PAR and CSD notes for Cyclic Queuing and Forwarding

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PAR

- Title
- Scope
- Purpose
- Need

Title

- Standard for Local and metropolitan area networks—Bridges and Bridged Networks Amendment: Cyclic Queuing and Forwarding

Scope

- This amendment specifies synchronized cyclic enqueuing and queue draining procedures, managed objects, and extensions to existing protocols that enable bridges and end stations to synchronize their transmission of frames to achieve zero congestion loss and deterministic latency.

Purpose and need

- This amendment specifies a transmission selection algorithm that allows deterministic delays through a bridged network to be easily calculated regardless of network topology.

- This is an improvement of the existing techniques that provides much simpler determination of network delays, reduces delivery jitter, and simplifies provision of deterministic services across a bridged LAN.

CSD

- Managed objects
- Coexistence
- Broad market potential
- Compatibility
- Distinct identity
- Technical feasibility
- Economic feasibility

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.

- Changes to the definition of managed objects in IEEE 802.1Q will be developed as part of this project.

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 is not a wireless project so a Coexistence Assurance (CA) document is not applicable.

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 proposed amendment will apply to 802 networks composed of full duplex IEEE 802.3 and Coordinated Shared Networks (CSN) such as IEEE 802.11 networks and Multimedia over Coax Alliance (MoCA) networks.

- This amendment is proposed based on requests from customers, equipment providers, and silicon providers who want to provide truly deterministic delays through 802 bridged VLAN systems. These capabilities have been requested by the industrial, automotive, and audio/video markets. (The Avnu Alliance is an industry alliance that promotes industry standards for AV, including the AV support provided by IEEE Std 802.1Q – see www.avnu.org.)

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 the 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.

- This is an amendment to IEEE Std 802.1Q and will be internally consistent.
- n/a

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 is no existing 802 standard or approved project that provides the easily calculated deterministic and distributed delays provided by this project.

- The proposed amendment will consist of a single set of specifications for the enhancements. Existing shapers can reduce delays or improve the delay characteristics, but do not provide easily calculated deterministic network delays.

- The proposed project will be formatted as an amendment to IEEE 802.1Q.

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.

- The techniques used in this specification are based on methods used in digital telecom circuit switches and IEEE 1394 (Firewire) systems which have been proven to be reliable.
- This amendment is based on externally observable synchronized buffering and queuing techniques.

Economic Feasibility

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 this enhancement.

- The cost factors are well known from similar technologies and proportional to the benefits gained.

- It will be possible for configuration related to the enhancements to be automatic and require no action by the user; therefore, there are no incremental installation costs for the provision of these enhancements.

- Adding the enhancements will have a negligible or positive impact on the operational cost of 802 networks.