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LSP-Ping and BFD encapsulation over ACH **draft-ietf-mpls-tp-lsp-ping-bfd-procedures-01**

Abstract

LSP-Ping and BFD for MPLS are existing and widely deployment OAM mechanisms for MPLS LSPs. This document describes an ACH encapsulation for LSP-Ping, that would enable use of LSP-Ping for networks where IP addressing is not in use. This document also clarifies the use of BFD for MPLS LSPs using ACH encapsulation, when IP addressing may not be available and/or it may not be desirable to encapsulate BFD packets in IP.

Status of this Memo

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1. Introduction

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LSP-Ping [[RFC4379](#)] (Kompella, K. and G. Swallow, "Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures," February 2006.) and BFD for MPLS [[RFC5884](#)] (Aggarwal, R., Kompella, K., Nadeau, T., and G. Swallow, "Bidirectional Forwarding Detection (BFD) for MPLS Label Switched Paths (LSPs)," June 2010.) are OAM mechanisms for MPLS LSPs. This document describes an ACH encapsulation for LSP-Ping for networks that do not use IP addressing. When IP addressing is in use, the LSP-Ping procedures specified in [[RFC4379](#)] (Kompella, K. and G. Swallow, "Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures," February 2006.) apply as is. This document also clarifies the use of

BFD for MPLS LSPs using ACH encapsulation [\[RFC5586\] \(Bocci, M., Vigoureux, M., and S. Bryant, "MPLS Generic Associated Channel," June 2009.\)](#), when IP addressing may not be available and/or it may not be desirable to encapsulate BFD packets in IP.

1.1. Conventions used in this document

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The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [\[RFC2119\] \(Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels," March 1997.\)](#).

1.2. LSP-Ping and BFD over ACH

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In certain MPLS-TP deployment scenarios IP addressing might not be available or it may be preferred to use non-IP encapsulation for LSP-Ping and BFD packets. The remainder of this document defines extensions to LSP-Ping and procedures for using BFD, for such scenarios. [Section 2.1 \(LSP-Ping packet over ACH for LSPs\)](#) and [Section 2.2 \(LSP-Ping packet over ACH for PWs\)](#) describe a new ACH code-point for performing LSP-Ping over ACH. [Section 3 \(Running BFD over MPLS-TP LSPs\)](#) describes procedures for using BFD over ACH.

2. LSP-Ping extensions

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2.1. LSP-Ping packet over ACH for LSPs

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[\[RFC5586\] \(Bocci, M., Vigoureux, M., and S. Bryant, "MPLS Generic Associated Channel," June 2009.\)](#) defines an ACH mechanism for MPLS LSPs. This document defines a new ACH channel type for LSP-Ping, when IP addressing is not in use, for LSP-Ping over associated bi-directional LSPs and co-routed bi-directional LSPs. ACH TLVs MAY be associated with this channel type.

2.2. LSP-Ping packet over ACH for PWs

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[\[RFC4385\]](#) (Bryant, S., Swallow, G., Martini, L., and D. McPherson, "Pseudowire Emulation Edge-to-Edge (PWE3) Control Word for Use over an MPLS PSN," February 2006.) defines an PW-ACH mechanism for pseudowires. The ACH channel type for LSP-Ping defined in [Section 2.1 \(LSP-Ping packet over ACH for LSPs\)](#) will be re-used for pseudowires so that IP addressing is not needed when using LSP-Ping OAM over pseudowires.

2.3. Source Address TLV

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When sending LSP-Ping packets using ACH, without IP encapsulation, there MAY be a need to identify the source address of the packet. This source address will be specified via the Source Address TLV, being defined in [\[I-D.ietf-mpls-tp-ach-tlv\]](#) (Boutros, S., Bryant, S., Sivabalan, S., Swallow, G., Ward, D., and V. Manral, "Definition of ACH TLV Structure," March 2010.). No more than 1 source address TLV MAY be present in a LSP-Ping packet. The source address MUST specify the address of the originator of the packet. If more than 1 such TLV is present in a LSP-Ping request packet, then an error code of 1 (Malformed echo request received), [Section 3.1 [\[RFC4379\]](#) (Kompella, K. and G. Swallow, "Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures," February 2006.)], SHOULD be returned. If more than 1 source address TLV is present, then the packet SHOULD be dropped without further processing.

