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

ethernet alliance

# Outline

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

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

ethernet alliance

# Bringing Ethernet Standards to Life

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

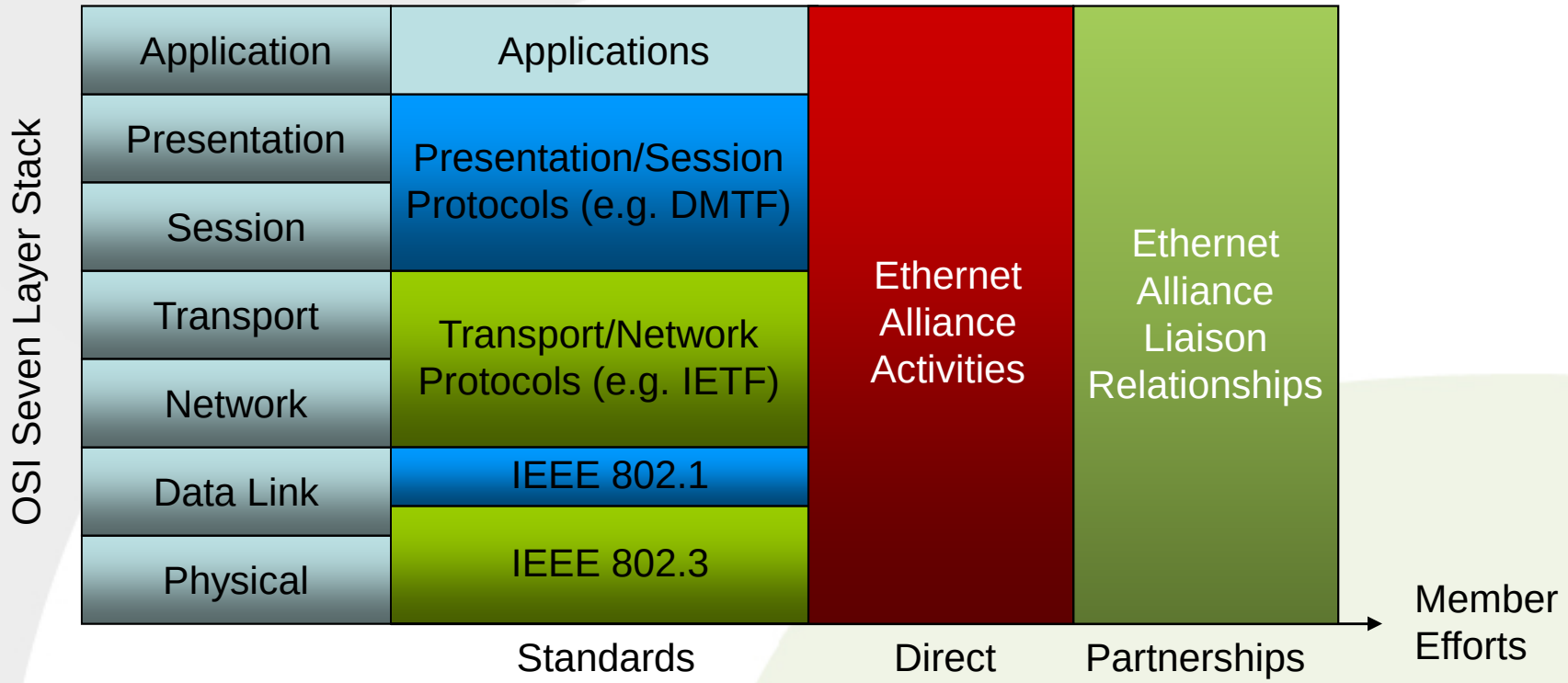
- Incubation
- Standards development support
- Education
- Interoperability testing
- Public demonstrations

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

# Ethernet Alliance in the Industry




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

ethernet alliance

# 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 alliance

# 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


ethernet alliance

# 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+

ethernet alliance

# Simplify IT Decision Making

Ease customers' purchasing decisions

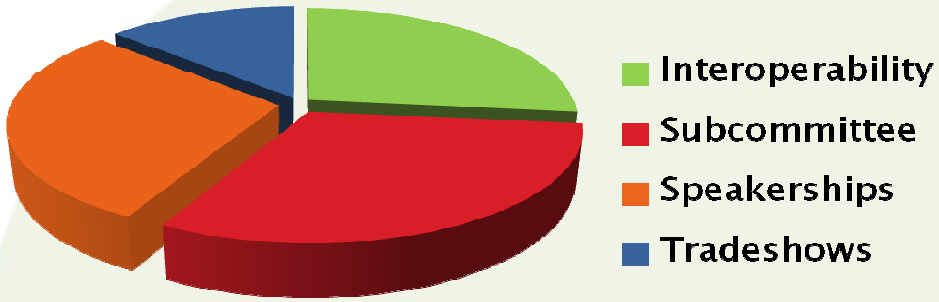
by interoperability and demonstrating market readiness:

