Use of BIER IPv6 Encapsulation (BIERv6) for Multicast VPN in Non-MPLS IPv6 networks

draft-xie-bier-ipv6-encapsulation-00

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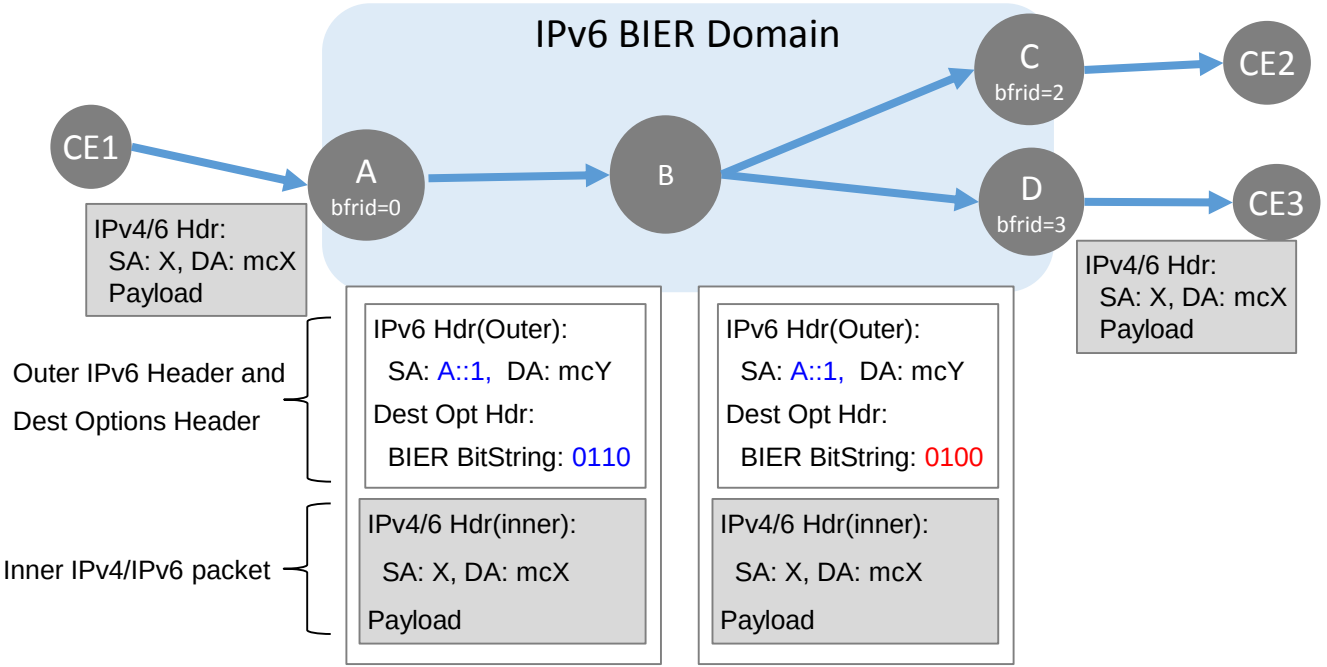
Draft purpose

- Initial idea to define BIERv6-MVPN procedures & messages.
  - Re-use the BGP BIER PTA Attribute, with MPLS Label set to zero.
  - Re-use the BGP Prefix-SID Attribute, with IPv6 Address to identify an MVPN.
  - Segmented MVPN and Extranet is not covered.
- Help understand BIERv6 and its applicability.
  - Provide an option to support Multicast Service in Non-MPLS IPv6 network, using the BIER IPv6 encapsulation(BIERv6).

BIERv6-MVPN: use IPv6 SA to identify VPN



- IPv6 Source Address used to identify VPN.
- LOC and FUNCT part represent the context and the upstream-assigned VPN Label respectively used in BIER-MVPN

