

200 Gb/s 30m over OM4 Objective

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IEEE 802.3 200 Gb/s per Wavelength MMF PHYs Study Group Ad Hoc Meeting

Supporters

Ramana Murty, Broadcom

Ali Ghiasi, Quantum

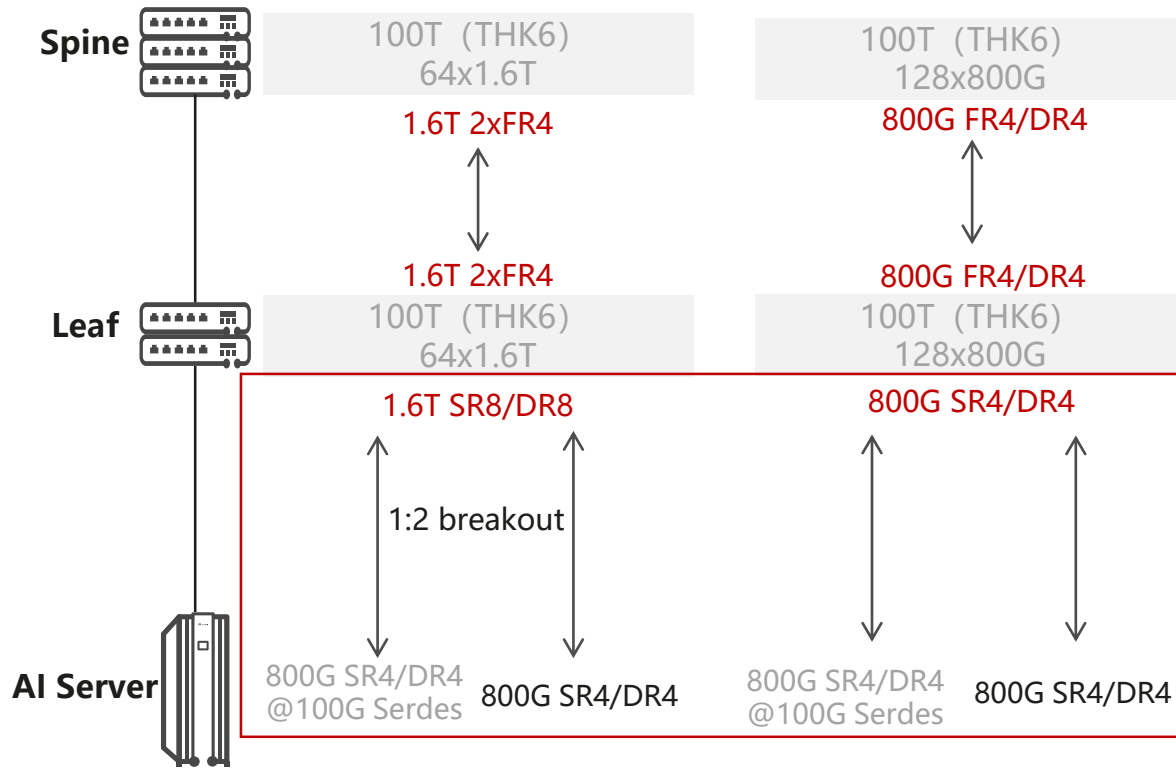
Overview

- Contribution in support of:
 - Objective(s) for 200 Gb/s operation over 30 m OM4
 - CSD:
 - Broad Market Potential
 - Technical Feasibility
 - Economic Feasibility

