draft-francois-segment-routing-ti-lfa-00

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Topology Independent Fast Reroute using Segment Routing

- Fast Reroute
  - Local protection of traffic against sudden failures of links and nodes
  - IP-FRR behavior when SR comes into play
- Topology Independent *coverage*
  - Full coverage for link and node protection
- Segment Routing
  - Leveraging the SR architecture allows to enforce any failover path

Which failover path?

- New in IP-FRR:
  Post-convergence path from the PLR to the destination
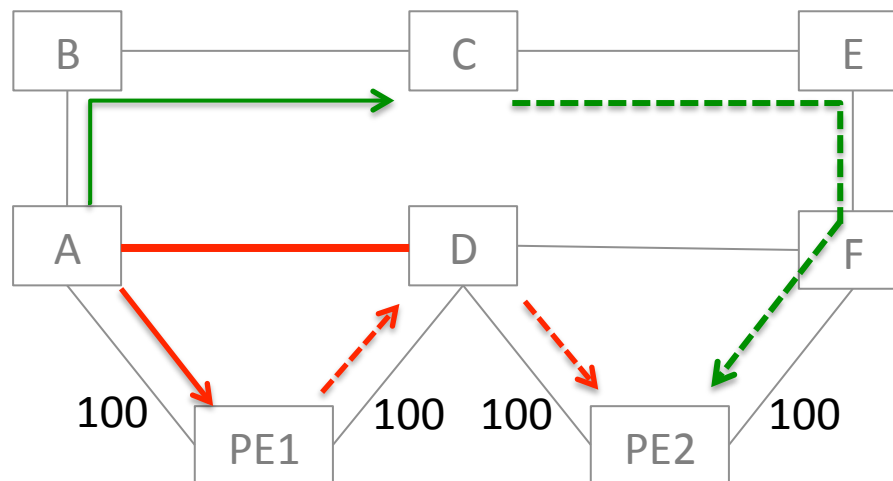
Why that choice?

- Post-convergence path
  - Typically in line with capacity planning
  - Easy to predict
- SR: No need for TLDP sessions
  - Useless to favor LFA over RLFA over…
  - Easier to provide the path that the operators actually want

Exercise

- draft-ietf-rtgwg-lfa-manageability-01
  - Cases where default IP-FRR behavior is not ideal
  - Need for manageability to enforce an ideal path
    - Turns out to always be the post-convergence one…
- Common sense
  - The operator configures metrics to obtain optimum paths for its services (bw, delay, …)
  - The PLR should respect such objectives upon FRR

How to do TI-LFA

- Enforcing loop-freeness on post-convergence path
  - Where can I release the packet?
    - At the intersection between the new shortest path and the per-destination Q-Space of the destination
  - How do I reach the release point?
    - By chaining intermediate segments that are assessed to be loop-free
- Maths: homework
- How many segments?

How many segments?

- Link protection, symmetric topology:
  - Maximum 2, guaranteed
  - Most often, 1 is enough
  - When a post-convergence LFA is available: 0

- Link protection, asymmetric topology
  - Many asymmetric nets where 2 was the max
  - A few cases here and there were a bit more are needed for a couple of links

- Node protection
  - Never more than 4, rarely more than 2

- -01 contains numbers
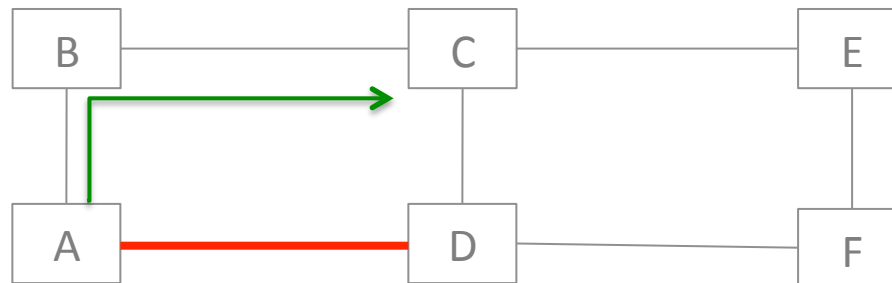 - Eager to increase the number of case studies

Protecting AdjSID's

- Packet with 2 top ADJ SIDs [AD, DF, …]
  - The packet should go to D
  - Repair: [C, D, *DF, …*], oif B
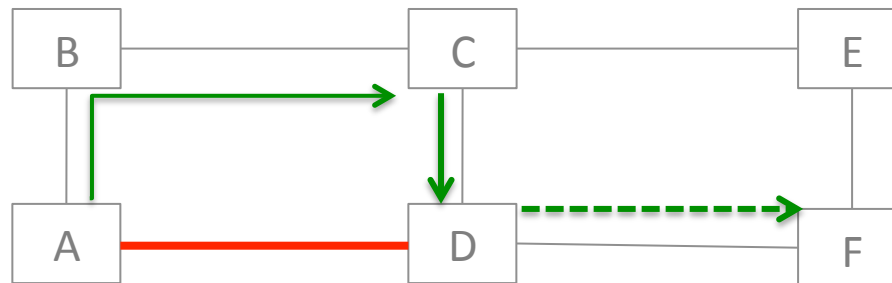
Protecting AdjSID's

- Packet with 1 top ADJ SID [AD, F, ...]
- Option
  - The packet could go to D
    - Repair: [C, **D**, *F, ...*], oif B
  - The packet could go directly to F
    - Repair: [C, *F, ...*], oif B

Summary

- FRR for Segment Routing
  - Node and Adjacency Segments
  - No more TLDP session required for FRR purposes
- Full coverage
  - More than 2 segments are rarely needed
- Post-convergence paths
  - Better fit with capacity planning
  - Respect of the ISP policy
- 1 implementation available
  - At least one more on the way

Thank you!