PCEP-LS: PCEP extensions for Distribution of Link-State and TE Information

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A very quick recap...

- Use of PCEP to also learn the network topology and state
- Applicable to Device to controller as well as controller to controller (H-PCE)
- Complementary extension (or another tool in the tool-box)
  - Not a replacement for running IGP in your network!
  - Or BGP-LS, Or Netconf!
  - Enable use of a single control plane protocol as an SBI in some scenarios
- A new PCEP Message and Object and reuse the TLVs already defined
  - Default is local-only (remote learned information can be enabled)

A rough summary of where we left off...

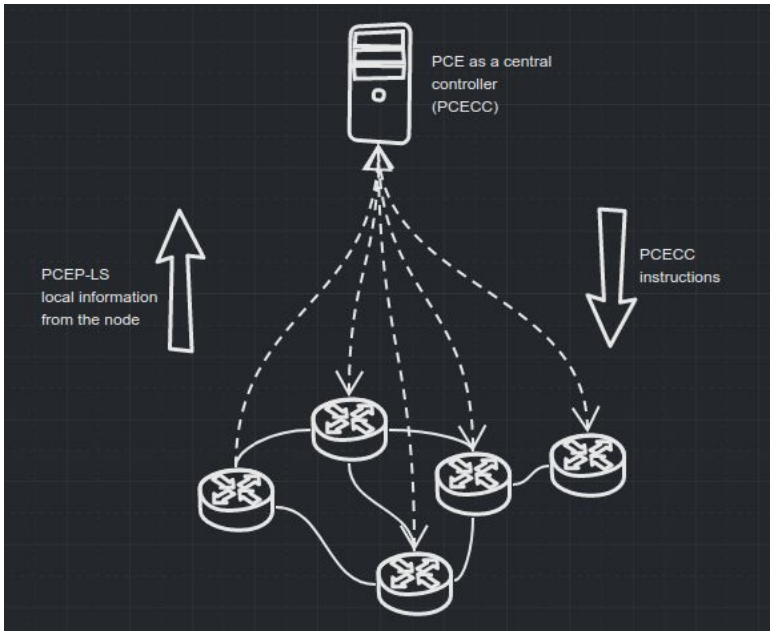
- Presence of other ways to do this
  - and some consider them to be better!
- PCEP scalability worries!
- Operational Complexity!
- Does this require multi-vendor inter-operable RFC?

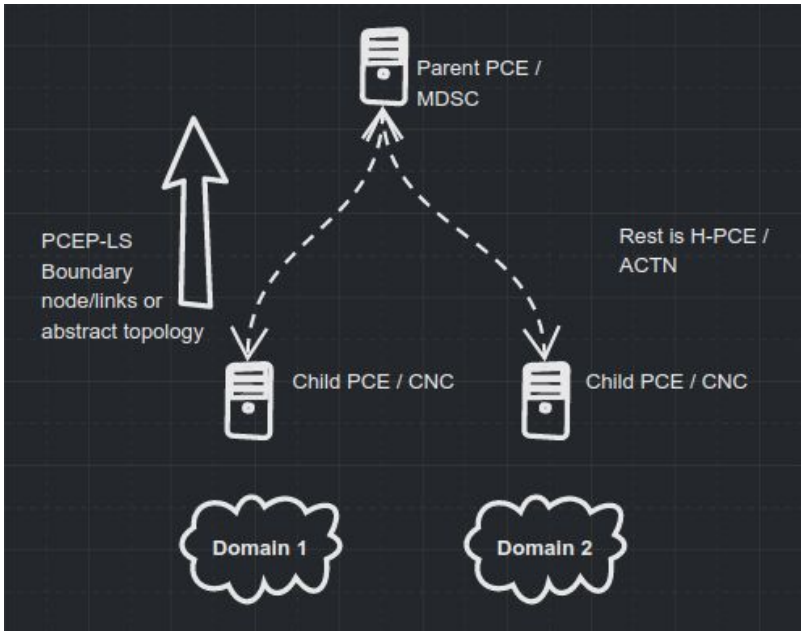
- Consensus on use of PCEP as SBI
- In some PCECC scenarios, there is a direct PCEP session with the nodes
  - Leveraging the direct PCEP session to also learn topology (and changes) is an attractive option!
- Usefulness in H-PCE, Inter-layer, Optical etc
- Another tool in the tool-box (and not replacing any other mechanism)
  - For instance we recognize that some may want to use YANG Path computation RPC instead of PCEP in some scenarios and we support both approaches!

Some Use Cases & Scenarios where PCEP-LS is an attractive choice!

- PCECC
  - Some use cases require direct PCEP session to all nodes
  - Reusing the same session to also learn local network state is attractive
  - Enable the possibility of a single SBI protocol for some use cases
- H-PCE (and ACTN)
  - Between controllers for boundary nodes/links as part of the abstract domain topology
- Partial
  - Some information such as Optical extension learned via PCEP-LS for faster learning
  - Reusing PCEP synchronization optimization techniques and incremental updates
  - Other mechanism can co-exist

Flow of information/control





Question to the WG

- Is there enough interest by some in the WG to work on this?
- Are there targeted experiments, demo, implementations
  - Some were showcased in the past in Hackathon and Bits-n-Bytes
  - Some open source implementation exist and documented
  - Some researchers have shown interest and experimented
  - Some operators have shown interest
- Is there a possibility of a somewhat rough consensus/support for this as an Experimental I-D?
  - Scope of the experiment and results to collect would be the next step!

Useful References

- Chairs Slide from IETF 101: https://datatracker.ietf.org/meeting/101/materials/slides-101-pce-update-on-pcep-sdn-discussion-00.pdf
- Mailing List Thread: https://mailarchive.ietf.org/arch/msg/pce/TXS2v8tXWCxXmp8Vxx59K2dOwCg/
- Implementation: https://mailarchive.ietf.org/arch/msg/pce/0zEEJv-u7mQ1drkkWkAJXLQnDpo/ and https://mailarchive.ietf.org/arch/msg/pce/HF_X3oUS7rIrjyymaw7miUQurpI/
- Researcher: https://mailarchive.ietf.org/arch/msg/pce/p1vKMyCWVxAd-Dpb5lcKX42BcVA/

Thank You!

Backup

- Scalability Concern
  - Some PCECC scenarios already have session to all nodes
  - Reusing the same session to also carry local node information is okay
  - Bulk of the work during PCEP session establishment and before any other PCEP interactions!
- Some benefits of PCEP-LS procedures
  - Incremental changes only
    - Use of stateful techniques: LS-ID to uniquely identify node/link and only the attributes that have changed need to be encoded
  - Synchronization Optimization techniques for PCEP
    - Can be leveraged for PCEP-LS as well during session up/down