module ieee802-ethernet-interface {

yang-version 1.1;

namespace

"urn:ieee:std:802.3:yang:ieee802-ethernet-interface";

prefix eth-if;

import ietf-yang-types {

prefix yang;

reference "IETF RFC 6991";

}

import ietf-interfaces {

prefix if;

reference "IETF RFC 7223";

}

import iana-if-type {

prefix ianaift;

reference "IETF RFC 7224";

}

organization

"IEEE Std 802.3 Ethernet Working Group

Web URL: http://www.ieee802.org/3/";

contact

"Web URL: http://www.ieee802.org/3/cf/";

description

"This module contains YANG definitions for configuring IEEE Std

802.3 Ethernet Interfaces.

In this YANG module, 'Ethernet interface' can be interpreted

as referring to 'IEEE Std 802.3 compliant Ethernet

interfaces'.";

reference "IEEE Std 802.3-2018, unless dated explicitly";

typedef eth-if-speed-type {

type decimal64 {

fraction-digits 3;

}

units "Gb/s";

description

"Used to represent the configured, negotiated, or actual speed

of an Ethernet interface in Gigabits per second (Gb/s),

accurate to 3 decimal places (i.e., accurate to 1 Mb/s).";

}

typedef duplex-type {

type enumeration {

enum full {

description

"Full duplex.";

}

enum half {

description

"Half duplex.";

}

enum unknown {

description

"Link is currently disconnected or initializing.";

}

}

default full;

description

"The current duplex mode of operation of an Ethernet

interface.";

reference "IEEE Std 802.3, 30.3.1.1.32, aDuplexStatus";

}

typedef pause-fc-direction-type {

type enumeration {

enum "disabled" {

description

"Flow-control disabled in both ingress and egress

directions, i.e., PAUSE frames are not transmitted and

PAUSE frames received in the ingress direction are

discarded without processing.";

}

enum "ingress-only" {

description

"PAUSE frame based flow control is enabled in the ingress

direction only, i.e., PAUSE frames may be transmitted to

reduce the ingress traffic flow, but PAUSE frames received

in the ingress direction are discarded without reducing

the egress traffic rate.";

}

enum "egress-only" {

description

"PAUSE frame based flow control is enabled in the egress

direction only, i.e., PAUSE frames are not transmitted,

but PAUSE frames received in the ingress direction are

processed to reduce the egress traffic rate.";

}

enum "bi-directional" {

description

"PAUSE frame based flow control is enabled in both ingress

and egress directions, i.e., PAUSE frames may be

transmitted to reduce the ingress traffic flow, and PAUSE

frames received on ingress are processed to reduce the

egress traffic rate.";

}

enum "undefined" {

description

"Link is currently disconnected or initializing.";

}

}

description

"Enumerates the possible PAUSE frame based flow

control settings that can be used in explicit configuration,

or when reporting the operational state.";

reference

"IEEE Std 802.3.1, dot3PauseAdminMode and dot3PauseOperMode";

}

feature ethernet-pfc {

description

"This device supports Ethernet priority flow-control.";

}

feature ethernet-pause {

description

"This device supports Ethernet PAUSE.";

}

augment "/if:interfaces/if:interface" {

when "derived-from-or-self(if:type, 'ianaift:ethernetCsmacd')" {

description

"Applies to all P2P Ethernet interfaces";

}

description

"Augment interface model with IEEE Std 802.3 Ethernet interface

specific configuration nodes.";

container ethernet {

description

"Contains all Ethernet interface related configuration.";

container auto-negotiation {

description

"Contains auto-negotiation transmission parameters.

This leaf allows the advertised duplex value in the

negotiation to be restricted.

If not specified then the default behavior is to

negotiate all available values for the particular type of

Ethernet PHY associated with the interface.

If auto-negotiation is enabled, and PAUSE frame based flow

control has not been explicitly configured, then the

default PAUSE frame based flow control capabilities that

are negotiated allows for bi-directional or egress-only

PAUSE frame based flow control to be negotiated (depending

on the peer device capabilities/configuration).

If auto-negotiation is enabled, and PAUSE frame based flow

control has been explicitly configured, then the

configuration settings restrict the values that may be

should be noted that the protocol

does not allow only egress PAUSE frame based flow control

to be negotiated without also allowing bi-directional

PAUSE frame based flow control.";

reference "IEEE Std 802.3, Clause 28 and Annexes 28A-D";

leaf enable {

type boolean;

default true;

description

"Controls whether auto-negotiation is enabled or

disabled.

