



**IEEE Standard for
Local and Metropolitan Area Networks—
Bridges and Bridged Networks
Amendment 33:
YANG Data Model for
Connectivity Fault Management**

IEEE Computer Society

Developed by the
LAN/MAN Standards Committee

IEEE Std 802.1Qcx™-2020
(Amendment to IEEE Std 802.1Q™-2018
as amended by IEEE Std 802.1Qcp™-2018,
IEEE Std 802.1Qcc™-2018, and IEEE Std 802.1Qcy™-2019)

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Approved 4 June 2020
IEEE SA Standards Board

Abstract: A YANG data model that supports configuration, status reporting, and monitoring for Connectivity Fault Management (CFM) for Two-Port MAC Relays, Customer VLAN Bridges, and Provider Bridges is further developed by this amendment to IEEE Std 802.1Q™-2018. See also IEEE Std 802.1Qcp™-2018 for the introduction of this YANG data model.

Keywords: amendment, Bridged Local Area Networks, CFM, Connectivity Fault Management, IEEE 802.1Q™, IEEE 802.1Qcp™, IEEE 802.1Qcx™, LANs, local area networks, MAC Bridges, metropolitan area networks, Virtual Bridged Local Area Networks, virtual LANs, YANG

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Introduction

This introduction is not part of IEEE Std 802.1Qcx-2020, IEEE Standard for Local and Metropolitan Area Networks—Bridges and Bridged Networks—Amendment 33: YANG Data Model for Connectivity Fault Management.

This amendment to IEEE Std 802.1Q™-2018, as amended by IEEE Std 802.1Qcp™-2018, IEEE Std 802.1Qcc™-2018, and IEEE Std 802.1Qcy™-2019, specifies a YANG data model that supports configuration, status reporting, and monitoring for Connectivity Fault Management (CFM) for Two-Port MAC Relays, Customer VLAN Bridges, and Provider Bridges.

This standard contains state-of-the-art material. The area covered by this standard is undergoing evolution. Revisions are anticipated within the next few years to clarify existing material, to correct possible errors, and to incorporate new related material. Information on the current revision state of this and other IEEE 802® standards may be obtained from

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(This amendment is based on IEEE Std 802.1Q™-2018, as amended by IEEE Std 802.1Qcp™-2018, IEEE Std 802.1Qcc™-2018, and IEEE Std 802.1Qcy™-2019.)

NOTE—The editing instructions contained in this amendment define how to merge the material contained here into the base document and its other amendments to form the new comprehensive standard.

Editing instructions are shown in *bold italic*. Four editing instructions are used: change, delete, insert, and replace. *Change* is used to make corrections in existing text or tables. The editing instruction specifies the location of the change and describes what is being changed either by using ~~striketrough~~ (to remove old material) and underscore (to add new material). *Delete* removes existing material. *Insert* adds new material without disturbing the existing material. Insertions may require renumbering. If so, renumbering instructions are given in the editing instruction. *Replace* is used to make changes in figures or equations by removing the existing figure or equation and replacing it with a new one. Editing instructions, change markings, and this NOTE will not be carried over into future editions because the changes will be incorporated into the base standard.¹

1. Overview

1.3 Introduction

Change item k) (as introduced in IEEE Std 802.1Qcp-2018) of the lettered list in 1.3 as follows:

- k) Defines YANG configuration and operational state models (Clause 48) in support of Two-Port MAC Relays, Customer VLAN Bridges, and Provider Bridges, including Connectivity Fault Management (CFM) for these bridges.

¹ Notes in text, tables, and figures are given for information only and do not contain requirements needed to implement the standard.

5. Conformance

5.4 VLAN Bridge component requirements

5.4.1 VLAN Bridge component options

5.4.1.4 Connectivity Fault Management (CFM) (optional)

Change item n) of the lettered list in 5.4.1.4 as follows:

- n) Support the CFM MIB module defined in 17.5 [and/or support the CFM YANG modules defined in Clause 48.](#)

5.19 VLAN-aware end station requirements for CFM

Insert the following list item after item i) (“Support the CFM MIB module”) of the lettered list in 5/19, and reletter the subsequent list item accordingly:

- j) Support the CFM YANG modules defined in Clause 48.

20. CFM protocols

20.1 Continuity Check protocol

20.1.2 Defects and Fault Alarms

Change the first paragraph of 20.1.2 as follows (text of footnote 27 remains unchanged):

Defects are separated from Fault Alarms (19.2.16), as is standard practice for service providers.²⁷ The loss of CCMs or the reception of a cross connected CCM ~~is a~~ are defects. A Fault Alarm is a Management operation (12.14.7.7), an unsolicited announcement by a Bridge. If the CFM MIB module is implemented (17.5), ~~it is an SNMP Notification, and is operating, an SNMP Notification is sent. If the CFM YANG module is implemented (Clause 48) and is operating, a YANG Notification is sent. Notifications are sent~~ It is issued when the MEP Fault Notification Generator state machine (20.37), or the MEP Mismatch Fault Notification Generator state machine (20.40), detects that a configured time period (default, 2.5 s) has passed with one or more defects indicated, and Fault Alarms are enabled. Each of these state machines can transmit no further Fault Alarms until it is reset by the passage of a configured time period (default, 10 s) during which no defect indication is present. The normal operator procedure upon receiving a Fault Alarm is to inspect the reporting MEP's managed objects, diagnose the fault, correct the fault, examine the MEP's managed objects to see whether the state machine has reset, and repeat those steps until the Fault Alarm has cleared.

48. YANG Data Model

Change the introductory text of Clause 48 (as introduced in IEEE Std 802.1Qcp-2018) as follows:

This clause specifies YANG data models that provide control and status monitoring of ~~bridges~~^{IEEE 802.1Q Bridges}. Specifically,

- a) Two-Port MAC Relays,
- b) Customer VLAN bridges Bridges, and
- c) Provider bridges Bridges.

The YANG bridge data management models are derived from UML models specified in 48.3. The UML models are based on Clause 12.

This clause also specifies YANG data models for CFM protocol suite control and monitoring when applied on the aforementioned ~~bridges~~^{Bridges}.

NOTE 1—OMB UML 2.5 [B78] conventions together with C++ language constructs are used in this clause as a representation to convey model structure and relationships.

NOTE 2—The MIB modules specified in Clause 17 were also derived from Clause 12. Consequently, the capabilities and structure of the YANG data models ~~align closely with~~^{should closely aligned with that represented by} the MIBs. However the YANG data model has not been derived from the MIB, and there has been no attempt to include data or modeling constructs that might appear in the MIB but not in the information model.

48.1 YANG Framework

Replace Figure 48-2 with the following figure:

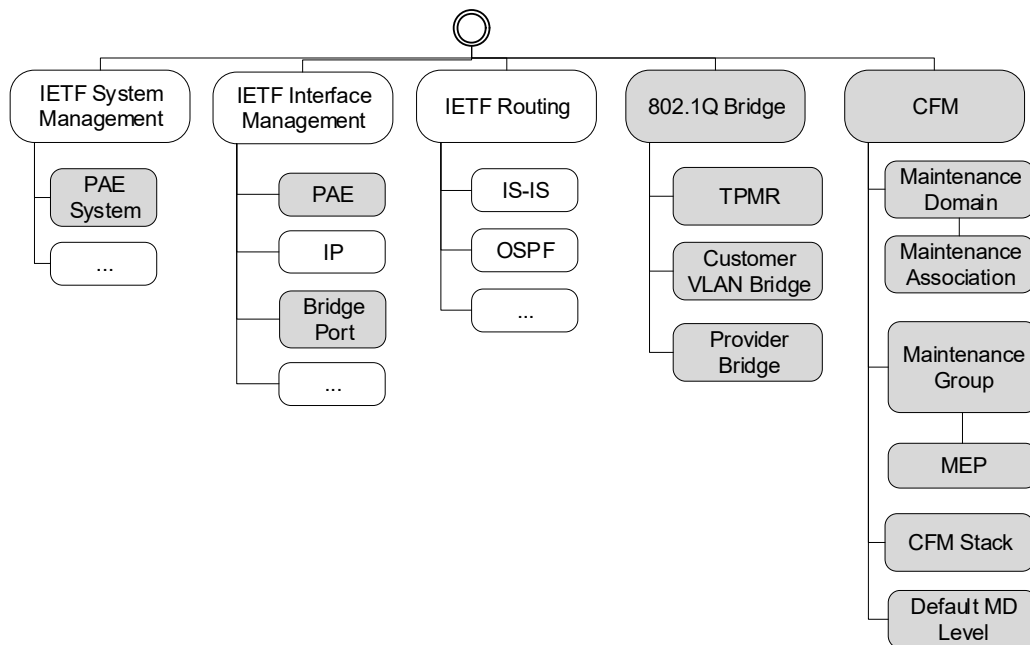


Figure 48-2—YANG root hierarchy with IEEE 802.1Q YANG modules

48.3 802.1Q YANG model

Insert the following subclause (48.3.3, including Figure 48-11 through Figure 48-14) after 48.3.2.3:

