                      Management Event MIB
                 for PacketCable/IPCablecom MTAs

Status of this Memo

Abstract

   This memo defines a portion of the Management Information Base (MIB)
   for use with network management protocols in the Internet community.
   In particular, it provides a common data and format representation
   for events generated by 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.

Table of Contents

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. A 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.

A 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].

Given the complexity of such systems it is important that a suitable
event management mechanism be defined to allow for effective
management. This MIB module provides objects suitable for generation
and management of events on the MTA.

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 PacketCable
   PacketCable is a CableLabs-led initiative that is aimed at developing
   interoperable interface specifications for delivering advanced, real-
   time multimedia services over two-way cable plants.

3.2 IPCableCom
   An ITU Telecommunication Standardization Sector (ITU-T) project that
   includes architecture and a series of recommendations that enable the
   delivery of real time services over the cable television networks
   using cable modems.

3.3 MTA

   A 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. A MTA can be an embedded or a

standalone device. An Embedded MTA (E-MTA) is a MTA device containing
an embedded Data Over Cable Service Interface Specifications (DOCSIS)
Cable Modem. A Standalone MTA (S-MTA) is a MTA device separated from
the DOCSIS Cable Modem by non-DOCSIS MAC interface (e.g., Ethernet,
USB).

3.4 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.

3.5 MSO
Multi-System Operator. A cable company that operates many head-end
locations in several cities.

3.6 UDP
User Datagram Protocol. A connectionless protocol built upon Internet
Protocol (IP).

4. Overview
This MIB module provides a set of objects required for generation and
management of events on PacketCable, European Telecommunications
Standards Institute (ETSI), and International Telecommunication Union
Telecommunication Standardization Sector (ITU-T) IPCablecom compliant
Multimedia Terminal Adapter (MTA) devices. The EVENT MIB module is
intended to supersede various EVENT MIB modules from which it is
partly derived:
  - the PacketCable 1.5 Management Event MIB Specification
    [PKT-SP-EVEMIB1.5],
  - the ITU-T IPCablecom management event mechanism MIB requirements
    [ITU-T-J176]

4.1 Structure of the MIB

  This MIB is structured in six groups:

  - Management information that controls the event reporting
    (pktcDevEventControl).

  - Management information that configures the event throttling control
    (pktcDevEventThrottle).

- Management information reflecting the status of the event
  transmission (pktcDevEventStatus).

- Management information that specifies the possible events that can
  be generated by the MTA (pktcDevEventDescr).

- Management information related to the events generated by the MTA
  (pktcDevEventLog).

- Management information that defines the trap and inform messages
  (pktcDevEvNotification).

4.1.1 pktcDevEventControl

   The objects in this group contain information related to the
   destination Syslog Server and actions related to the event tables.

   pkctDevEvControl - this object defines the actions related to the
   event tables.

   pkctDevEvSyslogAddressType - this object defines the address type of
   the Syslog Server.

   pktcDevEvSyslogAddress - this object specifies the address of the
   Syslog server.

   pkctDevEvSyslogUdpPort - this object specifies the UDP-port to which
   the Syslog messages need to be send.

4.1.2 pktcDevEventThrottle
   The objects in this group control the throttling of the reported
   events.

4.1.3 pktcDevEventStatus
   The objects in this group relate to the status of the event
   transmissions.

4.1.4 pktcDevEventDescr
   The objects in this group contain the description of the possible
   events that can be generated.

4.1.5 pktcDevEvNotification
   The objects in this group define the structure for the SNMP trap and
   SNMP Inform notifications.

5. Definitions

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

IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
    Unsigned32,
    NOTIFICATION-TYPE,
    mib-2                       FROM SNMPv2-SMI
    TruthValue,
    DateAndTime                 FROM SNMPv2-TC
    SnmpAdminString             FROM SNMP-FRAMEWORK-MIB
    OBJECT-GROUP,
    MODULE-COMPLIANCE,
    NOTIFICATION-GROUP          FROM SNMPv2-CONF
    ifPhysAddress               FROM IF-MIB
    InetAddressType,
    InetAddress,
    InetPortNumber              FROM INET-ADDRESS-MIB ;

pktcIetfEventMib MODULE-IDENTITY
    LAST-UPDATED "200510230000Z" -- 10/23/2005
    ORGANIZATION "IETF IP over Cable Data Network Working Group"
    CONTACT-INFO
            "Sumanth Channabasappa
             Cable Television Laboratories, Inc.
             858 Coal Creek Circle,
             Louisville, CO 80027, USA
             +1 303-661-3307
             Sumanth@cablelabs.com

             Wim De Ketelaere
             tComLabs
             Stapelplein 70
             9000 Gent, Belgium
             +32 9 269 22 90
             deketelaere@tComLabs.com

