

IEEE P802.3.2™/D3.0

Draft Standard for Ethernet YANG Data Model Definition

Prepared by the
LAN/MAN Standards Committee
of the
IEEE Computer Society

This draft is a revision of IEEE Std 802.3.2-2019. Draft D3.0 is prepared for initial Standards Association ballot. This draft expires 6 months after the date of publication or when the next version is published, whichever comes first.

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Abstract: YANG models for IEEE Std 802.3 are defined in this standard. This standard also publishes these models in a machine-readable format.

Keywords: 802.3, 802.3.2, Ethernet, YANG

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Introduction

This introduction is not part of IEEE Std 802.3.2-202x, IEEE Draft Standard for Ethernet YANG Data Model Definitions.

The YANG modules included in this standard provide YANG versions of attributes defined in IEEE Std 802.3™-2022, Clause 30, as well as derivative attributes defined in other management information bases (e.g., SNMP attributes included in IEEE Std 802.3.1, YANG versions of IETF Etherlike MIB attributes, etc.). The YANG modules defined in this standard accommodate IEEE Std 802.3-2022, excluding any currently published or future amendments.

IEEE Std 802.3 will continue to evolve. New Ethernet capabilities are anticipated to be added within the next few years as amendments to this standard.

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IEEE Standard for Ethernet YANG Data Model Definitions

1. Overview

This standard defines YANG modules for various Ethernet functions specified in IEEE Std 802.3.

1.1 Scope

This standard defines YANG data models for IEEE Std 802.3 Ethernet.

1.2 Purpose

The purpose of the standard is to define YANG modules for IEEE Std 802.3 and publish these modules in a machine-readable format.

1.3 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (*shall* equals *is required to*).^{a,b}

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (*should* equals *is recommended that*).

The word *may* is used to indicate a course of action permissible within the limits of the standard (*may* equals *is permitted to*).

The word *can* is used for statements of possibility and capability, whether material, physical, or causal (*can* equals *is able to*).

^aThe use of the word *must* is deprecated and cannot be used when stating mandatory requirements, *must* is used only to describe unavoidable situations.

^bThe use of *will* is deprecated and cannot be used when stating mandatory requirements, *will* is only used in statements of fact.

1.4 Machine-readable YANG modules

Editor's Note (to be removed prior to publication):

Yang files contained in <https://github.com/YangModels/yang/tree/main/standard/ieee/published/802.3> are IEEE 802.3.1-2019 version and will be updated at the publication time.

The machine-readable files are available for download at the following URL: <https://github.com/YangModels/yang/tree/master/standard/ieee/published/802.3> as text files with a .yang extension, e.g., *ieee802-ether-net-interface.yang*. The use of specialized tools to view YANG modules may be useful to create tree, UML image, and HTML outputs from the YANG modules.

Like other languages, YANG (see IETF RFC 7950) has an accepted style for machine-readable files, which was followed during the development of this standard. This formatting may not be preserved when importing the machine-readable YANG modules into the PDF. In case of any formatting discrepancies, the published machine-readable files should be consulted.

1.5 Summary of YANG-based management framework

The structure of YANG-based management framework closely resembles the structure of the Internet-Standard Management Framework, described in detail in section 7 of IETF RFC 3410.

Managed objects defined using YANG modeling language are hosted on the managed device and accessed through NETCONF (see IETF RFC 7803) or RESTCONF (see IETF RFC 8040). This standard specifies YANG modules that are compliant to YANG 1.1 (see IETF RFC 7950).

1.6 Security considerations

The YANG modules defined in this standard are designed to be accessed via network management protocols, including NETCONF (see IETF RFC 7803) or RESTCONF (see IETF RFC 8040). The lowest NETCONF layer is the secure transport layer, and the mandatory-to-implement secure transport is Secure Shell (SSH) (see IETF RFC 6242) or TLS (see IETF RFC 8446). The lowest RESTCONF layer is HTTPS, and the mandatory-to-implement secure transport is TLS (see IETF RFC 8446).

The NETCONF access control model (see IETF RFC 8341) provides the means to restrict access for particular NETCONF or RESTCONF users to a pre-configured subset of all available NETCONF or RESTCONF protocol operations and content.

There are a number of data nodes defined in these YANG modules that are writable/creatable/deletable, i.e., have the config property set to true, which is the default setting. These data nodes can be considered sensitive or vulnerable in some network environments. Write operations (e.g., edit-config) to these data nodes without proper protection can have a negative effect on network operations.

Some of the readable data nodes in these YANG modules can be considered sensitive or vulnerable in some network environments. It is thus important to control read access (e.g., via get, get-config, or notification) to these data nodes.

Some of the RPC operations in these YANG modules can be considered sensitive or vulnerable in some network environments. Therefore, it is important to control access to these operations.

1.7 YANG module syntax validation

1 All YANG modules included in this standard are YANG 1.1 (see IETF RFC 7950) compliant and pass auto-
2 mated checks using tools available at the time of publication.
3

4 The following open source and/or free versions of YANG validation tools may be used: Pyang (see <https://github.com/mbj4668/pyang>), ConfD (see <http://www.tail-f.com/confd-basic>), as well as other YANG model
5 validation tools listed at <http://www.yangvalidator.com>.
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2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

IEEE Std 802®-2014, IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture.^{c, d}

IEEE Std 802d™-2017, IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture Amendment 1: Allocation of Uniform Resource Name (URN) Values in IEEE 802 Standards.

IEEE Std 802.1Q™-2014, IEEE Standard for Local and metropolitan area networks—Bridges and Bridged Networks.

IEEE Std 802.3™-2022, IEEE Standard for Ethernet.

Editor's Note (to be removed prior to publication):

IEEE Std 802.3.1 to be updated to correct date once project is complete

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^dIEEE publications are available from the Institute of Electrical and Electronics Engineers (<http://standards.ieee.org/>).

^eInternet Requests for Comments (RFCs) are available on the World Wide Web at the following ftp site: venera.isi.edu; logon: anonymous; password: user's e-mail address; directory: in-inotes.

IETF RFC 8341, *Network Configuration Access Control Model*, A. Bierman and M. Bjorklund, March 2018.

IETF RFC 8343, *A YANG Data Model for Interface Management*, Bjorklund, M., March 2018.

IETF RFC 8407, *Guidelines for Authors and Reviewers of YANG Data Model Documents*, Bierman A., October 2018.

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3. Definitions

For the purposes of this document, the following terms and definitions apply. Some terms used in this document are defined in IEEE Std 802.3, and where alternative definitions occur in the IEEE Standards Dictionary, the IEEE Std 802.3 definition should be used. The *IEEE Standards Dictionary Online* should be consulted for terms not defined in this clause.^f

3.1 data model: A data model describes how data is represented and accessed.

3.2 YANG module: A YANG module defines a hierarchy of nodes that can be used for NETCONF-based (see IETF RFC 7803) and RESTCONF-based (see IETF RFC 8040) operations. With its definitions and the definitions it imports or includes from elsewhere, a module is self-contained and can be compiled.

^f*IEEE Standards Dictionary Online* is available at: <http://dictionary.ieee.org/>.

1 **4. Abbreviations**

2
3 This standard contains the following abbreviations:

4

5		
6	CO	Central Office
7	CPE	Customer Premise Equipment
8		
9	CSMA/CD	carrier sense multiple access with collision detection
10	DTE	data terminal equipment
11	EPON	Ethernet passive optical networks
12		
13	IEEE	Institute of Electrical and Electronics Engineers
14	IETF	Internet Engineering Task Force
15		
16	LLID	Link Local Identifier
17	MPCP	Multi-Point Control Protocol
18		
19	NETCONF	Network Configuration Protocol
20	OAM	Operations, Administration, and Maintenance
21	ONU	Optical Network Unit
22		
23	OLT	Optical Line terminal
24	PoE	Power over Ethernet
25	PoDL	Power over Data Line
26		
27	RESTCONF	RESTful Configuration Protocol
28	TDM	Time Division Multiplexing
29		
30	TDMA	Time Division Multiple Access
31	WDM	Wavelength Division Multiplexing
32		
33	YANG	Yet Another Next Generation
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5. Ethernet YANG Module

5.1 YANG module structure

Four modules defined in this clause are focused on the configuration and monitoring of IEEE Std 802.3 Ethernet interfaces.

ieee802-ethernet-interface YANG module contains definitions of current attributes used widely in the industry in current products,

ieee802-ethernet-interface-half-duplex YANG module contains definitions of half-duplex attributes.

ieee802-ethernet-lldp YANG module contains definitions for configuring LLDP for IEEE Std 802.3 compliant interfaces.

ieee802-ethernet-mac-merge modules contain definition for configuration of MAC Merge for IEEE Std 802.1Qcw frame preemption.

This standard does not have a normative requirement for data nodes of the base ietf-interfaces YANG module, but the following data nodes are supported: name, description, type, enabled, admin-status, oper-status, if-index, and phys-address.

5.2 Mapping of IEEE Std 802.3, Clause 30 managed objects

This subclause contains the mapping between YANG data nodes included in *ieee802-ethernet-interface* (see Table 5–1), *ieee802-ethernet-interface-half-duplex* (see Table 5–4), *ieee802-ethernet-mac-merge* (see Table 5–5), and *ieee802-ethernet-lldp* (see Table 5–6) YANG modules, managed objects, and attributes defined in IEEE Std 802.3, Clause 30.

Table 5–1—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-ethernet-interface* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-interface</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
oAutoNegotiation	acAutoNegAdminControl	30.6.1.2.2	interfaces/interface/ethernet/	auto-negotiation/enable	R/W
	aAutoNegAutoConfig	30.6.1.1.4		negotiation-status	R
N/A	N/A			flow-control/pause/direction	R/W
oMACControlFunctionEntity	aPAUSEMACCtrlFramesReceived	30.3.4.3		flow-control/pause/statistics/in-frames-pause	R
	aPAUSEMACCtrlFramesTransmitted	30.3.4.2		flow-control/pause/statistics/out-frames-pause	R
N/A	dot3HCOOutPFCFrames				
N/A	N/A			flow-control/force-flow-control	R/W
N/A	N/A			speed	R/W
oMACEntity	aDuplexStatus	30.3.1.1.32		duplex	R/W
	aMaxFrameLength	30.3.1.1.37		max-frame-length	R
	aSlowProtocolFrameLimit	30.3.1.1.38		frame-limit-slow-protocol	R
oEXTENSION	aEXTENSIONMACCtrlStatus	30.3.8.3		mac-control-extension-control	R
N/A	N/A			capabilities/auto-negotiation	R

Table 5–1—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-ethernet-interface* YANG data nodes (continued)

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-interface</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
oMACEntity	aFramesReceivedOK	30.3.1.1.5	interfaces/interface/ethernet/statistics/frame	in-frames	R
	aMulticastFramesReceivedOK	30.3.1.1.21		in-multicast-frames	R
	aBroadcastFramesReceivedOK	30.3.1.1.22		in-broadcast-frames	R
	aFrameCheckSequenceErrors + aAlignmentErrors	30.4.3.1.6, 30.4.3.1.7		in-error-fcs-frames	R
oMACEntity	aFrameTooLongErrors	30.3.1.1.25		in-error-oversize-frames	R
	aFramesLostDueToIntMACRcvError	30.3.1.1.15		in-error-mac-internal-frames	R
	aFramesTransmittedOK	30.3.1.1.2		out-frames	R
	aMulticastFramesXmittedOK	30.3.1.1.18		out-multicast-frames	R
	aBroadcastFramesXmittedOK	30.3.1.1.19		out-broadcast-frames	R
	aFramesLostDueToIntMACXmitError	30.3.1.1.12		out-error-mac-internal-frames	R
oPHYEntity	aSymbolErrorDuringCarrier	30.3.2.1.5	interfaces/interface/ethernet/statistics/phy	in-error-symbol	R
	aReceiveLPITransitions	30.3.2.1.11	interfaces/interface/ethernet/statistics/phy/lpi	in-lpi-transitions	R
	aReceiveLPIMicroseconds	30.3.2.1.9		in-lpi-time	R
	aTransmitLPITransitions	30.3.2.1.10		out-lpi-transitions	R
	aTransmitLPIMicroseconds	30.3.2.1.8		out-lpi-time	R

Table 5–1—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-ethernet-interface* YANG data nodes (continued)

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-interface</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
oMACControlEntity	aUnsupportedOpcodesReceived	30.3.3.5	interfaces/interface/ethernet/statistics/mac-control	in-frames-mac-control-unknown	R
oEXTENSION	aEXTENSIONMACCtrlFramesReceived	30.3.8.2		in-frames-mac-control-extension	R
	aEXTENSIONMACCtrlFramesTransmitted	30.3.8.1		out-frames-mac-control-extension	R

Table 5–2—Mapping between IETF RFC 2819 managed objects and *ieee802-ethernet-interface* YANG data nodes

IETF RFC 2819 Attribute(s)	Corresponding <i>ieee802-ethernet-interface</i> YANG data nodes		
	Container(s)	Data node(s)	R/W
no direct object ^a	interfaces/interface/ethernet/statistics/frame	in-total-frames	R
etherStatsOctets		in-total-octets	R
etherStatsUndersizePkts + etherStatsFragments		in-error-undersize-frames	R

^a Can be calculated as: aFramesReceivedOK + aFrameCheckSequenceErrors + aAlignmentErrors + aFrameTooLongErrors + aFramesLostDueToIntMACRcvError.

Table 5–3—Mapping between IETF RFC 3635 managed objects and *ieee802-ethernet-interface* YANG data nodes

ETHERLIKE MIB Attribute(s)	Corresponding <i>ieee802-ethernet-interface</i> YANG data nodes		
	Container(s)	Data node(s)	R/W
dot3HCInPFCFrames	interfaces/interface/ethernet/	flow-control/pfc{ethernet-pfc} / statistics/in-frames-pfc	R
dot3HCOutPFCFrames		flow-control/pfc{ethernet-pfc} / statistics/out-frames-pfc	R

Table 5–4—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-ethernet-interface-half-duplex* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-interface-half-duplex</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
oMACEntity	aRateControlAbility	30.3.1.1.33	interfaces/interface/ethernet	dynamic-rate-control	R/W
			interfaces/interface/ethernet/capability	dynamic-rate-control-supported	R
oPHYEntity	aSQETestErrors	30.3.2.1.4	interfaces/interface/ethernet/statistics/frame/csmacd{csma-cd}	in-errors-sqe-test	R
oMACEntity	aSingleCollisionFrames	30.3.1.1.3		out-frames-collision-single	R
	aMultipleCollisionFrames	30.3.1.1.4		out-frames-collision-multiple	R
	aFramesWithDeferredXmissions	30.3.1.1.9		out-frames-deferred	R
	aFramesAbortedDueToXSColls	30.3.1.1.11		out-frames-collisions-excessive	R
	aLateCollisions	30.3.1.1.10		out-collisions-late	R
	aCarrierSenseErrors	30.3.1.1.13		out-errors-carrier-sense	R
	aCollisionFrames	30.3.1.1.30		collision-histogram/collision-count	R
collision-histogram/collision-count-frames				R	

Table 5–5—Mapping between IEEE Std 802.3, 30.14 managed objects and *ieee802-ethernet-mac-merge* YANG data nodes

IEEE Std 802.3, 30.14		Reference	Corresponding <i>ieee802-ethernet-mac-merge</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
oMacMergeEntity	aMACMergeSupport	30.14.1.1	Interfaces/interface/ethernet/mac-merge/admin-status	merge-support	R
	aMACMergeStatusVerify	30.14.1.2		verify-status	R
	aMACMergeStatusTx	30.14.1.5		status-tx	R
	aMACMergeEnableTx	30.14.1.3	Interfaces/interface/ethernet/mac-merge/admin-control	merge-enable-tx	R/W
	aMACMergeVerifyDisableTx	30.14.1.4		verify-disable-tx	R/W
	aMACMergeVerifyTime	30.14.1.6		verify-time	R/W
	aMACMergeAddFragSize	30.14.1.7		frag-size	R/W
	aMACMergeFrameAssErrorCount	30.14.1.8	Interfaces/interface/ethernet/mac-merge/statistics	assembly-error-count	R
	aMACMergeFrameSmdErrorCount	30.14.1.9		smd-error-count	R
	aMACMergeFrameAssOkCount	30.14.1.10		assembly-ok-count	R
	aMACMergeFragCountRx	30.14.1.11		fragment-count-rx	R
	aMACMergeFragCountTx	30.14.1.12		fragment-count-tx	R
	aMACMergeHoldCount	30.14.1.13		hold-count	R

Table 5–6—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-lldp* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-llDP</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
oLldpXdot3Config	aLldpXdot3PortConfigTLVsTxEnable	30.12.1.1.1	lldp/port	tlvs-port-config-enable	R/W
oLldpXdot3LocSystemsGroup	aLldpXdot3LocPortAutoNegSupported	30.12.2.1.1		auto-negotiation-supported	R
	aLldpXdot3LocPortAutoNegEnabled	30.12.2.1.2		auto-negotiation-enabled	R
	aLldpXdot3LocPortAutoNegAdvertisedCap	30.12.2.1.3		auto-negotiation-cap	R
	aLldpXdot3LocPortOperMauType	30.12.2.1.4		operational-mau-type	R
	aLldpXdot3LocPowerPortClass	30.12.2.1.5		power-port-class	R
	aLldpXdot3LocPowerMDISupported	30.12.2.1.6		mdi-power-supported	R
	aLldpXdot3LocPowerMDIEnabled	30.12.2.1.7		mdi-power-enabled	R
	aLldpXdot3LocPowerPairControllable	30.12.2.1.8		power-pair-controlable	R

Table 5–6—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-lldp* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-llDP</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
	aLldpXdot3LocPowerPairs	30.12.2.1.9		power-pairs	R
	aLldpXdot3LocPowerClass	30.12.2.1.10		local-power-class	R
	aLldpXdot3LocLinkAggStatus	30.12.2.1.11		link-aggregation-status	R
	aLldpXdot3LocLinkAggPortId	30.12.2.1.12		aggregation-port-id	R
	aLldpXdot3LocMaxFrameSize	30.12.2.1.13		local-max-frame-size	R
	aLldpXdot3LocPowerType	30.12.2.1.14		power-type	R
	aLldpXdot3LocPowerSource	30.12.2.1.15		power-source	R
	aLldpXdot3LocPowerPriority	30.12.2.1.16		local-power-priority	R/W
	aLldpXdot3LocPDRequestedPowerValue	30.12.2.1.17		pd-requested-power-value	R
	aLldpXdot3LocPDRequestedPowerValueA	30.12.2.1.18		pd-requested-power-value-a	R
	aLldpXdot3LocPDRequestedPowerValueB	30.12.2.1.19		pd-requested-power-value-b	R
	aLldpXdot3LocPSEAllocatedPowerValue	30.12.2.1.20		pse-allocated-power-value	R
	aLldpXdot3LocPSEAllocatedPowerValueA	30.12.2.1.21		pse-allocated-power-value-a	R
	aLldpXdot3LocPSEAllocatedPowerValueB	30.12.2.1.22		pse-allocated-power-value-b	R

Table 5–6—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-lldp* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-lldp</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
	aLldpXdot3LocPSEPoweringStatus	30.12.2.1.23		pse-powering-status	R
	aLldpXdot3LocPDPoweredStatus	30.12.2.1.24		pd-powered-status	R
	aLldpXdot3LocPowerPairsExt	30.12.2.1.25		power-pairs-ext	R
	aLldpXdot3LocPowerClassExtA	30.12.2.1.26		power-class-ext-A	R
	aLldpXdot3LocPowerClassExtB	30.12.2.1.27		power-class-ext-B	R
	aLldpXdot3LocPowerClassExt	30.12.2.1.28		power-class-ext	R
	aLldpXdot3LocPowerTypeExt	30.12.2.1.29		power-type-ext	R
	aLldpXdot3LocPDLload	30.12.2.1.30		pd-load	R
	aLldpXdot3LocPD4PID	30.12.2.1.31		pd-4pid	R
	aLldpXdot3LocPSEMaxAvailPower	30.12.2.1.32		pse-max-avail-power	R
	aLldpXdot3LocPSEAutoclassSupport	30.12.2.1.33		pse-autoclass-support	R
	aLldpXdot3LocAutoclassCompleted	30.12.2.1.34		autoclass-completed	R
	aLldpXdot3LocAutoclassRequest	30.12.2.1.35		autoclass-request	R
	aLldpXdot3LocPowerDownRequest	30.12.2.1.36		power-down-request	R
	aLldpXdot3LocPowerDownTime	30.12.2.1.37		power-down-time	R

Table 5–6—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-lldp* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-llDP</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
	aLldpXdot3LocMeasVoltageSupport	30.12.2.1.38		meas-voltage-support	R
	aLldpXdot3LocMeasCurrentSupport	30.12.2.1.39		meas-current-support	R
	aLldpXdot3LocMeasPowerSupport	30.12.2.1.40		meas-power-support	R
	aLldpXdot3LocMeasEnergySupport	30.12.2.1.41		meas-energy-support	R
	aLldpXdot3LocMeasurementSource	30.12.2.1.42		measurement-source	R
	aLldpXdot3LocMeasVoltageRequest	30.12.2.1.43		meas-voltage-request	R
	aLldpXdot3LocMeasCurrentRequest	30.12.2.1.44		meas-current-request	R
	aLldpXdot3LocMeasCurrentRequest	30.12.2.1.45		meas-power-request	R
	aLldpXdot3LocMeasEnergyRequest	30.12.2.1.46		meas-energy-request	R
	aLldpXdot3LocMeasVoltageValid	30.12.2.1.47		meas-voltage-valid	R
	aLldpXdot3LocMeasCurrentValid	30.12.2.1.48		meas-current-valid	R
	aLldpXdot3LocMeasPowerValid	30.12.2.1.49		meas-power-valid	R
	aLldpXdot3LocMeasEnergyValid	30.12.2.1.50		meas-energy-valid	R

Table 5–6—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-lldp* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-llDP</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
	aLldpXdot3LocMeasVoltageUncertainty	30.12.2.1.51		meas-voltage-uncertainty	R
	aLldpXdot3LocMeasCurrentUncertainty	30.12.2.1.52		meas-current-uncertainty	R
	aLldpXdot3LocMeasPowerUncertainty	30.12.2.1.53		meas-power-uncertainty	R
	aLldpXdot3LocMeasEnergyUncertainty	30.12.2.1.54		meas-energy-uncertainty	R
	aLldpXdot3LocVoltageMeasurement	30.12.2.1.55		voltage-measurement	R
	aLldpXdot3LocCurrentMeasurement	30.12.2.1.56		current-measurement	R
	aLldpXdot3LocPowerMeasurement	30.12.2.1.57		power-measurement	R
	aLldpXdot3LocEnergyMeasurement	30.12.2.1.58		energy-measurement	R
	aLldpXdot3LocPSEPowerPriceIndex	30.12.2.1.59		pse-power-price-index	R
	aLldpXdot3LocResponseTime	30.12.2.1.60		local-response	R
	aLldpXdot3LocReady	30.12.2.1.61		local-system-ready	R
	aLldpXdot3LocTxTwSys	30.12.2.1.62		tx-system-value	R

Table 5–6—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-lldp* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-llDP</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
	aLldpXdot3LocTxTwSysEcho	30.12.2.1.63		tx-system-value-echo	R
	aLldpXdot3LocRxTwSys	30.12.2.1.64		rx-system-value	R
	aLldpXdot3LocRxTwSysEcho	30.12.2.1.65		rx-system-value-echo	R
	aLldpXdot3LocFbTwSys	30.12.2.1.66		fallback-system-value	R
	aLldpXdot3TxDllReady	30.12.2.1.67		tx-dll-ready	R
	aLldpXdot3RxDllReady	30.12.2.1.68		rx-dll-ready	R
	aLldpXdot3LocDllEnabled	30.12.2.1.69		dll-ready	R
	aLldpXdot3LocTxFw	30.12.2.1.70		tx-system-fw	R
	aLldpXdot3LocTxFwEcho	30.12.2.1.71		tx-system-fw-echo	R
	aLldpXdot3LocRxFw	30.12.2.1.72		rx-system-fw	R
	aLldpXdot3LocRxFwEcho	30.12.2.1.73		rx-system-fw-echo	R
	aLldpXdot3LocPreemptSupported	30.12.2.1.74		preemption-supported	R
	aLldpXdot3LocPreemptEnabled	30.12.2.1.75		preemption-enabled	R
	aLldpXdot3LocPreemptActive	30.12.2.1.76		preemption-active	R
	aLldpXdot3LocAddFragSize	30.12.2.1.77		additional-fragment-size	R

Table 5–6—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-lldp* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-lldp</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
oLldpXdot3RemSystemsGroup	aLldpXdot3RemPortAutoNegSupported	30.12.3.1.1	lldp/port/remote-systems-data	auto-negotiation-supported	R
	aLldpXdot3RemPortAutoNegEnabled	30.12.3.1.2		auto-negotiation-enabled	R
	aLldpXdot3RemPortAutoNegAdvertisedCap	30.12.3.1.3		auto-negotiation-cap	R
	aLldpXdot3RemPortOperMauType	30.12.3.1.4		operational-mau-type	R
	aLldpXdot3RemPowerPortClass	30.12.3.1.5		power-port-class	R
	aLldpXdot3RemPowerMDISupported	30.12.3.1.6		mdi-power-supported	R

Table 5–6—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-lldp* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-llDP</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
	aLldpXdot3RemPowerMDIEnabled	30.12.3.1.7		mdi-power-enabled	R
	aLldpXdot3RemPowerPairControllable	30.12.3.1.8		power-pair-controllable	R
	aLldpXdot3RemPowerPairs	30.12.3.1.9		power-pairs	R
	aLldpXdot3RemPowerClass	30.12.3.1.10		power-class	R
	aLldpXdot3RemLinkAggStatus	30.12.3.1.11		link-aggregation-status	R
	aLldpXdot3RemLinkAggPortId	30.12.3.1.12		aggregation-port-id	R
	aLldpXdot3RemMaxFrameSize	30.12.3.1.13		local-max-frame-size	R
	aLldpXdot3RemPowerType	30.12.3.1.14		power-type	R
	aLldpXdot3RemPowerSource	30.12.3.1.15		power-source	R
	aLldpXdot3RemPowerPriority	30.12.3.1.16		power-priority	RW
	aLldpXdot3RemPDRequestedPowerValue	30.12.3.1.17		pd-requested-power-value	R
	aLldpXdot3RemPDRequestedPowerValueA	30.12.3.1.18		pd-requested-power-value-a	R
	aLldpXdot3RemPDRequestedPowerValueB	30.12.3.1.19		pd-requested-power-value-b	R
	aLldpXdot3RemPSEAllocatedPowerValue	30.12.3.1.20		pse-allocated-power-value	R
	aLldpXdot3RemPSEAllocatedPowerValueA	30.12.3.1.21		pse-allocated-power-value-a	R
	aLldpXdot3RemPSEAllocatedPowerValueB	30.12.3.1.22		pse-allocated-power-value-b	R

Table 5–6—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-lldp* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-lldp</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
	aLldpXdot3RemPSEPoweringStatus	30.12.3.1.23		pse-powering-status	R
	aLldpXdot3RemPDPoweredStatus	30.12.3.1.24		pd-powered-status	R
	aLldpXdot3RemPowerPairsExt	30.12.3.1.25		power-pairs-ext	R
	aLldpXdot3RemPowerClassExtA	30.12.3.1.26		power-class-ext-A	R
	aLldpXdot3RemPowerClassExtB	30.12.3.1.27		power-class-ext-B	R
	aLldpXdot3RemPowerClassExt	30.12.3.1.28		power-class-ext	R
	aLldpXdot3RemPowerTypeExt	30.12.3.1.29		power-type-ext	R
	aLldpXdot3RemPDLload	30.12.3.1.30		pd-load	R
	aLldpXdot3RemPD4PID	30.12.3.1.31		pd-4pid	R
	aLldpXdot3RemPSEMaxAvailPower	30.12.3.1.32		pse-max-avail-power	R
	aLldpXdot3RemPSEAutoclassSupport	30.12.3.1.33		pse-autoclass-support	R
	aLldpXdot3RemAutoclassCompleted	30.12.3.1.34		autoclass-completed	R
	aLldpXdot3RemAutoclassRequest	30.12.3.1.35		autoclass-request	R
	aLldpXdot3RemPowerDownRequest	30.12.3.1.36		power-down-request	R
	aLldpXdot3RemPowerDownTime	30.12.3.1.37		power-down-time	R

Table 5–6—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-lldp* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-llp</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
	aLldpXdot3RemMeasVoltageSupport	30.12.3.1.38		meas-voltage-support	R
	aLldpXdot3RemMeasCurrentSupport	30.12.3.1.39		meas-current-support	R
	aLldpXdot3RemMeasPowerSupport	30.12.3.1.40		meas-power-support	R
	aLldpXdot3RemMeasEnergySupport	30.12.3.1.41		meas-energy-support	R
	aLldpXdot3RemMeasurementSource	30.12.3.1.42		measurement-source	R
	aLldpXdot3RemMeasVoltageRequest	30.12.3.1.43		meas-voltage-request	R
	aLldpXdot3RemMeasCurrentRequest	30.12.3.1.44		meas-current-request	R
	aLldpXdot3RemMeasCurrentRequest	30.12.3.1.45		meas-power-request	R
	aLldpXdot3RemMeasEnergyRequest	30.12.3.1.46		meas-energy-request	R
	aLldpXdot3RemMeasVoltageValid	30.12.3.1.47		meas-voltage-valid	R
	aLldpXdot3RemMeasCurrentValid	30.12.3.1.48		meas-current-valid	R
	aLldpXdot3RemMeasPowerValid	30.12.3.1.49		meas-power-valid	R
	aLldpXdot3RemMeasEnergyValid	30.12.3.1.50		meas-energy-valid	R

Table 5–6—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-lldp* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-llDP</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
	aLldpXdot3RemMeasVoltageUncertainty	30.12.3.1.51		meas-voltage-uncertainty	R
	aLldpXdot3RemMeasCurrentUncertainty	30.12.3.1.52		meas-current-uncertainty	R
	aLldpXdot3RemMeasPowerUncertainty	30.12.3.1.53		meas-power-uncertainty	R
	aLldpXdot3RemMeasEnergyUncertainty	30.12.3.1.54		meas-energy-uncertainty	R
	aLldpXdot3RemVoltageMeasurement	30.12.3.1.55		voltage-measurement	R
	aLldpXdot3RemCurrentMeasurement	30.12.3.1.56		current-measurement	R
	aLldpXdot3RemPowerMeasurement	30.12.3.1.57		power-measurement	R
	aLldpXdot3RemEnergyMeasurement	30.12.3.1.58		energy-measurement	R
	aLldpXdot3RemPSEPowerPriceIndex	30.12.3.1.59		pse-power-price-index	R
	aLldpXdot3RemTxTwSys	30.12.3.1.60		tx-system-value	R
	aLldpXdot3RemTxTwSysEcho	30.12.3.1.61		tx-system-value-echo	R
	aLldpXdot3RemRxTwSys	30.12.3.1.62		rx-system-value	R

Table 5–6—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-lldp* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-llDP</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
	aLldpXdot3RemRxTwSysEcho	30.12.3.1.63		rx-system-value-echo	R
	aLldpXdot3RemFbTwSys	30.12.3.1.64		fallback-system-value	R
	aLldpXdot3RemTxFw	30.12.3.1.65		tx-system-fw	R
	aLldpXdot3RemTxFwEcho	30.12.3.1.66		tx-system-fw-echo	R
	aLldpXdot3RemRxFw	30.12.3.1.67		rx-system-fw	R
	aLldpXdot3RemRxFwEcho	30.12.3.1.68		rx-system-fw-echo	R
	aLldpXdot3RemPreemptSupported	30.12.3.1.69		preemption-supported	R
	aLldpXdot3RemPreemptEnabled	30.12.3.1.70		preemption-enabled	R
	aLldpXdot3RemPreemptActive	30.12.3.1.71		preemption-active	R
	aLldpXdot3RemAddFragSize	30.12.3.1.72		additonal-fragment-size	R

5.3 YANG module definition⁹

The YANG module tree hierarchy uses terms defined in IETF RFC 8407.

5.3.1 Tree hierarchy

5.3.1.1 ieee802-ethernet-interface

```

module: ieee802-ethernet-interface
  augment /if:interfaces/if:interface:
    +--rw ethernet
      +--rw auto-negotiation!
        | +--rw enable?          boolean
        | +--ro negotiation-status? enumeration
      +--rw duplex?              duplex-type
      +--rw speed?               eth-if-speed-type
      +--rw flow-control
        | +--rw pause {ethernet-pause}?
        | | +--rw direction?    pause-fc-direction-type
        | | +--ro statistics
        | |   +--ro in-frames-pause? yang:counter64
        | |   +--ro out-frames-pause? yang:counter64
        | +--rw pfc {ethernet-pfc}?
        | | +--rw enable?        boolean
        | | +--ro statistics
        | |   x--ro in-frames-pfc? yang:counter64
        | |   x--ro out-frames-pfc? yang:counter64
        | +--rw force-flow-control? boolean
      +--ro max-frame-length?      uint16
      +--ro mac-control-extension-control? boolean
      +--ro frame-limit-slow-protocol? uint64
      +--ro capabilities
        | +--ro auto-negotiation? boolean
      +--ro statistics
        +--ro frame

```

⁹Copyright release for YANG modules: Users of this standard may freely reproduce the YANG module contained in this subclause so that it can be used for its intended purpose.

```

1      |  +--ro in-total-frames?          yang:counter64
2      |  +--ro in-total-octets?       yang:counter64
3      |  +--ro in-frames?             yang:counter64
4      |  +--ro in-multicast-frames?   yang:counter64
5      |  +--ro in-broadcast-frames?   yang:counter64
6      |  +--ro in-error-fcs-frames?   yang:counter64
7      |  +--ro in-error-undersize-frames? yang:counter64
8      |  +--ro in-error-oversize-frames? yang:counter64
9      |  +--ro in-error-mac-internal-frames? yang:counter64
10     |  +--ro out-frames?            yang:counter64
11     |  +--ro out-multicast-frames?   yang:counter64
12     |  +--ro out-broadcast-frames?   yang:counter64
13     |  +--ro out-error-mac-internal-frames? yang:counter64
14     |  +--ro out-error-mac-internal-frames? yang:counter64
15     +--ro phy
16     |  +--ro in-error-symbol?        yang:counter64
17     |  +--ro lpi
18     |  |  +--ro in-lpi-transitions?   yang:counter64
19     |  |  +--ro in-lpi-time?          decimal64
20     |  |  +--ro out-lpi-transitions?   yang:counter64
21     |  |  +--ro out-lpi-time?          decimal64
22     |  +--ro out-lpi-time?          decimal64
23     +--ro mac-control
24     |  +--ro in-frames-mac-control-unknown? yang:counter64
25     |  +--ro in-frames-mac-control-extension? yang:counter64
26     |  +--ro out-frames-mac-control-extension? yang:counter64
27
28
29

```

5.3.1.2 ieee802-ethernet-interface-half-duplex

```

30 module: ieee802-ethernet-interface-half-duplex
31
32 augment /if:interfaces/if:interface/ieee802-eth-if:ethernet:
33
34     +--rw dynamic-rate-control?    dynamic-rate-control-type {dynamic-rate-control}?
35
36 augment /if:interfaces/if:interface/ieee802-eth-if:ethernet/ieee802-eth-if:capabilities:
37
38     +--ro dynamic-rate-control-supported? boolean {dynamic-rate-control}?
39
40 augment /if:interfaces/if:interface/ieee802-eth-if:ethernet/ieee802-eth-if:statistics/ieee802-eth-if:frame:
41
42     +--ro csma-cd {csma-cd}?
43     |  +--ro in-errors-sqe-test?      yang:counter64
44     |  +--ro out-frames-collision-single? yang:counter64
45     |  +--ro out-frames-collision-multiple? yang:counter64

```



```

1      +---ro out-frames-deferred?          yang:counter64
2      +---ro out-frames-collisions-excessive? yang:counter64
3      +---ro out-collisions-late?          yang:counter64
4      +---ro out-errors-carrier-sense?     yang:counter64
5      +---ro collision-histogram* [collision-count]
6          +---ro collision-count           yang:counter64
7          +---ro collision-count-frames?   yang:counter64

```

5.3.1.3 ieee802-ethernet-mac-merge

```

14 module: ieee802-ethernet-mac-merge
15
16 augment /if:interfaces/if:interface/ieee802-eth-if:ethernet:
17     +---rw mac-merge {mac-merge}?
18         +---rw admin-control
19             | +---rw merge-enable-tx?      enumeration
20             | +---rw verify-disable-tx?    enumeration
21             | +---rw verify-time?          uint16
22             | +---rw frag-size?            uint8
23         +---ro admin-status
24             | +---ro merge-support?        enumeration
25             | +---ro verify-status?        enumeration
26             | +---ro status-tx?            enumeration
27         +---ro statistics
28             +---ro assembly-error-count?   yang:counter64
29             +---ro smd-error-count?        yang:counter64
30             +---ro assembly-ok-count?      yang:counter64
31             +---ro fragment-count-rx?      yang:counter64
32             +---ro fragment-count-tx?      yang:counter64
33             +---ro hold-count?             yang:counter64

```

5.3.1.4 ieee802-ethernet-lldp

```

41 module: ieee802-ethernet-lldp
42
43     augment /lldp:lldp/lldp:port:

