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Signaling MIB for PacketCable and IPCablecom Multimedia Terminal Adapters (MTAs)

Status of This Memo

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 defines a basic set of managed objects for Simple Network Management Protocol (SNMP)-based management of PacketCable- and IPCablecom-compliant Multimedia Terminal Adapter devices.

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1. 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].

2. Introduction

A multimedia terminal adapter (MTA) is used to deliver broadband Internet, data, and/or voice access jointly with telephony service to a subscriber's or customer's premises using a cable network infrastructure. An MTA is normally installed at the customer's or subscriber's premises, and it is coupled to a multiple system operator (MSO) using a hybrid fiber coax (HFC) access network.

An MTA is provisioned by the MSO for broadband Internet, data, and/or voice service. For more information on MTA provisioning, refer to

the PacketCable Provisioning Specification [PKT-SP-PROV] and [RFC4682]. MTA devices include one or more endpoints (e.g., telephone ports), which receive call signaling information to establish ring cadence, and codecs used for providing telephony service. For more information on call signaling, refer to the PacketCable Signaling Specification [PKT-SP-MGCP] and [RFC3435]. For more information on codecs refer to the PacketCable Audio/Video Codecs Specification [PKT-SP-CODEC].

Telephone systems are typically very complex and often have a wide distribution. It is therefore important for management systems to support MTAs from multiple vendors at the same time, including those from multiple countries. This MIB module provides objects suitable for managing signaling for MTA devices in the widest possible range of markets.

3. Terminology

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 RFC 2119 [RFC2119].

The terms "MIB module" and "information module" are used interchangeably in this memo. As used here, both terms refer to any of the three types of information modules defined in Section 3 of RFC 2578 [RFC2578].

3.1. MTA

An MTA is a PacketCable or IPCablecom compliant device providing telephony services over a cable or hybrid system used to deliver video signals to a community. It contains an interface to endpoints, a network interface, codecs, and all signaling and encapsulation functions required for Voice-over IP transport, call signaling, and Quality of Service signaling. An MTA can be an embedded or standalone device. An Embedded MTA (E-MTA) is an MTA device containing an embedded Data Over Cable Service Interface Specifications (DOCSIS) Cable Modem. A Standalone MTA (S-MTA) is an MTA device separated from the DOCSIS Cable Modem by non-DOCSIS Media Access Control (MAC) interface (e.g., Ethernet, USB).

3.2. Endpoint

An endpoint or MTA endpoint is a standard telephony physical port located on the MTA and used for attaching the telephone device to the MTA.

3.3. L Line Package

The L line package refers to the Media Gateway Control Protocol (MGCP) package for the core signaling functionality, as defined by PacketCable and IPCablecom. An MTA provides all L package elements: however, the operator determines their application.

3.4. E Line Package

The E line package refers to the MGCP package extensions, over and above the core L package, defined in support of international requirements. E line package elements are optional, vary from country to country, and are set by operator or regulatory requirements.

4. Overview

This MIB module provides a set of objects required for Multimedia Terminal Adapter (MTA) devices compliant with the PacketCable and IPCablecom signaling specifications published by CableLabs, the European Telecommunications Standards Institute (ETSI), and the International Telecommunication Union Telecommunication Standardization Sector (ITU-T) IPCablecom compliant Multimedia Terminal Adapter (MTA) devices. The Signaling MIB module (PKTC-IETF-SIG-MIB) is intended to update various Signaling MIB modules from which it is partly derived:

- the PacketCable 1.0 Signaling MIB Specification [PKT-SP-MIB-SIG-1.0],

- the PacketCable 1.5 Signaling MIB Specification [PKT-SP-MIB-SIG-1.5],

- the ITU-T IPCablecom Signaling MIB requirements [ITU-T-J169],

- the ETSI Signaling MIB [ETSI-TS-101-909-9]. The ETSI Signaling MIB requirements also refer to various signal characteristics defined in [ETSI-TS-101-909-4], [ETSI-EN-300-001], [ETSI-EN-300-659-1], [ETSI-EN-300-324-1] and [ETSI-TR-101-183].

Several normative and informative references are used to help define Signaling MIB objects. As a convention, wherever PacketCable and IPCablecom requirements are equivalent, the PacketCable reference is used in the object REFERENCE clause. IPCablecom compliant MTA devices MUST use the equivalent IPCablecom references.

This MIB module describes the various Signaling MIB objects that are directly related to the PacketCable MTA and the endpoints supported on the MTA, each of which provides services independently. The recognition and distinction of the endpoints are made by utilizing the ifTable (IF-MIB [RFC2863]), where each index (ifIndex) value refers to a unique endpoint. This MIB module also utilizes the syntax definition of the Differentiated Services Code Point (DSCP) from DIFFSERV-DSCP-TC [RFC3289] for defining MIB objects that allow for differentiation between various types of traffic in the service provider network.

4.1. Structure of the MIB

This MIB module is identified by pktcIetfSigMib and is structured into two major parts:

- Signaling information that controls device and endpoint configuration (pktcSigMibObjects)

- Module Conformance information(pktcSigConformance)

The following sections explain each part in further detail. It is to be noted that future enhancements to specify Notification Objects are also allowed (pktcSigNotification).

4.2. pktcSigMibObjects

This is further divided into device-specific elements (pktcSigDevObjects) and endpoint-specific elements (pktcSigEndPntConfigObjects).

Some highlights of the device-specific elements are as follows:

pktcSigDevCodecTable - this object identifies the codec types available on the device.

pktcSigDevEchoCancellation - this object identifies the capability of echo cancellation on the device.

pktcSigDevSilenceSuppression - this object specifies if the device is capable of silence suppression (Voice Activity Detection).

pktcSigPulseSignalTable - this table selects the various signals used in the application of the metering pulse signal to the twisted pair line.

pktcSigDevToneTable - this table specifies a flexible structure within which to specify all of the tones used in the MTA.

pktcSigDevMultiFreqToneTable - this table defines the characteristics of tones with multiple frequencies. Each entry in this table represents the frequency reference of a multi-frequency tone.

The endpoint-specific elements are mostly confined to the Endpoint configuration MIB table (pktcSigEndPntConfigTable). This table describes the MTA endPoint configuration. The number of entries in this table represents the number of provisioned endpoints.

4.3. pktcSigConformance

pktcSigDeviceGroup - this group contains all the MIB objects that apply on a per-device basis and need to be implemented by an MTA to claim compliance with the specified MIB module.

pktcSigEndpointGroup - this group contains all the MIB objects that apply on a per-endpoint basis and need to be implemented by an MTA to claim compliance with the specified MIB module.

pktcLLinePackageGroup - this group contains the MIB objects that need to be implemented to support the L line package.

pktcELinePackageGroup - this group contains the MIB objects that need to be implemented to support the E line package.

pktcInternationalGroup - this group contains optional MIB objects designed to support operations over the widest possible range of markets.

