8x100G Objectives

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Optics options for 800GbE, Revisited

100G/lane

- 8x100G/lane parallel **adopted as objective for 500m**
  - Useful, but expected to be ~same as existing 2x400G DR4/8x100G DR1 and 2x400G DR4+/8x100G FR1 solutions in the market this year
- Run 800GbE over two duplex fiber pairs as “2x400G” optical interface
  - Twice fiber count, but possible; 400G FR4+LR4 interfaces already defined in MSA and 802.3cu
- 8x100G/lane duplex
  - **Does not exist (? not clear at this point if this is adopted for 10km and 40km)**

200G/lane

- 4x200G/lane parallel **adopted as objective for 500m**
- 4x200G/lane duplex **adopted as objective for 2km**

Proposal 1

- Most 400G DR4 deployment today is actually “DR4+” over 2km (or 4x100G FR)
- Same for early 800G (8x100G) customer requirements – most or all 2km loss budget
- This is unlikely to change in the near future – connectors and fiber plant (much of it already installed) not suddenly becoming lower loss, equipment not moving closer together, in breakout modes interoperating with existing 100G/lane optics with 2km reach
- So highly relevant to support interface spec with 2km loss budget, even for parallel optics
- Alternative is to let an MSA define this again
- (This is not an argument against the current 500m objective)
- **Proposal: add objective for 800G with 2km reach on 8 singlemode fiber pairs**

Proposal 2

- Also gap in support for 800G 2km duplex for 100G/lane networking equipment
  - Again this is a large expected portion of demand/application for 400G
  - Next-generation switch infrastructure (25T and 51T) already being designed and built with 100G/lane interfaces
- Same fiber plant and link budgets as 400G FR4. No new FEC, no gearboxes
- 8λ x 100G PAM4 based 800G duplex could be built and deployed today
  - Technology already proven, 8λ x 100G can leverage almost all design elements from current 100G/lane optics shipping in volume now.
- 100G PAM4 already demonstrated at 2km worst-case dispersion (and beyond)
  - Feasible for 8-channel CWDM wavelength grid (<0.2 dB dispersion penalty), 8-channel LAN-WDM wavelength grid (~no dispersion penalty), or something else – see next slide
- This is not arguing against an 800G 4x200G 2km objective, which is also needed
- **Proposal: add objective for 800G over 8 wavelengths with 2km reach on single singlemode fiber pair**

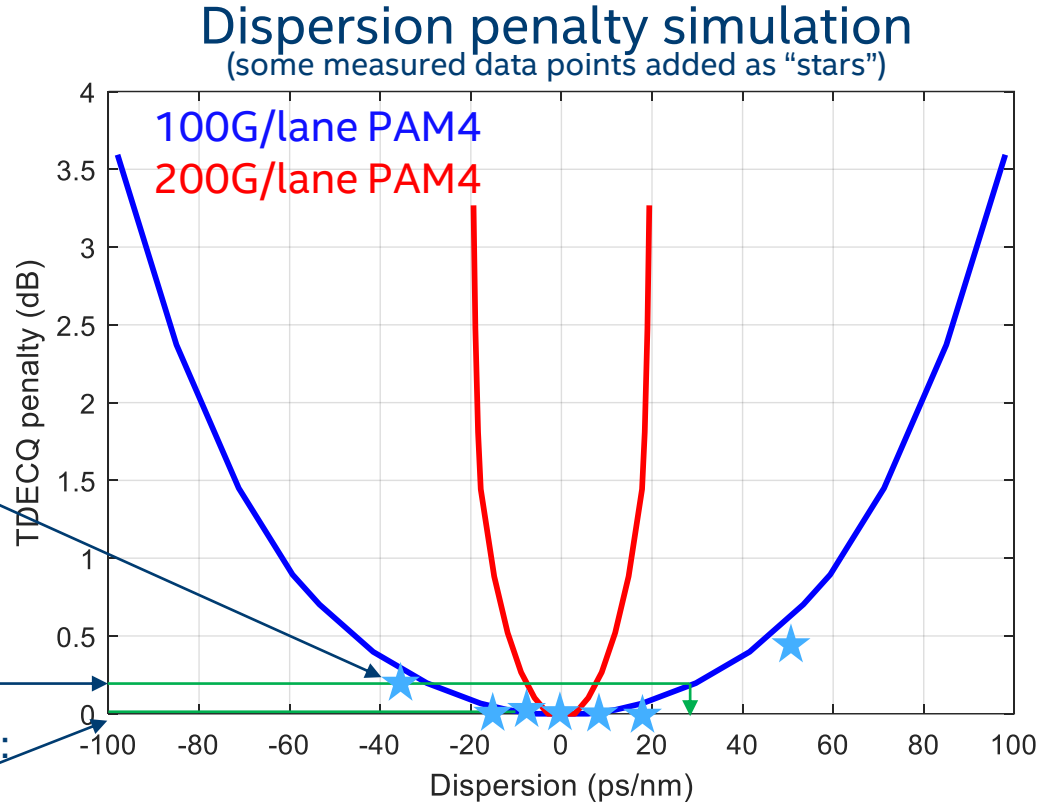
A Little More on 8x100G Dispersion Penalty