             Eugene Nechamkin
             Broadcom Corporation
             200 - 13711 International Place
             Richmond, BC, V6V 2Z8, Canada
             +1 604 233 8500
             enechamkin@broadcom.com"

    DESCRIPTION
            "This MIB module supplies the basic management objects
             for event reporting
```

                Acknowledgements:
                  John Berg   - CableLabs
                  Venkatesh Sunkad   - CableLabs
                  Kevin Marez   - Motorola, Inc.
                  Satish Kumar   - Texas Instruments

             Copyright(C) The Internet Society (2005). This version of
             this MIB module is part of RFC nnnn; see the RFC itself
             for full legal notices."
    -- RFC Ed: replace nnnn with actual RFC number and remove this note.

        REVISION   "200510230000Z"

        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

    --
    --
    pktcDevEvNotification OBJECT IDENTIFIER ::= { pktcIetfEventMib 0 }
    pktcDevEvMibObjects   OBJECT IDENTIFIER ::= { pktcIetfEventMib 1 }
    pktcDevEvConformance OBJECT IDENTIFIER ::= { pktcIetfEventMib 2 }
       --
       --
    pktcDevEventControl   OBJECT IDENTIFIER ::= { pktcDevEvMibObjects 1 }
    pktcDevEventThrottle OBJECT IDENTIFIER ::= { pktcDevEvMibObjects 2 }
    pktcDevEventStatus   OBJECT IDENTIFIER ::= { pktcDevEvMibObjects 3 }
    pktcDevEventDescr   OBJECT IDENTIFIER ::= { pktcDevEvMibObjects 4 }
    pktcDevEventLog   OBJECT IDENTIFIER ::= { pktcDevEvMibObjects 5 }

       ---   Event Reporting control objects
       ---
    pktcDevEvControl OBJECT-TYPE
        SYNTAX BITS {
                   resetEventLogTable(0),
                   resetEventDescrTable(1)
                   }
        MAX-ACCESS read-write
        STATUS   current
        DESCRIPTION
               "This MIB object defines the actions related to the event

                   log configuration.

                   The MTA MUST take the appropriate action whenever
                   a bit is set to a value of '1'.

                   Setting the resetEventLogTable(0) bit to
                   a value of '1' clears the entire event log
                   (Deletes all entries in pktcDevEventLogTable).

                   Setting resetEventDescrTable(1) to a value of '1'
                   resets the pktcDevEventDescrTable to the
                   factory default values.

                   Setting a control bit to a value of '0' MUST not
                   result in any action.

                   Reading this MIB object MUST always return '00'."
          ::= { pktcDevEventControl 1 }

    pktcDevEvSyslogAddressType OBJECT-TYPE
          SYNTAX   InetAddressType
          MAX-ACCESS read-write
          STATUS   current
          DESCRIPTION
                   "This MIB Object defines the address type of the
                   Syslog server.
                   MTAs implementing this MIB MUST support an
                   InetAddressType of ipv4(1).
                   MTAs MAY optionally implement other address types.

                   If an unsupported InetAddressType is used to set
                   this object, the MTA MUST reject it and report an SNMP
                   error stating 'wrong value'.

                   If an SNMP SET results in a type that does not match
                   the value contained in the MIB Object
                   pktcDevEvSyslogAddress, the MTA MUST reject
                   the SNMP SET with an 'inconsistent value'
                   error."
          ::= { pktcDevEventControl 2 }

    pktcDevEvSyslogAddress OBJECT-TYPE
          SYNTAX   InetAddress
          MAX-ACCESS read-write
          STATUS   current
          DESCRIPTION
                   "This MIB Object contains the IP address of the
                   Syslog server. If this is set to either 0.0.0.0 or
                   255.255.255.255 the device MUST inhibit syslog

                    transmission.
                    The use of FQDNs is syntactically allowed, but
                    discouraged since a failure to resolve them in a
                    timely manner may leave the device without access to
                    the Syslog daemon during critical network events.
                    The type of address this object represents is defined
                    by the MIB Object pktDevEvSyslogAddressType.

                    If an SNMP SET results in a type that does not match
                    that indicated by the MIB Object
                    pktcDevEvSyslogAddressType, the MTA MUST
                    reject the SNMP SET with an 'inconsistent value'
                    error."
            ::= { pktcDevEventControl 3 }

    pktcDevEvSyslogUdpPort OBJECT-TYPE
        SYNTAX   InetPortNumber
        MAX-ACCESS   read-write
        STATUS   current
        DESCRIPTION
                "This MIB Object contains the UDP Port Number of the
                 Syslog Server. The MTA must send the
                 Syslog messages to this port on the Syslog Server."
        DEFVAL { 514 }
        ::= { pktcDevEventControl 4 }

    pktcDevEvReportingLevel OBJECT-TYPE
        SYNTAX   BITS {
                    emergency(0),
                    alert(1),
                    critical(2),
                    error(3),
                    warning(4),
                    notice(5),
                    info(6),
                    debug(7)
                    }
        MAX-ACCESS   read-write
        STATUS   current
        DESCRIPTION
                "This MIB Object can be used to collectively
                 turn on/off event levels for all enabled
                 event classes as described in the MIB table
                 'pktcDevEventClassReportTable'.

                 The value of a 'reporting level bit' set
                 through this MIB Object results in the
                 corresponding bit in the MIB Object
                 'pktcDevEventClassReportLevel' set to the

