

Ethernet Alliance - Connecting. Educating. Advancing.

Los Angeles Convention Center • March 8 - 10, 2011



**Ethernet Alliance
OFC/NFOEC 2011
Booths #2108 & #1253**



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Outline

- What's New
- Ethernet Alliance Overview
- Next Generation Ethernet
- OFC Overview
- Technologies Displayed
- Where to Find the Ethernet Alliance



What's New

- 100G Traffic Over a Live Network
 - Multi-vendor interoperability
 - Includes 40G and 10G
 - Includes RDMA over Ethernet (RoCE)
- Preparing for the Next Generation Ethernet
 - Next Gen Enterprise Cabling Subcommittee Formation
 - High Speed Modular I/O Subcommittee Formation
 - Technology Exploration Forum: Next Generation 100GbE Interconnect Specifications



Overview



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Bringing Ethernet Standards to Life

For *any* standards-based Ethernet technology we offer:

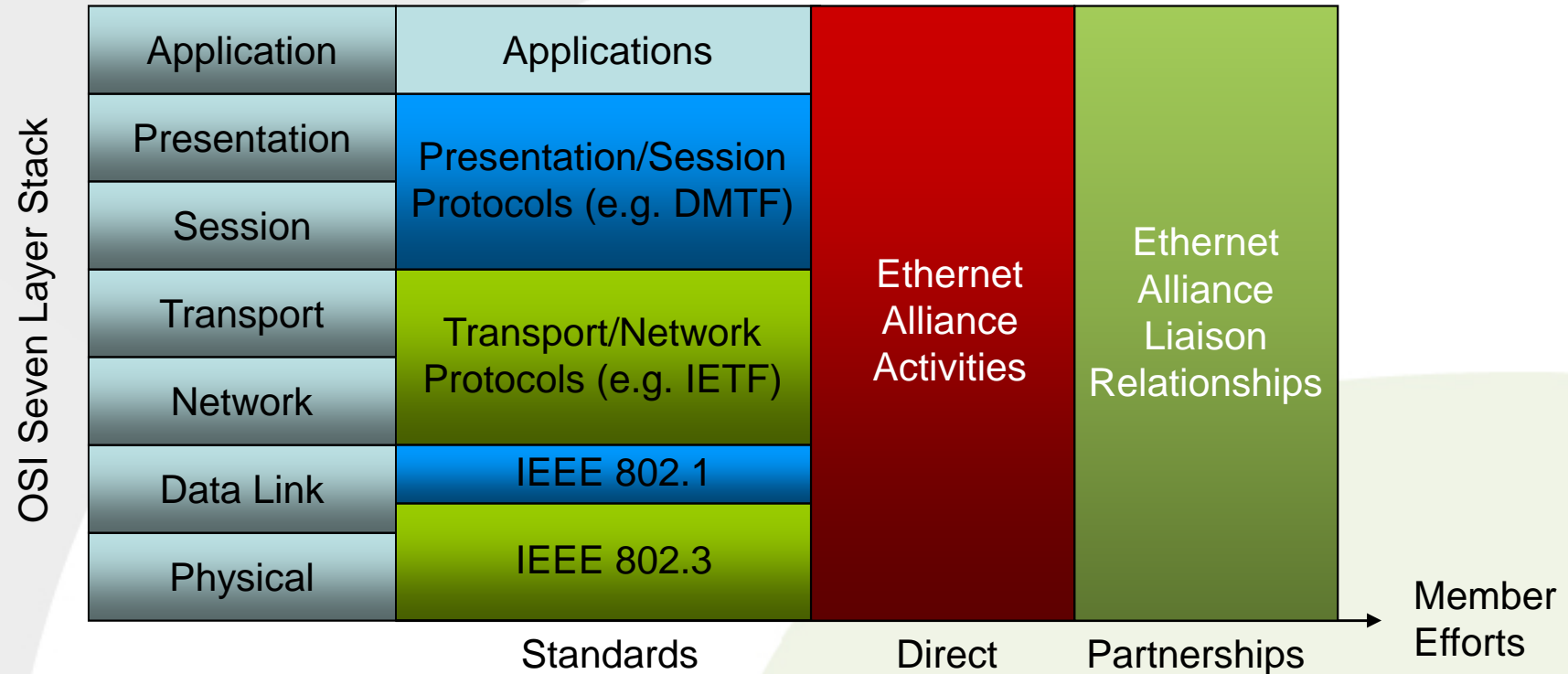
- Incubation
- Standards development support
- Education
- Interoperability testing
- Public demonstrations

