BIER IPv6 Encapsulation

draft-xie-bier-ipv6-encapsulation-03

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Jingrong Xie (Huawei)

Liang Geng (China Mobile)

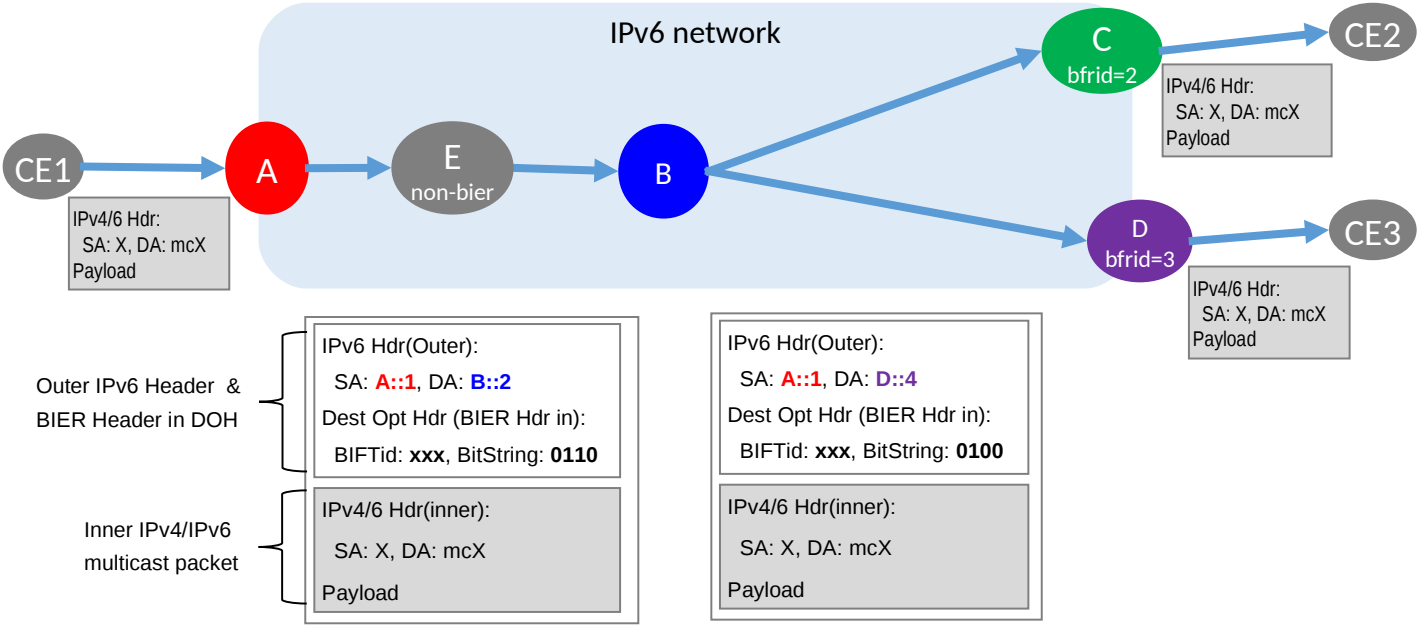
Mike McBride (Futurewei)

Rajiv Asati (Cisco)

Senthil Dhanaraj (Huawei)

Speaker: Liang Geng

The proposed BIER IPv6 encapsulation



- Standard BIER Header in IPv6 Destination Options Header.
- Unicast Address of BFIR in IPv6 Source Address field.
- Unicast Address of Neighbor BFR in IPv6 Destination Address field.
- BFR gets an End.BIER indication by FIB lookup, and process the BIER header in DOH.

Comply with the BIERv6 requirements (1)

- Req 4.7. BIER architecture support ----Yes/Comply
  - Multiple Sub-domains
  - Multiple Sets for scalability
  - Multiple BSLs (64,128,256,…,4096)
  - Multiple BIFTs for ECMP
  - Bypassing non-BIER routers or bypassing Layer-2 switches
  - BIER architecture support comes from the fact that
    - Standard BIER Header encoding does not change (per the past IETF 102-105 meetings).
    - Standard BIER Header encapsulated in existing IPv6 EH (Dest Options Header).

Comply with the BIERv6 requirements (2)

- Req 4.3. L4 Inspection not required ----Yes/Comply
- Req 4.11. Support Fragmentation ----Yes/Comply
- Req 4.12. Support IPv6 Security ----Yes/Comply
  - BIER forwarding and BitString modifying by Layer-3 headers.
  - No Conflict with other Layer-3 functions:
    - Fragmentation and Assembly on BFIR and BFERs only.
    - IPSEC Confidentiality or Integrity on BFIR and BFERs only.

Comply with the BIERv6 requirements (3)

- Req 4.2 Hop by hop SA or DA modification ----Yes/Comply
  - DA modification by each BFR to its NBR-BFR
    - Using unicast DA for many benefits (per the past IETF 102-105 meetings)
      - Bypassing Layer-3 Non-BFR router(s) or Layer-2 switch(es).
      - One encapsulation/forwarding method for one-hop and multi-hop cases.
  - No SA modification by each BFR to its NBR-BFR
    - Once the IPv6 Source Address is set by BFIR.
      - Receiving notices on the BFIR for functions of PING, TRACE and MTU
      - For better SA filtering and data origin authentication.
      - No SA change helps reducing cost when forwarding packet.

Comply with the BIERv6 requirements (4)

- Req 4.1. L2 Agnostic ----Yes/Comply
  - Based on IPv6 unicast, and can run on various link types.
- Req 4.4. Multicast address in SA field not allowed ----Yes/Comply
  - Multicast address in SA field not used or required.
- Req 4.5. Incorrect bits handling ---Yes/Comply
  - BitString update per 8279 prevents duplication.
- Req 4.6. SA filtering ----Yes/Comply
  - Unchanged IPv6 address of BFIR as SA helps SA filtering.
- Req 4.8. Simple Encapsulation ----Yes/Comply
  - One encapsulation for one-hop and multi-hop replication.
- Req 4.9. Hardware fast path ----Yes/Comply
  - Forwarding based on IPv6 DA lookup and BIER Header
- Req 4.10. Conform to existing IPv6 Spec ----Yes/Comply
  - Existing IPv6 Extension Header with option TLV extension.

Next Step

- First revision post in April 2018, based on a lot of earlier work before.
  - Based on earlier V6 drafts and requirements since 2016 (ietf97 to ietf100).
  - Based on working group charter V2 in early 2018 (ietf101).
- Has been stable since rev-03, based on a lot of improvements before.
  - Based on discussions since its first post (ietf102 to ietf103).
  - Based on discussions on the requirements draft (ietf104 to ietf105).
- It’s mature, and we’d like to ask for working group adoption.
- Thank you !