Encapsulation of BFD for SRv6 Policy

draft-liu-bfd-srv6-policy-encap-02

Yisong Liu (China Mobile)(Presenter)
Weiqiang Cheng (China Mobile**)**
Changwang Lin (New H3C Technologies**)**
Mengxiao Chen (New H3C Technologies)
Xiao Min (ZTE Corp.)

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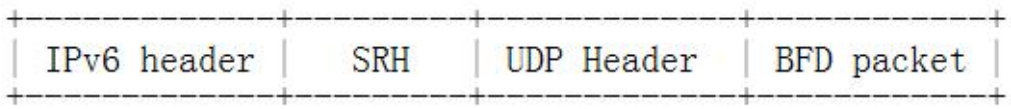
Introduction

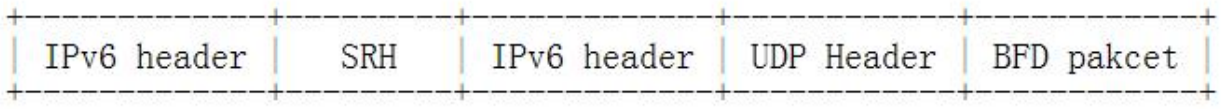
- BFD mechanisms can be used for failure detection of SR Policy
- BFD detecting the hierarchical relationship of SR policy:
  - BFD session down ---> **Segment List** fail
  - All Segment List fail ---> Candidate Path fail
  - All Candidate Path fail ---> SR Policy fail
- On IPv6 data plane (SRv6 Policy), BFD packet needs to carry a Segment Routing Header(SRH), which contains a list of SRv6 SID associated with the BFD session.
- This draft describes the encapsulation method of BFD for SRv6 Policy. It can be applied for seamless BFD and echo BFD.

Encapsulation of BFD packet for SRv6 Policy

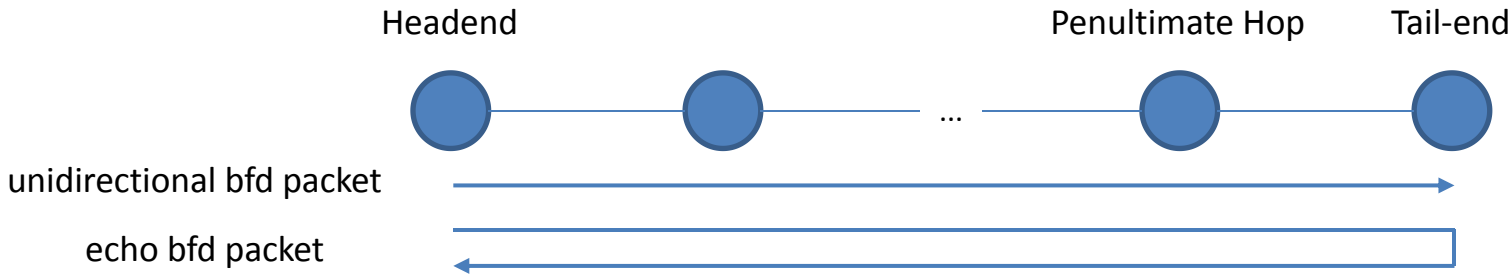
- Transport Mode
  - an SRH is inserted after the IPv6 header of a BFD packet
  - Reduce header overhead and reduce detection packet bandwidth when the detection interval is very short (e.g.<10ms)



- Encap Mode
  - an outer IPv6 header with an SRH is encapsulated
  - preserve the original complete BFD packet, only modified outer IPv6 header

