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Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering, and Virtual LAN Extensions

Status of This Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in TCP/IP-based internets. In particular, it defines two MIB modules for managing the capabilities of MAC bridges defined by the IEEE 802.1D-1998 (TM) MAC Bridges and the IEEE 802.1Q-2003 (TM) Virtual LAN (VLAN) standards for bridging between Local Area Network (LAN) segments. One MIB module defines objects for managing the 'Traffic Classes' and 'Enhanced Multicast Filtering' components of IEEE 802.1D-1998 and P802.1t-2001 (TM). The other MIB module defines objects for managing VLANs, as specified in IEEE 802.1Q-2003, P802.1u (TM), and P802.1v (TM).

Provisions are made for support of transparent bridging. Provisions are also made so that these objects apply to bridges connected by subnetworks other than LAN segments.

This memo supplements RFC 4188 and obsoletes RFC 2674.

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1. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to section 7 of RFC 3410 [RFC3410].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIV2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

2. Overview

A common device present in many networks is the Bridge. This device is used to connect Local Area Network segments below the network layer. These devices are often known as 'layer 2 switches'.

The transparent method of bridging is defined by IEEE 802.1D-1998 [802.1D]. Managed objects for transparent bridging are defined in the BRIDGE-MIB [BRIDGE-MIB].

The original IEEE 802.1D is augmented by IEEE 802.1Q-2003 [802.1Q] to provide support for 'virtual bridged LANs' where a single bridged physical LAN network may be used to support multiple logical bridged LANs, each of which offers a service approximately the same as that defined by IEEE 802.1D. Such virtual LANs (VLANs) are an integral feature of switched LAN networks. A VLAN can be viewed as a group of end-stations on multiple LAN segments and can communicate as if they were on a single LAN. IEEE 802.1Q defines port-based Virtual LANs where membership is determined by the bridge port on which data frames are received, and port-and-protocol-based Virtual LANs where membership is determined by the bridge port on which frames are received and the protocol identifier of the frame. This memo defines the objects needed for the management of port-based VLANs in bridge entities.

This memo supplements RFC 4188 [BRIDGE-MIB] and obsoletes RFC 2674 [RFC2674].

2.1. Scope

The MIB modules defined in this document include a comprehensive set of managed objects that attempts to match the set defined in IEEE 802.1D and IEEE 802.1Q. However, to be consistent with the spirit of

the SNMP Framework, a subjective judgement was made to omit the objects from those standards most 'costly' to implement in an agent and least 'essential' for fault and configuration management. The omissions are described in Section 3 below.

Historical note:

The original BRIDGE-MIB [RFC1493] used the following principles for determining inclusion of an object in the BRIDGE-MIB module:

- (1) Start with a small set of essential objects and add only as further objects are needed.
- (2) Require that objects be essential for either fault or configuration management.
- (3) Consider evidence of current use and/or utility.
- (4) Limit the total number of objects.
- (5) Exclude objects that are simply derivable from others in this or other MIBs.
- (6) Avoid causing critical sections to be heavily instrumented. The guideline that was followed is one counter per critical section per layer.

3. Structure of MIBs

This document defines objects that supplement those in the BRIDGE-MIB module [BRIDGE-MIB]. Section 3.4.3 of the present document contains some recommendations regarding usage of objects in the BRIDGE-MIB by devices implementing the enhancements defined here.

An extended bridge MIB module P-BRIDGE-MIB defines managed objects for the traffic class and multicast filtering enhancements defined by IEEE 802.1D-1998 [802.1D], including the Restricted Group Registration control defined by IEEE P802.1t [802.1t].

A virtual bridge MIB module Q-BRIDGE-MIB defines managed objects for the Virtual LAN bridging enhancements defined by IEEE 802.1Q-2003 [802.1Q], including the Restricted VLAN Registration control, defined by IEEE P802.1u [802.1u], and the VLAN Classification by Protocol and Port enhancement, defined by IEEE P802.1v [802.1v].

3.1. Structure of Extended Bridge MIB Module

Objects in this MIB are arranged into subtrees. Each subtree is organized as a set of related objects. The overall structure and assignment of objects to their subtrees is shown below.

3.1.1. Relationship to IEEE 802.1D-1998 Manageable Objects

This section contains a cross-reference to the objects defined in IEEE 802.1D-1998 [802.1D]. It also details those objects that are not considered necessary in this MIB module.

Some objects defined by IEEE 802.1D-1998 have been included in the virtual bridge MIB module rather than this one: entries in dot1qTpGroupTable, dot1qForwardAllTable, and dot1qForwardUnregisteredTable are required for virtual bridged LANs with additional indexing (e.g., per-VLAN, per-Filtering-Database (per-FDB)) and so are not defined here. Instead, devices that do not implement virtual bridged LANs but do implement the Extended Forwarding Services defined by IEEE 802.1D (i.e., dynamic learning of multicast group addresses and group service requirements in the filtering database) should implement these tables with a fixed value for dot1qFdbId (the value 1 is recommended) or dot1qVlanIndex (the value 1 is recommended). Devices that support Extended Filtering Services should support dot1qTpGroupTable, dot1qForwardAllTable, and dot1qForwardUnregisteredTable.

Extended Bridge MIB Name	IEEE 802.1D-1998 Name
dot1dExtBase	Bridge
dot1dDeviceCapabilities	
dot1dExtendedFilteringServices	
dot1dTrafficClasses	
dot1dTrafficClassesEnabled	
dot1dGmrpStatus	.ApplicantAdministrativeControl
dot1dPriority	
dot1dPortPriorityTable	
dot1dPortDefaultUserPriority	.UserPriority
dot1dPortNumTrafficClasses	
dot1dUserPriorityRegenTable	.UserPriorityRegenerationTable
dot1dUserPriority	
dot1dRegenUserPriority	
dot1dTrafficClassTable	.TrafficClassTable
dot1dTrafficClassPriority	
dot1dTrafficClass	
dot1dPortOutboundAccessPriorityTable	.OutboundAccessPriorityTable
dot1dPortOutboundAccessPriority	

```

dot1dGarp
  dot1dPortGarpTable
    dot1dPortGarpJoinTime          .JoinTime
    dot1dPortGarpLeaveTime         .LeaveTime
    dot1dPortGarpLeaveAllTime      .LeaveAllTime
dot1dGmrp
  dot1dPortGmrpTable
    dot1dPortGmrpStatus            .ApplicantAdministrativeControl
    dot1dPortGmrpFailedRegistrations .FailedRegistrations
    dot1dPortGmrpLastPduOrigin     .OriginatorOfLastPDU
    dot1dPortRestrictedGroupRegistration
                                   Restricted Group Registration
                                   (Ref. IEEE 802.1t 10.3.2.3)
dot1dTp
  dot1dTpHCPortTable
    dot1dTpHCPortInFrames          .BridgePort.FramesReceived
    dot1dTpHCPortOutFrames         .ForwardOutBound
    dot1dTpHCPortInDiscards        .DiscardInbound
  dot1dTpPortOverflowTable
    dot1dTpPortInOverflowFrames     .BridgePort.FramesReceived
    dot1dTpPortOutOverflowFrames    .ForwardOutBound
    dot1dTpPortInOverflowDiscards   .DiscardInbound

```

The following IEEE 802.1D-1998 management objects have not been included in the Bridge MIB for the indicated reasons.

IEEE 802.1D-1998 Object	Disposition
Bridge.StateValue	not considered useful
Bridge.ApplicantAdministrativeControl	not provided per-attribute (e.g., per-VLAN, per-Group). Only per-{device,port,application} control is provided in this MIB.
notify group registration failure (IEEE 802.1t 14.10.1.2)	not considered useful

3.1.2. Relationship to IEEE 802.1Q Manageable Objects

This section contains section number cross-references to manageable objects defined in IEEE 802.1Q-2003 [802.1Q]. These objects have been included in this MIB as they provide a natural fit with the IEEE 802.1D objects with which they are co-located.

Extended Bridge MIB Name	IEEE 802.1Q-2003 Section and Name
dot1dExtBase	Bridge
dot1dDeviceCapabilities	
dot1qStaticEntryIndividualPort	5.2 implementation options
dot1qIVLCapable	
dot1qSVLCapable	
dot1qHybridCapable	
dot1qConfigurablePvidTagging	12.10.1.1 read bridge vlan config
dot1dLocalVlanCapable	
dot1dPortCapabilitiesTable	
dot1dPortCapabilities	
dot1qDot1qTagging	5.2 implementation options
dot1qConfigurableAcceptableFrameTypes	5.2 implementation options
dot1qIngressFiltering	5.2 implementation options

3.1.3. The dot1dExtBase Subtree

This subtree contains the objects that are applicable to all bridges implementing the traffic class and multicast filtering features of IEEE 802.1D-1998 [802.1D]. It includes per-device configuration of Generic Attribute Registration Protocol (GARP) and GARP Multicast Registration Protocol (GMRP) protocols.

3.1.4. The dot1dPriority Subtree

This subtree contains the objects for configuring and reporting status of priority-based queuing mechanisms in a bridge. This includes per-port `user_priority` treatment, mapping of `user_priority` in frames into internal traffic classes, and outbound `user_priority` and `access_priority`.

3.1.5. The dot1dGarp Subtree

This subtree contains the objects for configuring and reporting on operation of the Generic Attribute Registration Protocol (GARP).

3.1.6. The dot1dGmrp Subtree

This subtree contains the objects for configuring and reporting on operation of the GARP Multicast Registration Protocol (GMRP).

3.1.7. The dot1dTpHCPortTable

This table extends the dot1dTp subtree from the BRIDGE-MIB [BRIDGE-MIB] and contains the objects for reporting port-bridging statistics for high-capacity network interfaces.

3.1.8. The dot1dTpPortOverflowTable

This table extends the dot1dTp subtree from the BRIDGE-MIB [BRIDGE-MIB] and contains the objects for reporting the upper bits of port-bridging statistics for high-capacity network interfaces for when 32-bit counters are inadequate.

3.2. Structure of Virtual Bridge MIB module

Objects in this MIB are arranged into subtrees. Each subtree is organized as a set of related objects. The overall structure and assignment of objects to their subtrees is shown below. Some manageable objects defined in the BRIDGE-MIB [BRIDGE-MIB] need to be indexed differently when they are used in a VLAN bridging environment: these objects are, therefore, effectively duplicated by new objects with different indexing, which are defined in the Virtual Bridge MIB.

3.2.1. Relationship to IEEE 802.1Q Manageable Objects

This section contains section-number cross-references to manageable objects defined in clause 12 of IEEE 802.1Q-2003 [802.1Q]. It also details those objects that are not considered necessary in this MIB module.

Note: Unlike IEEE 802.1D-1998, IEEE 802.1Q-2003 [802.1Q] did not define exact syntax for a set of managed objects. The following cross-references indicate the section numbering of the descriptions of management operations from clause 12 in the latter document.

