

Network Working Group
Request for Comments: 1696
Category: Standards Track

J. Barnes
Xylogics, Inc.
L. Brown
Motorola
R. Royston
US Robotics, Inc.
S. Waldbusser
Carnegie Mellon University
August 1994

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	1
2 The SNMPv2 Network Management Framework	2
2.1 Object Definitions	2
3 Definitions	2
4 Acknowledgements	30
5. Security Considerations	30
6. Authors' Addresses	31

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

```
"      Steven Waldbusser
      Postal: Carnegie Mellon University
              5000 Forbes Ave
              Pittsburgh, PA, 15213
              US
```

```
      Tel: +1 412 268 6628
```

```
      Fax: +1 412 268 4987
```

```
      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 { mdmECErrorsControlUsed }
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
        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), -- 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 occurred in one of the protocols 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 {

mdmECEnterControlUsed

OBJECT IDENTIFIER

}

mdmECEnterControlUsed 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"

::= { mdmECEnter 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 }
```

```
MdmSCEntiry ::= 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"
 ::= { mdmSCEntiry 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"
 ::= { mdmSCEntiry 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."

```
 ::= { mdmSCEntiry 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."

::= { mdmSCEnterY 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"

::= { mdmSCEnterY 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

This document was produced by the Modem Management Working group.

In addition, the authors gratefully acknowledge the comments of Tom Holodnik and Mark S. Lewis.

5. Security Considerations

Security issues are not discussed in this memo.

6. Authors' Addresses

Jim Barnes
Xylogics, Inc.
53 Third Avenue
Burlington, MA 01803
USA

Phone: 617-272-8140
Fax: 617-272-2618
EMail: barnes@xylogics.com

Les Brown
Motorola

Phone: 416-507-7200
EMail: brown_l@msm.cdx.mot.com

Rick Royston
US Robotics, Inc.
8100 N. McCormick Boulevard
Skokie, IL 60076-2999
USA

Phone: 708-933-5430
Fax: 708-982-1348
EMail: rroyston@usr.com

Steven Waldbusser
Carnegie Mellon University
Computing and Communications
Cyert Hall 130
5000 Forbes Avenue
Pittsburgh, PA 15213-3890
USA

Phone: 412-268-6628
Fax: 412-268-4987
EMail: swol@andrew.cmu.edu