- 800G (8x100G/lane) FR8 a good solution for longer reach on single mode fiber

Measured 100G PAM4 data

FR8 @ 100G/lane with CWDM spacing:
~0.2 dB dispersion penalty at 2km

FR8 @ 100G/lane with LAN-WDM spacing:
~no dispersion penalty at 2km



Summary

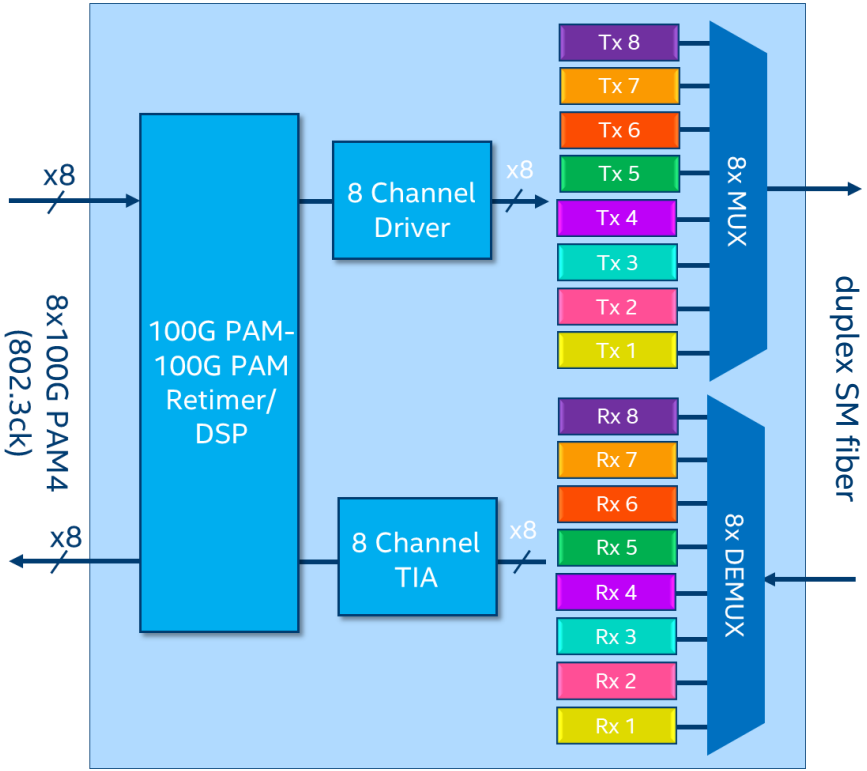
- In addition to already-adopted objectives, suggest adding the following two objectives:
  - 800G over 8 singlemode fiber pairs with reach up to 2km
    - ✓ Supports main application / use-case / link budget that 100G/lane optics are currently being used with today
  - 800G over 8 wavelengths on one singlemode fiber pair with reach up to 2km
    - ✓ Supports volume 2km duplex-fiber application for 100G/lane networking equipment base with already-available proven technology

Thank you

Questions? Email me at scott.schube@intel.com

Backup (prior presented material)

800GbE on duplex singlemode fiber: FR8



- 8λ x 100G PAM4 on one duplex SM fiber pair
  - Multiple wavelength grids possible – CWDM, LAN-WDM, etc. – to be defined
- Could leverage most design elements (form factor, ICs, packaging, etc.) from 400G FR4 and 2x400G FR4 optics shipping now and/or coming this year
- Same fiber plant and link budgets as 400G FR4. No new FEC, no gearboxes
- See further slides for more on technical feasibility