Virtual Bridge MIB object	IEEE 802.1Q-2003 Reference
dot1qBase	
dot1qVlanVersionNumber	12.10.1.1 read bridge vlan config
dot1qMaxVlanId	12.10.1.1 read bridge vlan config
dot1qMaxSupportedVlans	12.10.1.1 read bridge vlan config
dot1qNumVlans	
dot1qGvrpStatus	12.9.2.1/2 read/set garp applicant controls
dot1qTp	
dot1qFdbTable	
dot1qFdbId	

dot1qFdbDynamicCount	12.7.1.1.3 read filtering d/base
dot1qTpFdbTable	
dot1qTpFdbAddress	
dot1qTpFdbPort	
dot1qTpFdbStatus	
dot1qTpGroupTable	12.7.7.1 read filtering entry
dot1qTpGroupAddress	
dot1qTpGroupEgressPorts	
dot1qTpGroupLearnt	
dot1qForwardAllTable	12.7.7.1 read filtering entry
dot1qForwardAllPorts	
dot1qForwardAllStaticPorts	
dot1qForwardAllForbiddenPorts	
dot1qForwardUnregisteredTable	12.7.7.1 read filtering entry
dot1qForwardUnregisteredPorts	
dot1qForwardUnregisteredStaticPorts	
dot1qForwardUnregisteredForbiddenPorts	
dot1qStatic	
dot1qStaticUnicastTable	12.7.7.1 create/delete/read filtering entry
	12.7.6.1 read permanent database
dot1qStaticUnicastAddress	
dot1qStaticUnicastReceivePort	
dot1qStaticUnicastAllowedToGoTo	
dot1qStaticUnicastStatus	
dot1qStaticMulticastTable	12.7.7.1 create/delete/read filtering entry
	12.7.6.1 read permanent database
dot1qStaticMulticastAddress	
dot1qStaticMulticastReceivePort	
dot1qStaticMulticastStaticEgressPorts	
dot1qStaticMulticastForbiddenEgressPorts	
dot1qStaticMulticastStatus	
dot1qVlan	
dot1qVlanNumDeletes	
dot1qVlanCurrentTable	12.10.2.1 read vlan configuration
	12.10.3.5 read VID to FID allocations
	12.10.3.6 read FID allocated to VID
	12.10.3.7 read VIDs allocated to FID
dot1qVlanTimeMark	
dot1qVlanIndex	
dot1qVlanFdbId	
dot1qVlanCurrentEgressPorts	
dot1qVlanCurrentUntaggedPorts	
dot1qVlanStatus	

dot1qVlanCreationTime	
dot1qVlanStaticTable	12.7.7.1/2/3 create/delete/read filtering entry
	12.7.6.1 read permanent database
	12.10.2.2 create vlan config
	12.10.2.3 delete vlan config
dot1qVlanStaticName	12.4.1.3 set bridge name
dot1qVlanStaticEgressPorts	
dot1qVlanForbiddenEgressPorts	
dot1qVlanStaticUntaggedPorts	
dot1qVlanStaticRowStatus	
dot1qNextFreeLocalVlanIndex	
dot1qPortVlanTable	12.10.1.1 read bridge vlan configuration
dot1qPvid	12.10.1.2 configure PVID values
dot1qPortAcceptableFrameTypes	12.10.1.3 configure acceptable frame types parameter
dot1qPortIngressFiltering	12.10.1.4 configure ingress filtering parameters
dot1qPortGvrpStatus	12.9.2.2 read/set garp applicant controls
dot1qPortGvrpFailedRegistrations	
dot1qPortGvrpLastPduOrigin	
dot1qPortRestrictedVlanRegistration	IEEE 802.1u 11.2.3.2.3 Restricted VLAN Registration
dot1qPortVlanStatisticsTable	12.6.1.1 read forwarding port counters
dot1qTpVlanPortInFrames	
dot1qTpVlanPortOutFrames	
dot1qTpVlanPortInDiscards	
dot1qTpVlanPortInOverflowFrames	
dot1qTpVlanPortOutOverflowFrames	
dot1qTpVlanPortInOverflowDiscards	
dot1qPortVlanHCStatisticsTable	12.6.1.1 read forwarding port counters
dot1qTpVlanPortHCInFrames	
dot1qTpVlanPortHCOutFrames	
dot1qTpVlanPortHCInDiscards	
dot1qLearningConstraintsTable	12.10.3.1/3/4 read/set/delete vlan learning constraints
	12.10.3.2 read vlan learning constraints for VID
dot1qConstraintVlan	
dot1qConstraintSet	
dot1qConstraintType	
dot1qConstraintStatus	
dot1qConstraintSetDefault	

dot1qConstraintTypeDefault

dot1vProtocol	IEEE 802.1v Reference:
dot1vProtocolGroupTable	8.6.4 Protocol Group Database, 8.6.2 Protocol Template
dot1vProtocolTemplateFrameType	
dot1vProtocolTemplateProtocolValue	
dot1vProtocolGroupId	8.6.3 Protocol Group Identifier
dot1vProtocolGroupRowStatus	
dot1vProtocolPortTable	8.4.4 VID Set for each Port
dot1vProtocolPortGroupId	
dot1vProtocolGroupVid	
dot1vProtocolPortRowStatus	

The following IEEE 802.1Q management objects have not been included in the Bridge MIB for the indicated reasons.

IEEE 802.1Q-2003 Operation	Disposition
reset bridge (12.4.1.4)	not considered useful
reset vlan bridge (12.10.1.5)	not considered useful
read forwarding port counters (12.6.1.1)	
discard on error details	not considered useful
read permanent database (12.7.6.1)	
permanent database size	not considered useful
number of static filtering entries	count rows in dot1qStaticUnicastTable + dot1qStaticMulticastTable
number of static VLAN registration entries	count rows in dot1qVlanStaticTable
read filtering entry range (12.7.7.4)	use GetNext operation.
read filtering database (12.7.1.1)	
filtering database size	not considered useful
number of dynamic group address entries (12.7.1.3)	count rows applicable to each FDB in dot1dTpGroupTable
read garp state (12.9.3.1)	not considered useful
notify vlan registration failure (12.10.1.6)	not considered useful

notify learning constraint violation
(12.10.3.10) not considered useful

3.2.2. The dot1qBase Subtree

This subtree contains the objects that are applicable to all bridges implementing IEEE 802.1Q virtual LANs.

3.2.3. The dot1qTp Subtree

This subtree contains objects that control the operation and report the status of transparent bridging. This includes management of the dynamic Filtering Databases for both unicast and multicast forwarding. This subtree will be implemented by all bridges that perform destination-address filtering.

3.2.4. The dot1qStatic Subtree

This subtree contains objects that control static configuration information for transparent bridging. This includes management of the static entries in the Filtering Databases for both unicast and multicast forwarding.

3.2.5. The dot1qVlan Subtree

This subtree contains objects that control configuration and report status of the Virtual LANs known to a bridge. This includes management of the statically configured VLANs as well as reporting VLANs discovered by other means (e.g., GARP VLAN Registration Protocol (GVRP)). It also controls configuration and reports status of per-port objects relating to VLANs and reports traffic statistics. It also provides for management of the VLAN Learning Constraints.

3.3. Textual Conventions

Various Working Groups have defined standards-track MIB documents (for example, [RFC2613] and [RFC3318]), that contain objects and Textual Conventions to represent a Virtual Local Area Network Identifier (VLAN-ID) [802.1Q]. New definitions are showing up in various documents (for example, [RFC4323] and [RFC4149]). Unfortunately, the result is a set of different definitions for the same piece of management information. This may lead to confusion and unnecessary complexity. In order to address this situation, three new textual conventions are defined in the Q-BRIDGE-MIB, called VlanIdOrAny, VlanIdOrNone, and VlanIdOrAnyOrNone. These new textual conventions should be (re)used in MIB modules so that they all represent a VLAN-ID in the same way.

These textual conventions provide a means to specify MIB objects that refer to a specific VLAN, to any VLAN, or to no VLAN. For an example of how these textual conventions might be used, consider a MIB object, with SYNTAX of `VlanIdOrAnyOrNone`, that specifies the VLAN on which to accept incoming packets of a particular protocol. Such an object would allow the device to be configured to accept packets of this protocol received with a specific 802.1q tag value, with any 802.1q tag value, or with no 802.1q tag. Note that a MIB object that is defined using one of these textual conventions should clarify the meaning of 'any VLAN' and/or 'no VLAN' in its DESCRIPTION clause.

3.4. Relationship to Other MIBs

As described above, some IEEE 802.1D management objects have not been included in this MIB because they overlap with objects in other MIBs applicable to a bridge implementing this MIB module.

3.4.1. Relationship to the SNMPv2-MIB

The SNMPv2-MIB [RFC3418] defines objects that are generally applicable to managed devices. These objects apply to the device as a whole, irrespective of whether bridging is the device's sole functionality or only a subset of the device's functionality.

Full support for the 802.1D management objects requires that the SNMPv2-MIB objects `sysDescr` and `sysUpTime` be implemented. Note that compliance to the current SNMPv2-MIB module requires additional objects and notifications to be implemented as specified in RFC 3418 [RFC3418].

3.4.2. Relationship to the IF-MIB

The IF-MIB, [RFC2863], requires that any MIB that is an adjunct of the IF-MIB clarify specific areas within the IF-MIB. These areas were intentionally left vague in the IF-MIB in order to avoid over-constraining the MIB, thereby precluding management of certain media-types.

The IF-MIB enumerates several areas that a media-specific MIB must clarify. Each of these areas is addressed in a following subsection. The implementor is referred to the IF-MIB in order to understand the general intent of these areas.

The IF-MIB [RFC2863] defines managed objects for managing network interfaces. A network interface is considered attached to a 'subnetwork'. (Note that this term is not to be confused with 'subnet', which refers to an addressing partitioning scheme used in the Internet suite of protocols.) The term 'segment' is used in this

memo to refer to such a subnetwork, whether it be an Ethernet segment, a 'ring', a WAN link, or even an X.25 virtual circuit.

Full support for the 802.1D management objects requires that the IF-MIB objects `ifIndex`, `ifType`, `ifDescr`, `ifPhysAddress`, and `ifLastChange` are implemented. Note that compliance to the current IF-MIB module requires additional objects and notifications to be implemented as specified in RFC 2863 [RFC2863].

Implicit in this Extended Bridge MIB is the notion of ports on a bridge. Each of these ports is associated with one interface of the 'interfaces' subtree (one row in `ifTable`), and, in most situations, each port is associated with a different interface. However, there are situations in which multiple ports are associated with the same interface. An example of such a situation would be several ports each corresponding one-to-one with several X.25 virtual circuits but all on the same interface.

Each port is uniquely identified by a port number. A port number has no mandatory relationship to an interface number, but in the simple case a port number will have the same value as the corresponding interface's interface number. Port numbers are in the range (1..`dot1dBaseNumPorts`).

Some entities perform other functionality as well as bridging through the sending and receiving of data on their interfaces. In such situations, only a subset of the data sent/received on an interface is within the domain of the entity's bridging functionality. This subset is considered delineated according to a set of protocols, with some protocols being bridged, and other protocols not being bridged. For example, in an entity that exclusively performed bridging, all protocols would be considered bridged, whereas in an entity that performed IP routing on IP datagrams and only bridged other protocols, only the non-IP data would be considered bridged.

Thus, this Extended Bridge MIB (and in particular, its counters) is applicable only to that subset of the data on an entity's interfaces that is sent/received for a protocol being bridged. All such data is sent/received via the ports of the bridge.

3.4.2.1. Layering Model

This memo assumes the interpretation of the Interfaces Subtree to be in accordance with the IF-MIB [RFC2863], which states that the interfaces table (`ifTable`) contains information on the managed resource's interfaces and that each sub-layer below the internetwork layer of a network interface is considered an interface.

This document does not make any assumption that within an entity, VLANs that are instantiated as an entry in `dot1qVlanCurrentTable` by either management configuration through `dot1qVlanStaticTable` or by dynamic means (e.g., through GVRP) are also represented by an entry in `ifTable`.

Where an entity contains higher-layer protocol entities (e.g., IP-layer interfaces that transmit and receive traffic to/from a VLAN), these should be represented in the `ifTable` as interfaces of type `propVirtual(53)`. Protocol-specific types such as `l3ipxvlan(137)` should not be used here, since there is no implication that the bridge will perform any protocol filtering before delivering up to these virtual interfaces.

3.4.2.2. `ifStackTable`

In addition, the IF-MIB [RFC2863] defines a table '`ifStackTable`' for describing the relationship between logical interfaces within an entity. It is anticipated that implementors will use this table to describe the binding of (for example) IP interfaces to physical ports, although the presence of VLANs makes the representation less than perfect for showing connectivity. The `ifStackTable` cannot represent the full capability of the IEEE 802.1Q VLAN bridging standard, since that makes a distinction between VLAN bindings on 'ingress' to and 'egress' from a port: these relationships may or may not be symmetrical whereas Interface MIB Evolution assumes a symmetrical binding for transmit and receive. This makes it necessary to define other manageable objects for configuring which ports are members of which VLANs.

3.4.2.3. `ifRcvAddressTable`

This table contains all MAC addresses, unicast, multicast, and broadcast, for which an interface will receive packets and forward them up to a higher-layer entity for local consumption. Note that this does not include addresses for data-link layer control protocols such as Spanning-Tree, GMRP, or GVRP. The format of the address, contained in `ifRcvAddressAddress`, is the same as for `ifPhysAddress`.

This table does not include unicast or multicast addresses that are accepted for possible forwarding out some other port. This table is explicitly not intended to provide a bridge address filtering mechanism.

3.4.3. Relationship to the BRIDGE-MIB

This section defines how objects in the BRIDGE-MIB module [BRIDGE-MIB] should be represented for devices that implement the extensions: some of the old objects are less useful in such devices but must still be implemented for reasons of backwards compatibility.

3.4.3.1. The dotldBase Subtree

This subtree contains objects that are applicable to all types of bridges. Interpretation of this subtree is unchanged.

3.4.3.2. The dotldStp Subtree

This subtree contains the objects that denote the bridge's state with respect to the Spanning Tree Protocol. Interpretation of this subtree is unchanged.

