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Ethernet in the First Mile (EFM) OAM MIB

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Abstract

This document defines objects for managing Operations, Administration, and Maintenance (OAM) capabilities on Ethernet-like interfaces conformant to the Ethernet OAM functionality defined in [[802.3ah](#)]. The Ethernet OAM functionality is complementary to SNMP management in that it is focused on a small set of link-specific functions for Ethernet interfaces. This document defines objects for controlling those link OAM functions, and on providing mechanisms to take status and input from Ethernet OAM and feed it into a larger TCP/IP network management system.

Conventions used in this document

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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](#) [[RFC2119](#)].

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[1.](#) Introduction

The IEEE 802.3ah Ethernet in the First Mile (EFM) task force added new management capabilities to Ethernet like interfaces. These management capabilities were introduced to provide some basic OAM function on Ethernet media. The defined functionality includes discovery, error signaling, loopback, and link monitoring. This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community to manage these new EFM interface capabilities.

[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 the past 30 years from simple LANs to a variety of other applications, including wide area networks. To address some of these emerging markets, the IEEE 802.3ah task force defined additional clauses for the IEEE 802.3 standard [[802.3-2002](#)] to better address Ethernet deployments in the public access network.

The Ethernet in the First Mile (EFM) task force was focused on four somewhat independent objectives to better address Ethernet access deployments: optics, copper, Ethernet passive optical networks (Ethernet PON, or EPON), and operations, administration, and maintenance (OAM). The optics sub-taskforce developed new optical physical layers that better served the long-reach outside plant networks typically found in the access network, including developing physical layers that operate up to 20Km and supporting the environmental conditions of outside deployments. The copper sub-taskforce developed two new physical layers that run Ethernet natively over existing twisted pair wires that have been supporting voice services for decades. The EPON sub-taskforce developed a new point-to-multipoint Ethernet physical layer, utilizing Ethernet framing natively over a time-division multiple-access (TDMA) infrastructure. The OAM sub-taskforce introduced some basic management functionality into an Ethernet link to better monitor and maintain Ethernet networks in geographically disparate networks.

This document defines the management objects necessary to integrate

Ethernet OAM functionality into the SNMP management framework.

Ethernet OAM is composed of a core set of functions and a set of optional functional groups that are not required to be implemented along with the core set. The mandatory functions include discovery operations (determining if the other end of the link is OAM capable, and what OAM functions it implements), state machine implementation, and some critical event flows. The optional functional groups are for (a) link events, (b) remote loopback, and (c) variable retrieval and response. Each optional functional group is controlled by a separate MIB table(s).

Ethernet OAM is complementary, not competitive, with SNMP management in that it provides some basic management functions at layer two,

rather than using layer three and above as required by SNMP over an IP infrastructure. Ethernet OAM provides single-hop functionality in that it works only between two directly connected Ethernet stations. SNMP can be used to manage the Ethernet OAM interactions of one Ethernet station with another.

Ethernet OAM has three functional objectives which are detailed in the following sections.

[3.1](#) Remote fault indication

Remote fault indication provides a mechanism for one end of an Ethernet link to signal the other end that the receive path is non-operational. Some Ethernet physical layers offer mechanisms to signal this condition at the physical layer. Ethernet OAM added a mechanism so that some Ethernet physical layers can operate in unidirectional mode, allowing frames to be transmitted in one direction even when the other direction is non-operational. Traditionally, Ethernet PHYs do not allow frame transmission in one direction if the other direction is not operational. Using this mode, Ethernet OAM allows frame-based signaling of remote fault conditions while still not allowing higher layer applications to be aware of the unidirectional capability. This document includes mechanisms for capturing that information and reflecting such information in objects and notifications into the SNMP management framework.

[3.2](#) Link monitoring

Ethernet OAM includes event signaling capability so that one end of an Ethernet link can indicate the occurrence of certain important events to the other end of the link. This happens via a layer two protocol. This document defines methods for incorporating the occurrence of these layer two events, both at the local end and far end of the link, into the SNMP management framework.

Ethernet OAM also includes mechanisms for one Ethernet station to query another directly connected Ethernet station about the status of its Ethernet interface variables and status. This document DOES NOT include mechanisms for controlling how one Ethernet endpoint may use this functionality to query the status or statistics of a peer Ethernet entity.

[3.3](#) Remote loopback

Remote loopback is a link state where the peer Ethernet entity echoes every received packet (without modifications) back onto the link. Remote loopback is intrusive in that the other end of the link is not forwarding traffic from higher layers out over the link. This

document defines objects controlling loopback operation and reading the status of the loopback state.

[4.](#) Relation to the Other MIBs

The definitions presented here are based on Clauses 30 and 57 of [\[802.3ah\]](#). Note that these clauses describe many of these variables and their affects on the MAC layer. In some cases there is a one-to-one relationship between an object in this document and an object in the Clause 30 MIB of [\[802.3ah\]](#). In other cases, the objects of this document reflect a more complex entity and are reflected by more than one objectx in the Clause 30 MIB of [\[802.3ah\]](#).

[4.1](#) Relation to other SNMP MIBs

This objects defined in this document do not overlap with MIB-2 [\[RFC1213\]](#), the interfaces MIB [\[RFC2863\]](#), or the Ethernet-like interfaces MIB [\[RFC3635\]](#). The objects defined here are defined for Ethernet-like interfaces only and use the same ifIndex as the associated Ethernet interface.

This document is independent of the other MIBs derived from [802.3ah] for copper [802.3ah-copper] and EPON [802.3ah-epon].

4.2 IANA Considerations

The EFM OAM MIB requires the allocation of a single object identifier for its MODULE-IDENTITY under the MIB-2 tree. IANA has not yet allocated this object identifier.

4.3 Mapping of IEEE 802.3ah Managed Objects

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

IEEE 802.3 Managed Object	Corresponding SNMP object
.a0AMID	IF-MIB ifIndex
.a0AMAdminState	dot30amAdminState
.a0AMMode	dot30amMode
.a0AMDiscoveryState	dot30amOperStatus
.a0AMRemoteMACAddress	dot30amPeerMacAddress
.a0AMLocalConfiguration	dot30amFunctionsSupported
.a0AMRemoteConfiguration	dot30amPeerFunctionsSupported, dot30amPeerMode
.a0AMLocalPDUConfiguration	dot30amMaxOamPduSize
.a0AMRemotePDUConfiguration	dot30amPeerMaxOamPduSize
.a0AMLocalFlagsField	dot30amOperStatus,

.a0AMRemoteFlagsField	dot30amLclErrEventFlagsData dot30amOperStatus, dot30amRmtErrEventFlagsData
.a0AMLocalRevision	dot30amConfigRevision
.a0AMRemoteRevision	dot30amPeerConfigRevision
.a0AMLocalState	dot30amLoopbackStatus
.a0AMRemoteState	dot30amLoopbackStatus
.a0AMRemoteVendorOUI	dot30amPeerVendorOui
.a0AMRemoteVendorSpecificInfo	dot30amPeerVendorInfo
.a0AMUnsupportedCodesTx	dot30amUnsupportedCodesTx
.a0AMUnsupportedCodesRx	dot30amUnsupportedCodesRx
.a0AMInformationTx	dot30amInformationTx
.a0AMInformationRx	dot30amInformationRx

