Rooted multipath VIDs

Version 1

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References

- This presentation is at:
  http://www.ieee802.org/1/files/public/docs2010/liaison-rooted-multipath-vids-0310-v01.pdf

Rooted Multipath service definition

- A "Rooted Multipath" service has:

    One or more "root ports" that have connectivity to each other and have connectivity to all "leaf ports".

    Zero or more "individual leaf ports" that each have connectivity with all root ports, but not with any other leaf port.

    Zero or more "leaf groups," each consisting of two or more "group leaf ports" that connectivity among all of the leaf ports in the leaf group and with all root ports, but not with any leaf port outside the leaf group.

Required VLAN IDs (VIDs)

- A "Rooted Multipath" service requires:

  One "root VID" R.

  One "individual VID" I, if there are any individual leaf ports, else VID I is not needed.

  One "group VID" V_G for each leaf group G (if any).

- For example, any number of individual leaves can be supported with two VIDs R and I.

- Or, three leaf groups plus any number of individual leaves can be supported with 5 VIDs R, I, V_1, V_2, and V_3.

- 4094 VIDs can support 2047 rooted multipath services, or 3094 ordinary services plus 500 rooted multipath services; no bit need be reserved for the distinction.

Configuration: tagged frames not admitted

	root port	group G leaf port	Individual leaf port
Port VID Set	R, I, all V_g	R, V_G	R
Untagged VID set	R, I, all V_g	R, V_G	R
Port VID	R	V_G	I
MVRP asks for	R, I, all V_g	R, V_G	R

- Port VID Set: Bridge can transmit these VIDs.

- Untagged VID Set: Bridge transmits these VIDs untagged.

- Port VID: Bridge assigns this VID to any untagged frame received.

- MVRP asks for: The Bridge attracts these VIDs towards this port via MVRP (controls VID pruning).

- The Bridge discards received frames on any port with a tag.

- The Bridge disables VLAN filtering on received frames.

Configuration: ports are tagged

- If multiple rooted multipoint services are allowed on any port, then:

  - Ingress VLAN filtering is turned on, and tagged frames allowed.

- If a root port serves multiple rooted multipoint services:

  - The Bridge translates all VIDs in an $\{R, I, V_G...\}$ set to VID R of that set on received frames and admits only VIDs R.

- If a group leaf port serves multiple rooted multipoint services:

  - The Bridge translates all VIDs R to the corresponding V_G on transmitted frames and admits only VIDs V_G.

- If an individual leaf port serves multiple rooted multipoint services:

  - The Bridge translates all VIDs R to the corresponding I on transmitted frames and admits only VIDs I.

Configuration: ports are tagged

- In order to support multiple rooted multipath services on a single port, the Bridge must support two VID filters, one for controlling egress VIDs and one for controlling ingress VIDs.

  - IEEE 802.1Q-2005 does not provide for a separate ingress VID filter; it provides only an egress VID filter.

  - This feature could be provided in future revisions of 802.1Q.

- To support a single rooted multipath service, no extension of 802.1Q-2005 is necessary.