Forwarding and Queuing for Time-Sensitive Streams

Draft 5 Criteria

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Broad Market Potential

Broad set(s) of applicability

Multiple vendors and numerous users

Balanced cost (LAN vs. attached stations)

- Carrying time-sensitive streaming applications with guaranteed QoS represent a new and very broad application space for IEEE 802 technologies. This requires a defined rules for reserving internal bridge resource, admission control and rules for packet queuing and forwarding along the end-to-end paths of streams.
- Many vendors and users have expressed their support for a standardized requirements for internal resource reservation and packet queuing and forwarding rules to facilitate the use of bridged LANs for time-sensitive applications.
- Simple queuing and forwarding rules combined with simple internal bridge resource allocation rules will not impact complexity of the bridge design in a significant way, preserving at large the cost model for bridges.

Compatibility with IEEE Std. 802.1

Conformance with 802 Overview and Architecture

Conformance with 802.1D, 802.1Q

Conformance with 802 Functional Requirements

- As an extension to IEEE Std. 802.1Q-2005, the proposed standard will conform to the aforementioned documents.
  - The standard defines optional queuing and forwarding rules as well as internal bridge resource allocation rules for certain traffic classes for bridges with support for 802.1 AVB.
  - No new mandatory bridge packet queuing and forwarding rules are defined by this standard

Distinct Identity

Substantially different from other IEEE 802 standards
Unique solution for problem (not two alternatives / problem)
Easy for document reader to select relevant spec.

- There is no existing 802 standard or approved project that defines packet queuing and forwarding rules and internal bridge resource allocation rules enabling deterministic end-to-end performance guarantees for time-sensitive streams.

Technical Feasibility

Demonstrated system feasibility; reports – working models

Proven technology, reasonable testing

Confidence in reliability

- Forwarding and Queuing rules for time-sensitive traffic have been a subject of research for the last 10 years
  - Research addressed also bridge resource allocation and admission control rules
- There are number of research papers with specific solutions and reports of prototype networks.
- Some queuing schemes are tested in existing standards such as IEEE 1394, which are proven technologies
- Prior art gives grounds to be confident in achieving reliability of the proposed solution

Economic Feasibility

Known cost factors, reliable data

Reasonable cost for performance expected

Consideration of installation costs

- Proposed standard builds on the existing knowledge in the research community as well as on the existing technologies. Known cost factors will include small additional area in the bridge silicon for implementation of the logic of proposed queuing/forwarding rules.
- Adding queuing/forwarding rules for time-sensitive streams will be optional, and will have insignificant impact on the current cost of bridges.
- It is expected that solution will require no installation or configuration.