802.3 Closing Report

IEEE 802.3

Next Generation

40 Gb/s and 100 Gb/s Optical Ethernet Study Group

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Overview

- November Plenary Meeting highlights
  - 88 People signed the attendance sheet
  - 34 Presentations from various contributors
  - 2½ days of meetings
- Baseline Proposals
  - A single baseline proposal for CAUI-4 chip to module was adopted
- Objectives
  - A new objective to add optional support for EEE was adopted
- Working Documents
  - A modification to our PAR was approved to address optional EEE support
  - A modification to our 5 Criteria document was approved to address optional EEE support
  - An Informal Communication to OIF was approved to address CEI-VSR-28G and CEI-28G-MR
    http://www.ieee802.org/3/bm/public/nov12/IC_802_3bm_oif_1112.pdf
- Motions & Straw Polls
  - 7 Motions and 5 Straw Polls were held

New Objective

What we (802.3bm) are signing up for [1]

- Leverage Fast Wake from P802.3bj
  - No PMD shutdown
- Use a LLDP based mechanism for EEE "Capability Exchange"
  - No Clause 74 Auto Negotiation
- Apply to new and existing 40G and 100G optical PMDs
  - Need to change the scope of the project to cover old PMDs (as per P803.3bj)
- Resolve OTN interoperability issue

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[1] updated slide from bennett_01_0912_optx.pdf

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

Working Documents

Working Documents (1)

- The P802.3bm Task Force modified our PAR and 5C documents to address the proposed change to our objectives.

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.

Working Documents (2)

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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Working Documents (3)

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 with optional additions for Energy Efficient Ethernet.
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.

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Working Documents (4)

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

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Task Force Motions & Polls

TF Straw Poll # 1

- I support adopting the proposal in slides 3 to 11 of latchman_02_1112_optx as the baseline for "a re-timed 4-lane 100G PMA to PMA electrical interface for chip to module applications"

- Yes: 24
- No: 15
- Abstain: 28

TF Straw Poll # 2

- I support adopting the proposal in slides 3 to 11 of latchman_02_1112_optx *with the modification of TBD for all jitter and eye height specifications* as the baseline for “a re-timed 4-lane 100G PMA to PMA electrical interface for chip to module applications”

- Yes: 34
- No: 4
- Abstain: 25

TF Motion # 1

- Move to adopt the proposal in slides 3 to 11 of latchman_02_1112_optx with the modification of TBD for jitter, eye height and BER specifications as the baseline for “a re-timed 4-lane 100G PMA to PMA electrical interface for chip to module applications”
- Mover: Tom Palkert Seconded: Chris Cole
- Technical ≥ 75%
- Yes:45 No:1 Abstain:21
- Passes

TF Motion # 2

- Adopt the following objective:

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

- Mover: Gary Nicholl Seconded: Mike Bennett
- Technical ≥ 75%
- Yes: 47 No: 0 Abstain: 9
- Passes

TF Motion # 3: Motion to amend TF Motion # 2

- Adopt the following objective:

  Specify optional Energy Efficient Ethernet (EEE) for 40 Gb/s and 100 Gb/s operation over fiber optic cables without disabling the optical transmitter.

- Mover: John Petrilla Seconded: Jonathan King
- Technical ≥ 75%
- Yes: 7 No: 41 Abstain: 27
- Fails

TF Motion # 4

- Move to approve changes to the 5 Criteria responses as noted on page 8 (Broad Market Potential), page 9 (Compatibility), and page 10 (Distinct Identity) of bennett_01_0912_optx.pdf

- Mover: Mike Bennett Seconded: Jeff Maki
- Technical ≥ 75%
- Yes: 46 No: 0 Abstain: 9
- Passes

TF Motion # 5

- Move to approve the change to the project scope as shown on page 7 of bennett_01_0912_optx.pdf

- Mover: Mike Bennett Seconded: Pete Anslow
- Technical ≥ 75%
- Yes: 48 No: 0 Abstain: 5
- Passes

TF Motion # 6

- Move that the Task Force: Submit the amended project documentation to the 802.3 Working Group for approval. Request that the 802.3 Working Group chair submit the amended PAR and 5 criteria responses to the 802 Executive Committee for consideration at the March 2013 Plenary Session.

- Mover: Dan Dove Seconded: Pete Anslow
- Technical ≥ 75%
- Yes: 56 No: 0 Abstain: 2
- Passes

TF Motion # 7

- Move that the Task Force: Approve the Informal Communication (IC_802_3bm_oif_1112) for submission to OIF
- Mover: Dan Dove Seconded: Steve Trowbridge
- Procedural > 50%

- Passes by voice without opposition

TF Straw Poll # 3

- I would NOT support a baseline proposal for a SMF PMD based on:
  a) CWDM
  b) C-BAND
  c) DMT
  d) PSM4
  e) PAMn
  f) Would not rule any of the above out

  Chicago Rules

  a:28 b:30 c:17 d:26 e:21 f:12

  Room count : 89

TF Straw Poll # 4

- I would support a baseline proposal for a SMF PMD based on:
  a) CWDM
  b) C-BAND
  c) DMT
  d) PSM4
  e) PAMn
  f) none of the above - rely on LR4 with CAUI-4.

  Chicago Rules

  a:2 b:10 c:16 d:14 e:21 f:25

TF Straw Poll # 5

- I would **only** support a baseline proposal for a SMF PMD based on:
  a) CWDM
  b) C-BAND
  c) DMT
  d) PSM4
  e) PAMn
  f) none of the above - rely on LR4 with CAUI-4.

a:0 b:1 c:6 d:14 e:14 f:23

Working Group Motions

802.3 WG Motion # 1

- Move that 802.3 approve the new objective to IEEE P802.3bm Task Force objectives, as per 1112_bm_close_report.pdf
  - Specify optional Energy Efficient Ethernet (EEE) for 40 Gb/s and 100 Gb/s operation over fiber optic cables.

- Mover: Dan Dove Seconded: Brad Booth
- Technical ≥ 75% / Procedural > 50%
- Yes: No: Abstain:

802.3 WG Motion # 2

- Approve the changes to IEEE P802.3bm PAR and 5C responses as per 1112_bm_close_report.pdf
- The 802.3 Working Group chair presubmit the amended PAR and 5 criteria responses to the 802 Executive Committee for consideration at the March 2013 Plenary Session, subject to final approval by the Working Group.

- Mover: Dan Dove Seconded: Pete Anslow
- Technical ≥ 75% / Procedural > 50%
- Yes: No: Abstain: