IEEE 802.3 Working Group
March 2019 Plenary Week

David Law
Chair, IEEE 802.3 Working Group
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Web site: www.ieee802.org/3
Current IEEE 802.3 activities

IEEE 802.3 Task Forces
- IEEE P802.3ca 25 Gb/s, and 50 Gb/s EPON
- IEEE P802.3.2 (IEEE 802.3cf) YANG Data Model
- IEEE P802.3cg 10 Mb/s Single Pair Ethernet
- IEEE P802.3ch Multi-Gig Automotive Ethernet PHY
- IEEE P802.3ck 100 Gb/s, 200 Gb/s, and 400 Gb/s Electrical Interfaces
- IEEE P802.3cm 400 Gb/s over Multimode Fiber
- IEEE P802.3cn 50 Gb/s, 200 Gb/s, and 400 Gb/s over greater than 10 km of SMF
- IEEE P802.3cp Bidirectional 10 Gb/s, 25 Gb/s and 50 Gb/s Optical Access PHYs
- IEEE P802.3cq Power over Ethernet over 2 Pairs (Maintenance #13) Task Force
- IEEE P802.3cr Isolation (Maintenance #14) Task Force
- IEEE P802.3cs Increased-reach Ethernet optical subscriber access (Super-PON)
- IEEE P802.3ct 100 Gb/s and 400 Gb/s over DWDM systems

IEEE 802.3 Study Group
- IEEE 802.3 100 Gb/s per lane optical PHYs

IEEE 802.3 Call for Interest
- IEEE 802.3 Automotive Ethernet beyond 10 Gb/s Electrical PHYs call for interest

IEEE 802.3 Industry Connection activity
- IEEE 802.3 New Ethernet Applications Ad Hoc
IEEE 802.3 Maintenance

Meeting plan

- Consider new maintenance requests
- Review status of outstanding maintenance requests
- ISO/IEC JTC1 SC6 adoptions under PSDO agreement
  - Submission of IEEE 802.3 drafts for review
  - Submission of IEEE 802.3 standards for adoption
  - Respond to any comments on adoption of IEEE 802.3 standards
  - Consider any other maintenance business

Web page

IEEE P802.3ca 25 Gb/s and 50 Gb/s Passive Optical Networks Task Force

Description

The scope of this project is to amend IEEE Std 802.3 to add physical layer specifications and management parameters for point-to-multipoint passive optical networks supporting MAC data rates of 25 Gb/s or 50 Gb/s in the downstream direction and 10 Gb/s, 25 Gb/s, or 50 Gb/s in the upstream direction, with distance and split ratios consistent with those defined in IEEE Std 802.3. It also extends the operation of Ethernet Passive Optical Networks (EPON) protocols, such as MultiPoint Control Protocol (MPCP) and Operation Administration and Management (OAM)


Status

Last met during the January 2019 interim meeting series
Draft D1.5 sent out for 6th Task Force review

Meeting plan

Consideration of comments received against draft D1.5
Continue work towards technically complete draft for working group ballot
IEEE P802.3.2 (IEEE 802.3cf) YANG Data Model Definitions Task Force

Description
Define YANG data models for IEEE Std 802.3 Ethernet

Status
Last met during the January 2019 interim meeting series
Draft D3.2 sent out for 2nd Standards Association recirculation ballot
   No comments received
Draft D3.2 pre-submitted to March 2019 RevCom agenda

Meeting plan
Obtain necessary approvals for submittal to remain on March 2019 RevCom agenda
IEEE P802.3cg 10 Mb/s Single Pair Ethernet Task Force

Description
Specify additions to and appropriate modifications of IEEE Std 802.3 to add 10 Mb/s Physical Layer (PHY) specifications and management parameters for operation, and associated optional provision of power, using a single balanced pair of conductors

Status
Last met during a February 2019 Task Force interim
Draft D2.4 sent out for 4th Working Group recirculation ballot

Meeting plan
Consideration of comments received against draft D2.4
Prepare for request to proceed to Standards Association ballot
IEEE P802.3ch Multi-Gig Automotive Ethernet Task Force

Description
Specify additions to and appropriate modifications of IEEE Std 802.3 to add greater than 1 Gb/s Physical Layer (PHY) specifications and management parameters for media and operating conditions for applications in the automotive environment

Status
Last met during the January 2019 interim meeting series
Draft D1.1 sent out for 2nd Task Force review

Meeting plan
Consideration of comments received against draft D1.1
Continue work towards technically complete draft for working group ballot
IEEE P802.3ck 100 Gb/s, 200 Gb/s, and 400 Gb/s Electrical Interfaces Task Force

