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**BIER BFD**  
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Abstract

Point to multipoint (P2MP) BFD is designed to verify multipoint connectivity. This document specifies the support of P2MP BFD in BIER network.

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## [1.](#) Introduction

Bit Index Explicit Replication(BIER)[[I-D.ietf-bier-architecture](#)] provides optimal forwarding of multicast data packets through a multicast domain. It does so without requiring any explicit tree-building protocol and without requiring intermediate nodes to maintain any per-flow state.

[[I-D.ietf-bfd-multipoint](#)] defines a method of using Bidirectional Detection(BFD) to monitor and detect unicast failures between the sender (head) and one or more receivers (tails) in multipoint or multicast networks.

This document describes the procedures for using such mode of BFD protocol to provide verification of multipoint or multicast connectivity between a multipoint sender (the "head", Bit-Forwarding Ingress Routers(BFIRs)) and a set of one or more multipoint receivers (the "tails", Bit-Forwarding Egress Routers(BFERs)).This document defines use of the point-to-multipoint BFD for BIER domain.

## [2.](#) Conventions used in this document

### [2.1.](#) Terminology

This document uses the acronyms defined in [[I-D.ietf-bier-architecture](#)] along with the following:

BFD: Bidirectional Forwarding Detection.







## **4. Bootstrapping BIER BFD**

### **4.1. One-hop Bootstrapping**

The ISIS BFD-Enable TLV is defined in [RFC6213], which could be used for BIER BFD bootstrapping if the underlay routing protocol is ISIS routing protocol. When the adjacency between BIER nodes reaches the 2-Way state, ISIS Hellos will already have been exchanged. If an BIER node supports BFD, it will have learned whether the other BIER node has BFD enabled by whether or not a BFD-Enabled TLV was included in its Hellos. The BFD-Enable TLV format is defined in [RFC6213] and reused in this document. The MT ID is the BIER multi-topology identify. If the BIER node only supports single ISIS topology, the MT ID is zero. NLPID is a Network Layer Protocol ID [RFC6328] and will be [TBD](IANA assigned, suggesting 0XC2) for BIER, but additional topology and protocol pairs could conceivably be listed.

### **4.2. Multi-hop Bootstrapping**

The BIER OAM ping could be used for BIER BFD bootstrap. The multipoint header sends the BIER OAM packet with Target SI-Bitstring TLV (section 3.3.2 of [I-D.ietf-bier-ping]) carrying the set of BFER information (Sub-domain-id, Set ID, BS Len, Bitstring) to the multipoint tails to bootstrap the BIER BFD sessions.

## **5. Discriminators and Packet Demultiplexing**

The tail(BFER) demultiplexes incoming BFD packets based on a combination of the source address and My discriminator as specified in [I-D.ietf-bfd-multipoint]. The source address is BFIR-id and BIER MPLS Label(MPLS network) or BFIR-id and BIFT-id(Non-MPLS network)for BIER BFD.

## **6. Security Considerations**

## **7. Acknowledgements**

## **8. IANA Considerations**

[IS09577]defines one-octet network layer protocol identifiers that are commonly called NLPIDs and [RFC6328] defines the NLPID IANA consideration. The code points 0xC0, 0xC1, 0xCC, 0xCF are assigned to TRILL, IEEE 802.1aq , IPv4 and PPP respectively [RFC6328]. It is requested for IANA to assign 0XC2 to NLPID for BIER in this document.



Code Point	Use
0xC0	TRILL
0xC1	IEEE 802.1aq
0xC2	BIER[This Document]
0xCC	IPv4
0xCF	PPP

Table 1

IANA is requested to create new registry called "BIER OAM Message Type" and assign new type from the BIER OAM Message Type registry as follows:

Value	Description	Reference
TBD1	BIER BFD	[this document]

Table 2

## 9. References

### 9.1. Normative References

[I-D.ietf-bfd-multipoint]

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[I-D.ietf-bier-ping]

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[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.

[RFC6213] Hopps, C. and L. Ginsberg, "IS-IS BFD-Enabled TLV", [RFC 6213](#), DOI 10.17487/RFC6213, April 2011, <<https://www.rfc-editor.org/info/rfc6213>>.

[RFC6328] Eastlake 3rd, D., "IANA Considerations for Network Layer Protocol Identifiers", [BCP 164](#), [RFC 6328](#), DOI 10.17487/RFC6328, July 2011, <<https://www.rfc-editor.org/info/rfc6328>>.

[RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.

## 9.2. Informative References

[ISO9577] ISO/IEC TR 9577:1999,, "International Organization for Standardization "Information technology - Telecommunications and Information exchange between systems - Protocol identification in the network layer"", 1999.

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