Strategies for Scale Across and Scale Out Networking

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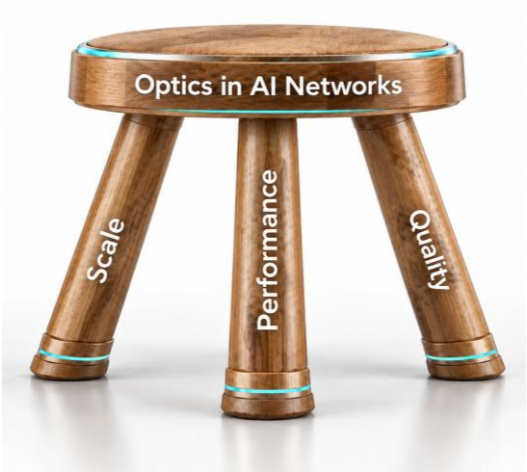
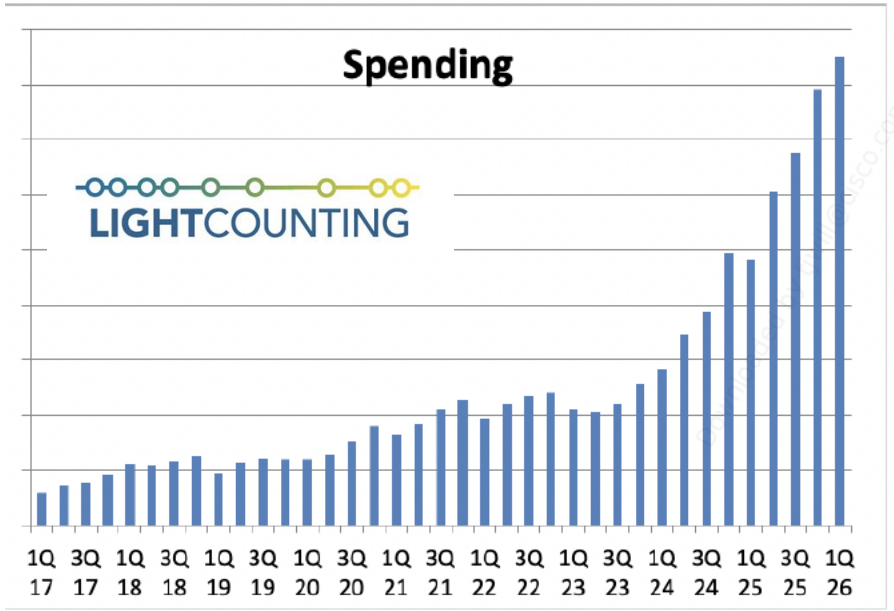
ECOC 2026

AI is Driving Everything

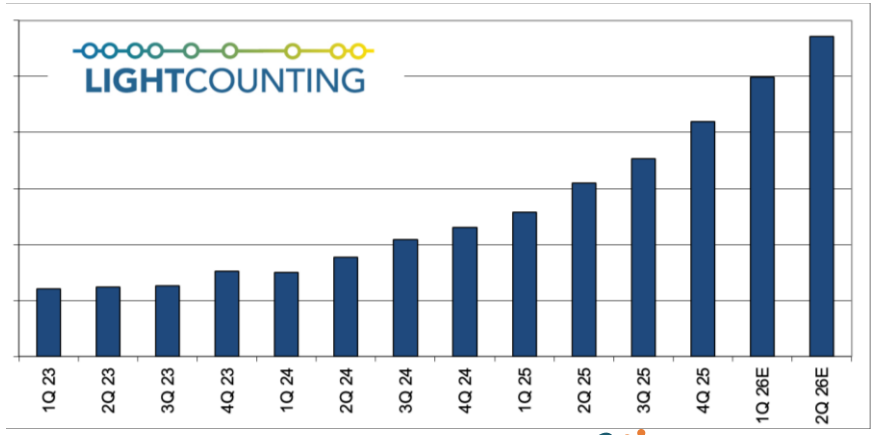
- Tremendous growth in demand driven by frontier models and web
- Driving accelerated roadmaps and unprecedented scale
- Shifting emphasis for optics
  - Ability to scale and effectively manage the supply chain
  - Performance has more value as it translates to margin and more robust links
  - Significantly increased focus on quality



