Modem Management Information Base (MIB) using SMIv2

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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1. Introduction

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes managed objects used for managing dial-up modems and similar dial-up devices. This MIB module provides a set of objects that are the minimum necessary to provide the ability to monitor and control those devices, and is consistent with the SNMP framework and existing SNMP standards.
2. The SNMPv2 Network Management Framework

The SNMPv2 Network Management Framework consists of four major components. They are:

- **RFC 1442** which defines the SMI, the mechanisms used for describing and naming objects for the purpose of management.

- **STD 17, RFC 1213** defines MIB-II, the core set of managed objects for the Internet suite of protocols.

- **RFC 1445** which defines the administrative and other architectural aspects of the framework.

- **RFC 1448** which defines the protocol used for network access to managed objects.

The Framework permits new objects to be defined for the purpose of experimentation and evaluation.

2.1. Object Definitions

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the subset of Abstract Syntax Notation One (ASN.1) defined in the SMI. In particular, each object object type is named by an OBJECT IDENTIFIER, an administratively assigned name. The object type together with an object instance serves to uniquely identify a specific instantiation of the object. For human convenience, we often use a textual string, termed the descriptor, to refer to the object type.

3. Definitions

Modem-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, OBJECT-IDENTITY,
    Counter32, Integer32 FROM SNMPv2-SMI
    DisplayString FROM SNMPv2-TC
    MODULE-COMPLIANCE, OBJECT-GROUP FROM SNMPv2-CONF
    mib-2 FROM RFC1213-MIB;

mdmMIB MODULE-IDENTITY
    LAST-UPDATED "9406120000Z"
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DESCRIPTION
"The MIB module for management of dial-up modems."
::= { mdmMIB 1 }

mdmMib OBJECT IDENTIFIER ::= { mib-2 38 }

mdmMIBObjects OBJECT IDENTIFIER ::= { mdmMIB 1 }

-- conformance information

mdmConformance OBJECT IDENTIFIER ::= { mdmMIB 2 }

mdmCompliances OBJECT IDENTIFIER ::= { mdmConformance 1 }
mdmGroups OBJECT IDENTIFIER ::= { mdmConformance 2 }

-- units of conformance

mdmIDGroup OBJECT-GROUP
OBJECTS { mdmIDManufacturerOID, mdmIDProductDetails }
STATUS current
DESCRIPTION
"A collection of objects that identify the manufacturer and
model information for a modem."
::= { mdmGroups 1 }

mdmLineInterfaceGroup OBJECT-GROUP
OBJECTS { mdmLineCarrierLossTime,
mdmLineState, mdmLineCapabilitiesID,
mdmLineCapabilitiesEnableRequested,
mdmLineCapabilitiesEnableGranted }
STATUS current
DESCRIPTION
"A collection of objects that describe the configuration and
state of the modem’s line interface."
::= { mdmGroups 2 }

mdmDTEInterfaceGroup OBJECT-GROUP
OBJECTS { mdmDTEActionDTROnToOff, mdmDTEActionDTROffToOn,
    mdmDTESyncTimingSource, mdmDTESyncAsyncMode,
    mdmDTEInactivityTimeout }

STATUS     current
DESCRIPTION
    "A collection of objects that describe the configuration and
    state of the modem's DTE interface."
 ::= { mdmGroups 3 }

mdmCallControlGroup OBJECT-GROUP
OBJECTS { mdmCCRingsBeforeAnswer, 
    mdmCCCallSetUpFailTimer, mdmCCResultCodeEnable, 
    mdmCCEscapeAction, mdmCCCallDuration, 
    mdmCCConnectionFailReason, mdmCCStoredDialString }

STATUS     current
DESCRIPTION
    "A collection of objects that describe the configuration of
    call control capabilities on the modem and the status of
    calls placed with this modem."
 ::= { mdmGroups 4 }

mdmErrorControlGroup OBJECT-GROUP
OBJECTS { mdmECErrorControlUsed }

STATUS     current
DESCRIPTION
    "A collection of objects that describe the configuration and
    state of error control on a modem."
 ::= { mdmGroups 5 }

mdmDataCompressionGroup OBJECT-GROUP
OBJECTS { mdmDCCompressionTypeUsed }

STATUS     current
DESCRIPTION
    "A collection of objects that describe the configuration and
    state of data compression on a modem."
 ::= { mdmGroups 6 }

mdmSignalConvertorGroup OBJECT-GROUP
OBJECTS { mdmSCCurrentLineReceiveRate, mdmSCCurrentLineTransmitRate, 
    mdmSCInitialLineReceiveRate, mdmSCInitialLineTransmitRate, 
    mdmSCModulationSchemeUsed }

