

**Ethernet in the First Mile (EFM) Common MIB**  
**draft-ietf-hubmib-efm-mib-00.txt**

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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. This document proposes an extension to the Ethernet-like Interfaces MIB for the capability to manage Ethernet-in-the-First-Mile (EFM) devices.

**1 Introduction**

New capabilities have been added to Ethernet like interfaces within the IEEE P802.3ah project for Ethernet in the First Mile (EFM). This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community to manage the new capabilities of EFM Ethernet interfaces.

**1.1 Specification of Requirements**

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 [RFC 2119](#).

## **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**

Ethernet networks have evolved over time from an enterprise backbone to a variety of other applications. The IEEE P802.3ah task force has defined extensions to the Ethernet standard for Ethernet deployments in the access space.

The Ethernet-in-the-First-Mile (EFM) task force has focused its efforts into four categories: optics, copper, Ethernet passive optical networks (Ethernet PON, or EPON), and operations, administration, and maintenance (OAM).

Generally, one can categorize the changes developed by IEEE P802.3ah as extending Ethernet with new physical layers (e.g. new optical physical layers, new copper physical layers, EPON), or as adding new common functionality applicable to many Ethernet physical layers (e.g. OAM).

This memo focuses on the management extensions to the MIB for Ethernet-like interfaces to address the new common Ethernet functionality developed in IEEE P802.3ah.

Two additional Ethernet MIB extensions are defined for IEEE P802.3ah. The EFM Copper MIB [[EFM-CU-MIB](#)] and EFM P2MP MIB [[EFM-P2MP-MIB](#)] address the new physical layers introduced by IEEE P802.3ah.

EdNote: Might want to expand this more.

## **4 Relation to the Other MIBs**

EdNote: Need to fill this section in

## **5 Mapping of IEEE 802.3ah Managed Objects**

[Page 2]

This section contains the mapping between managed objects defined in [802.3ah] Clause 30, and managed objects defined in this document.

EdNote: Add mapping table here.

## 6 MIB Structure

The common EFM MIB objects of this memo focus on the OAM capabilities introduced in IEEE P802.3ah. The MIB objects are partitioned into four (4) different MIB groups.

The dot30amTable group manages the primary OAM objects of the Ethernet interface. This group controls the state and status of OAM as well as the mode in which it operates.

The dot30amStats table maintains statistics on the number and type of Ethernet OAM frames being transmitted and received on the Ethernet interface.

The dot30amPeer table maintains the current information on the status and configuration of the peer OAM entity on the Ethernet interface. Managed information includes the capabilities and function available on the peer OAM entity.

The dot30amEvent table defines the management objects for the event notification capability available in IEEE P802.3ah OAM. With IEEE P802.3ah OAM, one device may send notifications to its peer devices whenever an important event happens on the local device.

## 7 Definitions

```
EFM-COMMON-MIB DEFINITIONS ::= BEGIN
    IMPORTS
        MODULE-IDENTITY, mib-2, OBJECT-TYPE, Counter32,
            Unsigned32, Integer32
            FROM SNMPv2-SMI
        TEXTUAL-CONVENTION, RowStatus, MacAddress
            FROM SNMPv2-TC
        ifIndex
            FROM IF-MIB
        MODULE-COMPLIANCE, OBJECT-GROUP
            FROM SNMPv2-CONF;

    efmCommonMIB MODULE-IDENTITY
        LAST-UPDATED      "200402010000Z" -- February 1, 2004"
        ORGANIZATION      "IETF Ethernet Interfaces and Hub MIB
            Working Group"
```

CONTACT-INFO

"

WG Charter:

<http://www.ietf.org/html.charters/hubmib-charter.html>

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"

DESCRIPTION

"The MIB module for managing the new common Ethernet features introduced by the Ethernet in the First Mile task force (IEEE P802.3ah). The functionality presented here is based on IEEE P802.3ah/D3.0 [[802.3ah](#)], released in December 2003.

In particular, this MIB focused on the changes to Clause 30 of the draft that are not specific to any physical layer. These changes are primarily reflected in the new OAM features developed under this project, that can be applied to any Ethernet like interface. The OAM features are described in Clause 57 of [[802.3ah](#)].

The following reference is used throughout this MIB module:

[802.3ah] refers to:

IEEE Draft P802.3ah/D3.0: 'Draft amendment to - 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 - Media Access Control Parameters, Physical Layers and Management Parameters for subscriber access networks', 05 December 2003.  
-- Editor's note - update this to normative  
-- reference when finalized

version of this MIB module is part of RFC XXXX;  
See the RFC itself for full legal notices. "  
-- RFC Editor: Update XXXX to appropriate RFC number  
-- RFC Editor: Remote these notes

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```
REVISION      "200402010000Z"  -- February 3, 2004"
DESCRIPTION   "Initial version, published as RFC XXXX."
-- RFC Editor: Update XXXX to appropriate RFC number
-- RFC Editor: Remove these notes

 ::= { mib-2 XXX }
-- RFC Editor: Replace value with IANA assigned number
-- RFC Editor: Remove these notes