```

1	+++rw	tlvs-port-config-enable?	bits
2	+++ro	auto-negotiation-supported?	boolean
3	+++ro	auto-negotiation-enabled?	boolean
4	+++ro	auto-negotiation-cap?	binary
5	+++ro	operational-mau-type?	int32
6	+++ro	power-port-class?	port-class-type
7	+++ro	mdi-power-supported?	boolean
8	+++ro	mdi-power-enabled?	boolean
9	+++ro	power-pair-controlable?	boolean
10	+++ro	power-pairs?	pse-pinout-type
11	+++ro	local-power-class?	pse-power-class-type
12	+++ro	link-aggregation-status?	bits
13	+++ro	aggregation-port-id?	int32
14	+++ro	local-max-frame-size?	int32
15	+++ro	power-type?	bits
16	+++ro	power-source?	power-source-type
17	+++rw	local-power-priority?	power-priority-type
18	+++ro	pd-requested-power-value?	int32
19	+++ro	pd-requested-power-value-a?	int32
20	+++ro	pd-requested-power-value-b?	int32
21	+++ro	pse-allocated-power-value?	int32
22	+++ro	pse-allocated-power-value-a?	int32
23	+++ro	pse-allocated-power-value-b?	int32
24	+++ro	pse-powering-status?	powering-status-type
25	+++ro	pd-powered-status?	powered-status-type
26	+++ro	power-pairs-ext?	power-pairs-type
27	+++ro	power-class-ext-A?	power-class-ext-AB-type
28	+++ro	power-class-ext-B?	power-class-ext-AB-type
29	+++ro	power-class-ext?	power-class-ext-type
30	+++ro	power-type-ext?	power-type
31	+++ro	pd-load?	boolean
32	+++ro	pd-4pid?	boolean
33	+++ro	pse-max-avail-power?	int32
34	+++ro	pse-autoclass-support?	boolean
35	+++ro	autoclass-completed?	boolean
36	+++ro	autoclass-request?	boolean

```
1  +---rw power-down-request?          int32
2  +---rw power-down-time?             int32
3  +---ro meas-voltage-support?        boolean
4  +---ro meas-current-support?        boolean
5  +---ro meas-power-support?          boolean
6  +---ro meas-energy-support?          boolean
7  +---ro meas-energy-support?          boolean
8  +---rw measurement-source?          bits
9  +---ro meas-voltage-request?        boolean
10 +---ro meas-current-request?        boolean
11 +---ro meas-power-request?          boolean
12 +---ro meas-energy-request?          boolean
13 +---ro meas-voltage-valid?          boolean
14 +---ro meas-current-valid?          boolean
15 +---ro meas-power-valid?            boolean
16 +---ro meas-energy-valid?            boolean
17 +---ro meas-voltage-uncertainty?    int32
18 +---ro meas-current-uncertainty?    int32
19 +---ro meas-power-uncertainty?      int32
20 +---ro meas-energy-uncertainty?      int32
21 +---ro voltage-measurement?         int32
22 +---ro current-measurement?         int32
23 +---ro power-measurement?           int32
24 +---ro energy-measurement?          int32
25 +---ro pse-power-price-index?       int32
26 +---ro local-response?              int32
27 +---ro local-system-ready?          boolean
28 +---ro tx-system-value?             int32
29 +---ro tx-system-value-echo?        int32
30 +---ro rx-system-value?             int32
31 +---ro rx-system-value-echo?        int32
32 +---ro fallback-system-value?       int32
33 +---ro tx-dll-ready?                boolean
34 +---ro rx-dll-ready?                boolean
35 +---ro dll-enabled?                 boolean
36 +---ro tx-system-fw?                boolean
37 +---ro tx-system-fw-echo?           boolean
```

```

1      +---ro rx-system-fw?                boolean
2      +---ro rx-system-fw-echo?          boolean
3      +---ro preemption-supported?        boolean
4      +---ro preemption-enabled?          boolean
5      +---ro preemption-active?           boolean
6      +---ro additional-fragment-size?    int32
7
8      augment /lldp:lldp/lldp:port/lldp:remote-systems-data:
9
10     +---ro auto-negotiation-supported?   boolean
11     +---ro auto-negotiation-enabled?     boolean
12     +---ro auto-negotiation-cap?         binary
13     +---ro operational-mau-type?         int32
14     +---ro power-port-class?             port-class-type
15     +---ro mdi-power-supported?          boolean
16     +---ro mdi-power-enabled?            boolean
17     +---ro power-pair-controlable?       boolean
18     +---ro power-pairs?                  pse-pinout-type
19     +---ro power-class?                  pse-power-class-type
20     +---ro link-aggregation-status?      bits
21     +---ro aggregation-port-id?          int32
22     +---ro local-max-frame-size?         int32
23     +---ro power-type?                   bits
24     +---ro power-source?                 power-source-type
25     +---ro power-priority?               power-priority-type
26     +---ro pd-requested-power-value?     int32
27     +---ro pd-requested-power-value-a?   int32
28     +---ro pd-requested-power-value-b?   int32
29     +---ro pse-allocated-power-value?    int32
30     +---ro pse-allocated-power-value-a?  int32
31     +---ro pse-allocated-power-value-b?  int32
32     +---ro pse-powering-status?          powering-status-type
33     +---ro pd-powered-status?            powered-status-type
34     +---ro power-pairs-ext?              power-pairs-type
35     +---ro power-class-ext-A?            power-class-ext-AB-type
36     +---ro power-class-ext-B?            power-class-ext-AB-type
37     +---ro power-class-ext?              power-class-ext-type
38     +---ro power-type-ext?               power-type

```

1	+++ro pd-load?	boolean
2	+++ro pd-4pid?	boolean
3	+++ro pse-max-avail-power?	int32
4	+++ro pse-autoclass-support?	boolean
5	+++ro autoclass-completed?	boolean
6	+++ro autoclass-request?	boolean
7	+++ro power-down-request?	int32
8	+++ro power-down-time?	int32
9	+++ro meas-voltage-support?	boolean
10	+++ro meas-current-support?	boolean
11	+++ro meas-power-support?	boolean
12	+++ro meas-energy-support?	boolean
13	+++ro measurement-source?	bits
14	+++ro meas-voltage-request?	boolean
15	+++ro meas-current-request?	boolean
16	+++ro meas-power-request?	boolean
17	+++ro meas-energy-request?	boolean
18	+++ro meas-voltage-valid?	boolean
19	+++ro meas-current-valid?	boolean
20	+++ro meas-power-valid?	boolean
21	+++ro meas-energy-valid?	boolean
22	+++ro meas-voltage-uncertainty?	int32
23	+++ro meas-current-uncertainty?	int32
24	+++ro meas-power-uncertainty?	int32
25	+++ro meas-energy-uncertainty?	int32
26	+++ro voltage-measurement?	int32
27	+++ro current-measurement?	int32
28	+++ro power-measurement?	int32
29	+++ro energy-measurement?	int32
30	+++ro pse-power-price-index?	int32
31	+++ro tx-system-value?	int32
32	+++ro tx-system-value-echo?	int32
33	+++ro rx-system-value?	int32
34	+++ro rx-system-value-echo?	int32
35	+++ro fallback-system-value?	int32
36	+++ro tx-system-fw?	boolean

```
1  +---ro tx-system-fw-echo?          boolean
2  +---ro rx-system-fw?              boolean
3  +---ro rx-system-fw-echo?         boolean
4  +---ro preemption-supported?      boolean
5  +---ro preemption-enabled?        boolean
6  +---ro preemption-active?         boolean
7  +---ro preemption-active?         boolean
8  +---ro additional-fragment-size?  int32
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5.3.2 YANG module

In the following YANG module definition, should any discrepancy between the text of the description for individual YANG nodes and the corresponding definition in 5.2 through 5.3 of this clause occur, the definitions and mappings in 5.3 shall take precedence.

Editor's Note (to be removed prior to publication):

Yang files contained in <https://github.com/YangModels/yang/tree/main/standard/ieee/published/802.3> are IEEE 802.3.2-2019 version and will be updated at the publication time.

An ASCII text version of the Ethernet YANG module can be found at the following URL:^h
<https://github.com/YangModels/yang/tree/master/standard/ieee/published/802.3>

Editor's Note (to be removed prior to publication):

There is missing content from oPHYEntity, at least aPhyType and aPhyTypeList. In 802.3.1 these come in as IANAifMauTypeListBits and ifMauType(AutonomousType) from IANA-MAU-MIB. We need the equivalent definitions and attributes for the YANG model. IEEE 802.3.2 task force is encouraged to provide contributions defining the missing Yang definitions

5.3.2.1 Ethernet interface module

Editor's Note (to be removed prior to publication):

Pretty printing of ieee802-ethernet-interface.yang file may change the appearance by adding whitespace and reformatting lines

Editor's Note (to be removed prior to publication):

IEEE Std 802.3.1 and IEEE Std 802.3.2 to be updated at the publication time

Editor's Note (to be removed prior to publication):

IEEE 802.3.2 task force is encouraged to provide contributions defining the missing Yang definitions and module for Ethernet MAU

```
module ieee802-ethernet-interface {
  yang-version 1.1;
  namespace "urn:ieee:std:802.3:yang:ieee802-ethernet-interface";
  prefix ieee802-eth-if;

  import ietf-yang-types {
    prefix yang;
    reference
      "IETF RFC 6991";
  }
  import ietf-interfaces {
    prefix if;
    reference
      "IETF RFC 8343";
  }
  import iana-if-type {
```

^hCopyright release for YANG modules: Users of this standard may freely reproduce the YANG module contained in this subclause so that it can be used for its intended purpose.

```
1      prefix ianaifc;
2      reference
3          "http://www.iana.org/assignments/yang-parameters/
4          iana-if-type@2023-01-26.yang";
5  }
6
7  //import ieee802-ethernet-mau {
8  //    prefix ieee802-mau;
9  //    reference
10     //    "IEEE Std 802.3-2022";
11     //}
12
13
14  organization
15      "IEEE Std 802.3 Ethernet Working Group
16      Web URL: http://www.ieee802.org/3/";
17  contact
18      "Web URL: http://www.ieee802.org/3/";
19  description
20      "This module contains YANG definitions for configuring IEEE Std
21      802.3 Ethernet Interfaces.
22      In this YANG module, 'Ethernet interface' can be interpreted
23      as referring to 'IEEE Std 802.3 compliant Ethernet
24      interfaces'.";
25
26
27  revision 2024-08-17 {
28      description
29          "Updates under IEEE Std 802.3.2-202x, Draft D3.0";
30      reference
31          "IEEE Std 802.3-2022 and IEEE Std 802.3.1-202X, unless dated
32          explicitly";
33  }
34
35
36  feature ethernet-pfc {
37      description
38          "This device supports Ethernet priority flow-control.";
39  }
40
41
42  feature ethernet-pause {
43      description
44          "This device supports Ethernet PAUSE.";
45  }
46
47  typedef eth-if-speed-type {
48      type decimal64 {
49          fraction-digits 3;
50      }
51      units "Gb/s";
52      description
53          "Used to represent the configured, negotiated, or actual
54          speed of an Ethernet interface in Gigabits per second
55          (Gb/s), accurate to 3 decimal places (i.e., accurate to 1
56          Mb/s).";
57  }
58
59
60  typedef duplex-type {
61      type enumeration {
62          enum full {
63              description
64                  "Full duplex.";
65          }
```



```
1      }
2      enum half {
3          description
4              "Half duplex.";
5      }
6      enum unknown {
7          description
8              "Link is currently disconnected or initializing.";
9      }
10     }
11 }
12 default "full";
13 description
14     "Used to represent the configured, negotiated, or actual
15     duplex mode of an Ethernet interface.";
16 reference
17     "IEEE Std 802.3, 30.3.1.1.32, aDuplexStatus";
18 }
19
20
21 typedef pause-fc-direction-type {
22     type enumeration {
23         enum disabled {
24             description
25                 "Flow-control disabled in both ingress and egress
26                 directions, i.e., PAUSE frames are not transmitted and
27                 PAUSE frames received in the ingress direction are
28                 discarded without processing.";
29         }
30         enum ingress-only {
31             description
32                 "PAUSE frame based flow control is enabled in the ingress
33                 direction only, i.e., PAUSE frames may be transmitted to
34                 reduce the ingress traffic flow, but PAUSE frames
35                 received in the ingress direction are discarded without
36                 reducing the egress traffic rate.";
37         }
38         enum egress-only {
39             description
40                 "PAUSE frame based flow control is enabled in the egress
41                 direction only, i.e., PAUSE frames are not transmitted,
42                 but PAUSE frames received in the ingress direction are
43                 processed to reduce the egress traffic rate.";
44         }
45         enum bi-directional {
46             description
47                 "PAUSE frame based flow control is enabled in both
48                 ingress and egress directions, i.e., PAUSE frames may
49                 be transmitted to reduce the ingress traffic flow, and
50                 PAUSE frames received on ingress are processed to
51                 reduce the egress traffic rate.";
52         }
53         enum undefined {
54             description
55                 "Link is currently disconnected or initializing.";
56         }
57     }
58 }
59 description
60     "Used to represent the configured, negotiated, or actual
61     PAUSE frame-based flow control setting.";
62 reference
```

```
1      "IEEE Std 802.3.1, dot3PauseAdminMode and dot3PauseOperMode";
2  }
3
4  augment "/if:interfaces/if:interface" {
5      when "derived-from-or-self(if:type, 'ianaift:ethernetCsmacd')" {
6          description
7              "Applies to all P2P Ethernet interfaces.";
8      }
9
10     description
11         "Augment interface model with Ethernet interface
12         specific configuration nodes.";
13     container ethernet {
14         description
15             "Contains all Ethernet interface related configuration.";
16         container auto-negotiation {
17             presence "The presence of this container indicates that
18             auto-negotiation is supported on this Ethernet
19             interface.";
20             description
21                 "Contains auto-negotiation transmission parameters
22
23                 This container contains a data node that allows the
24                 advertised duplex value in the negotiation to be
25                 restricted.
26
27                 If not specified then the default behavior for the
28                 duplex data node is to negotiate all available values for
29                 the particular type of Ethernet PHY associated with the
30                 interface.
31
32                 If auto-negotiation is enabled, and PAUSE frame based
33                 flow control has not been explicitly configured, then
34                 the default PAUSE frame based flow control capabilities
35                 that are negotiated allow for bi-directional or
36                 egress-only PAUSE frame based flow control.
37
38                 If auto-negotiation is enabled, and PAUSE frame based
39                 flow control has been explicitly configured, then the
40                 configuration settings restrict the values that may be
41                 negotiated. However, it should be noted that the
42                 protocol does not allow only egress PAUSE frame based
43                 flow control to be negotiated without also allowing
44                 bi-directional PAUSE frame based flow control.";
45             reference
46                 "IEEE Std 802.3, Clause 28 and Annexes 28A-D";
47         leaf enable {
48             type boolean;
49             default "true";
50             description
51                 "Controls whether auto-negotiation is enabled or
52                 disabled.
53                 For interface types that support auto-negotiation then
54                 it defaults to being enabled.
55
56                 For interface types that do not support
57                 auto-negotiation, the related configuration data is
58                 ignored.";
59         }
60         leaf negotiation-status {
```

```
1      when "../enable = 'true'";
2      type enumeration {
3          enum in-progress {
4              description
5                  "The auto-negotiation protocol is running and
6                  negotiation is currently in-progress.";
7          }
8          enum complete {
9              description
10                 "The auto-negotiation protocol has completed
11                 successfully.";
12             }
13         enum failed {
14             description
15                 "The auto-negotiation protocol has failed.";
16         }
17         enum unknown {
18             description
19                 "The auto-negotiation status is not currently known,
20                 this could be because it is still negotiating or the
21                 protocol cannot run
22                 (e.g., if no medium is present).";
23         }
24         enum no-negotiation {
25             description
26                 "No auto-negotiation is executed.
27                 The auto-negotiation function is either not
28                 supported on this interface or has not been
29                 enabled.";
30         }
31     }
32     config false;
33     description
34         "The status of the auto-negotiation protocol.";
35     reference
36         "IEEE 802.3, 30.6.1.1.4, aAutoNegAutoConfig";
37 }
38 /*
39 leaf mau-type {
40     type ieee802-mau:mau-type;
41     description
42         "A value that uniquely identifies the IEEE 802.3 MAU type
43         of the interface.";
44     reference
45         "IEEE Std 802.3, 30.????";
46 }
47
48 leaf mau-type-list {
49     type ieee802-mau:type-list-bits;
50     description
51         "A value that uniquely identifies the set of
52         possible IEEE 802.3 types that the MAU could be.";
53     reference
54         "IEEE Std 802.3, 30.????";
55 }
56 */
57 leaf duplex {
58     type duplex-type;
```

```
1      description
2          "Operational duplex mode of the Ethernet interface.";
3      reference
4          "IEEE Std 802.3, 30.3.1.1.32 aDuplexStatus";
5  }
6  leaf speed {
7      type eth-if-speed-type;
8      units "Gb/s";
9      description
10         "Operational speed (data rate) of the Ethernet interface.
11         The default value is implementation-dependent.";
12 }
13
14 container flow-control {
15     description
16         "Holds the different types of Ethernet PAUSE frame based
17         flow control that can be enabled.";
18     container pause {
19         if-feature "ethernet-pause";
20         description
21             "IEEE Std 802.3 PAUSE frame based PAUSE frame based
22             flow control.";
23         reference
24             "IEEE Std 802.3, Annex 31B";
25         leaf direction {
26             type pause-fc-direction-type;
27             description
28                 "Indicates which direction PAUSE frame based flow
29                 control is enabled in, or whether it is disabled.
30                 The default flow-control settings are vendor
31                 specific. If auto-negotiation is enabled, then PAUSE
32                 based flow-control is negotiated by default.
33                 The default value is implementation-dependent.";
34         }
35     }
36 }
37 container statistics {
38     config false;
39     description
40         "Contains the number of PAUSE frames received or
41         transmitted.
42
43         Discontinuities in the values of counters in
44         this container can occur at re-initialization of
45         the management system, and at other times as
46         indicated by the value of the 'discontinuity-time'
47         leaf defined in the ietf-interfaces YANG module
48         (IETF RFC 8343).";
49     leaf in-frames-pause {
50         type yang:counter64;
51         units "frames";
52         description
53             "A count of PAUSE MAC Control frames transmitted on
54             this Ethernet interface.";
55         reference
56             "IEEE Std 802.3, 30.3.4.3
57             aPAUSEMACCtrlFramesReceived";
58     }
59     leaf out-frames-pause {
60         type yang:counter64;
61         units "frames";
62         description
63             "A count of PAUSE MAC Control frames received on
64             this Ethernet interface.";
```

```
1           "A count of PAUSE MAC Control frames transmitted on
2             this Ethernet interface.";
3         reference
4             "IEEE Std 802.3, 30.3.4.2
5             aPAUSEMACCtrlFramesTransmitted";
6     }
7 }
8 }
9 }
10 container pfc {
11     if-feature "ethernet-pfc";
12     description
13         "IEEE Std 802.3 Priority-based flow control.";
14     reference
15         "IEEE Std 802.3, Annex 31D";
16     leaf enable {
17         type boolean;
18         description
19             "True indicates that IEEE Std 802.3 priority-based
20             flow control is enabled, false indicates that
21             IEEE Std 802.3 priority-based flow control is
22             disabled. For interfaces that have auto-negotiation,
23             the priority-based flow control is enabled by
24             default.";
25     }
26 }
27 container statistics {
28     config false;
29     description
30         "This container collects all statistics for
31         Ethernet interfaces.
32
33         Discontinuities in the values of counters in
34         this container can occur at re-initialization of
35         the management system, and at other times as
36         indicated by the value of the 'discontinuity-time'
37         leaf defined in the ietf-interfaces YANG module
38         (IETF RFC 8343).";
39     leaf in-frames-pfc {
40         type yang:counter64;
41         units "frames";
42         status deprecated;
43         description
44             "Deprecated in-frames-pfc as not defined in base
45             standard. A count of PFC MAC Control frames
46             received on this Ethernet interface.";
47         reference
48             "IEEE Std 802.3.1, dot3HCInPFCFrames";
49     }
50 }
51 leaf out-frames-pfc {
52     type yang:counter64;
53     units "frames";
54     status deprecated;
55     description
56         "Deprecated out-frames-pfc as not defined in base
57         standard. A count of PFC MAC Control frames
58         transmitted on this interface.";
59     reference
60         "IEEE Std 802.3.1, dot3HCInPFCFrames";
61 }
62 }
63 }
64 }
65 }
```

```
1      }
2      leaf force-flow-control {
3          type boolean;
4          default "false";
5          description
6              "Explicitly forces the local PAUSE frame based flow
7              control settings regardless of what has been
8              negotiated.
9
10             Since the auto-negotiation of flow-control settings
11             does not allow all sane combinations to be negotiated
12             (e.g., consider a device that is only capable of
13             sending PAUSE frames connected to a peer device that
14             is only capable of receiving and acting on PAUSE
15             frames) and failing to agree on the flow-control
16             settings does not cause the auto-negotiation to fail
17             completely, then it is sometimes useful to be able to
18             explicitly enable particular PAUSE frame based flow
19             control settings on the local device regardless of
20             what is being advertised or negotiated.";
21             reference
22                 "IEEE Std 802.3, Table 28B-3";
23         }
24     }
25     leaf max-frame-length {
26         type uint16;
27         units "octets";
28         config false;
29         description
30             "This indicates the MAC frame length (including FCS bytes)
31             at which frames are dropped for being too long.";
32         reference
33             "IEEE Std 802.3, 30.3.1.1.37 aMaxFrameLength";
34     }
35     leaf mac-control-extension-control {
36         type boolean;
37         config false;
38         description
39             "A value that identifies the current EXTENSION
40             MAC Control function, as specified in
41             IEEE Std 802.3, Annex 31C.";
42         reference
43             "IEEE Std 802.3, 30.3.8.3 aEXTENSIONMACCtrlStatus
44             IEEE Std 802.3.1, dot3ExtensionMacCtrlStatus ";
45     }
46     leaf frame-limit-slow-protocol {
47         type uint64;
48         units "f/s";
49         default "10";
50         config false;
51         description
52             "The maximum number of Slow Protocol frames of a given
53             subtype that can be transmitted in a one second
54             interval.
55             The default value is 10.";
56         reference
57             "IEEE Std 802.3, 30.3.1.1.38 aSlowProtocolFrameLimit";
58     }
59     container capabilities {
```

```
1      config false;
2      description
3          "Container all Ethernet interface specific capabilities.";
4      leaf auto-negotiation {
5          type boolean;
6          description
7              "Indicates whether auto-negotiation may be configured on
8               this interface.";
9      }
10     }
11 }
12 container statistics {
13     config false;
14     description
15         "Contains statistics specific to Ethernet interfaces.
16
17         Discontinuities in the values of counters in the
18         container can occur at re-initialization of the
19         management system, and at other times as indicated by
20         the value of the 'discontinuity-time' leaf defined in
21         the ietf-interfaces YANG module (IETF RFC 8343).";
22     container frame {
23         description
24             "Contains frame statistics specific to Ethernet
25              interfaces.
26
27              All octet frame lengths include the 4 byte FCS.
28
29              Error counters are only reported once. The count
30              represented by an instance of this object is
31              incremented when the frameCheckError status is
32              returned by the MAC service to the MAC Client.
33              Received frames for which multiple error conditions
34              pertain are, according to the conventions of
35              IEEE Std 802.3 Layer Management, counted exclusively
36              according to the error status presented to the MAC
37              Client.
38
39              A frame that is counted by an instance of this object
40              is also counted by the corresponding instance of
41              'in-errors' leaf defined in the ietf-interfaces YANG
42              module (IETF RFC 8343).
43
44              Discontinuities in the values of counters in the
45              container can occur at re-initialization of the
46              management system, and at other times as indicated by
47              the value of the 'discontinuity-time' leaf defined in
48              the ietf-interfaces YANG module (IETF RFC 8343).";
49         leaf in-total-frames {
50             type yang:counter64;
51             units "frames";
52             description
53                 "The total number of frames (including bad frames)
54                  received on the Ethernet interface.
55
56                  This counter is calculated by summing the following
57                  IEEE Std 802.3, Clause 30 counters:
58                  aFramesReceivedOK +
59                  aFrameCheckSequenceErrors +
60                  aAlignmentErrors +
```

```
1         aFrameTooLongErrors +
2         aFramesLostDueToIntMACRcvError";
3     reference
4         "IEEE Std 802.3, Clause 30 counters, as specified
5         in the description above.";
6 }
7 leaf in-total-octets {
8     type yang:counter64;
9     units "octets";
10    description
11        "The total number of octets of data (including those
12        in bad frames) received on the Ethernet interface.
13
14        Includes the 4-octet FCS.";
15    reference
16        "IETF RFC 2819, etherStatsOctets";
17 }
18 leaf in-frames {
19     type yang:counter64;
20     units "frames";
21     description
22        "A count of frames (including unicast, multicast and
23        broadcast) that have been successfully received on
24        the Ethernet interface.
25
26        This count does not include frames received with
27        frame-too-long, FCS, length or alignment errors, or
28        frames lost due to internal MAC sublayer error.";
29    reference
30        "IEEE Std 802.3, 30.3.1.1.5 aFramesReceivedOK";
31 }
32 leaf in-multicast-frames {
33     type yang:counter64;
34     units "frames";
35     description
36        "A count of multicast frames that have been
37        successfully received on the Ethernet interface.
38
39        This counter represents a subset of the frames
40        counted by in-frames.
41
42        This count does not include frames received with
43        frame-too-long, FCS, length or alignment errors, or
44        frames lost due to internal MAC sublayer error.";
45    reference
46        "IEEE Std 802.3, 30.3.1.1.21
47        aMulticastFramesReceivedOK";
48 }
49 leaf in-broadcast-frames {
50     type yang:counter64;
51     units "frames";
52     description
53        "A count of broadcast frames that have been
54        successfully received on the Ethernet interface.
55
56        This counter represents a subset of the frames
57        counted by in-frames.
58
59        This count does not include frames received with
```



```
1         frame-too-long, FCS, length or alignment errors, or
2         frames lost due to internal MAC sublayer error.";
3     reference
4         "IEEE Std 802.3, 30.3.1.1.22
5         aBroadcastFramesReceivedOK";
6     }
7 leaf in-error-fcs-frames {
8     type yang:counter64;
9     units "frames";
10    description
11        "A count of receive frames that are of valid length,
12        but do not pass the FCS check, regardless of whether
13        or not the frames are an integral number of octets
14        in length.
15
16        This counter is calculated by summing the following
17        counters:
18        aFrameCheckSequenceErrors +
19        aAlignmentErrors";
20    reference
21        "IEEE Std 802.3, 30.3.1.1.6 aFrameCheckSequenceErrors;
22        IEEE Std 802.3, 30.3.1.1.7 aAlignmentErrors";
23    }
24 leaf in-error-undersize-frames {
25     type yang:counter64;
26     units "frames";
27     status deprecated;
28     description
29        "Deprecated in-error-undersize-frames as not defined
30        in base standard. A count of frames received on a
31        particular Ethernet interface that are less than
32        64 bytes in length, and are discarded.
33
34        This counter is incremented regardless of whether
35        the frame passes the FCS check.";
36    reference
37        "IETF RFC 2819, etherStatsUndersizePkts and
38        etherStatsFragments";
39    }
40 leaf in-error-oversize-frames {
41     type yang:counter64;
42     units "frames";
43     description
44        "A count of frames received on a particular Ethernet
45        interface that exceed the maximum permitted frame
46        size, that is specified in max-frame-length, and are
47        discarded.
48
49        This counter is incremented regardless of whether
50        the frame passes the FCS check.";
51    reference
52        "IEEE Std 802.3, 30.3.1.1.25
53        aFrameTooLongErrors";
54    }
55 leaf in-error-mac-internal-frames {
56     type yang:counter64;
57     units "frames";
58     description
59        "A count of frames for which reception on a
```

```
1           particular Ethernet interface fails due to an
2           internal MAC sublayer receive error.
3
4           A frame is only counted by an instance of this
5           object if it is not counted by the corresponding
6           instance of either the in-error-fcs-frames,
7           in-error-undersize-frames, or
8           in-error-oversize-frames. The precise meaning of
9           the count represented by an instance of this object
10          is implementation-specific.
11
12          In particular, an instance of this object may
13          represent a count of receive errors on a particular
14          Ethernet interface that are not otherwise counted.";
15          reference
16          "IEEE Std 802.3, 30.3.1.1.15
17          aFramesLostDueToIntMACRcvError";
18      }
19  leaf out-frames {
20      type yang:counter64;
21      units "frames";
22      description
23      "A count of frames (including unicast, multicast and
24      broadcast) that have been successfully transmitted
25      on the Ethernet interface.";
26      reference
27      "IEEE Std 802.3, 30.3.1.1.2 aFramesTransmittedOK";
28  }
29  leaf out-multicast-frames {
30      type yang:counter64;
31      units "frames";
32      description
33      "A count of multicast frames that have been
34      successfully transmitted on the Ethernet interface.
35
36      This counter represents a subset of the frames
37      counted by out-frames.";
38      reference
39      "IEEE Std 802.3, 30.3.1.1.18
40      aMulticastFramesXmittedOK";
41  }
42  leaf out-broadcast-frames {
43      type yang:counter64;
44      units "frames";
45      description
46      "A count of broadcast frames that have been
47      successfully transmitted on the Ethernet interface.
48
49      This counter represents a subset of the frames
50      counted by out-frames.";
51      reference
52      "IEEE Std 802.3, 30.3.1.1.19
53      aBroadcastFramesXmittedOK";
54  }
55  leaf out-error-mac-internal-frames {
56      type yang:counter64;
57      units "frames";
58      description
59      "A count of frames for which transmission on a
```

```
1           particular Ethernet interface fails due to an
2           internal MAC sublayer transmit error.
3
4           The precise meaning of the count represented by an
5           instance of this object is implementation-specific.
6           In particular, an instance of this object may
7           represent a count of transmission errors on a
8           particular Ethernet interface that are not otherwise
9           counted.";
10          reference
11            "IEEE Std 802.3, 30.3.1.1.12
12            aFramesLostDueToIntMACXmitError";
13          }
14        }
15      }
16      container phy {
17        description
18          "Ethernet statistics related to the PHY layer.
19
20          Discontinuities in the values of counters in the
21          container can occur at re-initialization of the
22          management system, and at other times as indicated by
23          the value of the 'discontinuity-time' leaf defined in
24          the ietf-interfaces YANG module (IETF RFC 8343).";
25        leaf in-error-symbol {
26          type yang:counter64;
27          units "errors";
28          description
29            "A count of the number of symbol errors that have
30            occurred.
31
32            For the precise definition of when the symbol error
33            counter is incremented, please see the 'description'
34            text associated with aSymbolErrorDuringCarrier,
35            specified in IEEE Std 802.3, 30.3.2.1.5.";
36          reference
37            "IEEE Std 802.3, 30.3.2.1.5
38            aSymbolErrorDuringCarrier";
39        }
40      }
41      container lpi {
42        description
43          "Physical Ethernet statistics for the energy
44          efficiency related low power idle indications.";
45        leaf in-lpi-transitions {
46          type yang:counter64;
47          units "transitions";
48          description
49            "A count of occurrences of the transition from
50            DEASSERT to ASSERT of the LPI_INDICATE
51            parameter. The indication reflects the state of
52            the PHY according to the requirements of the RS
53            (see IEEE Std 802.3, 22.7, 35.4, and 46.4).";
54          reference
55            "IEEE Std 802.3, 30.3.2.1.11
56            aReceiveLPITransitions";
57        }
58      }
59      leaf in-lpi-time {
60        type decimal64 {
61          fraction-digits 6;
62        }
63      }
64    }
65  }
```

```
1         units "seconds";
2         description
3             "A count reflecting the total amount of time (in
4             seconds) that the LPI_REQUEST parameter has the
5             value ASSERT. The request is indicated to the PHY
6             according to the requirements of the RS (see
7             IEEE Std 802.3, 22.7, 35.4, and 46.4).";
8         reference
9             "IEEE Std 802.3, 30.3.2.1.9
10            aReceiveLPIMicroseconds";
11     }
12 leaf out-lpi-transitions {
13     type yang:counter64;
14     units "transitions";
15     description
16         "A count of occurrences of the transition from
17         state LPI_DEASSERTED to state LPI_ASSERTED in the
18         LPI transmit state diagram of the RS. The state
19         transition corresponds to the assertion of the
20         LPI_REQUEST parameter. The request is indicated to
21         the PHY according to the requirements of the RS
22         (see IEEE Std 802.3, 22.7, 35.4, 46.4).";
23     reference
24         "IEEE Std 802.3, 30.3.2.1.10
25         aTransmitLPITransitions";
26 }
27 leaf out-lpi-time {
28     type decimal64 {
29         fraction-digits 6;
30     }
31     units "seconds";
32     description
33         "A count reflecting the total amount of time (in
34         seconds) that the LPI_INDICATION parameter has the
35         value ASSERT. The request is indicated to the PHY
36         according to the requirements of the RS (see IEEE
37         802.3, 22.7, 35.4, and 46.4).";
38     reference
39         "IEEE Std 802.3, 30.3.2.1.8
40         aTransmitLPIMicroseconds";
41 }
42 }
43 container mac-control {
44     description
45         "A group of statistics specific to MAC Control
46         operation of selected Ethernet interfaces.
47
48         Discontinuities in the values of counters in the
49         container can occur at re-initialization of the
50         management system, and at other times as indicated
51         by the value of the 'discontinuity-time' leaf defined
52         in the ietf-interfaces YANG module (IETF RFC 8343).";
53     reference
54         "IEEE Std 802.3.1, dot3ExtensionTable";
55 leaf in-frames-mac-control-unknown {
56     type yang:counter64;
57     units "frames";
58     description
```

```
1          "A count of MAC Control frames with an unsupported
2          opcode received on this Ethernet interface.
3
4          Frames counted against this counter are also counted
5          against in-discards defined in the ietf-interfaces
6          YANG module (IETF RFC 8343).";
7      reference
8          "IEEE Std 802.3, 30.3.3.5
9          aUnsupportedOpCodesReceived";
10     }
11     leaf in-frames-mac-control-extension {
12         type yang:counter64;
13         units "frames";
14         description
15             "The count of Extension MAC Control frames received
16             \t on this Ethernet interface.";
17         reference
18             "IEEE Std 802.3, 30.3.8.2
19             aEXTENSIONMACCtrlFramesReceived";
20     }
21     leaf out-frames-mac-control-extension {
22         type yang:counter64;
23         units "frames";
24         description
25             "The count of Extension MAC Control frames
26             transmitted on this Ethernet interface.";
27         reference
28             "IEEE Std 802.3, 30.3.8.1
29             aEXTENSIONMACCtrlFramesTransmitted";
30     }
31 }
32 }
33 }
34 }
35 }
36 }
37 }
38 }
39 }
```

5.3.2.2 Ethernet interface module (half-duplex)

Editor's Note (to be removed prior to publication):

Pretty printing of ieee802-ethernet-interface-half-duplex.yang file may change the appearance by adding whitespace and reformatting lines

Editor's Note (to be removed prior to publication):

IEEE Std 802.3.1 and IEEE Std 802.3.2 to be updated at the publication time

```
55 module ieee802-ethernet-interface-half-duplex {
56     yang-version 1.1;
57     namespace
58         "urn:ieee:std:802.3:yang:ieee802-ethernet-interface-half-duplex";
59     prefix ieee802-eth-half-duplex;
60
61     import ietf-yang-types {
62         prefix yang;
63         reference
64             "IETF RFC 6991";
65     }
```

```
1      }
2      import ietf-interfaces {
3          prefix if;
4          reference
5              "IETF RFC 8343";
6      }
7      import iana-if-type {
8          prefix ianaift;
9          reference
10             "http://www.iana.org/assignments/yang-parameters/
11             iana-if-type@2023-01-26.yang";
12      }
13      import ieee802-ethernet-interface {
14          prefix ieee802-eth-if;
15      }
16
17
18      organization
19          "IEEE Std 802.3 Ethernet Working Group
20          Web URL: http://www.ieee802.org/3/";
21      contact
22          "Web URL: http://www.ieee802.org/3/";
23      description
24          "This module contains YANG definitions for configuring Ethernet
25          interfaces that are deprecated, and are no longer
26          widely used in the industry. The definitions are maintained
27          for backwards compatibility purposes, but the general
28          expectation is that this module is not anticipated to be
29          widely implemented.";
30
31
32      revision 2024-08-17 {
33          description
34              "Updates under IEEE Std 802.3.2-202x, Draft D3.0";
35          reference
36              "IEEE Std 802.3-2022, unless dated explicitly";
37      }
38
39
40      feature dynamic-rate-control {
41          description
42              "This feature indicates that the device supports Ethernet
43              interfaces lowering the average data rate of the MAC
44              sublayer, with frame granularity, by using Rate Control to
45              dynamically increase the inter-packet gap for some types of
46              Ethernet interface.
47              Only valid for Ethernet interfaces operating at speeds
48              (data rates) above 1000 Mb/s.";
49          reference
50              "IEEE Std 802.3, 30.3.1.1.33 aRateControlAbility";
51      }
52
53
54      feature csma-cd {
55          description
56              "This feature indicates that the device supports Ethernet
57              interfaces running at half-duplex using CSMA/CD.";
58      }
59
60
61      typedef dynamic-rate-control-type {
62          type enumeration {
63              enum disabled {
64                  description
65
```

```

1      "Dynamic rate control is disabled";
2    }
3    enum sonet-oc192 {
4      value 2;
5      description
6        "Dynamic rate control is enabled for a 10 Gb/s Ethernet
7          interface to SONET/SDH OC192/STM64.";
8    }
9  }
10 }
11 default "disabled";
12 description
13   "Allowed values for dynamic-rate-control.";
14 reference
15   "IEEE Std 802.3, 4.4.2 ipgStretchRatio and 30.3.1.1.34
16     aRateControlStatus";
17 }
18
19 augment "/if:interfaces/if:interface/ieee802-eth-if:ethernet" {
20   when "derived-from-or-self(..if:type, 'ianaift:ethernetCsmacd')
21     and ieee802-eth-if:duplex = 'half'" {
22     description
23       "Applies to half-duplex Ethernet interfaces.";
24   }
25   description
26     "Augment with Ethernet interface configuration parameters
27       for half-duplex operation.";
28   leaf dynamic-rate-control {
29     if-feature "dynamic-rate-control";
30     type dynamic-rate-control-type;
31     description
32       "Enables dynamic rate control and specifies what speed
33         (data rate) the dynamic rate control is operating at.
34         The value of this attribute is constrained by the MAC
35         data rate and hardware support.
36         The default value is implementation-dependent.";
37     reference
38       "IEEE Std 802.3, 30.3.1.1.34 aRateControlStatus";
39   }
40 }
41
42 }
43
44 augment "/if:interfaces/if:interface/ieee802-eth-if:ethernet/"
45   + "ieee802-eth-if:capabilities" {
46   when
47     "derived-from-or-self(..if:type,
48       'ianaift:ethernetCsmacd') and ../ieee802-eth-if:duplex = 'half'" {
49     description
50       "Applies to half-duplex Ethernet interfaces";
51   }
52   description
53     "Augment with configuration capabilities for half-duplex
54       Ethernet interface.";
55   leaf dynamic-rate-control-supported {
56     if-feature "dynamic-rate-control";
57     type boolean;
58     default "false";
59     description
60       "Indicates whether the Ethernet interface supports lowering
61         the average data rate of the MAC sublayer, with frame
62         granularity, by using Rate Control to dynamically increase

```

```

1         the inter-packet gap.
2         Only valid for Ethernet interfaces operating at speeds
3         (data rates) above 1000 Mb/s.";
4     reference
5         "IEEE Std 802.3, 30.3.1.1.33 aRateControlAbility";
6     }
7 }
8 }
9
10 augment "/if:interfaces/if:interface/ieee802-eth-if:ethernet/"
11     + "ieee802-eth-if:statistics/ieee802-eth-if:frame" {
12     when
13         "derived-from-or-self(..../if:type,
14         'ianaift:ethernetCsmacd') and ..../ieee802-eth-if:duplex = 'half'" {
15         description
16             "Applies to half-duplex Ethernet interfaces.";
17     }
18     description
19         "Augment with statistics for half-duplex Ethernet
20         interface.";
21     container csma-cd {
22         if-feature "csma-cd";
23         description
24             "Holds counters that are specific to CDMA/CD half-duplex
25             operation of Ethernet interfaces.
26             This counter does not increment on Ethernet interfaces
27             operating at speeds (data rates) greater than 10 Mb/s, or
28             on Ethernet interfaces operating in full-duplex mode.
29             Discontinuities in the value of this counter can occur at
30             re-initialization of the management system, and at other
31             times as indicated by the value of the
32             'discontinuity-time' leaf defined in the ietf-interfaces
33             YANG module (IETF RFC 8343).";
34     leaf in-errors-sqe-test {
35         type yang:counter64;
36         units "errors";
37         description
38             "A count of times that the SQE TEST ERROR is received on
39             a particular interface. The SQE TEST ERROR is set in
40             accordance with the rules for verification of the SQE
41             detection mechanism in the PLS Carrier Sense Function as
42             described in IEEE Std 802.3, 7.2.4.6.";
43     reference
44         "IEEE Std 802.3, 7.2.4.6, and 30.3.2.1.4 aSQETestErrors";
45     }
46     leaf out-frames-collision-single {
47         type yang:counter64;
48         units "frames";
49         description
50             "A count of frames that are involved in a single
51             collision, and are subsequently transmitted
52             successfully. A frame that is counted by an instance of
53             this object is also counted by the corresponding
54             instance of either 'out-unicast-frames',
55             'out-broadcast-frames', or 'out-multicast-frames',
56             and is not counted by the corresponding instance of the
57             'out-frames-collision-multiple'.";
58     reference
59         "IEEE Std 802.3, 30.3.1.1.3 aSingleCollisionFrames";
60     }
61 }
62 }
63 }
64 }
65 }
```



