IEEE 802 LAN/MAN STANDARDS COMMITTEE (LMSC)

CRITERIA FOR STANDARDS DEVELOPMENT (CSD)

Based on IEEE 802 LMSC Operations Manuals approved 15 November 2013
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P802.1Qdd Standard for Local and metropolitan area networks - Bridges and Bridged Networks
Amendment: Resource Allocation Protocol (RAP)

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.

This project will use method a). The managed objects definitions will be part of this project.

1.1.2 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? (yes/no)
 b) If not, explain why the CA document is not applicable.

This project will use method b). This project is not a wireless project.

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.
b) Multiple vendors and numerous users.

The original version of 802.1Q Multiple Stream Reservation Protocol (MSRP) has been successfully and widely accepted by the Professional, Industrial, Consumer, and Automotive markets as an essential tool to realize automatic stream setup with dynamic resource allocation. The success of MSRP has expanded the requirements on that protocol beyond that capability. RAP addresses the expanded markets.

Multiple vendors and users for Industrial Automation, Professional Audio-Video (AV), automotive and other systems requiring a protocol to signal the resource reservation along the end-to-end paths of streams for time-sensitive applications will participate in the development of the project.

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 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.

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

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.

No existing 802 standard or approved project provides end-to-end distributed stream reservation that supports the required performance and capabilities.

This amendment differs from the existing 802.1Q MSRP and its enhancements being specified in IEEE P802.1Qcc in that Resource Allocation Protocol (RAP) will be an application for Link-local Registration Protocol (LRP) being specified by IEEE P802.1CS, while MSRP is specified as an application for 802.1Q Multiple Registration Protocol (MRP). RAP will leverage the LRP mechanisms to support much larger application databases and to transfer data more efficiently than MRP can support.

This amendment will specify a signaling protocol for use in the fully distributed model, which enables resource allocation for the streams that desire using the 802.1 Time-Sensitive Networking (TSN) features defined by IEEE 802.1Q and IEEE 802.1CB, such as the QoS functions and redundancy. Such capabilities are neither supplied by the original MSRP nor by its enhancements.

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.

RAP is similar in principle to the successful MSRP. RAP will build on LRP to provide additional capabilities.

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

There is a considerable body of experience in supplying data streams with guarantees for quality of service parameters such as latency, latency variation, or bandwidth. Mechanisms needed for this project are widely used by other protocols already, e.g. 802.1Q MSRP for use in bridged networks and the Resource Reservation Protocol (RSVP, IETF RFC 2205, and IETF RFC 2750) for routers and hosts that use the Internet Protocol.

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) 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 well-established balance between infrastructure and attached stations will not be changed by the proposed amendment.

The amendment will specify an application for LRP and add no additional hardware costs to bridges and end stations beyond the minimal and firmly bounded resources consumed by LRP.

The cost factors, including installation and operational costs are well-known from existing MSRP that is built on MRP. The proposed amendment will specify an application running over LRP that supports a larger database with fewer message exchanges and thus will provide better economic feasibility than MSRP built on MRP.