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Authors: H. Song G. Fioccola
Futurewei Technologies Huawei Technologies
Flag-based MPLS On Path Telemetry Network Actions
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Abstract

This document describes the scheme to support two on-path telemetry techniques, PBT-M and Alternate Marking, as flag-based MPLS network actions for MPLS network OAM.

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1. Introduction

On-path telemetry, as described in [I-D.song-opsawg-ifit-framework], is a kind of hybrid type I network OAM [RFC7799] which directly measure and monitor the user packets. Some on-path telemetry technique incur very little overhead but offer big benefits on network performance monitoring and troubleshooting. PBT-M [I-D.song-ippm-postcard-based-telemetry] is such an on-path telemetry technique which uses only a single flag bit to trigger the collection of the telemetry data regarding the packet. Alternate Marking [I-D.ietf-ippm-rfc8321bis] is another on-path performance measurement method which uses only two bits to measure packet loss, delay, and jitter on live traffic.

In MPLS networks, MPLS Network Action (MNA) [<u>I-D.ietf-mpls-mna-fwk</u>] extends the MPLS label stack by supporting extra network actions encoded both in stack and post stack. The MNA header encoding is described in [<u>I-D.jags-mpls-mna-hdr</u>].

This document describe the scheme to use flag-based MNAs to support PBT-M and Alternate Marking.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [<u>RFC2119</u>][<u>RFC8174</u>] when, and only when, they appear in all capitals, as shown here.

2. PBT-M Action

A flag bit (TBA1) in the flag-based action field is used as the PBT-M indicator. If the bit is set to '1', a configured node is triggered to collect and export the telemetry data as configured by the control plane. The detailed method on node configuration, data export and correlation are recommended in [I-D.song-ippm-postcard-based-telemetry].

3. Alternate Marking Action

Two flag bits (TBA2) in the flag-based action field are used to support the alternate marking method as described in [<u>I-D.ietf-ippm-rfc8321bis</u>].

4. Action Encoding

The proposed action encoding is shown in <u>Figure 1</u> adapted from [<u>I-D.jags-mpls-mna-hdr</u>]. In the figure, 'P' stands for PBT-M flag and 'AM' stands for alternate marking flags.

0123456	7012	34567	012345	670123	4 5 6 7
+ - + - + - + - + - + - + - +	-+-+-+-	+ - + - + - + - +	-+-+-+-+-+-+	- + - + - + - + - + - +	-+-+-+
NASI=bSP	L		TC	S TTL	
+ - + - + - + - + - + - + - +	-+-+-+-	+ - + - + - + - +	-+-+-+-+-+-+	- + - + - + - + - + - +	-+-+-+
NAI-Opcode=2	P AM		I	S	
+-	-+-+-+-	+ - + - + - + - +	-+	- + - + - + - + - + - +	-+-+-+
	(TBA)				

Figure 1: Action Encoding

Note that the in-stack MNA encoding may take different form, and these flag-based on-path telemetry use cases would adapt to it.

5. Security Considerations

Only the ingress edge node is allowed to set/reset these flag bits. The other on-path nodes can only react to the bit values. The tampering of these flag-based actions would result in DoS attack or unreliable measurements. Therefore, security measures must be taken to ensure the proper functioning of these actions.

6. IANA Considerations

This document requires IANA allocation a bit for PBT-M action (TBA1) and two bits for Alternate Marking (TBA2) from the MPLS "In-Stack MPLS Network Action Indicator Flags" registry.

7. Acknowledgments

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Authors' Addresses

Haoyu Song Futurewei Technologies United States of America

Email: haoyu.song@futurewei.com

Giuseppe Fioccola Huawei Technologies Germany

Email: giuseppe.fioccola@huawei.com