3.4.3.3. The dotldTp Subtree

This subtree contains objects that describe the entity's state with respect to transparent bridging.

In a device operating with a single Filtering Database, interpretation of this subtree is unchanged.

In a device supporting multiple Filtering Databases, this subtree is interpreted as follows:

dotldTpLearnedEntryDiscards

The number of times that *any* of the FDBs became full.

dotldTpAgingTime

This applies to all Filtering Databases.

dotldTpFdbTable

Report MAC addresses learned on each port, regardless of which Filtering Database they have been learned in. If an address has been learned in multiple databases on a single port, report it only once. If an address has been learned in multiple databases on more than one port, report the entry on any one of the valid ports.

dotldTpPortTable

This table is port-based and is not affected by multiple Filtering Databases or multiple VLANs. The counters should include frames received or transmitted for all VLANs. Note that equivalent 64-bit port statistics counters, as well as other objects to represent the upper 32 bits of these counters, are defined in this document for high-capacity network interfaces. These have conformance statements to indicate for which speeds of interface they are required.

3.4.3.4. The dotldStatic Subtree

This optional subtree contains objects that describe the configuration of destination-address filtering.

In a device operating with a single Filtering Database, interpretation of this subtree is unchanged.

In a device supporting multiple Filtering Databases, this subtree is interpreted as follows:

dotldStaticTable

Entries read from this table include all static entries from all of the Filtering Databases. Entries for the same MAC address and receive port in more than one Filtering Database must appear only once, since these are the indices of this table. This table should be implemented as read-only in devices that support multiple Forwarding Databases. Instead, write access should be provided through dot1qStaticUnicastTable and dot1qStaticMulticastTable, as defined in this document.

3.4.3.5. Additions to the BRIDGE-MIB

To supplement the BRIDGE-MIB [BRIDGE-MIB], this module contains:

- (1) support for multiple traffic classes and dynamic multicast filtering as per IEEE 802.1D-1998 [802.1D].
- (2) support for bridged Virtual LANs as per IEEE 802.1Q-2003 [802.1Q].
- (3) support for 64-bit versions of BRIDGE-MIB [BRIDGE-MIB] port counters.

4. Definitions for Extended Bridge MIB

P-BRIDGE-MIB DEFINITIONS ::= BEGIN

-- -----
-- MIB for IEEE 802.1p devices
-- -----

IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, Counter32, Integer32, Counter64
FROM SNMPv2-SMI
TruthValue, TimeInterval, MacAddress, TEXTUAL-CONVENTION
FROM SNMPv2-TC
MODULE-COMPLIANCE, OBJECT-GROUP
FROM SNMPv2-CONF
dot1dTp, dot1dTpPort, dot1dBridge,
dot1dBasePortEntry, dot1dBasePort
FROM BRIDGE-MIB;

pBridgeMIB MODULE-IDENTITY

LAST-UPDATED "200601090000Z"
ORGANIZATION "IETF Bridge MIB Working Group"
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DESCRIPTION

"The Bridge MIB Extension module for managing Priority and Multicast Filtering, defined by IEEE 802.1D-1998, including Restricted Group Registration defined by IEEE 802.1t-2001.

Copyright (C) The Internet Society (2006). This version of this MIB module is part of RFC 4363; See the RFC itself for full legal notices."

REVISION "200601090000Z"

DESCRIPTION

"Added dot1dPortRestrictedGroupRegistration.
Deprecated pBridgePortGmrpGroup and pBridgeCompliance
and added pBridgePortGmrpGroup2 and pBridgeCompliance2."

REVISION "199908250000Z"

DESCRIPTION

"The Bridge MIB Extension module for managing Priority
and Multicast Filtering, defined by IEEE 802.1D-1998.

Initial version, published as RFC 2674."

::= { dot1dBridge 6 }

pBridgeMIBObjects OBJECT IDENTIFIER ::= { pBridgeMIB 1 }

-- -----
-- Textual Conventions
-- -----

EnabledStatus ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"A simple status value for the object."

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

-- -----
-- subtrees in the P-BRIDGE MIB
-- -----

dot1dExtBase OBJECT IDENTIFIER ::= { pBridgeMIBObjects 1 }
dot1dPriority OBJECT IDENTIFIER ::= { pBridgeMIBObjects 2 }
dot1dGarp OBJECT IDENTIFIER ::= { pBridgeMIBObjects 3 }
dot1dGmrp OBJECT IDENTIFIER ::= { pBridgeMIBObjects 4 }

-- -----
-- the dot1dExtBase subtree
-- -----

dot1dDeviceCapabilities OBJECT-TYPE

SYNTAX BITS {
dot1dExtendedFilteringServices(0),
dot1dTrafficClasses(1),
dot1qStaticEntryIndividualPort(2),
dot1qIVLCapable(3),
dot1qSVLCapable(4),
dot1qHybridCapable(5),
dot1qConfigurablePvidTagging(6),
dot1dLocalVlanCapable(7)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the optional parts of IEEE 802.1D and 802.1Q that are implemented by this device and are manageable through this MIB. Capabilities that are allowed on a per-port basis are indicated in dot1dPortCapabilities.

```
dot1dExtendedFilteringServices(0),
    -- can perform filtering of
    -- individual multicast addresses
    -- controlled by GMRP.
dot1dTrafficClasses(1),
    -- can map user priority to
    -- multiple traffic classes.
dot1qStaticEntryIndividualPort(2),
    -- dot1qStaticUnicastReceivePort &
    -- dot1qStaticMulticastReceivePort
    -- can represent non-zero entries.
dot1qIVLCapable(3),    -- Independent VLAN Learning (IVL).
dot1qSVLCapable(4),    -- Shared VLAN Learning (SVL).
dot1qHybridCapable(5),
    -- both IVL & SVL simultaneously.
dot1qConfigurablePvidTagging(6),
    -- whether the implementation
    -- supports the ability to
    -- override the default PVID
    -- setting and its egress status
    -- (VLAN-Tagged or Untagged) on
    -- each port.
dot1dLocalVlanCapable(7)
    -- can support multiple local
    -- bridges, outside of the scope
    -- of 802.1Q defined VLANs."
```

REFERENCE

```
"ISO/IEC 15802-3 Section 5.2,
IEEE 802.1Q/D11 Section 5.2, 12.10.1.1.3/b/2"
::= { dot1dExtBase 1 }
```

dot1dTrafficClassesEnabled OBJECT-TYPE

```
SYNTAX      TruthValue
MAX-ACCESS  read-write
STATUS      current
```

DESCRIPTION

"The value true(1) indicates that Traffic Classes are enabled on this bridge. When false(2), the bridge operates with a single priority level for all traffic.

The value of this object MUST be retained across reinitializations of the management system."

```
DEFVAL      { true }
```

```
::= { dot1dExtBase 2 }
```

```
dot1dGmrpStatus OBJECT-TYPE
    SYNTAX      EnabledStatus
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
```

"The administrative status requested by management for GMRP. The value enabled(1) indicates that GMRP should be enabled on this device, in all VLANs, on all ports for which it has not been specifically disabled. When disabled(2), GMRP is disabled, in all VLANs and on all ports, and all GMRP packets will be forwarded transparently. This object affects both Applicant and Registrar state machines. A transition from disabled(2) to enabled(1) will cause a reset of all GMRP state machines on all ports.

The value of this object MUST be retained across reinitializations of the management system."

```
DEFVAL      { enabled }
::= { dot1dExtBase 3 }
```

```
-- -----
-- Port Capabilities Table
-- -----
```

```
dot1dPortCapabilitiesTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Dot1dPortCapabilitiesEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
```

"A table that contains capabilities information about every port that is associated with this bridge."

```
::= { dot1dExtBase 4 }
```

```
dot1dPortCapabilitiesEntry OBJECT-TYPE
    SYNTAX      Dot1dPortCapabilitiesEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
```

"A set of capabilities information about this port indexed by dot1dBasePort."

```
AUGMENTS { dot1dBasePortEntry }
::= { dot1dPortCapabilitiesTable 1 }
```

```
Dot1dPortCapabilitiesEntry ::=
    SEQUENCE {
```

```

        dot1dPortCapabilities
            BITS
    }

dot1dPortCapabilities OBJECT-TYPE
    SYNTAX      BITS {
        dot1qDot1qTagging(0),
        dot1qConfigurableAcceptableFrameTypes(1),
        dot1qIngressFiltering(2)
    }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Indicates the parts of IEEE 802.1D and 802.1Q that are
        optional on a per-port basis, that are implemented by
        this device, and that are manageable through this MIB.

        dot1qDot1qTagging(0), -- supports 802.1Q VLAN tagging of
                                -- frames and GVRP.
        dot1qConfigurableAcceptableFrameTypes(1),
                                -- allows modified values of
                                -- dot1qPortAcceptableFrameTypes.
        dot1qIngressFiltering(2)
                                -- supports the discarding of any
                                -- frame received on a Port whose
                                -- VLAN classification does not
                                -- include that Port in its Member
                                -- set."

    REFERENCE
        "ISO/IEC 15802-3 Section 5.2,
        IEEE 802.1Q/D11 Section 5.2"
    ::= { dot1dPortCapabilitiesEntry 1 }

-- -----
-- the dot1dPriority subtree
-- -----

-- -----
-- Port Priority Table
-- -----

dot1dPortPriorityTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Dot1dPortPriorityEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table that contains information about every port that
        is associated with this transparent bridge."

```

```
::= { dotldPriority 1 }
```

```
dotldPortPriorityEntry OBJECT-TYPE
```

```
SYNTAX      DotldPortPriorityEntry
```

```
MAX-ACCESS  not-accessible
```

```
STATUS      current
```

```
DESCRIPTION
```

```
    "A list of Default User Priorities for each port of a
    transparent bridge.  This is indexed by dotldBasePort."
```

```
AUGMENTS { dotldBasePortEntry }
```

```
::= { dotldPortPriorityTable 1 }
```

```
DotldPortPriorityEntry ::=
```

```
SEQUENCE {
```

```
    dotldPortDefaultUserPriority
```

```
        Integer32,
```

```
    dotldPortNumTrafficClasses
```

```
        Integer32
```

```
}
```

```
dotldPortDefaultUserPriority OBJECT-TYPE
```

```
SYNTAX      Integer32 (0..7)
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The default ingress User Priority for this port.  This
    only has effect on media, such as Ethernet, that do not
    support native User Priority.
```

```
    The value of this object MUST be retained across
    reinitializations of the management system."
```

```
::= { dotldPortPriorityEntry 1 }
```

```
dotldPortNumTrafficClasses OBJECT-TYPE
```

```
SYNTAX      Integer32 (1..8)
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The number of egress traffic classes supported on this
    port.  This object may optionally be read-only.
```

```
    The value of this object MUST be retained across
    reinitializations of the management system."
```

```
::= { dotldPortPriorityEntry 2 }
```

```
-- -----
-- User Priority Regeneration Table
-- -----
```


dotldUserPriorityRegenTable OBJECT-TYPE

SYNTAX SEQUENCE OF DotldUserPriorityRegenEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A list of Regenerated User Priorities for each received User Priority on each port of a bridge. The Regenerated User Priority value may be used to index the Traffic Class Table for each input port. This only has effect on media that support native User Priority. The default values for Regenerated User Priorities are the same as the User Priorities."

REFERENCE

"ISO/IEC 15802-3 Section 6.4"

::= { dotldPriority 2 }

dotldUserPriorityRegenEntry OBJECT-TYPE

SYNTAX DotldUserPriorityRegenEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A mapping of incoming User Priority to a Regenerated User Priority."

INDEX { dotldBasePort, dotldUserPriority }

::= { dotldUserPriorityRegenTable 1 }

DotldUserPriorityRegenEntry ::=

```
SEQUENCE {  
    dotldUserPriority  
        Integer32,  
    dotldRegenUserPriority  
        Integer32  
}
```

dotldUserPriority OBJECT-TYPE

SYNTAX Integer32 (0..7)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The User Priority for a frame received on this port."

::= { dotldUserPriorityRegenEntry 1 }

dotldRegenUserPriority OBJECT-TYPE

SYNTAX Integer32 (0..7)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The Regenerated User Priority that the incoming User

Priority is mapped to for this port.

The value of this object MUST be retained across reinitializations of the management system."

```
::= { dotldUserPriorityRegenEntry 2 }
```

```
-- -----
-- Traffic Class Table
-- -----
```

dotldTrafficClassTable OBJECT-TYPE

SYNTAX SEQUENCE OF DotldTrafficClassEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table mapping evaluated User Priority to Traffic Class, for forwarding by the bridge. Traffic class is a number in the range (0..(dotldPortNumTrafficClasses-1))."

