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Physical Layer Optimization

Mike Connaughton

Nexans Data Center Solutions

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Nexans Data Center Solutions

Nexans

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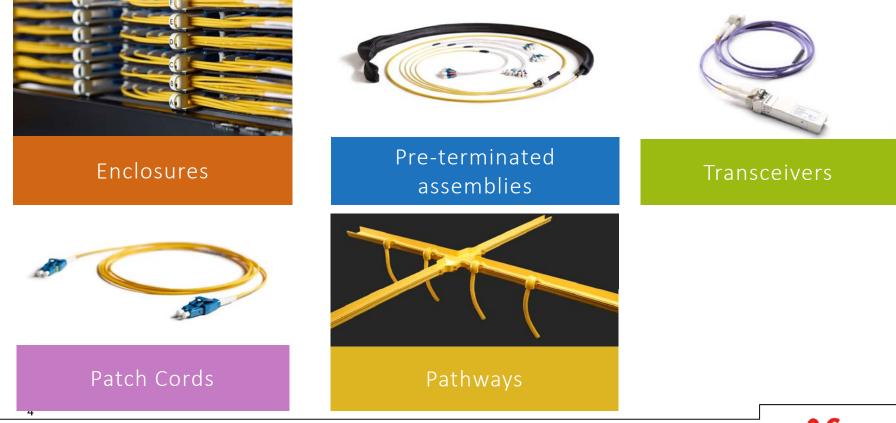- €6.37 billion ($7.8 billion) in revenue

Nexans Data Center Solutions (NDS)

- Launched in 2017 to service hyperscale/cloud data centers
- US base of operations, global reach
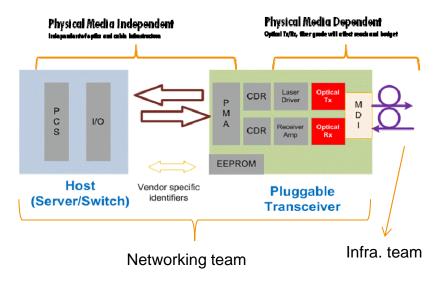- Complete physical layer portfolio

Nexans Data Center Solutions

Enclosures

Pre-terminated assemblies
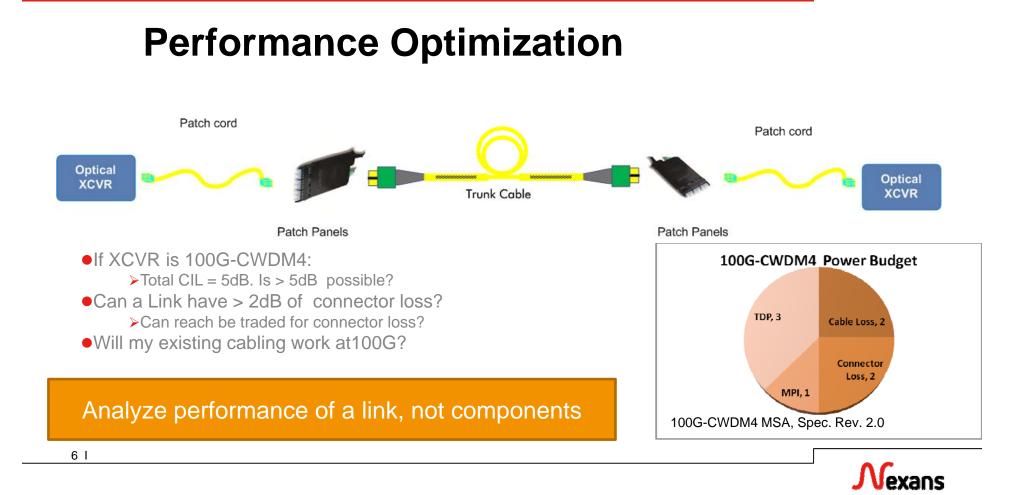

Transceivers

Patch Cords

Pathways

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What is Physical Layer?

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

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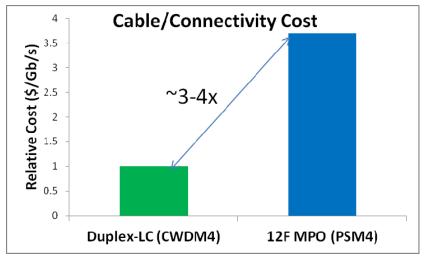 - Optimization of performance, cost, and logistics

Networking team   Infra. team

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Performance Optimization

Patch cord — Optical XCVR — Patch Panels — Trunk Cable — Patch Panels — Patch cord — Optical XCVR

- 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 at100G?

Analyze performance of a link, not components

100G-CWDM4 Power Budget

TDP, 3
Cable Loss, 2
Connector Loss, 2
MPI, 1

100G-CWDM4 MSA, Spec. Rev. 2.0

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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
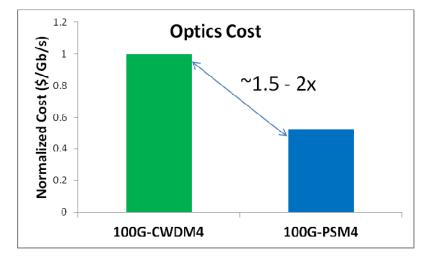 - ● Future migration cost may be impacted by optics design/cost

Souce: 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.
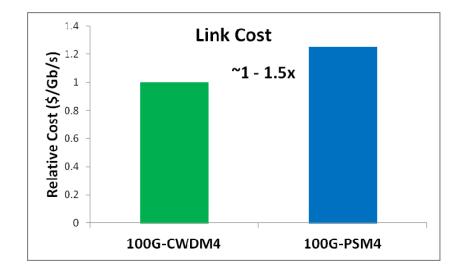

Source: Lightcounting, Nexans

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Cost Optimization – Physical Layer

- Physical Layer Cost:

  - Best represented in $/Gb/s

  - Link must be considered holistically

  - Including cable, architectures, density, optics, technology roadmap

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?

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