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Definitions of Managed Objects for IEEE 802.3
Medium Attachment Units (MAUs) 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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Table of Contents

1 The SNMPv2 Network Management Framework	2
1.1 Object Definitions	2
2 Overview	3
2.1 Relationship to RFC 1515	3
2.2 MAU Management	3
2.3 Relationship to Other MIBs	3
2.3.1 Relationship to the MIB-II 'interfaces' group	3
2.3.2 Relationship to the 802.3 Repeater MIB	4
2.4 Management of Internal MAUs	4
3 Definitions	4
4 Acknowledgements	39
5 References	40
6 Security Considerations	41
7 Authors' Addresses	41
8 Full Copyright Statement	43

Abstract

This memo defines an portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it defines objects for managing 10 and 100 Mb/second Medium Attachment Units (MAUs) based on IEEE Std 802.3 Section 30, "10 & 100 Mb/s Management," October 26, 1995.

1. The SNMPv2 Network Management Framework

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

- o the SMI, described in RFC 1902 [6] - the mechanisms used for describing and naming objects for the purpose of management.
- o the MIB-II, STD 17, RFC 1213 [5] - the core set of managed objects for the Internet suite of protocols.
- o the protocol, STD 15, RFC 1157 [10] and/or RFC 1905 [9] - the protocol used for accessing managed information.

Textual conventions are defined in RFC 1903 [7], and conformance statements are defined in RFC 1904 [8].

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

1.1. 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 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.

2. Overview

2.1. Relationship to RFC 1515

This MIB is intended to be a superset of that defined by RFC 1515 [11], which will go to historic status. This MIB includes all of the objects contained in that MIB, plus several new ones which provide additional capabilities. Implementors are encouraged to support all applicable conformance groups in order to make the best use of the new functionality provided by this MIB. The new objects provide management support for:

- o management of 100 Mb/s devices
- o auto-negotiation on interface MAUs
- o jack management

2.2. MAU Management

Instances of these object types represent attributes of an IEEE 802.3 MAU. Several types of MAUs are defined in the IEEE 802.3 CSMA/CD standard [1] and [2]. These MAUs may be connected to IEEE 802.3 repeaters or to 802.3 (Ethernet-like) interfaces. For convenience this document refers to these devices as "repeater MAUs" and "interface MAUs."

The definitions presented here are based on Section 30.5, "Layer Management for 10 & 100 Mb/s Medium Attachment Units (MAUs)", and Annex 30A, "GDMO Specifications for 802.3 managed objects" of IEEE Std 802.3u-1995. That specification includes definitions for both 10Mb/s and 100Mb/s devices, and is essentially a superset of the 10Mb/s definitions given by IEEE 802.3 Section 20. This specification is intended to serve the same purpose: to provide for management of both 10Mb/s and 100Mb/s MAUs.

2.3. Relationship to Other MIBs

It is assumed that an agent implementing this MIB will also implement (at least) the 'system' group defined in MIB-II [5]. The following sections identify other MIBs that such an agent should implement.

2.3.1. Relationship to the MIB-II 'interfaces' group

The sections of this document that define interface MAU-related objects specify an extension to the 'interfaces' group of MIB-II. An agent implementing these interface-MAU related objects must also

implement the 'interfaces' group of MIB-II. The value of the object ifMauIfIndex is the same as the value of 'ifIndex' used to instantiate the interface to which the given MAU is connected.

It is expected that an agent implementing the interface-MAU related objects in this MIB will also implement the Ethernet- like Interfaces MIB, RFC 1650.

(Note that repeater ports are not represented as interfaces in the sense of MIB-II's 'interfaces' group.)

2.3.2. Relationship to the 802.3 Repeater MIB

The section of this document that defines repeater MAU-related objects specifies an extension to the 802.3 Repeater MIB defined in [4]. An agent implementing these repeater-MAU related objects must also implement the 802.3 Repeater MIB.

The values of 'rpMauGroupIndex' and 'rpMauPortIndex' used to instantiate a repeater MAU variable shall be the same as the values of 'rpTrPortGroupIndex' and 'rpTrPortIndex' used to instantiate the port to which the given MAU is connected.

2.4. Management of Internal MAUs

In some situations, a MAU can be "internal" -- i.e., its functionality is implemented entirely within a device. For example, a managed repeater may contain an internal repeater- MAU and/or an internal interface-MAU through which management communications originating on one of the repeater's external ports pass in order to reach the management agent associated with the repeater. Such internal MAUs may or may not be managed. If they are managed, objects describing their attributes should appear in the appropriate MIB subtree:

dot3RpMauBasicGroup for internal repeater-MAUs and
dot3IfMauBasicGroup for internal interface-MAUs.

3. Definitions

MAU-MIB DEFINITIONS ::= BEGIN

IMPORTS

Counter32, Integer32,
OBJECT-TYPE, MODULE-IDENTITY, NOTIFICATION-TYPE,
OBJECT-IDENTITY, mib-2
FROM SNMPv2-SMI
TruthValue, TEXTUAL-CONVENTION

FROM SNMPv2-TC
OBJECT-GROUP, MODULE-COMPLIANCE, NOTIFICATION-GROUP
FROM SNMPv2-CONF;

mauMod MODULE-IDENTITY
LAST-UPDATED "9710310000Z"
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DESCRIPTION

"Management information for 802.3 MAUs.

The following references are used throughout this
MIB module:

[IEEE 802.3 Std]
 refers to IEEE 802.3/ISO 8802-3 Information
 processing systems - Local area networks -
 Part 3: Carrier sense multiple access with
 collision detection (CSMA/CD) access method
 and physical layer specifications (1993),
 and to IEEE Std 802.3u-1995, Supplement to
 IEEE Std 802.3, clauses 22 through 29.

[IEEE 802.3 Mgt]
 refers to IEEE 802.3u-1995, - 10 Mb/s &
 100 Mb/s Management, Section 30 -
 Supplement to IEEE Std 802.3."