STATUS     current
DESCRIPTION
    "A collection of objects that describe the configuration and
    state of error control on a modem."
 ::= { mdmGroups 7 }

mdmStatisticsGroup OBJECT-GROUP
OBJECTS { mdmStatsRingNoAnswers,
    mdmStatsIncomingConnectionFailures,
    mdmStatsIncomingConnectionCompletions,
    mdmStatsFailedDialAttempts,
    mdmStatsOutgoingConnectionFailures,
    mdmStatsOutgoingConnectionCompletions,
    mdmStatsRetrains,
    mdmStats2400OrLessConnections, mdmStats2400To14400Connections,
    mdmStatsGreaterThan14400Connections,
    mdmStatsErrorControlledConnections,
    mdmStatsCompressedConnections,
    mdmStatsCompressionEfficiency,
    mdmStatsSentOctets, mdmStatsReceivedOctets,
    mdmStatsSentDataFrames, mdmStatsReceivedDataFrames,
    mdmStatsResentFrames, mdmStatsErrorFrames }

STATUS  current
DESCRIPTION
'A collection of objects that describe the state of calls on
this modem.'
::= { mdmMIBObjects 1 }

mdmNumber OBJECT-TYPE
SYNTAX  Integer32
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
'The number of modem rows in the modem table. This value
defines the maximum value of the mdmIndex object.'
::= { mdmMIBObjects 2 }

-- The modem ID table.

mdmIDTable OBJECT-TYPE
SYNTAX      SEQUENCE OF MdmIDEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
'The base table for the modems managed by this MIB. The
mdmLineTable, mdmDTEInterfaceTable, mdmCallControlTable, and
mdmStatsTable all augment the rows defined in this table.'
::= { mdmMIBObjects 3 }

mdmIDEntry OBJECT-TYPE
SYNTAX      MdmIDEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
'Entries in this table are created only by the agent. One
entry exists for each modem managed by the agent.

INDEX { mdmIndex }
::= { mdmIDTable 1 }

MdmIDEntry ::= SEQUENCE {
      mdmIndex                Integer32,
      mdmIDManufacturerOID    OBJECT IDENTIFIER,
      mdmIDProductDetails     DisplayString
}

mdmIndex OBJECT-TYPE
SYNTAX      Integer32 (1..65535)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION "A unique number for each modem that ranges from 1 to
mdmNumber. The value must remain constant at least from one
re-initialization of the network management agent to the
next."
::= { mdmIDEntry 1 }

mdmIDManufacturerOID OBJECT-TYPE
SYNTAX      OBJECT IDENTIFIER
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION "This value is intended to identify the manufacturer, model,
and version of this modem. This may be used to identify the
existence of enterprise-specific functions and behaviours."
REFERENCE "V.58 attribute manufacturerID subfield ManufacturerOI"
::= { mdmIDEntry 2 }

mdmIDProductDetails OBJECT-TYPE
SYNTAX      DisplayString (SIZE (0..79))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION "A textual description of this device, including the
manufacturer’s name, modem model name, hardware revision,
firmware revision, and optionally, its serial number. The
exact format of this description is defined by the vendor.
This description may only contain characters from the NVT
ASCII character set."
REFERENCE "V.58 attribute manufacturerID subfield productDetails"
::= { mdmIDEntry 3 }
-- The modem Line Interface Table

mdmLineTable OBJECT-TYPE
SYNTAX      SEQUENCE OF MdmLineEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  "The modem Line Table augments the modem ID table."
 ::= { mdmMIBObjects 3 }

mdmLineEntry OBJECT-TYPE
SYNTAX      MdmLineEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  "Entries in this table are created only by the agent. One
entry exists for each modem managed by the agent."
AUGMENTS    { mdmIDEntry }
 ::= { mdmLineTable 1 }

MdmLineEntry ::= SEQUENCE { mdmLineCarrierLossTime          Integer32,
                      mdmLineState                    INTEGER
                    }

mdmLineCarrierLossTime OBJECT-TYPE
SYNTAX      Integer32 (1..255)
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  "Duration in 10ths of a second the modem waits after loss of
carrier before hanging up. If this value is set to '255',
the modem will not hang up upon loss of carrier. This
allows the modem to distinguish between a momentary lapse in
line quality and a true disconnect and can be useful to tune
the tolerance of the modem to lines of poor quality."
REFERENCE "V.58 lineSignalFailDisconnectTimer"
 ::= { mdmLineEntry 1 }

mdmLineState OBJECT-TYPE
SYNTAX      INTEGER {
               unknown(1),
               onHook(2),
               offHook(3),  -- not connected
               connected(4),
               busiedOut(5),
               reset(6)
             }

MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  
"Allows the inspection and alteration of the state of the modem. Management commands may change the state to 'on-hook', 'busied-out', or 'reset' from any state. No other alterations are permitted from the management protocol. When this object is set to reset, the modem shall be reset and the value will change to the modem’s new, implementation dependent state."
::= { mdmLineEntry 2 }

mdmLineCapabilitiesTable OBJECT-TYPE
SYNTAX      SEQUENCE OF MdmLineCapabilitiesEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  
"A list of protocol capabilities for this modem."
::= { mdmMIBObjects 4 }

mdmLineCapabilitiesEntry OBJECT-TYPE
SYNTAX      MdmLineCapabilitiesEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  
"A listing of the protocol(s) that this modem is capable of. Entries in this table are created only by the agent. One entry exists for each protocol that the modem is capable of, regardless of whether that protocol is enabled or not.

