS.</p>
69	Driver universal field is set to false in cat-file	<p>Sighting #: 1507942916 Affected Component: Thunderbolt DCH driver Impact: <i>tbthostcontroller.cat</i> indicates that the driver is not universal. This indication is not relevant for the current OS, including 20H1.</p>
42	Issue with running other applications, which communicate with TBT DCH driver, while updating FW for Host	<p>Sighting #: Affected Component: Impact: The Firmware Update SDK will throw an exception on the Host firmware update, in case there is an application that concurrently communicates with the driver.</p>
1.0.2.32	Pre-load HSA requires network connectivity in order to succeed in Windows® RS4	<p>Sighting #: 1305833580 Affected Component: Thunderbolt™ Control Center Impact: This issue is in debug with Microsoft. VSO ID #18605410 may be referenced if needed.</p>

4.2 Archive—Fixes in Previous Releases

Issue Fixed in Release #	Title	Details
81	Host controller lost after power cycle during host FW update	<p>Sighting #: 1508495807, 1508585377, 1306464353</p> <p>Affected Component: Thunderbolt FW update SDK</p> <p>Impact: During Fw update of TR host controller, the controller does not return from a power cycle.</p> <p>Fix: SDK will perform a rescan, so the OS can enumerate the host controller again.</p>
81	Fail to open SDK in case Thunderbolt device is connected in addition to GR device	<p>Sighting #: 1308107552, 18012809895</p> <p>Affected Component: Thunderbolt Bus Driver</p> <p>Impact: SDK tool fails to open when GR device and another Thunderbolt device are connected on different ports of MR/TGL system.</p> <p>Fix: Increase timeout on communication with FW CM, when working through the FW update related interface.</p>
81	BSOD may occur when video stress test is run	<p>Sighting #: 1508770107</p> <p>Affected Component: Thunderbolt Bus Driver</p> <p>Impact: In case of no available memory for TBT bus driver operation on RTD3 exit, the driver accesses null pointer causing BSOD.</p> <p>Fix: Check for null, to prevent BSOD condition. The event to the TCC will not be sent in this case.</p>
81	Downgrade to TBT W32 driver may not work properly	<p>Sighting #: 1308316943</p> <p>Affected Component: Thunderbolt Installer.</p> <p>Impact: In case a system was upgraded to TBT DCH driver from TBT W32 driver, if the TBT DCH driver is uninstalled, the W32 driver is brought back only partially.</p> <p>Fix: Ensure to follow the correct order of uninstallation in the installer.</p>
80	P2P desktop shortcut does not show up in SUT after S5 or Restart	<p>Sighting #: 1508381376</p> <p>Affected Component: Thunderbolt Bus Driver and the new P2P shortcut service.</p> <p>Impact: In some systems the P2P shortcut doesn't appear on desktop after shutdown or restart with P2P connected.</p> <p>Fix: Extract the P2P shortcut functionality to a new service - TbtP2pShortcutService. The service shall handle the P2P desktop shortcuts and solve the issue with shortcuts missing after restart/shutdown. The service is installed by the base driver inf and is available on all platforms.</p>
80	TBT app 'Approve Devices' UI texts are cut off in French/Brazil OS	<p>Sighting #: 1508419752</p> <p>Affected Component: Thunderbolt Control Center.</p> <p>Impact: When TCC UI is in French or Spanish, the text in "Approve devices" window is cutoff</p> <p>Fix: Use wrap text property for the text displayed.</p>

