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Path Computation Element Communication Protocol (PCEP)
Management Information Base (MIB) Module

Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes managed objects for modeling of the Path Computation Element Communication Protocol (PCEP) for communications between a Path Computation Client (PCC) and a Path Computation Element (PCE), or between two PCEs.

Status of This Memo

This is an Internet Standards Track document.

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1. Introduction

The PCE defined in [RFC4655] is an entity that is capable of computing a network path or route based on a network graph and applying computational constraints. A PCC may make requests to a PCE for paths to be computed.

PCEP is the communication protocol between a PCC and PCE and is defined in [RFC5440]. PCEP interactions include path computation requests and path computation replies as well as notifications of specific states related to the use of a PCE in the context of Multiprotocol Label Switching (MPLS) and Generalized MPLS (GMPLS) Traffic Engineering (TE).

This memo defines a portion of the MIB for use with network management protocols in the Internet community. In particular, it defines a MIB module that can be used to monitor PCEP interactions between a PCC and a PCE, or between two PCEs.

The scope of this document is to provide a MIB module for the PCEP base protocol defined in [RFC5440]. Extensions to the PCEP base protocol are beyond the scope for this document.

1.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY" and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119].

1.2. Terminology

This document uses the terminology defined in [RFC4655] and [RFC5440]. In particular, it uses the following acronyms.

- o Path Computation Request (PCReq) message.
- o Path Computation Reply (PCRep) message.
- o Notification (PCNtf) message.
- o Error (PCErr) message.
- o Request Parameter (RP) object.
- o Synchronization Vector (SVEC) object.
- o Explicit Route Object (ERO).

This document uses the term "PCEP entity" to refer to a local PCEP speaker, "peer" to refer to a remote PCEP speaker, and "PCEP speaker" where it is not necessary to distinguish between local and remote.

2. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to section 7 of RFC 3410 [RFC3410].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIV2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579], and STD 58, RFC 2580 [RFC2580].

3. PCEP MIB Module Architecture

The PCEP MIB module contains the following information:

- a. PCE and PCC local entity status (see pcePcepEntityTable).
- b. PCEP peer information (see pcePcepPeerTable).
- c. PCEP session information (see pcePcepSessTable).
- d. Notifications to indicate PCEP session changes.

The PCEP MIB module is limited to "read-only" access except for pcePcepNotificationsMaxRate, which is used to throttle the rate at which the implementation generates notifications.

3.1. pcePcepEntityTable

The PCEP MIB module may contain status information for multiple logical local PCEP entities. There are several scenarios in which there may be more than one local PCEP entity, including the following.

- o A physical router, which is partitioned into multiple virtual routers, each with its own PCC.
- o A PCE device that front ends a cluster of compute resources, each with a different set of capabilities that are accessed via different IP addresses.

The `pcePcepEntityTable` contains one row for each local PCEP entity. Each row is read-only and contains current status information, plus the PCEP entity's running configuration.

The `pcePcepEntityTable` is indexed by `pcePcepEntityIndex`, which also acts as the primary index for the other tables in this MIB module.

3.2. `pcePcepPeerTable`

The `pcePcepPeerTable` contains one row for each peer that the local PCEP entity knows about. Each row is read-only and contains information to identify the peer, the running configuration relating to that peer, and statistics that track the messages exchanged with that peer and its response times.

A PCEP speaker is identified by its IP address. If there is a PCEP speaker in the network that uses multiple IP addresses, then it looks like multiple distinct peers to the other PCEP speakers in the network.

The `pcePcepPeerTable` is indexed first by `pcePcepEntityIndex`, then by `pcePcepPeerAddrType` and `pcePcepPeerAddr`. This indexing structure allows each local PCEP entity to report its own set of peers.

Since PCEP sessions can be ephemeral, `pcePcepPeerTable` tracks a peer even when no PCEP session currently exists to that peer. The statistics contained in `pcePcepPeerTable` are an aggregate of the statistics for all successive sessions to that peer.

To limit the quantity of information that is stored, an implementation MAY choose to discard a row from `pcePcepPeerTable` if and only if no PCEP session exists to the corresponding peer.

3.3. `pcePcepSessTable`

The `pcePcepSessTable` contains one row for each PCEP session that the PCEP entity (PCE or PCC) is currently participating in. Each row is read-only and contains the running configuration that is applied to the session, plus identifiers and statistics for the session.

The statistics in `pcePcepSessTable` are semantically different from those in `pcePcepPeerTable` since the former applies to the current session only, whereas the latter is the aggregate for all sessions that have existed to that peer.

Although it is forbidden per [RFC5440] to have more than one active PCEP session between a given pair of PCEP entities at any one time, there is a window during session establishment where the

pcePcepSessTable may contain two rows for a given peer, one representing a session initiated by the local PCEP entity and one representing a session initiated by the peer. If either of these sessions reaches an active state, then the other is discarded.

The pcePcepSessTable is indexed first by pcePcepEntityIndex, then by pcePcepPeerAddrType and pcePcepPeerAddr, and finally by pcePcepSessInitiator. This indexing structure allows each local PCEP entity to report its own set of active sessions. The pcePcepSessInitiator index allows two rows to exist transiently for a given peer, as discussed above.

3.4. PCEP Notifications

The PCEP MIB module contains notifications for the following conditions.

- a. pcePcepSessUp: PCEP session has gone up.
- b. pcePcepSessDown: PCEP session has gone down.
- c. pcePcepSessLocalOverload: Local PCEP entity has sent an overload PCNTf on this session.
- d. pcePcepSessLocalOverloadClear: Local PCEP entity has sent an overload-cleared PCNTf on this session.
- e. pcePcepSessPeerOverload: Peer has sent an overload PCNTf on this session.
- f. pcePcepSessPeerOverloadClear: Peer has sent an overload-cleared PCNTf on this session.

3.5. Relationship to Other MIB Modules

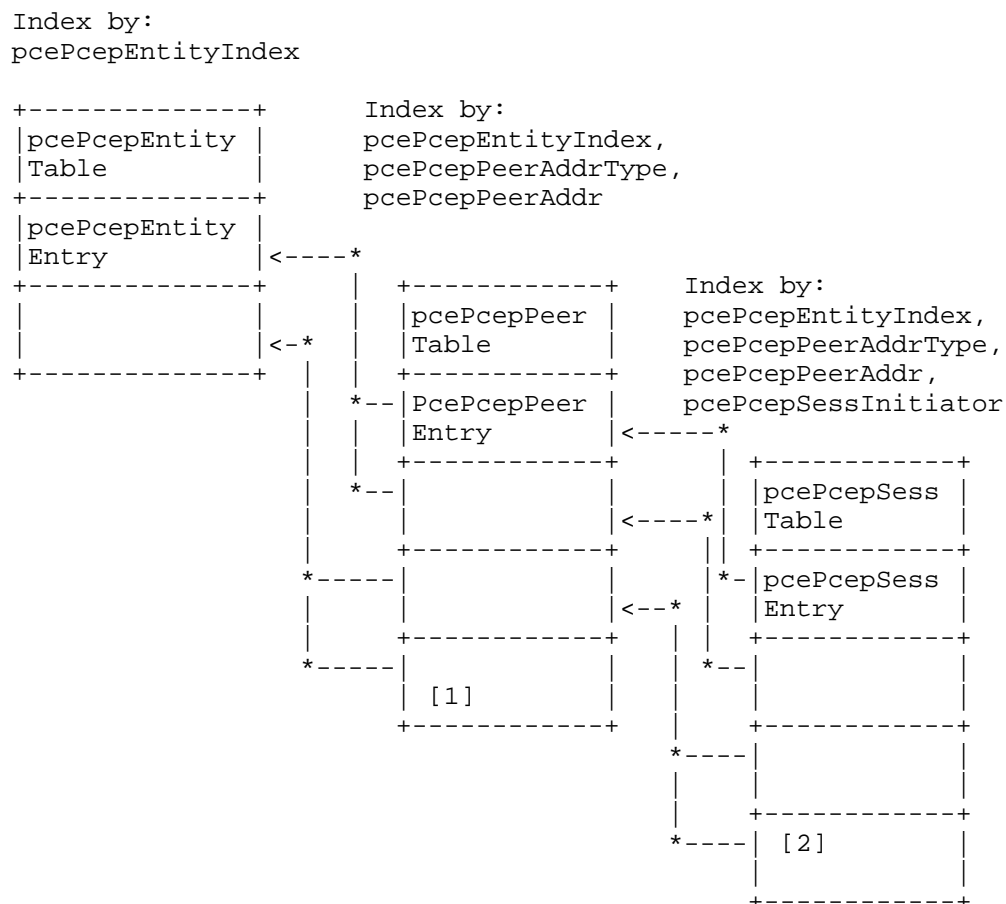
The PCEP MIB module imports the following textual conventions from the INET-ADDRESS-MIB defined in RFC 4001 [RFC4001]:

- o InetAddressType
- o InetAddress

PCEP relies on existing protocols that have specialized MIB objects to monitor their own activities. Consequently, this document considers that the monitoring of underlying protocols is out of scope of the PCEP MIB module.

3.6. Illustrative Example

The following diagram illustrates the relationships between pcepPcepEntityTable, pcepPcepPeerTable, and pcepPcepSessTable.



```
[1]: A peer entry with no current session.
```

```
[2]: Two sessions exist during a window in session
      initialization.
```

4. Object Definitions

4.1. PCE-PCEP-MIB

```
PCE-PCEP-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY,
    OBJECT-TYPE,
    mib-2,
    NOTIFICATION-TYPE,
    Unsigned32,
    Counter32
        FROM SNMPv2-SMI                -- RFC 2578
    TruthValue,
    TimeStamp
        FROM SNMPv2-TC                -- RFC 2579
    MODULE-COMPLIANCE,
    OBJECT-GROUP,
    NOTIFICATION-GROUP
        FROM SNMPv2-CONF              -- RFC 2580
    InetAddressType,
    InetAddress
        FROM INET-ADDRESS-MIB;        -- RFC 4001
```

```
pcePcepMIB MODULE-IDENTITY
```

```
    LAST-UPDATED
        "201412171200Z" -- 17 December 2014
    ORGANIZATION
        "IETF Path Computation Element (PCE) Working Group"
    CONTACT-INFO
        "Email: pce@ietf.org
         WG charter:
            http://datatracker.ietf.org/wg/pce/charter/"
```

```
DESCRIPTION
```

```
"This MIB module defines a collection of objects for managing
the Path Computation Element Communication Protocol (PCEP)."
```

```
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```

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```


REVISION

"201412171200Z" -- 17 December 2014

DESCRIPTION

"Initial version, published as RFC 7420."

::= { mib-2 227 }

```
pcePcepNotifications OBJECT IDENTIFIER ::= { pcePcepMIB 0 }
pcePcepObjects        OBJECT IDENTIFIER ::= { pcePcepMIB 1 }
pcePcepConformance    OBJECT IDENTIFIER ::= { pcePcepMIB 2 }
```

--

-- PCEP Entity Objects

--

pcePcepEntityTable OBJECT-TYPE

SYNTAX SEQUENCE OF PcePcepEntityEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains information about local PCEP entities.

The entries in this table are read-only."

::= { pcePcepObjects 1 }

pcePcepEntityEntry OBJECT-TYPE

SYNTAX PcePcepEntityEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This entry represents a local PCEP entity."

INDEX { pcePcepEntityIndex }

::= { pcePcepEntityTable 1 }

PcePcepEntityEntry ::= SEQUENCE {

pcePcepEntityIndex	Unsigned32,
pcePcepEntityAdminStatus	INTEGER,
pcePcepEntityOperStatus	INTEGER,
pcePcepEntityAddrType	InetAddressType,
pcePcepEntityAddr	InetAddress,
pcePcepEntityConnectTimer	Unsigned32,
pcePcepEntityConnectMaxRetry	Unsigned32,
pcePcepEntityInitBackoffTimer	Unsigned32,
pcePcepEntityMaxBackoffTimer	Unsigned32,
pcePcepEntityOpenWaitTimer	Unsigned32,
pcePcepEntityKeepWaitTimer	Unsigned32,
pcePcepEntityKeepAliveTimer	Unsigned32,
pcePcepEntityDeadTimer	Unsigned32,
pcePcepEntityAllowNegotiation	TruthValue,
pcePcepEntityMaxKeepAliveTimer	Unsigned32,

```

    pcePcepEntityMaxDeadTimer      Unsigned32,
    pcePcepEntityMinKeepAliveTimer Unsigned32,
    pcePcepEntityMinDeadTimer      Unsigned32,
    pcePcepEntitySyncTimer         Unsigned32,
    pcePcepEntityRequestTimer      Unsigned32,
    pcePcepEntityMaxSessions       Unsigned32,
    pcePcepEntityMaxUnknownReqs    Unsigned32,
    pcePcepEntityMaxUnknownMsgs    Unsigned32
}

pcePcepEntityIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This index is used to uniquely identify the PCEP entity."
    ::= { pcePcepEntityEntry 1 }

pcePcepEntityAdminStatus OBJECT-TYPE
    SYNTAX      INTEGER {
                    adminStatusUp(1),
                    adminStatusDown(2)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The administrative status of this PCEP entity.