This table is useful for providing an inventory of the capabilities on a modem, and allowing the manager to enable or disable capabilities from the menu of available possibilities. Row creation is not required to enable or disable capabilities."
INDEX       { mdmIndex, mdmLineCapabilitiesIndex }
::= { mdmLineCapabilitiesTable 1 }

MdmLineCapabilitiesEntry ::= SEQUENCE {
    mdmLineCapabilitiesIndex             Integer32,
    mdmLineCapabilitiesID               OBJECT IDENTIFIER,
    mdmLineCapabilitiesEnableRequested  INTEGER,
    mdmLineCapabilitiesEnableGranted    INTEGER
}

mdmLineCapabilitiesIndex OBJECT-TYPE
SYNTAX      Integer32
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  "A unique index for this capabilities entry."
 ::= { mdmLineCapabilitiesEntry 1 }

mdmLineCapabilitiesID OBJECT-TYPE
SYNTAX      OBJECT IDENTIFIER
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  
  "An identifier for this capability. Standard protocol capabilities will have identifiers registered in this document or other companion standards documents. Proprietary protocol capabilities will be registered by their respective organization. All capabilities, standard or vendor-specific, shall be registered in this table."
 ::= { mdmLineCapabilitiesEntry 2 }

mdmLineCapabilitiesEnableRequested OBJECT-TYPE
SYNTAX      INTEGER {
              disabled(1),
              optional(2),
              preferred(3)
           }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  
  "The requested configuration of this capability. If this value is ‘disabled(1)’, this is a request to disable this protocol. If this value is ‘preferred(3)’, this is a request to enable this protocol, and to prefer it in any negotiation over other appropriate protocols that have a value of ‘optional(2)’.’"
DEFVAL      { preferred }
 ::= { mdmLineCapabilitiesEntry 3 }

mdmLineCapabilitiesEnableGranted OBJECT-TYPE
SYNTAX      INTEGER {
              disabled(1),
              optional(2),
              preferred(3)
           }
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  
  "The actual configuration of this capability. The agent shall attempt to set this as close as possible to the associated mdmLineCapabilitiesEnableRequested value. The
agent shall make this determination in an implementation-specific manner that may take into account the configuration of other capabilities or other considerations. The modem will choose in an implementation-specific manner between multiple mutually-exclusive capabilities that each have the same (non-disabled) value. However, the modem must prefer all capabilities with a value of 'preferred(3)' over all capabilities with a value of 'optional(2)'.

In other words, if there are one or more mutually-exclusive capabilities (e.g. V.32 and V.32bis) that are set to 'preferred', the agent must choose one in an implementation-specific manner. Otherwise, if there are one or more mutually-exclusive capabilities that are set to 'optional', the agent must choose one in an implementation-specific manner."

::= { mdmLineCapabilitiesEntry 4 }

mdmLineCapabilities OBJECT IDENTIFIER ::= { mdmMIBObjects 5 }

mdmLineCapabilitiesV21 OBJECT-IDENTITY
  STATUS current
  DESCRIPTION
    "ITU V.21"
  ::= { mdmLineCapabilities 1 }

mdmLineCapabilitiesV22 OBJECT-IDENTITY
  STATUS current
  DESCRIPTION
    "ITU V.22"
  ::= { mdmLineCapabilities 2 }

mdmLineCapabilitiesV22bis OBJECT-IDENTITY
  STATUS current
  DESCRIPTION
    "ITU V.22bis"
  ::= { mdmLineCapabilities 3 }

mdmLineCapabilitiesV23CC OBJECT-IDENTITY
  STATUS current
  DESCRIPTION
    "ITU V.23CC"
  ::= { mdmLineCapabilities 4 }

mdmLineCapabilitiesV23SC OBJECT-IDENTITY
  STATUS current
  DESCRIPTION
    "ITU V.23SC"
::= { mdmLineCapabilities 5 }

mdmLineCapabilitiesV25bis OBJECT-IDENTITY
STATUS current
DESCRIPTION "ITU V.25bis"
::= { mdmLineCapabilities 6 }

mdmLineCapabilitiesV26bis OBJECT-IDENTITY
STATUS current
DESCRIPTION "ITU V.26bis"
::= { mdmLineCapabilities 7 }

mdmLineCapabilitiesV26ter OBJECT-IDENTITY
STATUS current
DESCRIPTION "ITU V.26ter"
::= { mdmLineCapabilities 8 }

mdmLineCapabilitiesV27ter OBJECT-IDENTITY
STATUS current
DESCRIPTION "ITU V.27ter"
::= { mdmLineCapabilities 9 }

