Abstract

This document describes a list of functional requirement toward Operations, Administration and Maintenance (OAM) toolset in Bit Index Explicit Replication (BIER) layer of a network.

Status of This Memo

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

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at http://datatracker.ietf.org/drafts/current/.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on July 20, 2017.
1. Introduction

[I-D.ietf-bier-architecture] introduces and explains Bit Index
Explicit Replication (BIER) architecture and how it supports
forwarding of multicast data packets.

This document lists the OAM requirements for BIER layer of multicast
domain. The list can further be used to for gap analysis of
available OAM tools to identify possible enhancements of existing or
whether new OAM tools are required to support proactive and on-demand
path monitoring and service validation.

1.1. Conventions used in this document

[I-D.ietf-bier-architecture] introduces and explains Bit Index
Explicit Replication (BIER) architecture and how it supports
forwarding of multicast data packets.

This document lists the OAM requirements for BIER layer of multicast
domain. The list can further be used to for gap analysis of
available OAM tools to identify possible enhancements of existing or
whether new OAM tools are required to support proactive and on-demand
path monitoring and service validation.

1.1. Conventions used in this document

[I-D.ietf-bier-architecture] introduces and explains Bit Index
Explicit Replication (BIER) architecture and how it supports
forwarding of multicast data packets.

This document lists the OAM requirements for BIER layer of multicast
domain. The list can further be used to for gap analysis of
available OAM tools to identify possible enhancements of existing or
whether new OAM tools are required to support proactive and on-demand
path monitoring and service validation.

1.1. Conventions used in this document

[I-D.ietf-bier-architecture] introduces and explains Bit Index
Explicit Replication (BIER) architecture and how it supports
forwarding of multicast data packets.

This document lists the OAM requirements for BIER layer of multicast
domain. The list can further be used to for gap analysis of
available OAM tools to identify possible enhancements of existing or
whether new OAM tools are required to support proactive and on-demand
path monitoring and service validation.
1.1.1. Terminology

Term "BIER OAM" used in this document interchangeably with longer version "set of OAM protocols, methods and tools for BIER layer".

BFR: Bit-Forwarding Router

BFER: Bit-Forwarding Egress Router

BIER: Bit Index Explicit Replication

OAM: Operations, Administration and Maintenance

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. Requirements

This section lists requirements for OAM of BIER layer:

1. The listed requirements MUST be supported with any type of transport layer over which BIER layer can be realized.

2. It MUST be possible to initialize BIER OAM session from any Bit-Forwarding Router (BFR) of the given BIER domain.

3. It SHOULD be possible to initialize BIER OAM session from a centralized controller.

4. BIER OAM MUST support proactive and on-demand OAM monitoring and measurement methods.

5. BIER OAM MUST support unidirectional OAM methods, both continuity check and performance measurement.

6. BIER OAM packets MUST be in-band, i.e. follow exactly the same path as data plane traffic, in forward direction, i.e. from ingress toward egress end point(s) of the OAM test session.

7. BIER OAM MUST support bi-directional OAM methods. Such OAM methods MAY combine in-band monitoring or measurement in forward direction and out-of-band notification in the reverse direction, i.e. from egress to ingress end point of the OAM test session.
8. BIER OAM MUST support proactive monitoring of BFER availability by a BFR in the given BIER domain, e.g. p2mp BFD active tail support.

9. BIER OAM MUST support Path Maximum Transmission Unit discovery.

10. BIER OAM MUST support Reverse Defect Indication (RDI) notification of the source of continuity checking BFR by Bit-Forwarding Egress Routers (BFERs), e.g. by using Diag in p2mp BFD with active tail support.

11. BIER OAM MUST support active and passive performance measurement methods.

12. BIER OAM MUST support unidirectional performance measurement methods to calculate throughput, loss, delay and delay variation metrics. [RFC6374] provides great details into performance measurement and performance metrics.

13. BIER OAM MUST support defect notification mechanism, like Alarm Indication Signal. Any BFR in the given BIER domain MAY originate a defect notification addressed to any subset of BFRs within the domain.

14. BIER OAM MUST support methods to enable survivability of a BIER layer. These recovery methods MAY use protection switching and restoration.

3. IANA Considerations

This document does not propose any IANA consideration. This section may be removed.

4. Security Considerations

This document list the OAM requirement for BIER-enabled domain and does not raise any security concerns or issues in addition to ones common to networking.

5. Acknowledgement

TBD

6. References
6.1. Normative References

[I-D.ietf-bier-architecture]


6.2. Informative References


Authors’ Addresses

Greg Mirsky
Independent
Email: gregimirsky@gmail.com

Erik Nordmark
Arista Networks
Email: nordmark@acm.org

Carlos Pignataro
Cisco Systems, Inc.
Email: cpignata@cisco.com

Nagendra Kumar
Cisco Systems, Inc.
Email: naikumar@cisco.com
Sam Aldrin
Google
Email: aldrin.ietf@gmail.com

Lianshu Zheng
Huawei Technologies
Email: vero.zheng@huawei.com

Mach Chen
Huawei Technologies
Email: mach.chen@huawei.com

Nobo Akiya
Big Switch Networks
Email: nobo.akiya.dev@gmail.com

Santosh Pallagatti
Email: santosh.palagatti@gmail.com