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BGP Extension for SR-MPLS Entropy Label Position
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Abstract

This document proposed an extension for BGP to configure the entropy label position for SR-MPLS networks.

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1. Introduction

Entropy Label(EL)[RFC6790] is a technology that can be used for load-balancing in Segment Routing (SR) MPLS. [I-D.ietf-mpls-spring-entropy-label] discusses in detail the factors to be considered when inserting EL in SR, analyzes the possible insertion positions of entropy labels, and gives a specific algorithm for calculating the position of entropy labels.

An MPLS label stack can contain multiple ELs, so multiple EL insertion positions may be calculated. When calculating the position, it is necessary to consider the Maximum SID Depth(MSD) capability of the head node and Entropy Readable Label Depth(ERLD) capability of the intermediate node in combination with the algorithm. The position calculation of EL is usually completed by the controller, which is issued by the controller to the head node.

[I-D.ietf-idr-segment-routing-te-policy] defines the specific process of how the controller in the SR network passes the path calculation result of the SR-TE policy to the head node of the network through BGP.

In this document, the EL position information is transmitted by extending the flags of Segment List Sub-TLV in the BGP.

2. BGP Extensions of Segment Flags

The Segment Flags is defined in Section 2.4.3.2.12 of [I-D.ietf-idr-segment-routing-te-policy].

E-Flag: This flag indicates that presence of <ELI, EL> label pairs are inserted after this segment. It is applicable to all Segment Types.

3. Operations

Supposed the head end had received a SR-TE path from the controller with multiple Segment List Sub-TLVs, for example, <S1, S2, S3, S4, S5, S6>, especially S3 and S6 with E-flag. It indicates that two <ELI, EL> pairs SHOULD be inserted into the label stack of the SR-TE forwarding entry, respectively after the Label for S3 and Label for S6. With EL information, the label stack for SR-MPLS would be <label1, label2, label3, ELI, EL, label4, label5, label6, ELI, EL>.

4. IANA Considerations

This document requests bit 2 for Entropy Label Flag.

Bit	Description	Reference
2	Entropy Label Flag(E-Flag)	This document

5. Normative References

[I-D.ietf-idr-segment-routing-te-policy]
Previdi, S., Filsfils, C., Talaulikar, K., Mattes, P., Rosen, E., Jain, D., and S. Lin, "Advertising Segment Routing Policies in BGP", draft-ietf-idr-segment-routing-te-policy-08 (work in progress), November 2019.

[I-D.ietf-mpls-spring-entropy-label]
Kini, S., Kompella, K., Sivabalan, S., Litkowski, S., Shakir, R., and J. Tantsura, "Entropy label for SPRING tunnels", draft-ietf-mpls-spring-entropy-label-12 (work in progress), July 2018.

[RFC6790] Kompella, K., Drake, J., Amante, S., Henderickx, W., and L. Yong, "The Use of Entropy Labels in MPLS Forwarding", RFC 6790, DOI 10.17487/RFC6790, November 2012, <https://www.rfc-editor.org/info/rfc6790>.

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