.a0AMUniqueEventNotificationTx	dot30amUniqueEventNotificationTx
.a0AMUniqueEventNotificationRx	dot30amUniqueEventNotificationRx
.a0AMDuplicateEventNotificationTx	dot30amDuplicateEventNotificationTx
.a0AMDuplicateEventNotificationRx	dot30amDuplicateEventNotificationRx
.a0AMLoopbackControlTx	dot30amLoopbackControlTx
.a0AMLoopbackControlRx	dot30amLoopbackControlRx
.a0AMVariableRequestTx	dot30amVariableRequestTx
.a0AMVariableRequestRx	dot30amVariableRequestRx
.a0AMVariableResponseTx	dot30amVariableResponseTx
.a0AMVariableResponseRx	dot30amVariableResponseRx
.a0AMOrganizationSpecificTx	dot30amOrgSpecificTx
.a0AMOrganizationSpecificRx	dot30amOrgSpecificTx
.a0AMLocalErrSymPeriodConfig	dot30amErrSymPeriodWindow, dot30amErrSymPeriodThreshold
.a0AMLocalErrSymPeriodEvent	dot30amLclErrSymPeriodData
.a0AMLocalErrFrameConfig	dot30amErrFrameWindow, dot30amErrFrameThreshold
.a0AMLocalErrFrameEvent	dot30amLclErrFrameData
.a0AMLocalErrFramePeriodConfig	dot30amErrFramePeriodWindow, dot30amErrFramePeriodThreshold
.a0AMLocalErrFramePeriodEvent	dot30amLclErrFramePeriodData
.a0AMLocalErrFrameSecsSummaryConfig	dot30amErrFrameSecsSummaryWindow, dot30amErrFrameSecsummaryThreshold
.a0AMLocalErrFrameSecsSummaryEvent	dot30amLclErrFrameSecsSumData
.a0AMRemoteErrSymPeriodEvent	dot30amRmtErrSymPeriodData
.a0AMRemoteErrFrameEvent	dot30amRmtErrFrameData
.a0AMRemoteErrFramePeriodEvent	dot30amRmtErrFramePeriodData
.a0AMRemoteErrFrameSecsSummaryEvent	dot30amRmtErrFrameSecsSumData

.aFramesLostDueToOamError	
.acOamAdminControl	dot30amFramesLostDueToOam

There are no IEEE 802.3ah managed objects that are not reflected in this MIB in some way.

5. MIB Structure

The common EFM MIB objects of this memo focus on the OAM capabilities introduced in IEEE 802.3ah. 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.

6. MIB Definition

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


efmOamMIB MODULE-IDENTITY

LAST-UPDATED "200406010000Z" -- June 01, 2004"

ORGANIZATION

"IETF Ethernet Interfaces and Hub MIB Working Group"

CONTACT-INFO

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"

DESCRIPTION

"The MIB module for managing the new Ethernet OAM features introduced by the Ethernet in the First Mile task force (IEEE P802.3ah). The functionality presented here is based on IEEE P802.3ah/D3.3 [[802.3ah](#)], released in April, 2004.

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/D3.3: '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', April 2004.

-- Editor's note - update this to normative reference when finalized

[802-2001] refers to:

'IEEE Standard for LAN/MAN (Local Area

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Network/Metropolitan Area Network): Overview and Architecture', IEEE 802, June 2001.

Copyright (c) The Internet Society (2004). This 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: Remove these notes

REVISION "200406010000Z" -- June 01, 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 OAM MIB
--

dot30amMIB OBJECT IDENTIFIER ::= { efmOamMIB 1 }
dot30amConformance OBJECT IDENTIFIER ::= { efmOamMIB 2 }

--
-- Textual conventions for OAM MIB
--

Dot30ui ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"24-bit Organizationally Unique Identifier. Information on OUIs can be found in IEEE 802-2001 [[802-2001](#)] Clause 9."

SYNTAX OCTET STRING(SIZE(3))

Dot30amUnsigned64 ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This convention represents a 64 bit unsigned integer. The convention replaces the Counter64 type for objects requiring read-write access."

SYNTAX OCTET STRING (SIZE(8))

Dot3OamEventTLVData ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This convention represents the fields in an Event TLV in an

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Event Notification OAMPDU. The data is interpreted as a sequence of six integer fields. Some fields are longer than is required for specific TLVs, but since this convention will be shared between all TLVs, the maximum size field is used.

In the list below, TYPE indicates one of Symbol, Frame, Frame Period or Frame Seconds Summary. See [[802.3ah](#)], 57.5.3, for details.

- The first field is 16 bit wide, and represents the Event Time Stamp field.
- The second field is 64 bit wide, and represents the Errored TYPE Window field.
- The third field is 64 bit wide, and represents the Errored TYPE Threshold field.
- The fourth field is 64 bit wide, and represents the Errored TYPE field.
- The fifth field is 64 bit wide, and represents the Error Running Total field.
- The sixth field is 32 bit wide, and represents the Event Running Total field.

Each integer field is encoded with the most important byte at the lowest number octet. The first integer field starts at location 0.

Values which do not use the whole field width, will be aligned to the right, with zeros padded at the start of the field."

SYNTAX OCTET STRING (SIZE (38))

--
-- Ethernet OAM Control group
--

```

dot30amTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Dot30amEntry
    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]."
    ::= { dot30amMIB 1 }