REFERENCE

"ISO/IEC 15802-3 Table 7-2"

```
::= { dotldPriority 3 }
```

dotldTrafficClassEntry OBJECT-TYPE

SYNTAX DotldTrafficClassEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"User Priority to Traffic Class mapping."

INDEX { dotldBasePort, dotldTrafficClassPriority }

```
::= { dotldTrafficClassTable 1 }
```

DotldTrafficClassEntry ::=

```
SEQUENCE {
    dotldTrafficClassPriority
        Integer32,
    dotldTrafficClass
        Integer32
}
```

dotldTrafficClassPriority OBJECT-TYPE

SYNTAX Integer32 (0..7)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The Priority value determined for the received frame. This value is equivalent to the priority indicated in the tagged frame received, or one of the evaluated priorities, determined according to the media-type."

For untagged frames received from Ethernet media, this value is equal to the dotldPortDefaultUserPriority value for the ingress port.

For untagged frames received from non-Ethernet media, this value is equal to the dotldRegenUserPriority value for the ingress port and media-specific user priority."

```
::= { dotldTrafficClassEntry 1 }
```

dotldTrafficClass OBJECT-TYPE

SYNTAX Integer32 (0..7)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The Traffic Class the received frame is mapped to.

The value of this object MUST be retained across reinitializations of the management system."

```
::= { dotldTrafficClassEntry 2 }
```

```
-- -----
-- Outbound Access Priority Table
-- -----
```

dotldPortOutboundAccessPriorityTable OBJECT-TYPE

SYNTAX SEQUENCE OF DotldPortOutboundAccessPriorityEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table mapping Regenerated User Priority to Outbound Access Priority. This is a fixed mapping for all port types, with two options for 802.5 Token Ring."

REFERENCE

"ISO/IEC 15802-3 Table 7-3"

```
::= { dotldPriority 4 }
```

dotldPortOutboundAccessPriorityEntry OBJECT-TYPE

SYNTAX DotldPortOutboundAccessPriorityEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Regenerated User Priority to Outbound Access Priority mapping."

INDEX { dotldBasePort, dotldRegenUserPriority }

```
::= { dotldPortOutboundAccessPriorityTable 1 }
```

DotldPortOutboundAccessPriorityEntry ::=

```
SEQUENCE {
```

```

        dotldPortOutboundAccessPriority
            Integer32
    }

dotldPortOutboundAccessPriority OBJECT-TYPE
    SYNTAX      Integer32 (0..7)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The Outbound Access Priority the received frame is
        mapped to."
    ::= { dotldPortOutboundAccessPriorityEntry 1 }

-- -----
-- the dotldGarp subtree
-- -----

-- -----
-- The GARP Port Table
-- -----

dotldPortGarpTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DotldPortGarpEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of GARP control information about every bridge
        port. This is indexed by dotldBasePort."
    ::= { dotldGarp 1 }

dotldPortGarpEntry OBJECT-TYPE
    SYNTAX      DotldPortGarpEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "GARP control information for a bridge port."
    AUGMENTS { dotldBasePortEntry }
    ::= { dotldPortGarpTable 1 }

DotldPortGarpEntry ::=
    SEQUENCE {
        dotldPortGarpJoinTime
            TimeInterval,
        dotldPortGarpLeaveTime
            TimeInterval,
        dotldPortGarpLeaveAllTime
            TimeInterval
    }

```

dotldPortGarpJoinTime OBJECT-TYPE

SYNTAX TimeInterval

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The GARP Join time, in centiseconds.

The value of this object MUST be retained across reinitializations of the management system."

DEFVAL { 20 }

::= { dotldPortGarpEntry 1 }

dotldPortGarpLeaveTime OBJECT-TYPE

SYNTAX TimeInterval

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The GARP Leave time, in centiseconds.

The value of this object MUST be retained across reinitializations of the management system."

DEFVAL { 60 }

::= { dotldPortGarpEntry 2 }

dotldPortGarpLeaveAllTime OBJECT-TYPE

SYNTAX TimeInterval

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The GARP LeaveAll time, in centiseconds.

The value of this object MUST be retained across reinitializations of the management system."

DEFVAL { 1000 }

::= { dotldPortGarpEntry 3 }

```
-- -----
-- The GMRP Port Configuration and Status Table
-- -----
```

dotldPortGmrpTable OBJECT-TYPE

SYNTAX SEQUENCE OF DotldPortGmrpEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table of GMRP control and status information about every bridge port. Augments the dotldBasePortTable."

::= { dotldGmrp 1 }

dot1dPortGmrpEntry OBJECT-TYPE

SYNTAX Dot1dPortGmrpEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"GMRP control and status information for a bridge port."

AUGMENTS { dot1dBasePortEntry }

::= { dot1dPortGmrpTable 1 }

Dot1dPortGmrpEntry ::=

SEQUENCE {

dot1dPortGmrpStatus

EnabledStatus,

dot1dPortGmrpFailedRegistrations

Counter32,

dot1dPortGmrpLastPduOrigin

MacAddress,

dot1dPortRestrictedGroupRegistration

TruthValue

}

dot1dPortGmrpStatus OBJECT-TYPE

SYNTAX EnabledStatus

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The administrative state of GMRP operation on this port. The value enabled(1) indicates that GMRP is enabled on this port in all VLANs as long as dot1dGmrpStatus is also enabled(1). A value of disabled(2) indicates that GMRP is disabled on this port in all VLANs: any GMRP packets received will be silently discarded, and no GMRP registrations will be propagated from other ports. Setting this to a value of enabled(1) will be stored by the agent but will only take effect on the GMRP protocol operation if dot1dGmrpStatus also indicates the value enabled(1). This object affects all GMRP Applicant and Registrar state machines on this port. A transition from disabled(2) to enabled(1) will cause a reset of all GMRP state machines on this port.

The value of this object MUST be retained across reinitializations of the management system."

DEFVAL { enabled }

::= { dot1dPortGmrpEntry 1 }

dot1dPortGmrpFailedRegistrations OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of failed GMRP registrations, for any reason, in all VLANs, on this port."

::= { dot1dPortGmrpEntry 2 }

dot1dPortGmrpLastPduOrigin OBJECT-TYPE

SYNTAX MacAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The Source MAC Address of the last GMRP message received on this port."

::= { dot1dPortGmrpEntry 3 }

dot1dPortRestrictedGroupRegistration OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The state of Restricted Group Registration on this port. If the value of this control is true(1), then creation of a new dynamic entry is permitted only if there is a Static Filtering Entry for the VLAN concerned, in which the Registrar Administrative Control value is Normal Registration.

The value of this object MUST be retained across reinitializations of the management system."

REFERENCE

"IEEE 802.1t clause 10.3.2.3, 14.10.1.3."

DEFVAL { false }

::= { dot1dPortGmrpEntry 4 }

-- -----
-- High-Capacity Port Table for Transparent Bridges
-- -----

dot1dTpHCPortTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1dTpHCPortEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table that contains information about every high-capacity port that is associated with this transparent bridge."

::= { dot1dTp 5 }

```
dot1dTpHCPortEntry OBJECT-TYPE
    SYNTAX      Dot1dTpHCPortEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Statistics information for each high-capacity port of a
         transparent bridge."
    INDEX      { dot1dTpPort }
    ::= { dot1dTpHCPortTable 1 }
```

```
Dot1dTpHCPortEntry ::=
    SEQUENCE {
        dot1dTpHCPortInFrames
            Counter64,
        dot1dTpHCPortOutFrames
            Counter64,
        dot1dTpHCPortInDiscards
            Counter64
    }
```

```
dot1dTpHCPortInFrames OBJECT-TYPE
    SYNTAX      Counter64
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of frames that have been received by this
         port from its segment. Note that a frame received on
         the interface corresponding to this port is only counted
         by this object if and only if it is for a protocol being
         processed by the local bridging function, including
         bridge management frames."
    REFERENCE
        "ISO/IEC 15802-3 Section 14.6.1.1.3"
    ::= { dot1dTpHCPortEntry 1 }
```

```
dot1dTpHCPortOutFrames OBJECT-TYPE
    SYNTAX      Counter64
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of frames that have been transmitted by this
         port to its segment. Note that a frame transmitted on
         the interface corresponding to this port is only counted
         by this object if and only if it is for a protocol being
         processed by the local bridging function, including
         bridge management frames."
    REFERENCE
        "ISO/IEC 15802-3 Section 14.6.1.1.3"
```



```
::= { dotldTpHCPortEntry 2 }
```

```
dotldTpHCPortInDiscards OBJECT-TYPE
```

```
SYNTAX Counter64
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

"Count of valid frames that have been received by this port from its segment that were discarded (i.e., filtered) by the Forwarding Process."

```
REFERENCE
```

"ISO/IEC 15802-3 Section 14.6.1.1.3"

```
::= { dotldTpHCPortEntry 3 }
```

```
-- -----
-- Upper part of High-Capacity Port Table for Transparent Bridges
-- -----
```

```
dotldTpPortOverflowTable OBJECT-TYPE
```

```
SYNTAX SEQUENCE OF DotldTpPortOverflowEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

"A table that contains the most-significant bits of statistics counters for ports that are associated with this transparent bridge that are on high-capacity interfaces, as defined in the conformance clauses for this table. This table is provided as a way to read 64-bit counters for agents that support only SNMPv1.

Note that the reporting of most-significant and least-significant counter bits separately runs the risk of missing an overflow of the lower bits in the interval between sampling. The manager must be aware of this possibility, even within the same varbindlist, when interpreting the results of a request or asynchronous notification."

```
::= { dotldTp 6 }
```

```
dotldTpPortOverflowEntry OBJECT-TYPE
```

```
SYNTAX DotldTpPortOverflowEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

"The most significant bits of statistics counters for a high-capacity interface of a transparent bridge. Each object is associated with a corresponding object in dotldTpPortTable that indicates the least significant bits of the counter."

```
INDEX { dotldTpPort }
```

```
::= { dot1dTpPortOverflowTable 1 }
```

```
Dot1dTpPortOverflowEntry ::=
```

```
SEQUENCE {  
    dot1dTpPortInOverflowFrames  
        Counter32,  
    dot1dTpPortOutOverflowFrames  
        Counter32,  
    dot1dTpPortInOverflowDiscards  
        Counter32  
}
```

```
dot1dTpPortInOverflowFrames OBJECT-TYPE
```

```
SYNTAX Counter32
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"The number of times the associated dot1dTpPortInFrames  
counter has overflowed."
```

```
REFERENCE
```

```
"ISO/IEC 15802-3 Section 14.6.1.1.3"
```

```
::= { dot1dTpPortOverflowEntry 1 }
```

```
dot1dTpPortOutOverflowFrames OBJECT-TYPE
```

```
SYNTAX Counter32
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"The number of times the associated dot1dTpPortOutFrames  
counter has overflowed."
```

```
REFERENCE
```

```
"ISO/IEC 15802-3 Section 14.6.1.1.3"
```

```
::= { dot1dTpPortOverflowEntry 2 }
```

```
dot1dTpPortInOverflowDiscards OBJECT-TYPE
```

```
SYNTAX Counter32
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"The number of times the associated  
dot1dTpPortInDiscards counter has overflowed."
```

```
REFERENCE
```

```
"ISO/IEC 15802-3 Section 14.6.1.1.3"
```

```
::= { dot1dTpPortOverflowEntry 3 }
```

```
-- -----  
-- IEEE 802.1p MIB - Conformance Information  
-- -----
```

pBridgeConformance OBJECT IDENTIFIER ::= { pBridgeMIB 2 }

pBridgeGroups OBJECT IDENTIFIER ::= { pBridgeConformance 1 }

pBridgeCompliances OBJECT IDENTIFIER
 ::= { pBridgeConformance 2 }

-- -----
 -- units of conformance
 -- -----

pBridgeExtCapGroup OBJECT-GROUP
 OBJECTS {
 dot1dDeviceCapabilities,
 dot1dPortCapabilities
 }
 STATUS current
 DESCRIPTION
 "A collection of objects indicating the optional
 capabilities of the device."
 ::= { pBridgeGroups 1 }

pBridgeDeviceGmrpGroup OBJECT-GROUP
 OBJECTS {
 dot1dGmrpStatus
 }
 STATUS current
 DESCRIPTION
 "A collection of objects providing device-level control
 for the Multicast Filtering extended bridge services."
 ::= { pBridgeGroups 2 }

pBridgeDevicePriorityGroup OBJECT-GROUP
 OBJECTS {
 dot1dTrafficClassesEnabled
 }
 STATUS current
 DESCRIPTION
 "A collection of objects providing device-level control
 for the Priority services."
 ::= { pBridgeGroups 3 }

pBridgeDefaultPriorityGroup OBJECT-GROUP
 OBJECTS {
 dot1dPortDefaultUserPriority
 }
 STATUS current
 DESCRIPTION