48.3.3 CFM model

The CFM UML data model is composed of the following set of major objects:

- The **Maintenance Domain** object is associated with a device (e.g., Bridge). It contains information used to identify the maintenance domain used to bind/contain Maintenance Association objects.
- The **Maintenance Association** objects are contained within a Maintenance Domain object. They contain maintenance point information related to the service instance being monitored.
- The **Maintenance Group** objects provide a convenient binding of a Maintenance Association object with a Maintenance Domain object.
- The **Maintenance association Endpoint** (MEP) object is associated with an Interface (e.g., Bridge port) and a Maintenance Association Group object. It contains all information to manage a CFM entity, associated with a specific DoSAP of a service instance, which can generate and receive CFM PDUs and track any responses.
- The **Maintenance domain Intermediate Point** (MIP) object is associated with an Interface (e.g., Bridge port) and a service (e.g., VID) to allow the explicit creation of an MHF.
- The **CFM Stack** object is associated with a device (e.g., Bridge). It contains information about maintenance points on a particular device Interface (e.g., Bridge port or Aggregation Port).
- The **Default MD Level** object is associated with a device (e.g., Bridge) component. It contains MHF information needed for the creation of these functions on the services (e.g., VIDs) that are not attached to any Maintenance Association.
- The **Configuration Error List** is associated with a device (e.g., Bridge). It contains configuration error information that is identifiable on a per-Interface (e.g., Bridge port) and per-service (e.g., VID) basis.

The UML model representing the relationship between relevant Bridge objects to CFM objects is illustrated in Figure 48-11.

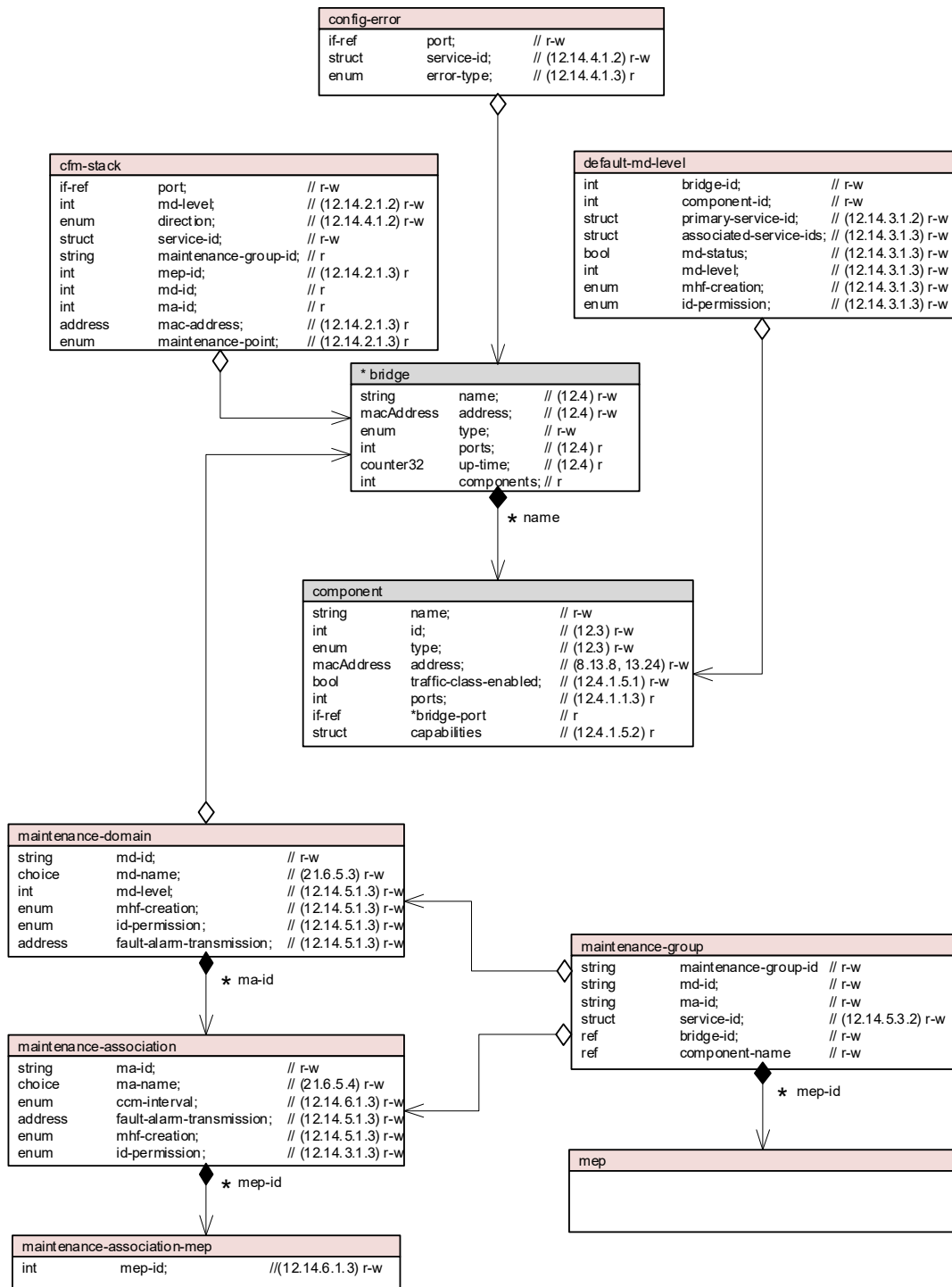


Figure 48-11—Bridge to CFM YANG model

The CFM objects (e.g., cfm-stack, configuration-error-list, default-md-level, maintenance-domain) reference the device (i.e., Bridge and/or Bridge Component) to which they belong. This reference allows CFM objects to be associated with other types of devices (e.g., non-Bridges, end stations) where appropriate.

The Maintenance Group is modeled as a list that contains a convenient reference to a Maintenance Association object and its corresponding Maintenance Domain object. The identification of this collection of objects allows other CFM objects to more easily attach to a maintenance group and, in turn, simplifies configuration and operation retrieval procedures supported by the data model.

As illustrated in Figure 48-12, MEP objects reference an Interface and are associated with a Maintenance Group. The interface relationship allows a MEP to be associated with a Bridge port, as specified by this standard. This model also allows MEPs to be associated with other Interface types (for other devices).