::= { snmpDot3MauMgt 6 }

```
snmpDot3MauMgt OBJECT IDENTIFIER ::= { mib-2 26 }
```

```
-- textual conventions
```

```
JackType ::= TEXTUAL-CONVENTION
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "Common enumeration values for repeater and
        interface MAU jack types."
```

```
    SYNTAX      INTEGER {
                    other(1),
                    rj45(2),
                    rj45S(3), -- rj45 shielded
                    db9(4),
                    bnc(5),
                    fAUI(6), -- female aui
                    mAUI(7), -- male aui
                    fiberSC(8),
                    fiberMIC(9),
                    fiberST(10),
                    telco(11)
                }
```

```
dot3RpMauBasicGroup      OBJECT IDENTIFIER ::= { snmpDot3MauMgt 1 }
```

```
dot3IfMauBasicGroup      OBJECT IDENTIFIER ::= { snmpDot3MauMgt 2 }
```

```
dot3BroadMauBasicGroup   OBJECT IDENTIFIER ::= { snmpDot3MauMgt 3 }
```

```
dot3IfMauAutoNegGroup    OBJECT IDENTIFIER ::= { snmpDot3MauMgt 5 }
```

```
-- object identities for MAU types
```

```
-- (see rpMauType and ifMauType for usage)
```

```
dot3MauType
```

```
    OBJECT IDENTIFIER ::= { snmpDot3MauMgt 4 }
```

```
dot3MauTypeAUI OBJECT-IDENTITY
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "no internal MAU, view from AUI"
```

```
    ::= { dot3MauType 1 }
```

```
dot3MauType10Base5 OBJECT-IDENTITY
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "thick coax MAU (per 802.3 section 8)"
```

```
    ::= { dot3MauType 2 }
```

```
dot3MauTypeFoir1 OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "FOIRL MAU (per 802.3 section 9.9)"
    ::= { dot3MauType 3 }

dot3MauType10Base2 OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "thin coax MAU (per 802.3 section 10)"
    ::= { dot3MauType 4 }

dot3MauType10BaseT OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "UTP MAU (per 802.3 section 14)"
    ::= { dot3MauType 5 }

dot3MauType10BaseFP OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "passive fiber MAU (per 802.3 section 16)"
    ::= { dot3MauType 6 }

dot3MauType10BaseFB OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "sync fiber MAU (per 802.3 section 17)"
    ::= { dot3MauType 7 }

dot3MauType10BaseFL OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "async fiber MAU (per 802.3 section 18)"
    ::= { dot3MauType 8 }

dot3MauType10Broad36 OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "broadband DTE MAU (per 802.3 section 11). Note
         that 10BROAD36 MAUs can be attached to interfaces
         but not to repeaters."
    ::= { dot3MauType 9 }

----- new since RFC 1515:

dot3MauType10BaseTHD OBJECT-IDENTITY
    STATUS      current
```

```
DESCRIPTION
    "UTP MAU (per 802.3 section 14), half duplex mode"
 ::= { dot3MauType 10 }

dot3MauType10BaseTFD OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "UTP MAU (per 802.3 section 14), full duplex mode"
 ::= { dot3MauType 11 }

dot3MauType10BaseFLHD OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "async fiber MAU (per 802.3 section 18), half
    duplex mode"
 ::= { dot3MauType 12 }

dot3MauType10BaseFLFD OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "async fiber MAU (per 802.3 section 18), full
    duplex mode"
 ::= { dot3MauType 13 }

dot3MauType100BaseT4 OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "4 pair categ. 3 UTP (per 802.3 section 23)"
 ::= { dot3MauType 14 }

dot3MauType100BaseTXHD OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "2 pair categ. 5 UTP (per 802.3 section 25), half
    duplex mode"
 ::= { dot3MauType 15 }

dot3MauType100BaseTXFD OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "2 pair categ. 5 UTP (per 802.3 section 25), full
    duplex mode"
 ::= { dot3MauType 16 }

dot3MauType100BaseFXHD OBJECT-IDENTITY
STATUS      current
DESCRIPTION
    "X fiber over PMT (per 802.3 section 26), half
```

```
        duplex mode"
 ::= { dot3MauType 17 }

dot3MauType100BaseFXFD OBJECT-IDENTITY
  STATUS      current
  DESCRIPTION
    "X fiber over PMT (per 802.3 section 26), full
    duplex mode"
 ::= { dot3MauType 18 }

dot3MauType100BaseT2HD OBJECT-IDENTITY
  STATUS      current
  DESCRIPTION
    "2 pair categ. 3 UTP (per 802.3 section 32), half
    duplex mode"
 ::= { dot3MauType 19 }

dot3MauType100BaseT2FD OBJECT-IDENTITY
  STATUS      current
  DESCRIPTION
    "2 pair categ. 3 UTP (per 802.3 section 32), full
    duplex mode"
 ::= { dot3MauType 20 }

--
-- The Basic Repeater MAU Table
--

rpMauTable OBJECT-TYPE
  SYNTAX      SEQUENCE OF RpMauEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "Table of descriptive and status information about
    the MAU(s) attached to the ports of a repeater."
 ::= { dot3RpMauBasicGroup 1 }

rpMauEntry OBJECT-TYPE
  SYNTAX      RpMauEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "An entry in the table, containing information
    about a single MAU."
  INDEX      { rpMauGroupIndex, rpMauPortIndex, rpMauIndex }
 ::= { rpMauTable 1 }
```

```

RpMauEntry ::=
  SEQUENCE {
    rpMauGroupIndex
      Integer32,
    rpMauPortIndex
      Integer32,
    rpMauIndex
      Integer32,
    rpMauType
      OBJECT IDENTIFIER,
    rpMauStatus
      INTEGER,
    rpMauMediaAvailable
      INTEGER,
    rpMauMediaAvailableStateExits
      Counter32,
    rpMauJabberState
      INTEGER,
    rpMauJabberingStateEnters
      Counter32,
    rpMauFalseCarriers
      Counter32
  }

```

rpMauGroupIndex OBJECT-TYPE

SYNTAX Integer32 (1..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This variable uniquely identifies the group containing the port to which the MAU described by this entry is connected.

Note: In practice, a group will generally be a field-replaceable unit (i.e., module, card, or board) that can fit in the physical system enclosure, and the group number will correspond to a number marked on the physical enclosure.

The group denoted by a particular value of this object is the same as the group denoted by the same value of rpMauGroupIndex."

::= { rpMauEntry 1 }

rpMauPortIndex OBJECT-TYPE

SYNTAX Integer32 (1..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This variable uniquely identifies the repeater port within group rpMauGroupIndex to which the MAU described by this entry is connected."

REFERENCE

"Reference RFC 1516, rptrPortIndex."

::= { rpMauEntry 2 }

rpMauIndex OBJECT-TYPE

SYNTAX Integer32 (1..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This variable uniquely identifies the MAU described by this entry from among other MAUs connected to the same port (rpMauPortIndex)."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.1, aMAUID."

