

Apr 8, 2021 IEEE 802.3 liaison report

Tom Palkert

Macom

Mabud Choudhury

OFS optics

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

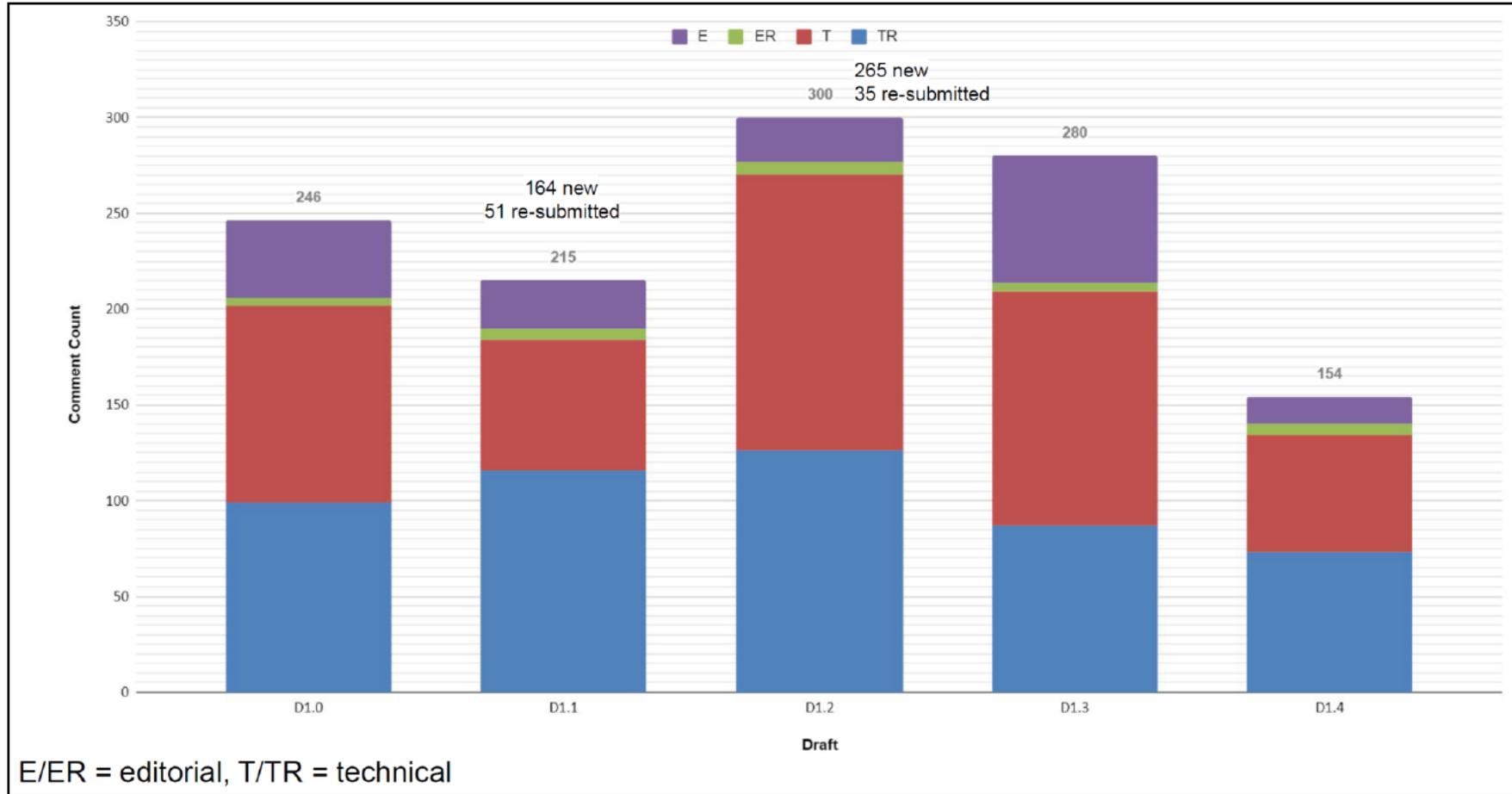
Adopted Objectives (2 of 2)

- 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
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- 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

802.3ck web site

- The TF web page is here: –
<http://www.ieee802.org/3/ck/index.html>
- Draft 2.0 is complete:
 - Focus was on technical completeness
 - Technical gaps
 - TBDs
 - Postponed editorial comments and some technical discussions
 - (Tom P. opinion): Rx testing is broken, needs changes to SJ test parameters.

