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Telecommunications
Engineers***

**ENGINEERING COMMITTEE
Data Standards Subcommittee**

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**IPCablecom 1.0 Part 7: Media Terminal Adapter (MTA)
Management Information Base (MIB) Requirements**

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Table of Contents

1	SCOPE	5
2	REFERENCES	6
2.1	NORMATIVE REFERENCES	6
2.2	INFORMATIVE REFERENCES	6
3	TERMS.....	7
4	ABBREVIATIONS AND ACRONYMS	7
5	REQUIREMENTS	8

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1 SCOPE

This standard describes the IPCablecom 1.0 MTA MIB requirement.

2 REFERENCES

The following documents contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the documents listed below. References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific. For a non-specific reference, the latest version applies.

2.1 Normative References

All references are subject to revision, and users of this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below.

- [1] ANSI/SCTE 24-06 2016, IPCablecom 1.0 Part 6: Management Information Base (MIB) Network.
- [2] ANSI/SCTE 24-03 2016, IPCablecom 1.0 Part 3: Network Call Signaling Protocol for the Delivery of Time-Critical Services of Cable Televisions Using Data Modems.
- [3] ANSI/SCTE 24-05 2016, IPCablecom 1.0 Part 5: Media Terminal Adapter (MTA) Device Provisioning Requirements for the Delivery of Real-Time Services over Cable Television Using Cable Modems.
- [4] IETF RFC 3413, Simple Network Management Protocol (SNMP) Applications, December 2002.
- [5] IETF STD 62, Simple Network Management Protocol Version 3 (SNMPv3), December 2002, D- Harrington, R. Presuhn, B. Wijnen, J. Case, D. Levi, P. Meyer, B. Stewart, U. Blumenthal, K. McCloghrie, <http://www.ietf.org>.
- [6] IETF RFC 3412, Message Processing and Dispatching for the Simple Network Management Protocol (SNMP), December 2002.
- [7] ANSI/SCTE 24-08 2016, IPCablecom 1.0 Part 8: Network Call Signaling Management Information Base (MIB) Requirements.
- [8] IETF RFC 3414, User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3), December 2002.
- [9] IETF RFC 3415, View-based Access Control Model (VACM) for Simple Network Management Protocol (SNMP), December 2002.
- [10] ANSI/SCTE 24-10 2016, IPCablecom 1.0 Part 10: Security Specification.
- [11] IETF RFC 1350 (STD0033) - The TFTP Protocol (Revision 2), July 1992, www.ietf.org.
- [12] IETF RFC 3617, Uniform Resource Identifier (URI) Scheme and Applicability Statement for the Trivial File Transfer Protocol (TFTP), October 2003, www.ietf.org
- [13] IETF RFC 2616, Hypertext Transfer Protocol -- HTTP/1.1, June 1999, www.ietf.org

2.2 Informative References

The following document may provide valuable information to the reader but is not required when complying with this standard.

- [14] ANSI/SCTE 24-01 2016, IPCablecom 1.0 Part 1: Architecture Framework for the Delivery of Time-Critical Services over Cable Television Networks Using Cable Modems.

3 TERMS

This standard uses the following term:

Management Information Base (MIB) The specification of information in a manner that allows standard access through a network management protocol.

4 ABBREVIATIONS AND ACRONYMS

The following abbreviations are used in this standard:

MIB	Management Information Base
MTA	Media Terminal Adapter

5 REQUIREMENTS

The IPCablecom MTA MIB MUST be implemented as defined below.

```
PKTC-MTA-MIB DEFINITIONS ::= BEGIN
    IMPORTS
        MODULE-IDENTITY,
        OBJECT-TYPE,
        Integer32, Counter32,
        BITS,IpAddress, NOTIFICATION-TYPE          FROM SNMPv2-SMI
        TruthValue, RowStatus, DisplayString,
        MacAddress, TEXTUAL-CONVENTION              FROM SNMPv2-TC
        OBJECT-GROUP, MODULE-COMPLIANCE,
        NOTIFICATION-GROUP                          FROM SNMPv2-CONF
        clabProjPacketCable                         FROM CLAB-DEF-MIB
        ifIndex                                      FROM IF-MIB
        SnmpAdminString                             FROM SNMP-FRAMEWORK-MIB
        sysDescr                                    FROM SNMPv2-MIB;

pktcMtaMib MODULE-IDENTITY
    LAST-UPDATED      "200711290000Z" -- November 29, 2007
    ORGANIZATION      "PacketCable OSS Group"
    CONTACT-INFO
        "Sumanth Channabasappa
        Postal: Cable Television Laboratories, Inc.
        858 Coal Creek Circle
        Louisville, Colorado 80027-9750
        U.S.A.
        Phone:  +1 303-661-9100
        Fax:    +1 303-661-9199
        E-mail: mibs@cablelabs.com"

    DESCRIPTION
        "This MIB module supplies the basic management objects
        for the MTA Device
        Acknowledgements:
        Angela Lyda           -   Arris Interactive
        Chris Melle           -   AT&T Broadband Labs
        Sasha Medvinsky       -   Motorola
        Roy Spitzer           -   Telocity Networks, Inc.
        Rick Vetter           -   Motorola
        Eugene Nechamkin      -   BroadCom Corp.
        Satish Kumar          -   Texas Instruments
        Copyright 1999-2007 Cable Television Laboratories, Inc.
        All rights reserved."
    REVISION "200711290000Z"
    DESCRIPTION
        "This revision, published as part of the PacketCable MIB MTA
        Standard."
    ::= { clabProjPacketCable 1 }

-- Textual conventions
X509Certificate ::= TEXTUAL-CONVENTION
    STATUS current
    DESCRIPTION
        "An X509 digital certificate encoded as an ASN.1 DER object."
    SYNTAX OCTET STRING (SIZE (0..4096))
--

-- PacketCable 1.0 only supports Embedded MTAs
--
=====
--
-- The MTA MIB only supports a single provisioning server.
```



```
--
-----

pktcMtaMibObjects      OBJECT IDENTIFIER ::= { pktcMtaMib 1 }
pktcMtaDevBase         OBJECT IDENTIFIER ::= { pktcMtaMibObjects 1 }
pktcMtaDevServer       OBJECT IDENTIFIER ::= { pktcMtaMibObjects 2 }
pktcMtaDevSecurity     OBJECT IDENTIFIER ::= { pktcMtaMibObjects 3 }

--
-- The following group describes the base objects in the MTA
--
pktcMtaDevResetNow    OBJECT-TYPE
    SYNTAX             TruthValue
    MAX-ACCESS          read-write
    STATUS              current
    DESCRIPTION
        "Setting this object to true(1) causes the device to reset.
        Reading this object always returns false(2).  When
        pktcMtaDevResetNow is set to true, the following actions
        occur:
        1. All connections (if present) are flushed locally
        2. All current actions such as ringing immediately
           terminate
        3. Requests for notifications such as notification based
           on digit map recognition are flushed
        4. All endpoints are disabled.
        5. The provisioning flow is started at step MTA - 1."
    ::= { pktcMtaDevBase 1 }

pktcMtaDevSerialNumber OBJECT-TYPE
    SYNTAX             SnmpAdminString(SIZE (0..128))
    MAX-ACCESS          read-only
    STATUS              current
    DESCRIPTION
        "This object specifies the manufacturer's serial number
        for this MTA.  The value of this object MUST be identical
        to the value specified in DHCP option 43 sub-option 4. "
    REFERENCE
        "PacketCable MTA Device Provisioning Specification;
        RFC 2132, DHCP Options and BOOTP Vendor Extensions"
    ::= { pktcMtaDevBase 2 }

pktcMtaDevHardwareVersion OBJECT-TYPE
    SYNTAX             SnmpAdminString(SIZE (0..48))
    MAX-ACCESS          read-only
    STATUS              obsolete
    DESCRIPTION
        "The manufacturer's hardware version for this MTA."
    ::= { pktcMtaDevBase 3 }

pktcMtaDevMacAddress  OBJECT-TYPE
    SYNTAX             MacAddress
    MAX-ACCESS          read-only
    STATUS              current
    DESCRIPTION
        "This object specifies the telephony MAC address for
        this device.  The value of this object MUST be identical
        to the value specified in DHCP option 43 sub-option 11."
    REFERENCE
        "PacketCable MTA Device Provisioning Specification;
        RFC 2132, DHCP Options and BOOTP Vendor Extensions"
    ::= { pktcMtaDevBase 4 }
```

```
pktcMtaDevFQDN          OBJECT-TYPE
    SYNTAX               SnmpAdminString
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION
        "The Fully Qualified Domain Name for this MTA."
    ::= { pktcMtaDevBase 5 }

pktcMtaDevEndPntCount   OBJECT-TYPE
    SYNTAX               Integer32 (1..255)
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION
        "The physical end points for this MTA."
    ::= { pktcMtaDevBase 6 }

pktcMtaDevEnabled       OBJECT-TYPE
    SYNTAX               TruthValue
    MAX-ACCESS            read-write
    STATUS                 current
    DESCRIPTION
        "This object contains the MTA Admin Status of this device.
        If this object is set to 'true', the MTA is
        administratively enabled and the MTA MUST be able to
        interact with PacketCable entities such as CMS,
        Provisioning Server, KDC, other MTAs and MGs on all
        PacketCable interfaces.
        If this object is set to 'false', the MTA is
        administratively disabled and the MTA MUST perform the
        following actions for all endpoints:
            - Shutdown all media sessions if present,
            - Shutdown NCS signaling by following the Restart in
              Progress procedures in the PacketCable NCS
              specification.
        Additionally, the MTA MUST maintain the SNMP Interface for
        management. Also, the MTA MUST NOT continue Kerberized Key
        Management with CMSes until this object is set to 'true'.
        Note: MTAs MUST renew the CMS kerberos tickets according
        to the PacketCable Security Specification"
    REFERENCE
        "PacketCable Security Specification;
        PacketCable MTA Device Provisioning Specification"
    ::= { pktcMtaDevBase 7 }

pktcMtaDevTypeIdentifier OBJECT-TYPE
    SYNTAX               SnmpAdminString
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION
        "This is a copy of the device type identifier used in the
        DHCP option 60 exchanged between the MTA and the DHCP
        server."
    ::= { pktcMtaDevBase 8 }

pktcMtaDevProvisioningState OBJECT-TYPE
    SYNTAX               INTEGER {
        pass                (1),
        inProgress          (2),
        failConfigFileError (3),
        passWithWarnings    (4),
        passWithIncompleteParsing (5),
        failureInternalError (6),
        failOtherReason     (7)
    }
```

```

}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This object indicates the completion state of the
    MTA device provisioning process.

    pass:
    If the configuration file could be parsed
    successfully and the MTA is able to reflect the same in
    its MIB, the MTA MUST return the value 'pass'.

    inProgress:
    If the MTA is in the process of being provisioned,
    the MTA MUST return the value 'inProgress'.

    failConfigFileError:
    If the configuration file was in error due to
    incorrect values in the mandatory parameters, the MTA MUST
    reject the configuration file and the MTA MUST return the
    value 'failConfigFileError'.

    passWithWarnings:
    If the configuration file had proper values for
    all the mandatory parameters but has errors in any of
    the optional parameters (this includes any vendor specific
    OIDs which are incorrect or not known to the MTA), the MTA
    MUST return the value 'passWithWarnings'.

    passWithIncompleteParsing:
    If the configuration file is valid, but the MTA
    cannot reflect the same in its configuration (for example,
    too many entries caused memory exhaustion), it must accept
    the CMS configuration entries related and the MTA MUST
    return the value 'passWithIncompleteParsing'.

    failureInternalError:
    If the configuration file cannot be parsed due to
    an internal error, the MTA MUST return the value
    'failureInternalError'.

    failureOtherReason:
    If the MTA cannot accept the configuration file for
    any other reason than the ones stated above, the MTA MUST
    return the value 'failureOtherReason'.

    When a final SNMP INFORM is sent as part of Step 25 of
    the MTA Provisioning process, this parameter is also
    included in the final INFORM message."
REFERENCE
    "PacketCable MTA Device Provisioning Specification"
 ::= { pktcMtaDevBase 9 }

pktcMtaDevHttpAccess OBJECT-TYPE
    SYNTAX TruthValue
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This indicates whether HTTP file access is supported for
        MTA configuration file transfer."
    ::= { pktcMtaDevBase 10 }

pktcMtaDevProvisioningTimer OBJECT-TYPE