```
                   same value, for all event classes that
                   are enabled for reporting
                   ('pktcDevEventReportStatus' set to a value
                   of 'true').

                   It is recommended that the bits corresponding
                   to emergency(0), alert(1), critical(2)
                   and error(3) always be set to a value of '1'. "
        ::= { pktcDevEventControl 5 }

    pktcDevEventClassReportTable OBJECT-TYPE
        SYNTAX        SEQUENCE OF PktcDevEventClassReportEntry
        MAX-ACCESS  not-accessible
        STATUS        current
        DESCRIPTION
                "This MIB table contains all the event classes
                 and the reporting status information."
        ::= { pktcDevEventControl 6 }

    pktcDevEventClassReportEntry OBJECT-TYPE
        SYNTAX        PktcDevEventClassReportEntry
        MAX-ACCESS  not-accessible
        STATUS        current
        DESCRIPTION
                "An entry in this table MUST be created for each
                 event class defined by a vendor for the events
                 described as part of 'pktcDevEventDescrTable'.

                 By definition of the MIB Object
                 'pktcDevEventDescrClass', an entry MUST be
                 created for the event class 'generic'."
        INDEX { pktcDevEventClass }
        ::= { pktcDevEventClassReportTable 1 }

    PktcDevEventClassReportEntry::= SEQUENCE {
        pktcDevEventClass                  SnmpAdminString,
        pktcDevEventReportStatus          TruthValue,
        pktcDevEventClassReportLevel    BITS
        }


    pktcDevEventClass OBJECT-TYPE
        SYNTAX        SnmpAdminString (SIZE (1..10))
        MAX-ACCESS  not-accessible
        STATUS        current
        DESCRIPTION
            "This MIB Object contains the identifier
             of an event class supported by the device."
        ::= { pktcDevEventClassReportEntry 1 }
```

```
   pktcDevEventReportStatus OBJECT-TYPE
       SYNTAX       TruthValue
       MAX-ACCESS   read-write
       STATUS       current
       DESCRIPTION
            "This MIB Object indicates if events belonging
             to a particular event class are to be enabled
             or disabled for reporting.

             Setting this object to a value of 'true' enables
             reporting as per the MIB Object
             'pktcDevEventDescrReporting'.

             Setting this object to a value of 'false' disables
             any reporting, irrespective of the value of the
             MIB Object 'pktcDevEventDescrReporting'.

             The default value of this MIB Object is vendor
             specific. However, the vendor SHOULD enable all
             event categories defined by PacketCable or
             IPCableCom, by default."
       ::= { pktcDevEventClassReportEntry 2 }

   pktcDevEventClassReportLevel OBJECT-TYPE
       SYNTAX       BITS {
                    emergency(0),
                    alert(1),
                    critical(2),
                    error(3),
                    warning(4),
                    notice(5),
                    info(6),
                    debug(7)
                    }
       MAX-ACCESS   read-write
       STATUS       current
       DESCRIPTION
               "This MIB Object defines the reporting levels
                of events for the corresponding event class,
                that need to be included for reporting.

                This MIB Object has no effect unless the
                'pktcDevEventReportStatus' is set to a value
                of 'true', for the corresponding event class.

