PCEP Extension for Stateful Inter-Domain Tunnels

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Update since previous versions

- Version 00 & 01:
  - Merge draft draft-lee-pce-lsp-stitching-hpce to add Hierarchical method
  - Clarify Border node notation

- Version 02:
  - Correct and precise some steps and exchange in section 3
    - E.g. the ERO convey in the PCInitiate message is now only composed by the PKS to simplify the message parsing
  - Add a new section to request a new Inter-domain association ID (within the Association Object)
    - This is to help the management of the association of local and end-to-end part of the tunnels in case of failure.
  - Rewrite section 6, clarifying Segment Routing part and how PCE choose between RSVP-TE and Segment Routing to enforce its local part of the end-to-end tunnel
  - Correct typos and clarify acronyms in various place

Hot Topic

- Data Centre interconnection use case is highlight in portfolio of Vendors and requested by Operators

- Several drafts ask for a label to stitch, nest, bind ... tunnels
  - E.g. draft-sivabalan-pce-binding-label-sid

- BGP-LU could be a challenger

- But none of the mentioned solutions provide a mechanism to exchange stitching label nor provide Traffic Engineering support

Technical solution

- Choose to request code points in existing PCEP Objects
  - Path Setup Type: 3 new code points
    - Inter-domain, RSVP-TE Inter-domain & SR-Inter-domain
  - Association Group: 1 new code point
    - Inter-domain association group
  - Error: 2 new error values
    - Missing Label in RRO & Inter-domain association group error

- But Could be applicable with a new PCEP Object
  - Need more modification in protocol stack
  - Open to discussion on the mailing list

1ˢᵗ Implementation based on ODL

- Draft fully implemented on ODL
  - BGPCEP project enhanced with BRPC, stateful BRPC and Stitching Label
  - Demo available here: https://www.youtube.com/watch?v=ipVPh2q27Ts
  - Prototype feedback has been used to release version 02 of the draft
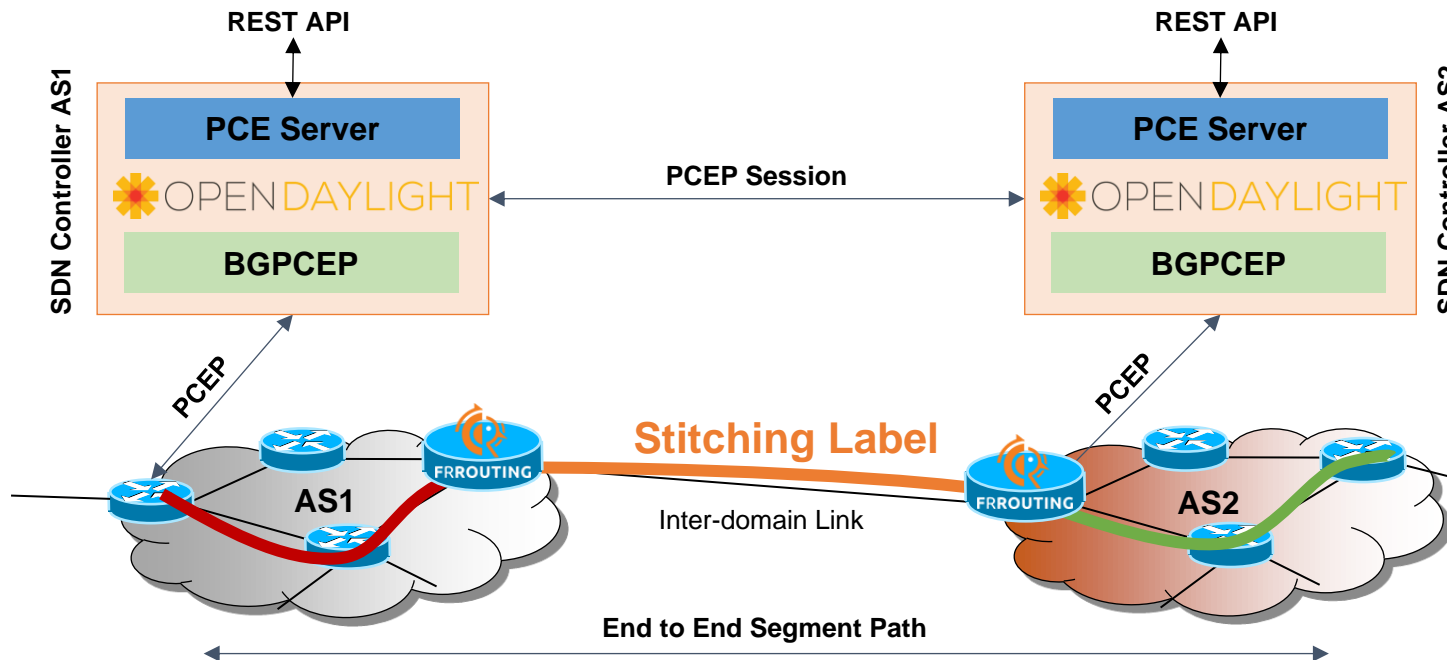
Conclusion

- Propose to extend PST and Association Group to inter-domain
  - To exchange Stitching Label between PCEs and PCE / PCCs
  - To automatically stich / nest local LSP tunnel to form inter-domain LSP tunnel

- Applicability
  - Inter-domain LSP tunnels setup by RSVP-TE and/or Segment Routing
  - Allow stitching of Segment Routing paths and RSVP-TE LSP tunnels
  - Targeted use case: inter-domain VPN, Data Centre interconnection …

- Request PCE WG to adopt this draft as WG draft