mdmLineCapabilitiesV32 OBJECT-IDENTITY
STATUS current
DESCRIPTION "ITU V.32"
::= { mdmLineCapabilities 10 }

mdmLineCapabilitiesV32bis OBJECT-IDENTITY
STATUS current
DESCRIPTION "ITU V.32bis"
::= { mdmLineCapabilities 11 }

mdmLineCapabilitiesV32terbo OBJECT-IDENTITY
STATUS current
DESCRIPTION "ITU V.32terbo"
::= { mdmLineCapabilities 12 }

mdmLineCapabilitiesVFC OBJECT-IDENTITY
STATUS current
DESCRIPTION "ITU V.FC"
::= { mdmLineCapabilities 13 }

mdmLineCapabilitiesV34 OBJECT-IDENTITY
  STATUS current
  DESCRIPTION "ITU V.34"
  ::= { mdmLineCapabilities 14 }

mdmLineCapabilitiesV42 OBJECT-IDENTITY
  STATUS current
  DESCRIPTION "ITU V.42"
  ::= { mdmLineCapabilities 15 }

mdmLineCapabilitiesV42bis OBJECT-IDENTITY
  STATUS current
  DESCRIPTION "ITU V.42bis"
  ::= { mdmLineCapabilities 16 }

mdmLineCapabilitiesMNP1 OBJECT-IDENTITY
  STATUS current
  DESCRIPTION "MNP1"
  ::= { mdmLineCapabilities 17 }

mdmLineCapabilitiesMNP2 OBJECT-IDENTITY
  STATUS current
  DESCRIPTION "MNP2"
  ::= { mdmLineCapabilities 18 }

mdmLineCapabilitiesMNP3 OBJECT-IDENTITY
  STATUS current
  DESCRIPTION "MNP3"
  ::= { mdmLineCapabilities 19 }

mdmLineCapabilitiesMNP4 OBJECT-IDENTITY
  STATUS current
  DESCRIPTION "MNP4"
  ::= { mdmLineCapabilities 20 }

mdmLineCapabilitiesMNP5 OBJECT-IDENTITY
  STATUS current
  DESCRIPTION "MNP5"
::= { mdmLineCapabilities 21 }

mdmLineCapabilitiesMNP6 OBJECT-IDENTITY
STATUS current
DESCRIPTION "MNP6"
::= { mdmLineCapabilities 22 }

mdmLineCapabilitiesMNP7 OBJECT-IDENTITY
STATUS current
DESCRIPTION "MNP7"
::= { mdmLineCapabilities 23 }

mdmLineCapabilitiesMNP8 OBJECT-IDENTITY
STATUS current
DESCRIPTION "MNP8"
::= { mdmLineCapabilities 24 }

mdmLineCapabilitiesMNP9 OBJECT-IDENTITY
STATUS current
DESCRIPTION "MNP9"
::= { mdmLineCapabilities 25 }

mdmLineCapabilitiesMNP10 OBJECT-IDENTITY
STATUS current
DESCRIPTION "MNP10"
::= { mdmLineCapabilities 26 }

mdmLineCapabilitiesV29 OBJECT-IDENTITY
STATUS current
DESCRIPTION "ITU V.29"
::= { mdmLineCapabilities 27 }

mdmLineCapabilitiesV33 OBJECT-IDENTITY
STATUS current
DESCRIPTION "ITU V.33"
::= { mdmLineCapabilities 28 }

mdmLineCapabilitiesBell208 OBJECT-IDENTITY
STATUS current
DESCRIPTION "Bell 208"
-- DTE Interface Table

mdmDTEInterfaceTable OBJECT-TYPE
SYNTAX SEQUENCE OF MdmDTEInterfaceEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The modem DTE Interface Table augments the modem ID table."
 ::= { mdmMIBObjects 6 }  

mdmDTEInterfaceEntry OBJECT-TYPE
SYNTAX MdmDTEInterfaceEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Entries in this table are created only by the agent. One entry exists for each modem managed by the agent."
AUGMENTS { mdmIDEntry }
 ::= { mdmDTEInterfaceTable 1 }  

MdmDTEInterfaceEntry ::= SEQUENCE {
  mdmDTEActionDTROnToOff      INTEGER,
  mdmDTEActionDTROffToOn      INTEGER,
  mdmDTESyncTimingSource      INTEGER,
  mdmDTESyncAsyncMode         INTEGER,
  mdmDTEInactivityTimeout     Integer32
}  

mdmDTEActionDTROnToOff OBJECT-TYPE
SYNTAX INTEGER {
  ignore(1),
  escapeToCommandMode(2),
  disconnectCall(3),
  resetModem(4)
}
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Defines the action the modem will take when DTR drops."

If the value is set to ignore(1), the modem takes no action when DTR drops. Typically, mdmDTEActionDTROffToOn would also be set to ignore(1) if this object is set to ignore(1).

