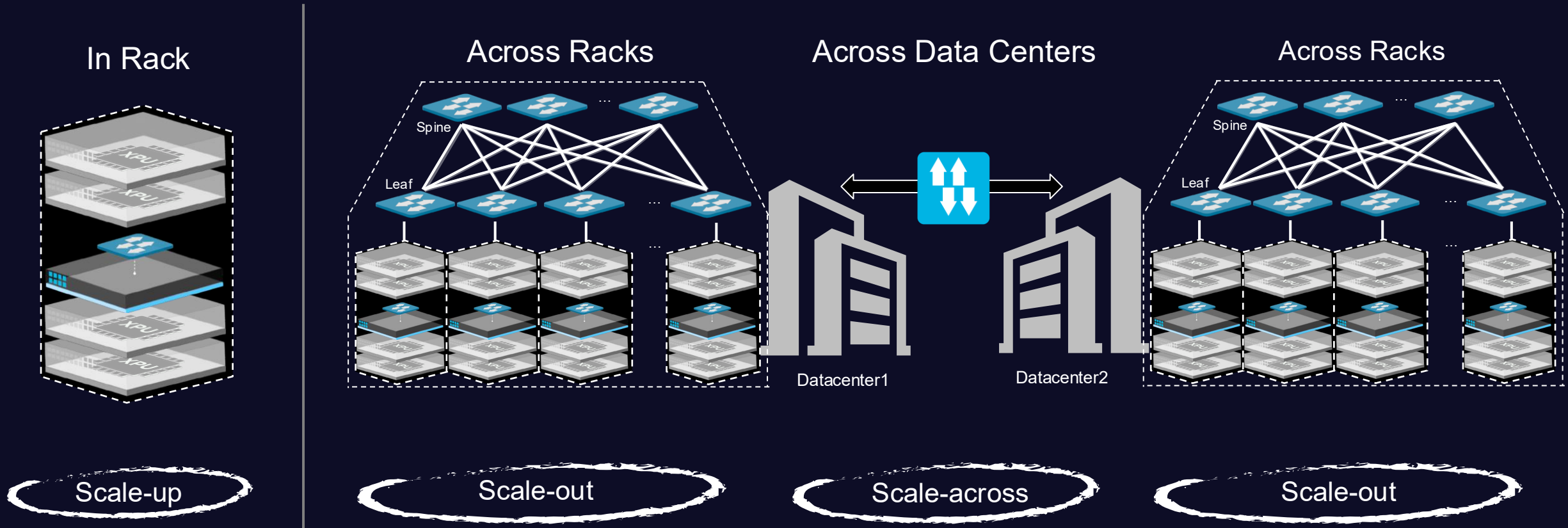


CPO, OCI

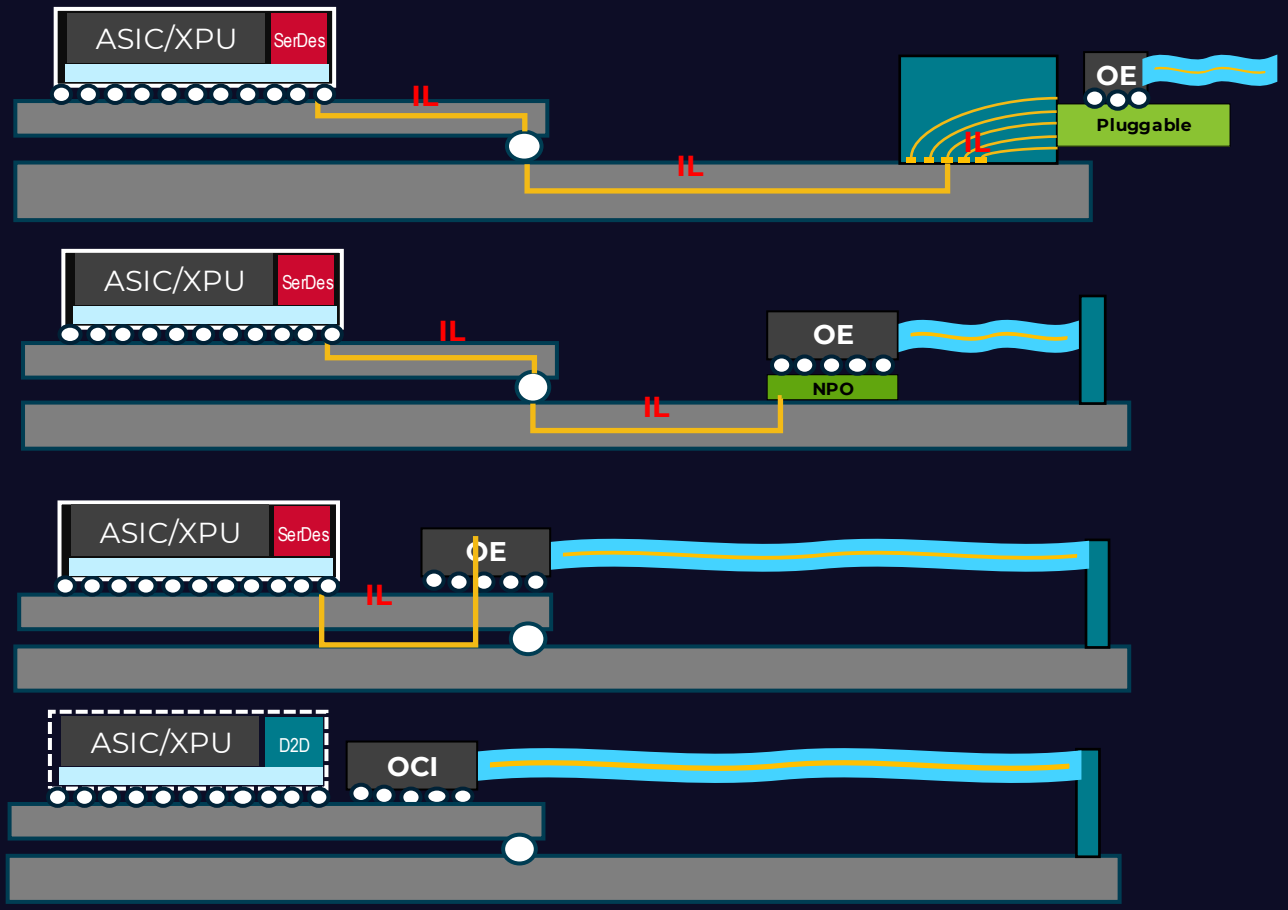
Rajiv Pancholy *Director Hyperscale Strategy & Products, Broadcom*

AI Scale-up, Scale-out and Scale-across Networking

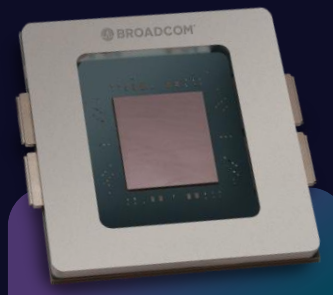


Optical Interconnect Technology Options

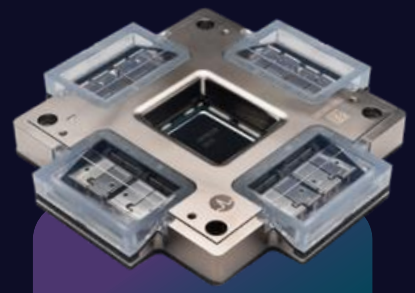
Pluggable flexibility but limited reach, power/performance	**FRO/LRO/ LPO**
Faceplate density & thermal Improvements	**NPO**
10x reliability improvement vs. pluggables	**CPO**
Lowest latency, power and cost -at par with copper reliability	**OCI**



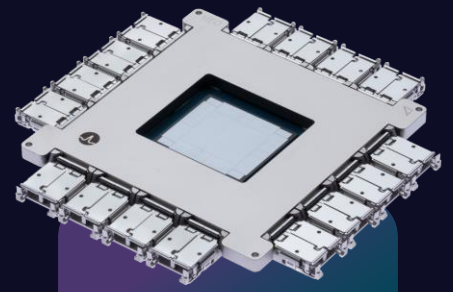
Leading the Future of Co-Packaged Optics



