Traffic Engineering Database Dissemination for Hierarchical PCE scenarios

CCAMP WG, IETF89,

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draft-lopez-pce-hpce-ted-01
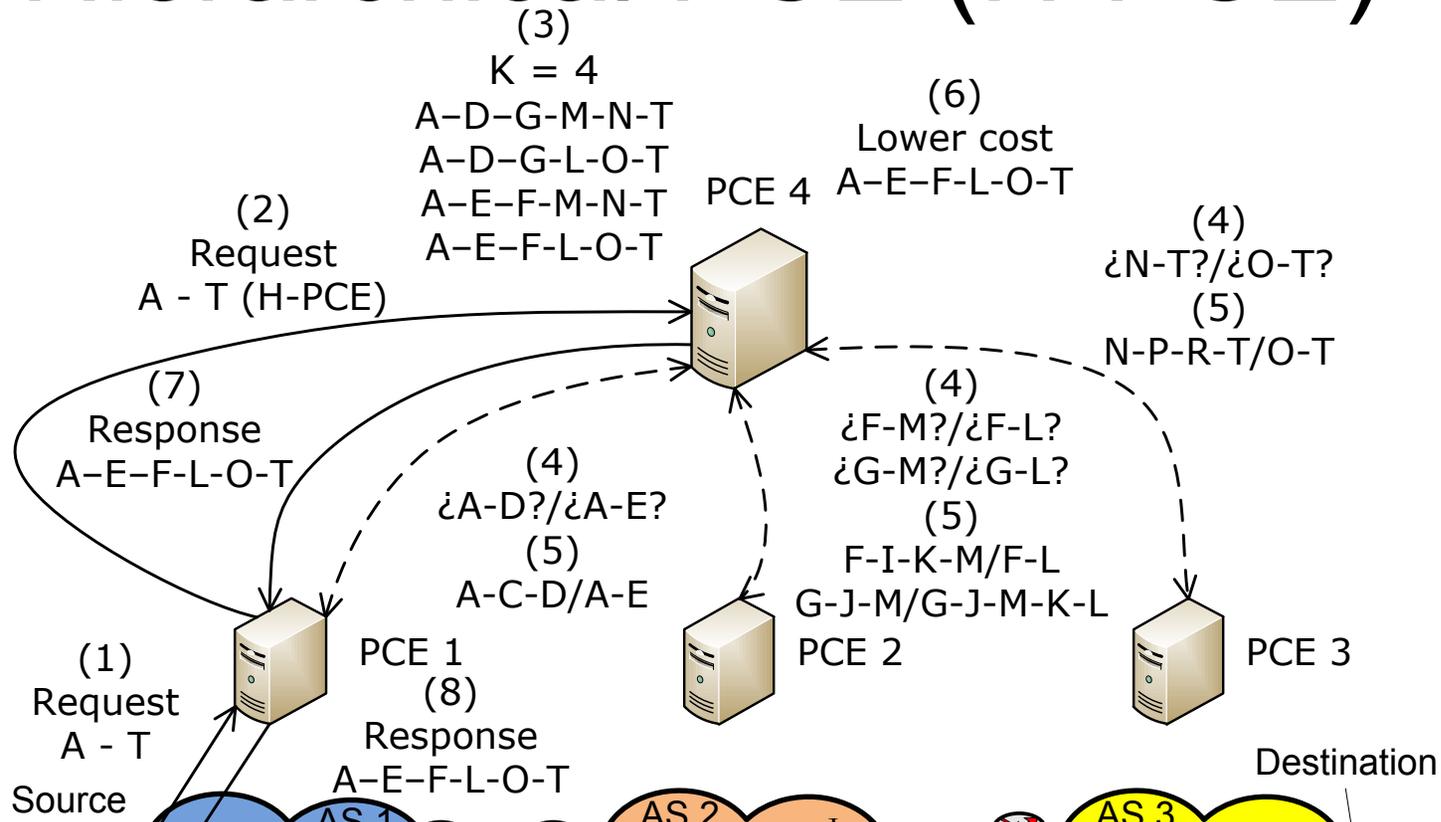
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Hierarchical PCE (H-PCE)

(3)
K = 4
A–D–G-M-N-T
A–D–G-L-O-T
A–E–F-M-N-T
A–E–F-L-O-T

(2)
Request
A - T (H-PCE)

(6)
Lower cost
A–E–F-L-O-T

PCE 4

(4)
¿N-T?/¿O-T?
(5)
N-P-R-T/O-T

(7)
Response
A–E–F-L-O-T

(4)
¿F-M?/¿F-L?
¿G-M?/¿G-L?
(5)
F-I-K-M/F-L
G-J-M/G-J-M-K-L

(4)
¿A-D?/¿A-E?
(5)
A-C-D/A-E

PCE 2

PCE 3

PCE 1
(8)
Response
A–E–F-L-O-T

(1)
Request
A - T

Destination

Source

AS 1

AS 2

AS 3

Problems:
- Solve the problem with the sequence domains.
- Domain sequence is computed with the topological information of the parent PCE.
- Better network resource utilization than BRPC or Per-Domain approaches.