                Setting a bit to a value of '1' implies that
                events corresponding to that level MUST be
                reported as defined by the corresponding
```

                 value of 'pktcDevEventDescrReporting'.

                 Setting a bit to a value of '0' implies that
                 events corresponding to that level MUST NOT be
                 reported, irrespective of the corresponding
                 value of 'pktcDevEventDescrReporting'.

                 It is recommended that the bits corresponding
                 to emergency(0), alert(1), critical(2) and error(3)
                 always be set to a value of '1'. "

        ::= { pktcDevEventClassReportEntry 3 }
   --
   --   Event throttling control
   --

   pktcDevEvThrottleAdminStatus OBJECT-TYPE
       SYNTAX   INTEGER {
                    unconstrained(1),
                    maintainBelowThreshold(2),
                    stopAtThreshold(3),
                    inhibited(4)
                    }
       MAX-ACCESS   read-write
       STATUS   current
       DESCRIPTION

               "This MIB Object controls the throttling of of the
               transmitted messages upon generation of an event
               (SNMP/Syslog).

               A value of unconstrained(1) causes event messages
               to be transmitted without regard to the threshold
               settings.

               A value of maintainBelowThreshold(2) causes event
               messages to be suppressed if the number of transmissions
               would otherwise exceed the threshold.
               A value of stopAtThreshold(3) causes event message
               transmission to cease at the threshold, and not
               resume until directed to do so.

               A value of inhibited(4) causes all event message
               Transmission to be suppressed.

               An event causing both an SNMP and a Syslog message
               is still treated as a single event.

               Writing to this object resets the thresholding state.

```
              Refer to MIB Objects pktcDevEvThrottleThreshold and
              pktcDevEvThrottleInterval for information on throttling."
      DEFVAL { unconstrained }
      ::= { pktcDevEventThrottle 1 }


  pktcDevEvThrottleThreshold  OBJECT-TYPE
      SYNTAX      Unsigned32
      MAX-ACCESS  read-write
      STATUS      current
      DESCRIPTION
              "This MIB Object contains the number of events per
              pktcDevEvThrottleInterval to be transmitted before
              throttling.


              An event causing both a  SNMP and a syslog message is
              still treated as a single event."
      DEFVAL { 2 }
      ::= { pktcDevEventThrottle 2 }

  pktcDevEvThrottleInterval  OBJECT-TYPE
      SYNTAX      Unsigned32
      UNITS       "seconds"
      MAX-ACCESS  read-write
      STATUS      current
      DESCRIPTION

              "This MIB Object contains the interval over which
               the throttle threshold applies."
      DEFVAL { 1 }
      ::= { pktcDevEventThrottle 3 }


  ---
  -- Status Reporting
  ---

  pktcDevEvTransmissionStatus OBJECT-TYPE

      SYNTAX      BITS {
                  syslogThrottled(0),
                  snmpThrottled(1),
                  validSyslogServerAbsent(2),
                  validSnmpManagerAbsent(3),
                  syslogTransmitError(4),
                  snmpTransmitError(5)
                  }
```

```
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
             "This MIB Object reflects the status of the event
              transmission.

             If a bit corresponding to a state is set to a value
             of:
                 '1', it indicates that the state is true
                 '0', it indicates that the state is false

             'Event throttling' is based on thresholds and the current
             setting of pktcDevEvThrottleAdminStatus.

             'Server/Manager' indicators must be based on the
             availability of valid Syslog server/SNMP managers.

             'Transmit Errors' must only be used in cases where the
             MTA can identify unavailable servers."


     ::= { pktcDevEventStatus 1 }



 ---
 -- Event Descriptions
 ---

 pktcDevEventDescrTable OBJECT-TYPE
     SYNTAX      SEQUENCE OF PktcDevEventDescrEntry
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
             "This MIB table contains all the possible events
             that can be generated by the device. This includes
             both PacketCable/IPCableCom defined and
             vendor-specific events."
     ::= { pktcDevEventDescr 1 }

 pktcDevEventDescrEntry OBJECT-TYPE
     SYNTAX      PktcDevEventDescrEntry
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
             "An entry in this table is created for each
             event the MTA implementing this MIB is
             capable of reporting."
     INDEX { pktcDevEventDescrId, pktcDevEventDescrEnterprise }
```

```
        ::= { pktcDevEventDescrTable 1 }

   PktcDevEventDescrEntry::= SEQUENCE {
        pktcDevEventDescrId             Unsigned32,
        pktcDevEventDescrEnterprise     Unsigned32,
        pktcDevEventDescrFacility       INTEGER,
        pktcDevEventDescrLevel          INTEGER,
        pktcDevEventDescrReporting      BITS,
        pktcDevEventDescrText           SnmpAdminString,
        pktcDevEventDescrClass          SnmpAdminString
        }

   pktcDevEventDescrId OBJECT-TYPE
        SYNTAX      Unsigned32
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
                "This MIB Object contains the event identifier for the
                specific event to which the priority and display
                strings belong.
                The event identifier can either be PacketCable/IPCableCom
                defined or vendor-specific."
        ::= { pktcDevEventDescrEntry 1 }

   pktcDevEventDescrEnterprise OBJECT-TYPE
        SYNTAX      Unsigned32
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
                "This MIB Object provides the IANA enterprise number of
                the Organization defining the event. Thus, all
                PacketCable or IPCableCom defined events will contain the
                PacketCable or IPCableCom IANA enterprise number and for
                vendor-specific events it will contain the IANA
                enterprise number of the defining organization."
        ::= { pktcDevEventDescrEntry 2 }


   pktcDevEventDescrFacility OBJECT-TYPE
        SYNTAX       INTEGER {
                 kernel(0),
                 user(1),
                 mail(2),
                 daemon(3),
                 auth(4),
                 syslog(5),
                 lpr(6),
                 news(7),
                 uucp(8),
```