--
-- Sections of the EFM Common MIB
--
dot3OamMIB OBJECT IDENTIFIER ::= { efmCommonMIB 1}
-- Editor's Note:  If only OAM content in this MIB, it
-- may be worthwhile to eliminate the Common
-- nomenclature and make this OAM only.

dot3OamConformance OBJECT IDENTIFIER ::= { efmCommonMIB 2 }

--
-- Textual conventions
--
Dot3Oui ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION  "24-bit Organizationally Unique Identifier.
                  Information on OUIs can be found in IEEE
                  802-2001 [802-2001] Clause 9."
    -- Editors Note - Include reference for [802-2001]
    SYNTAX      OCTET STRING(SIZE(3))

--
-- Ethernet OAM Control group
--
dot3OamTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Dot3OamEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION  "Primary controls and status for the OAM
                  capabilities of an Ethernet like interface.
                  There will be one row in this table for each
                  Ethernet-like interface in the system that
                  supports the Ethernet OAM functions defined
                  in [802.3ah]."
```

```
 ::= { dot3OamMIB 1 }

dot3OamEntry OBJECT-TYPE
    SYNTAX      Dot3OamEntry
```



MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION "An entry in the table, containing  
information on the Ethernet OAM function for  
a single Ethernet-like interface."

```
INDEX      { ifIndex }  
::= { dot30amTable 1 }
```

```
Dot30amEntry ::=
```

```
SEQUENCE {  
    dot30amRowStatus          RowStatus,  
    dot30amAdminState         INTEGER,  
    dot30amOperStatus         INTEGER,  
    dot30amMode               INTEGER,  
    dot30amMaxOamPduSize      Integer32,  
    dot30amConfigRevision     Unsigned32,  
    dot30amFunctionsSupported BITS  
}
```

```
dot30amRowStatus OBJECT-TYPE
```

```
SYNTAX      RowStatus  
MAX-ACCESS  read-create  
STATUS      current  
DESCRIPTION "Row creation is automatic for each Ethernet-  
             like interface that supports OAM functionality  
             as defined in [802.3ah].  
  
             Note that implementation of OAM is not  
             required for any Ethernet like interface.  
             "  
REFERENCE   "[802.3ah], 57.1.2 point d.1"  
::= { dot30amEntry 1 }
```

```
dot30amAdminState OBJECT-TYPE
```

```
SYNTAX      INTEGER {  
                disabled(1),  
                enabled(2)  
            }  
MAX-ACCESS  read-write  
STATUS      current  
DESCRIPTION "This object is used to configure the default  
             administrative OAM mode for this interface.  
             This object represents the administratively  
             configured OAM state for this interface."  
REFERENCE   "[802.3ah], 30.11.1.1.2"  
::= { dot30amEntry 2 }
```

```
dot30amOperStatus OBJECT-TYPE
```

```
SYNTAX      INTEGER {  
                disabled(1),  
                passiveWait(2),  
                activeSendLocal(3),  
                sendLocalAndRemote1(4),  
            }
```