```
1     leaf out-frames-collision-multiple {
2         type yang:counter64;
3         units "frames";
4         description
5             "A count of frames that are involved in multiple
6             collisions, and are subsequently transmitted
7             successfully. A frame that is counted by an instance of
8             this object is also counted by the corresponding
9             instance of either 'out-unicast-frames',
10            'out-broadcast-frames', or 'out-multicast-frames', and
11            is not counted by the corresponding instance of the
12            'out-frames-collision-single'.";
13        reference
14            "IEEE Std 802.3, 30.3.1.1.4 aMultipleCollisionFrames";
15    }
16    leaf out-frames-deferred {
17        type yang:counter64;
18        units "frames";
19        description
20            "A count of frames for which the first transmission
21            attempt on a particular Ethernet interface is delayed
22            because the medium is busy.
23            A deferred frame that is not subject to any number of
24            collisions is not counted by an instance of
25            'out-frames-collision-single' or
26            'out-frames-collision-multiple' objects.";
27        reference
28            "IEEE Std 802.3, 30.3.1.1.9
29            aFramesWithDeferredXmissions";
30    }
31    leaf out-frames-collisions-excessive {
32        type yang:counter64;
33        units "frames";
34        description
35            "A count of frames for which transmission on a particular
36            Ethernet interface fails due to excessive collisions.";
37        reference
38            "IEEE Std 802.3, 30.3.1.1.11 aFramesAbortedDueToXSColls";
39    }
40    leaf out-collisions-late {
41        type yang:counter64;
42        units "collisions";
43        description
44            "The number of times that a collision is detected on a
45            particular Ethernet interface later than one slotTime
46            into the transmission of a packet.
47            A (late) collision included in a count represented by an
48            instance of this object is also considered as a
49            (generic) collision for purposes of other
50            collision-related statistics.";
51        reference
52            "IEEE Std 802.3, 30.3.1.1.10 aLateCollisions";
53    }
54    leaf out-errors-carrier-sense {
55        type yang:counter64;
56        units "errors";
57        description
58            "The number of times that the carrier sense condition was
59            lost or never asserted when attempting to transmit a
```

```
1         frame on a particular Ethernet interface.
2         The count represented by an instance of this object is
3         incremented at most once per transmission attempt, even
4         if the carrier sense condition fluctuates during a
5         transmission attempt.";
6     reference
7     "IEEE Std 802.3, 30.3.1.1.13 aCarrierSenseErrors";
8 }
9 list collision-histogram {
10     key "collision-count";
11     description
12     "A collection of collision histograms for a particular
13     interface.";
14     reference
15     "IEEE Std 802.3, 30.3.1.1.30 aCollisionFrames";
16     leaf collision-count {
17         type yang:counter64;
18         units "collisions";
19         description
20         "The number of per-frame media collisions for which a
21         particular collision histogram cell represents the
22         frequency on a particular interface.";
23     }
24     leaf collision-count-frames {
25         type yang:counter64;
26         units "frames";
27         description
28         "A count of individual MAC frames for which the
29         transmission (successful or otherwise) on a particular
30         interface occurs after the frame has experienced
31         exactly the number of collisions in the associated
32         dot3CollCount object.
33         For example, a frame which is transmitted on an
34         interface after experiencing exactly 4 collisions
35         would be indicated by incrementing only
36         collision-count-frames object associated with the
37         collision-count value of 4. No other instance of
38         collision-count-frames would be incremented in this
39         example.";
40     }
41 }
42 }
43 }
44 }
45 }
```

5.3.2.3 Ethernet MAC merge module

Editor's Note (to be removed prior to publication):

Pretty printing of ieee802-mac-merge.yang file may change the appearance by adding whitespace and reformatting lines

Editor's Note (to be removed prior to publication):

IEEE Std 802.3.1 and IEEE Std 802.3.2 to be updated at the publication time

Editor's Note (to be removed prior to publication):

MAC merge yang module is missing descriptions marked with "Missing description D1.2 2024-04-04"

```
module ieee802-ethernet-mac-merge {
  yang-version 1.1;
  namespace "urn:ieee:std:802.3:yang:ieee802-ethernet-mac-merge";
  prefix mac-merge;

  import ietf-yang-types {
    prefix yang;
    reference
      "IETF RFC 6991";
  }
  import ietf-interfaces {
    prefix if;
    reference
      "IETF RFC 8343";
  }
  import ieee802-ethernet-interface {
    prefix ieee802-eth-if;
    reference
      "IEEE Std 802.3.2-2019";
  }

  organization
    "IEEE Std 802.3 Ethernet Working Group
    Web URL: http://www.ieee802.org/3/";
  contact
    "Web URL: http://www.ieee802.org/3/";
  description
    "The Yang model for managing devices that support the MAC merge
    sublayer as defined in Clause 99. Unless otherwise indicated,
    the references in this model module are to
    IEEE Std 802.3-2022.";

  revision 2024-08-17 {
    description
      "Updates under IEEE Std 802.3.2-202x, Draft D3.0";
    reference
      "IEEE Std 802.3-2022, unless dated explicitly";
  }
}
```

```
1     feature mac-merge {
2         description
3             "Each Port supports the MAC merge sublayer.";
4         reference
5             "IEEE Std 802.3-2022";
6     }
7
8     augment "/if:interfaces/if:interface/ieee802-eth-if:ethernet" {
9         if-feature "mac-merge";
10        description
11            "Missing description D1.2 2024-04-04";
12        container mac-merge {
13            description
14                "Missing description D1.2 2024-04-04";
15            container admin-control {
16                description
17                    "Missing description D1.2 2024-04-04";
18                leaf merge-enable-tx {
19                    type enumeration {
20                        enum Disabled {
21                            description
22                                "Transmit preemption is disabled";
23                        }
24                        enum Enabled {
25                            description
26                                "Transmit preemption is enabled";
27                        }
28                    }
29                default "Disabled";
30            }
31            description
32                "This attribute indicates (when accessed via a
33                READ operation) the status of the MAC Merge
34                sublayer on the given device in the
35                transmit direction. The status of the
36                MAC Merge sublayer may be modified to the
37                indicated value via a WRITE operation.
38                This attribute maps to the variable pEnable
39                (see 99.4.7.3).";
40            reference
41                "IEEE Std 802.3, 30.14.1.3";
42        }
43        leaf verify-disable-tx {
44            type enumeration {
45                enum Disabled {
46                    description
47                        "Verify is disabled";
48                }
49                enum Enabled {
50                    description
51                        "Verify is enabled";
52                }
53            }
54            default "Disabled";
55            description
56                "This attribute indicates (when accessed
57                via a READ operation) the status of the
58                Verify function of MAC Merge sublayer on
59                the given device in the transmit
60                direction. The status of the Verify
```

```
1         function may be modified to the indicated
2         value via a read-write operation.
3         This attribute maps to the variable
4         disableVerify (see 99.4.7.3).";
5     reference
6         "IEEE Std 802.3, 30.14.1.4";
7
8 }
9 leaf verify-time {
10     type uint16 {
11         range "1..128";
12     }
13     units "milliseconds";
14     default "10";
15     description
16         "The value of this attribute defines the
17         nominal wait time between verification
18         attempts in milliseconds.
19         Valid range is 1 to 128 inclusive.
20         The default value is 10. This attribute
21         maps to the variable verifyTime
22         (see 99.4.7.3).";
23     reference
24         "IEEE Std 802.3, 30.14.1.6";
25 }
26 leaf frag-size {
27     type uint8 {
28         range "0..3";
29     }
30     default "0";
31     description
32         "A 2-bit integer value used to indicate
33         the value of addFragSize variable used by
34         the Transmit Processing State Diagram
35         (see Figure IEEE Std 802.3, 99-5).";
36     reference
37         "IEEE Std 802.3, 30.14.1.7";
38 }
39 }
40
41 container admin-status {
42     config false;
43     description
44         "Missing description D1.2 2024-04-04";
45     leaf merge-support {
46         type enumeration {
47             enum Supported {
48                 description
49                     "MAC Merge sublayer is
50                     supported on the device";
51             }
52             enum NotSupported {
53                 description
54                     "MAC Merge sublayer is not
55                     supported on the device";
56             }
57         }
58     }
59     description
60         "This attribute indicates (when accessed
61         via a READ operation) whether the given
62         device supports a MAC Merge sublayer.
```

```
1         The WRITE operation shall have no effect
2         on a device.";
3     reference
4         "IEEE Std 802.3, 30.14.1.1";
5     }
6     leaf verify-status {
7         type enumeration {
8             enum unknown {
9                 description
10                    "Verification status is unknown";
11            }
12            enum initial {
13                description
14                    "The Verify State diagram
15                     Figure 99-8 IEEE Std 802.3 is in
16                     the state INIT_VERIFICATION";
17            }
18            enum verifying {
19                description
20                    "The Verify State diagram is in
21                     the state VERIFICATION_IDLE,
22                     SEND_VERIFY or WAIT_FOR_RESPONSE";
23            }
24            enum succeeded {
25                description
26                    "Indicates that the Verify State
27                     diagram is in the state VERIFIED";
28            }
29            enum failed {
30                description
31                    "The Verify State diagram is in
32                     the state VERIFY_FAIL";
33            }
34            enum disabled {
35                description
36                    "Verification of
37                     preemption operation is disabled";
38            }
39        }
40        description
41            "This attribute indicates (when accessed
42             via a READ operation) the status of the
43             MAC Merge sublayer verification on the
44             given device. The WRITE operation shall
45             have no effect on a device.";
46        reference
47            "IEEE Std 802.3, 30.14.1.2";
48    }
49    leaf status-tx {
50        type enumeration {
51            enum unknown {
52                description
53                    "transmit preemption status is
54                     unknown";
55            }
56            enum inactive {
57                description
58                    "transmit preemption is inactive";
59            }
60        }
61    }
```

```
1         enum active {
2             description
3                 "transmit preemption is active";
4         }
5     }
6     description
7         "This attribute indicates (when accessed
8         via a READ operation) the status of the
9         MAC Merge sublayer on the given device in
10        the transmit direction. The SET operation
11        shall have no effect on a device. This
12        attribute maps to the variable preempt
13        (see 99.4.7.3).";
14    reference
15        "IEEE Std 802.3, 30.14.1.5";
16    }
17 }
18 }
19 container statistics {
20     config false;
21     description
22         "Missing description D1.2 2024-04-04";
23     leaf assembly-error-count {
24         type yang:counter64;
25         description
26             "A count of MAC frames with reassembly
27             errors. The counter is incremented by one
28             every time the ASSEMBLY_ERROR state in
29             the Receive Processing State Diagram is
30             entered";
31         reference
32             "IEEE Std 802.3, 30.14.1.8";
33     }
34     leaf smd-error-count {
35         type yang:counter64;
36         description
37             "A count of received MAC frames / MAC
38             frame fragments rejected due to unknown
39             SMD value or arriving with an SMD-C when
40             no frame is in progress. The counter is
41             incremented by one every time the
42             BAD_FRAG state in the Receive Processing
43             State Diagram is entered and every time
44             the WAIT_FOR_DV_FALSE state is entered
45             due to the invocation of the SMD_DECODE
46             function returning the value ERR";
47         reference
48             "IEEE Std 802.3, 30.14.1.9";
49     }
50     leaf assembly-ok-count {
51         type yang:counter64;
52         description
53             "count of MAC frames that were
54             successfully reassembled and delivered to
55             MAC. The counter is incremented by one
56             every time the FRAME_COMPLETE state in the
57             Receive Processing state diagram
58             (see Figure 99-6) is entered if the state
59             CHECK_FOR_RESUME was previously entered
60             while processing the packet";
```

```
1         reference
2             "IEEE Std 802.3, 30.14.1.10";
3     }
4     leaf fragment-count-rx {
5         type yang:counter64;
6         description
7             "A count of the number of additional
8              mPackets received due to preemption.
9              The counter is incremented by one every
10             time the state CHECK_FRAG_CNT in the
11             Receive Processing State Diagram
12             (see Figure 99-6) is entered";
13         reference
14             "IEEE Std 802.3, 30.14.1.11";
15     }
16     leaf fragment-count-tx {
17         type yang:counter64;
18         description
19             "A count of the number of additional
20             mPackets transmitted due to preemption.
21             This counter is incremented by one every
22             time the SEND_SMD_C state in the Transmit
23             Processing State Diagram
24             (see Figure 99-5) is entered.";
25         reference
26             "IEEE Std 802.3, 30.14.1.12";
27     }
28     leaf hold-count {
29         type yang:counter64;
30         description
31             "A count of the number of times the
32             variable hold (see 99.4.7.3) transitions
33             from FALSE to TRUE.";
34         reference
35             "IEEE Std 802.3, 30.14.1.13";
36     }
37 }
38 }
39 }
40 }
41 }
42 }
43 }
44 }
```

5.3.2.4 Ethernet LLDP module

Editor's Note (to be removed prior to publication):

Pretty printing of ieee802-ethernet-lldp.yang file may change the appearance by adding whitespace and reformatting lines

Editor's Note (to be removed prior to publication):

IEEE Std 802.3.1 and IEEE Std 802.3.2 to be updated at the publication time

```
60 module ieee802-ethernet-lldp {
61     yang-version 1.1;
62     namespace "urn:ieee:std:802.3:yang:ieee802-ethernet-lldp";
63     prefix ieee802-eth-lldp;
64 }
65
```



```
1  import ieee802-dot1ab-lldp {
2      prefix lldp;
3      reference
4          "IEEE Std 802.1ABcu-2021";
5  }
6
7  organization
8      "IEEE Std 802.3 Ethernet Working Group
9      Web URL: http://www.ieee802.org/3/";
10
11  contact
12      "Web URL: http://www.ieee802.org/3/";
13
14  description
15      "This module contains YANG definitions for configuring LLDP for
16      802.3 Ethernet Interfaces.
17      In this YANG module, 'Ethernet interface' can be interpreted
18      as referring to 'IEEE Std 802.3 compliant Ethernet
19      interfaces'.";
20
21  revision 2024-08-17 {
22      description
23          "Updates under IEEE Std 802.3.2-202x, Draft D3.0";
24      reference
25          "IEEE Std 802.3-2022, unless dated explicitly";
26  }
27
28  typedef port-class-type {
29      type enumeration {
30          enum p-class-pse {
31              value 0;
32              description
33                  "Power Sourcing Equipment";
34          }
35          enum p-class-pd {
36              value 1;
37              description
38                  "Powered Device";
39          }
40      }
41      description
42          "Enumeration for the power port class";
43      reference
44          "IEEE Std 802.3, 30.12.2.1.5";
45  }
46
47  typedef pse-pinout-type {
48      type enumeration {
49          enum signal {
50              value 0;
51              description
52                  "PSE Pinout Alternative A";
53          }
54          enum spare {
55              value 1;
56              description
57                  "PSE Pinout Alternative B";
58          }
59      }
60      description
61          "Enumeration for the pinout alternatives used for PD
62
63
64
65
```

```
1      detection and power ";
2      reference
3          "IEEE Std 802.3, 30.12.2.1.9";
4  }
5
6  typedef pse-power-class-type {
7      type enumeration {
8          enum class0 {
9              value 0;
10             description
11                 "Class 0 PD";
12             }
13             enum class1 {
14                 value 1;
15                 description
16                     "Class 1 PD";
17             }
18             enum class2 {
19                 value 2;
20                 description
21                     "Class 2 PD";
22             }
23             enum class3 {
24                 value 3;
25                 description
26                     "Class 3 PD";
27             }
28             enum class4 {
29                 value 4;
30                 description
31                     "Class 4 PD";
32             }
33         }
34         description
35             "Enumeration for the PD class";
36         reference
37             "IEEE Std 802.3, 30.12.2.1.10";
38     }
39
40     typedef power-class-ext-AB-type {
41         type enumeration {
42             enum singlesig {
43                 value 0;
44                 description
45                     "Single-signature PD or 2-pair only PSE";
46             }
47             enum class1 {
48                 value 1;
49                 description
50                     "Class 1";
51             }
52             enum class2 {
53                 value 2;
54                 description
55                     "Class 2";
56             }
57             enum class3 {
58                 value 3;
59                 description
```

```
1         "Class 3";
2     }
3     enum class4 {
4         value 4;
5         description
6             "Class 4";
7     }
8     enum class5 {
9         value 5;
10        description
11            "Class 5";
12    }
13 }
14 }
15 description
16     "Enumeration for the assigned power class ";
17 reference
18     "IEEE Std 802.3, 30.12.3.1.26";
19 }
20
21
22 typedef power-class-ext-type {
23     type enumeration {
24         enum dualsig {
25             value 0;
26             description
27                 "Dual-signature PD";
28         }
29         enum class1 {
30             value 1;
31             description
32                 "Class 1";
33         }
34         enum class2 {
35             value 2;
36             description
37                 "Class 2";
38         }
39         enum class3 {
40             value 3;
41             description
42                 "Class 3";
43         }
44         enum class4 {
45             value 4;
46             description
47                 "Class 4";
48         }
49         enum class5 {
50             value 5;
51             description
52                 "Class 5";
53         }
54         enum class6 {
55             value 6;
56             description
57                 "Class 6";
58         }
59         enum class7 {
60             value 7;
61             description
```

```
1         "Class 7";
2     }
3     enum class8 {
4         value 8;
5         description
6             "Class 8";
7     }
8 }
9
10 description
11     "Enumeration for the assigned power class ";
12 reference
13     "IEEE Std 802.3, 30.12.3.1.28";
14 }
15
16 typedef power-type {
17     type enumeration {
18         enum type4dualsigPD {
19             value 0;
20             description
21                 "Type 4 dual-signature PD";
22         }
23         enum type4singlesigPD {
24             value 1;
25             description
26                 "Type 4 single-signature PD";
27         }
28         enum type3dualsigPD {
29             value 2;
30             description
31                 "Type 3 dual-signature PD";
32         }
33         enum type3singlesigPD {
34             value 3;
35             description
36                 "Type 3 single-signature PD";
37         }
38         enum type4PSE {
39             value 4;
40             description
41                 "Type 4 PSE";
42         }
43         enum type3PSE {
44             value 5;
45             description
46                 "Type 3 PSE";
47         }
48     }
49 }
50 description
51     "Enumeration for the PD class";
52 reference
53     "IEEE Std 802.3, 30.12.2.1.29";
54 }
55
56 typedef power-priority-type {
57     type enumeration {
58         enum low {
59             value 0;
60             description
61                 "low priority PD";
```

```
1      }
2      enum high {
3          value 1;
4          description
5              "high priority PD";
6      }
7      enum critical {
8          value 2;
9          description
10             "critical priority PD";
11      }
12      enum unknown {
13          value 3;
14          description
15              "priority unknown";
16      }
17  }
18  }
19  description
20      "Enumeration for possible priorities of a PD system";
21  reference
22      "IEEE Std 802.3, 30.12.2.1.16";
23  }
24
25
26  typedef power-source-type {
27      type enumeration {
28          enum pse-primary {
29              value 0;
30              description
31                  "PSE powered by a primary power source";
32          }
33          enum pse-backup {
34              value 1;
35              description
36                  "PSE powered by a backup power source";
37          }
38          enum pse-unknown {
39              value 2;
40              description
41                  "PSE powered by an unknown power source";
42          }
43          enum pd-pse-and-local {
44              value 3;
45              description
46                  "PD powered by a PSE and locally";
47          }
48          enum pd-local-only {
49              value 4;
50              description
51                  "PD powered only locally";
52          }
53          enum pd-pse-only {
54              value 5;
55              description
56                  "PD powered by PD only";
57          }
58          enum pd-unknown {
59              value 6;
60              description
61                  "PD powered by an unknown source";
62          }
63      }
64  }
```

```
1      }
2    }
3    description
4      "Enumeration for the power sources of the
5       remote system. When the remote system is a PSE, it
6       indicates whether it is being powered by a primary
7       power source; a backup power source; or unknown.
8       When the remote system is a PD, it indicates whether
9       it is being powered by a PSE and locally;
10      locally only; by a PSE only; or unknown.";
11    reference
12      "IEEE Std 802.3, 30.12.2.1.15";
13  }
14
15
16  typedef powering-status-type {
17    type enumeration {
18      enum 4PdualsigPD {
19        value 0;
20        description
21          "4-pair powering a dual-signature PD";
22      }
23      enum 4PsigPD {
24        value 1;
25        description
26          "4-pair powering a single-signature PD";
27      }
28      enum 2P {
29        value 2;
30        description
31          "2-pair powering";
32      }
33    }
34    description
35      "Enumeration for the power status of the PSE";
36    reference
37      "IEEE Std 802.3, 30.12.2.1.23";
38  }
39
40
41
42  typedef powered-status-type {
43    type enumeration {
44      enum 4PdualsigPD {
45        value 0;
46        description
47          "4-pair powered dual-signature PD";
48      }
49      enum 2PdualsigPD {
50        value 1;
51        description
52          "2-pair powered dual-signature PD";
53      }
54      enum sigPD {
55        value 2;
56        description
57          "powered single-signature PD";
58      }
59    }
60    description
61      "Enumeration for the power status of the PSE";
62    reference
```

```
1      "IEEE Std 802.3, 30.12.2.1.24";
2  }
3
4  typedef power-pairs-type {
5      type enumeration {
6          enum altA {
7              value 0;
8              description
9                  "Alternative A";
10         }
11         enum altB {
12             value 1;
13             description
14                 "Alternative B";
15         }
16         enum both {
17             value 2;
18             description
19                 "both";
20         }
21     }
22 }
23
24 description
25     "Enumeration for the PSE Pinout Alternative";
26 reference
27     "IEEE Std 802.3, 30.12.2.1.25";
28
29 }
30
31 augment "/lldp:lldp/lldp:port" {
32     description
33         "Augments port with 802.3 port config tlvs";
34     leaf tlvs-port-config-enable {
35         type bits {
36             bit mac-phy-config-status {
37                 position 0;
38                 description
39                     "IEEE Std 802.3, 30.12.1.1.1";
40             }
41             bit power-via-mdi {
42                 position 1;
43                 description
44                     "IEEE Std 802.3, 30.12.1.1.1";
45             }
46             bit unused {
47                 position 2;
48                 description
49                     "IEEE Std 802.3, 30.12.1.1.1";
50             }
51             bit max-frame-size {
52                 position 3;
53                 description
54                     "IEEE Std 802.3, 30.12.1.1.1";
55             }
56             bit eee-tlv {
57                 position 4;
58                 description
59                     "IEEE Std 802.3, 30.12.1.1.1";
60             }
61             bit eee-fast-wake-tlv {
62                 position 5;
```

```
1         description
2             "IEEE Std 802.3, 30.12.1.1.1";
3     }
4     bit additional-ethernet-capabilities-tlv {
5         position 6;
6         description
7             "IEEE Std 802.3, 30.12.1.1.1";
8     }
9 }
10 }
11 description
12     "Bitmap that corresponds to an IEEE 802.3 subtype
13     associated with a specific IEEE 802.3 port config TLV";
14 reference
15     "IEEE Std 802.3, 30.12.1.1.1";
16 }
17 leaf auto-negotiation-supported {
18     type boolean;
19     config false;
20     description
21         "True if the port supports Auto-negotiation";
22     reference
23         "IEEE Std 802.3, 30.12.2.1.1";
24 }
25 leaf auto-negotiation-enabled {
26     type boolean;
27     config false;
28     description
29         "True if Auto-negotiation is enabled";
30     reference
31         "IEEE Std 802.3, 30.12.2.1.2";
32 }
33 leaf auto-negotiation-cap {
34     type binary {
35         length "2";
36     }
37     config false;
38     description
39         "A read-only 2-octet value that contains the value (bitmap)
40         of the ifMauAutoNegCapAdvertisedBits object
41         (defined in IETF RFC 4836) which is associated with the
42         given port on the local system.";
43     reference
44         "IEEE Std 802.3, 30.12.2.1.3";
45 }
46 leaf operational-mau-type {
47     type int32;
48     config false;
49     description
50         "32-bit integer value that indicates the operational MAU
51         type of the given port";
52     reference
53         "IEEE Std 802.3, 30.12.2.1.4";
54 }
55 leaf power-port-class {
56     type port-class-type;
57     config false;
58     description
59         "A read-only value that identifies the port Class of the
60         given port";
61 }
```



```
1      reference
2          "IEEE Std 802.3, 30.12.2.1.5";
3  }
4  leaf mdi-power-supported {
5      type boolean;
6      config false;
7      description
8          "True if MDI power is supported";
9      reference
10         "IEEE Std 802.3, 30.12.2.1.6";
11  }
12  leaf mdi-power-enabled {
13      type boolean;
14      config false;
15      description
16          "True if MDI power is enabled";
17      reference
18         "IEEE Std 802.3, 30.12.2.1.7";
19  }
20  leaf power-pair-controlable {
21      type boolean;
22      config false;
23      description
24          "True if the pair selection can be controlled";
25      reference
26         "IEEE Std 802.3, 30.12.2.1.8";
27  }
28  leaf power-pairs {
29      type pse-pinout-type;
30      config false;
31      description
32          "Indicates which pinout alternative is used for PD detection
33          and power";
34      reference
35         "IEEE Std 802.3, 30.12.2.1.9";
36  }
37  leaf local-power-class {
38      type pse-power-class-type;
39      config false;
40      description
41          "PD Power Class";
42      reference
43         "IEEE Std 802.3, 30.12.2.1.10";
44  }
45  leaf link-aggregation-status {
46      type bits {
47          bit aggregation-capability {
48              position 0;
49              description
50                  "IEEE Std 802.3, 79.3.3.1";
51          }
52          bit aggregation-status {
53              position 1;
54              description
55                  "IEEE Std 802.3, 79.3.3.1";
56          }
57      }
58      config false;
59      description
```

```
1         "The bitmap value which contains the link aggregation
2         capabilities and the current aggregation
3         status of the link";
4     reference
5         "IEEE Std 802.3, 30.12.2.1.11";
6 }
7 leaf aggregation-port-id {
8     type int32;
9     config false;
10    description
11        "The unique identifier allocated to this Aggregation Port
12        by the local System.";
13    reference
14        "IEEE Std 802.3, 30.12.2.1.12";
15 }
16 leaf local-max-frame-size {
17     type int32;
18     config false;
19     description
20        "An integer value indicating the maximum supported frame
21        size in octets on the given port of the local system.";
22    reference
23        "IEEE Std 802.3, 30.12.2.1.13";
24 }
25 leaf power-type {
26     type bits {
27         bit type1-or-greater {
28             position 0;
29             description
30                 "0-type1, 1-greater than type1";
31         }
32         bit pse-or-pd {
33             position 1;
34             description
35                 "0-pse, 1-pd";
36         }
37     }
38     config false;
39     description
40        "A read-only attribute that returns a bit string indicating
41        whether the local system is a PSE or a PD and whether it
42        is Type 1 or greater than Type 1. The first bit indicates
43        Type 1 or greater than Type 1. The second bit indicates
44        PSE or PD. A PSE sets this bit to indicate a PSE. A PD sets
45        this bit to indicate a PD. See also
46        aLldpXdot3LocPowerTypeExt..";
47    reference
48        "IEEE Std 802.3, 30.12.2.1.14";
49 }
50 leaf power-source {
51     type power-source-type;
52     config false;
53     description
54        "Indicates the power sources of the local system. A PSE
55        indicates whether it is being powered by a primary power
56        source; a backup power source; or unknown. A PD indicates
57        whether it is being powered by a PSE and locally; by a PSE
58        only; or unknown.";
59    reference
```

```
1      "IEEE Std 802.3, 30.12.2.1.15";
2  }
3  leaf local-power-priority {
4      type power-priority-type;
5      description
6          "Priority of a PD system. For a PSE, this is the priority
7           that the PSE assigns to the PD. For a PD, this is the
8           priority that the PD requests from the PSE";
9      reference
10         "IEEE Std 802.3, 30.12.2.1.16";
11  }
12  leaf pd-requested-power-value {
13      type int32;
14      config false;
15      description
16          "PD requested power value. For a PD, it is the power value
17           that the PD has currently requested from the remote
18           system. For a PSE, it is the power value that the PSE
19           mirrors back to the remote system";
20      reference
21         "IEEE Std 802.3, 30.12.2.1.17";
22  }
23  leaf pd-requested-power-value-a {
24      type int32;
25      config false;
26      description
27          "A read-only attribute that returns the PD requested power
28           value for the Mode A pairset in units of 0.1 W. For a PD,
29           it is the power value that the PD has currently requested
30           from the remote system for the Mode A pairset. For a PSE,
31           it is the power value for the Alternative A pairset that
32           the PSE echoes back to the remote system";
33      reference
34         "IEEE Std 802.3, 30.12.2.1.18";
35  }
36  leaf pd-requested-power-value-b {
37      type int32;
38      config false;
39      description
40          "A read-only attribute that returns the PD requested power
41           value for the Mode B pairset in units of 0.1 W.
42           For a PD, it is the power value that the PD has currently
43           requested from the remote system for the Mode B pairset.
44           For a PSE, it is the power value for the Alternative B
45           pairset that the PSE echoes back to the remote system";
46      reference
47         "IEEE Std 802.3, 30.12.2.1.19";
48  }
49  leaf pse-allocated-power-value {
50      type int32;
51      config false;
52      description
53          "PSE allocated power value. For a PSE, it is the power
54           value that the PSE has currently allocated to the remote
55           system. For a PD, it is the power value that the PD mirrors
56           back to the remote system";
57      reference
58         "IEEE Std 802.3, 30.12.2.1.20";
59  }
60  }
```

```
1     leaf pse-allocated-power-value-a {
2         type int32;
3         config false;
4         description
5             " PSE allocated power value for the Alternative A pairset
6               in units of 0.1 W. For a PSE, it is the power value for the
7               Alternative A pairset that the PSE has currently allocated
8               to the remote system. For a PD, it is the power value for
9               the Mode A pairset that the PD echoes back to the remote
10              system.";
11         reference
12             "IEEE Std 802.3, 30.12.2.1.21";
13     }
14     leaf pse-allocated-power-value-b {
15         type int32;
16         config false;
17         description
18             "PSE allocated power value for the Alternative B pairset
19               in units of 0.1 W. For a PSE, it is the power value for the
20               Alternative B pairset that the PSE has currently
21               allocated to the remote system. For a PD, it is the power
22               value for the Mode B pairset that the PD echoes back to the
23               remote system.";
24         reference
25             "IEEE Std 802.3, 30.12.2.1.22";
26     }
27     leaf pse-powering-status {
28         type powering-status-type;
29         config false;
30         description
31             "A read only value that indicates the powering status of
32               the PSE. For a PD, the contents of this
33               attribute are undefined.";
34         reference
35             "IEEE Std 802.3, 30.12.2.1.23";
36     }
37     leaf pd-powered-status {
38         type powered-status-type;
39         config false;
40         description
41             " A read only value that indicates the powering status of
42               the PD. For a PSE, the contents of this attribute are
43               undefined";
44         reference
45             "IEEE Std 802.3, 30.12.2.1.24";
46     }
47     leaf power-pairs-ext {
48         type power-pairs-type;
49         config false;
50         description
51             " A read-only value that identifies the supported PSE
52               Pinout Alternative specified in 145.2.4. For a PSE, this
53               attribute contains the value of the aPSEPowerPairs
54               attribute (see 30.9.1.1.4). For a PD, the contents of this
55               attribute are undefined";
56         reference
57             "IEEE Std 802.3, 30.12.2.1.25";
58     }
59     leaf power-class-ext-A {
```

```
1      type power-class-ext-AB-type;
2      config false;
3      description
4          "For a dual-signature PD, a read-only value that indicates
5           the requested Class for Mode A during Physical Layer
6           Classification (see 145.3.6). For a single-signature PD, a
7           read-only value set to â€šinglesigâ€™. For a PSE connected to
8           a dual-signature PD, a read-only value that indicates the
9           currently assigned Class for Mode A (see 145.2.8). For a
10          PSE connected to a single-signature PD or a PSE that
11          operates only in 2-pair mode, a read-only value set to
12          â€šinglesigâ€™";
13      reference
14          "IEEE Std 802.3, 30.12.2.1.26";
15  }
16  leaf power-class-ext-B {
17      type power-class-ext-AB-type;
18      config false;
19      description
20          "For a dual-signature PD, a read-only value that indicates
21           the requested Class for Mode B during Physical Layer
22           Classification (see 145.3.6). For a single-signature PD,
23           a read-only value set to â€šinglesigâ€™. For a PSE connected to
24           a dual-signature PD, a read-only value that indicates the
25           currently assigned Class for Mode B (see 145.2.8). For a
26           PSE connected to a single-signature PD or a PSE that
27           operates only in 2-pair mode, a read-only value set to
28           â€šinglesigâ€™";
29      reference
30          "IEEE Std 802.3, 30.12.2.1.27";
31  }
32  leaf power-class-ext {
33      type power-class-ext-type;
34      config false;
35      description
36          "For a single-signature PD, a read-only value that
37           indicates the requested Class during Physical
38           Layer Classification (see 145.3.6). For a dual-signature
39           PD, a read-only value set to â€šdualsigâ€™.
40           For a PSE connected to a single-signature PD or a PSE that
41           operates only in 2-pair mode, a read-only value that
42           indicates the currently assigned Class (see 145.2.8).
43           For a PSE connected to a dual-signature PD,
44           a read-only value set to â€šdualsigâ€™.â€™";
45      reference
46          "IEEE Std 802.3, 30.12.2.1.28";
47  }
48  leaf power-type-ext {
49      type power-type;
50      config false;
51      description
52          "A read-only attribute that returns a value to indicate if
53           the local system is a Type 3 or Type 4 PSE or PD and, in
54           the case of a Type 3 or Type 4 PD, if it is a
55           single-signature PD or a dual-signature
56           PD";
57      reference
58          "IEEE Std 802.3, 30.12.2.1.29";
59  }
```

```
1     leaf pd-load {
2         type boolean;
3         config false;
4         description
5             "For a dual-signature PD, a read-only attribute that
6             returns whether the load of a dual-signature PD is
7             electrically isolated, as defined in 79.3.2.10.2. For a
8             single-signature PD or a PSE, the value of this attribute
9             is FALSE";
10        reference
11            "IEEE Std 802.3, 30.12.2.1.30";
12    }
13    leaf pd-4pid {
14        type boolean;
15        config false;
16        description
17            "A read-only Boolean attribute indicating whether the local
18            PD system supports powering of both PD Modes.";
19        reference
20            "IEEE Std 802.3, 30.12.2.1.31";
21    }
22    leaf pse-max-avail-power {
23        type int32;
24        config false;
25        description
26            "A read-only attribute that returns the local PSE maximum
27            available power value in units of 0.1 W";
28        reference
29            "IEEE Std 802.3, 30.12.2.1.32";
30    }
31    leaf pse-autoclass-support {
32        type boolean;
33        config false;
34        description
35            "Indicates whether the local PSE system supports Autoclass.";
36        reference
37            "IEEE Std 802.3, 30.12.2.1.33";
38    }
39    leaf autoclass-completed {
40        type boolean;
41        config false;
42        description
43            "Indicates whether the local PSE system has completed the
44            Autoclass measurement.";
45        reference
46            "IEEE Std 802.3, 30.12.2.1.34";
47    }
48    leaf autoclass-request {
49        type boolean;
50        config false;
51        description
52            "A read-only Boolean attribute indicating whether the local
53            PD system is requesting an Autoclass measurement.";
54        reference
55            "IEEE Std 802.3, 30.12.2.1.35";
56    }
57    leaf power-down-request {
58        type int32;
59        description
```

```
1         "A read-write attribute that indicates the local PD system
2         is requesting a power down when the value is 0x1D.>";
3     reference
4         "IEEE Std 802.3, 30.12.2.1.36";
5 }
6 leaf power-down-time {
7     type int32;
8     description
9         "A read-write attribute that indicates the number of
10        seconds the PD requests to stay powered off. A value of
11        zero indicates an indefinite amount of time.";
12     reference
13         "IEEE Std 802.3, 30.12.2.1.37";
14 }
15 leaf meas-voltage-support {
16     type boolean;
17     config false;
18     description
19         "A read-only attribute that indicates the local device is
20        capable of providing a voltage measurement.";
21     reference
22         "IEEE Std 802.3, 30.12.2.1.38";
23 }
24 leaf meas-current-support {
25     type boolean;
26     config false;
27     description
28         "A read-only attribute that indicates the local device is
29        capable of providing a current measurement.";
30     reference
31         "IEEE Std 802.3, 30.12.2.1.39";
32 }
33 leaf meas-power-support {
34     type boolean;
35     config false;
36     description
37         "A read-only attribute that indicates the local device is
38        capable of providing a power measurement.";
39     reference
40         "IEEE Std 802.3, 30.12.2.1.40";
41 }
42 leaf meas-energy-support {
43     type boolean;
44     config false;
45     description
46         "A read-only attribute that indicates the local device is
47        capable of providing a energy measurement.";
48     reference
49         "IEEE Std 802.3, 30.12.2.1.41";
50 }
51 leaf measurement-source {
52     type bits {
53         bit bit1 {
54             position 0;
55             description
56                 "-";
57         }
58         bit bit2 {
59             position 1;
```

```
1         description
2             "-";
3     }
4 }
5 description
6     "A read-write attribute value that indicates to local
7     device on which Alternative or Mode the measurement
8     is to be taken";
9 reference
10     "IEEE Std 802.3, 30.12.2.1.42";
11 }
12 leaf meas-voltage-request {
13     type boolean;
14     config false;
15     description
16         "A read-only attribute that indicates the local device is
17         requesting a voltage measurement from the remote device.";
18     reference
19         "IEEE Std 802.3, 30.12.2.1.43";
20 }
21 leaf meas-current-request {
22     type boolean;
23     config false;
24     description
25         "A read-only attribute that indicates the local device is
26         requesting a current measurement from the remote device.";
27     reference
28         "IEEE Std 802.3, 30.12.2.1.44";
29 }
30 leaf meas-power-request {
31     type boolean;
32     config false;
33     description
34         "A read-only attribute that indicates the local device is
35         requesting a power measurement from the remote device.";
36     reference
37         "IEEE Std 802.3, 30.12.2.1.45";
38 }
39 leaf meas-energy-request {
40     type boolean;
41     config false;
42     description
43         "A read-only attribute that indicates the local device is
44         requesting an energy measurement from the remote device.";
45     reference
46         "IEEE Std 802.3, 30.12.2.1.46";
47 }
48 leaf meas-voltage-valid {
49     type boolean;
50     config false;
51     description
52         "A read-only attribute that indicates the local device's
53         voltage measurement is valid.";
54     reference
55         "IEEE Std 802.3, 30.12.2.1.47";
56 }
57 leaf meas-current-valid {
58     type boolean;
59     config false;
```