Top 15 Cloud Companies Capex



Quarterly Sales of Optical Transceivers

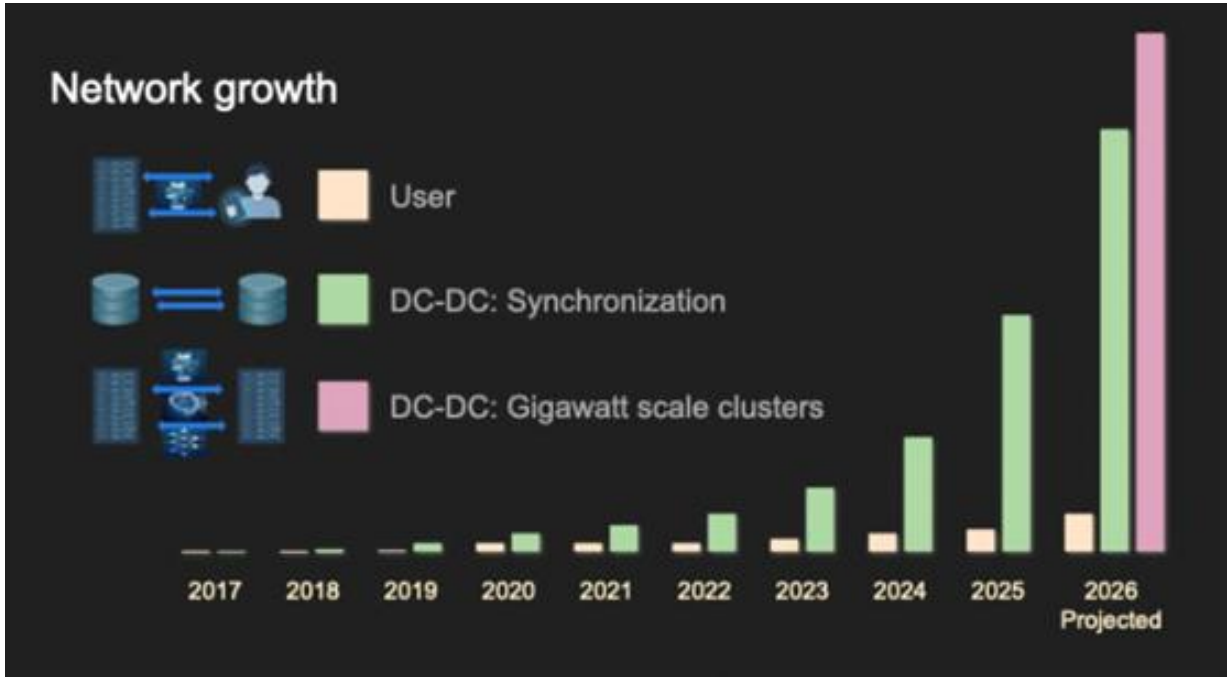


Cost/bit is still important, but optimizing for GPU utilization is the key metric for success

Scale Across Driving Coherent Optics Demand

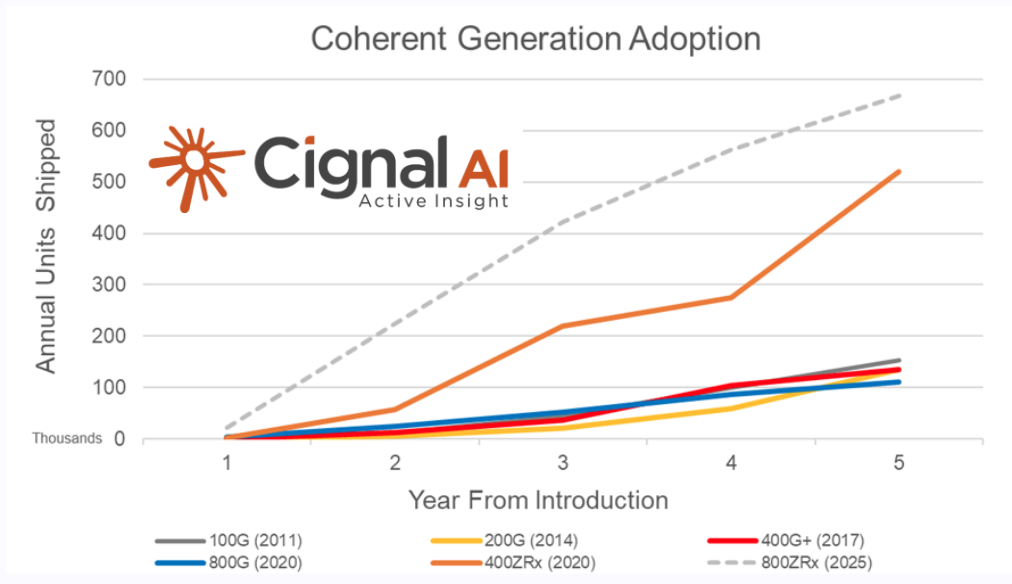
Back End connectivity between geographically diverse data centers