```
    "A collection of objects defining the User Priority
    applicable to each port for media that do not support
    native User Priority."
 ::= { pBridgeGroups 4 }
```

```
pBridgeRegenPriorityGroup OBJECT-GROUP
  OBJECTS {
    dot1dRegenUserPriority
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects defining the User Priorities
    applicable to each port for media that support native
    User Priority."
 ::= { pBridgeGroups 5 }
```

```
pBridgePriorityGroup OBJECT-GROUP
  OBJECTS {
    dot1dPortNumTrafficClasses,
    dot1dTrafficClass
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects defining the traffic classes
    within a bridge for each evaluated User Priority."
 ::= { pBridgeGroups 6 }
```

```
pBridgeAccessPriorityGroup OBJECT-GROUP
  OBJECTS {
    dot1dPortOutboundAccessPriority
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects defining the media-dependent
    outbound access level for each priority."
 ::= { pBridgeGroups 7 }
```

```
pBridgePortGarpGroup OBJECT-GROUP
  OBJECTS {
    dot1dPortGarpJoinTime,
    dot1dPortGarpLeaveTime,
    dot1dPortGarpLeaveAllTime
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects providing port level control
    and status information for GARP operation."
 ::= { pBridgeGroups 8 }
```

```
pBridgePortGmrpGroup OBJECT-GROUP
  OBJECTS {
    dot1dPortGmrpStatus,
    dot1dPortGmrpFailedRegistrations,
    dot1dPortGmrpLastPduOrigin
  }
  STATUS      deprecated
  DESCRIPTION
    "A collection of objects providing port level control
    and status information for GMRP operation."
  ::= { pBridgeGroups 9 }

pBridgeHCPortGroup OBJECT-GROUP
  OBJECTS {
    dot1dTpHCPortInFrames,
    dot1dTpHCPortOutFrames,
    dot1dTpHCPortInDiscards
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects providing 64-bit statistics
    counters for high-capacity bridge ports."
  ::= { pBridgeGroups 10 }

pBridgePortOverflowGroup OBJECT-GROUP
  OBJECTS {
    dot1dTpPortInOverflowFrames,
    dot1dTpPortOutOverflowFrames,
    dot1dTpPortInOverflowDiscards
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects providing overflow statistics
    counters for high-capacity bridge ports."
  ::= { pBridgeGroups 11 }

pBridgePortGmrpGroup2 OBJECT-GROUP
  OBJECTS {
    dot1dPortGmrpStatus,
    dot1dPortGmrpFailedRegistrations,
    dot1dPortGmrpLastPduOrigin,
    dot1dPortRestrictedGroupRegistration
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects providing port level control
    and status information for GMRP operation."
  ::= { pBridgeGroups 12 }
```

```
-- -----
-- compliance statements
-- -----

pBridgeCompliance MODULE-COMPLIANCE
    STATUS deprecated
    DESCRIPTION
        "The compliance statement for device support of Priority
        and Multicast Filtering extended bridging services."

MODULE
    MANDATORY-GROUPS { pBridgeExtCapGroup }

    GROUP          pBridgeDeviceGmrpGroup
    DESCRIPTION
        "This group is mandatory for devices supporting the GMRP
        application, defined by IEEE 802.1D Extended Filtering
        Services."

    GROUP          pBridgeDevicePriorityGroup
    DESCRIPTION
        "This group is mandatory only for devices supporting
        the priority forwarding operations defined by IEEE
        802.1D."

    GROUP          pBridgeDefaultPriorityGroup
    DESCRIPTION
        "This group is mandatory only for devices supporting
        the priority forwarding operations defined by the
        extended bridge services with media types, such as
        Ethernet, that do not support native User Priority."

    GROUP          pBridgeRegenPriorityGroup
    DESCRIPTION
        "This group is mandatory only for devices supporting
        the priority forwarding operations defined by IEEE 802.1D
        and that have interface media types that support
        native User Priority, e.g., IEEE 802.5."

    GROUP          pBridgePriorityGroup
    DESCRIPTION
        "This group is mandatory only for devices supporting
        the priority forwarding operations defined by IEEE 802.1D."

    GROUP          pBridgeAccessPriorityGroup
    DESCRIPTION
        "This group is optional and is relevant only for devices
        supporting the priority forwarding operations defined by
```

IEEE 802.1D and that have interface media types that support native Access Priority, e.g., IEEE 802.5."

GROUP pBridgePortGarpGroup

DESCRIPTION

"This group is mandatory for devices supporting any of the GARP applications: e.g., GMRP, defined by the extended filtering services of 802.1D; or GVRP, defined by 802.1Q (refer to the Q-BRIDGE-MIB for conformance statements for GVRP)."

GROUP pBridgePortGmrpGroup

DESCRIPTION

"This group is mandatory for devices supporting the GMRP application, as defined by IEEE 802.1D Extended Filtering Services."

GROUP pBridgeHCPortGroup

DESCRIPTION

"Support for this group in a device is mandatory for those bridge ports that map to network interfaces that have the value of the corresponding instance of ifSpeed greater than 650,000,000 bits/second."

GROUP pBridgePortOverflowGroup

DESCRIPTION

"Support for this group in a device is mandatory for those bridge ports that map to network interfaces that have the value of the corresponding instance of ifSpeed greater than 650,000,000 bits/second."

OBJECT dot1dPortNumTrafficClasses

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT dot1dTrafficClass

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT dot1dRegenUserPriority

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

::= { pBridgeCompliances 1 }

pBridgeCompliance2 MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"The compliance statement for device support of Priority and Multicast Filtering extended bridging services."

MODULE

MANDATORY-GROUPS { pBridgeExtCapGroup }

GROUP pBridgeDeviceGmrpGroup

DESCRIPTION

"This group is mandatory for devices supporting the GMRP application, defined by IEEE 802.1D Extended Filtering Services."

GROUP pBridgeDevicePriorityGroup

DESCRIPTION

"This group is mandatory only for devices supporting the priority forwarding operations defined by IEEE 802.1D."

GROUP pBridgeDefaultPriorityGroup

DESCRIPTION

"This group is mandatory only for devices supporting the priority forwarding operations defined by the extended bridge services with media types, such as Ethernet, that do not support native User Priority."

GROUP pBridgeRegenPriorityGroup

DESCRIPTION

"This group is mandatory only for devices supporting the priority forwarding operations defined by IEEE 802.1D and that have interface media types that support native User Priority, e.g., IEEE 802.5."

GROUP pBridgePriorityGroup

DESCRIPTION

"This group is mandatory only for devices supporting the priority forwarding operations defined by IEEE 802.1D."

GROUP pBridgeAccessPriorityGroup

DESCRIPTION

"This group is optional and is relevant only for devices supporting the priority forwarding operations defined by IEEE 802.1D and that have interface media types that support native Access Priority, e.g., IEEE 802.5."

GROUP pBridgePortGarpGroup

DESCRIPTION

"This group is mandatory for devices supporting any of the GARP applications: e.g., GMRP, defined by the extended filtering services of 802.1D; or GVRP, defined by 802.1Q (refer to the Q-BRIDGE-MIB for conformance statements for GVRP)."

GROUP pBridgePortGmrpGroup2

DESCRIPTION

"This group is mandatory for devices supporting the GMRP application, as defined by IEEE 802.1D Extended Filtering Services."

GROUP pBridgeHCPortGroup

DESCRIPTION

"Support for this group in a device is mandatory for those bridge ports that map to network interfaces that have the value of the corresponding instance of ifSpeed greater than 650,000,000 bits/second."

GROUP pBridgePortOverflowGroup

DESCRIPTION

"Support for this group in a device is mandatory for those bridge ports that map to network interfaces that have the value of the corresponding instance of ifSpeed greater than 650,000,000 bits/second."

OBJECT dot1dPortNumTrafficClasses

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT dot1dTrafficClass

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT dot1dRegenUserPriority

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

::= { pBridgeCompliances 2 }

END

5. Definitions for Virtual Bridge MIB

```
Q-BRIDGE-MIB DEFINITIONS ::= BEGIN
```

```
-- -----
-- MIB for IEEE 802.1Q Devices
-- -----
```

IMPORTS

```
MODULE-IDENTITY, OBJECT-TYPE,
Counter32, Counter64, Unsigned32, TimeTicks, Integer32
    FROM SNMPv2-SMI
RowStatus, TruthValue, TEXTUAL-CONVENTION, MacAddress
    FROM SNMPv2-TC
SnmpAdminString
    FROM SNMP-FRAMEWORK-MIB
MODULE-COMPLIANCE, OBJECT-GROUP
    FROM SNMPv2-CONF
dot1dBridge, dot1dBasePortEntry, dot1dBasePort
    FROM BRIDGE-MIB
EnabledStatus
    FROM P-BRIDGE-MIB
TimeFilter
    FROM RMON2-MIB;
```

qBridgeMIB MODULE-IDENTITY