        This is the desired operational status as currently set by
        an operator or by default in the implementation. The value
        of pcePcepEntityOperStatus represents the current status of
        an attempt to reach this desired status."
    ::= { pcePcepEntityEntry 2 }

pcePcepEntityOperStatus OBJECT-TYPE
    SYNTAX      INTEGER {
                    operStatusUp(1),
                    operStatusDown(2),
                    operStatusGoingUp(3),
                    operStatusGoingDown(4),
                    operStatusFailed(5),
                    operStatusFailedPerm(6)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The operational status of the PCEP entity. It takes one of
        the following values.
```

- operStatusUp(1): the PCEP entity is active.
- operStatusDown(2): the PCEP entity is inactive.
- operStatusGoingUp(3): the PCEP entity is activating.
- operStatusGoingDown(4): the PCEP entity is deactivating.
- operStatusFailed(5): the PCEP entity has failed and will recover when possible.
- operStatusFailedPerm(6): the PCEP entity has failed and will not recover without operator intervention."

```
::= { pcePcepEntityEntry 3 }
```

pcePcepEntityAddrType OBJECT-TYPE

```
SYNTAX      InetAddressType
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
```

"The type of the PCEP entity's Internet address. This object specifies how the value of the pcePcepEntityAddr object should be interpreted. Only values unknown(0), ipv4(1), or ipv6(2) are supported."

```
::= { pcePcepEntityEntry 4 }
```

pcePcepEntityAddr OBJECT-TYPE

```
SYNTAX      InetAddress
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
```

"The local Internet address of this PCEP entity. The type is given by pcePcepEntityAddrType.

If operating as a PCE server, the PCEP entity listens on this address. If operating as a PCC, the PCEP entity binds outgoing TCP connections to this address.

It is possible for the PCEP entity to operate both as a PCC and a PCE server, in which case it uses this address both to listen for incoming TCP connections and to bind outgoing TCP connections."

```
::= { pcePcepEntityEntry 5 }
```

pcePcepEntityConnectTimer OBJECT-TYPE

```
SYNTAX      Unsigned32 (1..65535)
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
```

DESCRIPTION

"The time that the PCEP entity will wait to establish a TCP connection with a peer. If a TCP connection is not established within this time, then PCEP aborts the session setup attempt."

::= { pcePcepEntityEntry 6 }

pcePcepEntityConnectMaxRetry OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum number of times the system tries to establish a TCP connection to a peer before the session with the peer transitions to the idle state.

When the session transitions to the idle state:

- pcePcepPeerSessionExists transitions to false(2).
- the associated PcePcepSessEntry is deleted.
- a backoff timer runs before the session is tried again."

::= { pcePcepEntityEntry 7 }

pcePcepEntityInitBackoffTimer OBJECT-TYPE

SYNTAX Unsigned32 (1..65535)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The initial backoff time for retrying a failed session setup attempt to a peer.

The backoff time increases for each failed session setup attempt, until a maximum backoff time is reached. The maximum backoff time is pcePcepEntityMaxBackoffTimer."

::= { pcePcepEntityEntry 8 }

pcePcepEntityMaxBackoffTimer OBJECT-TYPE

SYNTAX Unsigned32

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum backoff time for retrying a failed session setup attempt to a peer.

The backoff time increases for each failed session setup attempt, until this maximum value is reached. Session setup attempts then repeats periodically without any further increase in backoff time."

::= { pcePcepEntityEntry 9 }

pcePcepEntityOpenWaitTimer OBJECT-TYPE

SYNTAX Unsigned32 (1..65535)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time that the PCEP entity will wait to receive an Open message from a peer after the TCP connection has come up. If no Open message is received within this time, then PCEP terminates the TCP connection and deletes the associated PcePcepSessEntry."

::= { pcePcepEntityEntry 10 }

pcePcepEntityKeepWaitTimer OBJECT-TYPE

SYNTAX Unsigned32 (1..65535)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time that the PCEP entity will wait to receive a Keepalive or PCErr message from a peer during session initialization after receiving an Open message. If no Keepalive or PCErr message is received within this time, then PCEP terminates the TCP connection and deletes the associated PcePcepSessEntry."

::= { pcePcepEntityEntry 11 }

pcePcepEntityKeepAliveTimer OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The Keepalive transmission timer that this PCEP entity will propose in the initial OPEN message of each session it is involved in. This is the maximum time between two consecutive messages sent to a peer. Zero means that the PCEP entity prefers not to send Keepalives at all."

Note that the actual Keepalive transmission intervals, in either direction of an active PCEP session, are determined by negotiation between the peers as specified by RFC

5440, and so may differ from this configured value. For the actually negotiated values (per session), see pcePcepSessKeepaliveTimer and pcePcepSessPeerKeepaliveTimer."

::= { pcePcepEntityEntry 12 }

pcePcepEntityDeadTimer OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The DeadTimer that this PCEP entity will propose in the initial OPEN message of each session it is involved in. This is the time after which a peer should declare a session down if it does not receive any PCEP messages. Zero suggests that the peer does not run a DeadTimer at all."

::= { pcePcepEntityEntry 13 }

pcePcepEntityAllowNegotiation OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Whether the PCEP entity will permit negotiation of session parameters."

::= { pcePcepEntityEntry 14 }

pcePcepEntityMaxKeepAliveTimer OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"In PCEP session parameter negotiation, the maximum value that this PCEP entity will accept from a peer for the interval between Keepalive transmissions. Zero means that the PCEP entity will allow no Keepalive transmission at all."

::= { pcePcepEntityEntry 15 }

pcePcepEntityMaxDeadTimer OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"In PCEP session parameter negotiation, the maximum value that this PCEP entity will accept from a peer for the DeadTimer. Zero means that the PCEP entity will allow not running a DeadTimer."

::= { pcePcepEntityEntry 16 }

pcePcepEntityMinKeepAliveTimer OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"In PCEP session parameter negotiation, the minimum value that this PCEP entity will accept for the interval between Keepalive transmissions. Zero means that the PCEP entity insists on no Keepalive transmission at all."

::= { pcePcepEntityEntry 17 }

pcePcepEntityMinDeadTimer OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"In PCEP session parameter negotiation, the minimum value that this PCEP entity will accept for the DeadTimer. Zero means that the PCEP entity insists on not running a DeadTimer."

::= { pcePcepEntityEntry 18 }

pcePcepEntitySyncTimer OBJECT-TYPE

SYNTAX Unsigned32 (0..65535)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of SyncTimer is used in the case of a synchronized path computation request using the SVEC object.

Consider the case where a PCReq message is received by a PCE that contains the SVEC object referring to M synchronized path computation requests. If after the expiration of the SyncTimer all the M path computation requests have not been received, a protocol error is triggered and the PCE MUST cancel the whole set of path computation requests.

The aim of the SyncTimer is to avoid the storage of unused synchronized requests should one of them get lost for some reason (for example, a misbehaving PCC).

A value of zero is returned if and only if the entity does not use the SyncTimer."

::= { pcePcepEntityEntry 19 }

pcePcepEntityRequestTimer OBJECT-TYPE

SYNTAX Unsigned32 (1..65535)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum time that the PCEP entity will wait for a response to a PCReq message."

::= { pcePcepEntityEntry 20 }

pcePcepEntityMaxSessions OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum number of sessions involving this PCEP entity that can exist at any time."

::= { pcePcepEntityEntry 21 }

pcePcepEntityMaxUnknownReqs OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum number of unrecognized requests and replies that any session on this PCEP entity is willing to accept per minute before terminating the session.

A PCRep message contains an unrecognized reply if it contains an RP object whose request ID does not correspond to any in-progress request sent by this PCEP entity.

A PCReq message contains an unrecognized request if it contains an RP object whose request ID is zero."

::= { pcePcepEntityEntry 22 }

pcePcepEntityMaxUnknownMsgs OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum number of unknown messages that any session on this PCEP entity is willing to accept per minute before terminating the session."

::= { pcePcepEntityEntry 23 }

--

-- The PCEP Peer Table

--

pcePcepPeerTable OBJECT-TYPE

SYNTAX SEQUENCE OF PcePcepPeerEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains information about peers known by the local PCEP entity. The entries in this table are read-only.

This table gives peer information that spans PCEP sessions. Information about current PCEP sessions can be found in the pcePcepSessTable table."

::= { pcePcepObjects 2 }

pcePcepPeerEntry OBJECT-TYPE

SYNTAX PcePcepPeerEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Information about a single peer that spans all PCEP sessions to that peer."

INDEX { pcePcepEntityIndex,
pcePcepPeerAddrType,
pcePcepPeerAddr }

::= { pcePcepPeerTable 1 }

PcePcepPeerEntry ::= SEQUENCE {

pcePcepPeerAddrType	InetAddressType,
pcePcepPeerAddr	InetAddress,
pcePcepPeerRole	INTEGER,
pcePcepPeerDiscontinuityTime	TimeStamp,
pcePcepPeerInitiateSession	TruthValue,
pcePcepPeerSessionExists	TruthValue,
pcePcepPeerNumSessSetupOK	Counter32,
pcePcepPeerNumSessSetupFail	Counter32,
pcePcepPeerSessionUpTime	TimeStamp,
pcePcepPeerSessionFailTime	TimeStamp,
pcePcepPeerSessionFailUpTime	TimeStamp,