Issue Fixed in Release #	Title	Details
80	FW update SDK changes	<p>Sighting #: 1308218849</p> <p>Affected Component: Thunderbolt Bus Driver and Thunderbolt FW update SDK.</p> <p>Impact: FW update will not work with prior SDKs (1.15 and older).</p> <p>Important note: Existing FW update applications need to be updated to use the new SDK 1.16 to be able to perform FW update through the TBT DCH driver in this release rev 80.</p>
79	Driver information is not complete in TCC	<p>Sighting #: 1508301423</p> <p>Affected Component: Thunderbolt Control Center.</p> <p>Impact: The Thunderbolt Control Center does not display information as it should.</p> <p>Fix: Acquire and release the Custom Device interface properly.</p>
78	Incorrect percentage of progress is displayed during GR device 2 nd FWU flow	<p>Sighting #: 1307984822</p> <p>Affected Component: Thunderbolt DCH bus driver.</p> <p>Impact: If done fast enough, in 15s time window, the second FW update starts with 100%.</p> <p>Fix: Reset the number of bytes written, once the device is back after authentication.</p>
77	Firmware update for GR with NVM 28 doesn't work through DCH FW update SDK on windows OS 20H1	<p>Sighting #: 1307972422</p> <p>Affected Component: Thunderbolt DCH firmware update SDK and Thunderbolt DCH bus driver.</p> <p>Impact: GR with NVM up to 28 cannot be updated through DCH SDK running on TGL host in Windows OS 20H1.</p> <p>Fix: Display GR device for update in SDK. In the driver after FW update is completed, check the last Auth status from vendor specific register on GR.</p>
76	Wrong failure message upon GR disconnection during its FW Update	<p>Sighting #: 1307910481</p> <p>Affected Component: Thunderbolt DCH firmware update SDK.</p> <p>Impact: Wrong failure message appears after GR gets disconnected during its FW Update.</p> <p>Fix: Check for NULL returning from the driver in case of disconnect and throw the relevant exception.</p>
76	Failure message is shown after FW Update completes on GR	<p>Sighting #: 1307952219</p> <p>Affected Component: Thunderbolt DCH firmware update SDK.</p> <p>Impact: Failure message appears after FW Update completes on GR through Usb3.</p> <p>Fix: Increase time to wait for device to complete authentication. It was 2s and now it is increased to 5s.</p>

Issue Fixed in Release #	Title	Details
76	Cannot install TCC after one uninstall	<p>Sighting #: 1307904078</p> <p>Affected Component: Thunderbolt DCH One Click Installer.</p> <p>Impact: Cannot install TCC after install-uninstall-install sequence.</p> <p>Fix: In addition to the command used today to remove TCC, Use <i>Remove-AppxProvisionedPackage</i> command.</p>
76	GR FW update with newer CMs does not work the second time	<p>Sighting #: 1307872922</p> <p>Affected Component: Thunderbolt DCH driver.</p> <p>Impact: Second FW update to GR device might fail to start.</p> <p>Fix: Fix typo in the driver, thus retaining the details of the disconnected device after the first firmware update.</p>
76	No Thunderbolt driver after W32->DCH->W32 manual downgrade flow using W32 msi	<p>Sighting #: 1307679669</p> <p>Affected Component: Thunderbolt DCH One Click installer.</p> <p>Impact: If a user downgrades the DCH using the W32 installer, the driver is removed but W32 is failing.</p> <p>Fix: Block W32 installation by installing dummy software with the same Upgrade Code.</p>
76	Thunderbolt device not described in HSA due to TBT port and TCSS mismatch.	<p>Sighting #: 1508051297</p> <p>Affected Component: Thunderbolt DCH driver, Thunderbolt Control Center.</p> <p>Impact: If port A is disabled on a host, the devices connected to port B are not shown in the TCC.</p> <p>Fix: Driver provides info of disabled ports to TCC. TCC correctly maps between route string of a connected device to shown port.</p>
76	Thunderbolt DCH SW version 74 uninstall script cannot remove the "TbtHostControllerToastComponent.inf"	<p>Sighting #: 22011189806</p> <p>Affected Component: Thunderbolt Install scripts.</p> <p>Impact: Installation failure noticed when running Setup.bat the second time after uninstalling with Uninstall.bat.</p> <p>Fix: Remove the newly added component - <i>tbthostcontrollertoastcomponent.cat</i> when running the <i>Uninstall.bat</i> file.</p>
75	Driver allows updating NVM for the hosts where it is not supported	<p>Sighting #: 1307518878</p> <p>Affected Component: Thunderbolt DCH driver.</p> <p>Impact: TBT3 host NVM tries to update even when it is not supported.</p> <p>Fix: Block NVM update on hosts where it is not supported.</p>

