

Round Pegs for Round Holes

Ethernet Alliance TEF 2014

The Rate Debate

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Industry trends...

Network effect...

Cloud



85%

Using cloud tools
next 3 years

Changes in traffic patterns in the
data center

Big Data



35

Zettabytes data stored
by 2020

Migration to 10/40GbE leaf-spine
fabric architectures

Mobility



5X

Personal devices in
workplace now

BYOD and workload-driven
infrastructure

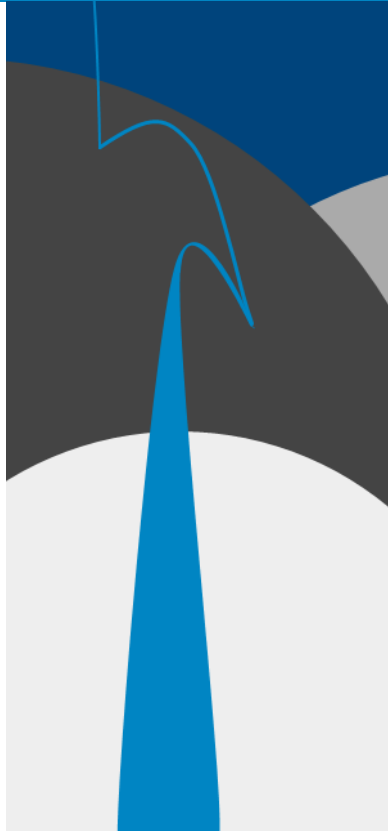
... creating opportunities for innovation



Open Networking Vision

Industry imperatives

- **Speed innovation** through standards-based platforms
- Drive a new **open ecosystem for all**
- Offer **best-of-breed** solutions backed by global support
- **Serve customers' unique business needs (including speed)**



Industry advantages

- **Enter the open networking era** with best-of-breed solutions
- **Simplify** network management, orchestration and automation
- **Leverage open-source, standards-based** tools and expertise

Networking: The Power to Do More

Goal
for industry

Deliver for a given application –
the right product @ the right cost

What
needs to be
considered

Scale Efficiency Right rate Productivity
Customer Centricity Risk Mitigation

What
you need
to do

Deliver technology solutions

Factors Shaping the World of Networking



"The whole ecosystem is moving to this standardized infrastructure," he said. "Standards-based hardware and software represents the future of our industry."

*Michael Dell
Nov 12, 2002*



Driving Standardization



MARKET DEMAND

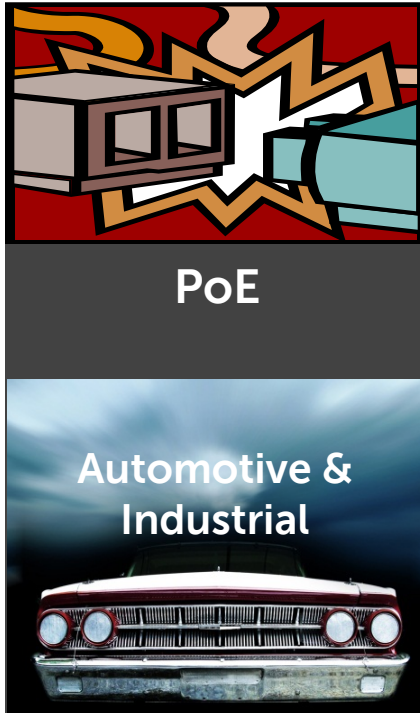


STANDARDIZATION ?



TECHNOLOGY.

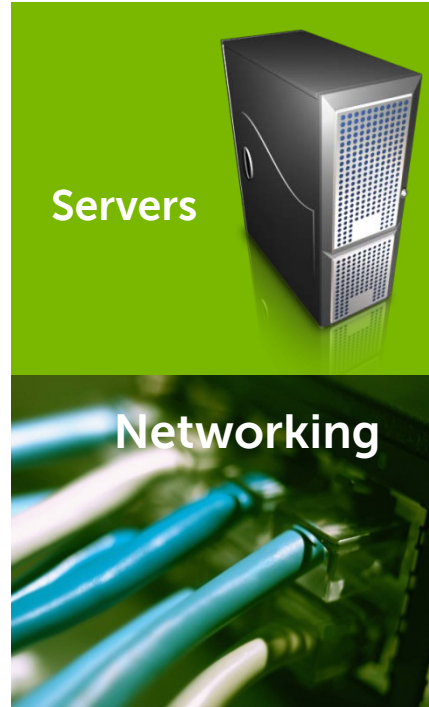
IEEE 802.3 Ethernet Working Group Efforts



PoE

Automotive & Industrial

The top half of the image features a stylized, comic-book-like illustration of a computer monitor and keyboard with jagged, energy-like lines around them, set against a red and black background. The bottom half shows a front view of a classic red and white car, possibly a Ford Mustang, against a dark, atmospheric background.



Servers

Networking

The top half shows a black server tower with a perforated front panel, set against a solid green background. The bottom half is a close-up of several blue and white Ethernet cables plugged into a network switch or patch panel.



