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

draft-dhodylee-pce-pcep-ls-22

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PCEP-LS Feedback recap...

- Was presented at IETF 110.
  - Highlighted some key scenarios such as PCECC & H-PCE
- Note: This is an experimental I-D with an aim to progress R&D efforts & is not a replacement for any existing mechanisms
  - There are specific scenarios highlighted where the reuse of PCEP sessions for this information is deemed useful
- What would be useful is to help progress this draft is find out if there is interest in this experimental work and a poll for WG adoption can be issued.
PCEP-LS Feedback recap...

- Positive feedback on the list
  - Aijun Wang with China Telecom showed key interest
    - Highlighted the use of PCEP-LS in PCECC scenarios
  - Peter Park with Telco KT
  - Bin Yun with ETRI
- Plea for WG adoption on Experimental track
  - Scope & goal of the experiment would include testing this solutions viability to help eliminate any concerns
- Post Adoption
  - Refine the scope of the Experiments & expected output, especially targeting scalability concerns and impact in other protocols and the network.
Quick Overall Recap...

- Update on latest Feedback from PCE Working Group ↔ WG Adoption Poll?
- 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
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
Ready for WG Adoption?

- Is there enough interest by some in the WG to work on this? Yes*
- Are there targeted experiments, demo, implementations? Yes*
  - 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? Yes*
  - Scope of the experiment can be further refined after adoption

* author’s opinion
Useful References

- Chairs Slide from IETF 101:
- 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_X3oUS7rIrjyymaw7miUQurpl/
- Researcher:
  https://mailarchive.ietf.org/arch/msg/pce/p1vKMyCWWxAd-Dpb5IcKX42BcVA/
Working Group Adoption
Thank You!
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?

Some of these questions would be tested & answered as part of the Experiment!

- 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!
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
Orchestrator / Service Manager / OSS / NMS
PCE CC (SDN)

P-PCE

C-PCE
Use existing SBI PCE<>PCC To carry PCEP-LS via new LS Report

C-PCE

C-PCE
Use existing SBI PCE<>PCC To carry PCEP-LS via new LS Report

PCC
PCC
PCC
AS 1

PCC
PCC
AS 2

PCC
PCC
AS 3