

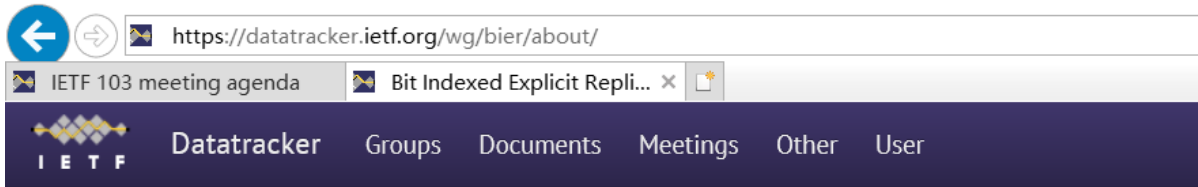
Encapsulation for BIER in Non-MPLS IPv6 Networks

draft-xie-bier-6man-encapsulation-02

IETF103 2018-11-07 Bangkok

**Jingrong Xie @Huawei
Liang Geng @China Mobile
Lei Wang @China Mobile
Mike McBride @Huawei
Gang Yan @Huawei
Yang Xia@Huawei**

Should bier start work on v6 encap?



* teas on architecture and control-plane mechanisms to use BIER-TE forwarding mechanisms.

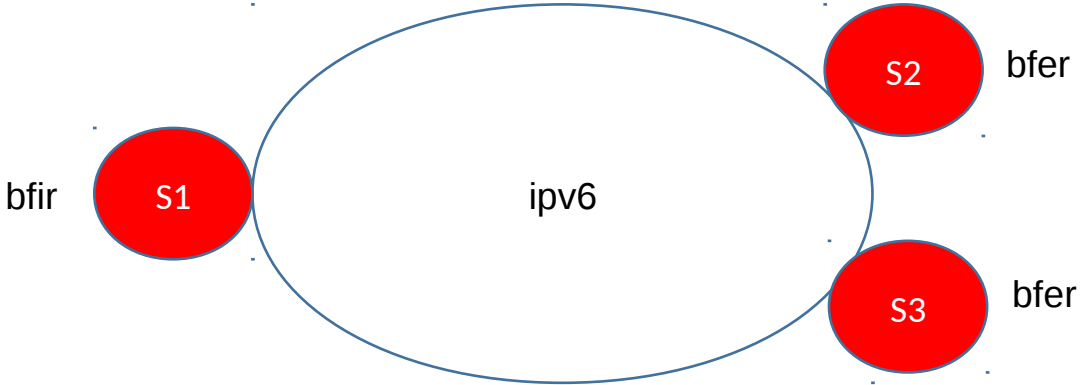
Milestones

Date	↕ Milestone
Mar 2019	WGLC BIER-TE drafts
Nov 2018	Publish document(s) solidifying BAR/IPA complexity
Nov 2018	Progress YANG BIER drafts to WGLC
Nov 2018	Target feasibility and solution selection for IPv6 encap
1 2018	WGLC 1.1.1.1

If there is interest let's get going, perhaps problem statement draft with use cases and then solutions draft?

Determine if we really have a need for an encapsulation that is IPv6-specific

Replicate bier packets from BFIR to BFERs across v6



Do we need an IPv6 encapsulation ?

- SR has simplified the IP transport.
- SR has SR-MPLS and SRv6.
- SRv6 works without MPLS labels: transport labels like LSP, Service labels like Vpn, etc.
- How does BIER run in SRv6 network ?
- Do we need a BIER IPv6 encapsulation ?

