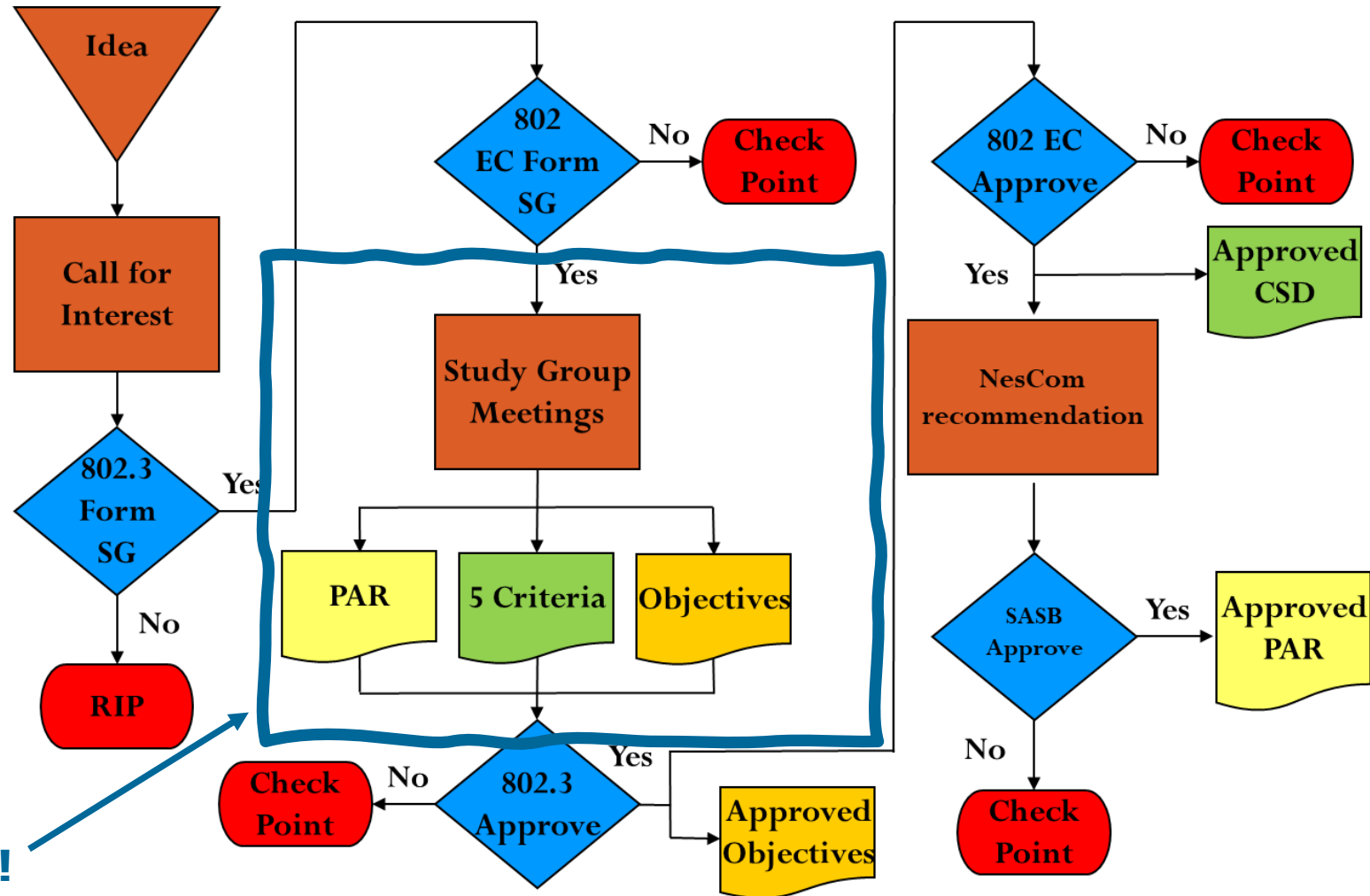


Project Documentation Revisited

**IEEE 802.3 Beyond 400 Gb/s Ethernet Study Group
Electronic July 2021 Session**

**John D'Ambrosia,
Chair, IEEE 802.3 Beyond 400 Gb/s Ethernet Study Group
Futurewei, U.S. Subsidiary of Huawei
13 July 2021 Electronic Meeting**

Overview of IEEE 802.3 Standards Process (1/5)- Study Group Phase



We are here!