```

pcePcepPeerAvgRspTime      Unsigned32,
pcePcepPeerLWMRspTime      Unsigned32,
pcePcepPeerHWMRspTime      Unsigned32,
pcePcepPeerNumPCReqSent    Counter32,
pcePcepPeerNumPCReqRcvd    Counter32,
pcePcepPeerNumPCRepSent    Counter32,
pcePcepPeerNumPCRepRcvd    Counter32,
pcePcepPeerNumPCErrSent    Counter32,
pcePcepPeerNumPCErrRcvd    Counter32,
pcePcepPeerNumPCNtfSent     Counter32,
pcePcepPeerNumPCNtfRcvd     Counter32,
pcePcepPeerNumKeepaliveSent Counter32,
pcePcepPeerNumKeepaliveRcvd Counter32,
pcePcepPeerNumUnknownRcvd   Counter32,
pcePcepPeerNumCorruptRcvd   Counter32,
pcePcepPeerNumReqSent       Counter32,
pcePcepPeerNumSvecSent      Counter32,
pcePcepPeerNumSvecReqSent   Counter32,
pcePcepPeerNumReqSentPendRep Counter32,
pcePcepPeerNumReqSentEroRcvd Counter32,
pcePcepPeerNumReqSentNoPathRcvd Counter32,
pcePcepPeerNumReqSentCancelRcvd Counter32,
pcePcepPeerNumReqSentErrorRcvd Counter32,
pcePcepPeerNumReqSentTimeout Counter32,
pcePcepPeerNumReqSentCancelSent Counter32,
pcePcepPeerNumReqSentClosed Counter32,
pcePcepPeerNumReqRcvd       Counter32,
pcePcepPeerNumSvecRcvd      Counter32,
pcePcepPeerNumSvecReqRcvd   Counter32,
pcePcepPeerNumReqRcvdPendRep Counter32,
pcePcepPeerNumReqRcvdEroSent Counter32,
pcePcepPeerNumReqRcvdNoPathSent Counter32,
pcePcepPeerNumReqRcvdCancelSent Counter32,
pcePcepPeerNumReqRcvdErrorSent Counter32,
pcePcepPeerNumReqRcvdCancelRcvd Counter32,
pcePcepPeerNumReqRcvdClosed Counter32,
pcePcepPeerNumRepRcvdUnknown Counter32,
pcePcepPeerNumReqRcvdUnknown Counter32
}

```

```

pcePcepPeerAddrType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS   not-accessible
    STATUS      current

```

DESCRIPTION

"The type of the peer's Internet address. This object specifies how the value of the pcePcepPeerAddr object should be interpreted. Only values unknown(0), ipv4(1), or ipv6(2) are supported."

::= { pcePcepPeerEntry 1 }

pcePcepPeerAddr OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The Internet address of the peer. The type is given by pcePcepPeerAddrType."

::= { pcePcepPeerEntry 2 }

pcePcepPeerRole OBJECT-TYPE

SYNTAX INTEGER {
 unknown(0),
 pcc(1),
 pce(2),
 pccAndPce(3)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The role that this peer took the last time a session was established. It takes one of the following values.

- unknown(0): this peer's role is not known.
- pcc(1): this peer is a Path Computation Client (PCC).
- pce(2): this peer is a Path Computation Element (PCE).
- pccAndPce(3): this peer is both a PCC and a PCE."

::= { pcePcepPeerEntry 3 }

pcePcepPeerDiscontinuityTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of sysUpTime at the time that the information and statistics in this row were last reset."

::= { pcePcepPeerEntry 4 }

pcePcepPeerInitiateSession OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the local PCEP entity initiates sessions to this peer or waits for the peer to initiate a session."

::= { pcePcepPeerEntry 5 }

pcePcepPeerSessionExists OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether a session with this peer currently exists."

::= { pcePcepPeerEntry 6 }

pcePcepPeerNumSessSetupOK OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of PCEP sessions successfully established with the peer, including any current session. This counter is incremented each time a session with this peer is successfully established."

::= { pcePcepPeerEntry 7 }

pcePcepPeerNumSessSetupFail OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of PCEP sessions with the peer that have been attempted but failed before being fully established. This counter is incremented each time a session retry to this peer fails."

::= { pcePcepPeerEntry 8 }

pcePcepPeerSessionUpTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of sysUpTime the last time a session with this peer was successfully established."

If pcePcepPeerNumSessSetupOK is zero, then this object contains zero."

::= { pcePcepPeerEntry 9 }

pcePcepPeerSessionFailTime OBJECT-TYPE

SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The value of sysUpTime the last time a session with this peer failed to be established.

If pcePcepPeerNumSessSetupFail is zero, then this object contains zero."

::= { pcePcepPeerEntry 10 }

pcePcepPeerSessionFailUpTime OBJECT-TYPE

SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The value of sysUpTime the last time a session with this peer failed from active.

If pcePcepPeerNumSessSetupOK is zero, then this object contains zero."

::= { pcePcepPeerEntry 11 }

pcePcepPeerAvgRspTime OBJECT-TYPE

SYNTAX Unsigned32
UNITS "milliseconds"
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The average response time for this peer.

If an average response time has not been calculated for this peer, then this object has the value zero.

If pcePcepPeerRole is pcc, then this field is meaningless and is set to zero."

::= { pcePcepPeerEntry 12 }

pcePcepPeerLWMRspTime OBJECT-TYPE

SYNTAX Unsigned32
UNITS "milliseconds"
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The smallest (low-water mark) response time seen from this peer.

If no responses have been received from this peer, then this object has the value zero.

If pcePcepPeerRole is pcc, then this field is meaningless and is set to zero."

::= { pcePcepPeerEntry 13 }

pcePcepPeerHWMRspTime OBJECT-TYPE

SYNTAX Unsigned32

UNITS "milliseconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The greatest (high-water mark) response time seen from this peer.

If no responses have been received from this peer, then this object has the value zero.

If pcePcepPeerRole is pcc, then this field is meaningless and is set to zero."

::= { pcePcepPeerEntry 14 }

pcePcepPeerNumPCReqSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of PCReq messages sent to this peer."

::= { pcePcepPeerEntry 15 }

pcePcepPeerNumPCReqRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of PCReq messages received from this peer."

::= { pcePcepPeerEntry 16 }

pcePcepPeerNumPCRepSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of PCRep messages sent to this peer."

::= { pcePcepPeerEntry 17 }

```
pcePcepPeerNumPCRepRcvd OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The number of PCRep messages received from this peer."
    ::= { pcePcepPeerEntry 18 }

pcePcepPeerNumPCErrSent OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The number of PCErr messages sent to this peer."
    ::= { pcePcepPeerEntry 19 }

pcePcepPeerNumPCErrRcvd OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The number of PCErr messages received from this peer."
    ::= { pcePcepPeerEntry 20 }

pcePcepPeerNumPCNtfSent OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The number of PCNtf messages sent to this peer."
    ::= { pcePcepPeerEntry 21 }

pcePcepPeerNumPCNtfRcvd OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The number of PCNtf messages received from this peer."
    ::= { pcePcepPeerEntry 22 }

pcePcepPeerNumKeepaliveSent OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The number of Keepalive messages sent to this peer."
    ::= { pcePcepPeerEntry 23 }
```

pcePcepPeerNumKeepaliveRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of Keepalive messages received from this peer."

::= { pcePcepPeerEntry 24 }

pcePcepPeerNumUnknownRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of unknown messages received from this peer."

::= { pcePcepPeerEntry 25 }

pcePcepPeerNumCorruptRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of corrupted PCEP messages received from this peer."

::= { pcePcepPeerEntry 26 }

pcePcepPeerNumReqSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests sent to this peer. A request corresponds 1:1 with an RP object in a PCReq message."

This might be greater than pcePcepPeerNumPCReqSent because multiple requests can be batched into a single PCReq message."

::= { pcePcepPeerEntry 27 }

pcePcepPeerNumSvecSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of SVEC objects sent to this peer in PCReq messages. An SVEC object represents a set of synchronized requests."

::= { pcePcepPeerEntry 28 }

pcePcepPeerNumSvecReqSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests sent to this peer that appeared in one or more SVEC objects."

::= { pcePcepPeerEntry 29 }

pcePcepPeerNumReqSentPendRep OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that have been sent to this peer for which a response is still pending."

::= { pcePcepPeerEntry 30 }

pcePcepPeerNumReqSentEroRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that have been sent to this peer for which a response with an ERO was received. Such responses indicate that a path was successfully computed by the peer."

::= { pcePcepPeerEntry 31 }

pcePcepPeerNumReqSentNoPathRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that have been sent to this peer for which a response with a NO-PATH object was received. Such responses indicate that the peer could not find a path to satisfy the request."

::= { pcePcepPeerEntry 32 }

pcePcepPeerNumReqSentCancelRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that were canceled by the peer with a PCNtf message."

This might be different than pcePcepPeerNumPCNtfRcvd because not all PCNtf messages are used to cancel requests, and a single PCNtf message can cancel multiple requests."

```
::= { pcePcepPeerEntry 33 }
```

pcePcepPeerNumReqSentErrorRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that were rejected by the peer with a PCErr message.

This might be different than pcePcepPeerNumPCErrRcvd because not all PCErr messages are used to reject requests, and a single PCErr message can reject multiple requests."

```
::= { pcePcepPeerEntry 34 }
```

pcePcepPeerNumReqSentTimeout OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that have been sent to a peer and have been abandoned because the peer has taken too long to respond to them."

```
::= { pcePcepPeerEntry 35 }
```

pcePcepPeerNumReqSentCancelSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that were sent to the peer and explicitly canceled by the local PCEP entity sending a PCNtf."

```
::= { pcePcepPeerEntry 36 }
```

pcePcepPeerNumReqSentClosed OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that were sent to the peer and implicitly canceled when the session they were sent over was closed."

```
::= { pcePcepPeerEntry 37 }
```

pcePcepPeerNumReqRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests received from this peer. A request corresponds 1:1 with an RP object in a PCReq message.

This might be greater than pcePcepPeerNumPCReqRcvd because multiple requests can be batched into a single PCReq message."

::= { pcePcepPeerEntry 38 }

pcePcepPeerNumSvecRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of SVEC objects received from this peer in PCReq messages. An SVEC object represents a set of synchronized requests."

::= { pcePcepPeerEntry 39 }

pcePcepPeerNumSvecReqRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests received from this peer that appeared in one or more SVEC objects."

::= { pcePcepPeerEntry 40 }

pcePcepPeerNumReqRcvdPendRep OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that have been received from this peer for which a response is still pending."

::= { pcePcepPeerEntry 41 }

pcePcepPeerNumReqRcvdEroSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that have been received from this peer for which a response with an ERO was sent. Such responses indicate that a path was successfully computed by the local PCEP entity."

::= { pcePcepPeerEntry 42 }

pcePcepPeerNumReqRcvdNoPathSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that have been received from this peer for which a response with a NO-PATH object was sent. Such responses indicate that the local PCEP entity could not find a path to satisfy the request."

::= { pcePcepPeerEntry 43 }

pcePcepPeerNumReqRcvdCancelSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests received from this peer that were canceled by the local PCEP entity sending a PCNtf message.

This might be different than pcePcepPeerNumPCNtfSent because not all PCNtf messages are used to cancel requests, and a single PCNtf message can cancel multiple requests."

::= { pcePcepPeerEntry 44 }

pcePcepPeerNumReqRcvdErrorSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests received from this peer that were rejected by the local PCEP entity sending a PCErr message.

This might be different than pcePcepPeerNumPCErrSent because not all PCErr messages are used to reject requests, and a single PCErr message can reject multiple requests."

::= { pcePcepPeerEntry 45 }

pcePcepPeerNumReqRcvdCancelRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that were received from the peer and explicitly canceled by the peer sending a PCNtf."

::= { pcePcepPeerEntry 46 }

pcePcepPeerNumReqRcvdClosed OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that were received from the peer and implicitly canceled when the session they were received over was closed."

::= { pcePcepPeerEntry 47 }

pcePcepPeerNumRepRcvdUnknown OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of responses to unknown requests received from this peer. A response to an unknown request is a response whose RP object does not contain the request ID of any request that is currently outstanding on the session."

::= { pcePcepPeerEntry 48 }

pcePcepPeerNumReqRcvdUnknown OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of unknown requests that have been received from a peer. An unknown request is a request whose RP object contains a request ID of zero."

::= { pcePcepPeerEntry 49 }

--

-- The PCEP Sessions Table

--

pcePcepSessTable OBJECT-TYPE

SYNTAX SEQUENCE OF PcePcepSessEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table of PCEP sessions that involve the local PCEP entity. Each entry in this table represents a single session. The entries in this table are read-only."

An entry appears in this table when the corresponding PCEP session transitions out of idle state. If the PCEP session transitions back into an idle state, then the corresponding entry in this table is removed."

::= { pcePcepObjects 3 }

pcePcepSessEntry OBJECT-TYPE

SYNTAX PcePcepSessEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This entry represents a single PCEP session in which the local PCEP entity participates.

This entry exists only if the corresponding PCEP session has been initialized by some event, such as manual user configuration, auto-discovery of a peer, or an incoming TCP connection."

INDEX { pcePcepEntityIndex,
pcePcepPeerAddrType,
pcePcepPeerAddr,
pcePcepSessInitiator }

::= { pcePcepSessTable 1 }

PcePcepSessEntry ::= SEQUENCE {

pcePcepSessInitiator	INTEGER,
pcePcepSessStateLastChange	TimeStamp,
pcePcepSessState	INTEGER,
pcePcepSessConnectRetry	Counter32,
pcePcepSessLocalID	Unsigned32,
pcePcepSessRemoteID	Unsigned32,
pcePcepSessKeepaliveTimer	Unsigned32,
pcePcepSessPeerKeepaliveTimer	Unsigned32,
pcePcepSessDeadTimer	Unsigned32,
pcePcepSessPeerDeadTimer	Unsigned32,
pcePcepSessKAHoldTimeRem	Unsigned32,
pcePcepSessOverloaded	TruthValue,
pcePcepSessOverloadTime	Unsigned32,
pcePcepSessPeerOverloaded	TruthValue,
pcePcepSessPeerOverloadTime	Unsigned32,
pcePcepSessDiscontinuityTime	TimeStamp,
pcePcepSessAvgRspTime	Unsigned32,
pcePcepSessLWMRspTime	Unsigned32,
pcePcepSessHWMRspTime	Unsigned32,
pcePcepSessNumPCReqSent	Counter32,
pcePcepSessNumPCReqRcvd	Counter32,
pcePcepSessNumPCRepSent	Counter32,
pcePcepSessNumPCRepRcvd	Counter32,

