From Gigabit to Terabit Ethernet

The Past Present and Future of Ethernet Optics

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President of the Ethernet Alliance

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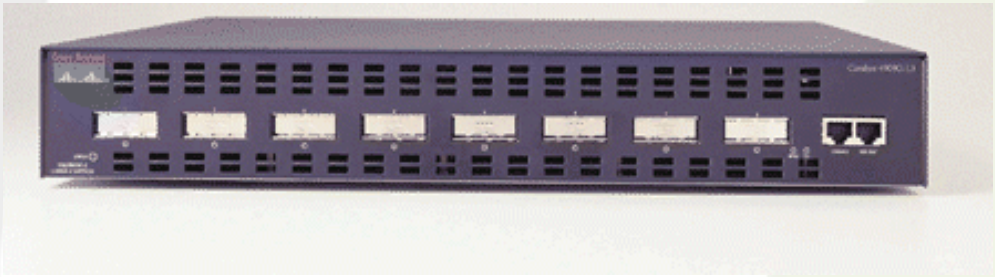
What is this?

Early Gigabit Blade

4 FDDI Ports at 250 Mbps to yield one of the first Gigabit/second blades -circa 1990s

FDDI Module on IEEE 802.4

By 2000, up to 8 GBICs in one switch – no 10GbE yet



GBIC Module for 100BASE-SR

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Generations of Optics

- GbE from GBIC to SFP to 1000BASE-T

- 10GbE from 300pin to SFP+ to 10GBASE-T

- Will 100GbE follow?

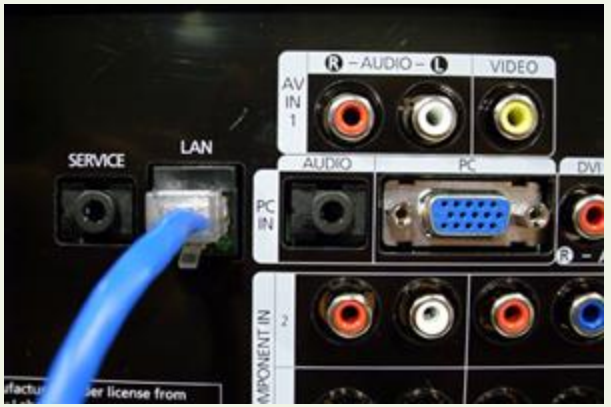
Or Twinax

The First Speaker

- Chris Cole
  - Finisar Engineering Director
    - Leading the development of 100Gb/s and beyond optics
  - IEEE 802.3 contributor
  - CFP MSA Spokesman

The Perfect Storm that Won't Stop

- More Devices
  - Over a billion smart devices to ship in 2012 (desktops, laptops, pads and smartphones)
  - TVs connecting to the Internet for Over-The-Top (OTT) Video
- More Users
- More Applications



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By 2010, 100s of Gbps / blade

640Gbps/blade – 80 times faster than a decade ago

Four 40G
QSFP Ports

48 10G
SFP+ Ports

We're in the early days of 100GbE, so we're seeing only 1, 2 to 4 ports of 100GbE per blade today.

