

BIER WG
Internet-Draft
Intended status: Standards Track
Expires: May 3, 2017

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October 30, 2016

BIER in BABEL
draft-zhang-bier-babel-extensions-00

Abstract

BIER introduces a novel architecture for multicast packet forwarding. It does not require a signalling protocol to explicitly build multicast distribution trees, nor does it require intermediate nodes to maintain any per-flow state.

Babel defines a distance-vector routing protocol that operates in a robust and efficient fashion both in ordinary wired as well as in wireless mesh networks. This document defines a way to carry BIER information in Babel.

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[1.](#) Introduction

[I-D.ietf-bier-architecture] introduces a novel architecture for multicast data packets forwarding. It does not require a signalling protocol to explicitly build multicast distribution trees, nor does it require intermediate nodes to maintain any per-flow state. All the necessary extensions to perform this functionality are abbreviated by the "BIER architecture" moniker.

BIER information can be carried in OSPF and ISIS routing protocol as defined in [[I-D.ietf-bier-isis-extensions](#)] and [[I-D.ietf-bier-ospf-bier-extensions](#)] respectively. The according tables for BIER forwarding purposes are built when OSPF/ISIS performs according calculations on the advertised information.

[RFC6126] and [[I-D.ietf-babel-rfc6126bis](#)] define a distance-vector routing protocol under the name of "Babel". Babel operates in a robust and efficient fashion both in ordinary wired as well as in wireless mesh networks.

[2.](#) Terminology

The terminology of this documents follows

[\[I-D.ietf-bier-architecture\]](#), [\[RFC6126\]](#), [\[RFC7557\]](#) and [\[I-D.ietf-babel-rfc6126bis\]](#).

[3.](#) Advertisement of BIER information

[3.1.](#) BIER BFR-prefix and BIER sub-TLV

BFR-prefix and according information is carried in a Babel Update TLV per [\[RFC6126\]](#). Several new sub-TLVs and sub-sub-TLVs are defined to convey further BIER information such as BFR-id, sub-domain-id and BSL.

[3.1.1.](#) BIER sub-TLV

The BIER sub-TLV format aligns exactly with the definition and restrictions in [\[I-D.ietf-bier-isis-extensions\]](#) and [\[I-D.ietf-bier-ospf-bier-extensions\]](#). It is a sub-TLV of Babel update TLV. The prefix MUST NOT be summarized and the according sub-TLV MUST be treated as optional and transitive.

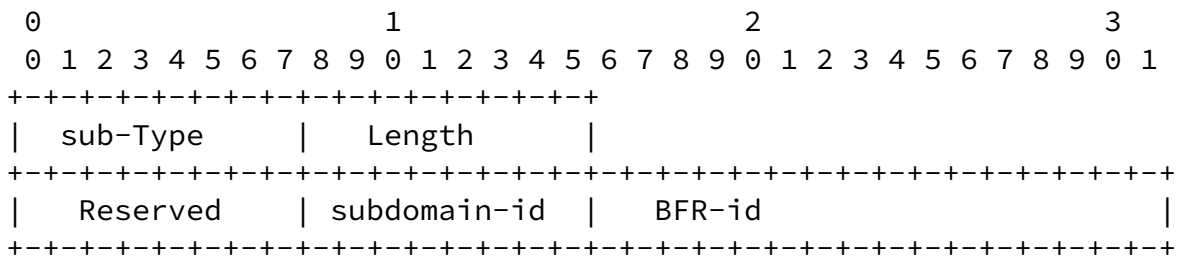


Figure 1: BIER sub-TLV

- o Type: as indicated in IANA section.
- o Length: 1 octet
- o Reserved: MUST be 0 on transmission, ignored on reception. May be used in future versions. 8 bits.
- o subdomain-id: Unique value identifying the BIER sub-domain. 1 octet.

- o BFR-id: A 2 octet field encoding the BFR-id, as documented in [[I-D.ietf-bier-architecture](#)]. If no BFR-id has been assigned this field is set to the invalid BFR-id.

3.2. BIER MPLS Encapsulation sub-sub-TLV

The BIER MPLS Encapsulation sub-sub-TLV can be carried by BIER sub-TLV. The format and restrictions are aligned with [[I-D.ietf-bier-isis-extensions](#)] and [[I-D.ietf-bier-ospf-bier-extensions](#)]. This sub-sub-TLV carries the information for the BIER MPLS encapsulation including the label range for a specific BSL for a certain <MT,SD> pair.