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

ethernet alliance

# 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




ethernet alliance

# 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

ethernet alliance

# 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.

ethernet alliance

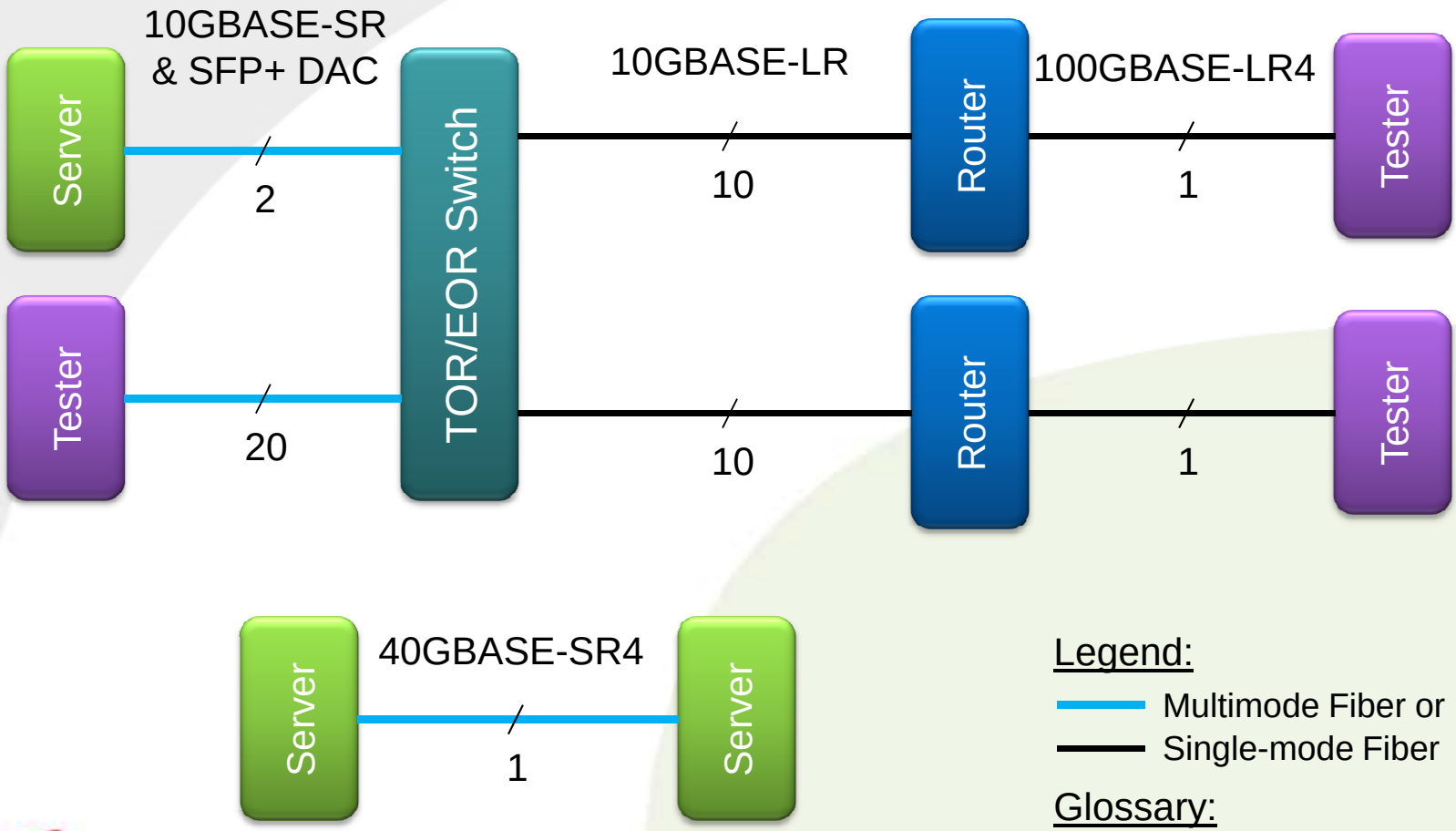

# OFC/NFOEC 2011 News
# Booth #2108 & 1253

ethernet alliance

# Demonstration

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

# 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

ethernet alliance

# Member Participants













ethernet alliance

# 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

# 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

ethernet alliance

# Technologies Displayed

ethernet alliance

# 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

ethernet alliance

# 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

ethernet alliance

# Thank you

ethernet alliance