

# CC, CV and RDI for MPLS-TP

## draft-ietf-mpls-tp-cc-cv-rdi.03

Last call comments

# Situation

- Version 03 went through last call ending Feb 28<sup>th</sup>
- Editors have reviewed some 90 comments and proposed resolution for each
  - A few more have trickled in which we've not yet discussed resolution of...
- The following is where we are
- Plan is to edit to proposed resolution and wrap the document up

1	Joel Halpern	The last paragraph of the main text of section 3.5 proper specifies that Lock Instruct / Lock Report act as inputs to the BFD state machine. Section 3.5.5 indicates that LKR can cause a transition to the DOWN state. But section 3.5.2 does not include LKR in any of its text on Defect entry criteria.	clarification required
2	Joel Halpern	I would suggest that the BFD CC code point be referred to with a different referent than the BGD CV code point (HH1 and HH2 maybe? GG and HH?), unless the intent was that they actually be the same, which I do not believe was the purpose. This is in section 4.1.	update to 3.1, 3.3, 3.5 required to clarify
3	Joel Halpern	The text for the MEP-ID in section 3.3 slightly does not match the figure. The figure simply says "Unique MEP-ID of the source of the BFD packet." The text says that this is actually a TLV. Can the figure be modified to say "MEP-ID TLV with unique source of the BFD packet" or some related wording that includes TLV?	update figure to say MEP-ID of source...
4	Joel Halpern	Clarification question: It seems to me likely in practice that the configuration for sink MEPs on a node is likely to cover all end-points residing on that node. It is unlikely to be session specific. (To the point that if one enables CC Sink MEP behavior, and then a new LSP is configured, that would also be able to be a Sink MEP without any further configuration. Is this consistent with the wording in section 3.4 that the BFD session needs to be enabled on a configured Maintenance Entity?	really an OAM framework clarification that a MEP is per LSP
5	Joel Halpern	this is the way things are referred to all the time, then we are fine.)  Editorial, but annoying enough to mention early: RFC Editor Policy is that acronyms are not use in abstracts, and that they should be expanded on their first uses in the body of the document.	editorial
6	Joel Halpern	Probably editorial: Section 3, third non-bulleted paragraph has the string: "the BFD PW-ACH- encapsulated for PW fault detection only encapsulation can be ..." I am not sure what is intended, but my best guess is that this was supposed to say: the PW-ACH encapsulation of BFD, which is used only for PW fault detection, can be ... Note: If that is not what is intended, then the sentence needs work so that the reader can figure out at all, rather than currently guessing after staring long enough.	remove "only encapsulation"
7	Mach Chen	1.Section 3.5, last sentence of first paragraph: Poll/final discipline can only used for VCCV and UDP/IP encapsulated BFD. There is a "be" lost between "can" and "only".	On hold pending discussions

