# SPMD Study Group
# CSD - Strawman

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# 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**xx** 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.**

The definition of protocol independent managed objects will be part of this project.

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

**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.

# 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:

Multidrop 10 Mb/s single-pair Ethernet is a key element in enabling replacement of multiple legacy protocols with Ethernet. IEEE P802.3cg supports mixing segments up to 25 meters and up to 8 nodes. There are a number of key enhancements (e.g., extended reach, increased node count, power over the mixing segment) needed to expand the addressable use cases in automotive, building and industrial automation.

## Multiple vendors and numerous users:

At the Call for Interest, 57 individuals from 38 organizations indicated they would support this project. These included companies from industrial automation, building automation, automotive, automotive OEMs, silicon, infrastructure, cabling, connector, and test equipment vendors.

## Substantial Market Potential:

Data presented at the CFI indicate a substantial market potential in a number of the possible applications. Examples in industrial automation include the total low voltage contactor and overload protection device 2020 market projections of $5B and $1B respectively. Examples in building automation include intelligent lighting where global lighting node shipments are expected to exceed 210 million by 2021.

# 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**

As a Physical Layer and powering amendment to IEEE Std 802.3, the proposed project will remain in conformance with IEEE Std 802, IEEE Std 802.1AC, and IEEE Std 802.1Q.

As an amendment to IEEE Std 802.3, new physical layer and powering specifications will be defined for multidrop 10 Mb/s single-pair Ethernet.

By utilizing the existing IEEE Std802.3 MAC protocol, this proposed amendment will maintain maximum compatibility with the installed base of Ethernet nodes.

The proposed amendment will conform to the IEEE 802.3 MAC as defined in Clause 4 of IEEE Std 802.3-2018.

# 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.**

There is no IEEE 802.3 standard using a single balanced pair of conductors to provide 10 Mb/s data and power on a (multidrop) mixing segment.

There is no IEEE 802.3 standard using a single balanced pair of conductors supporting more than 25 meter reach or more than 8 nodes.

There is no IEEE 802.3 standard providing Time Synchronization Service Interface (TSSI, IEEE Std 802.3 Clause 90) on a (multidrop) mixing segment.

The project will define a single PHY or modify an existing PHY.

The project will modify one or more IEEE Std 802.3 RS (Reconciliation Sublayer) clauses (e.g. Clause 90, Clause 148).

The project will define an optional power delivery supporting multiple PDs on the mixing segment.

# 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 proposed project will build on the array of Ethernet component and system design experience, and the broad knowledge base of Ethernet network operation.

Multi-drop Ethernet over a single balanced pair of conductors has been proven both technically and operationally under IEEE Std 802.3cg-2019.

Multiple vendors have presented technical approaches for providing power over a mixing segment.

Component vendors, including IC vendors, cabling vendors and systems vendors have presented data on the feasibility of the necessary components for this project. Proposals which leverage existing technologies have been provided.

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) **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 10 Mb/s Single Pair Ethernet multidrop interface defined by this project will maintain a favorable cost balance for applications operating over a single balanced pair (multidrop) mixing segment.

As a Physical Layer and powering project, it will maintain the balance of costs for infrastructure vs. attached stations.

The cost factors for Ethernet components and systems are well known. The proposed project may introduce new cost factors which can be quantified.

Prior experience in the development of the IEEE Std 802.3cg-2019 10BASE-T1S indicates that the specifications developed by this project will entail a reasonable cost for the resulting performance.

The reduction in the number of legacy networks requiring specialized components, expertise, and gateways in the targeted markets will result in a significant drop in both installation and operational costs.

Overall costs are minimized by introducing Ethernet network architecture, management, and software into the target environments.

# Thank You!

IEEE 802.3 SPMG SG