```

```

SYNTAX      Integer32 (0..30)
UNITS       "minutes"
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object defines the time interval for the
    provisioning flow to complete. The MTA MUST finish
    all provisioning operations starting from the moment when
    an MTA receives its DHCP ACK and ending at the moment when
    the MTA downloads its configuration file (e.g., MTA5 to
    MTA23 for Secure Flow) within the period of time set by
    this object. Failure to comply with this condition
    constitutes the provisioning flow failure. If the
    object is set to 0, the MTA MUST ignore the provisioning
    timer condition."
REFERENCE
    "PacketCable MTA Device Provisioning Specification."
DEFVAL {10}
 ::= { pktcMtaDevBase 11}

pktcMtaDevProvisioningCounter OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object is the count of the number of times the
    provisioning cycle has looped through step MTA-1 since
    the last reboot."
 ::= { pktcMtaDevBase 12}

--
pktcMtaDevErrorOidsTable OBJECT-TYPE
SYNTAX SEQUENCE OF PktcMtaDevErrorOidsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "If pktcMtaDevProvisioningState is reported with anything
    other than a pass(1) then this table is populated with the
    necessary information, each pertaining to observations of
    the configuration file. Even if different parameters
    share the same error ( Ex: All Realm Names are invalid ),
    all recognized errors must be reported as different
    instances."
 ::= { pktcMtaDevBase 13 }

pktcMtaDevErrorOidsEntry OBJECT-TYPE
SYNTAX PktcMtaDevErrorOidsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "This contains the necessary information an MTA must
    attempt to provide in case the configuration file
    is not parsed and/or accepted in its entirety."
INDEX { pktcMtaDevErrorOidIndex }
 ::= { pktcMtaDevErrorOidsTable 1 }

PktcMtaDevErrorOidsEntry ::= SEQUENCE {
    pktcMtaDevErrorOidIndex      Integer32,
    pktcMtaDevErrorOid          SnmpAdminString,
    pktcMtaDevErrorGiven        SnmpAdminString,
    pktcMtaDevErrorReason       SnmpAdminString
}

pktcMtaDevErrorOidIndex OBJECT-TYPE

```

```
SYNTAX Integer32(1..1024)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "This is the index to pktcMtaDevErrorOidsEntry.
    This is an integer value and will start from the value 1
    and be incremented for each error encountered in the
    configuration file. The indices need not necessarily
    reflect the order of error occurrences in the
    configuration file."
 ::= { pktcMtaDevErrorOidsEntry 1}

pktcMtaDevErrorOid OBJECT-TYPE
SYNTAX      SnmpAdminString
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This is the OID associated with the particular error. If
    the error was not due to an identifiable OID, then this
    can be populated with impartial identifiers, in hexadecimal
    or numeric format."
 ::= { pktcMtaDevErrorOidsEntry 2}

pktcMtaDevErrorGiven OBJECT-TYPE
SYNTAX      SnmpAdminString
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "If the error was due to the value associated
    with the corresponding pktcMtaDevErrorOid, then this
    contains the value of the OID as interpreted by the MTA in
    the configuration file provided. If the error was not due
    to the value of an OID this must be set to an empty
    string. This is provided to eliminate errors due to
    misrepresentation/misinterpretation of data."
 ::= { pktcMtaDevErrorOidsEntry 3}

pktcMtaDevErrorReason OBJECT-TYPE
SYNTAX      SnmpAdminString
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This indicates the reason for the error,
    as per the MTAs interpretation, in human readable form.
    Example include:
    VALUE NOT IN RANGE,
    VALUE DOES NOT MATCH TYPE
    UNSUPPORTED VALUE
    LAST 4 BITS MUST BE SET TO ZERO,
    OUT OF MEMORY, CANNOT STORE etc.
    This MAY also contain vendor specific errors
    for vendor specific OIDS and any proprietary error
    codes/messages which can help diagnose errors
    better, in a manner the vendor deems fit."
 ::= { pktcMtaDevErrorOidsEntry 4}

pktcMtaDevSwCurrentVers OBJECT-TYPE
SYNTAX      SnmpAdminString
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object identifies the software version currently
    operating in the MTA."
```

The MTA MUST return a string descriptive of the current software load. This object should use the syntax defined by the individual vendor to identify the software version. The data presented in this object MUST be identical with the software version information contained in the sysDescr MIB Object of the MTA. The value of this object MUST be identical to the value specified in DHCP option 43 sub-option 6."