Meta network traffic



Meta at Exec Forum, OFC 2026

Strong demand for Scale Across making 800ZR+ the fastest growing coherent technology in history

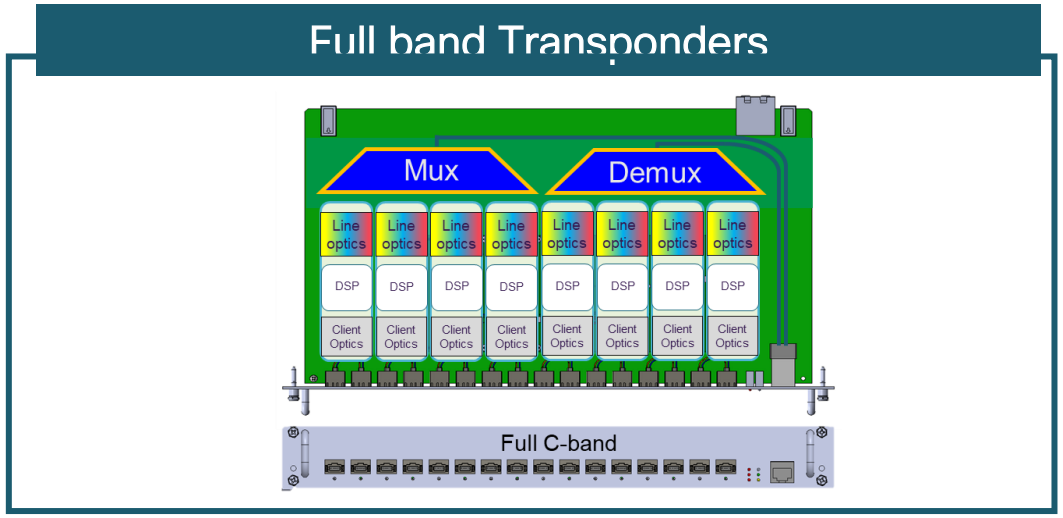


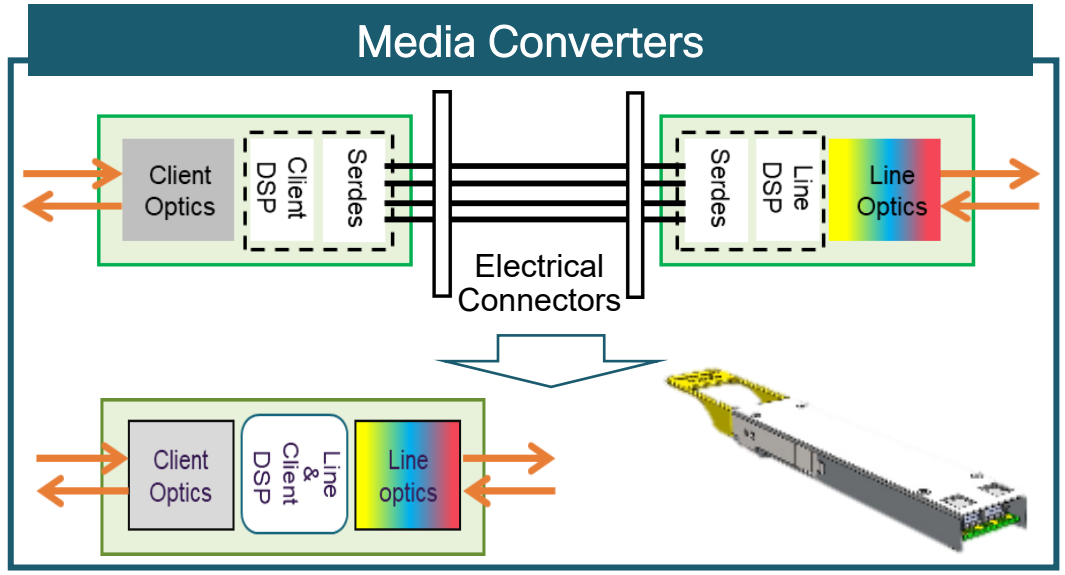
Acacia is the leading vendor with >75,000 800ZR+ modules shipped