```

pcePcepSessNumPCErrSent      Counter32,
pcePcepSessNumPCErrRcvd     Counter32,
pcePcepSessNumPCNtfSent     Counter32,
pcePcepSessNumPCNtfRcvd     Counter32,
pcePcepSessNumKeepaliveSent Counter32,
pcePcepSessNumKeepaliveRcvd Counter32,
pcePcepSessNumUnknownRcvd   Counter32,
pcePcepSessNumCorruptRcvd   Counter32,
pcePcepSessNumReqSent       Counter32,
pcePcepSessNumSvecSent      Counter32,
pcePcepSessNumSvecReqSent   Counter32,
pcePcepSessNumReqSentPendRep Counter32,
pcePcepSessNumReqSentEroRcvd Counter32,
pcePcepSessNumReqSentNoPathRcvd Counter32,
pcePcepSessNumReqSentCancelRcvd Counter32,
pcePcepSessNumReqSentErrorRcvd Counter32,
pcePcepSessNumReqSentTimeout Counter32,
pcePcepSessNumReqSentCancelSent Counter32,
pcePcepSessNumReqRcvd       Counter32,
pcePcepSessNumSvecRcvd      Counter32,
pcePcepSessNumSvecReqRcvd   Counter32,
pcePcepSessNumReqRcvdPendRep Counter32,
pcePcepSessNumReqRcvdEroSent Counter32,
pcePcepSessNumReqRcvdNoPathSent Counter32,
pcePcepSessNumReqRcvdCancelSent Counter32,
pcePcepSessNumReqRcvdErrorSent Counter32,
pcePcepSessNumReqRcvdCancelRcvd Counter32,
pcePcepSessNumRepRcvdUnknown Counter32,
pcePcepSessNumReqRcvdUnknown Counter32
}

```

pcePcepSessInitiator OBJECT-TYPE

```

SYNTAX      INTEGER {
                local(1),
                remote(2)
            }
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION

```

"The initiator of the session; that is, whether the TCP connection was initiated by the local PCEP entity or the peer.

There is a window during session initialization where two sessions can exist between a pair of PCEP speakers, each initiated by one of the speakers. One of these sessions is always discarded before it leaves OpenWait state. However, before it is discarded, two sessions to the given peer

appear transiently in this MIB module. The sessions are distinguished by who initiated them, and so this field is an index for pcePcepSessTable."

::= { pcePcepSessEntry 1 }

pcePcepSessStateLastChange OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of sysUpTime at the time this session entered its current state as denoted by the pcePcepSessState object."

::= { pcePcepSessEntry 2 }

pcePcepSessState OBJECT-TYPE

SYNTAX INTEGER {
tcpPending(1),
openWait(2),
keepWait(3),
sessionUp(4)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The current state of the session.

The set of possible states excludes the idle state since entries do not exist in this table in the idle state."

::= { pcePcepSessEntry 3 }

pcePcepSessConnectRetry OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of times that the local PCEP entity has attempted to establish a TCP connection for this session without success. The PCEP entity gives up when this reaches pcePcepEntityConnectMaxRetry."

::= { pcePcepSessEntry 4 }

pcePcepSessLocalID OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of the PCEP session ID used by the local PCEP entity in the Open message for this session."

If pcePcepSessState is tcpPending, then this is the session ID that will be used in the Open message. Otherwise, this is the session ID that was sent in the Open message."
 ::= { pcePcepSessEntry 5 }

pcePcepSessRemoteID OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of the PCEP session ID used by the peer in its Open message for this session.

If pcePcepSessState is tcpPending or openWait, then this field is not used and MUST be set to zero."

::= { pcePcepSessEntry 6 }

pcePcepSessKeepaliveTimer OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The agreed maximum interval at which the local PCEP entity transmits PCEP messages on this PCEP session. Zero means that the local PCEP entity never sends Keepalives on this session.

This field is used if and only if pcePcepSessState is sessionUp. Otherwise, it is not used and MUST be set to zero."

::= { pcePcepSessEntry 7 }

pcePcepSessPeerKeepaliveTimer OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The agreed maximum interval at which the peer transmits PCEP messages on this PCEP session. Zero means that the peer never sends Keepalives on this session.

This field is used if and only if pcePcepSessState is sessionUp. Otherwise, it is not used and MUST be set to zero."

::= { pcePcepSessEntry 8 }

pcePcepSessDeadTimer OBJECT-TYPE
SYNTAX Unsigned32 (0..255)
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The DeadTimer interval for this PCEP session."
::= { pcePcepSessEntry 9 }

pcePcepSessPeerDeadTimer OBJECT-TYPE
SYNTAX Unsigned32 (0..255)
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The peer's DeadTimer interval for this PCEP session."

If pcePcepSessState is tcpPending or openWait, then this
field is not used and MUST be set to zero."
::= { pcePcepSessEntry 10 }

pcePcepSessKAHoldTimeRem OBJECT-TYPE
SYNTAX Unsigned32 (0..255)
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The Keepalive hold time remaining for this session."

If pcePcepSessState is tcpPending or openWait, then this
field is not used and MUST be set to zero."
::= { pcePcepSessEntry 11 }

pcePcepSessOverloaded OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"If the local PCEP entity has informed the peer that it is
currently overloaded, then this is set to true. Otherwise,
it is set to false."
::= { pcePcepSessEntry 12 }

pcePcepSessOverloadTime OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The interval of time that is remaining until the local PCEP entity will cease to be overloaded on this session.

This field is only used if pcePcepSessOverloaded is set to true. Otherwise, it is not used and MUST be set to zero."

::= { pcePcepSessEntry 13 }

pcePcepSessPeerOverloaded OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"If the peer has informed the local PCEP entity that it is currently overloaded, then this is set to true. Otherwise, it is set to false."

::= { pcePcepSessEntry 14 }

pcePcepSessPeerOverloadTime OBJECT-TYPE

SYNTAX Unsigned32

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The interval of time that is remaining until the peer will cease to be overloaded. If it is not known how long the peer will stay in overloaded state, this field is set to zero.

This field is only used if pcePcepSessPeerOverloaded is set to true. Otherwise, it is not used and MUST be set to zero."

::= { pcePcepSessEntry 15 }

pcePcepSessDiscontinuityTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of sysUpTime at the time that the statistics in this row were last reset."

::= { pcePcepSessEntry 16 }

pcePcepSessAvgRspTime OBJECT-TYPE

SYNTAX Unsigned32

UNITS "milliseconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The average response time for this peer on this session.

If an average response time has not been calculated for this peer, then this object has the value zero."

::= { pcePcepSessEntry 17 }

pcePcepSessLWMRspTime OBJECT-TYPE

SYNTAX Unsigned32

UNITS "milliseconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The smallest (low-water mark) response time seen from this peer on this session.

If no responses have been received from this peer, then this object has the value zero."

::= { pcePcepSessEntry 18 }

pcePcepSessHWMRspTime OBJECT-TYPE

SYNTAX Unsigned32

UNITS "milliseconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The greatest (high-water mark) response time seen from this peer on this session.

If no responses have been received from this peer, then this object has the value zero."

::= { pcePcepSessEntry 19 }

pcePcepSessNumPCReqSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of PCReq messages sent on this session."

::= { pcePcepSessEntry 20 }

pcePcepSessNumPCReqRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of PCReq messages received on this session."

::= { pcePcepSessEntry 21 }

```
pcePcepSessNumPCRepSent OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The number of PCRep messages sent on this session."
    ::= { pcePcepSessEntry 22 }

pcePcepSessNumPCRepRcvd OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The number of PCRep messages received on this session."
    ::= { pcePcepSessEntry 23 }

pcePcepSessNumPCErrSent OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The number of PCErr messages sent on this session."
    ::= { pcePcepSessEntry 24 }

pcePcepSessNumPCErrRcvd OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The number of PCErr messages received on this session."
    ::= { pcePcepSessEntry 25 }

pcePcepSessNumPCNtfSent OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The number of PCNtf messages sent on this session."
    ::= { pcePcepSessEntry 26 }

pcePcepSessNumPCNtfRcvd OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The number of PCNtf messages received on this session."
    ::= { pcePcepSessEntry 27 }
```

pcePcepSessNumKeepaliveSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of Keepalive messages sent on this session."

::= { pcePcepSessEntry 28 }

pcePcepSessNumKeepaliveRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of Keepalive messages received on this session."

::= { pcePcepSessEntry 29 }

pcePcepSessNumUnknownRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of unknown messages received on this session."

::= { pcePcepSessEntry 30 }

pcePcepSessNumCorruptRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of corrupted PCEP messages received on this session."

::= { pcePcepSessEntry 31 }

pcePcepSessNumReqSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests sent on this session. A request corresponds 1:1 with an RP object in a PCReq message."

This might be greater than pcePcepSessNumPCReqSent because multiple requests can be batched into a single PCReq message."

::= { pcePcepSessEntry 32 }

pcePcepSessNumSvecSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of SVEC objects sent on this session in PCReq messages. An SVEC object represents a set of synchronized requests."

::= { pcePcepSessEntry 33 }

pcePcepSessNumSvecReqSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests sent on this session that appeared in one or more SVEC objects."

::= { pcePcepSessEntry 34 }

pcePcepSessNumReqSentPendRep OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that have been sent on this session for which a response is still pending."

::= { pcePcepSessEntry 35 }

pcePcepSessNumReqSentEroRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of successful responses received on this session. A response corresponds 1:1 with an RP object in a PCRep message. A successful response is a response for which an ERO was successfully computed."

::= { pcePcepSessEntry 36 }

pcePcepSessNumReqSentNoPathRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of unsuccessful responses received on this session. A response corresponds 1:1 with an RP object in a PCRep message. An unsuccessful response is a response with a NO-PATH object."

