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Signaling Entropy Label Capability Using IS-IS
draft-ietf-isis-mpls-elc-02

Abstract

Multi Protocol Label Switching (MPLS) has defined a mechanism to load balance traffic flows using Entropy Labels (EL). An ingress LSR cannot insert ELs for packets going into a given tunnel unless an egress LSR has indicated via signaling that it can process ELs on that tunnel. This draft defines a mechanism to signal that capability using IS-IS. This mechanism is useful when the label advertisement is also done via IS-IS.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

Status of This Memo

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

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This Internet-Draft will expire on April 17, 2017.

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1. Introduction

Multi Protocol Label Switching (MPLS) has defined a method in [RFC6790] to load balance traffic flows using Entropy Labels (EL). An ingress LSR cannot insert ELs for packets going into a given tunnel unless an egress LSR has indicated that it can process ELs on that tunnel. [RFC6790] defines the signaling of this capability (a.k.a., Entropy Label Capability - ELC) via signaling protocols. Recently, mechanisms are being defined to signal labels via link state Interior Gateway Protocols (IGP) such as IS-IS [I-D.ietf-isis-segment-routing-extensions] . In such scenario the signaling mechanisms defined in [RFC6790] are inadequate. This draft defines a mechanism to signal the ELC using IS-IS. This mechanism is useful when the label advertisement is also done via IS-IS. In addition, in the cases where stacked LSPs are used for whatever reasons (e.g., SPRING-MPLS [I-D.ietf-spring-segment-routing-mpls]), it would be useful for ingress LSRs to know each LSR's capability of reading the maximum label stack deepth. This capability, referred to

as Readable Label Deepth Capability (RLDC) can be used by ingress LSRs to determine whether it's necessary to insert an EL for a given LSP tunnel in the case where there has already been at least one EL in the label stack [I-D.ietf-mpls-spring-entropy-label] . Of course, even it has been determined that it's neccessary to insert an EL for a given LSP tunnel, if the egress LSR of that LSP tunnel has not yet indicated that it can process ELs for that tunnel, the ingress LSR MUST NOT include an entropy label for that tunnel as well.

2. Terminology

This memo makes use of the terms defined in [RFC6790] and [RFC4971].

3. Advertising ELC Using IS-IS

The IS-IS Router CAPABILITY TLV as defined in [RFC4971] is used by IS-IS routers to announce their capabilities. A new sub-TLV of this TLV, called ELC sub-TLV is defined to advertise the capability of the router to process the ELs. It is formatted as described in [RFC5305] with a Type code to be assigned by IANA and a Length of zero. The scope of the advertisement depends on the application but it is RECOMMENDED that it SHOULD be domain-wide. If a router has multiple linecards, the router MUST NOT advertise the ELC unless all of the linecards are capable of processing ELs.

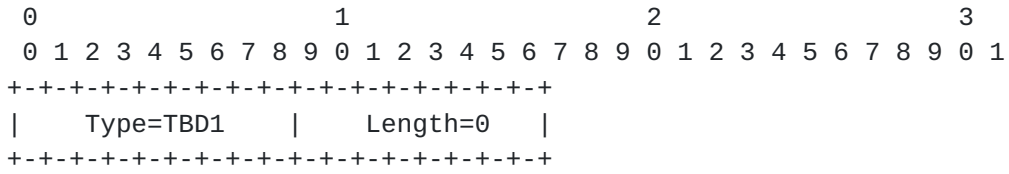

Figure 1: ELC sub-TLV Format

4. Advertising RLDC Using IS-IS

A new sub-TLV of the IS-IS Router CAPABILITY TLV, called RLDC sub-TLV is defined to advertise the capability of the router to read the maximum label stack depth. As shown in Figure 2, it is formatted as described in [RFC5305] with a Type code to be assigned by IANA and a Length of one. The Value field is set to the maximum readable label stack deepth in the range between 1 to 255. The scope of the advertisement depends on the application but it is RECOMMENDED that it SHOULD be domain-wide. If a router has multiple linecards with different capabilities of reading the maximum label stack deepth, the router MUST advertise the smallest one in the RLDC sub-TLV.

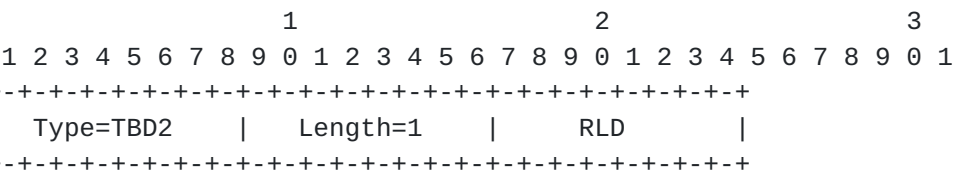

Figure 2: RLDC sub-TLV Format

5. Usage and Applicability

The ELC is used by ingress LSRs to determine whether an EL could be inserted into a given LSP tunnel. The RLDC is used by ingress LSRs to determine whether it's necessary to insert an EL for a given LSP tunnel in the case where there has already been at least one EL in the label stack. This document only describes how to signal the ELC and RLDC using IS-IS. As for how to apply those capabilities when inserting EL(s) into LSP tunnel(s), it's outside the scope of this document and accordingly would be described in [I-D.ietf-mpls-spring-entropy-label].

6. Acknowledgements

The authors would like to thank Yimin Shen, George Swallow, Acee Lindem and Carlos Pignataro for their valuable comments.

7. IANA Considerations

This memo includes a request to IANA to allocate two sub-TLV types within the IS-IS Router Capability TLV.

8. Security Considerations

The security considerations as described in [RFC4971] is appliable to this document. This document does not introduce any new security risk.

9. References

9.1. Normative References

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9.2. Informative References

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