REFERENCE

"PacketCable MTA Device Provisioning Specification; RFC 2132, DHCP Options and BOOTP Vendor Extensions"

::= { pktcMtaDevBase 14}

-- The following group describes server access and parameters used for -- initial provisioning and bootstrapping.

--
--*****
--*****This object is obsolete*****
--*****

pktcMtaDevServerBootState OBJECT-TYPE

SYNTAX INTEGER {
operational (1),
disabled (2),
waitingForDhcpOffer (3),
waitingForDhcpResponse (4),
waitingForConfig (5),
refusedByCmts (6),
other (7),
unknown (8)
}

MAX-ACCESS read-only

STATUS obsolete

DESCRIPTION

"If operational(1), the device has completed loading and processing of configuration parameters and the CMTS has completed the Registration exchange. If disabled(2) then the device was administratively disabled, possibly by being refused network access in the configuration file. If waitingForDhcpOffer(3) then a DHCP Discover has been transmitted and no offer has yet been received. If waitingForDhcpResponse(4) then a DHCP Request has been transmitted and no response has yet been received. If waitingForConfig(5) then a request to the config parameter server has been made and no response received. If refusedByCmts(6) then the Registration Request/Response exchange with the CMTS failed. "

REFERENCE

"DOCSIS Radio Frequency Interface Specification"

::= { pktcMtaDevServer 1 }

--*****
--*****This object is obsolete*****
--*****

pktcMtaDevServerDhcp OBJECT-TYPE

SYNTAX IpAddress

MAX-ACCESS read-only

STATUS obsolete

DESCRIPTION

"The IP address of the DHCP server that assigned an IP address to this device. Returns 0.0.0.0 if DHCP was not

```

        used for IP address assignment."
 ::= { pktcMtaDevServer 2 }
--
pktcMtaDevServerDns1 OBJECT-TYPE
    SYNTAX      IpAddress
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The IP address of the primary DNS server to be used by the
        MTA to resolve the FQDNs and IP addresses."
 ::= { pktcMtaDevServer 3 }

pktcMtaDevServerDns2 OBJECT-TYPE
    SYNTAX      IpAddress
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The IP address of the Secondary DNS server to be used by the MTA to
        resolve the FQDNs and IP addresses. Contains 0.0.0.0 if
        there is no Secondary DNS server specified for the MTA
        under consideration."
 ::= { pktcMtaDevServer 4 }

pktcMtaDevConfigFile OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object specifies the MTA device configuration file
        information, including the access method, the server
        name and the configuration file name. The value of this
        object is the Uniform Resource Locator (URL) of the
        configuration file for TFTP or HTTP download.
        If this object value is a TFTP URL, it must be formatted
        as defined in RFC 3617.
        If this object value is an HTTP URL, it must be formatted
        as defined in RFC 2616.
        If the MTA SNMP Enrollment mechanism is used, then the MTA
        must download the file provided by the Provisioning Server
        during provisioning via an SNMP SET on this object.
        If the MTA SNMP Enrollment mechanism is not used, this
        object MUST contain the URL value corresponding to the
        'siaddr' and 'file' fields received in the DHCP ACK to
        locate the configuration file: the 'siaddr' & 'file'
        fields represents the host and file of the TFTP URL.
        In this case, the MTA MUST return an
        'inconsistentValue' error in response to SNMP SET
        operations. The MTA MUST return a zero-length string if
        the server address (host part of the URL) is unknown."
    REFERENCE
        "RFC 3617, URI Scheme for TFTP; RFC 2616, HTTP 1.1"
 ::= { pktcMtaDevServer 5 }

pktcMtaDevSnmpEntity OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object contains the FQDN of the SNMP entity of the
        Provisioning Server. When the MTA SNMP Enrollment
        Mechanism is used, this object represents the server the
        MTA communicates with, to receive the configuration file
        URL from, and, to send the enrollment notification to."

```

The SNMP entity is also the destination entity for all the provisioning notifications. It may be also used for post-provisioning SNMP operations. During the provisioning phase, this SNMP entity FQDN is supplied to the MTA via the DHCP option 122 sub-option 3 as defined in RFC 3495."

REFERENCE

"PacketCable MTA Device Provisioning Specification;
 RFC 3495, DHCP Option for CableLabs Client Configuration."
 ::= { pktcMtaDevServer 6 }

pktcMtaDevProvConfigHash OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(16|20))
 MAX-ACCESS read-write
 STATUS current

DESCRIPTION

"This object contains the hash value of the contents of the config file.
 If the authentication algorithm is MD5, the length is 128 bits. If the authentication algorithm is SHA-1, the length is 160 bits. The hash calculation MUST follow the requirements defined in the PacketCable Security specification.
 When the MTA SNMP Enrollment mechanism is used, this hash value is calculated and sent to the MTA prior to sending the config file. This object value is then provided by the Provisioning server via an SNMP SET operation.
 When the MTA SNMP Enrollment mechanism is not in use, the hash value is provided in the configuration file itself and it is also calculated by the MTA. This object value MUST represent the hash value calculated by the MTA.
 When the MTA SNMP Enrollment mechanism is not in use, the MTA must reject all SNMP SET operations on this object and return an 'inconsistentValue' error."

REFERENCE

"PacketCable MTA Device Provisioning Specification;
 PacketCable Security Specification."
 ::= { pktcMtaDevServer 7 }

pktcMtaDevProvConfigKey OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(0|8))
 MAX-ACCESS read-write
 STATUS current

DESCRIPTION

"This object contains the key used to encrypt/decrypt the configuration file when secure SNMPv3 provisioning is used.
 It is sent to the MTA prior to sending the config file. If the privacy algorithm is null, the length is 0. If the privacy algorithm is DES, the length is 64 bits. This object must not be used in non secure provisioning mode.
 In non secure provisioning modes, the MTA MUST return an 'inconsistentValue' in response to SNMP SET operations, and, the MTA MUST return a 'genErr' error in response to SNMP GET operations."

::= { pktcMtaDevServer 8 }

pktcMtaDevProvSolicitedKeyTimeout OBJECT-TYPE

SYNTAX Integer32 (15..600)
 UNITS "seconds"
 MAX-ACCESS read-write


```

STATUS      current
DESCRIPTION
  "This object defines a Kerberos Key Management timer on the
  MTA. It is the time period during which the MTA saves the
  nonce and Server Kerberos Principal Identifier to match an
  AP Request and its associated AP Reply response from the
  Provisioning Server.
  After the timeout has been exceeded, the client discards
  this (nonce, Server Kerberos Principal Identifier) pair,
  after which it will no longer accept a matching AP Reply.
  This timer only applies when the Provisioning Server
  initiated key management for SNMPv3 (with a
  Wake Up message). This object should not be used in non
  secure provisioning modes. In non secure provisioning
  modes, the MTA MUST return an 'inconsistentValue' in
  response to SNMP SET operations, and the MTA MUST
  return a 'genErr' error in response to SNMP GET
  operations."
DEFVAL { 120 }
 ::= { pktcMtaDevServer 9 }

```

```

-----
--
-- Unsolicited Key Updates are based on an exponential backoff
-- mechanism with two timers for AS replies. The fast timers have a
-- maximum timer (pktcMtaDevProvUnsolicitedKeyMaxTimeout seconds) and
-- a nominal timer pktcMtaDevProvUnsolicitedKeyNomTimeout seconds)
-- from which the backoff timer determinations are made.
--
-----
--
-- Timeouts for unsolicited key management updates are only pertinent
-- before the first SNMPv3 message is sent between the MTA and the
-- Provisioning server and before the configuration file is loaded.
--
-----

```

pktcMtaDevProvUnsolicitedKeyMaxTimeout OBJECT-TYPE

```

SYNTAX      Integer32 (15..600)
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "This object defines the timeout value that applies to
  an MTA-initiated AP-REQ/REP key management exchange with
  the Provisioning Server in SNMPv3 provisioning.
  It is the maximum timeout value and it may not be exceeded
  in the exponential back-off algorithm. If the DHCP option
  code 122 sub-option 5 is provided to the MTA, it overwrites
  this value.
  In non secure provisioning mode, the MTA MUST return
  a 'genErr' error in response to SNMP GET operations."
REFERENCE
  "PacketCable Security Specification"
DEFVAL { 600 }
 ::= { pktcMtaDevServer 10 }