```
1      description
2          "A read-only attribute that indicates the local device's
3          current measurement is valid.";
4      reference
5          "IEEE Std 802.3, 30.12.2.1.48";
6  }
7  leaf meas-power-valid {
8      type boolean;
9      config false;
10     description
11         "A read-only attribute that indicates the local device's
12         power measurement is valid.";
13     reference
14         "IEEE Std 802.3, 30.12.2.1.49";
15 }
16 leaf meas-energy-valid {
17     type boolean;
18     config false;
19     description
20         "A read-only attribute that indicates the local device's
21         energy measurement is valid.";
22     reference
23         "IEEE Std 802.3, 30.12.2.1.50";
24 }
25 leaf meas-voltage-uncertainty {
26     type int32;
27     config false;
28     description
29         "A read-only attribute that indicates the expanded
30         uncertainty (coverage factor k = 2) for the device's
31         voltage measurement.";
32     reference
33         "IEEE Std 802.3, 30.12.2.1.51";
34 }
35 leaf meas-current-uncertainty {
36     type int32;
37     config false;
38     description
39         "A read-only attribute that indicates the expanded
40         uncertainty (coverage factor k = 2) for the device's
41         current measurement.";
42     reference
43         "IEEE Std 802.3, 30.12.2.1.52";
44 }
45 leaf meas-power-uncertainty {
46     type int32;
47     config false;
48     description
49         "A read-only attribute that indicates the expanded
50         uncertainty (coverage factor k = 2) for the device's
51         power measurement.";
52     reference
53         "IEEE Std 802.3, 30.12.2.1.53";
54 }
55 leaf meas-energy-uncertainty {
56     type int32;
57     config false;
58     description
59         "A read-only attribute that indicates the expanded
```

```
1         uncertainty (coverage factor k = 2) for the device's
2         energy measurement.";
3     reference
4         "IEEE Std 802.3, 30.12.2.1.54";
5 }
6 leaf voltage-measurement {
7     type int32;
8     config false;
9     description
10        "A read-only attribute that returns the measured device
11        voltage.";
12    reference
13        "IEEE Std 802.3, 30.12.2.1.55";
14 }
15 leaf current-measurement {
16     type int32;
17     config false;
18     description
19        "A read-only attribute that returns the measured device
20        current.";
21    reference
22        "IEEE Std 802.3, 30.12.2.1.56";
23 }
24 leaf power-measurement {
25     type int32;
26     config false;
27     description
28        "A read-only attribute that returns the measured device
29        power.";
30    reference
31        "IEEE Std 802.3, 30.12.2.1.57";
32 }
33 leaf energy-measurement {
34     type int32;
35     config false;
36     description
37        "A read-only attribute that returns the measured device
38        energy.";
39    reference
40        "IEEE Std 802.3, 30.12.2.1.58";
41 }
42 leaf pse-power-price-index {
43     type int32;
44     config false;
45     description
46        "A read-only attribute that returns an index of the price
47        of power being sourced by the PSE. For a PD, this value
48        is undefined";
49    reference
50        "IEEE Std 802.3, 30.12.2.1.59";
51 }
52 leaf local-response {
53     type int32;
54     config false;
55     description
56        "The maximum time required to update
57        pse-allocated-power-value";
58    reference
59        "IEEE Std 802.3, 30.12.2.1.60";
60 }
```

```
1      }
2      leaf local-system-ready {
3          type boolean;
4          config false;
5          description
6              "Initialization status of the Data Link Layer
7               classification engine on the local system";
8          reference
9              "IEEE Std 802.3, 30.12.2.1.61";
10     }
11     leaf tx-system-value {
12         type int32;
13         config false;
14         description
15             "Returns the value of Tw_sys_tx that the local system can
16              support in the transmit direction.";
17         reference
18             "IEEE Std 802.3, 30.12.2.1.62";
19     }
20     leaf tx-system-value-echo {
21         type int32;
22         config false;
23         description
24             "Returns the value of Tw_sys_tx that the emote system is
25              advertising that it can support in the transmit direction
26              and is echoed by the local system under the control of the
27              EEE DLL receiver state diagram.";
28         reference
29             "IEEE Std 802.3, 30.12.2.1.63";
30     }
31     leaf rx-system-value {
32         type int32;
33         config false;
34         description
35             "Returns the value of Tw_sys_tx that the local system is
36              requesting in the receive direction.";
37         reference
38             "IEEE Std 802.3, 30.12.2.1.64";
39     }
40     leaf rx-system-value-echo {
41         type int32;
42         config false;
43         description
44             "Returns the value of Tw_sys_tx that the remote system is
45              advertising that it is requesting in the receive direction
46              and is echoed by the local system under the control of the
47              EEE DLL transmitter state diagram.";
48         reference
49             "IEEE Std 802.3, 30.12.2.1.65";
50     }
51     leaf fallback-system-value {
52         type int32;
53         config false;
54         description
55             "Returns the value of the fallback Tw_sys_tx that the local
56              system is advertising to the remote system.";
57         reference
58             "IEEE Std 802.3, 30.12.2.1.66";
59     }
60 }
```

```
1     leaf tx-dll-ready {
2         type boolean;
3         config false;
4         description
5             "Returns the initialization status of the EEE transmit Data
6             Link Layer management function on the local system.";
7         reference
8             "IEEE Std 802.3, 30.12.2.1.67";
9     }
10
11     leaf rx-dll-ready {
12         type boolean;
13         config false;
14         description
15             "Returns the initialization status of the EEE receive Data
16             Link Layer management function on the local system.";
17         reference
18             "IEEE Std 802.3, 30.12.2.1.68";
19     }
20
21     leaf dll-enabled {
22         type boolean;
23         config false;
24         description
25             "Returns the status of the EEE capability negotiation on
26             the local system.";
27         reference
28             "IEEE Std 802.3, 30.12.2.1.69";
29     }
30
31     leaf tx-system-fw {
32         type boolean;
33         config false;
34         description
35             "Returns the value of LPI_FW that the local system can
36             support in the transmit direction.";
37         reference
38             "IEEE Std 802.3, 30.12.2.1.70";
39     }
40
41     leaf tx-system-fw-echo {
42         type boolean;
43         config false;
44         description
45             "Returns the value of LPI_FW that the remote system is
46             advertising that it can support in the transmit direction
47             and is echoed by the local system under the control of the
48             EEE DLL receiver state diagram.";
49         reference
50             "IEEE Std 802.3, 30.12.2.1.71";
51     }
52
53     leaf rx-system-fw {
54         type boolean;
55         config false;
56         description
57             "Returns the value of LPI_FW that the local system is
58             requesting in the receive direction.";
59         reference
60             "IEEE Std 802.3, 30.12.2.1.72";
61     }
62
63     leaf rx-system-fw-echo {
64         type boolean;
65         config false;
```

```
1      description
2          "Returns the value of LPI_FW that the remote system is
3          advertising that it is requesting in the receive direction
4          and is echoed by the local system under the control of the
5          IEEE DDL transmitter state diagram.";
6      reference
7          "IEEE Std 802.3, 30.12.2.1.73";
8  }
9
10 leaf preemption-supported {
11     type boolean;
12     config false;
13     description
14         "Indicates whether the given port (associated with the local
15         System) supports the preemption capability.";
16     reference
17         "IEEE Std 802.3, 30.12.2.1.74";
18 }
19
20 leaf preemption-enabled {
21     type boolean;
22     config false;
23     description
24         "Indicates whether the preemption capability is enabled on
25         the given port associated with the local System.";
26     reference
27         "IEEE Std 802.3, 30.12.2.1.75";
28 }
29
30 leaf preemption-active {
31     type boolean;
32     config false;
33     description
34         "Indicates whether the preemption capability is active on
35         the given port associated with the local System.";
36     reference
37         "IEEE Std 802.3, 30.12.2.1.76";
38 }
39
40 leaf additional-fragment-size {
41     type int32;
42     config false;
43     description
44         "Indicate the minimum size of non-final fragments supported
45         by the receiver on the given port associated with the local
46         System. This value is expressed in units of 64 octets of
47         additional fragment length.";
48     reference
49         "IEEE Std 802.3, 30.12.2.1.77";
50 }
51 }
52
53
54 augment "/lldp:lldp/lldp:port/lldp:remote-systems-data" {
55     description
56         "Augments port with 802.3 port config tlvs";
57     leaf auto-negotiation-supported {
58         type boolean;
59         config false;
60         description
61             "True if the port supports Auto-negotiation";
62         reference
63             "IEEE Std 802.3, 30.12.3.1.1";
64     }
65 }
```

```
1     leaf auto-negotiation-enabled {
2         type boolean;
3         config false;
4         description
5             "True if Auto-negotiation is enabled";
6         reference
7             "IEEE Std 802.3, 30.12.3.1.2";
8     }
9
10    leaf auto-negotiation-cap {
11        type binary {
12            length "2";
13        }
14        config false;
15        description
16            "A read-only 2-octet value that contains the value (bitmap)
17            of the ifMauAutoNegCapAdvertisedBits object (defined in
18            IETF RFC 4836) which is associated with the given port on
19            the local system.";
20        reference
21            "IEEE Std 802.3, 30.12.3.1.3";
22    }
23
24    leaf operational-mau-type {
25        type int32;
26        config false;
27        description
28            "32-bit integer value that indicates the operational MAU
29            type of the given port";
30        reference
31            "IEEE Std 802.3, 30.12.3.1.4";
32    }
33
34    leaf power-port-class {
35        type port-class-type;
36        config false;
37        description
38            "A read-only value that identifies the port Class of the
39            given port";
40        reference
41            "IEEE Std 802.3, 30.12.3.1.5";
42    }
43
44    leaf mdi-power-supported {
45        type boolean;
46        config false;
47        description
48            "True if MDI power is supported";
49        reference
50            "IEEE Std 802.3, 30.12.3.1.6";
51    }
52
53    leaf mdi-power-enabled {
54        type boolean;
55        config false;
56        description
57            "True if MDI power is enabled";
58        reference
59            "IEEE Std 802.3, 30.12.3.1.7";
60    }
61
62    leaf power-pair-controlable {
63        type boolean;
64        config false;
65        description
```

```
1         "True if the pair selection can be controlled";
2     reference
3         "IEEE Std 802.3, 30.12.3.1.8";
4 }
5 leaf power-pairs {
6     type pse-pinout-type;
7     config false;
8     description
9         "Indicates which pinout alternative is used for PD
10         detection and power";
11     reference
12         "IEEE Std 802.3, 30.12.3.1.9";
13 }
14 leaf power-class {
15     type pse-power-class-type;
16     config false;
17     description
18         "PD Power Class";
19     reference
20         "IEEE Std 802.3, 30.12.3.1.10";
21 }
22 leaf link-aggregation-status {
23     type bits {
24         bit aggregation-capability {
25             position 0;
26             description
27                 "IEEE Std 802.3, 79.3.3.1";
28         }
29         bit aggregation-status {
30             position 1;
31             description
32                 "IEEE Std 802.3, 79.3.3.1";
33         }
34         bit bit2-reserved {
35             position 2;
36             description
37                 "IEEE Std 802.3, 79.3.3.1";
38         }
39         bit bit3-reserved {
40             position 3;
41             description
42                 "IEEE Std 802.3, 79.3.3.1";
43         }
44         bit bit4-reserved {
45             position 4;
46             description
47                 "IEEE Std 802.3, 79.3.3.1";
48         }
49         bit bit5-reserved {
50             position 5;
51             description
52                 "IEEE Std 802.3, 79.3.3.1";
53         }
54         bit bit6-reserved {
55             position 6;
56             description
57                 "IEEE Std 802.3, 79.3.3.1";
58         }
59         bit bit7-reserved {
60             position 7;
61             description
62                 "IEEE Std 802.3, 79.3.3.1";
63         }
64     }
65 }
```

```
1         position 7;
2         description
3             "IEEE Std 802.3, 79.3.3.1";
4     }
5 }
6 config false;
7 description
8     "The bitmap value which contains the link aggregation
9     capabilities and the current aggregation status
10    of the link";
11 reference
12     "IEEE Std 802.3, 30.12.3.1.11";
13 }
14 leaf aggregation-port-id {
15     type int32;
16     config false;
17     description
18         "The unique identifier allocated to this Aggregation Port
19         by the local System.";
20     reference
21         "IEEE Std 802.3, 30.12.3.1.12";
22 }
23 leaf local-max-frame-size {
24     type int32;
25     config false;
26     description
27         "An integer value indicating the maximum supported frame
28         size in octets on the given port of the local system.";
29     reference
30         "IEEE Std 802.3, 30.12.3.1.13";
31 }
32 leaf power-type {
33     type bits {
34         bit type1-or-greater {
35             position 0;
36             description
37                 "0-type1, 1-greater than type1";
38         }
39         bit pse-or-pd {
40             position 1;
41             description
42                 "0-pse, 1-pd";
43         }
44     }
45     config false;
46     description
47         "A read-only attribute that returns a bit string indicating
48         whether the local system is a PSE or a PD and whether it
49         is Type 1 or greater than Type 1. The first bit indicates
50         Type 1 or greater than Type 1. The second bit indicates
51         PSE or PD. A PSE sets this bit to indicate a PSE. A PD
52         sets this bit to indicate a PD. See also
53         aLldpXdot3LocPowerTypeExt.";
54     reference
55         "IEEE Std 802.3, 30.12.3.1.14";
56 }
57 leaf power-source {
58     type power-source-type;
59     config false;
```



```
1      description
2          "Indicates the power sources of the remote system. A PSE
3          indicates whether it is being powered by a primary power
4          source; a backup power source; or unknown. A PD indicates
5          whether it is being powered by a PSE and locally; by a PSE
6          only; or unknown.";
7      reference
8          "IEEE Std 802.3, 30.12.3.1.15";
9  }
10
11  leaf power-priority {
12      type power-priority-type;
13      description
14          "The priority of the PD system received from the remote
15          system";
16      reference
17          "IEEE Std 802.3, 30.12.3.1.16";
18  }
19
20  leaf pd-requested-power-value {
21      type int32;
22      config false;
23      description
24          "PD requested power value that was used by the remote
25          system to compute the power value that is has currently
26          allocated to the PD.";
27      reference
28          "IEEE Std 802.3, 30.12.3.1.17";
29  }
30
31  leaf pd-requested-power-value-a {
32      type int32;
33      config false;
34      description
35          "A read-only attribute that returns the PD requested power
36          value for the Mode A pairset that was used by the remote
37          system to compute the power value that it has currently
38          allocated to the PD. For a PSE, it is the PD requested
39          power value for the Alternative A pairset received from
40          the remote system. For a PD, it is the PD requested power
41          value for the Alternative A pairset that the PSE echoes
42          back to the remote system. The definition and encoding of
43          PD requested power value for the Mode A pairset is the same
44          as described in aLldpXdot3LocPDRequestedPowerValueA";
45      reference
46          "IEEE Std 802.3, 30.12.3.1.18";
47  }
48
49  leaf pd-requested-power-value-b {
50      type int32;
51      config false;
52      description
53          "A read-only attribute that returns the PD requested power
54          value for the Mode B pairset that was used by the remote
55          system to compute the power value that it has currently
56          allocated to the PD. For a PSE, it is the PD requested
57          power value for the Alternative B pairset received from
58          the remote system. For a PD, it is the PD requested power
59          value for the Alternative B pairset that the PSE echoes
60          back to the remote system. The definition and encoding of
61          PD requested power value for the Mode B pairset is the
62          same as described in aLldpXdot3LocPDRequestedPowerValueB";
63      reference
```

```
1      "IEEE Std 802.3, 30.12.3.1.19";
2  }
3  leaf pse-allocated-power-value {
4      type int32;
5      config false;
6      description
7          "PSE allocated power value. For a PSE, it is the power value
8           that the PSE has currently allocated to the remote system.
9           For a PD, it is the power value that the PD mirrors back to
10          the remote system";
11      reference
12          "IEEE Std 802.3, 30.12.3.1.20";
13  }
14  leaf pse-allocated-power-value-a {
15      type int32;
16      config false;
17      description
18          "A read-only attribute that returns the PSE allocated power
19          value for the Alternative A pairset received from the
20          remote system. For a PSE, it is the PSE allocated power
21          value for the Alternative A pairset that was echoed back
22          by the remote PD. For a PD, it is the PSE allocated power
23          value for the Mode A pairset received from the remote
24          system. The definition and encoding of PSE allocated power
25          value for the Alternative A pairset is the same as
26          described in aLldpXdot3LocPSEAllocatedPowerValueA";
27      reference
28          "IEEE Std 802.3, 30.12.3.1.21";
29  }
30  leaf pse-allocated-power-value-b {
31      type int32;
32      config false;
33      description
34          "A read-only attribute that returns the PSE allocated power
35          value for the Alternative B pairset received from the
36          value for the Alternative B pairset that was echoed back
37          by the remote PD. For a PD, it is the PSE allocated power
38          value for the Mode B pairset received from the remote
39          system. The definition and encoding of PSE allocated power
40          value for the Alternative B pairset is the same as
41          described in aLldpXdot3LocPSEAllocatedPowerValueB";
42      reference
43          "IEEE Std 802.3, 30.12.3.1.22";
44  }
45  leaf pse-powering-status {
46      type powering-status-type;
47      config false;
48      description
49          "A read only value that indicates the powering status of
50          the remote PSE. For a PD, the contents of this attribute
51          are undefined.";
52      reference
53          "IEEE Std 802.3, 30.12.3.1.23";
54  }
55  leaf pd-powered-status {
56      type powered-status-type;
57      config false;
58      description
59          "A read only value that indicates the powering status of
```

```
1         the PD. For a PSE, the contents of this attribute are
2         undefined";
3     reference
4         "IEEE Std 802.3, 30.12.3.1.24";
5 }
6 leaf power-pairs-ext {
7     type power-pairs-type;
8     config false;
9     description
10        "A read-only value that identifies the supported PSE
11        Pinout Alternative specified in 145.2.4. For a PD, this
12        attribute contains the value of the aPSEPowerPairs
13        attribute (see 30.9.1.1.4). For a PSE, the contents of
14        this attribute are undefined";
15    reference
16        "IEEE Std 802.3, 30.12.3.1.25";
17 }
18 leaf power-class-ext-A {
19     type power-class-ext-AB-type;
20     config false;
21     description
22        "For a dual-signature PD, a read-only value that indicates
23        the currently assigned Class for Mode A by the remote
24        4-pair PSE. For a single-signature PD or a dual-signature
25        PD connected to a 2-pair only PSE, a read-only value set
26        to â€šinglesigâ€™ by the remote PSE. For a PSE connected to a
27        dual-signature PD, a read-only value that indicates the
28        requested Class for Mode A during Physical Layer
29        classification (see 145.2.8) by the remote PD. For a PSE
30        connected to a single-signature PD, a read-only value set
31        to â€šinglesigâ€™ by the remote PD";
32    reference
33        "IEEE Std 802.3, 30.12.3.1.26";
34 }
35 leaf power-class-ext-B {
36     type power-class-ext-AB-type;
37     config false;
38     description
39        "For a dual-signature PD, a read-only value that indicates
40        the currently assigned Class for Mode B by the remote
41        4-pair PSE. For a single-signature PD or a dual-signature
42        PD connected to a 2-pair only PSE, a read-only value set
43        to â€šinglesigâ€™ by the remote PSE. For a PSE connected to a
44        dual-signature PD, a read-only value that indicates the
45        requested Class for Mode B during Physical Layer
46        classification (see 145.2.8) by the remote PD. For a PSE
47        connected to a single-signature PD, a read-only value set
48        to â€šinglesigâ€™ by the remote PD";
49    reference
50        "IEEE Std 802.3, 30.12.3.1.27";
51 }
52 leaf power-class-ext {
53     type power-class-ext-type;
54     config false;
55     description
56        "For a single-signature PD or a dual-signature PD connected
57        to a 2-pair only PSE, a read-only value that indicates the
58        currently assigned Class by the remote PSE. For a
59        dual-signature PD connected to a 4-pair capable PSE, a
```

```
1         read-only value set to "dualsig" by the remote PSE. For a
2         PSE connected to a single-signature PD, a read-only value
3         that indicates the requested Class during Physical Layer
4         classification (see 145.2.8) by the remote PD. For a PSE
5         connected to a dual-signature PD, a read-only value set to
6         "dualsig" by the remote PD.";
7     reference
8         "IEEE Std 802.3, 30.12.3.1.28";
9 }
10 leaf power-type-ext {
11     type power-type;
12     config false;
13     description
14         "A read-only attribute that returns a value to indicate if
15         the remote system is a Type 3 or Type 4 PSE or PD and, in
16         the case of a Type 3 or Type 4 PD, if it is a
17         single-signature PD or dual-signature PD.";
18     reference
19         "IEEE Std 802.3, 30.12.3.1.29";
20 }
21 leaf pd-load {
22     type boolean;
23     config false;
24     description
25         "For a PSE, a read-only attribute that returns whether the
26         load of the remote dual-signature PD is electrically
27         isolated, as defined in 79.3.2.10.2. For a PD, this
28         attribute is set to FALSE.";
29     reference
30         "IEEE Std 802.3, 30.12.3.1.30";
31 }
32 leaf pd-4pid {
33     type boolean;
34     config false;
35     description
36         "A read-only Boolean attribute indicating whether the
37         remote PD system supports powering of both PD Modes.";
38     reference
39         "IEEE Std 802.3, 30.12.3.1.31";
40 }
41 leaf pse-max-avail-power {
42     type int32;
43     config false;
44     description
45         "A read-only attribute that returns the remote PSE maximum
46         available power value in units of 0.1 W";
47     reference
48         "IEEE Std 802.3, 30.12.3.1.32";
49 }
50 leaf pse-autoclass-support {
51     type boolean;
52     config false;
53     description
54         "Indicates whether the remote PSE system supports
55         Autoclass.";
56     reference
57         "IEEE Std 802.3, 30.12.3.1.33";
58 }
59 leaf autoclass-completed {
```

```
1      type boolean;
2      config false;
3      description
4          "Indicates whether the remote PSE system has completed the
5          Autoclass measurement.";
6      reference
7          "IEEE Std 802.3, 30.12.3.1.34";
8  }
9
10 leaf autoclass-request {
11     type boolean;
12     config false;
13     description
14         "A read-only Boolean attribute indicating whether the
15         remote PD system is requesting an Autoclass measurement.";
16     reference
17         "IEEE Std 802.3, 30.12.3.1.35";
18 }
19
20 leaf power-down-request {
21     type int32;
22     description
23         "A read-write attribute that indicates the remote PD system
24         is requesting a power down when the value is 0x1D.";
25     reference
26         "IEEE Std 802.3, 30.12.3.1.36";
27 }
28
29 leaf power-down-time {
30     type int32;
31     description
32         "A read-only attribute that indicates the number of seconds
33         the remote PD requests to stay powered off. A value of zero
34         indicates an indefinite amount of time";
35     reference
36         "IEEE Std 802.3, 30.12.3.1.37";
37 }
38
39 leaf meas-voltage-support {
40     type boolean;
41     config false;
42     description
43         "A read-only attribute that indicates the remote device is
44         capable of providing a voltage measurement.";
45     reference
46         "IEEE Std 802.3, 30.12.3.1.38";
47 }
48
49 leaf meas-current-support {
50     type boolean;
51     config false;
52     description
53         "A read-only attribute that indicates the remote device is
54         capable of providing a current measurement.";
55     reference
56         "IEEE Std 802.3, 30.12.3.1.39";
57 }
58
59 leaf meas-power-support {
60     type boolean;
61     config false;
62     description
63         "A read-only attribute that indicates the remote device is
64         capable of providing a power measurement.";
65     reference
```

```
1      "IEEE Std 802.3, 30.12.3.1.40";
2  }
3  leaf meas-energy-support {
4      type boolean;
5      config false;
6      description
7          "A read-only attribute that indicates the remote device is
8          capable of providing a energy measurement.;";
9      reference
10         "IEEE Std 802.3, 30.12.3.1.41 ";
11  }
12  leaf measurement-source {
13      type bits {
14          bit bit1 {
15              position 0;
16              description
17                  "-";
18          }
19          bit bit2 {
20              position 1;
21              description
22                  "-";
23          }
24      }
25      description
26          "A read-write attribute value that indicates on which
27          Alternative or Mode the measurement was taken by the remote
28          device.";
29      reference
30          "IEEE Std 802.3, 30.12.3.1.42";
31  }
32  leaf meas-voltage-request {
33      type boolean;
34      config false;
35      description
36          "A read-only attribute that indicates the remote device is
37          requesting a voltage measurement from the local device.";
38      reference
39          "IEEE Std 802.3, 30.12.3.1.43";
40  }
41  leaf meas-current-request {
42      type boolean;
43      config false;
44      description
45          "A read-only attribute that indicates the remote device is
46          requesting a current measurement from the local device.";
47      reference
48          "IEEE Std 802.3, 30.12.3.1.44";
49  }
50  leaf meas-power-request {
51      type boolean;
52      config false;
53      description
54          "A read-only attribute that indicates the remote device is
55          requesting a power measurement from the local device.";
56      reference
57          "IEEE Std 802.3, 30.12.3.1.45";
58  }
59  leaf meas-energy-request {
```

```
1      type boolean;
2      config false;
3      description
4          "A read-only attribute that indicates the remote device is
5           requesting an energy measurement from the local device.";
6      reference
7          "IEEE Std 802.3, 30.12.3.1.46";
8  }
9
10 leaf meas-voltage-valid {
11     type boolean;
12     config false;
13     description
14         "A read-only attribute that indicates the remote deviceâ€™s
15          voltage measurement is valid.";
16     reference
17         "IEEE Std 802.3, 30.12.3.1.47";
18 }
19
20 leaf meas-current-valid {
21     type boolean;
22     config false;
23     description
24         "A read-only attribute that indicates the remote deviceâ€™s
25          current measurement is valid.";
26     reference
27         "IEEE Std 802.3, 30.12.3.1.48";
28 }
29
30 leaf meas-power-valid {
31     type boolean;
32     config false;
33     description
34         "A read-only attribute that indicates the remote deviceâ€™s
35          power measurement is valid.";
36     reference
37         "IEEE Std 802.3, 30.12.3.1.49";
38 }
39
40 leaf meas-energy-valid {
41     type boolean;
42     config false;
43     description
44         "A read-only attribute that indicates the remote deviceâ€™s
45          energy measurement is valid.";
46     reference
47         "IEEE Std 802.3, 30.12.3.1.50";
48 }
49
50 leaf meas-voltage-uncertainty {
51     type int32;
52     config false;
53     description
54         "A read-only attribute that indicates the expanded
55          uncertainty (coverage factor k = 2) for the remote deviceâ€™s
56          voltage measurement.";
57     reference
58         "IEEE Std 802.3, 30.12.3.1.51";
59 }
60
61 leaf meas-current-uncertainty {
62     type int32;
63     config false;
64     description
65         "A read-only attribute that indicates the expanded
```

```
1         uncertainty (coverage factor k = 2) for the remote device's
2         current measurement.";
3     reference
4         "IEEE Std 802.3, 30.12.3.1.52";
5 }
6 leaf meas-power-uncertainty {
7     type int32;
8     config false;
9     description
10        "A read-only attribute that indicates the expanded
11        uncertainty (coverage factor k = 2) for the remote device's
12        power measurement.";
13    reference
14        "IEEE Std 802.3, 30.12.3.1.53";
15 }
16 leaf meas-energy-uncertainty {
17     type int32;
18     config false;
19     description
20        "A read-only attribute that indicates the expanded
21        uncertainty (coverage factor k = 2) for the remote device's
22        energy measurement.";
23    reference
24        "IEEE Std 802.3, 30.12.3.1.54";
25 }
26 leaf voltage-measurement {
27     type int32;
28     config false;
29     description
30        "A read-only attribute that returns the measured remote
31        device voltage.";
32    reference
33        "IEEE Std 802.3, 30.12.3.1.55";
34 }
35 leaf current-measurement {
36     type int32;
37     config false;
38     description
39        "A read-only attribute that returns the measured remote
40        device current.";
41    reference
42        "IEEE Std 802.3, 30.12.3.1.56";
43 }
44 leaf power-measurement {
45     type int32;
46     config false;
47     description
48        "A read-only attribute that returns the measured remote
49        device power.";
50    reference
51        "IEEE Std 802.3, 30.12.3.1.57";
52 }
53 leaf energy-measurement {
54     type int32;
55     config false;
56     description
57        "A read-only attribute that returns the measured remote
58        device energy.";
59    reference
```



```
1         "IEEE Std 802.3, 30.12.3.1.58";
2     }
3     leaf pse-power-price-index {
4         type int32;
5         config false;
6         description
7             "A read-only attribute that returns an index of the price
8              of power being sourced by the remote PSE. For a PSE, this
9              value is undefined.";
10        reference
11            "IEEE Std 802.3, 30.12.3.1.59";
12    }
13    leaf tx-system-value {
14        type int32;
15        config false;
16        description
17            "Returns the value of Tw_sys_tx that the remote system can
18             support in the transmit direction.";
19        reference
20            "IEEE Std 802.3, 30.12.3.1.60";
21    }
22    leaf tx-system-value-echo {
23        type int32;
24        config false;
25        description
26            "Returns the value of Tw_sys_tx that the local system is
27             advertising that it can support in the transmit direction
28             and is echoed by the local system under the control of the
29             IEEE DLL receiver state diagram.";
30        reference
31            "IEEE Std 802.3, 30.12.3.1.61";
32    }
33    leaf rx-system-value {
34        type int32;
35        config false;
36        description
37            "Returns the value of Tw_sys_tx that the remote system is
38             requesting in the receive direction.";
39        reference
40            "IEEE Std 802.3, 30.12.3.1.62";
41    }
42    leaf rx-system-value-echo {
43        type int32;
44        config false;
45        description
46            "Returns the value of Tw_sys_tx that the local system is
47             advertising that it is requesting in the receive direction
48             and is echoed by the local system under the control of the
49             IEEE DLL transmitter state diagram.";
50        reference
51            "IEEE Std 802.3, 30.12.3.1.63 ";
52    }
53    leaf fallback-system-value {
54        type int32;
55        config false;
56        description
57            "Returns the value of the fallback Tw_sys_tx that the
58             remote system is advertising to the remote system.";
59        reference
```

```
1      "IEEE Std 802.3, 30.12.3.1.64";
2  }
3  leaf tx-system-fw {
4      type boolean;
5      config false;
6      description
7          "Returns the value of LPI_FW that the remote system can
8           support in the transmit direction.";
9      reference
10         "IEEE Std 802.3, 30.12.3.1.65";
11  }
12  leaf tx-system-fw-echo {
13      type boolean;
14      config false;
15      description
16          "Returns the value of LPI_FW that the local system is
17           advertising that it can support in the transmit direction
18           and is echoed by the local system under the control of the
19           IEEE DLL receiver state diagram.";
20      reference
21         "IEEE Std 802.3, 30.12.3.1.66";
22  }
23  leaf rx-system-fw {
24      type boolean;
25      config false;
26      description
27          "Returns the value of LPI_FW that the remote system is
28           requesting in the receive direction.";
29      reference
30         "IEEE Std 802.3, 30.12.3.1.67";
31  }
32  leaf rx-system-fw-echo {
33      type boolean;
34      config false;
35      description
36          "Returns the value of LPI_FW that the local system is
37           advertising that it is requesting in the receive direction
38           and is echoed by the local system under the control of the
39           IEEE DLL transmitter state diagram.";
40      reference
41         "IEEE Std 802.3, 30.12.3.1.68";
42  }
43  leaf preemption-supported {
44      type boolean;
45      config false;
46      description
47          "Indicates whether the given port (associated with the
48           remote System) supports the preemption capability.";
49      reference
50         "IEEE Std 802.3, 30.12.3.1.69";
51  }
52  leaf preemption-enabled {
53      type boolean;
54      config false;
55      description
56          "Indicates whether the preemption capability is enabled on
57           the given port associated with the remote System.";
58      reference
59         "IEEE Std 802.3, 30.12.3.1.70";
60  }
```

```
1      }
2      leaf preemption-active {
3
4          type boolean;
5          config false;
6          description
7              "Indicates whether the preemption capability is active on
8              the given port associated with the remote System.>";
9          reference
10             "IEEE Std 802.3, 30.12.3.1.72";
11     }
12     leaf additional-fragment-size {
13
14         type int32;
15         config false;
16         description
17             "Indicate the minimum size of non-final fragments supported
18             by the receiver on the given port associated with the
19             remote System. This value is expressed in units of 64
20             octets of additional fragment length.";
21         reference
22             "IEEE Std 802.3, 30.12.3.1.72 ";
23     }
24 }
25
26
27
28
29
30
31
32
33
34 }
```

6. YANG module for Ethernet data terminal equipment (DTE) power via medium dependent interface (MDI) and Power over Data Lines (PoDL)

6.1 Introduction

This clause defines a YANG module to manage power via MDI Power Sourcing Equipment (PSE) and Power over Data Line (PoDL) PSE.

IEEE Std 802.3 defines the hardware registers that allow management interfaces to be built for a DTE Power via MDI and Power over Data Line device. The YANG module defined in this clause extends the Ethernet-interface YANG data modules defined in Clause 5 with the management objects required for the management of PoE and PoDL devices and ports.

6.2 YANG module structure

The *ieee802-ethernet-pse* YANG module of this clause is focused on the configuration and monitoring of the Power over Ethernet (PoE) function defined in IEEE Std 802.3, including power via MDI, as well as Power over Data Line which can also be considered as the single pair PoE. The module augments the *ieee802-ethernet-interface* YANG module with attributes for the PoE function. The module is partitioned into two major containers.

The PoE PSE container describes a multi-pair PSE, while the PoDL PSE describes a single-pair PSE.

6.3 Security considerations for Ethernet data terminal equipment (DTE) power via medium dependent interface (MDI) and Power over Data Line Module

There are a number of data nodes defined in this YANG module that are configurable as read-write. Such data nodes can be considered sensitive or vulnerable in some network environments. The support for configuration operations in a non-secure environment without proper protection can have a negative effect on network operations.

Setting the following data nodes to incorrect values can result in improper operation of the PSE, including the possibility that the Powered Device (PD) does not receive power from the PSE port:

- `pse-enable`
- `powering-pairs`

Some of the readable operational states in this module can be considered sensitive or vulnerable in some network environments. These are as follows:

- `pairs-control-ability`
- `classifications`
- `pd-power-class`
- `pse-type`
- `detected-pd-type`

It is thus important to control GET access to these data nodes and to possibly encrypt their values when sending them over the network.

6.4 Mapping of IEEE Std 802.3, Clause 30 managed objects

This subclause contains the mapping between YANG data nodes included in *ieee802-ethernet-pse* (see Table 6-1) YANG module, managed objects, and attributes defined in IEEE Std 802.3, Clause 30.

Table 6–1—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-ethernet-pse* YANG data nodes

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-pse</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
N/A	N/A		interfaces/interface/ethernet/pse	supported-pse-type	R
oPSE	aPSEAdminState	30.9.1	interfaces/interface/ethernet/pse/multi-pair	pse-enable	R
	aPSEPowerPairs			powering-pairs	R/W
	aPSEPowerPairsControlAbility			pairs-control-ability	R
	aPSEPowerDetectionStatus			detection-status	R
	aPSEPowerClassification			classifications	R
	aPSEActualPower			actual-power	R
	aPSEPowerAccuracy			power-accuracy	R
	aPSEInvalidSignatureCounter		interfaces/interface/ethernet/pse/multi-pair/statistics	invalid-signature	R
	aPSEPowerDeniedCounter			power-denied	R
	aPSEOverLoadCounter			overload	R
	aPSEShortCounter			short	R
	aPSEMPSAbsentCounter			mps-absent	R
	aPSECumulativeEnergy			cumulative-energy	R

Table 6–1—Mapping between IEEE Std 802.3, Clause 30 managed objects and *ieee802-ethernet-pse* YANG data nodes (continued)

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-pse</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
oPoDLPSE	aPoDLPSEAdminState	30.15	interfaces/interface/ethernet/pse/single-pair	pse-enable	R
	aPoDLPSEPowerDetectionStatus			detection-status	R
	aPoDLPSEType			podl-type	R
	aPoDLPSEDetectedPDType			detected-pd-type	R
	aPoDLPSEDetectedPDPowerClass			pd-power-class	R
	aPoDLPSEActualPower			actual-power	R
	aPoDLPSEPowerAccuracy			power-accuracy	R
	aPoDLPSEInvalidSignatureCounter		interfaces/interface/ethernet/pse/single-pair/statistics	invalid-signature	R
	aPoDLPSEInvalidClassCounter			invalid-class	R
	aPoDLPSEPowerDeniedCounter			power-denied	R
	aPoDLPSEOverLoadCounter			overload	R
	aPoDLPSEMaintainFullVoltageSignatureAbsentCounter			fvs-absent	R
	aPoDLPSECumulativeEnergy			cumulative-energy	R

6.5 YANG module definitionⁱ

The YANG module tree hierarchy uses terms defined in IETF RFC 8407.

6.5.1 Tree hierarchy

6.5.1.1 ieee802-ethernet-pse

```

module: ieee802-ethernet-pse
  augment /if:interfaces/if:interface/ieee802-eth-if:ethernet:
    +--rw pse
      +--ro supported-pse-type?  identityref
      +--rw multi-pair!
        | +--rw pse-enable?      boolean
        | +--rw powering-pairs?  identityref
        | +--ro pairs-control-ability?  boolean
        | +--ro detection-status?  multi-pair-detection-state
        | +--ro classifications?  power-class
        | +--ro statistics
        | | +--ro power-denied?    yang:counter64
        | | +--ro invalid-signature?  yang:counter64
        | | +--ro mps-absent?      yang:counter64
        | | x--ro overload?        yang:counter64
        | | x--ro short?           yang:counter64
        | | +--ro cumulative-energy?  yang:counter64
        | +--ro actual-power?      decimal64
        | +--ro power-accuracy?    int64
      +--rw single-pair!
        +--rw pse-enable?      boolean
        +--ro detection-status?  single-pair-detection-state
        +--ro podl-type?        enumeration
        +--ro detected-pd-type?  enumeration

```

ⁱ Copyright release for YANG modules: Users of this standard may freely reproduce the YANG module contained in this subclause so that it can be used for its intended purpose.

