

Multiple I-SID Registration Protocol (MIRP)

Proposal for PAR and 5 Criteria

Version 4

Norman Finn

Cisco Systems

Project Authorization Request

Title

- PAR for an amendment to an existing Standard 802.1Q-2005
- P802.1Qbc (or Qbd, etc., as appropriate)
- IEEE Standard for Local and Metropolitan Area Networks---Virtual Bridged Local Area Networks - Amendment: Multiple I-SID Registration Protocol (MIRP)

Scope

- This standard specifies protocols, procedures, and managed objects to support topology change signaling to alter the binding (held in an I-Component) of Customer addresses to Backbone addresses on a per-I-SID basis. This is accomplished by extending the use of the Multiple Registration Protocol (MRP).

Purpose

- MIRP provides the capabilities necessary when topology changes occur in networks attached to a Provider Backbone Bridged Network. A Backbone Edge Bridge (BEB) signals to other potentially affected BEBs the need to alter certain learned associations between Customer MAC Addresses and Backbone MAC Addresses. An access cloud that has an I-tagged connection to a Backbone network signals both its requirements for specific services, and topology change events in those services.

Need

- The deployment of IEEE Provider Backbone Bridged Networks, including I-tagged connections between these networks, has raised requirements for both signaling among Provider Edge Bridges the need to forget MAC address associations, and for extending the capabilities of MRP to backbone service identifiers. In the absence of MIRP, customer connections across a Provider Backbone Network can take several minutes to restore connectivity after a topology change in an access network.

Stakeholders

- Vendors, users, administrators, designers, customers, and owners of Provider Backbone Bridged Networks.

Other standards with a similar scope

- There are no standards solving this problem for IEEE 802.1Q bridges. Partial solutions to this problem have been offered to the IETF for the VPLS environment, and the problem has been discussed in ITU-T for the G.8032 ring environment. IEEE 802.1 intends that the semantics of the protocol commands and the data formats encoded in the MIRP PDUs be coordinated with ITU-T, for use in ITU-T topologies.

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 Ethernet services across metropolitan or larger networks is a large and growing business. Provider Backbone Networks are a significant part of this market. MIRP can significantly speed recovery from failover in these networks.

- Multiple vendors and numerous users.

Multiple bridge vendors offer the Provider Backbone Networks that need this protocol, and have proprietary solutions.

- 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, which defines MRP. MRP was designed to add exactly the type of application proposed by this PAR.

- 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.
There are no standards solving this problem in other IEEE 802 standards.
- One unique solution per problem (not two solutions to a problem).
There are no other standard solutions to this problem.
- Easy for the document reader to select the relevant specification.
This project will amend the only IEEE 802 standard defining Provider 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 wide deployment of MRP-based applications shows that the very similar MGRP is feasible.

- Proven technology, reasonable testing.

MRP Applications, including MGRP and MGRP, are a proven technology. 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 significantly worse than that of the existing MRP applications.

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 an additional software protocol whose requirements are firmly bounded.

- Reasonable cost for performance.

The cost of upgrading software and configuring the protocol is reasonable, given the improvement in recovery time due to a network topology change.

- 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.