



100Gb/s per Lane for Electrical Interfaces and Electrical PHYs Study Group: Status and Work

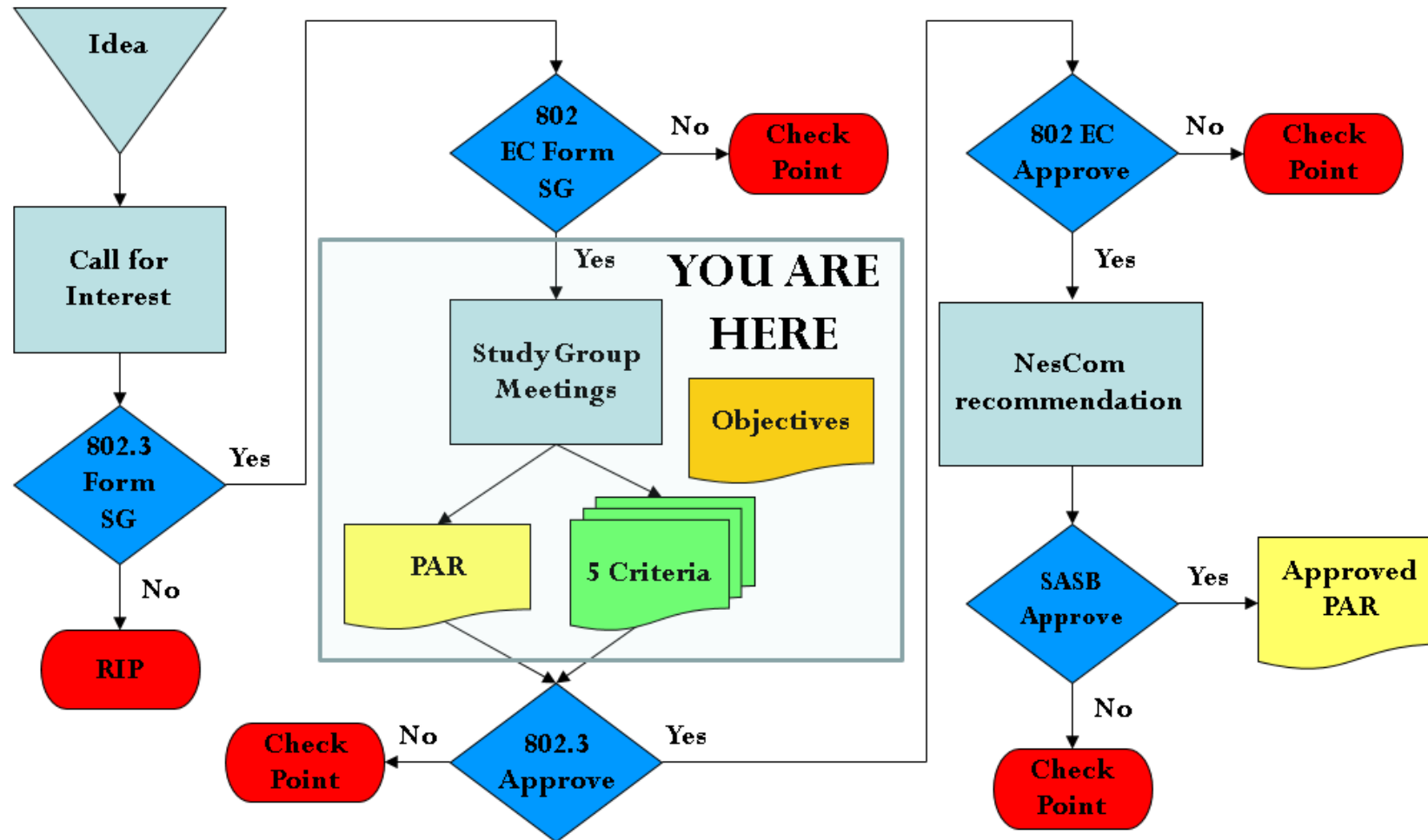
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Website: <http://www.ieee802.org/3/100GEL/index.html>

OUTLINE

- Study group goals
- Proposed text
- Call to action
- Straw Polls

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



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

TIMELINE

Option 1

- Understand boundaries of Objectives to write CSD and PAR.
- May need further study and modification to objectives in Task Force,
- Allows us to move into baseline proposals when ready

PAR and CSD in January; objectives in March

May Interim Task Force

Option 2

- Do deeper study prior to Objectives/CSD/PAR
- Have more firm Objectives and head straight into baseline proposals once a Task Force.
- May need to wait a meeting cycle or two after consensus is formed due to scheduling/process

PAR, CSD, and Objectives in March/May

Nov Plenary Task Force

Straw Poll from Dec 20

1. I would support			
A. Targeting TF in May	16/47	(34%)
B. Targeting TF in November	11/47	(23%)
C. Targeting TF later than November	1/47	(2%)
D. Need more information	8/47	(17%)
No Answer	11/47	(23%)