::= { rpMauEntry 3 }

rpMauType OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object identifies the 10 or 100 Mb/s baseband MAU type. An initial set of MAU types are defined above. The assignment of OBJECT IDENTIFIERS to new types of MAUs is managed by the IANA. If the MAU type is unknown, the object identifier

unknownMauType OBJECT IDENTIFIER ::= { 0 0 }

is returned. Note that unknownMauType is a syntactically valid object identifier, and any conformant implementation of ASN.1 and the BER must be able to generate and recognize this value."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.2, aMAUType."

::= { rpMauEntry 4 }

rpMauStatus OBJECT-TYPE

SYNTAX INTEGER {
 other(1),
 unknown(2),
 operational(3),

```
        standby(4),
        shutdown(5),
        reset(6)
    }
MAX-ACCESS read-write
STATUS current
DESCRIPTION
```

"The current state of the MAU. This object may be implemented as a read-only object by those agents and MAUs that do not implement software control of the MAU state. Some agents may not support setting the value of this object to some of the enumerated values.

The value other(1) is returned if the MAU is in a state other than one of the states 2 through 6.

The value unknown(2) is returned when the MAU's true state is unknown; for example, when it is being initialized.

A MAU in the operational(3) state is fully functional, operates, and passes signals to its attached DTE or repeater port in accordance to its specification.

A MAU in standby(4) state forces DI and CI to idle and the media transmitter to idle or fault, if supported. Standby(4) mode only applies to link type MAUs. The state of rpMauMediaAvailable is unaffected.

A MAU in shutdown(5) state assumes the same condition on DI, CI, and the media transmitter as though it were powered down or not connected. The MAU may return other(1) value for the rpMauJabberState and rpMauMediaAvailable objects when it is in this state. For an AUI, this state will remove power from the AUI.

Setting this variable to the value reset(6) resets the MAU in the same manner as a power-off, power-on cycle of at least one-half second would. The agent is not required to return the value reset(6).

Setting this variable to the value operational(3), standby(4), or shutdown(5) causes the MAU to

assume the respective state except that setting a mixing-type MAU or an AUI to standby(4) will cause the MAU to enter the shutdown state."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.7, aMAUAdminState, 30.5.1.2.2, acMAUAdminControl, and 30.5.1.2.1, acRESETMAU."

::= { rpMauEntry 5 }

rpMauMediaAvailable OBJECT-TYPE

```
SYNTAX      INTEGER {
                other(1),
                unknown(2),
                available(3),
                notAvailable(4),
                remoteFault(5),
                invalidSignal(6),
                remoteJabber(7),
                remoteLinkLoss(8),
                remoteTest(9)
            }
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"If the MAU is a link or fiber type (FOIRL, 10BASE-T, 10BASE-F) then this is equivalent to the link test fail state/low light function. For an AUI or a coax (including broadband) MAU this indicates whether or not loopback is detected on the DI circuit. The value of this attribute persists between packets for MAU types AUI, 10BASE5, 10BASE2, 10BROAD36, and 10BASE-FP.

The value other(1) is returned if the mediaAvailable state is not one of 2 through 6.

The value unknown(2) is returned when the MAU's true state is unknown; for example, when it is being initialized. At power-up or following a reset, the value of this attribute will be unknown for AUI, coax, and 10BASE-FP MAUs. For these MAUs loopback will be tested on each transmission during which no collision is detected. If DI is receiving input when DO returns to IDL after a transmission and there has been no collision during the transmission then loopback will be detected. The value of this attribute will only change during non-collided transmissions for AUI,

coax, and 10BASE-FP MAUs.

For 100BASE-T4, 100BASE-TX and 100BASE-FX the enumerations match the states within the respective link integrity state diagrams, fig 23-12 and 24-15 of sections 23 and 24 of [2]. Any MAU which implements management of auto-negotiation will map remote fault indication to remote fault.

The value available(3) indicates that the link, light, or loopback is normal. The value notAvailable(4) indicates link loss, low light, or no loopback.

The value remoteFault(5) indicates that a fault has been detected at the remote end of the link. This value applies to 10BASE-FB, 100BASE-T4 Far End Fault Indication and non-specified remote faults from a system running auto-negotiation. The values remoteJabber(7), remoteLinkLoss(8), and remoteTest(9) should be used instead of remoteFault(5) where the reason for remote fault is identified in the remote signaling protocol.

The value invalidSignal(6) indicates that an invalid signal has been received from the other end of the link. InvalidSignal(6) applies only to MAUs of type 10BASE-FB.

Where an IEEE Std 802.3u-1995 clause 22 MII is present, a logic one in the remote fault bit (reference section 22.2.4.2.8 of that document) maps to the value remoteFault(5), and a logic zero in the link status bit (reference section 22.2.4.2.10 of that document) maps to the value notAvailable(4). The value notAvailable(4) takes precedence over the value remoteFault(5)."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.4, aMediaAvailable."
::= { rpMauEntry 6 }

rpMauMediaAvailableStateExits OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of times that

rpMauMediaAvailable for this MAU instance leaves the state available(3)."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.5, aLoseMediaCounter."
::= { rpMauEntry 7 }

rpMauJabberState OBJECT-TYPE

SYNTAX INTEGER {
 other(1),
 unknown(2),
 noJabber(3),
 jabbering(4)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value other(1) is returned if the jabber state is not 2, 3, or 4. The agent must always return other(1) for MAU type dot3MauTypeAUI.

The value unknown(2) is returned when the MAU's true state is unknown; for example, when it is being initialized.

If the MAU is not jabbering the agent returns noJabber(3). This is the 'normal' state.

If the MAU is in jabber state the agent returns the jabbering(4) value."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.6,
aJabber.jabberFlag."
::= { rpMauEntry 8 }

rpMauJabberingStateEnters OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of times that mauJabberState for this MAU instance enters the state jabbering(4). For MAUs of type dot3MauTypeAUI, dot3MauType100BaseT4, dot3MauType100BaseTX, and dot3MauType100BaseFX, this counter will always indicate zero."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.6,
aJabber.jabberCounter."

```
::= { rpMauEntry 9 }
```

```
rpMauFalseCarriers OBJECT-TYPE
```

```
SYNTAX      Counter32
```

```
MAX-ACCESS  read-only
```

```
STATUS      current
```

```
DESCRIPTION
```

"A count of the number of false carrier events during IDLE in 100BASE-X links. This counter does not increment at the symbol rate. It can increment after a valid carrier completion at a maximum rate of once per 100 ms until the next carrier event.

This counter increments only for MAUs of type dot3MauType100BaseT4, dot3MauType100BaseTX, and dot3MauType100BaseFX. For all other MAU types, this counter will always indicate zero.

The approximate minimum time for rollover of this counter is 7.4 hours."

