

Explanation of Changes

- **Formatting:**
 - **Economic Feasibility:** Formatting only – points made subordinate to emphasize there are no changes to the cost elements of existing Ethernet.
- **Response to 802.11 comment:**
 - **Technical Feasibility:** Formatting – Changed from MACMERGE to “MAC Merge” to conform with other references

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 4.5 ‘Criteria for Standards Development’ of the ‘IEEE 802.3 Ethernet Working Group Operations Manual’.

The following are the CSD Responses in relation to the IEEE P802.3~~de~~ 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

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.
- c) The project is expected to add existing PHYs to existing managed capabilities in IEEE Std 802.3, without new objects.

Coexistence

A WG proposing a wireless project shall prepare a Coexistence Assessment (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? (yes/no)**
 - b) **If not, explain why the CA document is not applicable.**
- **No. A CA document is not applicable because the proposed project is not a wireless project.**

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.**
- **Broad sets of applications:**
 - Time Sensitive Networking (TSN) is currently used with 802.3 PHYs in a broad set of applications, including ProAV, Industrial, and Automotive. TSN use is expected to expand to include applications enabled by the PHYs uniquely defined in IEEE Std 802.3cg.
 - **Multiple vendors and numerous users:**
 - At the Call for Interest, 54 individuals from 46 companies indicated they would support enhancements to 10 Mb/s single pair point-to-point Ethernet. These included companies from industrial automation, building automation, automotive, automotive OEMs, silicon, infrastructure, cabling, connector, and test equipment vendors.
 - At the Study Group meeting, a straw poll indicated that 22 individuals from 18 companies would specifically support enhancements to support TSN functionality for 10Mb/s Single-Pair Ethernet Point-to-Point PHYs.
 - **Substantial market potential:**
 - It is currently estimated a substantial number of Single Pair Ethernet ports will be used in process control and other applications where TSN support is highly desired.

Compatibility

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**
- The proposed standard adds existing point-to-point IEEE Std 802.3 10 Mb/s PHYs using MII architected the same way as modern 100 Mb/s and higher speed PHYs to the supported PHYs for existing IEEE Std 802.3 capabilities. As such, it is expected to be fully in conformance to IEEE Std 802, IEEE Std 802.1AC, IEEE Std 802.1Q, IEEE Std 802.3, and the IEEE Std 802.3 MAC.

Distinct Identity

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.

- Existing specifications exclude all 10 Mb/s PHYs from functions needed for IEEE 802.1 TSN functionality, such as Clause 99 frame preemption capability. The proposed standard is unique in that it adds IEEE 802.3cg-2019 point-to-point 10 Mb/s PHYs to the PHYs supporting TSN functionality.

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.**
- The study group has heard presentations detailing testing and demonstration of 10 Mb/s point to point PHYs supporting frame preemption without modification of the PHYs, cabling, or Ethernet MAC (including MAC Merge functionality).
 - The point-to-point 10BASE-T1L and 10BASE-T1S PHYs introduced by IEEE Std 802.3cg-2019 are architected similarly to modern 100 Mb/s and higher speed Ethernet PHYs which have been proven to work with the existing technology.
 - The reliability of Ethernet components and systems can be projected 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) 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.
- The modifications envisioned by this project are expected to make no or minimal changes to the cost balance for applications or components.
 - As a result, the existing balance of costs for infrastructure vs. attached stations for Ethernet systems is expected to be unchanged.
 - The cost factors for Ethernet components and systems are well known. The proposed project may introduce new cost factors which can be quantified.
 - The reduction in the number of legacy networks requiring specialized components, expertise, and gateways in the targeted markets is anticipated to result in a significant drop in both installation and operational costs.
 - Overall costs are anticipated to be minimized by introducing Ethernet network architecture, management, and software into the target environments.
 - Migrating intra-system control, automotive, and automation networking to Ethernet is anticipated to result in a significant improvement in system cost/performance.