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# Management Event Management Information Base (MIB) for PacketCable- and IPCablecom-Compliant Devices

## Status of This Memo



## Copyright Notice



## Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it defines a basic set of managed objects for Simple Network Management Protocol (SNMP)-based management of events that can be generated by PacketCable- and IPCablecom-compliant Multimedia Terminal Adapter devices.

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## 1. The Internet-Standard Management Framework

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

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIv2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

## 2. Introduction

A Multimedia Terminal Adapter (MTA) is used to deliver broadband Internet, data, and/or voice access jointly with telephony service to a subscriber's or customer's premises using a cable network

infrastructure. An MTA is normally installed at the subscriber's or customer's premises and 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 [RFC4682]. MTA devices include one or more endpoints (e.g., telephone ports), which receive call signaling information to establish ring cadence, and codecs, which provide 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", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

The terms "MIB module" and "information module" are used interchangeably in this memo. As used here, both terms refer to any of the three types of information modules defined in Section 3 of RFC 2578 [RFC2578]. Some of the terms used in this memo are defined below. Some additional terms are also defined in the PacketCable(TM) Management Event Mechanism Specification [PKT-SP-MEM1.5] and the PacketCable MTA Device Provisioning Specification [PKT-SP-PROV].

### 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

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

### 3.4. Endpoint

An endpoint or MTA endpoint is a standard RJ-11 telephony physical port located on the MTA and used for attaching the telephone device to the MTA.

### 3.5. MSO

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

### 3.6. UDP

A User Datagram Protocol is a connectionless protocol built upon Internet Protocol (IP), as per RFC 768 [RFC768].

## 4. Overview

PacketCable, European Telecommunications Standards Institute (ETSI), and International Telecommunication Union Telecommunication Standardization Sector (ITU-T) IPCablecom-compliant Multimedia Terminal Adaptors (MTAs) are required to generate management events upon the occurrence of certain operational conditions (for instance, "AC power failure, MTA operational on battery power"). The complete set of conditions and the corresponding management events to be generated are specified in [PKT-SP-MEM1.5] (PacketCable), [ETSITS101909-22] (ETSI), and [ITU-T-J176] (ITU-T). In addition, the MTA manufacturer is allowed to specify vendor-specific management events. For example, vendor XYZ can specify "Memory read error, terminating process, code: XYZ123".

When management events are generated, they can either be stored in a local log on the MTA or transmitted using two possible mechanisms: SNMP or syslog. This choice between storing and transmitting is required to be configurable and manageable by the management station for each management event (default values can be provided when the events are defined). This document proposes a MIB that can provide for configuration and management of such management events. A means to log the events is provided within the specified MIB module. For syslog as a transport, the necessary information (format, transport, etc.) is also specified. For SNMP as a transport, the MIB objects specified in the SNMP-TARGET-MIB and SNMP-NOTIFICATION-MIB as utilized, is specified in [RFC3413].

Further, each management event can be uniquely identified using the 'Organization ID' and 'Event ID'. The 'Organization ID' is the private enterprise number of the organization specifying the event (e.g., 4491 for CableLabs) and a unique identifier that identifies the event. The 'Event ID' is an identifier that uniquely identifies the event within the 'Organization ID' space. This document does not specify any management events. It only provides a mechanism to manage the storage and transmission of events.

The EVENT MIB module specified in this document is intended to update the EVENT MIB modules from which it is partly derived:

- the PacketCable 1.5 Management Event MIB Specification [PKT-SP-EVEMIB1.5] and

- the ITU-T IPCablecom management event mechanism MIB requirements [ITU-T-J176].

Several normative and informative references are used to help define Management Event MIB objects. As a convention, wherever the requirements are equivalent at the time of the writing, the PacketCable reference is used. However, MTA implementations MUST refer to the corresponding specifications to ensure compliance.

## 4.1. Structure of the MIB

The Management Event MIB module is identified by pktcIetfEventMib and is structured into the following sub-trees:

- pktcEventControl specifies the management information pertinent to control of the device's event generation capabilities.

- pktcEventThrottle specifies the management information pertinent to throttling the transmission of management events using syslog or SNMP.

- pktcEventStatus specifies the management information for the device to report status information related to the generated events.

- pktcEvents specifies the management information for the device to list all the events it is capable of generating.

- pktcEventLog specifies the management information for the device to store the generated events.

- pktcEventNotifications specifies the management information that defines the SNMP trap and inform messages.

### 4.2. pktcEventControl

The group of objects in this sub-tree provide for three important controls: ability to reset the event logs and event descriptions, syslog configuration, and event classes.

Some highlights are as follows:

pktcEventReset - this MIB object allows a management station to reset the event logs, the event descriptions, or both.

pktcEventSyslog - this group of MIB objects allows the management station to provide information for transmission of events to a syslog server, such as message formats and transport protocols.

pktcEventClassTable - this MIB table allows for MTAs to classify the management events into different categories, termed 'event classes'. It then allows for common operations to be affected across all the events pertaining to a specific event class.