Comment History



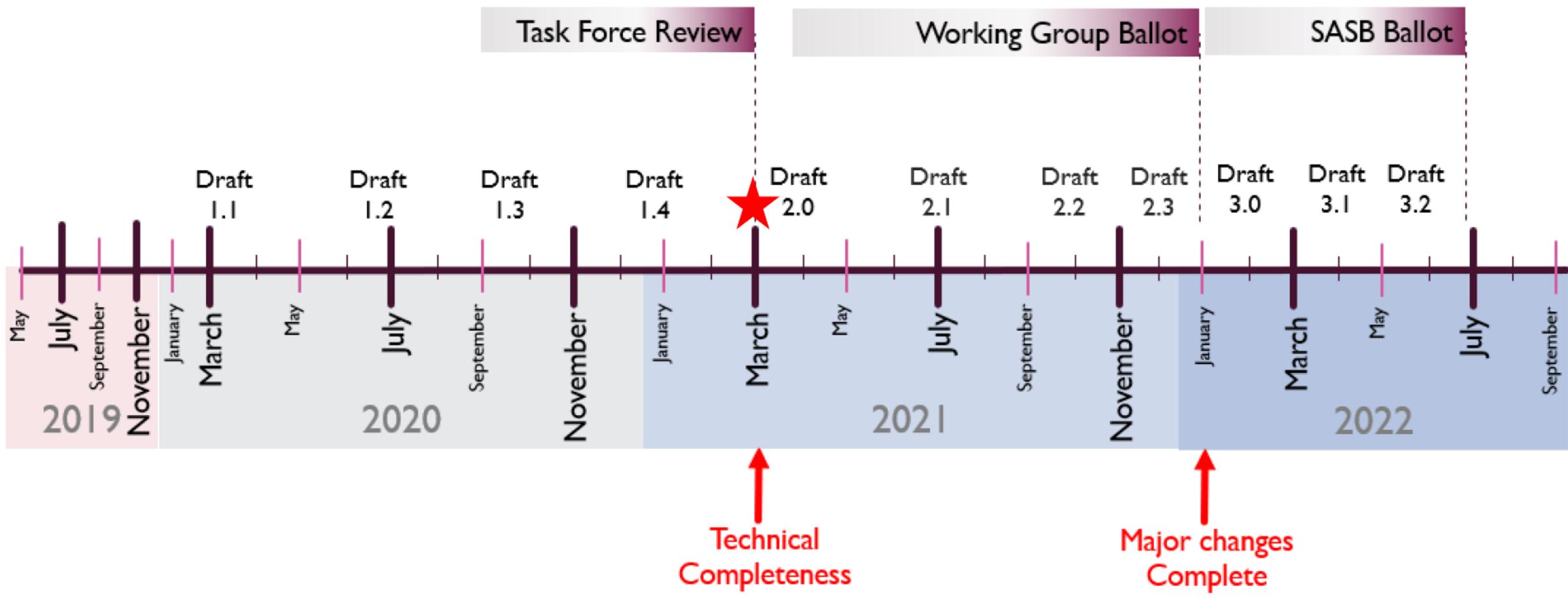
Channel budget

Reference RX

VEC & test channel
measurement method

TBDs & eye width
measurement method

Remaining TBDs
& refinement



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

- Task Force Interim meeting (Teleconference) 4 March 2021
 - Meeting Materials: <https://www.ieee802.org/3/db/public/March-04-2021/>
 - Adopted nomenclature **100GBASE-VR, 200GBASE-VR2, 400GBASE-VR4 for 50 m PHYs**
 - Adopted nomenclature **100GBASE-SR, 200GBASE-SR2, 400GBASE-SR4 for 100 m PHYs**
- Task Force Plenary meeting 16 March 2021 (Teleconference)
 - Meeting Materials: <https://www.ieee802.org/3/db/public/March-16-2021/>
 - **D0.1** Editors' Report: https://www.ieee802.org/3/db/public/March-16-2021/murty_3db_01a_031621.pdf
 - Approve Liaison Communication between IEEE 802.3 WG with INCITS T11.2 to share **P802.3db D0.1**
- Task Force Ad Hoc meetings: <https://www.ieee802.org/3/db/public/adhoc/index.html>
 - 1 April 2021 ad hoc meeting (Teleconference)
- Optical specifications will be generated in parallel with 53 G VCSEL/100 Gb/s per wavelength VCSEL development
- More TBDs with VR or 50 m specifications. SR or 100 m specifications – relevant for FC-PI-8 - has fewer TBDs
- TF Adopted [Timeline](#) at November Plenary
 - Target date for authorizing D1.0, Task Force reviews: **15 April 2021 (1 month behind schedule)**
 - Target date for authorizing D2.0, Working Group ballots (Last Feature, no TBDs): **September 2021**
 - Target date for Last Technical Change/technical stability (technical changes will happen 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/s and 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

