Network-Based Call Signaling (NCS) Signaling MIB for PacketCable and IPCablecom Multimedia Terminal Adapters (MTAs)

Status of this Memo

By submitting this Internet-Draft, each author represents that any applicable patent or other IPR claims of which he or she is aware have been or will be disclosed, and any of which he or she becomes aware will be disclosed, in accordance with Section 6 of BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at http://www.ietf.org/ietf/1id-abstracts.html

The list of Internet-Draft Shadow Directories can be accessed at http://www.ietf.org/shadow.html

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 provides a common data and format representation for PacketCable and IPCablecom compliant Multimedia Terminal Adapter devices.

This memo specifies a MIB module in a manner that is compliant to the SNMP SMIv2. The set of objects are consistent with the SNMP framework and existing SNMP standards.
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 [PKT-SP-PROV] and [RFCXYZ]. 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 [PKT-SP-MGCP] and [RFC3435]. For more information on codecs refer to [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", "NOT RECOMMENDED", "MAY", and "OPTIONAL", when used in the guidelines in this memo, 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 a 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 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 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 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 Signaling PacketCable, European Telecommunications Standards Institute (ETSI), and International Telecommunication Union Telecommunication Standardization Sector (ITU-T) IPCablecom compliant Multimedia Terminal Adapter (MTA) devices. The SIG MIB module is intended to supersede various SIG 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 SIG MIB requirements [ITU-T-J169],
- the ETSI SIG MIB [ETSI-TS-101-909-9]. The ETSI SIG MIB requirements also refer to various signal characteristics defined in [ETSI-EN-300-001], [ETSI-EN-300-659-1], and [ETSI-TR-101-183].

Several normative and informative references are used to help define NCS 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 is made by utilizing the ifTable (IF-MIB), where each index (ifIndex) 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 signaling MIB objects to allow for differentiation between various types of traffic in the service provider network. This MIB module also utilizes SNMP management MIB architecture from SNMP-FRAMEWORK-MIB [RFC3411].
4.1 Structure of the MIB

This MIB is structured in three groups:

- Signaling information that control device and endpoint configuration objects (pktcSigMibObjects)

- Signaling Notification object, that notifies the status (pktcSigNotification)

- Signaling Conformance has mandatory signaling objects (pktcSigConformance)

Each group of objects is explained in detail.

4.2 pktcSigDevConfigObjects

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).

pktcSigDevR0Cadence - this object specifies ring cadence 0.

pktcSigDevR1Cadence - this object specifies ring cadence 1.

pktcSigDevR2Cadence - this object specifies ring cadence 2.

pktcSigDevR3Cadence - this object specifies ring cadence 3.

pktcSigDevR4Cadence - this object specifies ring cadence 4.

pktcSigDevR5Cadence - this object specifies ring cadence 5.

pktcSigDevR6Cadence - this object specifies ring cadence 6.

pktcSigDevR7Cadence - this object specifies ring cadence 7.

pktcSigDevRgCadence - this object specifies ring cadence for ringing (rg).

pktcSigDevRsCadence - this object specifies ring cadence for ring splash (rs).

pktcSigDefCallSigDscp - this object specifies the default value used in the IP header for setting the Differentiated Services Code Point (DSCP) value for call signaling.
pktcSigDefMediaStreamDscp - this object specifies the default value used in the IP header for setting the Differentiated Services Code Point (DSCP) value for media stream packets.

pktcSigCapabilityTable - this table specifies list of supported signaling types, versions and vendor extensions for MTA.

pktcSigDefNcsReceiveUdpPort - this object contains the MTA User Datagram Protocol (UDP) receive port that is being used for NCS call signaling.

pktcSigDevCIDMode - this international object selects various modes of caller id in common use.

pktcSigDevCIDFskafterRing - this international object sets the delay between the end of first ringing and the transmission of caller id information.

pktcSigDevCIDFskafterDTAS - this international object sets the delay between the dual-tone alert signal and the transmission of caller id information.

pktcSigDevCIDFskafterRPAS - this international object sets the delay between the ring pulse alert signal and the transmission of caller id information.

pktcSigDevCIDRingAfterFSK - this international object sets the delay between the transmission of caller id information and the first ringing pattern.

pktcSigDevCIDDTASafterLR - this international object sets the delay between the end of a line reversal and the dual-tone alert signal.

pktcSigDevVmwiMode - this object selects various modes of visual message waiting indicator service in common use.

pktcSigDevVmwiFskafterDTAS - this international object sets the delay between the dual-tone alert signal and the transmission of visual message waiting information.

pktcSigDevVmwiFskafterRPAS - this international object sets the delay between the ring pulse alert signal and the transmission of visual message waiting information.

pktcSigDevVmwiDTASafterLR - this international object sets the delay between the end of a line reversal and the dual-tone alert signal for visual message waiting information.
pktcSigDevRingCadenceTable - this international object provides a flexible structure within which to specify a variety of ring cadences.

pktcSigDevToneTable - this international 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.

pktcNcsEndPntConfigTable - this table describes the PacketCable NCS endPoint configuration. The number of entries in this table represents the number of provisioned endpoints.

pktcSigEndPntConfigTable - this table describes the PacketCable endPoint selected signaling type. The number of entries in this table represents the number of provisioned endpoints.

4.3 pktcSigNotification

pktcSigNotification - this object is used for signaling notification and reserved for future use.

4.4 pktcSigConformance

pktcSigCompliances - this table has one object that has compliance statements for devices that implement Signaling on the MTA.

pktcSigGroups - this table contains group of objects for the common portion of the PacketCable NCS and Signaling MIB.

pktcInternationalGroup - this table extends this MIB Module by establishing a set of 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,

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 "200509090000Z" -- September 9, 2005  
ORGANIZATION "IETF IPCDN Working Group"  
CONTACT-INFO  
"Sumanth Channabasappa  
Cable Television Laboratories, Inc.  
858 Coal Creek Circle,  
Louisville, CO 80027, USA  
Phone: +1 303-661-3307  
Email: Sumanth@cablelabs.com  

Gordon Beacham  
Motorola, Inc.  
6450 Sequence Drive, Bldg. 1  
San Diego, CA 92121, USA  
Phone: +1 858-404-2335  
Email: gordon.beacham@motorola.com  

Satish Kumar Mudugere Eswaraiah  
Texas Instruments India (P) Ltd.,  
Golf view, Wind Tunnel Road  
Murugesh Palya  
Bangalore 560 017, INDIA  
Phone: +91 80 5269451  
Email: satish.kumar@ti.com  

IETF IPCDN Working Group  
General Discussion: ipcdn@ietf.org  
Subscribe: http://www.ietf.org/mailman/listinfo/ipcdn  
Archive: ftp://ftp.ietf.org/ietf-mail-archive/ipcdn  
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 object 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 Internet Society (2005). This version of this MIB module is part of RFC yyyy; see the RFC itself for full legal notices."

