

Inter-domain Multicast using BIERv6

draft-geng-bier-ipv6-inter-domain-00

Presenter: Jingrong Xie

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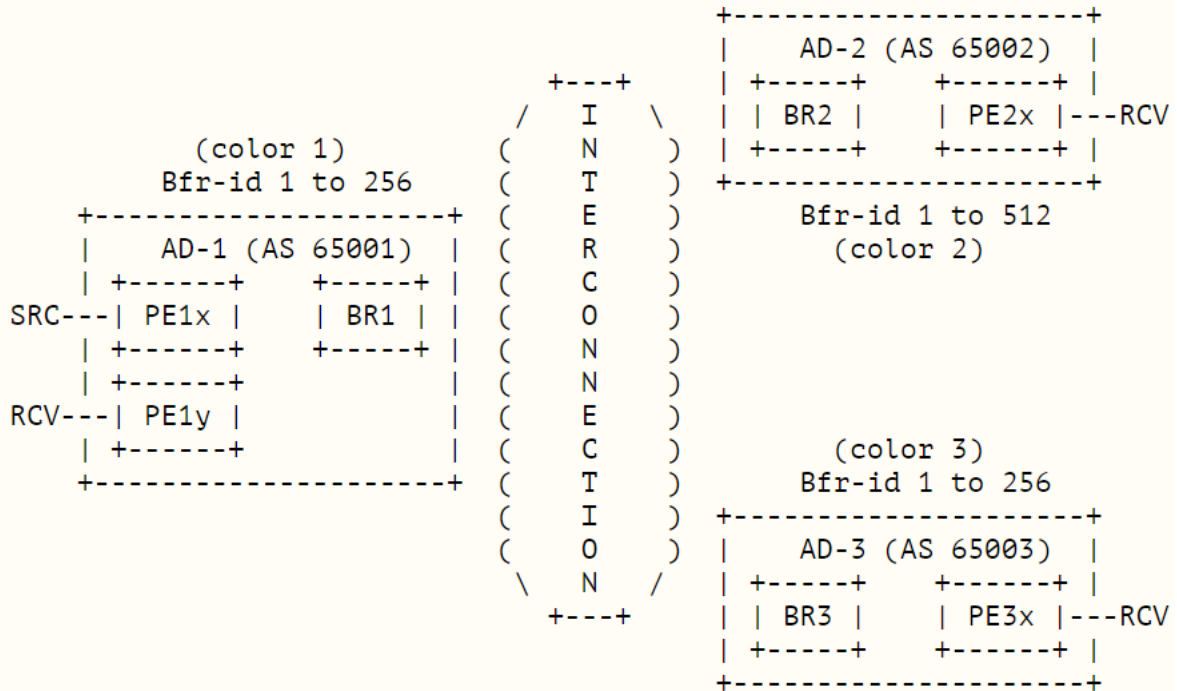
Solution: Static-bift for BIERv6

```
bier sub-domain 6 ipv6-underlay ##configuration for BR1  
  bfr-prefix 2001:DB8::B1:AB37  
  bfr-id 0  
  encapsulation ipv6 bsl 256 max-si 2  
  static-bift  
    nexthop 2001:DB8::B2:AB37 bfr-id 1 to 256 ##Note1  
    nexthop 2001:DB8::B3:AB37 bfr-id 257 to 512 ##Note1
```

```
bier sub-domain 6 ipv6-underlay ##configuration for PE1x  
  bfr-prefix 2001:DB8::E1:AB37  
  bfr-id 0  
  encapsulation ipv6 bsl 256 max-si 2  
  static-bift  
    nexthop 2001:DB8::B1:AB37 bfr-id 1 to 512 ##Note1
```

- [Note1: Use the BSL-SD-SI BIFT-id encoding method described in \[I-D.ietf-bier-non-mpls-bift-encoding\]](#) as auto-generation method.

