

BIER WG
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BIER in BABEL
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Abstract

BIER introduces a novel multicast architecture. It does not require a signaling 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 wired as well as in wireless mesh networks. This document defines a way to carry necessary BIER signaling information in Babel.

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1. Introduction

[I-D.ietf-bier-architecture] introduces a novel multicast architecture. It does not require a signaling protocol to explicitly build multicast distribution trees, nor does it require intermediate nodes to maintain any per-flow state. All procedures necessary to support BIER are abbreviated by the "BIER architecture" moniker in this document.

[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

In case a router is configured with BIER information, and Babel is the routing protocol used, such a router MAY use Babel protocol to announce the BIER information using the BIER sub-TLV specified below.

3.1. BIER BFR-prefix and BIER sub-TLV

BFR-prefix and according information is carried in a Babel Update TLV per [I-D.ietf-babel-rfc6126bis]. A new sub-TLV is defined to convey further BIER information such as BFR-id, sub-domain-id and BSL. Two sub-sub-TLVs are carried as payload of BIER sub-TLV.

The mandatory bit of BIER sub-TLV should be set to 0. If a router cannot recognize a sub-TLV, the router MUST ignore this unknown sub-TLV.

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.

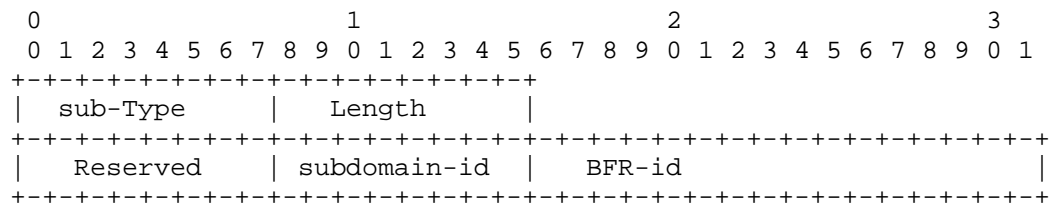


Figure 1: BIER sub-TLV

- o Type: as indicated in IANA section.
- o Length: 1 octet. Include the length of BIER sub-TLV and potential length of the two sub-sub-TLVs.
- 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.

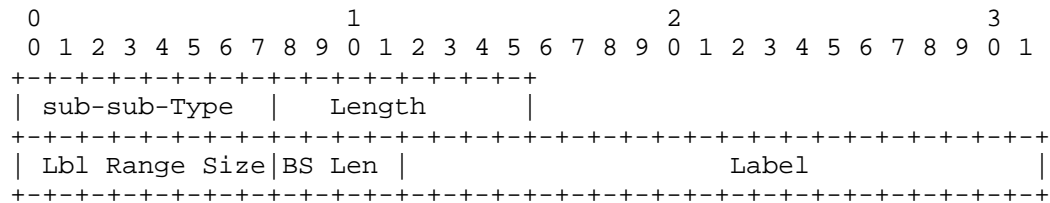


Figure 3: MPLS Encapsulation sub-sub-TLV

- 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]. 4 bits.
- o Label Range Size: Number of labels in the range for this BIER sub-domain and bitstring length combination, 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].

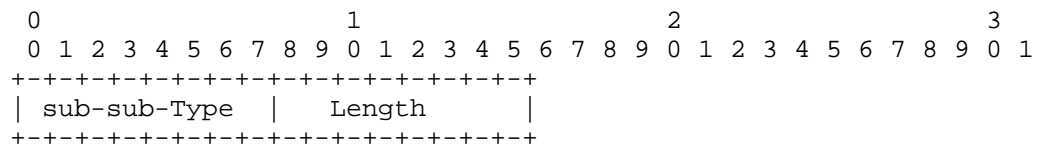


Figure 4: BSL conversion sub-sub-TLV

4. Tree types and tunneling

Since Babel is performing a diffusion computation, support for different tree types is not as natural as with link-state protocols. Hence this specification is assuming that normal Babel reachability computation is performed without further modifications.

BIER architecture does not rely on all routers in a domain performing BFR procedures. How to support tunnels that will allow to tunnel BIER across such routers in Babel is for further study.

5. Security Considerations

TBD

6. IANA Considerations

A new type of Babel update sub-TLV needs to be defined for BIER information advertisement.

7. 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.

8. Normative References

[I-D.ietf-babel-rfc6126bis]

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