



Secondary Address Support

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Secondary Addresses

- Allows for more efficient support of protocols like "RFC 2338 Virtual Router Redundancy Protocol".
- Lets a station advertise that it wishes to receive traffic being sent to one or two extra address.
- Allows this traffic to be sent without flooding, and get the benefit of:
 - Ringlet selection
 - Destination Stripping

Secondary Addresses

- Add the concept of “secondary addresses” to RPR topology and client interface data path
 - Registered by the client when it becomes a VRRP master
 - Advertised through topology ATD message
 - Becomes part of the topology image as extra columns in the table
- VRMAC DA address is processed in the ringlet selection block in frame transmission to:
 - Determine the associated station
 - Select the ringlet and transmit the frame as if it was being sent to the associated station.
 - Insert the associated station MAC address as the DA in the frame

Secondary Addresses (cont.)

- This allows the frame to be delivered to the correct station on the ring without modification of the receive rules.
- The other possibility is to transmit the secondary address in the frame DA.
 - This requires expanding the receive rules to check "myMacAddress" and "mySecondaryAddresses".
 - More complex than first option (substitution in transmit processing), so not the preferred option.

Secondary Addresses (cont.)

- Impact of this proposal
 - **Optional behavior!**
 - New ATD attribute advertised and processed in topology
 - Secondary entries processed in ringlet selection (associative lookup??)
 - NOT Affected
 - Fairness
 - Protection
 - Transit path

Secondary Addresses (cont.)

- May want to limit the number of active secondary addresses on the ring to control maximum size of table in ringlet selection
 - 32 sounds like a good minimum number of extra addresses.
- Support at one or two secondary addresses per station.
 - Allows for load sharing between two real routers supporting two virtual routers
 - Limit to maximum 2 per station to reduce impact to the topology protocol and data structures
- Extra fields in the MIB to report the active secondary entries in the topology table

Conclusions

- At a minimum, we need to add text to the draft to explain how VRRP and RPR will interact.
- I recommend we make changes to D2.3 (comment number 505 and outlined in pj_d2_3_vrrp_proposal_01.doc) to support spatial reuse for transmissions to secondary address.

Backup Material

VRRP Background

- VRRP provides layer 3 resiliency by allowing 2 or more routers to act as a single “virtual router”.
 - One becomes “Master”, others are “Backup” .
 - “Clients” don’t need to know that they are talking to a virtual router.
- Master uses special MAC address (VRMAC) assigned from IANA - 00-00-5E-00-01- $\{VRID\}$
 - $\{VRID\}$ is the VRRP Virtual Router Identifier allowing up to 255 VRRP routers on a LAN.
- The Master sends advertisements which are sent every 1 second (default) and timeout after 3 intervals.

VRRP Background (cont.)

- Advertisements use IP multicast packets
- The Master responds to ARPs with the VRMAC in the ARP contents.
- The Traffic sent to the Virtual Router uses the VRMAC as the DA
- Most traffic sent by the Virtual Router (i.e. all the data traffic) uses it's real MAC as the SA.
- VRMAC address is used as the source MAC address in VRRP messages sent by the Master to enable bridges to learn the VR location.

VRRP and Draft 2.3

- VRRP can function correctly with draft 2.3 of 802.17, but not efficiently
- All transmissions to the VRMAC will be flooded as the VRMAC is not in the topology image, so these frames will not get spatial reuse.
- A client wishing to act as a VRRP router will have to use “Bridge Mode” to receive transmissions to the VRMAC.
- This client will need to filter out other traffic such as that being sent between bridges on the ring.

VRRP and Draft 2.3 (cont.)

- D2.3 does not discuss how to implement VRRP over RPR and it's not obvious at first reading.
- It can be made to work, but it's not efficient
- Are we happy to have all transmission to the VRRP Master be flooded?
- Does this fit RPR's position in the market

Possible Options

- We could
 - Do nothing
 - Add some text into the draft to explain how VRRP and RPR work together
 - Make changes to the current behavior to support VRRP and spatial reuse.
- The rest of this presentation discusses a proposal to add support for VRRP and Spatial reuse to 802.17
- This proposal has been discussed in the BAH and PAH adhocs, although this presentation is not a BAH or PAH agreed position.