IEEE 802.3 Liaison Report (3Q2021)

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OFS

IEEE 802.3 Standards in force

- The current version in force is IEEE Std 802.3-2018 – Approved 14 June 2018, Published 31 August 2018
    - This incorporates 802.3bw, 802.3bp, 802.3bq, 8023br, 802.3by, 802.3bz, 802.3bn, 802.3bu, 802.3bv, 802.3bs, 802.3cc, and Corrigendum 1.
- IEEE Std 802.3bt-2018, Power over Ethernet over 4 Pairs, approved 27 September 2018, published 31 January 2019
- IEEE Std 802.3cb-2018, 2.5 Gb/s and 5 Gb/s Operation over Backplane, approved 27 September 2018, published 4 January 2019
- IEEE Std 802.3cd-2018, 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, approved 6 December 2018, published 15 February 2019
- IEEE Std 802.3cn-2019, Physical Layers and Management Parameters for 50 Gb/s, 200 Gb/s, and 400 Gb/s Operation over Single-Mode Fiber, approved 7 November 2019, published 20 December 2019
- IEEE Std 802.3cg-2019, Physical Layer Specifications and Management Parameters for 10 Mb/s Operation and Associated Power Delivery over a Single Balanced Pair of Conductors, approved 7 November 2019, published 5 February 2020
- IEEE Std 802.3cm-2020, Physical Layer and Management Parameters for 400 Gb/s over Multimode Fiber, approved 31 January 2020, published 30 March 2020
- IEEE Std 802.3cq-2020, Maintenance #13: Power over Ethernet 2 pairs, approved 30 January 2020, published 13 March 2020
- IEEE Std 802.3ch-2020, Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Automotive Electrical Ethernet, approved 4 June 2020, published 30 June 2020
- IEEE Std 802.3ca-2020, Physical Layer Specifications and Management Parameters for 25 Gb/s and 50 Gb/s Passive Optical Networks, approved 4 June 2020, published 3 July 2020
- IEEE Std 802.3cr-2021 Maintenance #14: Isolation, approved 9 February 2021, published 24 February 2021
- IEEE Std 802.3cu-2021, Physical Layers and Management Parameters for 100 Gb/s and 400 Gb/s Operation over Single-Mode Fiber at 100 Gb/s per wavelength, approved 9 February 2021, published 26 February 2021.
- IEEE Std 802.3cv-2021, Maintenance #15: Power over Ethernet, approved 9 May 2021, published 28 May 2021.
- IEEE Std 802.3ct-2021, 100 Gb/s Ethernet over DWDM systems, approved 16 June 2021, published 9 July 2021.
- IEEE Std 802.3cp-2021, Bidirectional 10 Gb/s, 25 Gb/s, and 50 Gb/s Optical Access PHYs, approved 16 June 2021, published 16 July 2021.
- Ethernet MIBs –IEEE Std 802.3.1-2013 published on 2 August 2013
- Ethernet YANG models – IEEE Std 802.3.2-2019 approved 26 March 2019, published 21 June 2019

IEEE 802.3 Task Forces, Study Groups, CFIs

- P802.3ck 100 Gb/s per Lane Electrical Task Force
- P802.3cs Ethernet Access PMDs for Central Office Consolidation Task Force
- P802.3cw 400 Gb/s Ethernet over DWDM systems Task Force
- P802.3cx Improving PTP Timestamping Accuracy Task Force
- P802.3cy Greater than 10 Gb/s Electrical Automotive Ethernet Task Force
- P802.3cz Multi-Gigabit Optical Automotive Ethernet Task Force
- P802.3da 10 Mb/s Single Pair Multidrop Segments Enhancements Task Force
- P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force
- Revision to IEEE Standard 802.3-2018 (P802.3dc)
- P802.3dd Power over Data Lines of Single Pair Ethernet (Maintenance #17) Task Force
- Beyond 400 Gigabit Ethernet Study Group
- Enhancements to Point-to-Point Single Pair Ethernet Study Group

