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Segment Routing IPv6 Prefix-SID
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Abstract

This document defines the Segment Routing IPv6-Prefix-SID sub-TLV. This new sub-TLV allows to specify which of the prefixes advertised by a node are to be used as Segment Routing Identifiers (SID) for the IPv6 data plane.

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 November 18, 2016.

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1. Introduction

With Segment Routing (SR)[I-D.ietf-spring-segment-routing], a node steers a packet through an ordered list of instructions, called segments. Segments are identified through Segment Identifiers (SIDs) that are advertised by routing protocols. The IS-IS extensions for SR information advertisement are defined in [I-D.ietf-isis-segment-routing-extensions].

Segment Routing can be directly applied to the IPv6 data plane through the use of the Segment Routing Header defined in [I-D.ietf-6man-segment-routing-header].

When applied to the IPv6 data plane, the SID is represented by an IPv6 address. This document defines a new IS-IS Prefix sub-TLV where information related to the IPv6 address used as SR IPv6 SID is conveyed.

2. IPv6 Prefix SID

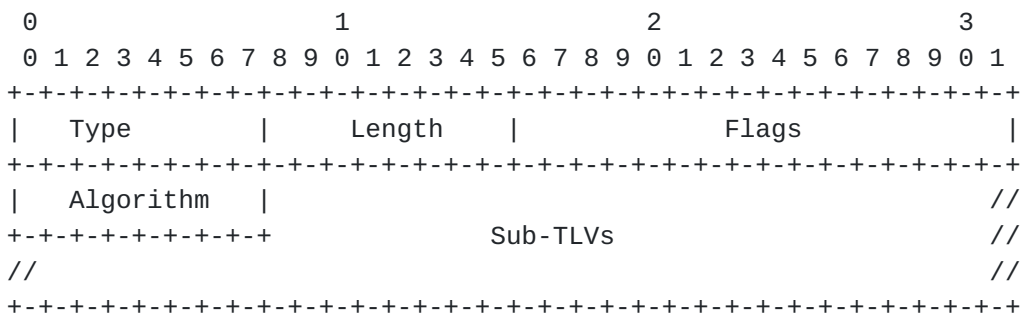
When SR is applied to the IPv6 data plane, Segment Identifiers (SIDs) are IPv6 addresses. In a router, it is desirable to identify which of the local prefixes can be used as SIDs. Also, and in order to provide the same functionalities defined in [I-D.ietf-spring-segment-routing] and according to [I-D.ietf-isis-segment-routing-extensions], a new sub-TLV is defined: the IPv6-Prefix-SID sub-TLV.

The IPv6-Prefix-SID sub-TLV is attached to an IPv6 prefix advertised by a node and MAY be present in any of the following TLVs:

TLV-236 (IPv6) defined in [RFC5308].

TLV-237 (MT-IPv6) defined in [RFC5120].

The IPv6-Prefix-SID sub-TLV is optional, MAY appear only once for a given prefix and has the following format:



where:

Type: To be assigned by IANA (suggested value 5).

Length: 3 + length of sub-TLVs.

Flags: 2 octet field of flags. None of them is defined at this stage.

Algorithm: as defined in [I-D.ietf-isis-segment-routing-extensions].

Sub-TLVs: additional information encoded into the IPv6-Prefix-SID Sub-TLV. Currently, no sub-TLVs are defined yet.

A prefix with an attached IPv6-Prefix-SID sub-TLV is defined as an SR-IPv6 Prefix SID. If the prefix is to be used as a Node-SID (according to [I-D.ietf-isis-segment-routing-extensions]) then the following applies:

- The IPv6 prefix MUST be advertised with the IPv6-Prefix-SID sub-TLV attached.

- The Extended Reachability Attribute Flags sub-TLV defined in [RFC7794] MUST be attached to the prefix and the N-flag MUST be set.

When a router has attached an IPv6-Prefix-SID sub-TLV to a prefix, it implies that the router supports the Segment Routing Header (SRH, defined in [I-D.ietf-6man-segment-routing-header] and its associated procedures for packets destined to the advertised prefix.

A router receiving an IPv6-Prefix-SID from a remote node and with an algorithm value that such remote node has not advertised in the SR-Capability sub-TLV (as defined in [I-D.ietf-isis-segment-routing-extensions]) MUST ignore the IPv6-Prefix-SID sub-TLV.

3. IANA Considerations

This document makes the following registrations in the "sub-TLVs for TLV 135, 235, 236 and 237" registry.

Type: TBD (suggested value 5)

Description: IPv6 Prefix Segment Identifier

TLV 135: no

TLV 235: no

TLV 236: yes

TLV 237: yes

Reference: This document (Section 2)

4. Security Considerations

This document doesn't introduce new security considerations.

5. Acknowledgements

The authors would like to thank Nagendra Kumar for his review of this document.

6. References

6.1. Normative References

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6.2. Informative References

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