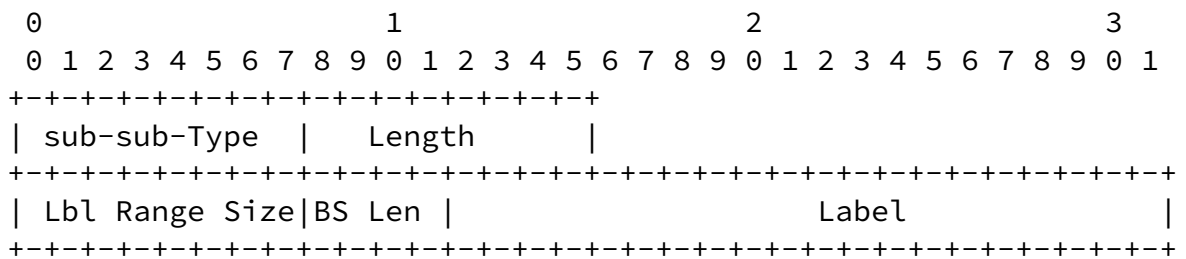


Figure 3: MPLS Encapsulation sub-sub-TLV

- o Type: value of 1 indicating MPLS encapsulation.
- o Length: 1 octet
- o Local BitString Length (BS Len): Encoded bitstring length as per [[I-D.ietf-bier-mpls-encapsulation-05](#)]. 4 bits.
- o Label Range Size: Number of labels in the range used on encapsulation for this BIER sub-domain for this bitstring length, 1 octet.
- o Label: First label of the range, 20 bits. The labels are as defined in [[I-D.ietf-bier-mpls-encapsulation](#)].

3.3. Optional BIER sub-domain BSL conversion sub-sub-TLV

This sub-sub-TLV is used to carry the BSL information. Its definition and restrictions are aligned with [[I-D.ietf-bier-isis-extensions](#)].

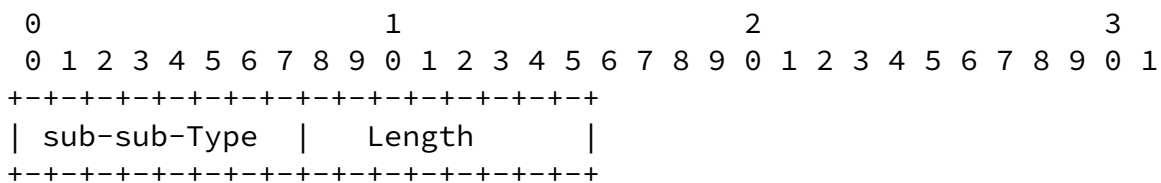


Figure 4: BSL conversion sub-sub-TLV

4. Security Considerations

TBD

5. Acknowledgements

The draft is aligned with the [\[I-D.ietf-bier-isis-extensions\]](#) and [\[I-D.ietf-bier-ospf-bier-extensions\]](#) as far as feasible.

6. Normative References

[I-D.ietf-babel-rfc6126bis]

Chroboczek, J., "The Babel Routing Protocol", [draft-ietf-babel-rfc6126bis-00](#) (work in progress), August 2016.

[I-D.ietf-bier-architecture]

Wijnands, I., Rosen, E., Dolganow, A., Przygienda, T., and S. Aldrin, "Multicast using Bit Index Explicit Replication", [draft-ietf-bier-architecture-05](#) (work in progress), October 2016.

[I-D.ietf-bier-isis-extensions]

Ginsberg, L., Przygienda, T., Aldrin, S., and Z. Zhang, "BIER support via ISIS", [draft-ietf-bier-isis-extensions-03](#) (work in progress), September 2016.

[I-D.ietf-bier-mpls-encapsulation]

Wijnands, I., Rosen, E., Dolganow, A., Tantsura, J., Aldrin, S., and I. Meilik, "Encapsulation for Bit Index Explicit Replication in MPLS Networks", [draft-ietf-bier-mpls-encapsulation-05](#) (work in progress), July 2016.

[I-D.ietf-bier-ospf-bier-extensions]

Psenak, P., Kumar, N., Wijnands, I., Dolganow, A., Przygienda, T., Zhang, Z., and S. Aldrin, "OSPF Extensions for BIER", [draft-ietf-bier-ospf-bier-extensions-04](#) (work in progress), September 2016.

[I-D.pfister-bier-over-ipv6]

Pfister, P. and I. Wijnands, "An IPv6 based BIER Routing Underlay", [draft-pfister-bier-over-ipv6-00](#) (work in progress), September 2016.

[RFC6126] Chroboczek, J., "The Babel Routing Protocol", [RFC 6126](#), DOI 10.17487/RFC6126, April 2011, <<http://www.rfc-editor.org/info/rfc6126>>.

[RFC7557] Chroboczek, J., "Extension Mechanism for the Babel Routing Protocol", [RFC 7557](#), DOI 10.17487/RFC7557, May 2015, <<http://www.rfc-editor.org/info/rfc7557>>.

Authors' Addresses

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October 2016

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