Wavelength Plan for 100G and 200G Bidi optical PMDs targeting 10km and 20km reach

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Introduction

- The task force has adopted the objectives to define 100Gb/s and 200Gb/s bidi optical specification for 10, 20 and 40km. During the discussion, we are mostly focusing on 10/20km objectives, with 40km objectives to be further studied. It is currently assumed that PAM4 modulation format will be used.
- In the February meeting the following straw poll was performed.

Discussions, straw-polls, other motions

Straw poll #1: I support specification of 100 Gb/s per wavelength for 10 km and 20 km objectives (1304.6 and 1309.1 nm). (17 attendees)
Y: 13 N: 0 Need more info: 0

- In the March meeting the following straw poll was performed.

Discussions, straw-polls, other motions

Straw poll #1: I support specification of 100 Gb/s PAM4 modulation using wavelengths 1304.6 and 1309.1 for 10 km and 20 km objectives. (18 attendees)
Y: 7 N: 3 Need more info: 4

- In April ad hoc meeting the following straw poll was performed.

Discussions, straw-polls, other motions

Straw poll #1: I support specification of 100 Gb/s per wavelength for 10 km and 20 km objectives (1304.6 and 1309.1 nm). (16 attendees)
Y: 7 N: 1 Need more info: 5

- Some concerns were expressed that the discussion has a focus on 100G-BRx, while 200G-BRx should be considered at the same time. This contribution outlines the possible wavelength plan for 100G-BR10, 100G-BR20, 200G-BR10, 200G-BR20, and the path forward to baselines.

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Wavelength Plan

	Possible Wavelength Plan	
	100G-BRx	200G-BRx
10km	1303.54 ~ 1305.63nm ---------- 1308.09 ~ 1310.19nm	1299.02 ~ 1301.09nm 1303.54 ~ 1305.63nm ---------- 1308.09 ~ 1310.19nm 1312.58 ~ 1314.88nm
20km	1303.54 ~ 1305.63nm ---------- 1308.09 ~ 1310.19nm	1299.02 ~ 1301.09nm 1303.54 ~ 1305.63nm ---------- 1308.09 ~ 1310.19nm 1312.58 ~ 1314.88nm
40km	TBD, but possibly sharing the above wavelengths	TBD, but possibly sharing the above wavelengths

For 10km and 20km, 100G-PAM4 signaling rate is assumed.

Wavelength Plan

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40km	TBD, but possibly sharing the above wavelengths	TBD, but possibly sharing the above wavelengths

Reuse of wavelengths is good for achieving lowest cost

Path towards Baselines

- IEEE have existing 100Gb/s PMA4 optical specification for up to 10km reach, 100GBASE-LR1, which allows wavelength range from 1304.5 to 1317.5, in CL140, Table 140-6 of 802.3-2022.
  - The baseline of 100G-BR10 could be generated from the baseline of 100G-LR1
  - The baseline of 200G-BR10, if based on the proposed wavelength plan, could largely leverage the baseline of 100G-LR1, with ~5nm wavelength out to the left of 100G-LR1 spec. Technical contributions of testing is recommended to bring in data for supporting the baseline.
- IEEE currently does not have existing 100Gb/s PMA4 optical specification for up to 20km reach.
- 100G LAMBDA MSA however, has published specification for 20km, i.e. 100G-LR1-20, which uses the wavelength range of 1304.5- 1317.5, same as IEEE 802.3 100GBASE-LR1.
  - Could be leveraged as a start point for 100G-BR20, 200G-BR20.
  - Technical contributions on 20km transmission would be needed with consideration of multiplexers.
- For 40km applications, more technical contributions based on experiment data are needed to support the decision on both optical signaling rate and its wavelength plan.

Thank you.

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