Note: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

Current Objectives

* 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
Approval by 802.3 WG Pending

- 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 ***
- 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 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 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 #

IEEE 802.3 Beyond 400 Gb/s Ethernet Objectives Landscape

Ethernet Rate	Assumed Signaling Rate	AUI	Cu Cable	MMF 50m	MMF 100m	SMF 500m	SMF 2km	SMF 10km	SMF 40km
200 Gb/s	200 Gb/s	?	?			?	?		
400 Gb/s	200 Gb/s	?	?						
800 Gb/s	100 Gb/s	Over 8 lanes		Over 8 pairs	Over 8 pairs	Over 8 pairs	Over 8 pairs		
	200 Gb/s	Over 4 lanes	?			Over 4 pairs	Over 4 pairs		
	200 Gb/s						Over 4 λ 's		
	TBD							Over single SMF in each direction	Over single SMF in each direction
1.6 Tb/s	100 Gb/s	?							
	200 Gb/s	Over 8 lanes	?			Over 8 pairs	Over 8 pairs		

Objectives – Going Forward

- 800 Gb/s Related Objectives
 - AUI objectives (x8, x4) adopted
 - MMF and SMF objectives adopted
 - **Cu Cable objective proposed**
- 1.6 Tb/s Related Objectives
 - AUI objective (x8) adopted
 - SMF objectives adopted
 - **AUI objective (x16) proposed**
- 200 Gb/s Objectives
 - **AUI objective proposed**
 - **Cu Cable objective proposed**
 - **SMF objectives proposed**
- 400 Gb/s Objective
 - **AUI objective proposed**
 - **Cu Cable objective proposed**



Traditional
higher speed
project



Traditional
higher speed
project

Technology
reuse

Support 1 to 8 lane architectures

PAR

- **Project Title**
 - **Project Date**
 - **Project Scope**
 - **Project Contingency**
 - **Project Purpose**
 - **Project Need**
 - **Stakeholders**
-
- **Challenging to draft response to these questions given current state of objectives**

Key Critters to Address

■ **Broad Market Potential**

Each proposed IEEE 802 LMSC standard shall have broad market potential. At a minimum, address the following areas:

- a) **Broad sets of applicability.**
- b) **Multiple vendors and numerous users.**

■ **Technical Feasibility**

Each proposed IEEE 802 LMSC standard shall provide evidence that the project is technically feasible within the time frame of the project. At a minimum, address the following items to demonstrate technical feasibility:

- a) **Demonstrated system feasibility.**
- b) **Proven similar technology via testing, modeling, simulation, etc.**
- c) **Confidence in reliability.**

■ **Economic Feasibility**

Each proposed IEEE 802 LMSC standard shall provide evidence of economic feasibility. Demonstrate, as far as can reasonably be estimated, the economic feasibility of the proposed project for its intended applications. Among the areas that may be addressed in the cost for performance analysis are the following:

- a) **Known cost factors.**
- b) **Balanced cost factors.**
- c) **Consideration of installation costs.**
- d) **Consideration of operational costs (e.g., energy consumption).**
- e) **Other areas, as appropriate.**

Key Anticipated Dates

- Jan 14, 2021: 1st Meeting of B400G Study Group
- Mar 2021: B400G SG Rechartered by IEEE 802 EC to July 2021 Plenary
- Jul 14, 2021:
 - B400G SG extension deadline
 - Recharter by IEEE 802 EC to Nov 2021 Plenary
- **Sept 2021**
 - **SG - Finish / approve project documentation (PAR / CSD / Objectives)**
- **30 days before start of Nov 2021 Plenary (Est – Oct 5, exact date pending)**
 - **Submit PAR / CSD to 802**
- **Oct 18 – NesCom Submittal Deadline**
- **Between NesCom Submittal and Nov Plenary – consider presenting project / project documentation to 802.3 WG for review**
- **Nov 2021 Plenary**
 - **802.3 WG Approval**
 - **802 EC Approval**
- **Dec 6 -8 – IEEE SA Standards Board Meeting**
- **Jan 2022 – 1st TF Meeting**

Moving Forward

- **Resolving decisions of July Session proposed objectives ASAP is necessary**
 - **Will 200 Gb/s Ethernet be included?**
 - **Will 400 Gb/s Ethernet be included?**
- **August will need to be spent on reviewing / discussing anticipated proposed text for PAR / 5C**

BACKUP

IEEE 802.3 Major PAR form questions

The PAR form is completed on-line in through the myProject system. Many of the PAR question are proforma and are automatically complete by selecting a IEEE 802.3 amendment project. These items include Standards Committee and the Working Group officers. This slideset therefore provides the major items from the PAR form to assist in consensus building leading up to approving a completed draft PAR form.