```

pktcMtaDevProvUnsolicitedKeyNomTimeout OBJECT-TYPE

```

SYNTAX      Integer32 (15..600)
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object defines the starting value of the timeout
    for the AP-REQ/REP Backoff and Retry mechanism
    with exponential timeout in SNMPv3 provisioning.
    If the DHCP option code 122 sub-option 5 is provided
    the MTA, it overwrites this value.
    In non secure provisioning mode, the MTA MUST return
    a 'genErr' error in response to SNMP GET operations."
REFERENCE
    "PacketCable Security Specification"
DEFVAL      {30}
 ::= { pktcMtaDevServer 11 }
pktcMtaDevProvUnsolicitedKeyMeanDev OBJECT-TYPE
SYNTAX      Integer32 (15..600)
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      obsolete
DESCRIPTION
    "This is the mean deviation for the round trip delay
    timings."
REFERENCE
    "PacketCable Security Specification"
 ::= { pktcMtaDevServer 12 }

pktcMtaDevProvUnsolicitedKeyMaxRetries OBJECT-TYPE

SYNTAX      Integer32 (1..32)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object contains a retry counter that applies to
    an MTA-initiated AP-REQ/REP key management exchange with
    the Provisioning Server in secure SNMPv3 provisioning.
    It is the maximum number of retries before the MTA stops
    attempting to establish a Security Association with
    Provisioning Server.
    If the DHCP option code 122 sub-option 5 is provided to
    the MTA, it overwrites this value.
    In non secure provisioning mode, the MTA MUST return
    a 'genErr' error in response to SNMP GET operations."
REFERENCE
    "PacketCable Security Specification"
DEFVAL      {8}
 ::= { pktcMtaDevServer 13 }

pktcMtaDevProvKerbRealmName OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE(1..255))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "For Secure provisioning this object contains the name of
    the associated provisioning Kerberos realm acquired during
    the MTA4 provisioning step (DHCP Ack).
    Additionally this object value is used as an index
    into the pktcMtaDevRealmTable. In which case, the upper
    case ASCII representation of the associated Kerberos realm
    name MUST be used by both the Manager (SNMP entity)
    and the MTA. The Kerberos realm name for the Provisioning
    Server is supplied to the MTA via DHCP option code 122

```

sub-option 6 as defined in RFC 3495.
 For non secure provisioning modes, the value of
 this object MUST contain the value supplied in the DHCP
 ACK message (option code 122 sub-option 6)."

REFERENCE

"PacketCable MTA Device Provisioning Specification;
 RFC 3495, DHCP Option for CableLabs Client Configuration."

::= { pktcMtaDevServer 14 }

pktcMtaDevProvState OBJECT-TYPE

SYNTAX INTEGER {
 operational (1),
 waitingForSnmpSetInfo (2),
 waitingForTftpAddrResponse (3),
 waitingForConfigFile (4)
 }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object defines the MTA provisioning state.
 If the state is:
 'operational(1)', the device has completed the loading
 and processing of the initialization parameters.

'waitingForSnmpSetInfo(2)', the device is waiting on
 its configuration file download access information.
 Note that this state is only reported when the MTA
 SNMP enrollment mechanism is used.

'waitingForTftpAddrResponse(3)', the device has sent a
 DNS request to resolve the server providing the
 configuration file and it is awaiting for a response.
 Note that this state is only reported when the MTA
 SNMP enrollment mechanism is used.

'waitingForConfigFile(4)', the device has sent a
 request via TFTP or HTTP for the download of its
 configuration file and it is awaiting for a response or
 the file download is in progress."

REFERENCE

"PacketCable MTA Device Provisioning Specification,
 PacketCable Security Specification"

::= { pktcMtaDevServer 15 }

pktcMtaDevServerDhcp1 OBJECT-TYPE

SYNTAX IpAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The IP address of the primary DHCP server which would
 cater to the to the MTA during its provisioning.
 Contains 255.255.255.255 if there was no preference given
 with respect to the DHCP servers for MTA provisioning."

::= { pktcMtaDevServer 16 }

pktcMtaDevServerDhcp2 OBJECT-TYPE

SYNTAX IpAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The IP address of the Secondary DHCP server
 which could cater to the MTA during its provisioning.
 Contains 0.0.0.0 if there is no specific secondary DHCP

```

server to be considered during MTA provisioning."
 ::= { pktcMtaDevServer 17 }

pktcMtaDevTimeServer      OBJECT-TYPE
    SYNTAX      IpAddress
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "IP address of the Time Server from which to obtain the
        time. Contains 0.0.0.0 if the Time Protocol is not used for
        time synchronization."
    ::= { pktcMtaDevServer 18}

--
-- The following group describes the security objects in the MTA
--

pktcMtaDevManufacturerCertificate  OBJECT-TYPE
    SYNTAX      X509Certificate
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " This object contains the MTA Manufacturer Certificate.
        The object value must be the ASN.1 DER encoding of the MTA
        manufacturer's X.509 public key certificate. The MTA
        Manufacturer Certificate is issued to each MTA
        manufacturer and is installed into each MTA at the time of
        manufacture or with a secure code download. The specific
        requirements related to this certificate are defined in
        the PacketCable Security specification."
    REFERENCE
        "PacketCable Security Specification."
    ::= { pktcMtaDevSecurity 1}

pktcMtaDevCertificate  OBJECT-TYPE
    SYNTAX      X509Certificate
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "ASN.1 DER encoding of the MTA's X.509 public-key
        certificate issued by the manufacturer and installed
        into the embedded-MTA in the factory. This certificate,
        called MTA Device Certificate, contains the MTA's MAC
        address. It cannot be updated by the provisioning server."
    ::= { pktcMtaDevSecurity 2 }

--*****
--***** THIS OBJECT IS OBSOLETE *****
--*****

pktcMtaDevSignature  OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (0..256))
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "A unique signature created by the MTA for each SNMP
        Inform or SNMP Trap or SNMP GetResponse message exchanged
        prior to enabling SNMPv3 security ASN.1 encoded Digital
        signature in the Cryptographic message syntax (includes
        nonce). "
    ::= { pktcMtaDevSecurity 3 }

pktcMtaDevCorrelationId  OBJECT-TYPE
    SYNTAX      Integer32

```

```

MAX-ACCESS read-only
STATUS current
DESCRIPTION
  "Random value generated by the MTA for use in registration
  authorization. It is for use only in the MTA initialization
  messages and for MTA configuration file download "
 ::= { pktcMtaDevSecurity 4 }

-----
--
-- pktcMtaDevSecurityTable
--
-- The pktcMtaDevSecurityTable shows security association information
-- relating to a particular MTA endpoint. The MTA endpoint is indexed
-- with ifIndex.
--
-----
--*****
--***** THIS TABLE IS OBSOLETE *****
--*****

pktcMtaDevSecurityTable OBJECT-TYPE
  SYNTAX SEQUENCE OF PktcMtaDevSecurityEntry
  MAX-ACCESS not-accessible
  STATUS obsolete
  DESCRIPTION
    "Contains per endpoint security information."
  ::= { pktcMtaDevSecurity 5 }

pktcMtaDevSecurityEntry OBJECT-TYPE
  SYNTAX PktcMtaDevSecurityEntry
  MAX-ACCESS not-accessible
  STATUS obsolete
  DESCRIPTION
    "List of security attributes for a single PacketCable
    endpoint interface."
  INDEX { ifIndex }
  ::= { pktcMtaDevSecurityTable 1 }

PktcMtaDevSecurityEntry ::= SEQUENCE {
  pktcMtaDevServProviderCertificate X509Certificate,
  pktcMtaDevTelephonyCertificate X509Certificate,
  pktcMtaDevKerberosRealm OCTET STRING,
  pktcMtaDevKerbPrincipalName DisplayString,
  pktcMtaDevServGracePeriod Integer32,
  pktcMtaDevLocalSystemCertificate X509Certificate,
  pktcMtaDevKeyMgmtTimeout1 Integer32,
  pktcMtaDevKeyMgmtTimeout2 Integer32
}

pktcMtaDevServProviderCertificate OBJECT-TYPE
  SYNTAX X509Certificate
  MAX-ACCESS read-write
  STATUS obsolete
  DESCRIPTION
    "ASN.1 DER encoding of the Telephony Service
    Provider's X.509 public-key certificate, called
    Telephony Service Provider Certificate. It serves
    as the root of the intra-domain trust hierarchy.
    Each MTA is configured with this certificate so
    that it can authenticate TGSSs owned by the same
    service provider. The provisioning server needs
    the ability to update this certificate in the MTAs
  
