



IEEE 802.3 NEA Ad hoc

**Potential 400 Gb/s-based IMDD
SMF Optics**

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Electronic Meeting

Introduction

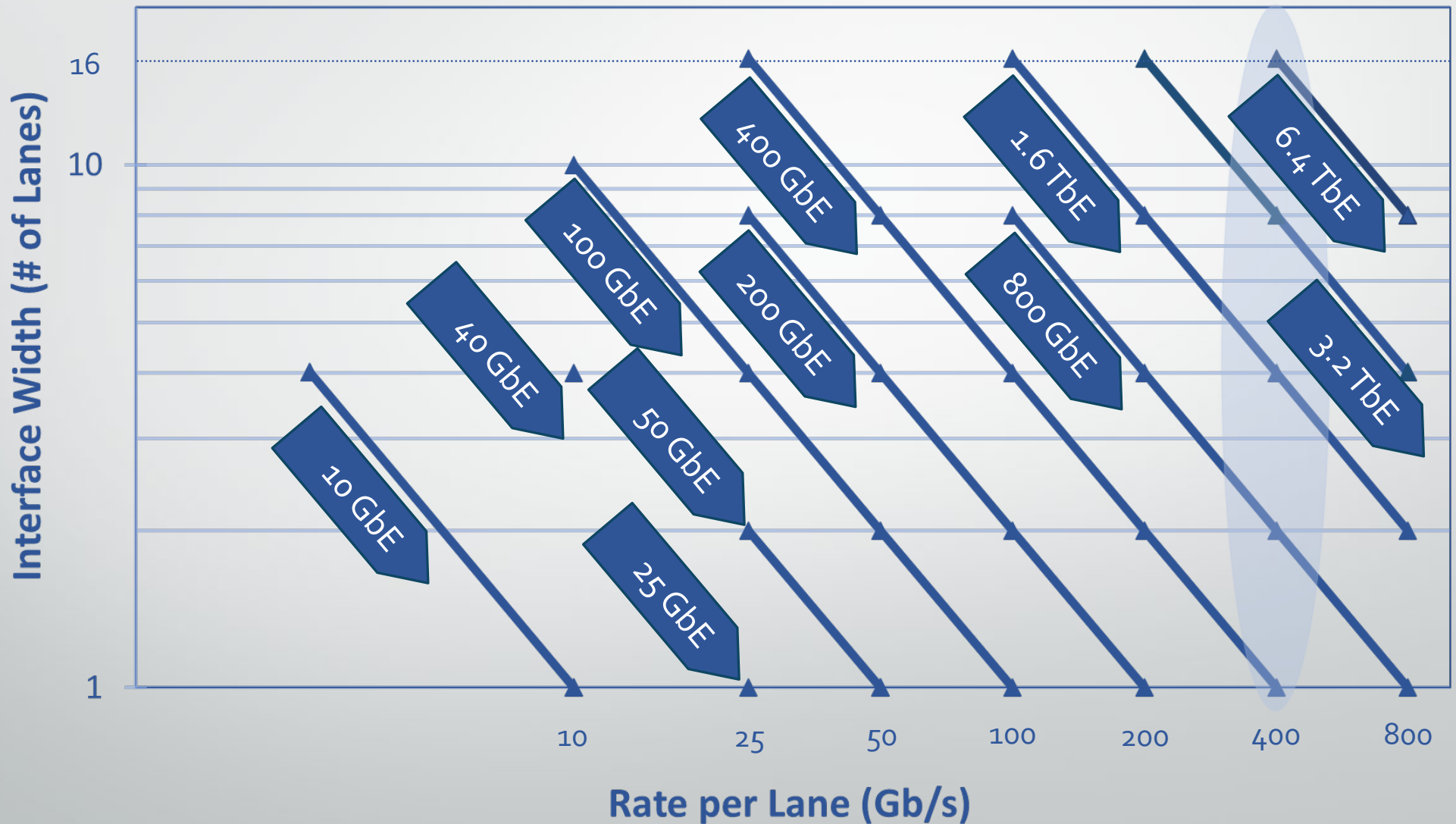
- Request for this NEA Activity –
 - To develop consensus on a liaison and / or white paper addressing future needs of **SMF** optical fiber to address signaling for IMDD Optics greater than 200 Gb/s.
- This presentation discusses **potential** future SMF IMDD PHYs that might benefit from improvements in SMF
- Note – This presentation is focusing on IMDD SMF based optics per the requested activity. It is evident that MMF and Coherent optics may want an activity to begin discussions in these respective areas. Interested parties can contact me offline to discuss other NEA activities.