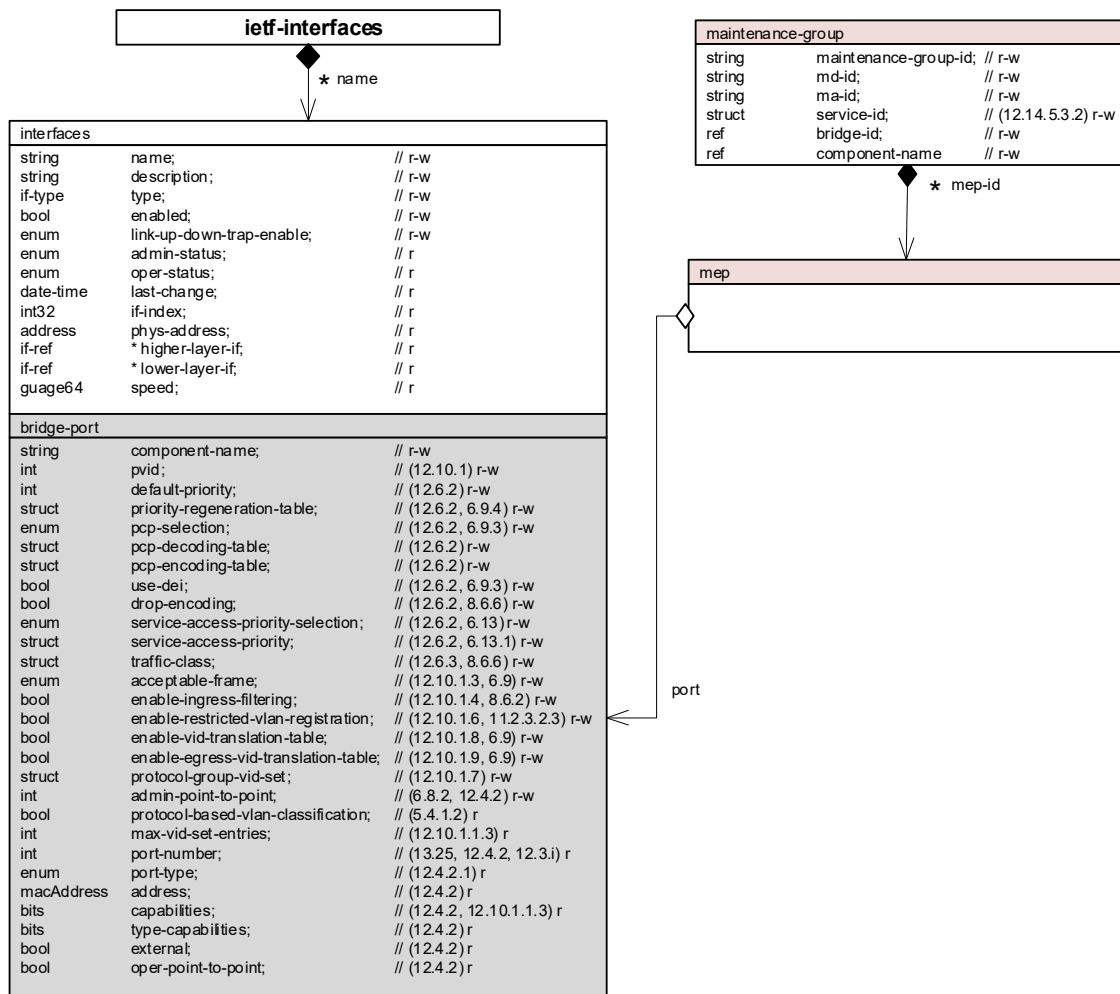


Figure 48-12—CFM MEP model relationships

The MEP object has relationships with other MEP-related objects. As illustrated in Figure 48-13, the CFM continuity check protocol suite-specific data needed to initiate protocol-specific sessions or maintain protocol-specific state information are grouped together. In addition, the MEP object will also reference the MEP CCM database and Stats objects.

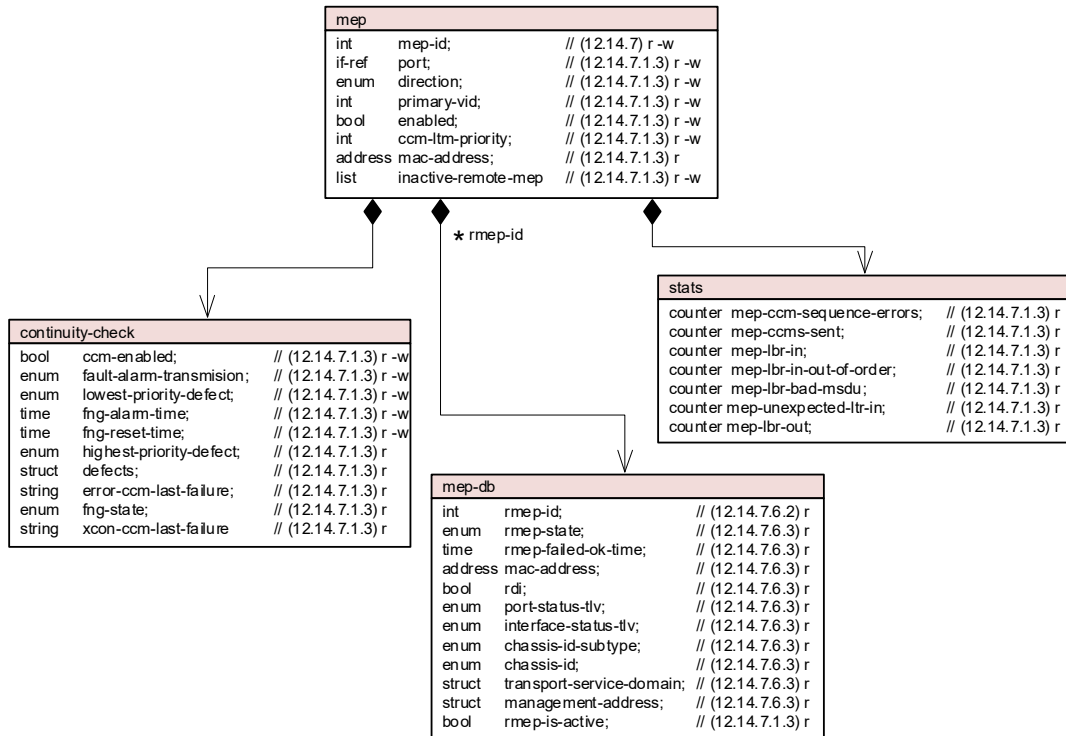


Figure 48-13—CFM MEP model

48.3.3.1 CFM model support of CFM Operations

The CFM model also supports the initiation of Continuity Check, Loopback, and Linktrace protocol sessions. The general structure of the CFM session action data model is illustrated in Figure 48-14.

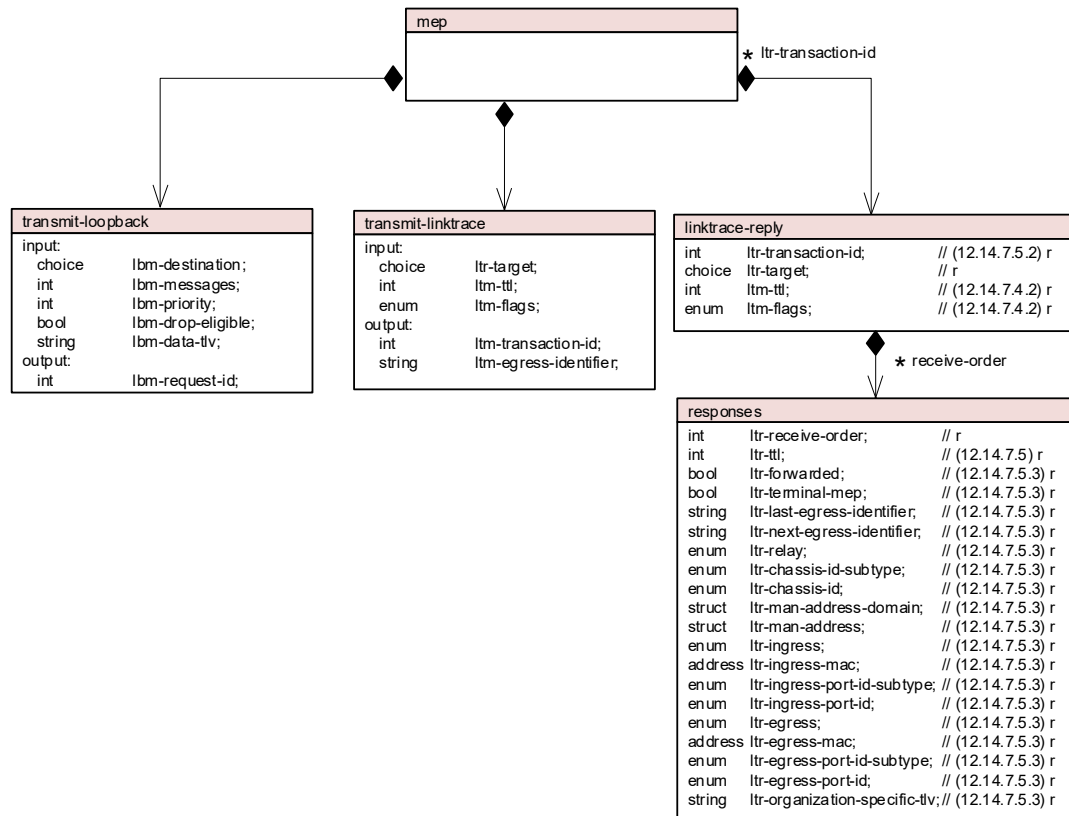


Figure 48-14—CFM operations structure

Delete the following subclauses, as introduced in IEEE Std 802.1Qcp-2018:

~~48.4 Structure of the YANG model~~

Deletion includes introductory text, 48.4.1 through 48.4.4, and Table 48-1 through Table 48-5.

~~48.5 Relationship to IEEE 802.1Q managed objects~~

Deletion includes introductory text, 48.5.1 through 48.5.7, and Table 48-6 through Table 48-12.

~~48.6 Definition of IEEE 802.1Q YANG modules~~

Deletion includes introductory text and 48.6.1 through 48.6.3.6.

