P802.1BR – 5C

Five Criteria

1. Broad Market Potential

a. Broad sets of applicability

Data centers containing hundreds or thousands of deployed bridges are common. These include data centers that have deployed high density server solutions including “1U” servers, server blade racks, etc. Deployments such as these are expected to significantly benefit from the technologies proposed. Additionally, data centers that have deployed server virtualization technology are expected to enjoy even greater benefits.

b. Multiple vendors and numerous users

There has been interest expressed by multiple vendors in this technology. In addition, many vendors have announced products supporting similar technology in a proprietary fashion. This technology is applicable to bridge, NIC, server, and software vendors. Given the wide deployment of networks that would benefit from this technology, numerous users may clearly be expected.

c. Balanced costs (LAN versus attached stations)

This technology has been expressly designed for balanced costs. It is deployable with no change to existing attached stations (that is, the technology interoperates with existing NIC cards). The design of the Bridge Port Extender function has been carefully considered to keep costs constrained. This has been a high priority since it is expected that Bridge Port Extenders may well outnumber bridges in typical deployments and are likely to be integrated in with attached stations.

2. Compatibility

The combination of Bridge Port Extenders and their Controlling Bridge result in an 802.1Q bridge, thus compatibility with external devices is assured. In particular, such a combination will fully interoperate with neighbor bridges (whether embedded in stations or external), as well as existing NIC cards. Finally, this technology will assume full benefit of other Data Center Bridging technologies under development including Priority-based flow control, Enhanced Transmission Selection, and Congestion Notification.

3. Distinct Identity

a. Substantially different from other IEEE 802 standards

This standard will be the authoritative specification of Bridge Port Extension. No other IEEE 802 standard addresses Bridge Port Extension.

b. One unique solution per problem (not two solutions to a problem)

The need to provide remote replication and Port Extension has not been anticipated by any other standard. Consequently, this is the only solution to this problem. Importantly, this proposal address the needs produced by both external and embedded bridge devices along with server virtualization with a common solution thereby eliminating the need for an additional solution in the future.

c. Easy for the document reader to select the relevant specification

This standard will be the authoritative specification of Port Extension. No other IEEE 802 standard addresses Bridge Port Extension.

4. Technical Feasibility

a. Demonstrated system feasibility

Similar techniques have been deployed as proprietary enhancements to 802.1Q bridging and are supported by multiple vendors. In addition, roughly analogous techniques have been deployed in Fibre Channel that have been widely adopted. These deployments have shown that the technology proposed is feasible.

b. Proven technology, reasonable testing

This technology has been proven on an operational basis in data centers using proprietary implementations. The resulting behavior remains that of an 802.1Q bridge thus existing testing methodologies remain applicable. The on-the-wire indication of ingress / egress Port numbers is intuitively reasonable to test and has been shown to be such in the existing proprietary implementations.

c. Confidence in reliability

The overall behavior is that of an 802.1Q bridge; the reliability of such has been firmly established. Furthermore, the simplicity of the Bridge Port Extenders compared to that of the bridges they replace, along with the associated reductions in management complexity, is expected to yield an increase in reliability over that achievable today.

d. Coexistence of 802 wireless standards specifying devices for unlicensed operation

Not applicable.

5. Economic Feasibility

a. Known cost factors, reliable data

Bridge Port Extenders are expected to cost less than existing bridges due to their relative simplicity (e.g. by simplifying the address table structure and eliminating many of the advanced functions typically found in the bridges that Bridge Port Extenders would replace). This is supported by experience in existing deployments of this technology. In addition, the resultant reduction in management complexity brings significant cost advantages. The Bridge Port Extender creates many lower cost Ports for every controlling bridge Port further benefiting the overall system cost. Existing experience also indicates no significant increase in the cost of the bridges that attach to the Bridge Port Extenders.

b. Reasonable cost for performance

The proposed technology reduces overall system cost while maintaining existing performance (both in raw bandwidth and feature / functionality) for a wide variety of deployments thus cost for performance is benefited.

c. Consideration of installation costs

Due to the simplicity of the Bridge Port Extender device, initial capital expenditure and initial configuration costs are expected to be reduced.