For interface types that support auto-negotiation then

it defaults to being enabled.";

}

leaf negotiation-status {

when "../enable = 'true'";

type enumeration {

enum in-progress {

description

"The auto-negotiation protocol is running and

negotiation is currently in-progress";

}

enum complete {

description

"The auto-negotation protocol has completed

successfully";

}

enum failed {

description

"The auto-negotiation protocol has failed.";

}

enum unknown {

description

"The auto-negotiation status is not currently known,

this could be because it is still negotiating or the

protocol cannot run (e.g., if no medium is

present).";

}

}

config false;

description

"The status of the auto-negotiation protocol.";

reference "IEEE 802.3, 30.6.1.1.4, aAutoNegAutoConfig";

}

}

leaf duplex {

type duplex-type;

description

"Operational duplex mode of the Ethernet interface.

The default value is implementation-dependent.";

reference "IEEE Std 802.3, 30.3.1.1.32 aDuplexStatus";

}

leaf speed {

type eth-if-speed-type;

units "Gb/s";

description

"Operational speed of the Ethernet interface.

The default value is implementation-dependent.";

}

container flow-control {

description

"Holds the different types of Ethernet PAUSE frame based

flow control that can be enabled.";

container pause {

if-feature "ethernet-pause";

description

"IEEE Std 802.3 PAUSE frame based PAUSE frame based flow

Control.";

reference "IEEE Std 802.3, Annex 31B";

leaf direction {

type pause-fc-direction-type;

description

"Indicates which direction PAUSE frame based flow

control is enabled in, or whether it is disabled. The

default flow-control settings are vendor specific.

If auto-negotiation is enabled, then PAUSE based

flow-control is negotiated by default.

The default value is implementation-dependent.";

}

container statistics {

config false;

description

"Contains the number of PAUSE frames received or

Transmitted.";

leaf in-pkts-pause {

type yang:counter64;

units frames;

description

"A count of PAUSE MAC Control frames transmitted on

this Ethernet interface.

Discontinuities in the values of counters in

this container can occur at re-initialization of the

management system, and at other times as indicated

by the value of the 'discontinuity-time' leaf

defined in the ietf-interfaces YANG module

(RFC 7223).";

reference

"IEEE Std 802.3, 30.3.4.3 aPAUSEMACCtrlFramesReceived";

}

leaf out-pkts-pause {

type yang:counter64;

units frames;

description

"A count of PAUSE MAC Control frames transmitted on

this Ethernet interface.

Discontinuities in the values of counters in

this container can occur at re-initialization of the

management system, and at other times as indicated

by the value of the 'discontinuity-time' leaf

defined in the ietf-interfaces YANG module

(RFC 7223).";

reference

"IEEE Std 802.3, 30.3.4.2

aPAUSEMACCtrlFramesTransmitted";

}

}

}

container pfc {

if-feature "ethernet-pfc";

description

"IEEE Std 802.3 Priority-based PAUSE frame based flow

Control.";

reference "IEEE Std 802.3, Annex 31D";

leaf enable {

type boolean;

description

"True indicates that IEEE Std 802.3 priority-based

PAUSE frame based flow control is enabled, false

indicates that IEEE Std 802.3 priority-based PAUSE

frame based flow control is disabled.

For interfaces that have auto-negotiation, then

priority-based PAUSE frame based flow control is

negotiated by default.

If explicitly configured, when auto-negotiated is

enabled, then the configuration will restrict the

priority PAUSE frame based flow control settings that

can be negotiated.

The default value is implementation-dependent.";

}

container statistics {

config false;

description

"This container collects all statistics for IEEE

Std 802.3 Ethernet interfaces.";

leaf in-pkts-pfc {

type yang:counter64;

units frames;

description

"A count of PFC MAC Control frames received on this

Ethernet interface.

Discontinuities in the values of counters in

this container can occur at re-initialization of the

management system, and at other times as indicated

by the value of the 'discontinuity-time' leaf

defined in the ietf-interfaces YANG module

(RFC 7223).";

reference "IEEE Std 802.3.1, dot3HCInPFCFrames";

}

leaf out-pkts-pfc {

type yang:counter64;

units frames;

description

"A count of PFC MAC Control frames transmitted on

this interface.