```
REFERENCE
```

"[IEEE 802.3 Mgt], 30.5.1.1.10, aFalseCarriers."

```
::= { rpMauEntry 10 }
```

```
-- The rpJackTable applies to MAUs attached to repeaters
```

```
-- which have one or more external jacks (connectors).
```

```
rpJackTable OBJECT-TYPE
```

```
SYNTAX      SEQUENCE OF RpJackEntry
```

```
MAX-ACCESS  not-accessible
```

```
STATUS      current
```

```
DESCRIPTION
```

"Information about the external jacks attached to MAUs attached to the ports of a repeater."

```
::= { dot3RpMauBasicGroup 2 }
```

```
rpJackEntry OBJECT-TYPE
```

```
SYNTAX      RpJackEntry
```

```
MAX-ACCESS  not-accessible
```

```
STATUS      current
```

```
DESCRIPTION
```

"An entry in the table, containing information about a particular jack."

```
INDEX      { rpMauGroupIndex,
              rpMauPortIndex,
```

```

        rpMauIndex,
        rpJackIndex }
 ::= { rpJackTable 1 }

RpJackEntry ::=
    SEQUENCE {
        rpJackIndex
            Integer32,
        rpJackType
            JackType
    }

rpJackIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This variable uniquely identifies the jack
        described by this entry from among other jacks
        attached to the same MAU (rpMauIndex)."
    ::= { rpJackEntry 1 }

rpJackType OBJECT-TYPE
    SYNTAX      JackType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The jack connector type, as it appears on the
        outside of the system."
    ::= { rpJackEntry 2 }

--
-- The Basic Interface MAU Table
--

ifMauTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IfMauEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Table of descriptive and status information about
        MAU(s) attached to an interface."

    ::= { dot3IfMauBasicGroup 1 }

ifMauEntry OBJECT-TYPE
    SYNTAX      IfMauEntry

```

```

MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
    "An entry in the table, containing information
    about a single MAU."
INDEX       { ifMauIfIndex, ifMauIndex }
 ::= { ifMauTable 1 }

```

```

IfMauEntry ::=
    SEQUENCE {
        ifMauIfIndex
            Integer32,
        ifMauIndex
            Integer32,
        ifMauType
            OBJECT IDENTIFIER,
        ifMauStatus
            INTEGER,
        ifMauMediaAvailable
            INTEGER,
        ifMauMediaAvailableStateExits
            Counter32,
        ifMauJabberState
            INTEGER,
        ifMauJabberingStateEnters
            Counter32,
        ifMauFalseCarriers
            Counter32,
        ifMauTypeList
            Integer32,
        ifMauDefaultType
            OBJECT IDENTIFIER,
        ifMauAutoNegSupported
            TruthValue
    }

```

```

ifMauIfIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This variable uniquely identifies the interface
        to which the MAU described by this entry is
        connected."
    REFERENCE
        "RFC 1213, ifIndex"
    ::= { ifMauEntry 1 }

```

```

ifMauIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This variable uniquely identifies the MAU
        described by this entry from among other MAUs
        connected to the same interface (ifMauIfIndex)."
```

REFERENCE

```

    "[IEEE 802.3 Mgt], 30.5.1.1.1, aMAUID."
    ::= { ifMauEntry 2 }
```

```

ifMauType OBJECT-TYPE
    SYNTAX      OBJECT IDENTIFIER
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object identifies the 10 or 100 Mb/s
        baseband or broadband MAU type. An initial set of
        MAU types are defined above. The assignment of
        OBJECT IDENTIFIERS to new types of MAUs is managed
        by the IANA. If the MAU type is unknown, the
        object identifier

        unknownMauType OBJECT IDENTIFIER ::= { 0 0 }
```

is returned. Note that unknownMauType is a syntactically valid object identifier, and any conformant implementation of ASN.1 and the BER must be able to generate and recognize this value.

This object represents the operational type of the MAU, as determined by either (1) the result of the auto-negotiation function or (2) if auto-negotiation is not enabled or is not implemented for this MAU, by the value of the object ifMauDefaultType. In case (2), a set to the object ifMauDefaultType will force the MAU into the new operating mode."

REFERENCE

```

    "[IEEE 802.3 Mgt], 30.5.1.1.2, aMAUType."
    ::= { ifMauEntry 3 }
```

```

ifMauStatus OBJECT-TYPE
    SYNTAX      INTEGER {
        other(1),
        unknown(2),
        operational(3),
```

```
        standby(4),
        shutdown(5),
        reset(6)
    }
MAX-ACCESS read-write
STATUS current
DESCRIPTION
```

"The current state of the MAU. This object may be implemented as a read-only object by those agents and MAUs that do not implement software control of the MAU state. Some agents may not support setting the value of this object to some of the enumerated values.

The value other(1) is returned if the MAU is in a state other than one of the states 2 through 6.

The value unknown(2) is returned when the MAU's true state is unknown; for example, when it is being initialized.

A MAU in the operational(3) state is fully functional, operates, and passes signals to its attached DTE or repeater port in accordance to its specification.

A MAU in standby(4) state forces DI and CI to idle and the media transmitter to idle or fault, if supported. Standby(4) mode only applies to link type MAUs. The state of ifMauMediaAvailable is unaffected.

A MAU in shutdown(5) state assumes the same condition on DI, CI, and the media transmitter as though it were powered down or not connected. The MAU may return other(1) value for the ifMauJabberState and ifMauMediaAvailable objects when it is in this state. For an AUI, this state will remove power from the AUI.

Setting this variable to the value reset(6) resets the MAU in the same manner as a power-off, power-on cycle of at least one-half second would. The agent is not required to return the value reset(6).

Setting this variable to the value operational(3), standby(4), or shutdown(5) causes the MAU to

assume the respective state except that setting a mixing-type MAU or an AUI to standby(4) will cause the MAU to enter the shutdown state."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.7, aMAUAdminState, 30.5.1.2.2, acMAUAdminControl, and 30.5.1.2.1, acRESETMAU."

::= { ifMauEntry 4 }

ifMauMediaAvailable OBJECT-TYPE

```
SYNTAX      INTEGER {
                other(1),
                unknown(2),
                available(3),
                notAvailable(4),
                remoteFault(5),
                invalidSignal(6),
                remoteJabber(7),
                remoteLinkLoss(8),
                remoteTest(9)
            }
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"If the MAU is a link or fiber type (FOIRL, 10BASE-T, 10BASE-F) then this is equivalent to the link test fail state/low light function. For an AUI or a coax (including broadband) MAU this indicates whether or not loopback is detected on the DI circuit. The value of this attribute persists between packets for MAU types AUI, 10BASE5, 10BASE2, 10BROAD36, and 10BASE-FP.

