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RFC8287 Sub-TLV Length Clarification
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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](#).

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Internet-Draft [RFC8287](#) Sub-TLV Length Clarification

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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](#)].

2. Terminology

This document uses the terminologies defined in [[RFC8402](#)], [[RFC8029](#)], [[RFC8287](#)] and so the readers are expected to be familiar with the same.

3. Requirements notation

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.

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.

The TLVs representation defined in [section 5.1](#), 5.2 and 5.3 of [[RFC8287](#)] are updated to clarify the length calculation as shown in [section 4.1](#), 4.2 and 4.3 respectively. The updated TLV representation contain explicitly defined length.

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
      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|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:

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```

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|Type = 35 (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. Table 1 below list the length for different combinations of Adj.Type and Protocol.

Protocol	Length for Adj.Type			
	Parallel	IPv4	IPv6	Unnumbered
OSPF	20	20	44	20

ISIS	24	24	48	24
Any	20	20	44	20

Table 1. IGP-Adjacency SID Length Comparison

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:

0	1	2	3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1			
Type = 36 (IGP-Adjacency SID)		Length = 20	
Adj. Type = 1 Protocol = 0		Reserved	
Local Interface ID (4 octets)			
Remote Interface ID (4 octets)			
Advertising Node Identifier (4 octets)			
Receiving Node Identifier (4 octets)			

5. IANA Considerations

This document does not introduce any IANA consideration.

6. Security Considerations

This document updates [[RFC8287](#)] and does not introduce any additional security considerations.

[7.](#) Contributors

The below individuals contributed to this document:

Zafar Ali, Cisco Systems, Inc.

[8.](#) Acknowledgement

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[9.](#) Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [RFC8029] Kompella, K., Swallow, G., Pignataro, C., Ed., Kumar, N., Aldrin, S., and M. Chen, "Detecting Multiprotocol Label Switched (MPLS) Data-Plane Failures", [RFC 8029](#), DOI 10.17487/RFC8029, March 2017, <<https://www.rfc-editor.org/info/rfc8029>>.

- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.
- [RFC8287] Kumar, N., Ed., Pignataro, C., Ed., Swallow, G., Akiya, N., Kini, S., and M. Chen, "Label Switched Path (LSP) Ping/Traceroute for Segment Routing (SR) IGP-Prefix and IGP-Adjacency Segment Identifiers (SIDs) with MPLS Data Planes", [RFC 8287](#), DOI 10.17487/RFC8287, December 2017, <<https://www.rfc-editor.org/info/rfc8287>>.
- [RFC8402] Filsfils, C., Ed., Previdi, S., Ed., Ginsberg, L., Decraene, B., Litkowski, S., and R. Shakir, "Segment Routing Architecture", [RFC 8402](#), DOI 10.17487/RFC8402, July 2018, <<https://www.rfc-editor.org/info/rfc8402>>.

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