```
1  +---ro pd-power-class?      power-class
2  +---ro statistics
3  |  +---ro power-denied?      yang:counter64
4  |  +---ro invalid-signature? yang:counter64
5  |  +---ro invalid-class?     yang:counter64
6  |  +---ro overload?          yang:counter64
7  |  +---ro fvs-absence?       yang:counter64
8  |  +---ro cumulative-energy?  yang:counter64
9  |  +---ro cumulative-energy?  yang:counter64
10 +---ro actual-power?         decimal64
11 +---ro power-accuracy?       int64
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
```


6.5.2 YANG module

In the following YANG module definition, should any discrepancy between the text of the description for individual YANG nodes and the corresponding definition in 6.2 through 6.5 of this clause occur, the definitions and mappings in 6.5 shall take precedence.

Editor's Note (to be removed prior to publication):

Yang files contained in <https://github.com/YangModels/yang/tree/main/standard/ieee/published/802.3> are IEEE 802.3.1-2019 version and will be updated at the publication time.

An ASCII text version of the YANG module can be found at the following URL:^j <https://github.com/YangModels/yang/tree/master/standard/ieee/published/802.3>

Editor's Note (to be removed prior to publication):

Contributions to complete the ieee802-ethernet-pse is encouraged

Editor's Note (to be removed prior to publication):

Pretty printing of ieee802-ethernet-pse.yang file may change the appearance by adding whitespace and reformatting lines

Editor's Note (to be removed prior to publication):

IEEE Std 802.3.1 and IEEE Std 802.3.2 to be updated at the publication time

```
module ieee802-ethernet-pse {
  yang-version 1.1;
  namespace "urn:ieee:std:802.3:yang:ieee802-ethernet-pse";
  prefix ieee802-pse;

  import ietf-interfaces {
    prefix if;
    reference
      "IETF RFC 8343";
  }
  import ietf-yang-types {
    prefix yang;
    reference
      "IETF RFC 6991";
  }
  import ieee802-ethernet-interface {
    prefix ieee802-eth-if;
  }

  organization
    "IEEE 802.3 Ethernet Working Group
      Web URL: http://www.ieee802.org/3/";
  contact
    "Web URL: http://www.ieee802.org/3/";
  description
    "This module contains YANG definitions for configuring and
```

^jCopyright release for YANG modules: Users of this standard may freely reproduce the YANG module contained in this subclause so that it can be used for its intended purpose.

```
1      managing ports with Power Over Ethernet feature defined by
2      IEEE 802.3. It provides functionality roughly equivalent to
3      that of the POWER-ETHERNET-MIB defined in IETF RFC 3621.";
4
5  revision 2024-08-17 {
6      description
7          "Updates under IEEE Std 802.3.2-202x, Draft D3.0";
8      reference
9          "IEEE Std IEEE Std 802.3.2-202x, unless dated
10         explicitly";
11  }
12
13
14  identity pse-type {
15      description
16          "Base type for PSE.";
17  }
18
19  identity all {
20      base powering-pairs;
21      description
22          "All pairs are in use.";
23  }
24
25
26  identity four-pair {
27      base pse-type;
28      description
29          "PSE support IEEE Std 802.3, Clause 145.";
30  }
31
32
33  identity two-pair {
34      base pse-type;
35      description
36          "PSE supports IEEE Std 802.3, Clause 33.";
37  }
38
39  identity single-pair {
40      base pse-type;
41      description
42          "PSE support IEEE Std 802.3, Clause 104.";
43  }
44
45
46  identity powering-pairs {
47      description
48          "Base type for powering pairs.";
49  }
50
51  identity signal {
52      base powering-pairs;
53      description
54          "The signal pairs are in use.";
55  }
56
57
58  identity spare {
59      base powering-pairs;
60      description
61          "The spare pairs are in use.";
62  }
63
64
65  typedef multi-pair-detection-state {
```

```
1      type enumeration {
2          enum disabled {
3              value 1;
4              description
5                  "PSE disabled.";
6          }
7          enum searching {
8              value 2;
9              description
10                 "PSE is searching.";
11          }
12          enum deliveringPower {
13              value 3;
14              description
15                  "PSE is delivering power.";
16          }
17          enum fault {
18              value 4;
19              description
20                  "PSE fault detected.";
21          }
22          enum test {
23              value 5;
24              description
25                  "PSE test mode.";
26          }
27          enum otherFault {
28              value 6;
29              description
30                  "PSE implementation specific fault detected.";
31          }
32      }
33      description
34          "Detection state of a multi-pair PSE.";
35      reference
36          "IEEE Std 802.3, 30.9.1.1.5";
37  }
38
39  typedef single-pair-detection-state {
40      type enumeration {
41          enum unknown {
42              value 1;
43              description
44                  "True detection state unknown.";
45          }
46          enum disabled {
47              value 2;
48              description
49                  "PoDL PSE is disabled.";
50          }
51          enum searching {
52              value 3;
53              description
54                  "PoDL PSE is searching.";
55          }
56          enum deliveringPower {
57              value 4;
58              description
59                  "PoDL PSE is delivering power.";
60          }
61      }
62  }
```

```
1      }
2      enum sleep {
3          value 5;
4          description
5              "PoDL PSE is in sleep state.";
6      }
7      enum idle {
8          value 6;
9          description
10             "PoDL PSE is idle.";
11      }
12      enum error {
13          value 7;
14          description
15              "PoDL PSE error.";
16      }
17  }
18  }
19  description
20      "Detection state of a PoDL PSE.";
21  reference
22      "IEEE Std 802.3, 30.15.1.1.3";
23  }
24
25
26  typedef power-class {
27      type enumeration {
28          enum class0 {
29              value 1;
30              description
31                  "Class 0";
32          }
33          enum class1 {
34              value 2;
35              description
36                  "Class 1";
37          }
38          enum class2 {
39              value 3;
40              description
41                  "Class 2";
42          }
43          enum class3 {
44              value 4;
45              description
46                  "Class 3";
47          }
48          enum class4 {
49              value 5;
50              description
51                  "Class 4";
52          }
53          enum class5 {
54              value 6;
55              description
56                  "Class 5 (for PoDL-only)";
57          }
58          enum class6 {
59              value 7;
60              description
61                  "Class 6 (for PoDL-only)";
62          }
63      }
64  }
```

```
1      }
2      enum class7 {
3          value 8;
4          description
5              "Class 7 (for PoDL-only)";
6      }
7      enum class8 {
8          value 9;
9          description
10             "Class 8 (for PoDL-only)";
11      }
12      enum class9 {
13          value 10;
14          description
15              "Class 9 (for PoDL-only)";
16      }
17      enum unknown {
18          value 11;
19          description
20              "Initializing, true Power Class not yet known
21              (only for PoDL PSE).";
22      }
23  }
24  }
25  }
26  description
27      "The power class.";
28  reference
29      "IEEE Std 802.3, 30.9.1.1.6 aPSEPowerClassification and
30      IEEE Std 802.3, 30.15.1.1.6 aPoDLPSEDetectedPDPowerClass.";
31  }
32  }
33
34  augment "/if:interfaces/if:interface/ieee802-eth-if:ethernet" {
35      description
36          "Augments ethernet interface configuration model with
37          nodes specific to DTE Power via MDI devices and ports";
38      container pse {
39          description
40              "DTE Power via MDI port configuration";
41          reference
42              "IEEE Std 802.3, 30.9.1 PoE PSE & IEEE Std 802.3, 30.15.1
43              PoDL PSE";
44          leaf supported-pse-type {
45              type identityref {
46                  base ieee802-pse:pse-type;
47              }
48          }
49          config false;
50          description
51              "PSE supports one or more of IEEE Std 802.3 Clause 33,
52              Clause 104, or Clause 145.";
53      }
54      container multi-pair {
55          presence "PSE port supports IEEE Std 802.3, Clause 33.";
56          description
57              "PSE port configuration in IEEE Std 802.3, 30.9.1.";
58          leaf pse-enable {
59              type boolean;
60              default "false";
61          }
62          description
63              "When true enables the PSE function on the interface,
64              when false disables the PSE function on the
65              "
```

```
1         interface.";
2     reference
3         "IEEE Std 802.3, 30.9.1.1.2 aPSEAdminState";
4     }
5     leaf powering-pairs {
6         type identityref {
7             base powering-pairs;
8         }
9         description
10            "Describes or controls the PSE pairs in use. If the
11             value of pairs-control-ability is true, this object
12             is writeable.";
13         reference
14            "IEEE Std 802.3, 30.9.1.1.4 aPSEPowerPairs";
15     }
16     leaf pairs-control-ability {
17         type boolean;
18         default "true";
19         config false;
20         description
21            "Describes the ability to control switching the
22             power sourcing pins of the PSE.";
23         reference
24            "IEEE Std 802.3, 30.9.1.1.3
25             aPSEPowerPairsControlAbility";
26     }
27     leaf detection-status {
28         type multi-pair-detection-state;
29         config false;
30         description
31            "Describes the operational status of the port
32             PD detection.";
33         reference
34            "IEEE Std 802.3, 30.9.1.1.5 aPSEPowerDetectionStatus";
35     }
36     leaf classifications {
37         when "../detection-status = 'deliveringPower'" {
38             description
39                "This node only applies when the detection status is
40                 delivering power.";
41         }
42         type power-class;
43         config false;
44         description
45            "The power class of the PSE port.";
46         reference
47            "IEEE Std 802.3, 30.9.1.1.6 aPSEPowerClassification";
48     }
49     container statistics {
50         config false;
51         description
52            "statistics information of the multi-pair port.";
53         leaf power-denied {
54             type yang:counter64;
55             description
56                "This counter is incremented when the PSE state
57                 diagram enters the POWER_DENIED state, per
58                 IEEE Std 802.3, Figure 33-9.";
59             reference
60                "IEEE Std 802.3, 30.9.1.1.6 aPSEPowerClassification";
61         }
62     }
63 }
64
65
```

```
1         "IEEE Std 802.3, 30.9.1.1.14";
2     }
3     leaf invalid-signature {
4         type yang:counter64;
5         description
6             "This counter is incremented when the PSE state
7              diagram enters the SIGNATURE_INVALID state per
8              IEEE Std 802.3, Figure 33-9.";
9         reference
10            "IEEE Std 802.3, 30.9.1.1.11";
11    }
12    leaf mps-absent {
13        type yang:counter64;
14        description
15            "This counter is incremented when the PSE
16             transitions directly from the POWER_ON state to the
17             IDLE state due to tmpdo_timer_done being asserted,
18             per IEEE Std 802.3, Figure 33-9.";
19        reference
20            "IEEE Std 802.3, 30.9.1.1.20";
21    }
22    leaf overload {
23        type yang:counter64;
24        status deprecated;
25        description
26            "This counter is incremented when the PSE state
27             diagram enters the ERROR_DELAY state due to the
28             ovld_detected variable being TRUE, per
29             IEEE Std 802.3, Figure 33-9.";
30        reference
31            "IEEE Std 802.3, 30.9.1.1.17";
32    }
33    leaf short {
34        type yang:counter64;
35        status deprecated;
36        description
37            "This Yang object is deprecated as its not defined in
38             base standard.
39             This counter is incremented when the PSE state
40             diagram enters the ERROR_DELAY state due to the
41             short_detected variable being TRUE, per
42             IEEE Std 802.3, Figure 33-9.";
43        reference
44            "IEEE Std 802.3, 30.9.1.1.10 aPSEShortCounter";
45    }
46    leaf cumulative-energy {
47        type yang:counter64;
48        units "millijoules";
49        description
50            "The cumulative energy supplied by the PSE as
51             measured at the MDI in millijoules.";
52        reference
53            "IEEE Std 802.3, 30.9.1.1.25";
54    }
55    }
56    leaf actual-power {
57        type decimal64 {
58            fraction-digits 4;
59        }
60    }
```

```
1         units "milliwatts";
2         config false;
3         description
4             "The actual power drawn by a PD over the port.";
5         reference
6             "IEEE Std 802.3, 30.9.1.1.23";
7     }
8
9     leaf power-accuracy {
10         type int64;
11         units "milliwatts";
12         config false;
13         description
14             "An integer value indicating the accuracy
15              associated with power-accuracy in +/- milliwatts.";
16         reference
17             "IEEE Std 802.3, 30.9.1.1.24";
18     }
19 }
20
21 container single-pair {
22     presence "PSE port working in PoDL.";
23     description
24         "PoDL PSE configuration as defined in
25          IEEE Std 802.3, 30.15.1.";
26     leaf pse-enable {
27         type boolean;
28         default "false";
29         description
30             "When true enables the PSE function on the interface,
31              when false disables the PSE function on the
32              interface.";
33         reference
34             "IEEE Std 802.3, 30.15.1.1.2 aPoDLPSEAdminState";
35     }
36
37     leaf detection-status {
38         type single-pair-detection-state;
39         config false;
40         description
41             "Indicates the current status of the PoDL PSE.";
42         reference
43             "IEEE Std 802.3, 30.15.1.1.3
44              aPoDLPSEPowerDetectionStatus";
45     }
46
47     leaf podl-type {
48         type enumeration {
49             enum unknown {
50                 description
51                     "Unknown PSE type.";
52             }
53             enum typeA {
54                 description
55                     "TypeA PSE";
56             }
57             enum typeB {
58                 description
59                     "TypeB PSE";
60             }
61             enum typeC {
62                 description
63                     "Type PSEC";
64             }
65         }
66     }
67 }
```



```
1      }
2      enum typeD {
3          description
4              "TypeD PSE";
5      }
6      enum typeE {
7          description
8              "TypeE PSE";
9      }
10     }
11     enum typeF {
12         description
13             "TypeF PSE";
14     }
15 }
16 config false;
17 description
18     "PSE type specified in and
19     IEEE Std 802.3, 30.15.1.1.4.";
20 }
21 leaf detected-pd-type {
22     when "../detection-status = 'deliveringPower'" {
23         description
24             "This node only applies when the detection status is
25             delivering power.";
26     }
27 }
28 type enumeration {
29     enum unknown {
30         description
31             "Unknown PD type";
32     }
33     enum typeA {
34         description
35             "TypeA PD";
36     }
37     enum typeB {
38         description
39             "TypeB PD";
40     }
41     enum typeC {
42         description
43             "TypeC PD";
44     }
45     enum typeD {
46         description
47             "TypeD PD";
48     }
49     enum typeE {
50         description
51             "TypeE PD";
52     }
53     enum typeF {
54         description
55             "TypeF PD";
56     }
57 }
58 config false;
59 description
60     "Indicates the Type of the detected PoDL PD as
61     specified in IEEE Std 802.3, 104.5.1.";
```

```
1         reference
2             "IEEE Std 802.3, 30.15.1.1.5 aPoDLPSEDetectedPDType";
3     }
4     leaf pd-power-class {
5         when "../detection-status = 'deliveringPower'" {
6             description
7                 "This node only applies when the detection status is
8                 delivering power.";
9         }
10    }
11    type power-class;
12    config false;
13    description
14        "Power class of the PD detected on the PSE port.";
15    reference
16        "IEEE Std 802.3, 30.15.1.1.6
17        aPoDLPSEDetectedPDPowerClass";
18    }
19    container statistics {
20        config false;
21        description
22            "Statistics information of the single-pair
23            PSE Discontinuities in the values of counters in this
24            container can occur at re-initialization of the
25            management system, and at other times as indicated by the
26            value of the 'discontinuity-time' leaf defined in the
27            ietf-interfaces YANG module (IETF RFC 8343).";
28    }
29    leaf power-denied {
30        type yang:counter64;
31        description
32            "This counter is incremented when the PoDL PSE state
33            diagram variable power_available transitions from
34            true to false (see IEEE Std 802.3, 104.4.3.3).";
35        reference
36            "IEEE Std 802.3, 30.15.1.1.9
37            \t aPoDLPSEPowerDeniedCounter";
38    }
39    }
40    leaf invalid-signature {
41        type yang:counter64;
42        description
43            "This counter is incremented when the PSE state
44            diagram enters the SIGNATURE_INVALID state per
45            IEEE Std 802.3, Figure 33-9.";
46        reference
47            "IEEE Std 802.3, 30.15.1.1.7
48            aPoDLPSEInvalidSignatureCounter";
49    }
50    }
51    leaf invalid-class {
52        type yang:counter64;
53        description
54            "This counter is incremented when the PoDL PSE state
55            diagram variable tclass_timer_done transitions from
56            false to true or when the valid_class variable
57            transitions from true to false
58            (see IEEE Std 802.3, 104.4.3.3).";
59        reference
60            "IEEE Std 802.3, 30.15.1.1.8
61            aPoDLPSEInvalidClassCounter";
62    }
63    }
64    leaf overload {
```

```

1         type yang:counter64;
2         description
3             "This counter is incremented when the PSE state
4             diagram variable overload_held transitions from
5             false to true (see IEEE Std 802.3, 104.4.3.3).";
6         reference
7             "IEEE Std 802.3, 30.15.1.1.10
8             aPoDLPSEOverLoadCounter";
9     }
10 }
11 leaf fvs-absence {
12     type yang:counter64;
13     description
14         "Maintain Full Voltage Signature absent counter.
15         This counter is incremented when the PoDL PSE state
16         diagram variable mfvs_timeout transitions from false
17         to true (see IEEE Std 802.3, 104.4.3.3).";
18     reference
19         "IEEE Std 802.3, 30.15.1.1.11
20         aPoDLPSEMaintainFullVoltageSignatureAbsentCounter";
21 }
22 }
23 leaf cumulative-energy {
24     type yang:counter64;
25     units "millijoules";
26     description
27         "A count of the cumulative energy supplied by the
28         PoDL PSE, measured at the MDI, and expressed in
29         units of millijoules.";
30     reference
31         "IEEE Std 802.3, 30.15.1.1.14
32         aPoDLPSECumulativeEnergy";
33 }
34 }
35 }
36 leaf actual-power {
37     type decimal64 {
38         fraction-digits 4;
39     }
40     units "milliwatts";
41     config false;
42     description
43         "An integer value indicating present (actual) power
44         being supplied by the PoDL PSE as measured at the MDI
45         in milliwatts.";
46     reference
47         "IEEE Std 802.3, 30.15.1.1.12 aPoDLPSEActualPower";
48 }
49 }
50 }
51 leaf power-accuracy {
52     type int64;
53     units "milliwatts";
54     config false;
55     description
56         "A signed integer value indicating the accuracy
57         associated
58         with power-accuracy in milliwatts.";
59     reference
60         "IEEE Std 802.3, 30.15.1.1.13 aPoDLPSEPowerAccuracy";
61 }
62 }
63 }
64 }
65 }

```

1 }
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7. YANG module for Ethernet Passive Optical Network (EPON)

7.1 Introduction

This clause defines a YANG module to manage Ethernet Passive Optical Network (EPON).

EPON is defined in IEEE Std 802.3, covering Physical Layers and Media Access Control sublayers. The Passive Optical Network (PON) is comprised of sections of single-mode fiber connected with passive optical splitter/coupler devices, forming a passive optical tree, as shown in Figure 7–1. Individual branches of the PON are terminated with the Optical Line Terminal (OLT) in the Central Office or at remote optical nodes, and Optical Network Units (ONUs) near the subscribers. ONUs can be located either in some remote location (e.g., basement in a multi-dwelling unit) or directly at the subscriber premises. Various types of Customer Premises Equipment (CPE) can be connected to ONUs or even integrated with such devices.

7.2 YANG module structure

The *ieee802-ethernet-pon* YANG module of this clause is focused on the configuration and monitoring of EPON.

7.3 Mapping of IEEE Std 802.3, Clause 30 managed objects

This sub-clause contains the mapping between YANG data nodes included in *ieee802-ethernet-pon* (see Table 7–1) YANG module, managed objects, and attributes defined in IEEE Std 802.3.1, IEEE8023-DOT3-EPON-MIB.

**Table 7–1—Mapping between IEEE Std 802.3.1, IEEE8023-DOT3-EPON-MIB managed objects
and *ieee802-ethernet-pon* YANG data nodes**

IEEE Std 802.3.1, IEEE8023-DOT3-EPON-MIB		Corresponding <i>ieee802-ethernet-pon</i> YANG data nodes		
Managed object(s)	Attribute(s)	Container(s)	Data node(s)	R/W
dot3EponFecTable	dot3EponFecMode		fec-mode	R/W
	dot3EponFecPCSCodingViolation	statistics-pon-fec	fec-code-group-violations	R
	dot3EponFecAbility		fec-capability	R
	dot3EponFecCorrectedBlocks	statistics-pon-fec	fec-code-word-corrected-errors	R
	dot3EponFecUncorrectableBlocks	statistics-pon-fec	fec-code-word-uncorrected-errors	R
	dot3EponFecBufferHeadCodingViolation	statistics-pon-fec	fec-buffer-head-coding-violation	R
dot3MpcpControl Table	dot3MpcpAdminState		mpcp-admin-state	R/W
	dot3MpcpMode		mpcp-mode	R
	dot3MpcpLinkID		mpcp-logical-link-id	R
	dot3MpcpRemoteMACAddress		mpcp-remote-mac-address	R
	dot3MpcpRegistrationState		mpcp-logical-link-state	R
	dot3MpcpSyncTime		mpcp-sync-time	R
	dot3MpcpTransmitElapsed		mpcp-elapsed-time-out	R
	dot3MpcpReceiveElapsed		mpcp-elapsed-time-in	R
	dot3MpcpRoundTripTime		mpcp-round-trip-time	R
	dot3MpcpMaximumPendingGrants		mpcp-maximum-grant-count	R

**Table 7–1—Mapping between IEEE Std 802.3.1, IEEE8023-DOT3-EPON-MIB managed objects
and *ieee802-ethernet-pon* YANG data nodes (continued)**

IEEE Std 802.3.1, IEEE8023-DOT3-EPON-MIB		Corresponding <i>ieee802-ethernet-pon</i> YANG data nodes		
Managed object(s)	Attribute(s)	Container(s)	Data node(s)	R/W
dot3ExtPkgQueueSets Table	dot3QueueSetIndex	mpcp-queue-thresholds	mpcp-queue-set-index	R/W
	dot3ExtPkgObjectReportThreshold		mpcp-queue-set-threshold	R/W
	dot3QueueIndex	mpcp-queues	mpcp-queue-index	R/W
	dot3ExtPkgObjectReportNumThreshold		mpcp-queue-threshold-count	R/W
	dot3ExtPkgObjectReportMaximumNumThreshold		mpcp-queue-threshold-count-max	R
	dot3ExtPkgStatTxFramesQueue		in-mpcp-queue-frames	R
	dot3ExtPkgStatRxFramesQueue		out-mpcp-queue-frames	R
	dot3ExtPkgStatDroppedFramesQueue		mpcp-queue-frames-drop	R
dot3ExtPkgControl Table	dot3ExtPkgObjectReset dot3MpcpOperStatus		mpcp-logical-link-admin-state	R/W
	dot3ExtPkgObjectNumberOfLLIDs		mpcp-logical-link-count	R
	dot3ExtPkgObjectReportMaximumNumQueues		mpcp-maximum-queue-count-per-report	R
dot3RecognizedMulticast-IDs Table	dot3RecognizedMulticastID	multicast-IDs	multicast-ID	R/W

**Table 7–1—Mapping between IEEE Std 802.3.1, IEEE8023-DOT3-EPON-MIB managed objects
and *ieee802-ethernet-pon* YANG data nodes (continued)**

IEEE Std 802.3.1, IEEE8023-DOT3-EPON-MIB		Corresponding <i>ieee802-ethernet-pon</i> YANG data nodes		
Managed object(s)	Attribute(s)	Container(s)	Data node(s)	R/W
dot3OmpEmulation Table	dot3OmpEmulationType	statistics-ompe	ompe-mode	R
	dot3OmpEmulationSLDErrors		in-ompe-frames-errored-sld	R
	dot3OmpEmulationCRC8Errors		in-ompe-frames-errored-crc8	R
	dot3OmpEmulationBadLLID		in-ompe-frames-with-bad-llid	R
	dot3OmpEmulationGoodLLID		in-ompe-frames-with-good-llid	R
	dot3OmpEmulationBroadcastBitNotOnuLlid		in-ompe-frames-not-match-onu-llid-broadcast	R
	dot3OmpEmulationOnuLLIDNotBroadcast		in-ompe-frames-match-onu-llid-not-broadcast	R
	dot3OmpEmulationBroadcastBitPlusOnuLlid		in-ompe-frames-match-onu-llid-broadcast	R
	dot3OmpEmulationNotBroadcastBitNotOnuLlid		in-ompe-frames-not-match-onu-llid-not-broad- cast	R
			in-ompe-frames	R
			ompe-onu-frames-with-good-llid-good-crc8	
			ompe-olt-frames-with-good-llid-good-crc8	

Table 7–1—Mapping between IEEE Std 802.3.1, IEEE8023-DOT3-EPON-MIB managed objects and *ieee802-ethernet-pon* YANG data nodes (continued)

IEEE Std 802.3.1, IEEE8023-DOT3-EPON-MIB		Corresponding <i>ieee802-ethernet-pon</i> YANG data nodes		
Managed object(s)	Attribute(s)	Container(s)	Data node(s)	R/W
dot3MpcpStat Table	dot3MpcpMACCtrlFramesTransmitted	statistics-mpcp	out-mpcp-mac-ctrl-frames	R
	dot3MpcpMACCtrlFramesReceived		in-mpcp-mac-ctrl-frames	R
	dot3MpcpDiscoveryWindowsSent		mpcp-discovery-window-count	R
	dot3MpcpDiscoveryTimeout		mpcp-discovery-timeout-count	R
	dot3MpcpTxRegRequest		out-mpcp-register-req	R
	dot3MpcpRxRegRequest		in-mpcp-register-req	R
	dot3MpcpTxRegAck		out-mpcp-register-ack	R
	dot3MpcpRxRegAck		in-mpcp-register-ack	R
	dot3MpcpTxReport		out-mpcp-report	R
	dot3MpcpRxReport		in-mpcp-report	R
	dot3MpcpTxGate		out-mpcp-gate	R
	dot3MpcpRxGate		in-mpcp-gate	R
	dot3MpcpTxRegister		out-mpcp-register	R
	dot3MpcpRxRegister		in-mpcp-register	R

Table 7–1—Mapping between IEEE Std 802.3.1, IEEE8023-DOT3-EPON-MIB managed objects and *ieee802-ethernet-pon* YANG data nodes (continued)

IEEE Std 802.3.1, IEEE8023-DOT3-EPON-MIB		Corresponding <i>ieee802-ethernet-pon</i> YANG data nodes		
Managed object(s)	Attribute(s)	Container(s)	Data node(s)	R/W
dot3ExtPkgOptIf Table	dot3ExtPkgOptIfLowerInputPowerThreshold	thresholds-trx	in-trx-power-low-threshold	R/W
	dot3ExtPkgOptIfUpperInputPowerThreshold		in-trx-power-high-threshold	R/W
	dot3ExtPkgOptIfLowerOutputPowerThreshold		out-trx-power-low-threshold	R/W
	dot3ExtPkgOptIfUpperOutputPowerThreshold		out-trx-power-high-threshold	R/W
	dot3ExtPkgOptIfSignalDetect		in-trx-power-signal-detect	R
	dot3ExtPkgOptIfInputPower		in-trx-power	R
	dot3ExtPkgOptIfLowInputPower		in-trx-power-low-15-minutes-bin	R
	dot3ExtPkgOptIfHighInputPower		in-trx-power-high-15-minutes-bin	R
	dot3ExtPkgOptIfTransmitEnable		out-trx-power-signal-detect	R/W
	dot3ExtPkgOptIfOutputPower		out-trx-power	R
	dot3ExtPkgOptIfLowOutputPower		out-trx-power-low-15-minutes-bin	R
	dot3ExtPkgOptIfHighOutputPower		out-trx-power-high-15-minutes-bin	R
	dot3ExtPkgOptIfSuspectedFlag		trx-data-reliable	R

7.4 YANG module definition^k

The YANG module tree hierarchy uses terms defined in IETF RFC 8407.

7.4.1 Tree hierarchy

7.4.1.1 ieee802-ethernet-pon

```

module: ieee802-ethernet-pon
  augment /if:interfaces/if:interface/ieee802-eth-if:ethernet:
    +--rw fec-mode?                fec-mode {fec-supported}?
    +--rw mpcp-admin-state?        mpcp-admin-state
    +--ro mpcp-logical-link-admin-state? mpcp-logical-link-admin-state
    +--rw trx-transmit-admin-state? trx-admin-state {trx-power-level-reporting-supported}?
    +--ro capabilities
    | +--ro mpcp-supported?    mpcp-supported
    +--ro statistics-mpcp
    | +--ro out-mpcp-mac-ctrl-frames?    yang:counter64
    | +--ro in-mpcp-mac-ctrl-frames?    yang:counter64
    | +--ro mpcp-discovery-window-count? yang:counter64
    | +--ro mpcp-discovery-timeout-count? yang:counter64
    | +--ro out-mpcp-register-req?    yang:counter64
    | +--ro in-mpcp-register-req?    yang:counter64
    | +--ro out-mpcp-register-ack?    yang:counter64
    | +--ro in-mpcp-register-ack?    yang:counter64
    | +--ro out-mpcp-report?    yang:counter64
    | +--ro in-mpcp-report?    yang:counter64
    | +--ro out-mpcp-gate?    yang:counter64
    | +--ro in-mpcp-gate?    yang:counter64
    | +--ro out-mpcp-register?    yang:counter64
    | +--ro in-mpcp-register?    yang:counter64
    +--rw statistics-ompe

```

^kCopyright release for YANG modules: Users of this standard may freely reproduce the YANG module contained in this subclause so that it can be used for its intended purpose.

```

1 | +--ro in-ompe-frames-errored-sld?                yang:counter64
2 | +--ro in-ompe-frames-errored-crc8?              yang:counter64
3 | +--ro ompe-onu-frames-with-good-llid-good-crc8?  yang:counter64
4 | +--ro ompe-olt-frames-with-good-llid-good-crc8? yang:counter64
5 | +--ro in-ompe-frames-with-bad-llid?             yang:counter64
6 | +--ro in-ompe-frames-with-good-llid?            yang:counter64
7 | +--ro in-ompe-frames?                           yang:counter64
8 | +--ro in-ompe-frames-not-match-onu-llid-broadcast? yang:counter64
9 | +--ro in-ompe-frames-match-onu-llid-not-broadcast? yang:counter64
10 | +--ro in-ompe-frames-match-onu-llid-broadcast?  yang:counter64
11 | +--ro in-ompe-frames-not-match-onu-llid-not-broadcast? yang:counter64
12 | +--rw thresholds-trx {trx-power-level-reporting-supported}?
13 |   +--rw in-trx-power-low-threshold?             power-level {trx-power-level-reporting-supported}?
14 |   +--rw in-trx-power-high-threshold?            power-level {trx-power-level-reporting-supported}?
15 |   +--rw out-trx-power-low-threshold?            power-level {trx-power-level-reporting-supported}?
16 |   +--rw out-trx-power-high-threshold?            power-level {trx-power-level-reporting-supported}?
17 | x--rw statistics-trx {trx-power-level-reporting-supported}?
18 |   +--ro in-trx-power-signal-detect?             boolean
19 |   +--ro in-trx-power?                           power-level
20 |   +--ro in-trx-power-low-15-minutes-bin?         power-level
21 |   +--ro in-trx-power-high-15-minutes-bin?        power-level
22 |   +--ro out-trx-power-signal-detect?             boolean
23 |   +--ro out-trx-power?                           power-level
24 |   +--ro out-trx-power-low-15-minutes-bin?         power-level
25 |   +--ro out-trx-power-high-15-minutes-bin?        power-level
26 |   +--ro trx-data-reliable?                       boolean {trx-power-level-reporting-supported}?
27 | +--rw monitoring-trx {trx-power-level-reporting-supported}?
28 |   +--ro in-trx-power-signal-detect?             boolean
29 |   +--ro in-trx-power?                           power-level
30 |   +--ro in-trx-power-low-15-minutes-bin?         power-level
31 |   +--ro in-trx-power-high-15-minutes-bin?        power-level
32 |   +--ro out-trx-power-signal-detect?             boolean
33 |   +--ro out-trx-power?                           power-level
34 |   +--ro out-trx-power-low-15-minutes-bin?         power-level
35 |   +--ro out-trx-power-high-15-minutes-bin?        power-level
36 |   +--ro trx-data-reliable?                       boolean {trx-power-level-reporting-supported}?

```

```

1  +---ro statistics-pon-fec {fec-supported}?
2  |   +---ro fec-code-group-violations?          yang:counter64
3  |   +---ro fec-buffer-head-coding-violations?   yang:counter64
4  |   +---ro fec-code-word-corrected-errors?      yang:counter64
5  |   +---ro fec-code-word-uncorrected-errors?     yang:counter64
6  +---rw mpcp-logical-link-admin-actions
7  |   +---x state-change-action-type
8  |   |   +---w input
9  |   |   +---w state-change-action-type?  identityref
10 |   +---x reset-action-type
11 |   |   +---w input
12 |   |   +---w reset-action-type?  identityref
13 |   +---x register-type
14 |   |   +---w input
15 |   |   +---w register-type?  identityref
16 +---rw mpcp-queues* [mpcp-queue-index]
17 |   +---rw mpcp-queue-index                uint8
18 |   +---rw mpcp-queue-threshold-count?      uint8
19 |   +---ro mpcp-queue-threshold-count-max?   uint8
20 |   +---rw mpcp-queue-thresholds* [mpcp-queue-set-index]
21 |   |   +---rw mpcp-queue-set-index          uint8
22 |   |   +---rw mpcp-queue-set-threshold?     uint64
23 |   +---ro in-mpcp-queue-frames?            yang:counter64
24 |   +---ro out-mpcp-queue-frames?           yang:counter64
25 |   +---ro mpcp-queue-frames-drop?          yang:counter64
26 +---rw multicast-IDs* [multicast-ID]
27 |   +---rw multicast-ID                    uint32
28 +---ro fec-capability?                      fec-capability
29 +---ro mpcp-mode?                           mpcp-mode
30 +---ro mpcp-sync-time?                       uint64
31 +---ro mpcp-logical-link-id?                 mpcp-supported
32 +---ro mpcp-remote-mac-address?              ieee:mac-address
33 +---ro mpcp-logical-link-state?              mpcp-logical-link-state
34 +---ro mpcp-elapsed-time-out?                uint64
35 +---ro mpcp-elapsed-time-in?                 uint64
36 +---ro mpcp-round-trip-time?                 uint16

```

```
1  +---ro mpcp-maximum-grant-count?          uint8
2  +---ro mpcp-logical-link-count?          mpcp-llid-count
3
4  +---ro mpcp-maximum-queue-count-per-report? mpcp-maximum-queue-count-per-report
5  +---ro ompe-mode?                        ompe-mode
6
7
8
9
10
11
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43
```

7.4.2 YANG module

In the following YANG module definition, should any discrepancy between the text of the description for individual YANG nodes and the corresponding definition in 7.2 through 7.4 of this clause occur, the definitions and mappings in 7.4 shall take precedence.

Editor's Note (to be removed prior to publication):

Yang files contained in <https://github.com/YangModels/yang/tree/main/standard/ieee/published/802.3> are IEEE 802.3.1-2019 version and will be updated at the publication time.

An ASCII text version of the YANG module can be found at the following URL:¹ <https://github.com/YangModels/yang/tree/master/standard/ieee/published/802.3>

Editor's Note (to be removed prior to publication):

Pretty printing of ieee802-ethernet-pon.yang file may change the appearance by adding whitespace and reformatting lines

Editor's Note (to be removed prior to publication):

IEEE Std 802.3.1 and IEEE Std 802.3.2 to be updated at the publication time

```
module ieee802-ethernet-pon {
  yang-version 1.1;
  namespace "urn:ieee:std:802.3:yang:ieee802-ethernet-pon";
  prefix ieee802-eth-pon;

  import ieee802-types {
    prefix ieee;
    reference
      "IEEE 802 types";
  }
  import ietf-yang-types {
    prefix yang;
    reference
      "IETF RFC 6991";
  }
  import ietf-interfaces {
    prefix if;
    reference
      "IETF RFC 8343";
  }
  import ieee802-ethernet-interface {
    prefix ieee802-eth-if;
  }

  organization
    "IEEE 802.3 Ethernet Working Group
    Web URL: http://www.ieee802.org/3/";
  contact
    "Web URL: http://www.ieee802.org/3/";
  description
    "This module contains a collection of YANG definitions for
```

¹Copyright release for YANG modules: Users of this standard may freely reproduce the YANG module contained in this subclause so that it can be used for its intended purpose.

