                    Enhanced Alternate Marking Method
                 draft-zhou-ippm-enhanced-alternate-marking-06

Abstract

   This document extends the IPv6 alternate marking option to provide
   the enhanced capabilities.

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].

Table of Contents

1. Introduction

The Alternate Marking [RFC8321] and Multipoint Alternate Marking
[I-D.ietf-ippm-multipoint-alt-mark] define the Alternate Marking
technique that is an hybrid performance measurement method, per
[RFC7799] classification of measurement methods. This method is
based on marking consecutive batches of packets and it can be used to
measure packet loss, latency, and jitter on live traffic.

AltMark Option [I-D.ietf-6man-ipv6-alt-mark] applies the Alternate
Marking Method for IPv6 protocol, and defines Extension Header Option
to encode Alternate Marking Method for both Hop-by-Hop Options Header
and Destination Options Header.

While the AltMark Option implement the basic alternate marking
method, this document defines the extended data fields for the
AltMark Option and provides the enhanced capabilities.

It is worth mentioning that the enhanced capabilities are intended
for further use and are optional.

2. Data Fields Format

The following figure shows the data fields format for enhanced
alternate marking. This data is expected to be encapsulated to
specific transports.

```
   0                   1                   2                   3
   0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
  +----------------------------------------+-+-+-+----------------+
  |             FlowMonID                  |L|D|R|R|  NextHeader   |
  +----------------------------------------+-+-+-+----------------+
  |            FlowMonID Ext               |R|R|F|R| Len   |   R   |
  +----------------------------------------+-+-+-+----------------+
  |            MetaInfo           |               R               |
  +----------------------------------------------------------------+
```
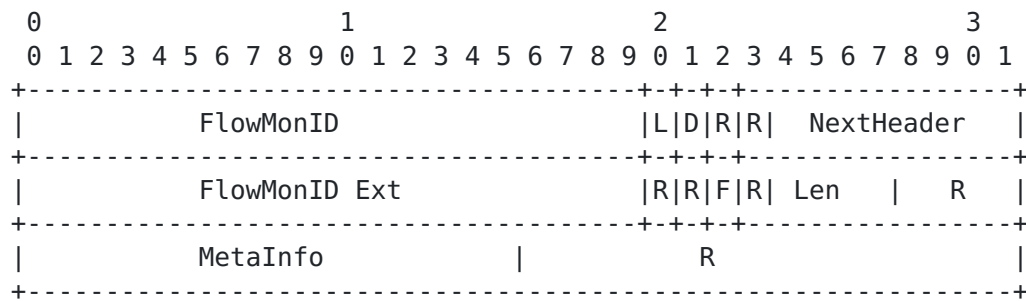
   where:

   o FlowMonID - Flow Monitoring Identification is the same as defined
      in AltMark Option [I-D.ietf-6man-ipv6-alt-mark].

   o L and D - Loss Flag and Delay Flag are the same as defined in
      AltMark Option [I-D.ietf-6man-ipv6-alt-mark].

   o NextHeader - Identify whether to carry the extended data fields.

   o FlowMonID Ext - 20 bits unsigned integer. This used to extend the
      FlowMonID to reduce the conflict when random allocation is applied

   o R - Reserved for further use. This bit MUST be set to zero.

   o F - Flow direction identification. F = 1, indicate the flow
      direction is forward.

   o Len - Length. It indicates the length of extension headers.

   o MetaInfo - A 16 bits Bitmap to indicate more meta data attached
      for the enhanced function.

3. Enhanced Alternate Marking capabilities

   The extended data fields presented in the previous section can be
   used for several uses. Some possible applications can be:

   1. shortest marking periods of single marking method for thicker
       packet loss measurements.

   2. more dense delay measurements than double marking method (down to
       each packet).

   3. increase the entropy of flow monitoring identifier by extending
       the size of FlowMonID.

   4. and so on.

4. Security Considerations

   TBD

5. IANA Considerations

   This document has no request to IANA.

6. References

6.1. Normative References

   [I-D.ietf-ippm-multipoint-alt-mark]
              Fioccola, G., Cociglio, M., Sapio, A., and R. Sisto,
              "Multipoint Alternate Marking method for passive and
              hybrid performance monitoring", draft-ietf-ippm-
              multipoint-alt-mark-09 (work in progress), March 2020.

   [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>.

6.2. Informative References

   [I-D.ietf-6man-ipv6-alt-mark]
              Fioccola, G., Zhou, T., Cociglio, M., Qin, F., and R.
              Pang, "IPv6 Application of the Alternate Marking Method",
              draft-ietf-6man-ipv6-alt-mark-02 (work in progress),
              October 2020.

Authors' Addresses

   Tianran Zhou
   Huawei
   156 Beiqing Rd.
   Beijing 100095
   China

   Email: zhoutianran@huawei.com

   Giuseppe Fioccola
   Huawei
   Riesstrasse, 25
   Munich 80992
   Germany

   Email: giuseppe.fioccola@huawei.com

   Shinyoung Lee
   LG U+
   71, Magokjungang 8-ro, Gangseo-gu
   Seoul
   Republic of Korea

   Email: leesy@lguplus.co.kr

   Mauro Cociglio
   Telecom Italia
   Via Reiss Romoli, 274
   Torino 10148
   Italy

   Email: mauro.cociglio@telecomitalia.it

   Weidong Li
   Huawei
   156 Beiqing Rd.
   Beijing 100095
   China

   Email: poly.li@huawei.com