2.4. MEP and MIP Identifier

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When sending LSP-Ping packets using ACH, there MAY be a need to identify the maintenance end point (MEP) and/or the maintenance intermediate point (MIP) being monitored [\[I-D.ietf-mpls-tp-rosetta-stone\]](#) (Sprecher, N., "A Thesaurus for the Terminology used in Multiprotocol Label Switching Transport Profile (MPLS-TP) drafts/RFCs and ITU-T's Transport Network Recommendations.," May 2010.). The MEP/MIP identifiers defined in [\[I-D.ietf-mpls-tp-identifiers\]](#) (Bocci, M. and G. Swallow, "MPLS-TP Identifiers," July 2010.) MAY be carried in the ACH TLVs [\[I-D.ietf-mpls-tp-ach-tlv\]](#) (Boutros, S., Bryant, S., Sivabalan, S., Swallow, G., Ward, D., and V. Manral, "Definition of ACH TLV Structure," March 2010.) for identification.

3. Running BFD over MPLS-TP LSPs

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[\[RFC5884\] \(Aggarwal, R., Kompella, K., Nadeau, T., and G. Swallow, "Bidirectional Forwarding Detection \(BFD\) for MPLS Label Switched Paths \(LSPs\)," June 2010.\)](#) describes how BFD can be used for Continuity Check of MPLS LSPs. The procedures described in [\[RFC5884\] \(Aggarwal, R., Kompella, K., Nadeau, T., and G. Swallow, "Bidirectional Forwarding Detection \(BFD\) for MPLS Label Switched Paths \(LSPs\)," June 2010.\)](#) MUST be used when IP encapsulation is in use. This section clarifies the usage of BFD in the context of MPLS-TP LSPs when it is not desirable to use IP encapsulation. When using BFD over MPLS-TP LSPs, the BFD discriminator MUST either be signaled via LSP-Ping or be statically configured. The BFD packets MUST be sent over ACH when IP encapsulation is not used.

This document defines a new ACH channel type for BFD over G-ACH, when IP addressing is not in use, for running BFD over associated bi-directional LSPs and co-routed bi-directional LSPs. ACH TLVs MAY be associated with this channel type.

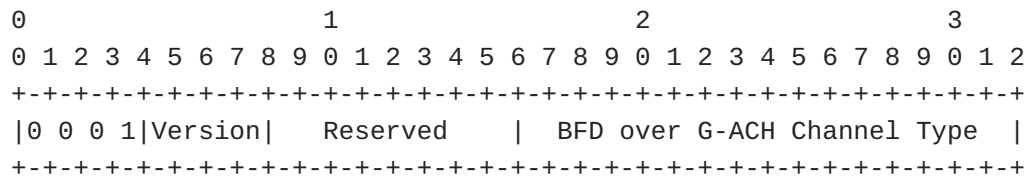
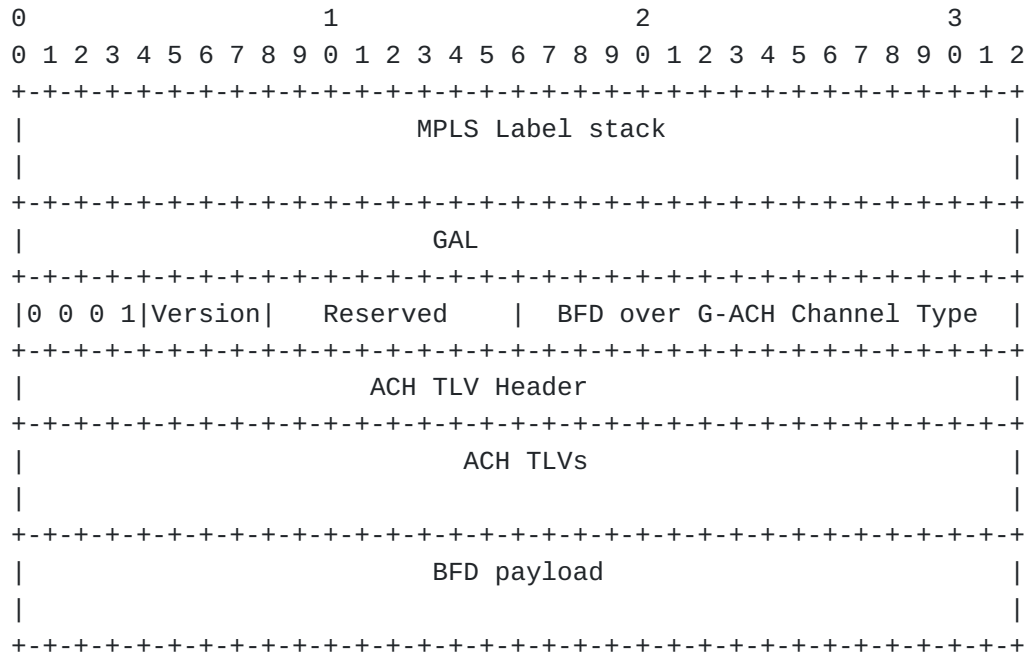


