

IEEE 802.3bz 2.5G/5G Timing considerations for Pause operation

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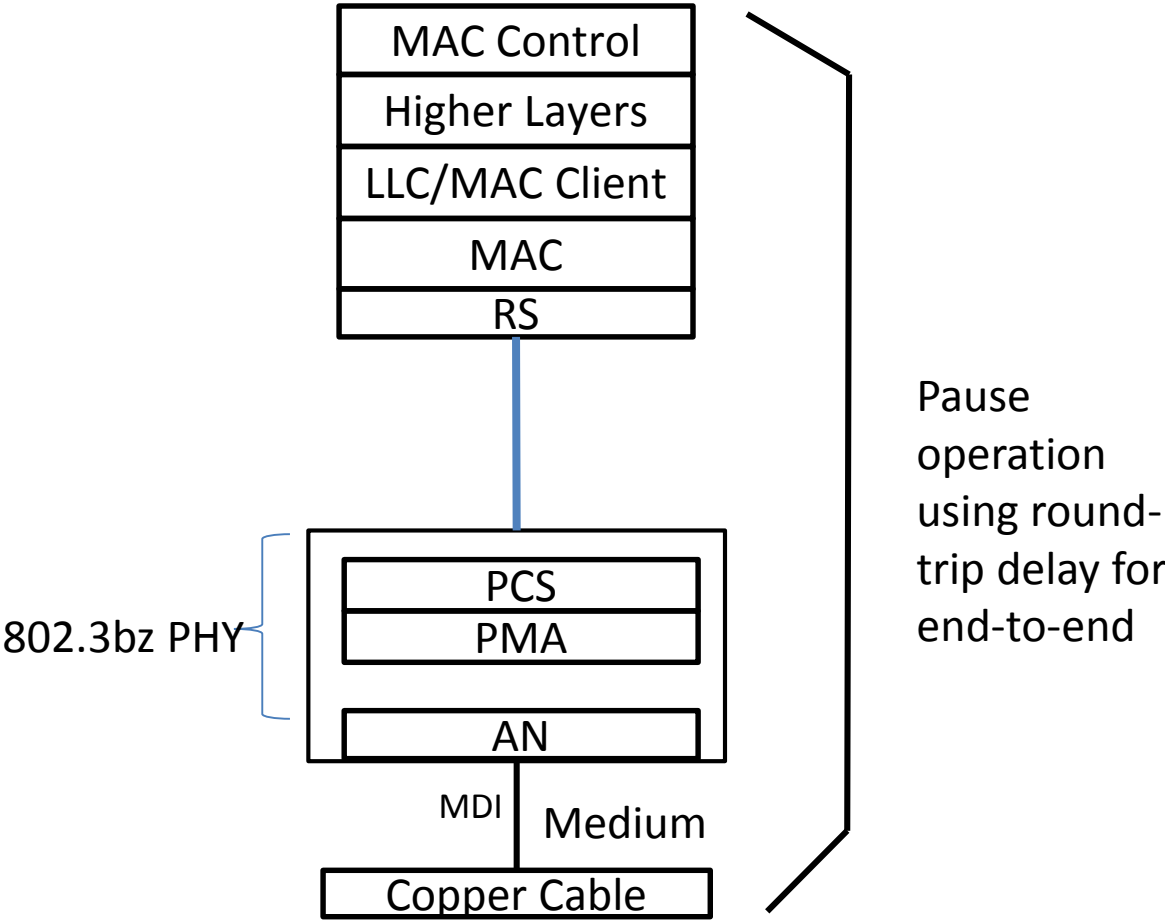
Background

- Clause 31B.3.7 specifies timing for Pause operation for data rates supported by IEEE 802.3
- IEEE 802.3bz draft 2p0 is missing “Timing consideration for Pause operation” for 2.5G/5G data rates required in the Clause 31B.3.7
- This proposal provides specification and text to be included to Clause 31B.3.7 for 2.5G and 5G data rates

Supporters

- George Zimmerman (CME Consulting/Commscope & Aquantia)

Pause operation relationship to ISO/IEC Open System Interconnection reference model



2.5G Pause operation

- 2.5G IEEE 802.3bz D2p0 PHY round-trip delay (Table 125-5 page 63)
 - 25 pause-quanta
 - 5120 ns (0.4ns per bit and 512-bit per pause_quanta)
- Cable round-trip delay (Clause 44.3, table 44-3)
 - cable delay = $10^{10} / nc$ BT/m . N = length in meters, c= speed relative to speed of light
 - Worst case cable delay of 1112 ns with c=0.6 and n=100m
- MAC (64-byte pause frame Tx/Rx processing delay)
 - 64-byte => 535.60 ns
- Maximum Delay of 6790.60 ns => 16924-bit => 33.05 pause-quanta
 - Rounding-off to integer pause-quanta => **34**

5G Pause operation

- 5G IEEE 802,3bz D2p0 PHY round-trip delay (Table 125-5 page 63)
 - 28 pause-quanta
 - 2867.20 ns (0.2ns per bit and 512-bit per pause_quanta)
- Cable round-trip delay (Clause 44.3, table 44-3)
 - cable delay = $10^{10} / nc$ BT/m . N = length in meters, c= speed relative to speed of light
 - Worst case cable delay of 1112 ns with c=0.6 and n=100m
- MAC (64-byte pause frame Tx/Rx processing delay)
 - 64-byte => 204.80 ns
- Maximum Delay of 4148 ns => 20920-bit => 40.86 pause-quanta
 - Rounding-off to integer pause-quanta => **41**

Summary

- Pause operation for 2.5G – add following text to 31B.3.7
 - At operating speeds of 2.5 Gb/s, a station with a 2.5GBASE-T PHY shall not begin to transmit a (new) frame more than 34 pause_quantum bit times after the reception of a valid PAUSE frame that contains a non-zero value of pause_time, as measured at the MDI.
 - 2.5Gb/s (using 2.5GBASE-T) – max_overrun = 2176+ frame_length
- Pause operation for 5G – add following text to 31B.3.7
 - At operating speeds of 5 Gb/s, a station with a 5GBASE-T PHY shall not begin to transmit a (new) frame more than 41 pause_quantum bit times after the reception of a valid PAUSE frame that contains a non-zero value of pause_time, as measured at the MDI.
 - 5Gb/s (using 5GBASE-T) – max_overrun = 2624+ frame_length

Thank you.