```
::= { pcePcepSessEntry 37 }
```

```
pcePcepSessNumReqSentCancelRcvd OBJECT-TYPE
```

```
SYNTAX Counter32
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"The number of requests sent on this session that were  
canceled by the peer with a PCNtf message."
```

```
This might be different than pcePcepSessNumPCNtfRcvd because  
not all PCNtf messages are used to cancel requests, and a  
single PCNtf message can cancel multiple requests."
```

```
::= { pcePcepSessEntry 38 }
```

```
pcePcepSessNumReqSentErrorRcvd OBJECT-TYPE
```

```
SYNTAX Counter32
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"The number of requests sent on this session that were  
rejected by the peer with a PCErr message."
```

```
This might be different than pcePcepSessNumPCErrRcvd because  
not all PCErr messages are used to reject requests, and a  
single PCErr message can reject multiple requests."
```

```
::= { pcePcepSessEntry 39 }
```

```
pcePcepSessNumReqSentTimeout OBJECT-TYPE
```

```
SYNTAX Counter32
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"The number of requests sent on this session that have been  
sent to a peer and have been abandoned because the peer has  
taken too long to respond to them."
```

```
::= { pcePcepSessEntry 40 }
```

```
pcePcepSessNumReqSentCancelSent OBJECT-TYPE
```

```
SYNTAX Counter32
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"The number of requests sent on this session that were sent  
to the peer and explicitly canceled by the local PCEP  
entity sending a PCNtf."
```

```
::= { pcePcepSessEntry 41 }
```


pcePcepSessNumReqRcvd OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The number of requests received on this session. A request corresponds 1:1 with an RP object in a PCReq message.

This might be greater than pcePcepSessNumPCReqRcvd because multiple requests can be batched into a single PCReq message."

::= { pcePcepSessEntry 42 }

pcePcepSessNumSvecRcvd OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The number of SVEC objects received on this session in PCReq messages. An SVEC object represents a set of synchronized requests."

::= { pcePcepSessEntry 43 }

pcePcepSessNumSvecReqRcvd OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The number of requests received on this session that appeared in one or more SVEC objects."

::= { pcePcepSessEntry 44 }

pcePcepSessNumReqRcvdPendRep OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The number of requests that have been received on this session for which a response is still pending."

::= { pcePcepSessEntry 45 }

pcePcepSessNumReqRcvdEroSent OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The number of successful responses sent on this session. A response corresponds 1:1 with an RP object in a PCRep

message. A successful response is a response for which an ERO was successfully computed."
 ::= { pcePcepSessEntry 46 }

pcePcepSessNumReqRcvdNoPathSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of unsuccessful responses sent on this session. A response corresponds 1:1 with an RP object in a PCEP message. An unsuccessful response is a response with a NO-PATH object."

::= { pcePcepSessEntry 47 }

pcePcepSessNumReqRcvdCancelSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests received on this session that were canceled by the local PCEP entity sending a PCNTf message."

This might be different than pcePcepSessNumPCNTfSent because not all PCNTf messages are used to cancel requests, and a single PCNTf message can cancel multiple requests."

::= { pcePcepSessEntry 48 }

pcePcepSessNumReqRcvdErrorSent OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests received on this session that were rejected by the local PCEP entity sending a PCErr message."

This might be different than pcePcepSessNumPCErrSent because not all PCErr messages are used to reject requests, and a single PCErr message can reject multiple requests."

::= { pcePcepSessEntry 49 }

pcePcepSessNumReqRcvdCancelRcvd OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of requests that were received on this session and explicitly canceled by the peer sending a PCNTf."

```
::= { pcePcepSessEntry 50 }
```

```
pcePcepSessNumRepRcvdUnknown OBJECT-TYPE
```

```
SYNTAX Counter32
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"The number of responses to unknown requests received on this
session. A response to an unknown request is a response
whose RP object does not contain the request ID of any
request that is currently outstanding on the session."
```

```
::= { pcePcepSessEntry 51 }
```

```
pcePcepSessNumReqRcvdUnknown OBJECT-TYPE
```

```
SYNTAX Counter32
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"The number of unknown requests that have been received on
this session. An unknown request is a request whose RP
object contains a request ID of zero."
```

```
::= { pcePcepSessEntry 52 }
```

```
---
```

```
--- Notifications Configuration
```

```
---
```

```
pcePcepNotificationsMaxRate OBJECT-TYPE
```

```
SYNTAX Unsigned32
```

```
MAX-ACCESS read-write
```

```
STATUS current
```

```
DESCRIPTION
```

```
"This variable indicates the maximum number of
notifications issued per second. If events occur
more rapidly, the implementation may simply fail to
emit these notifications during that period or may
queue them until an appropriate time. A value of zero
means no notifications are emitted and all should be
discarded (that is, not queued)."
```

```
::= { pcePcepObjects 4 }
```

```
---
```

```
--- Notifications
```

```
---
```

```
pcePcepSessUp NOTIFICATION-TYPE
```

```
OBJECTS {
    pcePcepSessState,
```

```
        pcePcepSessStateLastChange
    }
    STATUS      current
    DESCRIPTION
        "This notification is sent when the value of
        pcePcepSessState enters the sessionUp state."
    ::= { pcePcepNotifications 1 }

pcePcepSessDown NOTIFICATION-TYPE
    OBJECTS      {
        pcePcepSessState,
        pcePcepSessStateLastChange
    }
    STATUS      current
    DESCRIPTION
        "This notification is sent when the value of
        pcePcepSessState leaves the sessionUp state."
    ::= { pcePcepNotifications 2 }

pcePcepSessLocalOverload NOTIFICATION-TYPE
    OBJECTS      {
        pcePcepSessOverloaded,
        pcePcepSessOverloadTime
    }
    STATUS      current
    DESCRIPTION
        "This notification is sent when the local PCEP entity enters
        overload state for a peer."
    ::= { pcePcepNotifications 3 }

pcePcepSessLocalOverloadClear NOTIFICATION-TYPE
    OBJECTS      {
        pcePcepSessOverloaded
    }
    STATUS      current
    DESCRIPTION
        "This notification is sent when the local PCEP entity leaves
        overload state for a peer."
    ::= { pcePcepNotifications 4 }

pcePcepSessPeerOverload NOTIFICATION-TYPE
    OBJECTS      {
        pcePcepSessPeerOverloaded,
        pcePcepSessPeerOverloadTime
    }
    STATUS      current
```

```
DESCRIPTION
    "This notification is sent when a peer enters overload
    state."
    ::= { pcePcepNotifications 5 }

pcePcepSessPeerOverloadClear NOTIFICATION-TYPE
    OBJECTS      {
        pcePcepSessPeerOverloaded
    }
    STATUS      current
    DESCRIPTION
        "This notification is sent when a peer leaves overload
        state."
        ::= { pcePcepNotifications 6 }

--
-- Module Conformance Statement
--

pcePcepCompliances
    OBJECT IDENTIFIER ::= { pcePcepConformance 1 }

pcePcepGroups
    OBJECT IDENTIFIER ::= { pcePcepConformance 2 }

--
-- Read-Only Compliance
--

pcePcepModuleReadOnlyCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "The module is implemented with support for read-only. In
        other words, only monitoring is available by implementing
        this MODULE-COMPLIANCE."

    MODULE -- this module
        MANDATORY-GROUPS {
            pcePcepGeneralGroup,
            pcePcepNotificationsGroup
        }

    OBJECT      pcePcepEntityAddrType
    SYNTAX      InetAddressType { unknown(0), ipv4(1), ipv6(2) }
    DESCRIPTION "Only unknown(0), ipv4(1), and ipv6(2) support
        is required."
```

```
-- The following restriction is commented out because of a limitation
-- in SMIV2 which does not allow index objects to be restricted in
-- scope. Nevertheless, this object is intended to be restricted in
-- scope, as follows.
```

```
--
-- OBJECT      pcePcepPeerAddrType
-- SYNTAX      InetAddressType { unknown(0), ipv4(1), ipv6(2) }
-- DESCRIPTION "Only unknown(0), ipv4(1), and ipv6(2) support
--             is required."
```

```
 ::= { pcePcepCompliances 1 }
```

```
-- units of conformance
```

```
pcePcepGeneralGroup OBJECT-GROUP
    OBJECTS { pcePcepEntityAdminStatus,
              pcePcepEntityOperStatus,
              pcePcepEntityAddrType,
              pcePcepEntityAddr,
              pcePcepEntityConnectTimer,
              pcePcepEntityConnectMaxRetry,
              pcePcepEntityInitBackoffTimer,
              pcePcepEntityMaxBackoffTimer,
              pcePcepEntityOpenWaitTimer,
              pcePcepEntityKeepWaitTimer,
              pcePcepEntityKeepAliveTimer,
              pcePcepEntityDeadTimer,
              pcePcepEntityAllowNegotiation,
              pcePcepEntityMaxKeepAliveTimer,
              pcePcepEntityMaxDeadTimer,
              pcePcepEntityMinKeepAliveTimer,
              pcePcepEntityMinDeadTimer,
              pcePcepEntitySyncTimer,
              pcePcepEntityRequestTimer,
              pcePcepEntityMaxSessions,
              pcePcepEntityMaxUnknownReqs,
              pcePcepEntityMaxUnknownMsgs,
              pcePcepPeerRole,
              pcePcepPeerDiscontinuityTime,
              pcePcepPeerInitiateSession,
              pcePcepPeerSessionExists,
              pcePcepPeerNumSessSetupOK,
              pcePcepPeerNumSessSetupFail,
              pcePcepPeerSessionUpTime,
              pcePcepPeerSessionFailTime,
              pcePcepPeerSessionFailUpTime,
              pcePcepPeerAvgRspTime,
              pcePcepPeerLWMRspTime,
```

pcePcepPeerHWMRspTime,
pcePcepPeerNumPCReqSent,
pcePcepPeerNumPCReqRcvd,
pcePcepPeerNumPCRepSent,
pcePcepPeerNumPCRepRcvd,
pcePcepPeerNumPCErrSent,
pcePcepPeerNumPCErrRcvd,
pcePcepPeerNumPCNtfSent,
pcePcepPeerNumPCNtfRcvd,
pcePcepPeerNumKeepaliveSent,
pcePcepPeerNumKeepaliveRcvd,
pcePcepPeerNumUnknownRcvd,
pcePcepPeerNumCorruptRcvd,
pcePcepPeerNumReqSent,
pcePcepPeerNumSvecSent,
pcePcepPeerNumSvecReqSent,
pcePcepPeerNumReqSentPendRep,
pcePcepPeerNumReqSentEroRcvd,
pcePcepPeerNumReqSentNoPathRcvd,
pcePcepPeerNumReqSentCancelRcvd,
pcePcepPeerNumReqSentErrorRcvd,
pcePcepPeerNumReqSentTimeout,
pcePcepPeerNumReqSentCancelSent,
pcePcepPeerNumReqSentClosed,
pcePcepPeerNumReqRcvd,
pcePcepPeerNumSvecRcvd,
pcePcepPeerNumSvecReqRcvd,
pcePcepPeerNumReqRcvdPendRep,
pcePcepPeerNumReqRcvdEroSent,
pcePcepPeerNumReqRcvdNoPathSent,
pcePcepPeerNumReqRcvdCancelSent,
pcePcepPeerNumReqRcvdErrorSent,
pcePcepPeerNumReqRcvdCancelRcvd,
pcePcepPeerNumReqRcvdClosed,
pcePcepPeerNumRepRcvdUnknown,
pcePcepPeerNumReqRcvdUnknown,
pcePcepSessStateLastChange,
pcePcepSessState,
pcePcepSessConnectRetry,
pcePcepSessLocalID,
pcePcepSessRemoteID,
pcePcepSessKeepaliveTimer,
pcePcepSessPeerKeepaliveTimer,
pcePcepSessDeadTimer,
pcePcepSessPeerDeadTimer,
pcePcepSessKAHoldTimeRem,
pcePcepSessOverloaded,
pcePcepSessOverloadTime,

