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

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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Abstract

   This memo defines a portion of the Management Information Base (MIB)
   for use with network management protocols in the Internet community.
   In particular, it defines objects for managing IEEE 802.3 Medium
   Attachment Units (MAUs). This memo obsoletes RFC 2668. This memo
   extends that specification by including management information useful
   for the management of 10 gigabit per second (Gb/s) MAUs. This memo
   also obsoletes RFC 1515.

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1. Introduction

   This memo defines a portion of the Management Information Base (MIB)
   for use with network management protocols in the Internet community.
   In particular, it defines objects for managing IEEE 802.3 Medium
   Attachment Units (MAUs).

   This memo also includes a MIB module. This MIB module extends the
   list of managed objects specified in the earlier version of this MIB
   module, RFC 2668 [RFC2668].

   Ethernet technology, as defined by the 802.3 Working Group of the
   IEEE, continues to evolve, with scalable increases in speed, new
   types of cabling and interfaces, and new features. This evolution
   may require changes in the managed objects in order to reflect this
   new functionality. This document, as with other documents issued by
   this working group, reflects a certain stage in the evolution of
   Ethernet technology. In the future, this document might be revised,
   or new documents might be issued by the Ethernet Interfaces and Hub
   MIB Working Group, in order to reflect the evolution of Ethernet
   technology.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
"SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
document are to be interpreted as described in [RFC2119].

2. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current
Internet-Standard Management Framework, please refer to section 7 of
RFC 3410 [RFC3410].

Managed objects are accessed via a virtual information store, termed
the Management Information Base or MIB. MIB objects are generally
accessed through the Simple Network Management Protocol (SNMP).
Objects in the MIB are defined using the mechanisms defined in the
Structure of Management Information (SMI). This memo specifies a MIB
module that is compliant to the SMIv2, which is described in STD 58,
RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580
[RFC2580].

3. Overview

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 [IEEE802.3]. 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 Mb/s, 100 Mb/s, 1000 Mb/s and 10 Gb/s Medium
Attachment Units (MAUs)", Section 30.6, "Management for link Auto-
Negotiation", and Annex 30A, "GDMO Specifications for 802.3 managed
object classes" of IEEE Std. 802.3, 2002 edition [IEEE802.3], as
amended by IEEE Std. 802.3ae-2002 [IEEE802.3ae]. That specification
includes definitions for 10 Mb/s, 100 Mb/s, 1000 Mb/s and 10 Gb/s
devices. This specification is intended to serve the same purpose:
to provide for management of all types of Ethernet/802.3 MAUs.

3.1. Relationship to RFC 2668

This MIB is intended to be a superset of that defined by RFC 2668
[RFC2668]. This MIB includes all of the objects contained in that
MIB, with new and updated definitions which provide support for
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 and updated
definitions provide management support for 10 Gb/s devices.

3.2. Relationship to RFC 2239

   RFC 2668 was a replacement for RFC 2239 [RFC2239]. RFC 2668 defined
   a superset of that defined by RFC 2239, which contained all of the
   objects defined in RFC 2239, plus several new ones which provide
   additional capabilities. The new objects provided management support
   for:

   o management of 1000 Mb/s devices

   o management of PAUSE negotiation

   o management of remote fault status

3.3. Relationship to RFC 1515

   RFC 2239 was a replacement for RFC 1515 [RFC1515]. RFC 2239 defined
   a superset of RFC 1515 which contained all of the objects defined in
   RFC 1515, plus several new ones which provided additional
   capabilities. The new objects in RFC 2239 provided management
   support for:

   o management of 100 Mb/s devices

   o auto-negotiation on interface MAUs

   o jack management

3.4. Relationship to Other MIBs

   It is assumed that an agent implementing this MIB will also implement
   (at least) the 'system' group defined in the SNMPv2 MIB [RFC3418].
   The following sections identify other MIBs that such an agent should
   implement.

3.4.1. Relationship to the Interfaces MIB.

   The sections of this document that define interface MAU-related
   objects specify an extension to the Interfaces MIB [RFC2863]. An
   agent implementing these interface-MAU related objects MUST also
   implement the relevant groups of the ifCompliance3 MODULE-COMPLIANCE
   statement of the Interface MIB. 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 REQUIRED that an agent implementing the interface-MAU related
   objects in this MIB will also fully comply with the dot3Compliance2
   MODULE-COMPLIANCE statement of the Ethernet-like Interfaces MIB,

[RFC3635]. Furthermore, when the interface-MAU related objects are
used to manage a 10GBASE-W PHY -- i.e., when ifMauType is equal to
dot3MauType10GigBaseW or any other 10GBASE-W variant -- then the
agent MUST also support the Ethernet WAN Interface Sublayer (WIS) MIB
[RFC3637] and must follow the interface layering model specified
therein. In that case the value of the object ifMauIfIndex is the
same as the value of 'ifIndex' for the layer at the top of the stack,
i.e., for the ifTable entry that has 'ifType' equal to
ethernetCsmacd(6). If the interface-MAU related objects are used to
manage a PHY that allows the MAU type to be changed dynamically, then
the agent SHALL create ifTable, ifStackTable, and ifInvStackTable
entries that pertain to the WIS when ifMauDefaultType is changed to a
10GBASEW variant (i.e., one of dot3MauType10GigBaseW,
dot3MauType10GigBaseEW, dot3MauType10GigBaseLW, or
dot3MauType10GigBaseSW) from any other type, and shall destroy the
WIS-related entries when ifMauDefaultType is changed to a non-
10GBASE-W type. The agent SHALL also change the values of
'ifConnectorPresent' and 'ifHighSpeed' in the ifTable entry indexed
by ifMauIfIndex as specified in [RFC3635] and [RFC3637] when
ifMauDefaultType is manipulated in this way but SHALL NOT otherwise
alter that entry.

(Note that repeater ports are not represented as interfaces in the
Interface MIB.)

3.4.2. 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
[RFC2108]. An agent implementing these repeater-MAU related objects
MUST also comply with the snmpRptrModCompl compliance statement of
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.

3.5. 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.

3.6. Mapping of IEEE 802.3 Managed Objects

     IEEE 802.3 Managed Object   Corresponding SNMP Object

     oMAU
       .aMAUID   rpMauIndex or
                                          ifMauIndex or
                                          broadMauIndex
       .aMAUType   rpMauType or
                                          ifMauType
       .aMAUTypeList   ifMauTypeListBits
       .aMediaAvailable   rpMauMediaAvailable or
                                          ifMauMediaAvailable
       .aLoseMediaCounter   rpMauMediaAvailableStateExits
                                          or
                                          ifMauMediaAvailableStateExits
       .aJabber   rpMauJabberState and
                                          rpMauJabberingStateEnters or
                                          ifMauJabberState and
                                          ifMauJabberingStateEnters
       .aMAUAdminState   rpMauStatus or
                                          ifMauStatus
       .aBbMAUXmitRcvSplitType   broadMauXmtRcvSplitType
       .aBroadbandFrequencies   broadMauXmtCarrierFreq and
                                          broadMauTranslationFreq
       .aFalseCarriers   rpMauFalseCarriers or
                                          ifMauFalseCarriers
       .acResetMAU   rpMauStatus or
                                          ifMauStatus
       .acMAUAdminControl   rpMauStatus or
                                          ifMauStatus
       .nJabber   rpMauJabberTrap or
                                          ifMauJabberTrap

     oAutoNegotiation
       .aAutoNegID   ifMauIndex
       .aAutoNegAdminState   ifMauAutoNegAdminStatus
       .aAutoNegRemoteSignalling   ifMauAutoNegRemoteSignalling
       .aAutoNegAutoConfig   ifMauAutoNegConfig
       .aAutoNegLocalTechnologyAbility   ifMauAutoNegCapabilityBits
       .aAutoNegAdvertisedTechnologyAbility ifMauAutoNegAdvertisedBits and
                                         ifMauAutoNegRemoteFaultAdvertised
       .aAutoNegReceivedTechnologyAbility ifMauAutoNegReceivedBits and
                                         ifMauAutoNegRemoteFaultReceived
       .acAutoNegRestartAutoConfig   ifMauAutoNegRestart

```
   .acAutoNegAdminControl              ifMauAutoNegAdminStatus
```