Insert the following subclauses (new 48.4, 48.5, and 48.6, along with new Table 48-1 through Table 48-6) in place of the deleted subclauses described above. Note that the text of some subclauses remains unchanged from the original publication in 2018; however, the subclause numbers have changed due to the overall reorganization of this material.

<i>Text from 2018 in ...</i>	<i>Is now in ...</i>
<i>48.6.1</i>	<i>48.5</i>
<i>48.6.2</i>	<i>48.5.3</i>
<i>48.6.2.2</i>	<i>48.5.5</i>
<i>48.6.3.2</i>	<i>48.6.2</i>
<i>48.6.3.3</i>	<i>48.6.3</i>
<i>48.6.3.6</i>	<i>48.6.5</i>

48.4 Structure of the YANG model

The YANG models used to manage bridges comprise a number of YANG modules, which are summarized in Table 48-1.

In the YANG module definitions, if any discrepancy between the DESCRIPTION text and the corresponding definition in any other part of this standard occur, the definitions outside this clause (Clause 48) take precedence.

Table 48-1—Summary of the YANG modules

Module	Subclause	Notes
ieee802-types	48.6.1	General type definitions used within IEEE 802 standards.
ieee802-dot1q-types	48.6.2	General type definitions used by IEEE 802.1Q standard.
ieee802-dot1q-bridge	48.6.3	Generic IEEE 802.1Q Bridge YANG model, which is augmented by specific 802.1Q bridges.
ieee802-dot1q-tpmr	48.6.4	Two-Port MAC Relay YANG model, which augments the generic bridge YANG module.
ieee802-dot1q-pb	48.6.5	Provider Bridges YANG model, which augments the generic bridge YANG module.

Table 48-1—Summary of the YANG modules (*continued*)

Module	Subclause	Notes
ieee802-dot1q-cfm-types	48.6.6	General type definitions used by the CFM YANG modules.
ieee802-dot1q-cfm	48.6.7	Base/common CFM YANG model for augmentation to support device specific requirements. This module defines key CFM structural objects such as Maintenance Domains, Maintenance Associations, Maintenance Groups, MEPs and CFM session actions.
ieee802-dot1q-cfm-bridge	48.6.8	Defines 802.1Q Bridge specific extensions/augmentations of the base CFM YANG module. For example, Bridge port and Bridge specific service definition extensions are provided by this module. In addition, key CFM Bridge objects such as CFM Stack, Default MD Levels, and Configuration Error Lists are defined by this module.
ieee802-dot1q-cfm-alarm	48.6.9	Defines common CFM specific alarms. This module allows other users of the CFM YANG modules the option of supporting an alarm based on different framework (e.g., ietf-alarms).

The relationship between the models listed in 48.3 and the YANG modules listed in Table 48-1 is described in 48.4.1 through 48.4.5.

48.4.1 Generic Bridge model

The generic Bridge model provides basic bridging capabilities and allows for augmentation by specific YANG models (e.g., Two-Port MAC Relay model, Customer VLAN Bridge model, Provider Bridge model).

A system implementing the generic Bridge model implements the YANG modules listed in Table 48-2.

Table 48-2—YANG module dependencies for the generic Bridge model

YANG module
ieee802-types
ieee802-dot1q-types
ieee802-dot1q-bridge

48.4.2 Two-Port MAC Relay model

A system implementing the TPMR YANG model (48.3.2.1) implements the YANG modules listed in Table 48-3.

Table 48-3—YANG module dependencies for the Two-Port MAC Relay model

YANG module
ieee802-types
ieee802-dot1q-types
ieee802-dot1q-bridge
ieee802-dot1q-tpmr

48.4.3 Customer VLAN Bridge model

A system implementing the Customer VLAN Bridge model (48.3.2.2) implements the YANG modules listed in Table 48-4.

Table 48-4—YANG module dependencies for the Customer VLAN Bridge model

YANG module
ieee802-types
ieee802-dot1q-types
ieee802-dot1q-bridge

48.4.4 Provider Bridge model

A system implementing the Provider Bridge model (48.3.2.3) implements the YANG modules listed in Table 48-5.

Table 48-5—YANG module dependencies for the Provider Bridge model

YANG module
ieee802-types
ieee802-dot1q-types
ieee802-dot1q-bridge
ieee802-dot1q-pb

48.4.5 CFM model

A system implementing the CFM models (48.3.3) implements the YANG modules listed in Table 48-6.

Table 48-6—YANG module dependencies for the CFM model

YANG module
ieee802-types
ieee802-dot1q-types
ieee802-dot1q-cfm-types
ieee802-dot1q-bridge
ieee802-dot1q-cfm
ieee802-dot1q-cfm-bridge
ieee802-dot1q-cfm-alarm

48.5 YANG data scheme tree definitions

A simplified graphical representation of the data model is used in this document. The meaning of the symbols in these diagrams is as follows:

- Brackets "[" and "]" enclose list keys.
- Abbreviations before data node names: "rw" means configuration (read-write), and "ro" means state data (read-only).
- Symbols after data node names: "?" means an optional node, "!" means a presence container, and "*" denotes a list and leaf-list.
- Parentheses enclose choice and case nodes, and case nodes are also marked with a colon (":").
- Ellipsis ("...") stands for contents of subtrees that are not shown.

48.5.1 Data scheme definition for the ieee802-types YANG module

This YANG module does not have a YANG data scheme tree.

48.5.2 Data scheme definition for the ieee802-dot1q-types YANG module

This YANG module does not have a YANG data scheme tree.

48.5.3 Data scheme definition for the ieee802-dot1q-bridge YANG module

```

module: ieee802-dot1q-bridge
  +--rw bridges
    +--rw bridge* [name]
      +--rw name          dot1qtypes:name-type
      +--rw address       ieee:mac-address
      +--rw bridge-type    identityref
      +--ro ports?        uint16
      +--ro up-time?       yang:zero-based-counter32
      +--ro components?   uint32

```

```

+--rw component* [name]
  +--rw name                string
  +--rw id?                 uint32
  +--rw type                identityref
  +--rw address?            ieee:mac-address
  +--rw traffic-class-enabled? boolean
  +--ro ports?              uint16
  +--ro bridge-port*        if:interface-ref
  +--ro capabilities
  | +--ro extended-filtering? boolean
  | +--ro traffic-classes?    boolean
  | +--ro static-entry-individual-port? boolean
  | +--ro ivl-capable?        boolean
  | +--ro svl-capable?        boolean
  | +--ro hybrid-capable?     boolean
  | +--ro configurable-pvid-tagging? boolean
  | +--ro local-vlan-capable? boolean
  +--rw filtering-database
  | +--rw aging-time?        uint32
  | +--ro size?              yang:gauge32
  | +--ro static-entries?    yang:gauge32
  | +--ro dynamic-entries?   yang:gauge32
  | +--ro static-vlan-registration-entries? yang:gauge32
  | +--ro dynamic-vlan-registration-entries? yang:gauge32
  | +--ro mac-address-registration-entries? yang:gauge32 {extended-
filtering-services}?
  | +--rw filtering-entry* [database-id vids address]
  | | +--rw database-id      uint32
  | | +--rw address          ieee:mac-address
  | | +--rw vids             dot1qtys:vid-range-type
  | | +--rw entry-type?      enumeration
  | | +--rw port-map* [port-ref]
  | | | +--rw port-ref              port-number-type
  | | | +--rw (map-type)?
  | | | | +--:(static-filtering-entries)
  | | | | | +--rw static-filtering-entries
  | | | | | | +--rw control-element? enumeration
  | | | | | | +--rw connection-identifier? port-number-type
  | | | | +--:(static-vlan-registration-entries)
  | | | | | +--rw static-vlan-registration-entries
  | | | | | | +--rw registrar-admin-control? enumeration
  | | | | | | +--rw vlan-transmitted? enumeration
  | | | | +--:(mac-address-registration-entries)
  | | | | | +--rw mac-address-registration-entries
  | | | | | | +--rw control-element? enumeration
  | | | | +--:(dynamic-vlan-registration-entries)
  | | | | | +--rw dynamic-vlan-registration-entries
  | | | | | | +--rw control-element? enumeration
  | | | | +--:(dynamic-reservation-entries)
  | | | | | +--rw dynamic-reservation-entries
  | | | | | | +--rw control-element? enumeration
  | | | | +--:(dynamic-filtering-entries)
  | | | | | +--rw dynamic-filtering-entries
  | | | | | | +--rw control-element? enumeration
  | | +--ro status?          enumeration
  +--rw vlan-registration-entry* [database-id vids]
  | +--rw database-id      uint32
  | +--rw vids             dot1qtys:vid-range-type
  | +--rw entry-type?      enumeration
  | +--rw port-map* [port-ref]
  | | +--rw port-ref              port-number-type
  | | +--rw (map-type)?
  | | | +--:(static-filtering-entries)
  | | | | +--rw static-filtering-entries
  | | | | | +--rw control-element? enumeration
  | | | | | +--rw connection-identifier? port-number-type
  | | | | +--:(static-vlan-registration-entries)
  | | | | | +--rw static-vlan-registration-entries
  | | | | | | +--rw registrar-admin-control? enumeration
  | | | | | | +--rw vlan-transmitted? enumeration
  | | | | +--:(mac-address-registration-entries)
  | | | | | +--rw mac-address-registration-entries