		2. Section 3.5.2: 1. BFD control packets are received with an unexpected encapsulation (mis-connectivity defect), these include:	
8	Mach Chen	<p>- a PW receiving a packet with a GAL, Since GAL can be used for PW(<a href="http://tools.ietf.org/html/draft-ietf-pwe3-mpls-tp-gal-in-pw-00">http://tools.ietf.org/html/draft-ietf-pwe3-mpls-tp-gal-in-pw-00</a>), this should not be a defect. Suggest to remove it.</p> <p>3 Section 3.5.2: 4. Receipt of an expected session discriminator with an unexpected label (mis-connectivity defect)., For a receiver, how does it know that the session discriminator is valid but the label is invalid? IMHO, this defect is just another description of defect 3 . Suggest to remove it.</p>	On hold pending PWE resolution
9	Mach Chen		clarify 3 to say label and discriminator do not match, and 4 to say discriminator not in my database
10	Mach Chen	<p>4. Section 3.5.4.2 " Exit from a misconfiguration defect occurs when two consecutive CC or CV frames have been received with the expected M bit setting." IMHO, this sentence is little bit vague, and since this draft only defines for P2P LSP, why not just say "...with M bit clear."</p>	accepted
11	Mach Chen	<p>5. Section 3.5.4.3 "Exit from a mis-connectivity defect state occurs when no CV messages have been received with an incorrect source MEP-ID for a period of 3.5 seconds.", since there are several defects listed in Section 3.5.2 and this is only one condition for exiting from a mis-connectivity defect state. How about "Exit from a mis-connectivity defect state occurs when no CV messages with mis-connectivity defects have been received for a period of 3.5 seconds "</p>	accepted
12	Mach Chen	<p>6. Section 3.5.5 In Figure 5, seems that it is lack of "AIS-LDI, LKR" inputs for DOWN state.</p> <p>I'd like to remind you that Rob and I have already questioned the decision to change the BFD state machine by disabling in some case the Poll/Final sequence. The situation as presented in the draft seems to introduce even more problems. E.g., RFC 5885 allows to run BFD in VCCV without UDP/IP encapsulation but follows the procedures specified in RFC 5880 and 5881 which, to the best of my understanding, include usage of Poll/Final sequence. It is my understanding that BFD for an MPLS-TP LSP would look exactly as BFD in VCCV (including the same code point).</p> <p>If this is correct, how should the implementation distinguish between "PWE3 mode" (where poll/final are used) and "MPLS-TP mode where they seem to be prohibited?</p>	accepted
13	Sasha Vainshtein		on hold pending discussions

14	Martin Vigoreux	<p>it looks like you did not implement the change: &gt; OLD: Poll/final discipline can only used for VCCV and UDP/IP encapsulated BFD &gt; NEW: Poll/final discipline MUST not be used on the Associated Channels this document defines</p> <p>May be the following sentence.... A further artifact of IP encapsulation is that CV mis-connectivity defect detection can be performed by inferring MEP_ID on the basis of the combination of the source IP address and "my discriminator" fields. Can be extended/rephrased as follows to make it explicit for IP based BFD...A further artifact of IP encapsulation is that CV mis-connectivity defect detection can be performed by inferring MEP_ID on the basis of the combination of the source IP address and "my discriminator" fields. When ACH is not being used, CV is purely based on Source IP Address.</p>	on hold pending discussions
15	Kannan Sampath	<p>LSP MEP ID in draft-ietf-mpls-tp-identifiers-03 is: Node_ID::Tunnel_Num::LSP_Num, and for LSP MEG ID: (7.1.2.1.) Since a MEG pertains to a single MPLS-TP LSP, IP compatible MEG_IDs for MPLS-TP LSPs are simply the corresponding LSP_IDs. We note that while the two identifiers are syntactically identical, they have different semantics. This semantic difference needs to be made clear. For instance if both a MPLS-TP LSP_ID and MPLS-TP LSP MEG_IDs are to be encoded in TLVs different types need to be assigned for these two identifiers. you can only detect wrong MEP ID, that's Unexpected MEP, it is not Mis-merge.</p>	accepted
16	Feng Huang	<p>Why is there a single code point allocated for both CC and CV? If there were two different code points, it would allow mis-configuration alarm to be generated in case CC mode is used between CV MEPs? The present draft in section 3.1 has same filler value 0xHH to be filled by IANA PW ACh registry and is not clear if there will be two different ACh code point. Can you pl have a note telling that the expectation from IANA is to get two different code points in the draft till we get specific IANA code point mentioned below by you?</p>	clarify that there is one format per section, one per PW and receiving an unexpected MEG encoding is a fault
17	Jishnu Aravindakshan	<p>In the draft it is mentioned that MEP has to be configured for operation as either CC MEP or a CV MEP? How do you do this? Is there any draft on MEP configuration?</p>	editorial
18	Jishnu Aravindakshan		covered by configuration appendix to be added

