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 have identified the following application areas:
  - ISP Intra-POP LANs
  - ISP Inter-POP MANs
  - ISP Inter-POP WANs
  - Enterprise Campus LAN Backbones
  - Enterprise MANs
  - Enterprise WANs
- 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.
- 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. It is likely that the MIB for RPR will be defined by the IETF.

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 uniquely addresses the need for high speed, scalable, resilient ring based networks.
- The standard will define a single Media Access Control algorithm, along with multiple Physical Layer options, formatted in a fashion similar to 802.3 and 802.5.

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 both simulation and empirical results.
- Several implementations of candidate protocols exist in the industry, embodied in commercially available products comprising:
  - Systems (routers, switches, hubs)
  - Host interfaces (NICs)
  - Chipsets
  - Optical components
- Implementations of candidate protocols are currently deployed in major ISP and enterprise environments.
- Simulations based on the OpNet modeling system have been used to demonstrate the reliability of the candidate protocols under a broad range of operating conditions

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 Fibre 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 station 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 in a typical customer's network, thus reducing cost.
- The cost of installation in 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 star-wired topology.