-- RFC Ed: replace yyyy with actual RFC number and remove this note

REVISION                "200509090000Z"

DESCRIPTION
"Initial version, published as RFC yyyy."
-- RFC Ed: replace yyyy with actual RFC number and remove this note

::=  { mib-2 XXX }
-- RFC Ed: replace XXX with IANA-assigned number and remove this note
-- note

-- 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 in PacketCable
    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"
The list of codecs is consistent with the IETF Real Time Transport Protocol (RTP) Profile registry and the RTP Map Parameters Table in [PKT-SP-CODEC]. The literal codec name for each codec is listed below:

<table>
<thead>
<tr>
<th>Codec</th>
<th>Literal Codec Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>g729</td>
<td>G729</td>
</tr>
<tr>
<td>g729E</td>
<td>G729E</td>
</tr>
<tr>
<td>pcmu</td>
<td>PCMU</td>
</tr>
<tr>
<td>g726at32</td>
<td>G726-32</td>
</tr>
<tr>
<td>g728</td>
<td>G728</td>
</tr>
<tr>
<td>pcmu</td>
<td>PCMA</td>
</tr>
<tr>
<td>g726at16</td>
<td>G726-16</td>
</tr>
<tr>
<td>g726at24</td>
<td>G726-24</td>
</tr>
<tr>
<td>g726at40</td>
<td>G726-40</td>
</tr>
<tr>
<td>ilbc</td>
<td>iLBC</td>
</tr>
<tr>
<td>bv16</td>
<td>BV16</td>
</tr>
</tbody>
</table>

The literal codec name is the second column of the table with codec RTP Map Parameters. 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. 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),
  pcmu      (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 - set when signaling other than ncs is used
reserved - for future use
ncs - Network call signaling is a derivation of MGCP (Media Gateway Control Protocol) defined for IPCablecom/PacketCable MTAs."

SYNTAX INTEGER {
  other(1),
  reserved(2),
ns(3)

(pktcSigMibObjects OBJECT IDENTIFIER ::= { pktcIetfSigMib 1 }
 pktcSigDevConfigObjects OBJECT IDENTIFIER ::= 
    { pktcSigMibObjects 1 }
 pktcNcsEndPntConfigObjects 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 DSP and memory architecture that allows it to
support the following fixed combinations of codecs for
simultaneous operation:

<table>
<thead>
<tr>
<th>Codec Type</th>
<th>Maximum Number of Simultaneous Codecs</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCMA</td>
<td>3</td>
</tr>
<tr>
<td>PCMA</td>
<td>2</td>
</tr>
<tr>
<td>PCMU</td>
<td>1</td>
</tr>
<tr>
<td>PCMA</td>
<td>1</td>
</tr>
<tr>
<td>PCMU</td>
<td>2</td>
</tr>
<tr>
<td>PCMU</td>
<td>3</td>
</tr>
<tr>
<td>PCMA</td>
<td>1</td>
</tr>
<tr>
<td>G729</td>
<td>1</td>
</tr>
<tr>
<td>G729</td>
<td>2</td>
</tr>
<tr>
<td>PCMU</td>
<td>1</td>
</tr>
<tr>
<td>G729</td>
<td>1</td>
</tr>
</tbody>
</table>

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

CodecComboIndex pktcSigDevCodecType pktcSigDevCodecMax
  1   pcma       3

Beacham/Kumar/Channabasappa Expires - March 2006 [Page 12]
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.

```plaintext
::= { pktcSigDevConfigObjects 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 which 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."
::= { pktcSigDevConfigObjects 2 }

pktcSigDevSilenceSuppression  OBJECT-TYPE
SYNTAX       TruthValue
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
"This object specifies if the device is capable of
silence suppression (Voice Activity Detection)."
::= { pktcSigDevConfigObjects 3 }

pktcSigDevCallerIdSigProtocol  OBJECT-TYPE
SYNTAX       INTEGER {
          fsk  (1),
          dtmf (2)
        }
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
"This object identifies the subscriber line protocol used
for signaling on-hook caller id information. Different
countries define different caller id signaling protocols to
support caller identification. Frequency shift keying (FSK)
is most commonly used. Dual tone multi-frequency (DTMF)
is an alternative.

REFERENCE
"ETSI-EN-300-659-1 Specification"

DEFVAL { fsk }

::= { pktcSigDevConfigObjects 4 }

pktcSigDevR0Cadence OBJECT-TYPE
SYNTAX      PktcRingCadence
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  "This object specifies ring cadence 0 (a user defined field). This object is required for the L line package."

::= { pktcSigDevConfigObjects 5 }

pktcSigDevR1Cadence OBJECT-TYPE
SYNTAX      PktcRingCadence
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  "This object specifies ring cadence 1 (a user defined field). This object is required for the L line package."

::= { pktcSigDevConfigObjects 6 }

pktcSigDevR2Cadence OBJECT-TYPE
SYNTAX      PktcRingCadence
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  "This object specifies ring cadence 2 (a user defined field). This object is required for the L line package."

::= { pktcSigDevConfigObjects 7 }

pktcSigDevR3Cadence OBJECT-TYPE
SYNTAX      PktcRingCadence
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  "This object specifies ring cadence 3 (a user defined field). This object is required for the L line package."

::= { pktcSigDevConfigObjects 8 }

pktcSigDevR4Cadence OBJECT-TYPE
SYNTAX      PktcRingCadence
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  "This object specifies ring cadence 4 (a user defined field). This object is required for the L line package."
::= { pktcSigDevConfigObjects 9 }

pktcSigDevR5Cadence OBJECT-TYPE
SYNTAX       PktcRingCadence
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