### 4.3. pktcEventThrottle

As indicated earlier, the generated events can be stored locally or transmitted using SNMP, syslog, or both. However, the management stations receiving such events may wish to control the rate of transmission of such events. This event-throttling behavior is provided by the MIB objects in this sub-tree.

Some highlights are as follows:

pktcEventThrottleAdminStatus - this MIB object allows for transmissions to be unconstrained, maintained below threshold, stopped at the threshold, or inhibited.

pktcEventThrottleThreshold - this MIB object specifies the throttle, i.e., the number of events over an interval that is considered to be the threshold.

pktcEventThrottleInterval - this MIB object specifies the interval over which the threshold is calculated.

### 4.4. pktcEventStatus

This sub-tree is designed to provide status information related to event transmissions. It currently contains one MIB object, pktcEventTransmissionStatus, that allows a client to report the status of event transmissions.

### 4.5. pktcEvent

This sub-tree is designed to provide a list of all the events that can be generated by an MTA and its associated descriptions. The MIB objects are grouped under the MIB table pktcEventTable.

### 4.6. pktcEventLog

This sub-tree is designed to allow the MTA to store all the events that are generated during its operation. The events are stored with information such as the time of the event, its description and related characteristics like severity levels.

### 4.7. pktcEventNotifications

This sub-tree specifies the notification information, i.e., when MTAs transmit messages using SNMP traps and informs. SNMP traps refer to the SNMPv2-Trap-PDU. SNMPv1 traps are disallowed.

## 5. Relationship to Other MIB Modules

Some management objects defined in other MIB modules are applicable to an entity implementing this MIB. In particular, it is assumed that an entity implementing the PKTC-IETF-EVENT-MIB module will also implement the 'interfaces' group of the IF-MIB [RFC2863].

### 5.1. MIB Modules Required for IMPORTS

The PKTC-IETF-EVENT-MIB MIB module IMPORTS objects from SNMPv2-SMI [RFC2578], SNMPv2-TC [RFC2579], SNMP-FRAMEWORK-MIB [RFC3411], SNMPv2-CONF [RFC2580], IF-MIB [RFC2863], INET-ADDRESS-MIB [RFC4001], SNMP-TARGET-MIB [RFC3413], SNMP-NOTIFICATION-MIB [RFC3413], and the SYSLOG-TC-MIB [RFC5427].

## 6. Definitions

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

IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
    Unsigned32,
    NOTIFICATION-TYPE,
    mib-2                           FROM SNMPv2-SMI

    TruthValue,
    DateAndTime, TEXTUAL-CONVENTION
                                    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
    snmpTargetBasicGroup, snmpTargetResponseGroup
                                    FROM SNMP-TARGET-MIB
    snmpNotifyGroup, snmpNotifyFilterGroup
                                    FROM SNMP-NOTIFICATION-MIB
    SyslogSeverity, SyslogFacility  FROM SYSLOG-TC-MIB;

