

# **LSR extensions for advertising BIER-ETHER encapsulation capability & parameters**

**draft-dhanaraj-bier-lsr-ethernet-extensions-00**

**IETF104 2019-03-25 Prague**

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# Draft purpose

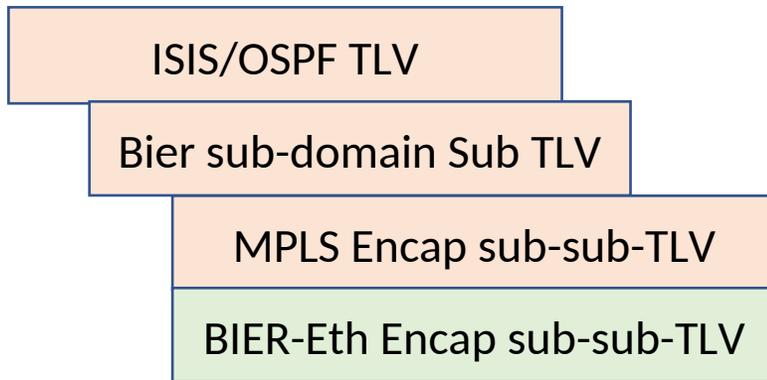
- BIER ETHERNET (BIER-ETH) is one of the encapsulation type to deploy BIER in Non-MPLS networks.



- Like BIER-MPLS, processing and forwarding of BIER-ETH packets requires new software / hardware.
- BFRs supporting BIER-ETH encapsulation must advertise this capability (along with the other required parameters) to the other BFRs in BIER domain (to aid building BIER Routing table).
- This draft defines the required extensions to ISIS and OSPF protocols to advertise the BIER-ETH encapsulation capability and parameters.

# How to advertise ?

## Add new sub-sub-TLV for BIER-ETH



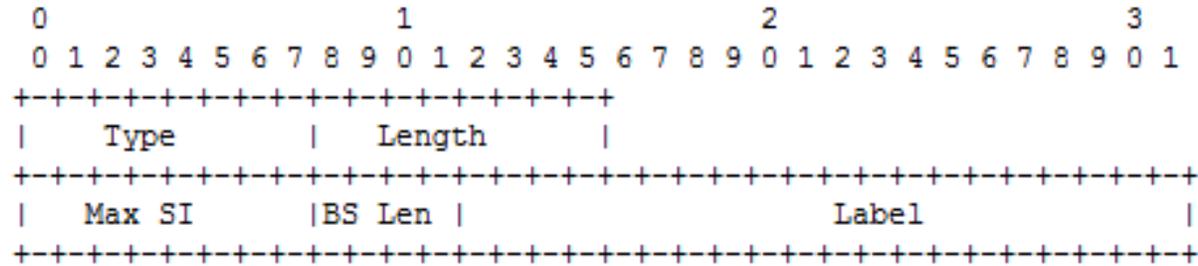
Existing TLV

New TLV

- ✓ Add a new **BIER-ETH sub-sub-TLV** under **BIER sub-domain sub-TLV** to advertise the BIER-ETH capability and other associated parameters of the encapsulation.
- ✓ A BIER sub-domain **MAY** support more than one BIER encapsulation type.
  - The different encapsulation types supported in a sub-domain shares the same BFR-id.
  - The selection of encapsulation type to be used by a BFIR or BFR for a sub-domain could be a matter of local policy and is outside the scope of this work.

# What to advertise ?

## Refer BIER-MPLS Encap sub-sub-TLV



## What to advertise in BIER-ETH Encap sub-sub-TLV ?

- ✓ bit-string-length supported (same as BS Len in BIER-MPLS)
  - Number of SETS supported for the bit-string-length (same as Max SI in BIER-MPLS)
  - [BIFT-id](#) for each SET (BIFT-id, not MPLS Base Label)

# More about BIFT-Id

[RFC8296] specifies that the BIFT-id in Non-MPLS networks is a "domain-wide-unique-value" and is not expected to change at each hops as the BFR forwards the BIER packet. [Then why advertise BIFT-id ?](#)

- [I-D.ietf-bier-non-mpls-bift-encoding] describes two possible methods for assigning and encoding the BIFT-id in Non-MPLS BIER Header.

Though BIFT-id is expected to be unique per BIER Sub-domain across all the BFRs, considering that there are multiple possible options to generate/assign BIFT-id, it is advisable to advertise the BIFT-id to detect any bad provisioning and thereby avoiding traffic black holing.

- Contrary to [RFC8296], BIER architecture [RFC8279] does NOT require domain-wide-unique BIFT-ids to be used (even for non-MPLS encapsulation) and is possible that a locally assigned non-unique value can be used as BIFT-id.

This can be seen as other reason why we need to advertise BIFT-id along with the previous reasoning.

# More about BIFT-Id

In BIER MPLS world, for an [SD, BSL] pair, contiguous labels are allocated and we advertise only the base label and the label-range-size (a.k.a Max SI).

This way, signaling of individual labels per SET is avoided and signaling is simplified.