FOUNDATIONAL OBJECTIVES

- Support a MAC data rates of 100, 200, and 400 Gb/s
- Support full-duplex operation only
- Preserve the Ethernet frame format utilizing the Ethernet MAC
- Preserve minimum and maximum Frame Size of current IEEE 802.3 standard
- Support a BER of better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent) for single-lane 100Gb/s operation
- Support a BER of better than or equal to 10^{-13} at the MAC/PLS service interface (or the frame loss ratio equivalent) for two-lane 200Gb/s or four-lane 400Gb/s operation
- Support optional Energy-Efficient Ethernet operation

PROPOSED FORM FOR 100G OBJECTIVES

- Define a single-lane 100 Gb/s Attachment User interface (AUI) for C2M electrical operation with a total channel insertion loss of \leq “x” dB at 28GHz.
- Define a single-lane 100 Gb/s Attachment User interface (AUI) for C2C electrical operation with a total channel insertion loss of \leq “y” dB at 28GHz.
- Define a single-lane 100Gb/s PHY for operation over electrical backplanes with a total insertion loss of \leq “z” dB at 28GHz.
- Define a single-lane 100Gb/s PHY for operation over twin-axial copper cable with lengths up to at least “w”m.

ASSUMPTIONS FOR CREATING 200G & 400G OBJECTIVE LANGUAGE

- Modify the above objectives with appropriate language for “two-lane” or “four-lane” interfaces.
- Any interface we define for single lane would have similar BMP for multiple lanes.
- Desire to keep same targets for loss/reach for single-lane, two-lane, four-lane

CSD TEXT – CALL TO ACTION

- **BROAD MARKET POTENTIAL**
 - **TECHNICAL FEASIBILITY**
 - **ECONOMIC FEASIBILITY**
 - MANAGED OBJECTS
 - CO-EXISTENCE
 - COMPATIBILITY
 - DISTINCT IDENTITY
- KENT WILL TAKE FEEDBACK HERE FOR DRAFT, BUT **NEED TO SUSTANTIATE!** 8

CALL TO ACTION

- Define a single-lane 100 Gb/s Attachment User interface (AUI) for C2M electrical operation with a total channel insertion loss of \leq “x” dB at 28GHz.
 - Seen range from $x=10.5\text{dB}$ to 20dB →
 - Does removing loss target harm CSD responses?
 - Is there consensus on re-use of FEC and PCS?
 - Need evidence of economic feasibility
 - Is this 1.5m or 2m for an appropriate budget?
 - Need evidence of broad market potential
- Define a single-lane 100Gb/s PHY for operation over twin-axial copper cable with lengths up to at least 2m.

CALL TO ACTION

- Seen “y”= everything from 18dB to 30dB →
 - need to understand the appropriate applications
 - Need evidence of distinct identity
- Define a single-lane 100 Gb/s Attachment User interface (AUI) for C2C electrical operation with a total channel insertion loss of \leq “y” dB at 28GHz.
- Define a single-lane 100Gb/s PHY for operation over electrical backplanes with a total insertion loss of ≤ 30 dB at 28GHz assuming low loss packages.
 - Elephant in the room has been the package
 - Do we have consensus if we state the assumed package for a given loss?
 - Need further evidence of technical feasibility?
- Define a single-lane 100 Gb/s Attachment User interface (AUI) for C2M electrical operation assuming re-use of FEC and PCS of 50Gbps electrical lane.
- Define a single-lane 100Gb/s PHY for operation over twin-axial copper cable with lengths up to at least 2m

STRAW POLLS

- I support...
 - PAM4 modulation for all interfaces
 - Different PAM modulation schemes targeted for each interface-type
 - Further study of all possible
 - No opinion
- For a Chip-to-Module objective, I support the following form:
 - Define a single-lane 100 Gb/s Attachment User interface (AUI) for C2M electrical operation with a total channel insertion loss of \leq "x" dB at 28GHz.
 - Define a single-lane 100 Gb/s Attachment User interface (AUI) for C2M electrical operation assuming re-use of FEC and PCS from clause "abc".
 - Another form
 - No Opinion
- I would support an objective for operation over... (select all that apply)
 - Electrical backplanes.
 - Electrical backplanes with a total insertion loss of ≤ 25 dB at 28GHz.
 - Electrical backplanes with a total insertion loss of ≤ 30 dB at 28GHz.
 - Electrical backplanes with a total insertion loss of ≤ 30 dB at 28GHz with low loss packages.
 - Electrical backplanes with total bump-to-bump insertion loss of ≤ 34 dB at 28GHz.
 - Electrical backplanes with total bump-to-bump insertion loss of ≤ 36 dB at 28GHz.
 - None of the above, at this time.

NEXT STEPS

- Prepare content and contributions to substantiate:
 - Technical feasibility
 - Economic Feasibility
 - Broad Market Potential
 - Distinct Identity
 - Compatibility
- January Ad Hocs – 8:00-10am PST – January 8th, 15th
 - **Propose to cancel due to OIF meeting & US holiday**
- **January Plenary – January 22-26**
 - **Thursday: 1pm-5:30pm & Friday: 8am-6pm**
 - **Will be VERY busy; please socialize before the meeting**
 - **Presentation requests due Next Friday, January 12**



THANK YOU!

BACKUP SLIDES: PREVIOUS PROJECT OBJECTIVES

