SRv6 inter-domain mapping SIDs

draft-salih-spring-srv6-inter-domain-sids

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Updates from last version

➢ New Co-authors
➢ Slight enhancements for SID behaviors to cater to cases like oam
➢ Added a section on Interworking Procedures with examples
Processing END.REPLACE

“Replace destination address with a new SID and forward packet on an outgoing interface”

S01. When an SRH is processed {
S02.   If (Segments Left == 0) {
      S03.       Stop processing the SRH, and proceed to process the next
               header in the packet, whose type is identified by
               the Next Header field in the routing header. Procedure is as
               per Section 4.1.1 of [RFC8986].
S04.   }
S05.   If (IPv6 Hop Limit <= 1) {
S06.       Send an ICMP Time Exceeded message to the Source Address with Code 0
               (Hop limit exceeded in transit), interrupt packet processing, and discard packet
S07.   }
S08.   Decrement IPv6 Hop Limit by 1
S09.   Update IPv6 DA with new destination address(SID) mapped with END.REPLACE SID.
S10.   Submit the packet to the IPv6 module for transmission
               to the new destination via a member of J.
S11. }

J, of one or more L3 adjacencies of immediate BGP neighbors
When an SRH is processed {
   If (Segments Left == 0) {
      Stop processing the SRH, and proceed to process the next header in the packet, whose type is identified by the Next Header field in the routing header. Procedure is as per Section 4.1.1 of [RFC8986].
   }
   If (IPv6 Hop Limit <= 1) {
      Send an ICMP Time Exceeded message to the Source Address with Code 0 (Hop limit exceeded in transit), interrupt packet processing, and discard packet.
   }
   Decrement IPv6 Hop Limit by 1
   Update IPv6 DA with new destination address (SID) mapped with END.REPLACEB6.
   Push an IPv6 header with an SRH.
   Set outer IPv6 SA = T and outer IPv6 DA to the first SID in the segment list.
   Set outer Payload Length, Traffic Class, Hop Limit, and Flow Label fields.
   Submit the packet to the IPv6 module for transmission to the First SID.
}

Implementation may choose to avoid outer encapsulation for flex-algo and best effort based SRv6 transport tunnels.

The Payload Length, Traffic Class, Hop Limit, and Next Header fields are set as per [RFC2473]. The Flow Label is computed as per [RFC6437].
When an SRH is processed {
  If (Segments Left != 0) {
    Send an ICMP Parameter Problem to the Source Address,
    Code 0 (Erroneous header field encountered),
    Pointer set to the Segments Left field,
    interrupt packet processing and discard the packet.
  }
  If (Upper Layer header type == 4(IPv4) OR Upper Layer header type == 41(IPv6) OR
      Upper Layer header type == 143(Ethernet)) {
    Remove the outer IPv6 header with all its extension headers.
    Push the new IPv6 header with the SRv6 SIDs associated with the END.DB6 sid
    in an SRH.
    Set outer IPv6 SA = T and outer IPv6 DA to the first SID in the segment list.
    Set outer Payload Length, Traffic Class, Hop Limit, and Flow Label fields
    Set the outer Next Header value
    Submit the packet to the IPv6 module for transmission to First SID.
  } else {
    Process as per Section 4.1.1 of [RFC8986].
  }
}

Decapsulate received srv6 header and Bind (encapsulate) new Srv6 header

The Payload Length, Traffic Class, Hop Limit, and Next Header fields are set as per [RFC2473]. The Flow Label is computed as per [RFC6437].
Option C Interworking Example

REPLACE B6 SID
12,6
13,7

REPLACE SID
10,4
11,5
Option B Interworking Example

[Diagram showing network topology with AS1 and SRv6 connections]

DB6 SID
4
Next Steps

➢ WG Review and comments
➢ Requesting WG for adoption