ECMP for 802.1Qbp

5 Criteria

Broad Market Potential

– Broad sets of applicability.

   • *The commercial provision of Ethernet services across a Data Center, metropolitan or larger networks is large and growing business. Provider Backbone Networks are a significant part of this market and a required component of the evolving Data Center. 802.1Qxx enables even greater use of these richer topologies.*

– Multiple vendors and numerous users.

   • *This work is being proposed by a number of major vendors representing the majority of current users in the market.*

– Balanced costs (LAN versus attached stations).

   • *This project does not materially alter the existing cost structure of bridged networks. Attached stations would not be aware of the operations by transit bridges.*

Compatibility

– IEEE 802 defines a family of standards. All standards shall be in conformance with the IEEE 802.1 Architecture, Management and Inter-working 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.

- 802.1Qxx would use the 802.1aq SBPM ECT-Algorithm framework for forwarding compatibility. This guarantees that 802.1Qxx bridges can be added to a network of 802.1aq bridges to increment the network functionality.

– 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.*

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Distinct Identity

- Substantially different from other IEEE 802 standards.

  - This is an amendment to 802.1Q the only standard for VLAN aware bridges.

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

  - There is currently no general on-data-path solution for ECMP forwarded frames.

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

  - *This project will amend only the IEEE 802 standard defining VLAN aware bridges.*

Technical Feasibility

– Demonstrated system feasibility.

  • *Hash based ECMP is widely deployed in IP networks and is well understood. The main issue is one of OA&M and we will standardize Ethernet solutions to OA&M issues raised by this new behavior.*

– Proven technology, reasonable testing.

  • *The main concepts are well proven. No unproven test technologies are required.*

– Confidence in reliability.

  • *ECMP has wide spread use today with known acceptable reliability.*

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

  • *Not applicable*

Economic Feasibility

- Known cost factors, reliable data.

  - *Minimally this will require either a software upgrade to NPU based Ethernet switches, or in the case of ASIC based devices a new B-VID behavior that mirrors existing 802.1ah with the exception of a hash based choice of possible next hops. There would therefore be a cost upgrade for ASIC based switches.*

- Reasonable cost for performance.

  - *The required hardware and software changes are a fraction of the cost of a typical network and provide commensurate additional capabilities.*

- Consideration of installation costs.

  - This functionality can be incrementally introduced thus minimizing installation costs.