Future Architectures for Scale Across

- Higher baud rates reduce the number of wavelengths per optical band
  - C+L deployments widely utilized
  - Additional bands starting to be considered
- Power and size optimized architectures
- Greater integration and fewer interconnections
  - Multi-rail amplification, full band transponders, media converters, etc.
- Multi-core and hollow-core fiber

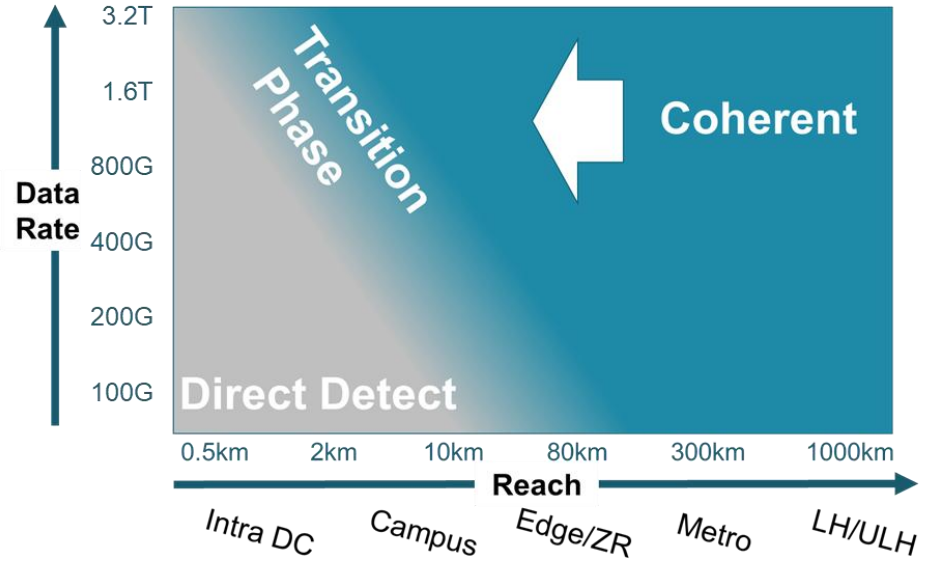
These new architectures are expected to coexist with pluggable implementations





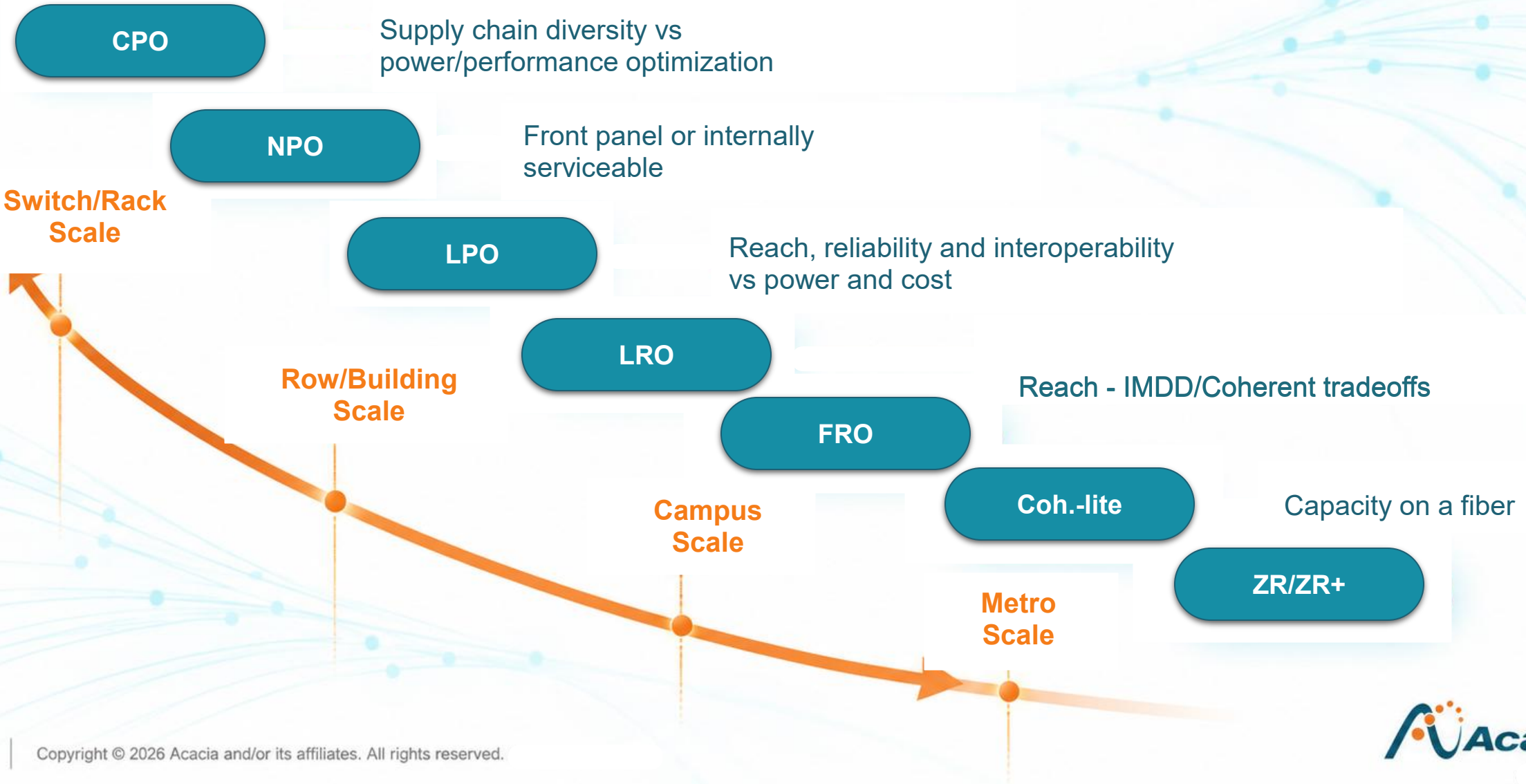
Coherent Optics moving to shorter reaches

