LDP Extensions for RMR

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Issues with LDP on Ring

- Single LDP LSP
- After failure, SPF changes nexthop of same LSP to other side of ring, resulting in micro-loops
- No weighted ECMP to optimally utilize all of the ring bandwidth
- Ring is worst topology for LFA protection
- LDP over RSVP protection has same limitation as described in RSVP-TE extensions
- More in architecture document - draft-ietf-mpls-rmr
LDP RMR LSPs

- After the Ring discovery, each node acting as egress signals two counter-rotating LSPs to itself.

- Each transit node that receives the label mapping message signals this LSP further in same direction by using the ring topology information from IGP discovery.

- Once the signaling is complete, every node in a ring should have two counter rotating LSPs in clockwise (CW) and anti-clockwise (AC) direction to reach every other node on the ring.

- Each node can send traffic to a specific node on the ring either via CW or AC or both LSPs.

  - It's a local decision via policy.
Protection

- Protection happens naturally - No LFA, No R-LFA, No TI-LFA, No RSVP-TE Bypasses

- RMR uses the two counter-rotating LSPs to protect one another
Protocol Extensions

• RMR LSP support for a LSR is advertised in LDP Initialization message using the new LDP capability called as RMR capability.

• Label mapping message with RMR FEC element is used to setup two counter rotating RMR LSPs

• Format

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<p>| | | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>0 1 2 3 4 5 6 7</td>
<td>RMR(TBD)</td>
<td>Address Family</td>
<td>PreLen</td>
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</tbody>
</table>
+---------------- |----------------- |----------------- |----------------- |
| 8 9 0 1 2 3 4 5 | Ring Prefix     |                 |                 |
| 6 7 8 9 0 1 2 3 | Ring ID         |                 |                 |
| 4 5 6 7 8 9 0 1| Ring Flags      | Reserved        |                 |
```

• Ring Flags value determine whether it is a CW or AC

• More details about upstream LSR selection and signaling procedures are described in the draft - draft-esale-mpls-ldp-rmr-extensions-00
Next Steps

• The new version addresses all the comments that we have received so far

• Need more feedback from the working group

• Request for MPLS WG Document
Thank you!