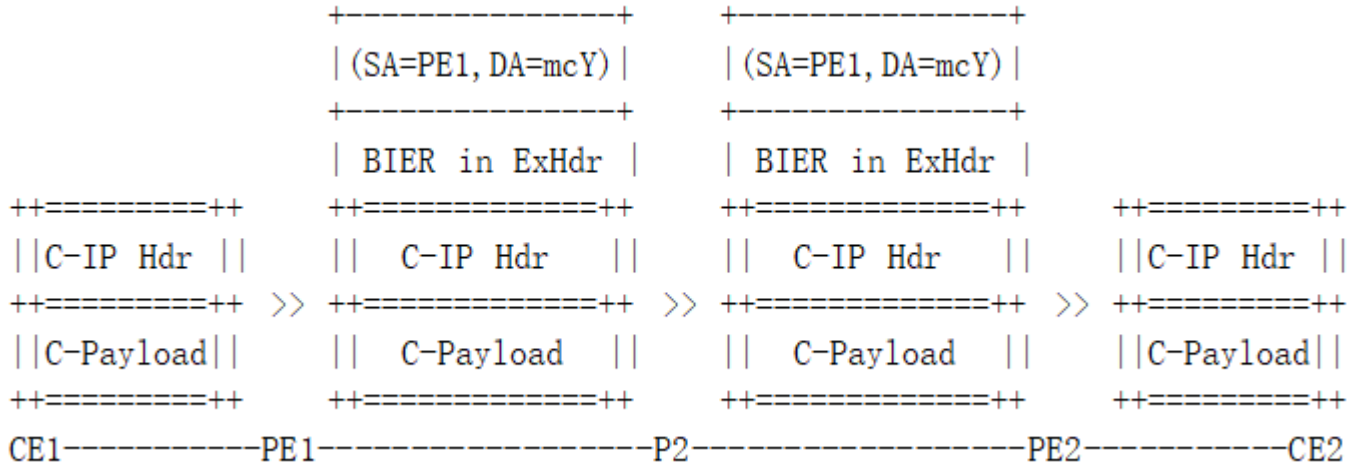
The existing proposals

- Embedded BitString in part of the 128bit IPv6 Destination.
- A new Hop-By-Hop Extension Header.
- A new Extension Header with unicast destination address.
- A new Extension Header with multicast destination address.
- A Destination Option Header with multicast destination address.

The past discussions

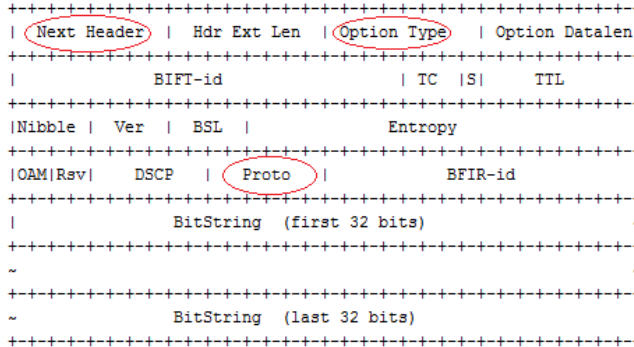
- In Sep 2016, there was a suggestion to provide a method of using IPv6 extension header:
 - <https://www.ietf.org/mail-archive/web/bier/current/msg00986.html>
- Again there were some 'requirements' mentioned by this thread:
 - <https://www.ietf.org/mail-archive/web/bier/current/msg00991.html>
 - "it shouldn't require hop-by-hop modification of the IP destination address field,
 - and it shouldn't require the BFRs to inspect layer 4,
 - and it shouldn't require changes to layer 4,
 - and it shouldn't allow a multicast address to be put in the IP source address field,
 - and it shouldn't assume that bits never get set incorrectly,
 - and it shouldn't require changes in source address filtering procedures.
 - In addition, it should be possible to use it to support the entire BIER architecture"

bierv6 encap



Could use new defined IPv6 extension to carry the BIER header.
 Could use existing Dest Option extension to carry the BIER header.

One proposed encapsulation



- **IPv6 Header**(DA=Multicast Addr) + **Dest Opt Hdr**(TLV<T=bier, L, V=BIER Hdr>)
- The IPv6 BIER Option is the only one TLV in the Destination Options, with a Option Type **BIER** [IANA].
- The Destination Options that carry a BIER Header, has a recommended Next Header Value of 59.
- Only be checked when the Destination Address is a Multicast Address indicating BIER.
- [IANA] is expected to specify a Multicast Address for **BIER**.

Why Proposing the encapsulation ?

- [RFC8200] Defining **new IPv6 extension headers is not recommended**, unless there are no existing IPv6 extension headers that can be used by specifying a new option for that IPv6 extension header.
- [RFC8200] it is **recommended that the Destination Options header is used** to carry optional information that must be examined only by a packet's destination node(s), because they provide better handling and backward compatibility.
- [RFC8200] Extension headers are not processed until the packet reaches the node (or **each of the set of nodes, in the case of multicast**) identified in the Destination Address field of the IPv6 header.
 - **The reason why we select Using [Multicast Addr + Dest Opt Hdr] to pilot the hop-by-hop replication.**

Open discussion

- Forget debating the different solutions right now...
- Does the WG think a BIER IPv6 encapsulation problem/requirement draft is good?
- If so let's do that. Then solutions.

Thank you !