```

```

        via both SNMP and configuration files"
 ::= { pktcMtaDevSecurityEntry 1 }

pktcMtaDevTelephonyCertificate OBJECT-TYPE
    SYNTAX      X509Certificate
    MAX-ACCESS  read-write
    STATUS      obsolete
    DESCRIPTION
        "ASN.1 DER encoding of the MTA's X.509 public-key
        certificate issued by the Service Provider with either
        the Service Provider CA or a Local System CA. This
        certificate, called MTA Telephony Certificate, contains
        the same public key as the MTA Device Certificate issued
        by the manufacturer. It is used to authenticate the
        identity of the MTA to the TGS (during PKINIT exchanges).
        The provisioning server needs the ability to update this
        certificate in the MTAs via both SNMP and configuration
        files"
 ::= { pktcMtaDevSecurityEntry 2 }

pktcMtaDevKerberosRealm OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (0..1280))
    MAX-ACCESS  read-write
    STATUS      obsolete -- moved to realm table
    DESCRIPTION
        "Specifies a Kerberos realm (i.e. administrative domain),
        required for PacketCable key management."
 ::= { pktcMtaDevSecurityEntry 3 }

pktcMtaDevKerbPrincipalName OBJECT-TYPE
    SYNTAX      DisplayString (SIZE(0..40))
    MAX-ACCESS  read-write
    STATUS      obsolete
    DESCRIPTION
        "Kerberos principal name for the Call Agent. This
        information is required in order for the MTA to obtain
        Call Agent Kerberos tickets. This principal name does not
        include the realm, which is specified as a separate field
        in this configuration file. A Single Kerberos principal
        name MAY be shared among several Call Agents."
 ::= { pktcMtaDevSecurityEntry 4 }

pktcMtaDevServGracePeriod OBJECT-TYPE
    SYNTAX      Integer32 (15..600)
    UNITS       "minutes"
    MAX-ACCESS  read-write
    STATUS      obsolete -- moved to realm table
    DESCRIPTION
        "The MTA MUST obtain a new Kerberos ticket (with a PKINIT
        exchange) this many minutes before the old ticket expires.
        The minimum allowable value is 15 mins. The default is 30
        mins."
    DEFVAL { 30 }
 ::= { pktcMtaDevSecurityEntry 5 }

pktcMtaDevLocalSystemCertificate OBJECT-TYPE
    SYNTAX      X509Certificate
    MAX-ACCESS  read-write
    STATUS      obsolete
    DESCRIPTION
        "The Telephony Service Provider CA may delegate the
        issuance of certificates to a regional Certification
        Authority called Local System CA (with the corresponding

```

```

    Local System Certificate). This parameter is the ASN.1
    DER encoding of the Local System Certificate. It MUST have
    a non-empty value when the MTA Telephony certificate is
    signed by a Local System CA. Otherwise, the value MUST
    be of length 0."
 ::= { pktcMtaDevSecurityEntry 6 }

pktcMtaDevKeyMgmtTimeout1 OBJECT-TYPE
    SYNTAX      Integer32 (15..600)
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      obsolete -- moved to cms table
    DESCRIPTION
        "This timeout applies only when the MTA initiated key
        management. It is the period during which the MTA will
        save a nonce (inside the sequence number field) from the
        sent out AP Request and wait for the matching AP Reply
        from the CMS."
    REFERENCE
        "PacketCable Security Specification"
 ::= { pktcMtaDevSecurityEntry 7 }

pktcMtaDevKeyMgmtTimeout2 OBJECT-TYPE
    SYNTAX      Integer32 (15..600)
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      obsolete -- changed to adaptive backoff and moved to
                -- cms table
    DESCRIPTION
        "This timeout applies only when the CMS initiated key
        management (with a Wake Up or Rekey message).
        It is the period during which the MTA will
        save a nonce (inside the sequence number field) from
        the sent out AP Request and wait for the matching AP
        Reply from the CMS."
    REFERENCE
        "PacketCable Security Specification"
 ::= { pktcMtaDevSecurityEntry 8 }

--
--          Ticket Granting Server information
--
--*****
--***** THIS TABLE IS OBSOLETE *****
--*****

pktcMtaDevTgsTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcMtaDevTgsEntry
    MAX-ACCESS  not-accessible
    STATUS      obsolete -- Secure Provisioning ECR
    DESCRIPTION
        "Contains per endpoint Ticket Granting Server information."
 ::= { pktcMtaDevSecurity 8 }

pktcMtaDevTgsEntry OBJECT-TYPE
    SYNTAX      PktcMtaDevTgsEntry
    MAX-ACCESS  not-accessible
    STATUS      obsolete -- Secure Provisioning ECR
    DESCRIPTION
        "List of Tgs attributes for a single PacketCable
        endpoint interface."
    INDEX { ifIndex, pktcMtaDevTgsIndex }
 ::= { pktcMtaDevTgsTable 1 }

```

```

pktcMtaDevTgsEntry ::= SEQUENCE {
    pktcMtaDevTgsIndex      Integer32,
    pktcMtaDevTgsLocation  DisplayString,
    pktcMtaDevTgsStatus    RowStatus
}

pktcMtaDevTgsIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      obsolete -- Secure Provisioning ECR
    DESCRIPTION
        "Index into the TGS table for TGS locations.
         IfType specifies the endpoint, TgsIndex specifies a TGS."
    ::= { pktcMtaDevTgsEntry 1 }
pktcMtaDevTgsLocation OBJECT-TYPE
    SYNTAX      DisplayString (SIZE (0..255))
    MAX-ACCESS  read-create
    STATUS      obsolete -- Secure Provisioning ECR
    DESCRIPTION
        "Name of the TGS Ticket Granting Server, which is the
         Kerberos Server. This parameter is a FQDN or Ipv4 address.
         There may be multiple entries of this type. The order
         in which these entries are listed is the priority order
         in which the MTA will attempt to contact them for this
         endpoint."
    ::= { pktcMtaDevTgsEntry 2 }

pktcMtaDevTgsStatus    OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      obsolete -- Secure Provisioning ECR
    DESCRIPTION
        "This object contains the Row Status associated with
         the pktcMtaDevTgsTable."
    ::= { pktcMtaDevTgsEntry 3 }

pktcMtaDevTelephonyRootCertificate OBJECT-TYPE
    SYNTAX      X509Certificate
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "ASN.1 DER encoding of the IP Telephony Root X.509
         public-key certificate stored in the MTA non-volatile
         memory and updateable with a code download. This
         certificate is used to validate the initial AS Reply
         from the KDC received during the MTA initialization."
    ::= { pktcMtaDevSecurity 9 }

-----
--
-- Procedures for setting up security associations:
--
-- A security association may be setup either via configuration or via
-- NCS signaling.
--
-- I. Security association setup via configuration.
--
-- The realm must be configured first. Associated with the
-- realm is a KDC. The realm table (pktcMtaDevRealmTable)
-- indicates information about realm (e.g., name,
-- organization name) and parameters associated with KDC
-- communications (e.g., grace periods, AS request/AS