Issue Fixed in Release #	Title	Details
75	Possible hang on device FW update	Sighting #: 1307611296 Affected Component: Thunderbolt DCH driver. Impact: On some devices, where power cycle command does not affect, the FW update is very slow, and SDK is stuck at 100% forever due to no timeout. Fix: Timeout is added to cover this case.
75	Device disconnect during the firmware update process may result in a long time wait for SDK to produce an error	Sighting #: 1307724500 Affected Component: Thunderbolt Firmware update SDK. Impact: If a device is disconnected during the FW update process, the SDK gets stuck approximately 6.5m. Fix: Do not retry sending IOCTL in case of other than buffer too small failure.
75	Add support for ADL in DCH driver	Sighting #: 1307690048 Affected Component: Thunderbolt DCH driver. Impact: Driver yellow bang is seen on ADL. Fix: Add support for ADL.
75	Device FW update timeout in response to SDK query	Sighting #: 1307682553 Affected Component: Thunderbolt DCH driver. Impact: If two FW updates are done back to back, the second one will get a timeout error. Fix: Do not add two entries to the power cycling device list.
74	TGL/ICL BSOD 0xE6 – VTd violation by TBT DMA.	Sighting #: 1707220760 Affected Component: Thunderbolt Bus Driver. Impact: During S4 cycles, BSOD 0xE6 pointing to TBT DMA. Fix: If MSIx table is not ready after preparing HW callback, make OS restart the driver.
73	GR image update while the host is USB4 FW based	Sighting #: 1307469996 Affected Component: Thunderbolt Bus Driver. Impact: While updating GR FW on USB4 hosts with FW CM, the FW update status is not correct. Fix: Wait for a response from CM and respond to FW update SDK accordingly.
73	TbtHostControllerService is not installed on a system with MR	Sighting #: 1307576804 Affected Component: Thunderbolt Bus Extension. Impact: The service cannot be installed on Maple Ridge (MR), which prevents safe mode toasts. Fix: Add MR HW id to extension inf.

Issue Fixed in Release #	Title	Details
73	Slow ethernet stack performance in some TBT p2p connection	<p>Sighting #: 14010814942, 18010389103 Affected Component: Thunderbolt Bus Driver. Impact: Slow ethernet stack performance is seen on a specific cross-OS TBT p2p connection. Fix: The bus driver will ignore the 64K MTU bit in the protocol settings and will assume that the peer supports 64K MTU as a receiver.</p>
73	TBT should fully support Componentization ("C") requirement for Modern Servicing	<p>Sighting #: 22010872796, 22010874968 Affected Component: Thunderbolt Bus Driver and Extension. Impact: Incorrect implementation of the extension, which includes Intel owned service and toast launcher application. Fix: Move Intel owned executables to a component inf. The base inf copies it to the driver store. Extension instantiates the component. No functional changes.</p>
73	Wrong class code for ADL	<p>Sighting #: 18011829032 Affected Component: Thunderbolt Bus Driver. Impact: Driver cannot be installed on ADL. Fix: Add USB class code to ADL HW ID.</p>
72	Extension inf shouldn't have the ICL/TGL device ids	<p>Sighting #: 1307496564 Affected Component: Thunderbolt Extension Impact: <i>TbtHostControllerExtension.inf</i> service responsible for toasts will be installed on ICL/TGL when the TBT SW is installed using <i>setup.bat</i> file. Since ICL/TGL does not have security levels, the toast for device approval is undesirable. Fix: Remove HW device IDs which do not need the toasts service.</p>
72	BSOD 0x7E when system is idle in MSC	<p>Sighting #: 1507895121 Affected Component: Thunderbolt Bus Driver Impact: When system is left idle in MS on CML for about 15mins, BSOD from the thunderbolt driver might appear. Fix: Add check for NULL pointer initialization</p>
72	TBT TCC missed localization of Brazilian Portuguese (PT-BR) language for the PCIe tunneling disabled information	<p>Sighting #: 1307493537 Affected Component: Thunderbolt Control Center Impact: English text is displayed on PCI tunneling information in case of Portuguese being the main language. Fix: Add localization for Portuguese</p>