5. Definitions

```
PKTC-IETF-SIG-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
    Integer32,
    Unsigned32,
    mib-2
          FROM SNMPv2-SMI                   -- [RFC2578]
    InetAddressType,
    InetAddress,
    InetPortNumber
          FROM INET-ADDRESS-MIB             -- [RFC4001]
    TEXTUAL-CONVENTION,
    RowStatus,
    TruthValue
          FROM SNMPv2-TC                    -- [RFC2579]
```

```
    OBJECT-GROUP,
    MODULE-COMPLIANCE
          FROM SNMPv2-CONF                  -- [RFC2580]
    SnmpAdminString
          FROM SNMP-FRAMEWORK-MIB           -- [RFC3411]
    ifIndex
          FROM IF-MIB                       -- [RFC2863]
    Dscp
          FROM DIFFSERV-DSCP-TC;            -- [RFC3289]

pktcIetfSigMib MODULE-IDENTITY
    LAST-UPDATED    "200712180000Z" -- December 18, 2007
    ORGANIZATION    "IETF IPCDN Working Group"
    CONTACT-INFO
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         Co-Chair: Jean-Francois Mule, jf.mule@cablelabs.com
         Co-Chair: Richard Woundy, Richard_Woundy@cable.comcast.com"

    DESCRIPTION
       "This MIB module supplies the basic management
        objects for the PacketCable and IPCablecom Signaling
        protocols.  This version of the MIB includes
        common signaling and Network Call Signaling
```

```
        (NCS)-related signaling objects.

        Copyright (C) The IETF Trust (2008).  This version of
        this MIB module is part of RFC 5098; see the RFC itself for
        full legal notices."
    REVISION               "200712180000Z"
    DESCRIPTION
       "Initial version, published as RFC 5098."

::=  { mib-2 169 }

-- Textual Conventions

TenthdBm ::= TEXTUAL-CONVENTION
    DISPLAY-HINT "d-1"
    STATUS       current
    DESCRIPTION
        "This TEXTUAL-CONVENTION represents power levels that are
         normally expressed in dBm.  Units are in tenths of a dBm;
         for example, -13.5 dBm will be represented as -135."
    SYNTAX       Integer32

PktcCodecType ::= TEXTUAL-CONVENTION
    STATUS       current
    DESCRIPTION
        " This TEXTUAL-CONVENTION defines various types of codecs
          that MAY be supported.  The description for each
          enumeration is listed below:

          Enumeration     Description
          other           a defined codec not in the enumeration
          unknown         a codec not defined by the PacketCable
                          Codec Specification
          g729            ITU-T Recommendation G.729
          reserved        for future use
          g729E           ITU-T Recommendation G.729E
          pcmu            Pulse Code Modulation u-law (PCMU)
          g726at32        ITU-T Recommendation G.726-32 (32 kbit/s)
          g728            ITU-T Recommendation G.728
          pcma            Pulse Code Modulation a-law (PCMA)
          g726at16        ITU-T Recommendation G.726-16 (16 kbit/s)
          g726at24        ITU-T Recommendation G.726-24 (24 kbit/s)
          g726at40        ITU-T Recommendation G.726-40 (40 kbit/s)
          ilbc            IETF Internet low-bit rate codec
          bv16            Broadcom BroadVoice16

          The list of codecs is consistent with the IETF
          Real-Time Transport Protocol (RTP) Profile registry and
```

```
          the RTP Map Parameters Table in PacketCable Audio/Video
          Codecs Specification [PKT-SP-CODEC].  The literal codec
          name for each codec is listed below:

          Codec     Literal Codec Name
          g729              G729
          g729E             G729E
          pcmu              PCMU
          g726at32          G726-32
          g728              G728
          pcma              PCMA
          g726at16          G726-16
          g726at24          G726-24
          g726at40          G726-40
          ilbc              iLBC
          bv16              BV16

          The literal codec name is the second column of the table
          with codec RTP Map Parameters.  The Literal Codec Name Column
          contains the codec name used in the local connection
          options (LCO) of the NCS messages create connection
          (CRCX)/modify connection (MDCX) and is also used to
          identify the codec in the Call Management System (CMS)
          Provisioning Specification.  The RTP Map Parameter column of
          the Table contains the string used in the media attribute
          line (a=) of the session description protocol (SDP)
          parameters in NCS messages."
    SYNTAX INTEGER {
                other     (1),
                unknown   (2),
                g729      (3),
                reserved  (4),
                g729E     (5),
                pcmu      (6),
                g726at32  (7),
                g728      (8),
                pcma      (9),
                g726at16  (10),
                g726at24  (11),
                g726at40  (12),
                ilbc      (13),
                bv16      (14)
    }

PktcRingCadence   ::= TEXTUAL-CONVENTION
    STATUS        current
    DESCRIPTION
          "This object provides an encoding scheme for ring
```

```
            cadences, including repeatability characteristics.  All
            fields in this object MUST be encoded in network-byte
            order.

            The first three higher-order octets are reserved.  The
            octets that follow are used to encode a 'bit-string', with
            each bit corresponding to 50 milliseconds.  A bit value of
            '1' indicates the presence of a ring-tone, and a bit value
            of '0' indicates the absence of a ring-tone, for that
            duration (50 ms) (Note: A minimum number of octets
            required to encode the bit-string MUST be used).

            The first two of the reserved octets MUST indicate the
            length of the encoded cadence (in bits) and MUST range
            between 1 and 264.  (Note: The length in bits MUST also be
            consistent with the number of octets that encode the
            cadence).  The MTA MUST ignore any unused bits in the last
            octet, but MUST reflect the value as provided on
            subsequent SNMP GETs.

            The third of the reserved octets indicates 'repeatability'
            and MUST be either 0x80 or 0x00 -- the former value
            indicating 'non-repeatability', and the latter indicating
            'repeatability'.

            The MTA MUST reject attempts to set a value that violates
            any of the above requirements."


        SYNTAX  OCTET STRING (SIZE(4..36))


PktcSigType     ::= TEXTUAL-CONVENTION
        STATUS       current
        DESCRIPTION
            " This object lists the various types of signaling that may
              be supported:

              other(1) - set when signaling other than NCS is used
              ncs(2)   - Network Call Signaling is a derivation of MGCP
                          (Media Gateway Control Protocol) defined for
                           IPCablecom/PacketCable MTAs."
        SYNTAX INTEGER {
                       other(1),
                       ncs(2)
        }
```

```
DtmfCode::=TEXTUAL-CONVENTION
    STATUS       current
    DESCRIPTION
        "This TEXTUAL-CONVENTION represents the Dual-Tone
         Multi-Frequency (DTMF) Character used
         to indicate the start or end of the digit transition
         sequence used for caller id or Visual Message Waiting
         Indicator (VMWI).

         Note: The DTMF code '*' is indicated using 'dtmfcodeStar',
         and the DTMF code '#' is indicated using ' dtmfcodeHash'."
    SYNTAX       INTEGER {
                  dtmfcode0(0),
                  dtmfcode1(1),
                  dtmfcode2(2),
                  dtmfcode3(3),
                  dtmfcode4(4),
                  dtmfcode5(5),
                  dtmfcode6(6),
                  dtmfcode7(7),
                  dtmfcode8(8),
                  dtmfcode9(9),
                  dtmfcodeStar(10),
                  dtmfcodeHash(11),
                  dtmfcodeA(12),
                  dtmfcodeB(13),
                  dtmfcodeC(14),
                  dtmfcodeD(15)
}

PktcSubscriberSideSigProtocol::=TEXTUAL-CONVENTION
    STATUS  current
    DESCRIPTION
        "This TEXTUAL-CONVENTION represents the Signaling
         protocol being used for purposes such as caller id
         or VMWI.

         A value of fsk(1) indicates Frequency Shift Keying
         (FSK).
         A value of dtmf(2) indicates Dual-Tone Multi-Frequency
         (DTMF)."
         SYNTAX INTEGER {
                fsk(1),
                dtmf(2)
         }

pktcSigMibObjects OBJECT IDENTIFIER ::= { pktcIetfSigMib 1 }
pktcSigDevObjects OBJECT IDENTIFIER ::=
```

```
                                        { pktcSigMibObjects 1 }
pktcSigEndPntConfigObjects OBJECT IDENTIFIER ::=
                                        { pktcSigMibObjects 2 }
--
-- The codec table (pktcSigDevCodecTable) defines all combinations
-- of codecs supported by the Multimedia Terminal Adapter (MTA).
--
pktcSigDevCodecTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcSigDevCodecEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
         " This table describes the MTA-supported codec types.  An MTA
          MUST populate this table with all possible combinations of
          codecs it supports for simultaneous operation.  For example,
          an MTA with two endpoints may be designed with a particular
          Digital Signal Processing (DSP) and memory architecture that
          allows it to support the following fixed combinations of
          codecs for simultaneous operation:

          Codec Type     Maximum Number of Simultaneous Codecs
          PCMA                              3

          PCMA                              2
          PCMU                              1

          PCMA                              1

          PCMU                              2

          PCMU                              3

          PCMA                              1
          G729                              1

          G729                              2

          PCMU                              1
          G729                              1

          Based on this example, the entries in the codec table
          would be:

            pktcSigDev        pktcSigDev        pktcSigDev
          CodecComboIndex     CodecType          CodecMax
                 1               pcma               3
                 2               pcma               2
                 2               pcmu               1
```

```
                3               pcma                1
                3               pcmu                2
                4               pcmu                3
                5               pcma                1
                5               g729                1
                6               g729                2
                7               pcmu                1
                7               g729                1

          An operator querying this table is able to determine all
          possible codec combinations the MTA is capable of
          simultaneously supporting.

          This table MUST NOT include non-voice codecs."
    ::= { pktcSigDevObjects 1 }

pktcSigDevCodecEntry  OBJECT-TYPE
    SYNTAX      PktcSigDevCodecEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Each entry represents the maximum number of active
         connections with a particular codec the MTA is capable of
         supporting.  Each row is indexed by a composite key
         consisting of a number enumerating the particular codec
         combination and the codec type."
    INDEX { pktcSigDevCodecComboIndex, pktcSigDevCodecType }
    ::= { pktcSigDevCodecTable 1 }

PktcSigDevCodecEntry  ::= SEQUENCE {
    pktcSigDevCodecComboIndex    Unsigned32,
    pktcSigDevCodecType     PktcCodecType,
    pktcSigDevCodecMax      Unsigned32
    }

pktcSigDevCodecComboIndex  OBJECT-TYPE
    SYNTAX      Unsigned32 (1..255)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        " The index value that enumerates a particular codec
          combination in the pktcSigDevCodecTable."
    ::= { pktcSigDevCodecEntry 1 }

pktcSigDevCodecType  OBJECT-TYPE
    SYNTAX       PktcCodecType
    MAX-ACCESS   not-accessible
    STATUS       current
```

```
    DESCRIPTION
        " A codec type supported by this MTA."
    ::= { pktcSigDevCodecEntry 2 }

pktcSigDevCodecMax  OBJECT-TYPE
    SYNTAX      Unsigned32(1..255)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " The maximum number of simultaneous sessions of a
          particular codec that the MTA can support."
    ::= { pktcSigDevCodecEntry 3 }

--
-- These are the common signaling-related definitions that affect
-- the entire MTA device.
--

pktcSigDevEchoCancellation  OBJECT-TYPE
    SYNTAX       TruthValue
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        " This object specifies if the device is capable of echo
          cancellation.  The MTA MUST set this MIB object to a
          value of true(1) if it is capable of echo
          cancellation, and a value of false(2) if not."
    ::= { pktcSigDevObjects 2 }

pktcSigDevSilenceSuppression  OBJECT-TYPE
    SYNTAX       TruthValue
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        " This object specifies if the device is capable of
          silence suppression (as a result of Voice Activity
          Detection).  The MTA MUST set this MIB object to a
          value of true(1) if it is capable of silence
          suppression, and a value of false(2) if not."
::= { pktcSigDevObjects 3 }

pktcSigDevCidSigProtocol  OBJECT-TYPE
    SYNTAX       PktcSubscriberSideSigProtocol
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "This object is used to configure the subscriber-line
         protocol used for signaling on-hook caller id information.
```

```
          Different countries define different caller id signaling
          protocols to support caller identification.

          Setting this object at a value fsk(1) sets the subscriber
          line protocol to be Frequency Shift Keying (FSK).

          Setting this object at a value dtmf(2) sets the subscriber
          line protocol to be Dual-Tone Multi-Frequency (DTMF).

          The value of this MIB object MUST NOT persist across MTA
          reboots."
      REFERENCE
         "ETSI-EN-300-659-1 Specification"
      DEFVAL { fsk }
::= { pktcSigDevObjects 4 }

pktcSigDevR0Cadence     OBJECT-TYPE
    SYNTAX      PktcRingCadence
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        " This object specifies ring cadence 0 (a user-defined
          field).

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    ::= { pktcSigDevObjects 5 }

pktcSigDevR1Cadence     OBJECT-TYPE
    SYNTAX      PktcRingCadence
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        " This object specifies ring cadence 1 (a user-defined
          field).

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    ::= { pktcSigDevObjects 6 }

pktcSigDevR2Cadence     OBJECT-TYPE
    SYNTAX       PktcRingCadence
    MAX-ACCESS    read-write
    STATUS        current
    DESCRIPTION
        " This object specifies ring cadence 2 (a user-defined
          field).
```

```
          The value of this MIB object MUST NOT persist across MTA
          reboots."
    ::= { pktcSigDevObjects 7 }

pktcSigDevR3Cadence     OBJECT-TYPE
    SYNTAX       PktcRingCadence
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies ring cadence 3 (a user-defined
          field).

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    ::= { pktcSigDevObjects 8 }

pktcSigDevR4Cadence     OBJECT-TYPE
    SYNTAX       PktcRingCadence
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies ring cadence 4 (a user-defined
          field).

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    ::= { pktcSigDevObjects 9 }

pktcSigDevR5Cadence     OBJECT-TYPE
    SYNTAX       PktcRingCadence
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies ring cadence 5 (a user-defined
          field).

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    ::= { pktcSigDevObjects 10 }

pktcSigDevR6Cadence     OBJECT-TYPE
    SYNTAX      PktcRingCadence
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        " This object specifies ring cadence 6 (a user-defined
          field).
```

```
          The value of this MIB object MUST NOT persist across MTA
          reboots."
    ::= { pktcSigDevObjects 11 }

pktcSigDevR7Cadence     OBJECT-TYPE
    SYNTAX       PktcRingCadence
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies ring cadence 7 (a user-defined
          field).

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    ::= { pktcSigDevObjects 12 }

pktcSigDevRgCadence     OBJECT-TYPE
    SYNTAX       PktcRingCadence
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies ring cadence rg (a user-defined
          field).

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    ::= { pktcSigDevObjects 13 }

pktcSigDevRsCadence     OBJECT-TYPE
    SYNTAX       PktcRingCadence
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies ring cadence rs (a user-defined
          field).  The MTA MUST reject any attempt to make this object
          repeatable.

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    ::= { pktcSigDevObjects 14 }

pktcSigDefCallSigDscp  OBJECT-TYPE
    SYNTAX      Dscp  -- RFC 3289: DIFFSERV-DSCP-TC
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        " The default value used in the IP header for setting the
          Differentiated Services Code Point (DSCP) value for call
```

```
          signaling.

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    DEFVAL { 0 }
    ::= { pktcSigDevObjects 15 }

pktcSigDefMediaStreamDscp  OBJECT-TYPE
    SYNTAX      Dscp  -- RFC 3289: DIFFSERV-DSCP-TC
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        " This object contains the default value used in the IP
          header for setting the Differentiated Services Code Point
          (DSCP) value for media stream packets.  The MTA MUST NOT
          update this object with the value supplied by the CMS in
          the NCS messages (if present).  Any currently active
          connections are not affected by updates to this object.
          When the value of this object is updated by SNMP, the MTA
          MUST use the new value as a default starting only from
          new connections.

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    DEFVAL { 0 }
    ::= { pktcSigDevObjects 16 }

--
-- pktcSigCapabilityTable - This table defines the valid signaling
-- types supported by this MTA.
--

pktcSigCapabilityTable    OBJECT-TYPE
    SYNTAX        SEQUENCE OF PktcSigCapabilityEntry
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        " This table describes the signaling types supported by this
          MTA."
    ::= { pktcSigDevObjects 17 }

pktcSigCapabilityEntry    OBJECT-TYPE
    SYNTAX        PktcSigCapabilityEntry
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        " Entries in pktcMtaDevSigCapabilityTable - list of
          supported signaling types, versions, and vendor extensions
```

```
          for this MTA.  Each entry in the list provides for one
          signaling type and version combination.  If the device
          supports multiple versions of the same signaling type, it
          will require multiple entries."
    INDEX { pktcSigCapabilityIndex }
    ::= { pktcSigCapabilityTable 1 }

PktcSigCapabilityEntry  ::= SEQUENCE {
    pktcSigCapabilityIndex             Unsigned32,
    pktcSigCapabilityType              PktcSigType,
    pktcSigCapabilityVersion           SnmpAdminString,
    pktcSigCapabilityVendorExt         SnmpAdminString
    }

pktcSigCapabilityIndex       OBJECT-TYPE
    SYNTAX        Unsigned32 (1..255)
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        " The index value that uniquely identifies an entry in the
          pktcSigCapabilityTable."
    ::= { pktcSigCapabilityEntry 1 }

pktcSigCapabilityType      OBJECT-TYPE
    SYNTAX        PktcSigType
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        " This object identifies the type of signaling used.  This
          value has to be associated with a single signaling
          version."
    ::= { pktcSigCapabilityEntry 2 }

pktcSigCapabilityVersion      OBJECT-TYPE
    SYNTAX        SnmpAdminString
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        " Provides the version of the signaling type - reference
          pktcSigCapabilityType.  Examples would be 1.0 or 2.33 etc."
    ::= { pktcSigCapabilityEntry 3 }

pktcSigCapabilityVendorExt      OBJECT-TYPE
    SYNTAX        SnmpAdminString
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        " The vendor extension allows vendors to provide a list of
```

```
           additional capabilities.

           The syntax for this MIB object in ABNF ([RFC5234]) is
           specified to be zero or more occurrences of vendor
           extensions, as follows:

            pktcSigCapabilityVendorExt  = *(vendor-extension)
            vendor-extension = (ext symbol alphanum) DQUOTE ; DQUOTE
            ext      = DQUOTE %x58 DQUOTE
            symbol   = (DQUOTE %x2D DQUOTE)/(DQUOTE %x2D DQUOTE)
            alphanum = 1*6(ALPHA/DIGIT)

        "
    ::= { pktcSigCapabilityEntry 4 }

pktcSigDefNcsReceiveUdpPort  OBJECT-TYPE
    SYNTAX      InetPortNumber (1025..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " This object contains the MTA User Datagram Protocol (UDP)
          receive port that is being used for NCS call signaling.
          This object should only be changed by the configuration
          file.

          Unless changed via configuration, this MIB object MUST
          reflect a value of '2427'."
    REFERENCE
        "PacketCable NCS Specification"
    ::= { pktcSigDevObjects 18 }

pktcSigPowerRingFrequency    OBJECT-TYPE
    SYNTAX       INTEGER {
                 f20Hz(1),
                 f25Hz(2),
                 f33Point33Hz(3),
                 f50Hz(4),
                 f15Hz(5),
                 f16Hz(6),
                 f22Hz(7),
                 f23Hz(8),
                 f45Hz(9)
    }
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        " This object must only be provided via the configuration
          file during the provisioning process.  The power ring
```

```
            frequency is the frequency at which the sinusoidal voltage
            must travel down the twisted pair to make terminal
            equipment ring.  Different countries define different
            electrical characteristics to make terminal equipment
            ring.

            The f20Hz setting corresponds to a power ring frequency
            of 20 Hertz.  The f25Hz setting corresponds to a power ring
            frequency of 25 Hertz.  The f33Point33Hz setting
            corresponds to a power ring frequency of 33.33 Hertz.  The
            f50Hz setting corresponds to a power ring frequency of 50
            Hertz.  The f15Hz setting corresponds to a power ring
            frequency of 15 Hertz.  The f16Hz setting corresponds to a
            power ring frequency of 16 Hertz.  The f22Hz setting
            corresponds to a power ring frequency of 22 Hertz.  The
            f23Hz setting corresponds to a power ring frequency of 23
            Hertz.  The f45Hz setting corresponds to a power ring
            frequency of 45 Hertz."
        REFERENCE
              "ETSI-EN-300-001"
        ::= { pktcSigDevObjects 19 }

pktcSigPulseSignalTable    OBJECT-TYPE
        SYNTAX       SEQUENCE OF PktcSigPulseSignalEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            " The Pulse signal table defines the pulse signal operation.
              There are nine types of international pulse signals,
              with each signal having a set of provisionable parameters.
              The values of the MIB objects in this table take effect
              only if these parameters are not defined via signaling, in
              which case, the latter determines the values of the
              parameters.  The MIB objects in this table do not persist
              across MTA reboots."
        REFERENCE
            "ETSI-TS-101-909-4 Specification"
        ::= { pktcSigDevObjects 20 }

pktcSigPulseSignalEntry    OBJECT-TYPE
        SYNTAX       PktcSigPulseSignalEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            " This object defines the set of parameters associated with
              each particular value of pktcSigPulseSignalType.  Each
              entry in the pktcSigPulseSignalTable is indexed by the
              pktcSigPulseSignalType object.
```

```
          The conceptual rows MUST NOT persist across MTA reboots."
    INDEX { pktcSigPulseSignalType }
    ::= { pktcSigPulseSignalTable 1 }

PktcSigPulseSignalEntry ::= SEQUENCE {
        pktcSigPulseSignalType              INTEGER,
        pktcSigPulseSignalFrequency         INTEGER,
        pktcSigPulseSignalDbLevel           TenthdBm,
        pktcSigPulseSignalDuration          Unsigned32,
        pktcSigPulseSignalPulseInterval     Unsigned32,
        pktcSigPulseSignalRepeatCount       Unsigned32
}

pktcSigPulseSignalType    OBJECT-TYPE
    SYNTAX       INTEGER
                 {
                     initialRing(1),
                     pulseLoopClose(2),
                     pulseLoopOpen(3),
                     enableMeterPulse(4),
                     meterPulseBurst(5),
                     pulseNoBattery(6),
                     pulseNormalPolarity(7),
                     pulseReducedBattery(8),
                     pulseReversePolarity(9)
                 }
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "There are nine types of international pulse signals.  These
         signals are defined as follows:
         initial ring
         pulse loop close
         pulse loop open
         enable meter pulse
         meter pulse burst
         pulse no battery
         pulse normal polarity
         pulse reduced battery
         pulse reverse polarity"
    REFERENCE
        "ETSI-EN-300-324-1 Specification"

    ::= { pktcSigPulseSignalEntry 1 }

pktcSigPulseSignalFrequency    OBJECT-TYPE
    SYNTAX       INTEGER {
                 twentyfive(1),
```

```
                twelvethousand(2),
                sixteenthousand(3)
    }
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object is only applicable to the initialRing,
          enableMeterPulse, and meterPulseBurst signal types.  This
          object identifies the frequency of the generated signal.
          The following table defines the default values for this
          object depending on signal type:

          pktcSigPulseSignalType     Default
          initialRing                25
          enableMeterPulse           16000
          meterPulseBurst            16000

          The value of twentyfive MUST only be used for the
          initialRing signal type.  The values of twelvethousand and
          sixteenthousand MUST only be used for enableMeterPulse and
          meterPulseBurst signal types.  An attempt to set this
          object while the value of pktcSigPulseSignalType is not
          initialRing, enableMeterPulse, or meterPulseBurst will
          result in an 'inconsistentValue' error."
    REFERENCE
        "ETSI-EN-300-001 Specification"
         ::= { pktcSigPulseSignalEntry 2}

pktcSigPulseSignalDbLevel    OBJECT-TYPE
    SYNTAX       TenthdBm (-350..0)
    UNITS        "1/10 of a dBm"
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object is only applicable to the enableMeterPulse and
          meterPulseBurst signal types.  This is the decibel level
          for each frequency at which tones could be generated at
          the a and b terminals (TE connection point).  An attempt to
          set this object while the value of pktcSigPulseSignalType
          is not enableMeterPulse or meterPulseBurst will result in
          an 'inconsistentValue' error."
    REFERENCE
        "ETSI-EN-300-001 Specification"

    DEFVAL { -135 }
    ::={pktcSigPulseSignalEntry 3 }

pktcSigPulseSignalDuration    OBJECT-TYPE
```

```
    SYNTAX       Unsigned32 (0..5000)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies the pulse duration for each
          signal type.  In addition, the MTA must accept the values
          in the incremental steps specific for each signal type.
          The following table defines the default values and the
          incremental steps for this object depending on the signal
          type:

          pktcSigPulseSignaltype  Default (ms)   Increment (ms)
          initialRing                 200             50
          pulseLoopClose              200             10
          pulseLoopOpen               200             10
          enableMeterPulse            150             10
          meterPulseBurst             150             10
          pulseNoBattery              200             10
          pulseNormalPolarity         200             10
          pulseReducedBattery         200             10
          pulseReversePolarity        200             10

          An attempt to set this object to a value that does not
          fall on one of the increment boundaries, or on the wrong
          increment boundary for the specific signal type, will
          result in an 'inconsistentValue' error."
    REFERENCE
        "ETSI-EN-300-324-1 Specification"
         ::= {pktcSigPulseSignalEntry 4 }

pktcSigPulseSignalPulseInterval     OBJECT-TYPE
    SYNTAX       Unsigned32 (0..5000)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies the repeat interval, or the period,
          for each signal type.  In addition, the MTA must accept
          the values in the incremental steps specific for each
          signal type.  The following table defines the default
          values and the incremental steps for this object, depending
          on the signal type:

          pktcSigPulseSignaltype  Default (ms)   Increment (ms)
          initialRing                 200             50
          pulseLoopClose             1000             10
          pulseLoopOpen              1000             10
```

```
          enableMeterPulse          1000            10
          meterPulseBurst           1000            10
          pulseNoBattery            1000            10
          pulseNormalPolarity       1000            10
          pulseReducedBattery       1000            10
          pulseReversePolarity      1000            10

          An attempt to set this object to a value that does not
          fall on one of the increment boundaries, or on the wrong
          increment boundary for the specific signal type, will
          result in an 'inconsistentValue' error."
    REFERENCE
        "ETSI-EN-300-324-1 Specification"
         ::= { pktcSigPulseSignalEntry 5}

pktcSigPulseSignalRepeatCount    OBJECT-TYPE
    SYNTAX       Unsigned32 (1..50)
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies how many times to repeat a pulse.
          This object is not used by the enableMeterPulse signal
          type, and in that case, the value is irrelevant.  The
          following table defines the default values and the valid
          ranges for this object, depending on the signal type:

          pktcSigPulseSignaltype  Default   Range

          initialRing               1       1-5
          pulseLoopClose            1       1-50
          pulseLoopOpen             1       1-50
          enableMeterPulse      (any value)(but not used)
          meterPulseBurst           1       1-50
          pulseNoBattery            1       1-50
          pulseNormalPolarity       1       1-50
          pulseReducedBattery       1       1-50
          pulseReversePolarity      1       1-50

          An attempt to set this object to a value that does not
          fall within the range for the specific
          signal type will result in an 'inconsistentValue' error."
    ::={ pktcSigPulseSignalEntry 6 }

pktcSigDevCidMode    OBJECT-TYPE
    SYNTAX       INTEGER {
                 duringRingingETS(1),
                 dtAsETS(2),
                 rpAsETS(3),
```

```
                lrAsETS(4),
                lrETS(5)
                }
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        " For on-hook caller id, pktcSigDevCidMode selects the method
          for representing and signaling caller identification.  For
          the duringRingingETS method, the Frequency Shift Keying
          (FSK) or the Dual-Tone Multi-Frequency (DTMF) containing
          the caller identification information is sent between the
          first and second ring pattern.

          For the dtAsETS,rpAsETS, lrAsETS and lrETS
          methods, the FSK or DTMF containing the caller id
          information is sent before the first ring pattern.

          For the dtAsETS method, the FSK or DTMF is sent after the
          Dual Tone Alert Signal.  For the rpAsETS method, the FSK or
          DTMF is sent after a Ring Pulse.

          For the lrAsETS method, the Line Reversal occurs first,
          then the Dual Tone Alert Signal, and, finally, the FSK or
          DTMF is sent.

          For the lrETS method, the Line Reversal occurs first,
          then the FSK or DTMF is sent.

          The value of this MIB object MUST NOT persist across MTA
          reboots."

    DEFVAL { rpAsETS}
    ::= {pktcSigDevObjects 21 }

pktcSigDevCidAfterRing     OBJECT-TYPE
    SYNTAX       Unsigned32 (0|50..2000)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies the delay between the end of first
          ringing pattern and the start of the transmission of the
          FSK or DTMF containing the caller id information.  It is
          only used when pktcSigDevCidMode is set to a value of
          'duringRingingETS'.

          The following table defines the default values
          for this MIB object, depending on the signal type
```

