IEEE-SA Standards Board Project Authorization Request (PAR) Page1 (Dec98,Rev V1)

1. Sponsor Date of Request [xxxx1999]

2. Assigned Project Number [P802.1?]

3. PAR Approval DATE _____
[ ] PAR Signature Page Received {IEEE Staff to check Box}

4. Project Title and Working Group/Sponsor for this Project
Document type : {Place an X in only one option below}
[X] Standard for {Document stressing the verb "SHALL"}
[ ] Recommended Practice for {Document stressing the verb "SHOULD"}

TITLE: [Supplement to ISO/IEC 15802-3 (802.1D): Information Technology - Telecommunications and information exchange between systems - Local & Metropolitan Area Networks - Common specifications - Part 3: Media Access Control (MAC) Bridges – Rapid Reconfiguration]
{Copyright release at the end of this form must be submitted with appropriate signatures by postal mail or FAX (1-732-562-1571)}

Name of Working Group(WG) : [802.1]

Name of Official Reporter (usually the WG Chair) who MUST be an SA member as well as an IEEE/Affiliate Member: [William P. Lidinsky]
Title in WG: [WG Chair] IEEE/Affiliate Memb # [1069269SM]
Organization: [HEPNRC at Fermilab] Telephone: [630-840-8067]
Address: [M/S 368, PO Box 500, Kirk Rd. & Pine St.] FAX: [630-840-8463]
City/State/Zip: [Batavia/IL/60510] EMAIL: [lidinsky@hep.net]

Name of WG Chair (if different than Reporter): [--]
IEEE/Affiliate Memb # [ ]{Required}
Company: [ ] Telephone: [ ]
Address: [ ] FAX: [ ]
City/State/Zip: [ ] EMAIL: [ ]

Name of Sponsoring Society and Committee: [IEEE Comp. Soc. / LMSC]
Name of Sponsoring Committee Chair: [Jim Carlo]
Organization: [Texas Instrument] Telephone: [214-340-8837]
Address: [9208 Heatherdale Dr.] FAX: [214-853-5274]
City/State/Zip: [Dallas/Texas/75243] EMAIL: [jcarlo@ti.com]

5. Describe this Project by answering each of four questions below:

5a.  Update an existing PAR? {Yes/No} [NO]
  If YES: Indicated PAR number/approval date [--]
  If YES: Attach cover letter indicating changes/rationale for changes.
  If YES: Is this project in ballot now? [--] {Yes/No}

5b.  Choose one from the following:
b1 -[  ] New Standard
b2 -[  ] Revision of existing standard {number and year} [  ]
b3 -[XX] Amendment (Supplement) to existing standard {number and year}
      [802.1D-1998]
b4 -[  ] Corrigenda to existing standard {number and year} [  ]

5c.  Choose one from the following:
  c1 -[XX] Full Use (5-year life cycle)
  c2 -[  ] Trial Use (2-year cycle)

5d.  Choose one from the following:
  d1 -[XX] Individual Sponsor Ballot Process
  d2 -[  ] Entity (not Individual) Sponsor Ballot Process

5d.  Fill in Target Completion Date to IEEE RevCom [2001]

6.  Scope of Proposed Project
{what is being done, including technical boundaries on the work}
[Specification of enhancements to the auto-configuring mechanisms and management controls in 802.1D-1998 that constrain user data frames to all or part of a loop free topology. Where redundant alternate bridges and/or connecting LANs are available, these enhancements will provide faster reconfiguration and restoration of the MAC service if LAN component failure occurs.] {This should be brief (less than 5 lines recommended)}

7. Purpose of Proposed Project:
{why it is being done, including intended users, and benefits to users}
[LAN based applications, including new voice and multi-media solutions, are increasingly mission critical and require much improved network availability and scalability. An availability strategy that includes redundant bridges and LAN media, together with rapid failure detection and reconfiguration, allows the use of currently available cost effective LAN components. Techniques that are broadly compatible with 802.1D-1998, but not interoperable, are now emerging from multiple vendors. The proposed project will provide users with interoperable solutions.] {This should be brief (less than 5 lines recommended)}

8. Intellectual Property {Answer each of the questions below}
8a. Are you aware of any patents relevant to this project?
  [NO] {Yes, with detailed explanation below/ No}
  [--] {Explanation}

8b. Are you aware of any copyrights relevant to this project?
  [NO] {Yes,with detailed explanation below/ No}
  [--] {Explanation}

8c. Are you aware of any trademarks relevant to this project?
  [NO] {Yes, with explanation below/ No}
  [--] {Explanation}

8d. Are you aware of any registration of objects or numbers relevant to this project?
  [NO] {Yes, with explanation below/ No}

9. Are you aware of other standards or projects with a similar scope?
[NO]{Yes, with explanation below/ No}
[--] {Explanation}10. International Harmonization
Is this standard planned for adoption by another international organization?
[YES] {Yes/No/?? if you don’t know at this time}
If Yes: Which International Organization [ISO/IEC JTC 1]
If Yes: Include coordination in question 13 below
If No: Explanation [--]

11. Is this project intended to focus on health, safety or environmental issues?
[NO] {Yes/No/?? if you don’t know at this time}
If Yes: Explanation? [--]

12. Proposed Coordination/Recommended Method of Coordination

12a. Mandatory Coordination
SCC 10 (IEEE Dictionary) by [DR]
IEEE Staff Editorial Review by [DR]
SCC 14 (Quantities, Units and Letter symbols) by [DR]

