Network Working Group
Internet Draft
Intended status: Standards Track
Expires: April 24, 2023

C. Lin
M. Chen
H. Li
New H3C Technologies

October 24, 2022

BGP-LS Advertisement of TE Policy Performance Metric
draft-lin-idr-bgpls-te-policy-pm-00

Abstract

This document describes a way to advertise the performance metrics for Traffic Engineering (TE) Policy using BGP Link State (BGP-LS).

Status of this Memo

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

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at http://www.ietf.org/ietf/1id-abstracts.txt

The list of Internet-Draft Shadow Directories can be accessed at http://www.ietf.org/shadow.html

This Internet-Draft will expire on April 24, 2023.

Table of Contents

1. Introduction

BGP Link State (BGP-LS) can be used to distribute link-state and traffic engineering (TE) information to external components [RFC7752]. [I-D.draft-ietf-idr-te-lsp-distribution] describes the mechanism for BGP-LS to distribute the information of TE policies, such as MPLS TE LSPs, SR Policies, etc.

In some network scenarios, the controller needs to obtain the performance information of TE Policies, which can be used in service placement to meet better customer requirements and utilize network resources more efficiently.

This document describes a way to advertise the performance metrics for Traffic Engineering (TE) Policy using BGP Link State (BGP-LS).

1.1. Requirements Language

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. Advertisement of TE Policy Performance Metric

[RFC8571] defines several Link Attribute TLVs for BGP-LS to carry the IGP Traffic Engineering Performance Metric Extensions:

TLV Code Point	Value
1114	Unidirectional Link Delay
1115	Min/Max Unidirectional Link Delay
1116	Unidirectional Delay Variation
1117	Unidirectional Link Loss
1118	Unidirectional Residual Bandwidth
1119	Unidirectional Available Bandwidth
1120	Unidirectional Utilized Bandwidth

The above TLVs can be re-used to advertise the performance metrics for TE Policies.

When used to describe the performance metric of the TE Policy NLRI, they are carried in the optional non-transitive BGP Path Attribute "BGP-LS Attribute" defined in [RFC7752]. The semantics of the above TLVs comply with [RFC8571], except for that they are extended to describe TE Policies besides IGP links.

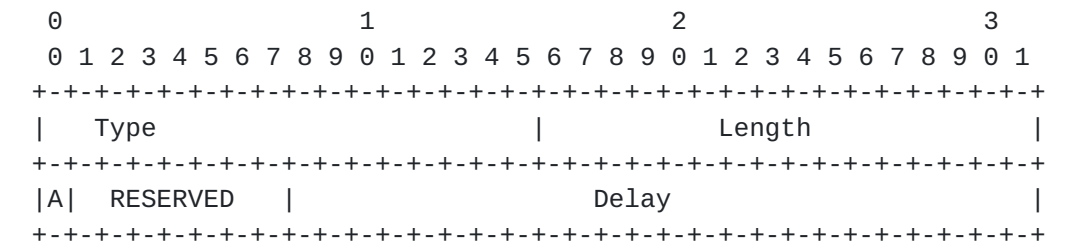
The performance metric of TE Policy may be measured at the headend, for example, by using TWAMP for SR Policy. But the measurement methods are out of the scope of this document.

The existing performance metrics above are all unidirectional. However, there are also requirements to advertise round-trip performance metrics for TE Policies. The BGP-LS extensions for round-trip TE performance metrics are defined in the following section.

3. Extensions for Round-trip TE Performance Metric

3.1. Round-trip Delay TLV

This TLV advertises the average round-trip delay for TE Policy.



where:

o Type: TBD

o Length: 4

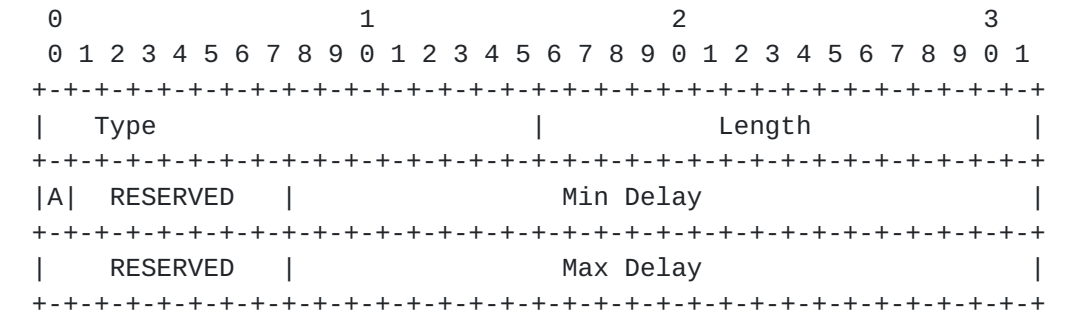
o Reserved: Reserved for future use. MUST be set to 0 when sent and MUST be ignored when received.

o A: Anomalous (A) Bit. Same with the A Bit in Unidirectional Link Delay TLV [RFC8571].

o Delay: Similar with the Delay filed in Unidirectional Link Delay TLV [RFC8571], except for that the delay is round-trip.

3.2. Min/Max Round-trip Delay TLV

This TLV advertises the minimum and maximum round-trip delay for TE Policy.



where:

o Type: TBD

o Length: 4

o Reserved: Reserved for future use. MUST be set to 0 when sent and MUST be ignored when received.