Figure 3: BFD over G-ACH Channel Type

BFD packets, for both directions, MUST be sent over the MPLS-TP LSP and IP forwarding SHOULD NOT be used for the reverse path. The format of a BFD packet when using it as an OAM tool for MPLS-TP LSPs SHOULD be as follows:



[RFC5885] ([Nadeau, T. and C. Pignataro, "Bidirectional Forwarding Detection \(BFD\) for the Pseudowire Virtual Circuit Connectivity Verification \(VCCV\)," June 2010.](#)) specifies how BFD can be used over MPLS PWs. One MAY use BFD over G-ACH channel type to run BFD over PWs if ACH TLV support is needed.

4. Security Considerations

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The draft does not introduce any new security considerations. Those discussed in [\[RFC4379\]](#) (Kompella, K. and G. Swallow, "Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures," February 2006.) are also applicable to this document.

5. IANA Considerations

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5.1. New ACH Channel Types

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New Channels type are defined in [Section 2.1 \(LSP-Ping packet over ACH for LSPs\)](#) and [Section 3 \(Running BFD over MPLS-TP LSPs\)](#). IANA is requested to assign new values from the "PW Associated Channel Type" registry, as per IETF consensus policy.

Value	Meaning
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TBD	Associated Channel carries LSP-Ping packet
TBD	Associated Channel carries BFD over G-ACH

6. References

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6.1. Normative References

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[RFC2119]	Bradner, S. , "Key words for use in RFCs to Indicate Requirement Levels," BCP 14, RFC 2119, March 1997 (TXT , HTML , XML).
[RFC4379]	Kompella, K. and G. Swallow, " Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures ," RFC 4379, February 2006 (TXT).
[RFC4385]	

Bryant, S., Swallow, G., Martini, L., and D. McPherson, "[Pseudowire Emulation Edge-to-Edge \(PWE3\) Control Word for Use over an MPLS PSN](#)," RFC 4385, February 2006 ([TXT](#)).

6.2. Informative References

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[I-D.ietf-mpls-tp-ach-tlv]	Boutros, S., Bryant, S., Sivabalan, S., Swallow, G., Ward, D., and V. Manral, " Definition of ACH TLV Structure ," draft-ietf-mpls-tp-ach-tlv-02 (work in progress), March 2010 (TXT).
[I-D.ietf-mpls-tp-identifiers]	Bocci, M. and G. Swallow, " MPLS-TP Identifiers ," draft-ietf-mpls-tp-identifiers-02 (work in progress), July 2010 (TXT).
[I-D.ietf-mpls-tp-rosetta-stone]	Sprecher, N., " A Thesaurus for the Terminology used in Multiprotocol Label Switching Transport Profile (MPLS-TP) drafts/RFCs and ITU-T's Transport Network Recommendations. ," draft-ietf-mpls-tp-rosetta-stone-02 (work in progress), May 2010 (TXT).
[I-D.katz-ward-bfd-multipoint]	Katz, D. and D. Ward, " BFD for Multipoint Networks ," draft-katz-ward-bfd-multipoint-02 (work in progress), February 2009 (TXT).
[RFC5586]	Bocci, M., Vigoureux, M., and S. Bryant, " MPLS Generic Associated Channel ," RFC 5586, June 2009 (TXT).
[RFC5860]	Vigoureux, M., Ward, D., and M. Betts, " Requirements for Operations, Administration, and Maintenance (OAM) in MPLS Transport Networks ," RFC 5860, May 2010 (TXT).
[RFC5884]	Aggarwal, R., Kompella, K., Nadeau, T., and G. Swallow, " Bidirectional Forwarding Detection (BFD) for MPLS Label Switched Paths (LSPs) ," RFC 5884, June 2010 (TXT).
[RFC5885]	Nadeau, T. and C. Pignataro, " Bidirectional Forwarding Detection (BFD) for the Pseudowire Virtual Circuit Connectivity Verification (VCCV) ," RFC 5885, June 2010 (TXT).