The following IEEE 802.3 managed objects have not been included in
this MIB for the following reasons.

```
IEEE 802.3 Managed Object            Corresponding SNMP Object

oMAU
 .aIdleErrorCount                     Only useful for 100BaseT2,
                                      which is not widely
                                      implemented.

oAutoNegotiation
 .aAutoNegLocalSelectorAbility        Only needed for support of
 .aAutoNegAdvertisedSelectorAbility   isoethernet (802.9a), which is
 .aAutoNegReceivedSelectorAbility     not supported by this MIB.
```

4. Definitions

```
   MAU-MIB DEFINITIONS ::= BEGIN

       IMPORTS
           Counter32, Integer32, Counter64,
           OBJECT-TYPE, MODULE-IDENTITY, NOTIFICATION-TYPE,
           OBJECT-IDENTITY, mib-2
               FROM SNMPv2-SMI
           TruthValue, AutonomousType, TEXTUAL-CONVENTION
               FROM SNMPv2-TC
           OBJECT-GROUP, MODULE-COMPLIANCE, NOTIFICATION-GROUP
               FROM SNMPv2-CONF
           InterfaceIndex
               FROM IF-MIB;

       mauMod MODULE-IDENTITY
           LAST-UPDATED "200309190000Z"  -- September 19, 2003
           ORGANIZATION "IETF Ethernet Interfaces and Hub MIB
                         Working Group"
           CONTACT-INFO
               "WG E-mail: hubmib@ietf.org
             To subscribe: hubmib-request@ietf.org
                    Chair: Dan Romascanu
                   Postal: Avaya Inc.
                           Atidim Technology Park, Bldg. 3
                           Tel Aviv 61131
                           Israel
                      Tel: +972 3 645 8414
                   E-mail: dromasca@avaya.com
```

                    Editor: John Flick
                    Postal: Hewlett-Packard Company
                            8000 Foothills Blvd. M/S 5557
                            Roseville, CA 95747-5557
                            USA
                       Tel: +1 916 785 4018
                       Fax: +1 916 785 1199
                    E-mail: johnf@rose.hp.com"
             DESCRIPTION "Management information for 802.3 MAUs.

                     The following reference is used throughout
                     this MIB module:

                     [IEEE 802.3 Std] refers to:
                         IEEE Std 802.3, 2002 Edition: 'IEEE Standard
                         for Information technology -
                         Telecommunications and information exchange
                         between systems - Local and metropolitan
                         area networks - Specific requirements -
                         Part 3: Carrier sense multiple access with
                         collision detection (CSMA/CD) access method
                         and physical layer specifications', as
                         amended by IEEE Std 802.3ae-2002:
                         'Amendment: Media Access Control (MAC)
                         Parameters, Physical Layer, and Management
                         Parameters for 10 Gb/s Operation', August,
                         2002.

                     Of particular interest is Clause 30, '10Mb/s,
                     100Mb/s, 1000Mb/s and 10 Gb/s Management'.

                     Copyright (C) The Internet Society (2003). This
                     version of this MIB module is part of RFC 3636;
                     see the RFC itself for full legal notices."