TH4 Humboldt
100G/lane



TH5 Bailly
100G/lane



TH6 Davisson
200G/lane



4th Generation CPO

2022 — 25.6T

2024 — 51.2T

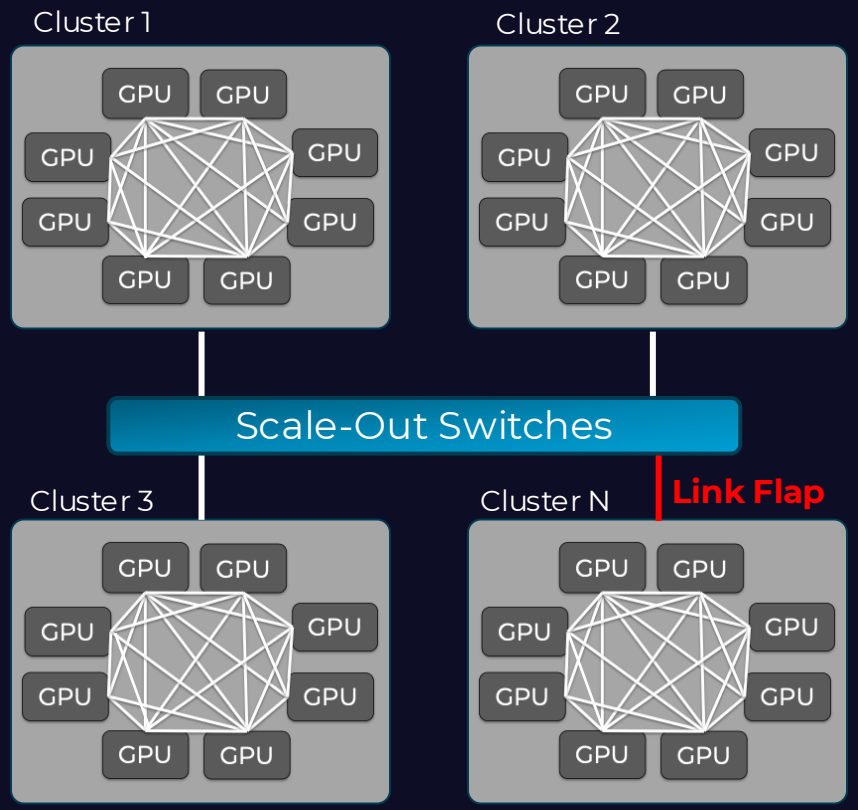
2026 — 102.4T

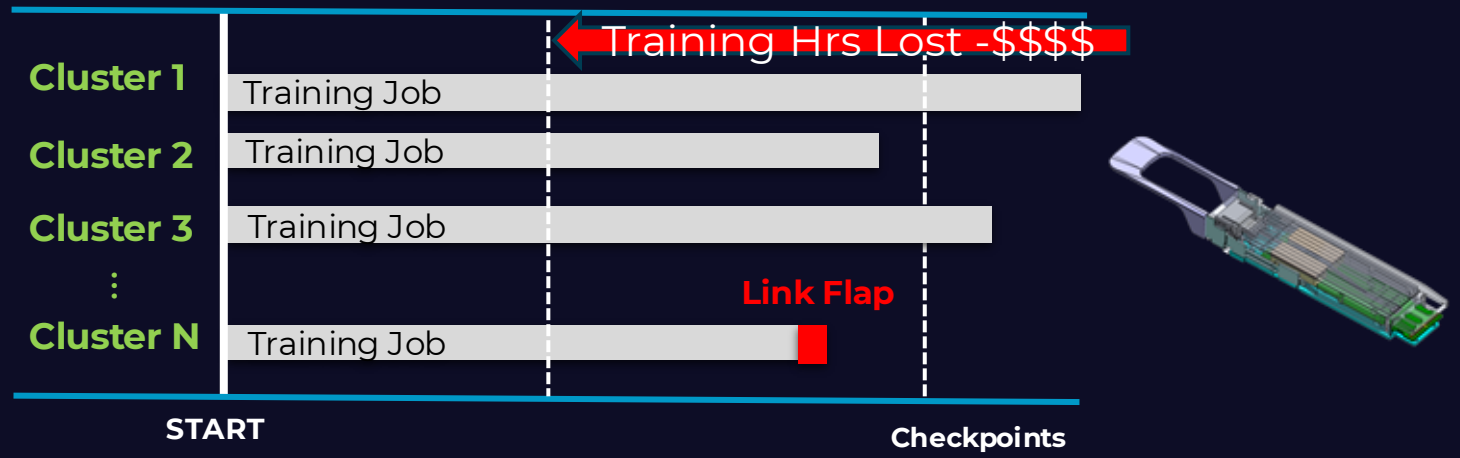
2028 — Next Gen

4th Generation CPO in development
> 1M device hours with 0 link flaps

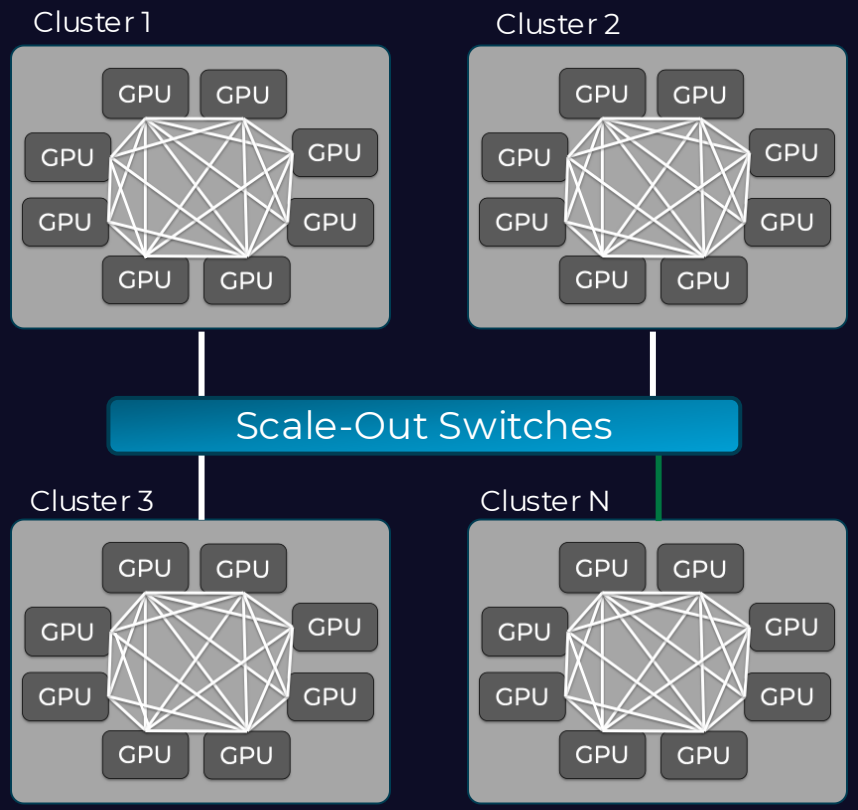
Open and Scalable
Mature Partner Ecosystem