19	Tom Petch	A minor quirk; the expansions given in s2.3 of this I-D for MIP and MEP are out of line with those used in other MPLS I-Ds.	editorial, accepted
20	Eric Osborne	mention RDI. Perhaps: OLD: Both PWs and MPLS-TP LSPs [10] emulating traditional transport circuits need to provide the same CC and proactive CV capabilities as required in RFC 5860[3]. NEW: Both PWs and MPLS-TP LSPs [10] emulating traditional transport circuits need to provide the same RDI and proactive CC and CV capabilities as required in RFC 5860[3].	editorial
21	Eric Osborne	Section 2.1: "RDI: Remote Defect Indication. " Period after 'Indication' that isn't present in other terms.	editorial
22	Eric Osborne	Section 3: First paragraph refers to 'ACH encapsulated BFD', should probably be 'ACH encapsulated' or 'ACH-enapsulated'.	editorial
23	Eric Osborne	Section 3: s/RDI is communicated:/RDI is communicated/(spurious colon)	editorial
24	Eric Osborne	Section 3: The paragraph at the bottom of p. 5 begins 'A further artifact of IP encapsulation' but nothing prior to that refers to itself as an 'artifact'. Perhaps: "Additionally, when using IP encapsulation, CV mis-connectivity defect detection can be performed by inferring MEP_ID on the basis of the combination of the source IP address and "my discriminator" fields."	editorial
25	Eric Osborne	Section 3.1:" Both CC and CV modes apply to PWs, MPLS LSPs (including SPMes), and Sections." It is unclear whether this sentence is intended to exclude things to which CC and CV do not apply (e.g. "Both CC and CV modes apply *only* to PWs, MPLS LSPs+SPMes, and Sections") or whether it's supposed to be inclusive ("Both CC and CV modes apply to all pertinent MPLS-TP structures, including PWs, LSPs, SPMes, and Sections".	inclusive accepted
26	Eric Osborne	Section 3.3: 'transmitted as MPLS labeled packet' -> 'transmitted as an MPLS labeled packet'	editorial
27	Eric Osborne	Section 3.3.2 and 3.3.3: A number of referenecs to "third two bit" and "sixteen bit" rather than "32-bit" and "16-bit". This is inconsistent with other documents and parts of this draft; IMO numbers, rather than words, should be used.	editorial

		Section 3.4: Extra punctuation in " configured Maintenance Entity (ME)." Also, this section is five paragraphs that are each one	
28	Eric Osborne	(ME)..". Also, this section is five paragraphs that are each one	editorial
		Section 3.5: The first use of 'The base spec' (5th paragraph) has no reference. This can be fixed by changing the first sentence in the	
29	Eric Osborne	Section 3.5: The first use of 'The base spec' (5th paragraph) has no reference. This can be fixed by changing the first sentence in the	cleanup, ref to 5880 should be 5884 throughout the doc
30	Eric Osborne	Section 3.5.3: 'traffic as consequent' -> 'traffic as a consequent'	editorial
		Section 3.5.2, The text says "BFD control packets are received with an unexpected encapsulation (mis-connectivity defect)". BFD control	believe confusion is around
		Section 3.5.2, The text says "BFD control packets are received with an unexpected encapsulation (mis-connectivity defect)". BFD control	"control" packets. We will
31	SG15/Q10 liaison	packet is just part of cc-cv-rdi OAM as in Figure 3, so the question	make description of BFD packets consistent with
		Section 3.5.2, The text says "BFD control packets are received with an unexpected encapsulation (mis-connectivity defect)". Even if only	will review def'n of unexpected
		Section 3.5.2, The text says "BFD control packets are received with an unexpected encapsulation (mis-connectivity defect)". Even if only	encap, unexpected period
32	SG15/Q10 liaison	time period, encapsulation (mis-connectivity defect). Even if only	does refer to BFD packet
		Section 3.5.2 end of 1st paragraph, The text says "BFD session times out (Loss of Continuity defect)". Why is BFD session times out	will review def'n of unexpected
		Section 3.5.2 end of 1st paragraph, The text says "BFD session times out (Loss of Continuity defect)". Why is BFD session times out	encap, unexpected period
33	SG15/Q10 liaison	out (Loss of Continuity defect)". Why is BFD session times out	missing 3 = LOC is by design
		Section 3.3 after 4th para, X1 to X3 are defined. There is not description	
		Section 3.3 after 4th para, X1 to X3 are defined. There is not description	
34	SG15/Q10 liaison	of the defect due to the mismatch Xi (e.g. send as X1 but receiver	same as comment 19
		Section 3.1, Para 3, PI add a note mentioning that CC and CV will have	
		Section 3.1, Para 3, PI add a note mentioning that CC and CV will have	
		separate ACh Code Point as it is not clear that both will have	
		separate code point as the place holder for both mention 0xHH in	
35	SG15/Q10 SG15/Q10	addition to the one mentioned in section 5 or use the same	see comment 17
		Section 3.5, Para 1 "In the rare circumstance where an operator has a	
		Section 3.5, Para 1 "In the rare circumstance where an operator has a	
		reason to change session parameters, poll/final discipline is	
		used." This can create issue of interoperability issue if one end	
36	SG15/Q10 SG15/Q10	MEP starts changing the rate all of sudden even if it is a rare	rejected