```
1      managing the Multi Point Control Protocol for
2      Ethernet PON (EPON), as defined in IEEE Std 802.3, Clause 64
3      and Clause 77.
4
5      This YANG module augments the 'ethernet' module.";
6
7  revision 2024-07-17 {
8      description
9          "Updates under IEEE Std 802.3.2-202x, Draft D3.0";
10     reference
11         "IEEE Std 802.3-2022, unless dated explicitly";
12 }
13
14
15 feature trx-power-level-reporting-supported {
16     description
17         "This object indicates the support for optical transceiver
18         power level monitoring and reporting capability.
19         When 'true', the given interface supports the optical power
20         level monitoring and reporting function. Otherwise,
21         the value is 'false'.";
22 }
23
24
25 feature fec-supported {
26     description
27         "This object indicates the support of operation of the
28         optional FEC sublayer of the 1G-EPON PHY specified in
29         IEEE Std 802.3, 65.2. The value of 'unknown' is reported in
30         the initialization, for non FEC support state or type not
31         yet known. The value of 'not supported' is reported when the
32         sublayer is not supported. The value of 'supported' is
33         reported when the sublayer is supported. This object is
34         applicable for an OLT, with the same value for all logical
35         links, and for an ONU.";
36     reference
37         "IEEE Std 802.3, 30.5.1.1.15";
38 }
39
40
41 identity state-change-action-type {
42     description
43         "Type of interface state change requested.";
44 }
45
46
47 identity power-down {
48     base state-change-action-type;
49     description
50         "Power down the EPON logical interface.
51         Power-down actions are applicable for the OLT and ONU. A
52         power down of a specific logical interface affects only
53         the logical interface (and not the physical interface).
54         the logical interface will be unavailable while the
55         power-down occurs and data may be lost. Other logical
56         interface are unaffected by power-down.
57
58         This action is relevant when the admin state is active.";
59 }
60
61
62 identity power-up {
63     base state-change-action-type;
64     description
65
```



```
1      "Exit EPON logical interface power-down state.";
2  }
3
4  identity reset-action-type {
5      description
6          "Type of reset action requested.";
7  }
8
9
10 identity reset-interface {
11     base reset-action-type;
12     description
13         "Reset the EPON logical interface. Resetting an interface
14         can lead an interruption of service for the users connected
15         to the respective EPON interface.
16
17         This object is applicable for an OLT and an ONU. At the
18         OLT, it has a distinct value for each logical interface.
19         A reset for a specific logical interface resets only
20         this logical interface and not the physical interface.
21
22         Thus, a logical link that is malfunctioning can be
23         reset without affecting the operation of other logical
24         interfaces.
25
26         The reset can cause Discontinuities in the values of the
27         counters of the interface, similar to re-initialization
28         of the management system.";
29 }
30
31
32 identity register-type {
33     description
34         "Type of registration requested.";
35 }
36
37
38 identity register {
39     base register-type;
40     description
41         "Register indicates a request to register an LLID.
42         This action applies to an OLT or ONU logical interface.";
43 }
44
45
46 identity reregister {
47     base register-type;
48     description
49         "Re-register indicates an request to re-register an LLID.
50         This action applies to an OLT or ONU logical interface.";
51 }
52
53
54 identity deregister {
55     base register-type;
56     description
57         "De-register indicates an request to de-register an LLID.
58         This action applies to an OLT or ONU logical interface.
59         Deregister may result in an interruption of service to
60         users connected to the respective EPON interface.";
61 }
62
63
64 typedef mpcp-supported {
65     type boolean;
```

```
1      description
2          "This object indicates that the given interface supports
3          MPCP, i.e., it is an Ethernet PON (EPON) interface.";
4      }
5
6      typedef mpcp-llid {
7          type uint64 {
8              range "0 .. 32767";
9          }
10         description
11             "Logical Link Identifiers (LLIDs) are used to identify a
12             single MAC from a number of MACs which may be present in the
13             EPON OLT or ONU. LLIDs between the value of 0x07FFE
14             and 0x7FFF are assigned for ONU discovery and registration.
15             Other LLIDs are dynamically assigned by the OLT during the
16             registration process. For a complete description of how the
17             LLID is used in an EPON device, see IEEE Std 802.3,
18             Clause 65 for 1G-EPON and Clause 76 for 10G-EPON.";
19         reference
20             "IEEE Std 802.3, 65.1.3.3 for 1G-EPON and
21             76.2.6.1.3 for 10G-EPON";
22     }
23
24     typedef mpcp-maximum-queue-count-per-report {
25         type uint8 {
26             range "0..7";
27         }
28         default "0";
29         description
30             "Defines the maximum number of queues (0-7) in the REPORT
31             MPCPDU as defined in IEEE Std 802.3, Clause 64 and
32             Clause 77.";
33     }
34
35     typedef mpcp-llid-count {
36         type uint64 {
37             range "0 .. 32767";
38         }
39         description
40             "Indicates the number of registered LLIDs. The initialization
41             value is 0. This is applicable for an OLT with the same
42             value for all logical interfaces and for an ONU.";
43         reference
44             "IEEE Std 802.3, 65.1.3.3 for 1G-EPON and
45             76.2.6.1.3 for 10G-EPON";
46     }
47
48     typedef mpcp-admin-state {
49         type enumeration {
50             enum enabled {
51                 description
52                     "When selecting the value of 'enabled', the MultiPoint
53                     Control Protocol sublayer on the OLT / ONU is enabled.";
54             }
55             enum disabled {
56                 description
57                     "When selecting the value of 'disabled', the MultiPoint
58                     Control Protocol sublayer on the OLT / ONU is
59                     disabled.";
60             }
61         }
62     }
```

```
1      }
2    }
3    description
4      "Enumeration of valid administrative states for a
5      MultiPoint MAC Control sublayer on the OLT or ONU.";
6    reference
7      "IEEE Std 802.3, 30.3.5.2.1";
8  }
9
10
11  typedef mpcp-mode {
12    type enumeration {
13      enum olt {
14        description
15          "MPCP mode: olt";
16      }
17      enum onu {
18        description
19          "MPCP mode: onu";
20      }
21    }
22  }
23  description
24    "Enumeration of valid MPCP modes for EPON interfaces.";
25  reference
26    "IEEE Std 802.3, 30.3.5.1.3";
27  }
28
29  typedef mpcp-logical-link-state {
30    type enumeration {
31      enum unregistered {
32        description
33          "MPCP registration state: logical link is
34          NOT registered.";
35      }
36      enum registering {
37        description
38          "MPCP registration state: logical link is currently in
39          the process of registering.";
40      }
41      enum registered {
42        description
43          "MPCP registration state: logical link is currently
44          registered.";
45      }
46    }
47  }
48  description
49    "Enumeration of valid MPCP registration states for EPON
50    interfaces.";
51  reference
52    "IEEE Std 802.3, 30.3.5.1.6";
53  }
54
55  typedef mpcp-logical-link-admin-state {
56    type enumeration {
57      enum reset {
58        description
59          "When read, the value of 'reset' indicates that the given
60          logical link on the OLT / ONU has been reset.";
61      }
62      enum operate {
```

```
1         description
2         "When read, the value of 'operate' indicates that the
3         given logical link on the OLT / ONU has moved into
4         operating mode.";
5     }
6     enum unknown {
7         description
8         "When read, the value of 'unknown' indicates that the
9         status of the given logical link on the OLT / ONU is
10        currently not known.";
11    }
12    enum registered {
13        description
14        "When read, the value of 'registered' indicates that the
15        given logical link on the OLT / ONU has been
16        registered.";
17    }
18    enum deregistered {
19        description
20        "When read, the value of 'deregistered' indicates that the
21        given logical link on the OLT / ONU has been
22        deregistered.";
23    }
24    enum reregistered {
25        description
26        "When read, the value of 'reregistered' indicates that the
27        given logical link on the OLT / ONU has been
28        reregistered.";
29    }
30    }
31    description
32    "Enumeration of valid administrative states for a logical
33    link on the OLT or ONU.";
34 }
35
36 typedef ompe-mode {
37     type enumeration {
38         enum unknown {
39             description
40             "omp-emulation mode: unknown = system is initializing";
41         }
42         enum olt {
43             description
44             "omp-emulation mode: olt";
45         }
46         enum onu {
47             description
48             "omp-emulation mode: onu";
49         }
50     }
51     description
52     "Enumeration of valid OMP-Emulation modes for EPON
53     interfaces.";
54     reference
55     "IEEE Std 802.3, 30.3.7.1.2";
56 }
57
58 typedef fec-capability {
59     type enumeration {
```

```
1      enum unknown {
2          description
3              "FEC capability: unknown = system is initializing.";
4      }
5      enum supported {
6          description
7              "FEC capability: supported.";
8      }
9
10     enum NotSupported {
11         description
12             "FEC capability: not supported.";
13     }
14 }
15 description
16     "Enumeration of valid FEC capability values for EPON
17     interfaces with enabled MPCP.";
18 reference
19     "IEEE Std 802.3, 30.5.1.1.15";
20 }
21
22
23 typedef fec-mode {
24     type enumeration {
25         enum unknown {
26             description
27                 "FEC mode: unknown = system is initializing.";
28         }
29         enum disabled {
30             description
31                 "FEC mode: disabled = FEC is disabled for the given
32                 logical link (both Tx and Rx directions).";
33         }
34         enum enabled-Tx-Rx {
35             description
36                 "FEC mode: enabled-Tx-Rx = FEC is enabled for the given
37                 logical link in both Tx and Rx directions.";
38         }
39         enum enabled-Tx-only {
40             description
41                 "FEC mode: enabled-Tx-only = FEC is enabled for
42                 the given logical link but only in Tx direction.";
43         }
44         enum enabled-Rx-only {
45             description
46                 "FEC mode: enabled-Rx-only = FEC is enabled for
47                 the given logical link but only in Rx direction.";
48         }
49     }
50 }
51 description
52     "Enumeration of valid FEC modes for EPON interfaces.";
53 reference
54     "IEEE Std 802.3, 30.5.1.1.16";
55 }
56
57
58
59 typedef power-level {
60     type int32;
61     units "0.1 dBm";
62     description
63         "Power level reflects the value of power, as measured at the
64         optical transceiver, expressed in units of 0.1 dBm.";
65 }
```

```
1      }
2
3      typedef trx-admin-state {
4          type enumeration {
5              enum enabled {
6                  description
7                      "When read as 'enabled', the transmitter is enabled and
8                       operating under the control of the logical control
9                       protocol. When set to 'enabled', the transmitter is
10                      enabled to operate under the control of the logical
11                      control protocol.";
12              }
13              enum disabled {
14                  description
15                      "When read as 'disabled', the transmitter is currently
16                      disabled (not transmitting). When set to 'disabled',
17                      the transmitter is expected to be disabled
18                      (to stop transmitting).";
19              }
20          }
21      }
22      description
23          "Enumeration of valid administrative states for an optical
24          transceiver.";
25      reference
26          "IEEE Std 802.3.1, dot3ExtPkgOptIfTransmitEnable";
27  }
28
29  augment "/if:interfaces/if:interface/ieee802-eth-if:ethernet" {
30      description
31          "Augments the definition of Ethernet interface (
32           /if:interfaces/if:interface/ieee802-eth-if:ethernet)
33           module with nodes specific to Ethernet PON (EPON).";
34      leaf fec-mode {
35          if-feature "fec-supported";
36          type fec-mode;
37          description
38              "This object reflects the current administrative state of
39              the FEC function for the given logical link on an ONU or
40              OLT.
41
42              When reading the value of 'disabled', the FEC function on
43              the given logical link is disabled.
44
45              When reading the value of 'enabled-Tx-Rx', the FEC function
46              on the given logical link is enabled in both Tx and Rx
47              directions.
48
49              When reading the value of 'enabled-Tx-only', the FEC
50              function on the given logical link is enabled in Tx
51              direction only.
52
53              When reading the value of 'enabled-Rx-only', the FEC
54              function on the given logical link is enabled in Rx
55              direction only.
56
57              When reading the value of 'unknown', the state of the FEC
58              function on the given logical link is unknown or the FEC
59              function is currently initializing.
60
61              "
62      }
63  }
64
65
```

```
1         This object is applicable for an OLT and an ONU. This
2         object has the same value for each logical link.";
3     reference
4         "IEEE Std 802.3, 30.5.1.1.16";
5 }
6 leaf mpcp-admin-state {
7     type mpcp-admin-state;
8     description
9         "This object reflects the current administrative state of
10        the MultiPoint MAC Control sublayer, as defined in
11        IEEE Std 802.3, Clause 64 and Clause 77, for the
12        OLT / ONU.
13
14        When reading the value of 'enabled', the MultiPoint
15        Control Protocol on the OLT / ONU is enabled.
16
17        When reading the value of 'disabled', the MultiPoint
18        Control Protocol on the OLT / ONU is disabled.
19
20        This object is applicable for an OLT and an ONU. It has
21        the same value for all logical links.";
22     reference
23         "IEEE Std 802.3, 30.3.5.1.2";
24 }
25 leaf mpcp-logical-link-admin-state {
26     type mpcp-logical-link-admin-state;
27     config false;
28     description
29         "This object reflects the current administrative state of a
30        logical link on an ONU or OLT.
31
32        When reading the value of 'reset', the given logical link
33        is undergoing a reset.
34
35        When reading the value of 'unknown', the current status of
36        the given logical link is unknown and the link might be
37        undergoing initialization.
38
39        When reading the value of 'operate', the given logical
40        link is operating normally.
41
42        When reading the value of 'registered', the given logical
43        link was requested to perform registration.
44
45        When reading the value of 'deregistered', the given
46        logical link was requested to perform deregistration.
47
48        When reading the value of 'reregistered', the given
49        logical link was requested to perform reregistration.
50
51        This object is applicable for an OLT and an ONU. It has a
52        distinct value for each logical link.";
53     reference
54         "IEEE Std 802.3.1, dot3ExtPkgObjectRegisterAction";
55 }
56 leaf trx-transmit-admin-state {
57     when "../..//ieee802-eth-if:ethernet/
58         ieee802-eth-pon:mpcp-admin-state = 'enabled'";
59     if-feature "trx-power-level-reporting-supported";
60 }
```

```
1      type trx-admin-state;
2      description
3          "This object reflects the current status of the transmitter
4            in the optical transceiver.
5
6            When read as 'enabled', the optical transmitter is enabled
7            and operating under the control of the logical control
8            protocol.
9
10           When read as 'disabled', the optical transmitter is
11            disabled.
12
13           This object is applicable for an OLT and an ONU.
14           At the OLT, this object has a distinct value for each
15           logical link.
16
17           The value of this object is only reliable when
18           /if:interfaces-state/if:interface/ieee802-eth-if:ethernet/
19           'mpcp-admin-state' is equal to 'enabled'.";
20      reference
21          "IEEE Std 802.3.1, dot3ExtPkgOptIfTransmitEnable";
22  }
23  container capabilities {
24      config false;
25      description
26          "This container includes all EPON interface-specific
27            capabilities.";
28      leaf mpcp-supported {
29          type mpcp-supported;
30          default "true";
31          description
32              "This object indicates that the given interface supports
33                MPCP, i.e., it is an Ethernet PON (EPON) interface.";
34      }
35  }
36  container statistics-mpcp {
37      config false;
38      description
39          "This container defines a set of MPCP-related statistics
40            counters of an EPON interface, as defined in
41            IEEE Std 802.3, Clause 64 and Clause 77.
42
43            Discontinuities in the values of counters in this
44            container can occur at re-initialization of the management
45            system, and at other times as indicated by the value of
46            the 'discontinuity-time' leaf defined in the ietf-interfaces
47            YANG module (IETF RFC 8343).";
48      leaf out-mpcp-mac-ctrl-frames {
49          type yang:counter64;
50          units "frames";
51          config false;
52          description
53              "A count of MPCP frames passed to the MAC sublayer for
54                transmission.
55
56                This counter is incremented when a MA_CONTROL.request
57                service primitive is generated within the MAC control
58                sublayer with an opcode indicating an MPCP frame.
```



```
1         This object is applicable for an OLT and an ONU. It has
2         a distinct value for each logical link.";
3     reference
4         "IEEE Std 802.3, 30.3.5.1.7";
5 }
6 leaf in-mpcp-mac-ctrl-frames {
7     type yang:counter64;
8     units "frames";
9     config false;
10    description
11        "A count of MPCP frames passed by the MAC sublayer to the
12        MAC Control sublayer.
13
14        This counter is incremented when a frame is received at
15        the interface which is an MPCP frame or has a
16        Length/Type Ethernet header field value equal to the
17        Type assigned for 802.3_MAC_Control as specified in
18        IEEE Std 802.3, 31.4.1.3.
19
20        This object is applicable for an OLT and an ONU. It has
21        a distinct value for each logical link.";
22    reference
23        "IEEE Std 802.3, 30.3.5.1.8";
24 }
25 leaf mpcp-discovery-window-count {
26     when "../ompe-mode = 'olt'";
27     type yang:counter64;
28     units "discovery windows";
29     config false;
30     description
31         "A count of discovery windows generated by the OLT.
32
33         The counter is incremented by one for each generated
34         discovery window.
35
36         This object is applicable for an OLT and has the same
37         value for each logical link.";
38     reference
39         "IEEE Std 802.3, 30.3.5.1.22";
40 }
41 leaf mpcp-discovery-timeout-count {
42     when "../ompe-mode = 'olt'";
43     type yang:counter64;
44     units "discovery timeouts";
45     config false;
46     description
47         "A count of the number of times a discovery timeout
48         occurs.
49
50         This counter is incremented by one for each discovery
51         processing state-machine reset resulting from timeout
52         waiting for message arrival.
53
54         This object is applicable for an OLT and has the same
55         value for each logical link.";
56     reference
57         "IEEE Std 802.3, 30.3.5.1.23";
58 }
59 leaf out-mpcp-register-req {
```

```
1      when "../..//ompe-mode = 'onu'";
2      type yang:counter64;
3      units "frames";
4      config false;
5      description
6          "A count of the number of times a REGISTER_REQ MPCP frame
7           transmission occurs.
8
9           This counter is incremented by one for each
10          REGISTER_REQ MPCP frame transmitted as defined in
11          IEEE Std 802.3, Clause 64 and Clause 77.
12
13          This object is applicable for an ONU and has the same
14          value for each logical link.";
15      reference
16          "IEEE Std 802.3, 30.3.5.1.12";
17  }
18  leaf in-mpcp-register-req {
19      when "../..//ompe-mode = 'olt'";
20      type yang:counter64;
21      units "frames";
22      config false;
23      description
24          "A count of the number of times a REGISTER_REQ MPCP frame
25           reception occurs.
26
27           This counter is incremented by one for each
28          REGISTER_REQ MPCP frame received as defined in
29          IEEE Std 802.3, Clause 64 and Clause 77.
30
31          This object is applicable for an OLT and has the same
32          value for each logical link.";
33      reference
34          "IEEE Std 802.3, 30.3.5.1.17";
35  }
36  leaf out-mpcp-register-ack {
37      when "../..//ompe-mode = 'onu'";
38      type yang:counter64;
39      units "frames";
40      config false;
41      description
42          "A count of the number of times a REGISTER_ACK MPCP frame
43           transmission occurs.
44
45           This counter is incremented by one for each
46          REGISTER_ACK MPCP frame transmitted as defined in
47          IEEE Std 802.3, Clause 64 and Clause 77.
48
49          This object is applicable for an ONU and has a distinct
50          value for each logical link.";
51      reference
52          "IEEE Std 802.3, 30.3.5.1.10";
53  }
54  leaf in-mpcp-register-ack {
55      when "../..//ompe-mode = 'olt'";
56      type yang:counter64;
57      units "frames";
58      config false;
59      description
```

```
1      "A count of the number of times a REGISTER_ACK MPCP frame
2      reception occurs.
3
4      This counter is incremented by one for each
5      REGISTER_ACK MPCP frame received as defined in
6      IEEE Std 802.3, Clause 64 and Clause 77.
7
8      This object is applicable for an OLT and has a distinct
9      value for each logical link.";
10     reference
11     "IEEE Std 802.3, 30.3.5.1.15";
12 }
13 leaf out-mpcp-report {
14     when "../ompe-mode = 'onu'";
15     type yang:counter64;
16     units "frames";
17     config false;
18     description
19     "A count of the number of times a REPORT MPCP frame
20     transmission occurs.
21
22     This counter is incremented by one for each REPORT MPCP
23     frame transmitted as defined in IEEE Std 802.3,
24     Clause 64 and Clause 77.
25
26     This object is applicable for an ONU and has a distinct
27     value for each logical link.";
28     reference
29     "IEEE Std 802.3, 30.3.5.1.13";
30 }
31 leaf in-mpcp-report {
32     when "../ompe-mode = 'olt'";
33     type yang:counter64;
34     units "frames";
35     config false;
36     description
37     "A count of the number of times a REPORT MPCP frame
38     reception occurs.
39
40     This counter is incremented by one for each REPORT MPCP
41     frame received as defined in IEEE Std 802.3,
42     Clause 64 and Clause 77.
43
44     This object is applicable for an OLT and has a distinct
45     value for each logical link.";
46     reference
47     "IEEE Std 802.3, 30.3.5.1.18";
48 }
49 leaf out-mpcp-gate {
50     when "../ompe-mode = 'olt'";
51     type yang:counter64;
52     units "frames";
53     config false;
54     description
55     "A count of the number of times a GATE MPCP frame
56     transmission occurs.
57
58     This counter is incremented by one for each GATE MPCP
59     frame transmitted as defined in IEEE Std 802.3,
```

```
1           Clause 64 and Clause 77.
2
3           This object is applicable for an OLT and has a distinct
4           value for each logical link.";
5       reference
6           "IEEE Std 802.3, 30.3.5.1.9";
7   }
8   leaf in-mpcp-gate {
9       when "../ompe-mode = 'onu'";
10      type yang:counter64;
11      units "frames";
12      config false;
13      description
14          "A count of the number of times a GATE MPCP frame
15          reception occurs.
16
17          This counter is incremented by one for each GATE MPCP
18          frame received as defined in IEEE Std 802.3,
19          Clause 64 and Clause 77.
20
21          This object is applicable for an ONU and has a distinct
22          value for each logical link.";
23      reference
24          "IEEE Std 802.3, 30.3.5.1.14";
25  }
26  leaf out-mpcp-register {
27      when "../ompe-mode = 'olt'";
28      type yang:counter64;
29      units "frames";
30      config false;
31      description
32          "A count of the number of times a REGISTER MPCP frame
33          transmission occurs.
34
35          This counter is incremented by one for each
36          REGISTER MPCP frame transmitted as defined in
37          IEEE Std 802.3, Clause 64 and Clause 77.
38
39          This object is applicable for an OLT and has a distinct
40          value for each logical link.";
41      reference
42          "IEEE Std 802.3, 30.3.5.1.11";
43  }
44  leaf in-mpcp-register {
45      when "../ompe-mode = 'onu'";
46      type yang:counter64;
47      units "frames";
48      config false;
49      description
50          "A count of the number of times a REGISTER MPCP frame
51          reception occurs.
52
53          This counter is incremented by one for each
54          REGISTER MPCP frame received as defined in
55          IEEE Std 802.3, Clause 64 and Clause 77.
56
57          This object is applicable for an ONU and has a distinct
58          value for each logical link.";
59      reference
```

```
1      "IEEE Std 802.3, 30.3.5.1.16";
2    }
3  }
4  container statistics-ompe {
5    description
6      "This container defines a set of OMP-Emulation-related
7       statistics counters of an EPON interface, as defined in
8       IEEE Std 802.3, Clause 65 and Clause 76.
9
10      Discontinuities in the values of counters in this
11      container can occur at re-initialization of the management
12      system, and at other times as indicated by the value of
13      the 'discontinuity-time' leaf defined in the
14      ietf-interfaces YANG module (IETF RFC 8343).";
15    reference
16      "IEEE Std 802.3.1, dot3OmpEmulationStatEntry";
17    leaf in-ompe-frames-errored-sld {
18      type yang:counter64;
19      units "frames";
20      config false;
21      description
22        "A count of frames received that do not contain a valid
23         SLD field as defined in IEEE Std 802.3, 65.1.3.3.1 or
24         76.2.6.1.3.1, as appropriate.
25
26         This object is applicable for an OLT and an ONU.
27         It has a distinct value for each logical link.";
28      reference
29        "IEEE Std 802.3, 30.3.7.1.3";
30    }
31    leaf in-ompe-frames-errored-crc8 {
32      type yang:counter64;
33      units "frames";
34      config false;
35      description
36        "A count of frames received that contain a valid SLD
37         field, as defined in IEEE Std 802.3, 65.1.3.3.1 or
38         76.2.6.1.3.1 as appropriate, but do not pass the CRC-8
39         check as defined in IEEE Std 802.3, 65.1.3.3.3 or
40         76.2.6.1.3.3 as appropriate.
41
42         This object is applicable for an OLT and an ONU.
43         It has a distinct value for each logical link.";
44      reference
45        "IEEE Std 802.3, 30.3.7.1.4";
46    }
47    leaf ompe-onu-frames-with-good-llid-good-crc8 {
48      when "../ompe-mode = 'onu'";
49      type yang:counter64;
50      units "frames";
51      config false;
52      description
53        "A count of frames received that 1) contain a valid SLD
54         field in an ONU, 2) meet the rule for frame acceptance,
55         and 3) pass the CRC-8 check.
56
57         The SLD is defined in IEEE Std 802.3, 65.1.3.3.1 or
58         76.2.6.1.3.1, as appropriate.
```

```
1         The rules for LLID acceptance are defined in
2         IEEE Std 802.3, 65.1.3.3.2 or 76.2.6.1.3.2,
3         as appropriate.
4
5         The CRC-8 check is defined in IEEE Std 802.3,
6         65.1.3.3.3 or 76.2.6.1.3.3, as appropriate.
7
8         This object is applicable for an ONU and has a distinct
9         value for each logical link.";
10        reference
11        "IEEE Std 802.3, 30.3.7.1.6";
12    }
13    leaf ompe-olt-frames-with-good-llid-good-crc8 {
14        when "../ompe-mode = 'olt'";
15        type yang:counter64;
16        units "frames";
17        config false;
18        description
19        "A count of frames received that 1) contain a valid SLD
20        field in an OLT, and 2) pass the CRC-8 check.
21
22        The SLD is defined in IEEE Std 802.3, 65.1.3.3.1 or
23        76.2.6.1.3.1, as appropriate.
24
25        The frame acceptance are defined in IEEE Std 802.3,
26        65.1.3.3.2 or 76.2.6.1.3.2, as appropriate.
27
28        The CRC-8 check is defined in IEEE Std 802.3,
29        65.1.3.3.3 or 76.2.6.1.3.3, as appropriate.
30
31        This object is applicable for an OLT and has a distinct
32        value for each logical link.";
33        reference
34        "IEEE Std 802.3, 30.3.7.1.6";
35    }
36    leaf in-ompe-frames-with-bad-llid {
37        when "../ompe-mode = 'olt'";
38        type yang:counter64;
39        units "frames";
40        config false;
41        description
42        "A count of frames received that contain a valid SLD
43        field, as defined in IEEE Std 802.3, 65.1.3.3.1 or
44        76.2.6.1.3.1, as appropriate, and pass the CRC-8 check
45        as defined in IEEE Std 802.3, 65.1.3.3.3 or
46        76.2.6.1.3.3, as appropriate, but are discarded due to
47        the LLID check.
48
49        This object is applicable for an OLT and has a distinct
50        value for each logical link.";
51        reference
52        "IEEE Std 802.3, 30.3.7.1.8";
53    }
54    leaf in-ompe-frames-with-good-llid {
55        type yang:counter64;
56        units "frames";
57        config false;
58        description
59        "A count of frames received that contain a valid SLD
```

```
1         field, as defined in IEEE Std 802.3, 65.1.3.3.1 or
2         76.2.6.1.3.1 as appropriate, but do not pass the CRC-8
3         check as defined in IEEE Std 802.3, 65.1.3.3.3 or
4         76.2.6.1.3.3 as appropriate.
5
6         This object is applicable for an OLT and an ONU. It has
7         a distinct value for each logical link.";
8     reference
9         "IEEE Std 802.3, 30.3.7.1.4";
10 }
11 leaf in-ompe-frames {
12     type yang:counter64;
13     units "frames";
14     config false;
15     description
16         "A count of frames received that contain a valid SLD
17         field, as defined in IEEE Std 802.3, 65.1.3.3.1 or
18         76.2.6.1.3.1, as appropriate, and pass the CRC-8
19         check as defined in IEEE Std 802.3, 65.1.3.3.3 or
20         76.2.6.1.3.3, as appropriate.
21
22         This object is applicable for an OLT and an ONU. It has
23         a distinct value for each logical link.";
24     reference
25         "IEEE Std 802.3, 30.3.7.1.6 (ONU) and 30.3.7.1.7 (OLT)";
26 }
27 leaf in-ompe-frames-not-match-onu-llid-broadcast {
28     when "../ompe-mode = 'onu'";
29     type yang:counter64;
30     units "frames";
31     config false;
32     description
33         "A count of frames received that contain a valid SLD
34         field, as defined in IEEE Std 802.3, 65.1.3.3.1 or
35         76.2.6.1.3.1, as appropriate, pass the CRC-8 check, as
36         defined in IEEE Std 802.3, 65.1.3.3.3 or 76.2.6.1.3.3,
37         as appropriate, and contain the broadcast bit in the
38         LLID and not the ONU's LLID (frame accepted) as defined
39         in IEEE Std 802.3, Clause 65 and Clause 76,
40         as appropriate.
41
42         This object is applicable for an ONU only.";
43     reference
44         "IEEE Std 802.3.1,
45         dot3OmpEmulationBroadcastBitNotOnuLlid";
46 }
47 leaf in-ompe-frames-match-onu-llid-not-broadcast {
48     when "../ompe-mode = 'onu'";
49     type yang:counter64;
50     units "frames";
51     config false;
52     description
53         "A count of frames received that contain a valid SLD
54         field, as defined in IEEE Std 802.3, 65.1.3.3.1 or
55         76.2.6.1.3.1, as appropriate, pass the CRC-8 check, as
56         defined in IEEE Std 802.3, 65.1.3.3.3 or 76.2.6.1.3.3,
57         as appropriate, and contain the ONU's LLID
58         (frame accepted) as defined in IEEE Std 802.3, Clause 65
59         and Clause 76, as appropriate.
```

```
1
2     This object is applicable for an ONU only.";
3     reference
4         "IEEE Std 802.3.1, dot3OmpEmulationOnuLLIDNotBroadcast";
5 }
6 leaf in-ompe-frames-match-onu-llid-broadcast {
7     when "../ompe-mode = 'onu'";
8     type yang:counter64;
9     units "frames";
10    config false;
11    description
12        "A count of frames received that contain a valid SLD
13         field, as defined in IEEE Std 802.3, 65.1.3.3.1 or
14         76.2.6.1.3.1, as appropriate, pass the CRC-8 check, as
15         defined in IEEE Std 802.3, 65.1.3.3.3 or 76.2.6.1.3.3,
16         as appropriate, and contain the broadcast bit in the
17         LLID and the ONU's LLID (frame accepted) as defined in
18         IEEE Std 802.3, Clause 65 and Clause 76, as appropriate.
19
20     This object is applicable for an ONU only.";
21     reference
22         "IEEE Std 802.3.1,
23         dot3OmpEmulationBroadcastBitPlusOnuLlid";
24 }
25 leaf in-ompe-frames-not-match-onu-llid-not-broadcast {
26     when "../ompe-mode = 'onu'";
27     type yang:counter64;
28     units "frames";
29     config false;
30     description
31         "A count of frames received that contain a valid SLD
32         field, as defined in IEEE Std 802.3, 65.1.3.3.1 or
33         76.2.6.1.3.1, as appropriate, pass the CRC-8 check,
34         as defined in IEEE Std 802.3, 65.1.3.3.3 or
35         76.2.6.1.3.3, as appropriate, do not contain the
36         broadcast bit in the LLID and do not contain the ONU's
37         LLID (frame is NOT accepted) as defined in
38         IEEE Std 802.3, Clause 65 and Clause 76, as appropriate.
39
40     This object is applicable for an ONU only.";
41     reference
42         "IEEE Std 802.3.1,
43         dot3OmpEmulationNotBroadcastBitNotOnuLlid";
44 }
45 }
46 container thresholds-trx {
47     if-feature "trx-power-level-reporting-supported";
48     description
49         "This container defines a set of optical transceiver
50         thresholds of an EPON interface as defined in
51         IEEE Std 802.3, Clause 60 and Clause 75.";
52     reference
53         "IEEE Std 802.3.1, dot3ExtPkgOptIfEntry";
54     leaf in-trx-power-low-threshold {
55         if-feature "trx-power-level-reporting-supported";
56         type power-level;
57         description
58             "This object reflects the current setting of low alarm
59             threshold for the input power into the optical receiver.
60
61         This object is applicable for an ONU only.";
62         reference
63             "IEEE Std 802.3.1, dot3ExtPkgOptIfEntry";
64     }
65 }
```



```
1         If the value reported in 'in-trx-power' object drops
2         below the value set in 'in-trx-power-low-threshold', a
3         'in-trx-power-low-threshold-crossing' event is
4         generated.
5
6         This object is applicable for an OLT and an ONU. It has
7         a distinct value for each logical link.";
8     reference
9         "IEEE Std 802.3.1,
10        dot3ExtPkgOptIfLowerInputPowerThreshold";
11
12 }
13 leaf in-trx-power-high-threshold {
14     if-feature "trx-power-level-reporting-supported";
15     type power-level;
16     description
17         "This object reflects the current setting of high alarm
18         threshold for the input power into the optical receiver.
19         If the value reported in 'in-trx-power' object exceeds
20         the value set in 'in-trx-power-high-threshold', a
21         'in-trx-power-high-threshold-crossing' event is
22         generated.
23
24         This object is applicable for an OLT and an ONU. It has
25         a distinct value for each logical link.";
26     reference
27         "IEEE Std 802.3.1,
28         dot3ExtPkgOptIfUpperInputPowerThreshold";
29
30 }
31 leaf out-trx-power-low-threshold {
32     if-feature "trx-power-level-reporting-supported";
33     type power-level;
34     description
35         "This object reflects the current setting of low alarm
36         threshold for the output power out of the optical
37         transmitter. If the value reported in 'out-trx-power'
38         object drops below the value set in
39         'out-trx-power-low-threshold', a
40         'out-trx-power-low-threshold-crossing' event is
41         generated.
42
43         This object is applicable for an OLT and an ONU. It has
44         a distinct value for each logical link.";
45     reference
46         "IEEE Std 802.3.1,
47         dot3ExtPkgOptIfLowerOutputPowerThreshold";
48
49 }
50 leaf out-trx-power-high-threshold {
51     if-feature "trx-power-level-reporting-supported";
52     type power-level;
53     description
54         "This object reflects the current setting of high alarm
55         threshold for the output power out of the optical
56         transmitter. If the value reported in 'out-trx-power'
57         object exceeds the value set in
58         'out-trx-power-high-threshold', a
59         'out-trx-power-high-threshold-crossing' event is
60         generated.
61
62         This object is applicable for an OLT and an ONU.
```

```
1           It has a distinct value for each logical link.";
2       reference
3           "IEEE Std 802.3.1,
4               dot3ExtPkgOptIfUpperOutputPowerThreshold";
5   }
6 }
7
8 container statistics-trx {
9     if-feature "trx-power-level-reporting-supported";
10    status deprecated;
11    description
12        "This container defines a set of optical transceiver
13            statistics counters of an EPON interface as defined in
14            IEEE Std 802.3, Clause 60 and Clause 75.";
15    reference
16        "IEEE Std 802.3.1, dot3ExtPkgOptIfEntry";
17    leaf in-trx-power-signal-detect {
18        type boolean;
19        config false;
20        description
21            "This object indicates whether a valid optical signal was
22                detected (when read as 'true') or not
23                (when read as 'false') at the input to the
24                optical transceiver.
25
26                This object is applicable for an OLT and an ONU. It has
27                a distinct value for each logical link.";
28        reference
29            "IEEE Std 802.3.1, dot3ExtPkgOptIfSignalDetect";
30    }
31
32    leaf in-trx-power {
33        type power-level;
34        config false;
35        description
36            "This object reflects the value of the input power, as
37                measured at the optical transceiver, expressed in units
38                of 0.1 dBm.
39
40                At the ONU, the measurement is performed in a continuous
41                manner.
42
43                At the OLT, the measurement is performed in a burst-mode
44                manner, for each incoming data burst.
45
46                This object is applicable for an OLT and an ONU. It has
47                a distinct value for each logical link.";
48        reference
49            "IEEE Std 802.3.1, dot3ExtPkgOptIfInputPower";
50    }
51
52    leaf in-trx-power-low-15-minutes-bin {
53        type power-level;
54        config false;
55        description
56            "This object reflects the lowest value of the input power
57                during the period of the last 15 minutes, as measured at
58                the optical transceiver, and expressed in units of
59                0.1 dBm.
60
61                At the ONU, the measurement is performed in a continuous
62                manner and stored in a rolling 15-minutes' long
```

```
1         observation bin.
2
3         At the OLT, the measurement is the average power for
4         each incoming data burst, and stored in a rolling
5         15-minutes' long observation bin.
6
7         This object is applicable for an OLT and an ONU. It has
8         a distinct value for each logical link.";
9
10        reference
11        "IEEE Std 802.3.1, dot3ExtPkgOptIfLowInputPower";
12    }
13    leaf in-trx-power-high-15-minutes-bin {
14        type power-level;
15        config false;
16        description
17        "This object reflects the highest value of the input
18        power during the period of the last 15 minutes, as
19        measured at the optical transceiver, and expressed in
20        units of 0.1 dBm.
21
22        At the ONU, the measurement is performed in a continuous
23        manner and stored in a rolling 15-minutes' long
24        observation bin.
25
26        At the OLT, the measurement is the average power for
27        each incoming data burst, and stored in a rolling
28        15-minutes' long observation bin.
29
30        This object is applicable for an OLT and an ONU. It has
31        a distinct value for each logical link.";
32
33        reference
34        "IEEE Std 802.3.1, dot3ExtPkgOptIfHighInputPower";
35    }
36
37    leaf out-trx-power-signal-detect {
38        type boolean;
39        config false;
40        description
41        "This object indicates whether a valid optical signal was
42        detected (when read as 'true') or not
43        (when read as 'false') at the output from the
44        optical transceiver.
45
46        This object is applicable for an OLT and an ONU. It has
47        a distinct value for each logical link.";
48
49        reference
50        "IEEE Std 802.3.1, dot3ExtPkgOptIfTransmitAlarm";
51    }
52
53    leaf out-trx-power {
54        type power-level;
55        config false;
56        description
57        "This object reflects the value of the output power, as
58        measured at the optical transceiver, expressed in units
59        of 0.1 dBm.
60
61        At the ONU, the measurement is performed in a burst-mode
62        manner for each outgoing data burst.
63
64        At the OLT, the measurement is performed in a continuous
```

```
1         manner.
2
3         This object is applicable for an OLT and an ONU. It has
4         a distinct value for each logical link.";
5     reference
6         "IEEE Std 802.3.1, dot3ExtPkgOptIfOutputPower";
7
8 }
9 leaf out-trx-power-low-15-minutes-bin {
10     type power-level;
11     config false;
12     description
13         "This object reflects the lowest value of the output
14         power during the period of the last 15 minutes, as
15         measured at the optical transceiver, and expressed in
16         units of 0.1 dBm.
17
18         At the ONU, the measurement is performed in a burst-mode
19         manner and stored in a rolling 15-minutes' long
20         observation bin.
21
22         At the OLT, the measurement is the average power for
23         each incoming data burst, and stored in a rolling
24         15-minutes' long observation bin.
25
26         This object is applicable for an OLT and an ONU. It has
27         a distinct value for each logical link.";
28     reference
29         "IEEE Std 802.3.1, dot3ExtPkgOptIfLowOutputPower";
30
31 }
32 leaf out-trx-power-high-15-minutes-bin {
33     type power-level;
34     config false;
35     description
36         "This object reflects the highest value of the output
37         power during the period of the last 15 minutes, as
38         measured at the optical transceiver, and expressed in
39         units of 0.1 dBm.
40
41         At the ONU, the measurement is performed in a burst-mode
42         manner and stored in a rolling 15-minutes' long
43         observation bin.
44
45         At the OLT, the measurement is the average power for
46         each incoming data burst, and stored in a rolling
47         15-minutes' long observation bin.
48
49         This object is applicable for an OLT and an ONU. It has
50         a distinct value for each logical link.";
51     reference
52         "IEEE Std 802.3.1, dot3ExtPkgOptIfHighOutputPower";
53
54 }
55 leaf trx-data-reliable {
56     if-feature "trx-power-level-reporting-supported";
57     type boolean;
58     config false;
59     description
60         "This object indicates whether data contained in
61         individual counters in 'statistics-trx' container are
62         reliable (when read as 'true') or not
```

```
1         (when read as 'false').
2
3         This object is applicable for an OLT and an ONU. It has
4         a distinct value for each logical link.";
5     reference
6         "IEEE Std 802.3.1, dot3ExtPkgOptIfSuspectedFlag";
7 }
8
9 }
10 container monitoring-trx {
11     if-feature "trx-power-level-reporting-supported";
12     description
13         "This container defines a set of optical transceiver
14         statistics counters of an EPON interface as defined in
15         IEEE Std 802.3, Clause 60 and Clause 75.";
16     reference
17         "IEEE Std 802.3.1, dot3ExtPkgOptIfEntry";
18     leaf in-trx-power-signal-detect {
19         type boolean;
20         config false;
21         description
22             "This object indicates whether a valid optical signal was
23             detected (when read as 'true') or not
24             (when read as 'false') at the input to the
25             optical transceiver.
26
27             This object is applicable for an OLT and an ONU. It has
28             a distinct value for each logical link.";
29         reference
30             "IEEE Std 802.3.1, dot3ExtPkgOptIfSignalDetect";
31     }
32     leaf in-trx-power {
33         type power-level;
34         config false;
35         description
36             "This object reflects the value of the input power, as
37             measured at the optical transceiver, expressed in units
38             of 0.1 dBm.
39
40             At the ONU, the measurement is performed in a continuous
41             manner.
42
43             At the OLT, the measurement is performed in a burst-mode
44             manner, for each incoming data burst.
45
46             This object is applicable for an OLT and an ONU. It has
47             a distinct value for each logical link.";
48         reference
49             "IEEE Std 802.3.1, dot3ExtPkgOptIfInputPower";
50     }
51     leaf in-trx-power-low-15-minutes-bin {
52         type power-level;
53         config false;
54         description
55             "This object reflects the lowest value of the input power
56             during the period of the last 15 minutes, as measured at
57             the optical transceiver, and expressed in units of
58             0.1 dBm.
59
60             At the ONU, the measurement is performed in a continuous
```

