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Enhanced Alternate Marking Method
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Abstract

This document proposes several ways to encapsulate the alternate marking field with enough space. More information can be considered within the alternate marking field to facilitate the efficiency and ease the deployment.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

The Alternate Marking [RFC8321] technique is an hybrid performance measurement method, per [RFC7799] classification of measurement methods. It can be used to measure packet loss, latency, and jitter on live traffic. Because this method is based on marking consecutive batches of packets.

For the basic Alternate Marking method, bits are needed to record the mark. However, in some protocols, no additional bit can be used, which blocks the wide deployment of the alternate marking technique. And the basic Alternate Marking method is limited with the scalability for further extension.

This document proposes several ways to encapsulate the alternate marking field with enough space. More information can be considered within the alternate marking field to facilitate the efficiency and ease the deployment.

2. Encapsulating Alternate Marking Field

2.1. Use the IOAM Data

In-situ Operations, Administration, and Maintenance (IOAM [I-D.ietf-ippm-ioam-data]) defines a generic meta data structure to records OAM information within user packets while the packets traverse a network. The data types and data formats for IOAM data records have been defined in [I-D.ietf-ippm-ioam-data]. The IOAM data can be embedded in many protocol encapsulations such as Network Services Header, Segment Routing, and IPv6 [I-D.brockners-inband-oam-transport].

The IOAM edge-to-edge option is to carry data that is added by the IOAM encapsulating node and interpreted by IOAM decapsulating node. It provide a bit map to indicate what is present in the data, so that alternate marking filed can be included in the IOAM edge-to-edge option. This provides a way for an end to end deployment for the alternate marking method.

Since the IOAM edge-to-edge option data is not able to be interpreted by the intermediate node, alternate marking method cannot be applied within the path hop by hop with this encapsulation way.

2.2. Use the PostCard based Telemetry Header

The PostCard Base Telemetry (PBT) [I-D.song-ippm-postcard-based-telemetry] is proposed to directly exports the telemetry data to a collector through separated OAM packets called postcards, while not require inserting telemetry data into user packets. The alternate making data can also be encapsulated in this option header. Different from the IOAM edge-to-edge option, the PostCard based Telemetry facilitates the hop by hop deployment of alternate marking method.

2.3. Encapsulate within the Transport Directly

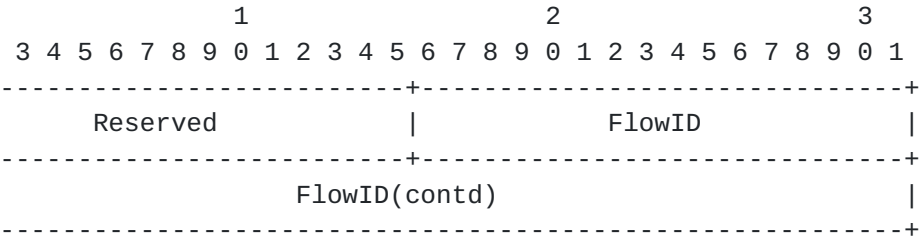
In addition to the previous ways which carry the alternate marking filed within the existing generic OAM header. The alternate marking field can also be encapsulate within the transport protocol directly as an extension header or so. This may vary according to the transport protocol.

3. Examples

3.1. Encapsulate with the End to End IOAM

The IOAM-E2E-Type filed within the IOAM edge-to-edge option header is a 16-bit identifier which specifies which data types are used in the E2E option data. The IOAM-E2E-Type value is a bit field, in which bit 0-3 are currently defined by [I-D.ietf-ippm-ioam-data]. So one bit from bit 4-15 can be used to indicate the presence of data used for alternate marking.

The alternate marking data is a 8-octet field defined as follows:

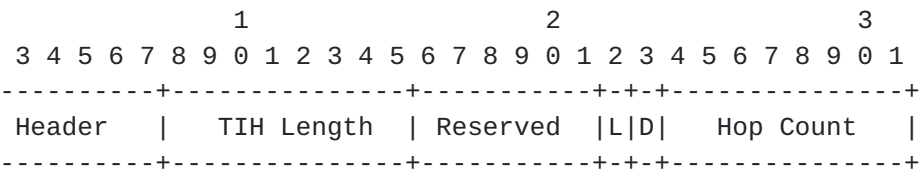


where:

- L - Loss flag;
- D - Delay flag;
- FlowID - 6-octet unsigned integer. Flow identifier field is to uniquely identify a monitored flow within the in-situ OAM domain.

3.2. Encapsulate with the PostCard Base Telemetry

The following figures shows a proposed change to the Telemetry Information Header (TIH) [I-D.song-ippm-postcard-based-telemetry].



This proposes to use the two bits from the Reserved field from the Telemetry Information Header.

Where:

- L - Loss flag;
- D - Delay flag.

The Data Element Bitmap defined in the TIH is an 31-bit bitmap indicating the list of required data elements. One not used bit from the Data Element Bitmap can be used to indicate the presence of the marking bits, and trigger the statistic process.

4. Security Considerations

TBD

5. IANA Considerations

TBD

6. Acknowledgements

TBD

7. References

7.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <https://www.rfc-editor.org/info/rfc2119>.

[RFC7799] Morton, A., "Active and Passive Metrics and Methods (with Hybrid Types In-Between)", RFC 7799, DOI 10.17487/RFC7799, May 2016, <https://www.rfc-editor.org/info/rfc7799>.

[RFC8321] Fioccola, G., Ed., Capello, A., Cociglio, M., Castaldelli, L., Chen, M., Zheng, L., Mirsky, G., and T. Mizrahi, "Alternate-Marking Method for Passive and Hybrid Performance Monitoring", RFC 8321, DOI 10.17487/RFC8321, January 2018, <https://www.rfc-editor.org/info/rfc8321>.

7.2. Informative References

[I-D.brockners-inband-oam-transport] Brockners, F., Bhandari, S., Govindan, V., Pignataro, C., Gredler, H., Leddy, J., Youell, S., Mizrahi, T., Mozes, D., Lapukhov, P., and R. Chang, "Encapsulations for In-situ OAM Data", draft-brockners-inband-oam-transport-05 (work in progress), July 2017.

[I-D.ietf-ippm-ioam-data]
Brockners, F., Bhandari, S., Pignataro, C., Gredler, H., Leddy, J., Youell, S., Mizrahi, T., Mozes, D., Lapukhov, P., Chang, R., daniel.bernier@bell.ca, d., and J. Lemon, "Data Fields for In-situ OAM", draft-ietf-ippm-ioam-data-04 (work in progress), October 2018.

[I-D.song-ippm-postcard-based-telemetry]
Song, H., Zhou, T., and Z. Li, "Export User Flow Telemetry Data by Postcard Packets", draft-song-ippm-postcard-based-telemetry-00 (work in progress), October 2018.

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