



# 10 Gigabit Ethernet Technology & Standards Update

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# 10 GE Market Drivers

- Research institutions: Hungry for bandwidth for supercomputing
- ISP, ASP & Telco: LAN & WAN
- B2B & remote offices: voice, video & data
- Investment protection



# Feature Objectives

- 10 Gbps, full-duplex only
- Preserves Ethernet frame & format
- 100 m MMF, 2, 10, & 40 km SMF
- Copper not defined yet. Cat. 6 proposed
- LAN & WAN
- Rate adaptation of 10 Gbps WAN to 9.584640 Gbps OC-192 SONET/telco
- Supports Link Aggregation/Trunking



# 10 GbE/GbE Differences

- Speed: 10 Gbps
- PHY: LAN, MAN & WAN
- Medium: Fiber only. Beyond limits of installed Cat. 5
- Full Duplex: No auto-negotiation



# 10 GbE/GbE Similarities

- Same Ethernet frames & protocol
- No change above MAC
- Same management architecture
- Compatibility with familiar tools
- Low total cost of ownership



# LAN/WAN Applications

- MAC standard to allow vendors to add logic for 9.584640 Gbps OC-192 SONET WAN
- Ethernet over Telco infrastructure
- Application scenario: campus LAN traffic to fiber to Telco CO Repeater into SONET frame
- 10 GE may need frame wrapper for management
- Cost savings ACT 010306



# 10 Gigabit Ethernet Alliance

- Founded on February, 2000
- Founding members: Sun, 3Com, Cisco, Extreme, Intel, Nortel & Worldwide Packets
- Goals:
  - Contributes to IEEE 802.3ae standard effort
  - Promotes 10 GE standard awareness
  - Creates guidelines for product compatibility & interoperability



# IEEE 802.3ae

- IEEE 802 plenary meeting in Kauai approved Project Authorization Request (PAR) on November, 1999
- Formed 802.3ae Task Force for 10 GE
- Objectives to preserve Ethernet frame format & size
- Technology demo prior to standard approval





# IEEE 802.3ae Timeline

- 11/99: Project Authorization Request (PAR) approved
- 1/00 802.3ae Task Force formed
- 10/00: 1st draft spec ready
- 12/01: Final draft spec
- 3/02: Standard approved



# 10 Gigabit Ethernet Alliance

- Technical committee to address standard issues & interoperability demo
- Marketing activities at N+I
- Membership info
  - [www.10gea.org](http://www.10gea.org)
  - Email: [10GEA @expomarketing.com](mailto:10GEA@expomarketing.com)
  - Phone: (949)250-7155



# Sun 10 Gigabit Ethernet Development

- Leads IEEE 802.3ae standards formation
- Promotes 10 GbE by co-founding 10 Gigabit Ethernet Alliance
- High-performance servers for 10 GbE
- 10 GbE ASIC development
- 10 GbE NICS & systems



# Interim Solution

- Sun Trunking software available now
- Aggregates 2 GbE links or 8 FE links
- IEEE 802.3ad Link Aggregation standard ratified on March, 2000



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