Considerations on 200G BiDi

Sisi Tan, Huawei Technologies

P802.3dk TF September 2024 Interim

Progress of 200G BiDi in IEEE 802.3dk

Meeting	Contribution number	Title
Jan, 2023	3dk_Mi_2301_1r1	Considerations on 100G and 200G Bidi Optics
Jan, 2023	3dk_Effenberger_2301_1	Potential solutions for >50G bidi objectives
Feb, 2023	3dk_Effenberger_2302_1	Longer distance solutions for bidi objectives
May, 2023	3dk_Stassar_2305_1	Wavelength Plan for 100G and 200G Bidi optical PMDs targeting 10km and 20km reach
Nov, 2023	3dk_effenberger_2311_1	Update on G.652 fiber chromatic dispersion, and how to do 200 Gbs
Mar, 2024	3dk_effenberger_2403_2	Proposals on Bidi 200 Gbs
May, 2024	3dk_effenberger_2405_2	200 GBASE-BR baseline proposal

- 200G BiDi have been discussed in several dk meetings, but no progress was made.
- No straw polls or motions related to 200G BiDi have been adopted.

Observation on IEEE 802.3 history

Signaling rate per lane	10km	40km
50GbE	50GBASE-LR	50GBASE-ER
	200GBASE-LR4	200GBASE-ER4
	400GBASE-LR8	400GBASE-ER8
100GbE	100GBASE-LR1	
	400GBASE-LR4-6	
200GbE	800GBASE-LR4	

- For 100G BiDi, we have good references of 100GBASE-LR1 from 802.3 cu, G.9806 from ITU-T and contributions from different companies with solid data.
- For 200G BiDi:
  - BR10 based on 2×100Gb/s or 200Gb/s seems feasible with references from IEEE history.
  - No references for BR40 based on 2×100Gb/s or 200Gb/s.
  - BR40 based on 4 × 50Gb/s seems well-founded, but do we really want that?

Technical uncertainties to be discussed for 200G BiDi

1. Approach: 200Gb/s, 2*100Gb/s or 4*50Gb/s
2. Wavelength plan: 800 GHz grid, 400GHz grid or …
3. Four wave mixing and dispersion analysis
4. MPI
5. Packaging…

Review of the requirements for higher speed Bidi

Recent BiDi PtP standardization activities outside IEEE802.3

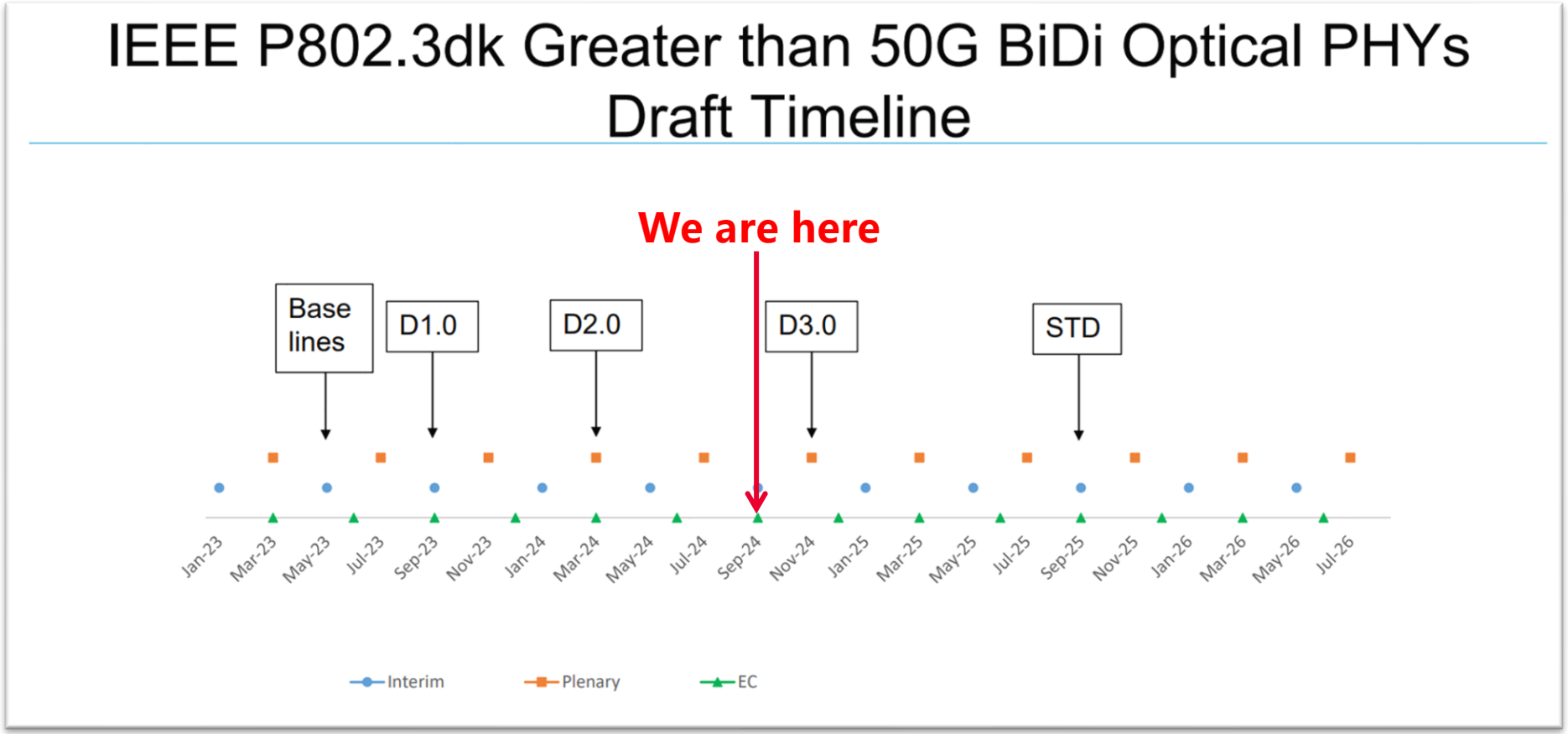
- In the readout of FSAN August meetings and in a joint contribution to ITU-T SG15 plenary (T22-SG15-C-0159), the following opinion was expressed:

  "Some operators see a fast growing market for 100 Gb/s at 10-40km. They expect demand in the future for 400 Gb/s; however, they have no/little interest for 200 Gb/s. Other operators expressed no opinion on the matter. Although an alignment with IEEE 802.3 standard is desired, FSAN operators believe it should not delay the progress of G.9806Am3 (100 Gb/s), which is targeting consent in 2023."

Jun Shan Wey, Hirotaka Nakamura, Fabrice Bourgart, "Requirements for higher speed bidi PTP optical access," Joint_0914_BiDiPtP, Sep, 2022

- 40km BiDi might be a small market since it' s typically used for wireless fronthaul. With the even more flexible 6G market, there are probably very few fronthaul links longer than 20km.

IEEE 802.3 dk timeline



- We are almost at halfway through dk project, nothing adopted for 200G BiDi yet.
- The uncertainties of 200G-BR40 may further drag the progress.

Thank you

Any questions?