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Question(s):	12/15	Stuttgart, 10-14 September 2007

LIAISON STATEMENT

Source:	ITU-T SG15
Title:	Addition of ATM and PDH clients to T-MPLS

LIAISON STATEMENT

To:	**IETF MPLS and PWE3 WG, MFA Forum, ITU-T Q7/13**
Approval:	**ITU-T SG15 Q12/15 and Q14/15 Joint Interim Meeting**
For:	**Action**
Deadline:	**4 February 2008**

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An experts meeting of Q12/15 took place in Stuttgart from the 10th to the 14th of September 2007.

During the meeting requirements to carry ATM and PDH signal over a T-MPLS network have been identified and agreed.

Q12/15 has agreed to use the encapsulation mechanisms defined in RFC 4717 (and in Y.1411 and Y.1412) for ATM and in RFC 4553 (and in Y.1413 but without the M-bits to keep compliance with RFC 4553) for PDH clients to meet those requirements.

The only work that is required in G.8110.1 to address these extensions, is to include the definition of three new atomic functions (i.e. TM/VP_A, TM/VC_A and TM/Pq_A) and reference the mappings provided in RFC 4717, RFC 4553 and the corresponding ITU-T Recommendations, Y.1411, Y.1412 and Y.1413.

Q12/15 has started working on a new amendment 2 to G.8110.1 to include these functionalities in T-MPLS Architecture to include clauses 7.1.4, 7.1.5 and 7.1.6.

Q12/15 welcomes any comments on the proposed draft below and would appreciate a reply by the deadline indicated above.

Replace sub-clause 7.1.4 with the following sub-clause

7.1.4 TM/VP adaptation

The bidirectional TM/VP adaptation (TM/VP_A) function is performed by a co-located pair of associated unidirectional TM/VP adaptation source (TM/VP_A_So) and sink (TM/VP_A_Sk) functions. The description of the client-specific processes is outside the scope of this Recommendation.

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The TM/VP adaptation functions can work in two basic modes: in the mode 1 one or more VP connection points are allowed (in line with the N-to-One cell mode of [IETF RFC 4717]) while in the mode 2 only a single VP connection point is allowed (in line with the One-to-One cell mode of [IETF RFC 4717].

Note – the support of mode 1 is mandatory while the support of mode 2 is optional.

The TM/VP adaptation source (TM/VP_A_So) performs the following server specific processes between its input and output:

- For the case of Mode 1
  - Set the VPI field into each VP_CI traffic unit to the value associated with a particular VP connection point
  - Cell multiplexing
- Map VP_CI traffic units in the ATM Service Payload field (defined in [IETF RFC 4717])
- Optionally insert the Common Interworking Indicators (CII) as defined in [ITU-T Y.1411]
- Generate the TM_AI_PHB: the PSC is associated with the VP CP the mapped VP_CI traffic unit has been received from while the drop precedence is mapped from the CLP field in the VP_CI traffic unit.

Note – If cell from multiple VPCs are concatenated, the TM_AI_PHB is generated as the highest PHB of the mapped VP_CI traffic units.

- Insert a 1-bit S field set to 1. This indicates that the client is not T-MPLS
- Select the output TM_AP: selection criteria are the packet's output PSC
- Output the resulting TM_AI

The TM/VP adaptation sink (TM/VP_A_Sk) performs the following server specific processes between its input and output:

- Multiplex the TM_AI traffic units coming from all the TM_APs
- Extract and process the 1-bit S field
- Extract the Common Interworking Indicators (CII), and process the sequence number field as defined in [ITU-T Y.1411]
- Demap the VP_CI traffic units from the ATM Service Payload field (defined in [IETF RFC 4717])
- For the case of Mode 1
  - Cell de-multiplexing according to the VPI value, including unmatched VPI cell discard
  - Remove the VPI field

Add a new sub-clause 7.1.5 as follows:

7.1.5 TM/VC adaptation

The bidirectional TM/VC adaptation (TM/VC_A) function is performed by a co-located pair of associated unidirectional TM/VC adaptation source (TM/VC_A_So) and sink (TM/VC_A_Sk) functions. The description of the client-specific processes is outside the scope of this Recommendation.

