

# PBB-TE Infrastructure Protection Proposed PAR

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# Title

- PAR for an amendment to an existing Standard 802.1Q
- P802.1Qbc (or Qbd, etc., as appropriate)
- IEEE Standard for Local and Metropolitan Area Networks---Virtual Bridged Local Area Networks - Amendment: PBB-TE Infrastructure Segment Protection

# Scope

**This standard specifies procedures and managed objects to provide 1:1 (M:1 if practical) protection switching, without modifying data or control frames and using CFM, for a group of Traffic Engineered Service Instances (TESIs) that traverses a sequence of LANs and intervening bridges. Operator requests and operational modes consistent with those supported by PBB-TE TESI Protection are specified.**

# Purpose

**Allows service providers to:**

- **Address the relatively high failure rate of particular links or bridges within a network.**
- **Address the likelihood of concurrent failures occurring in different segments of a network.**
- **Allow maintenance activities to be performed independently in different segments of the network.**
- **Allow maintenance activities to be performed in one segment of a network without disabling protection in another segment.**
- **Localize changes in traffic distribution due to failure or maintenance actions.**

# Need

- It is anticipated that Traffic Engineered bridged networks will be widely deployed when the PBB-TE (IEEE 802.1Qay) standard becomes available. Currently, only a hierarchy of end-to-end 1:1 TESI protection is specified. Localized infrastructure protection is supported by TDM-based and MPLS-based networks. A simple localized protection capability would strengthen the applicability of PBB-TE networks.

# Stakeholders

- Vendors, users, administrators, designers, customers, and owners of traffic-engineered bridged networks.

# Other standards with similar scope

- There are no standards providing localized protection for IEEE 802.1Q PBB-TE networks that preserve the frame format. Coordination with ITU on projects with related scope is in progress through overlapping membership as has been the case for prior P802.1 projects.

# Five Criteria

# Broad Market Potential

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

- **Broad sets of applicability.**
  - The commercial provision of Traffic Engineered services is a large and growing business. This type of localized protection switching would be advantageous.
- **Multiple vendors and numerous users.**
  - The same large body of vendors and users having a requirement for IEEE 802.1Qay.
- **Balanced costs (LAN versus attached stations).**
  - This project does not materially alter the existing cost structure of bridged networks.

# 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.
  - This PAR is for an amendment to 802.1Q designed to be interoperable with existing deployments and does not modify data or control frames (see scope).
- Each standard in the IEEE 802 family of standards shall include a definition of managed objects that are compatible with systems management standards.
  - Such a definition will be included.

# Distinct Identity

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

- Substantially different from other IEEE 802 standards.
  - This enhancement to 802.1Qay-2009 is distinct because it offers local protection switching while preserving the frame format.
- One unique solution per problem (not two solutions to a problem).
  - There are no other standard solutions to localized recovery with no increase in overhead in a Traffic Engineered bridged network.
- Easy for the document reader to select the relevant specification.
  - This project will amend the only IEEE 802 standard defining Traffic Engineered bridged networks.

# 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:

- Demonstrated system feasibility.
  - The function is similar in complexity to PBB-TE end-to-end TESI protection which is currently specified by amendment 802.1Qay to 802.1Q, which has been successfully implemented.
- Proven technology, reasonable testing.
  - The function can be implemented using existing bridge behaviors. Compliance with the project can be tested using straightforward extensions of existing test tools for bridged networks.
- Confidence in reliability.
  - The reliability of the modified protocols will be not be measurably worse than that of the existing Traffic Engineered Bridged networks.

# 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:

- Known cost factors, reliable data.
  - This project introduces no hardware costs beyond the minimal and well-known resources consumed by extending an existing software protocol.
- Reasonable cost for performance.
  - The cost of upgrading software and configuring a priori knowledge of the overall system topology is reasonable for the significant reduction in the time required to recover from a network failure.
- Consideration of installation costs.
  - The cost of installing enhanced software, in exchange for improved network performance, is familiar to vendors and users of bridged networks.