```
        sendLocalAndRemote2(5),  
        oamPeeringLocallyRejected(6),  
        oamPeeringRemotelyRejected(7),  
        operational(8)  
    }
```

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MAX-ACCESS read-only

STATUS current

DESCRIPTION "At initialization and failure conditions, OAM entities on the same Ethernet link begin a discovery phase to determine what OAM capabilities maybe used on that link. The progress of this initialization is controlled by the OAM sublayer. This value is always 'disabled' if OAM is disabled via the dot30amAdminState.

The 'passiveWait' state is returned only by OAM entities in passive mode (dot30amMode) and reflects the state in which the OAM entity is waiting to see if the peer device is OAM capable. The 'activeSendLocal' is used by active mode devices (dot30amMode) and reflects the OAM entity actively trying to discover whether the peer has OAM ability but has not yet made that determination.

The state 'sendLocalAndRemote1' reflects that the local OAM entity has discovered the peer but has not yet accepted or rejected the configuration of the peer. The local device can, for whatever reason, decide that the peer device is unacceptable and decline OAM peering. If the local OAM entity rejects the peer OAM entity, the state becomes 'oamPeeringLocallyRejected'. If the OAM peering is allowed by the local device, the state moves to 'sendLocalAndRemote2'. Note that both the 'sendLocalAndRemote1' and 'oamPeeringLocallyRejected' states fall within the state SEND\_LOCAL\_REMOTE\_1 of the Discovery state diagram [802.3ah, Figure 57-5], with the difference being whether the local OAM client has rejected the peering or just not decided yet.

If the remote OAM entity rejects the peering, the state becomes 'oamPeeringRemotelyRejected'. Note that both the 'sendLocalAndRemote2' and 'oamPeeringRemotelyRejected' states fall within the state SEND\_LOCAL\_REMOTE\_2 of the Discovery state diagram [802.3ah,

Figure 57-5], with the difference being whether the remote OAM client has rejected the peering or has just not yet decided.

When the local OAM entity learns that both it

and the remote OAM entity have accepted the  
peering, the state moves to 'operational'.  
"

REFERENCE "[802.3ah], REFERENCE TBD"

::= { dot30amEntry 3 }

-- Editor's Note: No C30 attribute in D3.0, should appear

in D3.1

dot30amMode OBJECT-TYPE

SYNTAX INTEGER {  
active(1),  
passive(2)  
}

MAX-ACCESS read-write

STATUS current

DESCRIPTION "This object configures the mode of OAM  
operation for this Ethernet like interface.  
OAM on Ethernet interfaces may be in  
'active' mode or 'passive' mode. These two  
modes differ in that active mode provides  
additional capabilities to initiate  
monitoring activities with the remote OAM  
peer entity, while passive mode generally  
waits for the peer to initiate OAM actions  
with it. As an example, an active OAM entity  
can put the remote OAM entity in a loopback  
state, where a passive OAM entity cannot.  
"

REFERENCE "[802.3ah], 30.11.1.1.3"

::= { dot30amEntry 4 }

dot30amMaxOamPduSize OBJECT-TYPE

SYNTAX Integer32 (64..1522)

MAX-ACCESS read-only

STATUS current

DESCRIPTION "The largest OAMPDU that the OAM entity  
supports. OAM entities exchange maximum  
OAMPDU sizes and negotiate to use the smaller  
of the two maximum OAMPDU sizes between the  
peers.  
"

REFERENCE "[802.3ah], REFERENCE TBD"

::= { dot30amEntry 5 }

-- Editor's Note: No C30 attribute in D3.0, should appear

in D3.1

dot30amConfigRevision OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "The configuration revision of the OAM entity  
as reflected in the latest OAMPDU sent by the  
OAM entity. The config revision is used by

OAM entities to indicate configuration changes have occurred which might require the peer OAM entity to re-evaluate whether the peering is allowed. See local\_satisfied in [802.3ah, 57.3.1.2].

"

REFERENCE "[802.3ah], REFERENCE TBD"

::= { dot30amEntry 6 }

-- Editor's Note: No C30 attribute in D3.0, should appear

in D3.1

dot30amFunctionsSupported OBJECT-TYPE

SYNTAX BITS {  
     unidirectionalSupport (0),  
     loopbackSupport(1),  
     eventSupport(2),  
     variableSupport(3)  
 }

MAX-ACCESS read-only

STATUS current

DESCRIPTION "The OAM functions supported on this Ethernet-like interface. OAM consists of separate functionality sets above the basic discovery process. These functional groups can be supported independently, and each is an optional capability above the basic discovery function."

"

REFERENCE "[802.3ah], REFERENCE TBD"

::= { dot30amEntry 7 }

-- Editor's Note: No C30 attribute in D3.0, should appear

in D3.1

--

-- Ethernet OAM Statistics group

--

dot30amStatsTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot30amStatsEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION "Statistics for the OAM function on a particular Ethernet like interface."

::= { dot30amMIB 2 }

dot30amStatsEntry OBJECT-TYPE

SYNTAX Dot30amStatsEntry

MAX-ACCESS not-accessible



STATUS	current
DESCRIPTION	"An entry in the table, containing statistics information on the Ethernet OAM function for a single Ethernet-like interface."
INDEX	{ ifIndex }

```
::= { dot30amStatsTable 1 }
```

```
Dot30amStatsEntry ::=
```

```
SEQUENCE {  
    dot30amPduTx                Counter32,  
    dot30amPduRx                Counter32,  
    dot30amInformationTx        Counter32,  
    dot30amInformationRx        Counter32,  
    dot30amEventNotificationTx  Counter32,  
    -- Editor's Note - This may change in D3.1  
    dot30amUniqueEventNotificationRx Counter32,  
    dot30amDuplicateEventNotificationRx Counter32,  
    dot30amLoopbackControlTx    Counter32,  
    dot30amLoopbackControlRx    Counter32,  
    dot30amVariableRequestTx    Counter32,  
    dot30amVariableRequestRx    Counter32,  
    dot30amVariableResponseTx   Counter32,  
    dot30amVariableResponseRx   Counter32,  
    dot30amOrgSpecificTx        Counter32,  
    dot30amOrgSpecificRx        Counter32,  
    dot30amUnsupportedCodesRx   Counter32  
}
```

```
dot30amPduTx OBJECT-TYPE
```

```
SYNTAX      Counter32  
MAX-ACCESS  read-only  
STATUS      current  
DESCRIPTION "A count of the number of Ethernet OAM frames  
             transmitted on this interface."  
REFERENCE   "[802.3ah], 30.11.1.1.14."  
::= { dot30amStatsEntry 1 }
```

```
dot30amPduRx OBJECT-TYPE
```

```
SYNTAX      Counter32  
MAX-ACCESS  read-only  
STATUS      current  
DESCRIPTION "A count of the number of Ethernet OAM frames  
             received on this interface."  
REFERENCE   "[802.3ah], 30.11.1.1.15."  
::= { dot30amStatsEntry 2 }
```