(pktcSigDevCidMode), and MUST be followed:

Value of pktcSigDevCidMode	Default value
duringringingETS	550 ms
dtAsETS	any value (not used)
rpAsETS	any value (not used)
lrAsETS	any value (not used)
lrETS	any value (not used)

An attempt to set this object while the value of pktcSigDevCidMode is not duringringingETS will result in an 'inconsistentValue' error.

The value of this MIB object MUST NOT persist across MTA reboots."

```
    REFERENCE
        "ETSI-EN-300-659-1 Specification"
    DEFVAL { 550 }
    ::= {pktcSigDevObjects 22 }

pktcSigDevCidAfterDTAS    OBJECT-TYPE
    SYNTAX       Unsigned32 (0|45..500)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies the delay between the end of the
          Dual Tone Alert Signal (DT-AS) and the start of the
          transmission of the FSK or DTMF containing the caller id
          information.  This object is only used when
          pktcSigDevCidMode is set to a value of 'dtAsETS' or
          'lrAsETS'.

          The following table defines the default values
          for this MIB object, depending on the signal type
        (pktcSigDevCidMode), and MUST be followed:
```

Value of pktcSigDevCidMode	Default value
duringringingETS	any value (not used)
dtAsETS	50 ms
rpAsETS	any value (not used)
lrAsETS	50 ms
lrETS	any value (not used)