IEEE P802.3dj Objectives

Ethernet Rate	Signaling Rate	AUI	Backplane	Cu Cable	SMF 500m	SMF 2km	SMF 10km	SMF 20km	SMF 40km
200 Gb/s	200 Gb/s	200GAUI-1 C2C C2M	200GBASE-KR1	200GBASE-CR1	200GBASE-DR1	200GBASE-DR1-2			
400 Gb/s	200 Gb/s	400GAUI-2 C2C C2M	400GBASE-KR2	400GBASE-CR2	400GBASE-DR2	400GBASE-DR2-2			
800 Gb/s	200 Gb/s	800GAUI-4 C2C C2M	800GBASE-KR4	800GBASE-CR4	1. 800GBASE-DR4 2. 800GBASE-FR4-500	1. 800GBASE-DR4-2 2. 800GBASE-FR4	800GBASE-LR4		
	800 Gb/s						800GBASE-LR1	800GBASE-ER1-20	800GBASE-ER1
1.6 Tb/s	100 Gb/s	1.6TAUI-16 C2C C2M							
	200 Gb/s	1.6TAUI-8 C2C C2M	1.6TBASE-KR8	1.6TBASE-CR8	1.6TBASE-DR8	1.6TBASE-DR8-2			

Fiber chromatic dispersion not considered benign during 802.3dj development

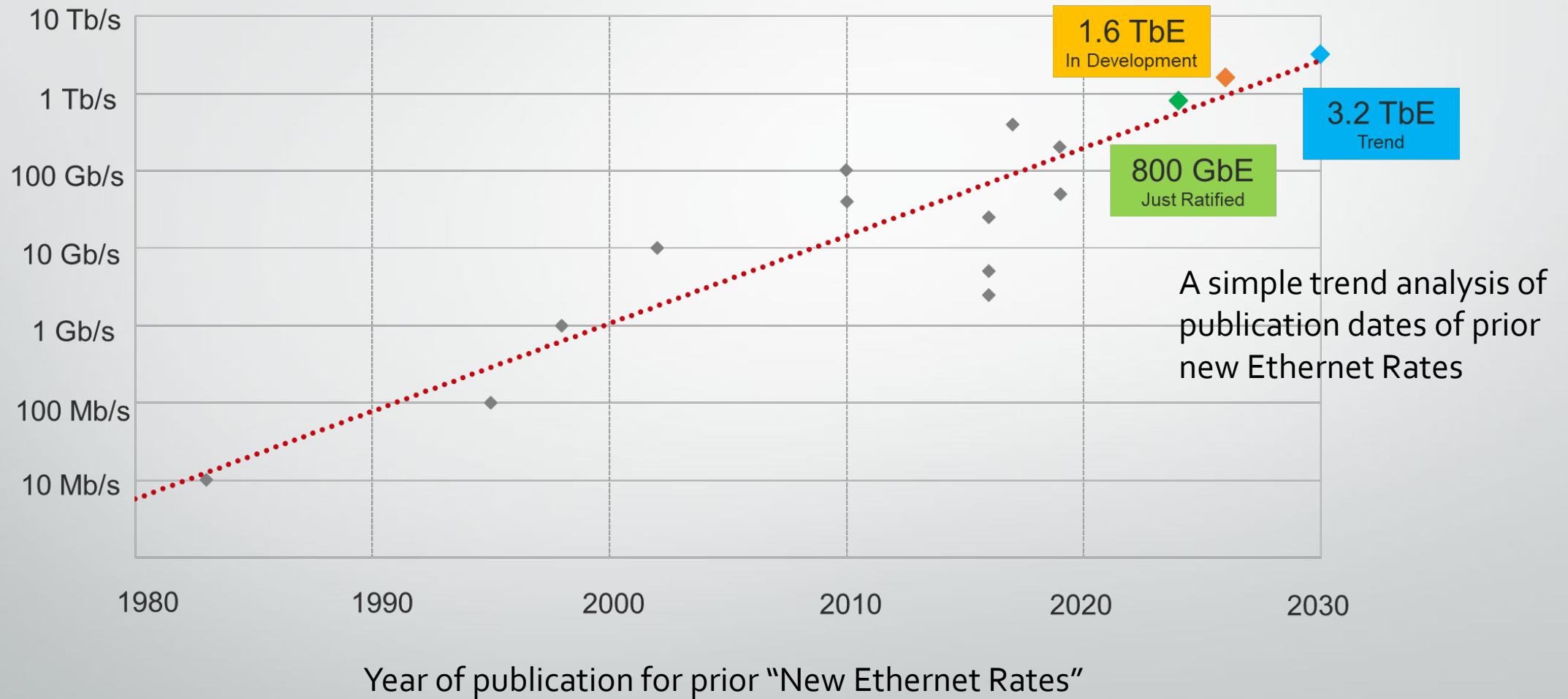
Ethernet Rate versus Lane Rate



Potential P802.3dj IMDD Optical PHYs that could Evolve with 400 Gb/s Signaling

Ethernet Rate	Signaling Rate	AUI	Backplane	Cu Cable	SMF 500m	SMF 2km	SMF 10km	SMF 20km	SMF 40km
200 Gb/s	200 Gb/s	200GAUI-1 C2C C2M	200GBASE-KR1	200GBASE-CR1	200GBASE-DR1	200GBASE-DR1-2			
400 Gb/s	200 Gb/s	400GAUI-2 C2C C2M	400GBASE-KR2	400GBASE-CR2	400GBASE-DR2 400GBASE-DR1	400GBASE-DR2-2 400GBASE-DR1-2			