```

```

dot30amEntry OBJECT-TYPE
    SYNTAX      Dot30amEntry
    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 provision the default administrative OAM mode for this interface. This object represents the desired state of OAM for this interface.

The dot30amAdminState always starts in the disabled(1) state until an explicit management action or configuration information retained by the system causes a transition to the

enabled(2) state.

Note that the value of this object is ignored when the interface is not operating in full-duplex mode. OAM is not supported on half-duplex links. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.2"

::= { dot30amEntry 2 }

dot30amOperStatus OBJECT-TYPE

SYNTAX INTEGER {
disabled(1),
linkfault(2),
passiveWait(3),
activeSendLocal(4),
sendLocalAndRemote(5),
sendLocalAndRemoteOk(6),
oamPeeringLocallyRejected(7),
oamPeeringRemotelyRejected(8),
operational(9)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"At initialization and failure conditions, two OAM entities on the same full-duplex Ethernet link begin a discovery phase to determine what OAM capabilities may be used on that link. The progress of this initialization is controlled by the OAM sublayer.

This value is always disabled(1) if OAM is disabled on this interface via the dot3OamAdminState.

If the link has detected a fault and is transmitting OAMPDUs with a link fault indication, the value is linkFault(2).

The passiveWait(3) state is returned only by OAM entities in passive mode (dot3OamMode) and reflects the state in which the OAM entity is waiting to see if the peer device is OAM capable. The activeSendLocal(4) is used by active mode devices (dot3OamMode) and reflects the OAM entity actively trying to discover whether the peer has OAM capability but has not yet made that determination.

The state sendLocalAndRemote(5) 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(7). If the OAM peering is allowed by the local device, the state moves to sendLocalAndRemoteOk(6). Note that both the sendLocalAndRemote(5) and oamPeeringLocallyRejected(7) states fall within the state SEND_LOCAL_REMOTE of the Discovery state diagram [802.3ah, Figure 57-5], with the difference being whether the local OAM client has actively rejected the peering or has just not indicated any decision yet. Whether a peering decision has been made is indicated via the local flags field in the OAMPDU (reflected in the aOAMLocalFlagsField of 30.3.6.1.10).

If the remote OAM entity rejects the peering, the state becomes oamPeeringRemotelyRejected(8). Note that both the sendLocalAndRemoteOk(6) and oamPeeringRemotelyRejected(8)

states fall within the state SEND_LOCAL_REMOTE_OK 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. This is indicated via the remote flags field in the OAM PDU (reflected in the aOAMRemoteFlagsField of 30.3.6.1.11).

When the local OAM entity learns that both it and the remote OAM entity have accepted the peering, the state moves to operational(9) corresponding to the SEND_ANY state of the Discovery state diagram [802.3ah, Figure 57-5]. "

REFERENCE "[802.3ah], 30.3.6.1.4, 30.3.6.1.10, 30.3.6.1.11"
 ::= { dot30amEntry 3 }

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.

Changing this value results in incrementing the configuration revision field of locally generated OAMPDUs (30.3.6.1.12) and

potentially re-doing the OAM discovery process if the dot30amOperStatus was already operational(9). "

REFERENCE "[802.3ah], 30.3.6.1.3"
 ::= { 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 30.3.6.1.8"
 ::= { dot30amEntry 5 }

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], 30.3.6.1.12"
 ::= { dot30amEntry 6 }

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 functional sets beyond the basic discovery process which is always required. These functional groups can be supported independently by any implementation. These values are communicated to the peer via the local configuration field of Information OAMPDUs. "

REFERENCE "[802.3ah], 30.3.6.1.6"
 ::= { dot30amEntry 7 }

--
-- 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. OAM entities communicate with a single OAM peer
entity on full-duplex Ethernet links on which OAM is enabled
and operating properly. "
 ::= { dot30amMIB 2 }

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.

Note that there is at most one OAM peer for each 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
}

dot30amPeerRowStatus OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"The peer row is automatically created when the dot30amOperStatus of this particular Ethernet interface is not 'disabled', 'linkFault', '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', 'linkfault', '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. The MAC address is derived from the most recently received OAMPDU.

An OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [802.3ah]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) and a Slow Protocols subtype equal to that of the subtype reserved for OAM. "

REFERENCE "[802.3ah], 30.3.6.1.5."

::= { 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 received with a Local Information TLV. The OUI can be used to identify the vendor of the remote OAM entity.

An Information OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [802.3ah]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the

subtype reserved for OAM, (4) a OAM code that equals the code reserved for Information OAMPDUs. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.16."

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::= { 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 received with a Local Information TLV. The vendor information field is within the Local Information TLV, and can be used to determine additional information about the peer entity. The format of the vendor information is unspecified within the 32-bit field.

An Information OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) a OAM code that equals the code reserved for Information OAMPDUs. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.17."

::= { 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 Information OAMPDU received with a Local Information TLV. The mode of the peer can be determined from the Configuration field in the Local Information TLV of the last Information OAMPDU received from the peer.

An Information OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) a OAM code that equals the code reserved for Information OAMPDUs. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.7."
 ::= { 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 Information OAMPDU received with a Local Information TLV. Ethernet OAM on this interface must not use OAMPDUs that exceed this size. The maximum OAMPDU size can be determined from the PDU Configuration field of the Local Information TLV of the last Information OAMPDU received from the peer.

An Information OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) a OAM code that equals the code reserved for Information OAMPDUs. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.9."

::= { 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.

The configuration revision can be determined from the Revision field of the Local Information TLV of the most recently received Information OAMPDU with a Local Information TLV.

An Information OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [802.3ah]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) a OAM code that equals the code reserved for Information OAMPDUs. "

REFERENCE "[802.3ah], 30.3.6.1.13."
 ::= { dot3OamPeerEntry 7 }

dot3OamPeerFunctionsSupported 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. This value indicates the capabilities of the peer OAM entity with respect to these functions.

The capabilities of the OAM peer can be determined from the configuration field of the Local Information TLV of the most recently received Information OAMPDU with a Local Information TLV.

An Information OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [802.3ah]), (2) a lengthOrType field equal to the reserved type for Slow

Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) a OAM code that equals the code reserved for Information OAMPDUs. "

REFERENCE "[[802.3ah](#)], REFERENCE 30.3.6.1.7."
 ::= { dot30amPeerEntry 8 }

--
-- 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.

Loopback can be used to place the remote OAM entity in a state where every received frame (except OAMPDUs) are echoed back

over the same interface on which they were received. In this state, at the remote entity, 'normal' traffic is disabled as only the looped back frames are transmitted on the interface. Loopback is thus an intrusive operation that prohibits normal data flow and should be used accordingly. "

::= { dot30amMIB 3 }

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. There is an entry in this table for every Ethernet-like interface on which supports OAM and loopback function within OAM (as indicated in dot30amFunctionsSupported). "

INDEX { ifIndex }

```
::= { dot30amLoopbackTable 1 }
```

```
Dot30amLoopbackEntry ::=
  SEQUENCE {
    dot30amLoopbackCommand          INTEGER,
    dot30amLoopbackStatus           INTEGER,
    dot30amLoopbackIgnoreRx        INTEGER
  }
```

```
dot30amLoopbackCommand OBJECT-TYPE
```

```
SYNTAX      INTEGER {
              noLoopback (1),
              startRemoteLoopback (2),
              stopRemoteLoopback (3)
            }
```

```
MAX-ACCESS  read-write
```

```
STATUS      current
```

```
DESCRIPTION
```

"This attribute initiates or terminates remote loopback with an OAM peer. Writing startRemoteLoopback(2) to this attribute cause the local OAM client to send a loopback OAMPDU to the OAM peer with the loopback enable flags set. Writing stopRemoteLoopback(3) 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.

Writes to this attribute are ignored unless the OAM status of this interface is 'operational' (dot30amOperStatus).

The attribute always returns noLoopback on a read. To

determine the loopback status, use the attribute dot30amLoopbackStatus. "

```
REFERENCE  "[802.3ah], 57.2.11"
```

```
::= { dot30amLoopbackEntry 1 }
```

```
dot30amLoopbackStatus OBJECT-TYPE
```

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