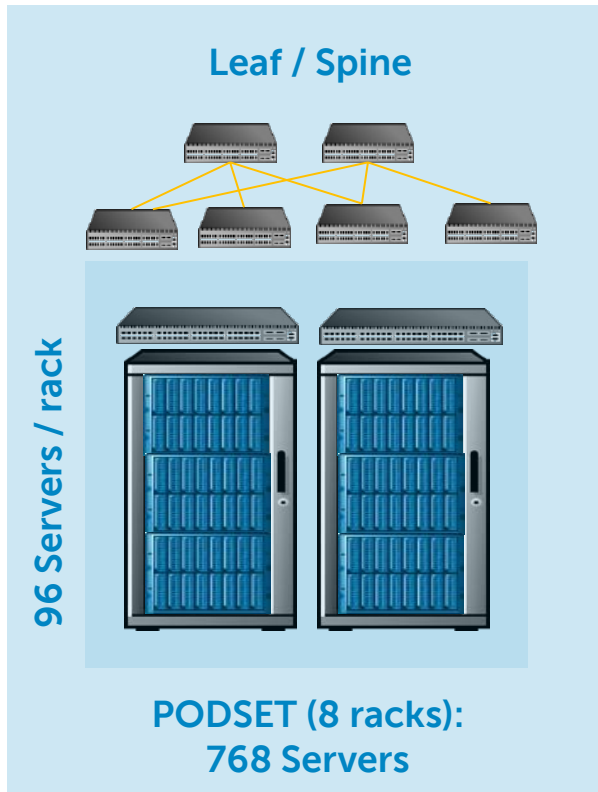
Nov 14
Calls-For-Interest

Next Gen Enterprise
Access BASE-T

25GBASE-T

The top half features a white wireless router with two antennas, set against a solid yellow background. The bottom half is a close-up of a purple Ethernet cable being plugged into a network port on a device.

Example: Why Servers need 25Gb/s Ethernet

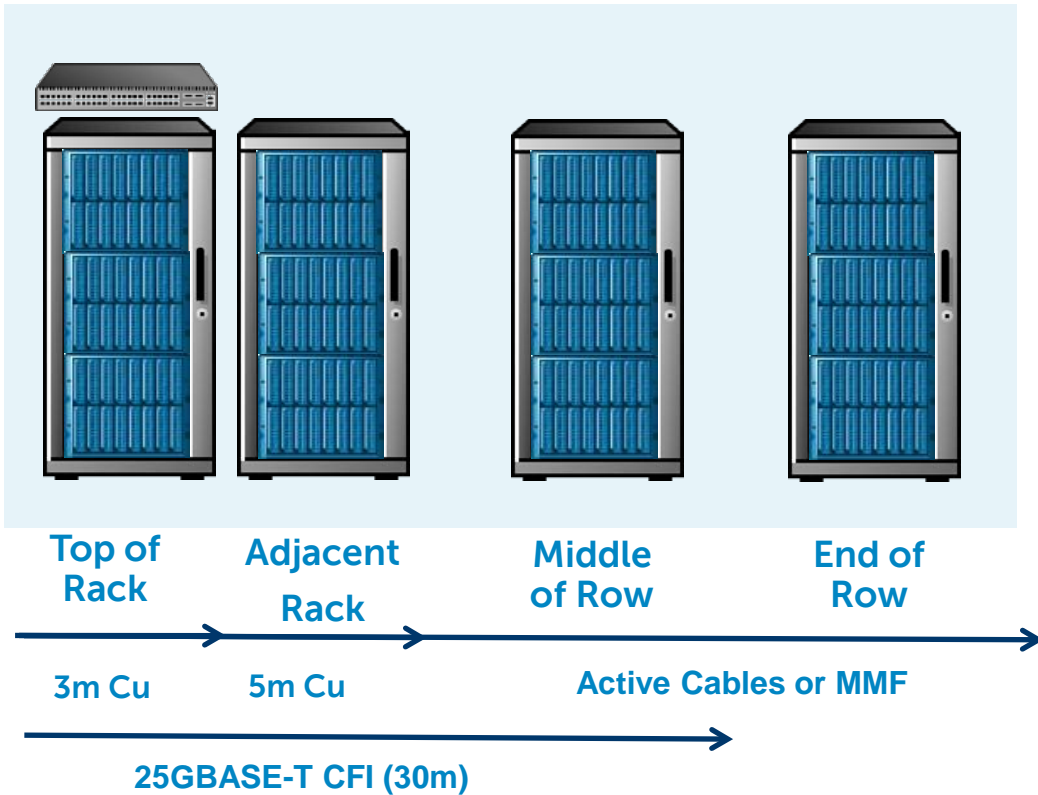


	25 GbE	40 GbE
# of Spine Devices	64	
# of Leaf Devices	768	
#100G Optic links	24,576	
# of ToR (32x100G)	1536	6,144
# 4x25 DAC (breakout)	36,864	n/a
# 40GbE (4X10) DAC	n/a	147,456
# of Servers	147,456	

- 25 GbE reduces CAPEX & OPEX!