		session with a BFD source set to zero interval behaves." The clause should say that it is NOT recommended to set BFD to zero	
37	liaison	hence the additional discussion on the following par. should not be added in the draft. There should be a configuration option to keep the MEG and MEP without BFD actually running E2E.	rejected
38	liaison	CV)mode, then it gets a BFD with CV code point it shall raise a misconfiguration alarm and vice versa. In case MEP operate in CC and CV mode then this is not applicable.	sender interleave, so receiving CC is not a fault
39	liaison	parameters which are configurable like MEP can be in CC, CV or CC&CV mode.	appendix to be added
40	liaison	and considerations. Note the results of the interop testing and ask what steps are being taken to improve the draft to ensure that we have an interoperable draft. Note that the requirements expressed by a significant number of members of SG15 have not been met  Recommendations.	as much as possible - see RFC xxxx
41	SG15/Q10 liaison	backwards compatible with RFC5880 from a network viewpoint, and will not have the same codepoint."	rejected
42	SG15/Q10 liaison	system initialization, only CVs are exchanged, to prevent a misconnected session from going up." "At system initialization, only CVs are exchanged, to prevent a misconnected session from going up."	rejected
43	SG15/Q10 liaison	entry criteria. Otherwise, a malicious user (the reason understood MD5 digest or SHA1 hash) easily bring service down at will.	rejected
44	SG15/Q10 liaison	Section 3.5.6, Could the authors please state the full list of parameters one needs to configure for a session, as captured in the week 14-18/Feb in Q10?	covered by configuration appendix to be added



