Physical Layer Optimization

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Nexans
- Locations in 40 countries
- 26,000 employees
- €6.37 billion ($7.8 billion) in revenue

Nexans Data Center Solutions (NDS)
- Launched in 2017 to service hyperscale/cloud data centers
- US base of operations, global reach
- Complete physical layer portfolio
Nexans Data Center Solutions

Enclosures

Pre-terminated assemblies

Transceivers

Patch Cords

Pathways
What is Physical Layer?

- Physical Layer is not just cable
  - cable + connectivity + transceiver

- Holistic Approach of Physical Layer
  - Optimization of performance, cost, and logistics
Performance Optimization

- If XCVR is 100G-CWDM4:
  - Total CIL = 5dB. Is > 5dB possible?
- Can a Link have > 2dB of connector loss?
  - Can reach be traded for connector loss?
- Will my existing cabling work at 100G?

Analyze performance of a link, not components
Cost Optimization – Cabling

- Cabling/Connectivity cost factors
  - Based on the connector: LC vs. MPO
  - Gb/s/Fiber.
  - Density, network architecture, etc.

- Decision based ONLY on cabling:
  - Most likely Duplex-LC architecture
  - Future migration cost may be impacted by optics design/cost

Source: Nexans
Cost Optimization – Optics

- Optics Cost factors
  - WDM vs. Parallel Optics
  - Technology platform/manufacturing process
  - Encoding /modulation scheme, baud-rate, etc
  - Market adoption/availability

- Decision based ONLY on optics cost:
  - Most likely 100G-PSM4
  - Will significantly impact cabling architecture, installation guidelines, etc.

Source: Lightcounting, Nexans
Cost Optimization – Physical Layer

- Physical Layer Cost:
  - Best represented in $/Gb/s
  - Link must be considered holistically
  - Including cable, architectures, density, optics, technology roadmap

![Graph showing Link Cost comparison between 100G-CWDM4 and 100G-PSM4, with a relative cost range of approximately 1 - 1.5x.](image)
Conclusions

- Data center physical layer is more than just cable or optics – it’s the combination

- Cable infrastructure design without the full consideration of optics (and vice-versa) leads to sub-optimal performance

- Cost optimization of components is sub optimal.

- OCP tool for performance/cost optimization?