If the value is escapeToCommandMode(2), the modem remains
connected and enters command mode. If the value is disconnectCall(3), the current call (if any) is terminated and the modem will not auto-answer while DTR is off. If the value is resetModem(4), the current call (if any) is terminated and the modem is reset."

DEFVAL { disconnectCall }
::= { mdmDTEInterfaceEntry 1 }

mdmDTEActionDTROffToOn OBJECT-TYPE
SYNTAX INTEGER {
  ignore(1),
  enableDial(2),
  autoAnswerEnable(3),
  establishConnection(4)
}
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Defines the action the modem will take when DTR is raised. If the value is set to ignore(1), the modem takes no action when DTR is raised. Typically, mdmDTEActionDTROnToOff would also be set to ignore(1) if this object is set to ignore(1).

If the value is set to enableDial(2), the modem prepares to dial an outgoing call. If the value is set to autoAnswerEnable(3), the modem will be configured to answer any incoming call. If the value is set to establishConnection(4), the modem dials an implementation specific number.

Immediately after any reset or power-on of the modem, if the DTR is high, the action specified here will be executed."

DEFVAL { autoAnswerEnable }
::= { mdmDTEInterfaceEntry 2 }

mdmDTESyncTimingSource OBJECT-TYPE
SYNTAX INTEGER {
  internal(1),
  external(2),
  loopback(3),
  network(4)
}
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The clock source for synchronous transmissions. If set to internal(1), the modem is the clock source and sends the
clock signals to the DTE. If set to external(2), the transmit clock signals are provided by the DTE. If loopback(3), the modem receiver clock is used for the transmit clock. If network(4), the clock signals are supplied by the DCE interface.

If the modem is not in synchronous mode, setting this object will have no effect on the current operations of the modem."  

REFERENCE   "V.58 transmitClockSource"  
DEFVAL      { internal }  
::= { mdmDTEInterfaceEntry 3 }

mdmDTESyncAsyncMode OBJECT-TYPE
SYNTAX      INTEGER {
            async(1),
            sync(2),
            syncAfterDial(3)
        }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  "The operational mode of the modem. If the value is
            syncAfterDial(3), the modem will accept commands in
            asynchronous mode and change to synchronous mode to pass
            data after a dial sequence has been executed."
DEFVAL      { async }
::= { mdmDTEInterfaceEntry 4 }

mdmDTEInactivityTimeout OBJECT-TYPE
SYNTAX      Integer32 (0..65535)
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  "The amount of idle time in minutes that the modem will wait
            before disconnecting a connection. When a call is connected
            and no data is transferred (continuous marking condition) on
            both circuits 103 and 104 for the specified time, the DCE
            disconnects the call. If the value is 0, no idle disconnect
            will occur. This function applies to asynchronous dial
            operations only and is intended for administrative control
            over idle connections."
REFERENCE   "V.58 inactivityTimerSelect"
DEFVAL { 0 }  
::= { mdmDTEInterfaceEntry 5 }

-- The Call Control Table
mdmCallControlTable OBJECT-TYPE
SYNTAX     SEQUENCE OF MdmCallControlEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
   "The modem Call Control Table augments the modem ID table."
 ::= { mdmMIBObjects 7 }

mdmCallControlEntry OBJECT-TYPE
SYNTAX     MdmCallControlEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
   "Entries in this table are created only by the agent. One entry exists for each modem managed by the agent."
AUGMENTS   { mdmIDEntry }
 ::= { mdmCallControlTable 1 }

MdmCallControlEntry ::= SEQUENCE {
  mdmCCRingsBeforeAnswer      Integer32,
  mdmCCCallSetUpFailTimer     Integer32,
  mdmCCResultCodeEnable       INTEGER,
  mdmCCEscapeAction           INTEGER,
  mdmCCCallDuration           Integer32,
  mdmCCConnectionFailReason   INTEGER
}

mdmCCRingsBeforeAnswer OBJECT-TYPE
SYNTAX     Integer32
MAX-ACCESS read-write
STATUS     current
DESCRIPTION
   "Determines which ring the modem will wait to answer the phone on. If this value is '0', the modem will not go offhook and answer a call when a ring signal is detected."
REFERENCE   "V.58 ringsBeforeAnswer"
DEFVAL      { 1 }
 ::= { mdmCallControlEntry 1 }

mdmCCCallSetUpFailTimer OBJECT-TYPE
SYNTAX     Integer32 (0..255)
MAX-ACCESS read-write
STATUS     current
DESCRIPTION
   "This parameter specifies the amount of time, in seconds, that the modem shall allow between either answering a call (automatically or manually) or completion of dialing, and establishment of a connection with the remote modem. If no
connection is established during this time, the modem disconnects from the line and returns a result code indicating the cause of the disconnection. In TIA-602, this is controlled by the value in the S7 register."