```

```

|         |         +---rw control-element?  enumeration
|         +---:(dynamic-vlan-registration-entries)
|         |         +---rw dynamic-vlan-registration-entries
|         |         |         +---rw control-element?  enumeration
|         +---:(dynamic-reservation-entries)
|         |         +---rw dynamic-reservation-entries
|         |         |         +---rw control-element?  enumeration
|         +---:(dynamic-filtering-entries)
|         |         +---rw dynamic-filtering-entries
|         |         |         +---rw control-element?  enumeration
+---rw permanent-database
|   +---ro size?                                yang:gauge32
|   +---ro static-entries?                      yang:gauge32
|   +---ro static-vlan-registration-entries?    yang:gauge32
|   +---rw filtering-entry* [database-id vids address]
|     +---rw database-id      uint32
|     +---rw address          ieee:mac-address
|     +---rw vids             dot1qtypes:vid-range-type
|     +---ro status?          enumeration
|     +---rw port-map* [port-ref]
|       +---rw port-ref                                port-number-type
|       +---rw (map-type)?
|         +---:(static-filtering-entries)
|         |         +---rw static-filtering-entries
|         |         |         +---rw control-element?  enumeration
|         |         |         +---rw connection-identifier? port-number-type
|         +---:(static-vlan-registration-entries)
|         |         +---rw static-vlan-registration-entries
|         |         |         +---rw registrar-admin-control? enumeration
|         |         |         +---rw vlan-transmitted?    enumeration
|         +---:(mac-address-registration-entries)
|         |         +---rw mac-address-registration-entries
|         |         |         +---rw control-element?  enumeration
|         +---:(dynamic-vlan-registration-entries)
|         |         +---rw dynamic-vlan-registration-entries
|         |         |         +---rw control-element?  enumeration
|         +---:(dynamic-reservation-entries)
|         |         +---rw dynamic-reservation-entries
|         |         |         +---rw control-element?  enumeration
|         +---:(dynamic-filtering-entries)
|         |         +---rw dynamic-filtering-entries
|         |         |         +---rw control-element?  enumeration
+---rw bridge-vlan
|   +---ro version?                            uint16
|   +---ro max-vids?                          uint16
|   +---ro override-default-pvid?             boolean
|   +---ro protocol-template?                 dot1qtypes:protocol-frame-format-
type {port-and-protocol-based-vlan}?
|     +---ro max-msti?                        uint16
|     +---rw vlan* [vid]
|       |         +---rw vid                  dot1qtypes:vlan-index-type
|       |         +---rw name?                dot1qtypes:name-type
|       |         +---ro untagged-ports*      if:interface-ref
|       |         +---ro egress-ports*        if:interface-ref
|       +---rw protocol-group-database* [db-index] {port-and-protocol-
based-vlan}?
|         |         +---rw db-index            uint16
|         |         +---rw frame-format-type?  dot1qtypes:protocol-frame-format-
type
|         |         +---rw (frame-format)?
|         |         |         +---:(ethernet-rfc1042-snap8021H)
|         |         |         |         +---rw ethertype?  dot1qtypes:ethertype-type
|         |         |         |         +---:(snap-other)
|         |         |         |         |         +---rw protocol-id?  string
|         |         |         |         +---:(llc-other)
|         |         |         |         |         +---rw dsap-ssap-pairs
|         |         |         |         |         |         +---rw llc-address?  string
|         |         |         +---rw group-id?      uint32
|         +---rw vid-to-fid-allocation* [vids]
|         |         +---rw vids                    dot1qtypes:vid-range-type
|         |         +---ro fid?                    uint32
|         |         +---ro allocation-type?        enumeration

```

```

|   +--rw fid-to-vid-allocation* [fid]
|   |   +--rw fid                uint32
|   |   +--ro allocation-type?   enumeration
|   |   +--ro vid*               dot1qtypes:vlan-index-type
|   +--rw vid-to-fid* [vid]
|       +--rw vid                dot1qtypes:vlan-index-type
|       +--rw fid?               uint32
+--rw bridge-mst
    +--rw mstid*                  dot1qtypes:mstid-type
    +--rw fid-to-mstid* [fid]
    |   +--rw fid                uint32
    |   +--rw mstid?             dot1qtypes:mstid-type
    +--rw fid-to-mstid-allocation* [fids]
    |   +--rw fids               dot1qtypes:vid-range-type
    |   +--rw mstid?             dot1qtypes:mstid-type
augment /if:interfaces/if:interface:
+--rw bridge-port
+--rw component-name?             string
+--rw port-type?                  identityref
+--rw pvid?                       dot1qtypes:vlan-index-type
+--rw default-priority?           dot1qtypes:priority-type
+--rw priority-regeneration
|   +--rw priority0?              priority-type
|   +--rw priority1?              priority-type
|   +--rw priority2?              priority-type
|   +--rw priority3?              priority-type
|   +--rw priority4?              priority-type
|   +--rw priority5?              priority-type
|   +--rw priority6?              priority-type
|   +--rw priority7?              priority-type
+--rw pcsp-selection?              dot1qtypes:pcsp-selection-type
+--rw pcsp-decoding-table
|   +--rw pcsp-decoding-map* [pcsp]
|   |   +--rw pcsp                pcsp-selection-type
|   |   +--rw priority-map* [priority-code-point]
|   |   |   +--rw priority-code-point    priority-type
|   |   |   +--rw priority?              priority-type
|   |   |   +--rw drop-eligible?         boolean
|   +--rw pcsp-encoding-table
|   |   +--rw pcsp-encoding-map* [pcsp]
|   |   |   +--rw pcsp                pcsp-selection-type
|   |   |   +--rw priority-map* [priority deil]
|   |   |   |   +--rw priority          priority-type
|   |   |   |   +--rw deil              boolean
|   |   |   |   +--rw priority-code-point? priority-type
|   +--rw use-deil?                boolean
|   +--rw drop-encoding?            boolean
|   +--rw service-access-priority-selection? boolean
+--rw service-access-priority
|   +--rw priority0?              priority-type
|   +--rw priority1?              priority-type
|   +--rw priority2?              priority-type
|   +--rw priority3?              priority-type
|   +--rw priority4?              priority-type
|   +--rw priority5?              priority-type
|   +--rw priority6?              priority-type
|   +--rw priority7?              priority-type
+--rw traffic-class
|   +--rw traffic-class-map* [priority]
|   |   +--rw priority              priority-type
|   |   +--rw available-traffic-class* [num-traffic-class]
|   |   |   +--rw num-traffic-class    uint8
|   |   |   +--rw traffic-class?       traffic-class-type
+--rw acceptable-frame?            enumeration
+--rw enable-ingress-filtering?     boolean
+--rw enable-restricted-vlan-registration? boolean
+--rw enable-vid-translation-table? boolean
+--rw enable-egress-vid-translation-table? boolean
+--rw protocol-group-vid-set* [group-id] {port-and-protocol-based-vlan}?
|   +--rw group-id                uint32
|   +--rw vid*                    dot1qtypes:vlanid
+--rw admin-point-to-point?         enumeration