" This object specifies ring cadence 5 (a user defined
    field). This object is required for the L line package."
::= { pktcSigDevConfigObjects 10 }

pktcSigDevR6Cadence OBJECT-TYPE
SYNTAX       PktcRingCadence
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
" This object specifies ring cadence 6 (a user defined
    field). This object is required for the L line package."
::= { pktcSigDevConfigObjects 11 }

pktcSigDevR7Cadence OBJECT-TYPE
SYNTAX       PktcRingCadence
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
" This object specifies ring cadence 7 (a user defined
    field). This object is required for the L line package."
::= { pktcSigDevConfigObjects 12 }

pktcSigDevRgCadence OBJECT-TYPE
SYNTAX       PktcRingCadence
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
" This object specifies ring cadence rg (a user defined
    field). This object is required for the L line package."
::= { pktcSigDevConfigObjects 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. This object is required for the L line
    package."
::= { pktcSigDevConfigObjects 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."
DEFVAL { 0 }
::= { pktcSigDevConfigObjects 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."
DEFVAL { 0 }
::= { pktcSigDevConfigObjects 16 }

--

pktcSigCapabilityTable  OBJECT-TYPE
SYNTAX        SEQUENCE OF PktcSigCapabilityEntry
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION  
"This table defines the valid signaling 
types supported by this MTA.

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 { pktcSignalingIndex }
 ::= { pktcSigCapabilityTable 1 }

PktcSigCapabilityEntry ::= SEQUENCE {
 pktcSignalingIndex             Unsigned32,
 pktcSignalingType              PktcSigType,
 pktcSignalingVersion           SnmpAdminString,
 pktcSignalingVendorExtension   SnmpAdminString
 }

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

pktcSignalingType      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 }

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

pktcSignalingVendorExtension      OBJECT-TYPE
 SYNTAX        SnmpAdminString
 MAX-ACCESS    read-only
 STATUS        current
 DESCRIPTION
 " The vendor extension allows vendors to provide a list of additional capabilities, vendors can decide how to encode
these extensions, although space separated text is suggested."
::= { 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."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 2427 }
::= { pktcSigDevConfigObjects 18 }

pktcSigPowerRingFrequency    OBJECT-TYPE
SYNTAX       INTEGER {
  f20Hz(1),
  f25Hz(2),
  f33Point33Hz(3),
  f50Hz(4),
  f15Hz(5),
  f16Hz(6),
  f22Hz(7),
  f23Hz(8),
  f45Hz(9)
}
UNITS "Hertz"
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 contains a list of frequency ranges that are defined for each country."

DEFVAL { f20Hz }
::= { pktcSigDevConfigObjects 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. This object is required for the E line package. Signals defined in this table are triggered using the E line package. Objects in this table do not persist across MTA reboots."

REFERENCE
"ETSI-TS-101-909-4 Specification"
::= { pktcSigDevConfigObjects 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."
INDEX { pktcSigPulseSignalType }
::= { pktcSigPulseSignalTable 1 }

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

This object is only applicable to the initialRing, enableMeterPulse, and meterPulseBurst signal type. This object identifies the frequency of the generated signal. The following table defines the default values for this object depending on signal type:
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 'inconsistent value' error.

REFERENCE
"ETSI-EN-300-001 Specification"
::= { pktcSigPulseSignalEntry 2 }

pktcSigPulseSignalDbLevel OBJECT-TYPE
SYNTAX TenthdBm (-350..0)
UNITS "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 'inconsistent value' 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 'inconsistent value' 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 'inconsistent value' error.

REFERENCE
"ETSI-EN-300-324-1 Specification"
::= { pktcSigPulseSignalEntry 5 }

pktcSigPulseSignalRepeatCount OBJECT-TYPE
SYNTAX       Unsigned32
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 as such must have a value of zero. The following table defines the default values and the valid ranges for this object depending on the signal type.

<table>
<thead>
<tr>
<th>pktcSigPulseSignaltype</th>
<th>Default</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>initialRing</td>
<td>1</td>
<td>1-5</td>
</tr>
<tr>
<td>pulseLoopClose</td>
<td>1</td>
<td>1-50</td>
</tr>
<tr>
<td>pulseLoopOpen</td>
<td>1</td>
<td>1-50</td>
</tr>
<tr>
<td>enableMeterPulse</td>
<td>0</td>
<td>Not Used</td>
</tr>
<tr>
<td>meterPulseBurst</td>
<td>1</td>
<td>1-50</td>
</tr>
<tr>
<td>pulseNoBattery</td>
<td>1</td>
<td>1-50</td>
</tr>
<tr>
<td>pulseNormalPolarity</td>
<td>1</td>
<td>1-50</td>
</tr>
<tr>
<td>pulseReducedBattery</td>
<td>1</td>
<td>1-50</td>
</tr>
<tr>
<td>pulseReversePolarity</td>
<td>1</td>
<td>1-50</td>
</tr>
</tbody>
</table>

An attempt to set this object to a value that does not fall within the range (or is not used) for the specific signal type will result in an 'inconsistent value' error.