45	SG15/Q10 liaison	Section 3.5.7, In Q10 clarification session, it was explained that discriminators have platform scope. Please reflect that in this section.	covered by reference to 5880
46	SG15/Q10 liaison	Section 3.3&3.5.2, mismerging detection, when detecting mismerging MEP need expected MEP_ID or MEG_ID, they can be found in "Unique MEP-ID of source of the BFD packet" which consist of 3 different TLVs. Different combination of these TLVs will involve different policies for mismerging detection and in some case configuration may be needed because certain TLV is not carried in packet. Futher clarification may be needed for this issue.	same as comment 19
47	SG15/Q10 liaison	Section 3.1 2 dependant mode for cc and cv, how to ensure CC and cv mode are used all MEG in order to garrentue 50ms protection switch?	text to be clarified, if you want ALL defects detected you have to run CV
48	SG15/Q10 liaison	Section 3.1 cc-cv-rdi is used in pw, lsp, SPME, how to support PW, it is not clear in the draft. and how to align VCCV in PW, it define 4th type of PW VCCV?	On hold pending PWE resolution
49	SG15/Q10 liaison	Section 3.3.1, MEP ID refer to draft-id, with IP based MEP ID, how to distinguish MIP misconfigure and MEG mismerger?	text to be clarified, reply not in RRO or mgmt equivalent
50	SG15/Q10 liaison	Section 3.5, draft-cc-cv-rdi support only co-routed Bidirectional LSP and Associated Bidirectional LSP, how to support Unidirectional p2p and p2mp LSP?	rejected, draft explicitly identifies this as FFS
51	SG15/Q10 liaison	Section 3.5, when support associated bidirectional lsp, 2 independant sessions used, how to connection this independatant session, because it is belong to one accociated LSP, from management view, it should be one session.	clarify coor/indep applies ot both assoc or corouted
52	SG15/Q10 liaison	Section 3.5.1 On transition to the UP state, message periodicity changes to the negotiated and/or configured rate and the detect interval switches to detect multiplier times the session peer's Tx Rate. It is ambiguous for using the word "and/or". clarify the use of the configured periodicity during negotiation.	editorial
	SG15/Q10 liaison	Section 3.5.1 it is not clear to how to configure Detect Mult and insure it is not change during transport or how to detect mis configuration?	defaults on the code point, will clarify
54	SG15/Q10 liaison	Section 3.5.1 negoton. "and/or" configuration period is used in cc-cv-rdi, and BFD packet in Gach, how to interwork with BFD in IP/MPLS, this requirment is request.	clarify that each BFD session uses common encap

			rejected, BFD not designed to detect signal degradation, no such condition is defined, PHY layer problems are input to BFD as fault management messages, adjacent link failure indication could be considered an input to the state machine
55	SG15/Q10 liaison	Section 3.5.2 MEP to enter the defect state-- if Singal Degrade, how to deal with?	
56	SG15/Q10 liaison	Need to clarify the behaviour when YourDiscriminator=0 is received.	on hold pending bootstrapping discussion
57	SG15/Q10 liaison	Need to clarify Detect Mult behaviour. Afterwards, it was clarified that Detect Mult is fixed to 3 when BFD runs under the new ACH codepoints	see coment 53
58	SG15/Q10 liaison	Clarify what types of packets are exchanged during the initialization procedure? CV packets.	see comment 42
59	SG15/Q10 liaison	Clarify whether CV needs to be used on all the sessions or not.	related to 42
60	SG15/Q10 liaison	Clarify that P/F is ignored if used by the other peer.	on hold pending P/F discussions
61	SG15/Q10 liaison	Clarify that backward compatibility is achieved by supporting both base BFD and TP BFD on the same box.	will clarify
62	SG15/Q10 liaison	clarify that the spec cover both base BFD and TP BFD. The two behaviours can be got by different configuration (may help an example)	covered by configuration appendix
63	SG15/Q10 liaison	Clarify that the profile is applicable to Sections, LSPs and PWs.	see comment 25
64	SG15/Q10 liaison	introduction: clarify the statement "Procedures for uni-directional LSPs are for further study". Suggested change "Procedures for uni-directional P2P and P2MP LSPs are for further study"	accepted