```

```

    +--ro protocol-based-vlan-classification?    boolean {port-and-protocol-
based-vlan}?
    +--ro max-vid-set-entries?                   uint16 {port-and-protocol-
based-vlan}?
    +--ro port-number?                          dot1qtypes:port-number-type
    +--ro address?                              ieee:mac-address
    +--ro capabilities?                         bits
    +--ro type-capabilities?                    bits
    +--ro external?                            boolean
    +--ro oper-point-to-point?                  boolean
    +--ro statistics
    | +--ro delay-exceeded-discards?            yang:counter64
    | +--ro mtu-exceeded-discards?              yang:counter64
    | +--ro frame-rx?                          yang:counter64
    | +--ro octets-rx?                         yang:counter64
    | +--ro frame-tx?                          yang:counter64
    | +--ro octets-tx?                         yang:counter64
    | +--ro discard-inbound?                   yang:counter64
    | +--ro forward-outbound?                  yang:counter64
    | +--ro discard-lack-of-buffers?            yang:counter64
    | +--ro discard-transit-delay-exceeded?    yang:counter64
    | +--ro discard-on-error?                  yang:counter64
    | +--ro discard-on-ingress-filtering?      yang:counter64 {ingress-
filtering}?
    +--rw vid-translations* [local-vid]
    | +--rw local-vid      dot1qtypes:vlanid
    | +--rw relay-vid?     dot1qtypes:vlanid
    +--rw egress-vid-translations* [relay-vid]
    | +--rw relay-vid      dot1qtypes:vlanid
    | +--rw local-vid?     dot1qtypes:vlanid

```

48.5.4 Data scheme definition for the ieee802-dot1q-tpmr YANG module

```

module: ieee802-dot1q-tpmr
  augment /if:interfaces/if:interface/dot1q:bridge-port:
    +--rw managed-address?          boolean
    +--rw mac-status-propagation
    | +--rw link-notify?            boolean
    | +--rw link-notify-wait?       yang:timeticks
    | +--rw link-notify-retry?      yang:timeticks
    | +--rw mac-notify?             boolean
    | +--rw mac-notify-time?        yang:timeticks
    | +--rw mac-recover-time?       yang:timeticks
  augment /if:interfaces/if:interface/dot1q:bridge-port/dot1q:statistics:
    +--ro acks-tx?                  yang:counter64
    +--ro add-notifications-tx?     yang:counter64
    +--ro add-confirmations-tx?     yang:counter64
    +--ro loss-notification-tx?     yang:counter64
    +--ro loss-confirmation-tx?     yang:counter64
    +--ro acks-rx?                  yang:counter64
    +--ro add-notifications-rx?     yang:counter64
    +--ro add-confirmations-rx?     yang:counter64
    +--ro loss-notification-rx?     yang:counter64
    +--ro loss-confirmation-rx?     yang:counter64
    +--ro add-events?               yang:counter64
    +--ro loss-events?              yang:counter64
    +--ro mac-status-notifications? yang:counter64

```

48.5.5 Data scheme definition for the ieee802-dot1q-pb YANG module

```

module: ieee802-dot1q-pb
  augment /if:interfaces/if:interface/dot1q:bridge-port:
    +--rw svid?                    dot1qtypes:vlanid
    +--rw cvid-registration* [cvid]
    | +--rw cvid      dot1qtypes:vlanid
    | +--rw svid?     dot1qtypes:vlanid
    | +--rw untagged-pep? boolean
    | +--rw untagged-cep? boolean
    +--rw service-priority-regeneration* [svid]

```

```
| +--rw svid dot1qtypes:vlanid
| +--rw priority-regeneration
|   +--rw priority0? priority-type
|   +--rw priority1? priority-type
|   +--rw priority2? priority-type
|   +--rw priority3? priority-type
|   +--rw priority4? priority-type
|   +--rw priority5? priority-type
|   +--rw priority6? priority-type
|   +--rw priority7? priority-type
+--rw rcap-internal-interface* [external-svid]
  +--rw external-svid dot1qtypes:vlanid
  +--rw internal-port-number? dot1qtypes:port-number-type
  +--rw internal-svid? dot1qtypes:vlanid
  +--rw internal-interface-type? enumeration
```

48.5.6 Data scheme definition for the ieee802-dot1q-cfm-types YANG module

This YANG module does not have a YANG data scheme tree.

48.5.7 Data scheme definition for the ieee802-dot1q-cfm YANG module

```
module: ieee802-dot1q-cfm
  +--rw cfm
    +--rw maintenance-domain* [md-id]
      +--rw md-id cfm-types:name-key-type
      +--rw (md-name)?
      | +--:(none)
      | | +--rw none? empty
      | +--:(dns-like-name)
      | | +--rw dns-like-name? string
      | +--:(mac-address-and-uint)
      | | +--rw mac-address-and-uint-type
      | |   +--rw address ieee:mac-address
      | |   +--rw int uint16
      | +--:(char-string)
      | | +--rw char-string? string
      +--rw md-level? cfm-types:md-level-type
      +--rw mhf-creation? cfm-types:mhf-creation-type
      +--rw id-permission? cfm-types:sender-id-permission-
type
    +--rw fault-alarm-transmission? cfm-types:fault-alarm-type
    +--rw maintenance-association* [ma-id]
      +--rw ma-id cfm-types:name-key-type
      +--rw (ma-name)
      | +--:(primary-vid)
      | | +--rw primary-vid? dot1q-types:vlanid
      | +--:(char-string)
      | | +--rw char-string? string
      | +--:(unsigned-int16)
      | | +--rw unsigned-int16? uint16
      | +--:(rfc2865-vpn-id)
      | | +--rw vpn-id
      | |   +--rw vpn-oui uint32
      | |   +--rw vpn-index uint32
      +--rw ccm-interval? cfm-types:ccm-interval-type
      +--rw fault-alarm-transmission? cfm-types:fault-alarm-type
      +--rw mhf-creation? cfm-types:mhf-creation-type
      +--rw id-permission? cfm-types:sender-id-permission-
type
    +--rw maintenance-association-mep* [mep-id]
      +--rw mep-id cfm-types:mep-id-type
  +--rw maintenance-group* [maintenance-group-id]
    +--rw maintenance-group-id cfm-types:name-key-type
    +--rw md-id -> /cfm/maintenance-domain/md-id
    +--rw ma-id -> /cfm/maintenance-domain[md-id = current()]/
../md-id]/maintenance-association/ma-id
    +--rw mep* [mep-id]
```

```

    +---rw mep-id                                -> /cfm/maintenance-domain[md-id =
current()/../../md-id]/maintenance-association[ma-id = current()/../../ma-id]/
maintenance-association-mep/mep-id
    +---rw direction                            cfm-types:mp-direction-type
    +---rw enabled?                             boolean
    +---rw ccm-ltm-priority?                     dot1q-types:priority-type
    +---ro mac-address                          ieee:mac-address
    +---rw inactive-remote-mep* [inactive-rmep-id]
    | +---rw inactive-rmep-id                  -> /cfm/maintenance-domain[md-id =
current()/../../md-id]/maintenance-association[ma-id = current()/../../ma-
id]/maintenance-association-mep/mep-id
    +---ro mep-db* [rmep-id]
    | +---ro rmep-id                            cfm-types:mep-id-type
    | +---ro rmep-state                        cfm-types:remote-mep-state-type
    | +---ro rmep-failed-ok-time               yang:timeticks
    | +---ro mac-address                       ieee:mac-address
    | +---ro rdi                               boolean
    | +---ro port-status-tlv?                  cfm-types:port-status-tlv-value-
type
    | +---ro interface-status-tlv?             cfm-types:interface-status-tlv-
value-type
    | +---ro chassis-id-subtype?               ieee:chassis-id-subtype-type
    | +---ro chassis-id?                       ieee:chassis-id-type
    | +---ro transport-service-domain
    | | +---ro domain?                         yang:object-identifier-128
    | | +---ro (management-address)
    | | | +---:(ip)
    | | | | +---ro ip-address                 inet:ip-address
    | | | | +---ro ip-port                    inet:port-number
    | | | +---:(local)
    | | | | +---ro local-address              string
    | | | +---:(dns)
    | | | | +---ro dns-address                string
    | | | +---:(other)
    | | | +---ro unknown-address?             binary
    | +---ro rmep-is-active?                   boolean
    +---rw continuity-check
    | +---rw ccm-enabled?                       boolean
    | +---ro fng-state?                         cfm-types:fng-state-type
    | +---rw fault-alarm-transmission?          cfm-types:fault-alarm-type
    | +---rw lowest-priority-defect?            cfm-types:lowest-alarm-priority-
type
    | +---rw fng-alarm-time?                    uint16
    | +---rw fng-reset-time?                    uint16
    | +---ro highest-priority-defect            cfm-types:highest-defect-priority-
type
    | +---ro defects                          cfm-types:mep-defects-type
    | +---ro error-ccm-last-failure?            binary
    | +---ro xcon-ccm-last-failure?            binary
    +---ro stats
    | +---ro mep-ccm-sequence-errors            yang:counter64
    | +---ro mep-ccms-sent                     yang:counter64
    | +---ro mep-lbr-in                        yang:counter64
    | +---ro mep-lbr-in-out-of-order            yang:counter64
    | +---ro mep-lbr-bad-msdu                  yang:counter64
    | +---ro mep-unexpected-ltr-in             yang:counter64
    | +---ro mep-lbr-out                       yang:counter64
    +---x transmit-loopback
    | +---w input
    | | +---w (lbr-destination)
    | | | +---:(dest-ucast-mac-address)
    | | | | +---w lbr-dest-ucast-mac-address?  cfm-
types:unicast-mac-address-type
    | | | | +---:(dest-mcast-class1-mac-address)
    | | | | +---w lbr-dest-mcast-class1-mac-address?  cfm-
types:multicast-class1-mac-address-type
    | | | | +---:(dest-mep-id)
    | | | | +---w lbr-dest-mep-id?              cfm-types:mep-
id-type
    | | +---w lbr-messages?                    uint16
    | | +---w lbr-priority?                    dot1q-
types:priority-type

