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**dm** 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, to be included in Clause 30 of IEEE Std 802.3, will be part of this project.

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 Applicability:
  - Migration of cameras, displays, and other imaging sensors to an automotive ethernet network present an inherently asymmetric data stream with gigabit rates in one direction and a typically low-rate control plane in the other direction.
  - These applications are highly cost and power sensitive and benefit from optimization, requiring a targeted solution
  - Market-adjacent sensor applications such as in-building sensors and other automotive sensors will benefit from the standardization of protocols for interfacing natively asymmetric physical layers, as many sensors are asymmetric and similarly constrained as automotive cameras.
- Multiple vendors and numerous users:
  - At the call for interest, 70 individuals from 49 affiliations indicated they would support this project. These included automotive OEMs, automotive Tier 1, networking OEMs, silicon, infrastructure, cabling, connector, and test equipment experts.
  - Data presented at the CFI indicate a substantial automotive camera market potential, exceeding 1 billion ports and adjacent automotive markets approaching 500 million ports in 2030.

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 Standards Committee.

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 amendment will remain in conformance with IEEE Std 802-2014, IEEE Std 802.1AC, and IEEE Std 802.1Q
- The proposed amendment will conform to existing IEEE 802.3 MAC specifications

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 are no point-to-point IEEE 802.3 PHYs that support one data rate in one direction but are limited to a lesser rate in the opposite direction.
- There are no reconciliation sublayers in IEEE Std 802.3 that support connecting PHYs with asymmetric data rate limitations to the MAC without an additional MAC control sublayer.

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.
- Symmetrical transmission at multi-gigabit rates accompanied by power distribution over electrical media has been proven technically and operationally at up to 25 Gb/s rates. Presentations have shown multiple feasible approaches to extend to asymmetric rates.
- Component subject matter experts (SMEs), including PHY and systems SMEs, have presented data on the feasibility of the necessary components for this project relevant to the target applications. Approaches which leverage existing technologies have been presented to the Study Group.
- 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.

- Ethernet interfaces defined by this project will maintain a favorable cost-performance balance.
- The balance of costs between infrastructure and attached stations is well understood in the target environments.
- The cost factors for Ethernet components and systems in the target environments are well known. The proposed project may introduce new cost factors which can be quantified.
- Prior experience in the development of other physical layer specifications for Ethernet 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 applications 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 environment(s).
- The use of physical layers optimized for asymmetric operation will result in reductions in energy consumption compared to symmetric physical layers.