```

pcePcepSessPeerOverloaded,
pcePcepSessPeerOverloadTime,
pcePcepSessDiscontinuityTime,
pcePcepSessAvgRspTime,
pcePcepSessLWMRspTime,
pcePcepSessHWMRspTime,
pcePcepSessNumPCReqSent,
pcePcepSessNumPCReqRcvd,
pcePcepSessNumPCRepSent,
pcePcepSessNumPCRepRcvd,
pcePcepSessNumPCErrSent,
pcePcepSessNumPCErrRcvd,
pcePcepSessNumPCNtfSent,
pcePcepSessNumPCNtfRcvd,
pcePcepSessNumKeepaliveSent,
pcePcepSessNumKeepaliveRcvd,
pcePcepSessNumUnknownRcvd,
pcePcepSessNumCorruptRcvd,
pcePcepSessNumReqSent,
pcePcepSessNumSvecSent,
pcePcepSessNumSvecReqSent,
pcePcepSessNumReqSentPendRep,
pcePcepSessNumReqSentEroRcvd,
pcePcepSessNumReqSentNoPathRcvd,
pcePcepSessNumReqSentCancelRcvd,
pcePcepSessNumReqSentErrorRcvd,
pcePcepSessNumReqSentTimeout,
pcePcepSessNumReqSentCancelSent,
pcePcepSessNumReqRcvd,
pcePcepSessNumSvecRcvd,
pcePcepSessNumSvecReqRcvd,
pcePcepSessNumReqRcvdPendRep,
pcePcepSessNumReqRcvdEroSent,
pcePcepSessNumReqRcvdNoPathSent,
pcePcepSessNumReqRcvdCancelSent,
pcePcepSessNumReqRcvdErrorSent,
pcePcepSessNumReqRcvdCancelRcvd,
pcePcepSessNumRepRcvdUnknown,
pcePcepSessNumReqRcvdUnknown,
pcePcepNotificationsMaxRate
}
STATUS current
DESCRIPTION
    "Objects that apply to all PCEP MIB module implementations."
::= { pcePcepGroups 1 }

```



```
pcePcepNotificationsGroup NOTIFICATION-GROUP
  NOTIFICATIONS { pcePcepSessUp,
                  pcePcepSessDown,
                  pcePcepSessLocalOverload,
                  pcePcepSessLocalOverloadClear,
                  pcePcepSessPeerOverload,
                  pcePcepSessPeerOverloadClear
                }
  STATUS      current
  DESCRIPTION
    "The notifications for a PCEP MIB module implementation."
    ::= { pcePcepGroups 2 }

END
```

5. Security Considerations

The pcePcepNotificationsMaxRate object defined in this MIB module has a MAX-ACCESS clause of read-write. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection opens devices to attack. In particular, pcePcepNotificationsMaxRate may be used improperly to stop notifications being issued or to permit a flood of notifications to be sent to the management agent at a high rate.

All the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP. The sensitivity/vulnerability arises because, collectively, these objects provide information about the amount and frequency of path computation requests and responses within the network and can reveal some aspects of its configuration.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPsec), there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB module.

Implementations SHOULD provide the security features described by the SNMPv3 framework (see [RFC3410]), and implementations claiming compliance to the SNMPv3 standard MUST include full support for authentication and privacy via the User-based Security Model (USM) [RFC3414] with the AES cipher algorithm [RFC3826]. Implementations MAY also provide support for the Transport Security Model (TSM)

[RFC5591] in combination with a secure transport such as SSH [RFC5592] or TLS/DTLS [RFC6353].

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

6. IANA Considerations

The MIB module in this document uses the following IANA-assigned OBJECT IDENTIFIER values recorded in the SMI Numbers registry:

Descriptor	OBJECT IDENTIFIER value
-----	-----
pcepPcepMIB	{ mib-2 227 }

7. References

7.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, <<http://www.rfc-editor.org/info/rfc2119>>.
- [RFC2578] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Structure of Management Information Version 2 (SMIv2)", STD 58, RFC 2578, April 1999, <<http://www.rfc-editor.org/info/rfc2578>>.
- [RFC2579] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Textual Conventions for SMIv2", STD 58, RFC 2579, April 1999, <<http://www.rfc-editor.org/info/rfc2579>>.
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- [RFC3414] Blumenthal, U. and B. Wijnen, "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", STD 62, RFC 3414, December 2002, <<http://www.rfc-editor.org/info/rfc3414>>.

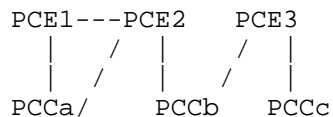
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- [RFC5591] Harrington, D. and W. Hardaker, "Transport Security Model for the Simple Network Management Protocol (SNMP)", STD 78, RFC 5591, June 2009, <<http://www.rfc-editor.org/info/rfc5591>>.
- [RFC5592] Harrington, D., Salowey, J., and W. Hardaker, "Secure Shell Transport Model for the Simple Network Management Protocol (SNMP)", RFC 5592, June 2009, <<http://www.rfc-editor.org/info/rfc5592>>.
- [RFC6353] Hardaker, W., "Transport Layer Security (TLS) Transport Model for the Simple Network Management Protocol (SNMP)", STD 78, RFC 6353, July 2011, <<http://www.rfc-editor.org/info/rfc6353>>.

7.2. Informative References

- [RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", RFC 3410, December 2002, <<http://www.rfc-editor.org/info/rfc3410>>.
- [RFC4655] Farrel, A., Vasseur, J., and J. Ash, "A Path Computation Element (PCE)-Based Architecture", RFC 4655, August 2006, <<http://www.rfc-editor.org/info/rfc4655>>.

Appendix A. PCEP MIB Module Example

This example considers the set of PCC/PCE relationships shown in the following figure. The example shows the contents of the PCEP MIB module as read at PCE2 and PCCb.



The IP addresses of the PCE speakers in this diagram are given in the following table.

PCE1	1.1.1.1	
PCE2	2.2.2.2	
PCE3	3.3.3.3	
PCCa	11.11.11.11	
PCCb	22.22.22.22	
PCCc	33.33.33.33	

In this example, the PCEP session between PCCb and PCE3 is currently down.

A.1. Contents of PCEP MIB Module at PCE2

At PCE2, there is a single local PCEP entity that has three peers (PCCa, PCCb, and PCE1). There is a session active to all of these peers.

The contents of the PCEP MIB module as read at PCE2 are as follows.

```
In pcePcepEntityTable {
    pcePcepEntityIndex                1,
    pcePcepEntityAdminStatus          adminStatusUp(1),
    pcePcepEntityOperStatus           operStatusUp(1),
    pcePcepEntityAddrType             ipv4(1),
    pcePcepEntityAddr                 2.2.2.2, -- PCE2
    pcePcepEntityConnectTimer         60,
    pcePcepEntityConnectMaxRetry      5,
    pcePcepEntityInitBackoffTimer     30,
    pcePcepEntityMaxBackoffTimer      3600,
    pcePcepEntityOpenWaitTimer        60,
    pcePcepEntityKeepWaitTimer        60,
    pcePcepEntityKeepAliveTimer       1,
    pcePcepEntityDeadTimer            4,
    pcePcepEntityAllowNegotiation     true(1),
    pcePcepEntityMaxKeepAliveTimer     60,
    pcePcepEntityMaxDeadTimer         240,
    pcePcepEntityMinKeepAliveTimer     1,
    pcePcepEntityMinDeadTimer         4,
    pcePcepEntitySyncTimer            60,
    pcePcepEntityRequestTimer         120,
    pcePcepEntityMaxSessions          999,
    pcePcepEntityMaxUnknownReqs       5,
    pcePcepEntityMaxUnknownMsgs       5
}

In pcePcepPeerTable {
    pcePcepPeerAddrType              ipv4(1), --PCE1
    pcePcepPeerAddr                  1.1.1.1,
    pcePcepPeerRole                   pccAndPce(3),
    pcePcepPeerDiscontinuityTime     TimeStamp,
    pcePcepPeerInitiateSession       true(1),
    pcePcepPeerSessionExists         true(1),
    pcePcepPeerNumSessSetupOK        1,
    pcePcepPeerNumSessSetupFail      0,
    pcePcepPeerSessionUpTime         TimeStamp,
    pcePcepPeerSessionFailTime       0,
    pcePcepPeerSessionFailUpTime     TimeStamp,
    pcePcepPeerAvgRspTime             0,
    pcePcepPeerLWMRspTime            0,
```

```

pcePcepPeerHWMRspTime          0,
pcePcepPeerNumPCReqSent        0,
pcePcepPeerNumPCReqRcvd        0,
pcePcepPeerNumPCRepSent        0,
pcePcepPeerNumPCRepRcvd        0,
pcePcepPeerNumPCErrSent        0,
pcePcepPeerNumPCErrRcvd        0,
pcePcepPeerNumPCNtfSent        0,
pcePcepPeerNumPCNtfRcvd        0,
pcePcepPeerNumKeepaliveSent    123,
pcePcepPeerNumKeepaliveRcvd    123,
pcePcepPeerNumUnknownRcvd      0,
pcePcepPeerNumCorruptRcvd      0,
pcePcepPeerNumReqSent          0,
pcePcepPeerNumSvecSent         0,
pcePcepPeerNumSvecReqSent      0,
pcePcepPeerNumReqSentPendRep   0,
pcePcepPeerNumReqSentEroRcvd   0,
pcePcepPeerNumReqSentNoPathRcvd 0,
pcePcepPeerNumReqSentCancelRcvd 0,
pcePcepPeerNumReqSentErrorRcvd 0,
pcePcepPeerNumReqSentTimeout   0,
pcePcepPeerNumReqSentCancelSent 0,
pcePcepPeerNumReqSentClosed    0,
pcePcepPeerNumReqRcvd          0,
pcePcepPeerNumSvecRcvd         0,
pcePcepPeerNumSvecReqRcvd      0,
pcePcepPeerNumReqRcvdPendRep   0,
pcePcepPeerNumReqRcvdEroSent   0,
pcePcepPeerNumReqRcvdNoPathSent 0,
pcePcepPeerNumReqRcvdCancelSent 0,
pcePcepPeerNumReqRcvdErrorSent 0,
pcePcepPeerNumReqRcvdCancelRcvd 0,
pcePcepPeerNumReqRcvdClosed    0,
pcePcepPeerNumRepRcvdUnknown    0,
pcePcepPeerNumReqRcvdUnknown    0
},
{
    pcePcepPeerAddrType          ipv4(1),  --PCCa
    pcePcepPeerAddr              11.11.11.11,
    pcePcepPeerRole              pcc(1),
    pcePcepPeerDiscontinuityTime TimeStamp,
    pcePcepPeerInitiateSession   false(0),
    pcePcepPeerSessionExists     true(1),
    pcePcepPeerNumSessSetupOK     1,
    pcePcepPeerNumSessSetupFail   0,
    pcePcepPeerSessionUpTime      TimeStamp,
    pcePcepPeerSessionFailTime    0,

```

