Encapsulation of BFD for SRv6 Policy

draft-liu-bfd-srv6-policy-encap-06

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IETF-125

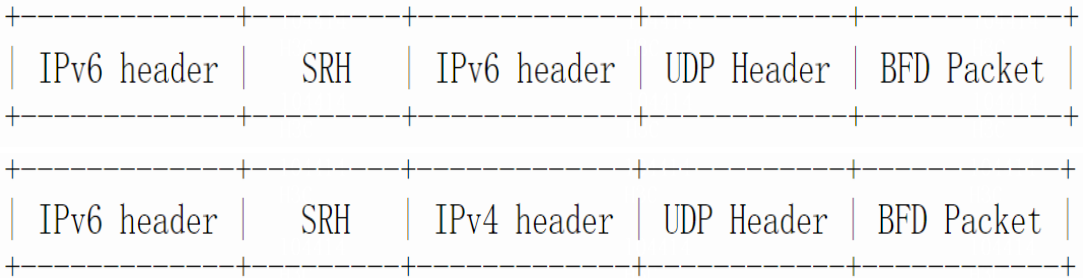
Introduction

- 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 SRv6 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. For encapsulating the BFD packets for the SRv6 data plane, two modes of encoding are defined in this document: Insert-Mode and Encaps- Mode.

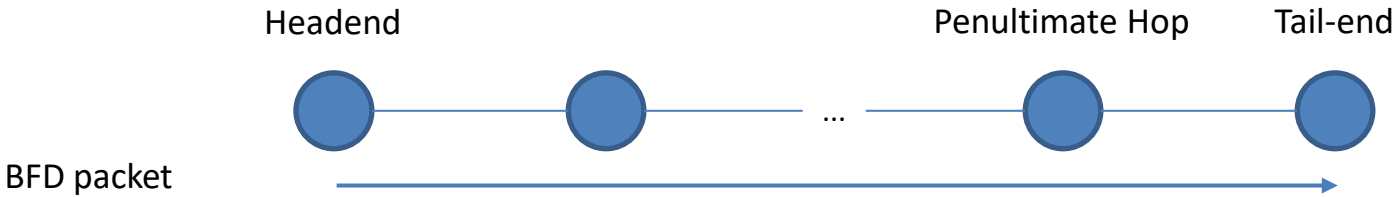
Encapsulation of BFD packet for SRv6 Policy

- Insert Mode
  - an SRH is inserted after the IPv6 header of a BFD packet
  - Reduce header overhead and reduce detection packet bandwidth
  - In this encoding mode , PSP is not supported

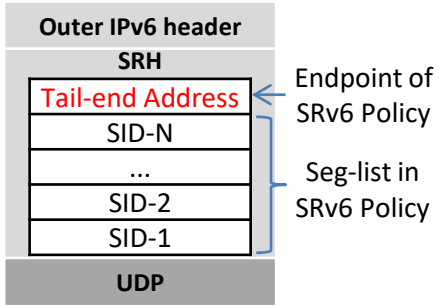
- Encap Mode
  - an outer IPv6 header with an SRH is encapsulated
  - preserve the original complete BFD packet, only modified outer IPv6 header
  - IPv6 BFD Encapsulated in Inner
  - IPv4 BFD Encapsulated in Inner



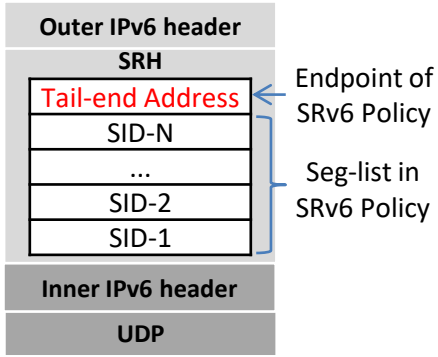
Ensure BFD Packets Reach Tail-end



In the SRH, the first element of the segment list (Segment List[0]) contains the SRv6 SID or IPv6 address of the tail-end node. The last SID in SRv6 Policy may not belong to the tail-end: Binding SID, End.X SID of penultimate hop, etc. --- need include the additional tail-end IPv6 address



Insert Mode

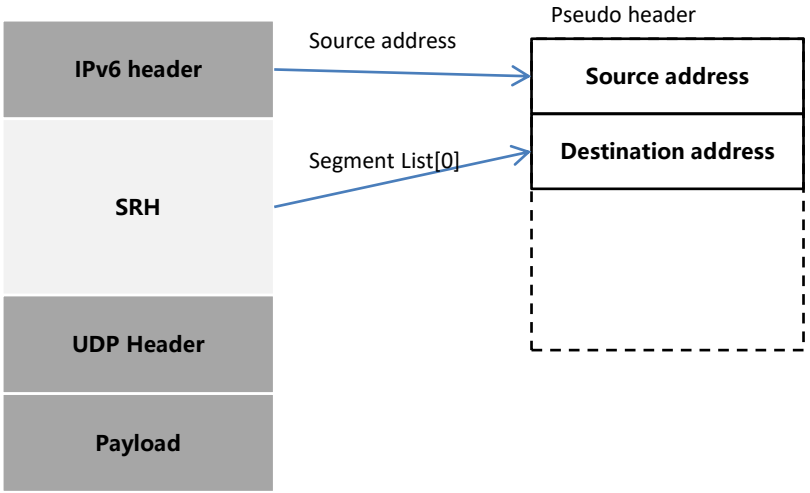


Encap Mode

Special handling of UDP checksum

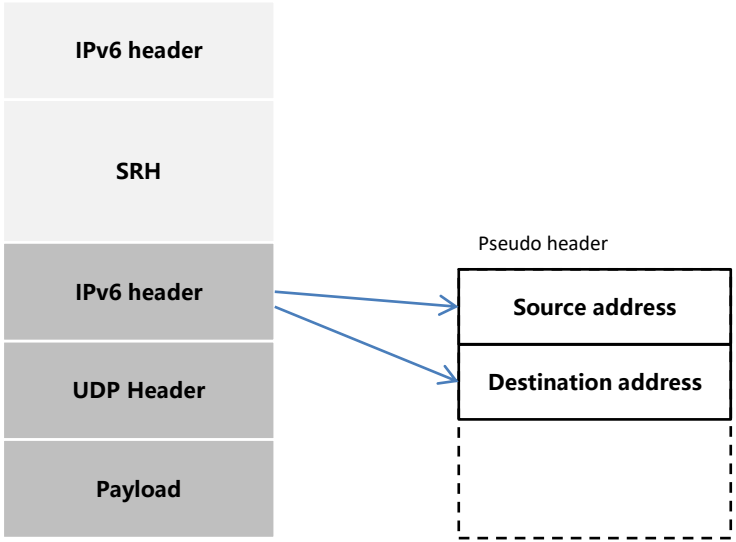
✓ Insert mode

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:

China Unitechs Unified Controller

Huawei NE40E and NE5000E

ZTE M6000-8S Plus and M6000-3S

H3C CR16010H-FA and CR19000-8

Ruijie RG-N8010-R

Draft history

- This document was presented at IETF-114, IETF-118, and IETF-121.
- The Key improvements in version -06 compared to version -00:
  - ✓ Transport Mode has been renamed to Insert-Mode.
  - ✓ Tunnel Mode has been renamed to Encaps-Mode.
  - ✓ Several editorial errors have been corrected.
  - ✓ New text has been added to the Introduction.
  - ✓ Alignment with draft-ietf-spring-bfd.
  - ✓ Added application descriptions for Encaps-Mode and Insert-Mode.

Next Steps

- Draft has been stable
- Ask for WG adoption

Thank You!