12b. Coordination requested by Sponsor and Method:
[ISO/IEC JTC1 SC6] by [DR/LI]
[IETF] by [DR]
{circulation of DRafts/LIaison memb/COmmon memb)
{Choose DR or LI or CO for each coordination request}

12c. Coordination Requested by Others:
[ ] {added by staff}

Additional Explanation Notes: {Item Number and Explanation}
[see attachment : “5 Criteria for 802.1? Rapid Reconfiguration PAR”]{If necessary, these can be continued on additional pages}

## 5 CRITERIA FOR 802.1? MAC BRIDGES : RAPID RECONFIGURATION PAR

1. Broad Market Potential
   + Broad set(s) of applicability
   + Multiple vendors and numerous users
   + Balanced costs (LAN versus attached stations)

All LAN based applications should benefit from rapid reconfiguration enhancements to MAC Bridges. Currently LAN availability, in the face of component failure or unanticipated change, falls far short of desirable. Sophisticated users resort to network timing analysis and manual configuration, or alternate network designs, in partial mitigation of this problem. The proposed enhancements will retain the operational and management simplicity that has characterized the success of MAC Bridges, while allowing multi-vendor bridged local area networks with redundant potential connectivity to reduce service disruption as a consequence of component failure to a much lower level. In particular service should always be restored within the timeout periods of higher level protocols, and usually within human acceptable times for interactive applications including voice and multi-media, even with default auto-configuration parameters.

Since many organization that use local area networks now regard the principal applications supported by those networks as mission critical, the proposed enhancements are anticipated to have broad market appeal and benefit many users.
Most vendors of MAC Bridges advise ways of configuring bridged local area networks to mitigate against the effects of component failure or accidental removal from service, and some have introduced proprietary supporting techniques. This proposal has attracted broad support in the vendor community.

The proposed standard will not significantly alter the existing balance of costs between the LAN infrastructure and attached end stations.

2. Compatibility with IEEE standards
   + Conformance with bridging 802.1D
   + Conformance with VLANs 802.1Q

The proposed standard will conform to the 802.1 Architecture, Management and Interworking standards, in particular it will:

- Conform to IEEE Std. 802 Overview and Architecture and the anticipated revision of that standard, now nearing completion.

- Revise IEEE Std. 802.1D, but include a defined level of compatability with 802.1D-1998. To ease deployment of new MAC Bridges conforming to the proposed standard, mechanisms and/or provisions will be included to allow such new bridges to be added to networks of existing 802.1D-1998 conformant bridges while providing at least the same level of service.

- Be compatible with 802.1Q, including any approved supplements to 802.1Q that exist on completion.

- Provide a definition of managed objects compatible with system management standards.

3. Distinct Identity
   + Substantially different from other specs / solutions
   + Unique solution for problem (not two alternatives / problem)
   + Easy for document reader to select relevant spec

The proposed standard is an enhancement to IEEE Std. 802.1D. It differs from the existing 802.1D-1998 standard by providing the benefits described above. No other 802.1 standard or proposed standard does so. No comparable standard or work exists elsewhere in 802. While access methods have their own reliability provisions, the individual LANs that they define are commonly interconnected by 802.1D compatible equipment. For example, though P802.3ad (Link Aggregation) can protect against the failure of some subset of a number of parallel links, it cannot be used to select an alternative path following the failure of a bridge.

The proposed standard differs from LAN based network reconfiguration and solutions standardized by organizations other than IEEE 802 in that reconfiguration and restoration of service is transparent to attached end stations : no end stations have to transmit to different MAC addresses or adopt different MAC addresses to complete the reconfiguration. In cases where component failure can be detected by physical level LAN interface signalling, the proposed standard offers service restoration much more quickly than the typical operating system based delays exhibited by those alternatives.

The proposed standard builds upon the widely deployed and accepted 802.1D Spanning Tree Protocol while including sufficient compatibility provisions to avoid the need for an either “old” or “new” choice for the user of the standard. Progressing the proposed standard as a revision to 802.1D-1998 should ensure that the document reader finds the new specification naturally.

4. Technical Feasibility
   + Demonstrated feasibility; reports – working models
   + Proven technology, reasonable testing
   + Confidence in reliability

The 802.1D Spanning Tree Protocol has been established and widely deployed for over ten years, and is familiar to the operators and users of LANs. The proposed enhancements are based in part on rapid failover techniques that have been widely sold and deployed, and in part on extensive analysis, simulation, and prototyping. Those features already implemented in some vendors products have demonstrated feasibility for part of this work.

5. Economic Feasibility
   + Cost factors known, reliable data
   + Reasonable cost for performance expected
   + Total installation costs considered

Redundantly configured and connected bridged local area networks are widely deployed today, so their costs are accurately known. In typical redundantly configured installations, the connections to ordinary end stations and the bridges (wiring closet switches) that are attached to them are not spared. The costs of these usually comprise the greater part of an entire installation, so the total cost of the redundant solution is rather less than twice that of the non-redundant alternative.
While the widespread adoption of redundant configurations argues reasonableness for the cost of the currently provided levels of availability, the proposed standard offers improved availability performance and hence added attractiveness through quicker restoration of service. The proposed standard will lower the administrative costs associated with highly available redundant solutions by retaining mechanisms (802.1D Spanning Tree) familiar to users, but removing any need for manual configuration.
The users' familiarity with spanning tree is also a factor in minimizing installation costs. It is further expected that the proposed standard might be implemented on much existing equipment through software upgrades in the field, while compatibility with the existing 802.1D-1998 standard in an operational network should enable piece-meal deployment, much dimishing the costs associated with planning improvements to and disrupting mission critical networks.