To help grow new markets faster and make existing markets bigger:

- Facilitate the development and expeditious completion of Ethernet standards
- Grow the Ethernet ecosystem by expanding Ethernet into new applications
- Simplify IT decision making process and accelerate the adoption of new standards-based Ethernet technologies



Ethernet Alliance in the Industry



- Primary focus: Ethernet Standards and Applications
- Partnerships and liaisons with Ethernet users/influencers



Grow the Ethernet Ecosystem

- Support the expansion of Ethernet applications
- Enhance Ethernet capabilities through standards incubation
- Build a community with programs that include end users, developers and academia
- Facilitate networking for networkers



Ethernet Community Development

- Market Education
 - Technology Exploration Forums
 - Tradeshows for hands-on experience
 - Speakerships, presentations and papers
 - Videos and webinars
- University Program
 - Intellectual property database
 - Supporting educational opportunities
 - IEEE workshops
 - Conference programs
 - Internship opportunities



Incubation Pipeline

Help shape the decisions...

- Current topics
 - 25 Gbps interfaces
 - 100GbE on a single wavelength
 - Terabit Ethernet
- Other considerations
 - Two-tier vs. three-tier networks
 - Enhanced energy-efficiency
 - Deterministic behavior
 - Increase power for PoE+



Simplify IT Decision Making

Ease customers' purchasing decisions

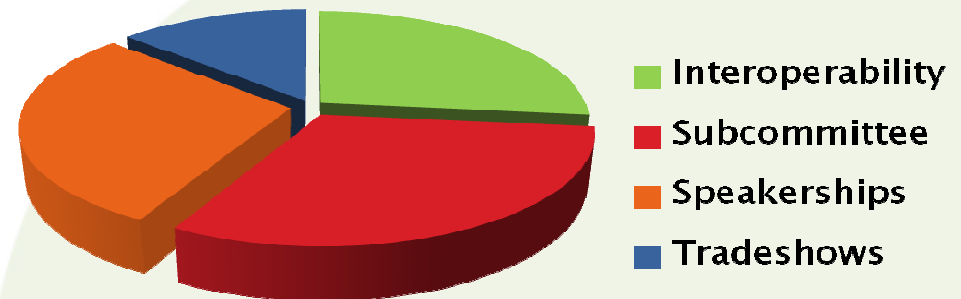
by interoperability and demonstrating market readiness:

- Tradeshows
- Hot staging
- Documented closed-door interoperability events
- Equipment testing



The Ethernet Alliance

- A global community of end users, system vendors, component suppliers and academia
- Activities
 - Technology and standards incubation
 - Industry consensus building
 - Education
 - Interoperability testing and demonstration



Subcommittees

- Key element of the organization
- Member-driven, and members decide on the formation, modification and tasks the subcommittees take on to best meet the needs of the industry.
- Examples of current subcommittees include:
 - 10GBASE-T
 - 10G EPON
 - Carrier Ethernet (includes 40G serial, Time Synchronization)
 - Energy Efficient Ethernet
 - Ethernet in the Data Center
 - Higher Speed Ethernet (40G, 100G, etc)
 - Higher Speed Pluggable I/O (10G,40G, 100G, etc modules)
 - Next Generation Enterprise Cabling
 - Power over Ethernet and its follow-on standards



Next Generation Ethernet



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Preparation for the Next Generation of Ethernet

- Next Generation Enterprise Cabling
 - Analyze deployment models, applications, and reaches
 - Share information with members and standards bodies
- Higher Speed Modular IO
 - IEEE Std. 802.3baTM-2010, for Higher Speed 40 and 100Gb has been ratified
 - Have been some interop demonstrations of the 40 Gb QSFP+ and the 100 Gb CXP interfaces but there have been no rigorous testing for interoperability or of proving out the specification
 - No real marking of those two interfaces and their capabilities
 - There will be additional modular interfaces being introduced