An attempt to set this object while the value of

```
          pktcSigDevCidMode is not 'dtAsETS' or 'lrAsETS' will
          result in an 'inconsistentValue' error.

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    REFERENCE
        "ETSI-EN-300-659-1 Specification"
    DEFVAL { 50 }
    ::= {pktcSigDevObjects 23 }

pktcSigDevCidAfterRPAS    OBJECT-TYPE
    SYNTAX       Unsigned32 (0|500..800)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies the delay between the end of the
          Ring Pulse Alert Signal (RP-AS) and the start of the
          transmission of the FSK or DTMF containing the caller id
          information.  This MIB object is only used when
          pktcSigDevCidMode is set to a value of 'rpAsETS'.
          The following table defines the default values
          for this MIB object, depending on the signal type
         (pktcSigDevCidMode), and MUST be followed:

          Value of pktcSigDevCidMode       Default value

          duringringingETS                 any value  (not used)
          dtAsETS                          any value  (not used)
          rpAsETS                          650 ms
          lrAsETS                          any value  (not used)
          lrETS                            any value  (not used)

          An attempt to set this object while the value of
          pktcSigDevCidMode is not 'rpAsETS' will result in an
          'inconsistentValue' error.

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    REFERENCE
        "ETSI-EN-300-659-1 Specification"
    DEFVAL { 650 }
    ::= {pktcSigDevObjects 24 }

pktcSigDevRingAfterCID    OBJECT-TYPE
    SYNTAX       Unsigned32 (0|50..500)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-write
```

```
    STATUS       current
    DESCRIPTION
        " This object specifies the delay between the end of the
          complete transmission of the FSK or DTMF containing the
          caller id information and the start of the first ring
          pattern.  It is only used when pktcSigDevCidMode is
          set to a value of 'dtAsETS', 'rpAsETS', 'lrAsETS' or
          'lrETS'.

          The following table defines the default values
          for this MIB object, depending on the signal type
         (pktcSigDevCidMode), and MUST be followed:

          Value of pktcSigDevCidMode       Default value

          duringringingETS                 any value  (not used)
          dtAsETS                          250 ms
          rpAsETS                          250 ms
          lrAsETS                          250 ms
          lrETS                            250 ms

          An attempt to set this object while the value of
          pktcSigDevCidMode is not 'dtAsETS', 'rpAsETS',
          'lrAsETS', or 'lrETS' will result in an 'inconsistent
          value' error.

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    REFERENCE
        "ETSI-EN-300-659-1 Specification"
    DEFVAL { 250 }
    ::= {pktcSigDevObjects 25 }

pktcSigDevCidDTASAfterLR    OBJECT-TYPE
    SYNTAX       Unsigned32 (50..655)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies the delay between the end of the
          Line Reversal and the start of the Dual Tone Alert Signal
          (DT-AS).  This object is only used when pktcSigDevCidMode
          is set to a value of 'lrAsETS'.

          The following table defines the default values
          for this MIB object, depending on the signal type
         (pktcSigDevCidMode), and MUST be followed:
```

```
          Value of pktcSigDevCidMode       Default value

          duringringingETS                 any value  (not used)
          dtAsETS                          any value  (not used)
          rpAsETS                          any value  (not used)
          lrAsETS                          250 ms
          lrETS                            any value  (not used)

          An attempt to set this object while the value of
          pktcSigDevCidMode is not lrAsETS will result in an
          'inconsistentValue' error.

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    REFERENCE
        "ETSI-EN-300-659-1 Specification"
    DEFVAL { 250 }

    ::= {pktcSigDevObjects 26 }

pktcSigDevVmwiMode    OBJECT-TYPE
    SYNTAX       INTEGER {
                 dtAsETS(1),
                 rpAsETS(2),
                 lrAsETS(3),
                 osi(4),
                 lrETS(5)
                 }
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        " For visual message waiting indicator (VMWI),
          pktcSigDevVmwiMode selects the alerting signal method.  For
          the dtAsETS, rpAsETS, lrAsETS, osi, and lrETS methods,
          the FSK containing the VMWI information is sent after an
          alerting signal.

          For the dtAsETS method, the FSK, or DTMF
          is sent after the Dual Tone Alert Signal.  For the rpAsETS
          method, the FSK or DTMF is sent after a Ring Pulse.

          For the lrAsETS method, the Line Reversal occurs first,
          then the Dual Tone Alert Signal, and, finally, the FSK or
          DTMF is sent.

          For the OSI method, the FSK or DTMF is sent after the Open
          Switching Interval.
```

```
          For the lrETS method, the Line Reversal occurs first,
          then the FSK or DTMF is sent.

          The value of this MIB object MUST NOT persist across MTA
          reboots."

    DEFVAL { rpAsETS }
    ::= {pktcSigDevObjects 27 }

pktcSigDevVmwiAfterDTAS    OBJECT-TYPE
    SYNTAX       Unsigned32 (0|45..500)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies the delay between the end of the
          Dual Tone Alert Signal (DT-AS) and the start of the
          transmission of the FSK or DTMF containing the VMWI
          information.

          This object is only used when pktcSigDevVmwiMode is
          set to a value of 'dtAsETS' or 'lrAsETS'.

          The following table defines the default values
          for this MIB object, depending on the signal type
         (pktcSigDevVmwiMode), and MUST be followed:

          Value of pktcSigDevVmwiMode       Default value

          dtAsETS                           50 ms
          rpAsETS                           any value  (not used)
          lrAsETS                           50 ms
          lrETS                             any value  (not used)

          An attempt to set this object while the value of
          pktcSigDevVmwiMode is not 'dtAsETS' or 'lrAsETS' will
          result in an 'inconsistentValue' error.

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    REFERENCE
        "ETSI-EN-300-659-1 Specification"
    DEFVAL { 50 }
    ::= {pktcSigDevObjects 28 }


pktcSigDevVmwiAfterRPAS    OBJECT-TYPE
    SYNTAX       Unsigned32 (0|500..800)
```

```
    UNITS        "Milliseconds"
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies the delay between the end of the
          Ring Pulse Alert Signal (RP-AS) and the start of the
          transmission of the FSK or DTMF containing the VMWI
          information.

          This object is only used when pktcSigDevVmwiMode is
          set to a value of 'rpAsETS'.

          The following table defines the default values
          for this MIB object, depending on the signal type
         (pktcSigDevVmwiMode), and MUST be followed:

          Value of pktcSigDevVmwiMode       Default value

          dtAsETS                           any value  (not used)
          rpAsETS                           650 ms
          lrAsETS                           any value  (not used)
          lrETS                             any value  (not used)

          An attempt to set this object while the value of
          pktcSigDevVmwiMode is not 'rpAsETS' will result in an
          'inconsistentValue' error.

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    REFERENCE
        "ETSI-EN-300-659-1 Specification"
    DEFVAL { 650 }
    ::= {pktcSigDevObjects 29 }

pktcSigDevVmwiDTASAfterLR    OBJECT-TYPE
    SYNTAX       Unsigned32 (0|50..655)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        " This object specifies the delay between the end of the
          Line Reversal and the start of the Dual Tone Alert Signal
          (DT-AS) for VMWI information.  This object is only used
          when pktcSigDevVmwiMode is set to a value of 'lrAsETS'.

          The following table defines the default values
          for this MIB object, depending on the signal type
         (pktcSigDevVmwiMode), and MUST be followed:
```

```
          Value of pktcSigDevVmwiMode       Default value

          dtAsETS                           any value  (not used)
          rpAsETS                           any value  (not used)
          lrAsETS                           250 ms
          lrETS                             any value  (not used)

          An attempt to set this object while the value of
          pktcSigDevVmwiMode is not 'lrAsETS' will result in an
          'inconsistentValue' error.

          The value of this MIB object MUST NOT persist across MTA
          reboots."
    REFERENCE
        "ETSI-EN-300-659-1 Specification"
    DEFVAL { 250 }
    ::= {pktcSigDevObjects 30 }

pktcSigDevRingCadenceTable    OBJECT-TYPE
    SYNTAX       SEQUENCE OF PktcSigDevRingCadenceEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "Cadence rings are defined by the telco governing
         body for each country.  The MTA must be able to support
         various ranges of cadence patterns and cadence periods.
         The MTA will be able to support country-specific
         provisioning of the cadence and idle period.  Each
         cadence pattern will be assigned a unique value ranging
         from 0-127 (inclusive) corresponding to the value of x,
         where x is the value sent in the cadence ringing (cr)
         signal cr(x), requested per the appropriate NCS
         message, and defined in the E package.  The MTA will derive
         the cadence periods from the ring cadence table entry, as
         provisioned by the customer.  The MTA is allowed to provide
         appropriate default values for each of the ring cadences.
         This table only needs to be supported when the MTA
         implements the E package."
    REFERENCE
        "ETSI-TS-101-909-4 Specification"
    ::= { pktcSigDevObjects 31 }

pktcSigDevRingCadenceEntry    OBJECT-TYPE
    SYNTAX       PktcSigDevRingCadenceEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
```

```
        " Each entry in this row corresponds to a ring cadence
          that is being supported by the device.  The conceptual
          rows MUST NOT persist across MTA reboots."
    INDEX { pktcSigDevRingCadenceIndex }
    ::= { pktcSigDevRingCadenceTable 1 }

PktcSigDevRingCadenceEntry ::= SEQUENCE {
        pktcSigDevRingCadenceIndex      Unsigned32,
        pktcSigDevRingCadence           PktcRingCadence
    }

pktcSigDevRingCadenceIndex    OBJECT-TYPE
    SYNTAX       Unsigned32 (0..127)
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        " A unique value ranging from 0 to 127 that corresponds to the
          value sent by the LE based on country-specific cadences,
          one row per cadence cycle.  In any given system
          implementation for a particular country, it is anticipated
          that a small number of ring cadences will be in use.  Thus,
          this table most likely will not be populated to its full
          size."
    ::= { pktcSigDevRingCadenceEntry 1 }

pktcSigDevRingCadence    OBJECT-TYPE
    SYNTAX       PktcRingCadence
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "This is the Ring Cadence."
    ::= { pktcSigDevRingCadenceEntry 2 }


pktcSigDevToneTable    OBJECT-TYPE
    SYNTAX       SEQUENCE OF PktcSigDevToneEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        " The Tone Table defines the composition of tones and
          various tone operations.

          The definition of the tones callWaiting1 through
          callWaiting4 in this table MUST only contain the
          audible tone itself; the delay between tones or the value
          of the tone repeat count are not applicable for the call
          waiting tones.
```

```
            The delay between tones or the repeat count is controlled
            by the objects pktcSigEndPntConfigCallWaitingDelay and
            pktcSigEndPntConfigCallWaitingMaxRep.  If the
            pktcSigDevToneType is set to either of the values
            callWaiting1, callWaiting2, callWaiting3, or callWaiting4,
            then the value of the pktcSigDevToneWholeToneRepeatCount
            object indicates that the particular frequency group is
            applicable, as a repeatable part of the tone, based on the
            value of the MIB object
            pktcSigDevToneWholeToneRepeatCount.

            The MTA MUST make sure that, after the provisioning
            cycle, the table is fully populated (i.e., for each
            possible index, an entry MUST be defined) using
            reasonable defaults for each row that was not defined
            by the provisioning information delivered via MTA
            Configuration.

            The frequency composition of each tone is defined by the
            pktcSigDevMultiFreqToneTable.  For each tone type defined
            in pktcSigDevToneTable, the MTA MUST populate at least
            one entry in the pktcSigDevMultiFreqToneTable.

            For each particular value of pktcSigDevToneType, the
            pktcSigDevToneTable table can define non-repeating and
            repeating groups of the frequencies defined by the
            pktcSigDevMultiFreqToneTable, such that each group is
            represented by the set of the consecutive rows
            (frequency group) in the pktcSigDevMultiFreqToneTable.

            Objects in this table do not persist across MTA reboots.
            For tones with multiple frequencies refer to the MIB table
            pktcSigDevMultiFreqToneTable."
        REFERENCE
            "PacketCable NCS Specification, ETSI-TS-101-909-4
             Specification."
        ::= { pktcSigDevObjects 32 }

pktcSigDevToneEntry    OBJECT-TYPE
        SYNTAX       PktcSigDevToneEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            " The different tone types that can be provisioned based on
              country-specific needs.

              Each entry contains the tone generation parameters for
              a specific frequency group of the specific Tone Type.
```

```
          The different parameters can be provisioned via MTA
          configuration based on country specific needs.
          An MTA MUST populate all entries of this table for each
          tone type."
    INDEX { pktcSigDevToneType, pktcSigDevToneFreqGroup }
    ::= { pktcSigDevToneTable 1 }

PktcSigDevToneEntry ::= SEQUENCE {
    pktcSigDevToneType                      INTEGER,
    pktcSigDevToneFreqGroup                 Unsigned32,
    pktcSigDevToneFreqCounter               Unsigned32,
    pktcSigDevToneWholeToneRepeatCount      Unsigned32,
    pktcSigDevToneSteady                    TruthValue
    }

pktcSigDevToneType        OBJECT-TYPE
    SYNTAX       INTEGER {
                 busy(1),
                 confirmation(2),
                 dial(3),
                 messageWaiting(4),
                 offHookWarning(5),
                 ringBack(6),
                 reOrder(7),
                 stutterdial(8),
                 callWaiting1(9),
                 callWaiting2(10),
                 callWaiting3(11),
                 callWaiting4(12),
                 alertingSignal(13),
                 specialDial(14),
                 specialInfo(15),
                 release(16),
                 congestion(17),
                 userDefined1(18),
                 userDefined2(19),
                 userDefined3(20),
                 userDefined4(21)
                 }
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "A unique value that will correspond to the different
         tone types.  These tones can be provisioned based on
         country-specific needs.  This object defines the type
         of tone being accessed.

         The alertingSignal, specialDial, specialInfo, release,
```

```
          congestion, userDefined1, userDefined2, userDefined3,
          and userDefined4 tone types are used in
          the E line package."
    ::= { pktcSigDevToneEntry 1 }

pktcSigDevToneFreqGroup  OBJECT-TYPE
       SYNTAX       Unsigned32(1..4)
       MAX-ACCESS   not-accessible
       STATUS       current
       DESCRIPTION
           "This MIB object represents the Tone Sequence reference
           of a multi-sequence tone."
       ::={ pktcSigDevToneEntry 2}

pktcSigDevToneFreqCounter OBJECT-TYPE
       SYNTAX       Unsigned32(1..8)
       MAX-ACCESS   read-only
       STATUS       current
       DESCRIPTION
           "This MIB object represents the number of consecutive
           multi-frequency tones for the particular tone type in
           the multi-frequency table (pktcSigDevMultiFreqToneTable).

           Such a sequence of the consecutive multi-frequency tones
           forms the tone group for the particular tone type in the
           pktcSigDevToneTable."
       ::={ pktcSigDevToneEntry 3}

pktcSigDevToneWholeToneRepeatCount      OBJECT-TYPE
    SYNTAX       Unsigned32 (0..5000)
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "This is the repeat count, which signifies how many times
         to repeat the entire on-off cadence sequence.  Setting this
         object may result in a cadence duration longer or shorter
         than the overall signal duration specified by the time out
         (TO) object for a particular signal.  If the repeat count
         results in a longer tone duration than the signal duration
         specified by the TO, the tone duration defined by the
         TO object for a particular signal always represents
         the overall signal duration for a tone.  In this case, the
         tone duration repeat count will not be fully exercised, and
         the desired tone duration will be truncated per the TO
         setting.  If the repeat count results in a shorter tone
         duration than the signal duration specified by the TO, the
         tone duration defined by the repeat count takes precedence
         over the TO and will end the signal event.  In this case,
```

```
          the TO represents a time not to be exceeded for the signal.
          It is recommended to ensure proper telephony signaling so that
          the TO duration setting should always be longer than the
          desired repeat count-time duration."
      ::={ pktcSigDevToneEntry 4 }

pktcSigDevToneSteady    OBJECT-TYPE
      SYNTAX       TruthValue
      MAX-ACCESS   read-only
      STATUS       current
      DESCRIPTION
          "This MIB object represents the steady tone status.  A value
           of 'true(1)' indicates that the steady tone is applied, and
           a value of 'false(2)' indicates otherwise.
           Devices must play out the on-off cadence sequence for
           the number of times indicated by the MIB object
           'pktcSigDevToneWholeToneRepeatCount' prior to applying the