The value other(1) is returned if the mediaAvailable state is not one of 2 through 6.

The value unknown(2) is returned when the MAU's true state is unknown; for example, when it is being initialized. At power-up or following a reset, the value of this attribute will be unknown for AUI, coax, and 10BASE-FP MAUs. For these MAUs loopback will be tested on each transmission during which no collision is detected. If DI is receiving input when DO returns to IDL after a transmission and there has been no collision during the transmission then loopback will be detected. The value of this attribute will only change during non-collided transmissions for AUI,

coax, and 10BASE-FP MAUs.

For 100BASE-T4, 100BASE-TX and 100BASE-FX the enumerations match the states within the respective link integrity state diagrams, fig 23-12 and 24-15 of sections 23 and 24 of [2]. Any MAU which implements management of auto-negotiation will map remote fault indication to remote fault.

The value available(3) indicates that the link, light, or loopback is normal. The value notAvailable(4) indicates link loss, low light, or no loopback.

The value remoteFault(5) indicates that a fault has been detected at the remote end of the link. This value applies to 10BASE-FB, 100BASE-T4 Far End Fault Indication and non-specified remote faults from a system running auto-negotiation. The values remoteJabber(7), remoteLinkLoss(8), and remoteTest(9) should be used instead of remoteFault(5) where the reason for remote fault is identified in the remote signaling protocol.

The value invalidSignal(6) indicates that an invalid signal has been received from the other end of the link. InvalidSignal(6) applies only to MAUs of type 10BASE-FB.

Where an IEEE Std 802.3u-1995 clause 22 MII is present, a logic one in the remote fault bit (reference section 22.2.4.2.8 of that document) maps to the value remoteFault(5), and a logic zero in the link status bit (reference section 22.2.4.2.10 of that document) maps to the value notAvailable(4). The value notAvailable(4) takes precedence over the value remoteFault(5)."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.4, aMediaAvailable."
::= { ifMauEntry 5 }

ifMauMediaAvailableStateExits OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of times that

ifMauMediaAvailable for this MAU instance leaves the state available(3)."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.5, aLoseMediaCounter."
::= { ifMauEntry 6 }

ifMauJabberState OBJECT-TYPE

SYNTAX INTEGER {
 other(1),
 unknown(2),
 noJabber(3),
 jabbering(4)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value other(1) is returned if the jabber state is not 2, 3, or 4. The agent must always return other(1) for MAU type dot3MauTypeAUI.

The value unknown(2) is returned when the MAU's true state is unknown; for example, when it is being initialized.

If the MAU is not jabbering the agent returns noJabber(3). This is the 'normal' state.

If the MAU is in jabber state the agent returns the jabbering(4) value."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.6,
aJabber.jabberFlag."
::= { ifMauEntry 7 }

ifMauJabberingStateEnters OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of times that mauJabberState for this MAU instance enters the state jabbering(4). For MAUs of type dot3MauTypeAUI, dot3MauType100BaseT4, dot3MauType100BaseTX, and dot3MauType100BaseFX, this counter will always indicate zero."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.6,
aJabber.jabberCounter."

```
::= { ifMauEntry 8 }
```

ifMauFalseCarriers OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of false carrier events during IDLE in 100BASE-X links. This counter does not increment at the symbol rate. It can increment after a valid carrier completion at a maximum rate of once per 100 ms until the next carrier event.

This counter increments only for MAUs of type dot3MauType100BaseT4, dot3MauType100BaseTX, and dot3MauType100BaseFX. For all other MAU types, this counter will always indicate zero.

The approximate minimum time for rollover of this counter is 7.4 hours."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.10, aFalseCarriers."

```
::= { ifMauEntry 9 }
```

ifMauTypeList OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A value that uniquely identifies the set of possible IEEE 802.3 types that the MAU could be. The value is a sum which initially takes the value zero. Then, for each type capability of this MAU, 2 raised to the power noted below is added to the sum. For example, a MAU which has the capability to be only 10BASE-T would have a value of 512 (2^{*9}). In contrast, a MAU which supports both 10Base-T (full duplex) and 100BASE-TX (full duplex) would have a value of $((2^{*11}) + (2^{*16}))$ or 67584.

The powers of 2 assigned to the capabilities are these:

Power	Capability
0	other or unknown
1	AUI

```

2      10BASE-5
3      FOIRL
4      10BASE-2
5      10BASE-T duplex mode unknown
6      10BASE-FP
7      10BASE-FB
8      10BASE-FL duplex mode unknown
9      10BROAD36
10     10BASE-T half duplex mode
11     10BASE-T full duplex mode
12     10BASE-FL half duplex mode
13     10BASE-FL full duplex mode
14     100BASE-T4
15     100BASE-TX half duplex mode
16     100BASE-TX full duplex mode
17     100BASE-FX half duplex mode
18     100BASE-FX full duplex mode
19     100BASE-T2 half duplex mode
20     100BASE-T2 full duplex mode

```

If auto-negotiation is present on this MAU, this object will map to ifMauAutoNegCapability."

```
 ::= { ifMauEntry 10 }
```

ifMauDefaultType OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object identifies the default administrative 10 or 100 Mb/s baseband MAU type, to be used in conjunction with the operational MAU type denoted by ifMauType.

The set of possible values for this object is the same as the set defined for the ifMauType object.

This object represents the administratively-configured type of the MAU. If auto-negotiation is not enabled or is not implemented for this MAU, the value of this object determines the operational type of the MAU. In this case, a set to this object will force the MAU into the specified operating mode.

If auto-negotiation is implemented and enabled for this MAU, the operational type of the MAU is

determined by auto-negotiation, and the value of this object denotes the type to which the MAU will automatically revert if/when auto-negotiation is later disabled.

NOTE TO IMPLEMENTORS: It may be necessary to provide for underlying hardware implementations which do not follow the exact behavior specified above. In particular, when ifMauAutoNegAdminStatus transitions from enabled to disabled, the agent implementation must ensure that the operational type of the MAU (as reported by ifMauType) correctly transitions to the value specified by this object, rather than continuing to operate at the value earlier determined by the auto-negotiation function."

REFERENCE

"[IEEE 802.3 Mgt], 30.5.1.1.1, aMAUID, and [IEEE 802.3 Std], 22.2.4.1.4."