```
                    cron(9),
                    authPriv(10),
                    ftp(11),
                    ntp(12),
                    security(13),
                    console(14),
                    clockDaemon(15),
                    local0(16),
                    local1(17),
                    local2(18),
                    local3(19),
                    local4(20),
                    local5(21),
                    local6(22),
                    local7(23)
                    }
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "This MIB Object contains the facility
                for the event.
                For PacketCable/IPCableCom events this MUST
                be set to local0(16)."
        ::= { pktcDevEventDescrEntry 3 }

    pktcDevEventDescrLevel OBJECT-TYPE
        SYNTAX      INTEGER {
                    emergency(0),
                    alert(1),
                    critical(2),
                    error(3),
                    warning(4),
                    notice(5),
                    info(6),
                    debug(7)
                    }
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
                "This MIB Object contains the priority level that
                is applicable to the corresponding event.

                The levels are as described below:

                emergency(0) - A condition that makes the system
                               unusable.
                alert(1)     - A service-affecting condition for which
                               immediate action must be taken.
                critical(2)  - A service-affecting critical condition.
```

```
              error(3)      - An error condition.
              warning(4)    - A warning condition.
              notice(5)     - A normal but significant condition.
              info(6)       - An informational message.
              debug(7)      - A debug message."
      ::= { pktcDevEventDescrEntry 4 }

   pktcDevEventDescrReporting OBJECT-TYPE
      SYNTAX       BITS {
                   local(0),
                   syslog(1),
                   snmpTrap(2),
                   snmpInform(3)
                   }
      MAX-ACCESS   read-write
      STATUS       current
      DESCRIPTION
              "This MIB Object defines the action to be taken on
              occurrence of this event. Bit local(0) refers to local
              logging of events, bit sylog(1) refers to the
              transmission of events using Syslog, bit snmpTrap(2)
              refers to the transmission of events using SNMP Trap
              and bit snmpInform(3)refers to the transmission of events
              using SNMP INFORMs.

              Setting a bit to a value of '1' indicates that the
              corresponding action will be taken upon occurrence of
              this event, provided the required parameters are present.
              (e.g.: Syslog Server for Syslog messages, SNMP targets
              for SNMP traps and SNMP INFORMs etc). If none of the bits
              are set then no action is taken upon occurrence of the
              event.

              The default value of this MIB OBject is dependent on the
              value of the MIB Object 'pktcDevEventDescrLevel', for
              the corresponding event.

              For the following values of 'pktcDevEventDescrLevel':
                 emergency(0), alert(1), critical(2) and error(3),
              the MTA MUST set the bits for local(0), syslog(1)
              and snmpInform(3) to a value of '1' and the
              rest to a value of '0'.

              For all the remaining values of 'pktcDevEventDescrLevel',
              the MTA MUST set the bits for local(0) and syslog(1)
              to a value of '1' and the rest to a value of '0'."
      ::= { pktcDevEventDescrEntry 5 }

   pktcDevEventDescrText OBJECT-TYPE
```

```
        SYNTAX       SnmpAdminString(SIZE (0..127))
        MAX-ACCESS   read-write
        STATUS       current
        DESCRIPTION
                "This MIB Object contains event display
                string providing a human-readable description of the
                event."
        ::= { pktcDevEventDescrEntry 6 }

    pktcDevEventDescrClass OBJECT-TYPE
        SYNTAX       SnmpAdminString(SIZE (1..10))
        MAX-ACCESS   read-write
        STATUS       current
        DESCRIPTION
                "This MIB Object represents an event class
                 associated with the corresponding event.

                 Vendors MAY choose to define different event
                 classes (e.g. DHCP, SNMP, DEBUG) to
                 group together related events. Vendors SHOULD
                 use standard protocol acronyms for well known
                 protocols. However, separating packetcable
                 defined from vendor-specific events for the
                 same protocol is recommended (e.g DHCP and
                 V-DHCP for the DHCP protocol).

                 If vendors choose not to define event classes,
                 then the value of this MIB Object MUST be set
                 to 'generic'."