- New Ethernet Applications Ad Hoc

P802.3ck 100 Gb/s per lane Electrical Task Force

- 46th (teleconference) meeting 4, 5, 18, 19, 25, 26, 31 May; 1, 2 June to resolve 238 comments on D2.0
  - Meeting materials: https://ieee802.org/3/ck/public/21_05/index.html
  - Meeting minutes: https://www.ieee802.org/3/ck/public/21_05/minutes_3ck_0521_final_unapproved.pdf
- 47th (teleconference) meeting 21, 27, 28 July; 9-11 August to resolve 153 comments on D2.1
  - Meeting materials: https://ieee802.org/3/ck/public/21_07/index.html
  - Meeting minutes (up to 28 July): https://www.ieee802.org/3/ck/public/21_07/minutes_3ck_0721_pt2_3.pdf

P802.3ck 100 Gb/s per lane Electrical Task Force Adopted Objectives (1 of 2)

- Support a MAC data rate of 100 Gb/s, 200 Gb/s, and 400 Gb/s
- Support full-duplex operation only
- Preserve the Ethernet frame format utilizing the Ethernet MAC
- Preserve minimum and maximum FrameSize of current IEEE 802.3 standard
- Support the existing bit error ratios (BERs) at the MAC/PLS service interface (or the frame loss ratio equivalent) for 100 Gb/s, 200 Gb/s, and 400 Gb/s Ethernet

- Define a single-lane 100 Gb/s Attachment Unit interface (AUI) for chip-to-module applications, compatible with PMDs based on 100 Gb/s per lane optical signaling
- Define a single-lane 100 Gb/s Attachment Unit Interface (AUI) for chip-to-chip applications
- Define a single-lane 100 Gb/s PHY for operation over electrical backplanes supporting an insertion loss ≤28 dB at 26.56 GHz.
- Define a single-lane 100 Gb/s PHY for operation over twin-axial copper cables with lengths up to at least 2m

P802.3ck 100 Gb/s per lane Electrical Task Force Adopted Objectives (2 of 2)

- Define a two-lane 200 Gb/s Attachment Unit interface (AUI) for chip-to-module applications, compatible with PMDs based on 100 Gb/s per lane optical signaling
- Define a two-lane 200 Gb/s Attachment Unit Interface (AUI) for chip-to-chip applications
- Define a two-lane 200 Gb/s PHY for operation over electrical backplanes supporting an insertion loss ≤28 dB at 26.56 GHz.
- Define a two-lane 200 Gb/s PHY for operation over twin-axial copper cables with lengths up to at least 2m

- Define a four-lane 400 Gb/s Attachment Unit interface (AUI) for chip-to-module applications, compatible with PMDs based on 100 Gb/s per lane optical signaling
- Define a four-lane 400 Gb/s Attachment Unit Interface (AUI) for chip-to-chip applications
- Define a four-lane 400 Gb/s PHY for operation over electrical backplanes supporting an insertion loss ≤28 dB at 26.56 GHz.
- Define a four-lane 400 Gb/s PHY for operation over twin-axial copper cables with lengths up to at least 2m

P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force

- 13th Task Force meeting (teleconference) 1 July 2021 interim
  - Meeting Materials: https://www.ieee802.org/3/db/public/July-01-2021/
  - Meeting Minutes: https://www.ieee802.org/3/db/public/July-01-2021/approved_meeting_minutes_3db_01_070121.pdf
- 14th Task Force meeting (teleconference) 19 July 2021 plenary
  - Meeting Materials: https://www.ieee802.org/3/db/public/July-19-2021/
  - Meeting Minutes: https://www.ieee802.org/3/db/public/July-19-2021/approved_meeting_minutes_3db_01_071921.pdf
- 15th Task Force meeting (teleconference) 29 July, 5 August, 12 August interim series
  - Meeting Materials: https://www.ieee802.org/3/db/public/July-29-August-12-2021/
  - Authorized D1.2. Only 1 TBD remains [overshoot/undershoot (max)]
- Task Force Ad Hoc meetings: https://www.ieee802.org/3/db/public/adhoc/index.html
  - 24 June 2021 ad hoc meeting (Teleconference)
- VR designation 50 m PMD (low cost, low power). SR for 100 m PMD – relevant for FC-PI-8
- TF Adopted Timeline at November Plenary
  - Target date for authorizing D2.0, Working Group ballots (Last Feature, no TBDs): September 2021
  - Target date for Last Technical Change/technical stability (specified values will change based on comments after this date): November 2021
  - Target date for Standard: June 2022