- High volume use cases inside data centers use IMDD optics
  - Established high volume supply chain
  - Low latency where end-end FEC can be utilized
- CD tolerance of IMDD reduced by square of baud rate
  - IMDD limit for 200G/lane is ~10km
  - At 400G/lane, coherent is needed for >2km
- IEEE has leveraged ZR technology for 800G interfaces beyond 10km
  - 800GBASE-ER1 and 800GBASE-ER1-20 interfaces support 20km and 40km links
- Coherent technology at 1600G/lane can support campus DCI use cases >2km



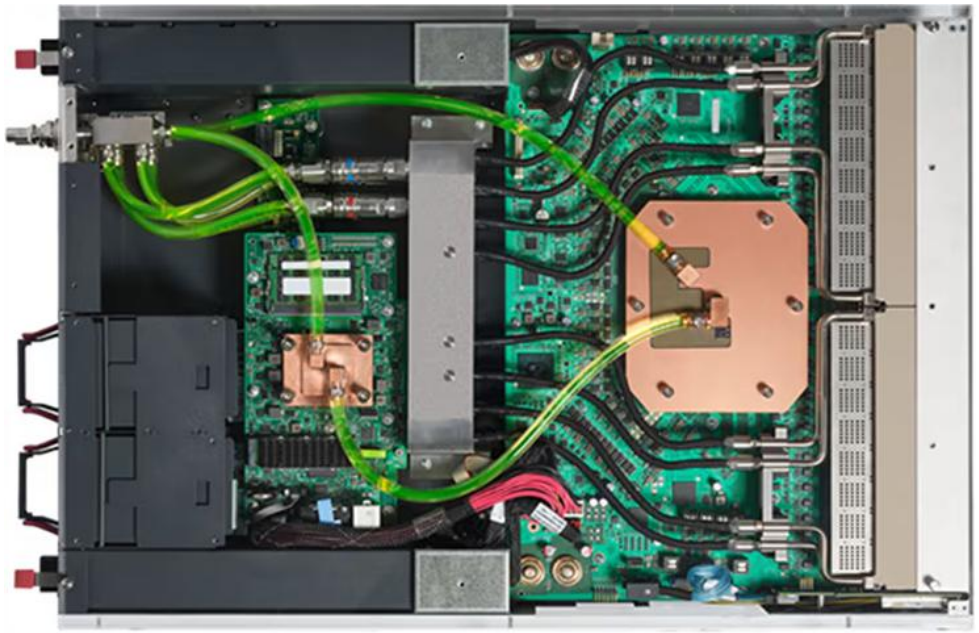
- Why move from IMDD to coherent?
  - 4x capacity per lane or wavelength
  - Digital compensation of CD
  - Support for DWDM
  - Fewer amplifiers where required