pktcIetfEventMib MODULE-IDENTITY
    LAST-UPDATED "200903300000Z" -- 30 March 2009
    ORGANIZATION "IETF IP over Cable Data Network Working Group"
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DESCRIPTION
"This MIB module specifies the basic management objects
for managing events generated by the Multimedia
Terminal Adapter devices compliant with the PacketCable
and IPCablecom requirements.

```
          (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE
          GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR
          BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF
          LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
          (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT
          OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE
          POSSIBILITY OF SUCH DAMAGE.

          This version of this MIB module is part of RFC 5428;
          see the RFC itself for full legal notices."

    REVISION   "200903300000Z" -- 30 March 2009

    DESCRIPTION
       "Initial version, published as RFC 5428."

::=  { mib-2 182 }

SyslogSeverityMask ::= TEXTUAL-CONVENTION
     STATUS       current
     DESCRIPTION
     "This textual convention represents a bit mask representing
      the severity of the syslog events that can be generated.
      It corresponds to the various severity levels associated
      with syslog messages, as specified in 'The Syslog Protocol',
      [RFC5424].

          emerg          (0),  - emergency; system is unusable
          alert          (1),  - action must be taken immediately
          crit           (2),  - critical condition
          err            (3),  - error condition
          warning        (4),  - warning condition
          notice         (5),  - normal but significant condition
          info           (6),  - informational message
          debug          (7)   - debug-level messages"


       SYNTAX  BITS {
               emerg(0),
               alert(1),
               crit(2),
               err(3),
               warning(4),
               notice(5),
               info(6),
               debug(7)
               }
```

```
--
--
pktcEventNotifications OBJECT IDENTIFIER ::= { pktcIetfEventMib 0 }
pktcEventMibObjects    OBJECT IDENTIFIER ::= { pktcIetfEventMib 1 }
pktcEventConformance   OBJECT IDENTIFIER ::= { pktcIetfEventMib 2 }
--
--
pktcEventControl   OBJECT IDENTIFIER ::= { pktcEventMibObjects 1 }
pktcEventThrottle  OBJECT IDENTIFIER ::= { pktcEventMibObjects 2 }
pktcEventStatus    OBJECT IDENTIFIER ::= { pktcEventMibObjects 3 }
pktcEvents         OBJECT IDENTIFIER ::= { pktcEventMibObjects 4 }
pktcEventLog       OBJECT IDENTIFIER ::= { pktcEventMibObjects 5 }

---
--   Event Reporting control objects
---
pktcEventReset  OBJECT-TYPE
    SYNTAX  BITS {
                resetEventLogTable(0),
                resetEventTable(1)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "This MIB object allows a management station to
            clear the local log of generated events, reset the
            management event descriptions, or both.

            MTAs generate management events.  These events are stored
            in the MIB table pktcEventLogTable.  If a management
            station needs to clear all the current entries (e.g.,
            after a troubleshooting operation is complete), it can
            do so by setting the resetEventLogTable(0) bit to a
            value of '1'.

            The MTA is pre-configured with the events that it can
            generate.  This is stored in the MIB table
            pktcEventTable.  This table also contains the
            descriptions associated with these events.  These
            descriptions can be modified by a management station.
            However, if the management station wishes to reset the
            descriptions to factory defaults, it can do so by
            setting the resetEventTable(1) bit to a value of '1'.

            The MTA actions are summarized below:

              Bit resetEventLogTable(0) set to a value of '1'
               - delete all entries in pktcEventLogTable;
```

```
                - reset the value of pktcEventLogIndex to '0'.

              Bit resetEventTable(1) set to a value of '1'
               - reset the pktcEventTable to the
                 factory default values.

              Bits resetEventLogTable(0) and resetEventTable(1)
              set to a value of '1'
               - perform the above actions as though they were
                 performed individually (in any order).

              Setting a reset bit to a value of '0' MUST NOT
              result in any action.

            The MTA MUST perform the above actions regardless of
            persistence (i.e., storage in non-volatile memory).

            The MTA MUST always return a value of '00' when
            this MIB object is read.

            A management station that resets tables using this MIB
            object needs to be careful about the impact to other
            management stations that may be reliant on the
            information contained in the table(s) being reset.  For
            example, say management station A creates a specific set
            of event descriptions in the event table
            (pktcEventTable) for debugging purposes and expects any
            generated events to report the modified descriptions.  In
            such a case, if another management station resets the
            event table to factory defaults, any subsequent events
            will not contain the modified descriptions expected by
            management station A.  Such multi-manager contentions are
            not addressed within this MIB module.  Thus, management
            stations are RECOMMENDED to use this MIB object with
            care and caution, and only when absolutely required."
    ::= { pktcEventControl 1 }

---
-- syslog-specific MIB objects
---

pktcEventSyslog   OBJECT IDENTIFIER ::= { pktcEventControl 2 }

pktcEventSyslogCapabilities  OBJECT-TYPE
    SYNTAX  BITS {
                formatBSDSyslog(0),
                formatSyslogProtocol(1),
                transportUDP(2),
```

```
                transportTLS(3),
                transportBEEP(4)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "This MIB object contains the MTA capabilities
            for supporting the syslog protocol, specifically
            the message formats and the transport protocols.

            The BSD syslog message format is specified
            in [RFC3164] (formatBSDSyslog), and the IETF
            syslog protocol is specified in [RFC5424]
            (formatSyslogProtocol).

            The MTA MUST set the appropriate protocol and
            transport bits, based on implementation."
    REFERENCE
            "The BSD syslog Protocol, [RFC3164];
             The Syslog Protocol, [RFC5424];
             Transmission of Syslog Messages over UDP, [RFC5426];
             TLS Transport Mapping for Syslog, [RFC5425];
             Reliable Delivery for syslog, [RFC3195]."
    ::= { pktcEventSyslog 1 }

pktcEventSyslogAddressType  OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "This MIB object defines the Internet address type of
            the syslog server specified by the MIB object