CPO: MTBF Advantage for AI Networks

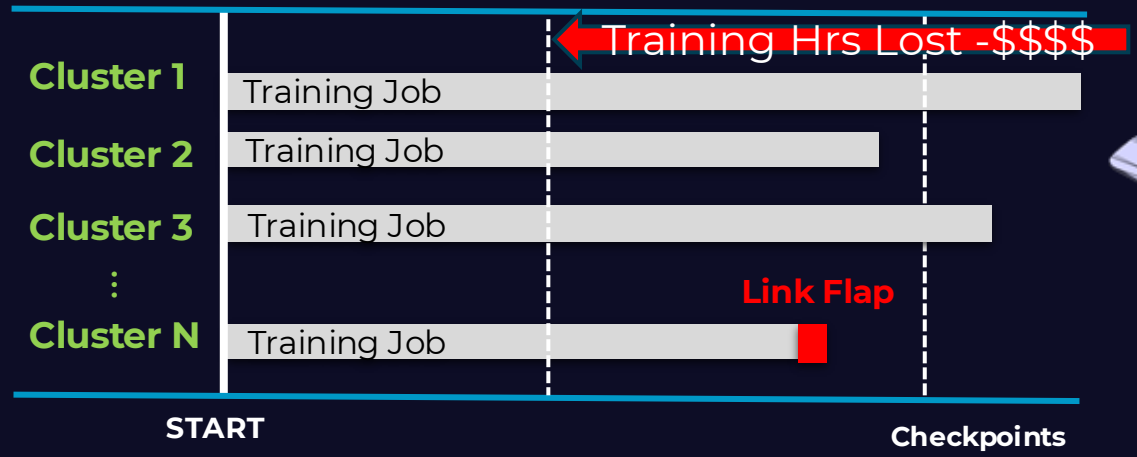


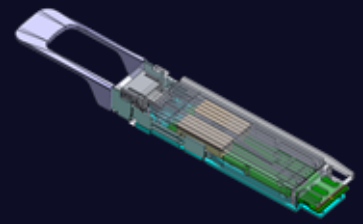


CPO: MTBF Advantage for AI Networks

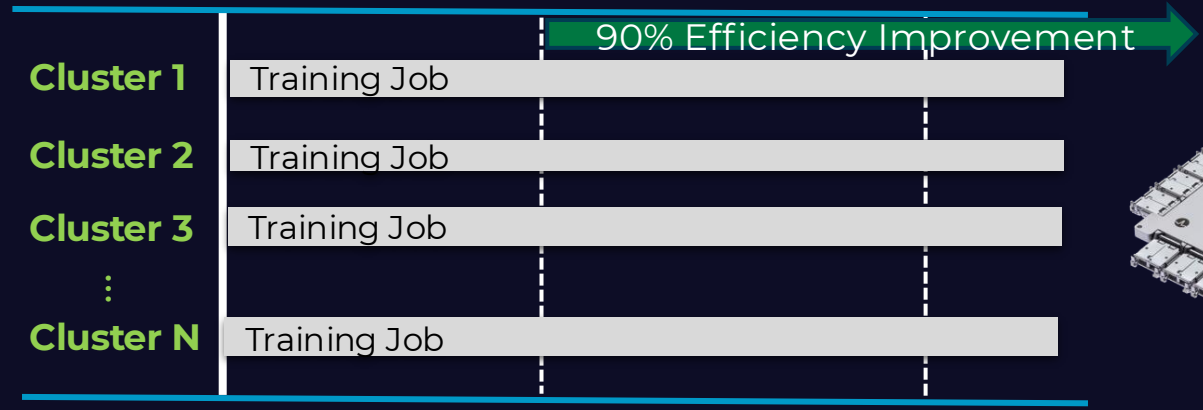


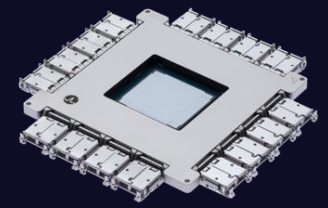
Scale-Out with Pluggable Optics





Scale-Out with CPO



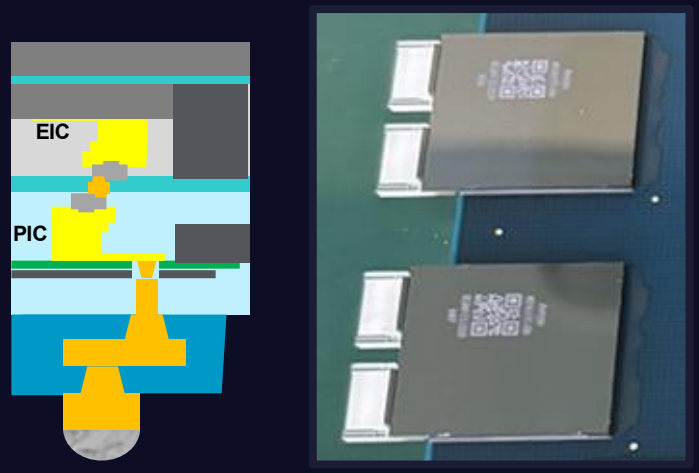


Challenges to Overcome for CPO & OCI at Scale

Advanced Packaging

- High-density and high-quality PIC to EIC attach required
- Must optimize signal integrity
- Enablement for 400G direct drive

EIC to PIC attach with COUPE



Optical Connectivity

- More than 1k fibers connecting to each chip package
- Detachable fiber connectivity to enable package reflow

Detachable fiber connector



Volume Manufacturing

- Must deliver industry leading yield and reliability through automation