             REVISION   "200309190000Z" -- September 19, 2003
             DESCRIPTION "Updated to include support for 10 Gb/s MAUs.
                     This resulted in the following revisions:
                     - Added OBJECT-IDENTITY definitions for
                       10 gigabit MAU types
                     - Added fiberLC jack type to JackType TC
                     - Extended ifMauTypeListBits with bits for
                       the 10 gigabit MAU types
                     - Added enumerations to ifMauMediaAvailable,
                       and updated its DESCRIPTION to reflect
                       behaviour at 10 Gb/s
                     - Added 64-bit version of ifMauFalseCarriers
                       and added mauIfGrpHCStats object group to

```
                        contain the new object
                      - Deprecated mauModIfCompl2 and replaced it
                        with mauModIfCompl3, which includes the new
                        object group

                       This version published as RFC 3636."

        REVISION      "199908240400Z" -- August 24, 1999
        DESCRIPTION "This version published as RFC 2668.  Updated
                      to include support for 1000 Mb/sec
                      MAUs and flow control negotiation."

        REVISION      "199710310000Z" -- October 31, 1997
        DESCRIPTION "Version published as RFC 2239."

        REVISION      "199309300000Z" -- September30, 1993
        DESCRIPTION "Initial version, published as RFC 1515."

        ::= { 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),
                       mtrj(12),  -- fiber MT-RJ
                       hssdc(13), -- fiber channel style-2
                       fiberLC(14)
                    }

    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"
        REFERENCE   "[IEEE 802.3 Std.], Section 7"
        ::= { dot3MauType 1 }

    dot3MauType10Base5 OBJECT-IDENTITY
        STATUS       current
        DESCRIPTION "thick coax MAU"
        REFERENCE   "[IEEE 802.3 Std.], Section 7"
        ::= { dot3MauType 2 }

    dot3MauTypeFoirl OBJECT-IDENTITY
        STATUS       current
        DESCRIPTION "FOIRL MAU"
        REFERENCE   "[IEEE 802.3 Std.], Section 9.9"
        ::= { dot3MauType 3 }

    dot3MauType10Base2 OBJECT-IDENTITY
        STATUS       current
        DESCRIPTION "thin coax MAU"
        REFERENCE   "[IEEE 802.3 Std.], Section 10"
        ::= { dot3MauType 4 }

    dot3MauType10BaseT OBJECT-IDENTITY
        STATUS       current
        DESCRIPTION "UTP MAU.
                    Note that it is strongly recommended that
                    agents return either dot3MauType10BaseTHD or
                    dot3MauType10BaseTFD if the duplex mode is
                    known.  However, management applications should
                    be prepared to receive this MAU type value from
                    older agent implementations."
        REFERENCE   "[IEEE 802.3 Std.], Section 14"
        ::= { dot3MauType 5 }
```

```
    dot3MauType10BaseFP OBJECT-IDENTITY
        STATUS        current
        DESCRIPTION "passive fiber MAU"
        REFERENCE    "[IEEE 802.3 Std.], Section 16"
        ::= { dot3MauType 6 }

    dot3MauType10BaseFB OBJECT-IDENTITY
        STATUS        current
        DESCRIPTION "sync fiber MAU"
        REFERENCE    "[IEEE 802.3 Std.], Section 17"
        ::= { dot3MauType 7 }

    dot3MauType10BaseFL OBJECT-IDENTITY
        STATUS        current
        DESCRIPTION "async fiber MAU.
                     Note that it is strongly recommended that
                     agents return either dot3MauType10BaseFLHD or
                     dot3MauType10BaseFLFD if the duplex mode is
                     known.  However, management applications should
                     be prepared to receive this MAU type value from
                     older agent implementations."
        REFERENCE    "[IEEE 802.3 Std.], Section 18"
        ::= { dot3MauType 8 }

    dot3MauType10Broad36 OBJECT-IDENTITY
        STATUS        current
        DESCRIPTION "broadband DTE MAU.
                     Note that 10BROAD36 MAUs can be attached to
                     interfaces but not to repeaters."
        REFERENCE    "[IEEE 802.3 Std.], Section 11"
        ::= { dot3MauType 9 }
    ------ new since RFC 1515:

    dot3MauType10BaseTHD OBJECT-IDENTITY
        STATUS        current
        DESCRIPTION "UTP MAU, half duplex mode"
        REFERENCE    "[IEEE 802.3 Std.], Section 14"
        ::= { dot3MauType 10 }

    dot3MauType10BaseTFD OBJECT-IDENTITY
        STATUS        current
        DESCRIPTION "UTP MAU, full duplex mode"
        REFERENCE    "[IEEE 802.3 Std.], Section 14"
        ::= { dot3MauType 11 }

    dot3MauType10BaseFLHD OBJECT-IDENTITY
        STATUS        current
        DESCRIPTION "async fiber MAU, half duplex mode"
```

```
        REFERENCE    "[IEEE 802.3 Std.], Section 18"
        ::= { dot3MauType 12 }

    dot3MauType10BaseFLFD OBJECT-IDENTITY
        STATUS       current
        DESCRIPTION "async fiber MAU, full duplex mode"
        REFERENCE    "[IEEE 802.3 Std.], Section 18"
        ::= { dot3MauType 13 }

    dot3MauType100BaseT4 OBJECT-IDENTITY
        STATUS       current
        DESCRIPTION "4 pair category 3 UTP"
        REFERENCE    "[IEEE 802.3 Std.], Section 23"
        ::= { dot3MauType 14 }

    dot3MauType100BaseTXHD OBJECT-IDENTITY
        STATUS       current
        DESCRIPTION "2 pair category 5 UTP, half duplex mode"
        REFERENCE    "[IEEE 802.3 Std.], Section 25"
        ::= { dot3MauType 15 }

    dot3MauType100BaseTXFD OBJECT-IDENTITY
        STATUS       current
        DESCRIPTION "2 pair category 5 UTP, full duplex mode"
        REFERENCE    "[IEEE 802.3 Std.], Section 25"
        ::= { dot3MauType 16 }

    dot3MauType100BaseFXHD OBJECT-IDENTITY
        STATUS       current
        DESCRIPTION "X fiber over PMT, half duplex mode"
        REFERENCE    "[IEEE 802.3 Std.], Section 26"
        ::= { dot3MauType 17 }

    dot3MauType100BaseFXFD OBJECT-IDENTITY
        STATUS       current
        DESCRIPTION "X fiber over PMT, full duplex mode"
        REFERENCE    "[IEEE 802.3 Std.], Section 26"
        ::= { dot3MauType 18 }

    dot3MauType100BaseT2HD OBJECT-IDENTITY
        STATUS       current
        DESCRIPTION "2 pair category 3 UTP, half duplex mode"
        REFERENCE    "[IEEE 802.3 Std.], Section 32"
        ::= { dot3MauType 19 }

    dot3MauType100BaseT2FD OBJECT-IDENTITY
        STATUS       current
        DESCRIPTION "2 pair category 3 UTP, full duplex mode"
```

```
         REFERENCE    "[IEEE 802.3 Std.], Section 32"
         ::= { dot3MauType 20 }

      ------ new since RFC 2239:

      dot3MauType1000BaseXHD OBJECT-IDENTITY
         STATUS        current
         DESCRIPTION "PCS/PMA, unknown PMD, half duplex mode"
         REFERENCE    "[IEEE 802.3 Std.], Section 36"
         ::= { dot3MauType 21 }

      dot3MauType1000BaseXFD OBJECT-IDENTITY
         STATUS        current
         DESCRIPTION "PCS/PMA, unknown PMD, full duplex mode"
         REFERENCE    "[IEEE 802.3 Std.], Section 36"
         ::= { dot3MauType 22 }

      dot3MauType1000BaseLXHD OBJECT-IDENTITY
         STATUS        current
         DESCRIPTION "Fiber over long-wavelength laser, half duplex
                     mode"
         REFERENCE    "[IEEE 802.3 Std.], Section 38"
         ::= { dot3MauType 23 }

      dot3MauType1000BaseLXFD OBJECT-IDENTITY
         STATUS        current
         DESCRIPTION "Fiber over long-wavelength laser, full duplex
                     mode"
         REFERENCE    "[IEEE 802.3 Std.], Section 38"
         ::= { dot3MauType 24 }

      dot3MauType1000BaseSXHD OBJECT-IDENTITY
         STATUS        current
         DESCRIPTION "Fiber over short-wavelength laser, half
                     duplex mode"
         REFERENCE    "[IEEE 802.3 Std.], Section 38"
         ::= { dot3MauType 25 }

      dot3MauType1000BaseSXFD OBJECT-IDENTITY
         STATUS        current
         DESCRIPTION "Fiber over short-wavelength laser, full
                     duplex mode"
         REFERENCE    "[IEEE 802.3 Std.], Section 38"
         ::= { dot3MauType 26 }

      dot3MauType1000BaseCXHD OBJECT-IDENTITY
         STATUS        current
         DESCRIPTION "Copper over 150-Ohm balanced cable, half
```

```
                         duplex mode"
            REFERENCE    "[IEEE 802.3 Std.], Section 39"
            ::= { dot3MauType 27 }


       dot3MauType1000BaseCXFD OBJECT-IDENTITY
            STATUS       current
            DESCRIPTION "Copper over 150-Ohm balanced cable, full
                         duplex mode"
            REFERENCE    "[IEEE 802.3 Std.], Section 39"
            ::= { dot3MauType 28 }


       dot3MauType1000BaseTHD OBJECT-IDENTITY
            STATUS       current
            DESCRIPTION "Four-pair Category 5 UTP, half duplex mode"
            REFERENCE    "[IEEE 802.3 Std.], Section 40"
            ::= { dot3MauType 29 }


       dot3MauType1000BaseTFD OBJECT-IDENTITY
            STATUS       current
            DESCRIPTION "Four-pair Category 5 UTP, full duplex mode"
            REFERENCE    "[IEEE 802.3 Std.], Section 40"
            ::= { dot3MauType 30 }


       ------ new since RFC 2668:


       dot3MauType10GigBaseX OBJECT-IDENTITY
            STATUS       current
            DESCRIPTION "X PCS/PMA, unknown PMD."
            REFERENCE    "[IEEE 802.3 Std.], Section 48"
            ::= { dot3MauType 31 }


       dot3MauType10GigBaseLX4 OBJECT-IDENTITY
            STATUS       current
            DESCRIPTION "X fiber over WWDM optics"
            REFERENCE    "[IEEE 802.3 Std.], Section 53"
            ::= { dot3MauType 32 }


       dot3MauType10GigBaseR OBJECT-IDENTITY
            STATUS       current
            DESCRIPTION "R PCS/PMA, unknown PMD."
            REFERENCE    "[IEEE 802.3 Std.], Section 49"
            ::= { dot3MauType 33 }


       dot3MauType10GigBaseER OBJECT-IDENTITY
            STATUS       current
            DESCRIPTION "R fiber over 1550 nm optics"
            REFERENCE    "[IEEE 802.3 Std.], Section 52"
            ::= { dot3MauType 34 }
```

```
        dot3MauType10GigBaseLR OBJECT-IDENTITY
            STATUS        current
            DESCRIPTION "R fiber over 1310 nm optics"
            REFERENCE    "[IEEE 802.3 Std.], Section 52"
            ::= { dot3MauType 35 }

        dot3MauType10GigBaseSR OBJECT-IDENTITY
            STATUS        current
            DESCRIPTION "R fiber over 850 nm optics"
            REFERENCE    "[IEEE 802.3 Std.], Section 52"
            ::= { dot3MauType 36 }

        dot3MauType10GigBaseW OBJECT-IDENTITY
            STATUS        current
            DESCRIPTION "W PCS/PMA, unknown PMD."
            REFERENCE    "[IEEE 802.3 Std.], Section 49 and 50"
            ::= { dot3MauType 37 }

        dot3MauType10GigBaseEW OBJECT-IDENTITY
            STATUS        current
            DESCRIPTION "W fiber over 1550 nm optics"
            REFERENCE    "[IEEE 802.3 Std.], Section 52"
            ::= { dot3MauType 38 }

        dot3MauType10GigBaseLW OBJECT-IDENTITY
            STATUS        current
            DESCRIPTION "W fiber over 1310 nm optics"
            REFERENCE    "[IEEE 802.3 Std.], Section 52"
            ::= { dot3MauType 39 }

        dot3MauType10GigBaseSW OBJECT-IDENTITY
            STATUS        current
            DESCRIPTION "W fiber over 850 nm optics"
            REFERENCE    "[IEEE 802.3 Std.], Section 52"
            ::= { dot3MauType 40 }

        --
        -- 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                       AutonomousType,
                rpMauStatus                     INTEGER,
                rpMauMediaAvailable             INTEGER,
                rpMauMediaAvailableStateExits   Counter32,
                rpMauJabberState                INTEGER,
                rpMauJabberingStateEnters       Counter32,
                rpMauFalseCarriers              Counter32
            }

        rpMauGroupIndex OBJECT-TYPE
            SYNTAX        Integer32 (1..2147483647)
            MAX-ACCESS    read-only  -- read-only since originally an
                                     -- SMIv1 index
            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 rptrGroupIndex."
            REFERENCE   "Reference RFC 2108, rptrGroupIndex."
            ::= { rpMauEntry 1 }

        rpMauPortIndex OBJECT-TYPE
```

```
        SYNTAX        Integer32 (1..2147483647)
        MAX-ACCESS    read-only  -- read-only since originally an
                                 -- SMIv1 index
        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 2108, rptrPortIndex."
        ::= { rpMauEntry 2 }

    rpMauIndex OBJECT-TYPE
        SYNTAX        Integer32 (1..2147483647)
        MAX-ACCESS    read-only  -- read-only since originally an
                                 -- SMIv1 index
        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 Std], 30.5.1.1.1, aMAUID."
        ::= { rpMauEntry 3 }

    rpMauType OBJECT-TYPE
        SYNTAX        AutonomousType
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION "This object identifies the MAU type.  Values for
                     standard IEEE 802.3 MAU types are defined above.
                     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 Std], 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 Std], 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),
                         offline(10),
                         autoNegError(11)
                         }
           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 11.

                         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 100Mbps and 1000Mbps MAUs, the enumerations
match the states within the respective link
integrity state diagrams, fig 32-16, 23-12 and
24-15 of sections 32, 23 and 24 of [IEEE802.3].
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 802.3-2002 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).

Any MAU that implements management of clause 37
Auto-Negotiation will map the received Remote
Fault (RF1 and RF2) bit values for Offline to
offline(10), Link Failure to remoteFault(5) and
Auto-Negotiation Error to autoNegError(11)."

REFERENCE   "[IEEE 802.3 Std], 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).

                         Discontinuities in the value of this counter can
                         occur at re-initialization of the management
                         system, and at other times as indicated by the
