

Annex A to Liaison reference #026.02

Q.12/15 Comments on Liaison reference #015.03

Response to ITU-T Last Call Comments on the MPLS-TP Framework

Please find the IETF responses to the ITU-T Last Call comments on the MPLS-TP Framework received in the liaison “Comments on draft-ietf-mpls-tp-framework-10 [Ref #015.02]” of March 5, 2010.

The liaison includes four major issues and several minor technical or editorial issues.

We have responded to the major issues separately below and the minor/editorial issues en block.

We also note that your comments have been extensively discussed at a number of our weekly phone conferences, with participation from most of the ITU-T experts that we believe originated the comments. At these meetings we achieved a consensus on how to address the ITU-T major comments and most of the ITU-T minor ones.

[Q.12/15 Response: Only the four major issues were discussed on the weekly calls.](#)

Major Issues

Packet insertion at intermediate nodes

Your comment says:

The current version of the MPLS-TP OAM framework draft includes an open issue 5 in section 1.2:

“The general framework will describe the mechanism for intermediate nodes to insert packets and each specific framework document (e.g., OAM framework) will describe the usage of this capability on a case-by-case basis. When you provision bw between two end-points you must allow enough bw for any additional traffic, including traffic from MEPs and MIPs.”

Our response is:

This is described at a high level in Section 3.7. We do not think that any further detail is needed in the MPLS-TP framework.

We do not think that it is necessary to clarify how OAM packets get inserted in an LSP since the injection of an MPLS packet into an LSP by a P router is a standard MPLS operation.

Capacity planning of OAM messages is already addressed in the Ach Section (3.6)

[Q.12/15 response: Thank you](#)

Tandem Connection Monitoring/PST for PWs

Your comment says:

Section 3.14 states:

“Pseudowire segment tunnels are for further study.”

Experience with other technologies e.g. SDH has shown that adding TCM at a later stage in the definition of a technology causes the design to be inefficient. At a minimum a high level outline for

Our response is:

We have clarified section 3.14 to say:

“Hierarchical label stacking, in a similar manner to that described above, can be used to implement path segment tunnels on pseudowires.”

[Q.12 response: The text is an improvement but needs further refinement.](#)

Misconnection between LSPs and PWs

Your comment says:

The OAM under development includes a connectivity verification (CV) function, which is intended to detect when two transport paths are misconnected. A label in the stack may represent either a LSP or a PW. Since LSPs and PWs use a different mechanism to identify OAM messages it is not clear how a configuration error or hardware error that causes a misconnection or a merge of a PW and a LSP can be detected. Some text should be added to describe this issue and provide a high level outline of a solution. The solution should be described in detail in the MPLS-TP OAM framework draft.

Our response is:

This issue is more appropriately discussed in the OAM framework document, and we do not propose to address this issue in the general framework.

A solution may be to allow the use of GALs on PWs. However any changes to the usage of the GAL on PWs to address this problem would need to be addressed in the PWE3 WG and would need an update to RFC5586. This is therefore out of scope of the MPLS-TP Framework.

[Q.12/15 Response: Your proposal is accepted](#)

QoS mapping in a Path Segment Tunnel

Your comment says:

During the review of the OAM Framework the following text was added:

"The PST would use the uniform model of EXP code point copying between sub-layers for DiffServ such that the E2E markings and PHB treatment for the transport path was preserved by the PST"

In MPLS-TP the QoS of different layer networks should be independent (therefore the need for pipe and short-pipe models only). However, the PST is a special case and this should be specified as described above. It is suggested that this text be added to section 3.13.

Our response is:

The QoS aspects of a PST are network specific and are therefore a matter for the network operator to configure as they see necessary to meet their operational requirements.

[Q.12/15 Response: This proposal is acceptable, please add this text and areference the OAM framework in the appropriate section.](#)

SS-PW over a multi operator LSP:

Your comment says:

draft-ietf-mpls-tp-framework-10, section 3.4 "MPLS-TP Native Service" describes the following

MPLS-TP architectures:

1. SS-PW (figure 6)
2. MS-PW (figure 7)
3. architecture for Network layer clients (figure 9)

Please confirm that running a SS-PW over an LSP used as transport service layer rather than as transport path layer is allowed. We intend to describe this scenario in G.8110.1, do we need an additional figure in the draft to explicitly support this configuration.

