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LIAISON STATEMENT

Source: ITU-T Study Group 15

Title: Early review of draft-ietf-mpls-tp-fault (ref # 016.02)

LIAISON STATEMENT

For action to: IETF MPLS WG

Approval: Agreed to by Question 10/15 (by correspondence)

Deadline: 11 April 2010

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Thank you for your liaison statement (ref # 016.01) soliciting early review comments by ITU-T of draft-ietf-mpls-tp-fault-00.
The experts of Q10/15 have reviewed this draft by correspondence.

The following comments and requests for clarification were received:

1. Comments sent to mpls-tp email exploder

The comments sent to the mpls-tp list in December 2009 are still applicable, see:
http://www.ietf.org/mail-archive/web/mpls-tp/current/msg02793.html and follow-up.
Most of them are captured in the next comments.

2. Alignment with draft-ietf-mpls-tp-oam-framework

Proper references to draft-ietf-mpls-tp-oam-framework are missing. Alignment with draft-ietf-mpl-tp-oam-framework is also missing; e.g. there should be a common description of AIS.

3. Section 2.1 Alarm Indication Signal

In section 2.1 it is stated:

> For example an AIS message may be sent during a protection switching event and would cease being sent if the protection switch was successful in restoring the link.
>
> Its primary purpose is to suppress alarms in the MPLS-TP layer network above the level at which the defect occurs. The AIS message MAY be used to trigger recovery mechanisms. It should be noted that such use would be subject to false positives, e.g. unnecessary protection switching events in the client layer."

It is not correct to state that AIS sending is stopped if the protection switch was successful. The reason is that the AIS insertion is performed by a MEP Sink function that is upstream of the protection switch selector process, and this MEP Sink function is as such unaware of the presence of a protection switch process and of the state of the protection switch process.

Example: A service (svc) LSP is protected between PE nodes B and E. Working PST (W-PST) is set up from B via PE C1, PE C2 to E and Protection PST (P-PST) is set up from B via PE D1, PE D2, PE D3 to E. Between each two PE nodes there is an edge-to-edge (e2e) LSP represented by "[----]" in Figure 1 below. The working PST is monitored by two wMEP functions, the protection PST is monitored by two pMEP functions. The edge-to-edge LSPs are monitored by two eMEP functions. Any intermediate P nodes are ignored in this example.

When B and E select traffic from working, then when there is e.g. a cable break between C1 an C2 the physical media and section layer connections fail, the edge-to-edge LSP fails, the working PST fails and the service LSP fails. The input port on C2 detects the fault, declares the LOS defect and inserts Section-AIS. The Section MEP detects the loss of CC fault, declares the LOC defect and inserts edge-to-edge-LSP-AIS. The edge-to-edge LSP MEP detects the loss of CC fault, declares the LOC defect and inserts W-PST-LSP-AIS (marked as "AIS (1)"). The working PST LSP wMEP detects loss of CC fault, declares the LOC defect and inserts service-LSP-AIS (marked as "AIS (2)"). As long as the protection switch selector in PE E selects traffic from working this service-LSP-AIS signal will be output by E to F (marked as "AIS (3)"). When however this selector in PE E selects traffic from protection, then the service-LSP-AIS signal will not longer be forwarded by the selector (marked as "no AIS (5)"). The AIS (1) and AIS (2) signals are still being generated, but the output of the protection switch selector does not forward AIS (2) any longer. AIS (1) is still used to suppress the W-PST LOC failure.

AIS in packet transport networks must ***not*** be used to trigger recovery mechanisms. Reason is that AIS OAM messages in packet transport network are to be generated within 1 second after the detection of the signal fail type defect detection and be generated with a periodicity of 1 second. These times are much too long to trigger any recovery mechanism.

The 1 second time requirement to generate the first AIS message is derived from the 2.5 ± 0.5 second fault cause to failure integration timer as specified in G.7710. Generation of the first AIS message within a period of 1 second will leave enough time to reach the downstream MEP Sink function and suppress the fault cause that report the interruption of the connection.

Protection switching in packet transport networks is triggered by e.g. loss of continuity and misconnection defects.