- Enable system partners with automated assembly and test

Auto dispenser with loader and unloader



CPO Support Frame Attach Automation Example

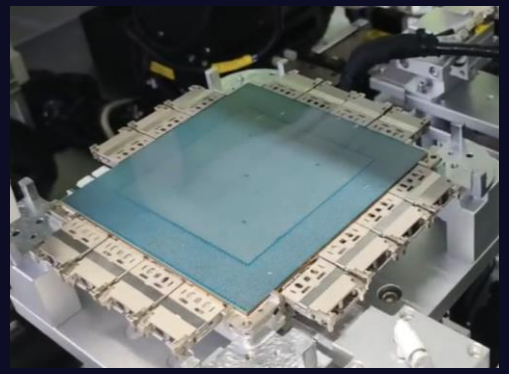


Broadcom CPO Backend MFG Automation Line



Support Frame Attach
(Automation Example)





TH6-Davisson CPO Partner Ecosystem

CORNING

TwinstarTech
TWINSTAR TECHNOLOGIES CO., LTD.



FAU

eoptolink

O-Net Technologies

TFC

FIT

SP SOURCE PHOTONICS

APERION TECHNOLOGIES

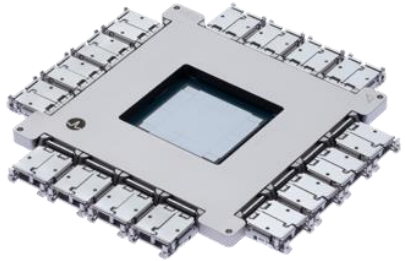
LIGENT



ELSFP

tsmc

SPIL



TH6-Davisson

Celestica

nexthop ai

Micas NETWORKS

HPE

SUPERMICRO

JABIL

DELTA

QCT



CPO Rack Unit

OCI-MSA

OCI-MSA GEN1 Specification www.oci-msa.org

Founding Members

Industry alignment around an optical scale-up.

