

# Datacom Optics Investment Priority Problem

Photonic Interconnects in AI Clusters Session  
OFC Optica Executive Forum

25 March 2024

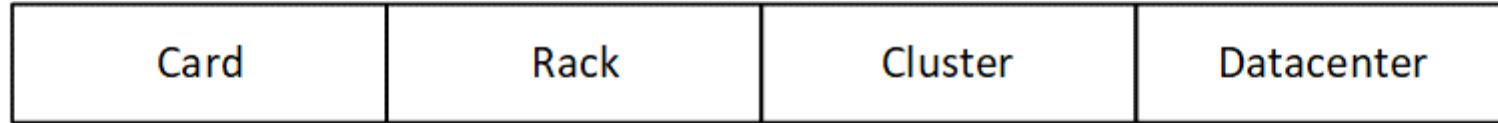
Chris Cole, Parallax Group

# Introduction

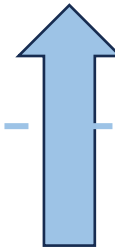
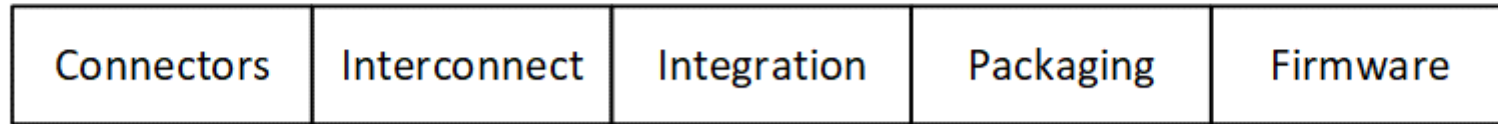
- Next Datacom Paradigm shift:
  - Optical Computer I/O driven by AI/ML
- Optical Computer I/O requirements:
  - Order(s) of magnitude more stringent than Optical Networking
  - Only met with fundamentally new optical Components and Devices
- Datacom Optics investment unfortunate priority:
  - Sub-systems and Systems
  - Rearranging and/or aggregating existing optical technology
- This is in sharp contrast to electronics, which benefit from huge CMOS investment
  - ex. CHIP ACT and matching industry investment: ~\$150B

# Datacom Optics Hierarchy

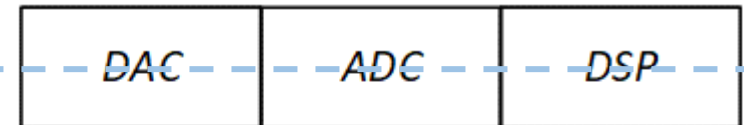
Network System



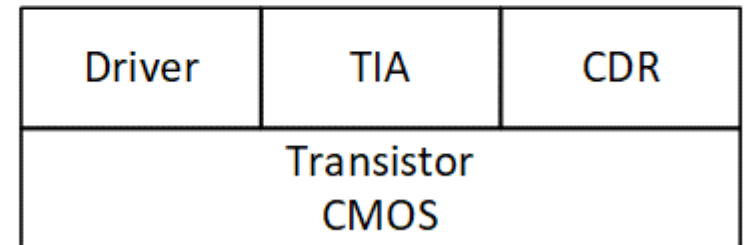
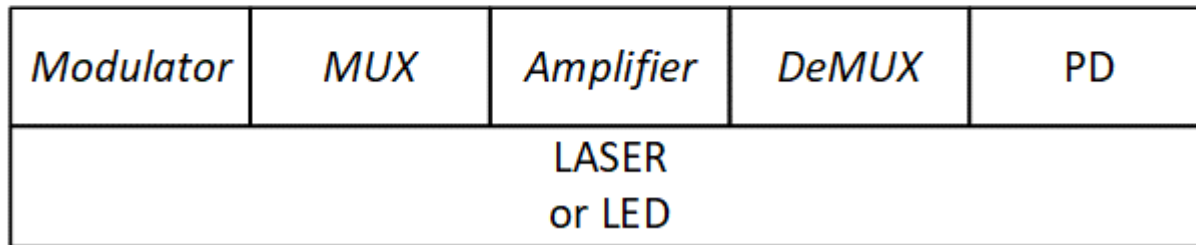
Sub-system (Transceiver)