Discontinuities in the values of counters in

this container can occur at re-initialization of the

management system, and at other times as indicated

by the value of the 'discontinuity-time' leaf

defined in the ietf-interfaces YANG module

(RFC 7223).";

reference "IEEE Std 802.3.1, dot3HCInPFCFrames";

}

}

}

leaf force-flow-control {

type boolean;

default false;

description

"Explicitly forces the local PAUSE frame based flow

control settings regardless of what has been negotiated.

Since the auto-negotiation of flow-control settings

does not allow all sane combinations to be negotiated

(e.g., consider a device that is only capable of sending

PAUSE frames connected to a peer device that is only

capable of receiving and acting on PAUSE frames) and

failing to agree on the flow-control settings does not

cause the auto-negotiation to fail completely, then it is

sometimes useful to be able to explicitly enable

particular PAUSE frame based flow control settings on

the local device regardless of what is being advertised

or negotiated.

The default value is implementation-dependent.";

reference

"IEEE Std 802.3, Table 28B-3";

}

}

leaf max-frame-length {

type uint16;

units octets;

config false;

description

"This indicates the MAC frame length (including FCS bytes)

at which frames are dropped for being too long.";

reference "IEEE Std 802.3, 30.3.1.1.37 aMaxFrameLength";

}

leaf mac-control-extension-control {

type boolean;

config false;

description

"A value that identifies the current EXTENSION MAC Control

function, as specified in IEEE Std 802.3, Annex 31C.";

reference

"IEEE Std 802.3, 30.3.8.3 aEXTENSIONMACCtrlStatus

IEEE Std 802.3.1, dot3ExtensionMacCtrlStatus ";

}

leaf frame-limit-slow-protocol {

type uint64;

units fps;

default 10;

config false;

description

"The maximum number of Slow Protocol frames of a given

subtype that can be transmitted in a one second interval.

The default value is 10.";

reference

"IEEE Std 802.3, 30.3.1.1.38 aSlowProtocolFrameLimit";

}

container capabilities {

config false;

description

"Container all Ethernet interface specific capabilities.";

leaf auto-negotiation {

type boolean;

default false;

description

"Indicates whether auto-negotiation may be configured on

this interface.";

}

}

container statistics {

config false;

description

"Contains statistics specific to Ethernet interfaces.

Discontinuities in the values of counters in the

container can occur at re-initialization of the management

system, and at other times as indicated by the value of

the 'discontinuity-time' leaf defined in the

ietf-interfaces YANG module (IETF RFC 7223).";

container frame {

description

"Contains frame statistics specific to Ethernet

Interfaces.

All octet frame lengths include the 4 byte FCS.

Error counters are only reported once. The count

represented by an instance of this object is incremented

when the frameCheckError status is returned by the MAC

service to the LLC (or other MAC user). Received frames

for which multiple error conditions pertain are,

according to the conventions of IEEE Std 802.3 Layer

Management, counted exclusively according to the error

status presented to the LLC.

A frame that is counted by an instance of this object is

also counted by the corresponding instance of

'in-errors' leaf defined in the ietf-interfaces YANG

module (IETF RFC 7223).

Discontinuities in the values of counters in the

container can occur at re-initialization of the

management system, and at other times as indicated by

the value of the 'discontinuity-time' leaf defined in

the ietf-interfaces YANG module (IETF RFC 7223).";

leaf in-total-pkts {

type yang:counter64;

units frames;

description

"The total number of frames (including bad frames)

received on the Ethernet interface.

This counter is calculated by summing the following

IEEE Std 802.3, Clause 30 counters:

aFramesReceivedOK +

aFrameCheckSequenceErrors +

aAlignmentErrors +

aFrameTooLongErrors +

aFramesLostDueToIntMACRcvError

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, Clause 30 counters, as specified

in the description above.";

}

leaf in-total-octets {

type yang:counter64;

units octets;

description

"The total number of octets of data (including those in

bad frames) received on the Ethernet interface.

Includes the 4 byte FCS.

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference

"IETF RFC 2819, etherStatsOctets";

}

leaf in-pkts {

type yang:counter64;

units frames;

description

"A count of frames (including unicast, multicast and

broadcast) that have been successfully received on the

Ethernet interface.