        ::= { pktcDevEventDescrEntry 7 }

    ---
    -- Events generated
    ---
    pktcDevEventLogTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF PktcDevEventLogEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
                "This MIB table contains a log of the events
                generated by the MTA.
                A description of all the events that can be
                generated by the device can be obtained from the
                MIB table 'pktcDevEventDescrTable'."
        ::= { pktcDevEventLog 1 }

    pktcDevEventLogEntry OBJECT-TYPE
        SYNTAX       PktcDevEventLogEntry
```

```
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
                "Each entry in this table describes an event that
                has occurred, indexed in the chronological order of
                generation. The details of the event are borrowed
                from the parameters associated with the corresponding
                event entry in 'pktcDevEventDescrTable', at the
                time of the event generation.
                While all entries created as such can be cleared using
                the MIB Object pktcDevEvControl, the Event entries
                themselves cannot be individually deleted."

        INDEX { pktcDevEvLogIndex }
        ::= { pktcDevEventLogTable 1 }

    PktcDevEventLogEntry ::= SEQUENCE {
        pktcDevEvLogIndex           Unsigned32,
        pktcDevEvLogTime            DateAndTime,
        pktcDevEvLogEnterprise      Unsigned32,
        pktcDevEvLogId              Unsigned32,
        pktcDevEvLogText            SnmpAdminString,
        pktcDevEvLogEndpointName    SnmpAdminString,
        pktcDevEvLogType            BITS,
        pktcDevEvLogTargetInfo      SnmpAdminString,
        pktcDevEvLogCorrelationId   Unsigned32,
        pktcDevEvLogAdditionalInfo  SnmpAdminString
        }

    pktcDevEvLogIndex OBJECT-TYPE
        SYNTAX      Unsigned32
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
                "This MIB Object provides relative ordering of the
                objects in the event log.
                 This object will always increase except when
                (a) the log is reset via pktcDevEvControl,
                (b) the device reboots and does not implement
                    non-volatile storage for this log,
                (c) it reaches the value 2^31.
                The next entry for all the above cases is 0.
                This also serves as an indicator of event sequence."
        ::= { pktcDevEventLogEntry 1 }


    pktcDevEvLogTime OBJECT-TYPE
        SYNTAX      DateAndTime
        MAX-ACCESS  read-only
```

```
        STATUS        current
        DESCRIPTION
                "This MIB Object provides a human-readable description
                of the time at which the event occurred."
        ::= { pktcDevEventLogEntry 2 }


    pktcDevEvLogEnterprise OBJECT-TYPE
        SYNTAX        Unsigned32
        MAX-ACCESS  read-only
        STATUS        current
        DESCRIPTION
                "This MIB Object provides the IANA enterprise number of
                the Organization defining the event. Thus, all
                PacketCable or IPCableCom defined events will contain
                the CableLabs or IPCableCom IANA enterprise number and
                for vendor-specific events it will contain the IANA
                enterprise number of the defining organization."


        ::= { pktcDevEventLogEntry 3 }

    pktcDevEvLogId OBJECT-TYPE
        SYNTAX        Unsigned32
        MAX-ACCESS  read-only
        STATUS        current
        DESCRIPTION

                "This MIB Object contains the event identifier for the
                specific event to which the priority and
                display strings belong.
                The event identifier can either be PacketCable defined
                or vendor-specific."
        ::= { pktcDevEventLogEntry 4 }

    pktcDevEvLogText OBJECT-TYPE
        SYNTAX        SnmpAdminString
        MAX-ACCESS  read-only
        STATUS        current
        DESCRIPTION
                "This MIB Object contains the contents of
                pktcDevEventDescrText, corresponding to the event, at
                the moment of generation."
        ::= { pktcDevEventLogEntry 5 }


    pktcDevEvLogEndpointName OBJECT-TYPE
        SYNTAX        SnmpAdminString
        MAX-ACCESS  read-only
```

```
        STATUS       current
        DESCRIPTION
                "This MIB Object provides the endpoint identifier
                 followed by the PacketCable MTA's Fully Qualified
                 Domain Name (FQDN) and the IP Address (IP)
                 of the PacketCable MTA device.

                 This will be denoted as follows:
                 aaln/n:<FQDN>/<IP>, where 'n' is the Endpoint number.
                  or
                 <FQDN>/<IP> if it is not specific to an endpoint."

        ::= { pktcDevEventLogEntry 6 }

   pktcDevEvLogType OBJECT-TYPE
        SYNTAX       BITS {
                     local(0),
                     syslog (1),
                     trap (2),
                     inform (3)
                     }
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
                "This MIB Object contains the kind of actions taken by
                 the MTA when the event under consideration occurred.

                 A bit with a value of 1 indicates the corresponding
                 action was taken. Setting it to a value of 0 indicates
                 that the corresponding action was not taken.