```

        localLoopback (5),
        unknown (6)
    }
MAX-ACCESS read-only
STATUS current
DESCRIPTION

```

"The loopback status of the OAM entity. This status is determined by a combination of the local parser and multiplexer states, the remote 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 reads noLoopback(1).

If the OAM client has sent an Loopback OAMPDU 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'. In this case, the local OAM entity has yet to receive any acknowledgement that the remote OAM entity has received its loopback command request.

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, 30.3.6.1.15]), the status is remoteLoopback(3). If the local OAM client is in the process of terminating the remote loopback [802.3ah, 57.2.11.3, 30.3.6.1.14], with its local multiplexer and parser states in DISCARD, the status is terminatingLoopback(4). 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(5).

The unknown(6) status indicates the parser and multiplexer combination is unexpected. This status may be returned if the OAM loopback is in a transition state but should not persist.

The values of this attribute correspond to the following values of the local and remote parser and multiplexer states.

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value	LclPrsr	LclMux	RmtPrsr	RmtMux
noLoopback	FWD	FWD	FWD	FWD
initLoopback	DISCARD	DISCARD	FWD	FWD
rmtLoopback	DISCARD	FWD	LPBK	DISCARD

tmtngLoopback	DISCARD	DISCARD	LPBK	DISCARD
lclLoopback	LPBK	DISCARD	DISCARD	FWD
unknown	***	any other combination	***	

"

REFERENCE "[[802.3ah](#)], REFERENCE 57.2.11, 30.3.61.14,
30.3.6.1.15"

::= { dot30amLoopbackEntry 2 }

dot30amLoopbackIgnoreRx OBJECT-TYPE

SYNTAX INTEGER { ignore(1), process(2) }

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Since OAM loopback is a disruptive operation (user traffic does not pass), this attribute provides a mechanism to provide controls over whether received OAM loopback commands are processed or ignored. When the value is ignore(1), received loopback commands are ignored. When the value is process(2), OAM loopback commands are processed. The default value is to ignore loopback commands.

The attribute has no meaning if the local OAM entity does not support the loopback function (as defined in dot30amFunctionsSupported). "

REFERENCE "[[802.3ah](#)], REFERENCE 57.2.11, 30.3.61.14,
30.3.6.1.15"

::= { dot30amLoopbackEntry 3 }

--

-- 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 4 }

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 {

dot30amInformationTx	Counter32,
dot30amInformationRx	Counter32,
dot30amUniqueEventNotificationTx	Counter32,
dot30amUniqueEventNotificationRx	Counter32,
dot30amDuplicateEventNotificationTx	Counter32,
dot30amDuplicateEventNotificationRx	Counter32,
dot30amLoopbackControlTx	Counter32,
dot30amLoopbackControlRx	Counter32,
dot30amVariableRequestTx	Counter32,
dot30amVariableRequestRx	Counter32,
dot30amVariableResponseTx	Counter32,
dot30amVariableResponseRx	Counter32,
dot30amOrgSpecificTx	Counter32,
dot30amOrgSpecificRx	Counter32,
dot30amUnsupportedCodesTx	Counter32,
dot30amUnsupportedCodesRx	Counter32,
dot30amFramesLostDueToOam	Counter32

}

dot30amInformationTx OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of Information OAMPDUs transmitted on this interface.

An Information OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [\[802.3ah\]](#)), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Information code.

Discontinuities of this counter can occur at re-initialization

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of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.20."

::= { dot30amStatsEntry 1 }

dot30amInformationRx OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of Information OAMPDUs received on this interface.

An Information OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Information code.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.21."

::= { dot30amStatsEntry 2 }

dot30amUniqueEventNotificationTx OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of unique Event OAMPDUs transmitted on this interface. Event notifications may be sent in duplicate to increase the probability of successfully being received, given the possibility that a frame may be lost in transit.

An Event Notification OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a

lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Event code.

A unique Event Notification OAMPDU is indicated as an Event Notification OAMPDU with a Sequence Number field that is distinct from the previously transmitted Event Notification OAMPDU Sequence Number.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.22."
 ::= { dot30amStatsEntry 3 }

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. Event notification OAMPDUs may be sent in duplicate to increase the probability of successfully being received, given the possibility that a frame may be lost in transit.

An Event Notification OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Event code.

A unique Event Notification OAMPDU is indicated as an Event Notification OAMPDU with a Sequence Number field that is distinct from the previously received Event Notification OAMPDU Sequence Number.

Discontinuities of this counter can occur at re-initialization

of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.24."

::= { dot30amStatsEntry 4 }

dot30amDuplicateEventNotificationTx OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of duplicate Event OAMPDUs transmitted on this interface. Event notification OAMPDUs may be sent in duplicate to increase the probability of successfully being received, given the possibility that a frame may be lost in transit.

An Event Notification OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Event code.

A duplicate Event Notification OAMPDU is indicated as an Event Notification OAMPDU with a Sequence Number field that is identical to the previously transmitted Event Notification OAMPDU Sequence Number.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.23."

::= { dot30amStatsEntry 5 }

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. Event notification OAMPDUs may be sent in

duplicate to increase the probability of successfully being received, given the possibility that a frame may be lost in transit.

An Event Notification OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [802.3ah]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Event code.

A duplicate Event Notification OAMPDU is indicated as an Event Notification OAMPDU with a Sequence Number field that is identical to the previously received Event Notification OAMPDU Sequence Number.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[802.3ah], 30.3.6.1.25."
 ::= { dot30amStatsEntry 6 }

dot30amLoopbackControlTx OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of Loopback Control OAMPDUs transmitted on this interface.

An Loopback Control OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [802.3ah]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Loopback Control code.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[802.3ah], 30.3.6.1.26."
 ::= { dot30amStatsEntry 7 }

dot30amLoopbackControlRx OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"A count of the number of Loopback Control OAMPDUs transmitted on this interface.

An Loopback Control OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [802.3ah]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Loopback Control code.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[802.3ah], 30.3.6.1.27."
 ::= { dot30amStatsEntry 8 }

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.

An Variable Request OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [802.3ah]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Variable Request code.

Discontinuities of this counter can occur at re-initialization

of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.28."
 ::= { dot30amStatsEntry 9 }

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.

An Variable Request OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Variable Request code.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.29."
 ::= { dot30amStatsEntry 10 }

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.

An Variable Response OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC

address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Variable Response code.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.30."

::= { dot30amStatsEntry 11 }

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.

An Variable Response OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Variable Response code.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.31."

::= { dot30amStatsEntry 12 }

dot30amOrgSpecificTx OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of Organization Specific OAMPDUs transmitted on this interface.

An Organization Specific OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Organization Specific code.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.32."

::= { dot30amStatsEntry 13 }

dot30amOrgSpecificRx OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of Organization Specific OAMPDUs received on this interface.

An Organization Specific OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the OAM Organization Specific code.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.33."

::= { dot30amStatsEntry 14 }

dot30amUnsupportedCodesTx OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of OAMPDUs transmitted on this interface with an unsupported op-code.

An unsupported opcode OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the opcode for a function that is not supported by the device.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

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REFERENCE "[[802.3ah](#)], 30.3.6.1.18."
 ::= { dot30amStatsEntry 15 }

dot30amUnsupportedCodesRx OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"A count of the number of OAMPDUs received on this interface with an unsupported op-code.

An unsupported opcode OAMPDU is indicated by a valid frame with (1) destination MAC address equal to that of the reserved MAC address for Slow Protocols (See 43B of [[802.3ah](#)]), (2) a lengthOrType field equal to the reserved type for Slow Protocols, (3) a Slow Protocols subtype equal to that of the subtype reserved for OAM, and (4) an OAMPDU code equals the opcode for a function that is not supported by the device.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.19."
 ::= { dot30amStatsEntry 16 }

dot30amFramesLostDueToOam OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"A count of the number of frames that were dropped by the OAM multiplexer. Since the OAM multiplexer has multiple inputs and a single output, there may be cases where frames are dropped due to transmit resource contention. This counter is incremented whenever a frame is dropped by the OAM layer. When this counter is incremented, no other counters in this MIB are incremented.

Discontinuities of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of the ifCounterDiscontinuityTime. "

REFERENCE "[[802.3ah](#)], 30.3.6.1.46."

```
::= { dot30amStatsEntry 17 }
```

```
-----  
--  
-- Ethernet OAM Event group  
--
```

dot30amEventConfigTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot30amEventConfigEntry

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 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 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
    "Event configuration information is available for every
    Ethernet like interface that supports OAM and the event
    function of OAM as indicated in the dot30amFunctionsSupported
    attribute.

    Event configuration controls when the local management entity
    sends Event Notification OAMPDUs to its OAM peer. "
INDEX { ifIndex }
 ::= { dot30amEventConfigTable 1 }

```

```
Dot30amEventConfigEntry ::=
```

```

SEQUENCE {
    dot30amErrSymPeriodWindow          Dot30amUnsigned64,
    dot30amErrSymPeriodThreshold       Dot30amUnsigned64,
    dot30amErrSymPeriodEvNotifEnable  INTEGER,
    dot30amErrFramePeriodWindow       Unsigned32,
    dot30amErrFramePeriodThreshold    Unsigned32,
    dot30amErrFramePeriodEvNotifEnable INTEGER,
    dot30amErrFrameWindow              Unsigned32,
    dot30amErrFrameThreshold           Unsigned32,
    dot30amErrFrameEvNotifEnable      INTEGER,
    dot30amErrFrameSecsSummaryWindow  Integer32,
    dot30amErrFrameSecsSummaryThreshold Integer32,
    dot30amErrFrameSecsEvNotifEnable  INTEGER
}

```

```
dot30amErrSymPeriodWindow OBJECT-TYPE
```

```
SYNTAX Dot30amUnsigned64
```

```
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], 30.3.6.1.34"
```

```
::= { dot30amEventConfigEntry 1 }
```

dot30amErrSymPeriodThreshold OBJECT-TYPE

SYNTAX Dot30amUnsigned64

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](#)], 30.3.6.1.34"

```
::= { dot30amEventConfigEntry 2 }
```

dot30amErrSymPeriodEvNotifEnable OBJECT-TYPE

SYNTAX INTEGER { enabled(1), disabled(2) }

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Indicates whether the occurrence of Errored Symbol Period Events should result in Event Notification OAMPDUs generated by the OAM layer.

By default, this object should have the value enabled(1) for Ethernet like interfaces that support OAM. If the OAM layer does not support event notifications (as indicated via the dot30amFunctionsSupported attribute), this value is ignored. "

REFERENCE "N/A"

```
::= { dot30amEventConfigEntry 3 }
```

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](#)], 30.3.6.1.38"
 ::= { dot30amEventConfigEntry 4 }

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](#)], 30.3.6.1.38"
 ::= { dot30amEventConfigEntry 5 }

dot30amErrFramePeriodEvNotifEnable OBJECT-TYPE

SYNTAX INTEGER { enabled(1), disabled(2) }
MAX-ACCESS read-write
STATUS current

DESCRIPTION

"Indicates whether the occurrence of an Errored Frame Period Event should result in an Event Notification OAMPDU generated by the OAM layer.

