IS-IS Spine-Leaf
DC RTGWG Interim

draft-shen-isis-spine-leaf-ext-03

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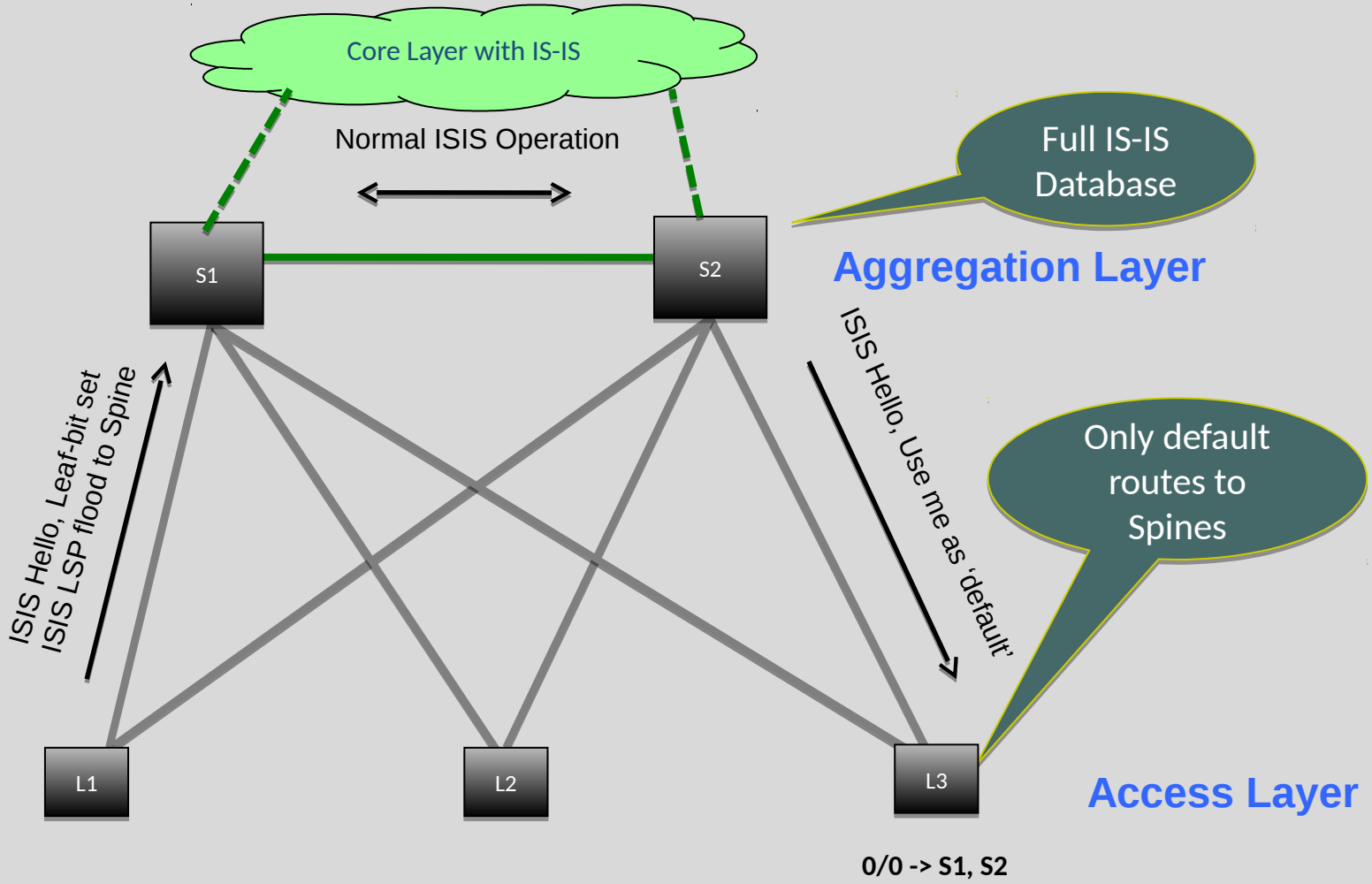
Agenda