P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force

Adopted Objectives (1 of 2)

1. Support a MAC data rate of 100 Gb/s, 200 Gb/sand 400 Gb/s

2. Support full-duplex operation only

3. Preserve the Ethernet frame format utilizing the Ethernet MAC

4. Preserve minimum and maximum FrameSize of current IEEE 802.3 standard

5. Provide appropriate support for OTN

6. Support a BER of better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent) for 100 Gb/s operation

7. Support a BER of better than or equal to 10^{-13} at the MAC/PLS service interface (or the frame loss ratio equivalent) for 200 Gb/s and 400 Gb/s operation
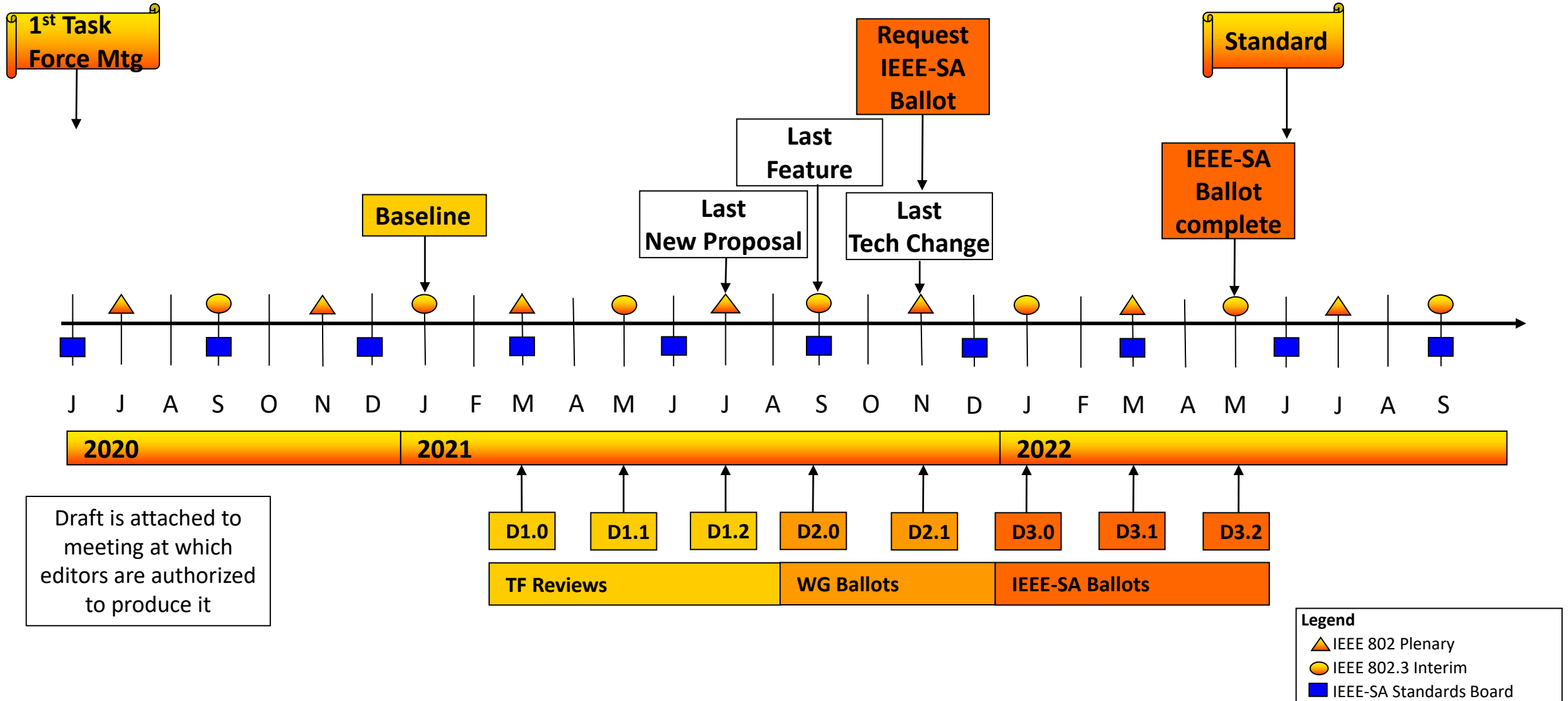
P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force

