40 Gb/s Ethernet
5 Criteria Responses

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Supporters

- Schelto Van Doorn – Intel
- Ilango Ganga – Intel
- Shimon Muller – Sun
- Andy Bechtolsheim – Sun
- Osamu Ishida – NTT
- Shoukei Kobayashi – NTT
- Paul Kolesar – CommScope
- Bruce Tolley – Solarflare
- David Martin – Nortel
- Brad Turner – Juniper Networks
- George Oulundsen – OFS
- Robert Lingle, Jr. – OFS
- Ali Ghiasi – Broadcom
- Petar Pepeljugoski – IBM

Outline

- Broad Market Potential
- Compatibility
- Distinct Identity
- Technical Feasibility
- Economic Feasibility
- Summary

Broad Market Potential

a) Broad sets of applicability
b) Multiple vendors and numerous users
c) Balanced costs (LAN versus attached stations)

Servers, high performance computing clusters, blade servers, storage attached networks and network attached storage all currently make use of 1G and 10G Ethernet, with significant growth of 10G projected in ’07 and ’08. Server I/O bandwidth projections indicate that there will be a significant market potential for a 40 Gb/s Ethernet interface.

Multiple component and system vendors have expressed the need for a 40 Gb/s Ethernet standard that addresses user requirements.

40 Gb/s Ethernet will provide approximately the same cost balance between the LAN and the attached stations as 10 Gb/s Ethernet.

Compatibility

IEEE 802 defines a family of standards. All standards shall be in conformance with the IEEE 802.1 Architecture, Management, and Interworking documents as follows: 802. Overview and Architecture, 802.1D, 802.1Q, and parts of 802.1f. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with 802.
Each standard in the IEEE 802 family of standards shall include a definition of managed objects that are compatible with systems management standards.

Conformance with upper layer standards will be achieved via reuse of the existing IEEE Std 802.3 MAC service interface.

Managed object definitions will be amended or added in a manner consistent with IEEE Std 802.3.

Distinct Identity

a) Substantially different from other IEEE 802 standards
b) One unique solution per problem (not two solutions to a problem)
c) Easy for the document reader to select the relevant specification

There is no IEEE 802 standard for data transmission at 40 Gb/s.

A standard for the transfer of Ethernet packets at a rate of 40 Gb/s will provide a valuable solution for a range of applications that may otherwise not be properly served.

The proposed amendment will be formatted as a distinct set of clauses within IEEE Std 802.3, and will be identified as the specification for 40 Gb/s transfer of Ethernet packets.

Technical Feasibility

a) Demonstrated system feasibility
b) Proven technology, reasonable testing
c) Confidence in reliability

Systems with an aggregate bandwidth of greater than or equal to 40 Gb/s have been demonstrated and deployed in operational networks.

The experience gained in the development and deployment of 10 Gb/s Physical Layer components is applicable to the development of specifications for 40 Gb/s Physical Layer components. For example, parallel transmission techniques allow reuse of 10 Gb/s components and testing methods.

The reliability of 40 Gb/s Ethernet links can be extrapolated from the reliability of 10 Gb/s Ethernet links.

Economic Feasibility

a) Known cost factors, reliable data
b) Reasonable cost for performance
c) Consideration of installation costs

The cost factors for 40 Gb/s Ethernet can be reliably projected from 10 Gb/s Ethernet.

The proposed standard will provide a better cost/performance ratio than alternative solutions at the same data transfer rate.

Installation costs for 40 Gb/s can be extrapolated from 10 Gb/s Ethernet and are not expected to be a barrier to adoption.

Summary

- There is clearly a need for a 40 Gb/s standard.
- 40 Gb/s Ethernet will make extensive reference to the existing standard for 10 Gb/s Ethernet.
- 40 Gb/s Ethernet meets all of the 5 Criteria.