Matching Optical Technologies to Needs



Liquid Cooling

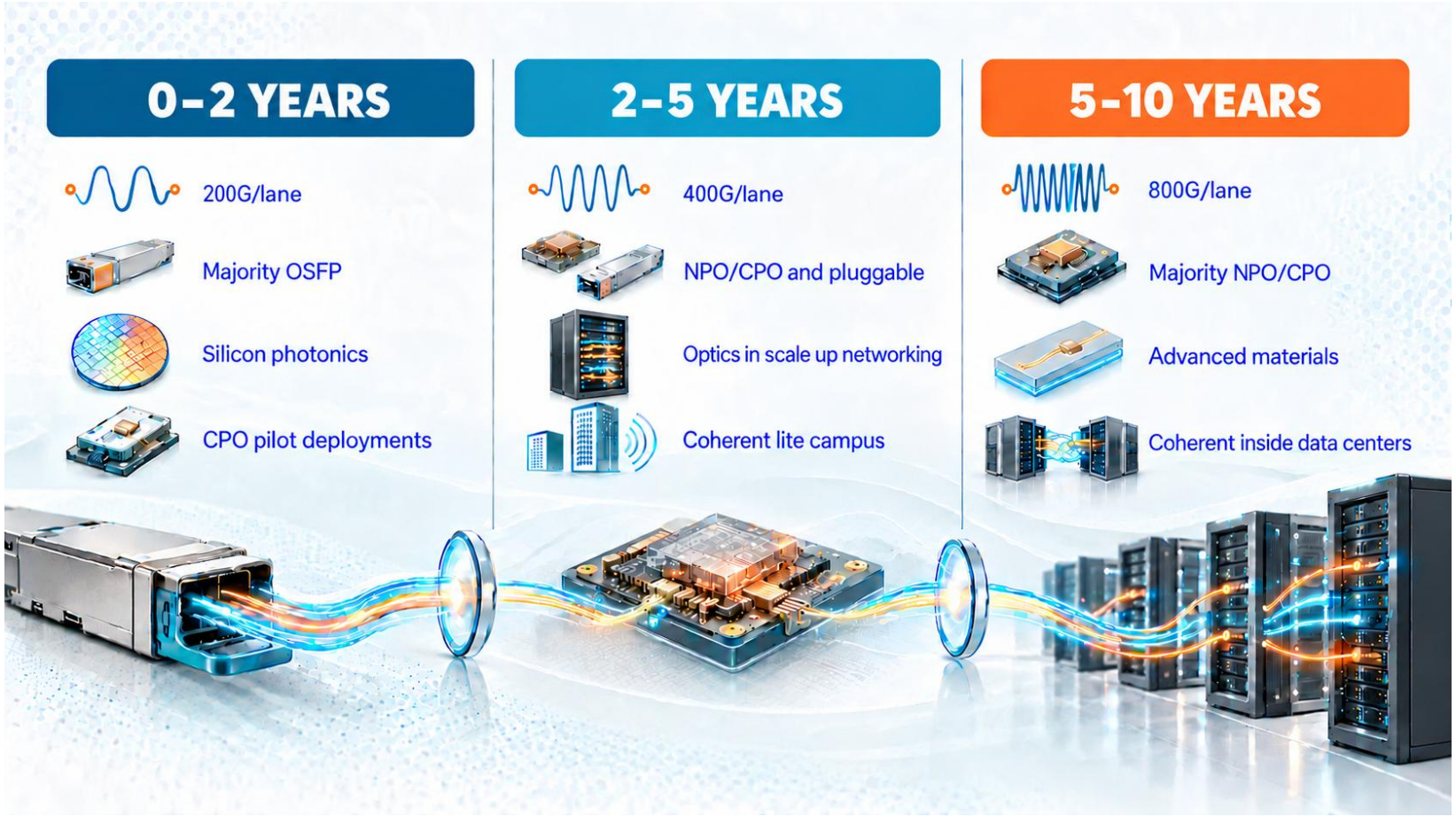
- Liquid cooling is common in compute and will become more pervasive in networking
  - Reduce facility cooling power
  - Enable higher power density designs
- Today's pluggable optics support air cooling or cold plate designs
- Optimizing design for liquid cooling can increase system density



Cisco

XPO is the industry's first effort to define a form factor optimized for liquid cooling

Data Center Optics of the Future



Multiple technology transitions are needed to support the AI build out

All new technologies need to be proven to meet the requirements of scale, performance and quality

Maximize GPU utilization!

AI as a tool to accelerate innovation may be critical to enabling successful introduction of so many new technologies

Connecting at the speed of light