Agenda

- Summary
- Extension Basics
- TLV in Hello and CS-LSP
- Link and Node Down (Pure Clos)
- Spine-Leaf Discussion
Summary

• Spine-Leaf draft first published in Nov. 2015
• Most recent version 03 first was presented in RTGWG Interim meeting Jan 2017
• The new version is on top of the basic spine-leaf extension, added the ‘negative routing’ scheme to handle the pure CLOS
• This draft is zero-flooding and zero topology for ToR switches, enables IS-IS routing fit better in DC and enterprise environment
Extension Basics

Normal ISIS Operation

Zero Flooding, Zero Topology on ToRs

Full ISIS Database

Aggregation Layer

Only default routes to Spines

Access Layer

Spine-Leaf Extension
TLV in Hello/CS-LSP

- **L**: Leaf mode bit; **R**: Default Route Gateway bit; **B**: Leaf-Leaf bit
- **IS-IS Reverse Metric** from Spine to Leaf nodes
- **Optional Sub-TLVs in CS-LSP**: *Leaf-Set, Info-Req*
Link/Node Down (CLOS)

- S1-S4 include Leaf-Set sub-TLV when sending Spine-Leaf TLV
- L4 picks S3 0/0, forward to L6 for p3
- S3-L6 link down
- S3 Leaf-Set lost L6 in sub-TLV
- L4 picks S4, sending “forward prefixes behind node L6” Info-Req sub-TLV
- S4 replies with “Prefixes are: p1, and p3 for L6” with IP/IPv6 Reachability
- L4 adds more specific entries p1, p3 with nexthop to S4
- L4 picks S4 lookup p3, forward to L6 for p3
- Leaf L3 Node down. Nothing special to do
- Spine S2 Node down. Nothing special to do

0/0 -> S1, S2

Node Down

0/0 -> S3, S4
p1, p3 -> S4

Link Down

Spine-Leaf Extension
Spine-Leaf Discussion

- Other networks vs DC networks (this draft helps to meet the DC special requirements)
- One protocol vs 2+, does it really matter
- Other rich features (past 20 years) using e.g. BGP-EVPN or other overlay protocols, multicast, TE, SR, etc.
- Topology-less on leaf nodes can also do TE.
- Discussion on-going with Open-Fabric co-authors to see how to compile the IS-IS signaling
- Welcome comments and reviews