           last tone steadily, indefinitely.  If the MIB table
           'pktcSigDevToneTable' contains multiple rows with this
           Object set to a value of 'true(1)', the steady tone is
           applied to the last repeating frequency group of the tone.

           Setting this MIB object may result in a tone duration that is
           longer or shorter than the overall signal duration
           specified by the time out (TO) MIB object for a particular
           signal.  If the repeat count results in a longer tone
           duration than the signal duration specified by the TO, the
           tone duration defined by the TO object for a particular
           signal always represents the overall signal duration for a
           tone.  In this case, the tone duration repeat count will
           not be fully exercised, and the desired tone duration will
           be truncated per the TO setting.  If the repeat count
           results in a shorter tone duration than the signal duration
           specified by the TO, the tone duration defined by the
           repeat count takes precedence over the TO and will end the
           signal event.  In this case, the TO represents a time not to
           be exceeded for the signal.

           It is recommended to ensure proper telephony signaling that
           The TO duration setting should always be longer than the
           desired repeat count-time duration, plus the desired maximum
           steady tone period."
      ::={ pktcSigDevToneEntry 5 }

   pktcSigDevMultiFreqToneTable    OBJECT-TYPE
       SYNTAX       SEQUENCE OF PktcSigDevMultiFreqToneEntry
       MAX-ACCESS   not-accessible
       STATUS       current
```

```
        DESCRIPTION
            " This MIB table defines the characteristics of tones
              with multiple frequencies.  The constraints imposed
              on the tones by the MIB table pktcSigDevToneTable
              need to be considered for MIB objects in this table
              as well.

              The MTA MUST populate the corresponding row(s)
              of the pktcSigDevMultiFreqToneTable for each tone
              defined in the pktcSigDevToneTable.

              The contents of the table may be provisioned via
              MTA configuration."
        REFERENCE
            "PacketCable NCS Specification, ETSI-TS-101-909-4
             Specification."
        ::= { pktcSigDevObjects 33 }

    pktcSigDevMultiFreqToneEntry    OBJECT-TYPE
        SYNTAX       PktcSigDevMultiFreqToneEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            " The different tone types with multiple frequencies
              that can be provisioned based on country-specific
              needs."
        INDEX {pktcSigDevToneType, pktcSigDevToneNumber}
        ::= { pktcSigDevMultiFreqToneTable 1 }

    PktcSigDevMultiFreqToneEntry ::= SEQUENCE {
          pktcSigDevToneNumber                    Unsigned32,
          pktcSigDevToneFirstFreqValue            Unsigned32,
          pktcSigDevToneSecondFreqValue           Unsigned32,
          pktcSigDevToneThirdFreqValue            Unsigned32,
          pktcSigDevToneFourthFreqValue           Unsigned32,
          pktcSigDevToneFreqMode                  INTEGER,
          pktcSigDevToneFreqAmpModePrtg           Unsigned32,
          pktcSigDevToneDbLevel                   TenthdBm,
          pktcSigDevToneFreqOnDuration            Unsigned32,
          pktcSigDevToneFreqOffDuration           Unsigned32,
          pktcSigDevToneFreqRepeatCount           Unsigned32
    }

    pktcSigDevToneNumber OBJECT-TYPE
        SYNTAX       Unsigned32(1..8)
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
```

```
            "This MIB object represents the frequency reference
             of a multi-frequency tone."
        ::={ pktcSigDevMultiFreqToneEntry 1}

    pktcSigDevToneFirstFreqValue    OBJECT-TYPE
        SYNTAX       Unsigned32(0..4000)
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
          "This MIB object represents the value of the first
           frequency of a tone type.  A value of zero implies
           absence of the referenced frequency."
        ::={ pktcSigDevMultiFreqToneEntry 2}

    pktcSigDevToneSecondFreqValue    OBJECT-TYPE
        SYNTAX       Unsigned32(0..4000)
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
          "This MIB object represents the value of the second
           frequency of a tone type.  A value of zero implies
           absence of the referenced frequency."
        ::={ pktcSigDevMultiFreqToneEntry 3}

    pktcSigDevToneThirdFreqValue    OBJECT-TYPE
        SYNTAX       Unsigned32(0..4000)
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
          "This MIB object represents the value of the third
           frequency of a tone type.  A value of zero implies
           absence of the referenced frequency."
        ::={ pktcSigDevMultiFreqToneEntry 4}

    pktcSigDevToneFourthFreqValue    OBJECT-TYPE
        SYNTAX       Unsigned32(0..4000)
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
          "This MIB object represents the value of the fourth
           frequency of a tone type.  A value of zero implies
           absence of the referenced frequency."
        ::={ pktcSigDevMultiFreqToneEntry 5}

    pktcSigDevToneFreqMode OBJECT-TYPE
        SYNTAX       INTEGER {
                      firstModulatedBySecond(1),
                      summation(2)
```

```
                    }
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
        "This MIB object provides directive on the
         modulation or summation of the frequencies
         involved in the tone.

         It is to be noted that while summation can
         be done without any constraint on the number
         of frequencies, the modulation (amplitude)
         holds good only when there are two frequencies
         (first and second).

         Thus:
           - If the mode is set to a value of
             'firstModulatedBySecond(1)', the first frequency
             MUST be modulated by the second, and the remaining
             frequencies (third and fourth) ignored.  The
             percentage of amplitude modulation to be applied
             is defined by the MIB object
             pktcSigDevToneFreqAmpModePrtg.

           - If the mode is set to a value of
             'summation(2)', all the frequencies MUST be
             summed without any modulation.
        "
        ::={ pktcSigDevMultiFreqToneEntry 6}

   pktcSigDevToneFreqAmpModePrtg OBJECT-TYPE
        SYNTAX       Unsigned32(0..100)
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
           "This MIB object represents the percentage of amplitude
            modulation applied to the second frequency
            when the MIB object pktcSigDevToneFreqMode is
            set to a value of 'firstModulatedBySecond (1)'.

            If the MIB object pktcSigDevToneFreqMode is set to
            value of 'summation (2)', then this MIB object MUST be
            ignored."
        ::={ pktcSigDevMultiFreqToneEntry 7}

   pktcSigDevToneDbLevel    OBJECT-TYPE
       SYNTAX       TenthdBm (-250..-110)
       UNITS        "1/10 of a dBm"
       MAX-ACCESS   read-only
```

```
      STATUS       current
      DESCRIPTION
          "This MIB object contains the decibel level for each
           analog signal (tone) that is locally generated
           (versus in-band supervisory tones) and sourced to
           the a-b terminals (TE connection point).  Each tone
           in itself may consist of multiple frequencies, as
           defined by the MIB table pktcSigDevMultiFreqToneTable.

           This MIB object reflects the desired level at
           the Telco (POTS) a-b (T/R) terminals, including the
           effect of any MTA receiver gain (loss).  This is required
           so that locally generated tones are consistent with
           remotely generated in-band tones at the a-b terminals,
           consistent with user expectations.

           This MIB object must be set for each tone.
           When tones are formed by combining multi-frequencies,
           the level of each frequency shall be set so as to result
           in the tone level specified in this object at the a-b
           (T/R) terminals.

           The wide range of levels for this Object is required
           to provide signal-generator levels across the wide
           range of gains (losses) -- but does not imply the entire
           range is to be achievable given the range of gains (losses)
           in the MTA."
     DEFVAL { -120 }
     ::={ pktcSigDevMultiFreqToneEntry 8}

   pktcSigDevToneFreqOnDuration OBJECT-TYPE
       SYNTAX       Unsigned32(0..5000)
       UNITS        "milliseconds"
       MAX-ACCESS   read-only
       STATUS       current
       DESCRIPTION
          "This MIB object represents the duration for which the
           frequency reference corresponding to the tone type
           is turned on."
       ::={ pktcSigDevMultiFreqToneEntry 9}

   pktcSigDevToneFreqOffDuration OBJECT-TYPE
       SYNTAX       Unsigned32(0..5000)
       UNITS        "milliseconds"
       MAX-ACCESS   read-only
       STATUS       current
       DESCRIPTION
          "This MIB object represents the duration for which the
```

```
            frequency reference corresponding to the tone type
            is turned off."
        ::={ pktcSigDevMultiFreqToneEntry 10}

    pktcSigDevToneFreqRepeatCount OBJECT-TYPE
        SYNTAX       Unsigned32(0..5000)
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
        "This MIB object indicates the number of times
        to repeat the cadence cycle represented by the
        on/off durations (refer to the MIB objects
        pktcSigDevToneFreqOnDuration and
        pktcSigDevToneFreqOffDuration).

        Setting this object may result in a tone duration that is
        longer or shorter than the overall signal duration
        specified by the time out (TO) object for the
        corresponding tone type.  If the value of this MIB
        Object indicates a longer duration than that
        specified by the TO, the latter overrules the former,
        and the desired tone duration will be truncated according
        to the TO.

        However, if the repeat count results in a shorter
        tone duration than the signal duration specified by
        the TO, the tone duration defined by the repeat count
        takes precedence over the TO and will end the signal
        event.  In this case, the TO represents a time not to
        be exceeded for the signal.  It is recommended, to
        ensure proper telephony signaling, that the TO
        duration setting should always be longer than the
        desired repeat count-time duration.  A value of zero
        means the tone sequence is to be played once but not
        repeated."
        ::={ pktcSigDevMultiFreqToneEntry 11}

    pktcSigDevCidDelayAfterLR  OBJECT-TYPE
        SYNTAX       Unsigned32 (300..800)
        UNITS        "Milliseconds"
        MAX-ACCESS   read-write
        STATUS       current
        DESCRIPTION
            "This object specifies the delay between the end of the
             Line Reversal and the start of the FSK or DTMF signal.
             This MIB object is used only when pktcSigDevCidMode is
             set to a value of 'lrETS'.  This timing has a range of
             300 to 800 ms.
```

```
            The following table defines the default values
            for this MIB object, depending on the signal type
           (pktcSigDevCidMode), and MUST be followed:

          Value of pktcSigDevCidMode       Default value

            duringringingETS               any value  (not used)
            dtAsETS                        any value  (not used)
            rpAsETS                        any value  (not used)
            lrAsETS                        any value  (not used)
            lrETS                          400

            An attempt to set this object while the value of
            pktcSigDevCidMode is not set to a value of 'lrETS' will
            result in an 'inconsistentValue' error.

            The value of this MIB object MUST NOT persist across MTA
            reboots."
        DEFVAL { 400 }
        ::= {pktcSigDevObjects 34 }

    pktcSigDevCidDtmfStartCode OBJECT-TYPE
        SYNTAX       DtmfCode
        MAX-ACCESS   read-write
        STATUS       current
        DESCRIPTION
            "This object identifies optional start codes used when
            the MIB object pktcSigDevCidSigProtocol is set
            to a value of 'dtmf(2)'.

            Different countries define different caller id signaling
            codes to support caller identification.  When Dual-Tone
            Multi-Frequency (DTMF) is used, the caller id digits are
            preceded by a 'start code' digit, followed by the digit
            transmission sequence <S1>...<Sn> (where Sx represents
            the digits 0-9), and terminated by the 'end code' digit.

            For example,
              <A><S1>...<Sn> <D><S1>...<Sn> <B><S1>...<Sn> <C>.
            The start code for calling number delivery may be DTMF
            'A' or 'D'.  The start code for redirecting a number may be
            DTMF 'D'.  The DTMF code 'B' may be sent by the network
            as a start code for the transfer of information values,
            through which special events can be indicated to the
            user.  In some countries, the '*' or '#' may be used
            instead of 'A', 'B', 'C', or 'D'.

            The value of this MIB object MUST NOT persist across MTA
```

```
            reboots."
        REFERENCE
            "ETSI-EN-300-659-1 specification"
        DEFVAL {dtmfcodeA}
    ::= { pktcSigDevObjects 35 }

    pktcSigDevCidDtmfEndCode OBJECT-TYPE
        SYNTAX       DtmfCode
        MAX-ACCESS   read-write
        STATUS       current
        DESCRIPTION
            "This object identifies optional end codes used when the
             pktcSigDevCidSigProtocol is set to a value of
             'dtmf(2)'.

             Different countries define different caller id signaling
             protocols to support caller identification.  When
             Dual-Tone Multi-Frequency (DTMF) is used, the caller id
             digits are preceded by a 'start code' digit, followed by
             the digit transmission sequence <S1>...<Sn> (where Sx
             represents the digits 0-9), and terminated by the 'end
             code' digit.

             For example,
               <A><S1>...<Sn> <D><S1>...<Sn> <B><S1>...<Sn> <C>.

             The DTMF code 'C' may be sent by the network as an
             end code for the transfer of information values, through
             which special events can be indicated to the user.  In
             some countries, the '*' or '#' may be used instead of
             'A', 'B', 'C', or 'D'.

             The value of this MIB object MUST NOT persist across MTA
             reboots."
        REFERENCE
            "ETSI-EN-300-659-1 specification"
        DEFVAL {dtmfcodeC}
    ::= { pktcSigDevObjects 36 }

    pktcSigDevVmwiSigProtocol  OBJECT-TYPE
        SYNTAX       PktcSubscriberSideSigProtocol
        MAX-ACCESS   read-write
        STATUS       current
        DESCRIPTION
            "This object identifies the subscriber line protocol used
             for signaling the information on Visual Message Waiting
             Indicator (VMWI).  Different countries define different
             VMWI signaling protocols to support VMWI service.
```

```
            Frequency shift keying (FSK) is most commonly used.
            DTMF is an alternative.

            The value of this MIB object MUST NOT persist across MTA
            reboots."
         DEFVAL { fsk }
    ::= { pktcSigDevObjects 37 }

    pktcSigDevVmwiDelayAfterLR    OBJECT-TYPE
        SYNTAX       Unsigned32 (0|300..800)
        UNITS        "Milliseconds"
        MAX-ACCESS   read-write
        STATUS       current
        DESCRIPTION
            "This object specifies the delay between the end of the
             Line Reversal and the start of the FSK or DTMF signal.
             This object is only used when pktcSigDevVmwiMode is
             set to a value of 'lrETS'.
             This timing has a range of 300 to 800 ms.

             The following table defines the default values
             for this MIB object, depending on the signal type
            (pktcSigDevVmwiMode), and MUST be followed:

             Value of pktcSigDevVmwiMode       Default value

             duringringingETS                  any value  (not used)
             dtAsETS                           any value  (not used)
             rpAsETS                           any value  (not used)
             lrAsETS                           any value  (not used)
             lrETS                             400

             An attempt to set this object while the value of
             pktcSigDevVmwiMode is not 'lrETS' will result in an
             'inconsistentValue' error.

             The value of this MIB object MUST NOT persist across MTA
             reboots."

        DEFVAL {400}
            ::= {pktcSigDevObjects 38 }

    pktcSigDevVmwiDtmfStartCode OBJECT-TYPE
        SYNTAX       DtmfCode
        MAX-ACCESS   read-write
        STATUS       current
        DESCRIPTION
            "This object identifies optional start codes used when
```

```
            the pktcSigDevVmwiSigProtocol is set to a value of
            'dtmf(2)'.  Different countries define different On Hook
            Data Transmission Protocol signaling codes to support
            VMWI.

            When Dual-Tone Multi-Frequency (DTMF) is used, the VMWI
            digits are preceded by a 'start code' digit, followed
            by the digit transmission sequence <S1>...<Sn> (where
            Sx represents the digits 0-9), and terminated by the 'end
            code' digit.

            For example,
              <A><S1>...<Sn> <D><S1>...<Sn> <B><S1>...<Sn> <C>.

            The start code for redirecting VMWI may be DTMF 'D'
            The DTMF code 'B' may be sent by the network as a start
            code for the transfer of information values, through
            which special events can be indicated to the user.  In
            some countries, the '*' or '#' may be used instead of
            'A', 'B', 'C', or 'D'.

            The value of this MIB object MUST NOT persist across MTA
            reboots."
        REFERENCE
            "ETSI-EN-300-659-1 specification"
        DEFVAL {dtmfcodeA}
    ::= { pktcSigDevObjects 39 }

    pktcSigDevVmwiDtmfEndCode OBJECT-TYPE
        SYNTAX       DtmfCode
        MAX-ACCESS   read-write
        STATUS       current
        DESCRIPTION
            "This object identifies an optional end code used when the
             pktcSigDevVmwiSigProtocol is set to a value of
             'dtmf(2)'.  Different countries define different on-hook
             Data Transmission Protocol signaling codes to support
             VMWI.

             When Dual-Tone Multi-Frequency (DTMF) is used, the VMWI
             digits are preceded by a 'start code' digit, followed