            pktcEventSyslogAddress.  A value of dns(16) is
            disallowed since a non-resolvable DNS domain name
            will leave the device without a syslog server to
            which it can report events."
    REFERENCE
            "PacketCable MTA Device Provisioning Specification,
            [PKT-SP-PROV]."
    DEFVAL { ipv4 }
    ::= { pktcEventSyslog 2 }

pktcEventSyslogAddress  OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "This MIB object contains the IP address of the
```

```
                syslog server to which the MTA can transmit a syslog
                message upon the generation of a management event.
                The type of address this object represents is defined
                by the MIB object pktDevEventSyslogAddressType.

                The format of the syslog message is specified by the
                MIB object pktcEventSyslogMessageFormat."
        REFERENCE
                "PacketCable MTA Device Provisioning Specification,
                [PKT-SP-PROV];
                PacketCable Management Event Mechanism Specification,
                [PKT-SP-MEM1.5];"
        DEFVAL { "0.0.0.0" }
        ::= { pktcEventSyslog 3 }

    pktcEventSyslogMessageFormat OBJECT-TYPE
        SYNTAX      INTEGER {
                    formatBSDSyslog(1),     -- The BSD syslog Protocol
                    formatSyslogProtocol(2) -- The syslog Protocol
                    }
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
                "This MIB object contains the syslog message format to
                 be used for transmitting syslog messages to the server
                 contained in the MIB object pktcEventSyslogServer."
        REFERENCE
                "The BSD syslog Protocol, [RFC3164];
                 The Syslog Protocol, [RFC5424]."
        DEFVAL { formatSyslogProtocol }
        ::= { pktcEventSyslog 4 }

    pktcEventSyslogTransport OBJECT-TYPE
        SYNTAX      INTEGER {
                      udp(1),-- Transmission of syslog messages over UDP
                      tls(2),-- TLS Transport Mapping for Syslog
                      beep(3)-- BEEP Transport Mapping for Syslog
                    }
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
                "This MIB object specifies the transport to be
                 used to transmit syslog messages to the syslog
                 server contained in the MIB object
                 pktcEventSyslogAddress.

                 If the MTA does not support the transport
                 specified in a SET operation, then the
```

```
                MTA MUST return an appropriate error
                response, such as 'inconsistentValue'."
        REFERENCE
                "Transmission of Syslog messages over UDP, [RFC5426];
                TLS Transport Mapping for Syslog, [RFC5425]."
        DEFVAL   {tls}
        ::= { pktcEventSyslog 5 }

    pktcEventSyslogPort  OBJECT-TYPE
        SYNTAX      InetPortNumber
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
                "This MIB object contains the port number of the
                syslog server to which the syslog messages are to
                be transmitted."
        REFERENCE
                "Transmission of Syslog Messages over UDP, [RFC5426];
                TLS Transport Mapping for Syslog, [RFC5425]."
        DEFVAL { 6514 }
        ::= { pktcEventSyslog 6 }

    ---
    --  Event classes
    ---

    pktcEventClassTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF PktcEventClassEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
                "This MIB table allows for management events that can be
                generated by an MTA to be classified into categories,
                or 'event classes'.  For example, all the configuration-
                related events can be associated with an event class
                titled 'configuration'.  Such a classification allows
                for a management station to affect changes on a common
                group of events at once.  Two operations are specified
                on an event class: enabling or disabling of all the
                events in an event class, and selective enabling or
                disabling based on the severity level."
        ::= { pktcEventControl 3 }

    pktcEventClassEntry OBJECT-TYPE
        SYNTAX      PktcEventClassEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
```

```
                "Each entry in this table specifies an event class, a
                 grouping of events, as identified by the MTA
                 manufacturer.  Any event associated with an event class
                 in this table MUST be specified in the
                 pktcEventTable.

                 The MTA MUST create one entry (index=100) for the event
                 class titled 'generic'.  This event class MUST contain
                 all the events that are not contained in any other
                 vendor-specified event classes.

                 A management station SHOULD NOT associate an event
                 with multiple event classes.  However, if an event is
                 associated with multiple event classes, the MTA
                 MUST give precedence to the event class with the
                 lowest index.  Thus, at a given point in time,
                 only one event class is applicable for an event.

                 The event table (pktcEventTable) provides the event
                 class that affects the event.  Whenever an event is
                 generated, the MTA MUST verify the applicable
                 event class entry to take any specified actions.

                 Entries in this table persist across resets and
                 reboots."
        INDEX { pktcEventClassIndex }
        ::= { pktcEventClassTable 1 }

    PktcEventClassEntry::= SEQUENCE {
        pktcEventClassIndex           Unsigned32,
        pktcEventClassName            SnmpAdminString,
        pktcEventClassStatus          TruthValue,
        pktcEventClassSeverity        SyslogSeverityMask
        }

    pktcEventClassIndex OBJECT-TYPE
        SYNTAX      Unsigned32 (1..100)
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "This MIB object is an index into the event
             class table.  It is a locally meaningful
             value."
        ::= { pktcEventClassEntry 1 }

    pktcEventClassName OBJECT-TYPE
        SYNTAX      SnmpAdminString (SIZE (1..100))
        MAX-ACCESS  read-only
```

```
        STATUS      current
        DESCRIPTION
            "This MIB object contains the name of the
             event class.

             Vendors MAY define different event classes
             (e.g., DHCP, SNMP, DEBUG) to group together
             management events of a particular category.

             Event class names need to take into
             consideration the SnmpAdminString definition
             requirements, such as the use of control code
             sequence CR LF to represent a newline."
        ::= { pktcEventClassEntry 2 }

    pktcEventClassStatus OBJECT-TYPE
        SYNTAX      TruthValue
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
            "This MIB object indicates if events belonging
             to the corresponding event class are enabled
             or disabled, for event reporting.