```
LAST-UPDATED "200601090000Z"
ORGANIZATION "IETF Bridge MIB Working Group"
CONTACT-INFO
    "Email: Bridge-mib@ietf.org
    ietfmibs@ops.ietf.org
```

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DESCRIPTION

"The VLAN Bridge MIB module for managing Virtual Bridged Local Area Networks, as defined by IEEE 802.1Q-2003, including Restricted Vlan Registration defined by IEEE 802.1u-2001 and Vlan Classification defined by IEEE 802.1v-2001.

Copyright (C) The Internet Society (2006). This version of this MIB module is part of RFC 4363; See the RFC itself for full legal notices."

REVISION "200601090000Z"

DESCRIPTION

"Added Vlan TEXTUAL-CONVENTIONS, dot1qPortRestrictedVlanRegistration, dot1vProtocol subtree, qBridgeClassificationDeviceGroup, qBridgePortGroup2, qBridgeClassificationPortGroup, and qBridgeCompliance2. Clarified dot1qForwardAllStaticPorts, qPortAcceptableFrameTypes, and qBridgeCompliance. Deprecated qBridgePortGroup and qBridgeCompliance."

REVISION "199908250000Z"

DESCRIPTION

"The VLAN Bridge MIB module for managing Virtual Bridged Local Area Networks, as defined by IEEE 802.1Q-1998.

Initial version, published as RFC 2674."

::= { dot1dBridge 7 }

qBridgeMIBObjects OBJECT IDENTIFIER ::= { qBridgeMIB 1 }

-- -----
 -- Textual Conventions
 -- -----

PortList ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Each octet within this value specifies a set of eight ports, with the first octet specifying ports 1 through 8, the second octet specifying ports 9 through 16, etc. Within each octet, the most significant bit represents the lowest numbered port, and the least significant bit represents the highest numbered port. Thus, each port of the bridge is represented by a single bit within the value of this object. If that bit has a value of '1', then that port is included in the set of ports; the port is not included if its bit has a value of '0'."

SYNTAX OCTET STRING

VlanIndex ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"A value used to index per-VLAN tables: values of 0 and 4095 are not permitted. If the value is between 1 and 4094 inclusive, it represents an IEEE 802.1Q VLAN-ID with global scope within a given bridged domain (see VlanId textual convention). If the value is greater than 4095,

then it represents a VLAN with scope local to the particular agent, i.e., one without a global VLAN-ID assigned to it. Such VLANs are outside the scope of IEEE 802.1Q, but it is convenient to be able to manage them in the same way using this MIB."

SYNTAX Unsigned32

VlanId ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"The VLAN-ID that uniquely identifies a VLAN. This is the 12-bit VLAN-ID used in the VLAN Tag header. The range is defined by the REFERENCED specification."

REFERENCE

"IEEE Std 802.1Q 2003 Edition, Virtual Bridged Local Area Networks."

SYNTAX Integer32 (1..4094)

VlanIdOrAny ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"The VLAN-ID that uniquely identifies a specific VLAN, or any VLAN. The special value of 4095 is used to indicate a wildcard, i.e., any VLAN. This can be used in any situation where an object or table entry must refer either to a specific VLAN or to any VLAN."

Note that a MIB object that is defined using this TEXTUAL-CONVENTION should clarify the meaning of 'any VLAN' (i.e., the special value 4095)."

SYNTAX Integer32 (1..4094 | 4095)

VlanIdOrNone ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"The VLAN-ID that uniquely identifies a specific VLAN, or no VLAN. The special value of zero is used to indicate that no VLAN-ID is present or used. This can be used in any situation where an object or a table entry must refer either to a specific VLAN, or to no VLAN."

Note that a MIB object that is defined using this TEXTUAL-CONVENTION should clarify the meaning of 'no VLAN' (i.e., the special value 0)."

SYNTAX Integer32 (0 | 1..4094)

VlanIdOrAnyOrNone ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"The VLAN-ID that uniquely identifies a specific VLAN, any VLAN, or no VLAN. The special values 0 and 4095 have the same meaning as described in the VlanIdOrAny and VlanIdOrNone TEXTUAL-CONVENTIONS.

Note that a MIB object that is defined using this TEXTUAL-CONVENTION should clarify the meaning of 'any VLAN' and 'no VLAN' (i.e., the special values 0 and 4095)."

SYNTAX Integer32 (0 | 1..4094 | 4095)

-- -----
 -- subtrees in the Q-BRIDGE MIB
 -- -----

dot1qBase OBJECT IDENTIFIER ::= { qBridgeMIBObjects 1 }
 dot1qTp OBJECT IDENTIFIER ::= { qBridgeMIBObjects 2 }
 dot1qStatic OBJECT IDENTIFIER ::= { qBridgeMIBObjects 3 }
 dot1qVlan OBJECT IDENTIFIER ::= { qBridgeMIBObjects 4 }
 dot1vProtocol OBJECT IDENTIFIER ::= { qBridgeMIBObjects 5 }

-- -----
 -- dot1qBase subtree
 -- -----

dot1qVlanVersionNumber OBJECT-TYPE

SYNTAX INTEGER {
 version1(1)
 }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The version number of IEEE 802.1Q that this device supports."

REFERENCE

"IEEE 802.1Q/D11 Section 12.10.1.1"

::= { dot1qBase 1 }

dot1qMaxVlanId OBJECT-TYPE

SYNTAX VlanId

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum IEEE 802.1Q VLAN-ID that this device

supports."

REFERENCE

"IEEE 802.1Q/D11 Section 9.3.2.3"

::= { dot1qBase 2 }

dot1qMaxSupportedVlans OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum number of IEEE 802.1Q VLANs that this device supports."

REFERENCE

"IEEE 802.1Q/D11 Section 12.10.1.1"

::= { dot1qBase 3 }

dot1qNumVlans OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The current number of IEEE 802.1Q VLANs that are configured in this device."

REFERENCE

"IEEE 802.1Q/D11 Section 12.7.1.1"

::= { dot1qBase 4 }

dot1qGvrpStatus OBJECT-TYPE

SYNTAX EnabledStatus

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The administrative status requested by management for GVRP. The value enabled(1) indicates that GVRP should be enabled on this device, on all ports for which it has not been specifically disabled. When disabled(2), GVRP is disabled on all ports, and all GVRP packets will be forwarded transparently. This object affects all GVRP Applicant and Registrar state machines. A transition from disabled(2) to enabled(1) will cause a reset of all GVRP state machines on all ports.

The value of this object MUST be retained across reinitializations of the management system."

DEFVAL { enabled }

::= { dot1qBase 5 }

```

-- the dot1qTp subtree
-- -----

-- -----
-- the current Filtering Database Table
-- -----

dot1qFdbTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Dot1qFdbEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table that contains configuration and control
        information for each Filtering Database currently
        operating on this device.  Entries in this table appear
        automatically when VLANs are assigned FDB IDs in the
        dot1qVlanCurrentTable."
    ::= { dot1qTp 1 }

dot1qFdbEntry OBJECT-TYPE
    SYNTAX      Dot1qFdbEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Information about a specific Filtering Database."
    INDEX       { dot1qFdbId }
    ::= { dot1qFdbTable 1 }

Dot1qFdbEntry ::=
    SEQUENCE {
        dot1qFdbId
            Unsigned32,
        dot1qFdbDynamicCount
            Counter32
    }

dot1qFdbId OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The identity of this Filtering Database."
    ::= { dot1qFdbEntry 1 }

dot1qFdbDynamicCount OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current

```


DESCRIPTION

"The current number of dynamic entries in this Filtering Database."

REFERENCE

"IEEE 802.1Q/D11 Section 12.7.1.1.3"

::= { dot1qFdbEntry 2 }

```
-- -----
-- Multiple Forwarding Databases for 802.1Q Transparent Devices
-- This table is an alternative to the dot1dTpFdbTable,
-- previously defined for 802.1D devices that only support a
-- single Forwarding Database.
-- -----
```

dot1qTpFdbTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1qTpFdbEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table that contains information about unicast entries for which the device has forwarding and/or filtering information. This information is used by the transparent bridging function in determining how to propagate a received frame."

REFERENCE

"IEEE 802.1Q/D11 Section 12.7.7"

::= { dot1qTp 2 }

dot1qTpFdbEntry OBJECT-TYPE

SYNTAX Dot1qTpFdbEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Information about a specific unicast MAC address for which the device has some forwarding and/or filtering information."

INDEX { dot1qFdbId, dot1qTpFdbAddress }

::= { dot1qTpFdbTable 1 }

Dot1qTpFdbEntry ::=

```
SEQUENCE {
    dot1qTpFdbAddress
        MacAddress,
    dot1qTpFdbPort
        Integer32,
    dot1qTpFdbStatus
        INTEGER
}
```

dot1qTpFdbAddress OBJECT-TYPE

SYNTAX MacAddress
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"A unicast MAC address for which the device has forwarding and/or filtering information."

::= { dot1qTpFdbEntry 1 }

dot1qTpFdbPort OBJECT-TYPE

SYNTAX Integer32 (0..65535)
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"Either the value '0', or the port number of the port on which a frame having a source address equal to the value of the corresponding instance of dot1qTpFdbAddress has been seen. A value of '0' indicates that the port number has not been learned but that the device does have some forwarding/filtering information about this address (e.g., in the dot1qStaticUnicastTable). Implementors are encouraged to assign the port value to this object whenever it is learned, even for addresses for which the corresponding value of dot1qTpFdbStatus is not learned(3)."

::= { dot1qTpFdbEntry 2 }

dot1qTpFdbStatus OBJECT-TYPE

SYNTAX INTEGER {
 other(1),
 invalid(2),
 learned(3),
 self(4),
 mgmt(5)
 }
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The status of this entry. The meanings of the values are:

other(1) - none of the following. This may include the case where some other MIB object (not the corresponding instance of dot1qTpFdbPort, nor an entry in the dot1qStaticUnicastTable) is being used to determine if and how frames addressed to the value of the corresponding instance of dot1qTpFdbAddress are being forwarded.

invalid(2) - this entry is no longer valid (e.g., it

was learned but has since aged out), but has not yet been flushed from the table.

learned(3) - the value of the corresponding instance of dot1qTpFdbPort was learned and is being used.

self(4) - the value of the corresponding instance of dot1qTpFdbAddress represents one of the device's addresses. The corresponding instance of dot1qTpFdbPort indicates which of the device's ports has this address.

mgmt(5) - the value of the corresponding instance of dot1qTpFdbAddress is also the value of an existing instance of dot1qStaticAddress."

```
::= { dot1qTpFdbEntry 3 }
```

```
-- -----
-- Dynamic Group Registration Table
-- -----
```

dot1qTpGroupTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1qTpGroupEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table containing filtering information for VLANs configured into the bridge by (local or network) management, or learned dynamically, specifying the set of ports to which frames received on a VLAN for this FDB and containing a specific Group destination address are allowed to be forwarded."

```
::= { dot1qTp 3 }
```

dot1qTpGroupEntry OBJECT-TYPE

SYNTAX Dot1qTpGroupEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Filtering information configured into the bridge by management, or learned dynamically, specifying the set of ports to which frames received on a VLAN and containing a specific Group destination address are allowed to be forwarded. The subset of these ports learned dynamically is also provided."

INDEX { dot1qVlanIndex, dot1qTpGroupAddress }

```
::= { dot1qTpGroupTable 1 }
```

Dot1qTpGroupEntry ::=

```
SEQUENCE {
    dot1qTpGroupAddress
```

```

        MacAddress,
        dot1qTpGroupEgressPorts
        PortList,
        dot1qTpGroupLearnt
        PortList
    }

dot1qTpGroupAddress OBJECT-TYPE
    SYNTAX      MacAddress
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The destination Group MAC address in a frame to which
        this entry's filtering information applies."
    ::= { dot1qTpGroupEntry 1 }

dot1qTpGroupEgressPorts OBJECT-TYPE
    SYNTAX      PortList
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The complete set of ports, in this VLAN, to which
        frames destined for this Group MAC address are currently
        being explicitly forwarded. This does not include ports
        for which this address is only implicitly forwarded, in
        the dot1qForwardAllPorts list."
    ::= { dot1qTpGroupEntry 2 }

dot1qTpGroupLearnt OBJECT-TYPE
    SYNTAX      PortList
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The subset of ports in dot1qTpGroupEgressPorts that
        were learned by GMRP or some other dynamic mechanism, in
        this Filtering database."
    ::= { dot1qTpGroupEntry 3 }

-- -----
-- Service Requirements subtree
-- -----

dot1qForwardAllTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Dot1qForwardAllEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "A table containing forwarding information for each

```

VLAN, specifying the set of ports to which forwarding of all multicasts applies, configured statically by management or dynamically by GMRP. An entry appears in this table for all VLANs that are currently instantiated."

REFERENCE

"IEEE 802.1Q/D11 Section 12.7.2, 12.7.7"

::= { dot1qTp 4 }

dot1qForwardAllEntry OBJECT-TYPE

SYNTAX Dot1qForwardAllEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Forwarding information for a VLAN, specifying the set of ports to which all multicasts should be forwarded, configured statically by management or dynamically by GMRP."

INDEX { dot1qVlanIndex }

::= { dot1qForwardAllTable 1 }

Dot1qForwardAllEntry ::=

```
SEQUENCE {
    dot1qForwardAllPorts
        PortList,
    dot1qForwardAllStaticPorts
        PortList,
    dot1qForwardAllForbiddenPorts
        PortList
}
```

dot1qForwardAllPorts OBJECT-TYPE

SYNTAX PortList

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The complete set of ports in this VLAN to which all multicast group-addressed frames are to be forwarded. This includes ports for which this need has been determined dynamically by GMRP, or configured statically by management."

::= { dot1qForwardAllEntry 1 }

dot1qForwardAllStaticPorts OBJECT-TYPE

SYNTAX PortList

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The set of ports configured by management in this VLAN to which all multicast group-addressed frames are to be forwarded. Ports entered in this list will also appear in the complete set shown by dot1qForwardAllPorts. This value will be restored after the device is reset. This only applies to ports that are members of the VLAN, defined by dot1qVlanCurrentEgressPorts. A port may not be added in this set if it is already a member of the set of ports in dot1qForwardAllForbiddenPorts. The default value is a string of ones of appropriate length, to indicate the standard behaviour of using basic filtering services, i.e., forward all multicasts to all ports.

The value of this object MUST be retained across reinitializations of the management system."

::= { dot1qForwardAllEntry 2 }

dot1qForwardAllForbiddenPorts OBJECT-TYPE

SYNTAX PortList
 MAX-ACCESS read-write
 STATUS current
 DESCRIPTION

"The set of ports configured by management in this VLAN for which the Service Requirement attribute Forward All Multicast Groups may not be dynamically registered by GMRP. This value will be restored after the device is reset. A port may not be added in this set if it is already a member of the set of ports in dot1qForwardAllStaticPorts. The default value is a string of zeros of appropriate length.

The value of this object MUST be retained across reinitializations of the management system."

::= { dot1qForwardAllEntry 3 }

dot1qForwardUnregisteredTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1qForwardUnregisteredEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

"A table containing forwarding information for each VLAN, specifying the set of ports to which forwarding of multicast group-addressed frames for which no more specific forwarding information applies. This is configured statically by management and determined dynamically by GMRP. An entry appears in this table for all VLANs that are currently instantiated."

REFERENCE

"IEEE 802.1Q/D11 Section 12.7.2, 12.7.7"

::= { dot1qTp 5 }

dot1qForwardUnregisteredEntry OBJECT-TYPE

SYNTAX Dot1qForwardUnregisteredEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Forwarding information for a VLAN, specifying the set of ports to which all multicasts for which there is no more specific forwarding information shall be forwarded. This is configured statically by management or dynamically by GMRP."

INDEX { dot1qVlanIndex }

::= { dot1qForwardUnregisteredTable 1 }

Dot1qForwardUnregisteredEntry ::=

SEQUENCE {

dot1qForwardUnregisteredPorts

PortList,

dot1qForwardUnregisteredStaticPorts

PortList,

dot1qForwardUnregisteredForbiddenPorts

PortList

}

dot1qForwardUnregisteredPorts OBJECT-TYPE

SYNTAX PortList

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The complete set of ports in this VLAN to which multicast group-addressed frames for which there is no more specific forwarding information will be forwarded. This includes ports for which this need has been determined dynamically by GMRP, or configured statically by management."

::= { dot1qForwardUnregisteredEntry 1 }

dot1qForwardUnregisteredStaticPorts OBJECT-TYPE

SYNTAX PortList

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The set of ports configured by management, in this VLAN, to which multicast group-addressed frames for which there is no more specific forwarding information

are to be forwarded. Ports entered in this list will also appear in the complete set shown by dot1qForwardUnregisteredPorts. This value will be restored after the device is reset. A port may not be added in this set if it is already a member of the set of ports in dot1qForwardUnregisteredForbiddenPorts. The default value is a string of zeros of appropriate length, although this has no effect with the default value of dot1qForwardAllStaticPorts.

The value of this object MUST be retained across reinitializations of the management system."