```



```
--      reply adaptive backoff parameters).

--      Once the realm is established, one or more servers may be
--      defined in the realm.  For PacketCable 1.0, these are
--      Call Management Servers (CMSs).  Associated with each CMS
--      entry in the pktcMtaDevCmsTable is an explicit reference
--      to a Realm via the realm index
--      (pktcMtaDevCmsKerbRealmName), the FQDN of the CMS,
--      and parameters associated with IPSec management with the
--      CMS (e.g., clock skew, AP request/
--      AP reply adaptive backoff parameters).
--
--
--
--
--
--
--
--
--
--
--      II.      Security association setup via NCS signaling
--
--
--      Note:  The following process is done automatically by the
--      MTA.  The NCS is not involved in creating signaled entries.
--      The current CMS signaling association being used by an
--      endpoint is marked as active in CMS MAP table.  If NCS
--      signaling requests a change of signaling association to
--      a different FQDN, the MTA checks the current CMS MAP
--      table entries for the affected endpoint.  If the entry
--      exists in the CMS MAP table, the current CMS MAP table
--      entry is marked inactive and the newly chosen CMS MAP
--      table entry is marked active.
--
--      If the entry does not exist in the CMS MAP table, the
--      CMS table is checked to determine whether or not it
--      contains the CMS specified by CMS signaling (possibly
--      a redirection).  If the desired CMS entry is defined,
--      then a corresponding entry is created and an entry in
--      the CMS MAP table is created.  If the MTA does not
--      have current associations with that CMS, it will now
--      perform key management to establish required security
--      associations.  Once the desired CMS entry is established,
--      the current CMS MAP table entry is marked inactive and
--      the newly created CMS MAP table entry is marked active.
--      Otherwise the current CMS MAP table entry remains
--      active and the newly created CMS MAP table entry is marked
--      in active.
--
--      If the entry does not exist in the CMS MAP table and the
--      CMS entry does not exist in the CMS table, a new CMS
--      table entry should be created.  This CMS entry should use
--      the same realm as used by this endpoint.  The default
--      values for the clock skew and AP request/AP reply adaptive
--      backoff parameters should be used.  The MTA will now
--      perform key management to establish required security
--      associations.  Once the desired CMS entry is established,
--      the current CMS MAP table entry is marked inactive and
--      the newly created CMS MAP table entry is marked active.
--      Otherwise the current CMS MAP table entry remains
--      active and the newly created CMS MAP table entry is
--      marked inactive.
--
--
--      III.     When the MTA receives wake-up or rekey messages from a CMS,
--      it performs key management based on the corresponding entry
--      in the CMS table.  If the matching CMS entry does not exist,
--      it must ignore the wake-up or rekey messages.
--
--
```

```

-----
-----
--
--      pktcMtaDevRealmTable
--
--      The pktcMtaDevRealmTable shows the KDC realms.  The table is
--      indexed with pktcMtaDevRealmName.  The Realm Table is used in with
--      conjunction any server which needs a security association with an
--      server MTA.  The table (today the CMS) has a security association.
--      Each server-MTA security association is associated with a
--      single Realm.  This allows for multiple realms, each
--      with its own security association.
--
-----

pktcMtaDevRealmTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcMtaDevRealmEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Contains per Kerberos realm security parameters."
    ::= {      pktcMtaDevSecurity 16 }

pktcMtaDevRealmEntry OBJECT-TYPE
    SYNTAX      PktcMtaDevRealmEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "List of security parameters for a single Kerberos realm."
    INDEX { IMPLIED pktcMtaDevRealmName }
    ::= {      pktcMtaDevRealmTable 1 }

PktcMtaDevRealmEntry ::= SEQUENCE {
    pktcMtaDevRealmName          SnmpAdminString,
    pktcMtaDevRealmPkinitGracePeriod  Integer32,
    pktcMtaDevRealmTgsGracePeriod    Integer32,
    pktcMtaDevRealmOrgName          OCTET STRING,
    pktcMtaDevRealmUnsolicitedKeyMaxTimeout  Integer32,
    pktcMtaDevRealmUnsolicitedKeyNomTimeout  Integer32,
    pktcMtaDevRealmUnsolicitedKeyMeanDev    Integer32,
    pktcMtaDevRealmUnsolicitedKeyMaxRetries  Integer32,
    pktcMtaDevRealmStatus          RowStatus
}

pktcMtaDevRealmName OBJECT-TYPE
    SYNTAX      SnmpAdminString(SIZE(1..255))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The corresponding Kerberos Realm name.  This is used as
        an index into pktcMtaDevRealmTable.  When used as an index,
        used by both the Manager(SNMPv3 Entity) and the MTA."
    ::= {      pktcMtaDevRealmEntry 1 }

pktcMtaDevRealmPkinitGracePeriod OBJECT-TYPE
    SYNTAX      Integer32 (15..600)
    UNITS      "minutes"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION

```

"For the purposes of the key management with an Application Server (CMS or Provisioning Server), the MTA MUST obtain a new Kerberos ticket (with a PKINIT exchange) this many minutes before the old ticket expires. The minimum allowable value is 15 mins. The default is 30 mins. This parameter MAY also be used with other Kerberized applications."

DEFVAL { 30 }
 ::= { pktcMtaDevRealmEntry 2 }

pktcMtaDevRealmTgsGracePeriod OBJECT-TYPE

SYNTAX Integer32 (1..600)
 UNITS "minutes"
 MAX-ACCESS read-create
 STATUS current

DESCRIPTION

"When the MTA implementation uses TGS Request/TGS Reply Kerberos messages for the purpose of the key management with an Application Server (CMS or Provisioning Server), the MTA MUST obtain a new service ticket for the Application Server (with a TGS Request) this many minutes before the old ticket expires. The minimum allowable value is 1 min. The default is 10 mins. This parameter MAY also be used with other Kerberized applications."

DEFVAL { 10 }
 ::= { pktcMtaDevRealmEntry 3 }

pktcMtaDevRealmOrgName OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (1..64))
 MAX-ACCESS read-create
 STATUS current

DESCRIPTION

"The value of the X.500 organization name attribute in the subject name of the Service provider certificate"

::= { pktcMtaDevRealmEntry 4 }

 --
 -- Unsolicited Key Updates are based on an exponential backoff
 -- mechanism with two timers for AS replies. The backoff timers has a
 -- maximum value of pktcMtaDevRealmUnsolicitedKeyMaxTimeout seconds
 -- and a nominal timer has a pktcMtaDevRealmUnsolicitedKeyNomTimeout
 -- seconds from which the backoff timer determinations are made.
 -- After pktcMatDevRealmUnsolicitedMaxRetries have occurred no more
 -- attempts are made.
 --

pktcMtaDevRealmUnsolicitedKeyMaxTimeout OBJECT-TYPE

SYNTAX Integer32 (1..600)
 UNITS "seconds"
 MAX-ACCESS read-create
 STATUS current

DESCRIPTION

"This timeout applies only when the MTA initiated key management. The maximum timeout is the value which may not be exceeded in the exponential backoff algorithm. If provided, DHCP-Option-122-Sub-option 4 overrides this value."

REFERENCE

"PacketCable Security Specification"

DEFVAL { 30 }
 ::= { pktcMtaDevRealmEntry 5 }

```
pktcMtaDevRealmUnsolicitedKeyNomTimeout OBJECT-TYPE
    SYNTAX      Integer32 (100..600000)
    UNITS       "milliseconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "Defines the starting value of the timeout for the AS-REQ/REP Backoff
         and Retry mechanism with exponential timeout. If
         provided, DHCP-Option-122-Sub-option 4 override this
         value."
    REFERENCE
        "PacketCable Security Specification,
         PacketCable Provisioning Specification"
    DEFVAL { 10000 }
    ::= { pktcMtaDevRealmEntry 6 }
```

```
pktcMtaDevRealmUnsolicitedKeyMeanDev OBJECT-TYPE
    SYNTAX      Integer32 (1..600)
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "This is measurement of the mean deviation for the round
         trip delay timings."
    REFERENCE
        "PacketCable Security Specification"
    DEFVAL { 2 }
    ::= { pktcMtaDevRealmEntry 7 }
```

```
pktcMtaDevRealmUnsolicitedKeyMaxRetries OBJECT-TYPE
    SYNTAX      Integer32 (0..1024)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This is the maximum number of retries before the MTA
         gives up attempting to establish a security association.
         If provided, DHCP-Option-122-Sub-option 4 overrides this
         value."
    REFERENCE
        "PacketCable Security Specification"
    DEFVAL { 5 }
    ::= { pktcMtaDevRealmEntry 8 }
```

```
pktcMtaDevRealmStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object contains the Row Status associated with
         the pktcMtaDevRealmTable."
    ::= { pktcMtaDevRealmEntry 9 }
```

```
-----
--
-- pktcMtaDevCmsTable
--
-- The pktcMtaDevCmsTable shows the IPsec key management policy
-- relating to a particular CMS. The table is indexed with
-- pktcMtaDevCmsFQDN.
--
-----
```

```
pktcMtaDevCmsTable OBJECT-TYPE
```

```

SYNTAX      SEQUENCE OF PkctcMtaDevCmsEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "Contains per CMS key management policy."
 ::= {      pkctcMtaDevSecurity 17 }

pkctcMtaDevCmsEntry OBJECT-TYPE
SYNTAX      PkctcMtaDevCmsEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "List of key management parameters for a single MTA-CMS
    interface."
    INDEX { IMPLIED pkctcMtaDevCmsFqdn }
    ::= {      pkctcMtaDevCmsTable 1 }

PkctcMtaDevCmsEntry ::= SEQUENCE {
    pkctcMtaDevCmsFqdn                SnmpAdminString,
    pkctcMtaDevCmsKerbRealmName       SnmpAdminString,
    pkctcMtaDevCmsSolicitedKeyTimeout Integer32,
    pkctcMtaDevCmsMaxClockSkew        Integer32,
    pkctcMtaDevCmsUnsolicitedKeyMaxTimeout Integer32,
    pkctcMtaDevCmsUnsolicitedKeyNomTimeout Integer32,
    pkctcMtaDevCmsUnsolicitedKeyMeanDev Integer32,
    pkctcMtaDevCmsUnsolicitedKeyMaxRetries Integer32,
    pkctcMtaDevCmsStatus              RowStatus,
    pkctcMtaDevCmsIpsecCtrl           TruthValue
}

pkctcMtaDevCmsFqdn OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE(1..255))
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The fully qualified domain name of the CMS.
    is the index into the pkctcMtaDevCmsTable.
    When used as an index, the upper case ASCII
    representation of the associated CMS FQDN
    MUST be used by both the SNMP Manager and the MTA."
    ::= {      pkctcMtaDevCmsEntry 1 }

pkctcMtaDevCmsKerbRealmName OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE(1..255))
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The Kerberos Realm Name of the associated CMS. This is
    the index into the pkctcMtaDevRealmTable.
    When used as an index, the upper case ASCII
    representation of the associated CMS FQDN
    must be used by both the SNMP Manager and the MTA "
    ::= {      pkctcMtaDevCmsEntry 2 }

pkctcMtaDevCmsMaxClockSkew OBJECT-TYPE
SYNTAX      Integer32 (1..1800)
UNITS       "seconds"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This is the maximum allowable clock skew between the
    MTA and CMS"
    DEFVAL { 300 }
  
