Segment Routing Header encapsulation for Alternate Marking Method

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

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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.

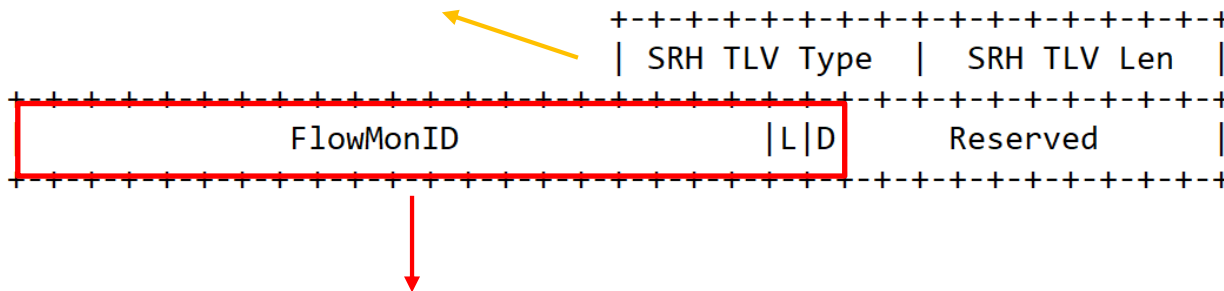This document defines how Alternate Marking data is carried as **SRH TLV** (as introduced in **RFC8754**)

- It can be can be piggybacked in the packet and transported as part of the SRH.

For SRv6, it may be preferred to use the SRH TLV, while for all the other cases with IPv6 data plane the use of the Hop-by-Hop and Destination Option to carry AltMark data fields is a good choice.

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.

3

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.

Changes from -00

- New section on Controlled Domain

RFC8799 introduces the concept of specific limited domain solutions.

- IPv6 has much more flexibility than IPv4. But, for a number of reasons, such as the policies, options supported, the style of network management and security requirements, it is suggested to limit some of the innovative applications, such as Alternate Marking to SRv6, to a controlled domain.

- Revised Security Considerations section

The Alternate Marking application to IPv6, defined in draft-ietf-6man-ipv6-alt-mark, already analyzes the security concerns and related solutions.

- Alternate Marking MUST be applied in a controlled domain, where the network nodes are locally administered and one or several operators decide on leveraging and configuring Alternate Marking according to their needs.

- A limited administrative domain provides the network administrator with the means to select, monitor and control the access to the network.

Next Steps

- A straightforward way to apply RFC 8321 and RFC 8889 to SRv6 has been proposed

- Companion draft-ietf-6man-ipv6-alt-mark in Last Call

- Evaluate WG Adoption

- Welcome questions, comments

Thank you