Issue Fixed in Release #	Title	Details
72	PCIe tunneling enabled info not reflected in TCC	Sighting #: 1307493534 Affected Component: Thunderbolt Control Center. Impact: When PCIe tunneling is enabled, the status is not reflected in the about window. Fix: Reflect the PCIe tunneling status regardless of the security level on TGL/MR and further.
72	SUT hang while running Prime95 V2 test	Sighting #: 16011060739 Affected Component: Thunderbolt Bus Driver Impact: BSOD pointing to Thunderbolt driver when running Prime95 V2 test with <i>New Prime 95 V2</i> and <i>New Diskcat 2</i> tests. Fix: Check for null.
72	Bugcheck 0x7E and 0x0 pointing to TBT driver during S4 cycling	Sighting #: 22010584962 Affected Component: Thunderbolt Bus Driver. Impact: BSOD pointing to Thunderbolt driver when running cycles of S4. Fix: Check for null pointer.
71	No error toast notification when connecting a device that does not support SL2	Sighting #: 1307046741 Affected Component: Thunderbolt Bus Driver, Thunderbolt Control Center. Impact: No connection failure toast notification is received when a device that doesn't support SL2 is connected when the system is configured to SL2. Fix: In the driver, use named event to trigger the service to send the toast through TCC. In the TCC, issue the required toast.
71	No error toast notification regarding the rejection of connected device in the second depth in SL4	Sighting #: 1306796405 Affected Component: Thunderbolt Bus Driver, Thunderbolt Control Center. Impact: No toast notification is received when the system is configured to SL4 and the user connects device in the second depth. Fix: In the driver, use named event to trigger the service to send the toast through TCC. In the TCC, issue the required toast.
71	PCIe tunneling messages localization	Sighting #: 1307454194 Affected Component: Thunderbolt Control Center. Impact: English text is displayed on PCI tunneling information regardless of the app language. Fix: Localize the required strings and add them to the application.

Issue Fixed in Release #	Title	Details
71	Missing device NVM version in Windows Event Viewer	Sighting #: 1307474883 Affected Component: Thunderbolt Bus Driver. Impact: No FW version is shown in the <i>DeviceConnected</i> event in Windows Event Viewer. Fix: Device FW version is added to the <i>DeviceConnected</i> event to Windows EventViewer.
71	TBT ports disappear from TCC	Sighting #: 1507862669 Affected Component: Thunderbolt Control Center. Impact: TCC sporadically does not display ports' information on systems with two controllers. Fix: Solve a race between two controllers which was introduced in 1.0.22.0
70	Teaching tip when PCIe tunneling is disabled	Sighting #: 1307378024 Affected Component: Thunderbolt Control Center Impact: Not a clear message regarding PCIe tunneling disabled. Fix: Added teaching tip for a user, when hovered over the question button, show tip explaining what PCIe tunneling disable means.
70	Remove external GPU supported message from HSA	Sighting #: 1307381032 Affected Component: Thunderbolt Control Center Impact: Redundant message saying external GPU supported is shown in the about window of TCC. Fix: Remove the External GPU supported strings as eGFX is supported on all modern platforms.
70	PCIe tunneling option should be hidden on ICL systems	Sighting #: 1307381032 Affected Component: Thunderbolt Control Center Impact: Redundant message, PCIe tunneling enabled, is shown in the about window of TCC. Fix: Remove the PCIe tunneling status for ICL platforms.
70	upon P2P unplug after a cold boot	Sighting #: 16010838872 Affected Component: Thunderbolt Bus Driver. Impact: BSOD(<i>KMOD_EXCEPTION_NOT_HANDLED</i>) occurs upon unplug p2p right after cold boot. Fix: Add checks for null and locks in the PDO class so during disable there will not be null access.
70	Driver events to telemetry fixes after release 69	Sighting #: 1307432062 Affected Component: Thunderbolt Bus Driver Impact: Events from driver to Event log are not clear enough. Fix: Change event IDs order and add RTD3 entry and RTD3 exit events.