```plaintext
::={ pktcSigPulseSignalEntry 6 }
```

```
pktcSigDevCIDMode    OBJECT-TYPE
SYNTAX       INTEGER {
   duringRingingETS(1),
   dtAsETS(2),
   rpAsETS(3),
   lrAsETS(4)
}
MAX-ACCESS read-write
STATUS       current
DESCRIPTION
" For on-hook Caller ID, pktcSigDevCIDMode selects the method of Caller ID. For the duringRingingETS method, the Frequency Shift Keying (FSK) containing the Caller ID information is sent between the first and second ring pattern. For the dtAsETS, rpAsETS, and lrAsETS methods, the FSK containing the Caller ID information is sent before the first ring pattern. For the dtAsETS method, the FSK is sent after the Dual Tone Alert Signal. For the rpAsETS method, the FSK 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 is sent."

DEFVAL { rpAsETS}
::= (pktcSigDevConfigObjects 21 )
```

```
pktcSigDevCIDFskAfterRing    OBJECT-TYPE
SYNTAX       Unsigned32 (50..2000)
UNITS        "Milliseconds"
MAX-ACCESS read-write
STATUS       current
DESCRIPTION
```

Beacham/Kumar/Channabasappa Expires - March 2006 [Page 24]
This object specifies the delay between the end of first ringing pattern and the start of the transmission of the FSK containing the Caller ID information. It is only used when pktcSigDevCIDMode is duringRingingETS. The following table defines the default values for this object depending on signal type:

<table>
<thead>
<tr>
<th>pktcSigDevCIDMode</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>duringringingETS</td>
<td>550 ms</td>
</tr>
<tr>
<td>dtAsETS</td>
<td>not used</td>
</tr>
<tr>
<td>rpAsETS</td>
<td>not used</td>
</tr>
<tr>
<td>lrAsETS</td>
<td>not used</td>
</tr>
</tbody>
</table>

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

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

pktcSigDevCIDFskAfterDTAS OBJECT-TYPE
SYNTAX       Unsigned32 (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 containing the Caller ID information. This object is only used when pktcSigDevCIDMode is dtAsETS or lrAsETS. The following table defines the default values for this object depending on signal type:

<table>
<thead>
<tr>
<th>pktcSigDevCIDMode</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>duringringingETS</td>
<td>not used</td>
</tr>
<tr>
<td>dtAsETS</td>
<td>50 ms</td>
</tr>
<tr>
<td>rpAsETS</td>
<td>not used</td>
</tr>
<tr>
<td>lrAsETS</td>
<td>50 ms</td>
</tr>
</tbody>
</table>

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

REFERENCE
"ETSI-EN-300-659-1 Specification"
DEFVAL { 50 }
::= {pktcSigDevConfigObjects 23 }

pktcSigDevCIDFskAfterRPAS OBJECT-TYPE
SYNTAX       Unsigned32 (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 containing the Caller ID 
                  information. This object is only used when 
pktcSigDevCIDMode is rpAsETS. The following table defines 
the default values for this object depending on signal 
type:

pktcSigDevCIDMode     Default
duringringingETS      not used
dtAsETS               not used
rpAsETS               650 ms
lrAsETS               not used

An attempt to set this object while the value of 
pktcSigDevCIDMode is not rpAsETS will result in an 
'inconsistent value' error."
REFERENCE       "ETSI-EN-300-659-1 Specification"
DEFVAL          { 650 }
::= {pktcSigDevConfigObjects 24 }

pktcSigDevCIDRingAfterFSK   OBJECT-TYPE
SYNTAX           Unsigned32 (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 containing the Caller ID 
                  information and the start of the first ring pattern. It is 
                  only used when pktcSigDevCIDMode is dtAsETS, rpAsETS or 
                  lrAsETS. The following table defines the default values 
                  for this object depending on signal type:

pktcSigDevCIDMode     Default
duringringingETS      not used
dtAsETS               250 ms
rpAsETS               250 ms
lrAsETS               250 ms

An attempt to set this object while the value of 
pktcSigDevCIDMode is not dtAsETS, rpAsETS, or lrAsETS will 
result in an 'inconsistent value' error."
REFERENCE       "ETSI-EN-300-659-1 Specification"
DEFVAL           { 250 }
::= {pktcSigDevConfigObjects 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 lrAsETS. The following table defines the default values for this object depending on signal type:
pktcSigDevCIDMode     Default
duringring_ETs       not used
dtAsETS               not used
rpAsETS               not used
lrAsETS               250 ms
An attempt to set this object while the value of pktcSigDevCIDMode is not lrAsETS will result in an 'inconsistent value' error."
REFERENCE
"ETSI-EN-300-659-1 Specification"
DEFVAL { 250 }
::= {pktcSigDevConfigObjects 26 }

pktcSigDevVmwiMode   OBJECT-TYPE
SYNTAX       INTEGER {
               dtAsETS(1),
               rpAsETS(2),
               lrAsETS(3),
               osi(4)
           }
MAX-ACCESS read-write
STATUS current
DESCRIPTION
" For visual message waiting indicator (VMWI), pktcSigDevVmwiMode selects the alerting signal method. For the dtAsETS, rpAsETS, lrAsETS, and OSI methods, the FSK containing the VMWI information is sent after an alerting signal. For the dtAsETS method, the FSK is sent after the Dual Tone Alert Signal. For the rpAsETS method, the FSK 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 is sent. For the OSI method, the FSK is sent after the Open Switching Interval."
DEFVAL { dtAsETS }
::= (pktcSigDevConfigObjects 27 )

pktcSigDevVmwiFskAfterDTAS OBJECT-TYPE
SYNTAX       Unsigned32 (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 containing the VMWI information.
This object is only used when pktcSigDevVmwiMode is
dtAsETS or lrAsETS. The following table defines the
default values for this object depending on signal type:

<table>
<thead>
<tr>
<th>pktcSigDevVmwiMode</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>dtAsETS</td>
<td>50 ms</td>
</tr>
<tr>
<td>rpAsETS</td>
<td>not used</td>
</tr>
<tr>
<td>lrAsETS</td>
<td>50 ms</td>
</tr>
</tbody>
</table>

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

REFERENCE
"ETSI-EN-300-659-1 Specification"

DEFVAL { 50 }
::= {pktcSigDevConfigObjects 28 }

pktcSigDevVmwiFskAfterRPAS OBJECT-TYPE
SYNTAX Unsigned32 (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 containing the VMWI information.
This object is only used when pktcSigDevVmwiMode is
rpAsETS. The following table defines the default values
for this object depending on signal type:

<table>
<thead>
<tr>
<th>pktcSigDevVmwiMode</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>dtAsETS</td>
<td>not used</td>
</tr>
<tr>
<td>rpAsETS</td>
<td>650 ms</td>
</tr>
<tr>
<td>lrAsETS</td>
<td>not used</td>
</tr>
</tbody>
</table>

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

REFERENCE
"ETSI-EN-300-659-1 Specification"

DEFVAL { 650 }
::= {pktcSigDevConfigObjects 29 }

pktcSigDevVmwiDTASAfterLR OBJECT-TYPE
SYNTAX Unsigned32 (50..655)
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 lrAsETS. The following table defines the default values for this object depending on signal type:

<table>
<thead>
<tr>
<th>pktcSigDevVmwiMode</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>dtAsETS</td>
<td>not used</td>
</tr>
<tr>
<td>rpAsETS</td>
<td>not used</td>
</tr>
<tr>
<td>lrAsETS</td>
<td>250 ms</td>
</tr>
</tbody>
</table>

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

REFERENCE
"ETSI-EN-300-659-1 Specification"

DEFVAL { 250 }
::= {pktcSigDevConfigObjects 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. Objects in this table do not persist across MTA reboots."

REFERENCE
"ETSI-TS-101-909-4 Specification"
::= { pktcSigDevConfigObjects 31 }

pktcSigDevRingCadenceEntry OBJECT-TYPE
SYNTAX PktcSigDevRingCadenceEntry
MAX-ACCESS   not-accessible  
STATUS       current 
DESCRIPTION
" Unique value ranging from 0 to 127 that will correspond to the different ring cadences that are being supported by the device."
INDEX { pktcSigDevRingCadenceIndex } ::= { pktcSigDevRingCadenceTable 1 }

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

pktcSigDevRingCadenceIndex    OBJECT-TYPE
SYNTAX       Unsigned32 (0..127)
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION
" 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. This object is required for the E line package."
 ::= { pktcSigDevRingCadenceEntry 2 }

pktcSigDevToneTable    OBJECT-TYPE
SYNTAX       SEQUENCE OF PktcSigDevToneEntry
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION
" The Tone Table defines the various tone operations. Any definition of the tones callWaiting1-4 in this table should just contain the audible tone itself and NOT contain the delay between tones or the tone repeat count. The delay between tones or the repeat count is controlled by the objects pktcNcsEndPntConfigCallWaitingDelay, and
pktcNcsEndPntConfigCallWaitingMaxRep. If the pktcSigDevToneType is set to either of the values callWaiting1, callWaiting2, callWaiting3 or callWaiting4, then the value of the pktcSigDevToneWholeToneRepeatCount object has no effect on the tone. 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 by the MTA Configuration File. The frequency composition of each tone is defined by the pktcSigDevMultiFreqToneTable. For each ToneType defined in pktcSigDevToneTable, the MTA MUST populate at least one entry 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." ::= { pktcSigDevConfigObjects 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 Tone Type. The different parameters can be provisioned by the MTA configuration file based on country specific needs. An MTA MUST populate all entries of this table for each tone type."
INDEX { pktcSigDevToneType }
 ::= { pktcSigDevToneTable 1 }

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

pktcSigDevToneType OBJECT-TYPE
SYNTAX INTEGER {
 busy(1),
 confirmation(2),
 dial(3),
packetCable/IPCablecom NCS Signaling MIB             September 2005

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
"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 }

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 that The TO duration setting should always be longer than the desired repeat count time duration."

::={ pktcSigDevToneEntry 2 }

pktcSigDevToneSteady OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION "This is the steady tone. Device must play out the on-off cadence sequence for pktcSigDevToneWholeRepeatCount times and then apply the last tone forever. Setting this object may result in a tone 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 that The TO duration setting should always be longer than the desired repeat count time duration plus the desired maximum steady tone period."

::={ pktcSigDevToneEntry 3 }

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 using the MTA configuration file."

REFERENCE
::= { pktcSigDevConfigObjects 35 }

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           Integer32,
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       Integer32(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..-30)
UNITS        "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 MUST reflect the desired level at the Telco (POTS) a-b (T/R) terminals including the affect 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 (loss) - but does not imply the entire range is to be achievable given the range of gains (loss) in the MTA."
DEFVAL { -40 }
::={ pktcSigDevMultiFreqToneEntry 8}

pktcSigDevToneFreqOnDuration OBJECT-TYPE
SYNTAX Unsigned32(0..5000)
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)
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
Setting this object may result in a tone duration 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 the 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}

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

pktcNcsEndPntConfigTable OBJECT-TYPE
SYNTAX SEQUENCE OF PktcNcsEndPntConfigEntry
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 signaling 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."
::= { pktcNcsEndPntConfigObjects 1 }

pktcNcsEndPntConfigEntry OBJECT-TYPE
SYNTAX PktcNcsEndPntConfigEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Each entry in the pktcNcsEndPntConfigTable represents required signaling parameters for the specific endpoint provisioned with voice services."
INDEX { ifIndex }
::= { pktcNcsEndPntConfigTable 1 }

PktcNcsEndPntConfigEntry ::= SEQUENCE {
  pktcNcsEndPntConfigCallAgentId             SnmpAdminString,
  pktcNcsEndPntConfigCallAgentUdpPort        InetPortNumber,
  pktcNcsEndPntConfigPartialDialTO           Unsigned32,
  pktcNcsEndPntConfigBusyToneTO             Unsigned32,
  pktcNcsEndPntConfigCriticalDialTO         Unsigned32,
  pktcNcsEndPntConfigMessageWaitingTO       Unsigned32,
  pktcNcsEndPntConfigOffHookWarnToneTO      Unsigned32,
  pktcNcsEndPntConfigRingingTO              Unsigned32,
  pktcNcsEndPntConfigRingBackTO             Unsigned32,
  pktcNcsEndPntConfigReorderToneTO          Unsigned32,
  pktcNcsEndPntConfigStutterDialToneTO      Unsigned32,
  pktcNcsEndPntConfigTSMax                  Unsigned32,
  pktcNcsEndPntConfigMax1                   Unsigned32,
  pktcNcsEndPntConfigMax2                   Unsigned32,
  pktcNcsEndPntConfigMax1QEnable            TruthValue,
  pktcNcsEndPntConfigMax2QEnable            TruthValue,
  pktcNcsEndPntConfigMWD                    Unsigned32,
  pktcNcsEndPntConfigTdinit                 Unsigned32,
  pktcNcsEndPntConfigTdmin                  Unsigned32,
  pktcNcsEndPntConfigTdmax                  Unsigned32,
  pktcNcsEndPntConfigRtoMax                 Unsigned32,
  pktcNcsEndPntConfigRtoInit                Unsigned32,
  pktcNcsEndPntConfigLongDurationKeepAlive  Unsigned32,
  pktcNcsEndPntConfigThist                  Unsigned32,
  pktcNcsEndPntConfigStatus                 RowStatus,
  pktcNcsEndPntConfigCallWaitingMaxRep      Unsigned32,
