



Beyond 10Gb/s

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Lessons learned from 10GbE

- **Fiber does not have infinite bandwidth**
 - Speed/reach penalties exist**
 - Chromatic dispersion**
 - Modal dispersion**
 - Attenuation**
- **How many PMD types?**
 - 10GBase - SR, LR, ER, LX4, SW, LW, EW, CX4, LRM**
- **Why so many PMDs?**
 - See first bullet**
- **Form factors are us...**
 - Xenpak, Xpak, X2, XFP, 300 pin (of which there are multiple sizes)**

Lessons learned from 10GbE

- **Optical industry is still downsizing/consolidating**
 - Still reeling from the opt bomb**
 - Nowhere near ROI for 10G**
- **Mass market adaptation didn't occur until very specific cost points were attained**
 - 10x speed 3-4x cost**

What's next?

- **How fast?**
40G?, 80G? 100G? 160G?
- **How far?**
1km? 10km? 100km?
- **What about multimode fiber?**
- **How much can it cost compared to 10G?**

IEEE 5 Criteria

- **Compatibility with 802.3**
- **Distinct Identity**
- **Technical Feasibility**
- **Economic Feasibility**
- **Broad Market Potential**

The faster the IEEE goes, the less number of ports it ships

Possible Optical Solutions

- **OC768 exists**
 - Steal it and re-label it 40GbE**
 - A 2km solution**
 - By the way, if you want to go faster it is available**
- **Go wide**
 - WDM**
 - Serial solutions are historically more cost effective**
 - Disruptive technologies are emerging**
 - What does this mean to the long haul?**
- **New modulation/encoding/amplification schemes**
 - Solutions are stretching the reach of OC768**

Conclusions

- **OC-768 is available today**
- **Next big speed jump may have to be proprietary**
- **Disruptive technologies are emerging, but may enhance current long haul instead of replacing it**
- **10GbE has now become part of the enterprise networks**