Local Addresses and SAS

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Local Addresses

- What kinds of local address considerations needs to be handled by SAS?
  - Whether or not an RPR station is SAS capable
  - Primary and Secondary MAC addresses
  - Proper handling of frames with VLANs

SAS Station Capability

- SAS station capability can be determined by the techniques currently being investigated
  - MAC Address Method
  - Topology Discovery Method
  - Explicit Notification Method

Primary / Secondary MAC Addresses

- The MAC needs to know primary/secondary addresses to determine when a frame can be transmitted locally and when it must be flooded.
  - The MAC currently makes this determination by the local and secondary topology images.
  - There is an issue with the current local / secondary topology images in that they do not check VLAN association. This will result in the .17 MAC mis-directing frames on the ring in cases where a local primary or secondary MAC address does not reside in the VLAN associated with the frame.
  - There is another issue with secondary MAC addresses in that the MAC addresses presented in the unitdata.request during transmission are not the same as those presented in the unitdata.indication during reception.
  - These issues can be fixed by the SAS.

Proper Handling of VLANs with Local Addresses

- Current handling of primary and secondary local addresses by 802.17 is not completely consistent with VLANs.
- The SAS needs to fully qualify all MAC addresses with their VLAN associations regardless of whether the MAC address is local or remote.
- Identifying the following restriction for 802.17 provides a reasonable work around to the VLAN issue:
  - Remote MAC addresses duplicating either a primary or secondary RPR address may not communicate with any local hosts on the ring. They may only be bridged.

802.17b VLAN Solution

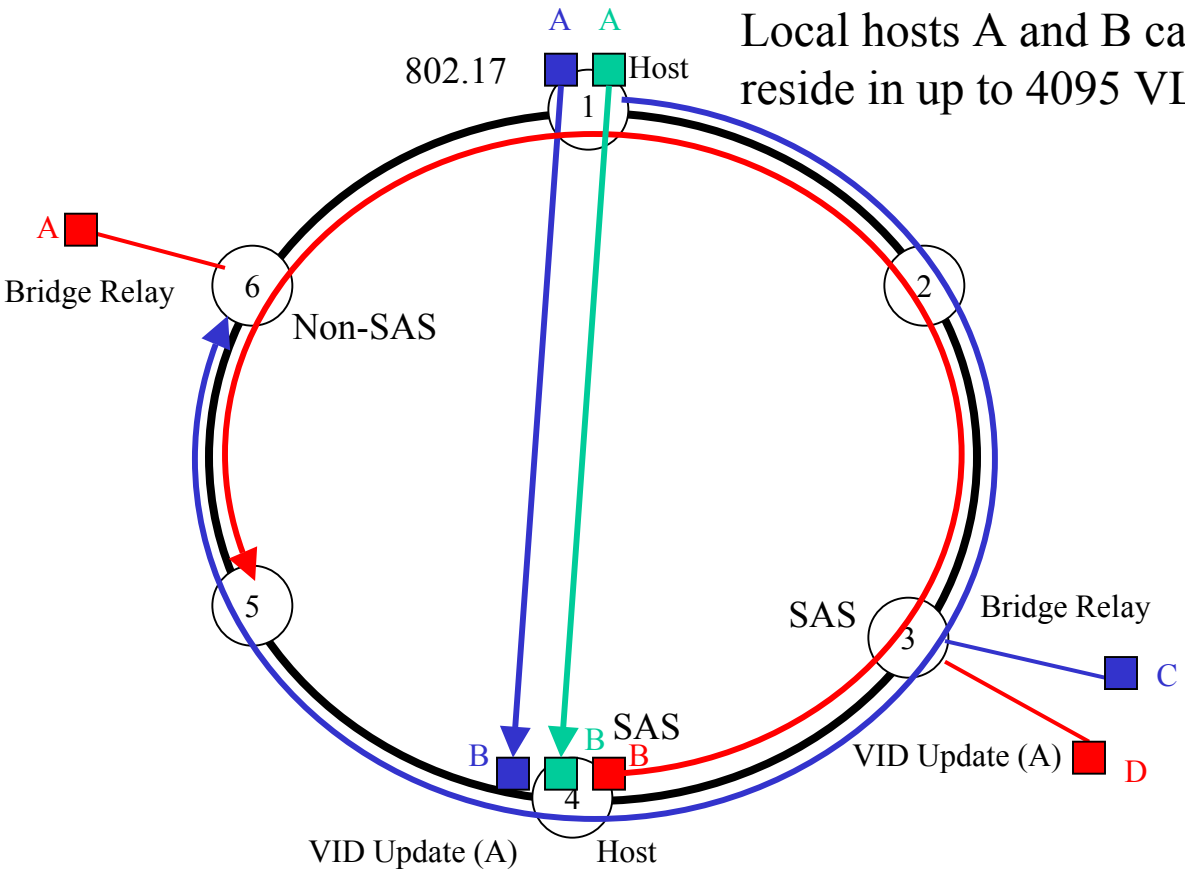
- The current limitation of 802.17 really limits the ability for local ring addresses to fully participate in VLANs.

- Provide a mechanism for the SAS to learn VLAN associations with all local primary and secondary MAC addresses.
  - VLAN associations may be distributed along with topology information and added to the primary / secondary topology images
  - VLAN associations may be part of SAS learning process and learned by SAS.

VLAN association with local addresses

- Distribute VLAN association with local primary and secondary MAC addresses during topology discovery
  - MAC addresses theoretically can be members of up to 4095 VLANs.
  - Supporting this many VLANs may be really cumbersome to distribute through topology discovery
  - Seems more reasonable to handle large numbers of VLANs during the SAS learning process.
  - For backwards compatibility with 802.17, the SAS can learn VLAN associations in frames received from 802.17 hosts. This enables SAS to properly learn VLAN associations from legacy hosts while not being limited by that deficiency.
    - Frames from hosts are identified as a basic frame or an extended frame where SA and extendedSA are the same.
  - Secondary addresses from legacy 802.17 stations presently cannot be learned by SAS if these addresses currently do not appear in the frame.
    - It seems reasonable to associate secondary MAC addresses from legacy stations with a single default VLAN.
    - While this may limit VLAN support for legacy secondary MAC addresses, these stations are inherently limited for this application anyway.
    - This enables 802.17b stations to fully address this issue as they interact with other 802.17b stations on the ring.

How to best learn VIDs for local hosts in multiple VLANs



Secondary MAC Address Support

- Secondary MAC addresses currently pose a bit of a problem since they cannot be learned.
  - Use the current secondary topology image with a default VLAN association to handle proper interworking with legacy stations.
  - SAS should use extended frame format to handle secondary addresses that are not in the default VLAN.
    - This enables other SAS stations to learn secondary MAC addresses beyond the default VLAN, providing more generalized support for VLANs with secondary MACs.

Recommendations

- SAS should learn all local primary MAC addresses and associated VIDs during the normal frame reception process.
  - SAS will transmit frames using basic frame format depending on source_address. (source_address == mymacaddress)
- SAS should associate secondary MAC addresses destined to legacy 802.17 hosts with a default VLAN.
  - These frames are transmitted using basic frame format. The destination MAC address may be translated as in 802.17.
- Frames originating from a secondary MAC address should be transmitted using extended frame format.
  - This allows secondary MACs to be learned by SAS during reception.
  - A station should send a gratuitous ARP periodically to ensure it is periodically updated by other SAS's on the ring.
- SAS should use SDB to determine how to transmit frames having secondary MACs that are not associated with the default VLAN.
  - If the destination_address/VID is in the SDB, the frame will be unicast, otherwise it will be flooded.