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## **MNA for Performance Measurement with Alternate Marking Method**

### **Abstract**

MPLS Network Action (MNA) is used to indicate action for Label Switched Paths (LSPs) and/or MPLS packets and to transfer data needed for the action.

This document defines MNA encoding for MPLS performance measurement with alternate marking method, which performs flow-based packet loss, delay, and jitter measurements on MPLS live traffic.

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## 1. Introduction

MPLS Network Action (MNA) is used to indicate action for Label Switched Paths (LSPs) and/or MPLS packets and to transfer data needed for the action. [[I-D.ietf-mpls-mna-hdr](#)] defines the MNA sub-stack solution for carrying Network Actions and Ancillary Data in the label stack.

As specified in [[I-D.ietf-mpls-inband-pm-encapsulation](#)], Flow-ID Label, L bit and D bit are used for MPLS flow identification and flow-based performance measurement with alternate marking method [[RFC9341](#)], which can be an applicable MNA usecase [[I-D.ietf-mpls-mna-usecases](#)].

This document defines MNA encoding for MPLS performance measurement with alternate marking method, which performs flow-based packet loss, delay, and jitter measurements on MPLS live traffic. The proposed MNA encoding is compliant with the MNA sub-stack solution specified in [[I-D.ietf-mpls-mna-hdr](#)] and reuses the data fields specified in [[I-D.ietf-mpls-inband-pm-encapsulation](#)].

### 1.1. Terminology

This document makes use of the terms defined in [[I-D.ietf-mpls-inband-pm-encapsulation](#)] and [[I-D.ietf-mpls-mna-hdr](#)].

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 [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

## 2. MPLS Network Action for Flow-based PM

The MNA format for performance measurement with alternate marking method is illustrated as below:

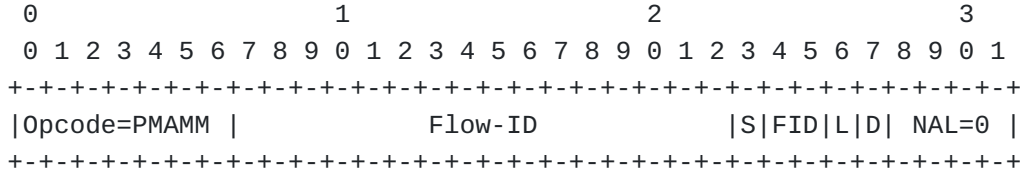


Figure 1: MNA for Alternate Marking

The description of MNA for Alternate Marking is as follows:

\*Name: Performance Measurement with Alternate Marking Method (PMAMM) Action.

\*Network Action Indication: The PMAMM Action indication is Opcode TBA1.

\*Scope: The PMAMM Action is valid in all scopes.

\*In-Stack Data: The PMAMM Action carries 20 bits of ancillary data. The most significant 18 bits of ancillary data is the Flow-ID Value, immediately followed by L bit and D bit. The three fields Flow-ID Value, L bit and D bit have semantics consistent with the Flow-ID Label, L bit and D bit defined in [\[I-D.ietf-mpls-inband-pm-encapsulation\]](#), except that the Flow-ID Value is an 18-bit value while the Flow-ID Label is a 20-bit value. While the Flow-ID Label has some restrictions to avoid collisions with the reserved label space (0-15) [\[RFC3032\]](#), those restrictions are not necessary for the Flow-ID Value and do not apply. The forwarding node in the scope of PMAMM Action SHOULD execute the flow-based performance measurement by using the Flow-ID Value, L bit and D bit.

\*LSE Format: Format C as defined in [\[I-D.ietf-mpls-mna-hdr\]](#). There is no additional data. The Network Action Length (NAL) field MUST be set to zero.

\*Post-Stack Data: None.

## 3. Security Considerations

Security issues discussed in [\[RFC9341\]](#), [\[I-D.ietf-mpls-inband-pm-encapsulation\]](#) and [\[I-D.ietf-mpls-mna-hdr\]](#) apply to this document.

#### 4. IANA Considerations

This document requests that IANA allocates a codepoint (TBA1) from the MPLS "HBH and Select In-Stack MPLS Network Action Indicator Opcodes" from the "IETF Review" range and the same codepoint from the MPLS "I2E In-Stack MPLS Network Action Indicator Opcodes" from the "IETF Review" range for the Performance Measurement with Alternate Marking Method Action. Note that both the "HBH and Select In-Stack MPLS Network Action Indicator Opcodes" and the "I2E In-Stack MPLS Network Action Indicator Opcodes" will be created based on the request from [I-D.ietf-mpls-mna-hdr]. Specifically, this document requests the following allocation from IANA.

MNA Opcode	Description	Scope
TBA1	PM with Alternate Marking Method	HBH, Select, or I2E

#### 5. Acknowledgements

The authors would like to acknowledge Loa Andersson for his careful review and helpful comments.

#### 6. References

##### 6.1. Normative References

- [I-D.ietf-mpls-inband-pm-encapsulation] Cheng, W., Min, X., Zhou, T., Dai, J., and Y. Peleg, "Encapsulation For MPLS Performance Measurement with Alternate Marking Method", Work in Progress, Internet-Draft, draft-ietf-mpls-inband-pm-encapsulation-06, 14 June 2023, <<https://datatracker.ietf.org/doc/html/draft-ietf-mpls-inband-pm-encapsulation-06>>.
- [I-D.ietf-mpls-mna-hdr] Rajamanickam, J., Gandhi, R., Zigler, R., Song, H., and K. Kompella, "MPLS Network Action (MNA) Sub-Stack Solution", Work in Progress, Internet-Draft, draft-ietf-mpls-mna-hdr-03, 6 September 2023, <<https://datatracker.ietf.org/doc/html/draft-ietf-mpls-mna-hdr-03>>.
- [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>>.
- [RFC3032] Rosen, E., Tappan, D., Fedorkow, G., Rekhter, Y., Farinacci, D., Li, T., and A. Conta, "MPLS Label Stack Encoding", RFC 3032, DOI 10.17487/RFC3032, January 2001, <<https://www.rfc-editor.org/info/rfc3032>>.

**[RFC8174]**

Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.

**[RFC9341]**

Fioccola, G., Ed., Cociglio, M., Mirsky, G., Mizrahi, T., and T. Zhou, "Alternate-Marking Method", RFC 9341, DOI 10.17487/RFC9341, December 2022, <<https://www.rfc-editor.org/info/rfc9341>>.

## 6.2. Informative References

**[I-D.ietf-mpls-mna-usecases]** Saad, T., Makhijani, K., Song, H., and G. Mirsky, "Use Cases for MPLS Network Action Indicators and MPLS Ancillary Data", Work in Progress, Internet-Draft, draft-ietf-mpls-mna-usecases-03, 15 September 2023, <<https://datatracker.ietf.org/doc/html/draft-ietf-mpls-mna-usecases-03>>.

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