Our response is:

This case corresponds to the second option in Figure 2 (PW over LSP). Note the transport network has no visibility of the packet payload of any client service label. This payload could contain any protocol that is specified to be carried over an MPLS label.

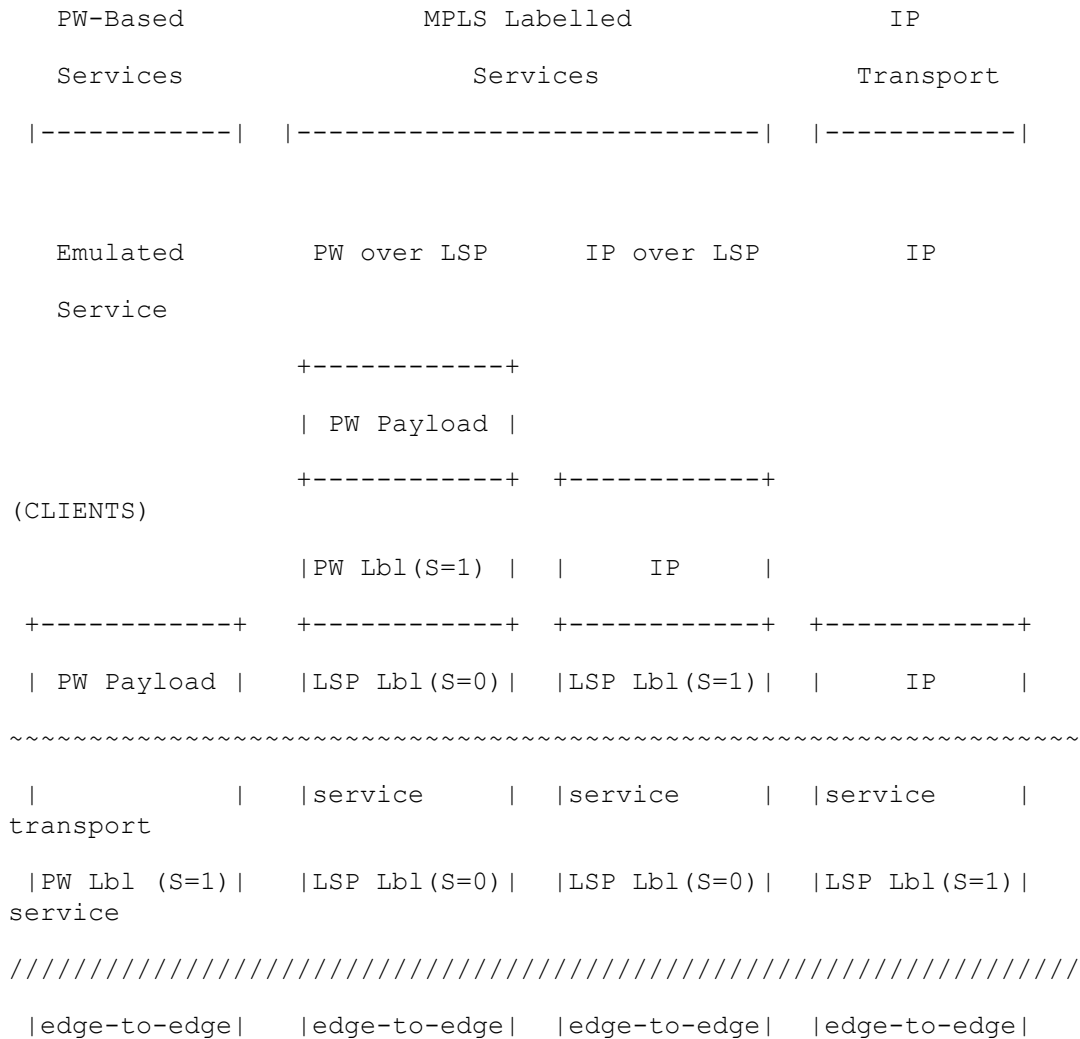
[Q.12/15 Response: Thank you for this confirmation of our understanding.](#)

Terminology:

The 4th and 5th paragraphs of section 3.7 it is suggested that LSP, PW and section are for transport paths. In G.8110.1 we intend to map these against the three types of transport paths:

- transport service layer transport path
- transport path layer transport path
- section layer transport path.