                         value of rptrMonitorPortLastChange."
            REFERENCE    "[IEEE 802.3 Std], 30.5.1.1.5,
                         aLoseMediaCounter.
                         RFC 2108, rptrMonitorPortLastChange"
            ::= { 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 Std], 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, dot3MauType100BaseFX and
                        all 1000Mbps types, this counter will always
                        indicate zero.

                        Discontinuities in the value of this counter can
                        occur at re-initialization of the management
                        system, and at other times as indicated by the
                        value of rptrMonitorPortLastChange."
            REFERENCE   "[IEEE 802.3 Std], 30.5.1.1.6,
                        aJabber.jabberCounter.
                        RFC 2108, rptrMonitorPortLastChange"
            ::= { 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 and all 1000Mbps types.

                        For all other MAU types, this counter will
                        always indicate zero.

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

                        Discontinuities in the value of this counter can
                        occur at re-initialization of the management
                        system, and at other times as indicated by the
                        value of rptrMonitorPortLastChange."
            REFERENCE   "[IEEE 802.3 Std], 30.5.1.1.10, aFalseCarriers.
                        RFC 2108, rptrMonitorPortLastChange"
            ::= { 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                      InterfaceIndex,
            ifMauIndex                        Integer32,
            ifMauType                         AutonomousType,
            ifMauStatus                       INTEGER,
            ifMauMediaAvailable               INTEGER,
            ifMauMediaAvailableStateExits     Counter32,
            ifMauJabberState                  INTEGER,
            ifMauJabberingStateEnters         Counter32,
            ifMauFalseCarriers                Counter32,
            ifMauTypeList                     Integer32,
            ifMauDefaultType                  AutonomousType,
            ifMauAutoNegSupported             TruthValue,
            ifMauTypeListBits                 BITS,
            ifMauHCFalseCarriers              Counter64
        }

    ifMauIfIndex OBJECT-TYPE
        SYNTAX      InterfaceIndex
        MAX-ACCESS  read-only  -- read-only since originally an
                               -- SMIv1 index
        STATUS      current
        DESCRIPTION "This variable uniquely identifies the interface
                    to which the MAU described by this entry is
                    connected."
        REFERENCE   "RFC 2863, ifIndex"
        ::= { ifMauEntry 1 }

    ifMauIndex OBJECT-TYPE
        SYNTAX      Integer32 (1..2147483647)
```

```
                MAX-ACCESS  read-only  -- read-only since originally an
                                       -- SMIv1 index
                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 Std], 30.5.1.1.1, aMAUID."
                ::= { ifMauEntry 2 }

        ifMauType OBJECT-TYPE
                SYNTAX      AutonomousType
                MAX-ACCESS  read-only
                STATUS      current
                DESCRIPTION "This object identifies the MAU type.  Values for
                            standard IEEE 802.3 MAU types are defined above.
                            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 Std], 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 Std], 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),
                            offline(10),
                            autoNegError(11),
                            pmdLinkFault(12),
                            wisFrameLoss(13),
                            wisSignalLoss(14),
                            pcsLinkFault(15),
                            excessiveBER(16),
                            dxsLinkFault(17),
                            pxsLinkFault(18)
                          }
            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 18.

                          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 100Mbps and 1000Mbps MAUs, the enumerations
match the states within the respective link
integrity state diagrams, fig 32-16, 23-12 and
24-15 of sections 32, 23 and 24 of [IEEE802.3].
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 802.3-2002 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).

Any MAU that implements management of clause 37
Auto-Negotiation will map the received RF1 and
RF2 bit values for Offline to offline(10), Link
Failure to remoteFault(5) and Auto-Negotiation
Error to autoNegError(11).

For 10 Gb/s, the enumerations map to the states
within the Reconciliation Sublayer state diagram

                         as follows:
                           NoFault maps to the enumeration 'available(3)'
                           LocalFault maps to the enumeration
                             'notAvailable(4)'
                           RemoteFault maps to the enumeration
                             'remoteFault(5)'
                         The enumerations 'pmdLinkFault(12)',
                         'wisFrameLoss(13)', 'wisSignalLoss(14)',
                         'pcsLinkFault(15)', 'excessiveBER(16)', and
                         'dxsLinkFault(17)' and 'pxsLinkFault(18)' should
                         be used instead of the enumeration
                         'notAvailable(4)' where the reason for the local
                         fault can be identified through the use of the
                         MDIO Interface. Where multiple reasons for the
                         local fault state can be identified only the
                         highest precedence error should be reported.
                         The precedence in descending order is as
                         follows:
                             pxsLinkFault
                             pmdLinkFault
                             wisFrameLoss
                             wisSignalLoss
                             pcsLinkFault
                             excessiveBER
                             dxsLinkFault"
            REFERENCE   "[IEEE 802.3 Std], 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).

                          Discontinuities in the value of this counter can
                          occur at re-initialization of the management
                          system, and at other times as indicated by the
                          value of ifCounterDiscontinuityTime."
            REFERENCE   "[IEEE 802.3 Std], 30.5.1.1.5,
                          aLoseMediaCounter.
                          RFC 2863, ifCounterDiscontinuityTime."
            ::= { 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 Std], 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). This counter will always
                    indicate zero for MAUs of type dot3MauTypeAUI
                    and those of speeds above 10Mbps.

                    Discontinuities in the value of this counter can
                    occur at re-initialization of the management
                    system, and at other times as indicated by the
                    value of ifCounterDiscontinuityTime."
        REFERENCE   "[IEEE 802.3 Std], 30.5.1.1.6,
                    aJabber.jabberCounter.
                    RFC 2863, ifCounterDiscontinuityTime."
        ::= { 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 and 1000BASE-X links.

                         For all other MAU types, this counter will
                         always indicate zero. 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
                         for 100BASE-X and once per 10us for 1000BASE-X
                         until the next CarrierEvent.

                         This counter can roll over very quickly. A
                         management station is advised to poll the
                         ifMauHCFalseCarriers instead of this counter in
                         order to avoid loss of information.

                         Discontinuities in the value of this counter can
                         occur at re-initialization of the management
                         system, and at other times as indicated by the
                         value of ifCounterDiscontinuityTime."
             REFERENCE   "[IEEE 802.3 Std], 30.5.1.1.10, aFalseCarriers.
                         RFC 2863, ifCounterDiscontinuityTime."
             ::= { ifMauEntry 9 }

         ifMauTypeList OBJECT-TYPE
             SYNTAX   Integer32
             MAX-ACCESS read-only
             STATUS   deprecated
             DESCRIPTION "********* THIS OBJECT IS DEPRECATED **********

                         This object has been deprecated in favour of
                         ifMauTypeListBits.

                         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       AutonomousType
           MAX-ACCESS   read-write
           STATUS       current
           DESCRIPTION "This object identifies the default
                    administrative 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 Std], 30.5.1.1.1, aMAUID, and
                    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 }

    ifMauTypeListBits OBJECT-TYPE
        SYNTAX      BITS {
            bOther(0),           -- other or unknown
            bAUI(1),             -- AUI
            b10base5(2),         -- 10BASE-5
            bFoirl(3),           -- FOIRL

            b10base2(4),         -- 10BASE-2
            b10baseT(5),         -- 10BASE-T duplex mode unknown
            b10baseFP(6),        -- 10BASE-FP
            b10baseFB(7),        -- 10BASE-FB
            b10baseFL(8),        -- 10BASE-FL duplex mode unknown
            b10broad36(9),       -- 10BROAD36
            b10baseTHD(10),      -- 10BASE-T  half duplex mode
            b10baseTFD(11),      -- 10BASE-T  full duplex mode
            b10baseFLHD(12),     -- 10BASE-FL half duplex mode
            b10baseFLFD(13),     -- 10BASE-FL full duplex mode
```

```
        b100baseT4(14),    -- 100BASE-T4
        b100baseTXHD(15),  -- 100BASE-TX half duplex mode
        b100baseTXFD(16),  -- 100BASE-TX full duplex mode
        b100baseFXHD(17),  -- 100BASE-FX half duplex mode
        b100baseFXFD(18),  -- 100BASE-FX full duplex mode
        b100baseT2HD(19),  -- 100BASE-T2 half duplex mode
        b100baseT2FD(20),  -- 100BASE-T2 full duplex mode

        b1000baseXHD(21),  -- 1000BASE-X half duplex mode
        b1000baseXFD(22),  -- 1000BASE-X full duplex mode
        b1000baseLXHD(23), -- 1000BASE-LX half duplex mode
        b1000baseLXFD(24), -- 1000BASE-LX full duplex mode
        b1000baseSXHD(25), -- 1000BASE-SX half duplex mode
        b1000baseSXFD(26), -- 1000BASE-SX full duplex mode
        b1000baseCXHD(27), -- 1000BASE-CX half duplex mode
        b1000baseCXFD(28), -- 1000BASE-CX full duplex mode
        b1000baseTHD(29),  -- 1000BASE-T half duplex mode
        b1000baseTFD(30),  -- 1000BASE-T full duplex mode

        b10GbaseX(31),     -- 10GBASE-X
        b10GbaseLX4(32),   -- 10GBASE-LX4
        b10GbaseR(33),     -- 10GBASE-R
        b10GbaseER(34),    -- 10GBASE-ER
        b10GbaseLR(35),    -- 10GBASE-LR
        b10GbaseSR(36),    -- 10GBASE-SR
        b10GbaseW(37),     -- 10GBASE-W
        b10GbaseEW(38),    -- 10GBASE-EW
        b10GbaseLW(39),    -- 10GBASE-LW
        b10GbaseSW(40)     -- 10GBASE-SW
    }
    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.
                If auto-negotiation is present on this MAU, this
                object will map to ifMauAutoNegCapabilityBits.

                Note that this MAU may be capable of operating
                as a MAU type that is beyond the scope of this
                MIB.  This is indicated by returning the
                bit value bOther in addition to any bit values
                for capabilities that are listed above."
    ::= { ifMauEntry 13 }

ifMauHCFalseCarriers OBJECT-TYPE
    SYNTAX      Counter64
    MAX-ACCESS  read-only
    STATUS      current
```

```
        DESCRIPTION "A count of the number of false carrier events
                    during IDLE in 100BASE-X and 1000BASE-X links.

                    For all other MAU types, this counter will
                    always indicate zero. This counter does not
                    increment at the symbol rate.

                    This counter is a 64 bit version of
                    ifMauFalseCarriers.  Since the 32 bit version of
                    this counter can roll over very quickly,
                    management stations are advised to poll the
                    64 bit version instead in order to avoid loss
                    of information.

                    Discontinuities in the value of this counter can
                    occur at re-initialization of the management
                    system, and at other times as indicated by the
                    value of ifCounterDiscontinuityTime."
        REFERENCE   "[IEEE 802.3 Std], 30.5.1.1.10, aFalseCarriers.
                    RFC 2863, ifCounterDiscontinuityTime."
        ::= { ifMauEntry 14 }

    -- 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 MAU Auto-Negotiation Table
--

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.

                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."
    ::= { 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,
                ifMauAutoNegCapabilityBits           BITS,
                ifMauAutoNegCapAdvertisedBits        BITS,
                ifMauAutoNegCapReceivedBits          BITS,
                ifMauAutoNegRemoteFaultAdvertised    INTEGER,
                ifMauAutoNegRemoteFaultReceived      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 Std], 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 Std], 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 Std], 30.6.1.1.4,
                        aAutoNegAutoConfig."
            ::= { ifMauAutoNegEntry 4 }

        ifMauAutoNegCapability OBJECT-TYPE
            SYNTAX        Integer32
            MAX-ACCESS  read-only
            STATUS      deprecated
            DESCRIPTION "********* THIS OBJECT IS DEPRECATED **********

                        This object has been deprecated in favour of
                        ifMauAutoNegCapabilityBits.
```