             Setting this object to a value of 'true' enables
             reporting of all the events in the event class.

             When enabled, the means of reporting events is
             specified by the MIB object pktcEventReporting.

             Setting this object to a value of 'false' disables
             any event reporting, irrespective of the value of the
             MIB object pktcEventReporting for a specific
             event.

             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."
        ::= { pktcEventClassEntry 3 }

    pktcEventClassSeverity OBJECT-TYPE
        SYNTAX      SyslogSeverityMask
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
            "This MIB object defines the severity level
             of events belonging to a specific event class
```

```
            that are enabled for event reporting.

            This MIB object has no effect on the event
            reporting unless the MIB object
            pktcEventClassStatus is set to a value
            of 'true' (enabled), for the corresponding
            event class.

            Setting a bit within the mask to a value of '1'
            implies that events corresponding to that
            severity level MUST be reported as defined by
            the corresponding value of 'pktcEventReporting'
            for events in the event class.

            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 'pktcEventReporting' for events
            in the event class.

            It is recommended that the bits corresponding
            to emerg(0), alert(1), crit(2), and err(3)
            be set to a value of '1' to ensure reporting of
            events requiring immediate attention."
        REFERENCE
                "The Syslog Protocol, [RFC5424]."
        ::= { pktcEventClassEntry 4 }

    ---
    --   Event throttling control
    ---

    pktcEventThrottleAdminStatus  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 the
                transmitted messages upon generation of an event
                (SNMP/syslog).  It does not affect local logging
                of events.

                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
                specified by pktcEventThrottleThreshold over the
                interval specified by pktcEventThrottleInterval.

                A value of stopAtThreshold(3) causes event message
                transmission to cease once the threshold specified
                by pktcEventThrottleThreshold (over the interval
                specified by pktcEventThrottleInterval) is reached.
                Event generation is resumed when the value of this
                MIB object is modified by a management station or
                when the device resets or reboots.

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

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

                Refer to MIB objects pktcEventThrottleThreshold and
                pktcEventThrottleInterval for information on
                throttling."
        DEFVAL { unconstrained }
        ::= { pktcEventThrottle 1 }

    pktcEventThrottleThreshold  OBJECT-TYPE
        SYNTAX      Unsigned32(0..1024)
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
                "This MIB object contains the number of events per
                pktcEventThrottleInterval to be transmitted before
                throttling.

                An event resulting in multiple actions (e.g., SNMP
                and syslog) is still treated as a single event."

        DEFVAL { 2 }
        ::= { pktcEventThrottle 2 }

    pktcEventThrottleInterval  OBJECT-TYPE
        SYNTAX      Unsigned32(0..604800)
        UNITS       "seconds"
        MAX-ACCESS  read-write
```

```
        STATUS      current
        DESCRIPTION
                "This MIB object contains the interval over which
                 the throttle threshold applies."
        DEFVAL { 1 }
        ::= { pktcEventThrottle 3 }

    ---
    -- Reporting of transmission status
    ---

    pktcEventTransmissionStatus 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
                 transmissions using syslog, SNMP, or both.

                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

                If the MTA is not configured with a syslog server
                or an SNMP Manager, the corresponding 'throttling'
                and 'transmit error' bits MUST be set to a value of
                '0'.  For example, if an SNMP Manager is not
                configured on the MTA, the bit corresponding to
                validSnmpManagerAbsent(3) is set to a value of '1',
                and the values of the bits corresponding to
                snmpThrottled(1) and snmpTransmitError(5) are set
                to a value of '0'.

                'Event throttling' is based on thresholds and the
                current setting of the MIB object
                pktcEventThrottleAdminStatus.

                'Server/Manager' indicators are based on the
                availability of valid syslog server/SNMP Managers.
```

```
            Transmit errors are reported when detected.  If an
            MTA cannot detect an error situation, the value of
            the BIT will be set '0'.

            It is to be noted that not all the conditions that are
            indicated by this MIB object are detectable by all
            devices, and when detected may not be accurate.  It is
            meant to provide a report of the status as determined
            by the device during event transmissions."
    ::= { pktcEventStatus 1 }

---
-- Description of events
---

pktcEventTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcEventEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This MIB table contains all possible management events
            that can be generated by the device.  This includes
            PacketCable- and IPCablecom-defined events and
            vendor-specific events."
    ::= { pktcEvents 1 }

pktcEventEntry OBJECT-TYPE
    SYNTAX      PktcEventEntry
    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.  Entries in this table
            are persisted across resets and reboots."
    INDEX { pktcEventOrganization, pktcEventIdentifier }
    ::= { pktcEventTable 1 }

PktcEventEntry::= SEQUENCE {
    pktcEventOrganization    Unsigned32,
    pktcEventIdentifier      Unsigned32,
    pktcEventFacility        SyslogFacility,
    pktcEventSeverityLevel   SyslogSeverity,
    pktcEventReporting       BITS,
    pktcEventText            SnmpAdminString,
    pktcEventClass           SnmpAdminString
    }
```

```
pktcEventOrganization OBJECT-TYPE
    SYNTAX      Unsigned32(1..4294967295)
    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 all vendor-specific events will contain
            the IANA enterprise number of the defining
            organization."
    REFERENCE
            "IANA Private Enterprise Number assignment,
            [IANA-ENTERPRISE]."
    ::= { pktcEventEntry 1 }

pktcEventIdentifier OBJECT-TYPE
    SYNTAX      Unsigned32(1..4294967295)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This MIB object contains the event identifier for the
            corresponding event."
    REFERENCE
            "PacketCable Management Event Mechanism Specification,