- Spine-Leaf Use Cases
- Extension Basics
- TLV in Hello and/or CSF-LSP
- Link and Node Down (Pure Clos)
- Spine-Leaf Summary

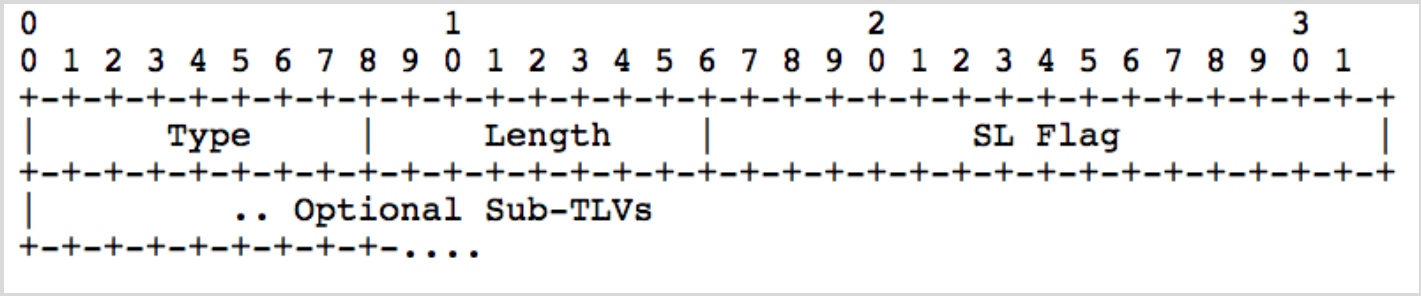
Spine-Leaf Use Cases

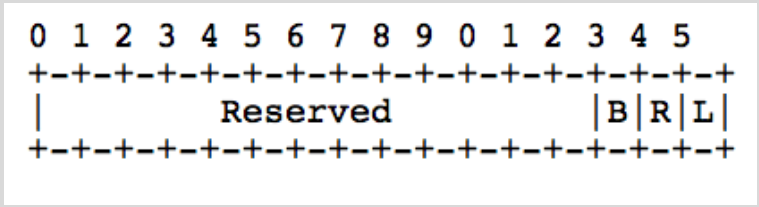
- Spine-Leaf Setup popular in Data Center and Campus
- Normally leaf-to-leaf traffic goes through one of the spine nodes, for east-west
- Basically some ECMP load sharing from leaf to spine nodes
- Rich mesh of spine-leaf IGP topology generates LSP flooding issues, in particular in the events of link and node down

