Q9's comments on draft-ietf-mpls-tp-linear-protection-04 **Feb. 23, 2011**

Comment No.	Relevant section	Comment Text	Proposed Resolution
1	Common	Protection State Coordination (PSC)	The term "state" is not appropriate. The operation described in this draft does not attempt to coordinate protection state. I suggest using the term Protection Switching Coordination
2	Common	The document uses consistently the term working path, but inconsistently recovery path, recovery transport path, recovery entity, recovery transport entity, protection path.	Use terms consistently. The term "protection path" is preferred due to its common use in transport networks.
3	Common	A definition of Failure of Protocol defects is missing. There is only a mention in 4.2.3 (Protection type field) or in 4.2.4 (Revertive field) that inconsistency in the value between both end points leads to an alarm SHALL be sent to the management system, but this is not sufficient; there are other protocol and configuration mismatches which should be alarmed. FOP defect is well-known in transport networks, was defined in SDH/SONET, is defined in ITU-T G.8031 and G.8032 for Ethernet Transport, and should also be present for MPLS-TP Protection. Although ITU-T G.8121 Equipment Specification for MPLS-TP will also specified	FOP defect detection criteria should be stated.

		FOP, mention of FOP defect detection criteria should also be mentioned in the current draft.	
4	Common	The current document misses a specification for a Hold-off timer. It is only shortly mentioned in section 3.1.1 (page 9) and is only a MAY. The reason is probably that this generic timer is mentioned in MPLS-TP Survivability Framework document (section 4.9). However the present document should be a self-containing document for implementers, like ITU-T G.8031 is for Ethernet. A specification document shall point explicitly and without ambiguity to any function within its scope. Hold-off timer is definitely within the scope of this draft specifying a protection switching protocol.	Either an explicit description of hold-off timer or a specific reference to a different document/recommendation where the function is detailed is needed.
5	Common	Neither this document nor the MPLS-TP Survivability Framework document mention the protection switching time performance objective of 50ms as requirement. In the MPLS-TP Survivability Framework document, there is only one mention on page 30 “For 50-ms protection switching, …”. In this document, there is only indirect mention in “For protection switching within 50ms, it is RECOMMENDED that the default interval of the first three PSC messages SHOULD be no larger than 3.3ms.” It seems 50ms is just an option. But it is a basic transport network requirement. It was	See the left cell.

		always explicitly mentioned in ITU-T protection recommendations. It is mentioned in G.8031 for example. Can it be added here? If considered out of scope for this document, where else?	
6	1.1 and 4.2.3	This draft defines both 1+1 and 1:1 unidirectional and 1+1 and 1:1 bidirectional. ITU-T G.8031 (Ethernet) and G.8131 defined 1+1 unidirectional, 1:1 and 1+1 bidirectional but not 1:1 unidirectional. What's the rationale behind the inclusion of 1:1 unidirectional? There is no known application for it, neither in legacy transport networks nor in Ethernet Transport networks.	Can the authors of this draft justify the applications for it?
7	1.1	Protection architecture figures should be added in this section	Please refer or reuse 4.7.x in [Surv-fwk] I-D.
8	1.1	For 1+1 case, it says "In 1+1 unidirectional architecture as presented in [SurvivFwk], a recovery transport path is dedicated to the working transport path."	But Figure 2 in [Surv-fwk] I-D uses Working path and Protection path. Terminologies should be aligned.
9	1.2	There is no mechanism to support following requirements in this draft. - Req. 66 (sharing of protection resources - Req. 67 (1:n protection)	Remove Req. 66 and 67.
10	2.1	Acronym "LER" is incorrectly defined.	Change "Switching" to "Edge".
11	2.1	Acronym "PSC" is incorrectly defined.	Remove "Protocol".
12	2.1	Definitions for LO, DNR and NR are missed.	Add definitions.
13	2.1	Acronym "PST" is never used in the draft.	Remove "PST".
14	Figure 1	Protection Switching Control Logic	You need to add Management commands/input to the block named "Local Request Logic". This is to

			provide for example provisioning of WRT. You may also need to consider events such as "Client Signal Fail". This is neither an OAM or Server events.
15	Figure 1.	Figure 1 is not complete. It could be enhanced with additional text and blocks as for example in ITU-T G.8031: the output of the PSC Control Logic is not only action to generate PSC message to far-end, it should also show the local action to set the local bridge/selector. The Remote PSC Request should first go through a PSC message Validity Check.	See the left cell.
16	3.1	In "e.g. switching the Selector Bridge to select the working or protection path, and transmit different protocol messages." It is not only the selector bridge which selects the working and protection paths: to be precise, it can be the Selector Bridge at the source or the Selective Selector at the sink of the protection domain.	See the left cell.
17	3.1.1	1st bullet: in "Operator command - the network operator may issue commands that trigger protection switching. The supported commands are Forced Switch, Manual Switch, Clear, Lockout of Protection, (see definitions in [RFC4427])" the local request logic only processes operator commands issued locally on this LER, while the operator commands on remote LER are received via PSC messages and handled in the PSC	See the left cell.