  pktcNcsEndPntConfigCallWaitingDelay       Unsigned32,
  pktcNcsEndPntStatusCallIpAddressType      InetAddressType,
  pktcNcsEndPntStatusCallIpAddress          InetAddress,
  pktcNcsEndPntStatusError                  INTEGER,
  pktcNcsEndPntConfigMinHookFlash           Unsigned32,
  pktcNcsEndPntConfigMaxHookFlash           Unsigned32,
  pktcNcsEndPntConfigPulseDialInterdigitTime Unsigned32,
  pktcNcsEndPntConfigPulseDialMinMakeTime   Unsigned32,
  pktcNcsEndPntConfigPulseDialMaxMakeTime   Unsigned32,
  pktcNcsEndPntConfigPulseDialMinBreakTime  Unsigned32,
  pktcNcsEndPntConfigPulseDialMaxBreakTime  Unsigned32
}
pktcNcsEndPntConfigCallAgentId 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."
::= { pktcNcsEndPntConfigEntry 1 }

pktcNcsEndPntConfigCallAgentUdpPort 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 signaling 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 }
::= { pktcNcsEndPntConfigEntry 2 }

pktcNcsEndPntConfigPartialDialTO OBJECT-TYPE
SYNTAX Unsigned32

Beacham/Kumar/Channabasappa Expires - March 2006
PacketCable/IPCablecom NCS Signaling MIB

UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "This object contains the value of the partial dial time out."
REFERENCE "PacketCable NCS Specification"
DEFVAL { 16 }
::= { pktcNcsEndPntConfigEntry 3 }

pktcNcsEndPntConfigCriticalDialTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "This object contains the value of the critical dial time out."
REFERENCE "PacketCable NCS Specification"
DEFVAL { 4 }
::= { pktcNcsEndPntConfigEntry 4 }

pktcNcsEndPntConfigBusyToneTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "This object contains the default timeout 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."
REFERENCE "PacketCable NCS Specification"
DEFVAL { 30 }
::= { pktcNcsEndPntConfigEntry 5 }

pktcNcsEndPntConfigDialToneTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "This object contains the default timeout 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.

REFERENCE
"PacketCable NCS Specification"
DEFVAL { 16 }
::= { pktcNcsEndPntConfigEntry 6 }

pktcNcsEndPntConfigMessageWaitingTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains the default timeout 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 Management Station, the MTA MUST use the new value as a default only for a new signal requested by the NCS message."

REFERENCE
"PacketCable NCS Specification"
DEFVAL { 16 }
::= { pktcNcsEndPntConfigEntry 7 }

pktcNcsEndPntConfigOffHookWarnToneTO OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object contains the default timeout 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 Management Station, the MTA MUST use the new value as a default only for a new signal requested by the NCS message."

REFERENCE
"PacketCable NCS Specification"
DEFVAL { 0 }
::= { pktcNcsEndPntConfigEntry 8 }
STATUS       current
DESCRIPTION
"This object contains the default timeout 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."

REFERENCE
"PacketCable NCS Specification"

DEFVAL    { 180 }
::= { pktcNcsEndPntConfigEntry 9 }

pktcNcsEndPntConfigRingBackTO     OBJECT-TYPE
SYNTAX       Unsigned32
UNITS        "seconds"
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION
"This object contains the default timeout 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."

REFERENCE
"PacketCable NCS Specification"

DEFVAL    { 180 }
::= { pktcNcsEndPntConfigEntry 10 }

pktcNcsEndPntConfigReorderToneTO     OBJECT-TYPE
SYNTAX       Unsigned32
UNITS        "seconds"
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION
"This object contains the default timeout 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."

REFERENCE
"PacketCable NCS Specification"

DEFVAL    { 30 }
::= { pktcNcsEndPntConfigEntry 11 }

pktcNcsEndPntConfigStutterDialToneTO     OBJECT-TYPE
SYNTAX       Unsigned32
This object contains the default timeout 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.

REFERENCE
"PacketCable NCS Specification"
DEFVAL { 16 }
 ::= { pktcNcsEndPntConfigEntry 12 }

pktcNcsEndPntConfigTSMax 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 Tsmmax time has elapsed, then the retransmissions MUST cease.

Refer to the MIB Object pktcNcsEndPntConfigThist for Information on when the endpoint becomes disconnected."

REFERENCE
"PacketCable NCS Specification"
DEFVAL { 20 }
 ::= { pktcNcsEndPntConfigEntry 13 }

pktcNcsEndPntConfigMax1 OBJECT-TYPE
SYNTAX    Unsigned32
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"This object contains the suspicious error threshold for signaling messages. The pktcNcsEndPntConfigMax1 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 }
::= { pktcNcsEndPntConfigEntry 14 }

pktcNcsEndPntConfigMax2 OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"This object contains the disconnect error threshold for signaling messages. The pktcNcsEndPntConfigMax2 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 }
::= { pktcNcsEndPntConfigEntry 15 }

pktcNcsEndPntConfigMax1QEnable 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 pktcNcsEndPntConfigMax1 threshold has been reached."
DEFVAL { true }
::= { pktcNcsEndPntConfigEntry 16 }

pktcNcsEndPntConfigMax2QEnable 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 pktcNcsEndPntConfigMax2 threshold has been reached."
DEFVAL { true }
::= { pktcNcsEndPntConfigEntry 17 }

pktcNcsEndPntConfigMWD 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
DEFVAL { 600 }
 ::= { pktcNcsEndPntConfigEntry 18 }

pktcNcsEndPntConfigTdinit  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 }
 ::= { pktcNcsEndPntConfigEntry 19 }

pktcNcsEndPntConfigTdmin  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 }
:= { pktcNcsEndPntConfigEntry 20 }

pktcNcsEndPntConfigTdmax 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 }
:= { pktcNcsEndPntConfigEntry 21 }

pktcNcsEndPntConfigRtoMax 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 }
:= { pktcNcsEndPntConfigEntry 22 }

pktcNcsEndPntConfigRtoInit 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 }
:= { pktcNcsEndPntConfigEntry 23 }

pktcNcsEndPntConfigLongDurationKeepAlive OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "minutes"
MAX-ACCESS  read-create
PacketCable/IPCablecom NCS Signaling MIB               September 2005

STATUS      current
DESCRIPTION
" Specifies a timeout value in minutes for sending long
duration call notification message."
REFERENCE
"PacketCable NCS Specification"
DEFVAL { 60 }
::= { pktcNcsEndPntConfigEntry 24 }

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

pktcNcsEndPntConfigStatus     OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
" This object contains the Row Status associated with the
pktcNcsEndPntConfigTable. 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 active(1)."
::= { pktcNcsEndPntConfigEntry 26 }

pktcNcsEndPntConfigCallWaitingMaxRep     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 Management Station, the MTA MUST use