```

```
 ::= { pktcMtaDevCmsEntry 3 }

pktcMtaDevCmsSolicitedKeyTimeout OBJECT-TYPE
    SYNTAX Integer32 (100..30000)
    UNITS "milliseconds"
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
        "This timeout applies only when the CMS initiated key
        management(with a Wake Up or Rekey message). It is the
        period during which the MTA will save a nonce (inside the
        sequence number field) from the sent out AP Request and
        wait for the matching AP Reply from the CMS."
    REFERENCE
        "PacketCable Security Specification"
    DEFVAL { 1000 }
    ::= { pktcMtaDevCmsEntry 4 }
```

```
-----
--
-- Unsolicited Key Updates are based on an exponential backoff
-- mechanism with mechanism with two timers for AP replies. The
-- backoff timers have a maximum value of
-- pktcMtaDevCmsUnsolicitedKeyMaxTimeout
-- seconds and a nominal timer has
-- pktcMtaDevCmsUnsolicitedKeyNomTimeout seconds from which the
-- backoff timer determinations are made. After
-- pktcMatDevCmsUnsolicitedMaxRetries have occurred no more
-- attempts are made.
--
-----
```

```
pktcMtaDevCmsUnsolicitedKeyMaxTimeout OBJECT-TYPE

    SYNTAX      Integer32 (1..600)
    UNITS        "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This timeout applies only when the MTA initiated key.
        The maximum management timeout is the value which may not
        be exceeded in the exponential backoff algorithm."
    REFERENCE
        "PacketCable Security Specification"
    DEFVAL { 8 }
    ::= { pktcMtaDevCmsEntry 5 }
```

```
pktcMtaDevCmsUnsolicitedKeyNomTimeout OBJECT-TYPE
    SYNTAX Integer32 (100..30000)
    UNITS "milliseconds"
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
        "Defines the starting value of the timeout for the
        AP-REQ/REP Backoff and Retry mechanism with exponential
        timeout for CMS."
    REFERENCE
        "PacketCable Security Specification"
    DEFVAL { 500 }
    ::= { pktcMtaDevCmsEntry 6 }
```

```
pktcMtaDevCmsUnsolicitedKeyMeanDev OBJECT-TYPE
```

```

SYNTAX      Integer32 (1..600)
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      obsolete
DESCRIPTION
    "This is the measurement of the mean deviation for the
    round trip delay timings."
REFERENCE
    "PacketCable Security Specification"
 ::= { pktcMtaDevCmsEntry 7 }
  
```

pktcMtaDevCmsUnsolicitedKeyMaxRetries OBJECT-TYPE

```

SYNTAX Integer32 (0..1024)
MAX-ACCESS read-create
STATUS current
DESCRIPTION
    "This is the maximum number of retries before the MTA
    gives up attempting to establish a security association."
REFERENCE
    "PacketCable Security Specification"
DEFVAL { 5 }
 ::= { pktcMtaDevCmsEntry 8 }
  
```

pktcMtaDevCmsStatus OBJECT-TYPE

```

SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object contains the Row Status associated with the
    pktcMtaDevCmsTable."
 ::= { pktcMtaDevCmsEntry 9 }
  
```

pktcMtaDevCmsIpssecCtrl OBJECT-TYPE

```

SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The value of 'true(1)' indicates that IPSEC and IPSEC
    KeyManagement MUST be used to communicate with the CMS.
    The value of 'false(2)' indicates that IPSEC Signaling
    Security is disabled for both the IPSEC Key Management and
    IPSECprotocol (for the specific CMS)."
DEFVAL { true }
 ::= { pktcMtaDevCmsEntry 10 }
  
```

```

=====
--
--      pktcMtaCmsMapTable
--*** this table is obsolete ***
--
--
-- The pktcMtaCmsMapTable contains the signaling associations
-- between MTA endpoints and CMSs. It maps the endpoint to
-- zero or more entries in pktcMtaDevCmsTable.
--
-- The table contains the following indexes and rows:
--
-- ifIndex -the index of the physical port
--
  
```

```
-- pktcMtaCmsMapCmsIndex - the index of the CMS entry in the
-- pktcMtaDevCmsTable. Valid indices are equal to current
-- pktcMtaDevCmsIndex values.
--
-- pktcMtaCmsMapOperStatus - this value indicates which signaling
-- association the endpoint is actively using
--
-- pktcMtaCmsMapAdminStatus - this flag indicates whether or not
-- an endpoint should use a particular CMS and its security
-- association. By setting this flag to inhibit, this associated
-- CMS cannot provide signaling to the referenced endpoint.
--
-- pktcMtaCmsMapRowStatus - allows for the creation and deletion of
-- endpoint mappings via the NMS
--
-----
pktcMtaCmsMapTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PktcMtaCmsMapEntry
    MAX-ACCESS  not-accessible
    STATUS      obsolete
    DESCRIPTION
        "Contains per endpoint CMS signaling associations."
    ::= { pktcMtaDevSecurity 18 }

pktcMtaCmsMapEntry OBJECT-TYPE
    SYNTAX      PktcMtaCmsMapEntry
    MAX-ACCESS  not-accessible
    STATUS      obsolete
    DESCRIPTION
        "List of signaling associations."
    INDEX { ifIndex, pktcMtaCmsMapCmsFqdn }
    ::= { pktcMtaCmsMapTable 1 }

PktcMtaCmsMapEntry ::= SEQUENCE {
    pktcMtaCmsMapCmsFqdn DisplayString,
    pktcMtaCmsMapOperStatus  INTEGER,
    pktcMtaCmsMapAdminStatus  INTEGER,
    pktcMtaCmsMapRowStatus  RowStatus
}

pktcMtaCmsMapCmsFqdn OBJECT-TYPE
    SYNTAX      DisplayString (SIZE(1..255))
    MAX-ACCESS  not-accessible
    STATUS      obsolete
    DESCRIPTION
        "The index for the associated CMS. Valid indices
        are equal to current pktcMtaDevCmsFqdn values."
    ::= { pktcMtaCmsMapEntry 1 }

pktcMtaCmsMapOperStatus OBJECT-TYPE
    SYNTAX      INTEGER {
        inactive      (1),
        active        (2)
    }
    MAX-ACCESS  read-only
    STATUS      obsolete
    DESCRIPTION
        "The operational status of signaling association. The
        meaning of the status is as follows:
        inactive - signaling is not currently active
        active - signaling is active."
```



```

 ::= { pktcMtaCmsMapEntry 2 }

pktcMtaCmsMapAdminStatus OBJECT-TYPE
    SYNTAX      INTEGER {
        inhibit (1),
        allow   (2)
    }
    MAX-ACCESS  read-create
    STATUS      obsolete
    DESCRIPTION
        "The administrative status for signaling over the indicated
        security association.  The meaning of the status is as
        follows:
        inhibit -signaling is not currently allowed
        allow - signaling is allowed."
    ::= { pktcMtaCmsMapEntry 3 }

pktcMtaCmsMapRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      obsolete
    DESCRIPTION
        "This object is used for creating and deleting an entry
        in this table via an element manager."
    ::= { pktcMtaCmsMapEntry 4 }

pktcMtaDevResetKrbTickets OBJECT-TYPE
    SYNTAX      BITS {
        invalidateProvOnReboot (0),
        invalidateAllCmsOnReboot (1)
    }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object defines a Kerberos Ticket Control Mask that
        instructs the MTA to invalidate the specific Application
        Server Kerberos Ticket(s) that are stored locally in the
        MTA NVRAM (non-volatile or persistent memory).
        If the MTA does not store Kerberos tickets in NVRAM, it
        MUST ignore setting of this object, and MUST report a BITS
        value of zero when the object is read.
        If the MTA supports Kerberos tickets storage in NVRAM, the
        object value is encoded as follows:
        - Setting the invalidateProvOnReboot bit (bit 0) to 1
          means that the MTA MUST invalidate the Kerberos
          Application Ticket(s) for the Provisioning Application
          at the next MTA reboot (if secure SNMP provisioning mode
          is used).  In non secure provisioning modes, the MTA MUST
          return an 'inconsistentValue' in response to SNMP SET
          operations with a bit 0 set to 1.
        - Setting the invalidateAllCmsOnReboot bit (bit 1) to 1
          means that the MTA MUST invalidate the Kerberos
          Application Ticket(s) for all CMSes currently assigned
          to the MTA endpoints."
    REFERENCE
        "PacketCable Security Specification"
    DEFVAL { { } }
    ::= { pktcMtaDevSecurity 19 }

--
-- notification group is for future extension.
--
pktcMtaNotificationPrefix OBJECT IDENTIFIER ::= { pktcMtaMib 2 }