```

```

| | +---w lbm-drop-eligible? boolean
| | +---w lbm-data-tlv? cfm-types:lbm-
data-tlv-type
| +--ro output
| | +--ro lbm-request-id cfm-types:seq-number-type
+---x transmit-linktrace
| +---w input
| | +---w (ltr-target)
| | | +---:(target-ucast-mac-address)
| | | +---w ltm-target-mac-address? cfm-types:unicast-mac-
address-type
| | | +---:(target-mep-id)
| | | +---w ltm-target-mep-id? cfm-types:mep-id-type
| | +---w ltm-ttl? uint8
| | +---w ltm-flags? cfm-types:mep-tx-ltm-flags-
type
| +--ro output
| | +--ro ltm-transaction-id cfm-types:seq-number-type
| | +--ro ltm-egress-identifier
| | | +--ro int uint16
| | | +--ro address ieee:mac-address
+--ro linktrace-reply* [ltr-transaction-id]
+--ro ltr-transaction-id cfm-types:seq-number-type
+--ro linktrace-input
| +--ro (ltr-target)
| | +---:(target-ucast-mac-address)
| | | +--ro ltm-target-mac-address? cfm-types:unicast-mac-
address-type
| | | +---:(target-mep-id)
| | | +--ro ltm-target-mep-id? cfm-types:mep-id-type
| | +--ro ltm-ttl? uint8
| | +--ro ltm-flags? cfm-types:mep-tx-ltm-flags-
type
+--ro responses* [ltr-receive-order]
+--ro ltr-receive-order uint32
+--ro ltr-ttl uint8
+--ro ltr-forwarded boolean
+--ro ltr-terminal-mep boolean
+--ro ltr-last-egress-identifier
| +--ro int uint16
| +--ro address ieee:mac-address
+--ro ltr-next-egress-identifier
| +--ro int uint16
| +--ro address ieee:mac-address
+--ro ltr-relay cfm-types:relay-action-
field-value-type
+--ro ltr-chassis-id-subtype? ieee:chassis-id-subtype-
type
+--ro ltr-chassis-id ieee:chassis-id-type
+--ro ltr-transport-service-domain
| +--ro domain? yang:object-identifier-128
| +--ro (management-address)
| | +---:(ip)
| | | +--ro ip-address inet:ip-address
| | | +--ro ip-port inet:port-number
| | +---:(local)
| | | +--ro local-address string
| | +---:(dns)
| | | +--ro dns-address string
| | +---:(other)
| | +--ro unknown-address? binary
+--ro ltr-ingress? cfm-types:ingress-action-
field-value-type
+--ro ltr-ingress-mac ieee:mac-address
+--ro ltr-ingress-port-id-subtype? ieee:port-id-subtype-type
+--ro ltr-ingress-port-id ieee:port-id-type
+--ro ltr-egress? cfm-types:egress-action-
field-value-type
+--ro ltr-egress-mac ieee:mac-address
+--ro ltr-egress-port-id-subtype? ieee:port-id-subtype-type
+--ro ltr-egress-port-id ieee:port-id-type
+--ro ltr-organization-specific-tlv? binary

```

48.5.8 Data scheme definition for the ieee802-dot1q-cfm-bridge YANG module

```

module: ieee802-dot1q-cfm-bridge
  augment /dot1q-cfm:cfm:
    +--ro cfm-stack* [port service-selector service-id md-level direction]
    |   +--ro port                               port-ref
    |   +--ro md-level                           cfm-types:md-level-type
    |   +--ro direction                         cfm-types:mp-direction-type
    |   +--ro service-selector                   cfm-types:service-selector-type
    |   +--ro service-id                         cfm-types:service-selector-value-type
    |   +--ro maintenance-group-id              -> /dot1q-cfm:cfm/maintenance-group/
  maintenance-group-id
  |   +--ro mep-id                              -> /dot1q-cfm:cfm/maintenance-group[dot1q-
cfm:maintenance-group-id = current()/../maintenance-group-id]/mep/mep-id
  |   +--ro md-id?                             -> /dot1q-cfm:cfm/maintenance-domain/md-id
  |   +--ro ma-id?                             -> /dot1q-cfm:cfm/maintenance-domain[dot1q-
cfm:md-id = current()/../md-id]/maintenance-association/ma-id
  |   +--ro mac-address                         ieee:mac-address
  |   +--ro maintenance-point                   cfm-types:mp-type
  +--rw default-md-level* [bridge-id component-id service-selector primary-
service-id]
  |   +--rw bridge-id                           bridge-ref
  |   +--rw component-id                       -> /dot1q:bridges/bridge[dot1q:name =
current()/../bridge-id]/component/name
  |   +--rw service-selector                     cfm-types:service-selector-type
  |   +--rw primary-service-id                   cfm-types:service-selector-value-type
  |   +--rw associated-service-ids
  |   |   +--rw (service-id)?
  |   |   |   +--:(vids)
  |   |   |   |   +--rw vid* [vlan-id]
  |   |   |   |   |   +--rw vlan-id          dot1q-types:vlanid
  |   |   |   |   +--:(isid)
  |   |   |   |   |   +--rw isid?             uint32
  |   |   |   |   +--:(tesid)
  |   |   |   |   |   +--rw tesid?            uint32
  |   |   |   |   +--:(segid)
  |   |   |   |   |   +--rw segid?            uint32
  |   |   |   |   +--:(path-tesid)
  |   |   |   |   |   +--rw path-tesid?       uint32
  |   |   |   |   +--:(group-isid)
  |   |   |   |   |   +--rw group-isid?       uint32
  |   |   +--ro md-status                       boolean
  |   +--rw md-level                           cfm-types:md-level-type
  |   +--rw mhf-creation?                       cfm-types:mhf-creation-type
  |   +--rw id-permission?                       cfm-types:sender-id-permission-type
  +--ro config-error* [port service-selector service-id]
  |   +--ro port                               port-ref
  |   +--ro service-selector                   cfm-types:service-selector-type
  |   +--ro service-id                         cfm-types:service-selector-value-type
  |   +--ro error-type                         cfm-types:config-error-type
  augment /dot1q-cfm:cfm/dot1q-cfm:maintenance-group:
    +--rw bridge-id?                           bridge-ref
    +--rw component-name                       -> /dot1q:bridges/bridge[dot1q:name = current()/../
cfm-bridge:bridge-id]/dot1q:component/name
    +--rw service-id
    |   +--rw (service-id)?
    |   |   +--:(vids)
    |   |   |   +--rw vid* [vlan-id]
    |   |   |   |   +--rw vlan-id          dot1q-types:vlanid
    |   |   |   |   +--:(isid)
    |   |   |   |   |   +--rw isid?             uint32
    |   |   |   |   +--:(tesid)
    |   |   |   |   |   +--rw tesid?            uint32
    |   |   |   |   +--:(segid)
    |   |   |   |   |   +--rw segid?            uint32
    |   |   |   |   +--:(path-tesid)
    |   |   |   |   |   +--rw path-tesid?       uint32
    |   |   |   |   +--:(group-isid)
    |   |   |   |   |   +--rw group-isid?       uint32
    |   +--rw group-isid?                       uint32
  augment /dot1q-cfm:cfm/dot1q-cfm:maintenance-group/dot1q-cfm:mep:
    +--rw port                               port-ref
    +--rw primary-vid?                       -> ../../service-id/vid/vlan-id

```

48.5.9 Data scheme definition for the ieee802-dot1q-cfm-alarm YANG module

```
module: ieee802-dot1q-cfm-alarm
  augment /dot1q-cfm:cfm/dot1q-cfm:maintenance-group/dot1q-cfm:mep:
    +---n mep-fault-alarm
      +--ro mep-priority-defect    -> ../../dot1q-cfm:continuity-check/highest-
priority-defect
```

