

# A YANG Data Model for PCEP

draft-pkd-pce-pcep-yang-06

<https://github.com/dhruvdhody-huawei/pcep-yang>

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# Introduction

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## Yang Data Model

Management of  
PCEP speakers

Configurations

State

PCEP as per RFC  
5440

Aligned to PCEP MIB

Extensions

Stateful PCE, SR, SVEC,  
OF, GCO, P2MP...

# Recent Changes

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- Adding reference to the LSP state in the TE model
- PCE-Initiated LSP
- Segment Routing (SR)
- Authentication
- Association

# LSP State

```
+--ro pcep-state
  +--ro entity
    ...
    +--ro lsp-db {stateful}?
      | +--ro association-list* [id source global-source extended-id]
        ...
      | +--ro lsp* [plsp-id pcc-id]
        | +--ro plsp-id          uint32
        | +--ro pcc-id          inet:ip-address
        | +--ro lsp-ref
        | | +--ro source?       -> /te:te/lsp-state/lsp/source
        | | +--ro destination?  -> /te:te/lsp-state/lsp/destination
        | | +--ro tunnel-id?     -> /te:te/lsp-state/lsp/tunnel-id
        | | +--ro lsp-id?        -> /te:te/lsp-state/lsp/lsp-id
        | | +--ro extended-tunnel-id? -> /te:te/lsp-state/lsp/extended-tunnel-id
        | | +--ro type?          -> /te:te/lsp-state/lsp/type
```

As discussed during the last meeting, a reference to the 'lsp-state' in TE model is added.

PCEP-Yang has only PCEP specific state.

All other state is in the TE model.

# PCE-Initiated LSP

```
module: ietf-pcep
  +--rw pcep!
  |   +--rw entity
  |       ...
  |   +--rw capability
  |       ...
  |   |   +--rw stateful {stateful}?
  |   |   |   +--rw enabled?          boolean
  |   |   |   +--rw active?          boolean
  |   |   |   +--rw pce-initiated?   boolean {pce-initiated}?
  |   * also added at -
  |     - the remote peer configurations
  |     - the pcep state of local entity and remote peers
```

- The PCE-Initiation capability at the local entity and the remote peer
  - Configurations
  - State

- Flag in the lsp-state, reference to PCE that initiated (if-known)
- PCinitiate message statistics

```
+--ro pcep-state
  +--ro entity
  |   ...
  |   +--ro lsp-db {stateful}?
  |   |   +--ro lsp* [plsp-id pcc-id]
  |   |       ...
  |   |   +--ro initiation {pce-initiated}?
  |   |   |   +--ro enabled?          boolean
  |   |   |   +--ro pce?              -> /pcep-state/entity/peers/peer/addr
  |   |   |   ...
  |   +--ro peers
  |       ...
  |       +--ro pcep-stats
  |       |   +--ro stateful {stateful}?
  |       |       ...
  |       |   +--ro initiation {pce-initiated}?
  |       |   |   +--ro num-pcinitiate-sent?          yang:counter32
  |       |   |   +--ro num-pcinitiate-rcvd?         yang:counter32
  |       |   |   +--ro num-initiate-sent?           yang:counter32
  |       |   |   +--ro num-initiate-rcvd?           yang:counter32
  |       |   |   +--ro num-initiate-rcvd-error-sent? yang:counter32
  |       * also added at -
  |         - the session statistics
```

# Segment Routing (SR)

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```
module: ietf-pcep
+--rw pcep!
|  +--rw entity
|      ...
|      +--rw capability
|          ...
|          |  +--rw sr {sr}?
|          |      +--rw enabled?   boolean
|          |      +--rw msd?       uint8
|
* also added at -
  - the remote peer configurations
  - the pcep state of local entity and remote peers
```

The SR capability at the local entity and the remote peer

- Configurations
- State

MSD

- Maximum SID Depth
- **Should be moved to the SR model**

No other change!

- Rest to be taken care by the TE models(?)

# Authentication

```
module: ietf-pcep
+--rw pcep!
| +--rw entity
|   ...
|   +--rw pce-info
|     ...
|     +--rw (auth-type-selection)?
|       +--:(auth-key-chain)
|         | +--rw key-chain?          key-chain:key-chain-ref
|         +--:(auth-key)
|           | +--rw key?              string
|           +--rw crypto-algorithm
|             +--rw (algorithm)?
|               +--:(hmac-sha-1-12) {crypto-hmac-sha-1-12}?
|                 | +--rw hmac-sha1-12?          empty
|                 +--:(aes-cmac-prf-128) {aes-cmac-prf-128}?
|                   | +--rw aes-cmac-prf-128?    empty
|                   +--:(md5)
|                     | +--rw md5?              empty
|                     +--:(sha-1)
|                       | +--rw sha-1?          empty
|                       +--:(hmac-sha-1)
|                         | +--rw hmac-sha-1?    empty
|                         +--:(hmac-sha-256)
|                           | +--rw hmac-sha-256? empty
|                           +--:(hmac-sha-384)
|                             | +--rw hmac-sha-384? empty
|                             +--:(hmac-sha-512)
|                               | +--rw hmac-sha-512? empty
|                               +--:(clear-text) {clear-text}?
|                                 | +--rw clear-text?    empty
|                                 +--:(replay-protection-only) {replay-protection-only}?
|                                   +--rw replay-protection-only? empty
|               +--:(auth-tls) {tls}?
|                 +--rw tls
```

## Key and Key-chain

- Support for key-chain
- Support for key
  - Including MD5
- As per the key-chain yang model

## TLS

## Pending

- TLS parameters
- TCP-AO

# Associations

```
module: ietf-pcep
  +--ro pcep-state
    +--ro entity
      ...
      +--ro lsp-db {stateful}?
        | +--ro association-list* [id source global-source extended-id]
        | | +--ro type?          assoc-type
        | | +--ro id             uint16
        | | +--ro source         inet:ip-address
        | | +--ro global-source  uint32
        | | +--ro extended-id   string
        | | +--ro lsp* [plsp-id pcc-id]
        | |   +--ro plsp-id     -> /pcep-state/entity/lsp-db/lsp/plsp-id
        | |   +--ro pcc-id     -> /pcep-state/entity/lsp-db/lsp/pcc-id
        | +--ro lsp* [plsp-id pcc-id]
        ...
        +--ro association-list* [id source global-source extended-id]
        | +--ro id             -> /pcep-state/entity/lsp-db/association-list/id
        | +--ro source         -> /pcep-state/entity/lsp-db/association-list/source
        | +--ro global-source  -> /pcep-state/entity/lsp-db/association-list/global-source
        | +--ro extended-id   -> /pcep-state/entity/lsp-db/association-list/extended-id
```

For each association

- list of all the LSPs

For each LSP

- list of all the associations it belongs to



# Requirement to the TE model

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TE  
Yang  
model

Mark tunnels to be delegated during configuration at the device

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Mark tunnels as PCE-initiated tunnels during configuration at the controller

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# Next Steps

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Fix some of the pending item in the existing features

Yang Model rearrangement based on the discussion in netmod (?)

WG Adoption – request chairs to poll...

Thank You!