800 Gb/s	200 Gb/s	800GAUI-4 C2C C2M	800GBASE-KR4	800GBASE-CR4	1. 800GBASE-DR4 800GBASE-DR2 2. 800GBASE-FR4-500 800GBASE-FR2-500	1. 800GBASE-DR4-2 800GBASE-DR2-2 2. 800GBASE-FR4 800GBASE-FR2	800GBASE-LR4 800GBASE-LR2		
	800 Gb/s						800GBASE-LR1	800GBASE-ER1-20	800GBASE-ER1
1.6 Tb/s	100 Gb/s	1.6TAUI-16 C2C C2M							
	200 Gb/s	1.6TAUI-8 C2C C2M	1.6TBASE-KR8	1.6TBASE-CR8	1.6TBASE-DR8 1.6TBASE-DR4	1.6TBASE-DR8-2 1.6TBASE-DR4-2			

Just to be Provocative....



Observations

- 400 Gb/s optical signaling for IMDD optics has potential
 - within the existing IEEE 802.3 400 GbE / 800 GbE / 1.6 TbE families
 - 500m – 2km Single λ per fiber
 - 500m – 2km WDM Optics
 - 10km WDM optics – feasibility?
 - Not a current existing IEEE 802.3dj 1.6 TbE Family member
 - 1.6 TbE 500m – 2km WDM Optics
 - Other PHYs???
 - Future Ethernet Rates?
 - 3.2 TbE?
 - 6.4 TbE?
- Existing 400 GbE / 800 GbE / 1.6 TbE families provide potential targets that could benefit from improvements in future SMF
- This activity is to discuss the need for potential improvements in SMF fiber that could benefit 400 Gb/s based PHYs, NOT THE PHYS themselves.