Adopted Objectives (2 of 2)

8. Define a physical layer specification that supports 100 Gb/s operation over 1 pair of MMF with lengths up to at least 50 m

9. Define a physical layer specification that supports 200 Gb/s operation over 2 pairs of MMF with lengths up to at least 50 m

10. Define a physical layer specification that supports 400 Gb/s operation over 4 pairs of MMF with lengths up to at least 50 m

11. Define a physical layer specification that supports 100 Gb/s operation over 1 pair of MMF with lengths up to at least 100 m

12. Define a physical layer specification that supports 200 Gb/s operation over 2 pairs of MMF with lengths up to at least 100 m

13. Define a physical layer specification that supports 400 Gb/s operation over 4 pairs of MMF with lengths up to at least 100 m

IEEE P802.3db Task Force Timeline
Adopted by TF November 2020

1st Task Force Mtg

Request IEEE-SA Ballot

Standard

Last Feature

Last New Proposal

Last Tech Change

IEEE-SA Ballot complete

Baseline

J J A S O N D J F M A M J J A S O N D J F M A M J J A S

2020   **2021**   **2022**

Draft is attached to meeting at which editors are authorized to produce it

D1.0   D1.1   D1.2   D2.0   D2.1   D3.0   D3.1   D3.2

TF Reviews   WG Ballots   IEEE-SA Ballots

Legend
△ IEEE 802 Plenary
○ IEEE 802.3 Interim
■ IEEE-SA Standards Board

Beyond 400 Gb/s Ethernet Study Group

- 8th Study Group meeting (teleconference) 13, 20, 29 July 2021
  - Meeting materials: https://www.ieee802.org/3/B400G/public/21_07/index.html
  - Meeting minutes: https://www.ieee802.org/3/B400G/public/21_07/minutes_b400G_2107_unapproved.pdf
- 9th Study Group meeting (teleconference) 12, 19, 26 August 2021
  - Meeting materials: https://www.ieee802.org/3/B400G/public/21_08/index.html
  - Meeting minutes: will be posted after 26 August meeting.
- Many new objectives adopted; focus will shift to PAR and CSD documentation
- 200 Gb/s signaling MMF objectives are <u>not</u> being adopted –
  - ➢Impact on FC-PI-9/256 GFC serial MMF variants.

B400G Adopted Objectives

- **Non-Rate Specific**
  - Support full-duplex operation only *
  - Preserve the Ethernet frame format utilizing the Ethernet MAC *
  - Preserve minimum and maximum FrameSize of current IEEE 802.3 standard *
  - Support a BER of better than or equal to 10 -13 at the MAC/PLS service interface (or the frame loss ratio equivalent) **
  - Provide support to enable mapping over OTN ***

- **200 Gb/s Related**
  - Support a MAC data rate of 200 Gb/s ##
  - Support optional single-lane 200 Gb/s attachment unit interfaces for chip-to-module and chip-to-chip applications ##
  - Define a physical layer specification that supports 200 Gb/s operation:
    - over 1 pair of SMF with lengths up to at least 500 m ##
    - over 1 pair of SMF with lengths up to at least 2 km ##