OCI-MSA

Est. March 12, 2026

Future AI infrastructure built on open standards.



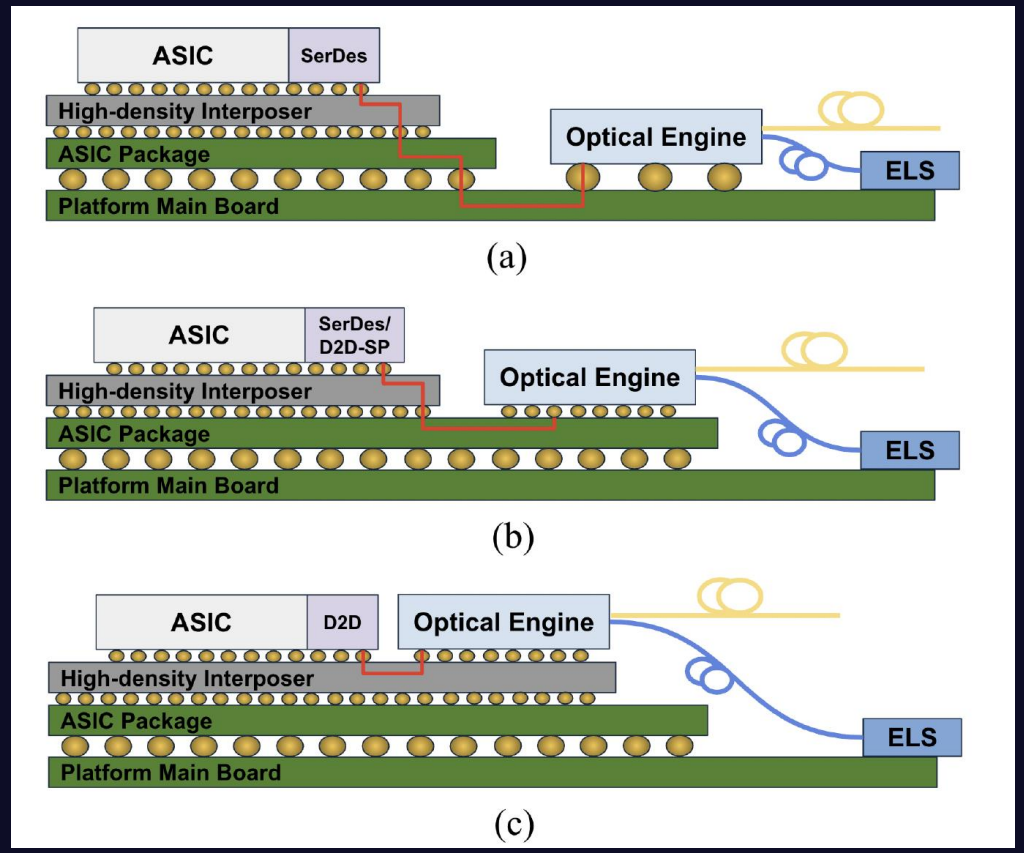
Optical Scale-Up

Architecture that delivers the efficiency required to scale AI infrastructure.

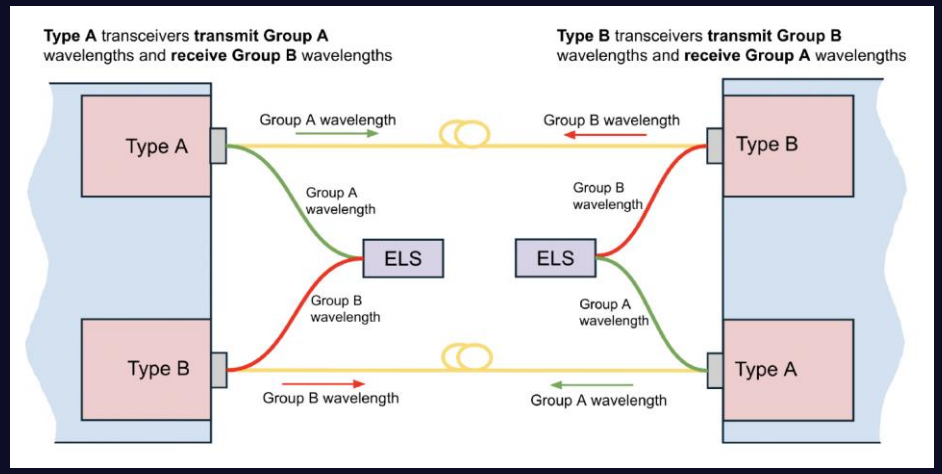
Working to enable a broader industry participation structure while maintaining pace of innovation.

