

Yang Model for PCEP

draft-pkd-pce-pcep-yang-03

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Introduction

A YANG data model
for the management
of PCEP

- Includes configuration data
and operational state

Base PCEP
specification as per
RFC 5440 and some
extensions

Changes in this version



This update adds stateful PCE -

- Configuration of capability and timers
- Configuration of delegation preference per peer
- LSP-DB operational state with PCEP specific attributes
 - Generic TE attributes pending!
- Statistics



Made following changes -

- Use of features for svec, stateful etc
- Single PCEP Entity instead of Entity-List
- Regrouping of PCE information
 - Information applicable to PCE only – Path Computation Scope, Neighboring PCE domains
 - Information applicable for both PCC/PCE – Local Domains and capabilities

Stateful PCE

```
module: ietf-pcep
+--rw pcep
| +--rw entity
| | +--rw capability
| | | +--rw stateful {stateful}?
| | | | +--rw enabled?          boolean
| | | | +--rw active?          boolean
| | | | +--rw pce-initiated?   boolean
| +--rw stateful-timer {stateful}?
| | +--rw state-timeout?      uint32
| | +--rw redelegation-timeout? uint32
| | +--rw rpt-non-pcep-lsp?   boolean
+--rw peers
| +--rw peer* [addr]
| | +--rw capability
| | | +--rw stateful {stateful}?
| | | | +--rw enabled?          boolean
| | | | +--rw active?          boolean
| | | | +--rw pce-initiated?   boolean
| +--rw delegation-pref?    uint8 {stateful}?
```

Capability configurations for local and remote peer

Stateful PCE timer configurations

Whether the PCC will advertise LSP that are not controlled by any PCE

Delegation preference for each configured peer

Stateful PCE

```
+--ro pcep-state
  +--ro entity
    +--ro capability
      | +--ro stateful {stateful}?
      |   +--ro enabled?          boolean
      |   +--ro active?           boolean
      |   +--ro pce-initiated?    boolean
    +--ro stateful-timer {stateful}?
      | +--ro state-timeout?      uint32
      | +--ro redelegation-timeout? uint32
    +--ro lsp-db {stateful}?
      | +--ro lsp* [plsp-id pcc-id]
      |   +--ro plsp-id           uint32
      |   +--ro pcc-id            inet:ip-address
      |   +--ro admin-state?      boolean
      |   +--ro operational-state? operational-state
      |   +--ro delegated
      |   | +--ro enabled?        boolean
      |   | +--ro pce?            leafref
      |   | +--ro srp-id?         uint32
      |   +--ro symbolic-path-name? string
      |   +--ro last-error?       lsp-error
    +--ro peers
      +--ro peer* [addr]
        +--ro capability
          | +--ro stateful {stateful}?
          |   +--ro enabled?        boolean
          |   +--ro active?          boolean
          |   +--ro pce-initiated?    boolean
        +--ro delegation-pref?      uint8 {stateful}?
```

Operational
State

- Capability for local and remote peer
- Timers etc

LSP-DB

- PCEP specific parameters
 - PLSP-ID, symbolic path name etc
- Generic TE attributes are pending

Stateful PCE

```
+--ro stateful {stateful}?
|  +--ro num-pcrpt-sent?          yang:counter32
|  +--ro num-pcrpt-rcvd?         yang:counter32
|  +--ro num-pcupd-sent?         yang:counter32
|  +--ro num-pcupd-rcvd?        yang:counter32
|  +--ro num-rpt-sent?           yang:counter32
|  +--ro num-rpt-rcvd?          yang:counter32
|  +--ro num-rpt-rcvd-error-sent? yang:counter32
|  +--ro num-upd-sent?           yang:counter32
|  +--ro num-upd-rcvd?          yang:counter32
|  +--ro num-upd-rcvd-unknown?   yang:counter32
|  +--ro num-upd-rcvd-undelgated? yang:counter32
|  +--ro num-upd-rcvd-error-sent? yang:counter32
+--ro sessions
  +--ro session* [initiator]
    +--ro stateful {stateful}?
      +--ro num-pcrpt-sent?          yang:counter32
      +--ro num-pcrpt-rcvd?         yang:counter32
      +--ro num-pcupd-sent?         yang:counter32
      +--ro num-pcupd-rcvd?        yang:counter32
      +--ro num-rpt-sent?           yang:counter32
      +--ro num-rpt-rcvd?          yang:counter32
      +--ro num-rpt-rcvd-error-sent? yang:counter32
      +--ro num-upd-sent?           yang:counter32
      +--ro num-upd-rcvd?          yang:counter32
      +--ro num-upd-rcvd-unknown?   yang:counter32
      +--ro num-upd-rcvd-undelgated? yang:counter32
      +--ro num-upd-rcvd-error-sent? yang:counter32
```

Statistics related to stateful PCEP operations

Regrouping of PCE Information

```

+--rw domain
|  +--rw domain* [domain-type domain]
|    +--rw domain-type  domain-type
|    +--rw domain        domain
+--rw capability
|  +--rw gmpls?          boolean {gmpls}?
|  +--rw bi-dir?         boolean
|  +--rw diverse?        boolean
|  +--rw load-balance?   boolean
|  +--rw synchronize?    boolean {svec}?
|  +--rw objective-function? boolean {obj-fn}?
|  +--rw add-path-constraint? boolean
|  +--rw prioritization? boolean
|  +--rw multi-request?  boolean
|  +--rw gco?            boolean {gco}?
|  +--rw p2mp?           boolean {p2mp}?
|  +--rw stateful {stateful}?
|    +--rw enabled?      boolean
|    +--rw active?       boolean
|    +--rw pce-initiated? boolean

+--rw pce-info
|  +--rw scope
|    +--rw intra-area-scope?    boolean
|    +--rw intra-area-pref?     uint8
|    +--rw inter-area-scope?    boolean
|    +--rw inter-area-scope-default? boolean
|    +--rw inter-area-pref?     uint8
|    +--rw inter-as-scope?      boolean
|    +--rw inter-as-scope-default? boolean
|    +--rw inter-as-pref?       uint8
|    +--rw inter-layer-scope?   boolean
|    +--rw inter-layer-pref?    uint8
|  +--rw neigh-domains
|    +--rw domain* [domain-type domain]
|      +--rw domain-type  domain-type
|      +--rw domain        domain

```

Local Domain and capability applicable for both PCC and PCE.
Where as Path computation scope and neighbor PCE domain only
for PCE!

Open Issue

Relationship with TE yang model - *How to reuse generic TE LSP attributes in PCEP LSP-DB?*



Use of groupings

Request TE yang model to provide generic LSP attributes grouping that could be reused here...

Use of augmentation

But TE yang model is according to the LSR; using it as external PCE server could be an issue?

Next Steps

Call for reviews and collaborations?

Resolve the LSP-DB and TE issue

Improve Yang

- Add when statements for statistics based on PCEP role

Request WG adoption

- A good base for WG to work on...

Thanks!