```
1      manner and stored in a rolling 15-minutes' long
2      observation bin.
3
4      At the OLT, the measurement is the average power for
5      each incoming data burst, and stored in a rolling
6      15-minutes' long observation bin.
7
8      This object is applicable for an OLT and an ONU.
9      It has a distinct value for each logical link.";
10     reference
11     "IEEE Std 802.3.1, dot3ExtPkgOptIfLowInputPower";
12 }
13 leaf in-trx-power-high-15-minutes-bin {
14     type power-level;
15     config false;
16     description
17     "This object reflects the highest value of the input
18     power during the period of the last 15 minutes,
19     as measured at the optical transceiver,
20     and expressed in units of 0.1 dBm.
21
22     At the ONU, the measurement is performed in a continuous
23     manner and stored in a rolling 15-minutes' long
24     observation bin.
25
26     At the OLT, the measurement is the average power for
27     each incoming data burst, and stored in a rolling
28     15-minutes' long observation bin.
29
30     This object is applicable for an OLT and an ONU. It has
31     a distinct value for each logical link.";
32     reference
33     "IEEE Std 802.3.1, dot3ExtPkgOptIfHighInputPower";
34 }
35 leaf out-trx-power-signal-detect {
36     type boolean;
37     config false;
38     description
39     "This object indicates whether a valid optical signal was
40     detected (when read as 'true') or not
41     (when read as 'false') at the output from the
42     optical transceiver.
43
44     This object is applicable for an OLT and an ONU. It has
45     a distinct value for each logical link.";
46     reference
47     "IEEE Std 802.3.1, dot3ExtPkgOptIfTransmitAlarm";
48 }
49 leaf out-trx-power {
50     type power-level;
51     config false;
52     description
53     "This object reflects the value of the output power, as
54     measured at the optical transceiver, expressed in units
55     of 0.1 dBm.
56
57     At the ONU, the measurement is performed in a burst-mode
58     manner for each outgoing data burst.
```

```
1         At the OLT, the measurement is performed in a continuous
2         manner.
3
4         This object is applicable for an OLT and an ONU. It has
5         a distinct value for each logical link.";
6     reference
7         "IEEE Std 802.3.1, dot3ExtPkgOptIfOutputPower";
8
9 }
10 leaf out-trx-power-low-15-minutes-bin {
11     type power-level;
12     config false;
13     description
14         "This object reflects the lowest value of the output
15         power during the period of the last 15 minutes, as
16         measured at the optical transceiver, and expressed in
17         units of 0.1 dBm.
18
19         At the ONU, the measurement is performed in a burst-mode
20         manner and stored in a rolling 15-minutes' long
21         observation bin.
22
23         At the OLT, the measurement is the average power for
24         each incoming data burst, and stored in a rolling
25         15-minutes' long observation bin.
26
27         This object is applicable for an OLT and an ONU. It has
28         a distinct value for each logical link.";
29     reference
30         "IEEE Std 802.3.1, dot3ExtPkgOptIfLowOutputPower";
31
32 }
33 leaf out-trx-power-high-15-minutes-bin {
34     type power-level;
35     config false;
36     description
37         "This object reflects the highest value of the output
38         power during the period of the last 15 minutes, as
39         measured at the optical transceiver, and expressed in
40         units of 0.1 dBm.
41
42         At the ONU, the measurement is performed in a burst-mode
43         manner and stored in a rolling 15-minutes' long
44         observation bin.
45
46         At the OLT, the measurement is the average power for
47         each incoming data burst, and stored in a rolling
48         15-minutes' long observation bin.
49
50         This object is applicable for an OLT and an ONU. It has
51         a distinct value for each logical link.";
52     reference
53         "IEEE Std 802.3.1, dot3ExtPkgOptIfHighOutputPower";
54
55 }
56 leaf trx-data-reliable {
57     if-feature "trx-power-level-reporting-supported";
58     type boolean;
59     config false;
60     description
61         "This object indicates whether data contained in
62         individual counters in 'statistics-trx' container are
```

```
1         reliable (when read as 'true') or not
2         (when read as 'false').
3
4         This object is applicable for an OLT and an ONU. It has
5         a distinct value for each logical link.";
6     reference
7         "IEEE Std 802.3.1, dot3ExtPkgOptIfSuspectedFlag";
8     }
9 }
10
11 container statistics-pon-fec {
12     when "(../fec-capability = 'supported') and
13         (../fec-mode = 'enabled-Tx-Rx')";
14     if-feature "fec-supported";
15     config false;
16     description
17         "This container defines a set of FEC-related statistics
18         counters of an EPON interface, as defined in
19         IEEE Std 802.3, Clause 65 and Clause 76.
20
21         Discontinuities in the value of this counter can occur at
22         re-initialization of the management system, and at other
23         times as indicated by the value of the
24         'discontinuity-time' leaf defined in the ietf-interfaces
25         YANG module (IETF RFC 8343).";
26     reference
27         "IEEE Std 802.3.1, dot3OmpEmulationStatEntry";
28     leaf fec-code-group-violations {
29         type yang:counter64;
30         units "code-group";
31         config false;
32         description
33             "For 1G-EPON this is a count of the number of events that
34             cause the PHY to indicate â€™Data reception errorâ€™ or
35             â€™Carrier Extend Errorâ€™ on the GMII (see IEEE Std 802.3,
36             Table 35-1). The contents of this counter is undefined
37             when FEC is operating. For 10G-EPON this object is not
38             applicable.
39
40             This object is applicable for an OLT and an ONU. At the
41             OLT, it has a distinct value for each logical link.";
42         reference
43             "IEEE Std 802.3, 30.5.1.1.14";
44     }
45     leaf fec-buffer-head-coding-violations {
46         type yang:counter64;
47         units "code-group";
48         config false;
49         description
50             "For 1G-EPON PHY, this object represents the count of the
51             number of invalid code-groups received directly from the
52             link when FEC is enabled. When FEC is disabled this
53             counter stops counting.
54
55             For 10G-EPON PHYs, this object is set to zero.
56
57             This object is applicable for an OLT and an ONU. It has
58             a distinct value for each logical link.";
59         reference
60             "IEEE Std 802.3.1, dot3EponFecBufferHeadCodingViolation";
```



```
1      }
2      leaf fec-code-word-corrected-errors {
3          type yang:counter64;
4          units "code-group";
5          config false;
6          description
7              "For 1G-EPON or 10G-EPON PHYs, this object represents a
8              count of corrected FEC blocks.
9
10             This counter increments by one for each received
11             FEC block that contained detected errors and was
12             corrected by the FEC function in the PHY.
13
14             This object is applicable for an OLT and an ONU. It has
15             a distinct value for each logical link.";
16          reference
17              "IEEE Std 802.3, 30.5.1.1.17";
18      }
19      leaf fec-code-word-uncorrected-errors {
20          type yang:counter64;
21          units "code-group";
22          config false;
23          description
24              "For 1G-EPON or 10G-EPON PHYs, this object represents a
25              count of uncorrectable FEC blocks.
26
27             This counter increments by one for each received FEC
28             block that contained detected errors and was not
29             corrected by the FEC function in the PHY.
30
31             This object is applicable for an OLT and an ONU. It has
32             a distinct value for each logical link.";
33          reference
34              "IEEE Std 802.3, 30.5.1.1.18";
35      }
36  }
37  }
38  container mpcp-logical-link-admin-actions {
39      description
40          "Container of actions.";
41      action state-change-action-type {
42          description
43              "Request a state change on the interface.";
44          input {
45              leaf state-change-action-type {
46                  type identityref {
47                      base state-change-action-type;
48                  }
49                  description
50                      "Type of interface state change requested.";
51              }
52          }
53      }
54      action reset-action-type {
55          description
56              "Request a reset-action of the interface.";
57          input {
58              leaf reset-action-type {
59                  type identityref {
60                      base reset-action-type;
61                  }
62              }
63          }
64      }
65  }
```

```

1      }
2      description
3      "Type of reset action requested of the interface.";
4    }
5  }
6  }
7  action register-type {
8    description
9    "Request a registration action.";
10   input {
11     leaf register-type {
12       type identityref {
13         base register-type;
14       }
15     }
16     description
17     "Type of registration action requested of the
18      interface.";
19   }
20 }
21 }
22 }
23 }
24 list mpcp-queues {
25   key "mpcp-queue-index";
26   description
27   "An instance of this object for each value of
28    'mpcp-queue-index' is created when a new logical link is
29    registered and deleted when the logical link is
30    deregistered.
31
32    All instances of this object in the ONU associated with
33    the given logical link are then mapped to a REPORT MPCPDU,
34    when generated.
35
36
37   +-----+
38   |          Destination Address          |
39   +-----+
40   |          Source Address              |
41   +-----+
42   |          Length/Type                 |
43   +-----+
44   |          OpCode                      |
45   +-----+
46   |          TimeStamp                   |
47   +-----+
48   |          Number of Queue Sets        |
49   +-----+
50   |          Report bitmap                |
51   +-----+
52   |          Queue 0 report               |
53   +-----+
54   |          Queue 1 report               |
55   +-----+
56   |          Queue 2 report               |
57   +-----+
58   |          Queue 3 report               |
59   +-----+
60   |          Queue 4 report               |
61   +-----+
62   |          Queue 5 report               |
63   +-----+
64   |          Queue 5 report               |
65   +-----+

```

1	+	-----	+	
2		Queue 6 report		
3	+	-----	+	
4		Queue 7 report		
5	+	-----	+	-
6		Pad/reserved		
7	+	-----	+	
8		FCS		
9	+	-----	+	

The 'Queue N report' field reports the current occupancy of each upstream transmission queue associated with the given logical link.

The 'Number of Queue Sets' field defines the number of reported 'Queue N report' sets.

For each Queue Set, the 'Report bitmap' field defines which upstream transmission queues are present in the REPORT MPCPDU.

Although the REPORT MPCPDU can report current occupation for up to 8 upstream transmission queues in a single REPORT MPCPDU, the actual number is flexible.

The 'mpcp-queue-group' grouping has a variable size that is limited by value of

'mpcp-maximum-queue-count-per-report' object, allowing ONUs report the occupancy of fewer upstream transmission queues, as needed.

This object is applicable for an OLT and an ONU.

At the OLT, this object has a distinct value for each logical link and every queue. At the ONU, it has a distinct value for every queue."

reference

"IEEE Std 802.3.1, dot3ExtPkgQueueEntry";

leaf mpcp-queue-index {

type uint8 {

range "0 .. 7" {

description

"This object indicates the identity (index) of a queue in the ONU. It can have a value between 0 and 7, limited by the value stored in the 'mpcp-maximum-queue-count-per-report' object.";

reference

"See 'mpcp-maximum-queue-count-per-report' object";

}

}

description

"An object represents the index of an upstream transmission queue storing subscriber packets. The size (occupancy) of the upstream transmission queue identified by this object is then reported within REPORT MPCPDU, defined in IEEE Std 802.3, Clause 64 and Clause 77.

This object indicates the identity (index) of a queue in the ONU. It can have a value between 0 and 7, limited by the value stored in the 'mpcp-maximum-queue-count-per-report' object.

```
1
2     This object is applicable for an OLT and an ONU.
3     It has a distinct value for each logical link and each
4     queue.
5     At the ONU, it has a distinct value for each queue.";
6 reference
7     "IEEE Std 802.3.1, dot3QueueIndex";
8
9 }
10 leaf mpcp-queue-threshold-count {
11     type uint8 {
12         range "0 .. 7" {
13             description
14                 "This object indicates the identity (index) of a
15                 queue in the ONU. It can have a value between
16                 0 and 7, limited by the value stored in the
17                 'mpcp-maximum-queue-count-per-report' object.";
18             reference
19                 "See 'mpcp-queue-threshold-count-max' object";
20         }
21     }
22 }
23 description
24     "This object reflects the number of reporting thresholds
25     for the specific upstream transmission queue, reflected
26     in the REPORT MPCPDU, as defined in IEEE Std 802.3,
27     Clause 64 and Clause 77.
28
29     Each 'Queue set' provides information for the specific
30     upstream transmission queue occupancy of frames below
31     the matching reporting threshold.
32
33     A read of this object reflects the number of reporting
34     thresholds for the specific upstream transmission queue.
35
36     This object is applicable for an OLT and an ONU. It has
37     a distinct value for each logical link and each queue.
38     At the ONU, it has a distinct value for each queue.";
39 reference
40     "IEEE Std 802.3.1, dot3ExtPkgObjectReportNumThreshold";
41
42 }
43 leaf mpcp-queue-threshold-count-max {
44     type uint8 {
45         range "0 .. 7" {
46             description
47                 "This object can have a value between 0 and 7.";
48         }
49     }
50 }
51
52 config false;
53 description
54     "This object reflects the maximum number of reporting
55     thresholds for the specific upstream transmission queue,
56     reflected in the REPORT MPCPDU, as defined in
57     IEEE Std 802.3, Clause 64 and Clause 77.
58
59     A read of this object reflects the maximum number of
60     reporting thresholds for the specific upstream
61     transmission queue.
62
63     This object is applicable for an OLT and an ONU. It has
64     a distinct value for each logical link and each queue.
```

Destination Address	
Source Address	
Length/Type	
OpCode	
Time Stamp	
Number of Queue Sets	
Report bitmap	
Queue 0 report	
Queue 1 report	
Queue 2 report	
Queue 3 report	
Queue 4 report	
Queue 5 report	
Queue 6 report	
Queue 7 report	
Pad/reserved	
FCS	

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The 'Number of Queue Sets' field defines the number of reported 'Queue N report' sets.

For each Queue Set, the 'Report bitmap' field defines which upstream transmission queues are present in the REPORT MPCPDU. Although the REPORT MPCPDU can report current occupation for up to 8 upstream transmission queues in a single REPORT MPCPDU, the actual number is flexible.

The 'mpcp-queue-group' grouping has a variable size that is limited by value of 'mpcp-maximum-queue-count-per-report' object, allowing ONUs to report the occupancy of fewer upstream transmission queues, as needed.

This object is applicable for an OLT and an ONU. It has a distinct value for each logical link and every queue. At the ONU, it has a distinct value for every queue."

reference

"IEEE Std 802.3.1, dot3ExtPkgQueueSetsEntry";

leaf mpcp-queue-set-index {

type uint8 {

range "0 .. 7" {

description

"This object indicates the identity (index) of a queue in the ONU. It can have a value between 0 and 7, limited by the value stored in the 'mpcp-maximum-queue-count-per-report' object.";

reference

"See 'mpcp-maximum-queue-count-per-report' object";

}

}

description

"This object represents the index of the Queue Set for the 'mpcp-queue-set-group' grouping. The size (occupancy) of the upstream transmission queues belonging to the given Queue Set is then reported within REPORT MPCPDU, defined in IEEE Std 802.3, Clause 64 and Clause 77.

This object can have a value between 0 and 7, limited by the value stored in the

'mpcp-queue-threshold-count-max' object.";

reference

"IEEE Std 802.3.1, dot3QueueSetIndex";

}

leaf mpcp-queue-set-threshold {

type uint64;

units "TQ";

default "0";

description

"This object defines the value of a reporting threshold for each Queue Set stored in REPORT MPCPDU defined in IEEE Std 802.3, Clause 64 and Clause 77.

The number of Queue Sets for each upstream transmission queue is defined in the 'mpcp-queue-threshold-count' object.

```
1
2       Within REPORT MPCPDU, each Queue Set provides
3       information on the current upstream transmission queue
4       occupancy for frames below the matching threshold.
5
6       The value stored in this object is expressed in the
7       units of Time quanta (TQ), where 1 TQ = 16 ns.
8
9       A read of this object provides the current threshold
10      value for the specific upstream transmission queue.
11
12      This object is applicable for an OLT and an ONU. At
13      the OLT, it has a distinct value for each logical link,
14      each queue, and each Queue Set.
15
16      At the ONU, it has a distinct value for each queue and
17      each Queue Set.";
18
19      reference
20      "IEEE Std 802.3.1, dot3ExtPkgObjectReportThreshold";
21  }
22 }
23
24 leaf in-mpcp-queue-frames {
25     type yang:counter64;
26     config false;
27     description
28         "A count of the number of times a frame reception event
29         results in a frame being queued in (for ONUs) or
30         received from (for OLTs) the corresponding queue. This
31         object is incremented by one for each frame written to
32         (in the case of the ONU) or received for (in case of the
33         OLT) the associated queue.
34
35         The queue index matches the queue number in
36         REPORT MPCPDU, as defined in IEEE Std 802.3, Clause 64
37         and Clause 77.
38
39         This object is applicable for an OLT and an ONU.
40         At the OLT, it has a distinct value for each logical link
41         and each queue. At the ONU, it has a distinct value for
42         each queue.";
43
44     reference
45     "IEEE Std 802.3.1, dot3ExtPkgStatRxFramesQueue";
46 }
47
48 leaf out-mpcp-queue-frames {
49     when "../..mpcp-mode = 'onu'";
50     type yang:counter64;
51     config false;
52     description
53         "This object reflects the number of frame transmission
54         events from the corresponding upstream transmission
55         queue. This object is incremented by one for each frame
56         transmitted, when it is output from the associated
57         queue.
58
59         The queue index matches the queue number in
60         REPORT MPCPDU, as defined in IEEE Std 802.3, Clause 64
61         and Clause 77.
62
63         This object is applicable for an ONU only. At the ONU,
```

```

1         it has a distinct value for each queue.";
2     reference
3         "IEEE Std 802.3.1, dot3ExtPkgStatTxFramesQueue";
4 }
5 leaf mpcp-queue-frames-drop {
6     when "../mpcp-mode = 'onu'";
7     type yang:counter64;
8     config false;
9     description
10        "This object reflects the number of frame drop events
11        from the corresponding upstream transmission queue.
12        This object is incremented by one for each frame dropped
13        in the associated queue.
14
15        The queue index matches the queue number in
16        REPORT MPCPDU, as defined in IEEE Std 802.3, Clause 64
17        and Clause 77.
18
19        This object is applicable for an ONU only. At the ONU,
20        it has a distinct value for each queue.";
21    reference
22        "IEEE Std 802.3.1, dot3ExtPkgStatDroppedFramesQueue";
23 }
24 }
25 list multicast-IDs {
26     key "multicast-ID";
27     description
28         "Multicast-IDs list of multicast IDs
29         to be recognized by the device.";
30     leaf multicast-ID {
31         type uint32;
32         description
33             "Multicast-IDs to be recognized by the device.";
34         reference
35             "IEEE Std 802.3, 30.3.5.1.25";
36     }
37 }
38 leaf fec-capability {
39     type fec-capability;
40     config false;
41     description
42         "This object is used to identify whether the given
43         interface is capable of supporting FEC or not.";
44 }
45 leaf mpcp-mode {
46     type mpcp-mode;
47     config false;
48     description
49         "This object is used to identify the operational state of
50         the MultiPoint MAC Control sublayer as defined in
51         IEEE Std 802.3, Clause 64 and Clause 77.
52
53         Reading 'olt' for an OLT (controller) mode and 'onu' for
54         an ONU (client) mode.
55
56         This object is used to identify the operational mode for
57         the MPCP objects.
58
59         This object is applicable for an OLT, with the same value

```



```
1         for all logical links, and for an ONU.";
2     reference
3         "IEEE Std 802.3, 30.3.5.1.3";
4 }
5 leaf mpcp-sync-time {
6     type uint64;
7     units "TQ (16ns)";
8     config false;
9     description
10        "This object reports the 'sync lock time' of the OLT
11        receiver in units of Time Quanta (TQ; 1 TQ = 16 ns; see
12        IEEE Std 802.3, Clause 64 and Clause 77).
13
14        The value returned is equal to [sync lock time ns]/16,
15        rounded up to the nearest TQ. If this value exceeds
16        4,294,967,295 TQ, the value 4,294,967,295 TQ is returned.
17
18        This object is applicable for an OLT, with distinct values
19        for all logical links, and for an ONU.";
20    reference
21        "IEEE Std 802.3.1, dot3MpcpSyncTime";
22 }
23 leaf mpcp-logical-link-id {
24     type mpcp-supported;
25     config false;
26     description
27        "This object is used to identify the operational state of
28        the MultiPoint MAC Control sublayer as defined in
29        IEEE Std 802.3, Clause 64 and Clause 77.
30
31        Reading 'olt' for an OLT (controller) mode and 'onu' for
32        an ONU (client) mode.
33
34        This object is used to identify the operational mode for
35        the MPCP objects.
36
37        This object is applicable for an OLT, with the same value
38        for all logical links, and for an ONU.";
39    reference
40        "IEEE Std 802.3, 30.3.5.1.3";
41 }
42 leaf mpcp-remote-mac-address {
43     type ieee:mac-address;
44     config false;
45     description
46        "This object identifies the source_address parameter of the
47        last MPCPDUs passed to the MAC Control. This value is
48        updated on reception of a valid frame with:
49
50        1) a destination Field equal to the multicast address
51        assigned for MAC Control as specified in
52        IEEE Std 802.3, Annex 31A;
53
54        2) the lengthOrType field value equal to the Type assigned
55        for MAC Control as specified in IEEE Std 802.3, Annex 31A;
56
57        3) an MPCP Control opcode value equal to the subtype
58        assigned for MPCP as specified in IEEE Std 802.3,
59        Annex 31A.
```

```
1
2     This object is applicable for an OLT and an ONU. It has a
3     distinct value for each logical link.
4
5     The value reflects the MAC address of the remote entity
6     and therefore the OLT holds a value for each LLID, which
7     is the MAC address of the ONU.
8
9
10    The ONU has a single value that is the OLT MAC address.";
11    reference
12        "IEEE Std 802.3, 30.3.5.1.5";
13    }
14    leaf mpcp-logical-link-state {
15        type mpcp-logical-link-state;
16        config false;
17        description
18            "This object identifies the registration state of the
19            MultiPoint MAC Control sublayer as defined in
20            IEEE Std 802.3, Clause 64 and Clause 77.
21
22            When this object has the enumeration 'unregistered', the
23            interface is unregistered and may be used for registering
24            a link partner.
25
26            When this object has the enumeration 'registering',
27            the interface is in the process of registering a
28            link-partner.
29
30            When this object has the enumeration 'registered', the
31            interface has an established link-partner.
32
33            This object is applicable for an OLT and an ONU. It has a
34            distinct value for each logical link.";
35        reference
36            "IEEE Std 802.3, 30.3.5.1.6";
37    }
38    leaf mpcp-elapsed-time-out {
39        type uint64;
40        units "TQ (16ns)";
41        config false;
42        description
43            "This object reports the interval from the last MPCP frame
44            transmission in increments of Time Quanta
45            (TQ; 1 TQ = 16 ns;
46            see IEEE Std 802.3, Clause 64 and Clause 77).
47
48            The value returned is equal to [interval from last MPCP
49            frame transmission on this EPON interface, expressed
50            in ns]/16. If this value exceeds 4,294,967,295 TQ, the
51            value 4,294,967,295 TQ is returned.
52
53            This object is applicable for an OLT and an ONU. It has a
54            distinct value for each logical link.";
55        reference
56            "IEEE Std 802.3, 30.3.5.1.19";
57    }
58    leaf mpcp-elapsed-time-in {
59        type uint64;
60        units "TQ (16ns)";
```

```
1      config false;
2      description
3          "This object reports the interval from the last MPCP frame
4          reception in increments of Time Quanta (TQ; 1 TQ = 16 ns;
5          see IEEE Std 802.3, Clause 64 and Clause 77).
6
7          The value returned is equal to [interval from last MPCP
8          frame reception on this EPON interface, expressed in
9          ns]/16. If this value exceeds 4,294,967,295 TQ, the value
10         4,294,967,295 TQ is returned.
11
12         This object is applicable for an OLT and an ONU. It has a
13         distinct value for each logical link.";
14     reference
15         "IEEE Std 802.3, 30.3.5.1.20";
16 }
17 leaf mpcp-round-trip-time {
18     when "../ompe-mode = 'olt'";
19     type uint16;
20     units "TQ (16ns)";
21     config false;
22     description
23         "This object reports the MPCP round trip time in increments
24         of Time Quanta (TQ; 1 TQ = 16 ns; see IEEE Std 802.3,
25         Clause 64 and Clause 77).
26
27         The value returned is equal to [round trip time in ns]/16.
28         If this value exceeds 65,535 TQ, the value 65,535 TQ is
29         returned.
30
31         This object is applicable for an OLT. It has a distinct
32         value for each logical link.";
33     reference
34         "IEEE Std 802.3, 30.3.5.1.21";
35 }
36 leaf mpcp-maximum-grant-count {
37     when "../ompe-mode = 'onu'";
38     type uint8;
39     config false;
40     description
41         "This object reports the maximum number of grants that an
42         ONU can store for handling. The maximum number of grants
43         that an ONU can store for handling has a range of
44         0 to 255.
45
46         This object is applicable for an ONU and has a distinct
47         value for each logical link.";
48     reference
49         "IEEE Std 802.3, 30.3.5.1.24";
50 }
51 leaf mpcp-logical-link-count {
52     type mpcp-llid-count;
53     units "LLID";
54     config false;
55     description
56         "This object reflects the number of logical links
57         registered on the OLT / ONU. The LLID field, as defined in
58         the IEEE Std 802.3, Clause 65 and Clause 76, is a 2-byte
59         register (15-bit field and a broadcast bit) limiting the
```

```
1         number of logical links to 32,768.
2
3         This object is initialized to the value of 0 when the
4         OLT / ONU is powered up.
5
6         This object is applicable for an OLT and an ONU. It has
7         the same value for all logical links.";
8     reference
9     "IEEE Std 802.3.1, dot3ExtPkgObjectNumberOfLLIDs";
10 }
11 leaf mpcp-maximum-queue-count-per-report {
12     when "../ompe-mode = 'olt'";
13     type mpcp-maximum-queue-count-per-report;
14     config false;
15     description
16     "This object reflects the maximum number of queues (0-7)
17     that can be accepted by the OLT in a single REPORT MPCPDU,
18     as defined in IEEE Std 802.3, Clause 64 and Clause 77.
19
20     This object is applicable for an OLT and has a distinct
21     value for each logical link.";
22     reference
23     "IEEE Std 802.3.1, dot3ExtPkgObjectReportMaximumNumQueues";
24 }
25 leaf ompe-mode {
26     type ompe-mode;
27     config false;
28     description
29     "This object indicates the mode of operation of the
30     Reconciliation Sublayer for Point-to-Point Emulation (see
31     IEEE Std 802.3, 65.1 or 76.2 as appropriate).
32
33     The value of 'unknown' is assigned in initialization; true
34     state or type is not yet known.
35
36     The value of 'olt' is assigned when the sublayer is
37     operating in OLT mode.
38
39     The value of 'onu' is assigned when the sublayer is
40     operating in ONU mode.
41
42     This object is applicable for an OLT and an ONU. It has
43     the same value for each logical link.";
44     reference
45     "IEEE Std 802.3, 30.3.7.1.2";
46 }
47 }
48 }
49 }
50 }
51 }
52 }
53 }
54 }
55 }
56 }
57 }
58 }
59 }
60 }
61 }
62 }
63 }
64 }
65 }
```

8. YANG module for Ethernet Link OAM

8.1 Introduction

IEEE Std 802.3, Clause 57 includes management capabilities for Ethernet-like interfaces to provide some basic operations, administration and maintenance (OAM) functions. The defined functionality includes discovery, error signaling, loopback, and link monitoring. This clause defines a portion of the YANG module for use with NETCONF or RESTCONF to manage these Ethernet-like interface capabilities.

8.2 Overview

Ethernet OAM is composed of a core set of functions and a set of optional functional groups as described in Clause 57 of IEEE Std 802.3. The core functions include discovery operations (determining if the other end of the link is OAM capable and what OAM functions it supports), state machine implementation, and some critical event flows.

Ethernet OAM provides single-hop functionality in that it works only between two directly connected Ethernet stations. Ethernet OAM has three functional objectives, which are detailed in 8.2.1 through 8.2.3. The definition of a basic Ethernet OAM protocol data unit is given in 8.2.4.

8.2.1 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 clause includes mechanisms for capturing that fault information and reflecting such information in data nodes and notifications within the NETCONF management framework.

8.2.2 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 layer 2 protocols. This clause defines methods for incorporating the occurrence of these events, at both the local end and the far end of the link, into the YANG-based 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 clause 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.

8.2.3 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 clause defines data nodes controlling loopback operation and reading the status of the loopback state.

8.2.4 Ethernet OAM protocol data units

An Ethernet OAM protocol data unit (OAMPDU) is a valid Ethernet frame with a destination Media Access Control (MAC) address equal to the MAC address assigned for Slow Protocols (see IEEE Std 802.3, Annex 57A), a lengthOrType field equal to the Type assigned for Slow Protocols, and a Slow Protocols subtype equal to that of the subtype assigned for Ethernet OAM.

OAMPDU is used throughout this clause as an abbreviation for Ethernet OAM protocol data unit. OAMPDUs are the mechanism by which two directly connected Ethernet interfaces exchange OAM information.

8.3 Security considerations for Ethernet operations, administration, and maintenance (OAM) module

The readable data nodes in this module can provide information about network traffic, and therefore, they may be considered sensitive. In particular, OAM provides mechanisms for reading the Clause 30 IEEE 802.3 management attributes from a link partner via a layer 3 protocol. IEEE Std 802.3 OAM does not include encryption or authentication mechanisms. It should not be used in environments where this interface information is considered sensitive, and where the facility terminations are unprotected. By default, OAM is disabled on Ethernet-like interfaces and is therefore not a risk.

IEEE Std 802.3 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 Std 802.3 OAM, this protection from remote access is accomplished by configuring the CPE-side in passive mode using the mode leaf. 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 frequency of OAM PDUs 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. Although there are a number of objects in this module with read-write or read-create MAX-ACCESS, they have limited effects on user data.

The loopback capability of OAM can have potentially disruptive effects; when remote loopback is enabled, 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 NETCONF/RESTCONF.

The administrative state and mode are also configuration nodes. Disabling OAM can interrupt management activities between peer devices, potentially causing serious problems. Setting the mode node to an undesired value can allow access to Ethernet monitoring, events, and functions that may not be acceptable in a particular deployment scenario. In addition to loopback functionality, Ethernet interface statistics and events can be accessed via the OAM protocol, which may not be desired in some circumstances.

OAM event configuration also contains configuration nodes. These nodes control whether events are sent, and at what thresholds. Note that the frequency of event communication is limited by the frequency limits of Slow Protocols on Ethernet interfaces. Also, the information available via OAM events is also available via OAM Variable Requests. Access to this information via either OAM events or Variable Requests is controlled by the admin and mode nodes. As mentioned previously, inadequate protection of these variables can result in access to link information and functions.

8.4 Mapping of IEEE 802.3 managed objects

This subclause contains the mapping between the YANG data nodes defined in this clause and the attributes defined in IEEE Std 802.3, Clause 30. Table 8–1 provides the mapping between the *ieee802-ethernet-link-oam* module data nodes and the OAM attributes of IEEE Std 802.3, Clause 30.

**Table 8–1—Mapping between IEEE Std 802.3, Clause 30 managed objects
and *ieee802-ethernet-link-oam* YANG data nodes**

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-link-oam</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
oOAM	aOAMAdminState	30.3.6.1.2	interfaces/interface/ethernet/link-oam	admin	R/W
	dot3OamOperStatus	IEEE Std 802.3.1	interfaces/interface/ethernet/link-oam/ discovery-info/local	operational-status	R
	aOAMDiscoveryState	30.3.6.1.4			
	aOAMLocalFlagsField	30.3.6.1.10		loopback-mode	R
	aOAMRemoteFlagsField	30.3.6.1.11			
	aOAMLocalState	30.3.6.1.14			
	aOAMMode	30.3.6.1.3		mode	RW
	aOAMLocalRevision	30.3.6.1.12		revision	R
	aOAMLocalPDUConfiguration	30.3.6.1.8		oammtu	R
	aOAMRemoteConfiguration	30.3.6.1.7	interfaces/interface/ethernet/link-oam/ discovery-info/remote/functions-sup- ported	uni-directional-link-fault	R/W
				loopback	R/W
				mib-retrieval	R/W
	aOAMLocalConfiguration	30.3.6.1.6	interfaces/interface/ethernet/link-oam/ discovery-info/local/functions-sup- ported/link-monitor	link-monitoring	R/W
	aOAMLocalErrSymPeriodConfig	30.3.6.1.34	interfaces/interface/ethernet/link-oam/ link-monitor/event-type	threshold-type	R/W
	aOAMLocalErrFrameConfig	30.3.6.1.36		window	R/W
	aOAMLocalErrFramePeriodConfig	30.3.6.1.38		threshold	R/W
	aOAMLocalErrFrameSecsSummaryConfig	30.3.6.1.40			
	aOAMLocalErrSymPeriodConfig	30.3.6.1.42			
	aOAMRemoteMACAddress	30.3.6.1.5	interfaces/interface/ethernet/link-oam/ discovery-info/remote	mac-address	R
	aOAMRemoteVendorOUI	30.3.6.1.16		vendor-oui	R

Table 8–1—Mapping between IEEE Std 802.3, Clause 30 managed objects
and *ieee802-ethernet-link-oam* YANG data nodes (continued)

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-link-oam</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
	aOAMRemoteVendorSpecificInfo	30.3.6.1.17		vendor-info	R
	aOAMRemoteState	30.3.6.1.15		loopback-mode	R
	aOAMMode	30.3.6.1.3		mode	R
	aOAMRemoteRevision	30.3.6.1.13		revision	R
	aOAMRemotePDUConfiguration	30.3.6.1.9		oammtu	R

**Table 8–1—Mapping between IEEE Std 802.3, Clause 30 managed objects
and *ieee802-ethernet-link-oam* YANG data nodes (continued)**

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-link-oam</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
OAM	aOAMLocalConfiguration	30.3.6.1.6	interfaces/interface/ethernet/link-oam/ discovery-info/local/functions-sup- ported	uni-directional-link-fault	R
				loopback	R
				link-monitoring	R
				mib-retrieval	R
	dot3OamEventLogEntry	IEEE Std 802.3.1	interfaces-state/ interface/ethernet/ link-oam/event-log/event-log-entry	index	R
				oui	R
				timestamp	R
				location	R
				event-type	R
				running-total	R
				event-total	R
	aOAMLocalErrSymPeriodEvent aOAMLocalErrFrameEvent aOAMLocalErrFramePeriodConfig aOAMLocalErrFrameSecsSummaryEvent aOAMRemoteErrSymPeriodEvent aOAMRemoteErrFrameEvent aOAMRemoteErrFramePeriodEvent aOAMRemoteErrFrameSecsSummaryEvent	30.3.6.1.35 30.3.6.1.37 30.3.6.1.38 30.3.6.1.41 30.3.6.1.42 30.3.6.1.43 30.3.6.1.44 30.3.6.1.45	interfaces/interface/ethernet/link-oam/ event-log/event-log-entry/threshold	threshold-event-type window threshold value	R R R R
	Dot3OamStatsEntry	RFC-4878		out-information	R
	aOAMInformationTx	30.3.6.1.20			

Table 8–1—Mapping between IEEE Std 802.3, Clause 30 managed objects
and *ieee802-ethernet-link-oam* YANG data nodes (continued)

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-link-oam</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
	aOAMInformationRx	30.3.6.1.21		in-information	R
	aOAMUniqueEventNotificationTx	30.3.6.1.22		out-unique-event-notification	R
	aOAMUniqueEventNotificationRx	30.3.6.1.24		in-unique-event-notification	R
	aOAMDuplicateEventNotificationTx	30.3.6.1.23		out-duplicate-event-notification	R
	aOAMDuplicateEventNotificationRx	30.3.6.1.25		in-duplicate-event-notification	R
	aOAMLoopbackControlTx	30.3.6.1.26		out-loopback-control	R
	aOAMLoopbackControlRx	30.3.6.1.27		in-loopback-control	R
	aOAMVariableRequestTx	30.3.6.1.28		out-variable-request	R

**Table 8–1—Mapping between IEEE Std 802.3, Clause 30 managed objects
and *ieee802-ethernet-link-oam* YANG data nodes (continued)**

IEEE Std 802.3, Clause 30		Reference	Corresponding <i>ieee802-ethernet-link-oam</i> YANG data nodes		
Managed object(s)	Attribute(s)		Container(s)	Data node(s)	R/W
OAM	aOAMVariableRequestRx	30.3.6.1.29	interfaces/interface/ethernet/link-oam/ statistics	variable-requeste-rx	R
	aOAMVariableResponseTx	30.3.6.1.30		out-variable-response	R
	aOAMVariableResponseRx	30.3.6.1.31		in-variable-response	R
	aOAMOrganizationSpecificTx	30.3.6.1.32		out-org-specific	R
	aOAMOrganizationSpecificRx	30.3.6.1.33		in-org-specific	R
	aOAMUnsupportedCodesTx	30.3.6.1.18		unsupported-condes-tx	R
	aOAMUnsupportedCodesRx	30.3.6.1.19		in-unsupported-codes	R
	aFramesLostDueToOAMError	30.3.6.1.46		frames-lost-due-to-oam	R
	aOAMLocalErrSymPeriodEvent, Errored Symbols	30.3.6.1.35		local-error-symbol-period-log-entries	R
	aOAMLocalErrFrameEvent, Errored Frames	30.3.6.1.37		local-error-frame-log-entries	R
	aOAMLocalErrFramePeriodEvent, Errored Frames	30.3.6.1.39		local-error-frame-period-log-entries	R
	aOAMLocalErrFrameSecsSummaryEvent, Errored Frame Seconds Summary	30.3.6.1.41		local-error-frame-second-log-entries	R
	aOAMRemoteErrSymPeriodEvent, Errored Symbols	30.3.6.1.42		remote-error-symbol-period-log-entries	R
	aOAMRemoteErrFrameEven, Errored Frames	30.3.6.1.43		remote-error-frame-log-entries	R
	aOAMRemoteErrFramePeriodEvent, Errored Frames	30.3.6.1.44		remote-error-frame-period-log-entries	R
	aOAMRemoteErrFrameSecsSummaryEvent, Errored Frame Seconds Summary	30.3.6.1.45		remote-error-frame-second-log-entries	R

8.5 YANG module definition^m

The YANG module tree hierarchy uses terms defined in IETF RFC 8407.

8.5.1 Tree hierarchy

8.5.1.1 ieee802-ethernet-link-oam

```

module: ieee802-ethernet-link-oam
  augment /if:interfaces/if:interface:
    +--rw link-oam!
      +---x remote-loopback {remote-loopback-initiate}?
        | +---w input
        | | +---w enable      boolean
        | +--ro output
        |   +--ro success      boolean
        |   +--ro error-message? string
      +---x reset-stats
        | +--ro output
        |   +--ro success      boolean
        |   +--ro error-message? string
      +---n non-threshold-event
        | +-- oui              vendor-oui
        | +-- timestamp        uint64
        | +-- location         event-location
        | +-- event-type       identityref
        | +-- running-total    yang:counter64
        | +-- event-total      yang:counter64
      +---n threshold-event {link-monitoring-local or
link-monitoring-remote}?
        | +-- oui              vendor-oui
        | +-- timestamp        uint64

```

^mCopyright release for YANG modules: Users of this standard may freely reproduce the YANG module contained in this subclause so that it can be used for its intended purpose.