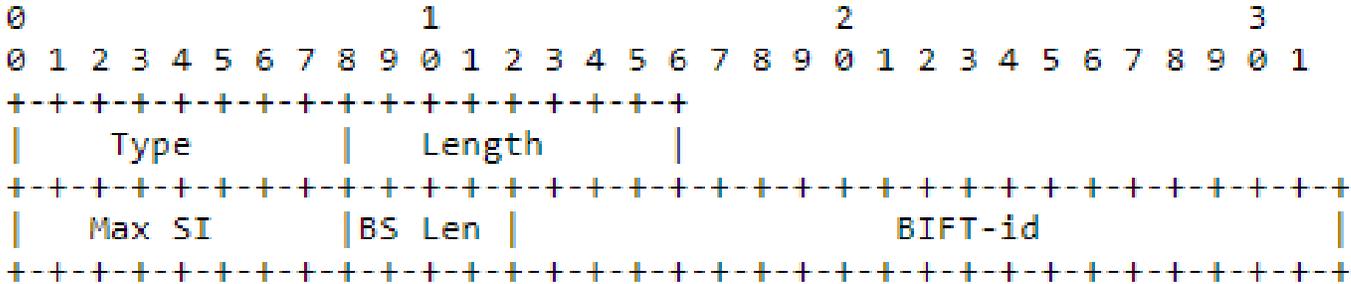
Should BIFT-id in Non-MPLS networks, be contiguous, similar to MPLS Labels ? Not necessarily !

But to make the IGP signaling simpler, we suggest to follow similar approach as BIER-MPLS.

- ✓ Allocate contiguous range of BIFT-Ids !
- ✓ Advertise only the Base BIFT-id and the BIFT-id range (a.k.a Max SI)

# ISIS – Add new BIER-ETH encap sub-sub-TLV

It is advertised within the BIER Info sub-TLV defined in [\[RFC8401\]](#) which in-turn is carried within the TLVs 235, 237 [\[RFC5120\]](#) or TLVs 135 [\[RFC5305\]](#), or TLV 236 [\[RFC5308\]](#).



**Type:** 2 (TBD – IANA)

**Length:** 4

**Max SI:** 1 octet. Maximum Set Identifier (Section 1 of [\[RFC8279\]](#)) used in the encapsulation for this BIER subdomain for this BitString length. The first BIFT-id is for SI=0, the second BIFT-id is for SI=1, etc. If the BIFT-id associated with the Maximum Set Identifier exceeds the 20-bit range, the sub-sub-TLV MUST be ignored.

**Local BitString Length (BS Len):** 4 bits. Encoded bitstring length as per [\[RFC8296\]](#).

**BIFT-id:** 20 bits. [First BIFT-id of the BIFT-id range](#). The usage of BIFT-id value for non-MPLS networks is as defined in [\[RFC8296\]](#).

# OSPF – Add new BIER-ETH encap sub-TLV

It is advertised within the BIER sub-TLV defined in [\[RFC8444\]](#) which in-turn is carried within the OSPFv2 Extended Prefix TLV defined in [\[RFC7684\]](#).



**Type:** 11 (TBD – IANA)

**Length:** 8

**Max SI:** 1 octet. Maximum Set Identifier (Section 1 of [\[RFC8279\]](#)) used in the encapsulation for this BIER subdomain for this BitString length. The first BIFT-id is for SI=0, the second BIFT-id is for SI=1, etc. If the BIFT-id associated with the Maximum Set Identifier exceeds the 20-bit range, the sub-sub-TLV MUST be ignored.

**BIFT-id:** 20 bits. [First BIFT-id of the BIFT-id range](#). The usage of BIFT-id value for non-MPLS networks is as defined in [\[RFC8296\]](#).

**Local BitString Length (BS Len):** 4 bits. Encoded bitstring length as per [\[RFC8296\]](#).

# Request to the WG

- Comments / Inputs
- Adoption Request

# Appendix (BIFT-id range)

As an example, suppose a particular BIER domain contains a SD (SD 0), supports two BSLs (256 and 512), and contains 512 BFRs. A BFR that is provisioned for above SD, and that supports both BSLs, would have to advertise the following set of BIFT-id's:

BIFT-id 1: corresponding to SD 0, BSL 256, SI 0.

BIFT-id 2: corresponding to SD 0, BSL 256, SI 1.

BIFT-id 3: corresponding to SD 0, BSL 256, SI 2.

BIFT-id 4: corresponding to SD 0, BSL 256, SI 3.

BIFT-id 5: corresponding to SD 0, BSL 512, SI 0.

BIFT-id 6: corresponding to SD 0, BSL 512, SI 1.

In such case, a BFR MUST assign a contiguous range of BIFT-ids as,

BIFT-id range [1 to 4] correspond to <SD 0, BSL 256>.

BIFT-id range [5 to 6] correspond to <SD 0, BSL 512>.

The first BIFT-id in the range correspond to SI=0, the second correspond to SI=1, and so on.