Issue Fixed in Release #	Title	Details
69	Firmware update status is always the same	Sighting #: 1307275915 Affected Component: Thunderbolt bus driver Impact: FW update on GR device always finishes with the same status Fix: Stop reading NVM on a device connected to get the NVM version rather read it only when needed.
68	FW update error with DCH driver	Sighting #: 1307151768 Affected Component: Thunderbolt bus driver Impact: FW update on devices failed. Fix: Increased the timeout from 100ms to 500ms for a block write operation.
68	Thunderbolt DCH SW cannot be installed on systems with Maple Ridge Universal Serial Bus (USB) Controller	Sighting #: 1307124837 Affected Component: Thunderbolt bus driver Impact: Driver installation failure on systems with MR, when it is configured with DMA class code for USB4. Fix: Add support for different hardware ID for MR in the INF.
68	Add support TGL B step to the base inf.	Sighting #: 1307215248 Affected Component: Thunderbolt bus driver. Impact: No support for TGL B step and on. Redundant inf for TGL A0 was used. Fix: Added support for TGL B step, removed TGL A0 inf. Now use TbtHostController.inf to install driver on TGL and others.
68	Bugcheck 0 on reboot with driver verifier and debugging enabled - TbtBusDrv	Sighting #: 2209875034 , 1608908056 Affected Component: Thunderbolt bus driver. Impact: Cannot run HLK on TGL A0. Fix: Move interrupt allocation to later stage, where the real resources provided are known. Use only provided interrupt resources without assuming they are MSIX and all valid.
68	TBT app will not show connected TBT device normally after resume from MS/S4	Sighting #: 1507570730 Affected Component: Thunderbolt Control Center. Impact: The application stops showing its views properly after S4/MS. Fix: Do not release the communication with driver (Custom Device) if it is not needed. The only time the release will happen is when the application is closed.
68	Random port numbers seen in the Thunderbolt control Centre app	Sighting #: 1707040806 , 1608619083 Affected Component: Thunderbolt Control Center. Impact: The Thunderbolt application shows wrong port numbers. Fix: Enumerate ports of a controller differently, based on its PCI Serial number.

Issue Fixed in Release #	Title	Details
68	No device is shown in HSA in case of fast unplug/plug	<p>Sighting #: 1809316233</p> <p>Affected Component: Thunderbolt Control Center, Thunderbolt bus driver</p> <p>Impact: The Thunderbolt application (HSA) does not show the device in case of fast unplug and plugging the device back. This issue is seen in non-rtd3 platforms.</p> <p>Fix: Close the application early when the driver is about to be removed.</p>
68	Unexpected port/controller number is displayed	<p>Sighting #: 1807445361</p> <p>Affected Component: Thunderbolt Control Center</p> <p>Impact: Wrong port numbers shown in the Thunderbolt application (HSA) in case of platform change but same windows.</p> <p>Fix: Detect platform change using UWP API and reset controllers mapping.</p>
67	Thunderbolt is blocking pkg c state entry no-device-attached after Sx Cycling - TBT DMA stuck	<p>Sighting #: 2209860687</p> <p>Affected Component: Thunderbolt bus driver.</p> <p>Impact: Thunderbolt Driver blocks entry to low CPU states, lower than C3.</p> <p>Fix: Memory allocation should be explicitly requested by the driver from the BIOS upon S4 exit - only needed on A-step.</p>
66	Two stage inter domain disconnect together with L1s enable makes CM not responsive.	<p>Sighting #: 1307088469</p> <p>Affected Component: Thunderbolt bus driver.</p> <p>Impact: CM becomes not responsive on driver disable during P2P traffic. The issue can exist only on TR based systems.</p> <p>Fix: Usage of one stage disconnect interdomains instead of two stages.</p>
66	BSOD (0xD1) occurs during file copy, unplug the cable of TBT Peer to Peer Networking.	<p>Sighting #: 1507634159</p> <p>Affected Component: Thunderbolt bus driver.</p> <p>Impact: BSOD on disconnect P2P during traffic under certain conditions.</p> <p>Fix: On release, TX buffers need to lock transmit lock to prevent nullify TX buffers list, while TX is actively working on them.</p>
65	P2P throughput is very low	<p>Sighting #: 1606913021</p> <p>Affected Component: Thunderbolt bus driver.</p> <p>Impact: Low P2P throughput. P2P file transfer is around 400Mbps instead of 4-8Gbps or greater.</p> <p>Fix: Disable L1 on PCI upstream bridge, When P2P connection is established.</p>