```

1      |   +-- location          event-location
2      |   +-- event-type      identityref
3      |   +-- running-total   yang:counter64
4      |   +-- event-total     yang:counter64
5      |   +-- threshold {link-monitoring-local or
6      |   link-monitoring-remote}?
7      |       +-- threshold-event-type    threshold-event-enum
8      |       +-- window                  uint64
9      |       +-- threshold                uint64
10     |       +-- value                    uint64
11     +--rw admin?                        admin-state
12     +--rw discovery-info
13     |   +--rw local
14     |   |   +--ro operational-status    operational-state
15     |   |   +--ro loopback-mode        loopback-status {remote-loopback-initiate or
16     |   remote-loopback-respond}?
17     |   |   +--rw mode?                  mode
18     |   |   +--rw functions-supported
19     |   |   |   +--rw uni-directional-link-fault?    boolean {uni-directional-link-fault}?
20     |   |   |   +--rw loopback?                    boolean {remote-loopback-initiate}?
21     |   |   +--rw link-monitor {link-monitoring-remote or
22     |   link-monitoring-local}?
23     |   |   |   +--rw link-monitoring?    boolean
24     |   |   |   +--rw event-type* [threshold-type] {link-monitoring-local}?
25     |   |   |   +--rw threshold-type      threshold-event-enum
26     |   |   |   +--rw window?             uint64
27     |   |   |   +--rw threshold?          uint64
28     |   |   x--rw mib-retrieval?          boolean {remote-mib-retrieval-initiate or
29     |   remote-mib-retrieval-respond}?
30     |   |   +--rw data-retrieval?        boolean {remote-data-retrieval-initiate or
31     |   remote-mib-retrieval-respond}?
32     |   |   +--ro revision?               uint64
33     |   |   +--ro oammtu?                 uint16
34     |   +--ro remote
35     |   +--ro mac-address?                ieee:mac-address
36     |   +--ro vendor-oui?                 vendor-oui

```

```

1      |      +---ro vendor-info?                uint64
2      |      +---ro loopback-mode             loopback-status
3      |      +---ro mode?                     mode
4      |      +---ro functions-supported
5      |      |      +---ro uni-directional-link-fault?    boolean
6      |      |      +---ro loopback?                     boolean
7      |      |      +---ro link-monitoring?               boolean
8      |      |      +---ro mib-retrieval?                 boolean
9      |      +---ro revision?                    uint64
10     |      +---ro oammtu?                      uint16
11     +---ro event-log
12     |      +---ro event-log-entry* [index]
13     |      |      +---ro index                uint64
14     |      |      +---ro oui                  vendor-oui
15     |      |      +---ro timestamp            uint64
16     |      |      +---ro location             event-location
17     |      |      +---ro event-type           identityref
18     |      |      +---ro running-total        yang:counter64
19     |      |      +---ro event-total          yang:counter64
20     |      |      +---ro threshold {link-monitoring-local or
21     |      |      link-monitoring-remote}?
22     |      |      +---ro threshold-event-type    threshold-event-enum
23     |      |      +---ro window                uint64
24     |      |      +---ro threshold             uint64
25     |      |      +---ro value                 uint64
26     +---ro statistics
27     |      +---ro out-information              yang:counter64
28     |      +---ro in-information              yang:counter64
29     |      +---ro out-unique-event-notification    yang:counter64 {link-monitoring-local}?
30     |      +---ro in-unique-event-notification    yang:counter64 {link-monitoring-remote}?
31     |      +---ro out-duplicate-event-notification yang:counter64 {link-monitoring-local}?
32     |      +---ro in-duplicate-event-notification yang:counter64 {link-monitoring-remote}?
33     |      +---ro out-loopback-control          yang:counter64 {remote-loopback-initiate}?
34     |      +---ro in-loopback-control          yang:counter64 {remote-loopback-respond}?
35     |      +---ro out-variable-request          yang:counter64 {remote-data-retrieval-initiate}?
36     |      +---ro in-variable-request          yang:counter64 {remote-mib-retrieval-respond}?
37
38
39
40
41
42
43

```

1	+++ro out-variable-response	yang:counter64 {remote-mib-retrieval-respond}?
2	+++ro in-variable-response	yang:counter64 {remote-data-retrieval-initiate}?
3	+++ro out-org-specific	yang:counter64
4	+++ro in-org-specific	yang:counter64
5	+++ro out-unsupported-codes	yang:counter64
6	+++ro in-unsupported-codes	yang:counter64
7	+++ro frames-lost-due-to-oam	yang:counter64
8	+++ro local-error-symbol-period-log-entries	yang:counter64
9	+++ro local-error-frame-log-entries	yang:counter64
10	+++ro local-error-frame-period-log-entries	yang:counter64
11	+++ro local-error-frame-second-log-entries	yang:counter64
12	+++ro remote-error-symbol-period-log-entries	yang:counter64 {link-monitoring-remote}?
13	+++ro remote-error-frame-log-entries	yang:counter64 {link-monitoring-remote}?
14	+++ro remote-error-frame-period-log-entries	yang:counter64 {link-monitoring-remote}?
15	+++ro remote-error-frame-second-log-entries	yang:counter64 {link-monitoring-remote}?

8.5.2 YANG module

In the following YANG module definition, should any discrepancy between the text of the description for individual YANG nodes and the corresponding definition in 8.2 through 8.5 of this clause occur, the definitions and mappings in 8.5 shall take precedence.

Editor's Note (to be removed prior to publication):

Yang files contained in <https://github.com/YangModels/yang/tree/main/standard/ieee/published/802.3> are IEEE 802.3.1-2019 version and will be updated at the publication time.

An ASCII text version of the YANG module can be found at the following URL:ⁿ <https://github.com/YangModels/yang/tree/master/standard/ieee/published/802.3>

Editor's Note (to be removed prior to publication):

Pretty printing of ieee802-ethernet-link-oam.yang file may change the appearance by adding whitespace and reformatting lines

Editor's Note (to be removed prior to publication):

IEEE Std 802.3.1 and IEEE Std 802.3.2 to be updated at the publication time

```
module ieee802-ethernet-link-oam {
  yang-version 1.1;
  namespace "urn:ieee:std:802.3:yang:ieee802-ethernet-link-oam";
  prefix ieee802-link-oam;

  import ieee802-types {
    prefix ieee;
    reference
      "IEEE 802 types";
  }
  import ietf-yang-types {
    prefix yang;
    reference
      "IETF RFC 6991";
  }
  import iana-if-type {
    prefix ianaift;
    reference
      "http://www.iana.org/assignments/yang-parameters/
      iana-if-type@2023-01-26.yang";
  }
  import ietf-interfaces {
    prefix if;
    reference
      "IETF RFC 8343";
  }

  organization
    "IEEE 802.3 Ethernet Working Group
    Web URL: http://www.ieee802.org/3/";
  contact
```

ⁿCopyright release for YANG modules: Users of this standard may freely reproduce the YANG module contained in this subclause so that it can be used for its intended purpose.

```
1      "Web URL: http://www.ieee802.org/3/";
2  description
3      "This module contains a collection of YANG definitions
4      for managing the Ethernet Link OAM feature defined by IEEE
5      802.3. It provides functionality roughly equivalent to that of
6      the DOT3-OAM-MIB defined in IETF RFC 4878.";
7
8
9  revision 2024-08-17 {
10      description
11          "Updates under IEEE Std 802.3.2-202x, Draft D3.0";
12      reference
13          "IEEE Std 802.3-2022, unless dated explicitly";
14  }
15
16  feature uni-directional-link-fault {
17      description
18          "This feature means the device supports Uni Directional Link
19          Fault detection.";
20      reference
21          "IEEE Std 802.3, 57.1.2:a, 30.3.6.1.6 aOAMLocalConfiguration
22          and 30.3.6.1.7 aOAMRemoteConfiguration";
23  }
24
25
26  feature remote-loopback-initiate {
27      description
28          "This feature means the device supports being the initiator
29          of remote loopback.";
30      reference
31          "IEEE Std 802.3, 57.1.2:b, 30.3.6.1.6
32          aOAMLocalConfiguration";
33  }
34
35
36  feature remote-loopback-respond {
37      description
38          "This feature means the device supports responding to remote
39          loopback control OAMPDUs received from the peer";
40      reference
41          "IEEE Std 802.3, 57.1.2:b, 30.3.6.1.7
42          aOAMRemoteConfiguration";
43  }
44
45
46  feature link-monitoring-local {
47      description
48          "This feature means the device monitors the link at the local
49          side and can generate Link Event OAMPDUs to the peer
50          device.";
51      reference
52          "IEEE Std 802.3, 57.1.2:c:1, 30.3.6.1.6
53          aOAMLocalConfiguration, and 30.3.6.1.7
54          aOAMRemoteConfiguration";
55  }
56
57
58  feature link-monitoring-remote {
59      description
60          "This feature means the device can process Link Event OAMPDUs
61          received from the peer device and report itself about this
62          event on its own management interface.";
63      reference
64          "IEEE Std 802.3, 57.1.2:c:1,
```

```
1      30.3.6.1.6 aOAMLocalConfiguration,
2      and 30.3.6.1.7 aOAMRemoteConfiguration";
3  }
4
5  feature remote-mib-retrieval-initiate {
6      status deprecated;
7      description
8          "remote-mib-retrieval-initiate is deprecated and changed name
9          to feature remote-data-retrieval-initiate. This feature
10         means the device supports data retrieval from the peer
11         device. I.e. the device can send Variable Requests OAMPDUs
12         to the peer side and process the received Variable Response
13         OAMPDUs.";
14      reference
15          "IEEE Std 802.3, 57.1.2:c:2,
16          30.3.6.1.6 aOAMLocalConfiguration,
17          and 30.3.6.1.7 aOAMRemoteConfiguration";
18  }
19
20  feature remote-data-retrieval-initiate {
21      description
22          "This feature means the device supports data retrieval from
23          the peer device. I.e. the device can send Variable Requests
24          OAMPDUs to the peer side and process the received Variable
25          Response OAMPDUs.";
26      reference
27          "IEEE Std 802.3, 57.1.2:c:2,
28          30.3.6.1.6 aOAMLocalConfiguration,
29          and 30.3.6.1.7 aOAMRemoteConfiguration";
30  }
31
32  feature remote-mib-retrieval-respond {
33      description
34          "This feature means the device allows the peer device to
35          retrieve data from the managed device. I.e. the device can
36          process received Variable Requests OAMPDUs and respond with
37          Variable Response OAMPDUs.";
38      reference
39          "IEEE Std 802.3, 57.1.2:c:2,
40          30.3.6.1.6 aOAMLocalConfiguration,
41          and 30.3.6.1.7 aOAMRemoteConfiguration";
42  }
43
44  identity event-type {
45      description
46          "Base identity for all Link OAM event types.";
47  }
48
49  identity threshold-event-type {
50      base event-type;
51      description
52          "Event type for a Link Monitoring threshold event.";
53  }
54
55  identity link-fault-event {
56      if-feature "uni-directional-link-fault";
57      base event-type;
58      description
59          "Event type for a uni-directional link fault event.";
```

```
1     reference
2         "IEEE Std 802.3, 57.2.10.1";
3     }
4
5     identity dying-gasp-event {
6         base event-type;
7         description
8             "Event type for a dying gasp event.";
9         reference
10            "IEEE Std 802.3, 57.2.10.1";
11    }
12
13
14    identity critical-event {
15        base event-type;
16        description
17            "Event type for a critical event.";
18        reference
19            "IEEE Std 802.3, 57.2.10.1";
20    }
21
22
23    typedef threshold-event-enum {
24        type enumeration {
25            enum symbol-period-event {
26                value 1;
27                description
28                    "Errored symbol period event.";
29            }
30            enum frame-period-event {
31                value 2;
32                description
33                    "Errored frame period event.";
34            }
35            enum frame-event {
36                value 3;
37                description
38                    "Errored frame event";
39            }
40            enum frame-seconds-event {
41                value 4;
42                description
43                    "Errored frame seconds event.";
44            }
45        }
46        description
47            "Enumeration of the valid threshold event types.";
48        reference
49            "IEEE Std 802.3, 57.5.3";
50    }
51
52
53
54
55    typedef mode {
56        type enumeration {
57            enum passive {
58                value 0;
59                description
60                    "Ethernet Link OAM Passive mode.";
61            }
62            enum active {
63                value 1;
64                description
65
```

```
1         "Ethernet Link OAM Active mode.";
2     }
3 }
4 description
5     "Enumeration of the valid modes in which Link OAM may run.";
6 reference
7     "IEEE Std 802.3, 57.2.9 and 30.3.6.1.3.";
8 }
9
10
11 typedef event-location {
12     type enumeration {
13         enum event-location-local {
14             value 1;
15             description
16                 "A local event.";
17         }
18         enum event-location-remote {
19             value 2;
20             description
21                 "A remote event.";
22         }
23     }
24 }
25 description
26     "The location of the event that caused a log entry.";
27 }
28
29
30 typedef loopback-status {
31     type enumeration {
32         enum none {
33             value 1;
34             description
35                 "Loopback is not being performed.";
36         }
37         enum initiating {
38             value 2;
39             description
40                 "Initiating loopback.";
41         }
42         enum master-loopback {
43             value 3;
44             description
45                 "In loopback mode.";
46         }
47         enum terminating {
48             value 4;
49             description
50                 "Terminating loopback mode.";
51         }
52         enum local-loopback {
53             value 5;
54             description
55                 "In slave loopback mode.";
56         }
57         enum unknown {
58             value 6;
59             description
60                 "Parser and multiplexer combination unexpected.";
61         }
62     }
63 }
64
65 }
```

```
1      description
2          "The loopback mode of an OAM interface.";
3      reference
4          "IEEE Std 802.3, 57.2.11";
5  }
6
7  typedef operational-state {
8      type enumeration {
9          enum disabled {
10              value 1;
11              description
12                  "IEEE Std 802.3 OAM is disabled.";
13          }
14          enum link-fault {
15              value 2;
16              description
17                  "IEEE Std 802.3 OAM has encountered a link fault.";
18          }
19          enum passive-wait {
20              value 3;
21              description
22                  "Passive OAM entity waiting to see if peer is
23                  OAM capable.";
24          }
25          enum active-send-local {
26              value 4;
27              description
28                  "Active OAM entity trying to determine if peer
29                  is OAM capable.";
30          }
31          enum send-local-and-remote {
32              value 5;
33              description
34                  "OAM discovered peer but still to accept or
35                  reject peer configuration.";
36          }
37          enum send-local-and-remote-ok {
38              value 6;
39              description
40                  "OAM peering is allowed by local device.";
41          }
42          enum peering-locally-rejected {
43              value 7;
44              description
45                  "OAM peering rejected by local device.";
46          }
47          enum peering-remotely-rejected {
48              value 8;
49              description
50                  "OAM peering rejected by remote device.";
51          }
52          enum operational {
53              value 9;
54              description
55                  "IEEE Std 802.3 OAM is operational.";
56          }
57          enum operational-half-duplex {
58              value 10;
59              description
```

```
1      "IEEE Std 802.3 OAM is operating in half-duplex mode.";
2  }
3  }
4  description
5      "Operational state of an interface.";
6  reference
7      "IEEE Std 802.3, 30.3.6.1.4,
8      30.3.6.1.10, and 30.3.6.1.11";
9  }
10 }
11
12 typedef vendor-oui {
13     type string {
14         length "6";
15     }
16     description
17         "24-bit MAC addresses â€" large(MAâ€"L). Previously know as
18         Organizationally Unique Identifier (OUI).";
19     reference
20         "IEEE Std 802-2014, Clause 8.2.2";
21 }
22
23
24 typedef admin-state {
25     type enumeration {
26         enum enabled {
27             value 1;
28             description
29                 "IEEE Std 802.3, Clause 57 OAM is in the
30                 enabled admin state.";
31         }
32         enum disabled {
33             value 2;
34             description
35                 "IEEE Std 802.3, Clause 57 OAM is in the
36                 disabled admin state.";
37         }
38     }
39 }
40
41 description
42     "Admin state of the OAM function on an interface.";
43 reference
44     "IEEE Std 802.3, 30.3.6.1.2 and 30.3.6.2";
45 }
46
47 grouping event-details {
48     description
49         "Nodes describing an event, used in the event log and in
50         notifications.";
51     reference
52         "IETF RFC 4878, Dot3OamEventLogEntry";
53     leaf oui {
54         type vendor-oui;
55         mandatory true;
56         description
57             "Organizationally Unique Identifier for the device that
58             generated the event.";
59     }
60 }
61
62 leaf timestamp {
63     type uint64;
64     units "milliseconds";
65     mandatory true;
```

```
1      description
2          "Timestamp in milliseconds since Unix epoch for when the
3              event occurred.";
4      }
5      leaf location {
6          type event-location;
7          mandatory true;
8          description
9              "Where the event occurred (local or remote).";
10     }
11     leaf event-type {
12         type identityref {
13             base event-type;
14         }
15         mandatory true;
16         description
17             "Type of event that occurred.";
18         reference
19             "IEEE Std 802.3, 30.3.6.1.10 and 30.3.6.11";
20     }
21     leaf running-total {
22         type yang:counter64;
23         mandatory true;
24         description
25             "The running total number of errors seen since OAM was
26                 enabled on the interface. For threshold events, this is
27                 the total number of times that particular type of error
28                 (e.g. symbol error) has occurred, which may be greater
29                 than the number of threshold-crossing event notifications
30                 of that type generated during that time (which is conveyed
31                 by the event-total leaf).";
32     }
33     leaf event-total {
34         type yang:counter64;
35         mandatory true;
36         description
37             "Total number of times this event has occurred since OAM
38                 was enabled on the interface. For threshold events this is
39                 the number of events generated of this type (as opposed to
40                 the total number of errors of that type, which may be
41                 greater, and is conveyed by the running-total leaf.";
42     }
43 }
44
45 grouping threshold-event-details {
46     description
47         "Nodes describing a threshold event, used in the event
48             log and in notifications";
49     reference
50         "IETF RFC 4878, Dot3OamEventLogEntry";
51     container threshold {
52         when "../event-type = 'threshold-event-type'" {
53             description
54                 "These nodes only apply to threshold event types";
55         }
56         if-feature
57             "link-monitoring-local or
58                 link-monitoring-remote";
59         description
```



```
1      "Nodes specific to threshold (link monitoring) events";
2      leaf threshold-event-type {
3          type threshold-event-enum;
4          mandatory true;
5          description
6              "The type of threshold event";
7          reference
8              "IEEE Std 802.3, 57.5.3";
9      }
10     }
11     leaf window {
12         type uint64;
13         mandatory true;
14         description
15             "Size of the window in which the event was generated.
16             Units are dependent on the threshold event type.";
17     }
18     leaf threshold {
19         type uint64;
20         mandatory true;
21         description
22             "Size of the threshold that was breached during the
23             window. Units are dependent on the threshold
24             event type.";
25     }
26     }
27     leaf value {
28         type uint64;
29         mandatory true;
30         description
31             "Breaching value. Units are dependent on the threshold
32             event type, and match that of the threshold.";
33     }
34 }
35 }
36 }
37
38 grouping statistics-common {
39     description
40         "Collection of Link OAM event/packet counters.";
41     reference
42         "IETF RFC 4878, Dot3OamStatsEntry";
43     leaf out-information {
44         type yang:counter64;
45         mandatory true;
46         description
47             "Number of information OAMPDUs transmitted.";
48         reference
49             "IEEE Std 802.3, 30.3.6.1.20";
50     }
51     }
52     leaf in-information {
53         type yang:counter64;
54         mandatory true;
55         description
56             "Number of information OAMPDUs received.";
57         reference
58             "IEEE Std 802.3, 30.3.6.1.21";
59     }
60     }
61     leaf out-unique-event-notification {
62         if-feature "link-monitoring-local";
63         type yang:counter64;
64         mandatory true;
65     }
```

```
1      description
2          "Number of unique event notification OAMPDUs transmitted.";
3      reference
4          "IEEE Std 802.3, 30.3.6.1.22";
5  }
6  leaf in-unique-event-notification {
7      if-feature "link-monitoring-remote";
8      type yang:counter64;
9      mandatory true;
10     description
11         "Number of unique event notification OAMPDUs received.";
12     reference
13         "IEEE Std 802.3, 30.3.6.1.24";
14 }
15 leaf out-duplicate-event-notification {
16     if-feature "link-monitoring-local";
17     type yang:counter64;
18     mandatory true;
19     description
20         "Number of duplicate event notification OAMPDUs
21             transmitted.";
22     reference
23         "IEEE Std 802.3, 30.3.6.1.23";
24 }
25 leaf in-duplicate-event-notification {
26     if-feature "link-monitoring-remote";
27     type yang:counter64;
28     mandatory true;
29     description
30         "Number of duplicate event notification OAMPDUs
31             received.";
32     reference
33         "IEEE Std 802.3, 30.3.6.1.25";
34 }
35 leaf out-loopback-control {
36     if-feature "remote-loopback-initiate";
37     type yang:counter64;
38     mandatory true;
39     description
40         "Number of loopback control OAMPDUs transmitted.";
41     reference
42         "IEEE Std 802.3, 30.3.6.1.26";
43 }
44 leaf in-loopback-control {
45     if-feature "remote-loopback-respond";
46     type yang:counter64;
47     mandatory true;
48     description
49         "Number of loopback control OAMPDUs received.";
50     reference
51         "IEEE Std 802.3, 30.3.6.1.27";
52 }
53 leaf out-variable-request {
54     if-feature "remote-data-retrieval-initiate";
55     type yang:counter64;
56     mandatory true;
57     description
58         "Number of variable request OAMPDUs transmitted.";
59     reference
```

```
1         "IEEE Std 802.3, 30.3.6.1.28";
2     }
3     leaf in-variable-request {
4         if-feature "remote-mib-retrieval-respond";
5         type yang:counter64;
6         mandatory true;
7         description
8             "Number of variable request OAMPDUs received.";
9         reference
10            "IEEE Std 802.3, 30.3.6.1.29";
11    }
12    leaf out-variable-response {
13        if-feature "remote-mib-retrieval-respond";
14        type yang:counter64;
15        mandatory true;
16        description
17            "Number of variable response OAMPDUs transmitted.";
18        reference
19            "IEEE Std 802.3, 30.3.6.1.30";
20    }
21    leaf in-variable-response {
22        if-feature "remote-data-retrieval-initiate";
23        type yang:counter64;
24        mandatory true;
25        description
26            "Number of variable response OAMPDUs received.";
27        reference
28            "IEEE Std 802.3, 30.3.6.1.31";
29    }
30    leaf out-org-specific {
31        type yang:counter64;
32        mandatory true;
33        description
34            "Number of organization specific OAMPDUs transmitted.";
35        reference
36            "IEEE Std 802.3, 30.3.6.1.32";
37    }
38    leaf in-org-specific {
39        type yang:counter64;
40        mandatory true;
41        description
42            "Number of organization specific OAMPDUs received.";
43        reference
44            "IEEE Std 802.3, 30.3.6.1.33";
45    }
46    leaf out-unsupported-codes {
47        type yang:counter64;
48        mandatory true;
49        description
50            "Number of OAMPDUs with unsupported codes transmitted.";
51        reference
52            "IEEE Std 802.3, 30.3.6.1.18";
53    }
54    leaf in-unsupported-codes {
55        type yang:counter64;
56        mandatory true;
57        description
58            "Number of OAMPDUs with unsupported codes received.";
59        reference
```

```
1      "IEEE Std 802.3, 30.3.6.1.19";
2  }
3  leaf frames-lost-due-to-oam {
4      type yang:counter64;
5      mandatory true;
6      description
7          "A count of the number of frames that were dropped by the
8           OAM multiplexer. Since the OAM multiplexer has multiple
9           inputs and a single output, there may be cases where
10          frames are dropped due to transmit resource contention.
11          This counter is incremented whenever a frame is dropped by
12          the OAM layer.";
13      reference
14          "IEEE Std 802.3, 30.3.6.1.46";
15  }
16  }
17  }
18  }
19  grouping discovery-remote {
20      description
21          "Nodes describing the discovery process remote end of a
22          link.";
23      leaf mode {
24          type mode;
25          description
26              "Mode (passive/active).";
27          reference
28              "IEEE Std 802.3, 30.3.6.1.3";
29      }
30      container functions-supported {
31          description
32              "The Link OAM functions supported by this interface.";
33          reference
34              "IEEE Std 802.3, 30.3.6.1.7";
35          leaf uni-directional-link-fault {
36              type boolean;
37              description
38                  "Unidirectional link fault support.";
39          }
40          leaf loopback {
41              type boolean;
42              description
43                  "Remote Loopback support.";
44          }
45          leaf link-monitoring {
46              type boolean;
47              description
48                  "Link monitoring support.";
49          }
50          leaf mib-retrieval {
51              type boolean;
52              description
53                  "MIB variable retrieval support.";
54          }
55      }
56      leaf revision {
57          type uint64;
58          config false;
59          description
60              "Configuration revision.";
```

```
1      reference
2        "IEEE Std 802.3, 30.3.6.1.12 and 30.3.6.1.13";
3    }
4    leaf oammtu {
5      type uint16;
6      units "octets";
7      config false;
8      description
9        "The maximum OAMPDU size for the remote node.
10         The peer OAM entities exchange the maximum size they can
11         support and negotiate to use the smaller of the two maximum
12         OAMPDU sizes.";
13      reference
14        "IEEE Std 802.3, 30.3.6.1.8 and 30.3.6.1.9";
15    }
16  }
17 }
18
19 grouping discovery-local {
20   description
21     "Nodes describing the local end discovery process of a
22     link.";
23   leaf mode {
24     type mode;
25     description
26       "This object configures the mode of OAM operation as active
27       or passive. Active mode provides capabilities to initiate
28       monitoring activities with the remote OAM peer entity,
29       while passive mode waits for the peer to initiate actions
30       with it. Changing this value results in incrementing the
31       revision field of locally generated OAMPDUs
32       (see IEEE Std 802.3, 30.3.6.1.12) and triggers the
33       OAM discovery process if the operational state was
34       already 'operational'. The default value is
35       implementation-dependent.";
36     reference
37       "IEEE Std 802.3, 30.3.6.1.3";
38   }
39   container functions-supported {
40     description
41       "The Link OAM functions supported by this interface.";
42     reference
43       "IEEE Std 802.3, 30.3.6.1.7";
44     leaf uni-directional-link-fault {
45       if-feature "uni-directional-link-fault";
46       type boolean;
47       description
48         "Unidirectional link fault support.
49         This affects the setting of the 'Unidirectional Support'
50         bit in the OAM configuration field put in the
51         Information OAMPDU.
52         This bit indicates to the peer device that it can send
53         OAM PDUs on links that are operating in unidirectional
54         mode (traffic flowing in one direction only).";
55     }
56     leaf loopback {
57       if-feature "remote-loopback-initiate";
58       type boolean;
59       default "true";
60       description
```

```
1      "Remote Loopback support.";
2  }
3  container link-monitor {
4      if-feature
5          "link-monitoring-remote or
6            link-monitoring-local";
7      description
8          "Configure link monitor parameters.";
9      reference
10         "IEEE Std 802.3, 57.1.2:c";
11      leaf link-monitoring {
12          type boolean;
13          default "true";
14          description
15              "Enable or disable monitoring.
16                This affects the setting of the 'Link Events' bit in
17                the OAM configuration field put in the Information
18                OAMPDU. This bit indicates to the peer device that the
19                OAM entity can send and receive Event Notification
20                OAMPDUs.";
21      }
22      list event-type {
23          if-feature "link-monitoring-local";
24          key "threshold-type";
25          description
26              "A list containing at most one entry for each of the
27                threshold event types. If there is no entry for a
28                particular event type, the default values are used for
29                both window size and threshold.";
30          leaf threshold-type {
31              type threshold-event-enum;
32              description
33                  "The type of threshold event for which this list
34                    entry is specifying the configuration.";
35              reference
36                  "IEEE Std 802.3, 57.5.3";
37          }
38          leaf window {
39              type uint64;
40              description
41                  "The size of the window to use when monitoring for
42                    this threshold event. The units, default and upper
43                    and lower bounds depend on the threshold type as
44                    follows:
45
46                    Symbol Period:
47                        Units:    number of symbols
48                        Default:  number of symbols in one second for the
49                                underlying physical layer
50                        Min:      number of symbols in one second for the
51                                underlying physical layer
52                        Max:      number of symbols in one minute for the
53                                underlying physical layer
54
55                    Frame:
56                        Units:    deciseconds
57                        Default:  1 second
58                        Min:      1 second
59                        Max:      1 minute
```

```

1
2         Frame Period:
3             Units:    number of frames
4             Default:  number of minFrameSize frames in one
5                       second for the underlying physical layer
6             Min:      number of minFrameSize frames in one
7                       second for the underlying physical layer
8             Max:      number of minFrameSize frames in one
9                       minute for the underlying physical layer
10
11
12         Frame Seconds:
13             Units:    deciseconds
14             Default:  60 seconds
15             Min:      10 seconds
16             Max:      900 seconds";
17     reference
18         "IEEE Std 802.3, 30.3.6.1.34, 30.3.6.1.36, 30.3.6.1.38,
19         and 30.3.6.1.40";
20     }
21 leaf threshold {
22     type uint64 {
23         range "1..max";
24     }
25     default "1";
26     description
27         "The threshold value to use when determining whether
28         \t to generate an event given the number of errors that
29         occurred in a given window. The units depend on the
30         threshold type as follows:
31
32         Symbol Period: number of errored symbols
33         Frame:          number of errored frames
34         Frame Period:   number of errored frames
35         Frame Seconds:  number of seconds containing at least
36                         1 frame error";
37     reference
38         "IEEE Std 802.3, 30.3.6.1.34, 30.3.6.1.36, 30.3.6.1.38,
39         and 30.3.6.1.40";
40     }
41 }
42
43 leaf mib-retrieval {
44     if-feature
45         "remote-mib-retrieval-initiate or
46         remote-mib-retrieval-respond";
47     type boolean;
48     status deprecated;
49     description
50         "leaf mib-retrieval is deprecated and changed name to
51         data-retrieval.
52         MIB variable retrieval support.
53         This affects the setting of the 'Variable Retrieval' bit
54         in the OAM configuration field put in the Information
55         OAMPDU. This bit indicates to the peer device that the
56         OAM entity can send and receive Variable Request and
57         Response OAMPDUs.";
58 }
59 leaf data-retrieval {
60     if-feature
61

```

```
1         "remote-data-retrieval-initiate or
2         remote-mib-retrieval-respond";
3     type boolean;
4     description
5         "Variable retrieval support.
6         This affects the setting of the 'Variable Retrieval' bit
7         in the OAM configuration field put in the Information
8         OAMPDU. This bit indicates to the peer device that the
9         OAM entity can send and receive Variable Request and
10        Response OAMPDUs.";
11 }
12 }
13 }
14 leaf revision {
15     type uint64;
16     config false;
17     description
18         "Configuration revision.";
19     reference
20         "IEEE Std 802.3, 30.3.6.1.12 and 30.3.6.1.13";
21 }
22 }
23 leaf oammtu {
24     type uint16;
25     units "octets";
26     config false;
27     description
28         "The maximum OAMPDU size for the local node. The peer OAM
29         entities exchange the maximum size they can support and
30         negotiate to use the smaller of the two maximum OAMPDU
31         sizes.";
32     reference
33         "IEEE Std 802.3, 30.3.6.1.8 and 30.3.6.1.9";
34 }
35 }
36 }
37 }
38 grouping discovery-info {
39     description
40         "Information relating to the discovery process.";
41     container local {
42         description
43             "Properties of the local device.";
44         leaf operational-status {
45             type operational-state;
46             config false;
47             mandatory true;
48             description
49                 "Operational status.";
50             reference
51                 "IETF RFC 4878, dot3OamOperStatus; IEEE Std 802.3,
52                 30.3.6.1.4, 30.3.6.1.10, and 30.3.6.1.11";
53         }
54     }
55     leaf loopback-mode {
56         if-feature
57             "remote-loopback-initiate or
58             remote-loopback-respond";
59         type loopback-status;
60         config false;
61         mandatory true;
62         description
63             "The loopback mode the interface is in.";
64     }
65 }
```



```
1         reference
2             "IEEE Std 802.3, 30.3.6.1.14";
3     }
4     uses discovery-local;
5 }
6 container remote {
7     config false;
8     description
9         "Properties of the remote (peer) device.";
10    leaf mac-address {
11        type ieee:mac-address;
12        description
13            "Remote MAC address.";
14        reference
15            "IEEE Std 802.3, 30.3.6.1.5";
16    }
17    leaf vendor-oui {
18        type vendor-oui;
19        description
20            "Remote vendor OUI.";
21        reference
22            "IEEE Std 802.3, 30.3.6.1.16";
23    }
24    leaf vendor-info {
25        type uint64;
26        description
27            "Remote vendor info. The semantics of this value are
28            proprietary and specific to the vendor.";
29        reference
30            "IEEE Std 802.3, 30.3.6.1.17";
31    }
32    leaf loopback-mode {
33        type loopback-status;
34        mandatory true;
35        description
36            "The loopback mode the interface is in.";
37        reference
38            "IEEE Std 802.3, 30.3.6.1.15";
39    }
40    uses discovery-remote;
41 }
42 }
43
44 augment "/if:interfaces/if:interface" {
45     when "derived-from-or-self(if:type, 'ianaift:ethernetCsmacd') or
46         derived-from-or-self(if:type, 'ianaift:ptm') " {
47         description
48             "Augments the interface model with nodes
49             specific to Ethernet Link OAM.";
50     }
51     description
52         "Augments Ethernet interface model with nodes
53         specific to Ethernet Link OAM.";
54     container link-oam {
55         presence "Implies Link OAM is configured on the interface.";
56         description
57             "Interface operational state for Ethernet Link OAM.";
58         action remote-loopback {
59             if-feature "remote-loopback-initiate";
60         }
61     }
62 }
```

```
1      description
2          "Start/stop remote loopback on the specified interface.";
3      reference
4          "IEEE Std 802.3, 57.1.2:b";
5      input {
6          leaf enable {
7              type boolean;
8              mandatory true;
9              description
10                 "Whether to enable or disable remote loopback.";
11          }
12      }
13  }
14  output {
15      leaf success {
16          type boolean;
17          mandatory true;
18          description
19              "True if the operation was successful,
20               false otherwise.";
21      }
22  }
23  leaf error-message {
24      type string;
25      description
26          "If the operation failed, optionally used to
27           provide extra details.";
28  }
29  }
30  }
31  }
32  action reset-stats {
33      description
34          "Reset Ethernet Link OAM statistics on this interface.";
35      output {
36          leaf success {
37              type boolean;
38              mandatory true;
39              description
40                  "True if the operation was successful,
41                   false otherwise.";
42          }
43      }
44      leaf error-message {
45          type string;
46          description
47              "If the operation failed, optionally used to provide
48               extra details.";
49      }
50  }
51  }
52  }
53  notification non-threshold-event {
54      description
55          "This notification is sent when a local or remote
56           non-threshold crossing event is detected.";
57      uses event-details {
58          refine "event-type" {
59              must ". != 'threshold-event-type'" {
60                  description
61                      "This leaf is not set to
62                       'threshold-event-type'.";
63              }
64          }
65      }
```

```

1      }
2    }
3    notification threshold-event {
4      if-feature
5        "link-monitoring-local or
6          link-monitoring-remote";
7      description
8        "This notification is sent when a local or remote
9          threshold crossing event is detected.";
10     uses event-details {
11       refine "event-type" {
12         must ". = 'threshold-event-type'" {
13           description
14             "This leaf is set to 'threshold-event-type'.";
15         }
16       }
17     }
18   }
19   uses threshold-event-details;
20 }
21 leaf admin {
22   type admin-state;
23   default "disabled";
24   description
25     "This object is used to provision the default
26       administrative OAM mode for this interface. This object
27       represents the desired state of OAM for this interface.
28       It starts in the disabled state until an explicit
29       management action or configuration information retained
30       by the system causes a transition to the enabled(1)
31       state. When enabled(1), Ethernet OAM will attempt to
32       operate over this interface. The default value is
33       implementation-dependent.";
34 }
35 container discovery-info {
36   description
37     "Information relating to the discovery process.";
38   uses discovery-info;
39 }
40 container event-log {
41   config false;
42   description
43     "List of Ethernet Link OAM event log entries on the
44       interface.";
45   list event-log-entry {
46     key "index";
47     description
48       "Ethernet Link OAM event log entry.";
49     leaf index {
50       type uint64;
51       description
52         "Index of this event in the event log.";
53     }
54     uses event-details;
55     uses threshold-event-details;
56   }
57 }
58 container statistics {
59   config false;
60   description
61

```

```
1         "Statistics for an 802.3 OAM interface.";
2     uses statistics-common;
3     leaf local-error-symbol-period-log-entries {
4         type yang:counter64;
5         mandatory true;
6         description
7             "Number of local error symbol period log entries.";
8     }
9
10    leaf local-error-frame-log-entries {
11        type yang:counter64;
12        mandatory true;
13        description
14            "Number of local error frame log entries.";
15    }
16    leaf local-error-frame-period-log-entries {
17        type yang:counter64;
18        mandatory true;
19        description
20            "Number of local error frame period log entries.";
21    }
22
23    leaf local-error-frame-second-log-entries {
24        type yang:counter64;
25        mandatory true;
26        description
27            "Number of local error frame second log entries.";
28    }
29
30    leaf remote-error-symbol-period-log-entries {
31        if-feature "link-monitoring-remote";
32        type yang:counter64;
33        mandatory true;
34        description
35            "Number of remote error symbol period log entries.";
36    }
37    leaf remote-error-frame-log-entries {
38        if-feature "link-monitoring-remote";
39        type yang:counter64;
40        mandatory true;
41        description
42            "Number of remote error frame log entries.";
43    }
44
45    leaf remote-error-frame-period-log-entries {
46        if-feature "link-monitoring-remote";
47        type yang:counter64;
48        mandatory true;
49        description
50            "Number of remote error frame period log entries.";
51    }
52
53    leaf remote-error-frame-second-log-entries {
54        if-feature "link-monitoring-remote";
55        type yang:counter64;
56        mandatory true;
57        description
58            "Number of remote error frame second log entries.";
59    }
60 }
61 }
62 }
63 }
64 }
65
```

NOTE—IEEE Std 802.3, Annex K defines optional alternative terminology for “master” and “slave”.