                 An event may trigger one or more actions (e.g.: Syslog
                 and SNMP) or may remain as a local event since
                 transmissions could be disabled or inhibited as defined
                 by the Throttle MIB Objects."

        ::= { pktcDevEventLogEntry 7 }

   pktcDevEvLogTargetInfo OBJECT-TYPE
        SYNTAX       SnmpAdminString
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
                "This MIB Object contains a comma separated list of the
                 actions taken for external notifications, along with the
                 target IP address for the generated events. Locally
                 stored events must not be recorded in this MIB Object.

                 The syntax is as:
```

```
                <action-1/IP:port>,<action-2/IP:port>,<action-3/IP:port>

                Where <action-n/IP> is to be denoted as follows:
                  For Syslog events:
                          syslog/<IP address of the Syslog Server:port>
                  For SNMP traps:
                          snmpTrap/<IP address of the SNMP Server:port>
                  For SNMP INFORMS:
                          snmpInform/<IP address of the SNMP Server:port>

                 If there are multiple targets for the same type (SNMP
                 Traps sent to multiple IP addresses) or if there are
                 multiple messages sent to the same IP (Syslog and SNMP
                 sent to the same IP address) they need to be reported
                 individually."
        ::= { pktcDevEventLogEntry 8 }

    pktcDevEvLogCorrelationId OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
                "This MIB Object contains the correlation ID
                generated by the MTA during the initiation of the
                last provisioning flow, within or following which
                the event occurred.
                For information on the generation of correlation ids,
                refer to the corresponding PacketCable/IPCableCom
                Device Provisioning specifications."
        ::= { pktcDevEventLogEntry 9 }

    pktcDevEvLogAdditionalInfo OBJECT-TYPE
        SYNTAX       SnmpAdminString
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
                "This MIB Object contains additional, useful
                information in relation to the corresponding event that a
                MTA might wish to report (for example: parameterized
                data or debugging information). The format is
                vendor-specific.
                However, the MTA is not required to implement
                this functionality."
        ::= { pktcDevEventLogEntry 10 }

    ---
    -- Notifications
    ---
```

```
    pktcDevEvNotificationIndex  OBJECT IDENTIFIER ::=
                                            { pktcDevEvNotification 0
    }

    pktcDevEvInform NOTIFICATION-TYPE
        OBJECTS { pktcDevEvLogTime,
        pktcDevEvLogEnterprise,pktcDevEvLogId,
        pktcDevEvLogEndpointName,pktcDevEvLogCorrelationId,ifPhysAddress}
        STATUS       current
        DESCRIPTION
                "This Notification MIB Objects contains the Inform
                 contents for event reporting "
        ::= { pktcDevEvNotificationIndex 1 }

    pktcDevEvTrap NOTIFICATION-TYPE
        OBJECTS { pktcDevEvLogTime,
        pktcDevEvLogEnterprise,pktcDevEvLogId,
        pktcDevEvLogEndpointName,pktcDevEvLogCorrelationId,ifPhysAddress}
        STATUS       current
        DESCRIPTION
                "This Notification MIB Objects contains the Trap contents
                 for event reporting "
        ::= { pktcDevEvNotificationIndex 2 }

    ---
    -- Conformance/Compliance
    ---

    pktcEventCompliances  OBJECT IDENTIFIER ::=
                                      { pktcDevEvConformance  1 }
    pktcEventGroups       OBJECT IDENTIFIER ::=
                                      { pktcDevEvConformance  2 }


    pktcEventBasicCompliance MODULE-COMPLIANCE
        STATUS       current
        DESCRIPTION
                "The compliance statement for devices that implement
                Event reporting feature."
        MODULE    --pktcEventMib


    MANDATORY-GROUPS {
                    pktcEventGroup,
                    pktcEventNotificationGroup
                    }
      -- units of conformance
       ::= { pktcEventCompliances 3 }
```

```
    pktcEventGroup OBJECT-GROUP
        OBJECTS {
                pktcDevEvControl,
                pktcDevEvSyslogAddressType,
                pktcDevEvSyslogAddress,
                pktcDevEvSyslogUdpPort,
                pktcDevEvThrottleAdminStatus,
                pktcDevEvThrottleThreshold,
                pktcDevEvThrottleInterval,
                pktcDevEvTransmissionStatus,
                pktcDevEventDescrFacility,
                pktcDevEventDescrLevel,
                pktcDevEventDescrReporting,
                pktcDevEventDescrText,
                pktcDevEvLogTime,
                pktcDevEvLogEnterprise,
                pktcDevEvLogId,
                pktcDevEvLogText,
                pktcDevEvLogEndpointName,
                pktcDevEvLogType,
                pktcDevEvLogTargetInfo,
                pktcDevEvLogCorrelationId,
                pktcDevEvLogAdditionalInfo,
                pktcDevEvReportingLevel,
                pktcDevEventDescrClass,
                pktcDevEventReportStatus,
                pktcDevEventClassReportLevel
                }