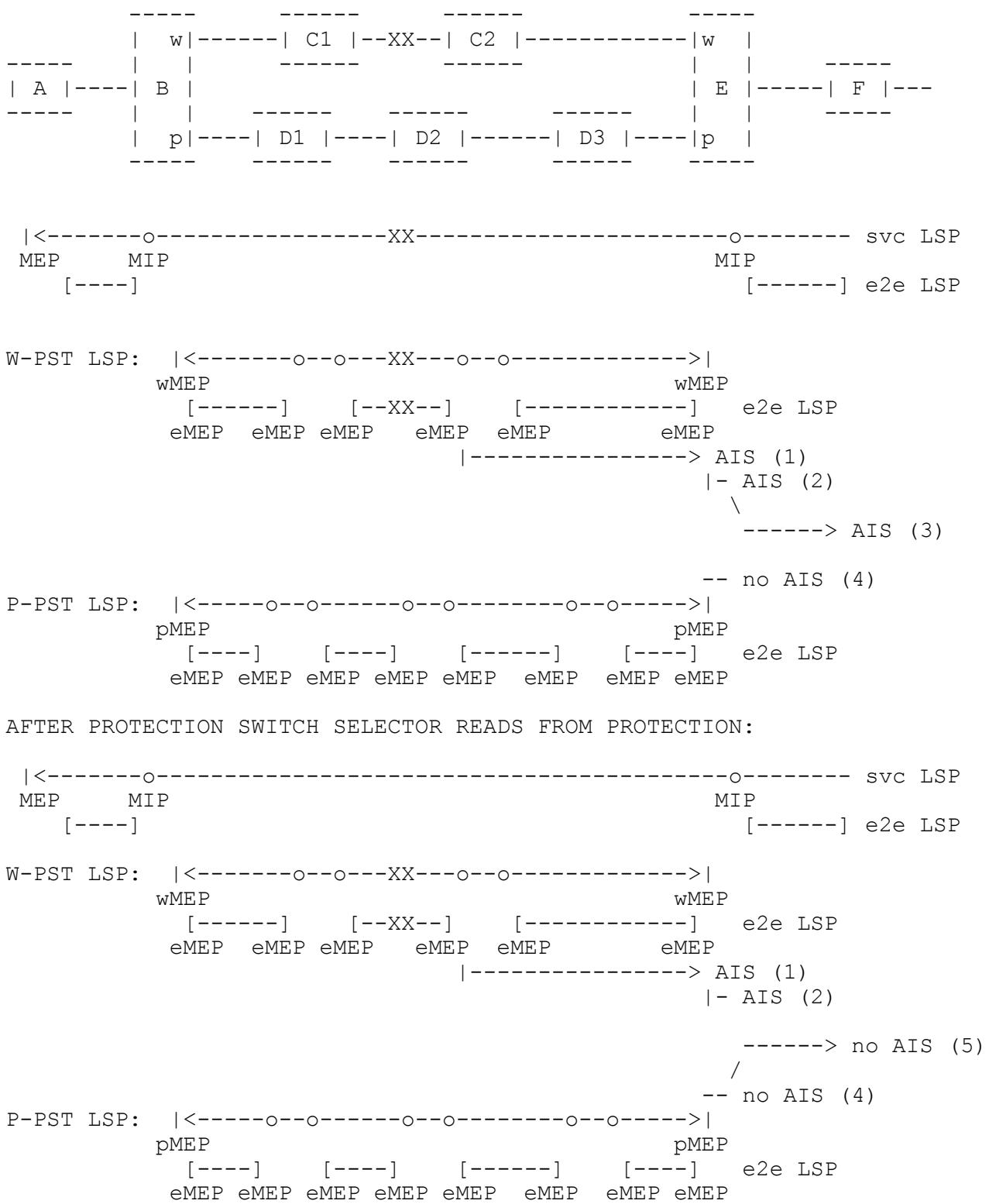

Figure 1.

4. Section 2.2 Link Down Indication

In section 2.2 it is stated:

The LDI message is generated in response to detecting a fatal failure

> in the server layer. The LDI message MUST NOT be sent until the defect has been determined to be fatal. For example during a protection switching event LDI messages are not sent. However if the protection switch was unsuccessful in restoring the link within the expected repair time, an LDI message MUST be sent.

and in section 2.1 it is stated:

> The MPLS-TP Alarm Indication Signal (AIS) message is generated in response to detecting defects in the server layer. The AIS message SHOULD be sent as soon is the condition is detected, that is before any determination has been made as to whether the condition is fatal.