48.6 YANG modules^{2,3}

48.6.1 Definitions for the ieee802-types YANG module

```
module ieee802-types {
  namespace urn:ieee:std:802.1Q:yang:ieee802-types;
  prefix ieee;
  organization
    "IEEE 802.1 Working Group";
  contact
    "WG-URL: http://ieee802.org/1/
    WG-EMail: stds-802-1-1@ieee.org

    Contact: IEEE 802.1 Working Group Chair
    Postal: C/O IEEE 802.1 Working Group
            IEEE Standards Association
            445 Hoes Lane
            Piscataway, NJ 08854
            USA

    E-mail: stds-802-1-chairs@ieee.org";
  description
    "This module contains a collection of generally useful derived
    data types for IEEE YANG models.";
  revision 2020-06-04 {
    description
      "Published as part of IEEE Std 802.1Qcx-2020.
      Second version.";
    reference
      "IEEE Std 802.1Qcx-2020, Bridges and Bridged Networks -
      YANG Data Model for Connectivity Fault Management.";
  }
  revision 2018-03-07 {
    description
      "Published as part of IEEE Std 802.1Q-2018.
      Initial version.";
    reference
      "IEEE Std 802.1Q-2018, Bridges and Bridged Networks.";
  }

  typedef mac-address {
    type string {
      pattern "[0-9a-fA-F]{2}(-[0-9a-fA-F]{2}){5}";
    }
    description
      "The mac-address type represents a MAC address in the canonical
      format and hexadecimal format specified by IEEE Std 802. The
      hexadecimal representation uses uppercase characters.";
    reference
      "3.1 of IEEE Std 802-2014
      8.1 of IEEE Std 802-2014";
  }

  typedef chassis-id-subtype-type {
```

² Copyright release for YANG: Users of this standard may freely reproduce the YANG modules contained in this clause so that they can be used for their intended purpose.

³ An ASCII version of each YANG module is attached to the PDF of this standard and can also be obtained from the IEEE 802.1 Website at <https://1.ieee802.org/yang-modules/>.

```
type enumeration {
  enum chassis-component {
    value 1;
    description
      "Represents a chassis identifier based on the value of
      entPhysicalAlias object (defined in IETF RFC 2737) for a
      chassis component (i.e., an entPhysicalClass value of
      chassis(3))";
  }
  enum interface-alias {
    value 2;
    description
      "Represents a chassis identifier based on the value of
      ifAlias object (defined in IETF RFC 2863) for an interface
      on the containing chassis.";
  }
  enum port-component {
    value 3;
    description
      "Represents a chassis identifier based on the value of
      entPhysicalAlias object (defined in IETF RFC 2737) for a
      port or backplane component (i.e., entPhysicalClass value of
      port(10) or backplane(4)), within the containing chassis.";
  }
  enum mac-address {
    value 4;
    description
      "Represents a chassis identifier based on the value of a
      unicast source address (encoded in network byte order and
      IEEE 802.3 canonical bit order), of a port on the containing
      chassis as defined in IEEE Std 802-2001.";
  }
  enum network-address {
    value 5;
    description
      "Represents a chassis identifier based on a network address,
      associated with a particular chassis. The encoded address is
      actually composed of two fields. The first field is a
      single octet, representing the IANA AddressFamilyNumbers
      value for the specific address type, and the second field is
      the network address value.";
  }
  enum interface-name {
    value 6;
    description
      "Represents a chassis identifier based on the value of
      ifName object (defined in IETF RFC 2863) for an interface
      on the containing chassis.";
  }
  enum local {
    value 7;
    description
      "Represents a chassis identifier based on a locally defined
      value.";
  }
}
description
  "The source of a chassis identifier.";
reference
  "LLDP MIB 20050506";
}

typedef chassis-id-type {
  type string {
    length "1..255";
  }
  description
    "The format of a chassis identifier string. Objects of this type
    are always used with an associated lldp-chassis-is-subtype
    object, which identifies the format of the particular
    lldp-chassis-id object instance."
```

If the associated lldp-chassis-id-subtype object has a value of chassis-component, then the octet string identifies a particular instance of the entPhysicalAlias object (defined in IETF RFC 2737) for a chassis component (i.e., an entPhysicalClass value of chassis(3)).

If the associated lldp-chassis-id-subtype object has a value of interface-alias, then the octet string identifies a particular instance of the ifAlias object (defined in IETF RFC 2863) for an interface on the containing chassis. If the particular ifAlias object does not contain any values, another chassis identifier type should be used.

If the associated lldp-chassis-id-subtype object has a value of port-component, then the octet string identifies a particular instance of the entPhysicalAlias object (defined in IETF RFC 2737) for a port or backplane component within the containing chassis.

If the associated lldp-chassis-id-subtype object has a value of mac-address, then this string identifies a particular unicast source address (encoded in network byte order and IEEE 802.3 canonical bit order), of a port on the containing chassis as defined in IEEE Std 802-2001.

If the associated lldp-chassis-id-subtype object has a value of network-address, then this string identifies a particular network address, encoded in network byte order, associated with one or more ports on the containing chassis. The first octet contains the IANA Address Family Numbers enumeration value for the specific address type, and octets 2 through N contain the network address value in network byte order.

If the associated lldp-chassis-id-subtype object has a value of interface-name, then the octet string identifies a particular instance of the ifName object (defined in IETF RFC 2863) for an interface on the containing chassis. If the particular ifName object does not contain any values, another chassis identifier type should be used.

If the associated lldp-chassis-id-subtype object has a value of local, then this string identifies a locally assigned Chassis ID.”;

```
reference
  "LLDP MIB 20050506";
}

typedef port-id-subtype-type {
  type enumeration {
    enum interface-alias {
      value 1;
      description
        "Represents a port identifier based on the ifAlias
        MIB object, defined in IETF RFC 2863.";
    }
    enum port-component {
      value 2;
      description
        "Represents a port identifier based on the value of
        entPhysicalAlias (defined in IETF RFC 2737) for a port
        component (i.e., entPhysicalClass value of port(10)),
        within the containing chassis.";
    }
    enum mac-address {
      value 3;
      description
        "Represents a port identifier based on a unicast source
        address (encoded in network byte order and IEEE 802.3
        canonical bit order), which has been detected by the agent
        and associated with a particular port (IEEE Std 802-2001).";
    }
    enum network-address {
```

```
    value 4;
    description
      "Represents a port identifier based on a network address,
       detected by the agent and associated with a particular
       port.";
  }
  enum interface-name {
    value 5;
    description
      "Represents a port identifier based on the ifName MIB object,
       defined in IETF RFC 2863.";
  }
  enum agent-circuit-id {
    value 6;
    description
      "Represents a port identifier based on the agent-local
       identifier of the circuit (defined in RFC 3046), detected by
       the agent and associated with a particular port.";
  }
  enum local {
    value 7;
    description
      "Represents a port identifier based on a value locally
       assigned.";
  }
}
description
  "The source of a particular type of port identifier used
   in the LLDP YANG module.";
}
```

```
typedef port-id-type {
  type string {
    length "8";
  }
}
description
  "The format of a port identifier string. Objects of this type
   are always used with an associated lldp-port-id-subtype object,
   which identifies the format of the particular lldp-port-id
   object instance.
```

If the associated lldp-port-id-subtype object has a value of interface-alias, then the octet string identifies a particular instance of the ifAlias object (defined in IETF RFC 2863). If the particular ifAlias object does not contain any values, another port identifier type should be used.

If the associated lldp-port-id-subtype object has a value of port-component, then the octet string identifies a particular instance of the entPhysicalAlias object (defined in IETF RFC 2737) for a port or backplane component.

If the associated lldp-port-id-subtype object has a value of mac-address, then this string identifies a particular unicast source address (encoded in network byte order and IEEE 802.3 canonical bit order) associated with the port (IEEE Std 802-2001).

If the associated lldp-port-id-subtype object has a value of network-address, then this string identifies a network address associated with the port. The first octet contains the IANA AddressFamilyNumbers enumeration value for the specific address type, and octets 2 through N contain the networkAddress address value in network byte order.

If the associated lldp-port-id-subtype object has a value of interface-name, then the octet string identifies a particular instance of the ifName object (defined in IETF RFC 2863). If the particular ifName object does not contain any values, another port identifier type should be used.

If the associated lldp-port-id-subtype object has a value of