REFERENCE   "V.58 callSetUpFailTimer"
DEFVAL      { 30 }
::= { mdmCallControlEntry 2 }

mdmCCResultCodeEnable OBJECT-TYPE
SYNTAX      INTEGER {
             disabled(1),
             numericEnabled(2),
             verboseEnabled(3)
          }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
"When disabled, the DCE shall issue no ‘result codes’ of any kind to the DTE either in response to unsolicited events (eg. ring signal), or commands. In TIA-602, this is controlled by the ATQ command. When numericEnabled, the DCE shall issue result codes in numeric form. When verboseEnabled, the DCE shall issue result codes in a verbose, textual form."

REFERENCE   "V.58 responseModeSelect"
DEFVAL      { verboseEnabled }
::= { mdmCallControlEntry 3 }

mdmCCEscapeAction OBJECT-TYPE
SYNTAX      INTEGER {
             ignoreEscape(1),
             hangUp(2),
             enterCommandMode(3)
          }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
"The modem’s action upon successfully recognizing the ‘escape to command mode’ character sequence."

DEFVAL      { ignoreEscape }
::= { mdmCallControlEntry 4 }

-- Call status portion of the call control table

mdmCCCallDuration OBJECT-TYPE
SYNTAX      Integer32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Present or last completed connection time in seconds. If there have been no previous connections, this value should be -1."

::= { mdmCallControlEntry 5 }

mdmCCConnectionFailReason OBJECT-TYPE
SYNTAX INTEGER {
    -- General
    unknown(1),
    other(2),
    managementCommand(3),
    inactivityTimeout(4),
    mnpIncompatibility(5),
    protocolError(6),
    -- DCE
    powerLoss(10),
    equipmentFailure(11),
    -- DTE Interface
    dtrDrop(20),
    -- Line Interface
    noDialTone(30),
    lineBusy(31),
    noAnswer(32),
    voiceDetected(33),
    -- Signal Converter
    carrierLost(40),
    trainingFailed(41),
    faxDetected(42)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates the reason that the last connection or attempt failed. The meaning of each reason code is explained below.

unknown:
This code means the failure reason is unknown or there has been no previous call.

other:
This code used when no other code is applicable. Additional vendor information may be available elsewhere.

managementCommand:
A management command terminated the call. These commands include escaping to command mode, initiating dialing, restoring lines, and disconnecting.

**inactivityTimeout:**
The call was terminated because it was inactive for at the minimum duration specified.

**mnpIncompatibility:**
The modems are unable to resolve MNP protocol differences.

**protocolError:**
An error occurred in one of protocol in use. Further information is required to determine in which protocol the error occurred, and the exact nature of the error.

**powerLoss:**
The modem lost power and disconnected the call.

**equipmentFailure:**
The modem equipment failed.

**dtrDrop:**
DTR has been turned off while the modem is to disconnect on DTR drop. (Ref: V.58 cct108TurnedOff)

**noDialTone:**
If the modem is to monitor for call progress tones, but the modem has failed to detect dial tone while attempting to dial a number.

**lineBusy:**
Busy signal is detected while busy signal detection is enabled, or while the 'W' or '@' dial modifier is used. (Ref: V.58 engagedTone)

**noAnswer:**
The call was not answered.

**voiceDetected:**
A voice was detected on the call.

**carrierLost:**
Indicates that the modem has disconnected due to detection of loss of carrier. In TIA-602, the S10 register determines the time that loss of carrier
must be detected before the modem disconnects.

trainingFailed:
Indicates that the modems did not successfully train
and reach data mode on the previous connection.

faxDetected:
A fax was detected on the call.
REFERENCE "V.58 callCleared"
::= { mdmCallControlEntry 6 }

-- The Stored Dial String table

mdmCCStoredDialStringTable OBJECT-TYPE
SYNTAX SEQUENCE OF MdmCCStoredDialStringEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The table of stored dial strings."
REFERENCE "V.58 telephoneNumbers"
::= { mdmMIBObjects 8 }

MdmCCStoredDialStringEntry OBJECT-TYPE
SYNTAX MdmCCStoredDialStringEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "A stored dial string."
INDEX { mdmIndex, mdmCCStoredDialStringIndex }
::= { mdmCCStoredDialStringTable 1 }

MdmCCStoredDialStringEntry ::= SEQUENCE {
  mdmCCStoredDialStringIndex Integer32,
  mdmCCStoredDialString DisplayString
}

mdmCCStoredDialStringIndex OBJECT-TYPE
SYNTAX Integer32 (0..65535)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The unique index of a particular dial string."
::= { mdmCCStoredDialStringEntry 1 }

mdmCCStoredDialString OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..64))
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"A dial string stored in the modem."
::= { mdmCCStoredDialStringEntry 2 }

-- The modem Error Correcting Group

mdmECTable OBJECT-TYPE
SYNTAX    SEQUENCE OF MdmECEntry
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION
"The modem error correcting table augments the modem ID
  table."
::= { mdmMIBObjects 9 }

