IS-IS Spine-Leaf

IETF 104 Prague

LSR

draft-ietf-isis-spine-leaf-ext-01

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DC IS-IS Spine-Leaf

- Incremental protocol improvement
- Reuses well deployed protocol for DC fabric supporting large number of network routing entries and features
- Supports full routing in small/median DC and serves as a DC fabric for overlay routing
- Supports Auto-tier discovery and protocol configuration for Zero Touch Provisioning
- Minimizes IS-IS LSP flooding to leaf nodes in DC spine-leaf topology
- Handles link/node DOWN events in spine-leaf topology to avoid black holes
- Supports other mechanisms/proposals such as Openfabric and Dynamic Flooding
Changes From
draft-shen-isis-spine-leaf-ext-07

- Became WG document
- Spine-Leaf TLV simplified and limited to hellos
- New TLV (Leaf-Set TLV) introduced for Circuit Scope LSPs
- (re)introduced limited support for leaf-leaf connections
Spine-Leaf TLV in Hello

- **T** bit: Tier field is valid
- **L**: Leaf mode bit – enables reduced flooding
- **R**: Default Route Gateway bit

*blue: sent by leaf nodes*

*green: sent by spine nodes*
Leaf-Set TLV (CS-LSPs)

- Sent by Spine Nodes
- Used by Leaf Nodes to detect spine nodes with incomplete reachability to leaf nodes

Leaf-Neighbors sub-TLV

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<tr>
<th>Type</th>
<th>Length</th>
<th>...Sub-TLVs</th>
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<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
<th>...System IDs of Leaf Node Neighbors</th>
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Leaf-Set TLV (CS-LSPs) (s)

- Sent by Leaf Nodes
- Requests Spine Node to send prefix reachability for the specified Leaf Nodes
- Spine Node then sends prefix reachability (TLVs 135/236) in CS-LSPs to the requesting leaf-node
Advertising Connections Between RF Leaf Nodes and Spine Nodes

Link Attribute sub-TLV (RFC 5029)

- Local Protection Available (P) (RFC 5029)
- Excluded from Local Protection (X) (RFC 5029)
- Connect to RF Leaf Node (L) – sent by Spines
  - Signals leaf node can be excluded from flooding
- Connect to RF Spine (S) – sent by Leaf Nodes
  - Signals Link is to a Spine Node – possible alternate default path

Spine-Leaf Extension
Use of Leaf-Leaf Connections

• Limited to one leaf neighbor
• Normal flooding
  ➢ Leaf Node LSPs are exchanged as normal and flooded to Spine Nodes
  ➢ Local (to each leaf) Reachability is known
• Local Traffic Only
  ➢ Leaf Node Sets OL bit so spine nodes cannot use the Link for transit
• Transit Traffic Allowed
  ➢ OL bit NOT set
  ➢ High Metric \(2^{24}-2\)
  ➢ Link of last resort – spine nodes can use the link to reach a leaf node which has been disconnected from all spine nodes
Next Steps

Comments welcomed