the new value as a default only for a new signal
requested by the NCS message."
DEFVAL    { 1 }
::= { pktcNcsEndPntConfigEntry 27 }

Beacham/Kumar/Channabasappa Expires - March 2006            [Page 48]
pktcNcsEndPntConfigCallWaitingDelay 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 }
::= { pktcNcsEndPntConfigEntry 28 }

pktcNcsEndPntStatusCallIpAddressType OBJECT-TYPE
SYNTAX InetAddressType
MAX-ACCESS read-only
STATUS current
DESCRIPTION "This object contains the type of Internet address of the 
CMS currently being used for this endpoint."
::= { pktcNcsEndPntConfigEntry 29 }

pktcNcsEndPntStatusCallIpAddress OBJECT-TYPE
SYNTAX InetAddress
MAX-ACCESS read-only
STATUS current
DESCRIPTION "This object contains the Internet address of the CMS 
currently being used for this endpoint. This Internet 
address is used to create the appropriate security 
association. The type of this IP address is determined by 
the value of the pktcNcsEndPntStatusCallIpAddressType 
object."
::= { pktcNcsEndPntConfigEntry 30 }

pktcNcsEndPntStatusError 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.

\[
\text{pktcNcsEndPntConfigEntry 31}
\]

pktcNcsEndPntConfigMinHookFlash 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 pktcNcsEndPntConfigPulseDialMaxBreakTime. The value of pktcNcsEndPntConfigMinHookFlash MUST be less than pktcNcsEndPntConfigMaxHookFlash. This object MUST only be set 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 greater than the value contained by the MIB Object pktcNcsEndPntConfigPulseDialMaxMakeTime."
DEFVAL { 300 }
::= { pktcNcsEndPntConfigEntry 32 }

pktcNcsEndPntConfigMaxHookFlash 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 pktcNcsEndPntConfigMaxHookFlash MUST be greater than pktcNcsEndPntConfigMinHookFlash. This object MUST only be
set via the configuration file during the provisioning process."
DEFVAL { 800 }
 ::= { pktcNcsEndPntConfigEntry 33 }

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

pktcNcsEndPntConfigPulseDialMinMakeTime  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 pktcNcsEndPntConfigPulseDialMinMakeTime MUST
  be less than pktcNcsEndPntConfigPulseDialMaxMakeTime. This object MUST only be set via the configuration file during
  the provisioning process."
DEFVAL { 25 }
 ::= { pktcNcsEndPntConfigEntry 35 }

pktcNcsEndPntConfigPulseDialMaxMakeTime  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 pktcNcsEndPntConfigPulseDialMaxMakeTime MUST
  be greater than pktcNcsEndPntConfigPulseDialMinMakeTime. 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 pktcNcsEndPntConfigMinHookFlash."
DEFVAL { 55 }
 ::= { pktcNcsEndPntConfigEntry 36 }
pktcNcsEndPntConfigPulseDialMinBreakTime  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 pktcNcsEndPntConfigPulseDialMinBreakTime MUST  
be less than pktcNcsEndPntConfigPulseDialMaxBreakTime. 
This object must only be provided via the configuration 
file during the provisioning process."
DEFVAL { 45 }
::= { pktcNcsEndPntConfigEntry 37 }

pktcNcsEndPntConfigPulseDialMaxBreakTime  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 pktcNcsEndPntConfigPulseDialMaxBreakTime MUST  
be greater than pktcNcsEndPntConfigPulseDialMinBreakTime. 
This object MUST only be provided via the configuration 
file during the provisioning process."
DEFVAL { 75 }
::= { pktcNcsEndPntConfigEntry 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 devices that implement 
Signaling on the MTA."

MODULE  -- pktcIetfSigMib
--
-- unconditionally mandatory groups
--

MANDATORY-GROUPS {
    pktcSigGroup
}

GROUP pktcNcsGroup
DESCRIPTION
"This group is mandatory for any MTA implementing NCS signaling"

GROUP pktcInternationalGroup
DESCRIPTION
"This group is mandatory for any MTA implementing international telephony features. In such cases, it is left to manufacturers to determine whether to support both PacketCable and IPCablecom objects in the same MTA."
::={ pktcSigCompliances 1 }

--
-- units of conformance
--

pktcSigGroup OBJECT-GROUP
OBJECTS {
    pktcSigDevCodecMax,
    pktcSigDevEchoCancellation,
    pktcSigDevSilenceSuppression,
    pktcSigDevR0Cadence,
    pktcSigDevR1Cadence,
    pktcSigDevR2Cadence,
    pktcSigDevR3Cadence,
    pktcSigDevR4Cadence,
    pktcSigDevR5Cadence,
    pktcSigDevR6Cadence,
    pktcSigDevR7Cadence,
    pktcSigDevRgCadence,
    pktcSigDevRsCadence,
    pktcSigDefCallSigDscp,
    pktcSigDefMediaStreamDscp,
    pktcSigDevVmwiMode,
    pktcSignalingType,
    pktcSignalingVersion,
    pktcSignalingVendorExtension,
    pktcSigDefNcsReceiveUdpPort
}
STATUS current
DESCRIPTION
"Group of objects for the common portion of the PacketCable Signaling MIB."
::= { pktcSigGroups 1 }

pktcNcsGroup OBJECT-GROUP
OBJECTS {
  pktcNcsEndPntConfigCallAgentId,
  pktcNcsEndPntConfigCallAgentUdpPort,
  pktcNcsEndPntConfigPartialDialTO,
  pktcNcsEndPntConfigCriticalDialTO,
  pktcNcsEndPntConfigBusyToneTO,
  pktcNcsEndPntConfigDialToneTO,
  pktcNcsEndPntConfigMessageWaitingTO,
  pktcNcsEndPntConfigOffHookWarnToneTO,
  pktcNcsEndPntConfigRingingTO,
  pktcNcsEndPntConfigRingBackTO,
  pktcNcsEndPntConfigReorderToneTO,
  pktcNcsEndPntConfigStutterDialToneTO,
  pktcNcsEndPntConfigTSMax,
  pktcNcsEndPntConfigMax1,
  pktcNcsEndPntConfigMax2,
  pktcNcsEndPntConfigMax1QEnable,
  pktcNcsEndPntConfigMax2QEnable,
  pktcNcsEndPntConfigMWD,
  pktcNcsEndPntConfigTdinit,
  pktcNcsEndPntConfigTdmin,
  pktcNcsEndPntConfigTdmax,
  pktcNcsEndPntConfigRtoMax,
  pktcNcsEndPntConfigRtoInit,
  pktcNcsEndPntConfigLongDurationKeepAlive,
  pktcNcsEndPntConfigThist,
  pktcNcsEndPntConfigStatus,
  pktcNcsEndPntConfigCallWaitingMaxRep,
  pktcNcsEndPntConfigCallWaitingDelay,
  pktcNcsEndPntStatusCallIpAddressType,
  pktcNcsEndPntStatusCallIpAddress,
  pktcNcsEndPntStatusError
}
STATUS current
DESCRIPTION
"Group of objects for the NCS portion of the PacketCable Signaling MIB. This is mandatory for NCS signaling."
::= { pktcSigGroups 2 }

pktcInternationalGroup OBJECT-GROUP
OBJECTS {
  pktcNcsEndPntConfigMinHookFlash,
pktcNcsEndPntConfigMaxHookFlash,
pktcNcsEndPntConfigPulseDialInterdigitTime,
pktcNcsEndPntConfigPulseDialMinMakeTime,
pktcNcsEndPntConfigPulseDialMaxMakeTime,
pktcNcsEndPntConfigPulseDialMinBreakTime,
pktcNcsEndPntConfigPulseDialMaxBreakTime,
pktcSigDevRingCadence,
pktcSigDevCallerIdSigProtocol,
pktcSigDevCIDMode,
pktcSigDevCIDFskAfterRing,
pktcSigDevCIDFskAfterDTAS,
pktcSigDevCIDFskAfterRPAS,
pktcSigDevCIDRingAfterFSK,
pktcSigDevCIDDTASAfterLR,
pktcSigDevVmwiFskAfterDTAS,
pktcSigDevVmwiFskAfterRPAS,
pktcSigDevVmwiDTASAfterLR,
pktcSigPowerRingFrequency,
pktcSigPulseSignalFrequency,
pktcSigPulseSignalDbLevel,
pktcSigPulseSignalDuration,
pktcSigPulseSignalPulseInterval,
pktcSigPulseSignalRepeatCount,
pktcSigDevToneDbLevel,
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 }

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(17) is assigned to this tone:

```
<table>
<thead>
<tr>
<th>ToneType</th>
<th>F-1</th>
<th>F-2</th>
<th>F-3</th>
<th>F-4</th>
<th>F-Mode</th>
<th>ModePrtg</th>
<th>DbL</th>
<th>OnDur</th>
<th>OffDur</th>
<th>Rep-Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>400</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>90</td>
<td>-40</td>
<td>500</td>
<td>400</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>400</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>-40</td>
<td>50</td>
<td>450</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>400</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>-40</td>
<td>50</td>
<td>3450</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>400</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>-40</td>
<td>50</td>
<td>450</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>400</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>-40</td>
<td>50</td>
<td>3450</td>
<td>0</td>
</tr>
</tbody>
</table>
```

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 timeout (which ever is shortest period)
pktcSigDevMultiFreqToneTable:
<table>
<thead>
<tr>
<th>ToneType</th>
<th>F-1</th>
<th>F-2</th>
<th>F-3</th>
<th>F-4</th>
<th>Mode</th>
<th>ModePrtg</th>
<th>DbL</th>
<th>OnDur</th>
<th>OffDur</th>
<th>Rep-Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>400</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>-100</td>
<td>400</td>
<td>350</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>400</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>-40</td>
<td>225</td>
<td>525</td>
<td>0</td>
</tr>
</tbody>
</table>

pktcSigDevToneTable:
<table>
<thead>
<tr>
<th>ToneType</th>
<th>ToneRep-Count</th>
<th>Steady</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>5000</td>
<td>false(0)</td>
</tr>
</tbody>
</table>

7. Acknowledgments

This document is a production of the PacketCable Working Group.

The editors wish to express gratitude to:

Angela Lyda            Arris Interactive  
Chad Griffiths         Broadcom Corp.     
Eugene Nechamkin       Broadcom Corp.     
Jean-Francois Mule     CableLabs(R)      
Matt A. Osman          CableLabs(R)      
Klaus Hermanns         Cisco Systems, Inc. 
Rich Woundy            Comcast Corp.      
Bert Wijnen            Lucent Technologies 
Randy Presuhn          Mindspring        
Phillip Freyman        Motorola, Inc.    
Rick Vetter            Motorola, Inc.     
Sasha Medvinsky        Motorola, Inc.    
Wim De Ketelaere       tComLabs          
David De Reu           tComLabs          
Kristof Sercu          tComLabs          
Roy Spitzer            Telogy Networks, Inc.  
Itay Sherman           Texas Instruments, Inc.  
Mauricio Sanchez       Texas Instruments, Inc.  
Shivakumar Thangapandi Texas Instruments, Inc.  
Mike Heard             Consultant         

8. Security Considerations

There are a number of management objects defined in this MIB that have 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
- pktcSigDevCallerIdSigProtocol
- 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 pktcNcsEndPntConfigTable are used for endpoint signaling. The pktcNcsEndPntConfigCallAgentId 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 pktcNcsEndPntConfigCallAgentUdpPort object identifies the UDP port for NCS signaling traffic. If this object is SET maliciously, the
call agent will not receive NCS signaling 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 pktcNcsEndPntStatusCallIpAddress within pktcNcsEndPntConfigTable. This information itself may be valuable to would-be attackers.

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 values recorded in the SMI Numbers registry:

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>OBJECT IDENTIFIER Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pktcIetfSigMib</td>
<td>{ mib-2 XXX }</td>
</tr>
</tbody>
</table>

Editor's Note (to be removed prior to publication): the IANA is requested to assign a value for XXX under the mib-2 subtree and to record the assignment in the SMI Numbers registry. When the assignment has been made, the RFC Editor is asked to replace XXX (here and in the MIB module) with the assigned value and to remove this note.

10. Normative References
[PKT-SP-MIB-SIG-1.0] PacketCable(TM) 1.0 Signaling MIB
Specification, Issued, PKT-SP-MIB-SIG-I09-050812,
August 2005.
http://www.packetcable.com/specifications/
http://www.cablelabs.com/specifications/archives/

[PKT-SP-MIB-SIG-1.5] PacketCable(TM) 1.5 Signaling MIB
Specification, Issued, PKT-SP-MIB-SIG1.5-I01-050128,
January 2005.
http://www.packetcable.com/specifications/
http://www.cablelabs.com/specifications/archives/

[ITU-T-J169] IPCablecom Network Call Signaling (NCS) MIB

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate

[RFC2578] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J.,
Rose, M., and S. Waldbusser, "Structure of Management
Information Version 2 (SMIv2)", STD 58, RFC 2578, April
1999.

[RFC2579] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J.,
Rose, M., and S. Waldbusser, "Textual Conventions for
SMIv2", STD 58, RFC 2579, April 1999.

[RFC2580] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J.,
Rose, M., and S. Waldbusser, "Conformance Statements for
SMIv2", STD 58, RFC 2580, April 1999.

[RFC3289] Baker, F., Chan, K., and A. Smith, "Management Information
Base for the Differentiated Services Architecture", RFC
3289, May 2002.

Schoenwaelder, "Textual Conventions for Internet Network

Architecture for Describing Simple Network Management
Protocol (SNMP) Management Frameworks", RFC 3411, December
2002.

--
-- NOTES TO RFC EDITOR (to be removed prior to publication)
--
-- The I-D <draft-ietf-ops-rfc3291bis-01.txt> (or a successor) is
-- expected to eventually replace RFC 3291. If that draft (or a
-- successor) is published as an RFC prior to, or concurrently with
-- this document, then the normative reference [RFC3291] should be
-- updated to point to the replacement RFC, and the reference tag
-- [RFC3291] should be updated to match.

[PKT-SP-CODEC] Packetcable Audio/Video Codecs Specification
PKT-SP-CODEC-IO5-040113.

[PKT-SP-MGCP] Packetcable Network-Based Call Signaling Protocol
Specification PKT-SP-EC-MGCP-I10-040402.

[PKT-SP-PROV] Packetcable MTA Device Provisioning Specification
PKT-SP-PROV-I10-040730.

11. Informative References

[RFC3410] Case, J., Mundy, R., Partain, D. and B. Stewart,
"Introduction and Applicability Statements for Internet-

[RFC3435] Andreasen, F., and B. Foster, "Media Gateway Control

(MTA) Management Information Base for PacketCable and
IPCablecom compliant devices", RFCKXYZ, <Date>.

Editor's Note (to be removed prior to publication): This is the
reference to 'draft-ietf-ipcdn-pktc-mtamib' which is expected to
accepted at the same time as this draft. When the draft is accepted,
the RFC Editor is asked to replace XYZ (and in the reference
earlier) with the assigned value and to remove this note.

[ETSI-TS-101-909-4] ETSI TS 101 909-4:"Access and Terminals (AT);
Digital Broadband Cable Access to the Public
Telecommunications Network; IP Multimedia Time Critical
Services; Part 4: Network Call Signaling Protocol".

[ETSI-TS-101-909-9] ETSI TS 101 909-9:"Access and Terminals (AT);
Digital Broadband Cable Access to the Public
Telecommunications Network; IP Multimedia Time Critical
Services; Part 9: IPCablecom Network Call Signalling
(NCS) MIB Requirements".

[ETSI-EN-300-001] ETSI EN 300-001 V1.5.1 (1998-10):"European
Standard (Telecommunications series) Attachments
to Public Switched Telephone Network (PSTN);
General technical requirements for equipment connected to an analogue subscriber interface in the PSTN; Chapter 3: Ringing signal characteristics (national deviations are in Table 3.1.1).

[ETSI-EN-300-324-1] ETSI EN 300 324-1 V2.1.1 (2000-04): "V Interfaces at the digital Loop Exchange (LE); V5.1 interface for the support of Access Network (AN); Part 1: V5.1 interface specification".

[ETSI-EN-300-659-1] ETSI EN 300 659-1: "Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 1: On hook data transmission".


Authors' Addresses

Gordon Beacham
Motorola, Inc.
6450 Sequence Drive, Bldg. 1
San Diego, CA 92121, USA
+1 858-404-2335
gordon.beacham@motorola.com

Satish Kumar Mudugere Eswaraiah
Texas Instruments India (P) Ltd.,
Golf view, Wind Tunnel Road
Murugesh Palya
Bangalore 560 017, INDIA
+91 80 5269451
satish.kumar@ti.com

Sumanth Channabasappa
Cable Television Laboratories, Inc.
858 Coal Creek Circle,
Louisville, CO 80027, USA
+1 303-661-3307
Sumanth@cablelabs.com

Disclaimer of validity

The IETF takes no position regarding the validity or scope of any Intellectual Property Rights or other rights that might be claimed
to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; nor does it represent that it has made any independent effort to identify any such rights. Information on the procedures with respect to rights in RFC documents can be found in BCP 78 and BCP 79.

Copies of IPR disclosures made to the IETF Secretariat and any assurances of licenses to be made available, or the result of an attempt made to obtain a general license or permission for the use of such proprietary rights by implementers or users of this specification can be obtained from the IETF on-line IPR repository at http://www.ietf.org/ipr.

The IETF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights that may cover technology that may be required to implement this standard. Please address the information to the IETF at ietf-ipr@ietf.org.

Full Copyright Statement

Copyright (C) The Internet Society (2005). This document is subject to the rights, licenses and restrictions contained in BCP 78, and except as set forth therein, the authors retain all their rights.

This document and the information contained herein are provided on an "AS IS" basis and THE CONTRIBUTOR, THE ORGANIZATION HE/SHE REPRESENTS OR IS SPONSORED BY (IF ANY), THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.