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LIAISON STATEMENT

Source: ITU-T Study Group 15

Title: Use of leaf indicator bit

LIAISON STATEMENT

For action to: IEEE 802.1

For comment to:

For information to:

Approval: Agreed to at Question 9/15 meeting (Darmstadt, 1-5 March 2010)

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Introduction

Work is underway in Question 9 of ITU-T Study Group 15 (Q9/15) on new draft recommendations G.ptneq (Packet Transport Network Equipment) and G.798.1 (Optical Transport Network Equipment). Such transport equipment should be able to support multi-root E-Tree services. An issue has come up with respect to the support of such services.

Discussion

ITU-T Recommendation G.8011.4 specifies a multi-root Ethernet virtual private tree service. Such service is supported by a multi-root rooted-multipoint Ethernet Virtual Channel connection in an optical and/or packet transport network. We have initiated discussion on this topic and would appreciate your feedback on IEEE mechanisms applicable to this service.

Our discussions have identified an issue with respect to the filtering rules within a rooted-multipoint Ethernet Virtual Channel connection with more then one root port. A similar issue was also addressed in related work in IETF [1]. This issue is not specific to VPLS over MPLS, it is generic and applies as well to the multi-root rooted-multipoint Ethernet Virtual Channel connections in the optical and packet transport networks.

Question

ITU-T Q.9/15 and Q.10/15 have received a proposal in their March 2010 meeting to resolve this issue. ITU-T Q.9/15 and Q.10/15 would like to coordinate with IEEE 802.1 in this matter. A brief description of the issue and the suggested solution are presented in the Annex.

We would appreciate a response in time for our next meeting on this topic to be held May 31 – June 11, 2010.

We look forward to your reply and continued assistance.

References

[1] "Extension to VPLS for E-Tree", Jan. 2010 https://datatracker.ietf.org/drafts/draft-key-l2vpn-vpls-etree/

ANNEX

An example of a multi-root rooted-multipoint ETH Virtual Channel connection is illustrated in Figure 1 below. This virtual channel connection has two roots (R1, R2) and nine leaves (L1 to L9) and includes three Ethernet switches (FF1, FF2, FF3). The Ethernet switch FF1 is connected with FF2 via an Ethernet Virtual Channel link connection with endpoints f2 on FF1 and f1 on FF2. The Ethernet switch FF2 is connected with FF3 via an Ethernet Virtual Channel link connection with endpoints f3 on FF2 and f2 on FF3.

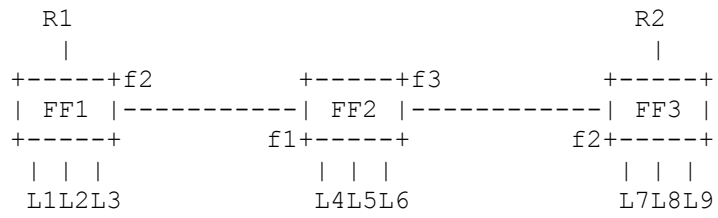

Figure 1 – Example of a multi-root rooted-multipoint Ethernet Virtual Channel connection

The ETH Virtual Channel link connection between FF1 and FF2 and the link connection between FF2 and FF3 will have to carry root-to-root, root-to-leaf and leaf-to-root traffic. As part of this traffic there are the ETH OAM frames, e.g. the CCM frames. Those CCM frames should go from R1-to-R2/L1/../L9, from R2-to-R1/L1/../L9 and from Li-to-R1/R2 (i=1..9). These CCM frames should however not go from Li-to-Lj (i,j=1..9).

The rooted-multipoint related frame forwarding behaviour is established by grouping leaves into 'port groups' and by preventing frames received on an input port of such 'port group' to be forwarded to an output port of such port group. But in this multi-root case, it is not possible to make e.g. port f2 a member of the leaf port group including also L1, L2 and L3.

The proposed solution in the internet drafts is to introduce a Leaf indicator bit into the control word and to use this bit as part of the extended filtering rule set. A similar Leaf Indicator bit could be used in the proposed Ethernet Virtual Channel's Transport VLAN Tag (refer to an accompanying liaison statement), and this bit can be located in the 'CFI/DEI bit location' of this proposed new Tag. This leaves the 3-bit PCP field to carry the priority and drop_eligible information. This is sufficient for the optical and packet transport network applications, as there are 3 or 4 queues in the NNI ports and the drop_eligible information can be encoded in the 3-bit PCP together with the 3 or 4 priority levels.

The Ethernet Virtual Channel's Transport VLAN Tag format will then become as follows:

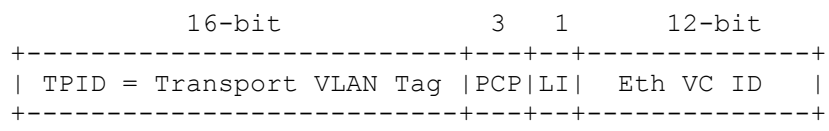

Figure 2 – Transport VLAN Tag with Leaf Indicator (LI) bit

The default value of the LI bit is 0. Frames applied at a leaf port will get the leaf indicator value set to 1. Frames applied at a root port will get the default leaf indicator value 0.

The LI bit in the above Tag allows the creation of two virtual endpoints on the link connections between FF1-FF2 and FF2-FF3. The link connection endpoints 'f2' can now be split into virtual endpoints 'f2.0' and 'f2.1' (see Figure 3) and ‘f1’ and ‘f3’ can be split into ‘f1.0’, ‘f1.1’, ‘f3.0’ and ‘f3.1’. The link connection endpoints f1.0, f2.0 and f3.0 carry all frames that have LI=0. Link connection endpoints f1.1, f2.1 and f3.1 carry all frames that have LI=1.

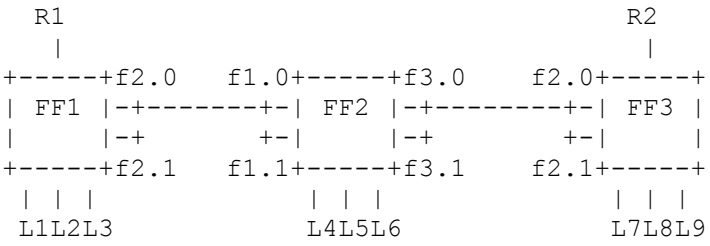

Figure 3 – Figure 1 with virtualized link connection endpoints

With this virtualization, it is possible to group the leaf ports L1,L2,L3 with link connection endpoint f2.1 into one port group. The connectivity in FF1 will then be:

R1 → L1/L2/L3/f2
L1/L2/L3 → R1/f2
f2.0 → R1/L1/L2/L3
f2.1 → R1

Similarly, it is possible to group the leaf ports L4,L5,L6 with link connection endpoints f1.1 and f3.1 into one port group. The connectivity in FF2 will be:

f1.0 → f3/L4/L5/L6
f3.0 → f1/L4/L5/L6
L4/L5/L6 → f1/f3
f1.1 → f3
f3.1 → f1

Similarly, it is possible to group the leaf ports L7,L8,L9 with link connection endpoints f2.1 into one port group. The connectivity in FF3 will be:

R2 → L7/L8/L9/f2
L7/L8/L9 → R2/f2
f2.0 → R2/L7/L8/L9
f2.1 → R2

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