```
::= { dot1qForwardUnregisteredEntry 2 }
```

dot1qForwardUnregisteredForbiddenPorts OBJECT-TYPE

SYNTAX PortList

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The set of ports configured by management in this VLAN for which the Service Requirement attribute Forward Unregistered Multicast Groups may not be dynamically registered by GMRP. This value will be restored after the device is reset. A port may not be added in this set if it is already a member of the set of ports in dot1qForwardUnregisteredStaticPorts. The default value is a string of zeros of appropriate length.

The value of this object MUST be retained across reinitializations of the management system."

```
::= { dot1qForwardUnregisteredEntry 3 }
```

```
-- -----
-- The Static (Destination-Address Filtering) Database
-- -----
```

dot1qStaticUnicastTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1qStaticUnicastEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table containing filtering information for Unicast MAC addresses for each Filtering Database, configured into the device by (local or network) management specifying the set of ports to which frames received from specific ports and containing specific unicast destination addresses are allowed to be forwarded. A value of zero in this table (as the port number from

which frames with a specific destination address are received) is used to specify all ports for which there is no specific entry in this table for that particular destination address. Entries are valid for unicast addresses only."

REFERENCE

"IEEE 802.1Q/D11 Section 12.7.7,
ISO/IEC 15802-3 Section 7.9.1"

```
::= { dot1qStatic 1 }
```

dot1qStaticUnicastEntry OBJECT-TYPE

SYNTAX Dot1qStaticUnicastEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Filtering information configured into the device by (local or network) management specifying the set of ports to which frames received from a specific port and containing a specific unicast destination address are allowed to be forwarded."

```
INDEX {
    dot1qFdbId,
    dot1qStaticUnicastAddress,
    dot1qStaticUnicastReceivePort
}
::= { dot1qStaticUnicastTable 1 }
```

Dot1qStaticUnicastEntry ::=

```
SEQUENCE {
    dot1qStaticUnicastAddress
        MacAddress,
    dot1qStaticUnicastReceivePort
        Integer32,
    dot1qStaticUnicastAllowedToGoTo
        PortList,
    dot1qStaticUnicastStatus
        INTEGER
}
```

dot1qStaticUnicastAddress OBJECT-TYPE

SYNTAX MacAddress

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The destination MAC address in a frame to which this entry's filtering information applies. This object must take the value of a unicast address."

```
::= { dot1qStaticUnicastEntry 1 }
```

dot1qStaticUnicastReceivePort OBJECT-TYPE

SYNTAX Integer32 (0..65535)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Either the value '0' or the port number of the port from which a frame must be received in order for this entry's filtering information to apply. A value of zero indicates that this entry applies on all ports of the device for which there is no other applicable entry."

::= { dot1qStaticUnicastEntry 2 }

dot1qStaticUnicastAllowedToGoTo OBJECT-TYPE

SYNTAX PortList

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The set of ports for which a frame with a specific unicast address will be flooded in the event that it has not been learned. It also specifies the set of ports on which a specific unicast address may be dynamically learned. The dot1qTpFdbTable will have an equivalent entry with a dot1qTpFdbPort value of '0' until this address has been learned, at which point it will be updated with the port the address has been seen on. This only applies to ports that are members of the VLAN, defined by dot1qVlanCurrentEgressPorts. The default value of this object is a string of ones of appropriate length.

The value of this object MUST be retained across reinitializations of the management system."

REFERENCE

"IEEE 802.1Q/D11 Table 8-5, ISO/IEC 15802-3 Table 7-5"

::= { dot1qStaticUnicastEntry 3 }

dot1qStaticUnicastStatus OBJECT-TYPE

SYNTAX INTEGER {
 other(1),
 invalid(2),
 permanent(3),
 deleteOnReset(4),
 deleteOnTimeout(5)
}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object indicates the status of this entry.
 other(1) - this entry is currently in use, but

the conditions under which it will remain so differ from the following values.

- invalid(2) - writing this value to the object removes the corresponding entry.
- permanent(3) - this entry is currently in use and will remain so after the next reset of the bridge.
- deleteOnReset(4) - this entry is currently in use and will remain so until the next reset of the bridge.
- deleteOnTimeout(5) - this entry is currently in use and will remain so until it is aged out.

The value of this object MUST be retained across reinitializations of the management system."

DEFVAL { permanent }
 ::= { dot1qStaticUnicastEntry 4 }

dot1qStaticMulticastTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1qStaticMulticastEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

"A table containing filtering information for Multicast and Broadcast MAC addresses for each VLAN, configured into the device by (local or network) management specifying the set of ports to which frames received from specific ports and containing specific Multicast and Broadcast destination addresses are allowed to be forwarded. A value of zero in this table (as the port number from which frames with a specific destination address are received) is used to specify all ports for which there is no specific entry in this table for that particular destination address. Entries are valid for Multicast and Broadcast addresses only."

REFERENCE

"IEEE 802.1Q/D11 Section 12.7.7,
 ISO/IEC 15802-3 Section 7.9.1"

::= { dot1qStatic 2 }

dot1qStaticMulticastEntry OBJECT-TYPE

SYNTAX Dot1qStaticMulticastEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

"Filtering information configured into the device by (local or network) management specifying the set of ports to which frames received from this specific port

for this VLAN and containing this Multicast or Broadcast destination address are allowed to be forwarded."

```
INDEX {
    dot1qVlanIndex,
    dot1qStaticMulticastAddress,
    dot1qStaticMulticastReceivePort
}
 ::= { dot1qStaticMulticastTable 1 }
```

```
Dot1qStaticMulticastEntry ::=
    SEQUENCE {
        dot1qStaticMulticastAddress
            MacAddress,
        dot1qStaticMulticastReceivePort
            Integer32,
        dot1qStaticMulticastStaticEgressPorts
            PortList,
        dot1qStaticMulticastForbiddenEgressPorts
            PortList,
        dot1qStaticMulticastStatus
            INTEGER
    }
```

```
dot1qStaticMulticastAddress OBJECT-TYPE
    SYNTAX      MacAddress
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The destination MAC address in a frame to which this
        entry's filtering information applies. This object must
        take the value of a Multicast or Broadcast address."
    ::= { dot1qStaticMulticastEntry 1 }
```

```
dot1qStaticMulticastReceivePort OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Either the value '0' or the port number of the port
        from which a frame must be received in order for this
        entry's filtering information to apply. A value of zero
        indicates that this entry applies on all ports of the
        device for which there is no other applicable entry."
    ::= { dot1qStaticMulticastEntry 2 }
```

```
dot1qStaticMulticastStaticEgressPorts OBJECT-TYPE
    SYNTAX      PortList
    MAX-ACCESS  read-write
```

STATUS current

DESCRIPTION

"The set of ports to which frames received from a specific port and destined for a specific Multicast or Broadcast MAC address must be forwarded, regardless of any dynamic information, e.g., from GMRP. A port may not be added in this set if it is already a member of the set of ports in dot1qStaticMulticastForbiddenEgressPorts. The default value of this object is a string of ones of appropriate length.

The value of this object MUST be retained across reinitializations of the management system."

::= { dot1qStaticMulticastEntry 3 }

dot1qStaticMulticastForbiddenEgressPorts OBJECT-TYPE

SYNTAX PortList

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The set of ports to which frames received from a specific port and destined for a specific Multicast or Broadcast MAC address must not be forwarded, regardless of any dynamic information, e.g., from GMRP. A port may not be added in this set if it is already a member of the set of ports in dot1qStaticMulticastStaticEgressPorts. The default value of this object is a string of zeros of appropriate length.

The value of this object MUST be retained across reinitializations of the management system."

::= { dot1qStaticMulticastEntry 4 }

dot1qStaticMulticastStatus OBJECT-TYPE

SYNTAX INTEGER {
 other(1),
 invalid(2),
 permanent(3),
 deleteOnReset(4),
 deleteOnTimeout(5)
 }

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object indicates the status of this entry.
 other(1) - this entry is currently in use, but
 the conditions under which it will remain
 so differ from the following values.

invalid(2) - writing this value to the object
removes the corresponding entry.
permanent(3) - this entry is currently in use
and will remain so after the next reset of
the bridge.
deleteOnReset(4) - this entry is currently in
use and will remain so until the next
reset of the bridge.
deleteOnTimeout(5) - this entry is currently in
use and will remain so until it is aged out.

The value of this object MUST be retained across
reinitializations of the management system."

DEFVAL { permanent }
::= { dot1qStaticMulticastEntry 5 }

-- -----
-- The Current VLAN Database
-- -----

dot1qVlanNumDeletes OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of times a VLAN entry has been deleted from
the dot1qVlanCurrentTable (for any reason). If an entry
is deleted, then inserted, and then deleted, this
counter will be incremented by 2."

::= { dot1qVlan 1 }

dot1qVlanCurrentTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1qVlanCurrentEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table containing current configuration information
for each VLAN currently configured into the device by
(local or network) management, or dynamically created
as a result of GVRP requests received."

::= { dot1qVlan 2 }

dot1qVlanCurrentEntry OBJECT-TYPE

SYNTAX Dot1qVlanCurrentEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Information for a VLAN configured into the device by

(local or network) management, or dynamically created as a result of GVRP requests received."
 INDEX { dot1qVlanTimeMark, dot1qVlanIndex }
 ::= { dot1qVlanCurrentTable 1 }

Dot1qVlanCurrentEntry ::=

```

SEQUENCE {
    dot1qVlanTimeMark
        TimeFilter,
    dot1qVlanIndex
        VlanIndex,
    dot1qVlanFdbId
        Unsigned32,
    dot1qVlanCurrentEgressPorts
        PortList,
    dot1qVlanCurrentUntaggedPorts
        PortList,
    dot1qVlanStatus
        INTEGER,
    dot1qVlanCreationTime
        TimeTicks
}
```

dot1qVlanTimeMark OBJECT-TYPE
 SYNTAX TimeFilter
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "A TimeFilter for this entry. See the TimeFilter textual convention to see how this works."
 ::= { dot1qVlanCurrentEntry 1 }

dot1qVlanIndex OBJECT-TYPE
 SYNTAX VlanIndex
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "The VLAN-ID or other identifier referring to this VLAN."
 ::= { dot1qVlanCurrentEntry 2 }

dot1qVlanFdbId OBJECT-TYPE
 SYNTAX Unsigned32
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The Filtering Database used by this VLAN. This is one of the dot1qFdbId values in the dot1qFdbTable. This value is allocated automatically by the device whenever

the VLAN is created: either dynamically by GVRP, or by management, in dot1qVlanStaticTable. Allocation of this value follows the learning constraints defined for this VLAN in dot1qLearningConstraintsTable."

::= { dot1qVlanCurrentEntry 3 }

dot1qVlanCurrentEgressPorts OBJECT-TYPE

SYNTAX PortList

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The set of ports that are transmitting traffic for this VLAN as either tagged or untagged frames."

REFERENCE

"IEEE 802.1Q/D11 Section 12.10.2.1"

::= { dot1qVlanCurrentEntry 4 }

dot1qVlanCurrentUntaggedPorts OBJECT-TYPE

SYNTAX PortList

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The set of ports that are transmitting traffic for this VLAN as untagged frames."

REFERENCE

"IEEE 802.1Q/D11 Section 12.10.2.1"

::= { dot1qVlanCurrentEntry 5 }

dot1qVlanStatus OBJECT-TYPE

SYNTAX INTEGER {
 other(1),
 permanent(2),
 dynamicGvrp(3)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object indicates the status of this entry.

 other(1) - this entry is currently in use, but the conditions under which it will remain so differ from the following values.

 permanent(2) - this entry, corresponding to an entry in dot1qVlanStaticTable, is currently in use and will remain so after the next reset of the device. The port lists for this entry include ports from the equivalent dot1qVlanStaticTable entry and ports learned dynamically.

 dynamicGvrp(3) - this entry is currently in use

and will remain so until removed by GVRP. There is no static entry for this VLAN, and it will be removed when the last port leaves the VLAN."

