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 P802.3ca 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.
- In addition it is expected that the definition of SNMP managed objects, through reference to the protocol independent managed objects provided by this project, will be added in a future amendment to, or revision of, IEEE Std 802.3.1 IEEE Standard for Management Information Base (MIB) Definitions for Ethernet.
- The Management Information Base (MIB) for NG-EPON will maintain compatibility with the current 802.3.1 MIB.

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.

- Access network bandwidth usage increases on average 50% year over year due to a continual increase in the number of subscribers, connected devices per subscriber, and higher data capacity requirements per connected device. In addition, the demand for higher peak speed is increasing at an even faster pace and is expected to continue. The definition of NG-EPON will address requirements for high-capacity interconnect in the Ethernet access network.
- There has been wide attendance and participation in the NG-EPON ad hoc and the Study Group by end users, equipment manufacturers, and component suppliers. It is anticipated that there will be a robust NG-EPON ecosystem of vendors and users of this standard.

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

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 was the case in previous IEEE Std 802.3 amendments, new EPON physical layers will be defined.
- As an amendment to IEEE Std 802.3, the proposed project will conform to the simplified full-duplex MAC defined in Annex 4A in IEEE Std 802.3.
- By utilizing the existing IEEE Std 802.3 MAC protocol, this proposed amendment will maintain maximum compatibility with the installed base of Ethernet nodes.
- See managed objects for SNMP compatibility

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 existing IEEE 802 LMSC standard or an approved project appropriate for fiber access using point-to-multipoint topology at a MAC data rate of at least 25 Gb/s.
- The proposed project is an upgrade for users of Ethernet Passive Optical Networks specified in IEEE Std 802.3 to a MAC data rate of at least 25 Gb/s.

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.

- Presentations made to IEEE 802.3 Industry Connections NG-EPON ad hoc and to the NG-EPON Study Group illustrate the technical feasibility of a point-to-multipoint PHY operating at a rate of at least 25 Gb/s.
- This project reuses the Ethernet point-to-multipoint technology that proved to be stable and reliable. The project will extend point-to-multipoint PHY technology to support MAC data rates of 25 Gb/s and ~~up to 100 Gb/s~~ 50Gb/s.
- Contributions received from PHY vendors, component vendors, system vendors, and service providers suggest that 10 Gb/s point-to-multipoint and 25 Gb/s point-to-point technologies are mature, which provides a high level of confidence in the reliability of future 25 Gb/s and ~~100 Gb/s~~ 50 Gb/s EPON systems.

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.

- Interfaces of at least 25Gb/s utilizing advanced modulation techniques are expected to exhibit a similar cost balance as 10G-EPON and 1G-EPON for EPON Optical Line Terminal ports versus attached stations.
- The cost factors for Ethernet components and systems are well known.
- The installation costs of cable plant and maintenance costs are similar to that of existing EPON technologies.
- Point-to-multipoint topology is optimal for access networks, providing a cost-efficient subscriber architecture as compared to point-to-point topology. Coupled with a higher capacity of the Optical Line Terminal equipment, reduction of trunk fiber count, and lower maintenance and repair costs, the introduction of NG-EPON will result in the further reduction of infrastructure cost and cost-to-performance ratio.