This count does not include frames received with

frame-too-long, FCS, length or alignment errors, or

frames lost due to internal MAC sublayer error.

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.1.1.5 aFramesReceivedOK";

}

leaf in-multicast-pkts {

type yang:counter64;

units frames;

description

"A count of multicast frames that have been

successfully received on the Ethernet interface.

This counter represents a subset of the frames counted

by in-pkts.

This count does not include frames received with

frame-too-long, FCS, length or alignment errors, or

frames lost due to internal MAC sublayer error.

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.1.1.21 aMulticastFramesReceivedOK";

}

leaf in-broadcast-pkts {

type yang:counter64;

units frames;

description

"A count of broadcast frames that have been

successfully received on the Ethernet interface.

This counter represents a subset of the frames counted

by in-pkts.

This count does not include frames received with

frame-too-long, FCS, length or alignment errors, or

frames lost due to internal MAC sublayer error.

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.1.1.22 aBroadcastFramesReceivedOK";

}

leaf in-error-fcs-pkts {

type yang:counter64;

units frames;

description

"A count of receive frames that are of valid length,

but do not pass the FCS check, regardless of whether

or not the frames are an integral number of octets in

length.

This count effectively comprises

aFrameCheckSequenceErrors and aAlignmentErrors added

together.

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.1.1.6 aFrameCheckSequenceErrors;

IEEE Std 802.3, 30.3.1.1.7 aAlignmentErrors";

}

leaf in-error-undersize-pkts {

type yang:counter64;

units frames;

description

"A count of frames received on a particular Ethernet

interface that are less than 64 bytes in length, and

are discarded.

This counter is incremented regardless of whether the

frame passes the FCS check.

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference

"IETF RFC 2819, etherStatsUndersizePkts and

etherStatsFragments";

}

leaf in-error-oversize-pkts {

type yang:counter64;

units frames;

description

"A count of frames received on a particular Ethernet

interface that exceed the maximum permitted frame

size, that is specified in max-frame-length, and are

discarded.

This counter is incremented regardless of whether the

frame passes the FCS check.

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference "IEEE Std 802.3, 30.3.1.1.25 aFrameTooLongErrors";

}

leaf in-error-mac-internal-pkts {

type yang:counter64;

units frames;

description

"A count of frames for which reception on a particular

Ethernet interface fails due to an internal MAC

sublayer receive error.

A frame is only counted by an instance of this object

if it is not counted by the corresponding instance of

either the in-error-fcs-pkts, in-error-undersize-pkts,

or in-error-oversize-pkts. The precise meaning of the

count represented by an instance of this object is

implementation-specific.

In particular, an instance of this object may

represent a count of receive errors on a particular

Ethernet interface that are not otherwise counted.

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.1.1.15

aFramesLostDueToIntMACRcvError";

}

leaf out-pkts {

type yang:counter64;

units frames;

description

"A count of frames (including unicast, multicast and

broadcast) that have been successfully transmitted on

the Ethernet interface.

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.1.1.2 aFramesTransmittedOK";

}

leaf out-multicast-pkts {

type yang:counter64;

units frames;

description

"A count of multicast frames that have been

successfully transmitted on the Ethernet interface.

This counter represents a subset of the frames counted

by out-pkts.

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.1.1.18 aMulticastFramesXmittedOK";

}

leaf out-broadcast-pkts {

type yang:counter64;

units frames;

description

"A count of broadcast frames that have been

successfully transmitted on the Ethernet interface.

This counter represents a subset of the frames counted

by out-pkts.

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.1.1.19 aBroadcastFramesXmittedOK";

}

leaf out-error-mac-internal-pkts {

type yang:counter64;

units frames;

description

"A count of frames for which transmission on a

particular Ethernet interface fails due to an internal

MAC sublayer transmit error.

The precise meaning of the count represented by an

instance of this object is implementation-specific. In

particular, an instance of this object may represent a

count of transmission errors on a particular Ethernet

interface that are not otherwise counted.

Also see the 'description' statement associated with

the parent 'statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.1.1.12

aFramesLostDueToIntMACXmitError";

}

}

container phy {

description

"Ethernet statistics related to the PHY layer.