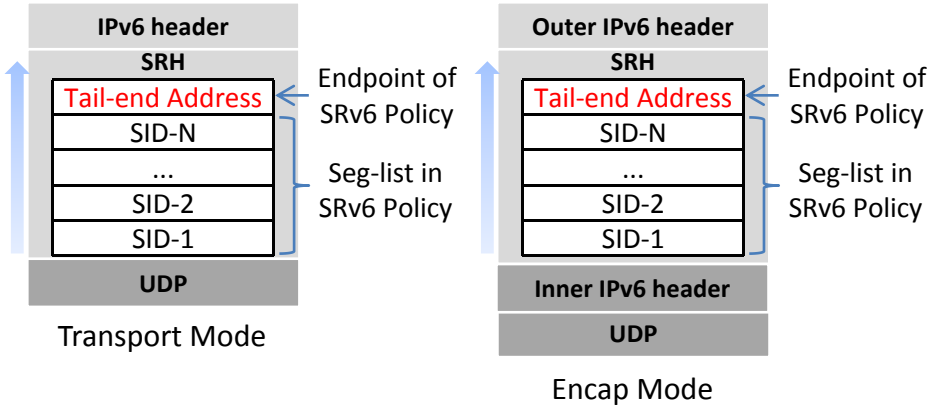


Ensure BFD Packets Reach Tail-end

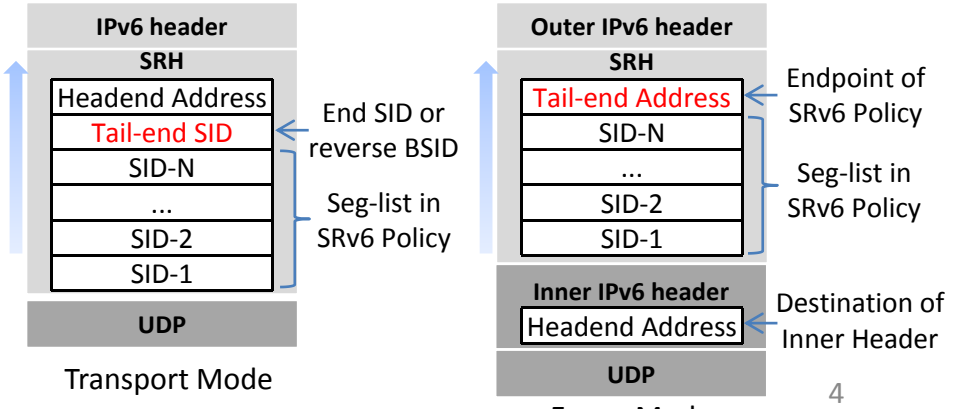


The last SID in SRv6 Policy may not belong to the tail-end: e.g. End.X SID of penultimate hop

Unidirectional Packet



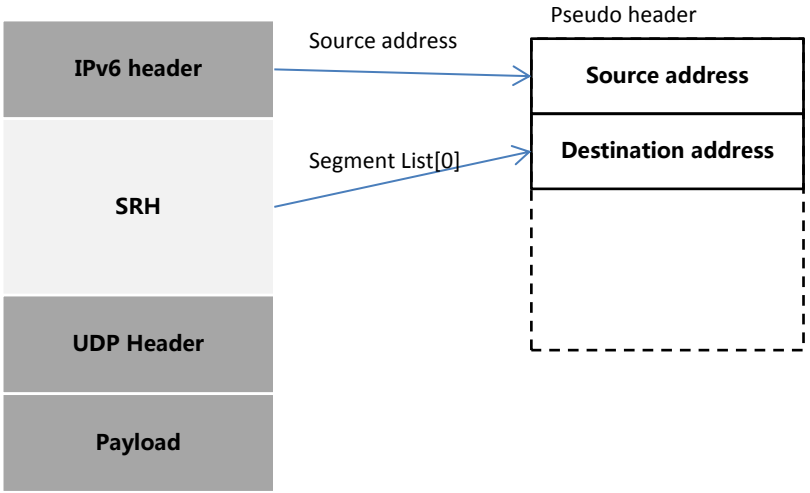
Echo Packet



Special handling of UDP checksum

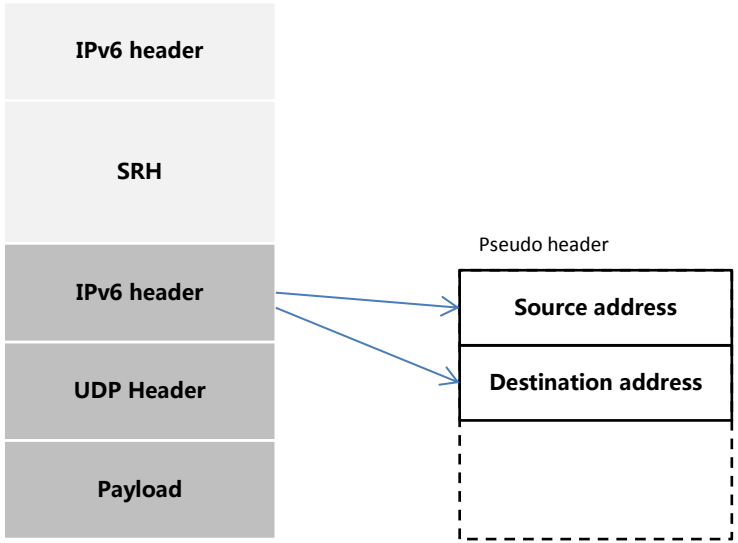
✓ Transport mode

Calculate UDP checksum using the source address of IPv6 Header and segment list[0] of SRH as destination addresses



✓ Encap mode

Calculate UDP checksum using the source and destination addresses of the inner IPv6 header



Running Code

Lab Interop-test Status

Hardware devices and software implementations which have passed BFD for SRv6 Policy interoperability tests of both encapsulations hosted by China Mobile in 2022:

Huawei NE40E and NE5000E

H3C CR16010H-FA and CR19000-8

ZTE M6000-8S Plus and M6000-3S

Ruijie RG-N8010-R

Next Steps

- Any questions or comments are Welcomed
- Seeking for feedback from WG

Thank You