Upcoming Technology Exploration Forum



Next Generation 100GbE Interconnect Specifications June 14, Santa Clara, CA, Techmart

- IEEE 802.3ba defined 100Gb/s Ethernet operation and introduced physical layer specifications across multimode and single-mode fiber and twin-axial copper cable assemblies.
- The IEEE 802.3 Working Group has already set up a study group to examine 100 Gb/s operation across an electrical backplane and a narrower twin-axial copper cable interface.
- Industry anticipation that further work on new physical layer specifications for 100 Gigabit Ethernet will be undertaken.
- Facilitate discussions on new 100GbE PHY specs
- Modules, speeds vs. lanes/wavelengths, BASE-T, etc.



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OFC/NFOEC 2011 News

Booth #2108 & 1253



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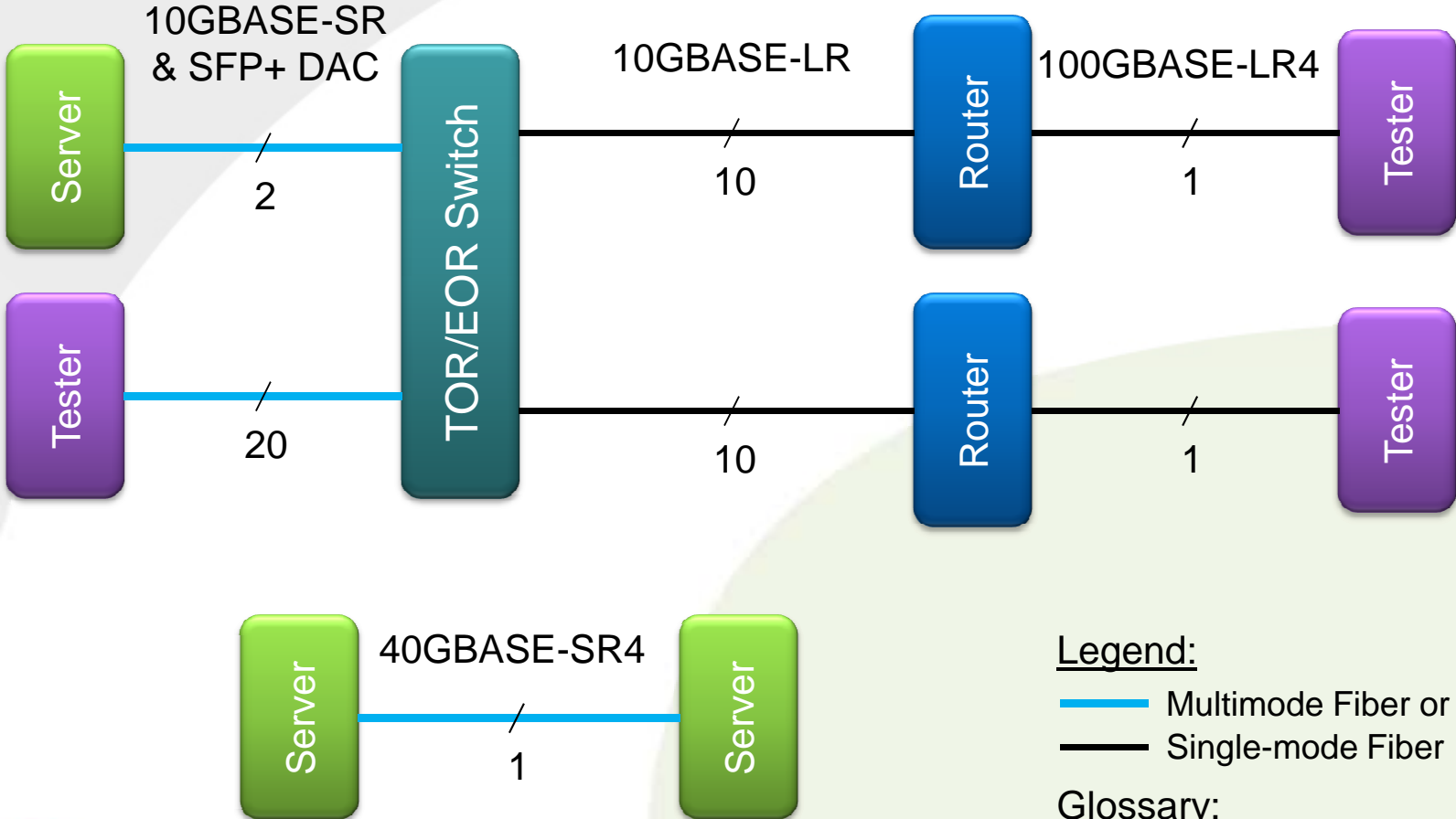
Demonstration

