Encoding Network Slice Identification for SRv6

draft-cheng-spring-srv6-encoding-network-sliceid-04

Weiqiang Cheng (China Mobile)
Changwang Lin (New H3C Technologies)
Liyan Gong (China Mobile)
Shay Zadok (Broadcom)
Xuewei Wang (Ruijie Networks Co., Ltd.)

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Overview

• Network nodes need to identify a packet belonging to a network slice before it can apply the proper forwarding treatment with associated network resources.

• [I-D.draft-ietf-teas-ietf-network-slices] defines the network resource mapped to the network slice as NRP (Network Resource Partition). The NRP-ID carried in the packet can be used to identify the NRP used in the forwarding process.

• In an SRv6 domain, the ingress router encapsulates a received packet in an outer IPv6 header, followed by an optional SRH.

• Draft describes a method to encode NRP-ID in the outer IPv6 header of an SR domain.
Encoding NRP-ID

- NRP-ID: Network Resource Partition Identifier, 16 least significant bits in Source Address of the outer IPv6 header, which uniquely identifies a NRP.
- NPI bit: NRP-ID Presence Indicator, a bit in Traffic Class of the outer IPv6 header. The choice of the NPI bit is a domain-wide configuration.
Procedure

: IP Backbone (SRv6) :
CPE PE1 P1 P2 PE2 ...... :
|----|   |---|     |---|     |---|  : DC :
|    o---|o-o|-----|o-o|-----|o-o|-----|o-o|--o    :
|----|   |---|     |---|     |---|     |---|  :....:
:                               :
:...............................:

+------------+     +------------+
|    IPv6    |     |    IPv6    |
|NRP-ID in SA|     |NRP-ID in SA|
|NPI in TS   |     |NPI in TS   |
+------------+     +------------+     +------------+     +-------+
|    SRH     |     |    SRH     |
+------+     +------------+<...>+------------+ <-> +-------+

Ingress PE:
• Encapsulate received packet with an outer IPv6 header
• Encode NRP-ID in the 16 least significant bits of Source Address
• Set NPI-bit in Traffic Class
P:
• Check NPI-bit in Traffic Class
• Parse NRP-ID from Source Address
• Apply proper forwarding treatment for the specific network slice
Next Steps

• Update terms, e.g., "SLID" -> "NRP-ID", “SPI-bit" -> "NPI-bit"

• Request further review and feedback

chengweiqiang@chinamobile.com
linchangwang.04414@h3c.com
gongliyan@chinamobile.com
shay.zadok@broadcom.com
wangxueweil@ruijie.com.cn
Thanks