BER TARGET, SNDR & COM MARGIN PROPOSAL FOR CDAUI-8

(IN SUPPORT OF COMMENTS #119, 120, 121, 122, 111, 113)

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BER TARGET & COM MARGIN

Discussed extensively in Ad-hoc presentations hegde_01_113015_elect, hegde_01_120715_elect, and hegde_01_011116_elect

- **CDAUI-8 FEC and the interleaving scheme allows for a BER target of 1e-5 on a single electrical segment in a multi-segment link.**
  - Based on the worst case assumption of a=0.75
  - Conservative as two of the C2M segments would likely not have DFEs or tap values would be very low.
  - **For COM, set DER0 target to 1e-5**
- **Receiver Interference Tolerance and Jitter Tolerance Test:**
  - CDAUI-8 PMA bit interleaving distributes symbols across lanes
  - FEC error count may not be available to all the receivers
  - **Use a BER target of 1e-5**
  - (line to limit error propagation to a=0.5)
- Use **COM margin of 3dB** as the current reference receiver is simplified and ideal in ways (quantization of detector levels, ideal DFE, no RX circuit noise & non-linearity)

SNDR AND SNR-TX

- PAM4 transmitters have a richer variety of transitions and more mechanisms to generate distortion compared to NRZ
- It is a function of TX de-emphasis as well. Higher de-emphasis lowers SNDR. Meeting the current 31dB target across de-emphasis levels is hard.
- Relaxed SNDR budget allows for ease of implementation leading to area and power savings.
- SNR-TX is derived from the TX SNDR specification.
- A couple of ways to relax SNDR/SNR-TX spec are presented.

COM UPDATE

- **Option 1: Use lower SNDR/SNR-TX value. We proposed lowering it to 29dB**
- **Option 2: Make SNDR/SNR-TX a function of de-emphasis**
  - Use 29 dB when de-emphasis (pre + post) >= 0.2
  - Use 30dB for lower de-emphasis levels.

Test Case	1	2	3	4	5	6	7	8	9	10
Insertion Loss (dB)	19.4	14.5	7.1	19.0	17.3	11.1	9.2	18.6	18.9	17.6
802.3bs D1.1 Rd=40	2.65	3.36	3.37	2.43	1.92	3.32	3.18	4.46	1.37	2.53
Rd = 55 Ohm, New Av values	2.54	3.14	2.83	2.37	1.7	2.99	2.77	4.2	1.09	2.23
SNR_TX = 29dB, DER0 = 1e-5	2.71	3.22	2.95	2.55	1.95	3.08	2.89	4.11	1.45	2.45
SNR_TX = 29/30dB, DER0 = 1e-5	2.71	3.67	3.38	2.55	1.95	3.52	3.31	4.64	1.45	2.45