Towards 800GBASE-LR1/ER1 PHY Baseline Decisions

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Introduction

- Two key decisions for 800GBASE-LR1 and ER1 to select a baseline
  - Frame/FEC scheme
  - Wavelength plan

Pros and cons of the Frame/FEC choices

- kota_3dj_01b_0723 provided a logic baseline to address 800GBASE-LR1/ER1 objective using a concatenated KP4+BCH inner FEC architecture
  + Lightweight, low complexity, low-power, low-latency frame and FEC
  + Enables both type-3 and type-2 modules
  - Requires new DSP developments to fully benefit from these advantages

- nicholl_3dj_02_2307 provided a logic baseline to address 800GBASE-LR1/ER1 objective using OFEC
  + Leveraging existing 800ZR industry investments
  - Higher power, complexity and latency

Pros and cons of the wavelength choices

- C-band (~ 1550nm)
  + All coherent investment to-date is in this band
  + Optical amplification technology is more mature
  + Lower fiber loss is beneficial especially for 40km objective
  - Higher chromatic dispersion blocks many DSP optimizations

- O-band (~ 1310nm)
  + Low chromatic dispersion enables lower power DSP architectures
  - Optical amplification technology is not as mature

What makes sense for 800GBASE-LR1?

- Frame/FEC choice
  - Type-2 modules enabled using an inner-FEC architecture provide clear benefits to end-users
- Wavelength choice
  - O-band enables lower complexity designs which benefit the LR application

What makes sense for 800GBASE-ER1?

- Wavelength choice
  - C-band is a clear frontrunner for the 40km application because of maturity of optical amplification technology
- Frame/FEC choice
  - Given the low volumes of this application, it could benefit from leveraging 800ZR development

Proposed Resolution

- Use O-Band and inner code for 800GBASE-LR1 PHY
  - Logic baseline from kota_3dj_01b_2307
  - Optical baseline from maniloff_3dj_01_2307 (slides 7-10)

- Use C-Band and OFEC for 800GBASE-ER1 PHY
  - Logic baseline from nicholl_3dj_02_2307
  - Optical baseline from williams_3dj_01a_2305 (slides 7-10)