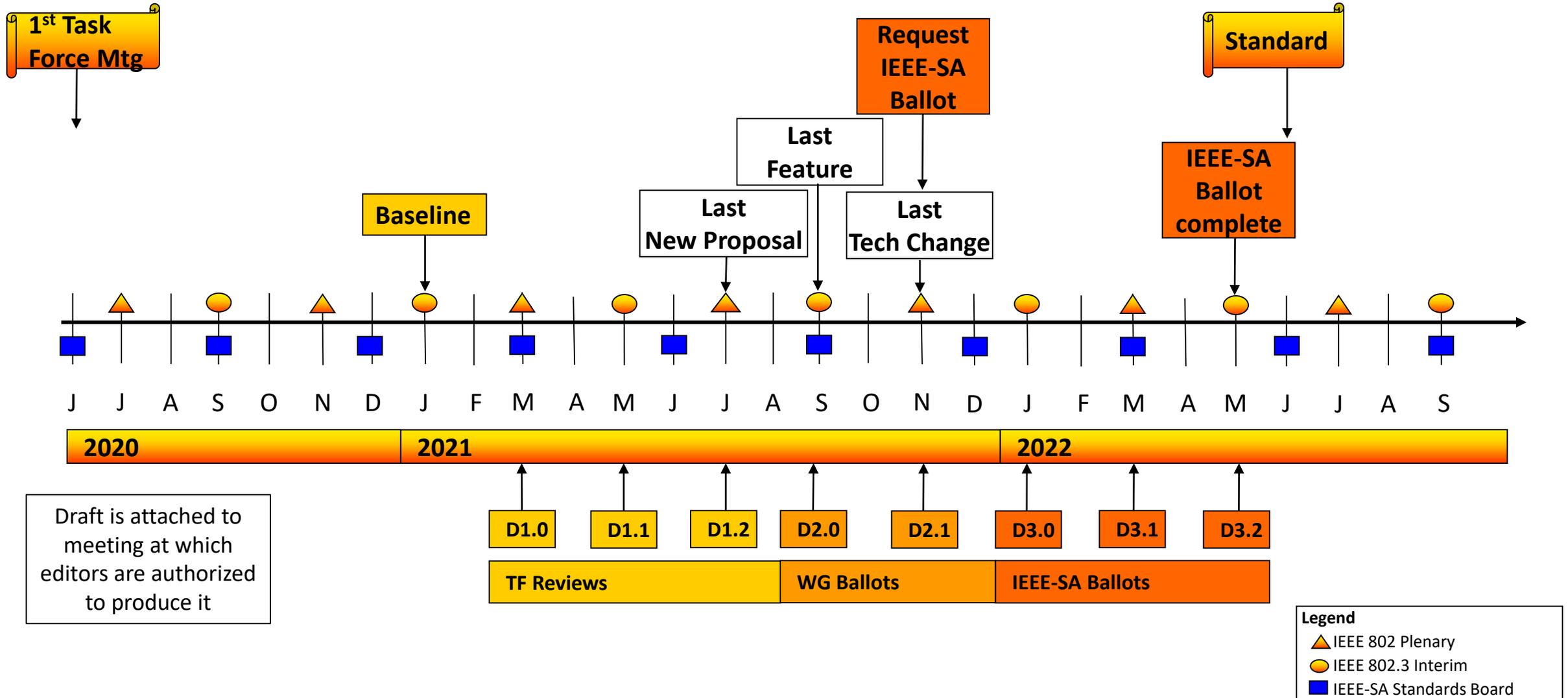
P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force

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



Beyond 400G Study Group

- The IEEE 802 LMSC Executive Committee has chartered a Study Group under the IEEE 802.3 Ethernet Working Group to develop a Project Authorization Request (PAR) and Criteria for Standards Development (CSD) responses for:
 - (1) Beyond 400 Gb/s Ethernet
 - (2) Physical Layer specifications for existing Ethernet rates based on Physical Layer specifications for beyond 400 Gb/s Ethernet.
- Call for interest Consensus presentation:
 - https://www.ieee802.org/3/ad_hoc/ngrates/public/calls/20_1029/CFI_Beyond400GbE_Rev7_201029.pdf

