Segment Routing Header encapsulation for Alternate Marking Method

draft-fz-spring-srv6-alt-mark-01

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Giuseppe Fioccola (Huawei)
Tianran Zhou (Huawei)
Mauro Cociglio (Telecom Italia)

SRv6 application of Alt-Mark

Alternate Marking methodology is an OAM Passive PM technique and enables Packet Loss, Delay and Delay Variation measurements.

The reference documents are **RFC8321** and **RFC8889**

draft-ietf-6man-ipv6-alt-mark defines a new TLV that can be encoded in the IPv6 Option Headers (both Hop-by-hop or Destination)

- Because SRv6 is a routing header, destination options before the routing header are processed by each destination in the route list.
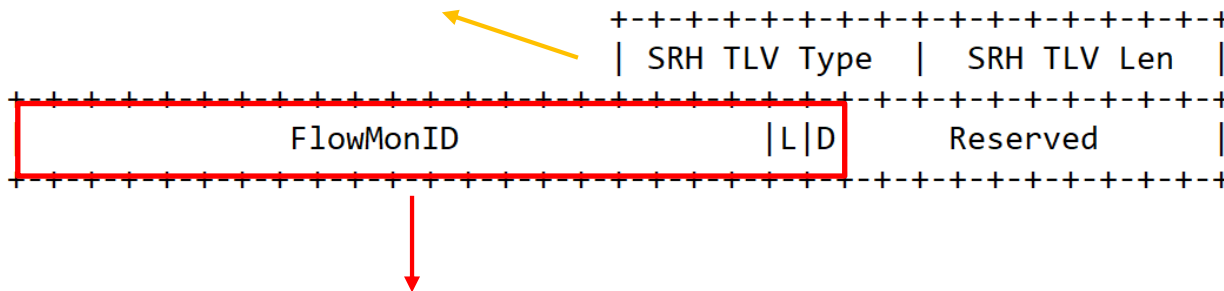
This document defines how Alternate Marking data is carried as **SRH TLV**

- It can be can be piggybacked in the packet and transported as part of the SRH (**RFC8754**).

Alternate Marking Data Fields

- Definition of a new SRH TLV for Alternate Marking

Skip if do not recognize and
data do not change en route

```
                               +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
                               |   SRH TLV Type  |   SRH TLV Len  |
 +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 |           FlowMonID              |L|D|     Reserved     |
 +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

- **L** and **D** are the Marking Fields
- The Flow Monitoring Identification (**FlowMonID**) is required for specific deployment reasons:
  - ✓ **It helps to reduce the per node configuration**. A flexible granularity for the flow definition is also enabled.
  - ✓ **It simplifies the counters handling**. Hardware processing of flow tuples (and ACL matching) is challenging and often incurs into performance issues, especially in tunnel interfaces.
  - ✓ **It eases the data export** encapsulation and correlation for the collectors.

The FlowMonID can be uniformly assigned by the central controller or algorithmically generated by the source node.

Use of the SRH AltMark TLV

SRH TLV can be used to encode the AltMark Data Fields for SRv6 and to monitor every node along the SR path.

- **Ingress Node**: As part of the SRH encapsulation, the ingress node of an SR domain or an SR Policy MAY add the AltMark TLV in the SRH of the data packet, if it supports AltMark functionality.

- **Intermediate SR Node** and **Egress Node**: If an intermediate or egress SR node is not capable of processing AltMark TLV, it simply ignores it. While, if an intermediate or egress SR node is capable of processing AltMark TLV, it checks if SRH AltMark TLV is present in the packet and process it.

Note: If nodes are not capable of processing AltMark TLV or are not configured to do so, this is not a big problem because the measurement can be done only for the supporting nodes.

DOH+SRH vs SRH TLV

The approach with DOH + SRH requires two extension headers and this can have operational implications (e.g. draft-ietf-v6ops-ipv6-ehs-packet-drops)

This document would update the AltMark application only for SRv6. This means that:

- in case of SRv6, AltMark can be applied through SRH TLV,
- for all the other cases with IPv6 data plane, the use of the HbH and DOH is the only choice to carry AltMark data fields.

The SRv6 Compression Design Team will hopefully come out with an optimized solution for SRv6 SID Compression and SRH implementation could also benefit from this.

Next Steps

- A straightforward way to apply <u>RFC 8321</u> and <u>RFC 8889</u> to SRv6 has been proposed

- Companion <u>draft-ietf-6man-ipv6-alt-mark</u> in IESG Evaluation

- Evaluate WG Adoption

- Welcome questions, comments

Thank you