40Gb/s SMF and MMF Considerations

Contributors

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Topics discussed so far at previous Mtgs (1)

- **PMD-PMA Interface discussion - "Not one fit all" scenario**
  - 4x10G 1310nm DML 10km SMF has been discussed based on retimed interface with quad CDR (X40) (*cole_03_0308*).
  - Similarly non-retimed, limiting-only PMD for <100m OM3 proposed for 40G (& 100G) (QSFP). (*pepeljugoski_01_0308.pdf*).
    - The technical risk is jitter budget due to multi-channel xtalk.
  - Simpler EDC-enabled Linear interface (QSFP+) (ghiasi_01_0108.pdf)
    - Robust perf: linear I/F can do 300m with ~1dB penalty than limiting can do 100m! The concern is extra power induced by EDC.
  - Common interface proposal supports retimed, limiting, and linear (with external S/G) for 40G (&100G) (QSFP+) (latchman_01_0308.pdf)
    - Leverage the work for SFP+ and XFI.

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Topics discussed so far at previous Mtgs (1)

- **PMD-PMA Interface discussion - “Not one fit all” scenario**
  - Supporting copper cable reference (diminico_01_0308) require an EDC to equalize 10m of copper cable (ghiasi_01_0508.pdf).
    - Assuming copper cable support is prevalent then we should take advantage of it.
    - XLAUI/CAUI simple interface does not burden the ASIC to support copper cable or other linear interfaces.
  - 40GbE 10km Serial at 1310nm (single lamda) also discussed based on retimed I/F with 4-bit MUX/DeMUX (SFI5.2) (*traverso_04_0308*).

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Topics discussed so far at previous Mtgs (2)

- **40G PMD reach extension – beyond 100m**
  - Datacenter survey/statistics show very low coverage (e.g. 70%) with existing 100m reach objective (*chang_01_0308*).
  - Extended reaches of >100m are suggested by many:
    - Petrilla_hse_01_0408 suggests following reaches;
      - CDR on Tx OM3 - 187m; CDR on Rx OM3 – 157m
    - Barbieri_01_0508 suggests 200-220m duplex OM3
  - MMF reaches are proposed to extend by using unfamiliar fiber media OM4 or KR FEC option (jewell_01_0308.pdf).
- **The need for 40GE SMF 10km PMD in duplex fiber well recognized & received wide support (*barbieri_01_0308*).**
- **Take LRM SFP+ as example, LR 10km SMF and LRM 220m OM3 can share same 1310nm TX and RX PMD.**
  - Take advantage of simple EDC structure and simplify PMD options.

Summary and Recommendation

- **Suggest common interface proposal supports retimed, limiting, and linear interface (with ext. S/G) for 40G following what states in latchman_01_0308.pdf**
  - Leverage the work for SFP+ and XFI.

- **Suggest to define single 4x10G CWDM PMD to cover both 10km SMF and 220m OM3.**
  - The technology choice similar to SFP+ LRM and LR.
  - Share same 1310nm CWDM TX and RX optics
  - One solution to take advantage of simpler EDC-based receiver, so provide enough perf. margin to compensate penalty due to xtalk.
  - Simplified PMD

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