Discontinuities in the values of counters in the

container can occur at re-initialization of the

management system, and at other times as indicated by

the value of the 'discontinuity-time' leaf defined in

the ietf-interfaces YANG module (IETF RFC 7223).";

leaf in-error-symbol {

type yang:counter64;

units errors;

description

"A count of the number of symbol errors that have

occurred.

For the precise definition of when the symbol error

counter is incremented, please see the 'description'

text associated with aSymbolErrorDuringCarrier,

specified in IEEE Std 802.3, 30.3.2.1.5.

Also see the 'description' statement associated with

the parent 'phy-statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.2.1.5 aSymbolErrorDuringCarrier";

}

container lpi {

description

"Physical Ethernet statistics for the energy efficiency

related low power idle indications.";

leaf in-lpi-transitions {

type yang:counter64;

units transitions;

description

"A count of occurrences of the transition from

DEASSERT to ASSERT of the LPI\_INDICATE

parameter. The indication reflects the state of the

PHY according to the requirements of the RS (see

IEEE Std 802.3, 22.7, 35.4, and 46.4).

Also see the 'description' statement associated with

the parent 'phy-statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.2.1.11 aReceiveLPITransitions";

}

leaf in-lpi-time {

type decimal64 {

fraction-digits 6;

}

units seconds;

description

"A count reflecting the total amount of time (in

seconds) that the LPI\_REQUEST parameter has the

value ASSERT. The request is indicated to the PHY

according to the requirements of the RS (see IEEE Std

802.3, 22.7, 35.4, and 46.4).

Also see the 'description' statement associated with

the parent 'phy-statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.2.1.9 aReceiveLPIMicroseconds";

}

leaf out-lpi-transitions {

type yang:counter64;

units transitions;

description

"A count of occurrences of the transition from state

LPI\_DEASSERTED to state LPI\_ASSERTED of the LPI

transmit state diagram is the RS. The state

transition corresponds to the assertion of the

LPI\_REQUEST parameter. The request is indicated to

the PHY according to the requirements of the RS (see

IEEE Std 802.3, 22.7, 35.4, 46.4.)

Also see the 'description' statement associated with

the parent 'phy-statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.2.1.10 aTransmitLPITransitions";

}

leaf out-lpi-time {

type decimal64 {

fraction-digits 6;

}

units seconds;

description

"A count reflecting the total amount of time (in

seconds) that the LPI\_INDICATION parameter has the

value ASSERT. The request is indicated to the PHY

according to the requirements of the RS (see IEEE

802.3, 22.7, 35.4, and 46.4).

Also see the 'description' statement associated with

the parent 'phy-statistics' container for additional

common semantics related to this counter.";

reference

"IEEE Std 802.3, 30.3.2.1.8 aTransmitLPIMicroseconds";

}

}

}

container mac-control {

description

"A group of statistics specific to MAC Control operation

of selected Ethernet interfaces.

Discontinuities in the values of counters in the

container can occur at re-initialization of the

management system, and at other times as indicated by

the value of the 'discontinuity-time' leaf defined in

the ietf-interfaces YANG module (IETF RFC 7223).";

reference

"IEEE Std 802.3.1, dot3ExtensionTable";

leaf in-pkts-mac-control-unknown {

type yang:counter64;

units frames;

description

"A count of MAC Control frames with an unsupported

opcode received on this Ethernet interface.

Frames counted against this counter are also counted

against in-discards defined in the ietf-interfaces

YANG module (IETF RFC 7223).

Also see the 'description' statement associated with

the parent 'mac-control-statistics' container for

additional semantics.";

reference

"IEEE Std 802.3, 30.3.3.5 aUnsupportedOpcodesReceived";

}

leaf in-pkts-mac-control-extension {

type yang:counter64;

units frames;

description

"The count of Extension MAC Control frames received on

this Ethernet interface.

Also see the 'description' statement associated with

the parent 'mac-control-statistics' container for

additional semantics.";

reference

"IEEE Std 802.3, 30.3.8.2

aEXTENSIONMACCtrlFramesReceived";

}

leaf out-pkts-mac-control-extension {

type yang:counter64;

units frames;

description

"The count of Extension MAC Control frames transmitted

on this Ethernet interface.

Also see the 'description' statement associated with

the parent 'mac-control-statistics' container for

additional semantics.";

reference

"IEEE Std 802.3, 30.3.8.1

aEXTENSIONMACCtrlFramesTransmitted";

}

}

}

}

}

}