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Motivation for the draft

- H-PCE Architecture (RFC6805)
  - Proposal to solve the multi-domain path computation by means of cooperation among different PCEs.
  - Solution draft for H-PCE (draft-ietf-pce-hierarchy-extensions-00)
    - Focus on computation procedures and PCEP protocol extensions.
- Unanswered Questions in the Path Computation Element Architecture (draft-ietf-pce-questions) presents the topology dissemination as an open issue.
- Procedure to build and populate the parent PCE Traffic Engineering Database (TED) is still an open issue.
- Goal of this draft
  - Analyse how topology dissemination mechanisms may be used to provide TE information between Parent and Child PCEs
- Not a goal of this draft
  - Solve the Internet via exposure of all internal domain topoloogies!

H-PCE Topology Dissemination Options

- What needs to be provided?
  - Inter-domain links
  - Edge-to-edge "virtual" TE links created out of (potential) LSPs

- How to provide?
  - Static configuration
  - Join an IGP instance
  - Via PCEP Notifications
  - Separate IGP instance
  - Northbound distribution of TE information (BGP-LS)

H-PCE with BGP-LS architecture
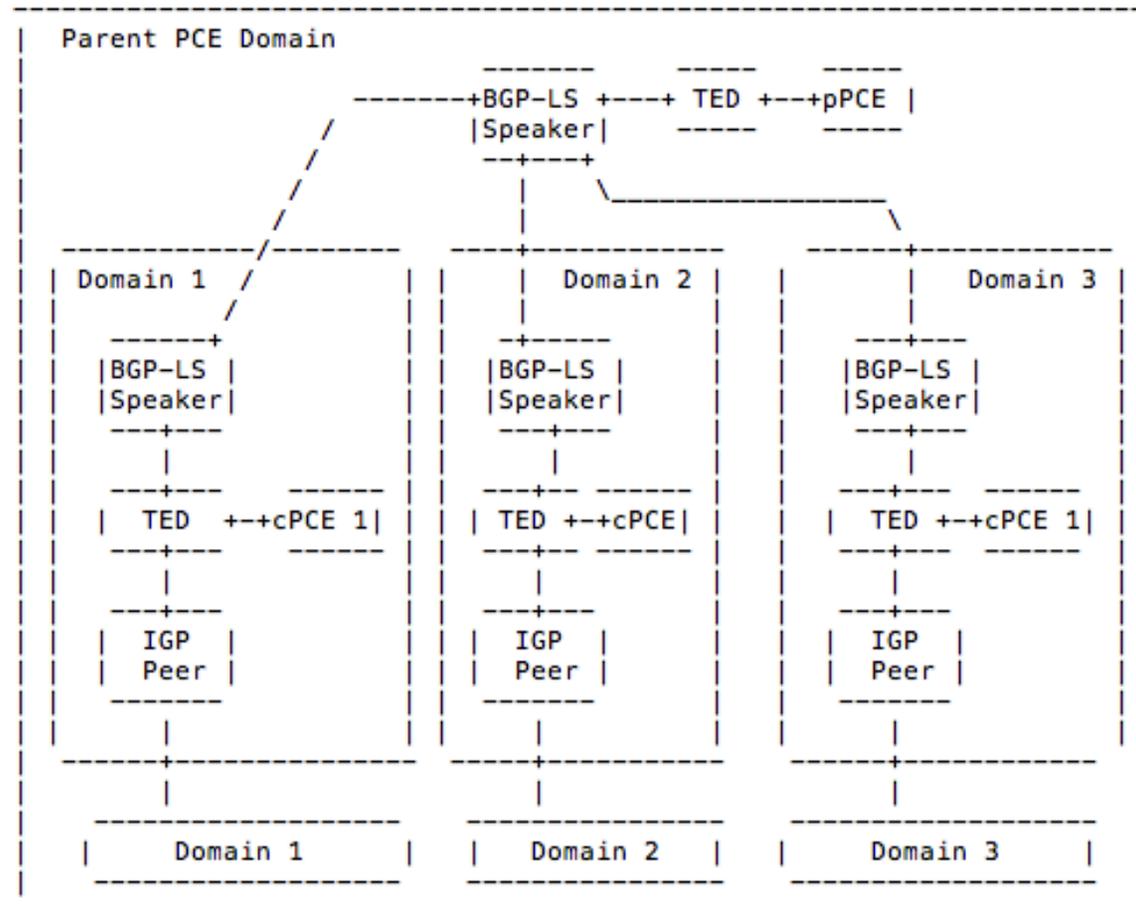
Open issues

- Is BGP-LS the way forward?
- Mapping of OSPF-TE / IS-IS-TE

Next Steps

– Continue to investigate and prototype

– Trigger discussion on which mechanisms should be used and why

- Application and scenario based?

- Scalability?

– Receive feedback