             by the digit transmission sequence <S1>...<Sn> (where
             Sx represents the digits 0-9), and terminated by the 'end
             code' digit.

             For example,
               <A><S1>...<Sn> <D><S1>...<Sn> <B><S1>...<Sn> <C>.
```

```
            The DTMF code 'C' may be sent by the network as an end code
            for the transfer of information values, through which
            special events can be indicated to the user.  In some
            countries, the '*' or '#' may be used instead of 'A',
            'B', 'C', or 'D'.

            The value of this MIB object MUST NOT persist across MTA
            reboots."
        REFERENCE
            "ETSI-EN-300-659-1 specification"
        DEFVAL {dtmfcodeC}
    ::= { pktcSigDevObjects 40 }

pktcSigDevrpAsDtsDuration     OBJECT-TYPE
        SYNTAX       Unsigned32 (0|200..500)
        UNITS        "Milliseconds"
        MAX-ACCESS   read-write
        STATUS       current
        DESCRIPTION
            " This object specifies the duration of the rpASDTS ring
              pulse prior to the start of the transmission of the
              FSK or DTMF containing the caller id information.  It is
              only used when pktcSigDevCidMode is set to a value of
              'rpAsETS'.

              The following table defines the default values
              for this MIB object, depending on the signal type
             (pktcSigDevCidMode), and MUST be followed:

              Value of pktcSigDevCidMode       Default value

              duringringingETS                 any value  (not used)
              dtAsETS                          any value  (not used)
              rpAsETS                          250
              lrAsETS                          any value  (not used)
              lrETS                            any value  (not used)

              An attempt to set this object while the value of
              pktcSigDevCidMode is not 'rpAsETS' will result in
              an 'inconsistentValue' error.

             The value of this MIB object MUST NOT persist across MTA
             reboots."
        REFERENCE
            "ETSI-EN-300-659-1 Specification and Belgacom
             BGC_D_48_9811_30_09_EDOC version 3.3"
        DEFVAL { 250 }
        ::= {pktcSigDevObjects 41 }
```

```
--
-- The Endpoint Config Table is used to define attributes that
-- are specific to connection EndPoints.
--

pktcSigEndPntConfigTable  OBJECT-TYPE
    SYNTAX        SEQUENCE OF PktcSigEndPntConfigEntry
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        " This table describes the information pertaining to each
          endpoint of the MTA.  All entries in this table represent
          the provisioned endpoints provisioned with the information
          required by the MTA to maintain the NCS protocol
          communication with the CMS.  Each endpoint can be assigned
          to its own CMS.  If the specific endpoint does not have
          the corresponding CMS information in this table, the
          endpoint is considered as not provisioned with voice
          services.  Objects in this table do not persist across
          MTA reboots."
   ::=  { pktcSigEndPntConfigObjects 1 }

pktcSigEndPntConfigEntry  OBJECT-TYPE
    SYNTAX        PktcSigEndPntConfigEntry
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        "Each entry in the pktcSigEndPntConfigTable represents
         required signaling parameters for the specific endpoint
         provisioned with voice services.  The conceptual rows MUST
         NOT persist across MTA reboots."
    INDEX { ifIndex }
    ::= { pktcSigEndPntConfigTable 1 }

PktcSigEndPntConfigEntry  ::= SEQUENCE {
    pktcSigEndPntConfigCallAgentId             SnmpAdminString,
    pktcSigEndPntConfigCallAgentUdpPort        InetPortNumber,
    pktcSigEndPntConfigPartialDialTO           Unsigned32,
    pktcSigEndPntConfigCriticalDialTO          Unsigned32,
    pktcSigEndPntConfigBusyToneTO              Unsigned32,
    pktcSigEndPntConfigDialToneTO              Unsigned32,
    pktcSigEndPntConfigMessageWaitingTO        Unsigned32,
    pktcSigEndPntConfigOffHookWarnToneTO       Unsigned32,
    pktcSigEndPntConfigRingingTO               Unsigned32,
    pktcSigEndPntConfigRingBackTO              Unsigned32,
    pktcSigEndPntConfigReorderToneTO           Unsigned32,
    pktcSigEndPntConfigStutterDialToneTO       Unsigned32,
```

```
    pktcSigEndPntConfigTSMax                    Unsigned32,
    pktcSigEndPntConfigMax1                     Unsigned32,
    pktcSigEndPntConfigMax2                     Unsigned32,
    pktcSigEndPntConfigMax1QEnable              TruthValue,
    pktcSigEndPntConfigMax2QEnable              TruthValue,
    pktcSigEndPntConfigMWD                      Unsigned32,
    pktcSigEndPntConfigTdinit                   Unsigned32,
    pktcSigEndPntConfigTdmin                    Unsigned32,
    pktcSigEndPntConfigTdmax                    Unsigned32,
    pktcSigEndPntConfigRtoMax                   Unsigned32,
    pktcSigEndPntConfigRtoInit                  Unsigned32,
    pktcSigEndPntConfigLongDurationKeepAlive    Unsigned32,
    pktcSigEndPntConfigThist                    Unsigned32,
    pktcSigEndPntConfigStatus                   RowStatus,
    pktcSigEndPntConfigCallWaitingMaxRep        Unsigned32,
    pktcSigEndPntConfigCallWaitingDelay         Unsigned32,
    pktcSigEndPntStatusCallIpAddressType        InetAddressType,
    pktcSigEndPntStatusCallIpAddress            InetAddress,
    pktcSigEndPntStatusError                    INTEGER,
    pktcSigEndPntConfigMinHookFlash             Unsigned32,
    pktcSigEndPntConfigMaxHookFlash             Unsigned32,
    pktcSigEndPntConfigPulseDialInterdigitTime Unsigned32,
    pktcSigEndPntConfigPulseDialMinMakeTime     Unsigned32,
    pktcSigEndPntConfigPulseDialMaxMakeTime     Unsigned32,
    pktcSigEndPntConfigPulseDialMinBreakTime    Unsigned32,
    pktcSigEndPntConfigPulseDialMaxBreakTime    Unsigned32
    }

pktcSigEndPntConfigCallAgentId     OBJECT-TYPE
    SYNTAX      SnmpAdminString(SIZE (3..255))
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This object contains a string indicating the call agent
          name (e.g., ca@example.com).  The call agent name, after
          the character '@', MUST be a fully qualified domain name
          (FQDN) and MUST have a corresponding pktcMtaDevCmsFqdn
          entry in the pktcMtaDevCmsTable.  The object
          pktcMtaDevCmsFqdn is defined in the PacketCable MIBMTA
          Specification.  For each particular endpoint, the MTA MUST
          use the current value of this object to communicate with
          the corresponding CMS.  The MTA MUST update this object
          with the value of the 'Notified Entity' parameter of the
          NCS message.  Because of the high importance of this object
          to the ability of the MTA to maintain reliable NCS
          communication with the CMS, it is highly recommended not
          to change this object's value using SNMP during normal
          operation."
```

```
    ::= {  pktcSigEndPntConfigEntry 1 }

pktcSigEndPntConfigCallAgentUdpPort    OBJECT-TYPE
    SYNTAX      InetPortNumber (1025..65535)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This object contains the current value of the User
          Datagram Protocol (UDP) receive port on which the
          call agent will receive NCS from the endpoint.
          For each particular endpoint, the MTA MUST use the current
          value of this object to communicate with the corresponding
          CMS.  The MTA MUST update this object with the value of the
          'Notified Entity' parameter of the NCS message.  If the
          Notified Entity parameter does not contain a CallAgent
          port, the MTA MUST update this object with the default
          value of 2727.  Because of the high importance of this
          object to the ability of the MTA to maintain reliable NCS
          communication with the CMS, it is highly recommended not
          to change this object's value using SNMP during normal
          operation."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL    { 2727 }
    ::= { pktcSigEndPntConfigEntry 2 }

pktcSigEndPntConfigPartialDialTO     OBJECT-TYPE
    SYNTAX       Unsigned32
    UNITS        "seconds"
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "This object contains the value of the partial dial
         time out.
         The time out (TO) elements are intended to limit the time a
         tone or frequency is generated.  When this MIB object is set
         to a value of '0', the MTA MUST NOT generate the
         corresponding frequency or tone, regardless of the
         definitions pertaining to frequency, tone duration, or
         cadence."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 16 }
    ::= { pktcSigEndPntConfigEntry 3 }

pktcSigEndPntConfigCriticalDialTO     OBJECT-TYPE
    SYNTAX       Unsigned32
    UNITS        "seconds"
```

```
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "This object contains the value of the critical
         dial time out.
         The time out (TO) elements are intended to limit the time a
         tone or frequency is generated.  When this MIB object is set
         to a value of '0', the MTA MUST NOT generate the
         corresponding frequency or tone, regardless of the
         definitions pertaining to frequency, tone duration, or
         cadence."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 4 }
    ::= { pktcSigEndPntConfigEntry 4 }

pktcSigEndPntConfigBusyToneTO     OBJECT-TYPE
    SYNTAX       Unsigned32
    UNITS        "seconds"
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        " This object contains the default time out value for busy
          tone.  The MTA MUST NOT update this object with the
          value provided in the NCS message (if present).  If
          the value of the object is modified by the SNMP Management
          Station, the MTA MUST use the new value as a default only
          for a new signal requested by the NCS message.
          The time out (TO) elements are intended to limit the time
          a tone or frequency is generated.  When this MIB object is
          set to a value of '0', the MTA MUST NOT generate the
          corresponding frequency or tone, regardless of the
          definitions pertaining to frequency, tone duration, or
          cadence."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL    { 30 }
    ::= { pktcSigEndPntConfigEntry 5 }

pktcSigEndPntConfigDialToneTO     OBJECT-TYPE
    SYNTAX       Unsigned32
    UNITS        "seconds"
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        " This object contains the default time out value for dial
          tone.  The MTA MUST NOT update this object with the
          value provided in the NCS message (if present).  If
```

```
          the value of the object is modified by the SNMP Management
          Station, the MTA MUST use the new value as a default only
          for a new signal requested by the NCS message.
          The time out (TO) elements are intended to limit the time
          a tone or frequency is generated.  When this MIB object is
          set to a value of '0', the MTA MUST NOT generate the
          corresponding frequency or tone, regardless of the
          definitions pertaining to frequency, tone duration, or
          cadence."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL    { 16 }
    ::= { pktcSigEndPntConfigEntry 6 }

pktcSigEndPntConfigMessageWaitingTO     OBJECT-TYPE
    SYNTAX       Unsigned32
    UNITS        "seconds"
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        " This object contains the default time out value for message
          waiting indicator.  The MTA MUST NOT update this object
          with the value provided in the NCS message (if
          present).  If the value of the object is modified by the
          SNMP Manager application, the MTA MUST use the new value
          as a default only for a new signal requested by the NCS
          message.
          The time out (TO) elements are intended to limit the time
          a tone or frequency is generated.  When this MIB object is
          set to a value of '0', the MTA MUST NOT generate the
          corresponding frequency or tone, regardless of the
          definitions pertaining to frequency, tone duration, or
          cadence."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL    { 16 }
    ::= { pktcSigEndPntConfigEntry 7 }

pktcSigEndPntConfigOffHookWarnToneTO     OBJECT-TYPE
    SYNTAX       Unsigned32
    UNITS        "seconds"
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        " This object contains the default time out value for the
          off-hook warning tone.  The MTA MUST NOT update this object
          with the value provided in the NCS message (if present).  If
          the value of the object is modified by the SNMP Manager
```

```
            application, the MTA MUST use the new value as a default
            only for a new signal requested by the NCS message.  The
            time out (TO) elements are intended to limit the time a tone
            or frequency is generated.  When this MIB object is set to a
            value of '0', the MTA MUST NOT generate the corresponding
            frequency or tone, regardless of the definitions pertaining
            to frequency, tone duration, or cadence."
        REFERENCE
            "PacketCable NCS Specification"
        DEFVAL { 0 }
        ::= { pktcSigEndPntConfigEntry 8 }

    pktcSigEndPntConfigRingingTO     OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "seconds"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            " This object contains the default time out value for
              ringing.  The MTA MUST NOT update this object with the
              value provided in the NCS message (if present).  If
              the value of the object is modified by the SNMP Management
              Station, the MTA MUST use the new value as a default only
              for a new signal requested by the NCS message.
              The time out (TO) elements are intended to limit the time
              a tone or frequency is generated.  When this MIB object is
              set to a value of '0', the MTA MUST NOT generate the
              corresponding frequency or tone, regardless of the
              definitions pertaining to frequency, tone duration, or
              cadence."
        REFERENCE
            "PacketCable NCS Specification"
        DEFVAL    { 180 }
        ::= { pktcSigEndPntConfigEntry 9 }

    pktcSigEndPntConfigRingBackTO     OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "seconds"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            " This object contains the default time out value for ring
              back.  The MTA MUST NOT update this object with the
              value provided in the NCS message (if present).  If
              the value of the object is modified by the SNMP Management
              Station, the MTA MUST use the new value as a default only
              for a new signal requested by the NCS message.
              The time out (TO) elements are intended to limit the time
```

```
          a tone or frequency is generated.  When this MIB object is
          set to a value of '0', the MTA MUST NOT generate the
          corresponding frequency or tone, regardless of the
          definitions pertaining to frequency, tone duration, or
          cadence."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL    { 180 }
    ::= { pktcSigEndPntConfigEntry 10 }

pktcSigEndPntConfigReorderToneTO     OBJECT-TYPE
    SYNTAX       Unsigned32
    UNITS        "seconds"
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        " This object contains the default time out value for reorder
          tone.  The MTA MUST NOT update this object with the
          value provided in the NCS message (if present).  If
          the value of the object is modified by the SNMP Management
          Station, the MTA MUST use the new value as a default only
          for a new signal requested by the NCS message.
          The time out (TO) elements are intended to limit the time
          a tone or frequency is generated.  When this MIB object is
          set to a value of '0', the MTA MUST NOT generate the
          corresponding frequency or tone, regardless of the
          definitions pertaining to frequency, tone duration, or
          cadence."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL    { 30 }
    ::= { pktcSigEndPntConfigEntry 11 }

pktcSigEndPntConfigStutterDialToneTO     OBJECT-TYPE
    SYNTAX       Unsigned32
    UNITS        "seconds"
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        " This object contains the default time out value for stutter
          dial tone.  The MTA MUST NOT update this object with the
          value provided in the NCS message (if present).  If
          the value of the object is modified by the SNMP Management
          Station, the MTA MUST use the new value as a default only
          for a new signal requested by the NCS message.
          The time out (TO) elements are intended to limit the time
          a tone or frequency is generated.  When this MIB object is
          set to a value of '0', the MTA MUST NOT generate the
```

```
          corresponding frequency or tone, regardless of the
          definitions pertaining to frequency, tone duration, or
          cadence."
    REFERENCE
          "PacketCable NCS Specification"
    DEFVAL    { 16 }
    ::= { pktcSigEndPntConfigEntry 12 }

pktcSigEndPntConfigTSMax     OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
           "This MIB object is used as part of an NCS
            retransmission algorithm.  Prior to any retransmission,
            the MTA must check to make sure that the time elapsed
            since the sending of the initial datagram does not
            exceed the value specified by this MIB object.  If more
            than Tsmax time has elapsed, then the retransmissions
            MUST cease.

            Refer to the MIB object pktcSigEndPntConfigThist for
            information on when the endpoint becomes disconnected."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 20 }
    ::= { pktcSigEndPntConfigEntry 13 }

pktcSigEndPntConfigMax1     OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object contains the suspicious error threshold for
         signaling messages.  The pktcSigEndPntConfigMax1 object
         indicates the retransmission threshold at which the MTA MAY
         actively query the domain name server (DNS) in order to
         detect the possible change of call agent interfaces."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 5 }
    ::= { pktcSigEndPntConfigEntry 14 }

pktcSigEndPntConfigMax2     OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
```

```
        "This object contains the disconnect error threshold for
         signaling messages.  The pktcSigEndPntConfigMax2 object
         indicates the retransmission threshold at which the MTA
         SHOULD contact the DNS one more time to see if any other
