mLDP/RSVP-TE P2MP with SRv6

draft-zzhang-mpls-mldp-rsvp-p2mp-srv6

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SR Replication Segment/SID

• An SR replication segment is a logical construct which connects a Replication Node to a set of Downstream Nodes
  • Identified by <replication-id, node-id> in control plane

• With MPLS data plane, the forwarding state for a replication SID is identical to forwarding state on mLDP/RSVP P2MP tree nodes
  • Incoming label \(\rightarrow\) (labeled) replication branches

• With SRv6 data plane, the FUNCT bits in the LOC:FUNCT:ARG SID encoding are the equivalent of MPLS label
  • The LOC bits get the packet to local or downstream nodes
Setting Up A P2MP Tree

• An SR-P2MP replication tree is a concatenation of replication segments
  • Installed on tree nodes, not encoded in packets

• A controller signals individual replication segments onto tree nodes
  • Currently assumed approach
  • BGP/PCEP signaling
  • Each replication segment is identified by a <replication-id, node-id> tuple in the control plane
    • Where the replication-id is <tree-root, tree-id>
Alternative Control Plane ID and Signaling

• Consider an existing MVPN deployment with MPLS mLDP/RSVP P2MP
  • Where part of it may be transitioned to SRv6
  • Good to keep using mLDP FEC or RSVP Session object even for the SRv6 part

• Three options
  • Controller-signaled via BGP
    • mLDP option already specified in draft-ietf-bess-bgp-multicast-controller
  • Controller-signaled via PCEP
  • Traditional hop-by-hop mLDP/RSVP signaling
    • For SRv6 data plane
    • When controller-based tree calculation/signaling is not needed/desired
SRv6 P2MP Signaled by mLDP/RSVP

• Existing mLDP/RSVP protocol signals incoming/outgoing labels

• We just need an indication “the signaled label is actually the FUNCT bits of an SRv6 SID”
  • In the signaling itself – per branch or sub-LSP
  • Or, by provisioning
    • Per-node but consistent across the domain
    • Per-peer on border nodes to do MPLS-SRv6 interworking

• A 20-bit FUNCT space could be carved out for mLDP/RSVP signaled SRv6 replication SIDs
  • If the FUNCT length of SID encoding scheme is larger than 20
mLDP Signaling

- SRv6 Capability signaling: a new bit in the P2MP Capability TLV
- SRv6 SID signaling: where a Generic Label TLV would be used, an SRv6 SID TLV is used instead

```
+--------------------------------------------+
| 0|0| SRv6 SID (TBD)       | Length (24)                 |
+--------------------------------------------+
        ~ SRv6 SID Value        ~
+--------------------------------------------+
| SRv6 Endpoint Behavior     | RESERVED                     |
+--------------------------------------------+
| Locator Block | Locator Node | Function            | Argument          |
| Length        | Length       | Length              | Length            |
+--------------------------------------------+
```
RSVP Signaling

- SRv6 capability signaling in Hello messages
- SRv6 SID signaling: where a C-Type 1 Label Object would be used, a new type of the Label Object is used instead

<table>
<thead>
<tr>
<th>Length (28)</th>
<th>Class (16)</th>
<th>C-Type (TBD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRv6 SID Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SRv6 Endpoint Behavior</td>
<td>RESERVED</td>
<td></td>
</tr>
<tr>
<td>Locator</td>
<td>Locator Node</td>
<td>Function</td>
</tr>
<tr>
<td>Block Length</td>
<td>Length</td>
<td>Length</td>
</tr>
</tbody>
</table>
Next Steps

• Finish some details that were left out
  • mLDP over targeted sessions
  • mLDP with multi-topology and FlexAglo
  • RSVP Hello Extension

• Comments and suggestions appreciated!