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Bidirectional Forwarding Detection (BFD) on Multi-chassis Ling Aggregation Group (MC-LAG) Interfaces in IP/MPLS Networks
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Abstract

This document describes use of Bidirectional Forwarding Detection for Multi-chassis Link Aggregation Group to provide faster than Link Aggregation Control Protocol convergence. This specification enhances and updates RFC 7130 "Bidirectional Forwarding Detection (BFD) on Link Aggregation Group (LAG) Interfaces".

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on September 11, 2017.

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1. Introduction

The [RFC7130] defines use of Bidirectional Forwarding Detection (BFD) on Link Aggregation Group (LAG) interfaces. Multi-chassis LAG (MC-LAG) is type of LAG [IEEE.802.1AX.2008] with member links terminated on separate chassis. [IEEE.802.1AX.2008] does not specify MC-LAG but doesn't preclude it either. Link Aggregation Control Protocol (LACP), also defined in [IEEE.802.1AX.2008], can work with MC-LAG but, as in LAG case, can detect link failure only in range of single seconds. This document defines how mechanism defined to work on LAG interfaces [RFC7130] can be adapted to MC-LAG case to enable sub-second detection of member link failure.

1.1. Conventions used in this document

1.1.1. Terminology

ACH: Associated Channel Header

BFD: Bidirectional Forwarding Detection

BoS: Bottom of the Stack

G-ACh: Generic Associated Channel

GAL: Generic Associated Label

LAG: Link Aggregation Group

LACP: Link Aggregation Control Protocol

MC-LAG: Multi-chassis Link Aggregation Group

MPLS: Multi-Protocol Label Switching

1.1.2. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

2. Problem Statement

[RFC7130] does not specify selection of the destination IP address for the BFD control packet. The only requirement related to the selection is in Section 2.1 stating that the use of address family across all member links of the given LAG MUST be consistent across all the links. Thus it is implied that the same unicast IP address will be used on all member links of the LAG as use of different destination addresses would defeat the purpose of [RFC7130] transforming the case into set of single-hop BFD sessions [RFC5881]. But single unicast IP address may not work in MC-LAG case as the member links are terminated on the separate chassis. This document proposes how to overcome this problem if using IP or Multi-Protocol Label Switching (MPLS) data plane encapsulation.

3. BFD on MC-LAG with IP/MPLS data plane

There are more optional encapsulation formats for the case of micro-BFD on MC-LAG over IP/MPLS data plane:

- [RFC5586] defined special purpose Generic Associated channel Label (GAL) that MAY be used in MPLS encapsulation of the micro-BFD control packet over MPSL data plane. Depending on the channel type specified in the Associated Channel Header (ACH) that immediately follows after the GAL, micro-BFD MAY use IP/UDP, as displayed in Figure 1 or BFD format, i.e. BFD control packet without IP and UDP headers.

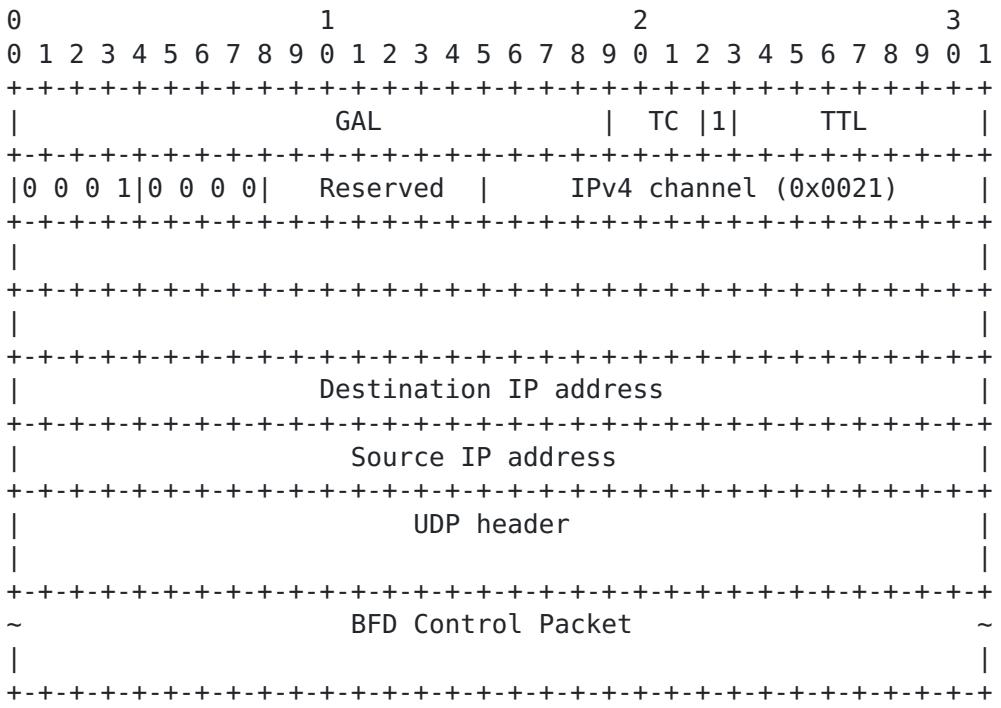

Figure 1: BFD on MC-LAG member link on IPv4/MPLS data plane

If IP/UDP format of BFD over MC-LAG interfaces is used, then for IPv4 address family the destination IP address MUST be selected from 127/8 range [RFC4379], and if IPv6 address family is used, then the destination IP address MUST be selected from 0:0:0:0:0:FFFF:127/104 range.

4. IANA Considerations

This document makes no requests for IANA allocations. This section may be deleted by RFC Editor.

5. Security Considerations

Security considerations discussed in [RFC7130] apply to this document.

6. Acknowledgements

7. Normative References

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