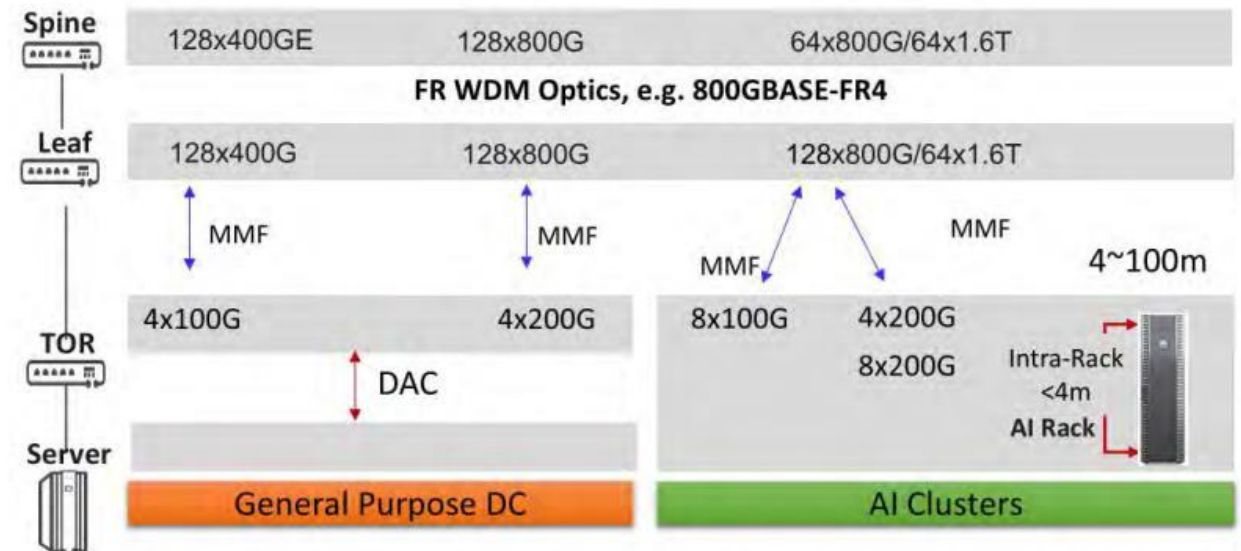
200 Gb/s/Lane application scenarios

The network architecture of general-purpose DC and AI clusters will gradually upgrade to 1.6 Tb/s.

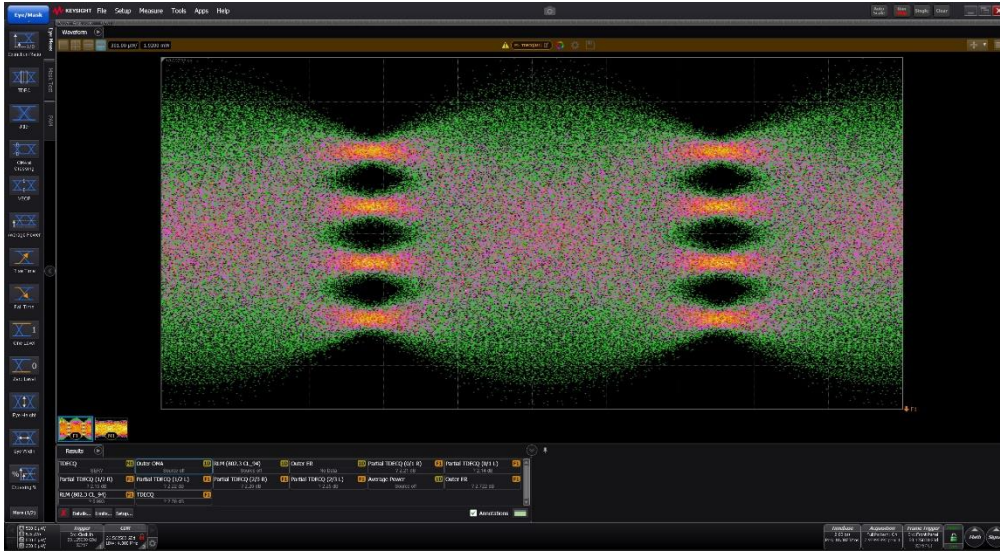
VCSEL are an excellent choice for SR due to low cost and low power consumption characteristics.



