USB 3.1 ENGINEERING CHANGE NOTICE FORM

Title: Retimer in Compliance Mode
Applied to: Appendix E rev1p1

Brief description of the functional changes:

Retimer in Compliance Mode to only enable the transmitter compliance test on its port NOT receiving Polling.LFPS in Rx.Detect. The transmitter on its other port remains in electrical idle.

Benefits as a result of the changes:

To achieve a robust operation for retimers in Compliance Mode by eliminating the following possible scenarios in the current operating condition where both ports are transmitting CPx.

1. Retimer as a captive retimer, the LFPS receiver of the associate host or device may not be able to filter out CP0 completely and could potentially exit from the squelched condition. This condition could be treated as receiving Ping.LFPS, that will potentially result in the associate host or device advaninge the compliance patterns including CP4/7/8, each of which is LFPS(CP4) or LFPS alike(CP7/CP8). If the duration of these patterns qualifies as Warm Reset, it will lead retimer to exit from Compliance Mode and transition to Rx.Detect.
2. Some of the existing USB implementations in Compliance Mode advances CPs if its LFPS receiver exit from squelch. They do not check if it is Ping.LFPS. If the retimer transmits CP4/7/8, the associate host or device may treat it as Ping.LFPS and advance the compliance patterns, thus leading the same issue described above.

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

No retimer compliant to exiting revision is available yet. For a very few on-going implementations that may be configured as a captive retimer, Tx compliance may be certified under a standalone retimer compliance test environment, and be waived at the system level. The system level compliance test may still be conducted in a limited fashion, or through proprietary control mechanisms.

An analysis of the hardware implications:

Will require design change

An analysis of the software implications:

None

An analysis of the compliance testing implications:

Will need to be updated

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Actual Change

(a). From Text (and location): Section E.3.3.5

E.3.3.5 Compliance Mode Requirements

- The re-timer shall monitor the LFPS signal at both ports.
  - If it is Ping.LFPS, it shall advance the compliance pattern accordingly.
  - If it is WarmReset, it shall conclude the compliance test.
- The re-timer shall transmit the compliance pattern at both ports.

(a). To Text (and location): Section E.3.3.5

E.3.3.5 Compliance Mode Requirements

- The re-timer shall monitor the LFPS signal at both ports.
  - If it is Ping.LFPS, it shall advance the compliance pattern accordingly.
  - If it is WarmReset, it shall conclude the compliance test.
- The re-timer shall configure the port not receiving Polling.LFPS in Rx.Detect for the transmitter compliance test, and keep the transmitter at its other port in electrical idle.