MdmECEntry OBJECT-TYPE
SYNTAX    MdmECEntry
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION
"Entries in this table are created only by the agent. One
  entry exists for each modem managed by the agent."
AUGMENTS    { mdmIDEntry }
::= { mdmECTable 1 }

MdmECEntry ::= SEQUENCE {
  mdmECErrorControlUsed           OBJECT IDENTIFIER
}

mdmECErrorControlUsed OBJECT-TYPE
SYNTAX    OBJECT IDENTIFIER
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
"Indicates the error control method used during the current
  or previous call. This shall be one of the values for error
  control protocols registered in the capabilities table for
  this modem. If no error control protocol is in use, this
  object shall have the value '{0 0}'."
REFERENCE   "V.58 errorControlActive"
::= { mdmECEentry 1 }

-- The modem Data Compression Group

mdmDCTable OBJECT-TYPE
SYNTAX    SEQUENCE OF MdmDCEntry
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION
"The modem data compression table augments the modem ID table."
::= { mdmMIBObjects 10 }

mdmDCEntry OBJECT-TYPE
SYNTAX      MdmDCEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"Entries in this table are created only by the agent. One entry exists for each modem managed by the agent."
AUGMENTS    { mdmIDEntry }
::= { mdmDCTable 1 }

MdmDCEntry ::= SEQUENCE {
    mdmDCCompressionTypeUsed            OBJECT IDENTIFIER
}

mdmDCCompressionTypeUsed OBJECT-TYPE
SYNTAX      OBJECT IDENTIFIER
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Indicates the data compression method used during the current or previous call. This shall be one of the values for compression protocols registered in the capabilities table for this modem. If no compression protocol is in use, this object shall have the value '{0 0}'."
::= { mdmDCEntry 1 }

-- The modem Signal Convertor Group

mdmSCTable OBJECT-TYPE
SYNTAX      SEQUENCE OF MdmSCEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The modem signal convertor table augments the modem ID table."
::= { mdmMIBObjects 11 }

mdmSCEntry OBJECT-TYPE
SYNTAX      MdmSCEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"Entries in this table are created only by the agent. One
entry exists for each modem managed by the agent.

AUGMENTS  { mdmIDEntry } ::= { mdmSCTable 1 }

MdmSCEntry ::= SEQUENCE {
  mdmSCCurrentLineTransmitRate        Integer32,
  mdmSCCurrentLineReceiveRate         Integer32,
  mdmSCInitialLineTransmitRate        Integer32,
  mdmSCInitialLineReceiveRate         Integer32,
  mdmSCModulationSchemeUsed           OBJECT IDENTIFIER
}

mdmSCCurrentLineTransmitRate OBJECT-TYPE
SYNTAX        Integer32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION    "The current link transmit rate of a connection, or the last
               link transmit rate of the last connection in bits per
               second."
REFERENCE "V.58 transmissionSignallingRateActive"
 ::= { mdmSCEntry 1 }

mdmSCCurrentLineReceiveRate OBJECT-TYPE
SYNTAX        Integer32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION    "The current link receive rate of a connection, or the last
               link receive rate of the last connection in bits per
               second."
REFERENCE "V.58 transmissionSignallingRateActive"
 ::= { mdmSCEntry 2 }

mdmSCInitialLineTransmitRate OBJECT-TYPE
SYNTAX        Integer32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION    "The initial link transmit rate of the current connection,
               or the initial link transmit rate of the last connection in
               bits per second."
 ::= { mdmSCEntry 3 }

mdmSCInitialLineReceiveRate OBJECT-TYPE
SYNTAX        Integer32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
"The initial link receive rate of the current connection, or
the initial link receive rate of the last connection in bits
per second."
::= { mdmSCEntry 4 }

mdmSCModulationSchemeUsed OBJECT-TYPE
SYNTAX OBJECT IDENTIFIER
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The modulation scheme of the current or previous call.
This shall be one of the values for modulation protocols
registered in the capabilities table for this modem."
REFERENCE "V.58 gstinModulationSchemeActive"
::= { mdmSCEntry 5 }

-- The Modem Statistics Table

mdmStatsTable OBJECT-TYPE
SYNTAX SEQUENCE OF MdmStatsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The modem statistics Table augments the modem ID table."
::= { mdmMIBObjects 12 }

MdmStatsEntry OBJECT-TYPE
SYNTAX MdmStatsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Entries in this table are created only by the agent. One
entry exists for each modem managed by the agent."
AUGMENTS { mdmIDEntry }
::= { mdmStatsTable 1 }