```
dot30amInformationTx OBJECT-TYPE
```

```
SYNTAX      Counter32  
MAX-ACCESS  read-only  
STATUS      current  
DESCRIPTION "A count of the number of Information OAMPDUs  
             transmitted on this interface."
```

REFERENCE "[[802.3ah](#)], 30.11.1.1.17."  
::= { dot30amStatsEntry 3 }

dot30amInformationRx OBJECT-TYPE  
SYNTAX Counter32

MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "A count of the number of Information OAMPDUs  
received on this interface."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.18."  
::= { dot30amStatsEntry 4 }

dot30amEventNotificationTx OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "A count of the number of Event OAMPDUs  
transmitted on this interface."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.19."  
::= { dot30amStatsEntry 5 }

dot30amUniqueEventNotificationRx OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "A count of the number of unique Event  
OAMPDUs received on this interface."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.20."  
::= { dot30amStatsEntry 6 }

dot30amDuplicateEventNotificationRx OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "A count of the number of duplicate Event  
OAMPDUs received on this interface."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.21."  
::= { dot30amStatsEntry 7 }

dot30amLoopbackControlTx OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "A count of the number of Loopback OAMPDUs  
transmitted on this interface."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.22."  
::= { dot30amStatsEntry 8 }

dot30amLoopbackControlRx OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "A count of the number of Loopback OAMPDUs

```
received on this interface."
REFERENCE "[802.3ah], 30.11.1.1.23."
::= { dot30amStatsEntry 9 }
```

dot30amVariableRequestTx OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "A count of the number of Variable Request  
OAMPDUs transmitted on this interface."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.24."  
 ::= { dot30amStatsEntry 10 }

dot30amVariableRequestRx OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "A count of the number of Variable Request  
OAMPDUs received on this interface."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.25."  
 ::= { dot30amStatsEntry 11 }

dot30amVariableResponseTx OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "A count of the number of Variable Response  
OAMPDUs transmitted on this interface."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.26."  
 ::= { dot30amStatsEntry 12 }

dot30amVariableResponseRx OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "A count of the number of Variable Response  
OAMPDUs received on this interface."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.27."  
 ::= { dot30amStatsEntry 13 }

dot30amOrgSpecificTx OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "A count of the number of Organizational  
Specific OAMPDUs transmitted on this  
interface."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.28."  
 ::= { dot30amStatsEntry 14 }

dot30amOrgSpecificRx OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only

STATUS           current  
DESCRIPTION "A count of the number of Organizational  
              Specific OAMPDUs received on this interface."  
REFERENCE     "[[802.3ah](#)], 30.11.1.1.29."  
::= { dot30amStatsEntry 15 }

```
dot30amUnsupportedCodesRx OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION  "A count of the number of OAMPDUS with an
                  unrecognized type received on this
                  interface."
    REFERENCE    "[802.3ah], 30.11.1.1.16."
    ::= { dot30amStatsEntry 16 }

--
-- Ethernet OAM Peer group
--
dot30amPeerTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Dot30amPeerEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION  "Information about the OAM peer for a
                  particular Ethernet like interface."
    ::= { dot30amMIB 3 }

dot30amPeerEntry OBJECT-TYPE
    SYNTAX      Dot30amPeerEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION  "An entry in the table, containing information
                  on the peer OAM entity for a single Ethernet
                  like interface.
                  "
    INDEX        { ifIndex }
    ::= { dot30amPeerTable 1 }

Dot30amPeerEntry ::=
    SEQUENCE {
        dot30amPeerRowStatus          RowStatus,
        dot30amPeerMacAddress          MacAddress,
        dot30amPeerVendorOui          Dot30oui,
        dot30amPeerVendorInfo          Unsigned32,
        dot30amPeerMode                INTEGER,
        dot30amPeerMaxOamPduSize       Integer32,
        dot30amPeerConfigRevision      Unsigned32,
        dot30amPeerFunctionsSupported  BITS,
        dot30amPeerMultiplexorState    INTEGER,
        dot30amPeerParserState         INTEGER
    }
```



dot30amPeerRowStatus OBJECT-TYPE

SYNTAX	RowStatus
MAX-ACCESS	read-create
STATUS	current

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DESCRIPTION "The peer row is automatically created when the dot30amOperStatus of this particular Ethernet interface is not 'disabled', 'passiveWait' or 'activeSendLocal'. In such cases, the remote OAM entity has been identified and its information and status can be made available.

This row is automatically deleted if the dot30amOperStatus changes to 'disabled', 'passiveWait', or 'activeSendLocal'.  
"

REFERENCE "N/A"  
 ::= { dot30amPeerEntry 1 }

dot30amPeerMacAddress OBJECT-TYPE

SYNTAX MacAddress  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "The MAC address of the peer OAM entity."  
"  
REFERENCE "[[802.3ah](#)], 30.11.1.1.4."  
 ::= { dot30amPeerEntry 2 }

dot30amPeerVendorOui OBJECT-TYPE

SYNTAX Dot3oui  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "The OUI of the OAM peer as reflected in the latest information OAMPDU."  
"  
REFERENCE "[[802.3ah](#)], 30.11.1.1.11."  
 ::= { dot30amPeerEntry 3 }

dot30amPeerVendorInfo OBJECT-TYPE

SYNTAX Unsigned32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "The Vendor Info of the OAM peer as reflected in the latest information OAMPDU."  
"  
REFERENCE "[[802.3ah](#)], 30.11.1.1.12, 30.11.1.1.13"  
 ::= { dot30amPeerEntry 4 }

dot30amPeerMode OBJECT-TYPE

SYNTAX INTEGER {