OCI-MSA GEN1 Specification Diagrams

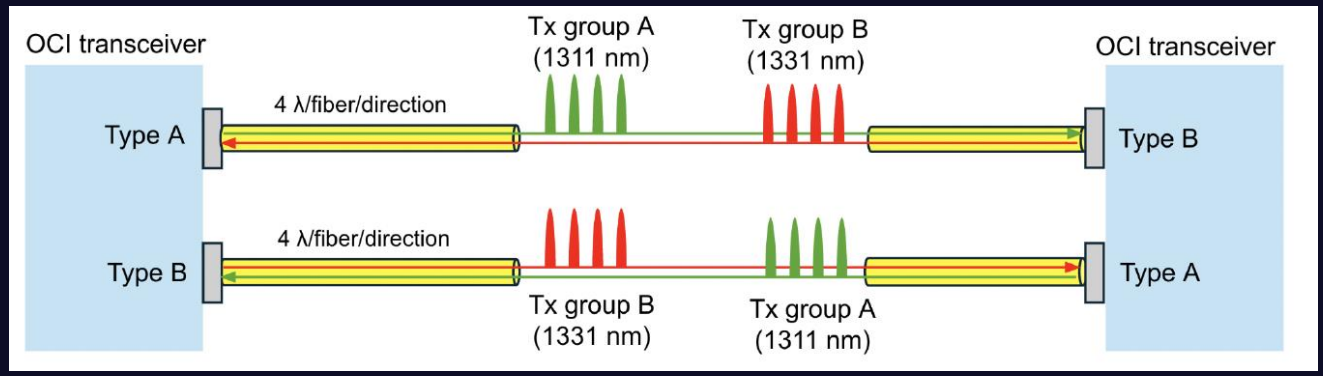
OCI-MSA GEN1 Specification www.oci-msa.org



OCI-MSA implementation options



Bi-Di Group A and B Wavelength Implementation



DWDM channels on CWDM grid for a Bi-Di link

Total Link Power and Reach Comparison – 200G



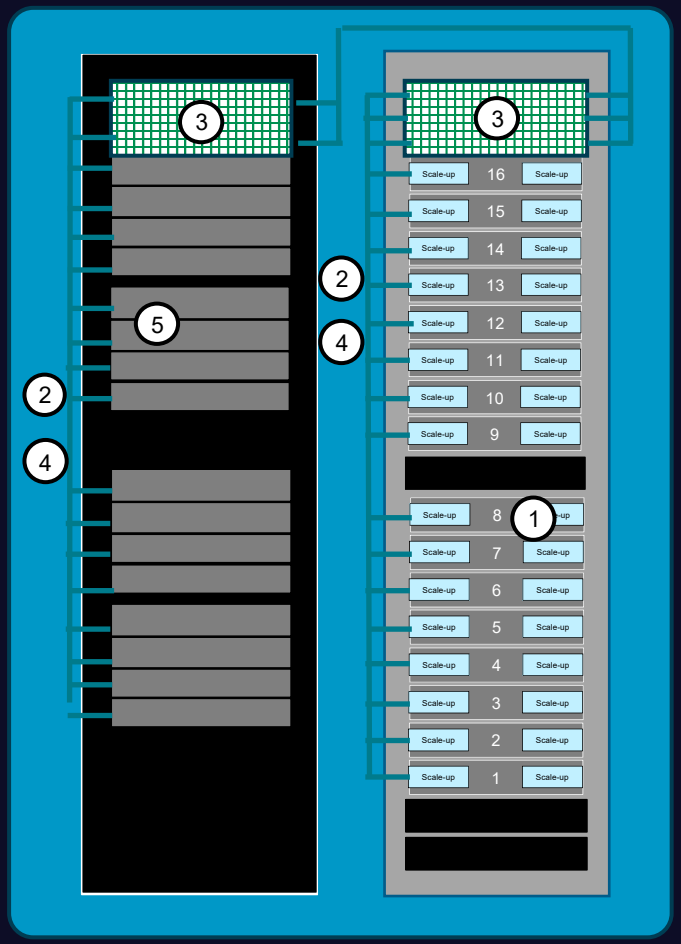
Interconnect	Total Link Power (pJ/bit)	Reach
DAC	7	2m
Integrated OCI	7	500m
DR LRO Front Panel Pluggable	23	500m

