

USB4 2.0 ENGINEERING CHANGE NOTICE FORM

Title: Enabling Scrambler Re-Sync Debug Feature
Applied to: USB4 Specification Version 2.0

Brief description of the functional changes:

Policies and triggers to enable Scrambler Re-Sync Debug feature should be in system software domain. Current description in the specification describes it strictly in the Connection Manager domain.

Benefits as a result of the changes:

Debug Feature should be part of system or debug software.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
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None.

An analysis of the hardware implications:
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None.

An analysis of the software implications:
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None.

An analysis of the compliance testing implications:
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None.

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Actual Change

(a). Section 4.4.8.1 Background (Informative)

From Text:

The Scrambler Re-Synchronization Debug feature is enabled for Routers subject to debug by the Connection Manager during enumeration. An alternative method is to have the test device itself enable the feature. Once the feature is enabled it shall be retained during Sleep. Following a device disconnect, the feature is disabled.

To Text:

The Scrambler Re-Synchronization Debug feature is enabled for Routers subject to **trigger from the system software** ~~to debug by the Connection Manager~~ during enumeration. An alternative method is to have the test device itself enable the feature. Once the feature is enabled it shall be retained during Sleep. Following a device disconnect, the feature is disabled.

(b). Section 4.4.8.2 Scrambler Re-Synchronization Debug at Gen 2 or Gen 3 Speeds

From Text:

- The Connection Manager has enabled the Scrambler Re-Synchronization feature for Gen 2 or Gen 3, by setting the Enable Scrambler Re-Sync (ESRS) bit to either 01b or 10b in the Debug Capability Configuration register for Gen 2 or Gen 3.

To Text:

- The **system software** ~~Connection Manager~~ has enabled the Scrambler Re-Synchronization feature for Gen 2 or Gen 3, by setting the *Enable Scrambler Re-Sync (ESRS)* bit to either 01b or 10b in the Debug Capability Configuration register for Gen 2 or Gen 3.

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(c). Section 4.4.8.3 Scrambler Re-Synchronization Debug at Gen speed

From Text:

- The Connection Manager has enabled the Scrambler Re-Synchronization feature for Gen 4 by setting *Enable Scrambler Re-Sync (ESRS)* bit to either 01b or 10b in the Debug Capability Configuration register for Gen 4.

CONNECTION MANAGER NOTE

When testing a USB4 Link that requires Scrambler Re-Sync capabilities, it is recommended that the Connection Manager read the Scrambler Re-Sync Support fields from the Debug Capability Configuration registers of both Link Partners and enable the Scrambler Re-Sync feature for transmitters only in case both sides support it. This is done independently for Gen 2 or Gen 3 speed, and for Gen 4 speed. In cases where a Link is subjected to testing and only one of the Link Partners supports the Scrambler Re-Sync capabilities, the Connection Manager can enable the Scrambler Re-Sync feature for both the transmitter and receiver Lanes of the Port that supports this feature

To Text:

- The ~~system software Connection Manager~~ has enabled the Scrambler Re-Synchronization feature for Gen 4 by setting *Enable Scrambler Re-Sync (ESRS)* bit to either 01b or 10b in the Debug Capability Configuration register for Gen 4.

~~CONNECTION MANAGER IMPLEMENTATION NOTE~~

When testing a USB4 Link that requires Scrambler Re-Sync capabilities, it is recommended that ~~the system software Connection Manager~~ read the Scrambler Re-Sync Support fields from the Debug Capability Configuration registers of both Link Partners and enable the Scrambler Re-Sync feature for transmitters only in case both sides support it. This is done independently for Gen 2 or Gen 3 speed, and for Gen 4 speed. In cases where a Link is subjected to testing and only one of the Link Partners supports the Scrambler Re-Sync capabilities, ~~the system software Connection Manager~~ can enable the Scrambler Re-Sync feature for both the transmitter and receiver Lanes of the Port that supports this feature.