Issue Fixed in Release #	Title	Details
65	System will BSOD when flash NVM FW with BME dock	<p>Sighting #: 1306970417, 1507519418</p> <p>Affected Component: Thunderbolt bus driver.</p> <p>Impact: Yellow bang and BSOD on HR FW update on some TR based systems.</p> <p>Fix: When Host controller is removed, stop the command sender and flush the command queue. Thus, prevents deadlock which was the cause of this issue.</p>
65	Docking cannot be detected in BIOS pre-boot menu Shutdown and Restart from OS in SL1 mode	<p>Sighting #: 2209672241, 1307001203</p> <p>Affected Component: Thunderbolt bus driver.</p> <p>Impact: Devices aren't available at pre-boot menu.</p> <p>Fix: Fix typo, which made the driver to not support pre-boot ACL.</p>
65	TBT docking will lose function after docking is attached to the system and then restart under SL2 with NVM39	<p>Sighting #: 1608809297</p> <p>Affected Component: Thunderbolt bus driver.</p> <p>Impact: Approved device is not connected after restart.</p> <p>Fix: The issue is with CM, which discards a packet from the driver if it came too fast after a previous command. The fix is to add a delay of 2ms after each command.</p>
64	Driver appends a device to the topology which is rejected by the FW	<p>Sighting #: 1306955986</p> <p>Affected Component: Thunderbolt bus driver.</p> <p>Impact: Misleading connected status in HSA in SL4 first depth. The second device is also displayed, which is unexpected.</p> <p>Fix: Report tunneled for the first depth device to HSA. Block devices starting from the second depth from entering topology.</p>
63	Thunderbolt APP doesn't POP up after hot plug then cold boot	<p>Sighting #: 1507224529</p> <p>Affected Component: Thunderbolt bus driver, Thunderbolt Service.</p> <p>Impact: Thunderbolt application has no reaction after the system cold boot.</p> <p>Fix: In the service, on user login, get all the devices which require approval and send a toast for each one of them.</p>
63	No notification (toast) is seen while Thunderbolt controller (CM FW) is in safe mode.	<p>Sighting #: 1306356294</p> <p>Affected Component: Thunderbolt bus driver, Thunderbolt Service.</p> <p>Impact: No toast is seen while the host controller is in safe mode.</p> <p>Fix: In the service, on user login, if host is in the safe mode, send the toast.</p>

