

IEEE 802 LAN/MAN STANDARDS COMMITTEE (LMSC)

CRITERIA FOR STANDARDS DEVELOPMENT (CSD)

Based on IEEE 802 LMSC Operations Manuals approved 4 August 2020
Last edited 31 August 2020

P802.1Qdt Standard for Local and Metropolitan Area Networks--Bridges and Bridged Networks Amendment Priority-based Flow Control Enhancements

1. IEEE 802 criteria for standards development (CSD)

The CSD documents an agreement between the WG and the Sponsor that provides a description of the project and the Sponsor's requirements more detailed than required in the PAR. The CSD consists of the project process requirements, 1.1, and the 5C requirements, 1.2.

1.1 Project process requirements

1.1.1 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.

Item a) is applicable to this project. This project will develop necessary managed objects described by a YANG model and will update existing SNMP MIBs.

1.1.2 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.

NA. This project is not a wireless project; therefore, the CA document is not applicable.

1.2 5C requirements

1.2.1 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.

The data center market continues to grow very fast. Networks with tens of thousands of nodes are common in cloud data centers. There is a trend to converge computing and storage on Ethernet in data center networks, supporting cloud services and high-performance applications such as Artificial Intelligence (AI), Machine Learning (ML), and High-Performance Computing (HPC). Remote Direct Memory Access over Converged Ethernet (RoCEv2) is widely deployed, both within data centers and across data center interconnects. RoCEv2 requires lossless operation on Ethernet to avoid wasteful retransmissions. Priority-based Flow Control (PFC, specified in IEEE Std 802.1Q) enhancements make Ethernet technology more applicable and appealing for data center environments.

- b) Multiple vendors and numerous users.

Most cloud data center providers are using RoCEv2 within their networks, require lossless operation, and currently need to configure PFC manually. RoCEv2 is also used by large enterprises, financial institutions, and other high-performance computing environments. Further there is strong interest in accessing new high-speed solid-state data storage technologies over Ethernet networks using RoCEv2. There are public cloud vendor requirements for Media Access Control Security (MACsec, specified in IEEE Std 802.1AE) integrity and confidentiality protection of all frames transmitted between geographically distributed data centers.

1.2.2 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.

The project will be in conformance with IEEE Std 802, IEEE Std 802.1AC, and the existing provisions of IEEE Std 802.1Q.

The review and response is not required if the proposed standard is an amendment or revision to an existing standard for which it has been previously determined that compliance with the above IEEE 802 standards is not possible. In this case, the CSD statement shall state that this is the case.

1.2.3 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.

There are no other IEEE 802 standards or projects that specify automatic configuration of PFC headroom, and the current standard does not adequately specify MACsec protection of PFC frames. Interoperability issues have been encountered.

1.2.4 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.

The proposed project incorporates techniques for peer-to-peer link delay measurement and information exchange mechanisms that are currently specified and available in many production bridges and end-stations. PFC operation with MACsec support has been deployed, although existing implementations do not necessarily interoperate.

b) Proven similar technology via testing, modeling, simulation, etc.

The proposed project enables peer nodes to advertise the new capability through the Data Center Bridging Capability Exchange (DCBX, specified in IEEE Std 802.1Q) mechanism which is widely deployed today using “Link Layer Discovery Protocol (LLDP, specified in IEEE Std 802.1AB). Roundtrip delay measurements for participating systems are based on the existing Precision Time Protocol (PTP, specified in IEEE Std 1588) delay measurement mechanism.

1.2.5 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.

The proposed project can reduce cost of data center bridges by avoiding wasting memory.

b) Balanced costs.

The proposed project does not change the cost characteristics of bridges and end stations.

c) Consideration of installation costs.

A modest reduction in installation cost of new equipment is expected.

There are no incremental installation costs relative to the existing PTP and DCBX that will be used by the proposed standard.

d) Consideration of operational costs (e.g., energy consumption).

The proposed project can reduce operational cost by configuration automation.

e) Other areas, as appropriate.

No other areas have been identified.