RPRSG

5 Criteria

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

- Presentations given to the Resilient Packet Ring Study Group has identified customer demand for resilient packet rings in the following application areas:
  - ISP Intra-POP LANs
  - Inter-POP MANs and WANs (e.g. ISP; MSO; *LEC)
  - Enterprise Campus LAN Backbones
  - Enterprise MANs and WANs
  - Multi-provider customer access MANs

- An efficient bandwidth sharing mechanism for ring topologies will provide optimum cost / performance for the identified application areas.

- At an 802 tutorial session, 33 individuals representing 14 organizations (including vendors of computer systems, networking systems, networking silicon, and Internet Service Providers) expressed interest in working on a standards project in this area. An RPRSG interim meeting was attended by 26 individuals representing 13 organizations. An RPRSG plenary meeting was attended by 29 individuals representing 19 organizations.

- In Metropolitan and Wide Area Networks, the medium (fiber optic cable) represents a significant portion of the total hardware cost. This standard will optimize the cost balance between the network medium and the station attachment hardware for ring topologies.

2. Compatibility

- 802. Overview and Architecture
- 802.1D, 802.1Q, 802.1f.
- Systems management standards.

- The Resilient Packet Ring standard will be fully compatible with the 802 Overview and Architecture document.

- The Resilient Packet Ring standard will be compatible with the relevant portions of 802.1D, 802.1Q and 802.1f.

- The Resilient Packet Ring standard will be compatible with the Simple Network Management Protocol. The MIB for RPR will be defined and submitted to the IETF.

- Selection of the frame format for the RPR is a subject of investigation for the working group. At the present time the 802.3 frame format with either the TYPE or LENGTH interpretation is being given prime consideration.

3. Distinct Identity

- Substantially different from other IEEE 802 standards.
- One unique solution per problem (not two solutions to a problem).
- Easy for the document reader to select the relevant specification.

- There is no other IEEE 802 standard which addresses high speed (622 Mbps and above) ring topologies optimized for data transmission.

- There is no other IEEE 802 standard which specifies a bandwidth sharing algorithm for data rates in excess of 1 Gbps.

- This standard will provide a solution which provides high speed, scalable, resilient ring based networks featuring spatial reuse and protection mechanisms (capable of sub 50 ms switching).

- The standard will define a single Media Access Control algorithm, along with multiple Physical Layer options, formatted in a fashion similar to other 802 standards.

4. Technical Feasibility
- Demonstrated system feasibility.
- Proven technology, reasonable testing.
- Confidence in reliability.

- Presentations given to the RPRSG have demonstrated the technical feasibility of candidate protocols using simulation. Empirical results will be presented at a future meeting.
- Several implementations of candidate protocols exist in the industry, embodied in commercially available products comprising:
  - Systems (routers, switches, Add drop nodes for optical networks, hubs)
  - Host interfaces (NICs)
  - Chipsets
  - Optical components
- Implementations of candidate protocols are currently deployed in major Service Provider and enterprise environments.
- Simulations have been used to demonstrate the feasibility of reliable protocols under a range of operating conditions. Traffic models, configurations and metrics for evaluating candidate protocols will be developed as part of the working group.

5. Economic Feasibility

- Known cost factors, reliable data.
- Reasonable cost for performance.
- Consideration of installation costs.

- Several implementations of high speed resilient packet ring networks exist in the industry from different vendors. The cost factors for the various components and sub-assemblies, as well as complete systems, are well known.

- In high speed networks, fiber optic components dominate the cost of a station. For data rates of 1 Gbps and below, the cost associated with these components is declining rapidly as technologies such as Gigabit Ethernet and Fiber Channel increase in volume. For data rates greater than 1 Gbps, this standard, as well as 802.3ae, and other industry standards (Fibre Channel, InfiniBand, etc) will generate the volumes necessary in order to produce similar cost reductions.

- The costs associated with a network based on this standard will be competitive with other technologies operating at similar data transmission rates. One of the goals of this project is to eliminate layers of equipment and reduce the port counts in a typical customer's network, thus reducing cost.

- The cost of installations based on a ring topology has been given prime consideration in the development of this project proposal. Ring topologies are preferred for MAN and WAN applications because they entail a lower installation cost than a mesh topology.