::= { ifMauEntry 11 }

ifMauAutoNegSupported OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object indicates whether or not auto-negotiation is supported on this MAU."

::= { ifMauEntry 12 }

-- The ifJackTable applies to MAUs attached to interfaces
-- which have one or more external jacks (connectors).

ifJackTable OBJECT-TYPE

SYNTAX SEQUENCE OF IfJackEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Information about the external jacks attached to MAUs attached to an interface."

::= { dot3IfMauBasicGroup 2 }

ifJackEntry OBJECT-TYPE

SYNTAX IfJackEntry

MAX-ACCESS not-accessible

STATUS current

```

DESCRIPTION
    "An entry in the table, containing information
    about a particular jack."
INDEX      { ifMauIfIndex,
             ifMauIndex,
             ifJackIndex }
::= { ifJackTable 1 }

IfJackEntry ::=
    SEQUENCE {
        ifJackIndex
            Integer32,
        ifJackType
            JackType
    }

ifJackIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This variable uniquely identifies the jack
        described by this entry from among other jacks
        attached to the same MAU."
    ::= { ifJackEntry 1 }

ifJackType OBJECT-TYPE
    SYNTAX      JackType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The jack connector type, as it appears on the
        outside of the system."
    ::= { ifJackEntry 2 }

-- The ifMauAutoNegTable applies to systems in which
-- auto-negotiation is supported on one or more MAUs
-- attached to interfaces. Note that if auto-negotiation
-- is present and enabled, the ifMauType object reflects
-- the result of the auto-negotiation function.

ifMauAutoNegTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IfMauAutoNegEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION

```

```

        "Configuration and status objects for the auto-
        negotiation function of MAUs attached to
        interfaces."
 ::= { dot3IfMauAutoNegGroup 1 }

ifMauAutoNegEntry OBJECT-TYPE
    SYNTAX      IfMauAutoNegEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the table, containing configuration
        and status information for the auto-negotiation
        function of a particular MAU."
    INDEX       { ifMauIfIndex, ifMauIndex }
 ::= { ifMauAutoNegTable 1 }

IfMauAutoNegEntry ::=
    SEQUENCE {
        ifMauAutoNegAdminStatus
            INTEGER,
        ifMauAutoNegRemoteSignaling
            INTEGER,
        ifMauAutoNegConfig
            INTEGER,
        ifMauAutoNegCapability
            Integer32,
        ifMauAutoNegCapAdvertised
            Integer32,
        ifMauAutoNegCapReceived
            Integer32,
        ifMauAutoNegRestart
            INTEGER
    }

ifMauAutoNegAdminStatus OBJECT-TYPE
    SYNTAX      INTEGER {
                    enabled(1),
                    disabled(2)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "Setting this object to enabled(1) will cause the
        interface which has the auto-negotiation signaling
        ability to be enabled.

```

If the value of this object is disabled(2) then the interface will act as it would if it had no auto-negotiation signaling. Under these conditions, an IEEE 802.3 MAU will immediately be forced to the state indicated by the value of the object ifMauDefaultType.

NOTE TO IMPLEMENTORS: When ifMauAutoNegAdminStatus transitions from enabled to disabled, the agent implementation must ensure that the operational type of the MAU (as reported by ifMauType) correctly transitions to the value specified by the ifMauDefaultType object, rather than continuing to operate at the value earlier determined by the auto-negotiation function."

REFERENCE

"[IEEE 802.3 Mgt], 30.6.1.1.2, aAutoNegAdminState and 30.6.1.2.2, acAutoNegAdminControl."

::= { ifMauAutoNegEntry 1 }

ifMauAutoNegRemoteSignaling OBJECT-TYPE

SYNTAX INTEGER {
detected(1),
notdetected(2)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A value indicating whether the remote end of the link is using auto-negotiation signaling. It takes the value detected(1) if and only if, during the previous link negotiation, FLP Bursts were received."

REFERENCE

"[IEEE 802.3 Mgt], 30.6.1.1.3, aAutoNegRemoteSignaling."

::= { ifMauAutoNegEntry 2 }

ifMauAutoNegConfig OBJECT-TYPE

SYNTAX INTEGER {
other(1),
configuring(2),
complete(3),
disabled(4),
parallelDetectFail(5)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A value indicating the current status of the auto-negotiation process. The enumeration parallelDetectFail(5) maps to a failure in parallel detection as defined in 28.2.3.1 of [IEEE 802.3 Std]."

REFERENCE

"[IEEE 802.3 Mgt], 30.6.1.1.4,
aAutoNegAutoConfig."
::= { ifMauAutoNegEntry 4 }

ifMauAutoNegCapability OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A value that uniquely identifies the set of capabilities of the local auto-negotiation entity. The value is a sum which initially takes the value zero. Then, for each capability of this interface, 2 raised to the power noted below is added to the sum. For example, an interface which has the capability to support only 100Base-TX half duplex would have a value of 32768 (2^{15}). In contrast, an interface which supports both 100Base-TX half duplex and 100Base-TX full duplex would have a value of 98304 ($(2^{15}) + (2^{16})$).

The powers of 2 assigned to the capabilities are these:

Power	Capability
0	other or unknown
(1-9)	(reserved)
10	10BASE-T half duplex mode
11	10BASE-T full duplex mode
12	(reserved)
13	(reserved)
14	100BASE-T4
15	100BASE-TX half duplex mode
16	100BASE-TX full duplex mode
17	(reserved)
18	(reserved)
19	100BASE-T2 half duplex mode
20	100BASE-T2 full duplex mode

Note that interfaces that support this MIB may

have capabilities that extend beyond the scope of this MIB."

REFERENCE

"[IEEE 802.3 Mgt], 30.6.1.1.5,
aAutoNegLocalTechnologyAbility."
::= { ifMauAutoNegEntry 5 }

ifMauAutoNegCapAdvertised OBJECT-TYPE

SYNTAX Integer32
MAX-ACCESS read-write
STATUS current
DESCRIPTION

"A value that uniquely identifies the set of capabilities advertised by the local auto-negotiation entity. Refer to ifMauAutoNegCapability for a description of the possible values of this object.

Capabilities in this object that are not available in ifMauAutoNegCapability cannot be enabled."

REFERENCE

"[IEEE 802.3 Mgt], 30.6.1.1.6,
aAutoNegAdvertisedTechnologyAbility."
::= { ifMauAutoNegEntry 6 }

ifMauAutoNegCapReceived OBJECT-TYPE

SYNTAX Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"A value that uniquely identifies the set of capabilities received from the remote auto-negotiation entity. Refer to ifMauAutoNegCapability for a description of the possible values of this object.

