PCEP Extensions For Transporting Traffic Engineering (TE) Data

draft-lee-pce-transporting-te-data-01 (informational)
draft-dhodylee-pce-pcep-te-data-extn-01 (standard)

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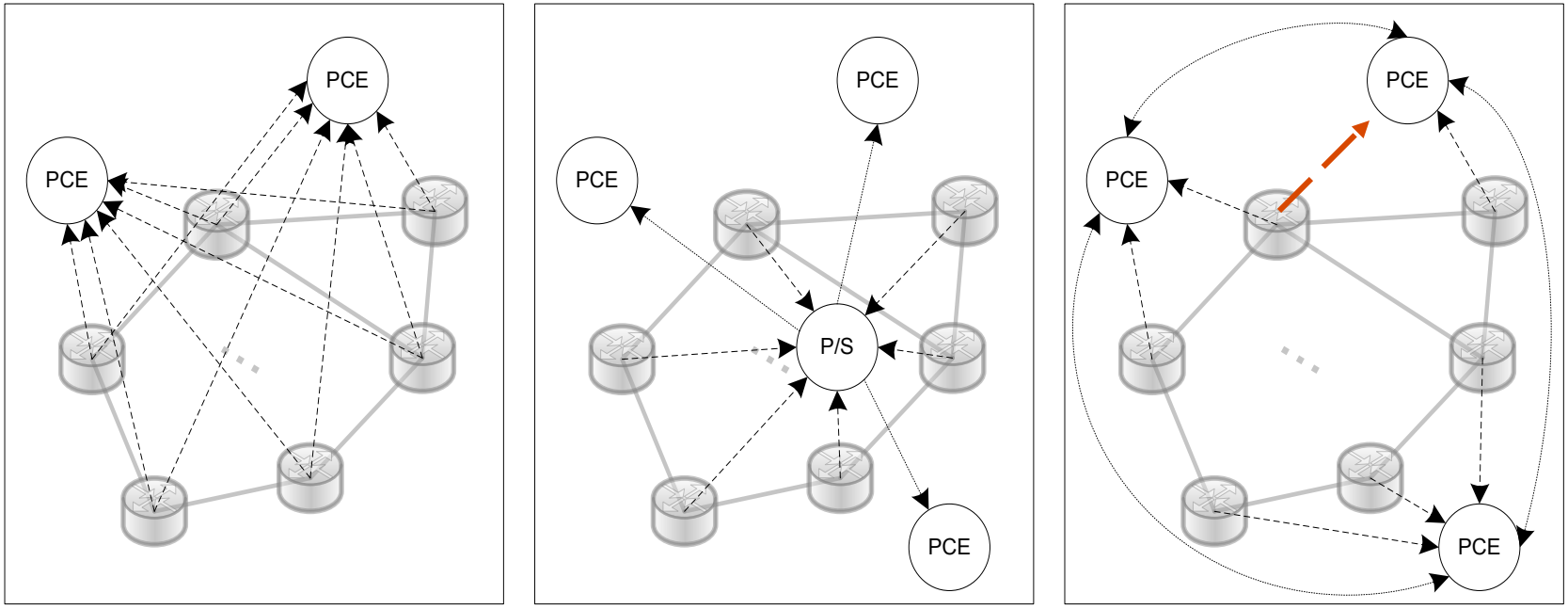
Architectural Context

- **[RFC4655]** Section 4.3 describes the potential load of the TED on a network node and proposes an architecture where the TED is maintained by the PCE rather than the network nodes.
- **[RFC7399]** ***pce-questions*** Section 3 touches upon this issue: "It has also been proposed that the PCE Communication Protocol (PCEP) [RFC5440] could be extended to serve as an information collection protocol to supply information from network devices to a PCE. The logic is that the network devices may already speak PCEP and so the protocol could easily be used to report details about the resources and state in the network, including the LSP state discussed in Sections 14 and 15."

Options for nodes to share local TED info with PCEs



(a) (b) (c)

(a) Nodes send local info directly to all PCEs,

(b) Nodes send local info to a intermediary (publish/ subscribe),

(c) Nodes send info to ***at least one PCE*** and have the PCEs share TED information.

