# Segment Routing Header encapsulation for Alternate Marking Method

**draft-fz-spring-srv6-alt-mark-00**

Online, Mar 2021, IETF 110

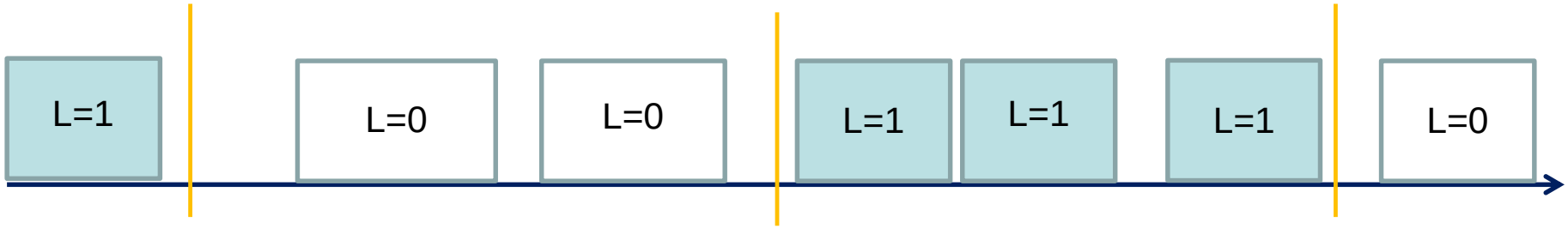
Giuseppe Fioccola (Huawei)
Tianran Zhou (Huawei)
Mauro Cociglio (Telecom Italia)

# Alternate Marking

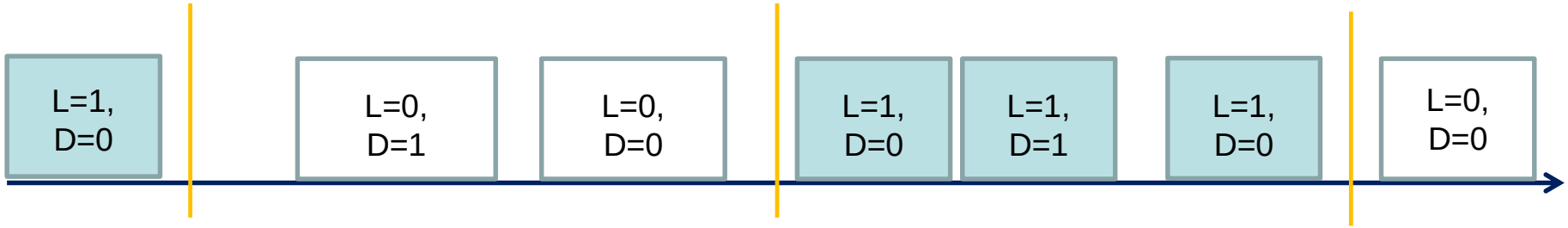
Alternate Marking methodology is an OAM Passive PM technique and enables Packet Loss, Delay and Delay Variation measurements.

The reference documents are **RFC 8321** and **RFC8889**

- Batching packets based on time interval to measure **Packet Loss** by switching value of L flag.
- **First/Last Packet Delay** calculation and **Average Packet Delay and Delay Variation** calculations are possible




- Use D flag to create a new set of marked packets fully identified over the network. D-marked packets to calculate **more informative Packet Delay Metrics**



# What about SRv6 application

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

- Like any other use case of IPv6, HbH and Destination Options are usable when SRv6 header is present.
- 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**)

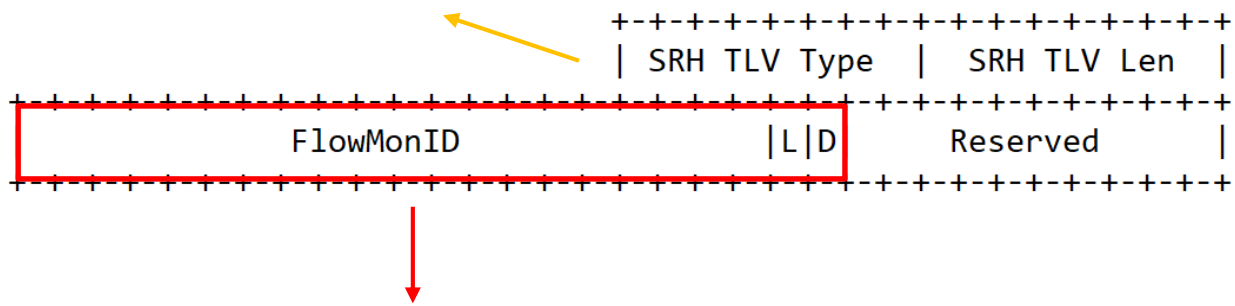
- It can be can be piggybacked in the packet and transported as part of the SRH.

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 (as described in draft-ietf-6man-ipv6-alt-mark) is the best 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




  - **L** and **D** are the Marking Fields
  - The Flow Monitoring Identification (**FlowMonID**) is required for specific deployment reasons (see next slide)

- The nodes that are not capable of supporting the Alternate Marking functionality do not have to look or process the SRH AltMark TLV and can simply ignore it.
- The collection of Alternate Marking data is possible only from the supporting segment endpoints.

# Flow Monitoring Identification

The Flow Monitoring Identification (**FlowMonID**) is required for the following 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.

- If the FlowMonID is **pseudo randomly generated by the source node** there is a chance of collision (50% chance of collision for just 1206 flows!) If this is not enough the entropy can be increased by tagging it with additional flow information to allow disambiguation.
- While, in case of a **centralized controller**, the controller can set FlowMonID by considering these aspects and instruct the nodes properly in order to guarantee its uniqueness.

# 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.

# Next Steps

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

- Welcome questions, comments

Thank you