State Synchronization Between Stateful PCE

PCE WG, IETF109

draft-litkowski-pce-state-sync-09

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Draft Re-Cap

• Procedure for Inter-Stateful PCE sync up
  ➢ Making PCE deployments more resilient
  ➢ Solve computation loop/optimality issues for dependent path computations (for e.g. diversity)

• Key Concept:
  ➢ Initiate sync up PCEP sessions among stateful PCEs;
  ➢ Sync incremental LSP states during the session;
  ➢ Setting Primary/Secondary PCE for different responsibilities;

• Scenarios include:
  ➢ Redundant PCEs (backup or load-balance)
  ➢ Inter-domain PCEs / H-PCEs

• Discussed previously in IETF 105 with good support for adoption
Sync-up Example

State Sync Session

Latest LSP State (V=100)

V=100, ignored

State Sync Session

Latest LSP State (V=101)

V=101, ignored

V=101, ignored

State Sync Session

Latest LSP State (V=101)

V=101, ignored
Status & Next Step

• Editorial changes made to align with recent RFCs after IETF 105, especially terminologies;
• Added security consideration;
• Request WG adoption;
Extension For Stateful PCE to allow Optional Processing of PCEP Objects

PCE WG, IETF109

draft-dhody-pce-stateful-pce-optional-07

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Draft Summary and Changes

• Clarified how the P and I flag usage:
  – Identify the optional objects;
  – Applicable to PCRpt/PCUpd/PCInitiate message;

• Updated the handling of unknown objects based on these flags!

• Described the processing rule in the delegation mode;
Background

- RFC 5440 has specified P and I flags
  - P flag for: must Processing or optional
  - I flag for: whether to Ignore for optional;
- RFC 8231 has specified the stateful PCE
  - The P and I flags of the PCEP objects defined in the current document MUST be set to 0 on transmission and SHOULD be ignored on receipt since they are exclusively related to path computation requests.
  - The behavior for P and I flag in OTHER objects was not specified.

![Figure 8: PCEP Common Object Header](image-url)
P/I Flag Usage

• **P Flag**
  - Indicate whether the object is mandatory (1) or just optional (0);
  - Indicated by PCE in PCUpd/PCInitiate, and by PCC in PCRpt;
  - P=1, means the object MUST be taken into account;
  - P=0, means PCC can be free to ignore;

• **I Flag**
  - PCUpd, whether (1) or not (0) an optional object was processed, indicated by PCE;
  - PCRpt, whether (1) or not (0) an optional object was processed, indicated by PCC;
  - Meaningless in PCInitiate;
Processing of Unknown Objects

• Checking P flag and process as follow:

- **P flag set?**
  - **N**
    - PCEP Speaker is free to ignore the objects
  - **Y**
    - Unknown Objects?
      - **N**
        - Normal Processing
      - **Y**
        - PCEP must be rejected with ERROR message (PCErr);

• LSP Error Code TLV defined in RFC8231 is used here.
Status & Next Step

• Problem statement confirmed on the list;
  – To be useful;
• Editorial changes made to align with recent RFCs after IETF 105;
• Request WG adoption.
Conveying Vendor-Specific Information in PCEP extensions for Stateful PCE

PCE WG, IETF109

draft-dhody-pce-stateful-pce-vendor-11

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Draft Re-Cap

• A Continuation of RFC7150/7470 about the vendor-specific information;
  – This I-D works on the stateful PCEP, i.e., the vendor information in PCRep, PCUpd and PCInitiate;

• Presented in IETF 105 with good support;
RBNF for Stateful PCEP Messages

<PCRpt Message> ::= <Common Header>  
    <state-report-list>  

Where:

<state-report-list> ::= <state-report>[<state-report-list>]  

<state-report> ::= [SRP]  
    <LSP>  
    <path>  
    [<vendor-info-list>]  

Where:

[vendor-info-list] ::= <VENDOR-INFORMATION>  
    [<vendor-info-list>]  

<path> is defined in [RFC8231].

<PCInitiate Message> ::= <Common Header>  
    <PCE-initiated-lsp-list>  

Where:

<PCE-initiated-lsp-list> ::= <PCE-initiated-lsp-request>  
    [<PCE-initiated-lsp-list>]  

<PCE-initiated-lsp-request> ::=  
    (PCE-initiated-lsp-instantiation> |  
    <PCE-initiated-lsp-deletion>)  

<PCE-initiated-lsp-instantiation> ::= <SRP>  
    <LSP>  
    [<END-POINTS>]  
    <ERO>  
    [<attribute-list>  
    [<vendor-info-list>]>  

Where:

<vendor-info-list> ::= <VENDOR-INFORMATION>  
    [<vendor-info-list>]  

<PCE-initiated-lsp-deletion> and <attribute-list> is as per [RFC8281].
Changes & Next Step

- Editorial changes made to align with recent RFCs after IETF 105;
- Added the implementation case (from Cisco);
  - Two more co-authors joined;
- Request WG adoption.
THANK YOU!