Applicability

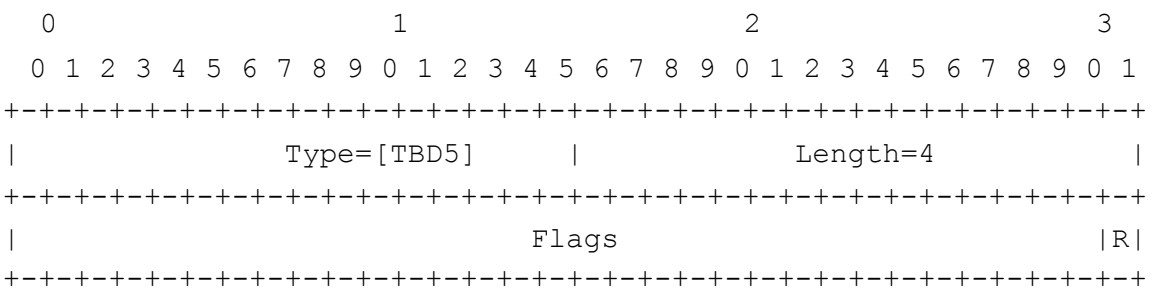
- As per [I-D.lee-pce-transporting-te-data], the mechanism specified in this draft is applicable to:
  - Where there is no IGP-TE or BGP-LS running at the PCE to learn TED.
  - Where there is IGP-TE or BGP-LS running but with a need for a faster TED population and convergence at the PCE.
    - A PCE may receive partial information (say basic TE) from IGP-TE and other information (optical and impairment) from PCEP.
    - A PCE may receive full information from both IGP-TE and PCEP.
- A PCC may further choose to send only local TE information or both local and remote learned TED information.

New Functions

- Capability Advertisement (PCE<->PCC):
  - Both PCC and PCE MUST announce they support PCEP extensions for TED population during PCEP session establishment
- TED Synchronization (PCC->PCE):
  - After initialization, the PCE MUST learn PCC's TED before path computation.
- TE Report (PCC->PCE)
  - A PCC sends a TE report to a PCE whenever the TED changes.

Capability Advertisement

- The OPEN object to include the TED Capability TLV



  - R (Remote – 1 bit):
    - If set by a PCC, it indicates that the PCC allows reporting of remote TED info learned via other means (e.g., IGP-TE or BGP-LS);
    - If set by a PCE, it indicates the PCE is capable of receiving remote TED info.
- The advertisement of the TED capability implies support of local TE population (to be advertised via TE Report Message)

TE Report

- A PCEP TE Report (TERpt) is a new message send by a PCC to PCE to report the TED state (via the TE object)

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<TERpt Message> ::= <Common Header>
                    <te-report-list>
      Where:
      <te-report-list> ::= <TE> [<te-report-list>]
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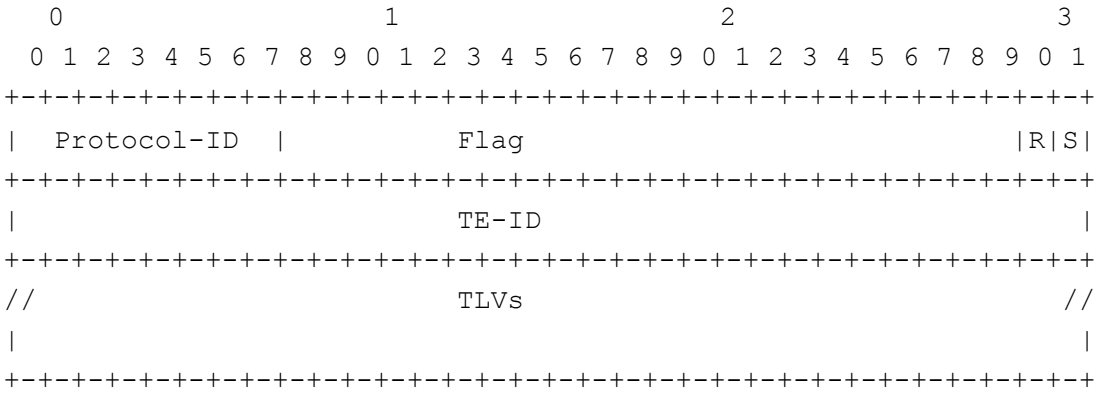
- The format of the TE object:



TE-ID

- A PCEP-specific identifier for the TE node or link. A PCC creates a unique TE-ID for each TE node/link that is constant for the lifetime of a PCEP session.
- All subsequent PCEP messages then address the TE node/link by the TE-ID making incremental TED changes easier to encode.

TED Synchronization

- When the SYNC Flag in the TE object is set to 1, each TE report is sent. The end of synchronization marker is a TERpt message with the SYNC Flag set to 0.

Summary & Next Steps

- A reasonable level of interest expressed in this work in the mailing list.
- What do you think?