Ethernet Alliance
Technology Exploration Forum 2014
"The Rate Debate"

Flexible Ethernet Rates for Router to Transport

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Abstract

For more than a decade, Ethernet and optical transport has converged around a common set of rates (10G, 40G, 100G) which have facilitated interconnection of Ethernet over transport networks and advantages of common components for various applications. Evolving beyond these rates, modern optical networking gear based on complex, polarization multiplexed modulation formats with intradyne, coherent receivers tend to be DSP-based implementations which can often be programmed to support a variety of different modulation formats where the complexity of the constellation (number of bits per symbol) and the symbol rate can be selected based on the reach required for a particular link. There has been considerable discussion about how to provide efficient Ethernet-based router to transport interconnection in this more flexible optical networking environment.

This panel brings together a group of distinguished experts representing cloud-scale data center operators, router manufacturers, optical networking equipment manufacturers, and component vendors. The panel will explore the merits of using flexible rates of Ethernet for router to transport interconnection, including configurations, use cases, and the implications for routers and transport gear.

PANELISTS

Dr. Vijay Vusirikala (Google) is currently an Optical Network Architect at Google where is focused on solutions for cost-effective network scaling. Prior to Google, Vijay was at Infinera, Motorola and Sycamore Networks in senior marketing, business development and architecture roles working on optical networks and systems ranging from backbone core to access networks. Vijay has published extensively, spoken at numerous industry events, and holds several patents in optical devices and systems. He obtained a Ph.D from the University of Maryland, College Park in optics and a BSEE from IIT, Madras in India.

Dr. Stephen Trowbridge (Alcatel-Lucent) joined Bell Laboratories over 30 years ago and has been involved in standards since 1995 in the areas of optical networking and high speed Ethernet. He is currently Chairman of ITU-T Study Group 15 which is responsible for Networks, Technologies and Infrastructures for Transport, Access and Home. He was a member of the IEEE 802.3ba editorial team during the development of 40 Gb/s and 100 Gb/s Ethernet and a key contributor to other Ethernet projects. He works in the IP Transport business unit of Alcatel-Lucent. He received his Ph.D. from the University of Colorado at Boulder.

PANELISTS - CONTINUED

Dr. David Ofelt (Juniper) is a Senior Distinguished Engineer in the Juniper silicon team. For the past 14 years, he has been part of the group that defines the systems and ASICs for many of Juniper's core, edge, and datacenter products. He is responsible for the logical definition of all Juniper's chip-to-chip links. In IEEE, he has been active in the 40G, 100G, and 400G projects. Before Juniper, he worked at Stanford University, Silicon Graphics, and Transmeta. Dave has a Ph.D. in Electrical Engineering from Stanford University and did his undergraduate work at the University of Minnesota.

Mark Gustlin (Xilinx) is a principal system architect at Xilinx working with customers on system architecture and design, and working with the Xilinx silicon team on next generation products and IP. Previously he spent 15 years at Cisco Systems architecting and designing high end routers. He is an active participant in the IEEE, one of the inventors of the 40/100GbE PCS, and was one of the editors of the 802.3ba standard. He is currently involved in the IEEE 802.bs task force and working on next generation 400GbE interfaces. Mark holds a B.S.E.E. in Electrical Engineering from San Jose State University.

Outline

- Flex Ethernet Use Cases (Vijay)
- Flexible Interfaces in Transport Networks (Steve)
- Flex Ethernet – A Systems View(Dave)
- Flex Ethernet – Protocols and Components (Mark)
- Q&A and Discussion