                          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
                          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 Std], 30.6.1.1.5,
                               aAutoNegLocalTechnologyAbility."
                  ::= { ifMauAutoNegEntry 5 }

          ifMauAutoNegCapAdvertised OBJECT-TYPE
                  SYNTAX   Integer32
                  MAX-ACCESS   read-write
                  STATUS   deprecated
                  DESCRIPTION "********* THIS OBJECT IS DEPRECATED *********

                          This object has been deprecated in favour of
                          ifMauAutoNegCapAdvertisedBits.

                          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 Std], 30.6.1.1.6,
                     aAutoNegAdvertisedTechnologyAbility."
        ::= { ifMauAutoNegEntry 6 }

    ifMauAutoNegCapReceived OBJECT-TYPE
        SYNTAX   Integer32
        MAX-ACCESS   read-only
        STATUS   deprecated
        DESCRIPTION "********* THIS OBJECT IS DEPRECATED **********

                     This object has been deprecated in favour of
                     ifMauAutoNegCapReceivedBits.

                     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 Std], 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 Std], 30.6.1.2.1,
                        acAutoNegRestartAutoConfig."
            ::= { ifMauAutoNegEntry 8 }

      ifMauAutoNegCapabilityBits OBJECT-TYPE
          SYNTAX        BITS {
              bOther(0),          -- other or unknown
              b10baseT(1),        -- 10BASE-T  half duplex mode
              b10baseTFD(2),      -- 10BASE-T  full duplex mode
              b100baseT4(3),      -- 100BASE-T4
              b100baseTX(4),      -- 100BASE-TX half duplex mode
              b100baseTXFD(5),    -- 100BASE-TX full duplex mode
              b100baseT2(6),      -- 100BASE-T2 half duplex mode
              b100baseT2FD(7),    -- 100BASE-T2 full duplex mode
              bfdxPause(8),       -- PAUSE for full-duplex links
              bfdxAPause(9),      -- Asymmetric PAUSE for full-duplex
                                  --     links
              bfdxSPause(10),     -- Symmetric PAUSE for full-duplex
                                  --     links
              bfdxBPause(11),     -- Asymmetric and Symmetric PAUSE for
                                  --     full-duplex links
              b1000baseX(12),     -- 1000BASE-X, -LX, -SX, -CX half
                                  --     duplex mode
              b1000baseXFD(13),   -- 1000BASE-X, -LX, -SX, -CX full
                                  --     duplex mode
              b1000baseT(14),     -- 1000BASE-T half duplex mode
              b1000baseTFD(15)    -- 1000BASE-T full duplex mode
          }
          MAX-ACCESS  read-only
          STATUS      current
          DESCRIPTION "A value that uniquely identifies the set of
                        capabilities of the local auto-negotiation
                        entity.  Note that interfaces that support this
                        MIB may have capabilities that extend beyond the
                        scope of this MIB.

