Advantages of the use of the periodic training sequence

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Improvement

• 10G PTS
  – All during 2s startup, the transmitter is periodically resetting its transmit LFSR at 16384 boundaries.
  – Transmit signal not spectrally rich enough to adapt all equalization coefficients.

• Improvement:
  – PTS is used only for synchronization of the two link partners.
    – Fast and
    – Robust.
  – Switch to CTS in PBO Exchange
    – If scrambler reinitialization is used for normal training, it shall be disabled and the scramblers shall begin free-running when the PHY Control state diagram is in the state PMA_PBO_Exch and the receiver detects a valid requested transmitter PBO setting (Octet 7 Valid<7> equal to 1).
    – Training of the DFE for THP already sees the continuous training signal.
Periodic training sequence advantage

• Faster
  – Correlation receiver vs. blind equalization
  – 5x faster for Slave
  – 10x faster for Master

• Robust
  – Suck outs
    – Insertion loss: cable vendors satisfy the letter of the law
    – 5G over CAT5E
      – Suck outs possible above 100MHz.
  – Blind equalization needs to invert the channel
    – Creating something out of nothing leaves us with a lot of noise.
    – Blind equalization either fails or takes a long time to converge.

• Easy
  – Link partner that does not want to implement the PTS
    – Reset one bit, when a valid requested transmitter PBO is received.
Do not be surprised by cables having suck-outs! Create an in-band notch using a stub now.

setup with a notch caused by a 17cm stub

Please try this at home!

RJ45 plug
Electrically connected To TWPs
17cm CAT6A stub

RJ45 connector
Thank you