         interfaces to the call agent have become available."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 7 }
    ::= { pktcSigEndPntConfigEntry 15 }

pktcSigEndPntConfigMax1QEnable     OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object enables/disables the Max1 domain name server
         (DNS) query operation when the pktcSigEndPntConfigMax1
         threshold has been reached.
         A value of true(1) indicates enabling, and a value of
         false(2) indicates disabling."
    DEFVAL { true }
    ::= { pktcSigEndPntConfigEntry 16 }

pktcSigEndPntConfigMax2QEnable     OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object enables/disables the Max2 domain name server
         (DNS) query operation when the pktcSigEndPntConfigMax2
         threshold has been reached.
         A value of true(1) indicates enabling, and a value of
         false(2) indicates disabling."
    DEFVAL { true }
    ::= { pktcSigEndPntConfigEntry 17 }

pktcSigEndPntConfigMWD     OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "Maximum Waiting Delay (MWD) contains the maximum number of
         seconds an MTA waits, after powering on, before initiating
         the restart procedure with the call agent."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 600 }
```

```
    ::= { pktcSigEndPntConfigEntry 18 }

pktcSigEndPntConfigTdinit     OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This MIB object represents the 'disconnected' initial
         waiting delay within the context of an MTA's 'disconnected
         procedure'.  The 'disconnected procedure' is initiated when
         an endpoint becomes 'disconnected' while attempting to
         communicate with a call agent.

         The 'disconnected timer' associated with the 'disconnected
         Procedure' is initialized to a random value, uniformly
         distributed between zero and the value contained in this
         MIB object.

         For more information on the usage of this timer, please
         refer to the PacketCable NCS Specification."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 15 }
    ::= { pktcSigEndPntConfigEntry 19 }

pktcSigEndPntConfigTdmin     OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "This MIB object represents the 'disconnected' minimum
             waiting delay within the context of an MTA's
             'disconnected procedure', specifically when local user
             activity is detected.
             The 'disconnected procedure' is initiated when
             an endpoint becomes 'disconnected' while attempting to
             communicate with a call agent.
             For more information on the usage of this timer, please
             refer to the PacketCable NCS Specification."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 15 }
    ::= { pktcSigEndPntConfigEntry 20 }

pktcSigEndPntConfigTdmax     OBJECT-TYPE
    SYNTAX      Unsigned32
```

```
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This object contains the maximum number of seconds the MTA
          waits, after a disconnect, before initiating the
          disconnected procedure with the call agent.
           "
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 600 }
    ::= { pktcSigEndPntConfigEntry 21 }

pktcSigEndPntConfigRtoMax     OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object specifies the maximum number of seconds the MTA
         waits for a response to an NCS message before initiating
         a retransmission."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 4 }
    ::= { pktcSigEndPntConfigEntry 22 }

pktcSigEndPntConfigRtoInit     OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This object contains the initial number of seconds for the
          retransmission timer."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 200 }
    ::= { pktcSigEndPntConfigEntry 23 }

pktcSigEndPntConfigLongDurationKeepAlive     OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "minutes"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " Specifies a time out value, in minutes, for sending long
          duration call notification messages."
```

```
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 60 }
    ::= { pktcSigEndPntConfigEntry 24 }

pktcSigEndPntConfigThist  OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " Time out period, in seconds, before no response is declared."
    REFERENCE
        "PacketCable NCS Specification"
    DEFVAL { 30 }
    ::= { pktcSigEndPntConfigEntry 25 }

pktcSigEndPntConfigStatus     OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This object contains the Row Status associated with the
          pktcSigEndPntConfigTable.  There are no restrictions or
          dependencies amidst the columnar objects before this
          row can be activated or for modifications of the
          columnar objects when this object is set to a
          value of 'active(1)."
    ::= { pktcSigEndPntConfigEntry 26 }

pktcSigEndPntConfigCallWaitingMaxRep     OBJECT-TYPE
    SYNTAX      Unsigned32 (0..10)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        " This object contains the default value of the maximum
          number of repetitions of the Call Waiting tone that the
          MTA will play from a single CMS request.  The MTA MUST NOT
          update this object with the information provided in the
          NCS message (if present).  If the value of the object is
          modified by the SNMP Manager application, the MTA MUST use
          the new value as a default only for a new signal
          requested by the NCS message."
    DEFVAL    { 1 }
    ::= { pktcSigEndPntConfigEntry 27 }

pktcSigEndPntConfigCallWaitingDelay     OBJECT-TYPE
    SYNTAX       Unsigned32 (1..100)
```

```
    UNITS        "seconds"
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        " This object contains the delay between repetitions of the
          Call Waiting tone that the MTA will play from a single CMS
          request."
    DEFVAL    { 10 }
    ::= { pktcSigEndPntConfigEntry 28 }

pktcSigEndPntStatusCallIpAddressType  OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       " This object contains the type of Internet address contained
         in the MIB object 'pktcSigEndPntStatusCallIpAddress'.

         Since pktcSigEndPntStatusCallIpAddress is expected to
         contain an IP address, a value of dns(16) is disallowed."

    ::= { pktcSigEndPntConfigEntry 29 }

pktcSigEndPntStatusCallIpAddress  OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       " This MIB object contains the chosen IP address of the CMS
         currently being used for the corresponding endpoint.

         The device determines the IP address by using DNS to
         resolve the IP address of the CMS from the FQDN stored in
         the MIB object 'pktcSigEndPntConfigCallAgentId'.  The
         processes are outlined in the PacketCable NCS and Security
         specifications, and MUST be followed by the MTA.

         The IP address type contained in this MIB object is
         indicated by pktcSigEndPntStatusCallIpAddressType."
    REFERENCE
        "PacketCable NCS Specification;
         PacketCable Security specification, [PKT-SP-SEC]."
::= { pktcSigEndPntConfigEntry 30 }

pktcSigEndPntStatusError  OBJECT-TYPE
    SYNTAX INTEGER {
               operational (1),
               noSecurityAssociation (2),
```

```
                disconnected (3)
              }
    MAX-ACCESS   read-only
    STATUS  current
    DESCRIPTION
       " This object contains the error status for this interface.
         The operational status indicates that all operations
         necessary to put the line in service have occurred, and the
         CMS has acknowledged the Restart In Progress (RSIP)
         message successfully.  If pktcMtaDevCmsIpsecCtrl is enabled
         for the associated call agent, the noSecurityAssociation
         status indicates that no Security Association (SA) yet
         exists for this endpoint.  If pktcMtaDevCmsIpsecCtrl is
         disabled for the associated call agent, the
         noSecurityAssociation status is not applicable and should
         not be used by the MTA.  The disconnected status indicates
         one of the following two:
         If pktcMtaDevCmsIpsecCtrl is disabled, then no security
         association is involved with this endpoint.  The NCS
         signaling software is in process of establishing the NCS
         signaling link via an RSIP exchange.
         Otherwise, when pktcMtaDevCmsIpsecCtrl is enabled,
         security Association has been established, and the NCS
         signaling software is in process of establishing the NCS
         signaling link via an RSIP exchange."
    ::= { pktcSigEndPntConfigEntry 31 }

pktcSigEndPntConfigMinHookFlash    OBJECT-TYPE
    SYNTAX       Unsigned32 (20..1550)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        " This is the minimum time a line needs to be on-hook for a
          valid hook flash.  The value of this object MUST be
          greater than the value of
          pktcSigEndPntConfigPulseDialMaxBreakTime.  The value of
          pktcSigEndPntConfigMinHookFlash MUST be less than
          pktcSigEndPntConfigMaxHookFlash.  This object MUST only be
          set via the MTA configuration during the provisioning
          process.
             Furthermore, given the possibility for the 'pulse dial'
             and 'hook flash' to overlap, the value of this object
             MUST be greater than the value contained by the MIB
             Object 'pktcSigEndPntConfigPulseDialMaxMakeTime'."
    DEFVAL { 300 }
    ::= { pktcSigEndPntConfigEntry 32 }
```

```
pktcSigEndPntConfigMaxHookFlash    OBJECT-TYPE
    SYNTAX       Unsigned32 (20..1550)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        " This is the maximum time a line needs to be on-hook for a
          valid hook flash.  The value of
          pktcSigEndPntConfigMaxHookFlash MUST be greater than
          pktcSigEndPntConfigMinHookFlash.  This object MUST only be
          set via the MTA configuration during the provisioning
          process."
    DEFVAL { 800 }
    ::= { pktcSigEndPntConfigEntry 33 }

pktcSigEndPntConfigPulseDialInterdigitTime    OBJECT-TYPE
    SYNTAX       Unsigned32 (100..1500)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        " This is the pulse dial inter-digit time out.  This object
          MUST only be set via the MTA configuration during the
          provisioning process."
    DEFVAL { 100 }
    ::= { pktcSigEndPntConfigEntry 34 }

pktcSigEndPntConfigPulseDialMinMakeTime    OBJECT-TYPE
    SYNTAX       Unsigned32 (20..200)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        " This is the minimum make pulse width for the dial pulse.
          The value of pktcSigEndPntConfigPulseDialMinMakeTime MUST
          be less than pktcSigEndPntConfigPulseDialMaxMakeTime.  This
          object MUST only be set via the MTA configuration during
          the provisioning process."
    DEFVAL { 25 }
    ::= { pktcSigEndPntConfigEntry 35 }

pktcSigEndPntConfigPulseDialMaxMakeTime    OBJECT-TYPE
    SYNTAX       Unsigned32 (20..200)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        " This is the maximum make pulse width for the dial pulse.
```

```
          The value of pktcSigEndPntConfigPulseDialMaxMakeTime MUST
          be greater than pktcSigEndPntConfigPulseDialMinMakeTime.
          This object MUST only be provided via the configuration
          file during the provisioning process.
          Furthermore, given the possibility for the 'pulse dial'
          and 'hook flash' to overlap, the value of this object MUST
          be less than the value contained by the MIB object
          pktcSigEndPntConfigMinHookFlash."
    DEFVAL { 55 }
    ::= { pktcSigEndPntConfigEntry 36 }

pktcSigEndPntConfigPulseDialMinBreakTime    OBJECT-TYPE
    SYNTAX       Unsigned32 (20..200)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        " This is the minimum break pulse width for the dial pulse.
          The value of pktcSigEndPntConfigPulseDialMinBreakTime MUST
          be less than pktcSigEndPntConfigPulseDialMaxBreakTime.
          This object must only be provided via the configuration
          file during the provisioning process."
    DEFVAL { 45 }
    ::= { pktcSigEndPntConfigEntry 37 }

pktcSigEndPntConfigPulseDialMaxBreakTime    OBJECT-TYPE
    SYNTAX       Unsigned32 (20..200)
    UNITS        "Milliseconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        " This is the maximum break pulse width for the dial pulse.
          The value of pktcSigEndPntConfigPulseDialMaxBreakTime MUST
          be greater than pktcSigEndPntConfigPulseDialMinBreakTime.
          This object MUST only be provided via the configuration
          file during the provisioning process."
    DEFVAL { 75 }
    ::= { pktcSigEndPntConfigEntry 38 }

--
-- notification group is for future extension.
--
pktcSigNotification  OBJECT IDENTIFIER ::= { pktcIetfSigMib 0 }
pktcSigConformance   OBJECT IDENTIFIER ::= { pktcIetfSigMib 2 }
pktcSigCompliances   OBJECT IDENTIFIER ::= { pktcSigConformance 1 }
pktcSigGroups        OBJECT IDENTIFIER ::= { pktcSigConformance 2 }

--
```

```
-- compliance statements
--

pktcSigBasicCompliance  MODULE-COMPLIANCE
    STATUS     current
    DESCRIPTION
        " The compliance statement for MTAs that implement
          NCS signaling."

MODULE  -- pktcIetfSigMib

---
-- Unconditionally mandatory groups for all MTAs
---

MANDATORY-GROUPS {
    pktcSigDeviceGroup,
    pktcSigEndpointGroup
}
---
-- Conditionally mandatory groups for MTAs
---

GROUP pktcInternationalGroup
    DESCRIPTION
        " This group is mandatory only for MTAs implementing
          international telephony features."

GROUP pktcLLinePackageGroup
    DESCRIPTION
        " This group is mandatory only for MTAs implementing the L
          line package."

GROUP pktcELinePackageGroup
    DESCRIPTION
        " This group is mandatory only for MTAs implementing the E
          Line Package."
    ::={ pktcSigCompliances 1 }

pktcSigDeviceGroup  OBJECT-GROUP
    OBJECTS {
    pktcSigDevCodecMax,
    pktcSigDevEchoCancellation,
    pktcSigDevSilenceSuppression,
    pktcSigDevR0Cadence,
    pktcSigDevR1Cadence,
    pktcSigDevR2Cadence,
    pktcSigDevR3Cadence,
```

```
    pktcSigDevR4Cadence,
    pktcSigDevR5Cadence,
    pktcSigDevR6Cadence,
    pktcSigDevR7Cadence,
    pktcSigDevRgCadence,
    pktcSigDevRsCadence,
    pktcSigDefCallSigDscp,
    pktcSigDefMediaStreamDscp,
    pktcSigDevVmwiMode,
    pktcSigCapabilityType,
    pktcSigCapabilityVersion,
    pktcSigCapabilityVendorExt,
    pktcSigDefNcsReceiveUdpPort
    }
    STATUS current
    DESCRIPTION
          "Group of MIB objects containing signaling configuration
           information that is applicable per-device."
    ::= { pktcSigGroups 1 }

pktcSigEndpointGroup  OBJECT-GROUP
    OBJECTS {
    pktcSigEndPntConfigCallAgentId,
    pktcSigEndPntConfigCallAgentUdpPort,
    pktcSigEndPntConfigPartialDialTO,
    pktcSigEndPntConfigCriticalDialTO,
    pktcSigEndPntConfigBusyToneTO,
    pktcSigEndPntConfigDialToneTO,
    pktcSigEndPntConfigMessageWaitingTO,
    pktcSigEndPntConfigOffHookWarnToneTO,
    pktcSigEndPntConfigRingingTO,
    pktcSigEndPntConfigRingBackTO,
    pktcSigEndPntConfigReorderToneTO,
    pktcSigEndPntConfigStutterDialToneTO,
    pktcSigEndPntConfigTSMax,
    pktcSigEndPntConfigMax1,
    pktcSigEndPntConfigMax2,
    pktcSigEndPntConfigMax1QEnable,
    pktcSigEndPntConfigMax2QEnable,
    pktcSigEndPntConfigMWD,
    pktcSigEndPntConfigTdinit,
    pktcSigEndPntConfigTdmin,
    pktcSigEndPntConfigTdmax,
    pktcSigEndPntConfigRtoMax,
    pktcSigEndPntConfigRtoInit,
    pktcSigEndPntConfigLongDurationKeepAlive,
    pktcSigEndPntConfigThist,
    pktcSigEndPntConfigStatus,
```

```
    pktcSigEndPntConfigCallWaitingMaxRep,
    pktcSigEndPntConfigCallWaitingDelay,
    pktcSigEndPntStatusCallIpAddressType,
    pktcSigEndPntStatusCallIpAddress,
    pktcSigEndPntStatusError
    }
    STATUS current
    DESCRIPTION
          "Group of MIB objects containing signaling configuration
           information that is applicable per-endpoint."
    ::= { pktcSigGroups 2 }

pktcInternationalGroup    OBJECT-GROUP
    OBJECTS {
    pktcSigEndPntConfigMinHookFlash,
    pktcSigEndPntConfigMaxHookFlash,
    pktcSigEndPntConfigPulseDialInterdigitTime,
    pktcSigEndPntConfigPulseDialMinMakeTime,
    pktcSigEndPntConfigPulseDialMaxMakeTime,
    pktcSigEndPntConfigPulseDialMinBreakTime,
    pktcSigEndPntConfigPulseDialMaxBreakTime,
    pktcSigDevRingCadence,
    pktcSigDevCidSigProtocol,
    pktcSigDevCidDelayAfterLR,
    pktcSigDevCidDtmfStartCode,
    pktcSigDevCidDtmfEndCode,
    pktcSigDevVmwiSigProtocol,
    pktcSigDevVmwiDelayAfterLR,
    pktcSigDevVmwiDtmfStartCode,
    pktcSigDevVmwiDtmfEndCode,
    pktcSigDevrpAsDtsDuration,
    pktcSigDevCidMode,
    pktcSigDevCidAfterRing,
    pktcSigDevCidAfterDTAS,
    pktcSigDevCidAfterRPAS,
    pktcSigDevRingAfterCID,
    pktcSigDevCidDTASAfterLR,
    pktcSigDevVmwiMode,
    pktcSigDevVmwiAfterDTAS,
    pktcSigDevVmwiAfterRPAS,
    pktcSigDevVmwiDTASAfterLR,
    pktcSigPowerRingFrequency,
    pktcSigPulseSignalFrequency,
    pktcSigPulseSignalDbLevel,
    pktcSigPulseSignalDuration,
    pktcSigPulseSignalPulseInterval,
    pktcSigPulseSignalRepeatCount,
    pktcSigDevToneDbLevel,
```

```
    pktcSigDevToneFreqCounter,
    pktcSigDevToneWholeToneRepeatCount,
    pktcSigDevToneSteady,
    pktcSigDevToneFirstFreqValue,
    pktcSigDevToneSecondFreqValue,
    pktcSigDevToneThirdFreqValue,
    pktcSigDevToneFourthFreqValue,
    pktcSigDevToneFreqMode,
    pktcSigDevToneFreqAmpModePrtg,
    pktcSigDevToneFreqOnDuration,
    pktcSigDevToneFreqOffDuration,
    pktcSigDevToneFreqRepeatCount
    }
    STATUS current
    DESCRIPTION
        " Group of objects that extend the behavior of existing
          objects to support operations in the widest possible set
          of international marketplaces.  Note that many of these
          objects represent a superset of behaviors described in
          other objects within this MIB module."
    ::= { pktcSigGroups 3 }

pktcLLinePackageGroup  OBJECT-GROUP
    OBJECTS {
    pktcSigDevR0Cadence,
    pktcSigDevR1Cadence,
    pktcSigDevR2Cadence,
    pktcSigDevR3Cadence,
    pktcSigDevR4Cadence,
    pktcSigDevR5Cadence,
    pktcSigDevR6Cadence,
    pktcSigDevR7Cadence,
    pktcSigDevRgCadence,
    pktcSigDevRsCadence
    }
    STATUS current
    DESCRIPTION
    "Group of Objects to support the L line package."
    ::= { pktcSigGroups 4 }

pktcELinePackageGroup  OBJECT-GROUP
    OBJECTS {
    pktcSigDevR0Cadence,
    pktcSigDevR1Cadence,
    pktcSigDevR2Cadence,
    pktcSigDevR3Cadence,
    pktcSigDevR4Cadence,
    pktcSigDevR5Cadence,
```

```
    pktcSigDevR6Cadence,
    pktcSigDevR7Cadence,
    pktcSigDevRgCadence,
    pktcSigDevRsCadence,
    pktcSigPulseSignalFrequency,
    pktcSigPulseSignalDbLevel,
    pktcSigPulseSignalDuration,
    pktcSigPulseSignalPulseInterval,
    pktcSigPulseSignalRepeatCount,
    pktcSigDevRingCadence
    }
    STATUS current
    DESCRIPTION
        "Group of Objects to support the E line package."
    ::= { pktcSigGroups 5 }

END
```