		Control logic, therefore, the sentence could be improved to “Operator command - the network operator may issue local administrative commands on the LER that trigger protection switching. The supported commands are Forced Switch, Manual Switch, Clear, Lockout of Protection, (see definitions in [RFC4427])”	
18	3.1.1	2nd bullet: It should also be clarified, which is the signal generated at server layer (or at its adaptation layer) expected to be used as “server layer alarm indication”. In ITU-T Equipment specification this would be defined in unambiguous terms by referring to the CI_SSF contribution from the server layer. But this contribution is unclear wrt current IETF OAM specification. Does it include for example AIS w/LDI indication? Description of an application scenario could also contribute in clarifying the function.	See the left cell.
19	3.1.1	4th bullet: in “OAM indication - OAM fault management or performance measurement tools may detect a failure or degrade condition on the MPLS-TP transport path and this SHOULD input an indication to the Local Request Logic.”	Suggest to rephrase “failure or degrade condition on the MPLS-TP transport path” with “failure and degrade conditions on either working and protection transport paths”
20	3.1.1	Tthe text should indicate which local request is global versus per transport path (working or protection): for example, SF condition is in reality SF-Working or SF-Protection	See the left cell.
21	3.1 2nd para	The term “PSC Control Logic” is incorrectly	Change to “Protection Switching Control Logic”.

		used.	
22	3.1.1 1st para	The term “protection switching logic” is incorrectly used.	Change to “Local Request Logic”.
23	3.1.1	Server layer alarm indication such as AIS may not be updated quickly, so it should not be used as a trigger source if faster defect indication such as OAM CC is available.	It should be stated that this can be used when CC (or OAM indication) is not used.
24	3.1.1	Server layer alarm indication	The use of hold-off timer is mentioned here, but hold-off timer also should be applied to OAM case, too.
25	3.1.1	It says “Lockout of Protection (LO) – if the operator requested to disable the protection path”. LO disables protection switching and does not disable protection path itself.	Change to “Lockout of Protection (LO) – if the operator requested to prevent switching to protection path in any cases”.
26	3.1.1	“Clear Signal Degrade” is missed as an output of Local Request Logic.	Define and add “Clear Signal Degrade”.
27	3.1.1	It says “Manual Switch (MS) – if the operator requested that traffic be switched from its current path to the other path”. However, in Section 4.3.3.6, when MS is issued in DNR, the outgoing message is MS(1,1). Inconsistent behavior of MS.	Correct the problem one way or the other.
28	3.1.3	In “b. the remote request message from the remote end point of the transport path,”	Add reference (see section 3.1.2) as done in the item #a.
29	3.1.4 1st para	Add “PSC” in front of “Control Logic”.	See the left cell.
30	3.1.4	What is “ PSC information” Is it the last 4 octets of PSC packet?	Need to define/describe clearly.
31	3.1.5	WTR	It is not indicated how the WTR is provisioned. I suggest using the management system.

32	3.1.5	Is it possible to list the range of values, steps and default for the WTR timer or is this left to future MIB specification?	In ITU-T, WTR values are explicitly provided: 1 minute steps between 5 and 12 minutes; the default value is 5 minutes.
33	3.1.5	Stop command: Why is it needed? Once WTR timer is stopped by this command, how do we run the WTR timer again? Or, is it for clearing WTR, so that the reversion can occur immediately without waiting for WTR expiration?	Need more descriptions.
34	3.1.5	The WTR timer can be stopped by the PSC Control Logic. The text is not clear if the operator also has possibility to override the WTR timer and its PSC Control logic by clearing manually the WTR timer. Clear of WTR is a capability in transport network.	Two solutions: either introduce a Clear WTR command or use the same Clear command as used for clearing LO/FS/MS operator command to stop the WTR timer.
35	3.1.6	The usage of (PSC Control) States should be more clarified. It seems to be based on 3.1.6 and it is determined for path, but in case of "Unavailable State" in 4.3.3.2 as an example, it says "the protection domain is in the unavailable state". This means that the state for domain. Further more "A local Clear input SHOULD be ignored if the LER is in remote Unavailable state." This says that state is for LER (e.g equipment)	See the left cell.
36	3.1.6	While both end nodes are in DNR state, if MS is issued at one node, what is the next state? According to the definition of MS in section	Definition of either “Protecting administrative state” or “MS” needs to be corrected.