Scenario: Peering Multicast



AD = Administrative Domain (independent autonomous system)
 BR = Border Router
 SRC = Multicast Source
 RCV = Multicast Receiver

Figure 2: Inter-Domain Peering Multicast

Solution: auto-IR to each domain

- # PE1x routing underlay layer configuration

```
bier sub-domain 6 ipv6-underlay
  bfr-prefix 2001:DB8::E1:AB37
  bfr-id 1
  encapsulation ipv6 bsl 256 max-si 1
  color 1 protocol isis
  color 2 static-bift
    next-hop 2001:DB8::B2:AB37 bfr-id 1 to 512
  color 3 static-bift
    next-hop 2001:DB8::B3:AB37 bfr-id 1 to 256
```
- The following lists the BIFTs that will be constructed on PE1x:
 - BIFT corresponding to SD<6>/BSL<256>/SI<0> for color 1 ;;Ref1
 - BIFT corresponding to SD<6>/BSL<256>/SI<0> for color 2 ;;Ref2
 - BIFT corresponding to SD<6>/BSL<256>/SI<1> for color 2 ;;Ref3
 - BIFT corresponding to SD<6>/BSL<256>/SI<0> for color 3 ;;Ref4

Solution: auto-IR to each domain

- Overlay Multicast Flow steering to (Color, SD/BSL/SI, BitString) tuple on Ingress PE

(VRF<X>, S<S1>, G<G1>)

(Color<1>, SD<6>, BSL<256>, SI<0>, BitString<0001>) ;;Ref1

(Color<2>, SD<6>, BSL<256>, SI<0>, BitString<0001>) ;;Ref2

(Color<2>, SD<6>, BSL<256>, SI<1>, BitString<0001>) ;;Ref3

(Color<3>, SD<6>, BSL<256>, SI<0>, BitString<0001>) ;;Ref4

- Color Extended Community carried in Leaf-AD route from Egress PE.

Leaf A-D route:

NLRI: RD, S, G, OrigIP, LeafIP

PMSI: Sub-domain, bfr-prefix, bfr-id

Color Extended Community: Color=1/2/3 (PE1y/PE2x/PE3x carry Color 1/2/3 resp.)

Comments on the list (1)

- For the “peering multicast”, how many BIER sub-domain do you have?
 - haven't evaluate that so far.
 - I initiate this idea when I found a recent rfc8313 and thought of the tenant spanning multiple DCs.
 - Also I assume the multicast as a service draft for this case.
 - The document assume a single BIER sub-domain (through multiple AS) for multicast deployment.

Comments on the list (2)

- What's the real difference between “hierarchical multicast” and “peering multicast”, once you take away the color and MVPN aspects that I believe are orthogonal here?
 - the hierarchical one is a P2MP case like IPTV in service provider.
 - The peering one is an MP2MP case where the multicast source may be more unpredictable.
 - From BIER point of view, there is still some difference.
 - In current BIER Architecture, BIFT is constructed per the tuple of <SD/BSL/SI>.
 - In the above Color case, BIFT is constructed per the tuple of <Color/SD/BSL/SI>.
 - There may be some consideration of supporting multiple encapsulation in one <SD/BSL>, then the BIFT may be constructed per the tuple of <SD/BSL/Encap/SI>.
 - Note the multicast overlay need to steering a flow to <Color/SD/BSL/SI> instead of <SD/BSL/SI>.

Comments on the list (3)

- What's the significance of "inter-domain" here, that requires this new draft?
 - static-configuration is not desired in intra-domain case since there is so automated IGP deployment.
 - For Inter-domain case (mainly about inter-AS case as this document examples), static-configuration can be used, and I am used to understand things clearly by using static-configuration first.
 - I will try to learn and understand how the dynamic protocol as proposed on the WG can be used for inter-domain.

Comments on the list

- What's the uniqueness of IPv6 here?
 - I found it difficult to construct the inter-domain BIFTs since the BIER-MPLS label is dynamic.
 - SRGB is a thing I could thought of to use for static-configuration.
 - Use of a static SRGB label as BIER-MPLS of a BR(border router) is wasteful, while use the SRGB for the entire domain seems not welcome in ietf102.
 - This document assume the 'SD-BSL-SI' auto-generation of BIFT-ID is used consistently in all BFRs, makes inter-domain BIERv6 deployment easy.
 - (1) inter-domain BIERv6 configuration is easy
 - (2) inter-domain BIERv6 can skip non-BFRs completely.
 - (3) inter-domain BFRs use only the BIERv6 encapsulation without any addition.

Request for

- Comments/questions/discussions

Thank you !