BIER Anycast and Overlay Considerations

draft-zzhang-bier-anycast
draft-zzhang-bier-egress-protection-overlay

Zhaohui (Jeffrey) Zhang, IJsbrand Wijnands, Zheng Zhang, Mankamana Prasad Mishra, Huaimo Chen

IETF 116, Yokohama
Anycast for Service Egress Protection

• It’s well-accepted practice to use anycast addresses for multi-homing PEs for service egress protection (RFC8679) - at least for unicast

• BIER (RFC8279) did not consider anycast
BIER Can Easily Support Anycast

- A non-zero BFR-ID can be advertised from different BFERs with the same anycast BFR-prefix
  - The rest works out automagically – it’s just like ECMP to a single BFER
- Different BFR-prefixes must have different BFR-IDs (if none-zero)
- A BFER may have multiple BFR-prefixes (anycast or not)
  - Each with its own BFR-IDs
  - This is to have different multi-homing protection groups
  - Traffic must be sent appropriate BFR-ID in the header
  - Number of BFR-prefixes for a BFER should be minimized
    - To reduce the number of bits needed
Backward Compatibility?

- A “legacy” BFR might treat same BFR-IDs advertised from different BFERs’ anycast BFR-prefix as duplicate
  - The BFR-ID will be treated as invalid and relevant BFERs won’t receive traffic
  - An error message will be logged
- To make use of anycast based egress protection, all BFRs must support it
  - The error log message from a “legacy” BFR will help identify the situation
- Signaling a BFR’s support of anycast?
  - It does not help
  - It is not needed anyway
MVPN Flow Overlay

• The CE connecting to the PE/BFERs must signal multicast interest to all multi-homing PEs of the same anycast protection groups
  • PIM/mLDP MoFRR
  • IGMP/MLD proxy with multiple upstream interface

• All those PEs will signal C-Multicast routes and Leaf-AD routes
  • Anycast BFR-prefix and corresponding BFR-ID used in the Leaf AD route’s PTA

• The CE must be prepared to receive traffic from all of them
  • Only one PE/BFER will receive traffic and deliver to the CE
    • This happens naturally – no special handling is needed

• This does not work for EVPN
MVPN/EVPN Tunnel Segmentation

- Segmentation points can be anycast BFERs
  - BFERs in the upstream sub-domain
  - BFIRs in the downstream sub-domain
    - PMSI routes are sent with anycast BFR-prefix/ID
- PEs (PE4/5) and segmentation points (SEG3/4) in the downstream region:
  - are BFERs in the downstream sub-domain
    - Leaf AD routes are sent to upstream PE or segmentation points (SEG1/2) for flow overlay signaling w/ anycast BFR-prefix/ID in PTA
    - are like CEs to the anycast PEs wrt the upstream sub-domain
      - Leaf AD routes are like the PIM joins in the PE-CE case
        - They trigger Leaf AD routes for the upstream sub-domain
- This does work with EVPN
  - If the segmentation points are not also MH PEs
Other Tunnel Types?

• Anycast segmentation points work with Ingress Replication the same way as with BIER
• Other tunnel types could be made work with additional procedures
  • Some details in the draft
Two Drafts

- **draft-zzhang-bier-anycast** - extension to base spec
  - Explicitly allow anycast BFERs
  - Explicitly tighten the duplication detection rule
  - Standards track

- **draft-zzhang-bier-egress-protection-overlay**
  - Describe how overlay signaling works, including tunnel segmentation case
  - Clarify the use of anycast BFR-prefix/ID in PMSI/Leaf AD routes
  - Considerations for PIM/mLDP/MLD overlay may be added
  - Standards/Informational