            [PKT-SP-MEM1.5];
            PacketCable MTA Device Provisioning Specification,
            [PKT-SP-PROV]."
    ::= { pktcEventEntry 2 }

pktcEventFacility OBJECT-TYPE
    SYNTAX      SyslogFacility
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "This MIB object contains the facility
            for the event.
            For PacketCable, IPCablecom, or ETSI events,
            this MUST be set to a value of local0(16)."
    REFERENCE
            "The Syslog Protocol, [RFC5424];
             Textual Conventions for Syslog Management,
             [RFC5427]."
    ::= { pktcEventEntry 3 }

pktcEventSeverityLevel OBJECT-TYPE
    SYNTAX      SyslogSeverity
```

```
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
                "This MIB object contains the severity level that
                is applicable to the specified event."
        REFERENCE
                "The Syslog Protocol, [RFC5424];
                 Textual Conventions for Syslog Management,
                 [RFC5427]."
        ::= { pktcEventEntry 4 }

    pktcEventReporting 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 Traps
                (SNMPv2-Trap-PDU); 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.  If none of the bits are set, then no action
                is taken upon occurrence of the event.  The success of
                transmission using syslog and SNMP depends on the
                MTA configuration.  For example, a valid syslog server
                address is required for syslog message transmission.

                Specification of a management event does not necessarily
                include the actions to be taken upon its generation,
                i.e., it does not need to specify if a generated event
                needs to be transmitted via SNMP or syslog, or stored
                locally.  Thus, certain default values are specified,
                based on the event's severity level specified by the
                MIB object pktcEventSeverityLevel, as follows:
                    - If the severity level of an event is emerg(0),
                    alert(1), crit(2), or err(3), set the bits for
                    local(0), syslog(1), and snmpInform(3) to a value
                    of '1' and set the remaining bits to a value of '0'.
```

```
                - For an event with any other severity level, set
                the bits for local(0) and syslog(1) to a value
                of '1' and set the rest of the bits to a value
                of '0'."
    ::= { pktcEventEntry 5 }

pktcEventText OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE (0..127))
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "This MIB object provides a human-readable
            description of the event.  Descriptions need
            to take into consideration the SnmpAdminString
            definition requirements such as the use of
            control code sequence CR LF to represent a
            newline."
    ::= { pktcEventEntry 6 }

pktcEventClass OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE (0..100))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "This MIB object represents the event class
             that affects the event.  If an event is associated
             with only one event class, then its name
             (pktcEventClassName) is reported.  If an event
             is associated with more than one event class,
             then the name of the event class with the
             lowest index in the event class table
             (pktcEventClassTable) is reported.

             See the MIB table pktcEventClassTable
             for a description of event classes and usage.

             Descriptions need to take into consideration the
             SnmpAdminString definition requirements, such as
             the use of control code sequence CR LF to
             represent a newline."
    ::= { pktcEventEntry 7 }

---
-- Log of generated events
---

pktcEventLogTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcEventLogEntry
```

```
        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 pktcEventTable.

                An MTA is not required to persist the contents of this
                table across resets."
        ::= { pktcEventLog 1 }

    pktcEventLogEntry OBJECT-TYPE
        SYNTAX      PktcEventLogEntry
        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 pktcEventTable at the
                time of the event generation.
                While all entries created as such can be cleared using
                the MIB object pktcEventReset, the event entries
                themselves cannot be individually deleted."

        INDEX { pktcEventLogIndex }
        ::= { pktcEventLogTable 1 }

    PktcEventLogEntry ::= SEQUENCE {
        pktcEventLogIndex             Unsigned32,
        pktcEventLogTime              DateAndTime,
        pktcEventLogOrganization      Unsigned32,
        pktcEventLogIdentifier        Unsigned32,
        pktcEventLogText              SnmpAdminString,
        pktcEventLogEndpointName      SnmpAdminString,
        pktcEventLogType              BITS,
        pktcEventLogTargetInfo        SnmpAdminString,
        pktcEventLogCorrelationId     Unsigned32,
        pktcEventLogAdditionalInfo    SnmpAdminString
        }

    pktcEventLogIndex OBJECT-TYPE
        SYNTAX      Unsigned32(1..4294967295)
        MAX-ACCESS  not-accessible
```

```
        STATUS      current
        DESCRIPTION
                "This MIB object provides relative ordering of the
                 objects in the event log.

                 If the MTA implements non-volatile storage,
                 then this object will always increase except when
                 the MIB object reaches a value of 2^32-1.

                 If the MTA does not implement non-volatile storage,
                 then this object will always increase except when
                 the MIB object reaches a value of 2^32-1 or the MTA
                 is reset.

                 When the value reaches 2^32-1, or an MTA that does
                 not implement non-volatile storage is reset,
                 newer events will be stored starting with an index
                 value of '1' (cyclic rotation)."
        ::= { pktcEventLogEntry 1 }

    pktcEventLogTime OBJECT-TYPE
        SYNTAX       DateAndTime
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
                "This MIB object provides a human-readable description
                of the date and time at which the event occurred.
                The value of the date and time contained in this MIB
                object SHOULD reflect the date and time used in the
                syslog message resulting from the associated event,
                if such a syslog message was transmitted."
        ::= { pktcEventLogEntry 2 }

    pktcEventLogOrganization OBJECT-TYPE
        SYNTAX      Unsigned32(1..4294967295)
        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
                all vendor-specific events will contain the IANA
                enterprise number of the defining organization."
        ::= { pktcEventLogEntry 3 }

    pktcEventLogIdentifier OBJECT-TYPE
        SYNTAX      Unsigned32
```

```
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "This MIB object contains the event identifier for the