Issue Fixed in Release #	Title	Details
63	Connection status "Not connected" displayed in SL4 on first depth instead of "Connected" status	Sighting #: 1306186099 Affected Component: Thunderbolt bus driver. Impact: Misleading status is displayed regarding the first depth device in SL4. Fix: Report tunneled status to HSA in such a case.
63	BSOD noticed during power stress test	Sighting #: 1507470766 Affected Component: Thunderbolt bus driver. Impact: BSOD noticed after a problem with CM ready. Fix: If driver context is not started, meaning CM is not ready.
62	Support P2P ring allocation via BIOS pre allocated memory	Sighting #: 1306766044 Affected Component: Thunderbolt Peer to Peer communication. Impact: P2P is blocked due to VTD bug. Workaround: Uses BIOS allocated memory for TBT rings. The driver is required to use this memory for P2P data path rings.
62	DCH support for TDT ring allocation via BIOS pre-allocated memory	Sighting #: 1306765876 Affected Component: TDT. Impact: TDT cannot allocate rings. Workaround: Uses BIOS allocated memory for TBT rings. The driver is required to use this memory for TDT rings.
62	Add Microsoft DFX opt-in support for the Intel Thunderbolt driver	Sighting #: 1406986249 Affected Component: Thunderbolt Bus Driver. Impact: Thunderbolt Bus driver is required to support DFX.
62	Thunderbolt FW Update Utilities Do Not Support Strong Naming	Sighting #: 2207434597 Affected Component: Thunderbolt SDK. Impact: SDK and TBT C# dlls don't support strong naming.
62	SDK Utilities, <i>HostUpdateSupported</i> function wrong return value for unsupported host controllers	Sighting #: 1306804151 Affected Component: Thunderbolt SDK. Impact: The <i>HostUpdateSupported</i> function returns wrong value for unsupported host controllers. Fix: The Utilities is updated, therefore the <i>HostUpdateSupported</i> function will return "true" only for the known controllers and "false" for unknown controllers.

Issue Fixed in Release #	Title	Details
60	Displays "Value cannot be null" during GR device FWU	Sighting #: 1306646690 Affected Component: Thunderbolt Firmware Update SDK. Impact: Displays "Value cannot be null" during GR device FWU. Fix: An exception is thrown on attempt to update NVM for GR.
60	TR Dock cannot be recognized in Thunderbolt Control Center when attached to TBT port of the system.	Sighting #: 1507223810 Affected Component: Thunderbolt Bus Driver Impact: Driver ignored a device connected notification during entry to RTD3.
60	DCH topology shows incorrect topology when unplugging devices just after running TL commands and no new enumeration is possible	Sighting #: 1807467061 Affected Component: Thunderbolt Bus Driver. Impact: Driver failed to send commands to CM. Therefore, DCH topology shows incorrect topology when unplugging devices just after running TL commands and no new enumeration is possible.
60	Device enters error state when FWU of device failed on authorization	Sighting #: 1306363167 , 1306417354 Affected Component: Thunderbolt Bus Driver. Impact: End point representation in the driver is in error state, when FW update fails.
60	No Thunderbolt Control Center functionality when Legacy Thunderbolt SW is installed	Sighting #: 1306465331 Affected Component: Thunderbolt Control Center Impact: Control Center could not access the driver due to admin security privileges left from the legacy software.
60	P2P Connectivity issues during Sx state	Sighting #: 1607017007 Affected Component: Thunderbolt P2P Impact: P2P connection is getting disconnected when Two Port concurrency (P2P+Storage) is connected to both SUT1 and SUT2 during Sx state.
60	Sporadic peer to peer connectivity issues	Sighting #: 1607127405 Affected Component: Thunderbolt P2P Impact: Sporadically peer to peer connection is directing to "Documents" folder when hot plugged/unplugged in S0 state.
60	Peer to Peer connection is not establishing sporadically after resuming from Sx state	Sighting #: 1507109245 Affected Component: Thunderbolt P2P Impact: Sporadically peer to peer connection is not established (3 out of 5) after resuming from Sx state.
60	No inter domain connection upon booting from S5 to S0 state while CIO connected	Sighting #: 1306464272 Affected Component: Thunderbolt P2P Impact: No inter domain connection is noticed when booting from S5 state to S0 state while CIO is connected.