```
        active(1),
        passive(2)
    }
MAX-ACCESS read-only
```

STATUS current  
DESCRIPTION "The mode of the OAM peer as reflected in the latest OAMPDU."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.5."  
 ::= { dot30amPeerEntry 5 }

dot30amPeerMaxOamPduSize OBJECT-TYPE

SYNTAX Integer32 (64..1522)  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "The maximum size of OAMPDU supported by the peer as reflected in the latest OAMPDU. Ethernet OAM on this interface must not use OAMPDUs that exceed this size."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.6."  
 ::= { dot30amPeerEntry 6 }

dot30amPeerConfigRevision OBJECT-TYPE

SYNTAX Unsigned32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "The configuration revision of the OAM peer as reflected in the latest OAMPDU. This attribute is changed by the peer whenever it has a local configuration change for Ethernet OAM this interface."  
REFERENCE "[[802.3ah](#)], 30.11.1.1.9."  
 ::= { dot30amPeerEntry 7 }

dot30amPeerFunctionsSupported OBJECT-TYPE

SYNTAX BITS {  
    unidirectionalSupport (0),  
    loopbackSupport(1),  
    eventSupport(2),  
    variableSupport(3)  
}  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION "The OAM functions supported on this Ethernet like interface. OAM consists of separate functionality sets above the basic discovery process."  
"

REFERENCE "[[802.3ah](#)], REFERENCE 30.11.1.1.5"  
 ::= { dot30amPeerEntry 8 }

dot30amPeerMultiplexorState OBJECT-TYPE  
 SYNTAX INTEGER {

[Page 15]

```
        forward(1),
        discard(2)
    }
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The state of the multiplexor function in the
OAM peer as reflected in the latest OAMPDU.
This value is changed based on loopback
actions by either the local or remote device.
The normal value for this attribute is
'forward'. When transitioning into or out of
a loopback state, the value goes to discard.
"
REFERENCE "[802.3ah], 30.11.1.1.10."
::= { dot30amPeerEntry 9 }
```

dot30amPeerParserState OBJECT-TYPE

```
SYNTAX INTEGER {
    forward(1),
    loopback(2),
    discard(3)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The state of the parser function in the
OAM peer as reflected in the latest OAMPDU.
This value is changed based on loopback
actions by either the local or remote
device. The normal value for this attribute
is forward.

When the remote OAM entity is performing
loopback operations with the local OAM entity,
the value goes to discard (when traffic is
looped back at the peer) or loopback (when
traffic is looped back locally).
"
REFERENCE "[802.3ah], 30.11.1.1.10."
::= { dot30amPeerEntry 10 }
```

--

-- Ethernet OAM Loopback group

--

dot30amLoopbackTable OBJECT-TYPE

```
SYNTAX SEQUENCE OF Dot30amLoopbackEntry
```

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION "This table contains methods to control the  
loopback state of the local link as well as  
indicating the status of the loopback

```

        function.
        "
 ::= { dot30amMIB 4 }

dot30amLoopbackEntry OBJECT-TYPE
    SYNTAX      Dot30amLoopbackEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION  "An entry in the table, containing information
                  on the loopback status for a single Ethernet
                  like interface.
                  "
    INDEX       { ifIndex }
    ::= { dot30amLoopbackTable 1 }

Dot30amLoopbackEntry ::=
    SEQUENCE {
        dot30amLoopbackCommand      INTEGER,
        dot30amLoopbackStatus      INTEGER
    }

dot30amLoopbackCommand OBJECT-TYPE
    SYNTAX      INTEGER {
                    noLoopback (1),
                    startRemoteLoopback (2),
                    endRemoteLoopback (3)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION  "This attribute initiates or terminates remote
                  loopback with an OAM peer. Writing
                  'startRemoteLoopback' to this attribute cause
                  the local OAM client to send a loopback OAMPDU
                  to the OAM peer with the loopback enable flags
                  set. Writing 'endRemoteLoopback' to this
                  attribute will cause the local OAM client to
                  send a loopback OAMPDU to the OAM peer with
                  the loopback enable flags cleared. Writing
                  noLoopback to this attribute has no effect.

                  The attribute always returns noLoopback on a
                  read. To determine the loopback status, use
                  the attribute dot30amLoopbackStatus.
                  "
    REFERENCE   "[802.3ah], REFERENCE 57.2.11"
    ::= { dot30amLoopbackEntry 1 }

dot30amLoopbackStatus OBJECT-TYPE

```



```
SYNTAX      INTEGER {  
              noLoopback (1),  
              initiatingLoopback (2),  
              remoteLoopback (3),  
              terminatingLoopback (4),
```

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```

        localLoopback (5)
    }
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The loopback status of the link. This status
is determined by a combination of the local
parser and multiplexer states, as well as by
the actions of the local OAM client. When
operating in normal mode with no loopback in
progress, the status is 'noLoopback'.

If the OAM client has sent an OAM loopback PDU
and is waiting for a response, where the local
parser and multiplexer states are DISCARD (see
[802.3ah, 57.2.11.1]), the status is
'initiatingLoopback'.

If the local OAM client knows that the remote
OAM entity is in loopback mode (via the remote
state information as described in [802.3ah,
57.2.11.1]), the status is 'remoteLoopback'.
If the local OAM client is in the process of
terminating the remote loopback [802.3ah,
57.2.11.3], with its local multiplexer and
parser states in DISCARD, the status is
'terminatingLoopback'. If the remote OAM
client has put the local OAM entity in
loopback mode as indicated by its local parser
state, the status is 'localLoopback'.
"
REFERENCE "[802.3ah], REFERENCE 57.2.11"
::= { dot3OamLoopbackEntry 2 }
-- Editor's Note: No C30 attribute in D3.0, should appear