- **400 Gb/s Related**
  - Support a MAC data rate of 400 Gb/s ##
  - Support optional two-lane 400 Gb/s attachment unit interfaces for chip-to-module and chip-to-chip applications ##
  - Define a physical layer specification that supports 400 Gb/s operation:
    - over 2 pairs of SMF with lengths up to at least 500 m ##

https://www.ieee802.org/3/B400G/proj_doc/objectives_b400g_210812.pdf

B400G Adopted Objectives

- **800 Gb/s Related**
    - Support a MAC data rate of 800 Gb/s *
    - Support optional eight-lane 800 Gb/s attachment unit interfaces for chip-to-module and chip-to-chip applications ****
    - Support optional four-lane 800 Gb/s attachment unit interfaces for chip-to-module and chip-to-chip applications ****
    - Define a physical layer specification that supports 800 Gb/s operation:
        - over eight lanes of twin axial copper cables with a reach up to at least 2 meters @
        - over eight lanes over electrical backplanes supporting an insertion loss ≤ 28dB at 26.56GHz @
        - over 8 pairs of MMF with lengths up to at least 50 m *
        - over 8 pairs of MMF with lengths up to at least 100 m *
        - over 8 pairs of SMF with lengths up to at least 500 m *
        - over 8 pairs of SMF with lengths up to at least 2 km #
        - over 4 pairs of SMF with lengths up to at least 500 m *
        - over 4 pairs of SMF with lengths up to at least 2 km *
        - over 4 wavelengths over a single SMF in each direction with lengths up to at least 2 km *
        - over a single SMF in each direction with lengths up to at least 10 km *
        - over a single SMF in each direction with lengths up to at least 40 km *

- **1.6 Tb/s Related**
    - Support a MAC data rate of 1.6 Tb/s #
    - Support optional sixteen-lane 1.6 Tb/s attachment unit interfaces for chip-to-module and chip-to-chip applications ###
    - Support optional eight-lane 1.6 Tb/s attachment unit interfaces for chip-to-module and chip-to-chip applications #
    - Define a physical layer specification that supports 1.6 Tb/s operation:
        - over 8 pairs of SMF with lengths up to at least 500 m #
        - over 8 pairs of SMF with lengths up to at least 2 km #

https://www.ieee802.org/3/B400G/proj_doc/objectives_b400g_210812.pdf

Adoption History

*	Adopted by B400G SG, Apr 2021
**	Adopted by B400G SG Apr 26, 2021
***	Adopted by B400G SG May 3, 2021
****	Adopted by B400G SG May 17, 2021
#	Adopted by B400G SG Jun 3, 2021
##	Adopted by B400G SG Jul 13, 2021
###	Adopted by B400G SG Jul 20, 2021
@	Adopted by B400G SG Aug 12, 2021

https://www.ieee802.org/3/B400G/proj_doc/objectives_b400g_210812.pdf

Future Meetings

Meeting	Location	Dates
IEEE 802.3 September 2021 interim	Virtual	20-23 & 27-30 September 2021
IEEE 802 November 2021 plenary	Vancouver, BC, Canada (TBD)*	15-18 November 2021
IEEE 802.3 January 2022 interim	TBD	10-14 & 17-21 January 2022
IEEE 802 March 2022 plenary	Orlando, FL, USA	14-17 March 2022
IEEE 802.3 May 2022 interim	TBD	16-20 & 23-27 May 2022
IEEE 802 July 2022 plenary	Montreal, Quebec, Canada	11-14 July 2022
IEEE 802.3 September 2022 interim	TBD	5-9 & 12-16 September 2022
IEEE 802 November 2022 plenary	Bangkok, Thailand	14-17 November 2022

*virtual or in-person will be decided by 7 Sep

The 802.3 working group does not intend to try to schedule a face-to-face interim meeting (January, May, or September) until IEEE 802 has successfully held a face-to-face plenary meeting (March, July or November).

Upcoming meeting details at: http://ieee802.org/3/interims/index.html