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

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1 SCOPE

This standard describes the IPCablecom 1.0 MTA MIB requirement.

2 REFERENCES

2.1 NORMATIVE 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.

- [1] ANSI/SCTE 24-6 2009, IPCablecom 1.0 Part 6: Management Information Base (MIB) Network.
- [2] ANSI/SCTE 24-8 2009, IPCablecom 1.0 Part 8: Network Call Signaling Management Information Base (MIB) Requirements.
- [3] ANSI/SCTE 24-5 2009, 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 24-8 2009, 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 2009, 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

- [14] ANSI/SCTE 24-1 2009, IPCablecom 1.0 Part 1: Architecture Framework for the Delivery of Time-Critical Services Over Cable Television Networks Using Cable Modems.

3 ABBREVIATIONS

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 ACRONYMS AND ABBREVIATIONS

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 "IPCablecom 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     - Telogy 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 IPCablecom 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))
```

```
--
```

```
-- IPCablecom 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  
"IPcablecom 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
```


"IPcablecom 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 IPcablecom entities such as CMS,
Provisioning Server, KDC, other MTAs and MGs on all
IPcablecom 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 IPcablecom 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 IPcablecom Security Specification"
REFERENCE
"IPcablecom Security Specification;
IPcablecom 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

"IPCablecom 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

"IPCablecom 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 PkctMtaDevErrorOidsEntry

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 PkctMtaDevErrorOidsEntry

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 }

PkctMtaDevErrorOidsEntry ::= SEQUENCE {

```

pkcMtaDevErrorOidIndex      Integer32,
pkcMtaDevErrorOid          SnmpAdminString,
pkcMtaDevErrorGiven        SnmpAdminString,
pkcMtaDevErrorReason       SnmpAdminString
}

pkcMtaDevErrorOidIndex OBJECT-TYPE
    SYNTAX Integer32(1..1024)
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "This is the index to pkcMtaDevErrorOidsEntry.
        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."
    ::= { pkcMtaDevErrorOidsEntry 1}

pkcMtaDevErrorOid          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."
    ::= { pkcMtaDevErrorOidsEntry 2}

pkcMtaDevErrorGiven       OBJECT-TYPE
    SYNTAX SnmpAdminString
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "If the error was due to the value associated
        with the corresponding pkcMtaDevErrorOid, 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."
    ::= { pkcMtaDevErrorOidsEntry 3}

pkcMtaDevErrorReason      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."
    ::= { pkcMtaDevErrorOidsEntry 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

"IPCom Cablecom 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 }

pktcMtaDevSnmEntity 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

"IPcablecom 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 IPcablecom 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

"IPcablecom MTA Device Provisioning Specification;
IPcablecom 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

"IPCablecom 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

"IPCablecom 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

"IPCablecom 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

"IPCablecom 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

"IPCablecom 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

"IPCablecom MTA Device Provisioning Specification, IPCablecom 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 IPCablecom Security specification."
    REFERENCE
        "IPCablecom 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 IPCablecom
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 TGSs 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 IPCablecom 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
 "IPCablecom 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
 "IPCablecom Security Specification"
 ::= { pktcMtaDevSecurityEntry 8 }

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

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

pkctMtaDevTgsEntry OBJECT-TYPE
SYNTAX PkctMtaDevTgsEntry
MAX-ACCESS not-accessible
STATUS obsolete -- Secure Provisioning ECR
DESCRIPTION
"List of Tgs attributes for a single IPCablecom
endpoint interface."
INDEX { ifIndex, pkctMtaDevTgsIndex }
::= { pkctMtaDevTgsTable 1 }

PkctMtaDevTgsEntry ::= SEQUENCE {
pkctMtaDevTgsIndex Integer32,
pkctMtaDevTgsLocation DisplayString,
pkctMtaDevTgsStatus RowStatus
}

pkctMtaDevTgsIndex 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."
::= { pkctMtaDevTgsEntry 1 }

pkctMtaDevTgsLocation 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."
::= { pkctMtaDevTgsEntry 2 }

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

pkctMtaDevTelephonyRootCertificate 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 IPCablecom 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
"IPcablecom 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
"IPcablecom Security Specification,
IPcablecom 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
"IPcablecom 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
"IPcablecom 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 PktcMtaDevCmsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "Contains per CMS key management policy."
::= { pktcMtaDevSecurity 17 }
```

```
pktcMtaDevCmsEntry OBJECT-TYPE
SYNTAX PkctMtaDevCmsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "List of key management parameters for a single MTA-CMS
    interface."
INDEX { IMPLIED pktcMtaDevCmsFqdn }
::= { pktcMtaDevCmsTable 1 }
```

```
PkctMtaDevCmsEntry ::= SEQUENCE {
    pktcMtaDevCmsFqdn          SnmpAdminString,
    pktcMtaDevCmsKerbRealmName SnmpAdminString,
    pktcMtaDevCmsSolicitedKeyTimeout Integer32,
    pktcMtaDevCmsMaxClockSkew Integer32,
    pktcMtaDevCmsUnsolicitedKeyMaxTimeout Integer32,
    pktcMtaDevCmsUnsolicitedKeyNomTimeout Integer32,
    pktcMtaDevCmsUnsolicitedKeyMeanDev Integer32,
    pktcMtaDevCmsUnsolicitedKeyMaxRetries Integer32,
    pktcMtaDevCmsStatus      RowStatus,
    pktcMtaDevCmsIpsecCtrl   TruthValue
}
```

```
pktcMtaDevCmsFqdn 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 pktcMtaDevCmsTable.
    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."
::= { pktcMtaDevCmsEntry 1 }

pktcMtaDevCmsKerbRealmName 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 pktcMtaDevRealmTable.
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 "
::= { pktcMtaDevCmsEntry 2 }

pktcMtaDevCmsMaxClockSkew 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
"IPCablecom 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

"IPcablecom 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

"IPcablecom 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

"IPcablecom 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

"IPcablecom 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 }

pktcMtaDevCmsIpsecCtrl 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

"IPCablecom 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 IPCablecom 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 IPCablecom 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 IPCablecom 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 IPCablecom MTA MIB."
::= { pktcMtaGroups 3 }

```

END