```

in D3.1

```

--
-- Ethernet OAM Event group
--
dot3OamEventConfigTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Dot3OamEventConfigEntry
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION "Ethernet OAM includes the ability to generate
and receive event notifications to indicate
various link problems. This table contains
the mechanisms to configure the thresholds to
generate the standard Ethernet OAM events.

```

These events are:

- Errored Symbol Period Event. Generated when the number of symbol errors exceeds a threshold within a given window defined by a number of symbols (e.g. 1,000 symbols out

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- of 1,000,000 had errors).
- Errored Frame Period Event. Generated when the number of frame errors exceeds a threshold within a given window defined by a number of frames (e.g. 10 frames out of 1000 had errors).
- Errored Frame Event. Generated when the number of frame errors exceeds a threshold within a given window defined by a period of time (e.g. 10 frames in 1 second had errors).
- Errored Frame Seconds Summary Event. Generated when the number of frame errors exceeds a threshold within a given window defined by a period of time (e.g. 10 frames in 1 second had errors).
- Errored Frame Seconds Summary Event. Generated when the number of errored frame seconds exceeds a threshold within a given time period (e.g. 10 errored frame seconds within the last 100 seconds). An errored frame second is defined as a 1 second interval which had >0 frame errors.

"

::= { dot30amMIB 5 }

dot30amEventConfigEntry OBJECT-TYPE

SYNTAX Dot30amEventConfigEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION "

"

INDEX { ifIndex }

::= { dot30amEventConfigTable 1 }

Dot30amEventConfigEntry ::=

SEQUENCE {

dot30amErrSymPeriodWindow	Unsigned32,
dot30amErrSymPeriodThreshold	Unsigned32,
dot30amErrFramePeriodWindow	Unsigned32,
dot30amErrFramePeriodThreshold	Unsigned32,
dot30amErrFrameWindow	Integer32,
dot30amErrFrameThreshold	Unsigned32,
dot30amErrFrameSecsSummaryWindow	Integer32,
dot30amErrFrameSecsSummaryThreshold	Integer32

}

dot30amErrSymPeriodWindow OBJECT-TYPE

SYNTAX       Unsigned32  
MAX-ACCESS   read-write  
STATUS       current  
DESCRIPTION   "The number of symbols over which the  
              threshold is defined.  If

dot30amErrSymPeriodThreshold symbol errors occur within a window of dot30amErrSymPeriodWindow symbols, an Event Notification OAMPDU should be generated with an Errored Symbol Period Event TLV indicating the threshold has been crossed in this window

"

REFERENCE "[802.3ah], 30.11.1.1.29"  
 ::= { dot30amEventConfigEntry 1 }

#### dot30amErrSymPeriodThreshold OBJECT-TYPE

SYNTAX Unsigned32  
 MAX-ACCESS read-write  
 STATUS current  
 DESCRIPTION "The number of symbols errors that must occur for this event to be triggered. If dot30amErrSymPeriodThreshold symbol errors occur within a window of dot30amErrSymPeriodWindow symbols, an Event Notification OAMPDU should be generated with an Errored Symbol Period Event TLV indicating the threshold has been crossed in this window.

"

REFERENCE "[802.3ah], 30.11.1.1.29"  
 ::= { dot30amEventConfigEntry 2 }

#### dot30amErrFramePeriodWindow OBJECT-TYPE

SYNTAX Unsigned32  
 MAX-ACCESS read-write  
 STATUS current  
 DESCRIPTION "The number of frames over which the threshold is defined. If dot30amErrFramePeriodThreshold frame errors occur within a window of dot30amErrFramePeriodWindow frames, an Event Notification OAMPDU should be generated with

an

Errored Frame Period Event TLV indicating the threshold has been crossed in this window.