Extension Basics



TLV in Hello/CSF-LSP

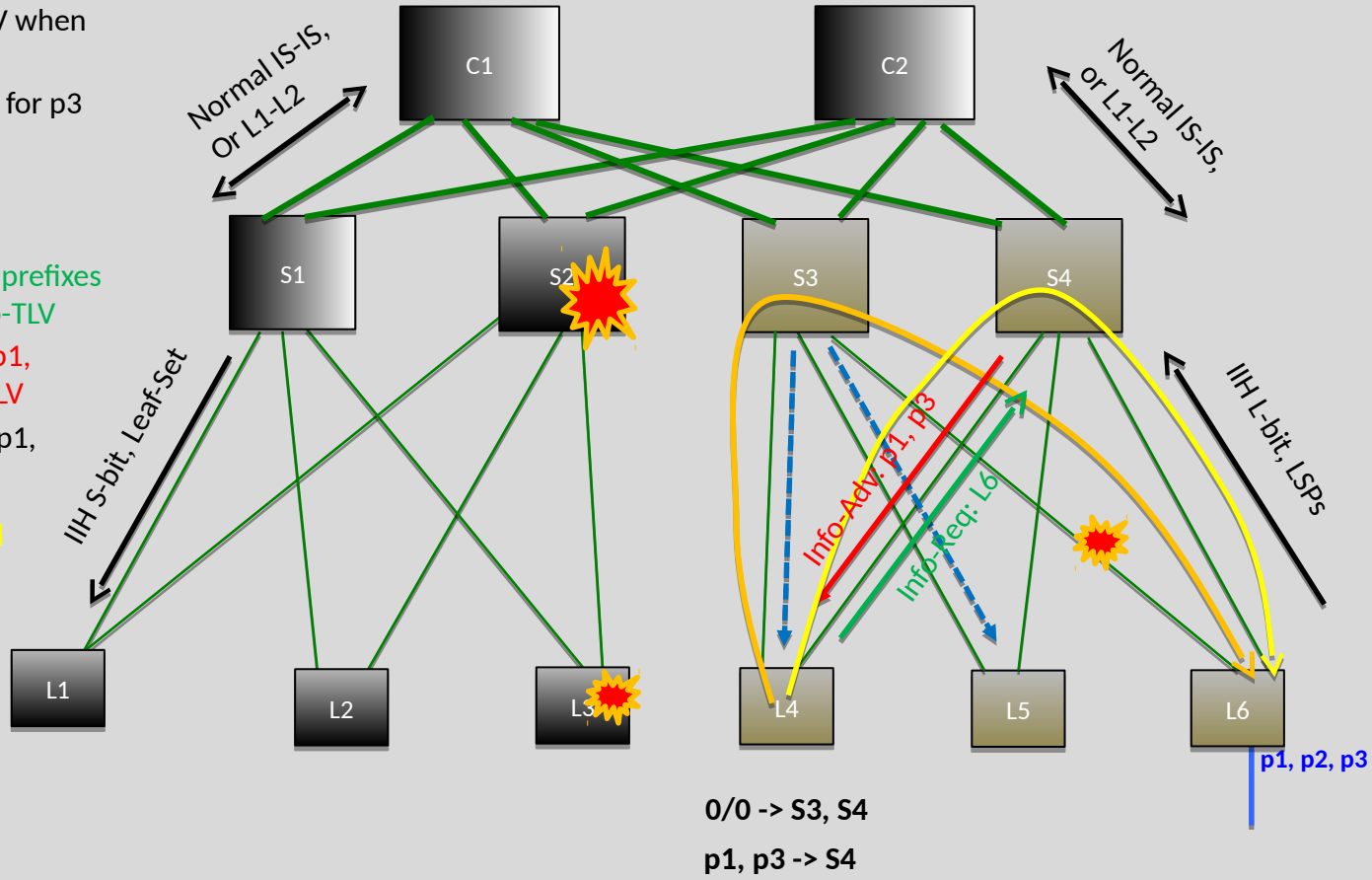




- L: Leaf mode bit; R: Default Route Gateway bit; B: Leaf-Leaf bit
- ‘Default Route metric’ is removed. Can use IS-IS *Reverse Metric* from Spine to Leaf nodes
- Optional Sub-TLVs: *Leaf-Set*, *Info-Req*, *IPv4/6 Info-Advertise*

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" Info-Adv sub-TLV
- L4 adds more specific entries p1, p3 with nexthop to S4
- L4 picks S4 lookup p3, forward to L6 for p3
- **L3 Node down. Nothing special to do**
- **S2 Node down. Nothing special to do**



Spine-Leaf Summary

- Leaf (ToR) nodes have no topology of the network, SPF is not even needed
- Rich connectivity without IGP flooding issues
- If topology has interconnections among Spine nodes, or core layer connectivity, reroute is possible in events of link/node down
- For pure CLOS without core layer, or to guarantee DC data forwarding latency, ‘negative routing’ or ‘conversational learning’ can be utilized to learn specific prefixes
- Can be a ‘thin-layer’ of underlay in an overlay routing/forwarding Data Centers