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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 application of P2MP BFD in BIER network.

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Table of Contents

1.	Introduction	2
2.	Conventions used in this document	2
2.1.	Terminology	3
2.2.	Requirements Language	3
3.	BIER BFD Encapsulation	3
4.	Bootstrapping BIER BFD	3
5.	Discriminators and Packet Demultiplexing	3
6.	Security Considerations	3
7.	Acknowledgements	4
8.	IANA Considerations	4
9.	References	4
9.1.	Normative References	4
9.2.	Informative References	5
	Authors' Addresses	5

[1.](#) Introduction

Bit Index Explicit Replication(BIER)[[RFC8279](#)] 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 verify 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)). The BIER BFD only supports the unidirectional multicast. This document defines the use of BFD, as defined in [[I-D.ietf-bfd-multipoint](#)], for BIER domain. Use of BFD for multipoint networks active tail [[I-D.ietf-bfd-multipoint-active-tail](#)] is for further study.

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

2.1. Terminology

This document uses the acronyms defined in [\[RFC8279\]](#) along with the following:

BFD: Bidirectional Forwarding Detection.

OAM: Operations, Administration, and Maintenance.

P2MP: Point to Multi-Point.

2.2. 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 [BCP 14](#) [\[RFC2119\]](#) [\[RFC8174\]](#) when, and only when, they appear in all capitals, as shown here.

3. BIER BFD Encapsulation

BIER BFD encapsulation uses the BIER OAM packet format defined in [\[I-D.ietf-bier-ping\]](#). The value of the Msg Type field MUST be set to BIER BFD (TBD by IANA). BFD Control packet, defined in [Section 4](#) [\[RFC5880\]](#) immediately follows the BIER OAM header.

4. Bootstrapping BIER BFD

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

For BIER OAM packet procssing security considerations, see [\[I-D.ietf-bier-ping\]](#).

For general multipoint BFD security considerations, see [\[I-D.ietf-bfd-multipoint\]](#).

No additional security issues are raised in this document beyond those that exist in the referenced BFD documents.

7. Acknowledgements

Authors would like to thank the comments and suggestions from Jeffrey (Zhaohui) Zhang, Donald Eastlake 3rd.

8. IANA Considerations

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

Value	Description	Reference
TBD	BIER BFD	[this document]

Table 1

9. References

9.1. Normative References

[I-D.ietf-bfd-multipoint]

Katz, D., Ward, D., Networks, J., and G. Mirsky, "BFD for Multipoint Networks", [draft-ietf-bfd-multipoint-18](#) (work in progress), June 2018.

[I-D.ietf-bier-ping]

Kumar, N., Pignataro, C., Akiya, N., Zheng, L., Chen, M., and G. Mirsky, "BIER Ping and Trace", [draft-ietf-bier-ping-03](#) (work in progress), January 2018.

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9.2. Informative References

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Katz, D., Ward, D., Networks, J., and G. Mirsky, "BFD Multipoint Active Tails.", [draft-ietf-bfd-multipoint-active-tail-09](#) (work in progress), June 2018.
- [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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