                        Note that the local auto-negotiation entity may
                        support some capabilities beyond the scope of
                        this MIB.  This is indicated by returning the
                        bit value bOther in addition to any bit values
                        for capabilities that are listed above."
          REFERENCE     "[IEEE 802.3 Std], 30.6.1.1.5,
                        aAutoNegLocalTechnologyAbility."
          ::= { ifMauAutoNegEntry 9 }

      ifMauAutoNegCapAdvertisedBits OBJECT-TYPE
```

```
            SYNTAX      BITS {
                bOther(0),         -- other or unknown
                b10baseT(1),       -- 10BASE-T  half duplex mode
                b10baseTFD(2),     -- 10BASE-T  full duplex mode
                b100baseT4(3),     -- 100BASE-T4
                b100baseTX(4),     -- 100BASE-TX half duplex mode
                b100baseTXFD(5),   -- 100BASE-TX full duplex mode
                b100baseT2(6),     -- 100BASE-T2 half duplex mode
                b100baseT2FD(7),   -- 100BASE-T2 full duplex mode
                bFdxPause(8),      -- PAUSE for full-duplex links
                bFdxAPause(9),     -- Asymmetric PAUSE for full-duplex
                                   --     links
                bFdxSPause(10),    -- Symmetric PAUSE for full-duplex
                                   --     links
                bFdxBPause(11),    -- Asymmetric and Symmetric PAUSE for
                                   --     full-duplex links
                b1000baseX(12),    -- 1000BASE-X, -LX, -SX, -CX half
                                   --     duplex mode
                b1000baseXFD(13),  -- 1000BASE-X, -LX, -SX, -CX full
                                   --     duplex mode
                b1000baseT(14),    -- 1000BASE-T half duplex mode
                b1000baseTFD(15)   -- 1000BASE-T full duplex mode
            }
            MAX-ACCESS  read-write
            STATUS      current
            DESCRIPTION "A value that uniquely identifies the set of
                        capabilities advertised by the local
                        auto-negotiation entity.

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

                        Note that the local auto-negotiation entity may
                        advertise some capabilities beyond the scope of
                        this MIB.  This is indicated by returning the
                        bit value bOther in addition to any bit values
                        for capabilities that are listed above."
            REFERENCE   "[IEEE 802.3 Std], 30.6.1.1.6,
                        aAutoNegAdvertisedTechnologyAbility."
            ::= { ifMauAutoNegEntry 10 }

        ifMauAutoNegCapReceivedBits OBJECT-TYPE
            SYNTAX      BITS {
                bOther(0),         -- other or unknown
                b10baseT(1),       -- 10BASE-T  half duplex mode
                b10baseTFD(2),     -- 10BASE-T  full duplex mode
                b100baseT4(3),     -- 100BASE-T4
```

```
             b100baseTX(4),    -- 100BASE-TX half duplex mode
             b100baseTXFD(5),  -- 100BASE-TX full duplex mode
             b100baseT2(6),    -- 100BASE-T2 half duplex mode
             b100baseT2FD(7),  -- 100BASE-T2 full duplex mode
             bFdxPause(8),     -- PAUSE for full-duplex links
             bFdxAPause(9),    -- Asymmetric PAUSE for full-duplex
                               --    links
             bFdxSPause(10),   -- Symmetric PAUSE for full-duplex
                               --    links
             bFdxBPause(11),   -- Asymmetric and Symmetric PAUSE for
                               --    full-duplex links
             b1000baseX(12),   -- 1000BASE-X, -LX, -SX, -CX half
                               --    duplex mode
             b1000baseXFD(13), -- 1000BASE-X, -LX, -SX, -CX full
                               --    duplex mode
             b1000baseT(14),   -- 1000BASE-T half duplex mode
             b1000baseTFD(15)  -- 1000BASE-T full duplex mode
         }
     MAX-ACCESS   read-only
     STATUS       current
     DESCRIPTION "A value that uniquely identifies the set of
                 capabilities received from the remote
                 auto-negotiation entity.
                 Note that interfaces that support this MIB may
                 be attached to remote auto-negotiation entities
                 which have capabilities beyond the scope of this
                 MIB.  This is indicated by returning the bit
                 value bOther in addition to any bit values for
                 capabilities that are listed above."
     REFERENCE   "[IEEE 802.3 Std], 30.6.1.1.7,
                 aAutoNegReceivedTechnologyAbility."
     ::= { ifMauAutoNegEntry 11 }

ifMauAutoNegRemoteFaultAdvertised OBJECT-TYPE
     SYNTAX       INTEGER {
                     noError(1),
                     offline(2),
                     linkFailure(3),
                     autoNegError(4)
                 }
     MAX-ACCESS   read-write
     STATUS       current
     DESCRIPTION "A value that identifies any local fault
                 indications that this MAU has detected and will
                 advertise at the next auto-negotiation
                 interaction for 1000Mbps MAUs."
     REFERENCE   "[IEEE 802.3 Std], 30.6.1.1.6,
                 aAutoNegAdvertisedTechnologyAbility."
```

```
        ::= { ifMauAutoNegEntry 12 }

ifMauAutoNegRemoteFaultReceived OBJECT-TYPE
    SYNTAX        INTEGER {
                     noError(1),
                     offline(2),
                     linkFailure(3),
                     autoNegError(4)
                  }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION "A value that identifies any fault indications
                received from the far end of a link by the
                local auto-negotiation entity for 1000Mbps
                MAUs."
    REFERENCE   "[IEEE 802.3 Std], 30.6.1.1.7,
                aAutoNegReceivedTechnologyAbility."
    ::= { ifMauAutoNegEntry 13 }


--
-- The Basic Broadband MAU Table
--

broadMauBasicTable OBJECT-TYPE
    SYNTAX        SEQUENCE OF BroadMauBasicEntry
    MAX-ACCESS  not-accessible
    STATUS      deprecated
    DESCRIPTION "********* THIS OBJECT IS DEPRECATED **********

                This entire table has been deprecated.  There
                have been no reported implementations of this
                table, and it is unlikely that there ever will
                be.  IEEE recommends that broadband MAU types
                should not be used for new installations.

                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      deprecated
    DESCRIPTION "********* THIS OBJECT IS DEPRECATED **********

                An entry in the table, containing information
```

```
                        about a single broadband MAU."
          INDEX           { broadMauIfIndex,
                            broadMauIndex
                          }
          ::= { broadMauBasicTable 1 }

      BroadMauBasicEntry ::=
          SEQUENCE {
              broadMauIfIndex                    InterfaceIndex,
              broadMauIndex                      Integer32,
              broadMauXmtRcvSplitType            INTEGER,
              broadMauXmtCarrierFreq             Integer32,
              broadMauTranslationFreq            Integer32
          }

      broadMauIfIndex OBJECT-TYPE
          SYNTAX        InterfaceIndex
          MAX-ACCESS    read-only  -- read-only since originally an
                                   -- SMIv1 index
          STATUS        deprecated
          DESCRIPTION "********* THIS OBJECT IS DEPRECATED **********

                       This variable uniquely identifies the interface
                       to which the MAU described by this entry is
                       connected."
          REFERENCE     "Reference RFC 2863, ifIndex."
          ::= { broadMauBasicEntry 1 }

      broadMauIndex OBJECT-TYPE
          SYNTAX        Integer32 (1..2147483647)
          MAX-ACCESS    read-only  -- read-only since originally an
                                   -- SMIv1 index
          STATUS        deprecated
          DESCRIPTION "********* THIS OBJECT IS DEPRECATED **********