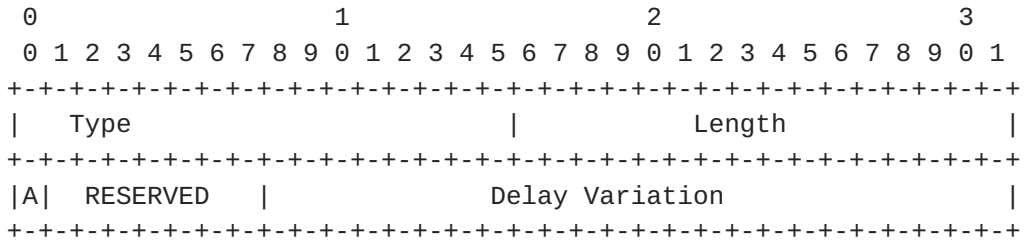
- A: Anomalous (A) Bit. Same with the A Bit in Min/Max Unidirectional Link Delay TLV [RFC8571].

- Min Delay: Similar with the Min Delay filed in Min/Max Unidirectional Link Delay TLV [RFC8571], except for that the delay is round-trip.

- Max Delay: Similar with the Max Delay filed in Min/Max Unidirectional Link Delay TLV [RFC8571], except for that the delay is round-trip.

3.3. Round-trip Delay Variation TLV

This TLV advertises the average round-trip delay variation for TE Policy.



where:

- Type: TBD

- Length: 4

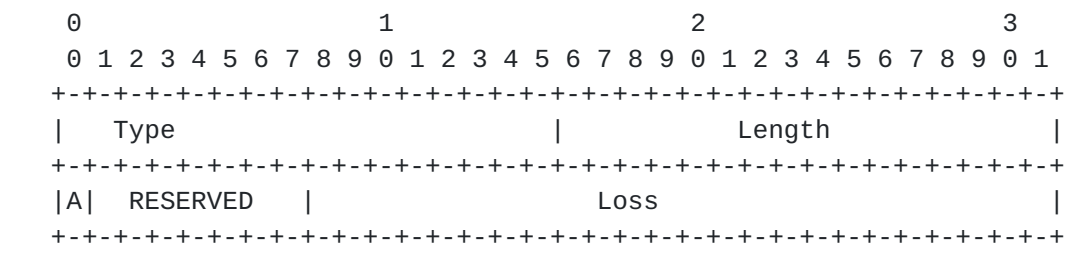
- Reserved: Reserved for future use. MUST be set to 0 when sent and MUST be ignored when received.

- A: Anomalous (A) Bit. Same with the A Bit in Unidirectional Delay Variation TLV [RFC8571].

- Delay Variation: Similar with the Delay Variation filed in Unidirectional Delay Variation TLV [RFC8571], except for that the delay variation is round-trip.

3.4. Round-trip Loss TLV

This TLV advertises the round-trip loss for TE Policy.



where:

o Type: TBD

o Length: 4

o Reserved: Reserved for future use. MUST be set to 0 when sent and MUST be ignored when received.

o A: Anomalous (A) Bit. Same with the A Bit in Unidirectional Link Loss TLV [RFC8571].

o Loss: Similar with the Link Loss filed in Unidirectional Link Loss TLV [RFC8571], except for that the loss is round-trip.

4. Security Considerations

This document does not introduce additional security issues than those described in [RFC7752] and [I-D.draft-ietf-idr-te-lsp-distribution].

5. IANA Considerations

This document defines the following TLVs for BGP-LS.

TLV Code Point	Value
TBD	Round-trip Delay
TBD	Min/Max Round-trip Delay
TBD	Round-trip Variation
TBD	Round-trip Loss

6. References

6.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, May 2017

[RFC7752] Gredler, H., Ed., Medved, J., Previdi, S., Farrel, A., and S. Ray, "North-Bound Distribution of Link-State and Traffic Engineering (TE) Information Using BGP", RFC 7752, DOI 10.17487/RFC7752, March 2016, <https://www.rfc-editor.org/info/rfc7752>.

[RFC8571] Ginsberg, L., Ed., Previdi, S., Wu, Q., Tantsura, J., and C. Filsfils, "BGP - Link State (BGP-LS) Advertisement of IGP Traffic Engineering Performance Metric Extensions", RFC 8571, DOI 10.17487/RFC8571, March 2019, <https://www.rfc-editor.org/info/rfc8571>.

[I-D.draft-ietf-idr-te-lsp-distribution] Previdi, S., Talaulikar, K., Ed., Dong, J., Ed., Chen, M., Gredler, H., and J. Tantsura, "Distribution of Traffic Engineering (TE) Policies and State using BGP-LS", Work in Progress, Internet-Draft, draft-ietf-idr-te-lsp-distribution-18, August 2022, <https://datatracker.ietf.org/doc/html/draft-ietf-idr-te-lsp-distribution-18>.

Authors' Addresses

Changwang Lin
New H3C Technologies

Email: linchangwang.04414@h3c.com

Mengxiao Chen
New H3C Technologies

Email: chen.mengxiao@h3c.com

Hao Li
New H3C Technologies

Email: lihao@h3c.com