65	SG15/Q10 <del>SG15/Q10</del>	section 3.5: clarify “Coordinated operation is as described in [4]”. Not all the behaviours are the same and therefore should be indicated which	on hold pending P/F discussions
66	SG15/Q10	rate.	Section 3.2.1: Clarify that the rate with MPLS-TP is the same as the rate with MPLS-TP, will delete negotiated
67	SG15/Q10 liaison	list parameters that need to be configured (in appendix?)	covered by configuration appendix to be added
68	SG15/Q10 liaison	LCC1: clarify the behaviour of the handling discriminator and the raising/clearing of defects	rejected as too vague to act rejected as too vague to act
69	SG15/Q10 <del>SG15/Q10</del>	LCC2: describe the start-up procedure	rejected as too vague to act rejected as too vague to act
70	SG15/Q10 SG15/Q10	LCC3: clarify the use of the multiplier filed	see comment 57
71	SG15/Q10 SG15/Q10	LCC4: during the initiation of a connection CV packets are exchanged, LCC4: during the initiation of a connection CV packets are exchanged,	see comment 58
72	SG15/Q10 SG15/Q10	LCC5: which part of the complete set of initiation packet exchange can/ LCC5: which part of the complete set of initiation packet exchange can/	rejected as too vague to act rejected as too vague to act
73	SG15/Q10 SG15/Q10	LCC6: clarify the difference in periodicity of the CC and CV packet LCC6: clarify the difference in periodicity of the CC and CV packet	rejected, document is clear on rejected, document is clear on
74	SG15/Q10 SG15/Q10	LCC7: clarify the use of the Tx and Rx fields in the PDU	rejected , see RFC 5884
75	SG15/Q10 SG15/Q10	LCC8: clarify the backwards compatibility with e.g. the VCCV mode and LCC8: clarify the backwards compatibility with e.g. the VCCV mode and	see comment 61
76	SG15/Q10 SG15/Q10	LCC9: where are the requirements for negotiation	see requirement for use of see requirement for use of existing OAM mechanisms in

77	liaison	LCC10: where are the requirements for including diagnostics	existing OAM mechanisms in RFC xxxx
78	liaison	the UP state	STA field in the PDU
79	liaison	the UP state in this case	defect state not the same thing, and the draft says it
80	liaison	also in view of backwards compatibility	addressed in other comments
81	liaison	LCC14: clarify why the backwards compatibility does not affect the interoperability	rejected as too vague to act upon
82	SG15/Q10 liaison	LCC15: are CC and CV always on? clarify, see also LCC6 for periodicity	see comment 73
83	SG15/Q10 liaison	LCC16: clarify how CC/CV/RDI can be used in associated bi-directional applications, and is this applicable for LSP and section?	addressed in earlier comments
84	SG15/Q10 liaison	LCC17: is this (LCC16) also applicable to PW and VCCV implementations	addressed in earlier comments
85	SG15/Q10 liaison	LCC18: clarify the use of poll-final, especially the dependency of the application/deployment	on hold pending P/F discussions
86	SG15/Q10 liaison	LCC19: consider adding an appendix to show typical applications	see G.8110
87	SG15/Q10 liaison	LCC20: clarify the raising/clearing of defects as well as any consequent actions,	rejected as too vague to act upon

88	SG15/Q10 SG15/Q10	LCC21: use consistent defect names, but not necessarily the ITU-T LCC21: use consistent defect names, but not necessarily the ITU-T	will check document for will check document for
89	Shahram Shahram	Comment relating to NOT treating unexpected OAM encap. As a mis- Comment relating to NOT treating unexpected OAM encap. As a mis- withdrawn	
90	Dave Ward	text should indicate periodicity is equal in both directions	accepted

# Current State

- This document an enhancement to RFC 5884/5885
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    - Definition of source MEP ID TLV
    - Defect entry/exit criteria for Mis-Connectivity
    - Addition of interleaved CV operation
    - Addition of AIS/LDI as state machine input

# Discussion Items

- Simplified configuration vs. three distinct modes of operation
  - All CC, All CV, interleaved CV
- More robust operation ← addresses some LC comments
- Implementations MAY implement P/F discipline
- RFC 5880 says nothing If you issue a Poll and do not get a Final response
- Proposal is if no Final reply received in a specified period, abandon the poll
  - Revert to using Admin Down to change session parameters
  - Consequence is that not all implementations are not obligated to implement P/F discipline

# Summary

- Informative configuration appendix to be
  - Informative configuration appendix to be
- We are awaiting PWE closure on use of
- Pretty much all of the rest are either