By default, this object should have the value enabled(1) for Ethernet like interfaces that support OAM. If the OAM layer does not support event notifications (as indicated via the dot30amFunctionsSupported attribute), this value is ignored. "

REFERENCE "N/A"
 ::= { dot30amEventConfigEntry 6 }

dot30amErrFrameWindow OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The amount of time (in 100ms increments) over which the
threshold is defined.

If dot30amErrFrameThreshold frame errors occur within a window
of dot30amErrFrameWindow seconds (measured 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](#)], 30.3.6.1.36"
::= { dot30amEventConfigEntry 7 }

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](#)], 30.3.6.1.36"
::= { dot30amEventConfigEntry 8 }

dot30amErrFrameEvNotifEnable OBJECT-TYPE

SYNTAX INTEGER { enabled(1), disabled(2) }
MAX-ACCESS read-write
STATUS current

DESCRIPTION

"Indicates whether the occurrence of an Errored Frame Event
should result in an Event Notification OAMPDU generated by the
OAM layer.

By default, this object should have the value enabled(1) for
Ethernet like interfaces that support OAM. If the OAM layer

does not support event notifications (as indicated via the dot30amFunctionsSupported attribute), this value is ignored. "

REFERENCE "N/A"

::= { dot30amEventConfigEntry 9 }

dot30amErrFrameSecsSummaryWindow OBJECT-TYPE

SYNTAX Integer32 (100..9000)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The amount of time (in 100ms intervals) 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](#)], 30.3.6.1.40"

::= { dot30amEventConfigEntry 10 }

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 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](#)], 30.3.6.1.40"

::= { dot30amEventConfigEntry 11 }

dot30amErrFrameSecsEvNotifEnable OBJECT-TYPE

SYNTAX INTEGER { enabled(1), disabled(2) }

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Indicates whether the occurrence of an Errored Frame Seconds Summary Event should result in an Event Notification OAMPDU generated by the OAM layer.

By default, this object should have the value enabled(1) for Ethernet like interfaces that support OAM. If the OAM layer does not support event notifications (as indicated via the dot30amFunctionsSupported attribute), this value is ignored."

REFERENCE "N/A"

::= { dot30amEventConfigEntry 12 }

--
-- Ethernet OAM Event Status group
--

dot30amEventStatusTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot30amEventStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"OAM event status information for a particular Ethernet-like interface. These objects will contain the most recently transmitted or received TLV event.

There is a strict one-to-one relation between entries in this table and entries in the dot30amTable. "

::= { dot30amMIB 6 }

dot30amEventStatusEntry OBJECT-TYPE

SYNTAX Dot30amEventStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION "An entry in the dot30amEventStatusTable."

INDEX { ifIndex }

::= { dot30amEventStatusTable 1 }

Dot30amEventStatusEntry ::=

SEQUENCE {

-- Local events

dot30amLclErrSymPeriodTime TimeStamp,

dot30amLclErrSymPeriodData Dot30amEventTLVData,

dot30amLclErrFramePeriodTime TimeStamp,

dot30amLclErrFramePeriodData Dot30amEventTLVData,

dot30amLclErrFrameTime TimeStamp,

dot30amLclErrFrameData Dot30amEventTLVData,

dot30amLclErrFrameSecsSumTime TimeStamp,

dot30amLclErrFrameSecsSumData Dot30amEventTLVData,

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```

dot30amLclErrEventFlagsTime      TimeStamp,
dot30amLclErrEventFlagsData      BITS,
dot30amLclErrEventOtherTime      TimeStamp,
dot30amLclErrEventOtherData      OCTET STRING,

-- Remote events
dot30amRmtErrSymPeriodTime        TimeStamp,
dot30amRmtErrSymPeriodData        Dot30amEventTLVData,
dot30amRmtErrFramePeriodTime      TimeStamp,
dot30amRmtErrFramePeriodData      Dot30amEventTLVData,
dot30amRmtErrFrameTime            TimeStamp,
dot30amRmtErrFrameData            Dot30amEventTLVData,
dot30amRmtErrFrameSecsSumTime     TimeStamp,
dot30amRmtErrFrameSecsSumData     Dot30amEventTLVData,
dot30amRmtErrEventFlagsTime       TimeStamp,
dot30amRmtErrEventFlagsData       BITS,
dot30amRmtErrEventOtherTime       TimeStamp,
dot30amRmtErrEventOtherData       OCTET STRING
}

dot30amLclErrSymPeriodTime      OBJECT-TYPE
    SYNTAX      TimeStamp
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The time at which the last Errored Symbol Period Event
        occurred locally. "
    REFERENCE   "[802.3ah], 30.3.6.1.35 and 57.5.3.1."
    ::= { dot30amEventStatusEntry 1 }

dot30amLclErrSymPeriodData      OBJECT-TYPE
    SYNTAX      Dot30amEventTLVData
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A sequence of six integers corresponding to the respective
        fields in the most recently transmitted Errored Symbol Period
        Event TLV in an Event Notification OAMPDU. "
    REFERENCE   "[802.3ah], 30.3.6.1.35 and 57.5.3.1."
    ::= { dot30amEventStatusEntry 2 }