The TM/VC adaptation functions can work in two basic modes: in the mode 1 one or more VC connection points are allowed (in line with the N-to-One cell mode of [IETF RFC 4717]) while in the mode 2 only a single VC connection point is allowed (in line with the One-to-One cell mode, the AAL5 CPCS-SDU mode and the AAL5 PDU frame mode of the [IETF RFC 4417]).

Note – the support of mode 1 is mandatory while the support of mode 2 is optional.

The TM/VC adaptation source (TM/VC_A_So) performs the following server specific processes between its input and output:

- For the case of Mode 1
  - Set the VPI and VCI fields into each VC_CI traffic unit to the values associated with a particular VC connection point
  - Cell multiplexing
- Map VC_CI traffic units in the ATM Service Payload field (defined in [IETF RFC 4717]).

Note – The AAL5 CPCS-SDU mode does not maintain the strict ordering of the ATM OAM cells relatively to the ATM user data cells. This mode should not be used if this strict ordering of ATM cells is required. Further information is provided by [IETF RFC 4717] and [ITU-T Y.1412].

[Editor's note – The note above is intended for G.8112: this assumption will be confirmed at the SG15 plenary meeting in February 2008.]

- Generate the TM_AI_PHB: the PSC is associated with the VP CP the mapped VP_CI traffic unit has been received from while the drop precedence is mapped from the CLP field in the VP_CI traffic unit.

Note – If cell from multiple VCCs are concatenated, the TM_AI_PHB is generated as the highest PHB of the mapped VP_CI traffic units.

- Optionally insert the Common Interworking Indicators (CII) as defined in [ITU-T Y.1411] or [ITU-T Y.1412]
- Insert a 1-bit S field set to 1. This indicates that the client is not T-MPLS
- Select the output TM_AP: selection criteria are the packet's output PSC
- Output the resulting TM_AI

The TM/VC adaptation sink (TM/VC_A_Sk) performs the following server specific processes between its input and output:

- Multiplex the TM_AI traffic units coming from all the TM_APs
- Extract and process the 1-bit S field
- Extract the Common Interworking Indicators (CII), and process the sequence number field as defined in [ITU-T Y.1411] or [ITU-T Y.1412].
- Demap the VC_CI traffic units from the ATM Service Payload field (defined in [IETF RFC 4717]).
- For the case of Mode 1
  - Cell de-multiplexing according to the VPI and VCI values, including unmatched VPI and/or VCI cell discard
  - Remove the VPI and VCI fields

Add a new sub-clause 7.1.6 as follows:

7.1.6 TM/PDH adaptation

7.1.6.1 Structure-agnostic mapping

The structure-agnostic mapping of PDH Path signals over a T-MPLS layer network is performed in the TM/Pqx_A adaptation function, where q=11, 12, 31, 32.

Note – The TM/Pqx_A function provides a single TM_AP and a single Pqx_CP.

The bidirectional TM/Pq adaptation (TM/ Pq_A) function is performed by a co-located pair of associated unidirectional TM/ Pq adaptation source (TM/ Pq_A_So) and sink (TM/ Pq_A_Sk) functions. The description of the client-specific processes is outside the scope of this Recommendation.

The TM/ Pq adaptation source (TM/ Pq_A_So) performs the following server specific processes between its input and output:

– Map Pq_CI traffic in the TDM Payload field as defined in [ITU-T Y.1413]

– Optionally insert the Timing Information as defined in [ITU-T Y.1413]

– Generate the TM_AI_PHB: the PHB should guarantee low jitter and low loss.

– Insert the mandatory Common Interworking Indicators (CII) as defined in [ITU-T Y.1413] and [IETF RFC 4553], without the M-bits defined in [ITU-T Y.1413] and thus in compliance with [IETF RFC 4553]

– Insert a 1-bit S field set to 1. This indicates that the client is not T-MPLS

– Output the resulting TM_AI

The TM/ Pq adaptation sink (TM/ Pq_A_Sk) performs the following server specific processes between its input and output:

– Extract and process the 1-bit S field

– Extract and processes the Common Interworking Indicators (CII) as defined in [ITU-T Y.1413]

– Recover the clock of the Pqx signal.

– Demap the Pq_CI traffic from the TDM Payload field as defined in [ITU-T Y.1413] and [IETF RFC 4553], without the M-bits defined in [ITU-T Y.1413]