Description
This project is to specify additions to and appropriate modifications of IEEE Std 802.3 to add Physical Layer specifications and Management Parameters for 100 Gb/s, 200 Gb/s, and 400 Gb/s electrical interfaces based on 100 Gb/s signaling

Status
Last met during the January 2019 interim meeting series
Selecting set of baseline proposals to satisfy project objectives

Meeting plan
Continue to work on selection of a set of baseline proposals
IEEE P802.3cm 400 Gb/s over Multimode Fiber Task Force

Description
Define Physical Layer specifications (PHY) and management parameters for the transfer of Ethernet format frames at 400 Gb/s over fewer than 16 pairs of multimode fiber physical media
Web site: <http://ieee802.org/3/cm/index.html>

Status
Last met during the January 2019 interim meeting series
Draft D1.2 sent out for 3rd Task Force review
Draft D1.2 also submitted for Working Group preview

Meeting plan
Consideration of comments received against draft D1.2
Continue work towards technically complete draft for working group ballot
IEEE P802.3cn 50Gb/s, 200Gb/s, and 400Gb/s over greater than 10 km of SMF Task Force

Description
Define physical layer specifications and management parameters for the transfer of Ethernet format frames at 50 Gb/s, 200 Gb/s, and 400 Gb/s at reaches greater than 10 km over single-mode fiber. Make TDECQ (Transmitter and dispersion eye closure for PAM4) related changes to existing 200 Gb/s and 400 Gb/s physical medium dependent sublayers over single-mode fiber.

Status
Last met during the January 2019 interim meeting series
Draft D1.0 sent out for 1st Task Force review
Draft D1.0 also submitted for Working Group preview
IEEE P802.3cn PAR modification request approved 8th February 2019
Former 100Gb/s and 400 Gb/s Operation over DWDM Systems portion of the project has been removed from the IEEE P802.3cn PAR and placed in the new IEEE P802.3ct amendment PAR

Meeting plan
Consideration of comments received against draft D1.0
Prepare for request to proceed to Working Group ballot
IEEE P802.3cp Bidirectional 10 Gb/s, 25 Gb/s, and 50 Gb/s Optical Access PHYs Task Force

Description

Define physical layer specifications and management parameters for symmetric bidirectional 10 Gb/s, 25 Gb/s, and 50 Gb/s operation over single strand of single mode fiber of at least 10 km


Status

IEEE P802.3cp PAR approved by IEEE-SA Standards Board
  Approval date 5th December 2018
  First meeting during the January 2019 interim meeting series
  Selecting set of baseline proposals to satisfy project objectives

Meeting plan

Continue to work on selection of a set of baseline proposals
IEEE P802.3cq Power over Ethernet over 2 Pairs (Maintenance #13) Task Force

Description
This project will implement editorial and technical corrections, refinements, and clarifications to Clause 33, Power over Ethernet over 2 pairs, and related portions of the standard. No new features will be added by this project.


Status
Last meeting during the November 2018 interim meeting series
Draft D1.1 sent out for 2nd Task Force review
Draft D1.1 also submitted for Working Group preview

Meeting plan
Consideration of comments received against draft D1.1
Continue work towards technically complete draft for working group ballot
IEEE P802.3cr Isolation
(Maintenance #14) Task Force

Description
Replace references to the IEC 60950 series of standards (including IEC 60950-1 "Information technology equipment - Safety - Part 1: General requirements") with appropriate references to the IEC 62368 "Audio/video, information and communication technology equipment" series and make appropriate changes to the standard corresponding to the new references

Status
Last met during the January 2019 interim meeting series
Selecting set of baseline proposals to satisfy project objectives

Meeting plan
Continue to work on selection of a set of baseline proposals
IEEE P802.3cs Increased-reach Ethernet optical subscriber access (Super-PON) Task Force

Description
Define physical layer specifications and management parameters for optical subscriber access supporting point-to-multipoint operations using wavelength division multiplexing over an increased-reach (up to at least 50 km) passive optical network (PON)

Status
IEEE P802.3cs PAR approved by IEEE-SA Standards Board
Approval date 5th December 2018
First meeting during the January 2019 interim meeting series
Selecting set of baseline proposals to satisfy project objectives

Meeting plan
Continue to work on selection of a set of baseline proposals
IEEE P802.3ct 100Gb/s and 400Gb/s over DWDM systems Task Force

Description

Define physical layer specifications and management parameters for the transfer of Ethernet format frames at 100 Gb/s and 400 Gb/s at reaches greater than 10 km over DWDM systems


