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# Proposed Responses: Criteria for Standards Development (CSD)

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Supporters:

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- Assumptions in CSD responses:
    - C2M AUIs using 100 Gb/s per lane electrical technology may be compatible with existing PMDs based on 100 Gb/s per lane optical signaling
    - Geneva 100GEL Study Group attendance correlates to the CFI attendance numbers
    - Single lane and multiple lane electrical PHYs/interfaces would have similar responses
  - Needs supporting material (see     ):
    - Technical feasibility of the necessary components for 100 Gb/s per lane electrical solutions
    - Component technology under development for other projects or demonstrations of working implementations of 100Gb/s per lane electrical technology
    - Proven and familiar media

# IEEE 802.3 Criteria for Standards Development (CSD)

The IEEE 802 Criteria for Standards Development (CSD) are defined in Clause 14 of the IEEE 802 LAN/MAN Standards Committee (LMSC) Operations Manual. The criteria include project process requirements (“Managed Objects”) and 5 Criteria (5C) requirements. The 5C are supplemented by subclause 7.2 ‘Five Criteria’ of the ‘Operating Rules of IEEE Project 802 Working Group 802.3, CSMA/CD LANs’.

The following are the CSD Responses in relation to the IEEE P802.3<sup>ck</sup> PAR

Items required by the IEEE 802 CSD are shown in Black text and supplementary items required by IEEE 802.3 are shown in blue text.

# Managed Objects

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Describe the plan for developing a definition of managed objects. The plan shall specify one of the following:

- a) **The definitions will be part of this project.**
  - b) **The definitions will be part of a different project and provide the plan for that project or anticipated future project.**
  - c) **The definitions will not be developed and explain why such definitions are not needed.**
- The project will include a protocol independent specification of managed objects. In addition, it is expected that the protocol specific definition of managed objects will be added in a future amendment to an IEEE 802.3 Standard for Management.

# Coexistence

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A WG proposing a wireless project shall demonstrate coexistence through the preparation of a Coexistence Assurance (CA) document unless it is not applicable.

- a) Will the WG create a CA document as part of the WG balloting process as described in Clause 13?
  - b) If not, explain why the CA document is not applicable
- A CA document is not applicable because the proposed project is not a wireless project.

No change from 802.3cd response

# Broad Market Potential

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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.**
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- Internet, cloud, and higher performance computing applications, along with advances in processors, server virtualization and converged networking, are driving the need for higher bandwidth switch connections e.g., in data centers, enterprises and campus networks. Increasing the electrical signaling data rate to 100 Gb/s provides cost effective 100 Gb/s, 200 Gb/s and 400 Gb/s Ethernet solutions that are required to maintain pace with new demands.
  - These target markets offer significant market potential for 100 Gb/s, 200 Gb/s and 400 Gb/s Ethernet electrical PHYs and interfaces that optimize the total cost of ownership.
  - 143 participants attended the “100 Gb/s per Lane Electrical Interfaces and PHYs” Call-For-Interest. 137 participants voted in favor of forming the Study Group. At least 80 participants affiliated with at least 45 companies indicated that they would support the standardization process. Study Group participation is consistent with these numbers.
  - There is sufficient participation to effectively complete the standardization process including participants from end-users, equipment manufacturers and component suppliers.

# Compatibility

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Each proposed IEEE 802 LMSC standard should be in conformance with IEEE Std 802, IEEE 802.1AC, and IEEE 802.1Q. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with IEEE 802.1 WG prior to submitting a PAR to the Sponsor.

- a) Will the proposed standard comply with IEEE Std 802, IEEE Std 802.1AC and IEEE Std 802.1Q?
  - b) If the answer to a) is “no”, supply the response from the IEEE 802.1 WG.
  - c) **Compatibility with IEEE Std 802.3**
  - d) **Conformance with the IEEE Std 802.3 MAC**
  - e) **Managed object definitions compatible with SNMP**
- As an amendment to IEEE Std 802.3, the proposed project shall comply with IEEE Std 802, IEEE Std 802.1AC and IEEE Std 802.1Q.
  - As an amendment to IEEE Std 802.3, the proposed project will conform to the full-duplex operating mode of the IEEE 802.3 MAC.
  - By utilizing the existing IEEE Std 802.3 MAC protocol, this proposed amendment will maintain maximum compatibility with the installed base of Ethernet nodes.
  - As was the case in previous IEEE Std 802.3 amendments, new electrical PHYs and interfaces will be defined for 100 Gb/s, 200 Gb/s, and 400 Gb/s operation.
  - The project will include a protocol independent specification of managed objects. In addition, it is expected that the protocol specific definition of managed objects will be added in a future amendment to an IEEE 802.3 Standard for Management.

# Distinct Identity

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Each proposed IEEE 802 LMSC standard shall provide evidence of a distinct identity. Identify standards and standards projects with similar scopes and for each one describe why the proposed project is substantially different.

**Substantially different from other IEEE 802.3 specifications / solutions.**

- There are no existing standards or projects addressing the specification of 100 Gb/s, 200 Gb/s, or 400 Gb/s Ethernet electrical PHYs or interfaces based on 100 Gb/s signaling.
- The proposed amendment to the existing IEEE 802.3 standard will be formatted as a collection of new clauses, making it easy for the reader to select the relevant specification.

# Technical Feasibility

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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.
- The principle of building equipment that supports IEEE 802.3 networks operating at different Ethernet rates has been amply demonstrated by a broad set of product offerings.
  - The proposed project will build on the array of Ethernet component and system design experience, and the broad knowledge base of Ethernet network operation.
    - Component vendors have presented data on the feasibility of the necessary components for 100 Gb/s electrical signaling. Proposals, which either leverage existing technologies or employ new technologies, have been provided.
    - Component technology using 100 Gb/s electrical signaling rates is either under development for other projects (e.g. OIF) or has been demonstrated.
  - The principle of scaling the IEEE 802.3 electrical PHYs and interfaces to different speeds has been well established by previous work within the IEEE 802.3 Working Group.
  - The reliability of Ethernet components and systems has been established in the target environments with a high degree of confidence.

# 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) **Balanced costs (infrastructure versus attached stations).**
  - b) **Known cost factors.**
  - c) **Consideration of installation costs.**
  - d) **Consideration of operational costs (e.g., energy consumption).**
  - e) **Other areas, as appropriate.**
- The cost factors for Ethernet components and systems are well known. The proposed project may introduce new cost factors which can be quantified.
  - A 100 Gb/s, 200 Gb/s or 400 Gb/s Ethernet link using 100 Gb/s electrical signaling will maintain a favorable cost for server-to-switch and switch-to-switch applications.
  - Electrical PHYs and interfaces based on 100 Gb/s electrical signaling can enable a higher switch radix and/or double the switch faceplate density over existing 50 Gb/s technology which reduces the overall data center interconnect cost.
  - In consideration of installation costs, the project is expected to use proven and familiar media.
  - Network design, installation and maintenance costs are minimized by preserving network architecture, management, and software.
  - Possible use of common 100 Gb/s components and technologies to support 100 Gb/s, 200 Gb/s and 400 Gb/s electrical PHYs and interfaces would allow economies of scale to reduce cost for all implementations.
  - Energy Efficient Ethernet will reduce the operational costs and the environmental footprint.