```

pcePcepPeerSessionFailUpTime      TimeStamp,
pcePcepPeerAvgRspTime              200,
pcePcepPeerLWMRspTime              100,
pcePcepPeerHWMRspTime              300,
pcePcepPeerNumPCReqSent            0,
pcePcepPeerNumPCReqRcvd            3,
pcePcepPeerNumPCRepSent            3,
pcePcepPeerNumPCRepRcvd            0,
pcePcepPeerNumPCErrSent            0,
pcePcepPeerNumPCErrRcvd            0,
pcePcepPeerNumPCNtfSent            0,
pcePcepPeerNumPCNtfRcvd            0,
pcePcepPeerNumKeepaliveSent        123,
pcePcepPeerNumKeepaliveRcvd        123,
pcePcepPeerNumUnknownRcvd          0,
pcePcepPeerNumCorruptRcvd          0,
pcePcepPeerNumReqSent              0,
pcePcepPeerNumSvecSent              0,
pcePcepPeerNumSvecReqSent          0,
pcePcepPeerNumReqSentPendRep       0,
pcePcepPeerNumReqSentEroRcvd       0,
pcePcepPeerNumReqSentNoPathRcvd    0,
pcePcepPeerNumReqSentCancelRcvd    0,
pcePcepPeerNumReqSentErrorRcvd     0,
pcePcepPeerNumReqSentTimeout       0,
pcePcepPeerNumReqSentCancelSent    0,
pcePcepPeerNumReqSentClosed        0,
pcePcepPeerNumReqRcvd              3,
pcePcepPeerNumSvecRcvd             0,
pcePcepPeerNumSvecReqRcvd          0,
pcePcepPeerNumReqRcvdPendRep       0,
pcePcepPeerNumReqRcvdEroSent       3,
pcePcepPeerNumReqRcvdNoPathSent    0,
pcePcepPeerNumReqRcvdCancelSent    0,
pcePcepPeerNumReqRcvdErrorSent     0,
pcePcepPeerNumReqRcvdCancelRcvd    0,
pcePcepPeerNumReqRcvdClosed        0,
pcePcepPeerNumRepRcvdUnknown       0,
pcePcepPeerNumReqRcvdUnknown       0
},
{
    pcePcepPeerAddrType              ipv4(1), -- PCCb
    pcePcepPeerAddr                  22.22.22.22,
    pcePcepPeerRole                   pcc(1),
    pcePcepPeerDiscontinuityTime      TimeStamp,
    pcePcepPeerInitiateSession       true(1),
    pcePcepPeerSessionExists         true(1),
    pcePcepPeerNumSessSetupOK        1,

```

```

pcePcepPeerNumSessSetupFail      0,
pcePcepPeerSessionUpTime         TimeStamp,
pcePcepPeerSessionFailTime       0,
pcePcepPeerSessionFailUpTime     TimeStamp,
pcePcepPeerAvgRspTime             200,
pcePcepPeerLWMRspTime            100,
pcePcepPeerHWMRspTime            300,
pcePcepPeerNumPCReqSent           0,
pcePcepPeerNumPCReqRcvd           4,
pcePcepPeerNumPCRepSent           4,
pcePcepPeerNumPCRepRcvd           0,
pcePcepPeerNumPCErrSent           0,
pcePcepPeerNumPCErrRcvd           0,
pcePcepPeerNumPCNtfSent           0,
pcePcepPeerNumPCNtfRcvd           0,
pcePcepPeerNumKeepaliveSent       123,
pcePcepPeerNumKeepaliveRcvd       123,
pcePcepPeerNumUnknownRcvd         0,
pcePcepPeerNumCorruptRcvd         0,
pcePcepPeerNumReqSent             0,
pcePcepPeerNumSvecSent            0,
pcePcepPeerNumSvecReqSent         0,
pcePcepPeerNumReqSentPendRep      0,
pcePcepPeerNumReqSentEroRcvd      0,
pcePcepPeerNumReqSentNoPathRcvd   0,
pcePcepPeerNumReqSentCancelRcvd   0,
pcePcepPeerNumReqSentErrorRcvd    0,
pcePcepPeerNumReqSentTimeout      0,
pcePcepPeerNumReqSentCancelSent   0,
pcePcepPeerNumReqSentClosed       0,
pcePcepPeerNumReqRcvd             4,
pcePcepPeerNumSvecRcvd            0,
pcePcepPeerNumSvecReqRcvd         0,
pcePcepPeerNumReqRcvdPendRep      0,
pcePcepPeerNumReqRcvdEroSent      3,
pcePcepPeerNumReqRcvdNoPathSent   1,
pcePcepPeerNumReqRcvdCancelSent   0,
pcePcepPeerNumReqRcvdErrorSent    0,
pcePcepPeerNumReqRcvdCancelRcvd   0,
pcePcepPeerNumReqRcvdClosed       0,
pcePcepPeerNumRepRcvdUnknown      0,
pcePcepPeerNumReqRcvdUnknown      0
}

In pcePcepSessTable {
    pcePcepSessInitiator          local(1), --PCE1
    pcePcepSessStateLastChange     TimeStamp,
    pcePcepSessState               sessionUp(4),

```


pcePcepSessConnectRetry	0,
pcePcepSessLocalID	1,
pcePcepSessRemoteID	2,
pcePcepSessKeepaliveTimer	1,
pcePcepSessPeerKeepaliveTimer	1,
pcePcepSessDeadTimer	4,
pcePcepSessPeerDeadTimer	4,
pcePcepSessKAHoldTimeRem	1,
pcePcepSessOverloaded	false(0),
pcePcepSessOverloadTime	0,
pcePcepSessPeerOverloaded	false(0),
pcePcepSessPeerOverloadTime	0,
pcePcepSessDiscontinuityTime	TimeStamp,
pcePcepSessAvgRspTime	0,
pcePcepSessLWMRspTime	0,
pcePcepSessHWMRspTime	0,
pcePcepSessNumPCReqSent	0,
pcePcepSessNumPCReqRcvd	0,
pcePcepSessNumPCRepSent	0,
pcePcepSessNumPCRepRcvd	0,
pcePcepSessNumPCErrSent	0,
pcePcepSessNumPCErrRcvd	0,
pcePcepSessNumPCNtfSent	0,
pcePcepSessNumPCNtfRcvd	0,
pcePcepSessNumKeepaliveSent	123,
pcePcepSessNumKeepaliveRcvd	123,
pcePcepSessNumUnknownRcvd	0,
pcePcepSessNumCorruptRcvd	0,
pcePcepSessNumReqSent	0,
pcePcepSessNumSvecSent	0,
pcePcepSessNumSvecReqSent	0,
pcePcepSessNumReqSentPendRep	0,
pcePcepSessNumReqSentEroRcvd	0,
pcePcepSessNumReqSentNoPathRcvd	0,
pcePcepSessNumReqSentCancelRcvd	0,
pcePcepSessNumReqSentErrorRcvd	0,
pcePcepSessNumReqSentTimeout	0,
pcePcepSessNumReqSentCancelSent	0,
pcePcepSessNumReqRcvd	0,
pcePcepSessNumSvecRcvd	0,
pcePcepSessNumSvecReqRcvd	0,
pcePcepSessNumReqRcvdPendRep	0,
pcePcepSessNumReqRcvdEroSent	0,
pcePcepSessNumReqRcvdNoPathSent	0,
pcePcepSessNumReqRcvdCancelSent	0,
pcePcepSessNumReqRcvdErrorSent	0,
pcePcepSessNumReqRcvdCancelRcvd	0,
pcePcepSessNumRepRcvdUnknown	0,

```

    pcePcepSessNumReqRcvdUnknown      0
},
{
    pcePcepSessInitiator               remote(2), --PCCa
    pcePcepSessStateLastChange         TimeStamp,
    pcePcepSessState                   sessionUp(4),
    pcePcepSessConnectRetry            0,
    pcePcepSessLocalID                 2,
    pcePcepSessRemoteID                1,
    pcePcepSessKeepaliveTimer          1,
    pcePcepSessPeerKeepaliveTimer      1,
    pcePcepSessDeadTimer               4,
    pcePcepSessPeerDeadTimer           4,
    pcePcepSessKAHoldTimeRem           1,
    pcePcepSessOverloaded              false(0),
    pcePcepSessOverloadTime            0,
    pcePcepSessPeerOverloaded          false(0),
    pcePcepSessPeerOverloadTime        0,
    pcePcepSessDiscontinuityTime       TimeStamp,
    pcePcepSessAvgRspTime              200,
    pcePcepSessLWMRspTime              100,
    pcePcepSessHWMRspTime              300,
    pcePcepSessNumPCReqSent            0,
    pcePcepSessNumPCReqRcvd            1,
    pcePcepSessNumPCRepSent            1,
    pcePcepSessNumPCRepRcvd            0,
    pcePcepSessNumPCErrSent            0,
    pcePcepSessNumPCErrRcvd            0,
    pcePcepSessNumPCNtfSent            0,
    pcePcepSessNumPCNtfRcvd            0,
    pcePcepSessNumKeepaliveSent        123,
    pcePcepSessNumKeepaliveRcvd        123,
    pcePcepSessNumUnknownRcvd          0,
    pcePcepSessNumCorruptRcvd          0,
    pcePcepSessNumReqSent              0,
    pcePcepSessNumSvecSent              0,
    pcePcepSessNumSvecReqSent          0,
    pcePcepSessNumReqSentPendRep       0,
    pcePcepSessNumReqSentEroRcvd       0,
    pcePcepSessNumReqSentNoPathRcvd    0,
    pcePcepSessNumReqSentCancelRcvd    0,
    pcePcepSessNumReqSentErrorRcvd     0,
    pcePcepSessNumReqSentTimeout       0,
    pcePcepSessNumReqSentCancelSent    0,
    pcePcepSessNumReqRcvd              3,
    pcePcepSessNumSvecRcvd             0,
    pcePcepSessNumSvecReqRcvd          0,
    pcePcepSessNumReqRcvdPendRep       0,

```

```

pcePcepSessNumReqRcvdEroSent      3,
pcePcepSessNumReqRcvdNoPathSent   0,
pcePcepSessNumReqRcvdCancelSent   0,
pcePcepSessNumReqRcvdErrorSent    0,
pcePcepSessNumReqRcvdCancelRcvd   0,
pcePcepSessNumRepRcvdUnknown       0,
pcePcepSessNumReqRcvdUnknown      0
},
{
  pcePcepSessInitiator              remote(2), --PCCb
  pcePcepSessStateLastChange         TimeStamp,
  pcePcepSessState                   sessionUp(4),
  pcePcepSessConnectRetry            0,
  pcePcepSessLocalID                 2,
  pcePcepSessRemoteID                1,
  pcePcepSessKeepaliveTimer          1,
  pcePcepSessPeerKeepaliveTimer      1,
  pcePcepSessDeadTimer               4,
  pcePcepSessPeerDeadTimer           4,
  pcePcepSessKAHoldTimeRem           1,
  pcePcepSessOverloaded              false(0),
  pcePcepSessOverloadTime            0,
  pcePcepSessPeerOverloaded          false(0),
  pcePcepSessPeerOverloadTime        0,
  pcePcepSessDiscontinuityTime       TimeStamp,
  pcePcepSessAvgRspTime              200,
  pcePcepSessLWMRspTime              100,
  pcePcepSessHWMRspTime              300,
  pcePcepSessNumPCReqSent            0,
  pcePcepSessNumPCReqRcvd            4,
  pcePcepSessNumPCRepSent            4,
  pcePcepSessNumPCRepRcvd            0,
  pcePcepSessNumPCErrSent            0,
  pcePcepSessNumPCErrRcvd            0,
  pcePcepSessNumPCNtfSent            0,
  pcePcepSessNumPCNtfRcvd            0,
  pcePcepSessNumKeepaliveSent        123,
  pcePcepSessNumKeepaliveRcvd        123,
  pcePcepSessNumUnknownRcvd          0,
  pcePcepSessNumCorruptRcvd          0,
  pcePcepSessNumReqSent              0,
  pcePcepSessNumSvecSent              0,
  pcePcepSessNumSvecReqSent          0,
  pcePcepSessNumReqSentPendRep       0,
  pcePcepSessNumReqSentEroRcvd       0,
  pcePcepSessNumReqSentNoPathRcvd    0,
  pcePcepSessNumReqSentCancelRcvd    0,
  pcePcepSessNumReqSentErrorRcvd     0,

```

