Abstract

RFC8287 defines the extensions to MPLS LSP Ping and Traceroute for Segment Routing IGP-Prefix and IGP-Adjacency Segment Identifier (SIDs) with an MPLS data plane. RFC8287 proposes 3 Target FEC Stack Sub-TLVs. While the standard defines the format and procedure to handle those Sub-TLVs, it does not sufficiently clarify how the length of the Segment ID Sub-TLVs should be computed to include in the Length field of the Sub-TLVs which may result in interoperability issues.

This document updates RFC8287 by clarifying the length of each Segment ID Sub-TLVs defined in RFC8287.

Status of This Memo

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1. Introduction

[RFC8287] defines the extensions to MPLS LSP Ping and Traceroute for Segment Routing IGP-Prefix and IGP-Adjacency Segment Identifier (SIDs) with an MPLS data plane. [RFC8287] proposes 3 Target FEC Stack Sub-TLVs. While the standard defines the format and procedure to handle those Sub-TLVs, it does not sufficiently clarify how the length of the Segment ID Sub-TLVs should be computed to include in the Length field of the Sub-TLVs which may result in interoperability issues.

This document updates [RFC8287] by clarifying the length of each Segment ID Sub-TLVs defined in [RFC8287].
3. Requirements notation

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 [RFC2119].

4. Length field clarification for Segment ID Sub-TLVs

Section 5 of [RFC8287] defines 3 different Segment ID Sub-TLVs that will be included in Target FEC Stack TLV defined in [RFC8029]. The length of each Sub-TLVs MUST be calculated as defined in this section.

4.1. IPv4 IGP-Prefix Segment ID Sub-TLV

The Sub-TLV length for IPv4 IGP-Prefix Segment ID MUST be set to 8 as shown in the below TLV format:

```
0                   1                   2                   3
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|Type = 34 (IPv4 IGP-Prefix SID)|          Length = 8           |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                          IPv4 prefix                          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|Prefix Length  |    Protocol   |              Reserved         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

4.2. IPv6 IGP-Prefix Segment ID Sub-TLV

The Sub-TLV length for IPv6 IGP-Prefix Segment ID MUST be set to 20 as shown in the below TLV format:

```
0                   1                   2                   3
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|Type = 34 (IPv6 IGP-Prefix SID)|          Length = 20          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                          IPv6 prefix                          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|Prefix Length  |    Protocol   |              Reserved         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
4.3. IGP-Adjacency Segment ID Sub-TLV

The Sub-TLV length for IGP-Adjacency Segment ID varies depending on the Adjacency Type and Protocol. In any of the allowed combination of Adjacency Type and Protocol, the sub-TLV length MUST be calculated by including 2 octets of Reserved field. Below is a table that list the length for different combinations.

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Length for Adj.Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Parallel</td>
<td></td>
</tr>
<tr>
<td>OSPF</td>
<td>20</td>
</tr>
<tr>
<td>ISIS</td>
<td>24</td>
</tr>
<tr>
<td>Any</td>
<td>20</td>
</tr>
</tbody>
</table>

For example, when the Adj. Type is set to Parallel Adjacency and the Protocol is set to 0, the Sub-TLV will be as below:
5. IANA Considerations

This document does not introduce any IANA consideration.

6. Security Considerations

This document updates [RFC8287] and does not introduce any security considerations.

7. Contributors

The below individuals contributed to this document:

Zafar Ali, Cisco Systems, Inc.

8. Acknowledgement

To be Updated

9. Normative References

[I-D.ietf-spring-segment-routing]


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