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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 isoethernet (802.9a), which is not supported by this MIB.
.aAutoNegAdvertisedSelectorAbility	
.aAutoNegReceivedSelectorAbility	

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"
```

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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'.

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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" -- September 30, 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 rpMauGroupIndex."

```

REFERENCE      "Reference RFC 2108, rpMauGroupIndex."
    ::= { 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, rpPtrPortIndex."
 ::= { 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 rpMauMonitorPortLastChange."

REFERENCE "[IEEE 802.3 Std], 30.5.1.1.5,
 aLoseMediaCounter.
 RFC 2108, rpMauMonitorPortLastChange"

::= { 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 rpPtrMonitorPortLastChange."

REFERENCE "[IEEE 802.3 Std], 30.5.1.1.6, aJabber.jabberCounter.
RFC 2108, rpPtrMonitorPortLastChange"
::= { 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 rpPtrMonitorPortLastChange."

REFERENCE "[IEEE 802.3 Std], 30.5.1.1.10, aFalseCarriers.
RFC 2108, rpPtrMonitorPortLastChange"
::= { 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,
    ifMauHCFFalseCarriers 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 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 mauIfGrp100Mbps

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

GROUP mauIfGrpJack

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

GROUP mauIfGrpAutoNeg

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

GROUP mauBroadBasic

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

GROUP ifMauNotifications

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

::= { mauModCompls 2 }

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 mauRpGrp100Mbps

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

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7. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirements Levels", BCP 14, RFC 2119, March 1997.
- [RFC2578] McCloghrie, K., Perkins, D. and J. Schoenwaelder, "Structure of Management Information Version 2 (SMIv2)", STD 58, RFC 2578, April 1999.
- [RFC2579] McCloghrie, K., Perkins, D. and J. Schoenwaelder, "Textual Conventions for SMIv2", STD 58, RFC 2579, April 1999.
- [RFC2580] McCloghrie, K., Perkins, D. and J. Schoenwaelder, "Conformance Statements for SMIv2", STD 58, RFC 2580, April 1999.
- [IEEE802.3] IEEE, IEEE Std 802.3, 2002 Edition: "Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications", March 2002.
- [IEEE802.3ae] IEEE, IEEE Std 802.3ae-2002, "Amendment: Media Access Control (MAC) Parameters, Physical Layers, and Management Parameters for 10 Gb/s Operation", August, 2002.
- [RFC2863] McCloghrie, K. and F. Kastenholz, "The Interfaces Group MIB using SMIv2", RFC 2863, June 2000.
- [RFC2108] de Graaf, K., Romascanu, D., McMaster, D. and K. McCloghrie, "Definitions of Managed Objects for IEEE 802.3 Repeater Devices using SMIv2", RFC 2108, February 1997.
- [RFC3635] Flick, J., "Definitions of Managed Objects for the Ethernet-like Interface Types", RFC 3635, September 2003.

8. Informative References

- [RFC3410] Case, J., Mundy, R., Partain, D. and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Network Management Framework", RFC 3410, December 2002.

- [RFC3418] Presuhn, R., Ed., "Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)", STD 62, RFC 3418, December 2002.
- [RFC2668] Smith, A., Flick, J., deGraaf, K., Romascanu, D., 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 IEEE 802.3 Medium Attachment Units (MAUs) using SMIV2", RFC 2239, November 1997.
- [RFC1515] McMaster, D., McCloghrie, K. and S. Roberts, "Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs)", RFC 1515, September 1993.
- [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.

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