Status

IEEE P802.3ct PAR approved by IEEE-SA Standards Board

  Approval date 8th February 2019

Former 100 Gb/s and 400 Gb/s Operation over DWDM Systems portion of IEEE P802.3cn project has been removed from the IEEE P802.3cn PAR and placed in the IEEE P802.3ct amendment PAR

Meeting plan

Consider baselines selected in IEEE P802.3cn for 100 Gb/s and 400 Gb/s over DWDM Systems

Continue to work on selection of a set of baseline proposals
IEEE 802.3 100 Gb/s per lane optical PHYs Study Group

Description
Develop a Project Authorization Request (PAR) and Criteria for Standards Development (CSD) responses for "100 Gb/s per lane optical PHYs for 2 km and 10 km for 100 Gb/s Ethernet and 400 Gb/s Ethernet.


Status
Met during the January 2019 interim meeting series
Completed draft objectives, CSD and PAR for proposed project

Meeting plan
Progress approval of objectives, CSD and NesCom submittal of PAR for IEEE P802.3cu Standard for Ethernet Amendment: Physical Layers and Management Parameters for 100 Gb/s and 400 Gb/s Operation over Single-Mode Fiber
IEEE 802.3 Automotive Ethernet
beyond 10 Gb/s Electrical PHYs Call for Interest

Ethernet data rates in automobiles are being driven by the push to fully-autonomous operation. 100BASE-T1 and 1000BASE-T1 are already in vehicles, and 2.5 Gb/s, 5 Gb/s and 10 Gb/s links (IEEE P802.3ch) are being designed in for model year 2023. With the move from domain-based architecture to zonal-based architecture, 10G+ links (typically redundant) between the electronic control units (ECU) will be required. Latest generation sensors (cameras, lidar, etc.) may transmit uncompressed data at rates greater than 10 Gb/s. "Black-box" data recorders also require 10G+ to handle the greater than 4 TB of data produced per day in autonomous cars. Test vehicles are under development using standard 25 Gb/s and 50Gb/s Ethernet, and will require an automotive Ethernet version for production. In order to meet the design cycles of the auto industry, the time to start this effort is now.

This request for agenda time for this CFI has been received from Steve Carlson <scarlson@hspdesign.com>
IEEE 802.3 New Ethernet Applications (NEA) Ad Hoc

Description

The goal of this activity is to assess requirements for new Ethernet-based applications, identify gaps not currently addressed by IEEE 802.3 standards, and facilitate building industry consensus towards proposals to initiate new standards development efforts.


Status

Last met during the January 2019 interim meeting series

Meeting plan

Two sessions on Tuesday evening

- Automotive Optical Multigig

- Next steps in single-pair ecosystem - consideration of long reach with higher rate
IEEE 802.3 Officers

IEEE 802.3 Chair: David Law <dlaw@hpe.com>
IEEE 802.3 Vice Chair: Adam Healey <adam.healey@broadcom.com>
IEEE 802.3 Secretary: Pete Anslow <panslow@ciena.com>
IEEE 802.3 Executive Secretary: Steve Carlson <scarlson@ieee.org>
IEEE 802.3 Treasurer: Valerie Maguire <valerie_maguire@siemon.com>

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IEEE P802.3ch Multi-Gig Automotive Ethernet PHY: Steve Carlson <scarlson@ieee.org>
IEEE P802.3ck 100 Gb/s, 200 Gb/s, and 400 Gb/s Electrical Interfaces: Elizabeth Kochuparambil <edonnay@cisco.com>
IEEE P802.3cm 400 Gb/s over Multimode Fiber: Robert Lingle <rlingle@ofsoptics.com>
IEEE P802.3cn 50Gb/s, 200Gb/s, and 400Gb/s over greater than 10 km of SMF: John D'Ambrosia <jdambrosia@ieee.org>
IEEE P802.3cp Bidirectional 10 Gb/s, 25 Gb/s and 50 Gb/s Optical Access PHYs: Frank Effenberger <frank.effenberger@huawei.com>
IEEE P802.3cq Power over Ethernet over 2 Pairs (Maintenance #13) Task Force: Chad Jones <cmjones@cisco.com>
IEEE P802.3cr Isolation (Maintenance #14) Task Force: Jon Lewis <jon_lewis@dell.com>
IEEE P802.3cs Increased-reach Ethernet optical subscriber access (Super-PON): Claudio DeSanti <cdssdc@google.com>
IEEE P802.3ct 100Gb/s and 400Gb/s over DWDM systems (acting): John D’Ambrosia <jdambrosia@ieee.org>