This draft suggest that it is possible for a MEP Sink function (e.g. in PE C2 in the above Figure 1) to determine if the fault is ***fatal*** or ***not fatal***. This is not possible for a MEP Sink function. The reason is that a MEP Sink function has no knowledge of the presence or state of a protection switch process associated with the connection. E.g. the protection switch process may be in a downstream node PE E as illustrated in the above Figure 1.

The ***fatal*** conditions are detected by CC and CV OAM only. E.g. the "absence of CC OAM packets" and/or the presence of "CV OAM packets with the wrong identifier" identify a ***fatal*** fault condition. The AIS maintenance signal is to suppress the report of such condition when it is not the primary condition.

It is also not necessary (essentially it is incorrect) to make AIS generation conditional on e.g. protection switch actions. Reason is that a protection switch process will select traffic from either a working connection input port, or a protection connection input port. Any traffic present on the not selected input port will drop at this input port and not be forwarded to the protection switch process output port. At the output port AIS messages will be present as long as the protection switch process selects its traffic from the failed connection; once the protection switch process selects its traffic from the non-failed connection AIS messages will not longer be forwarded to the output port.

Therefore, MPLS-TP must not specify a LDI OAM message. Instead, MPLS-TP must specify a regular AIS OAM message that is compatible in its behaviour with Ethernet AIS OAM.

5. Section 3 and 5.1 Fault Management

In section 3 it is stated:

> The FM Channel uses ACH TLVs and MUST include the ACH TLV header.

and

> The ACH TLVs may include (but are not limited to) IF-ID, Global-ID, and ICC.

In section 5.1 is stated:

> A Global-ID TLV or an ICC TLV MAY be included.

The AIS and LCK OAM messages should not carry any identifiers; as such identifiers are not read by the receiving MEP. Those identifiers are not providing any useful information to network management or detector circuits. Addition of such identifiers to the AIS and LCK frames adds unnecessary complexities to the designs.

6. Section 4

In section 4 it is stated:

> R-flag The R-flag is normally set to zero. A setting of one indicates the removal of a previously sent FM condition.

This R-flag is not a helpful feature in AIS and LCK messages. Addition of such flag only increases complexity of the solution and designs. It is a classical item, discussed in previous OAM developments as well. The idea is that the receiver can be explicitly informed about the end of the AIS or LCK condition. Unfortunately it is necessary to take into account that a packet may be dropped due to congestion or bit errors. As such, the AIS and LCK detector circuits in the MEP Sink functions must be able to clear the AIS and LCK defects also when such packet with R-flag was lost (which is foreseen in the specification in section 5.3). It is therefore less complex to have the absence of three AIS or LCK packets being used as clearing condition for the AIS and LCK defects.

7. Section 4

Also in section 4 it is stated:

> Refresh Timer The maximum time between successive FM messages specified in seconds. The range is 1 to 65535. The value 0 is not permitted. The default value is 60.

The default AIS and LCK repetition period is generically 1-second, not 60-seconds. There is no need for a range of AIS and LCK repetition periods. The first AIS packet for each LSP/PW impacted by the fault has to be generated within 1 second after a signal fail type defect is detected and the next one has to be generated 1-second later. This 1 second period is necessary in order to prevent that downstream the alarms are raised (which happens after 2.5 ± 0.5 seconds).
If the first AIS packet was lost (due to congestion or bit errors) then there is a second AIS packet that will be received by the MEP Sink function before the 2.5 ± 0.5 second fault cause to failure filter will expire. Either the first or second AIS packet will clear the fault cause and prevent the alarm from being raised.

MPLS-TP AIS and LCK OAM packets should be very simple OAM packets including only a Version number and OAM Type (MsgType or OpCode). AIS and LCK OAM packets should be inserted within 1 second after the condition to generate those packets became active and these OAM packets must be send with a 1 second repetition rate.

Furthermore, the presence of AIS for e.g. 3 seconds after the primary fault was repaired does not have an impact on the operation either. As soon as the loss of CC defect clears it is not important whether or not there is still an active AIS defect; i.e. there is nothing to suppress anymore. The clearing time of AIS defect is as such not critical.

8. Section 5.1 Sending FM message

It is stated:

> The message MUST be refreshed twice at an interval of one second.

What is the rational of requiring "twice"; in transport networks changed information is sent three times at the highest rate.

Should there be any further technical changes to the draft, we would appreciate the opportunity to provide additional review and comments.