                       This variable uniquely identifies the MAU
                       connected to interface broadMauIfIndex that is
                       described by this entry."
          REFERENCE     "[IEEE 802.3 Std], 30.5.1.1.1, aMAUID."
          ::= { broadMauBasicEntry 2 }

      broadMauXmtRcvSplitType OBJECT-TYPE
          SYNTAX        INTEGER {
                          other(1),
                          single(2),
                          dual(3)
                        }
          MAX-ACCESS    read-only
```

```
        STATUS      deprecated
        DESCRIPTION "********** THIS OBJECT IS DEPRECATED **********

                    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   "[IEEE 802.3 Std], 30.5.1.1.8,
                    aBbMAUXmitRcvSplitType."
        ::= { broadMauBasicEntry 3 }

    broadMauXmtCarrierFreq OBJECT-TYPE
        SYNTAX      Integer32
        MAX-ACCESS  read-only
        STATUS      deprecated
        DESCRIPTION "********** THIS OBJECT IS DEPRECATED **********

                    This variable indicates the transmit carrier
                    frequency of the 10BROAD36 MAU in MHz/4; that
                    is, in units of 250 kHz."
        REFERENCE   "[IEEE 802.3 Std], 30.5.1.1.9,
                    aBroadbandFrequencies.xmitCarrierFrequency."
        ::= { broadMauBasicEntry 4 }

    broadMauTranslationFreq OBJECT-TYPE
        SYNTAX      Integer32
        MAX-ACCESS  read-only
        STATUS      deprecated
        DESCRIPTION "********** THIS OBJECT IS DEPRECATED **********

                    This variable indicates the translation offset
                    frequency of the 10BROAD36 MAU in MHz/4; that
                    is, in units of 250 kHz."
        REFERENCE   "[IEEE 802.3 Std], 30.5.1.1.9,
                    aBroadbandFrequencies.translationFrequency."
        ::= { broadMauBasicEntry 5 }

    -- Notifications for use by 802.3 MAUs

    snmpDot3MauTraps OBJECT IDENTIFIER ::= { snmpDot3MauMgt 0 }
```

```
        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."
            ::= { snmpDot3MauTraps 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."
            ::= { snmpDot3MauTraps 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 or greater
                        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      deprecated
     DESCRIPTION "********* THIS GROUP IS DEPRECATED **********

                 Conformance group for MAUs attached to
                 interfaces with 100 Mb/s capability.

                 This object group has been deprecated in favor
                 of mauIfGrpHighCapacity."
     ::= { 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      deprecated
     DESCRIPTION "********* THIS GROUP IS DEPRECATED **********

                 Conformance group for MAUs attached to
                 interfaces with managed auto-negotiation.

                 This object group has been deprecated in favor
                 of mauIfGrpAutoNeg2."
     ::= { mauModObjGrps 7 }

mauBroadBasic OBJECT-GROUP
     OBJECTS       { broadMauIfIndex,
                     broadMauIndex,
                     broadMauXmtRcvSplitType,
                     broadMauXmtCarrierFreq,
                     broadMauTranslationFreq
                   }
     STATUS      deprecated
     DESCRIPTION "********* THIS GROUP IS DEPRECATED **********

                 Conformance group for broadband MAUs attached
                 to interfaces.
```

```
                    This object group is deprecated.  There have
                    been no reported implementations of this group,
                    and it was felt to be unlikely that there will
                    be any future implementations."
        ::= { mauModObjGrps 8 }

    mauIfGrpHighCapacity OBJECT-GROUP
        OBJECTS      { ifMauFalseCarriers,
                       ifMauTypeListBits,
                       ifMauDefaultType,
                       ifMauAutoNegSupported
                     }
        STATUS       current
        DESCRIPTION "Conformance group for MAUs attached to
                     interfaces with 100 Mb/s or greater capability."
        ::= { mauModObjGrps 9 }

    mauIfGrpAutoNeg2 OBJECT-GROUP
        OBJECTS      { ifMauAutoNegAdminStatus,
                       ifMauAutoNegRemoteSignaling,
                       ifMauAutoNegConfig,
                       ifMauAutoNegCapabilityBits,
                       ifMauAutoNegCapAdvertisedBits,
                       ifMauAutoNegCapReceivedBits,
                       ifMauAutoNegRestart
                     }
        STATUS       current
        DESCRIPTION "Conformance group for MAUs attached to
                     interfaces with managed auto-negotiation."
        ::= { mauModObjGrps 10 }

    mauIfGrpAutoNeg1000Mbps OBJECT-GROUP
        OBJECTS      { ifMauAutoNegRemoteFaultAdvertised,
                       ifMauAutoNegRemoteFaultReceived
                     }
        STATUS       current
        DESCRIPTION "Conformance group for 1000Mbps MAUs attached to
                     interfaces with managed auto-negotiation."
        ::= { mauModObjGrps 11 }

    mauIfGrpHCStats OBJECT-GROUP
        OBJECTS      { ifMauHCFalseCarriers }
        STATUS       current
        DESCRIPTION "Conformance for high capacity statistics for
                     MAUs attached to interfaces"
        ::= { mauModObjGrps 12 }

    -- 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        deprecated
            DESCRIPTION "******** THIS COMPLIANCE IS DEPRECATED ********
                        Compliance for MAUs attached to repeater
                        ports.

                        This compliance is deprecated and replaced by
                        mauModRpCompl2, which corrects an oversight by
                        allowing rpMauStatus to be implemented
                        read-only."

            MODULE -- this module
                MANDATORY-GROUPS { mauRpGrpBasic }

                GROUP        mauRpGrp100Mbs
                DESCRIPTION "Implementation of this optional group is
                            recommended for MAUs which have 100Mb/s or
                            greater 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        deprecated
            DESCRIPTION "******** THIS COMPLIANCE IS DEPRECATED ********

                        Compliance for MAUs attached to interfaces.
```

```
                  This compliance is deprecated and replaced by
                  mauModIfCompl2."

          MODULE -- this module
              MANDATORY-GROUPS { mauIfGrpBasic }

              GROUP       mauIfGrp100Mbs
              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 }

      mauModIfCompl2 MODULE-COMPLIANCE
          STATUS      deprecated
          DESCRIPTION "******** THIS COMPLIANCE IS DEPRECATED ********

                      Compliance for MAUs attached to interfaces.

                      This compliance is deprecated and replaced by
                      mauModIfCompl3."

          MODULE -- this module
              MANDATORY-GROUPS { mauIfGrpBasic }

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

              GROUP       mauIfGrpJack
```

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

                 GROUP       mauIfGrpAutoNeg2
                 DESCRIPTION "Implementation of this group is mandatory
                             for MAUs which support managed
                             auto-negotiation."

                 GROUP       mauIfGrpAutoNeg1000Mbps
                 DESCRIPTION "Implementation of this group is mandatory
                             for MAUs which have 1000Mb/s or greater
                             capability and support managed
                             auto-negotiation."

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

                 OBJECT      ifMauStatus
                 MIN-ACCESS  read-only
                 DESCRIPTION "Write access is not required."
             ::= { mauModCompls 3 }

         mauModRpCompl2 MODULE-COMPLIANCE
             STATUS      current
             DESCRIPTION "Compliance for MAUs attached to repeater
                         ports.

                         Note that compliance with this compliance
                         statement requires compliance with the
                         snmpRptrModCompl MODULE-COMPLIANCE statement of
                         the SNMP-REPEATER-MIB (RFC 2108)."

             MODULE -- this module
                 MANDATORY-GROUPS { mauRpGrpBasic }

                 GROUP       mauRpGrp100Mbs
                 DESCRIPTION "Implementation of this optional group is
                             recommended for MAUs which have 100Mb/s or
                             greater 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."

             OBJECT      rpMauStatus
             MIN-ACCESS  read-only
             DESCRIPTION "Write access is not required."
         ::= { mauModCompls 4 }

     mauModIfCompl3 MODULE-COMPLIANCE
         STATUS      current
         DESCRIPTION "Compliance for MAUs attached to interfaces.

                     Note that compliance with this compliance
                     statement requires compliance with the
                     ifCompliance3 MODULE-COMPLIANCE statement of the
                     IF-MIB (RFC 2863) and the dot3Compliance2
                     MODULE-COMPLIANCE statement of the
                     EtherLike-MIB (RFC3635)."

         MODULE -- this module
             MANDATORY-GROUPS { mauIfGrpBasic }

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

             GROUP       mauIfGrpHCStats
             DESCRIPTION "Implementation of this group is mandatory
                          for MAUs which have 1000Mb/s capacity, and
                          is recommended for MAUs which have 100Mb/s
                          capacity."

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

             GROUP       mauIfGrpAutoNeg2
             DESCRIPTION "Implementation of this group is mandatory
                          for MAUs which support managed
                          auto-negotiation."

             GROUP       mauIfGrpAutoNeg1000Mbps
             DESCRIPTION "Implementation of this group is mandatory
                          for MAUs which have 1000Mb/s or greater
                          capability and support managed
                          auto-negotiation."
```

```
            GROUP         ifMauNotifications
            DESCRIPTION  "Implementation of this group is recommended
                          for MAUs attached to interfaces."

            OBJECT        ifMauStatus
            MIN-ACCESS   read-only
            DESCRIPTION  "Write access is not required."
        ::= { mauModCompls 5 }

    END
```

