

Type of Project: Amendment to IEEE Standard

Status: Unapproved PAR, Std 802.1Q-2005

Project No.: P802.1Qa?

Title: IEEE Standard for Local and Metropolitan Area Networks---Virtual Bridged Local Area Networks – Amendment ??: Provider Backbone Bridge Traffic Engineering

Amendment/Corrigenda Title: ??: Provider Backbone Bridge Traffic Engineering

Scope: This amendment will support provisioning systems that explicitly select traffic engineered paths within Provider Backbone Bridge Networks (P802.1ah) by allowing a network operator to disable unknown destination address forwarding and source address learning for administratively selected VLAN Identifiers, while allowing other network control protocols to dynamically determine active topologies for other services. These interoperable capabilities will be supported by SNMP MIB management of individual bridges, by extensions to the other control protocols specified in this standard, by the use of CFM with the addresses and VLAN Identifiers that specify traffic engineered connections, and by 1:1 path protection switching capable of load sharing.

Purpose: An essential requirement of many provider networks is supporting traffic engineered paths. Complete route selection freedom must be allowed for a large number of paths. This amendment enables a Service Provider to traffic engineer provisioned paths in a Provider Backbone Bridged network while scaling the number of paths to the limits of the 802 MAC address space. This amendment will enable a service provider to use familiar 802.1 bridging technology to traffic engineer provisioned paths in a Provider Backbone Bridged network while scaling the number of service instances potentially supported to the limits of the 802 MAC address space.

Need for the Project: Provider networks rely on direct control of path routing so that traffic engineering can be used to allocate bandwidth, assure diverse backup path routing, and select path performance as required by service level agreements. Most major carriers, who will be the users of this standard, are currently deploying IEEE 802 based networks and will need traffic engineering capabilities, for load balancing, protection switching, bandwidth management, etc. The existing architecture of bridges and their associated protocols, as specified by 802.1 standards and P802.1ah (Provider Backbone Bridged Networks), allows the further specification of interoperable bridge capabilities that support traffic engineering at the required scale. This project will develop that specification, meeting the (as yet unsatisfied) demand for multi-vendor interoperability and a coherent management framework.

Stakeholders for the Standard: Developers and users of networking for Provider network environments including networking IC developers, switch and NIC vendors.

5 Criteria for P802.1ah

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).

This project is intended to provide traffic engineered paths for Provider Backbone Bridged P802.1ah networks using existing Bridged and Virtual Bridged LAN technologies. Despite user demand and initial deployment of scalable, traffic engineered, point-to-point path solutions for 802 networks no standards currently exist.

Most major carriers are currently deploying traffic engineered path solutions within their networks to meet the demands of transition from existing leased line service.

The costs related to this technology should be broadly similar to those of existing Bridging technology based on 802.1Q-2005/802.1ad.

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.

This standard will be compatible with work evolving in the current projects P802.1ah and P802.1ag.

This project will be compatible with existing 802.1 Architecture, Management and Interworking 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 other IEEE standards or projects that allows traffic engineered paths with complete route selection freedom within a Bridged network.

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 proposed standard will be based on existing, proven, standardized, Bridged LAN and Virtual Bridged LAN technology. This technology is widely implemented, is highly reliable.

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 technology that will be developed in the proposed standard will not differ significantly from the economic factors associated with existing Bridged LAN and Virtual Bridged LAN technologies. The costs factors for Virtual Bridged LAN technology are favorable when compared to existing provider networks based on MPLS or SONET.