```

```

pktcMtaNotification OBJECT IDENTIFIER ::= {
  pktcMtaNotificationPrefix 0 }
pktcMtaConformance OBJECT IDENTIFIER ::= { pktcMtaMib 3 }
pktcMtaCompliances OBJECT IDENTIFIER ::= { pktcMtaConformance 1 }
pktcMtaGroups OBJECT IDENTIFIER ::= { pktcMtaConformance 2 }
--
-- Notification Group
--
pktcMtaDevProvisioningEnrollment NOTIFICATION-TYPE
  OBJECTS {
    sysDescr,
    pktcMtaDevSwCurrentVers,
    pktcMtaDevTypeIdentifier,
    pktcMtaDevMacAddress,
    pktcMtaDevCorrelationId
  }
  STATUS current
  DESCRIPTION
    "This INFORM notification is issued by the MTA to initiate
    the PacketCable provisioning process when the MTA SNMP
    enrollment mechanism is used.
    It contains the system description, the current software
    version, the MTA device type identifier, the MTA MAC
    address (obtained in the MTA ifTable in the ifPhysAddress
    object that corresponds to the ifIndex 1) and a
    correlation ID."
  ::= { pktcMtaNotification 1 }

pktcMtaDevProvisioningStatus NOTIFICATION-TYPE
  OBJECTS {
    pktcMtaDevMacAddress,
    pktcMtaDevCorrelationId,
    pktcMtaDevProvisioningState
  }
  STATUS current
  DESCRIPTION
    "This INFORM notification may be issued by the MTA to
    confirm the completion of the PacketCable provisioning
    process, and to report its provisioning completion
    status.
    It contains the MTA MAC address (obtained in the MTA
    ifTable in the ifPhysAddress object that corresponds
    to the ifIndex 1), a correlation ID and the MTA
    provisioning state as defined in
    pktcMtaDevProvisioningState."
  ::= { pktcMtaNotification 2 }

-- compliance statements
pktcMtaBasicCompliance MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "The compliance statement for devices that implement
    MTA feature."
  MODULE --pktcMtaMib
-- unconditionally mandatory groups
  MANDATORY-GROUPS {
    pktcMtaGroup,
    pktcMtaNotificationGroup
  }
  ::= { pktcMtaCompliances 3 }

pktcMtaGroup OBJECT-GROUP
  OBJECTS {

```

```

    pktcMtaDevResetNow,
    pktcMtaDevSerialNumber,
    pktcMtaDevMacAddress,
    pktcMtaDevFQDN,
    pktcMtaDevEndPntCount,
    pktcMtaDevEnabled,
    pktcMtaDevTypeIdentifier,
    pktcMtaDevProvisioningState,
    pktcMtaDevHttpAccess,
    pktcMtaDevCertificate,
    pktcMtaDevCorrelationId,
    pktcMtaDevManufacturerCertificate,
    pktcMtaDevServerDhcp1,
    pktcMtaDevServerDhcp2,
    pktcMtaDevServerDns1,
    pktcMtaDevServerDns2,
    pktcMtaDevTimeServer,
    pktcMtaDevConfigFile,
    pktcMtaDevSnmpEntity,
    pktcMtaDevRealmPkinitGracePeriod,
    pktcMtaDevRealmTgsGracePeriod,
    pktcMtaDevRealmOrgName,
    pktcMtaDevRealmUnsolicitedKeyMaxTimeout,
    pktcMtaDevRealmUnsolicitedKeyNomTimeout,
    pktcMtaDevRealmUnsolicitedKeyMaxRetries,
    pktcMtaDevRealmStatus,
    pktcMtaDevCmsKerbRealmName,
    pktcMtaDevCmsUnsolicitedKeyMaxTimeout,
    pktcMtaDevCmsUnsolicitedKeyNomTimeout,
    pktcMtaDevCmsUnsolicitedKeyMaxRetries,
    pktcMtaDevCmsSolicitedKeyTimeout,
    pktcMtaDevCmsMaxClockSkew,
    pktcMtaDevCmsStatus,
    pktcMtaDevProvUnsolicitedKeyMaxTimeout,
    pktcMtaDevProvUnsolicitedKeyNomTimeout,
    pktcMtaDevProvUnsolicitedKeyMaxRetries,
    pktcMtaDevProvKerbRealmName,
    pktcMtaDevProvSolicitedKeyTimeout,
    pktcMtaDevProvConfigHash,
    pktcMtaDevProvConfigKey,
    pktcMtaDevProvState,
    pktcMtaDevProvisioningTimer,
    pktcMtaDevTelephonyRootCertificate,
    pktcMtaDevErrorOid,
    pktcMtaDevErrorGiven,
    pktcMtaDevErrorReason,
    pktcMtaDevSwCurrentVers,
    pktcMtaDevResetKrbTickets,
    pktcMtaDevCmsIpsecCtrl,
    pktcMtaDevProvisioningCounter
  }
  STATUS      current
  DESCRIPTION
    "Group of objects for PacketCable MTA MIB."
  ::= { pktcMtaGroups 1 }

pktcMtaNotificationGroup NOTIFICATION-GROUP
  NOTIFICATIONS {
    pktcMtaDevProvisioningStatus,
    pktcMtaDevProvisioningEnrollment
  }
  STATUS      current
  DESCRIPTION

```

```
        "These notifications deal with change in status of
        MTA Device."
 ::= { pktcMtaGroups 2 }

pktcMtaObsoleteGroup      OBJECT-GROUP
OBJECTS {
    pktcMtaDevHardwareVersion,
    pktcMtaDevSignature,
    pktcMtaDevServProviderCertificate,
    pktcMtaDevTelephonyCertificate,
    pktcMtaDevKerberosRealm,
    pktcMtaDevKerbPrincipalName,
    pktcMtaDevServGracePeriod,
    pktcMtaDevLocalSystemCertificate,
    pktcMtaDevKeyMgmtTimeout1,
    pktcMtaDevTgsLocation,
    pktcMtaDevTgsStatus,
    pktcMtaDevServerBootState,
    pktcMtaCmsMapOperStatus,
    pktcMtaCmsMapAdminStatus,
    pktcMtaCmsMapRowStatus,
    pktcMtaDevRealmUnsolicitedKeyMeanDev,
    pktcMtaDevCmsUnsolicitedKeyMeanDev,
    pktcMtaDevProvUnsolicitedKeyMeanDev,
    pktcMtaDevServerDhcp,
    pktcMtaDevKeyMgmtTimeout2
}
STATUS obsolete
DESCRIPTION
    "Group of obsolete objects for PacketCable MTA MIB."
 ::= { pktcMtaGroups 3}

END
```