		3.1.1, it switches traffic from protection path to working path since the current path is protection path. In this case, does the next state of both nodes become Normal state or Protecting administrative state?	
37	3.1.6	It says "The protection domain SHALL remain in DNR state until the operator issues a command to revert…"	Need to clarify which command can be used for this.
38	3.1.6.1	"If, however, the LER has local and remote indicators that would cause the PSC Control logic to enter different states, e.g. a Local SF on working and a Remote Lockout message, then the state with the higher importance will be the deciding factor and the source of that indicator will determine whether it is local or remote."	It is not clear what is the "state of higher importance". There is a definition of priority between different inputs in section 4.3.2, which it is assumed is what is referred to, but there is no definition of priority/importance of PSC control state in the document. Clarification needed.
39	4.1 2nd para	"When the PSC information changes due to a remote message there is no need for the aforementioned rapid transmission of three messages."	Doing this way is dangerous. When there is no response to a bridge request for more than 50 msec (i.e., mismatch between bridge position on one end and selector position on the other end), failure of protocol should be declared. In order to ensure this, three rapid messages should be generated. Also, for the sake of simplicity, it is desirable to maintain the same behavior regardless of the location of the input.
40	4.1	The continuous transmission interval is RECOMMENDED to be 5 seconds. However, it is specified as "SHOULD" in section 3.1.4. Needs to align.	See the left cell.

41	4.1	Wrt paragraph “The frequency of the three rapid messages and the separate frequency of the continual transmission SHOULD be configurable by the operator. For protection switching within 50ms, the default interval of the first three PSC messages is RECOMMENDED to be no larger than 3.3ms. The continuous transmission interval is RECOMMENDED to be 5 seconds”. The recommended values of 3.33ms of burst mode PSC and 5s for slow mode PSC are in-line with current ITU-T G.8031 specifications for Ethernet transport and are ok. However there is no strong requirement to make them configurable by the operator. All packet transport network operators want it to switch in 50ms and have as little configuration as possible. In current practice such rates are not configurable; neither are they in ITU-T G.8031. Therefore the proposal is to replace the “SHOULD” by a “MAY” in the first sentence.	See the left cell.
42	4.1	The following requirement "If no valid PSC specific information is received, the last valid received information remains applicable. In the event a signal fail condition is detected on the protection path, the received PSC specific information should be evaluated." should be revised:	The first sentence is ok. It is inherited from ITU-T G.8031 specification in force, just replacing APS with PSC. Indeed ITU-T G.8031 (latest draft) says this in clause 1.1.1 Transmission and acceptance of APS: "If no valid APS-specific information is received, the last valid received information remains applicable." However the second sentence "In the event a signal

			fail condition is detected on the protection transport entity, the received PSC specific information should be evaluated" is either incorrect or misleading. When SF is detected on a protection MPLS-TP LSP, the data is meaningless so evaluating it is not meaningful. Our understanding is that this second sentence is meant to say “If a PSC specific information is received, whose fields contains invalid values, the last received information remains applicable, i.e. no state change is triggered by this last invalid request. In the event a SF condition is detected by an end on protection path, the SF-P state is locally entered and the PSC specific information is sent to remote end, where it should be evaluated.” Therefore in case of a signal fail detected at both ends (bidirectional detection), both ends will enter, locally, the SF-P state, which takes priority over any other request (except Lockout of Protection); they, consequently sent each other an SF-P request, which is, actually, not received due to the impairment on the protection path. Moreover, the focus of this section is to address the rules for APS processing, with no mention to the specific contents, except for “valid” or “invalid” indication. Hence the detection of valid switching triggers (as SF-P) and the resulting transition is out of the scope of this section. Making such a statement in this section would be a duplicate of information available elsewhere in the document. It should be left out.