Note that interfaces that support this MIB may be attached to remote auto-negotiation entities which have capabilities beyond the scope of this MIB."

REFERENCE

"[IEEE 802.3 Mgt], 30.6.1.1.7,
aAutoNegReceivedTechnologyAbility."
::= { ifMauAutoNegEntry 7 }

ifMauAutoNegRestart OBJECT-TYPE

SYNTAX INTEGER {
 restart(1),
 norestart(2)

```

        }
MAX-ACCESS read-write
STATUS current
DESCRIPTION
    "If the value of this object is set to restart(1)
    then this will force auto-negotiation to begin
    link renegotiation. If auto-negotiation signaling
    is disabled, a write to this object has no effect.

    Setting the value of this object to norestart(2)
    has no effect."
REFERENCE
    "[IEEE 802.3 Mgt], 30.6.1.2.1,
    acAutoNegRestartAutoConfig."
 ::= { ifMauAutoNegEntry 8 }

--
-- The Basic Broadband MAU Table
--

broadMauBasicTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF BroadMauBasicEntry
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
        "Table of descriptive and status information about
        the broadband MAUs connected to interfaces."
    ::= { dot3BroadMauBasicGroup 1 }

broadMauBasicEntry OBJECT-TYPE
    SYNTAX      BroadMauBasicEntry
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the table, containing information
        about a single broadband MAU."
    INDEX      { broadMauIfIndex, broadMauIndex }
    ::= { broadMauBasicTable 1 }

BroadMauBasicEntry ::=
    SEQUENCE {
        broadMauIfIndex
            Integer32,
        broadMauIndex
            Integer32,
        broadMauXmtRcvSplitType
            INTEGER,

```

```
        broadMauXmtCarrierFreq
            Integer32,
        broadMauTranslationFreq
            Integer32
    }

broadMauIfIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This variable uniquely identifies the interface
        to which the MAU described by this entry is
        connected."
    REFERENCE
        "Reference RFC 1213, ifIndex."
    ::= { broadMauBasicEntry 1 }

broadMauIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This variable uniquely identifies the MAU
        connected to interface broadMauIfIndex that is
        described by this entry."
    REFERENCE
        "Reference IEEE 802.3 MAU Mgt, 20.2.3.2, aMAUID."
    ::= { broadMauBasicEntry 2 }

broadMauXmtRcvSplitType OBJECT-TYPE
    SYNTAX      INTEGER {
                    other(1),
                    single(2),
                    dual(3)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the type of frequency
        multiplexing/cabling system used to separate the
        transmit and receive paths for the 10BROAD36 MAU.

        The value other(1) is returned if the split type
        is not either single or dual.

        The value single(2) indicates a single cable
        system. The value dual(3) indicates a dual cable
```

```

        system, offset normally zero."
REFERENCE
    "Reference IEEE 802.3 MAU Mgt, 20.2.3.2,
    aBbMAUXmitRcvSplitType."
 ::= { broadMauBasicEntry 3 }

broadMauXmtCarrierFreq OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This variable indicates the transmit carrier
        frequency of the 10BROAD36 MAU in MHz/4; that is,
        in units of 250 kHz."
    REFERENCE
        "Reference IEEE 802.3 MAU Mgt, 20.2.3.2,
        aBroadbandFrequencies.xmitCarrierFrequency."
 ::= { broadMauBasicEntry 4 }

broadMauTranslationFreq OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This variable indicates the translation offset
        frequency of the 10BROAD36 MAU in MHz/4; that is,
        in units of 250 kHz."
    REFERENCE
        "Reference IEEE 802.3 MAU Mgt, 20.2.3.2,
        aBroadbandFrequencies.translationFrequency."
 ::= { broadMauBasicEntry 5 }

-- Notifications for use by 802.3 MAUs

rpMauJabberTrap NOTIFICATION-TYPE
    OBJECTS      { rpMauJabberState }
    STATUS      current
    DESCRIPTION
        "This trap is sent whenever a managed repeater MAU
        enters the jabber state.

        The agent must throttle the generation of
        consecutive rpMauJabberTraps so that there is at
        least a five-second gap between them."
    REFERENCE
        "[IEEE 802.3 Mgt], 30.5.1.3.1, nJabber

```

```

        notification."
 ::= { snmpDot3MauMgt 0 1 }

ifMauJabberTrap NOTIFICATION-TYPE
OBJECTS          { ifMauJabberState }
STATUS           current
DESCRIPTION
    "This trap is sent whenever a managed interface
    MAU enters the jabber state.

    The agent must throttle the generation of
    consecutive ifMauJabberTraps so that there is at
    least a five-second gap between them."
REFERENCE
    "[IEEE 802.3 Mgt], 30.5.1.3.1, nJabber
    notification."
 ::= { snmpDot3MauMgt 0 2 }

-- Conformance information

mauModConf
    OBJECT IDENTIFIER ::= { mauMod 1 }
mauModCompls
    OBJECT IDENTIFIER ::= { mauModConf 1 }
mauModObjGrps
    OBJECT IDENTIFIER ::= { mauModConf 2 }
mauModNotGrps
    OBJECT IDENTIFIER ::= { mauModConf 3 }

-- Object groups

mauRpGrpBasic OBJECT-GROUP
OBJECTS          { rpMauGroupIndex,
                  rpMauPortIndex,
                  rpMauIndex,
                  rpMauType,
                  rpMauStatus,
                  rpMauMediaAvailable,
                  rpMauMediaAvailableStateExits,
                  rpMauJabberState,
                  rpMauJabberingStateEnters }
STATUS           current
DESCRIPTION
    "Basic conformance group for MAUs attached to
    repeater ports. This group is also the
    conformance specification for RFC 1515