IEEE 802.3 Study Group chairs
IEEE 802.3 100 Gb/s per lane optical PHYs: Mark Nowell <mnowell@cisco.com>
# Preliminary IEEE 802.3 Meeting Plan

Always check [on-line schedule](#) for latest updates

## AM

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<th>IEEE P802.3cr</th>
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<tr>
<td>9:00 AM</td>
<td>IEEE 802.3</td>
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<tr>
<td>9:30 AM</td>
<td>Opening</td>
<td>Plenary</td>
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<td>IEEE P802.3cg</td>
<td>IEEE P802.3ck</td>
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<td>12:30 PM</td>
<td>IEEE P802.3cn/3ct</td>
<td>IEEE P802.3cp</td>
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<td>1:00 PM</td>
<td>IEEE P802.3c</td>
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## PM

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<td>IEEE P802.3cg</td>
<td>IEEE P802.3cg</td>
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<td>IEEE P802.3ch</td>
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- **100G SG**: IEEE 802.3 100 Gb/s per lane optical PHYs Study Group

- **100 Gb/s**: IEEE 802.3 100 Gb/s per lane optical PHYs Study Group

- **100G SG**: IEEE 802.3 Industry Connections New Ethernet Applications Ad Hoc
## State of the standard

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<td>MAC Control Auto-Negotiation (AN) Management</td>
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<td>Subscriber Access Networks (SA) Overview OAM MPMC 100BASE-LX10 100BASE-BX10 1000BASE-LX10 1000BASE-BX10 1000BASE-PX10 1000BASE-PX20 1000BASE-PR 10/1GBASE-PRX 10PASS-TS 2BASE-TL SA Topology 10GBASE-LRM Backplane Overview 1000BASE-KX 100BASE-KX4 10GBASE-KR Backplane AN BASE-R FEC</td>
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* Dates are approved/published
State of the standard
Current amendments and other IEEE 802.3 standards

<table>
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<tr>
<th>IEEE Std 802.3-2018 amendments</th>
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<td><strong>IEEE Std 802.3cb-2018</strong>&lt;br&gt;Physical Layer Specifications and Management Parameters for 2.5 Gb/s and 5 Gb/s Operation over Backplane&lt;br&gt;27-Sep-18/04-Jan-19*</td>
<td><strong>IEEE Std 802.3.1-2013</strong>&lt;br&gt;IEEE Standard for Management Information Base (MIB)&lt;br&gt;Definitions for Ethernet&lt;br&gt;14-Jun-13/02-Aug-13*</td>
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<td><strong>IEEE Std 802.3bt-2018</strong>&lt;br&gt;Physical Layer and Management Parameters for Power over Ethernet over 4 pairs&lt;br&gt;27-Sep-18/31-Jan-18*</td>
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<td><strong>IEEE Std 802.3cd-2018</strong>&lt;br&gt;Media Access Control Parameters for 50 Gb/s and Physical Layers and Management Parameters for 50 Gb/s, 100 Gb/s, and 200 Gb/s Operation&lt;br&gt;Approved 5-Dec-18/15-Feb-19*</td>
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State of the standard
IEEE 802.3 current status overview

Call for interest
IEEE 802.3
Automotive Ethernet beyond 10 Gb/s
Electrical PHYs

Study Group
IEEE 802.3
100 Gb/s per lane optical PHYs Study Group
PAR submittal

IEEE P802.3cr
Isolation (Maintenance #14)
Baseline selection

IEEE P802.3cs
Increased-reach Ethernet optical subscriber access (Super-PON)
Baseline selection

IEEE P802.3ct
100 Gb/s and 400 Gb/s over DWDM systems
Task Force
Baseline selection

IEEE P802.3ck
100 Gb/s, 200 Gb/s, and 400 Gb/s Electrical Interfaces
Baseline selection

IEEE P802.3ch
Multi-Gig Automotive Ethernet
D1.1 Task Force review

IEEE P802.3cm
400 Gb/s over Multimode Fiber
D1.2 Task Force review

IEEE P802.3cn
50 Gb/s, 200 Gb/s, and 400 Gb/s over greater than 10 km of SMF
D1.0 Task Force review

IEEE P802.3cq
Power over Ethernet over 2 Pairs (Maintenance #13)
D1.1 Task Force review

IEEE P802.3ca
25 and 50 Gb/s Passive Optical Networks
D1.5 Task Force review

Task Force
IEEE P802.3cg
10 Mb/s Single Pair Ethernet
D2.4 Working Group ballot

IEEE P802.3.2
(IEEE 802.3cf)
YANG Data Model Definitions
D3.2 Standards Association ballot

Progress to standard