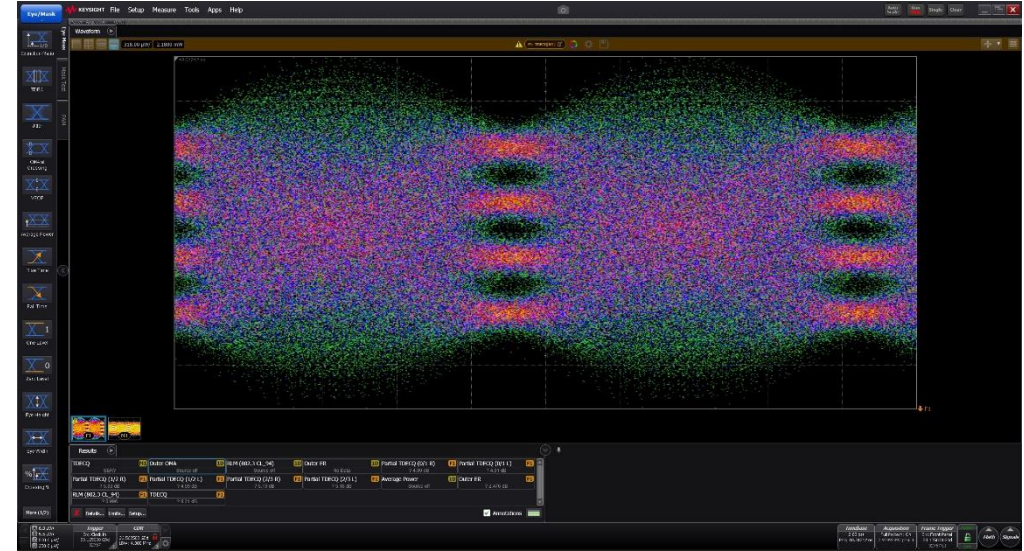
Guangcan Mi, Huawei and Yu (Helen) Xu, Huawei



VCSEL Transmission @200 Gb/s over 30m



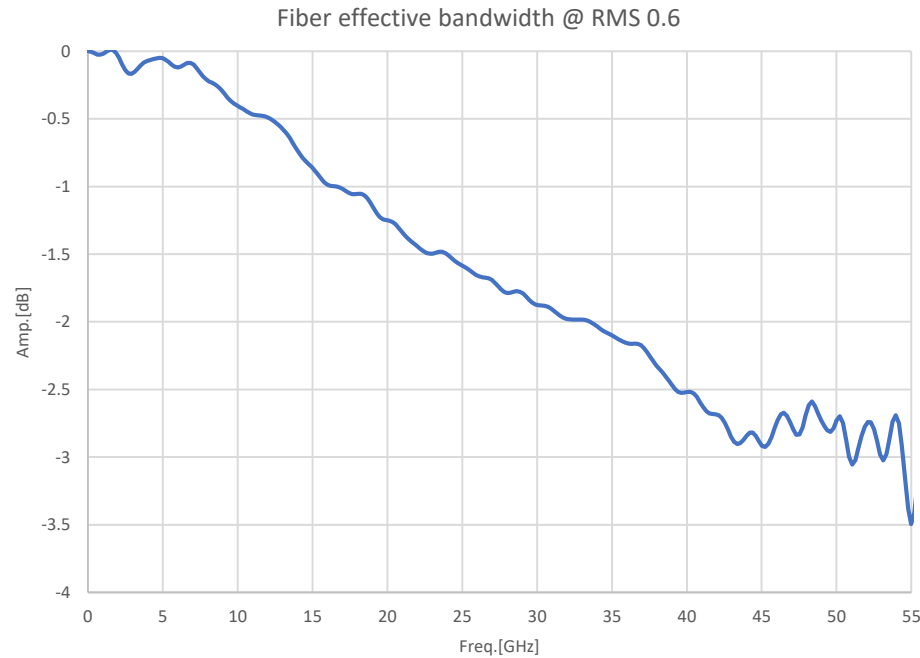
Back-to-Back (~TP2)



Optical eye diagram after 30m fiber transmission

- After 30m of OM4 fiber transmission, we obtained a relatively clear eye diagram.
- There are several ways to further improve the system performance
 - ✓ Optimize TX, tighten the RMS of VCSEL... Those are early results.

OM4 Fiber effective bandwidth



- We tested one 30m OM4 fiber, the effective bandwidth is 55 GHz, which is 0.53x of Nyquist frequency.
- By tightening RMS of VCSEL, the EMB of the MMF can be further increased.

Summary

- 1- Broad application for MMF links in AI clusters and in datacenters
- 2- OM4 Fiber has adequate bandwidth to support 30m of transmission at 200 Gb/s
- 3- VCSEL technology at 200 Gb/s is mature and make the links possible

Recommendation is for Objectives:

- Define a physical layer specification that supports 200 Gb/s operation over 1 pair of MMF with lengths up to at least 30 m
- Define a physical layer specification that supports 400 Gb/s operation over 2 pairs of MMF with lengths up to at least 30 m
- Define a physical layer specification that supports 800 Gb/s operation over 4 pairs of MMF with lengths up to at least 30 m
- Define a physical layer specification that supports 1.6 Tb/s operation over 8 pairs of MMF with lengths up to at least 30 m