        STATUS      current
        DESCRIPTION
                "Group of MIB objects for PacketCable Management Event
                MIB."
        ::= { pktcEventGroups 1 }


    pktcEventNotificationGroup NOTIFICATION-GROUP
        NOTIFICATIONS { pktcDevEvInform, pktcDevEvTrap }
        STATUS      current
        DESCRIPTION
                "Group of MIB objects for notifications related to
                change in status of the MTA Device."
        ::= { pktcEventGroups 2 }
    END
```

6. Acknowledgments

   This document is a production of the PacketCable Working Group.

The current editors wish to express gratitude to:

7. Normative References

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

    [RFCXYZ] Nechamkin, E., and Mule J., "Multimedia Terminal Adapter
       (MTA) Management Information Base for PacketCable and IPCablecom
       compliant devices", RFCXYZ, <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 requested to replace XYZ (and in the
       reference earlier) with the assigned value and to remove this
       note.

    [ITU-T-J176] IPCablecom management event mechanism MIB, J.176, ITU-T,
        August 2002.

    [PKT-SP-EVEMIB1.5] PacketCable(TM) Management Event MIB
        Specification, PKT-SP-EVEMIB1.5-I01-050128, January 2005.

    [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.

   [RFC3410] Case, J., Mundy, R., Partain, D. and B. Stewart,
   "Introduction and Applicability Statements for Internet - Standard
   Management Framework", RFC 3410, December 2002.

8. Informative References

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

   [RFC3435] Andreasen, F., and B. Foster, "Media Gateway Control
      Protocol (MGCP)", RFC 3435, January 2003.

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

   [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate
      Requirement Levels", BCP 14, RFC 2119, March 1997.

   [RFC821] J. Postel, "Simple Mail Transfer Protocol", RFC821,
      August 1982.

   [RFC2026] S. Bradner., "The Internet Standards Process
      -- Revision 3", RFC2026, October 1996.

   [RFC1034] P.V. Mockapetris, "Domain names - concepts and facilities",
      RFC1034, November 1987

   [RFC3550] H. Schulzrinne, S. Casner, R. Frederick, V. Jacobson, "RTP:
      A Transport Protocol for Real-Time Applications", RFC3550,
      July 2003.

9. IANA Considerations

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

      Descriptor   OBJECT IDENTIFIER Value
      ----------   -----------------------
      pktcIetfEventMib   { mib-2 XXX }

      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.   Security Considerations

    There are a number of management objects defined in this MIB module
    with a MAX-ACCESS clause of read-write and read-create. Such
    objects may be considered sensitive or vulnerable in some network
    environments. Security threats include events unreported on errors,
    redirection of events (deliberately or otherwise) or minimized
    reporting of errors. Such threats can mask certain misconfiguration
    attempts and denial of service attacks that can be recognized and
    thwarted via event reporting.

    MIB objects of significance include:
    - those that control the event generation, the target syslog address
    for events and the reporting levels, i.e.:
        pktcDevEvControl
        pktcDevEvSyslogAddressType
        pktcDevEvSyslogAddress
        pktcDevEvSyslogUdpPort
        pktcDevEvReportingLevel
        pktcDevEventReportStatus

    - those related to event classes, i.e.:
        pktcDevEventClassReportLevel

    - those related to throttling, i.e.:
        pktcDevEvThrottleAdminStatus
        pktcDevEvThrottleThreshold
        pktcDevEvThrottleInterval

    - those related to the event reporting capabilities of an MTA, i.e:
        pktcDevEventDescrLevel
        pktcDevEventDescrReporting
        pktcDevEventDescrText
        pktcDevEventDescrClass

    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 access to these objects and possibly
    to even encrypt the values of these objects when sending them over
    the network via SNMP. These are the tables and objects and their
    sensitivity/vulnerability:

pktcDevEventLogTable: This table contains the log of generated event
messages. Read access to this table might reveal some specific
information that should be kept confidential.

pktcDevEvTransmissionStatus: This MIB Object reveals the status of
event transmission and MAY be sensitive in some environments.

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.

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

    Wim De Ketelaere
    tComLabs
    Stapelplein 70
    9000 Gent, Belgium
    +32 9 269 22 90
    deketelaere@tComLabs.com

    Eugene Nechamkin
    Broadcom Corporation
    200 - 13711 International Place
    Richmond, BC, V6V 2Z8, Canada
    +1 604 233 8500
    enechamkin@broadcom.com

Disclaimer of validity:

Full Copyright Statement