```

    pcePcepSessNumReqSentTimeout      0,
    pcePcepSessNumReqSentCancelSent   0,
    pcePcepSessNumReqRcvd             4,
    pcePcepSessNumSvecRcvd            0,
    pcePcepSessNumSvecReqRcvd         0,
    pcePcepSessNumReqRcvdPendRep      0,
    pcePcepSessNumReqRcvdEroSent      3,
    pcePcepSessNumReqRcvdNoPathSent   1,
    pcePcepSessNumReqRcvdCancelSent   0,
    pcePcepSessNumReqRcvdErrorSent    0,
    pcePcepSessNumReqRcvdCancelRcvd   0,
    pcePcepSessNumRepRcvdUnknown      0,
    pcePcepSessNumReqRcvdUnknown      0
}

```

A.2. Contents of PCEP MIB Module at PCCb

At PCCb, there is a single local PCEP entity that has two peers (PCE2 and PCE3). There is a session active to PCE2, but the session to PCE3 is currently down.

The contents of the PCEP MIB module as read at PCCb are as follows.

```

In pcePcepEntityTable {
    pcePcepEntityIndex          1,
    pcePcepEntityAdminStatus    adminStatusUp(1),
    pcePcepEntityOperStatus     operStatusUp(1),
    pcePcepEntityAddrType       ipv4(1),
    pcePcepEntityAddr           22.22.22.22, -- PCCb
    pcePcepEntityConnectTimer   60,
    pcePcepEntityConnectMaxRetry 5,
    pcePcepEntityInitBackoffTimer 30,
    pcePcepEntityMaxBackoffTimer 3600,
    pcePcepEntityOpenWaitTimer  60,
    pcePcepEntityKeepWaitTimer  60,
    pcePcepEntityKeepAliveTimer  1,
    pcePcepEntityDeadTimer       4,
    pcePcepEntityAllowNegotiation true(1),
    pcePcepEntityMaxKeepAliveTimer 60,
    pcePcepEntityMaxDeadTimer     240,
    pcePcepEntityMinKeepAliveTimer 1,
    pcePcepEntityMinDeadTimer     4,
    pcePcepEntitySyncTimer        60,
    pcePcepEntityRequestTimer     120,
    pcePcepEntityMaxSessions      999,
    pcePcepEntityMaxUnknownReqs   5,
    pcePcepEntityMaxUnknownMsgs   5
}

```

```

In pcePcepPeerTable {
    pcePcepPeerAddrType          ipv4(1), --PCE2
    pcePcepPeerAddr              2.2.2.2,
    pcePcepPeerRole              pce(2),
    pcePcepPeerDiscontinuityTime TimeStamp,
    pcePcepPeerInitiateSession   true(1),
    pcePcepPeerSessionExists     true(1)),
    pcePcepPeerNumSessSetupOK     0,
    pcePcepPeerNumSessSetupFail  1,
    pcePcepPeerSessionUpTime     TimeStamp,
    pcePcepPeerSessionFailTime   TimeStamp,
    pcePcepPeerSessionFailUpTime TimeStamp,
    pcePcepPeerAvgRspTime        0,
    pcePcepPeerLWMRspTime        0,
    pcePcepPeerHWMRspTime        0,
    pcePcepPeerNumPCReqSent      4,
    pcePcepPeerNumPCReqRcvd      0,
    pcePcepPeerNumPCRepSent      0,
    pcePcepPeerNumPCRepRcvd      4,
    pcePcepPeerNumPCErrSent      0,
    pcePcepPeerNumPCErrRcvd      0,
    pcePcepPeerNumPCNtfSent      0,
    pcePcepPeerNumPCNtfRcvd      0,
    pcePcepPeerNumKeepaliveSent  0,
    pcePcepPeerNumKeepaliveRcvd  0,
    pcePcepPeerNumUnknownRcvd    0,
    pcePcepPeerNumCorruptRcvd    0,
    pcePcepPeerNumReqSent        4,
    pcePcepPeerNumSvecSent       0,
    pcePcepPeerNumSvecReqSent    0,
    pcePcepPeerNumReqSentPendRep 0,
    pcePcepPeerNumReqSentEroRcvd 3,
    pcePcepPeerNumReqSentNoPathRcvd 1,
    pcePcepPeerNumReqSentCancelRcvd 0,
    pcePcepPeerNumReqSentErrorRcvd 0,
    pcePcepPeerNumReqSentTimeout 0,
    pcePcepPeerNumReqSentCancelSent 0,
    pcePcepPeerNumReqSentClosed  0,
    pcePcepPeerNumReqRcvd        0,
    pcePcepPeerNumSvecRcvd       0,
    pcePcepPeerNumSvecReqRcvd    0,
    pcePcepPeerNumReqRcvdPendRep 0,
    pcePcepPeerNumReqRcvdEroSent 0,
    pcePcepPeerNumReqRcvdNoPathSent 0,
    pcePcepPeerNumReqRcvdCancelSent 0,
    pcePcepPeerNumReqRcvdErrorSent 0,
    pcePcepPeerNumReqRcvdCancelRcvd 0,
    pcePcepPeerNumReqRcvdClosed  0,

```

```

    pcePcepPeerNumRepRcvdUnknown      0,
    pcePcepPeerNumReqRcvdUnknown      0
  },
  {
    pcePcepPeerAddrType                ipv4(1),  --PCE3
    pcePcepPeerAddr                    3.3.3.3,
    pcePcepPeerRole                    pce(2),
    pcePcepPeerDiscontinuityTime       TimeStamp,
    pcePcepPeerInitiateSession         true(1),
    pcePcepPeerSessionExists           false(0),
    pcePcepPeerNumSessSetupOK          1,
    pcePcepPeerNumSessSetupFail        0,
    pcePcepPeerSessionUpTime           TimeStamp,
    pcePcepPeerSessionFailTime         TimeStamp,
    pcePcepPeerSessionFailUpTime       TimeStamp,
    pcePcepPeerAvgRspTime              200,
    pcePcepPeerLWMRspTime              100,
    pcePcepPeerHWMRspTime              300,
    pcePcepPeerNumPCReqSent            4,
    pcePcepPeerNumPCReqRcvd            0,
    pcePcepPeerNumPCRepSent            0,
    pcePcepPeerNumPCRepRcvd            3,
    pcePcepPeerNumPCErrSent            0,
    pcePcepPeerNumPCErrRcvd            0,
    pcePcepPeerNumPCNtfSent            0,
    pcePcepPeerNumPCNtfRcvd            0,
    pcePcepPeerNumKeepaliveSent        123,
    pcePcepPeerNumKeepaliveRcvd        123,
    pcePcepPeerNumUnknownRcvd          0,
    pcePcepPeerNumCorruptRcvd          0,
    pcePcepPeerNumReqSent              4,
    pcePcepPeerNumSvecSent              0,
    pcePcepPeerNumSvecReqSent          0,
    pcePcepPeerNumReqSentPendRep       0,
    pcePcepPeerNumReqSentEroRcvd       3,
    pcePcepPeerNumReqSentNoPathRcvd    0,
    pcePcepPeerNumReqSentCancelRcvd    0,
    pcePcepPeerNumReqSentErrorRcvd     0,
    pcePcepPeerNumReqSentTimeout       0,
    pcePcepPeerNumReqSentCancelSent    0,
    pcePcepPeerNumReqSentClosed        1,
    pcePcepPeerNumReqRcvd              0,
    pcePcepPeerNumSvecRcvd             0,
    pcePcepPeerNumSvecReqRcvd          0,
    pcePcepPeerNumReqRcvdPendRep       0,
    pcePcepPeerNumReqRcvdEroSent       0,
    pcePcepPeerNumReqRcvdNoPathSent    0,
    pcePcepPeerNumReqRcvdCancelSent    0,

```

```

    pcePcepPeerNumReqRcvdErrorSent      0,
    pcePcepPeerNumReqRcvdCancelRcvd     0,
    pcePcepPeerNumReqRcvdClosed         0,
    pcePcepPeerNumRepRcvdUnknown         0,
    pcePcepPeerNumReqRcvdUnknown        0
}

```

```

In pcePcepSessTable {
    pcePcepSessInitiator                local(1), --PCE2
    pcePcepSessStateLastChange          TimeStamp,
    pcePcepSessState                    sessionUp(4),
    pcePcepSessConnectRetry              0,
    pcePcepSessLocalID                  1,
    pcePcepSessRemoteID                  1,
    pcePcepSessKeepaliveTimer            1,
    pcePcepSessPeerKeepaliveTimer        1,
    pcePcepSessDeadTimer                 4,
    pcePcepSessPeerDeadTimer              4,
    pcePcepSessKAHoldTimeRem             1,
    pcePcepSessOverloaded                 false(0),
    pcePcepSessOverloadTime              0,
    pcePcepSessPeerOverloaded             false(0),
    pcePcepSessPeerOverloadTime           0,
    pcePcepSessDiscontinuityTime          TimeStamp,
    pcePcepSessAvgRspTime                 200,
    pcePcepSessLWMRspTime                 100,
    pcePcepSessHWMRspTime                 300,
    pcePcepSessNumPCReqSent               4,
    pcePcepSessNumPCReqRcvd               0,
    pcePcepSessNumPCRepSent               0,
    pcePcepSessNumPCRepRcvd               4,
    pcePcepSessNumPCErrSent               0,
    pcePcepSessNumPCErrRcvd               0,
    pcePcepSessNumPCNtfSent               0,
    pcePcepSessNumPCNtfRcvd               0,
    pcePcepSessNumKeepaliveSent            123,
    pcePcepSessNumKeepaliveRcvd            123,
    pcePcepSessNumUnknownRcvd              0,
    pcePcepSessNumCorruptRcvd              0,
    pcePcepSessNumReqSent                  4,
    pcePcepSessNumSvecSent                  0,
    pcePcepSessNumSvecReqSent              0,
    pcePcepSessNumReqSentPendRep           0,
    pcePcepSessNumReqSentEroRcvd           3,
    pcePcepSessNumReqSentNoPathRcvd        1,
    pcePcepSessNumReqSentCancelRcvd        0,
    pcePcepSessNumReqSentErrorRcvd         0,
    pcePcepSessNumReqSentTimeout           0,

```

```
pcePcepSessNumReqSentCancelSent    0,
pcePcepSessNumReqRcvd               0,
pcePcepSessNumSvecRcvd              0,
pcePcepSessNumSvecReqRcvd           0,
pcePcepSessNumReqRcvdPendRep        0,
pcePcepSessNumReqRcvdEroSent         0,
pcePcepSessNumReqRcvdNoPathSent     0,
pcePcepSessNumReqRcvdCancelSent     0,
pcePcepSessNumReqRcvdErrorSent      0,
pcePcepSessNumReqRcvdCancelRcvd     0,
pcePcepSessNumRepRcvdUnknown        0,
pcePcepSessNumReqRcvdUnknown        0
}
```

-- no session to PCE3

Acknowledgements

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Contributors

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