dot30amLclErrFramePeriodTime    OBJECT-TYPE

```

SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The time at which the last Errored Frame Period Event
 occurred locally. "

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REFERENCE "[[802.3ah](#)], 30.3.6.1.39 and 57.5.3.3."
 ::= { dot30amEventStatusEntry 3 }

dot30amLclErrFramePeriodData OBJECT-TYPE

SYNTAX Dot30amEventTLVData
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "A sequence of six integers corresponding to the respective
 fields in the most recently transmitted Errored Frame Period
 Event TLV in an Event Notification OAMPDU."
REFERENCE "[[802.3ah](#)], 30.3.6.1.39 and 57.5.3.3."
 ::= { dot30amEventStatusEntry 4 }

dot30amLclErrFrameTime OBJECT-TYPE

SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The time at which the last Errored Frame Event occurred
 locally. "
REFERENCE "[[802.3ah](#)], 30.3.6.1.37 and 57.5.3.2."
 ::= { dot30amEventStatusEntry 5 }

dot30amLclErrFrameData OBJECT-TYPE

SYNTAX Dot30amEventTLVData
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "A sequence of six integers corresponding to the respective
 fields in the most recently transmitted Errored Frame Event
 TLV in an Event Notification OAMPDU."
REFERENCE "[[802.3ah](#)], 30.3.6.1.37 and 57.5.3.2."
 ::= { dot30amEventStatusEntry 6 }

dot30amLclErrFrameSecsSumTime OBJECT-TYPE

SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The time at which the last Errored Frame Seconds Summary
 Event occurred locally. "
REFERENCE "[\[802.3ah\]](#), 30.3.6.1.36 and 57.5.3.4."
 ::= { dot30amEventStatusEntry 7 }

dot30amLclErrFrameSecsSumData OBJECT-TYPE
SYNTAX Dot30amEventTLVData
MAX-ACCESS read-only
STATUS current

DESCRIPTION
 "A sequence of six integers corresponding to the respective
 fields in the most recently transmitted Errored Frame Seconds
 Summary Event TLV in an Event Notification OAMPDU."
REFERENCE "[\[802.3ah\]](#), 30.3.6.1.36 and 57.5.3.4."
 ::= { dot30amEventStatusEntry 8 }

dot30amLclErrEventFlagsTime OBJECT-TYPE
SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The time at which the flag field in outgoing OAMPDUs changed.
 "
REFERENCE "[\[802.3ah\]](#), 30.3.6.1.10"
 ::= { dot30amEventStatusEntry 9 }

dot30amLclErrEventFlagsData OBJECT-TYPE
SYNTAX BITS {
 linkFault (0),
 dyingGasp(1),
 miscCritical(2)
 }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The value of the OAM event flags on the most recently
 generated OAMPDU. These flags are used to signal critical
 events to an OAM peer entity. "

REFERENCE "[802.3ah], 30.3.6.1.10"
 ::= { dot30amEventStatusEntry 10 }

dot30amLclErrEventOtherTime OBJECT-TYPE

SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The time at which the last non-802.3 define link event occurred.

The 802.3ah OAM protocol allows for organization specific events to be defined by any organization. Whenever a non-802.3 defined link event occurs, this timestamp is updated to reflect that occurrence. "

REFERENCE "[802.3ah], 57.5.3.5"
 ::= { dot30amEventStatusEntry 11 }

dot30amLclErrEventOtherData OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(3..255))

MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The value of the data field for the most recent Organization Specific link event occurring on the interface. The information syntax is defined by the vendor specified in the OUI field (the first 3 octets) of the data. "

REFERENCE "[802.3ah], 57.5.3.5"
 ::= { dot30amEventStatusEntry 12 }

dot30amRmtErrSymPeriodTime OBJECT-TYPE

SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The time at which the last Errored Symbol Period TLV was received in a unique Event Notification OAMPDU, indicating receipt of a notification about a remote Errored Symbol Period Event. "

REFERENCE "[802.3ah], 30.3.6.1.42 and 57.5.3.1."
 ::= { dot30amEventStatusEntry 13 }

dot30amRmtErrSymPeriodData OBJECT-TYPE
SYNTAX Dot30amEventTLVData
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"A sequence of six integers corresponding to the respective fields in the most recently received Errored Symbol Period Event TLV in an Event Notification OAMPDU."
REFERENCE "[[802.3ah](#)], 30.3.6.1.42 and 57.5.3.1."
 ::= { dot30amEventStatusEntry 14 }

dot30amRmtErrFramePeriodTime OBJECT-TYPE
SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The time at which the last Errored Frame Period TLV was received in a unique Event Notification OAMPDU, indicating receipt of a notification about a remote Errored Frame Period Event. "
REFERENCE "[[802.3ah](#)], 30.3.6.1.44 and 57.5.3.3."
 ::= { dot30amEventStatusEntry 15 }

dot30amRmtErrFramePeriodData OBJECT-TYPE
SYNTAX Dot30amEventTLVData
MAX-ACCESS read-only
STATUS current

DESCRIPTION
"A sequence of six integers corresponding to the respective fields in the most recently received Errored Frame Period Event TLV in an Event Notification OAMPDU."
REFERENCE "[[802.3ah](#)], 30.3.6.1.44 and 57.5.3.3."
 ::= { dot30amEventStatusEntry 16 }

dot30amRmtErrFrameTime OBJECT-TYPE
SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The time at which the last Errored Frame TLV was received in a unique Event Notification OAMPDU, indicating receipt of a notification about a remote Errored Frame Event. "

REFERENCE "[802.3ah], 30.3.6.1.43 and 57.5.3.2."
 ::= { dot30amEventStatusEntry 17 }

dot30amRmtErrFrameData OBJECT-TYPE

SYNTAX Dot30amEventTLVData

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A sequence of six integers corresponding to the respective fields in the most recently received Errored Frame Event TLV in an Event Notification OAMPDU."

REFERENCE "[802.3ah], 30.3.6.1.43 and 57.5.3.2."
 ::= { dot30amEventStatusEntry 18 }

dot30amRmtErrFrameSecsSumTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time at which the last Errored Frame Seconds Summary TLV was received in a unique Event Notification OAMPDU, indicating receipt of a notification about a remote Errored Frame Seconds Summary Event. "

REFERENCE "[802.3ah], 30.3.6.1.45 and 57.5.3.4."
 ::= { dot30amEventStatusEntry 19 }

dot30amRmtErrFrameSecsSumData OBJECT-TYPE

SYNTAX Dot30amEventTLVData

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A sequence of six integers corresponding to the respective fields in the most recently received Errored Frame Seconds Summary Event TLV in an Event Notification OAMPDU."

REFERENCE "[802.3ah], 30.3.6.1.45 and 57.5.3.4."
 ::= { dot30amEventStatusEntry 20 }

dot30amRmtErrEventFlagsTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time at which the flags field in incoming OAMPDUs last changed.

"

REFERENCE "[802.3ah], 30.3.6.1.10"

::= { dot30amEventStatusEntry 21 }

dot30amRmtErrEventFlagsData OBJECT-TYPE

SYNTAX BITS {
linkFault (0),
dyingGasp(1),
miscCritical(2)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of the OAM event flags on the most recently received OAMPDU. These flags are used to signal critical events to an OAM peer entity. "

REFERENCE "[802.3ah], 30.3.6.1.10"

::= { dot30amEventStatusEntry 22 }

dot30amRmtErrEventOtherTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time at which the last non-802.3 defined link event TLV was received.

The 802.3ah OAM protocol allows for organization specific events to be defined by any organization. Whenever an Organization Specific Link Event TLV is received in a Event OAMPDU, this timestamp is updated to reflect the occurrence."

REFERENCE "[802.3ah], 57.5.3.5"

::= { dot30amEventStatusEntry 23 }

dot30amRmtErrEventOtherData OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(3..255))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of the data field for the most recent Organization

Specific Link Event TLV received on the interface. The information syntax is defined by the vendor specified in the OUI field (the first 3 octets) of the data. "

REFERENCE "[[802.3ah](#)], 57.5.3.5"

::= { dot30amEventStatusEntry 24 }

--
-- Ethernet OAM Notifications
--

dot30amTraps OBJECT IDENTIFIER ::= { dot30amMIB 7 }
dot30amTrapsPrefix OBJECT IDENTIFIER ::= {dot30amTraps 0}

dot30amLclErrSymPeriod NOTIFICATION-TYPE
OBJECTS { ifIndex,
 dot30amLclErrSymPeriodData
 }

STATUS current

DESCRIPTION

"A dot30amLclErrSymPeriod trap is sent when the value of the dot30amLclErrSymPeriodTime changes for an Ethernet like interface supporting Ethernet OAM.

This trap can be utilized to indicate to a management system that too many symbol errors have occurred on the specified interface, resulting in an Event Notification OAMPDU to a peer and trap to the management entity.

The management entity should periodically check the value of dot30amLclErrSymPeriodTime to detect any missed dot30amLclErrSymPeriod trap-events. "

::= { dot30amTrapsPrefix 1 }

dot30amLclErrFramePeriod NOTIFICATION-TYPE
OBJECTS { ifIndex,
 dot30amLclErrFramePeriodData
 }

STATUS current

DESCRIPTION

"A dot30amLclErrFramePeriod trap is sent when the value of the dot30amLclErrFramePeriodTime changes for an Ethernet like interface supporting Ethernet OAM.

This trap can be utilized to indicate to a management system that too many frame errors have occurred on the specified interface, resulting in an Event Notification OAMPDU to a peer

and trap to the management entity.

The management entity should periodically check the value of dog3LclErrFramePeriodTime to detect any missed dot30amErrFramePeriod trap-events. "

```
::= { dot30amTrapsPrefix 2 }
```

dot30amLclErrFrame NOTIFICATION-TYPE

```
OBJECTS { ifIndex,  
          dot30amLclErrFrameData  
        }
```

STATUS current

DESCRIPTION

"A dot30amLclErrFrame trap is sent when the value of the dot30amLclErrFrameTime changes for an Ethernet like interface supporting Ethernet OAM.

This trap can be utilized to indicate to a management system that too many frame errors have occurred on the specified interface, resulting in an Event Notification OAMPDU to a peer and trap to the management entity.

The management entity should periodically check the value of dog3LclErrFrameTime to detect any missed dot30amErrFrame trap-events. "