IEEE 802.3 Beyond 400 Gb/s Ethernet Study Group

- Main webpage:
 - <https://www.ieee802.org/3/B400G/index.html>
- Study Group Interim meeting (Teleconference) 08 & 11 February 2021:
 - Meeting Materials: https://www.ieee802.org/3/B400G/public/21_02/index.html
 - Meeting Minutes: https://www.ieee802.org/3/B400G/public/21_02/minutes_b400g_a_2102_approved.pdf
- Study Group Interim meeting (Teleconference) 01, 15, 22 & 29 March 2021:
 - Meeting Materials: https://www.ieee802.org/3/B400G/public/21_03/index.html
 - Meeting Minutes: https://www.ieee802.org/3/B400G/public/21_03/minutes_b400g_a_2103_approved.pdf
- Study Group Interim meeting (Teleconference) 01 & 05 April 2021:
 - Meeting Materials: https://www.ieee802.org/3/B400G/public/21_04/index.html
 - Motions and Straw Polls: https://www.ieee802.org/3/B400G/public/21_04/motions_b400g_a_2104.pdf

IEEE 802.3 Beyond 400 Gb/s Ethernet Study Group

- 01 & 05 April SG interim meeting SG motions to adopt the following objectives **approved**:
 - Support a **MAC data rate of 800 Gb/s** objective
 - Define a physical layer specification that supports **800 Gb/s operation over 8 pairs of MMF** with lengths up to at least **50 m** - approved
 - Define a physical layer specification that supports **800 Gb/s operation over 8 pairs of MMF** with lengths up to at least **100 m** – approved
 - Define a physical layer specification that supports **800 Gb/s operation over 8 pairs of SMF** with lengths up to at least **500 m**
 - Define a physical layer specification that supports **800 Gb/s operation over 4 pairs of SMF** with lengths up to at least **500 m**
 - Define a physical layer specification that supports **800 Gb/s operation over 4 pairs of SMF** with lengths up to at least **2 km**

IEEE 802.3 Beyond 400 Gb/s Ethernet Study Group

- 01 & 05 April SG interim meeting SG motions to adopt the following objectives **approved**:
 - Define a physical layer specification that supports **800 Gb/s operation over 4 wavelengths over a single SMF in each direction** with lengths up to at least **2 km**
 - Define a physical layer specification that supports **800 Gb/s operation over a single SMF in each direction** with lengths up to at least **10 km**
 - Define a physical layer specification that supports **800 Gb/s operation over a single SMF in each direction** with lengths up to at least **40 km**

Relevant Excerpt from a presentation

- Webscaledeployments are driving the Ethernet switch and interconnect industry to develop solutions to allow them to continue to scale their networks.
- Unfortunately, not a lot of consistency on how they build their networks
- Radix, Fabric speed, Port speed, over-subscriptions, interconnect infrastructure
- Therefore, focus on key building blocks is important, with knowledge that the range of implementations and usage may be broad
- For Webscaledeployments, Multi-rate requirements needs to be considered (a.k.a. signaling backwards compatibility –not module backwards compatibility)
- e.g.A host and module that supports 400GBASE-FR4, that can also be able to support 200GBASE-FR4, or even 100G-CDWM4

Tom P. opinions on Beyond 400G study group

- The consideration of multi-rate brings Ethernet closer to Fibre Channel requirements
- This group will probably initiate a 224G electrical interface
- Lanes for optical channel will probably stay with PAM4 modulation but there is talk of PAM6 and PAM8.
- Both 800G and 1.6Tbit being considered for aggregate data rates. (I don't think this decision is relevant for T11)
- 224G optical interface for SM probable – impact on FC-PI-9 over SMF
- 224G optical interface for VCSEL-MMF not likely – impact on FC-PI-9 over MMF

Future Meetings

Meeting	Location	Dates
IEEE 802.3 May 2021 interim	Virtual	12-20 & 24-27 May 2021
IEEE 802 July 2021 plenary	Virtual	12-15 & 19-22 July 2021
IEEE 802.3 September 2021 interim	Virtual	TBD September 2021
IEEE 802 November 2021 plenary	Vancouver, BC, Canada	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

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