```

```
        implementations."
 ::= { mauModObjGrps 1 }

mauRpGrp100Mbs OBJECT-GROUP
OBJECTS      { rpMauFalseCarriers }
STATUS       current
DESCRIPTION
    "Conformance group for MAUs attached to
    repeater ports with 100 Mb/s capability."
 ::= { mauModObjGrps 2 }

mauRpGrpJack OBJECT-GROUP
OBJECTS      { rpJackType }
STATUS       current
DESCRIPTION
    "Conformance group for MAUs attached to
    repeater ports with managed jacks."
 ::= { mauModObjGrps 3 }

mauIfGrpBasic OBJECT-GROUP
OBJECTS      { ifMauIfIndex,
              ifMauIndex,
              ifMauType,
              ifMauStatus,
              ifMauMediaAvailable,
              ifMauMediaAvailableStateExits,
              ifMauJabberState,
              ifMauJabberingStateEnters }
STATUS       current
DESCRIPTION
    "Basic conformance group for MAUs attached to
    interfaces. This group also provides a
    conformance specification for RFC 1515
    implementations."
 ::= { mauModObjGrps 4 }

mauIfGrp100Mbs OBJECT-GROUP
OBJECTS      { ifMauFalseCarriers,
              ifMauTypeList,
              ifMauDefaultType,
              ifMauAutoNegSupported }
STATUS       current
DESCRIPTION
    "Conformance group for MAUs attached
    to interfaces with 100 Mb/s capability."
 ::= { mauModObjGrps 5 }

mauIfGrpJack OBJECT-GROUP
```

```
OBJECTS      { ifJackType }
STATUS       current
DESCRIPTION
    "Conformance group for MAUs attached
    to interfaces with managed jacks."
::= { mauModObjGrps 6 }

mauIfGrpAutoNeg OBJECT-GROUP
OBJECTS      { ifMauAutoNegAdminStatus,
               ifMauAutoNegRemoteSignaling,
               ifMauAutoNegConfig,
               ifMauAutoNegCapability,
               ifMauAutoNegCapAdvertised,
               ifMauAutoNegCapReceived,
               ifMauAutoNegRestart }
STATUS       current
DESCRIPTION
    "Conformance group for MAUs attached to
    interfaces with managed auto-negotiation."
::= { mauModObjGrps 7 }

mauBroadBasic OBJECT-GROUP
OBJECTS      { broadMauIfIndex,
               broadMauIndex,
               broadMauXmtRcvSplitType,
               broadMauXmtCarrierFreq,
               broadMauTranslationFreq }
STATUS       current
DESCRIPTION
    "Conformance group for broadband MAUs
    attached to interfaces. This group
    provides a conformance specification
    for RFC 1515 implementations."
::= { mauModObjGrps 8 }

-- Notification groups

rpMauNotifications NOTIFICATION-GROUP
NOTIFICATIONS { rpMauJabberTrap }
STATUS       current
DESCRIPTION
    "Notifications for repeater MAUs."
::= { mauModNotGrps 1 }

ifMauNotifications NOTIFICATION-GROUP
NOTIFICATIONS { ifMauJabberTrap }
STATUS       current
DESCRIPTION
```

```
    "Notifications for interface MAUs."
 ::= { mauModNotGrps 2 }

-- Compliances

mauModRpCompl MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
        "Compliance for MAUs attached to repeater ports."

    MODULE -- this module
        MANDATORY-GROUPS { mauRpGrpBasic }

        GROUP mauRpGrp100Mbps
        DESCRIPTION
            "Implementation of this optional group is
             recommended for MAUs which have 100Mb/s
             capability."

        GROUP mauRpGrpJack
        DESCRIPTION
            "Implementation of this optional group is
             recommended for MAUs which have one or more
             external jacks."

        GROUP rpMauNotifications
        DESCRIPTION
            "Implementation of this group is
             recommended for MAUs attached to repeater
             ports."

 ::= { mauModCompls 1 }

mauModIfCompl MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
        "Compliance for MAUs attached to interfaces."

    MODULE -- this module
        MANDATORY-GROUPS { mauIfGrpBasic }

        GROUP mauIfGrp100Mbps
        DESCRIPTION
            "Implementation of this optional group is
             recommended for MAUs which have 100Mb/s
             capability."
```

GROUP mauIfGrpJack

DESCRIPTION

"Implementation of this optional group is recommended for MAUs which have one or more external jacks."

GROUP mauIfGrpAutoNeg

DESCRIPTION

"Implementation of this group is mandatory for MAUs which support managed auto-negotiation."

GROUP mauBroadBasic

DESCRIPTION

"Implementation of this group is mandatory for broadband MAUs."

GROUP ifMauNotifications

DESCRIPTION

"Implementation of this group is recommended for MAUs attached to interfaces."

::= { mauModCompls 2 }

END

4. Acknowledgements

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5. References

- [1] IEEE 802.3/ISO 8802-3 Information processing systems - Local area networks - Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications, 1993.
- [2] IEEE 802.3u-1995, "MAC Parameters, Physical Layer, Medium Attachment Units and Repeater for 100 Mb/s Operation, Type 100BASE-T," Sections 21 through 29, Supplement to IEEE Std 802.3, October 26, 1995.
- [3] IEEE 802.3u-1995, "10 & 100 Mb/s Management," Section 30, Supplement to IEEE Std 802.3, October 26, 1995.
- [4] de Graaf, K., D. Romascanu, D. McMaster and K. McCloghrie, "Definitions of Managed Objects for IEEE 802.3 Repeater Devices using SMIV2", RFC 2108, February 1997.
- [5] McCloghrie, K. and M. Rose, Editors, "Management Information Base for Network Management of TCP/IP-based internets: MIB-II", STD 17, RFC 1213, March 1991.
- [6] Case, J., McCloghrie, K., Rose, M. and S. Waldbusser, "Structure of Management Information for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1902, January 1996.
- [7] Case, J., McCloghrie, K., Rose, M. and S. Waldbusser, "Textual Conventions for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1903, January 1996.
- [8] Case, J., McCloghrie, K., Rose, M. and S. Waldbusser, "Conformance Statements for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1904, January 1996.
- [9] Case, J., McCloghrie, K., Rose, M. and S. Waldbusser, "Protocol Operations for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1905, January 1996.
- [10] Case, J., M. Fedor, M. Schoffstall and J. Davin, "Simple Network Management Protocol", STD 15, RFC 1157, May 1990.
- [11] McMaster, D., K. McCloghrie and S. Roberts, "Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs)", RFC 1515, September 1993.

6. Security Considerations

Certain management information defined in this MIB may be considered sensitive in some network environments. Therefore, authentication of received SNMP requests and controlled access to management information should be employed in such environments. The method for this authentication is a function of the SNMP Administrative Framework, and has not been expanded by this MIB.

Several objects in this MIB allow write access. Setting these objects can have a serious effect on the operation of the network, including enabling or disabling a MAU, changing a MAU's default type, enabling, disabling or restarting autonegotiation, or modifying the capabilities that a MAU advertizes during autonegotiation. It is recommended that implementers seriously consider whether set operations should be allowed without providing, at a minimum, authentication of request origin.

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