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Encoding Network Slice Identification for SRv6
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Abstract

   This document describe a method to encode network slicing identifier
   within SRv6 domain.

Status of This Memo

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1. Introduction

SRv6 Network Programming[RFC8986] enables the creation of overlays
with underlay optimization to be deployed in an SR domain[RFC8402].

As defined in [RFC8754], all inter-domain packets are encapsulated
for the part of the packet journey that is within the SR domain. The
outer IPv6 header [RFC8200] is originated by a node of the SR domain
and is destined to a node of the SR domain.

This document describes a novel method to encode slice identifier
in the outer IPv6 header of an SR domain. Unlike other proposed
methods before, which will bring side effects on existed functions,
by encoding network slicing identifier in the source IPv6 address of
the outer header, this method avoids the drawbacks which previous
proposals incur.

1.1. 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].

2. Slice Identifier

Slice identifier (SLID) is a 16-bit Identifier which uniquely defines
a slicing of the network in the specified SR domain.

3. SLID Assignment

When SR domain enables network slicing, the ingress PE should reserve
16 least significant bits in its locater for slicing use. When a
packet enters the SR domain from an ingress PE, the ingress PE
encapsulates the packet in an outer IPv6 header and optional SRH as
defined in [RFC8754]. The ingress PE MAY also classify the packet
into a slice and set the slice identifier as follows:

o Set the SPI bit (SLID Presence Indicator) in the Traffic Class
   field of the outer IPv6 header.

o Write this SLID in the 16 least significant bits of source address
   of the outer IPv6 header.

```
 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|Version|   SPI Bit    |              Flow Label                |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|         Payload Length        |  Next Header  |   Hop Limit   |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                                                               |
+                                                               +
|                                                               |
+                        Source Address                         +
|                                                               |
+                               +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                               |             SLID              |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                                                               |
+                                                               +
|                                                               |
+                      Destination Address                      +
|                                                               |
+                                                               +
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
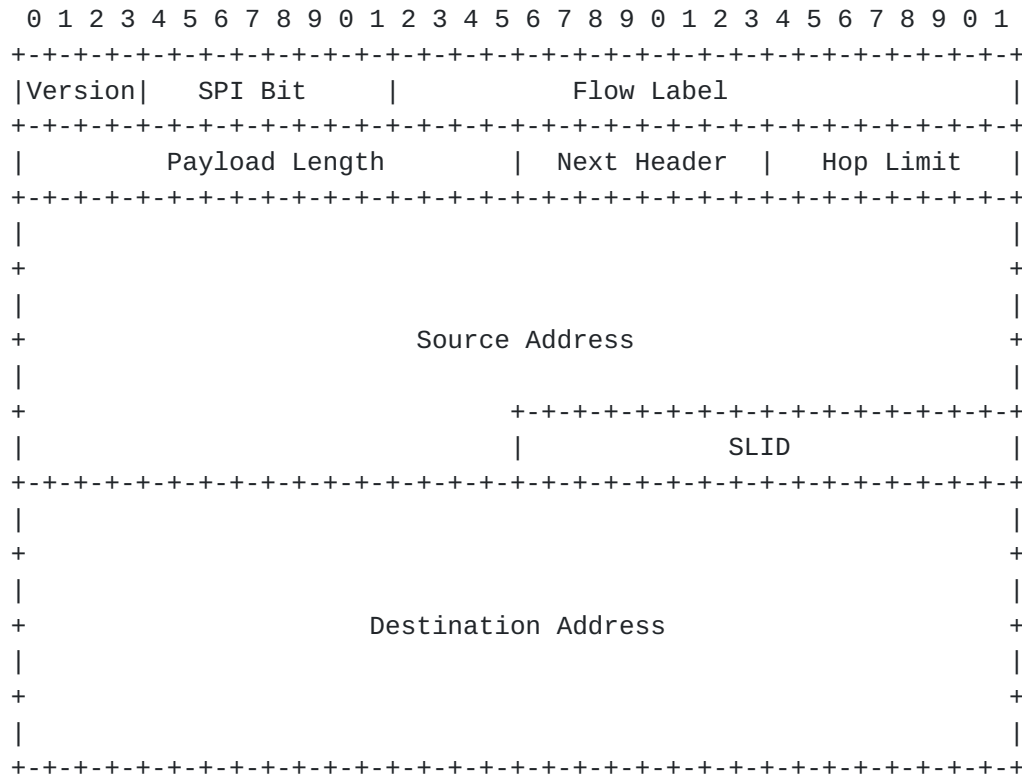
The choice of the SPI bit from within the IPv6 Traffic Class field is
a domain-wide configuration and is outside the scope of this
document.

4. Per-Slice Forwarding

Any router within the SR domain that forwards a packet with SPI bit
set uses the SLID to select a slice and apply per-slice policies.

5. Backward Compatibility

PE routers that do not set the SPI bit do not enable the SLID
semantic of the IPv6 source address bits. Hence, SLID-aware routers
would not attempt to classify these packets into a slice.

Any router that does not process the SPI nor the SLID forwards
packets as usual.

6. Acknowledgements

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7. References

7.1. Normative References

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