An unprecedented live demonstration featuring 10GbE, 40GbE, and 100GbE traffic over fiber optic and copper links, and RDMA over Converged Ethernet (RoCE) traffic

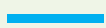



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Ethernet Alliance OFC 2011 Demo



Legend:

-  Multimode Fiber or DAC
-  Single-mode Fiber

Glossary:

- TOR – Top of Rack
- EOR – End of Row
- DAC – Direct Attach Copper Cable



Member Participants



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Ethernet Alliance OFC 2011 Demo

- Equipment
 - Mellanox 10G servers with RoCE traffic and 40G servers
 - Mellanox top-of-rack switch with pass-through for RoCE traffic
 - Cisco core routers with 14x10G and 1x100G
 - Ixia and Spirent testers sourcing and sinking all traffic for 100G
- Optics
 - Opnext 100GBASE-LR4 CFP
 - Tyco 40GBASE-SR4 QSFP+
 - Opnext 10GBASE-LR and 10GBASE-SR SFP+
- Cabling
 - Amphenol, Siemon and Tyco SFP+ DAC
 - Amphenol, Commscope, Siemon and Tyco MMF and SMF
- Other
 - Siemon racks and cable management
 - Siemon UTP cables for management port access



Ethernet Alliance Demo Highlights

- 200G of traffic flowing through each router
- 420G of traffic flowing through the TOR switch
- Plug-n-play
 - Pluggable optics up and running immediately
 - Link established immediately upon cable connection
- Hot-stage
 - Network built with a couple hours of equipment arrival
 - Passing real traffic shortly after network IP assignments



Technologies Displayed



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100 Gigabit Ethernet

- 100GBASE-LR4
 - Four 1310 nm wavelengths (WDM) with a minimum reach of 10 km over SMF
 - CFP optical modules in the testers are from Opnext
- Setup
 - Ixia and Spirent testers are sourcing/sinking the 100G streams from each Cisco CRS3
 - 100G streams map out to ten 10GBASE-LR ports
 - 10G streams are generated/terminated in testers



40 Gigabit Ethernet

- 40GBASE-SR4
 - Four parallel fibers using 850 nm wavelengths with a minimum reach of 100 m on OM3 & 150 m on OM4
 - QSFP optical modules are from Tyco Electronics
- Setup
 - Point-to-point, back-to-back server connection for high bandwidth video data streaming
 - Example of server-storage point-to-point connection



RDMA over Converged Ethernet

- RDMA = Remote Direct Memory Access
- Converged Ethernet = IEEE 802.1 DCB specs
- Setup
 - RDMA between two servers with Mellanox CNAs through the Mellanox/Voltaire Layer 2 top-of-rack switch
 - RDMA data able to move unimpeded through switch due to DCB protocols
 - Switch is handling 420G of data simultaneously



Module Form Factors

- CFP
 - First generation 100G form factor
- QSFP
 - Smallest 40G form factor built off of SFP+
 - Used with optics and direct-attach copper (DAC)
- SFP+
 - Smallest 10G pluggable form factor
 - Supporting 10GBASE-SR, -LR and DAC



“Ask the Experts” Booth #2108

Want to have all of your most pressing Ethernet related questions answered at one time?

- Participation from server, switch, storage, test equipment, and cabling / interconnect community
- Focus on a variety of Data Center & High Speed Ethernet related topics



Where to Find the Ethernet Alliance

- @ OFC/NFOEC 2011: Booth #2108 & 1253
- Twitter: EthernetAllianc
- Linked In: Ethernet Alliance
- Facebook: Ethernet Alliance
- URL: www.ethernetalliance.org



Thank you



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