200 GBASE-BR baseline proposal

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How to reach 200 Gb/s?

- The possibility that has been studied the most is simply to add two more channels to the existing 100 Gb/s bidi plan
- If this is possible, then nearly all the optical specifications become the same as those for the two channel 100 Gb/s optic – a huge savings in editorial and editing work

- There were questions on which wavelengths to use, and these depended on the outcome of the dispersion studies in ITU-T and .3dj
- Now that those have reached a major milestone, we can re-evaluate
- The following slide gives a proposed comment against D1.1 in 802.3dj

D1.1 comments # TBD, TBD

Table 183–9—Optical channel characteristics

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Description	800GBASE-FR4	800GBASE-LR4	Unit
Operating distance (max)	2	10	km
Channel insertion loss[a, b] (max)	4	6.3	dB
Channel insertion loss (min)	0		dB
Positive dispersion[b] (max)	6.02	2.8	ps/nm
Negative dispersion[b] (min)	-11.26	-24.6	ps/nm
DGD_max[c]	TBD	4	ps
Optical return loss (min)	TBD	TBD	dB

[a] These channel insertion loss values include cable, connectors, and splices.
[b] Over the wavelength range 1264.5 nm to 1337.5 nm for 800GBASE-FR4, and 1294.53 nm to 1310.19 nm for 800GBASE-LR4.
[c] Differential Group Delay (DGD) is the time difference at reception between the fractions of a pulse that were transmitted in the two principal states of polarization of an optical signal. DGD_max is the maximum differential group delay that the system is required to tolerate.

The dispersion specifications are based on the statistical link design methodology documented in ITU-T REC G.652, Appendix I, and the optical channel characteristics methodology described in Annex-TBD.

- The positive and negative dispersion limits per strawpoll #O-1 are added to Table 183-9.
- The FR4 limits correspond to CD values from G.652 Table I.3 for M = 1 at Q = 99.9% for the upper boundary at 1337.5 nm, and Q = 99% for the lower boundary at 1264.5 nm.
- The LR4 limits correspond to CD values from G.652 Table I.3 for M = 4 at Q = 99.9% for the upper boundary at 1310.19 nm and the lower boundary at 1294.53 nm.
- New text is added to footnote (b), pointing readers to the new informative Annex for additional information on the statistical CD methodology.

Similarity between 800G-LR4 and 200G-BR

- If 200G BR uses the same wavelength plan as 800G LR4, then the optical penalty situation should be similar or better
- 800G LR4 operates at 100 GBd / channel
- 200G BR operates at 50 GBd / channel
- Thus, 200G BR will be able to tolerate 4x more dispersion than 800G LR4
- 200G BR should also tolerate 2x more polarization mode dispersion

- BR10 and BR20, using the normal LR4 wavelengths, should have no optical channel impairment issues
- BR40 should have equal difficulty with 800G-LR4, and so the techno-economic feasibility of that should be considered

Proposal

- If the previous simple comparison is valid, then the way forward for 200G BR10 and BR20 can be simple
- We set the downstream channels at 1295 and 1304, upstream at 1300 and 1309 nm
- We set the optical channel characteristics using the same 99.9% values from the ITU-T G.652 Appendix I table (from the appropriate fiber length column) – maintaining similarity with .3dj
- We track whatever solution is found for the PMD question
- Everything else stays the same

Thank you

Any questions?