Re-use the BIER PTA Attribute

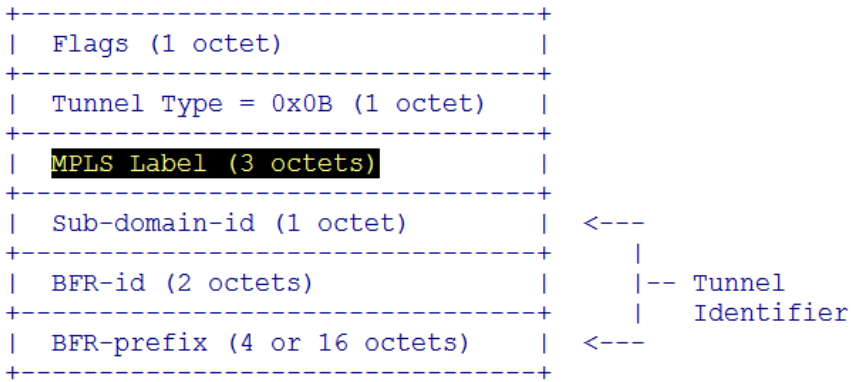
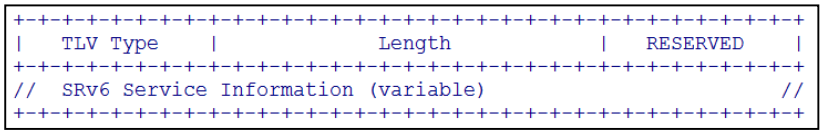
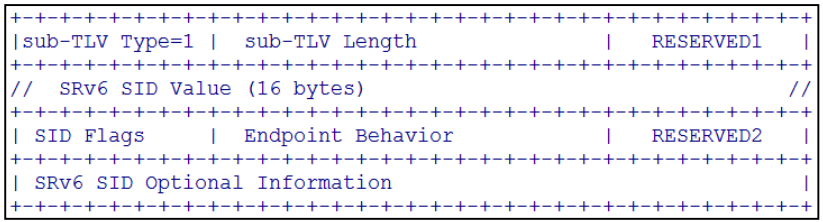


Figure 1: PMSI Tunnel Attribute for BIER

- Re-use the BIER PTA Attribute in BGP-MVPN x-PMSI A-D routes.
- MPLS Label is set to 0.
  - The Upstream-assigned ‘MPLS Label’ represent a VPN in BIER-MVPN.
  - An Upstream-assigned ‘IPv6 Address’ represent a VPN in BIERv6-MVPN.
    - This is carried in another BGP Attribute, see below.

Re-use the BGP-Prefix SID Attribute





- Re-use the Prefix-SID Attribute in BGP-MVPN x-PMSI A-D routes, together with PTA.
  - Only I-PMSI A-D route and/or wildcard S-PMSI A-D route need to carry this attribute.
  - The Prefix-SID Attribute is defined in <draft-ietf-idr-bgp-prefix-sid-27>
    - Attribute Type code 40 for Prefix SID Attribute.
  - The SRv6 L3 Service TLV is defined in < draft-dawra-bess-srv6-services-00>.
    - TLV Type 5 for SRv6 L3 Service TLV, and Sub-TLV Type 1 for IPv6 SID.
    - The End.DTx (End.DT4 or End.DT6 or End.DT46) is used in the 'SRv6 SID Value' field.
    - BFER use this IPv6 address to identify a VPN.

IPv6-infrastructure related fields

- "Originating Router's IP Address" in the NLRI of Type 1 or Type 3 BGP-MVPN route is an IPv6 address.
- "Network Address of Next Hop" field in the MP_REACH_NLRI attribute is an IPv6 address.
- Route Targets Extended Community (EC) used in C-multicast join (Type 6 or 7) route or Leaf A-D (Type 5) route is an IPv6 Address Specific Extended Community, where the Global Administrator field will be an IPv6 address identifies the Upstream PE or the UMH.
- "VRF Route Import Extended Community (EC)" carried by unicast VPN-IPv4/6(SAFI 128) routes as [RFC6515] specifies, or SAFI 1, 2, or 4 unicast routes, or MVPN (SAFI 5) Source-Active routes as [RFC7716] specifies is an IPv6 Address Specific Extended Community.

GTM using BIERv6

- Route Distinguishers - the RD field of a BGP-MVPN route's NLRI MUST be set to zero (i.e., to 64 bits of zero) to represent a Non-VPN GTM.
  - See section 2.2 of [RFC7716].
- GTM IPv4 multicast over an BIERv6 core may be considered an alternative to support IPv4 IPTV content delivery during transition to IPv6 period comparing to [RFC8114].
  - They both use IPv4-in-IPv6 encapsulation, while BIERv6 uses an additional BIER header within an IPv6 Extension header to support stateless core.

References

- RFC6515 //MVPN in IPv6-infrastructure
- RFC7716 //GTM and GTM in IPv6-infrastructure
- draft-ietf-bier-mvpn //BIER-MVPN
- draft-dawra-bess-srv6-services-00 //SRv6-VPN

Request to the WG

- Seek feedback/input.

Thank you !