                corresponding event."
        ::= { pktcEventLogEntry 4 }

    pktcEventLogText OBJECT-TYPE
        SYNTAX      SnmpAdminString (SIZE (0..127))
        MAX-ACCESS  read-only
        STATUS      current
       DESCRIPTION
                "This MIB object contains the contents of
                the MIB object pktcEventText, corresponding
                to the event, at the moment of generation."
        ::= { pktcEventLogEntry 5 }

    pktcEventLogEndpointName OBJECT-TYPE
        SYNTAX      SnmpAdminString (SIZE (0..255))
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "This MIB object contains the unique identifier of the
                 MTA endpoint that generated the corresponding event.
                 If the generated event was not associated with
                 any specific endpoint on the MTA, then this MIB object
                 contains the MTA identifier.

                 An MTA endpoint can be uniquely identified using a
                 combination of the MTA identifier and the endpoint
                 number.  The MTA is identified via its Fully-Qualified
                 Domain Name (FQDN) and the associated IP address at
                 the given point in time.

                 The format of the value contained by this MIB object
                 is as follows:

                 aaln/n:<FQDN>/<IP>, when it identifies an endpoint,
                                     'n' being the endpoint number;
                 or,
                 <FQDN>/<IP>, when it identifies an MTA.

                 The value contained by this MIB object needs to observe
                 the SnmpAdminString definition requirements."
        ::= { pktcEventLogEntry 6 }

    pktcEventLogType OBJECT-TYPE
        SYNTAX      BITS {
```

```
                local(0),
                syslog(1),
                snmpTrap(2),
                snmpInform(3)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "This MIB object contains the type of actions taken by
             the MTA when the event indicated by the MIB object
             pktcEventLogIdentifier 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 result only in a local log.  An action may
             also be prevented due to throttling, in which case it is
             not reported by this MIB object."
    ::= { pktcEventLogEntry 7 }

pktcEventLogTargetInfo OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE (0..255))
    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>,<action-2/IP>,<action-3/IP>

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

             If there are multiple targets for the same type (SNMP
             traps sent to multiple IP addresses) or if there are
             multiple message types sent to the same IP (syslog and
             SNMP sent to the same IP address), they need to be
             reported individually.
```

```
                It is to be noted that this MIB object may not be able
                to store all the data in some cases (e.g., multiple
                IPv6 addresses), in which case some actions may not be
                reported.  In such cases, the MTA MUST present a value
                of '...' at the end of the value.

                Values contained by this MIB object need to observe the
                SnmpAdminString definition requirements."
        ::= { pktcEventLogEntry 8 }

    pktcEventLogCorrelationId 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.

                Although a correlation ID once generated after MTA
                reset does not change until next MTA reset, the
                value of this object will differ for the events
                preserved across MTA resets in case of a persistent
                pktcEventLogTable.

                For more information on the generation of correlation
                IDs, refer to the corresponding PacketCable/IPCablecom
                Device Provisioning specifications."
        REFERENCE
                "PacketCable MTA Device Provisioning Specification,
                [PKT-SP-PROV]."
        ::= { pktcEventLogEntry 9 }

    pktcEventLogAdditionalInfo OBJECT-TYPE
        SYNTAX      SnmpAdminString (SIZE (0..255))
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "This MIB object contains additional information
                in relation to the corresponding event that an
                MTA might wish to report, such as parameterized
                data or debugging information.  The format is
                vendor-specific.

                If the MTA cannot provide any additional information for
                the particular event generated, it MUST populate this
```

```
            MIB object with a zero-length OCTET-STRING.  Vendors
            providing this information need to observe the
            SnmpAdminString definition requirements, such as the
            use of control code sequence CR LF for newline."
    ::= { pktcEventLogEntry 10 }

---
-- Notifications
---

pktcEventNotification NOTIFICATION-TYPE
    OBJECTS {
    pktcEventLogTime,
    pktcEventLogOrganization,
    pktcEventLogIdentifier,
    pktcEventLogEndpointName,
    pktcEventLogCorrelationId,
    ifPhysAddress
    }
    STATUS      current
    DESCRIPTION
            "This Notification MIB object contains the contents for
             event reporting.

             It contains the event log time, the organization
             ID, the event identifier, the endpoint identifier, the
             correlation ID, and the MTA's MAC address."
    ::= { pktcEventNotifications 1 }

---
-- Conformance/Compliance
---

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

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

    MODULE   --pktcIetfEventMib

MANDATORY-GROUPS {
                pktcEventGroup,
```

```
                pktcEventNotificationGroup
                }

        MODULE SNMP-TARGET-MIB
            MANDATORY-GROUPS {
                snmpTargetBasicGroup,
                snmpTargetResponseGroup
            }

        MODULE SNMP-NOTIFICATION-MIB
            MANDATORY-GROUPS {
                 snmpNotifyGroup,
                 snmpNotifyFilterGroup
            }

    ::= { pktcEventCompliances 3 }

pktcEventGroup OBJECT-GROUP
    OBJECTS {
            pktcEventReset,
            pktcEventSyslogCapabilities,
            pktcEventSyslogAddressType,
            pktcEventSyslogAddress,
            pktcEventSyslogTransport,
            pktcEventSyslogPort,
            pktcEventSyslogMessageFormat,
            pktcEventThrottleAdminStatus,
            pktcEventThrottleThreshold,
            pktcEventThrottleInterval,
            pktcEventTransmissionStatus,
            pktcEventFacility,
            pktcEventSeverityLevel,
            pktcEventReporting,
            pktcEventText,
            pktcEventLogTime,
            pktcEventLogOrganization,
            pktcEventLogIdentifier,
            pktcEventLogText,
            pktcEventLogEndpointName,
            pktcEventLogType,
            pktcEventLogTargetInfo,
            pktcEventLogCorrelationId,
            pktcEventLogAdditionalInfo,
            pktcEventClass,
            pktcEventClassName,
            pktcEventClassStatus,
            pktcEventClassSeverity
        }
```

