Agenda

• Problem
• Solution
MUST READ !!!!!!!

draft-filsfils-spring-srv6-network-programming

Also Read

draft-ietf-6man-segment-routing-header

draft-ietf-idr-bgp-prefix-sid
Agenda

- Problem
- Solution
What we want to do

- Enable segment routing over IPv6 Dataplane
- Advertise segments IDs (SIDs) and associated functions for VPN/Global AF(s)
- Reduce overhead in migration of brownfield deployments.

Note: Presented L3VPNNoSRv6 in IETF98
Agenda

- Problem
- Solution
Proposed BGP Extensions

• Extend Prefix-SID Attribute with new SRv6-VPN TLV
SRv6-VPN TLV

SRv6 SID information is encoded as follows:

```
+-------------------+
| SID Type (1 Octet) |
+-------------------+
| SRv6 SID (16 octet) |
+-------------------+
```

- Type is TBD
- Length: 16bit field. The total length of the value portion of the TLV.
- RESERVED: 8 bit field. SHOULD be 0 on transmission and MUST be ignored on reception.
VPN SID encoding in SRv6-EVPN TLV

SRv6 SID information is encoded as follows:

```
+------------------------------+
| SID Type (1 Octet)           |
+------------------------------+
| SRv6 SID (16 octet)          |
+------------------------------+
```

- **Type-1** - corresponds to the equivalent functionality provided by an L3VPN Label attribute.
- **Type-2** - corresponds to the equivalent functionality provided by an L2VPN / EVPN Label attribute.

**Type-1:** End.DX4 / DT4, End.DX6 / DT6  
**Type-2:** End.DX2, End.DX2V, End.DT2U, End.DT2M / Arg.FE2

Details are in SRv6 network programming document
SRv6-EVPN Encoding

- An SRv6 SID is a 128-bit IPv6 address structured in 3 parts
  - Locator: Node IPv6 address will be encoded
  - Function: VPN Label or L2VPN / EVPN functions will be encoded
  - Argument: Optional
  - Flexible bit-length allocation between the three parts
SRv6 EVPN

- RFC7432 baseline procedures were not modified
- SRv6-VPN SID corresponding to EVPN (L2/L3) is attached to EVPN NLRIs
- Reduce overhead in migration of brownfield deployments.
### Example EVPN L3 Encoding

<table>
<thead>
<tr>
<th>BGP RT-5</th>
<th>value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESI</td>
<td>ZERO</td>
</tr>
<tr>
<td>IP address</td>
<td>IPv4 address</td>
</tr>
<tr>
<td>GW IP address</td>
<td>ZERO</td>
</tr>
<tr>
<td>Label</td>
<td>MPLS L3VPN label</td>
</tr>
</tbody>
</table>

**SRv6-VPN SID TLV**

<table>
<thead>
<tr>
<th>Type</th>
<th>SID → End.DT6 / DT4 / DX6 / DX4</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGP RT-5</td>
<td>value</td>
</tr>
<tr>
<td>ESI</td>
<td>ZERO</td>
</tr>
<tr>
<td>IP address</td>
<td>IPv6 address</td>
</tr>
<tr>
<td>GW IP address</td>
<td>ZERO</td>
</tr>
<tr>
<td>Label</td>
<td>IMPLICIT NULL label</td>
</tr>
</tbody>
</table>
Global IPv4/IPv6 SRv6 Encoding

• MP_REACH_NLRI for IPv4/IPv6 is Encoded with AFI/SAFI with IPv6 NH

• Motivation to achieve BGP Free core with Global SIDs

• Function END.DX6/END.DX4 (or END.DT6/END.DT4) are encoded using SRv6 Global SID
Draft: Next Steps

• Seeking WG input and feedback
• Suggestions/comments are welcome!!