This is about to change…

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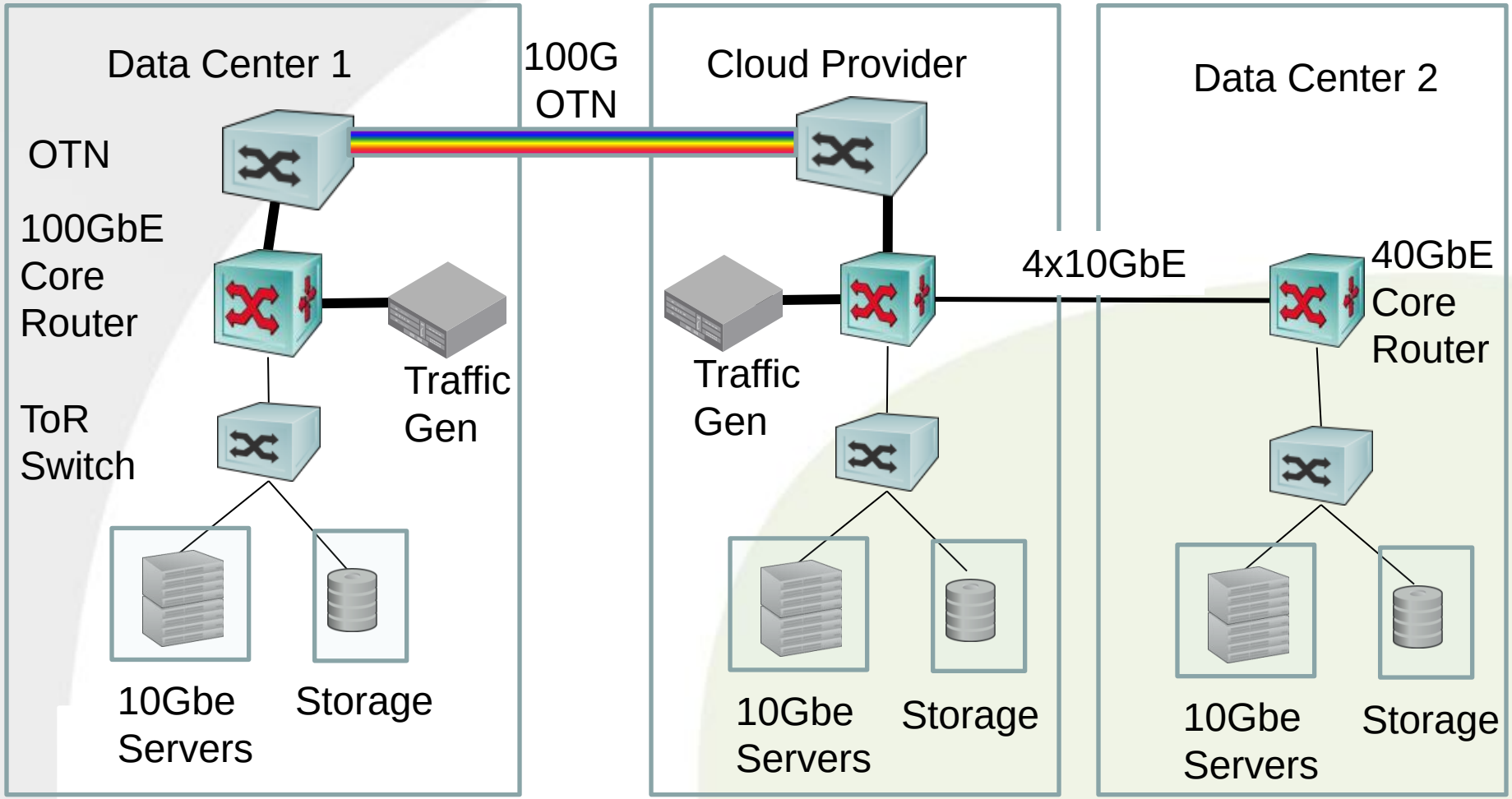
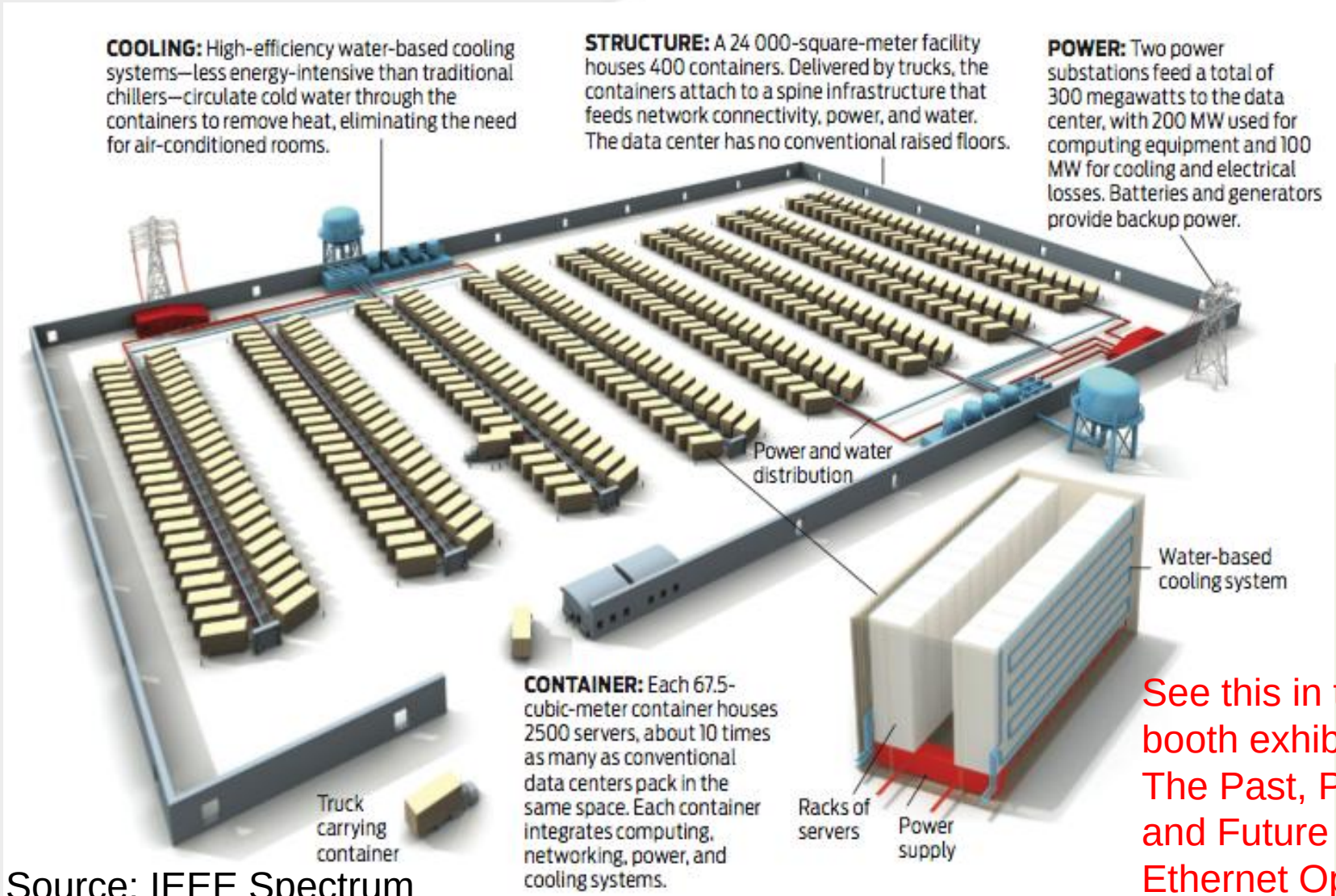
Second Speaker

- Mark Nowell
  - Cambridge graduate
  - Director of Engineering in Cisco's Silicon Engineering team
  - IEEE 802.3.bg Chair - 40 GbE Serial

From Switches to Networks



How do you build a million server DC?



Source: IEEE Spectrum

See this in the EA booth exhibit:
The Past, Present and Future of Ethernet Optics

Third Speaker

- Bikash Koley
  - University of Maryland graduate
  - Google Technical Lead and Manager, Network Architecture and Capacity Planning
  - 10X10 MSA Leader

100GbE Question

100Gbps Next Generation Optics Study Group considering three objectives

- CAUI-4 4X25G retimed interface – Approved
- 100m on MMF – 100GBASE-SR4
- 500m to 2km on SMF – 100GBASE-MR4
  - 8 Parallel SMF with Directly Modulated Lasers
  - 2 Duplex SMF with one Externally Modulated Lasers
  - What is best or is LR4 enough?

Discussion and Q&A

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