Issue Fixed in Release #	Title	Details
60	RTD3 support info is incorrect when TCM is reading it from TBT DCH	Sighting #: 1607548218 Affected Component: Thunderbolt Bus Driver Impact: The RTD3 capability is not properly displayed in TCM.
60	Successful FW update message is shown regardless of an actual failure	Sighting #: 1306584434 Affected Component: Thunderbolt Bus Driver Impact: Success message status is shown by FW update SDK, regardless of authentication status after the image update on GR.
60	Device grayed out in FW Update Tool	Sighting #: 1807870882 Affected Component: Thunderbolt Firmware Update SDK. Impact: Cannot perform FW update through TGL as the device is grayed out in FW Update Tool.
60	Timeout message during FWU with 2 or more devices connected	Sighting #: 1306420947 , 1507228520 Affected Component: Thunderbolt Firmware Update SDK. Impact: An Exception is thrown during HR FW update. Fix: The timeout for the whole FW update process is increased from 30 sec to 1 min.
60	KDP status hyperlink disappears on tab refresh	Sighting #: 1306513812 Affected Component: Thunderbolt Control Center Impact: The Kernel DMA Protection (KDP) status line disappears randomly on tab refresh.
60	Note section in approve page is displayed while VTd is enabled	Sighting #: 1306274178 Affected Component: Thunderbolt Control Center Impact: Note section in approve page is displayed while VTd is enabled (auto connect is enabled).
60	No space between Thunderbolt (TM) and controller on "Details" section in TCC	Sighting #: 2207412879 Affected Component: Thunderbolt Control Center Impact: No Space is noticed between Thunderbolt(TM) and controller on "Details" section in the Thunderbolt Control Center app.
60	The point of the NVM FW version number is a colon	Sighting #: 2207412993 Affected Component: Thunderbolt Control Center Impact: The point of the NVM FW version number is a colon (39:0), which is displayed in the Thunderbolt Control Center app. Fix: Replaced the colon ":" with the dot ".".
60	"Manage approved devices" is cutoff of Portuguese/Spanish/French language	Sighting #: 2207413043 Affected Component: Thunderbolt Control Center Impact: "Manage approved devices" is cutoff of Portuguese/Spanish/French language in Thunderbolt Control Center app.

Issue Fixed in Release #	Title	Details
60	Information for user "approval not needed" in SL3 and SL4	Sighting #: 1306191606 Affected Component: Thunderbolt Control Center Impact: Confusing note is displayed Fix: Note field has been removed for SL3 and SL4 (Security Level) in Thunderbolt Control Center app.
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.
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.

Issue Fixed in Release #	Title	Details
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 <i>after Sx cycles & Warm Reset</i> .	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> .
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 <i>SYSTEM_THREAD_EXCEPTION_NOT_HANDLED (7e)</i> 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 <i>SYSTEM_THREAD_EXCEPTION_NOT_HANDLED (7e)</i> pointing to TBT kernel mode driver, <i>TbtBusDrv</i> while running S4 cycle.
59.2	BSOD 0x50 (<i>PAGE-FAULT-IN-NONPAGED-AREA</i>) 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.

Issue Fixed in Release #	Title	Details
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 "Microsoft.NET.Native.Framework.2.1 not found" 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.
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 YFL0/1 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 DRIVER_POWER_STATE_FAILURE is observed during CS cycle

Issue Fixed in Release #	Title	Details
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 end point 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.
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 Thunderbolt controller App after wake from Sx	Sighting #: 1306174429 Affected Component: Thunderbolt Control Center Fix: The NVM FW version displays "unknown" in the About window in Thunderbolt controller App 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.

Issue Fixed in Release #	Title	Details
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.
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 devices connected	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.

Issue Fixed in Release #	Title	Details
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.
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.

Issue Fixed in Release #	Title	Details
46	Warm reset on YFL causing CATERR	Sighting #: 1305951801 Affected Component: Thunderbolt Bus Driver Impact: CATERR "PKG_C_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.
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.

Issue Fixed in Release #	Title	Details
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.

Issue Fixed in Release #	Title	Details
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.
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

Issue Fixed in Release #	Title	Details
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.
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.

Issue Fixed in Release #	Title	Details
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.
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.

Issue Fixed in Release #	Title	Details
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