OCI – the reach of Front Panel Pluggable, the power of Copper

Building a 1024 XPU Scale-Up Cluster



1024 Scale-Up	GPU	Switch
Scale-Up BW/XPU	25.6 Tbps	204.8 Tbps
Per Rack	64	32
Total racks	16	4
Total Units	1024	128
Fibers/unit	128 (Bi-Di)	1024 (Bi-Di)
Fibers/rack	8,192	32,768

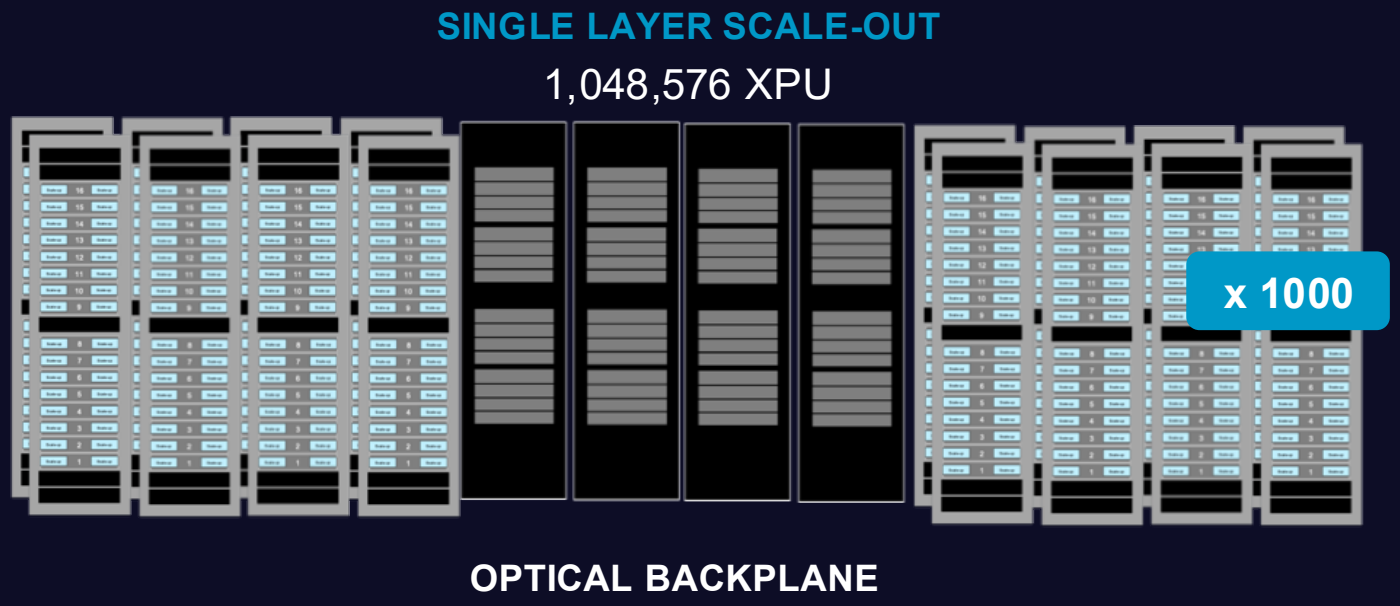


Optical Network Components

1. Inside GPU
2. Fiber Shuffle
3. Patch Panel
4. Fiber Jumpers
5. Inside Switch

1M XPU Cluster with Single Layer Scale-Out

- Very high bandwidth low latency scale-up domain → to connect many scale-out rails.
- ESUN framework to unify scale-up and scale-out messages
- Single scale-out switch can connect 1024 scale-up PODs (1024 x1024)



Use **ESUN** for unified protocol enabling domain fungibility

Advantage of Super High BW, Lowest Latency **Scale-up**

Call to Action

- Problem to solve
  - Need to address optical backplane and deployment challenges with industry participation
  - Adoption into a single type of Scale-Up interconnect will help to produce the right scale and cost point to drive the next phase of AI interconnect build outs
  - OCI-MSA movement to include a larger ecosystem of partners

- Links:
  - OCI-MSA GEN1 Specification please see www.oci-msa.org
  - Broadcom CPO BiDi White Paper https://docs.broadcom.com/doc/cpo-bidi
  - What is Integrated Optics for AI Infrastructure https://www.broadcom.com/topics/integrated-optics-for-ai-infrastructure

Thank You!

