

USB4 2.0 ENGINEERING CHANGE NOTICE FORM

Title: Configuration and Behavior When TMU is Disabled
Applied to: USB4 Specification Version 2.0

Brief description of the functional changes:

Changing the expected configuration when TMU is not supported in one of the Router on a Link
--

Benefits as a result of the changes:

Allowing CLx when TMU is not supported in one of the Routers on a Link
--

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
--

Routers with Downstream Facing Ports may be connected to Routers that do not support TMU. If the Connection Manager will configure Enhanced Uni-directional mode on these Links, the Links will not get to CL1/2 (remain in CL0s)

An analysis of the hardware implications:
--

None

An analysis of the software implications:
--

Need a Connection Manager change to not enable Enhanced Uni-directional when a Router does not support TMU.

An analysis of the compliance testing implications:
--

None

USB4 2.0 ENGINEERING CHANGE NOTICE FORM

Actual Change

(a). 7 Time Synchronization

To Text:

The Time Synchronization Protocol provides a mechanism for synchronizing the real-time clocks and absolute time of connected Routers to a high degree of accuracy and precision. A Router with one or more Downstream Facing Port shall support the Time Synchronization Protocol described in this chapter. A Router with no Downstream Facing Ports may optionally support the Time Synchronization Protocol described in this chapter. A Router that does not support the Time Synchronization Protocol shall set the Time Synchronization Protocol Not Supported bit in the TMU Router Configuration Capability to 1b.



CONNECTION MANAGER NOTE

When enumerating a Router, if the Time Synchronization Protocol Not Supported bit is set to 1b, the Connection Manager shall not enable TMU on the Downstream Facing Port connected to this Router's Upstream Facing Port.

USB4 2.0 ENGINEERING CHANGE NOTICE FORM

(b). 7.3.1.3 Enhanced Uni-directional Time Sync Handshake

To Text:

When Enhanced Uni-Directional Time Sync Handshakes are enabled, the first DirSwitchN number of handshakes are initiated by the Downstream Facing Port. These handshakes use Inversed Bi-Directional mode, which is described in Section 7.3.1.3.1. After executing the first DirSwitchN handshakes in Inversed Bi-Directional mode, the Downstream Facing Port continues to initiate handshakes but transitions to Adaptive Uni-Directional mode, which is described in Section 7.3.1.3.2.



IMPLEMENTATION NOTE

There are Connection Managers in the eco-system that will enable Enhanced Uni-directional Time Sync when the Upstream Facing Port does not support TMU. This configuration may cause a scenario where the Downstream Facing Port will not receive any Delay Response. It is recommended that the Downstream Facing Port will move to Adaptive Uni-directional mode after transmitting DirSwitchN Delay Requests even if it didn't manage to complete DirSwitchN successful TMU handshakes.



CONNECTION MANAGER NOTE

When the Routers on both sides of a Link support Version 2.0 of the USB4 Specification and support TMU, a Ver. 2 Connection Manager shall enable Enhanced Uni-Directional Time Sync Handshakes.

(c). 7.3.1.3.1 Inversed Bi-directional Mode

To Text:

If an error occurs during the transmission or reception of a Time Sync Packet, the entire Time Sync Handshake shall be voided (i.e. neither the time stamps nor the values from the Follow-Up Packet shall be used).

If the Downstream Facing Port sent DirSwitchN Delay Requests and did not receive any Delay Response it is recommended to transition to Adaptive Uni-directional mode.