6. Examples

This section provides a couple of examples, specifically related to the MIB tables pktcSigDevToneTable and pktcSigDevMultiFreqToneTable.

Example A: Call Waiting Tone Defined per [ITU-T E.180]:

1) 400 Hz AM modulated by 16 Hz, on for 500ms at -4 dBm
2) 400 Hz AM modulated by 16 Hz, off for 400ms
3) 400 Hz not AM modulated, on for 50 ms at -4 dBm
4) 400 Hz not AM modulated, off for 450 ms
5) 400 Hz not AM modulated, on for 50 ms at -4 dBm
6) 400 Hz not AM modulated, off for 3450 ms
7) 400 Hz not AM modulated, on for 50 ms at -4 dBm
8) 400 Hz not AM modulated, off for 450 ms
9) 400 Hz not AM modulated, on for 50 ms at -4 dBm
10) 400 Hz not AM modulated, off for 3450 ms
11) not repeated, not continuous

Assume userDefined1(18) is assigned to this tone:

pktcSigDevMultiFreqToneTable:

ToneType	F-1	F-2	F-3	F-4	F-Mode	ModePrtg	DbL	OnDur	OffDur	Rep-Count
18	400	16	0	0	1	90	-40	500	400	0
18	400	0	0	0	2	0	-40	50	450	0
18	400	0	0	0	2	0	-40	50	3450	0
18	400	0	0	0	2	0	-40	50	450	0
18	400	0	0	0	2	0	-40	50	3450	0

pktcSigDevToneTable:

ToneType	ToneFreqGroup	ToneFreqCounter	ToneRep-Count	Steady
18	1	5	0	false(2)

The single row of the pktcSigDevToneTable defines one multi-frequency group of five rows (ToneFreqCounter) defined in the pktcSigDevMultiFreqToneTable and instructs the MTA to play this group only once (non-repeatable as ToneRep-Count equals 0).

Example B - Congestion Tone - congestion(17):

Note: This example of an embedded cadence is based on an operator variation.

1) 400Hz on for 400ms -10 dBm

2) 400Hz off for 350ms

3) 400Hz on for 225ms -4 dBm

4) 400Hz off for 525ms

5) repeat (1) through (4) 5000 times or T0 time out (whichever is the shortest period)

pktcSigDevMultiFreqToneTable:

ToneType	F-1	F-2	F-3	F-4	F-Mode	ModePrtg	DbL	OnDur	OffDur	Rep-Count
17	400	0	0	0	2	0	-100	400	350	0
17	400	0	0	0	2	0	-40	225	525	0

pktcSigDevToneTable:

ToneType	ToneFreqGroup	ToneFreqCounter	ToneRep-Count	Steady
17	1	2	5000	false(2)

Example C - Call Waiting Tone - callWaiting1(9):

1) 16 Hz is modulated to carry the 400 Hz signal, ModulationRate within 85%, on for 500msec, at -25 dBm or more but less than -14 dBm

2) 16 Hz is modulated to carry the 400 Hz signal, off for 0 ~ 4 secs

3) 400 Hz not modulated, on for 50 ms at -25 dBm or more but less than -14 dBm

4) 400 Hz not modulated, off for 450ms

5) 400 Hz not modulated, on for 50 ms at -25 dBm or more but less than -14 dBm

6) 400 Hz not modulated, off for 3450ms ([4000 - (50+450+50)])

7) Steps 3 thru 6 are repeated

pktcSigDevMultiFreqToneTable:

ToneType	F-1	F-2	F-3	F-4	F-Mode	ModePrtg	DbL	OnDur	OffDur	Rep-Count
9	1	400	16	0	0	1	85	-25	500	1000	0
9	2	400	0	0	0	2	0	-25	50	450	0
9	3	400	0	0	0	2	0	-25	50	3450	0

pktcSigDevToneTable:

ToneType	ToneFreqGroup	ToneFreqCounter	ToneRep-Count	Steady
9	1	1	0	false(2)
9	2	2	1	false(2)

The first row of the pktcSigDevToneTable table instructs the MTA to play one row (ToneFreqCounter) of the pktcSigDevMultiFreqToneTable table only once (non-repeatable as ToneRep-Count equals 0). The second row of the pktcSigDevToneTable table instructs the MTA to play the next two rows (ToneFreqCounter) of the pktcSigDevMultiFreqToneTable table and make this frequency group repeatable (ToneRep-Count is not 0).

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8. Security Considerations

There are a number of management objects defined in this MIB module with a MAX-ACCESS clause of read-write and/or read-create. 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 can have a negative effect on network operations.

The following Differentiated Services Code Point (DSCP) and mask objects are used to differentiate between various types of traffic in the service provider network:

- pktcSigDefCallSigDscp
- pktcSigDefMediaStreamDscp

These objects may contain information that may be sensitive from a business perspective. For example, they may represent a customer's service contract that a service provider chooses to apply to a customer's ingress or egress traffic. If these objects are SET maliciously, it may permit unmarked or inappropriately marked signaling and media traffic to enter the service provider network, resulting in unauthorized levels of service for customers.

The following objects determine ring cadence, repeatable characteristics, signal duration, and caller id subscriber line protocol for telephony operation:

- pktcSigDevR0Cadence
- pktcSigDevR1Cadence
- pktcSigDevR2Cadence
- pktcSigDevR3Cadence
- pktcSigDevR4Cadence
- pktcSigDevR5Cadence
- pktcSigDevR6Cadence
- pktcSigDevR7Cadence
- pktcSigDevRgCadence
- pktcSigDevRsCadence
- pktcSigDevCidSigProtocol
- pktcSigDevVmwiSigProtocol
- pktcSigPulseSignalDuration
- pktcSigPulseSignalPauseDuration

If these objects are SET maliciously, it may result in unwanted operation, or a failure to obtain telephony service from client (MTA) devices.

The objects in the pktcSigEndPntConfigTable are used for endpoint signaling. The pktcSigEndPntConfigCallAgentId object contains the name of the call agent, which includes the call agent Fully Qualified Domain Name (FQDN). If this object is SET maliciously, the MTA will not be able to communicate with the call agent, resulting in a disruption of telephony service. The pktcSigEndPntConfigCallAgentUdpPort object identifies the UDP port for NCS traffic. If this object is SET maliciously, the call agent will not receive NCS traffic from the MTA, also resulting in a disruption of telephony service.

Some of 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 most sensitive is pktcSigEndPntStatusCallIpAddress within pktcSigEndPntConfigTable. This information itself may be valuable to would-be attackers. Other MIB Objects of similar sensitivity include pktcSigEndPntStatusError, which can provide useful information to MTA impersonators, and pktcSigDevCodecMax, which can provide useful information for planning Denial of Service (DoS) attacks on MTAs.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPsec), even then, 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.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [RFC3410], section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

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.

9. IANA Considerations

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

Descriptor	OBJECT IDENTIFIER Value
pktcIetfSigMib	{ mib-2 169 }

10. References

10.1. Normative References

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