"

REFERENCE "[802.3ah], 30.11.1.1.33"  
 ::= { dot30amEventConfigEntry 3 }

#### dot30amErrFramePeriodThreshold OBJECT-TYPE

SYNTAX Unsigned32  
 MAX-ACCESS read-write  
 STATUS current

DESCRIPTION "The number of frame errors that must occur for this event to be triggered. If dot30amErrFramePeriodThreshold frame errors occur within a window of dot30amErrFramePeriodWindow frames, an Event

Notification OAMPDU should be generated with an Errored Frame Period Event TLV indicating the threshold has been crossed in this window.  
"

REFERENCE "[[802.3ah](#)], 30.11.1.1.33"  
::= { dot30amEventConfigEntry 4 }

dot30amErrFrameWindow OBJECT-TYPE

SYNTAX Integer32 (10..600)  
MAX-ACCESS read-write  
STATUS current  
DESCRIPTION "The amount of time over which the threshold is defined. If dot30amErrFrameThreshold frame errors occur within a window of dot30amErrFrameWindow (in tenths of seconds), an Event Notification OAMPDU should be generated with an Errored Frame Event TLV indicating the threshold has been crossed in this window.  
"

REFERENCE "[[802.3ah](#)], 30.11.1.1.31"  
::= { dot30amEventConfigEntry 5 }

dot30amErrFrameThreshold OBJECT-TYPE

SYNTAX Unsigned32  
MAX-ACCESS read-write  
STATUS current  
DESCRIPTION "The number of frame errors that must occur for this event to be triggered. If dot30amErrFrameThreshold frame errors occur within a window of dot30amErrFrameWindow (in tenths of seconds), an Event Notification OAMPDU should be generated with an Errored Frame Event TLV indicating the threshold has been crossed in this window.  
"

REFERENCE "[[802.3ah](#)], 30.11.1.1.31"  
::= { dot30amEventConfigEntry 6 }

dot30amErrFrameSecsSummaryWindow OBJECT-TYPE

SYNTAX Integer32 (100..9000)  
MAX-ACCESS read-write  
STATUS current  
DESCRIPTION "The amount of time over which the threshold is defined. If dot30amErrFrameSecsSummaryThreshold frame errors occur within a window of dot30amErrFrameSecsSummaryWindow (in tenths of



seconds), an Event Notification OAMPDU should be generated with an Errored Frame Seconds Summary Event TLV indicating the threshold has been crossed in this window.  
"

```
REFERENCE    "[802.3ah], 30.11.1.1.35"  
::= { dot30amEventConfigEntry 7 }
```

```
dot30amErrFrameSecsSummaryThreshold OBJECT-TYPE  
    SYNTAX      Integer32 (1..900)  
    MAX-ACCESS  read-write  
    STATUS      current  
    DESCRIPTION "The number of errored frame seconds that must  
                occur for this event to be triggered.  If  
                dot30amErrFrameSecsSummaryThreshold errored  
                seconds occur within a window of  
                dot30amErrFrameSecsSummaryWindow (in  
                tenths of seconds), an Event Notification  
                OAMPDU should be generated with an Errored  
                Frame Seconds Summary Event TLV indicating the  
                threshold has been crossed in this window."  
    REFERENCE   "[802.3ah], 30.11.1.1.35"  
    ::= { dot30amEventConfigEntry 8 }
```

```
--  
-- Ethernet OAM Compliance group  
--  
dot30amGroups OBJECT IDENTIFIER ::= { dot30amConformance 1 }  
dot30amCompliances OBJECT IDENTIFIER ::= { dot30amConformance 2 }  
  
-- Compliance statements  
  
dot30amCompliance MODULE-COMPLIANCE  
    STATUS      current  
    DESCRIPTION "The compliance statement for managed entities  
                supporting OAM on Ethernet like interfaces."  
    MODULE      -- this module  
        MANDATORY-GROUPS { dot30amControlGroup, dot30amPeerGroup,  
                            dot30amStatsBaseGroup }  
  
        GROUP      dot30amLoopbackGroup  
        DESCRIPTION "This group is mandatory for all IEEE 802.3 OAM  
                    implementations that support loopback  
                    functionality."  
  
        GROUP      dot30amErrSymbolPeriodEventGroup  
        DESCRIPTION "This group is mandatory for all IEEE 802.3 OAM  
                    implementations that support event functionality."  
        --
```

