SAS Multicast Scoping

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Background

- The PAR says
  - This project amends 802.17-2004 adding one or more new clauses defining optional extensions to support increased spatial reuse on the media. 802.17-2004 allows spatial reuse for ring local unicast transmissions, this amendment adds support for spatial reuse of other frame transmissions (e.g. remote bridging as seen in 802.1 D/Q). Changes to existing clauses of 802.17-2004 are permitted if required to support the new clauses.

Background, continued

- Most work so far has been done for unicast transmissions
- We should support multicast scoping as an optional feature.
  - This allows systems implementing protocols such as GVMRP or IGMP snooping to control the propagation of particular multicast flows around the ring.
  - This supports optimizing bandwidth utilization for services that use multicast, e.g., broadcast video services, L2 VPNs, etc.

Basic Idea

- Use “static group address entries”, configured either through management or local protocol entities (e.g., GMRP, IGMP snooping, etc.).
  - Contents of the static group address entry:
    - Group Address
    - VLAN ID (for FID)
    - Multicast transmission scope
      - Hops to send on ringlet0
      - Hops to send on ringlet1

Basic Idea (cont.)

- Modify ringlet selection to search the static group address table to determine the TTL value to be used for a frame with a multicast destination address.

Required Changes

- Update the description of "initialTTL()" in Clause 7.7.1.6.3
  - initialTtl(frame)
    - Returns the initial value for frame.ttl given the values of frame.da and frame.ri within the constraints detailed in 7.7.3, including optionally searching the SDB static group address table for a matching static entry.

Required Changes(cont.)

- Add the following variables to an appropriate clause
  - optionSasVlanAware
    - Reports if the SAS layer is VLAN aware.
      - TRUE—Indicates that SAS layer is VLAN.
      - FALSE—(Otherwise.)
  - optionSasMcastScope
    - Available for stations which implement the optional SAS Multicast Scoping functionality
      - TRUE—Indicates that SAS Multicast Scoping is implemented and active.
      - FALSE—(Otherwise.)

Required Changes (cont.)

- Add a new function definition to Clause 7.7.3.3
  - SdbMcastLookup(frame)
    - Looks up the destination group address (and the VLAN identifier if optionSasMcastScope is TRUE) in the SDB static group address table. If an entry is found, it returns the configured number of hops for the ringlet and flooding form.
      - Returns the number of hops if an entry was found in the database; otherwise, it returns NULL

Required Changes (cont.)

- Table 7.30 – Initial *ttl* field values
  - Insert the following optional row in the FT_DATA section before Row 14
    - Condition
      - optionSasMcastScope && !Unicast(frame.da) && ((mcast_scope = SdbMcastLookup(frame) != NULL)
    - Constaint
      - ttl == mcast_scope