MPLS	D. Frost, Ed.
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A Packet Loss and Delay Measurement Profile for MPLS-based Transport Networks
draft-ietf-mpls-tp-loss-delay-profile-04

Abstract

Procedures and protocol mechanisms to enable efficient and accurate measurement of packet loss, delay, and throughput in MPLS networks are defined in RFC XXXX.
The MPLS Transport Profile (MPLS-TP) is the set of MPLS protocol functions applicable to the construction and operation of packet-switched transport networks.
This document describes a profile of the general MPLS loss, delay, and throughput measurement techniques that suffices to meet the specific requirements of MPLS-TP.
This document is a product of a joint Internet Engineering Task Force (IETF) / International Telecommunication Union Telecommunication Standardization Sector (ITU-T) effort to include an MPLS Transport Profile within the IETF MPLS and Pseudowire Emulation Edge-to-Edge (PWE3) architectures to support the capabilities and functionalities of a packet transport network as defined by the ITU-T.
This Informational Internet-Draft is aimed at achieving IETF Consensus before publication as an RFC and will be subject to an IETF Last Call.
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[RFC Editor, please replace XXXX with the RFC number assigned to draft-ietf-mpls-loss-delay.]

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1. Introduction

Procedures for the measurement of packet loss, delay, and throughput in MPLS networks are defined in [I-D.ietf-mpls-loss-delay]. This document describes a profile, i.e. a simplified subset, of these procedures that suffices to meet the specific requirements of MPLS-based transport networks [RFC5921] as defined in [RFC5860]. This profile is presented for the convenience of implementors who are concerned exclusively with the transport network context.
The use of the profile specified in this document is purely optional. Implementors wishing to provide enhanced functionality that is within the scope of [I-D.ietf-mpls-loss-delay] but outside the scope of this profile may do so, whether or not the implementation is restricted to the transport network context.
The assumption of this profile is that the devices involved in a measurement operation are configured for measurement by a means external to the measurement protocols themselves, for example via a Network Management System (NMS) or separate configuration protocol. The manageability considerations in [I-D.ietf-mpls-loss-delay] apply, and further information on MPLS-TP network management can be found in [RFC5950].
This document is a product of a joint Internet Engineering Task Force (IETF) / International Telecommunication Union Telecommunication Standardization Sector (ITU-T) effort to include an MPLS Transport Profile within the IETF MPLS and Pseudowire Emulation Edge-to-Edge (PWE3) architectures to support the capabilities and functionalities of a packet transport network as defined by the ITU-T.

2. MPLS-TP Measurement Considerations

The measurement considerations discussed in Section 2.9 of [I-D.ietf-mpls-loss-delay] apply also in the context of MPLS-TP, except for the following, which pertain to topologies excluded from MPLS-TP:

- Equal Cost Multipath considerations (Section 2.9.4 of [I-D.ietf-mpls-loss-delay])

*Considerations for direct Loss Measurement (LM) in the presence of Label Switched Paths constructed via the Label Distribution Protocol (LDP) or utilizing Penultimate Hop Popping (Section 2.9.8 of [I-D.ietf-mpls-loss-delay])

3. Packet Loss Measurement (LM) Profile

When an LM session is externally configured, the values of several protocol parameters can be fixed in advance at the endpoints involved in the session, so that negotiation of these parameters is not required. These parameters, and their default values as specified by this profile, are as follows:

Parameter	Default Value
Query control code	In-band response requested
Byte/packet Count (B) Flag	Packet count
Traffic-Class-specific (T) Flag	Traffic-class-scoped
Origin Timestamp Format (OTF)	Truncated IEEE 1588v2

A simple implementation may assume that external configuration will ensure that both ends of the communication are using the default values for these parameters. Implementations are, however, strongly advised to validate the values of these parameters in received messages so that configuration inconsistencies can be detected and reported.
LM message rates (and test message rates, when inferred LM is used) should be configurable by the network operator on a per-channel basis. The following intervals should be supported:

Message Type	Supported Intervals
LM Message	100 milliseconds, 1 second, 10 seconds, 1 minute, 10 minutes
Test Message	10 milliseconds, 100 milliseconds, 1 second, 10 seconds, 1 minute

4. Packet Delay Measurement (DM) Profile

When a DM session is externally configured, the values of several protocol parameters can be fixed in advance at the endpoints involved in the session, so that negotiation of these parameters is not required. These parameters, and their default values as specified by this profile, are as follows:

Parameter	Default Value
Query control code	In-band response requested

Parameter	Default Value
Querier Timestamp Format (QTF)	Truncated IEEE 1588v2
Responder Timestamp Format (RTF)	Truncated IEEE 1588v2
Responder's Preferred Timestamp Format (RPTF)	Truncated IEEE 1588v2

This profile uses the MPLS Delay Measurement (DM) Channel Type in the Associated Channel Header (ACH).
A simple implementation may assume that external configuration will ensure that both ends of the communication are using the default values for these parameters. Implementations are, however, strongly advised to validate the values of these parameters in received messages so that configuration inconsistencies can be detected and reported.
DM message rates should be configurable by the network operator on a per-channel basis. The following message intervals should be supported: 1 second, 10 seconds, 1 minute, 10 minutes.

5. Security Considerations

This document delineates a subset of the procedures specified in [I-D.ietf-mpls-loss-delay], and as such introduces no new security considerations in itself. The security considerations discussed in [I-D.ietf-mpls-loss-delay] apply also to the profile presented in this document. General considerations for MPLS-TP network security can be found in [I-D.ietf-mpls-tp-security-framework].

6. IANA Considerations

This document introduces no new IANA considerations.

7. References

7.1. Normative References

[RFC5586]	Bocci, M., Vigoureux, M. and S. Bryant, "MPLS Generic Associated Channel", RFC 5586, June 2009.
[RFC5860]	Vigoureux, M., Ward, D. and M. Betts, "Requirements for Operations, Administration, and Maintenance (OAM) in MPLS Transport Networks", RFC 5860, May 2010.
[I-D.ietf-mpls-loss-delay]	Frost, D and S Bryant, "Packet Loss and Delay Measurement for MPLS Networks", Internet-Draft draft-ietf-mpls-loss-delay-04, July 2011.

7.2. Informative References

[RFC5921]	Bocci, M., Bryant, S., Frost, D., Levrau, L. and L. Berger, "A Framework for MPLS in Transport Networks", RFC 5921, July 2010.

[RFC5950]	Mansfield, S., Gray, E. and K. Lam, "Network Management Framework for MPLS-based Transport Networks", RFC 5950, September 2010.
[I-D.ietf-mpls-tp-security-framework]	Fang, L, Niven-Jenkins, B, Mansfield, S and R Graveman, "MPLS-TP Security Framework", Internet-Draft draft-ietf-mpls-tp-security-framework-02, October 2011.

Authors' Addresses

Dan Frost editor Frost Cisco Systems EMail: danfrost@cisco.com

Stewart Bryant editor Bryant Cisco Systems EMail: stbryant@cisco.com

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