All acronyms shall be spelled out at first use.

The following are the Major PAR responses
for the IEEE P802.3^{df} draft PAR

To add a continuation slide: CTRL-M -> right click new slide -> Layout -> select 'Continued' layout

PAR item 2.1 – Project title

Project title: Standard for Ethernet Amendment:

Help text: The title of the base standard is uneditable. Please enter the amendment title in the text box. The title should be sufficiently unambiguous, understandable by NesCom member not from the society that submitted the PAR. All acronyms shall be spelled out in the title.

PAR item 4.2 and 4.3 Project dates

4.2 Expected Date of submission of draft to the IEEE-SA for Initial Standards Association Ballot:

Help text: Enter the date the draft standard is planned to be submitted to IEEE-SA for Initial Standards Association Ballot.

4.3 Projected Completion Date for Submittal to RevCom:

Help text: Enter the date the draft standard is planned to be submitted to RevCom for processing (not to exceed four years from the date of PAR submission). **It is suggested to allow at least six months after Initial Standards Association Ballot for the ballot process.** Cutoff dates for submitting draft standards to RevCom can be found in the yearly calendar located: <http://standards.ieee.org/about/sasb/meetings.html>.

PAR item 5.1 – Project participation

5.1 Approximate number of people expected to be actively involved in the development of this project:

Help text: This includes Working Group members, additional non-voting participants.

PAR item 5.2A – Standard scope

5.2A Scope of the complete standard:

This standard defines Ethernet local area, access and metropolitan area networks. Ethernet is specified at selected speeds of operation; and uses a common media access control (MAC) specification and management information base (MIB). The Carrier Sense Multiple Access with Collision Detection (CSMA/CD) MAC protocol specifies shared medium (half duplex) operation, as well as full duplex operation. Speed specific Media Independent Interfaces (MIIs) provide an architectural and optional implementation interface to selected Physical Layer entities (PHY). The Physical Layer encodes frames for transmission and decodes received frames with the modulation specified for the speed of operation, transmission medium and supported link length. Other specified capabilities include: control and management protocols, and the provision of power over selected twisted pair PHY types.

Help text: If this Amendment will change the scope statement of the complete document (base + Amendment), it can be edited and should be explained in the Additional Explanatory Notes field at the end of the PAR form. If this Amendment will not change the scope statement of the complete document the pre-populated text should be left as is.

PAR item 5.2B – Project scope

5.2B Scope of the Project:

Help text: State what the Amendment is changing or adding.

PAR item 5.3 – Project contingency

5.3 Is the completion of this standard contingent upon the completion of another standard (Yes or No)? If yes, please explain below:

5.3.1 If yes, please explain:

Help text: Your explanation should include how the standard is dependent upon the completion of another standard. Also, if applicable, why a PAR request is being submitted if the standard currently under development is not yet complete. The title and number of the standard which this project is contingent upon shall be included in the explanation.

PAR item 5.4 – Project purpose

5.4 Will the completed document (base + amendment) contain a purpose clause:

Yes No

Note: IEEE Std 802.3 does not contain a Purpose Clause.

PAR item 5.5 – Project need

5.5 Need for the Project:

The need for the project details the specific problem that the standard will resolve and the benefit that users will gain by the publication of the standard. The need statement should be brief, no longer than a few sentences.

PAR item 5.6 – Stakeholders

5.6 Stakeholders for the Standard:

The stakeholders (e.g., telecom, medical, environmental) for the standard consist of any parties that have an interest in or may be impacted by the development of the standard.

PAR item 7.1 – Similar scope

7.1 Are there other standards or projects with a similar scope? (Yes or No)?

If yes, please explain:

Help text: Identify any standard(s) or project(s) of similar scope(s), both within or outside of the IEEE, and explain the need for an additional standard in this area.

For any standard(s) or project(s) of similar scope(s) add 'Project slide(s)'

To add: CTRL-M -> right click new slide -> Layout -> select 'Project' layout

PAR item 8.1 – Additional notes

Additional Explanatory Notes:

If there is any further information that may assist NesCom in recommending approval for this project, include this information here. The title of any documents referenced in the PAR should be listed here.