5. Intellectual Property Statement

   The IETF takes no position regarding the validity or scope of any
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   Director.

6. Acknowledgements

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   Hub MIB Working Group. It extends that document by providing support
   for 10 Gb/s MAUs as defined in [IEEE802.3ae].

   RFC 2668, in turn, was based on the Proposed Standard MAU MIB, RFC
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   RFC 2239, in turn, was based on the Proposed Standard MAU MIB, RFC
   1515 [RFC1515], edited by Donna McMaster, then of SynOptics
   Communications, Keith McCloghrie, then of Hughes LAN Systems, and Sam
   Roberts, then of Farallon Computing, and produced by the Hub MIB
   Working Group. It extends that document by providing support for 100
   Mb/sec MAUs, full duplex MAUs, and auto-negotiation, as defined in
   [IEEE802.3].

7. Normative References

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8. Informative References

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                      McMaster, D., McCloghrie, K. and S. Roberts,
                      "Definitions of Managed Objects for IEEE 802.3 Medium
                      Attachment Units (MAUs)", RFC 2668, August 1999.

   [RFC2239]   de Graaf, K., Romascanu, D., McMaster, D., McCloghrie,
                      K. and S. Roberts, "Definitions of Managed Objects for
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                      RFC 2239, November 1997.

   [RFC1515]   McMaster, D., McCloghrie, K. and S. Roberts,
                      "Definitions of Managed Objects for IEEE 802.3 Medium
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   [RFC3637]   Heard, C. M., Ed., "Definitions of Managed Objects for
                      the Ethernet WAN Interface Sublayer", RFC 3637,
                      September 2003.

9. Security Considerations

   There are a number of management objects defined in this MIB that
   have a MAX-ACCESS clause of read-write. Setting these objects can
   have a serious effect on the operation of the network, including:

   o enabling or disabling a MAU

   o changing a MAU's default type

   o enabling, disabling or restarting autonegotiation

   o modifying the capabilities that a MAU advertizes during
      autonegotiation.

   Such objects may be considered sensitive or vulnerable in some
   network environments. The support for SET operations in a non-secure
   environment without proper protection can have a negative effect on
   network operations.

Some of the readable objects in this MIB module (i.e., objects with a
MAX-ACCESS other than not-accessible) may be considered sensitive or
vulnerable in some network environments. In some environments it may
be undesirable to allow unauthorized parties to access statistics or
status information about individual links in a network. It is thus
important to control even GET and/or NOTIFY access to these objects
and possibly to even encrypt the values of these objects when sending
them over the network via SNMP.

SNMP versions prior to SNMPv3 did not include adequate security.
Even if the network itself is secure (for example by using IPSec),
even then, there is no control as to who on the secure network is
allowed to access and GET/SET (read/change/create/delete) the objects
in this MIB module.

It is recommended that the implementors consider the security
features as provided by the SNMPv3 framework (see [RFC3410], section
8), including full support for the SNMPv3 cryptographic mechanisms
(for authentication and privacy).

Furthermore, deployment of SNMP versions prior to SNMPv3 is NOT
RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to
enable cryptographic security. It is then a customer/operator
responsibility to ensure that the SNMP entity giving access to an
instance of this MIB module is properly configured to give access to
the objects only to those principals (users) that have legitimate
rights to indeed GET or SET (change/create/delete) them.

A. Change Log

A.1. Changes since RFC 2668

   This section enumerates changes made to RFC 2668 to produce this
   document.

   (1)   Updated references to the IEEE 802.3 standard to refer to the
          2002 edition.

   (2)   Added reference to 802.3ae.

   (3)   Updated WG e-mail address.

   (4)   The following DESCRIPTION clauses have been updated to reflect
          behavior on 10 Gb/s interfaces: ifMauMediaAvailable.

   (5)   OBJECT-IDENTITY definitions have been added for 10 gigabit MAU
          types.

   (6)   Enumerations for 'pmdLinkFault', 'wisFrameLoss',
          'wisSignalLoss', pcsLinkFault', excessiveBER', 'dxsLinkFault'
          and 'pxsLinkFault' have been added for the ifMauMediaAvailable
          object.

   (7)   ifMauTypeListBits has been extended with bits for the 10 Gb/s
          MAU types.

   (8)   The MODULE-IDENTITY clause has been updated to reflect the
          changes in the MIB module.

   (9)   MIB boilerplate in section 2 has been updated to the latest
          approved text.

   (10)   Added 64-bit version of ifMauFalseCarriers, and updated
          compliances accordingly.

   (11)   Added section on mapping of IEEE managed objects to the objects
          in this MIB module.

A.2. Changes between RFC 2239 and RFC 2668

   This section enumerates the changes made to RFC 2239 to produce RFC
   2668.

   (1)   The MODULE-IDENTITY has been updated to reflect the changes in
          the MIB.

   (2)   OBJECT-IDENTITY definitions have been added for gigabit MAU
         types.

   (3)   The ifMauTypeList, ifMauAutoNegCapability,
         ifMauAutoNegCapAdvertised and ifMauAutoNegCapReceived objects
         have been deprecated and replaced by ifMauTypeListBits,
         ifMauAutoNegCapabilityBits, ifMauAutoNegCapAdvertisedBits and
         ifMauAutoNegCapReceivedBits.

   (4)   Two new objects, ifMauAutoNegRemoteFaultAdvertised and
         ifMauAutoNegRemoteFaultReceived have been added.

   (5)   Enumerations for 'offline' and 'autoNegError' have been added
         for the rpMauMediaAvailable and ifMauMediaAvailable objects.

   (6)   The broadMauBasicTable and mauBroadBasic object group have been
         deprecated.

   (7)   The mauIfGrp100Mbs and mauIfGrpAutoNeg object groups have been
         deprecated and replaced by mauIfGrpHighCapacity and
         mauIfGrpAutoNeg2.

   (8)   A new object group, mauIfGrpAutoNeg1000Mbps, has been added.

   (9)   The mauModIfCompl and mauModRpCompl compliances have been
         deprecated and replaced by mauModIfCompl2 and mauModRpCompl2.

   (10) Added section on relationship to RFC 2239.

   (11) Updated the SNMP Network Management Framework boilerplate.

   (12) Refer to the Interfaces MIB, rather than the interfaces group
         of MIB-II.

   (13) Updated references to refer to latest edition of IEEE 802.3.

   (14) An intellectual property notice was added, as required by RFC
         2026.

Author's Address

   John Flick
   Hewlett-Packard Company
   8000 Foothills Blvd. M/S 5557
   Roseville, CA 95747-5557

   Phone: +1 916 785 4018
   EMail: johnf@rose.hp.com

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