Component



Device

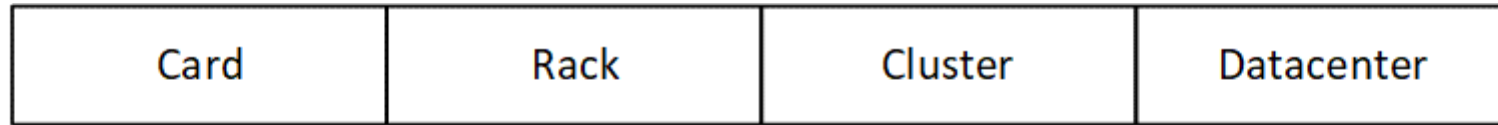


# Datacom Paradigm Shift Enabling Optical Technologies

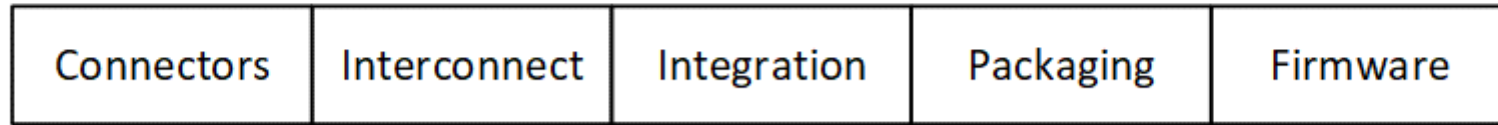
Datacenter Paradigm	Network or Computer Link Rate	No. of Lanes	Enabling Component & Device Technology	Enabling Sub-system Technology
Enterprise	100M (ex. Ethernet) 1G 10G	1	VCSEL DFB LASER	LC (Lucent Connector) Pluggable Module
Hyperscale	40G 25/50G 100G	4	EML WDM Si MZM	MT Parallel Connector
	200G 400G 800G	4, 8	DSP	Heatsink 
AI/ML	3.2T 12.8T 51.2T	≥ 16	Hi-Rel LASER (or LED) DWDM Dense BW Modulator	Dense BW Connector & Packaging

# Datacom Optics Investment Problem

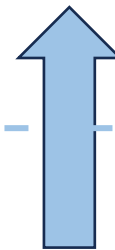
Network System



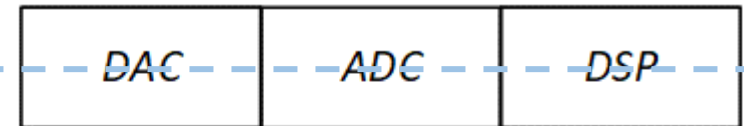
Sub-system (Transceiver)



\$\$\$\$

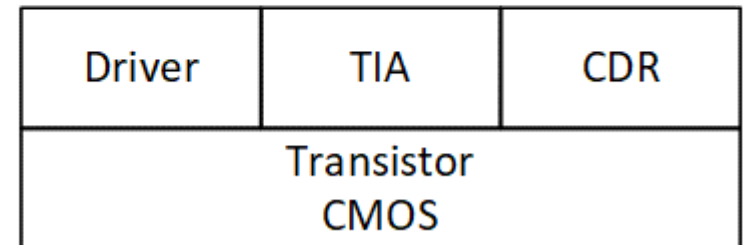
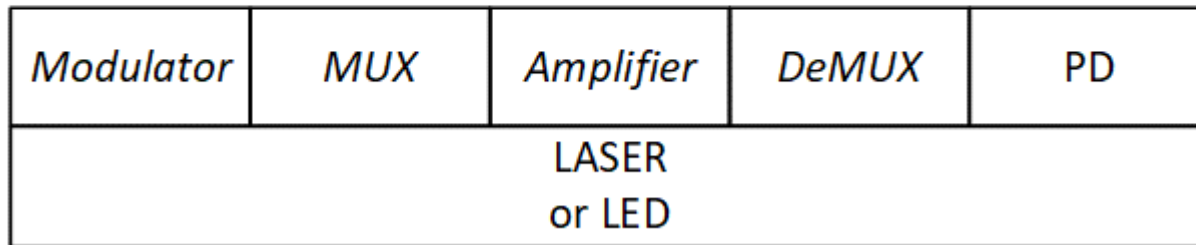


Component



\$

Device



# Datacom Optics Investment Priority Re-Focus Urgently Needed

Fund Fundamentally New Optical  
Component and Device Technology