EEE for P802.3bm

Objective Proposal

IEEE 40 Gb/s and 100 Gb/s Operation Over Fiber Optic Cables Task Force

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Topics

- Previous straw polls

- What we are signing up for

- Objective proposal

- Changes to the project documentation

Previous straw polls

- ## Next Gen Optics Study Group Minneapolis
  - Do you support the consideration of EEE in this project? Y:56, N:3, A:10

- ## P802.3bj Copper Task Force San Diego
  - Motion #4 to modify the Scope of the P802.3bj project to include EEE support for 40 Gb/s and 100 Gb/s operation over backplanes and copper cables – Y:38, N:3, A:9

  - Motion #5 to include EEE support for 40GBASE-CR4/KR4 and 100GBASE-CR10 as part of 802.3bj objectives – Y:38, N:3, A:4

What we are signing up for

- ## Leverage Fast Wake from P802.3bj
  - No PMD shutdown

- ## Use LLDP for link-partner communications
  - Capability exchange
  - System savings
  - No Auto Negotiation

- ## Apply to both new and existing 40G and 100G PMDs
  - Need to change the scope of the project to cover old PMDs (as per P802.3bj)

Objective Proposal

Proposed text for objective:

Specify optional Energy Efficient Ethernet (EEE) for 40 Gb/s and 100Gb/s operation over fiber optic cables.

Proposed project scope change

5.2.b. Scope of the project: This project is to specify additions to and appropriate modifications of IEEE Std 802.3 to add 100 Gb/s Physical Layer (PHY) specifications and management parameters, using a four-lane electrical interface for operation on multimode and single-mode fiber optic cables, and to specify optional Energy Efficient Ethernet (EEE) for 40 Gb/s and 100Gb/s operation over fiber optic cables. In addition, to add 40 Gb/s Physical Layer (PHY) specifications and management parameters for operation on extended reach (> 10 km) single-mode fiber optic cables.

Broad Market Potential

A standards project authorized by IEEE 802 LMSC shall have a broad market potential. Specifically, it shall have the potential for:

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

1. Optical Ethernet interfaces have been widely deployed. Examples include Data Centers, Enterprise and Telecom Network Equipment for edge, distribution and core connections.
2. Internet, cloud, and higher performance computing applications, along with advances in processors, server virtualization and converged networking, are driving the need for increasing numbers of high throughput LAN connections. As the market for 100 Gb/s LAN connections grows, lower cost, higher density, and lower power alternatives become necessary.
3. There has been wide attendance and participation (avg 108 persons, 71 companies) in the study group by equipment manufacturers, component suppliers and other stakeholders. It is anticipated that there will be sufficient participation to effectively complete the standardization process.
4. 100 Gb/s Ethernet optical PHY types utilizing a 4 x 25 Gb/s electrical interface, and optimized MMF interfaces will reduce cost, size and power for links in the growing Data Center market and provide a balance in cost between network equipment and attached stations.
5. 100 Gb/s Ethernet optical PHY types utilizing a 4 x 25 Gb/s electrical interface, and optimized SMF interfaces will reduce cost, size and power for links in the growing Data Center market and provide a balance in cost between network equipment and attached stations.
6. 40 Gb/s Ethernet has been deployed beyond its originally envisioned application space of server interconnect. Extending the reach of 40 Gb/s Ethernet will allow Ethernet to continue to address markets (such as telecom) as 10 Gb/s links are upgraded to 40 Gb/s.
7. Energy Efficient Ethernet will reduce the operational costs and the environmental footprint of Ethernet Systems.

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Compatibility

- **IEEE 802 LMSC defines a family of standards. All standards should be in conformance : IEEE Std 802, IEEE 802.1D, and IEEE 802.1Q. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with IEEE 802.1 Working Group. In order to demonstrate compatibility with this criterion, the Five Criteria statement must answer the following questions. Each standard in the IEEE 802 family of standards shall include a definition of managed objects that are compatible with systems management standards.**
  - a) **Does the PAR mandate that the standard shall comply with IEEE Std 802, IEEE Std 802.1D and IEEE Std 802.1Q?**
  - b) **If not, how will the Working Group ensure that the resulting draft standard is compliant, or if not, receives appropriate review from the IEEE 802.1 Working Group**
- **Compatibility with IEEE Std 802.3**
- **Conformance with the IEEE Std 802.3 MAC**
- **Managed object definitions compatible with SNMP**

1. As an amendment to IEEE Std 802.3 (as amended by IEEE Std 802.3ba-2010) the proposed project will remain in conformance with the IEEE 802 Overview and Architecture, the bridging standards IEEE Std 802.1D and IEEE Std 802.1Q

2. The proposed amendment will conform to the full-duplex operating mode of the IEEE 802.3 MAC.

3. The proposed amendment will conform to the 40 Gb/s and 100 Gb/s Media Independent Interfaces (XLGMII and CGMII) specified by IEEE Std 802.3 <u>with optional additions for Energy Efficient Ethernet</u>.

4. The proposed amendment will follow the existing format and structure of IEEE 802.3 management definitions by providing a protocol-independent specification of managed objects.

5. SNMP management capability to be provided in the future by an amendment to or revision of IEEE Std 802.3.1.

6. The PAR mandates the resulting standard will comply with IEEE Std 802, IEEE Std 802.1D, and IEEE Std 802.1Q.

Distinct Identity (2 of 2)

Each IEEE 802 LMSC standard shall have a distinct identity. To achieve this, each authorized project shall be:

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.**
d) **Substantially different from other IEEE 802.3 specifications/solutions.**

5. The amendment will define one or two PMD types over MMF depending on whether one PMD type with short reach and a second with longer reach have sufficient cost, density, or power difference to justify two PMD types.

6. The amendment will enable new PHY types over SMF which consist of the existing 100GBASE-LR4 and 100GBASE-ER4 optical PMDs with four electrical interconnect lanes in each direction. The amendment will define a new 100 Gb/s SMF PMD in addition to these if it can be shown that a SMF PMD with a shorter reach than 100GBASE-LR4 has sufficient cost, density, or power difference to justify an additional SMF PMD type.

7. The proposed amendment to the existing IEEE 802.3 standard will be formatted as a collection of new clauses and amendments of existing clauses as appropriate, making it easy for the reader to select the relevant specification.

8. IEEE Std 802.3 does not define Energy Efficient Ethernet for 40 Gb/s or 100 Gb/s operation

Questions?

References

[bennett_01_0312_NG100GOPTX.pdf](#)

[bennett_01a_0712_optx.pdf](#)

[diab_01_0712_optx.pdf](#)

Thank You!