```
::= { dot30amTrapsPrefix 3 }
```

dot30amLclErrFrameSecsSum NOTIFICATION-TYPE

```
OBJECTS { ifIndex,  
          dot30amLclErrFrameSecsSumData  
        }
```

STATUS current

DESCRIPTION

"A dot30amLclErrFrameSecsSum trap is sent when the value of the dot30amLclErrFrameSecsSumTime changes for an Ethernet like interface supporting Ethernet OAM.

This trap can be utilized to indicate to a management system that too many errored frame seconds have occurred on the specified interface, resulting in an Event Notification OAMPDU to a peer and trap to the management entity.

The management entity should periodically check the value of dog3LclErrFrameSecsSumTime to detect any missed dot30amErrFrameSecsSum trap-events. "

```
::= { dot30amTrapsPrefix 4 }
```

```
dot30amLclErrEventFlags NOTIFICATION-TYPE
```

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```
OBJECTS { ifIndex,  
          dot30amLclErrEventFlagsData  
        }
```

```
STATUS current
```

```
DESCRIPTION
```

"A dot30amLclErrEventFlags trap is sent when the value of the dot30amLclErrEventFlagsTime changes for an Ethernet like interface supporting Ethernet OAM.

This trap can be utilized to indicate to a management system that a critical link event has been signaled by the sending entity on the given interface. The value of the dot30amLclErrEventFlagsData provides additional details on the critical event.

The management entity should periodically check the value of dot30amLclErrEventFlagsTime to detect any missed dot30amLclErrEventFlags trap-events. "

```
::= { dot30amTrapsPrefix 5 }
```

```
dot30amLclErrEventOther NOTIFICATION-TYPE
```

```
OBJECTS { ifIndex,  
          dot30amLclErrEventOtherData  
        }
```

```
STATUS current
```

```
DESCRIPTION
```

"A dot30amLclErrEventOther trap is sent when the value of the dot30amLclErrEventOtherTime changes for an Ethernet like interface supporting Ethernet OAM.

This trap can be utilized to indicate to a management system that an organization specific link event has occurred on the specified interface. The value of the dot30amLclErrEventOtherData provides additional details on the organization specific link event.

The management entity should periodically check the value of dot30amLclErrEventOtherTime to detect any missed dot30amLclErrEventOther trap-events. "

```
::= { dot30amTrapsPrefix 6 }
```

```
dot30amRmtErrSymPeriod NOTIFICATION-TYPE
```

```
OBJECTS { ifIndex,  
          dot30amRmtErrSymPeriodData  
        }
```

```
STATUS current
```

```
DESCRIPTION
```

```
"A dot30amRmtErrSymPeriod trap is sent when the value of the  
dot30amRmtErrSymPeriodTime changes for an Ethernet like
```

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interface supporting Ethernet OAM.

This trap can be utilized to indicate to a management system that a Event Notification OAMPDU has been received on the specified interface indicating an Errored Symbol Period Event on the OAM peer entity.

The management entity should periodically check the value of dot30amRmtErrSymPeriodTime to detect any missed dot30amRmtErrSymPeriod trap-events. "

```
::= { dot30amTrapsPrefix 7 }
```

```
dot30amRmtErrFramePeriod NOTIFICATION-TYPE
```

```
OBJECTS { ifIndex,  
          dot30amRmtErrFramePeriodData  
        }
```

```
STATUS current
```

```
DESCRIPTION
```

```
"A dot30amRmtErrFramePeriod trap is sent when the value of the  
dot30amRmtErrFramePeriodTime changes for an Ethernet like  
interface supporting Ethernet OAM.
```

This trap can be utilized to indicate to a management system that a Event Notification OAMPDU has been received on the specified interface indicating an Errored Frame Period Event on the OAM peer entity.

The management entity should periodically check the value of dot30amRmtErrFramePeriodTime to detect any missed dot30amRmtErrFramePeriod trap-events. "

```
::= { dot30amTrapsPrefix 8 }
```

dot30amRmtErrFrame NOTIFICATION-TYPE

```
OBJECTS { ifIndex,  
          dot30amRmtErrFrameData  
        }
```

STATUS current

DESCRIPTION

"A dot30amRmtErrFrame trap is sent when the value of the dot30amRmtErrFrameTime changes for an Ethernet like interface supporting Ethernet OAM.

This trap can be utilized to indicate to a management system that a Event Notification OAMPDU has been received on the specified interface indicating an Errored Frame Event on the OAM peer entity.

The management entity should periodically check the value of dot30amRmtErrFrameTime to detect any missed dot30amErrFrame

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```
trap-events. "  
 ::= { dot30amTrapsPrefix 9 }
```

dot30amRmtErrFrameSecsSum NOTIFICATION-TYPE

```
OBJECTS { ifIndex,  
          dot30amRmtErrFrameSecsSumData  
        }
```

STATUS current

DESCRIPTION

"A dot30amRmtErrFrameSecsSum trap is sent when the value of the dot30amRmtErrFrameSecsSumTime changes for an Ethernet like interface supporting Ethernet OAM.

This trap can be utilized to indicate to a management system that a Event Notification OAMPDU has been received on the specified interface indicating an Errored Frame Seconds Summary Event on the OAM peer entity.

The management entity should periodically check the value of dot30amRmtErrFrameSecsSumTime to detect any missed dot30amErrFrameSecsSum trap-events. "

```
 ::= { dot30amTrapsPrefix 10 }
```

dot30amRmtErrEventFlags NOTIFICATION-TYPE

```
OBJECTS { ifIndex,  
          dot30amRmtErrEventFlagsData  
        }
```

```
STATUS current
```

DESCRIPTION

"A dot30amRmtErrEventFlags trap is sent when the value of the dot30amRmtErrEventFlagsTime changes for an Ethernet like interface supporting Ethernet OAM.

This trap can be utilized to indicate to a management system that a Event Notification OAMPDU has been received on the specified interface indicating a change in the critical event flags carried in the Flags field of the OAMPDU.

The management entity should periodically check the value of dot30amRmtErrEventFlagsTime to detect any missed dot30amRmtErrEventFlags trap-events. "

```
::= { dot30amTrapsPrefix 11 }
```

dot30amRmtErrEventOther NOTIFICATION-TYPE

```
OBJECTS { ifIndex,  
          dot30amRmtErrEventOtherData  
        }
```

```
STATUS current
```

DESCRIPTION

"A dot30amRmtErrEventOther trap is sent when the value of the dot30amRmtErrEventOtherTime changes for an Ethernet like interface supporting Ethernet OAM.

This trap can be utilized to indicate to a management system that an organization specific link event has been received on the specified interface indicating an Organization Specific Link Event has occurred on the OAM Peer entity.

The management entity should periodically check the value of dot30amRmtErrEventOtherTime to detect any missed dot30amRmtErrEventOther trap-events. "

```
::= { dot30amTrapsPrefix 12 }
```

```

--
-- 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 dot30amEventFlagsGroup

DESCRIPTION

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

GROUP dot30amEventOtherGroup

DESCRIPTION

"This group is mandatory for all IEEE 802.3 OAM implementations that support Organization Specific Event signaling. "

GROUP dot30amNotificationGroup

DESCRIPTION

"This group is mandatory for all IEEE 802.3 OAM implementations that support criticle event 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
    }
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     { dot30amInformationTx,
              dot30amInformationRx,
              dot30amUniqueEventNotificationTx,
              dot30amUniqueEventNotificationRx,
              dot30amDuplicateEventNotificationTx,
              dot30amDuplicateEventNotificationRx,
              dot30amLoopbackControlTx,
              dot30amLoopbackControlRx,
              dot30amVariableRequestTx,
              dot30amVariableRequestRx,
              dot30amVariableResponseTx,
              dot30amVariableResponseRx,
              dot30amOrgSpecificTx,
              dot30amOrgSpecificRx,
              dot30amUnsupportedCodesTx,
              dot30amUnsupportedCodesRx,
              dot30amFramesLostDueToOam
            }
STATUS      current
DESCRIPTION
    "A collection of objects providing the statistics for the
    number of various transmit and receive events for OAM on an
    Ethernet like interface.  Note that all of these counters must
    be supported even if the related function (as described in
    dot30amFunctionsSupported) is not supported.  "
 ::= { dot30amGroups 3 }

dot30amLoopbackGroup OBJECT-GROUP
OBJECTS     { dot30amLoopbackCommand,
              dot30amLoopbackStatus,
              dot30amLoopbackIgnoreRx
            }

```

