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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.

Table of Contents

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:

- o RFC 1442 which defines the SMI, the mechanisms used for describing and naming objects for the purpose of management.
- o STD 17, RFC 1213 defines MIB-II, the core set of managed objects for the Internet suite of protocols.
- o RFC 1445 which defines the administrative and other architectural aspects of the framework.
- o 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"
    ORGANIZATION "IETF Modem Management Working Group"
```

```
    CONTACT-INFO
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             E-mail: waldbusser@cmu.edu"
    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."
    ::= { mdmGroups 8 }

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 1 }

-- 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 2 }

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
            existance 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),  -- and 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"
```

```
    ::= { mdmLineCapabilities 29 }


-- 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 occured 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"
    ::= { mdmECEntry 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 gstnModulationSchemeActive"
    ::= { 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
            sucessfully 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

mdmStats2400OrLessConnections 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
```

4. Acknowledgements

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5. Security Considerations

Security issues are not discussed in this memo.

6. Authors' Addresses

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