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

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

## 7. 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-2 182 } |

## 8. Security Considerations

There are a number of management objects defined in this MIB module with a MAX-ACCESS clause of read-write. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations. 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 status, i.e.:
  pktcEventReset
  pktcEventSyslogAddressType
  pktcEventSyslogAddress
  pktcEventSyslogPort
  pktcEventSyslogMessageFormat
  pktcEventSyslogTransport
  pktcEventClassStatus

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

- those related to throttling, i.e.: pktcEventThrottleAdminStatus pktcEventThrottleThreshold pktcEventThrottleInterval

- those related to the event reporting capabilities of an MTA, i.e: pktcEventSeverityLevel pktcEventReporting pktcEventText

The MIB object pktcEventReset deserves special mention since access to this MIB object can be used to disrupt event collection by management stations. For example, consider a management station that modifies the descriptions in the event table pktcEventTable. It would then expect management events generated by the MTA to reflect the modified values. A rogue management station that has access to the pktcEventReset can reset the event table, resulting in the management station not receiving events with the expected descriptions. Further, a rogue management station with access to pktcEventReset can also clear local logs, eliminating local logs of generated events for management stations that are not configured to receive syslog or SNMP messages. The same concerns apply when allowed management stations performing such operations are unaware of other management stations that may be reliant on the event table or the event log table for management or monitoring. This MIB module does not address such multi-manager contentions, and recommends that the MIB object pktcEventReset be used with caution.

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. These are the tables and objects and their sensitivity/vulnerability:

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

pktcEventTransmissionStatus: 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 perform GET or SET (change/create/delete) operations.

## 9. Acknowledgments

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