```
STATUS      current
DESCRIPTION
  "A collection of objects for controlling the OAM remote
  loopback function.  "
 ::= { dot30amGroups 4 }

dot30amErrSymbolPeriodEventGroup OBJECT-GROUP
  OBJECTS      { dot30amErrSymPeriodWindow,
                  dot30amErrSymPeriodThreshold,
                  dot30amErrSymPeriodEvNotifEnable,
                  dot30amLclErrSymPeriodTime,
                  dot30amLclErrSymPeriodData,
                  dot30amRmtErrSymPeriodTime,
                  dot30amRmtErrSymPeriodData
                }
STATUS      current
DESCRIPTION
  "A collection of objects for configuring the thresholds for an
  Errored Symbol Period Event and maintaining the event
  information.  "
 ::= { dot30amGroups 5 }

dot30amErrFramePeriodEventGroup OBJECT-GROUP
  OBJECTS      { dot30amErrFramePeriodWindow,
                  dot30amErrFramePeriodThreshold,
                  dot30amErrFramePeriodEvNotifEnable,
                  dot30amLclErrFramePeriodTime,
                  dot30amLclErrFramePeriodData,
                  dot30amRmtErrFramePeriodTime,
                  dot30amRmtErrFramePeriodData
                }
STATUS      current
DESCRIPTION
  "A collection of objects for configuring the thresholds for an
  Errored Frame Period Event and maintaining the event
  information.  "
 ::= { dot30amGroups 6 }

dot30amErrFrameEventGroup OBJECT-GROUP
  OBJECTS      { dot30amErrFrameWindow,
                  dot30amErrFrameThreshold,
                  dot30amErrFrameEvNotifEnable,
                  dot30amLclErrFrameTime,
                  dot30amLclErrFrameData,
                  dot30amRmtErrFrameTime,
                  dot30amRmtErrFrameData
                }
}
```

STATUS current
DESCRIPTION

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"A collection of objects for configuring the thresholds for an
Errored Frame Event and maintaining the event information. "
 ::= { dot30amGroups 7 }

dot30amErrFrameSecsSummaryEventGroup OBJECT-GROUP

OBJECTS { dot30amErrFrameSecsSummaryWindow,
dot30amErrFrameSecsSummaryThreshold,
dot30amErrFrameSecsEvNotifEnable,
dot30amLclErrFrameSecsSumTime,
dot30amLclErrFrameSecsSumData,
dot30amRmtErrFrameSecsSumTime,
dot30amRmtErrFrameSecsSumData
}

STATUS current

DESCRIPTION

"A collection of objects for configuring the thresholds for an
Errored Frame Seconds Summary Event and maintaining the event
information. "
 ::= { dot30amGroups 8 }

dot30amEventFlagsGroup OBJECT-GROUP

OBJECTS { dot30amLclErrEventFlagsTime,
dot30amLclErrEventFlagsData,
dot30amRmtErrEventFlagsTime,
dot30amRmtErrEventFlagsData
}

STATUS current

DESCRIPTION

"A collection of objects for displaying the status of the event
flags (link fault, critical, dying gasp) in transmitted and
received OAMPDUs, reflecting the current status of critical
event information. "
 ::= { dot30amGroups 9 }

dot30amEventOtherGroup OBJECT-GROUP

OBJECTS { dot30amLclErrEventOtherTime,
dot30amLclErrEventOtherData,
dot30amRmtErrEventOtherTime,
dot30amRmtErrEventOtherData
}

```
STATUS      current
DESCRIPTION
  "A collection of objects for displaying the status of any
  Organization Specific Events that have occurred on the
  Ethernet-like interface.  "
 ::= { dot30amGroups 10 }
```

```
dot30amNotificationGroup NOTIFICATION-GROUP
  NOTIFICATIONS {
```

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```
    dot30amLclErrSymPeriod,
    dot30amLclErrFramePeriod,
    dot30amLclErrFrame,
    dot30amLclErrFrameSecsSum,
    dot30amLclErrEventFlags,
    dot30amLclErrEventOther,
    dot30amRmtErrSymPeriod,
    dot30amRmtErrFramePeriod,
    dot30amRmtErrFrame,
    dot30amRmtErrFrameSecsSum,
    dot30amRmtErrEventFlags,
    dot30amRmtErrEventOther
  }
STATUS      current
DESCRIPTION
  "A collection of notifications used by Ethernet OAM to signal
  to a management entity that local or remote events have occurred
  on a specified Ethernet link."
 ::= { dot30amGroups 11 }

END
```

7. 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. By default, OAM is disabled on Ethernet-like interfaces and is therefore not a risk.

IEEE 802.3ah 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. Therefore an attribute (dot30amLoopbackIgnoreRx) was introduced to control whether the local station processes or ignores received loopback commands.

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

[8. References](#)

[8.1 Normative References](#)

[802.3ah] Institute of Electrical and Electronic Engineers, IEEE Draft 802.3ah-2002 Draft 3.3, "IEEE Standard for Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications - Draft amendment to [IEEE 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](#) [IEEE Media Access Control Parameters, Physical Layers and Management Parameters](#)", May 2004.

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[802.3-2002] Institute of Electrical and Electronic Engineers, IEEE Std 802.3-2003, "IEEE Standard for Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications - Draft amendment to [IEEE 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](#) [IEEE Media Access Control Parameters, Physical Layers and Management Parameters](#)", March 2002.

[802-2001] Institute of Electrical and Electronic Engineers, IEEE Std 802-2001, "Standard for Local and Metropolitan Area Networks: Architecture and Overview", March 2002.

[RFC2026] Bradner, S, "The Internet Standards Process -- Revision 3", [BCP 9](#), [RFC 2026](#), October 1996.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997

[RFC2578] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., McCloghrie, K., Rose, M. and S. Waldbusser, "Structure of Management Information Version 2 (SMIv2)", STD 58, [RFC 2578](#), April 1999.

[RFC2579] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., McCloghrie, K., Rose, M. and S. Waldbusser, "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.

[RFC3668] Bradner, S. "Intellectual Property Rights in IETF Technology", [BCP 79](#), [RFC 3668](#), February 2004.

[8.2](#) Informative References

[802.3ah-copper] Beili, Ed, "Managed Objects for Ethernet Passive Optical Networks", [draft-ietf-hubmib-efm-epon-mib-01.txt](#), April 2004.

[802.3ah-epon] Khermosh, Lior, "Ethernet in the First Mile Copper (EFMCu) Interfaces MIB", [draft-ietf-hubmib-efm-cu-mib-00.txt](#), January 2004.

[RFC2665] Flick, J. and Johnson J. "Definitions of Managed Objects for the Ethernet-like Interface Types", STD 58, [RFC 2580](#), April 1999.

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[RFC2863] McCloghrie, K., Kastenholz, F., "The Interfaces Group MIB", [RFC 2863](#), June 2000.

[RFC3410] Case, J., Mundy, R., Partain, D., Stewart, B., "Introduction and Applicability Statements for Internet Standard Management Framework", [RFC 3410](#), December 2003.

[RFC3635] Flick, J., "Definitions of Managed Objects for the Ethernet-like Interface Types", [RFC 3635](#), September 2003.

[RFC3636] Flick, J., "Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs)", [RFC 3636](#), September 2003.

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10. Author's Address

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