BGP-LS Extensions for SR Network Resource Partition SIDs

draft-chen-idr-bgp-ls-transport-slice-05

Ran Chen (ZTE) ---- Presenter
Shaofu peng (ZTE)
Tarek Saad (Juniper Networks)
Vishnu Pavan Beeram (Juniper Networks)

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Introduction

- Framework and definition of IETF network slice is provided in draft-ietf-teas-ietf-network-slice. It also defines the term Network Resource Partition (NRP), which is a collection of resources identified in the underlay network.

- The solution to realize network slicing in IP/MPLS networks is described in draft-ietf-teas-ns-ip-mpls.

- The IGP extension for SR Network Resource Partition SIDs is defined in draft-bestbar-lsr-spring-nrp.

- This document specifies extensions to the BGP-LS in order to advertise the information of Network Resource Partition SIDs.
Extensions

• SR-MPLS
  – Advertising NRP-ID TLV to indicate the list of NRPs that a node belongs to
    • Defines the NRP-ID TLV associated with the node NLRI.
  – Advertising NRP-ID list Sub-TLV to indicate the list of NRPs that a link belongs to
    • Defines the NRP-ID list TLV associated with the link NLRI.
  – Advertising NRP-ID for L2 Bundle Member:
    • Defines a new L2 Bundle Member NRP-ID sub-TLV of TLV-25 to advertise NRP-ID for L2 Bundle Member associated with a parent L3 adjacency.
  – Advertising NRP SIDs
    – Advertising NRP Adjacency-SID
    – Advertising NRP LAN-Adj-SID TLV
    – Advertising NRP Prefix-SID

• SRv6
  – Advertising Locators and SRv6 End SIDs that are associated with NRP-IDs
  – Advertising NRP SRv6 End.X SIDs
  – Advertising NRP SRv6 LAN End.X SIDs
Advertising NRP-ID TLV

• The NRP-ID TLV associated with the node NLRI.
  – Advertising NRP-ID TLV to indicate the list of NRPs that a node belongs to.

• NRP-ID: Network Resource Partition ID is used to indication the resources on specific node(s) that will be traversed by a slice-aggregate.
Advertising NRP-ID list Sub-TLV

• The NRP-ID list TLV associated with the link NLRI.
  
  – Advertising NRP-ID TLV to indicate the list of NRPs that a link belongs to

```
+-----------------+-----------------+-----------------+-----------------+
| 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 |
+-----------------+-----------------+-----------------+-----------------+
| Type=TBD2       | Length          |
+-----------------+-----------------+-----------------+-----------------+
| NRP-ID1         |
+-----------------+-----------------+-----------------+-----------------+
|                 |
+-----------------+-----------------+-----------------+-----------------+
|                 |
+-----------------+-----------------+-----------------+-----------------+
| NRP-IDn         |
+-----------------+-----------------+-----------------+-----------------+
```

  – NRP-ID: Network Resource Partition ID is used to indication the resources on specific link(s) that will be traversed by a slice-aggregate.
Advertising NRP-ID for L2 Bundle Member

• A new L2 Bundle Member NRP-ID of TLV-25 (L2 Bundle Member Attributes) [RFC8668].
  – Advertising NRP-ID for L2 Bundle Member associated with a parent L3 adjacency which is Point-to-Point.
Advertising NRP SIDs

- **Advertising NRP Prefix-SID**
  - A new NRP Prefix-SID TLV is added to the BGP-LS Attribute associated with the Prefix NLRI

- **Advertising NRP Adjacency-SID**
  - A new NRP Adjacency-SID TLV is added to the BGP-LS Attribute associated with Link NLRI
Advertising NRP SIDs (cont.)

- Advertising NRP LAN-Adj-SID
  - A new NRP LAN-Adj-SID TLV is added to the BGP-LS Attribute associated with Link NLRI

```
+------------+------------+------------+------------+
|            |            |            |            |
|            |            |            |            |
| Type=TBD6  | Length     |            |            |
| Flags      | Weight     | Reserved   |            |
+------------+------------+------------+------------+

+--------------------------------------------------+
| Neighbor System-ID (ID length octets)             |
+--------------------------------------------------+

+------------------+
| NRPID            |
+------------------+

+------------------+
| SID/Label/Index (variable)                          |
+------------------+
```
Advertising NRP SRv6 SIDs

- Advertising SRv6 NRP SID sub-TLV under the SRv6 Locator TLV
- The SRv6 NRP SID sub-TLV

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---------------------------------------------+
| Type=0x1b08 | Length |
+---------------------------------------------+
| NRP-ID      |
+---------------------------------------------+
```

- NRPIP: Identifies the NRPIP information corresponding to an Locator.
- The new NRPIP SID sub-TLV is an optional Sub-TLV of:
  - SRv6 End.X SID TLV (Section 4.1 of draft-ietf-idr-bgpls-srv6-ext.
  - SRv6 LAN End.X SID TLV (Section 4.2 of draft-ietf-idr-bgpls-srv6-ext.
Next Step

• Welcome comments.
• Welcome to fulfill this work together

Thank you!