			Note the same discussion took place in ITU-T Q9/15. Initial G.8031 had the same misleading sentence. During the October 2010 interim meeting, ITU-T Q9/15 decided to simply remove the text in G.8031(v3) to avoid confusion. Our proposal for this draft is to do the same: simply remove the second sentence.
43	4.1 Last para	What is "PSC specific information" Is it the last 4 octets of PSC packet? Is it the same as "PSC information" in section 3.1.4?	Need to define/describe clearly.
44	4.1	The last paragraph should also add "If a protection end point receives PSC-specific information from the working entity, it should ignore this information. This will also lead to detection of a Failure of Protocol defect"	See the left cell.
45	4.2	PSC signaling: the LER always signals (in Request field) the local highest priority request and, consistently, signals in FPath field, either the signal 1 (when protection is required) or signal 0 (when the protection is unavailable). Then it matches the possible far end highest priority request, by signaling (in Path field) the same value of Path field in PSC packet received. With this behavior, a command locally applied at one end, with a lower priority than far end requests, seems to be kept as "pending" (there is no evidence of a different behavior in the draft). In any transport	See the left cell.

		oriented scheme, “pending” commands are not allowed to co-exist.	
46	4.2.2	Change (0101) Signal “Defect” to “Degrade”.	See the left cell..
47	4.2.2	Description on “(0100) Manual switch” is not aligned with the definition of MS in section 3.1.1. Needs to align.	See the left cell.
48	4.2.2	Why choose code points different from those already used in ITU-T G.8031?	Justify the need of different code points.
49	4.2.2	Typo: Signal Defect -> Signal Degrade	See the left cell.
50	4.3	SD is defined as a trigger for protection. However, it is not fully described in the draft.	Describe completely on SD cases.
51	4.3.2	“7. Clear Signal Fail/Degrade (OAM/Control Plane/Server Indication)” is listed as part of the priority list. In ITU-T linear protection specification, clearance of SF/SD is not listed explicitly in the priority list and is taken into account differently in the priority logic and state machine.	It is not a functional issue, but is it possible to add a note to clarify the need to keep this in the priority list?
52	4.3.2	Exercise operator command is missing. Exercise is used to test, while in idle situation, that a protection path is available and that the protection mechanism works properly without actually switching the traffic itself. Exercise is present in all transport network protection protocols defined in ITU-T Recommendations, such as G.808.1 and G.8031. It is also a requirement in RFC 5654 MPLS-TP Requirements (Reqt #84).	An exerciser for the protocol must be included. For further information on the exerciser, refer to ITU-T Recommendation.
53	4.3.2	It says “All local inputs with lower priority	See the left cell.

		than this current local request will be blocked." Needs to clarify whether the blocked local requests will be active after the blocking request has gone. Also needs to clarify this applies for both local requests (SF, SD) and local command (MS).	
54	4.3.3.2	It says "Both ends will resume sending …". PSC messages are always transmitted regardless of the state of protection path but it may not be received at the far-end. Needs to correct.	See the left cell.
55	4.3.3.5	No input for clearing WTR timer. The WTR timer can be cleared by the PSC Control Logic. Clear WTR is a capability in transport network.	Clearing WTR should be considered. Either introduce a Clear WTR command or use the same Clear command as used for clearing LO/FS/MS operator command to clear the WTR timer.
56	Appendix A	The end of first paragraph: typo "implmentation" -> "implementation"	See the left cell.
57	Appendix A.	The abbreviation CSF for Clear Signal Fail" is misleading as CSF is an already used term for Client Signal Fail indication in OAM.	The following syntax is preferable: SFc (SF Clear).
58	Appendix A	The sentence "In the event of a mismatch between these tables and the text in section 4.3.3, the text is authoritative." should not be present. It gives impression that the authors and reviewers have not checked in detail the consistency between the text in section 4.3.3 and the tables of Appendix A for each state transition. They must have done this check.	Remove the sentence.
59	Appendix A	In Part 1 (local input state machine), if a node	The operation principle in section 4.3 and state

		in UA:LO:L receives OC, is the next state always N? If SF on working which has been blocked by LO is reasserted after OC, protection switching occurs twice because the state changes as UA:LO:L → N → PF:W:L.	machine in Appendix A should consider reassertion cases to prevent glitch (switching twice).
60	Appendix A	The footnote [7] only applies to PF:W:L state. The sentence "If the SF being cleared is SF-P" is redundant.	See the left cell.
61	Appendix A	According to the state machine, WTR operation is not working as follows, 1. Initially, LER A detects SF on W and LER Z has no request. 2. LER A recovers from SF on W. LER A – PF:W:L / local CSF → WTR / run WTR timer & send WTR 3. LER Z receives WTR from LER A. LER Z – PF:W:R /WTR received → WTR / send current message (NR01) 4. LER A receives NR01 from LER Z LER A – WTR / NR01 received → Maintain current state since WTR timer is still running. 5. WTR timer is expired on LER A. LER A – WTR / local WTRExp → WTR / send NR01 6. LER Z receives NR01 from LER A LER Z – WTR / NR01 received → Maintain current state since WTR timer has not been started. 7. LER A and LER Z are all in WTR state and	Change state machine to fix WTR operation.

		sending NR01 forever.	