MdmStatsEntry := SEQUENCE {
  mdmStatsRingNoAnswers Counter32,
  mdmStatsIncomingConnectionFailures Counter32,
  mdmStatsIncomingConnectionCompletions Counter32,
  mdmStatsFailedDialAttempts Counter32,
  mdmStatsOutgoingConnectionFailures Counter32,
  mdmStatsOutgoingConnectionCompletions Counter32,
  mdmStatsRetrains Counter32,
  mdmStats2400OrLessConnections Counter32,
  mdmStats2400To14400Connections Counter32,
  mdmStatsGreaterThan14400Connections Counter32,
mdmStatsErrorControlledConnections Counter32,
mdmStatsCompressedConnections Counter32,
mdmStatsCompressionEfficiency Integer32,
mdmStatsSentOctets Counter32,
mdmStatsReceivedOctets Counter32,
mdmStatsSentDataFrames Counter32,
mdmStatsReceivedDataFrames Counter32,
mdmStatsResentFrames Counter32,
mdmStatsErrorFrames Counter32
}

mdmStatsRingNoAnswers OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The number of events in which ringing was detected but the
 call was not answered."
 ::= { mdmStatsEntry 1 }

mdmStatsIncomingConnectionFailures OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The number of incoming connection requests that this modem
 answered in which it could not train with the other DCE."
 ::= { mdmStatsEntry 2 }

mdmStatsIncomingConnectionCompletions OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The number of incoming connection requests that this modem
 answered and successfully trained with the other DCE."
 ::= { mdmStatsEntry 3 }

mdmStatsFailedDialAttempts OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The number of call attempts that failed because the modem
didn’t go off hook, or there was no dialtone."
 ::= { mdmStatsEntry 4 }

mdmStatsOutgoingConnectionFailures OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "The number of outgoing calls from this modem which
 successfully went off hook and dialed, in which it could not
 train with the other DCE."
 ::= { mdmStatsEntry 5 }

mdmStatsOutgoingConnectionCompletions OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "The number of outgoing calls from this modem which resulted
 in successfully training with the other DCE."
 ::= { mdmStatsEntry 6 }

mdmStatsRetrains OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "The number of retrains experienced on connections on this
 line."
 ::= { mdmStatsEntry 7 }

-- Utilization counters

mdmStats24000rLessConnections OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "The number of connections initially established at a
 modulation speed of 2400 bits per second or less."
 ::= { mdmStatsEntry 8 }

mdmStats2400To14400Connections OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "The number of connections initially established at a
 modulation speed of greater than 2400 bits per second and
 less than 14400 bits per second."
::= { mdmStatsEntry 9 }

mdmStatsGreaterThan14400Connections OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of connections initially established at a modulation speed of greater than 14400 bits per second."
::= { mdmStatsEntry 10 }

mdmStatsErrorControlledConnections OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of established connections using an error control protocol."
::= { mdmStatsEntry 11 }

mdmStatsCompressedConnections OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of established connections using a compression protocol."
::= { mdmStatsEntry 12 }

mdmStatsCompressionEfficiency OBJECT-TYPE
SYNTAX Integer32 (0..65535)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of bytes transferred into the compression encoder divided by the number of bytes transferred out of the encoder, multiplied by 100 for either the current or last call. If a data compression protocol is not in use, this value shall be '100'."
REFERENCE "V.58 compressionEfficiency"
::= { mdmStatsEntry 13 }

mdmStatsSentOctets OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of octets presented to the modem by the DTE."
::= { mdmStatsEntry 14 }

mdmStatsReceivedOctets OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of octets presented to the DTE by the modem."
::= { mdmStatsEntry 15 }

mdmStatsSentDataFrames OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of data frames sent on the line interface. If there is no frame-oriented protocol in use on the line interface, this counter shall not increment."
::= { mdmStatsEntry 16 }

mdmStatsReceivedDataFrames OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of data frames received on the line interface. If there is no frame-oriented protocol in use on the line interface, this counter shall not increment."
::= { mdmStatsEntry 17 }

mdmStatsResentFrames OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of times this modem retransmits frames on the line interface. If there is no frame-oriented protocol in use on the line interface, this counter shall not increment."
::= { mdmStatsEntry 18 }

mdmStatsErrorFrames OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of block errors received on the link. If there is no frame-oriented protocol in use on the line interface,
this counter shall not increment."
::= { mdmStatsEntry 19 }

-- compliance statements

mdmCompliance MODULE-COMPLIANCE
   STATUS current
   DESCRIPTION
   "The compliance statement for SNMPv2 entities which
   implement the modem MIB."

MODULE -- this module
   MANDATORY-GROUPS { mdmIDGroup, mdmLineInterfaceGroup,
                       mdmDTEInterfaceGroup, mdmCallControlGroup,
                       mdmSignalConvertorGroup, mdmStatisticsGroup }

GROUP mdmErrorControlGroup
   DESCRIPTION
   "This group is mandatory only for those modems that
   implement an error correction protocol."

GROUP mdmDataCompressionGroup
   DESCRIPTION
   "This group is mandatory only for those modems that
   implement a data compression protocol."
::= { mdmCompliances 1 }

END

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5. Security Considerations

Security issues are not discussed in this memo.
6. Authors' Addresses

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