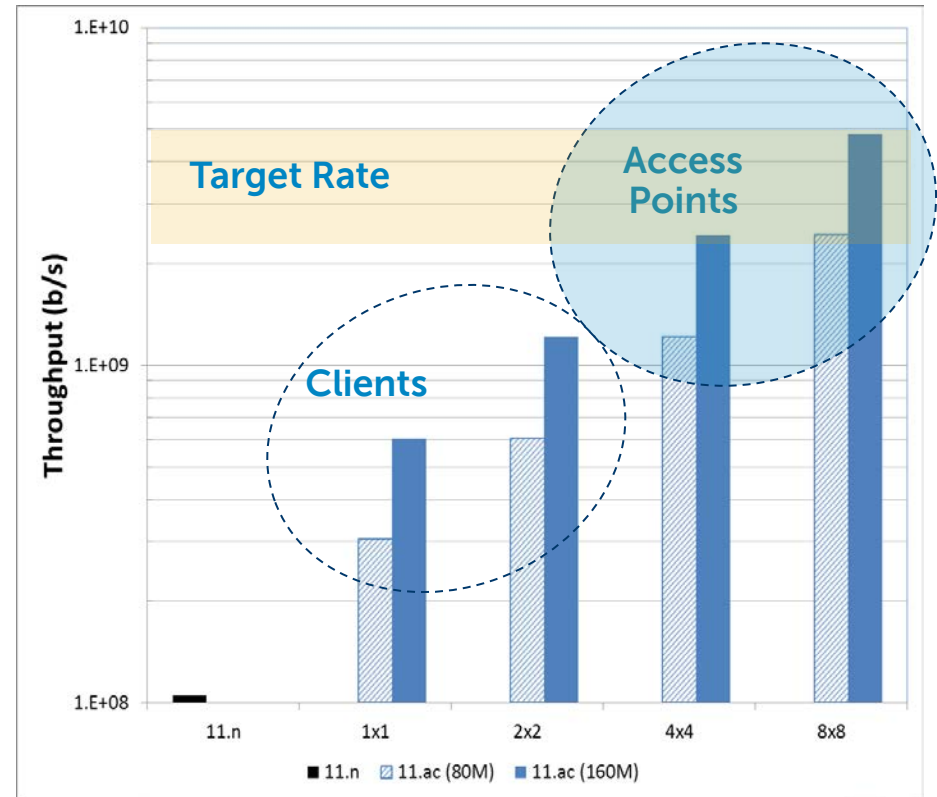
Example: What Servers Need from 25GbE



- No one solution for “server to switch” interconnect
 - Blade servers
 - Cu Cables
 - Active Cables
 - Multi-mode fiber
 - Future – 25GBASE-T?
- “Right” media dictated by customers architectural choices

Example: Next Gen Enterprise Access BASE-T PHY

- Gigabit Ethernet + PoE – the wired backbone for 802.11.x Wireless Access Points
- Existing enterprise infrastructure significant deployments of Cat5e, which doesn't support 10GbE
- Next Gen 802.11: 802.11ac
 - Multiple coding schemes
 - Various bandwidth options
- Richer media content at a faster data rate to more users with more devices
- An opportunity for Ethernet!



Imagine: The “Androidification” of Networking

- Standard orchestration & automation tools
- Optional 3rd party SDN/ NVO controller
- Any networking OS
- Merchant silicon
- Open standard hardware



- Standard orchestration & automation tools
- Optional 3rd party SDN/ NVO controller
- Virtual services
 - Power & traffic optimization app
 - Performance monitoring optimization app
 - Security app
- Open network platform OS
- Merchant silicon
- Open standard hardware



The Emerging Open Standards Library

- Power Over Ethernet

PoE over 4 Pair / PoDL

- Power Applications

- 10 Mbit Ethernet

- 100 Mbit Ethernet

- Gigabit Ethernet

100MbE to 1 GbE

- Automotive Ethernet

- 10 Gigabit Ethernet

2.5GbE to 5GbE

- Enterprise Access

- 40 Gigabit Ethernet

25 GbE

- Servers

- 100 Gigabit Ethernet

50 GbE

- Next Gen Servers

- 400 Gigabit Ethernet

200 GbE

- Leverage x4 50Gb/s

Develop the Right Tools

- **Standards-based tools are the foundation to success!**
- **Target applications with the right solutions!**
- **Opportunities exist, but diversity of applications must be embraced.**
- **Round pegs for round holes!**



What does the Future Hold?

- **Internet of Things**
 - What will be the new applications?
 - IDC forecast for end of 2020 – Installed base 212 billion, including 30.1 billion connected autonomous things. (Source: <http://www.zdnet.com/internet-of-things-8-9-trillion-market-in-2020-212-billion-connected-things-7000021516/>)
- **Remember Metcalfe's Law?**
 - The value of a network is proportional to the square of the number of connected users of the system

Thank you

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