This would result in the expansion of Figure 5 as shown below:



```
transport
|LSP Lbl(S=0)| |LSP Lbl(S=0)| |LSP Lbl(S=0)| |LSP Lbl(S=0)| path
(note1)
::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
                                                                    Section
(note2)

~~~~~ denotes Client <-> MPLS-TP layer boundary
////////// denotes transport service <-> transport path layer
boundary
:::::::::::: denotes transport path <-> section layer boundary
```

Note 1 - The transport path layer may be omitted on e.g. access links connecting a T-PE with a S-PE. Transport path layer is present between PEs at the edge of e.g. metro and core domains.

Note 2 - The section layer transport path is typically unlabelled.

Note that in the PW over LSP case the client may omit its LSP Label if penultimate hop popping has been agreed with its peer

Note 4 - Each layer may have more label stack entry headers than illustrated; additional label stack entry headers are present when the transport path in either of the three layers is tandem connection monitored to support multi-operator transport paths and/or protected transport paths and/or bundled services (TDM PW bundle).

Figure 5: MPLS-TP - Client Relationship and MPLS-TP layers

Our response is :

We believe that the current figure 2 (previously figure 5 in version 10 of the document) is correct. In particular we note that you have included a number of additional labels that are neither required nor precluded. For example it is possible to carry IP directly over an MPLS-TP LSP. You have clarified some of this as text within the figure. We do not believe that figure 2 requires modification.

[Q.12/15 Response: We accept that this need not be added to the draft. Could you please confirm that the figure is correct and that you would have no objections if it were included in G.8110.1](#)

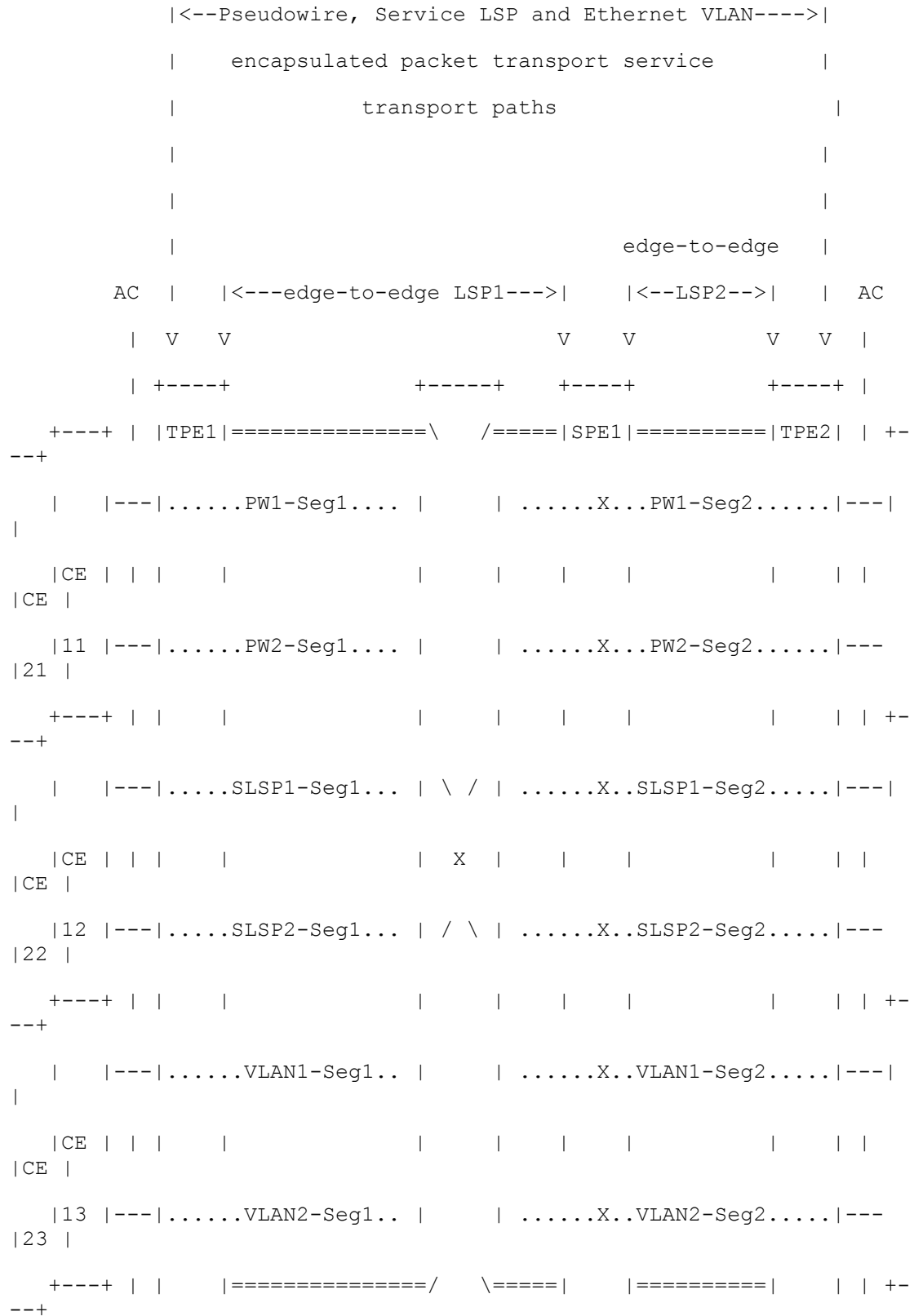
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And the inclusion of a new figure:

Your comment says:

The three transport service layer transport path signals (PW, Service

LSP and Ethernet VLAN) are transported through e.g. an edge-to-edge LSP based transport path layer transport path. It is important to realize that those three service layer transport path signals co-exist in their server layer transport paths. To make this explicit it is proposed to add the following figure to the framework document:



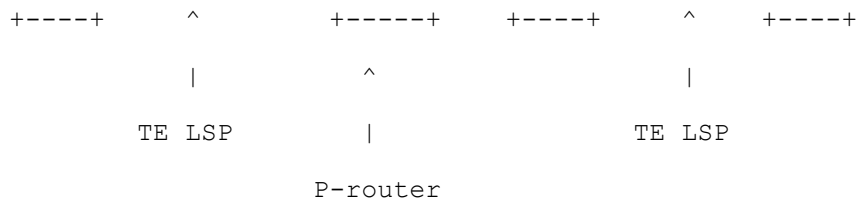


Figure K: MPLS-TP edge-to-edge LSP transporting PW, Service-LSP and Ethernet VLAN transport service layer transport path signals

Please confirm an expansion of the figures from the draft into the figures shown above that will be included in G.8110.1 is acceptable.

Our response is:

We are concerned that this over specifies the MPLS label stack semantics. Experience in the development of MPLS demonstrates that such constraints on the MPLS protocol are not in the best interests of the network operator. This was discussed on a call with ITU-T SG15 experts and it was agreed that the figure should be not included. It should be noted that the architectural elements of the above figure are already covered in RFC3031 RFC3985 etc and further clarification is not needed.

Q.12/15 Response: We accept that this need not be added to the draft. Could you please confirm that the figure is correct and that you would have no objections if it were included in G.8110.1

Minor technical or editorial issues

We respond to the minor technical and editorial uses en block.

Q.12/15 Response: Not all of the comments embedded in the draft were minor issues.

Our response is:

Response: The IETF understood that the comments embedded in the word document were minor technical issues or were editorial in nature. The editors accepted and addressed the majority of these comments and have discussed most of these with ITU-T experts on a number of MPLS-TP project calls.

Q.12/15 Response: Only the Major issues were discussed on the weekly calls.