GROUP dot30amErrFramePeriodEventGroup  
DESCRIPTION "This group is mandatory for all IEEE 802.3 OAM  
implementations that support event functionality.

```

"

GROUP          dot30amErrFrameEventGroup
DESCRIPTION "This group is mandatory for all IEEE 802.3 OAM
            implementations that support event functionality.
"

GROUP          dot30amErrFrameSecsSummaryEventGroup
DESCRIPTION "This group is mandatory for all IEEE 802.3 OAM
            implementations that support event functionality.
"

--GROUP        dot30amVariableGroup
--DESCRIPTION "This group is mandatory for all IEEE 802.3 OAM
--            implementations that support variable retrieval
--            functionality.
--            "

::= { dot30amCompliances 1}

dot30amControlGroup OBJECT-GROUP
    OBJECTS      { dot30amRowStatus,
                    dot30amAdminState,
                    dot30amOperStatus,
                    dot30amMode,
                    dot30amMaxOamPduSize,
                    dot30amConfigRevision,
                    dot30amFunctionsSupported
                  }
    STATUS       current
    DESCRIPTION "A collection of objects providing the abilities,
                configuration, and status of an Ethernet OAM
                entity.
                "

    ::= { dot30amGroups 1 }

dot30amPeerGroup OBJECT-GROUP
    OBJECTS      { dot30amPeerRowStatus,
                    dot30amPeerMacAddress,
                    dot30amPeerVendorOui,
                    dot30amPeerVendorInfo,
                    dot30amPeerMode,
                    dot30amPeerFunctionsSupported,
                    dot30amPeerMaxOamPduSize,
                    dot30amPeerConfigRevision,
                    dot30amPeerMultiplexorState,
                    dot30amPeerParserState
```

```
    }  
STATUS      current  
DESCRIPTION "A collection of objects providing the abilities,  
            configuration, and status of a peer Ethernet OAM  
            entity.
```

```

"
 ::= { dot30amGroups 2 }

dot30amStatsBaseGroup OBJECT-GROUP
  OBJECTS      {
    dot30amPduTx,
    dot30amPduRx,
    dot30amInformationTx,
    dot30amInformationRx,
    dot30amEventNotificationTx,
    dot30amUniqueEventNotificationRx,
    dot30amDuplicateEventNotificationRx,
    dot30amLoopbackControlTx,
    dot30amLoopbackControlRx,
    dot30amVariableRequestTx,
    dot30amVariableRequestRx,
    dot30amVariableResponseTx,
    dot30amVariableResponseRx,
    dot30amOrgSpecificTx,
    dot30amOrgSpecificRx,
    dot30amUnsupportedCodesRx
  }
  STATUS      current
  DESCRIPTION "A collection of objects providing the statistics
    for the number of various OAMPDUs sent and
    received on an Ethernet like interface.
    "
 ::= { dot30amGroups 3 }

dot30amLoopbackGroup OBJECT-GROUP
  OBJECTS      { dot30amLoopbackCommand,
    dot30amLoopbackStatus
  }
  STATUS      current
  DESCRIPTION "A collection of objects for controlling the OAM
    remote loopback function.
    "
 ::= { dot30amGroups 4 }

dot30amErrSymbolPeriodEventGroup OBJECT-GROUP
  OBJECTS      { dot30amErrSymPeriodWindow,
    dot30amErrSymPeriodThreshold
  }
  STATUS      current
  DESCRIPTION "A collection of objects for configuring the
    thresholds for an Errored Symbol Period Event.
    "
 ::= { dot30amGroups 5 }
```

```
dot30amErrFramePeriodEventGroup OBJECT-GROUP
    OBJECTS      { dot30amErrFramePeriodWindow,
                    dot30amErrFramePeriodThreshold
                  }
```

[Page 24]

```
STATUS      current
DESCRIPTION "A collection of objects for configuring the
            thresholds for an Errored Frame Event.
            "

 ::= { dot30amGroups 6 }

dot30amErrFrameEventGroup OBJECT-GROUP
OBJECTS      { dot30amErrFrameWindow,
                dot30amErrFrameThreshold
              }
STATUS      current
DESCRIPTION "A collection of objects for configuring the
            thresholds for an Errored Frame Event.
            "

 ::= { dot30amGroups 7 }

dot30amErrFrameSecsSummaryEventGroup OBJECT-GROUP
OBJECTS      { dot30amErrFrameSecsSummaryWindow,
                dot30amErrFrameSecsSummaryThreshold
              }
STATUS      current
DESCRIPTION "A collection of objects for configuring the
            thresholds for an Errored Frame Seconds Summary
            Event.
            "

 ::= { dot30amGroups 8 }

END
```

## **8 Security Considerations**

The readable objects in this module can provide information about network traffic, and therefore may be considered sensitive. In particular, OAM provides mechanisms for reading the IEEE 802.3 Clause 30 MIB attributes from a link partner via a specialized layer two protocol. Unlike SNMP, IEEE P802.3ah OAM does not include encryption or authorization mechanisms. It should be used in environments where either this interface information is not considered sensitive, or where the facility terminations are protected.

IEEE P802.3ah OAM is designed to support deployment in access and enterprise networks. In access networks, one end of a link is the CO-side, and the other is the CPE-side, and the facilities are often protected in wiring cages or closets. In such deployments, it is often the case that the CO-side is protected from access from the CPE side. Within IEEE P802.3ah OAM, this protection from remote access



is accomplished by configuring the CPE-side in passive mode using the dot30amMode attribute. This prevents the CPE from accessing functions and information at the CO-side of the connection. In

enterprise networks, read-only interface information is often considered non-sensitive.

The operation of OAM on an Ethernet interface does not adversely affect data traffic as OAM is a slow protocol with very limited bandwidth potential, and it is not required for normal link operation. And although there are a number of objects in this module with read-write or read-create MAX-ACCESS, they only affect the operation of the OAM protocol itself and not user data traffic.

The loopback capability of OAM can have potentially disruptive effects in that when enabling remote loopback, the remote station automatically transmits all received traffic back to the local station except for OAM traffic. This completely disrupts all higher layer protocols such as bridging, IP, and 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 implementers 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).

Further, 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

## [9](#) References

### [9.1](#) Normative References

[802.3ah]  
[802-2001]  
[\[RFC2119\]](#)  
[\[RFC2570\]](#)  
[\[RFC2578\]](#)  
[\[RFC2580\]](#)  
[\[RFC3410\]](#)

### [9.2](#) Informative References

[[RFC2863](#)]

[[RFC3635](#)]

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## [12](#) Acknowledgments

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