

## **Congestion Management PAR (P802.1xx)**

### **5 Criteria**

#### **1. Broad Market Potential**

A standards project authorized by IEEE 802 shall have a broad market potential. Specifically, it shall have the potential for:

- a) Broad sets of applicability.
- b) Multiple vendors and numerous users
- c) Balanced costs (LAN versus attached stations)

High-speed short-range networks such as data centers, backplane fabrics, computing clusters, and storage networks, represent a new and very broad application space for 802.1/802.3 LANs. Established applications solutions use transport mechanisms other than TCP, e.g. UDP, Infiniband, Fibre Channel, and proprietary fabrics, that expect the network to have an extremely low probability of frame loss.

There is significant customer interest and market opportunity for Ethernet as a consolidated Layer 2 solution for these applications, sufficient to support a number of vendors in this space.

This solution may be implemented solely in the bridges, or in both the bridges and in the attached stations, according to the customers' preferences for cost distribution. The overall cost to the customer is greatly reduced, because multiple parallel networks are consolidated into a single IEEE 802 network.

#### **2. Compatibility**

IEEE 802 defines a family of standards. All standards shall be in conformance with the IEEE 802.1 Architecture, Management and Interworking documents as follows: 802. Overview and Architecture, 802.1D, 802.1Q and parts of 802.1f. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with 802.

Each standard in the IEEE 802 family of standards shall include a definition of managed objects which are compatible with systems management standards.

The mechanisms will be defined in a manner such that stations or bridges employing them will remain perfectly compatible with stations or bridges that do not. A network consisting of a mixture of old and new bridges and stations can be configured to behave at least as well as an old network with respect to congestion and latency, while applications obtain incremental benefit from the compliant equipment.

This amendment will include extensions to MIBs, existing or under development as part of other 802.1 projects, to allow management of

congestion management as a natural extension of existing capabilities. As a supplement to IEEE Std. 802.1Q, the proposed project will remain in conformance with the 802 Overview and Architecture. Managed objects will be defined consistent with existing policies and practices for 802.1 standards.

### **3. Distinct Identity**

Each IEEE 802 standard shall have a distinct identity. To achieve this, each authorized project shall be:

- a) Substantially different from other IEEE 802 standards.
- b) One unique solution per problem (not two solutions to a problem).
- c) Easy for the document reader to select the relevant specification.

There is no existing standard that provides these capabilities for congestion management in IEEE 802 networks.

A single framework is envisaged for the standard.

IEEE 802.1Q will continue to be the standard for bridges.

### **4. Technical Feasibility**

For a project to be authorized, it shall be able to show its technical feasibility. At a minimum, the proposed project shall show:

- a) Demonstrated system feasibility.
- b) Proven technology, reasonable testing.
- c) Confidence in reliability.

The widespread use of Infiniband and Fibre Channel has proven the feasibility of providing an extremely low probability of frame loss and low latency across a network with a small number of hops.

The techniques proposed for this standard have been shown to be workable, by control theory analysis and by simulation, in the targeted networks.

The techniques proposed for this standard do not decrease the reliability of the network.

### **5. Economic Feasibility**

For a project to be authorized, it shall be able to show economic feasibility (so far as can reasonably be estimated), for its intended applications. At a minimum, the proposed project shall show:

- a) Known cost factors, reliable data.
- b) Reasonable cost for performance.
- c) Consideration of installation costs.

The overall cost of the network will be lowered, because parallel networks (Ethernet for transport outside the cluster, plus one or two networks for transport of interprocessor communication and storage data) are reduced to a single IEEE 802 network.

The additional features required to implement this capability are a small incremental cost to that of an existing bridge or station, when compared to existing IEEE 802 costs, and significantly lower than that of multiple networks.

There is no increase in installation costs over that of an existing IEEE 802 network.