```
::= { dot1qVlanCurrentEntry 6 }
```

```
dot1qVlanCreationTime OBJECT-TYPE
```

```
SYNTAX          TimeTicks
```

```
MAX-ACCESS      read-only
```

```
STATUS          current
```

```
DESCRIPTION
```

```
"The value of sysUpTime when this VLAN was created."
```

```
::= { dot1qVlanCurrentEntry 7 }
```

```
-- -----
-- The Static VLAN Database
-- -----
```

```
dot1qVlanStaticTable OBJECT-TYPE
```

```
SYNTAX          SEQUENCE OF Dot1qVlanStaticEntry
```

```
MAX-ACCESS      not-accessible
```

```
STATUS          current
```

```
DESCRIPTION
```

```
"A table containing static configuration information for each VLAN configured into the device by (local or network) management. All entries are permanent and will be restored after the device is reset."
```

```
::= { dot1qVlan 3 }
```

```
dot1qVlanStaticEntry OBJECT-TYPE
```

```
SYNTAX          Dot1qVlanStaticEntry
```

```
MAX-ACCESS      not-accessible
```

```
STATUS          current
```

```
DESCRIPTION
```

```
"Static information for a VLAN configured into the device by (local or network) management."
```

```
INDEX          { dot1qVlanIndex }
```

```
::= { dot1qVlanStaticTable 1 }
```

```
Dot1qVlanStaticEntry ::=
```

```
SEQUENCE {
```

```
dot1qVlanStaticName
```

```
SnmpAdminString,
```

```
dot1qVlanStaticEgressPorts
```

```
PortList,
```

```
dot1qVlanForbiddenEgressPorts
```

```
PortList,
```

```
dot1qVlanStaticUntaggedPorts
```

```
PortList,
```

```
        dot1qVlanStaticRowStatus
            RowStatus
    }

dot1qVlanStaticName OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE (0..32))
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "An administratively assigned string, which may be used
        to identify the VLAN."
    REFERENCE
        "IEEE 802.1Q/D11 Section 12.10.2.1"
    ::= { dot1qVlanStaticEntry 1 }

dot1qVlanStaticEgressPorts OBJECT-TYPE
    SYNTAX      PortList
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "The set of ports that are permanently assigned to the
        egress list for this VLAN by management. Changes to a
        bit in this object affect the per-port, per-VLAN
        Registrar control for Registration Fixed for the
        relevant GVRP state machine on each port. A port may
        not be added in this set if it is already a member of
        the set of ports in dot1qVlanForbiddenEgressPorts. The
        default value of this object is a string of zeros of
        appropriate length, indicating not fixed."
    REFERENCE
        "IEEE 802.1Q/D11 Section 12.7.7.3, 11.2.3.2.3"
    ::= { dot1qVlanStaticEntry 2 }

dot1qVlanForbiddenEgressPorts OBJECT-TYPE
    SYNTAX      PortList
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "The set of ports that are prohibited by management
        from being included in the egress list for this VLAN.
        Changes to this object that cause a port to be included
        or excluded affect the per-port, per-VLAN Registrar
        control for Registration Forbidden for the relevant GVRP
        state machine on each port. A port may not be added in
        this set if it is already a member of the set of ports
        in dot1qVlanStaticEgressPorts. The default value of
        this object is a string of zeros of appropriate length,
        excluding all ports from the forbidden set."
```

REFERENCE

"IEEE 802.1Q/D11 Section 12.7.7.3, 11.2.3.2.3"

::= { dot1qVlanStaticEntry 3 }

dot1qVlanStaticUntaggedPorts OBJECT-TYPE

SYNTAX PortList

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The set of ports that should transmit egress packets for this VLAN as untagged. The default value of this object for the default VLAN (dot1qVlanIndex = 1) is a string of appropriate length including all ports. There is no specified default for other VLANs. If a device agent cannot support the set of ports being set, then it will reject the set operation with an error. For example, a manager might attempt to set more than one VLAN to be untagged on egress where the device does not support this IEEE 802.1Q option."

REFERENCE

"IEEE 802.1Q/D11 Section 12.10.2.1"

::= { dot1qVlanStaticEntry 4 }

dot1qVlanStaticRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object indicates the status of this entry."

::= { dot1qVlanStaticEntry 5 }

dot1qNextFreeLocalVlanIndex OBJECT-TYPE

SYNTAX Integer32 (0|4096..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The next available value for dot1qVlanIndex of a local VLAN entry in dot1qVlanStaticTable. This will report values >=4096 if a new Local VLAN may be created or else the value 0 if this is not possible."

A row creation operation in this table for an entry with a local VlanIndex value may fail if the current value of this object is not used as the index. Even if the value read is used, there is no guarantee that it will still be the valid index when the create operation is attempted; another manager may have already got in during the intervening time interval. In this case, dot1qNextFreeLocalVlanIndex should be re-read

and the creation re-tried with the new value.

This value will automatically change when the current value is used to create a new row."

```
::= { dot1qVlan 4 }
```

```
-- -----
-- The VLAN Port Configuration Table
-- -----
```

dot1qPortVlanTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1qPortVlanEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table containing per-port control and status information for VLAN configuration in the device."

```
::= { dot1qVlan 5 }
```

dot1qPortVlanEntry OBJECT-TYPE

SYNTAX Dot1qPortVlanEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Information controlling VLAN configuration for a port on the device. This is indexed by dot1dBasePort."

AUGMENTS { dot1dBasePortEntry }

```
::= { dot1qPortVlanTable 1 }
```

Dot1qPortVlanEntry ::=

```
SEQUENCE {
    dot1qPvid
        VlanIndex,
    dot1qPortAcceptableFrameTypes
        INTEGER,
    dot1qPortIngressFiltering
        TruthValue,
    dot1qPortGvrpStatus
        EnabledStatus,
    dot1qPortGvrpFailedRegistrations
        Counter32,
    dot1qPortGvrpLastPduOrigin
        MacAddress,
    dot1qPortRestrictedVlanRegistration
        TruthValue
}
```

dot1qPvid OBJECT-TYPE

```

SYNTAX      VlanIndex
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "The PVID, the VLAN-ID assigned to untagged frames or
    Priority-Tagged frames received on this port.

    The value of this object MUST be retained across
    reinitializations of the management system."
REFERENCE
    "IEEE 802.1Q/D11 Section 12.10.1.1"
DEFVAL      { 1 }
 ::= { dot1qPortVlanEntry 1 }

```

dot1qPortAcceptableFrameTypes OBJECT-TYPE

```

SYNTAX      INTEGER {
                    admitAll(1),
                    admitOnlyVlanTagged(2)
                }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "When this is admitOnlyVlanTagged(2), the device will
    discard untagged frames or Priority-Tagged frames
    received on this port.  When admitAll(1), untagged
    frames or Priority-Tagged frames received on this port
    will be accepted and assigned to a VID based on the
    PVID and VID Set for this port.

    This control does not affect VLAN-independent Bridge
    Protocol Data Unit (BPDU) frames, such as GVRP and
    Spanning Tree Protocol (STP).  It does affect VLAN-
    dependent BPDU frames, such as GMRP.

    The value of this object MUST be retained across
    reinitializations of the management system."
REFERENCE
    "IEEE 802.1Q/D11 Section 12.10.1.3"
DEFVAL      { admitAll }
 ::= { dot1qPortVlanEntry 2 }

```

dot1qPortIngressFiltering OBJECT-TYPE

```

SYNTAX      TruthValue
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "When this is true(1), the device will discard incoming
    frames for VLANs that do not include this Port in its

```

Member set. When false(2), the port will accept all incoming frames.

This control does not affect VLAN-independent BPDU frames, such as GVRP and STP. It does affect VLAN-dependent BPDU frames, such as GMRP.

The value of this object MUST be retained across reinitializations of the management system."

REFERENCE

"IEEE 802.1Q/D11 Section 12.10.1.4"

DEFVAL { false }
 ::= { dot1qPortVlanEntry 3 }

dot1qPortGvrpStatus OBJECT-TYPE

SYNTAX EnabledStatus
 MAX-ACCESS read-write
 STATUS current

DESCRIPTION

"The state of GVRP operation on this port. The value enabled(1) indicates that GVRP is enabled on this port, as long as dot1qGvrpStatus is also enabled for this device. When disabled(2) but dot1qGvrpStatus is still enabled for the device, GVRP is disabled on this port: any GVRP packets received will be silently discarded, and no GVRP registrations will be propagated from other ports. This object affects all GVRP Applicant and Registrar state machines on this port. A transition from disabled(2) to enabled(1) will cause a reset of all GVRP state machines on this port.

The value of this object MUST be retained across reinitializations of the management system."

DEFVAL { enabled }
 ::= { dot1qPortVlanEntry 4 }

dot1qPortGvrpFailedRegistrations OBJECT-TYPE

SYNTAX Counter32
 MAX-ACCESS read-only
 STATUS current

DESCRIPTION

"The total number of failed GVRP registrations, for any reason, on this port."

::= { dot1qPortVlanEntry 5 }

dot1qPortGvrpLastPduOrigin OBJECT-TYPE

SYNTAX MacAddress
 MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The Source MAC Address of the last GVRP message received on this port."

::= { dot1qPortVlanEntry 6 }

dot1qPortRestrictedVlanRegistration OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The state of Restricted VLAN Registration on this port. If the value of this control is true(1), then creation of a new dynamic VLAN entry is permitted only if there is a Static VLAN Registration Entry for the VLAN concerned, in which the Registrar Administrative Control value for this port is Normal Registration.

The value of this object MUST be retained across reinitializations of the management system."

REFERENCE

"IEEE 802.1u clause 11.2.3.2.3, 12.10.1.7."

DEFVAL { false }

::= { dot1qPortVlanEntry 7 }

-- -----
 -- Per port VLAN Statistics Table
 -- -----

dot1qPortVlanStatisticsTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1qPortVlanStatisticsEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table containing per-port, per-VLAN statistics for traffic received. Separate objects are provided for both the most-significant and least-significant bits of statistics counters for ports that are associated with this transparent bridge. The most-significant bit objects are only required on high-capacity interfaces, as defined in the conformance clauses for these objects. This mechanism is provided as a way to read 64-bit counters for agents that support only SNMPv1.

Note that the reporting of most-significant and least-significant counter bits separately runs the risk of missing an overflow of the lower bits in the interval between sampling. The manager must be aware of this possibility, even within the same varbindlist, when interpreting the results of a request or

```
    asynchronous notification."  
 ::= { dot1qVlan 6 }
```

```
dot1qPortVlanStatisticsEntry OBJECT-TYPE  
SYNTAX      Dot1qPortVlanStatisticsEntry  
MAX-ACCESS  not-accessible  
STATUS      current  
DESCRIPTION  
    "Traffic statistics for a VLAN on an interface."  
INDEX       { dot1dBasePort, dot1qVlanIndex }  
 ::= { dot1qPortVlanStatisticsTable 1 }
```

```
Dot1qPortVlanStatisticsEntry ::=  
SEQUENCE {  
    dot1qTpVlanPortInFrames  
        Counter32,  
    dot1qTpVlanPortOutFrames  
        Counter32,  
    dot1qTpVlanPortInDiscards  
        Counter32,  
    dot1qTpVlanPortInOverflowFrames  
        Counter32,  
    dot1qTpVlanPortOutOverflowFrames  
        Counter32,  
    dot1qTpVlanPortInOverflowDiscards  
        Counter32  
}
```

```
dot1qTpVlanPortInFrames OBJECT-TYPE  
SYNTAX      Counter32  
MAX-ACCESS  read-only  
STATUS      current  
DESCRIPTION  
    "The number of valid frames received by this port from  
    its segment that were classified as belonging to this  
    VLAN. Note that a frame received on this port is  
    counted by this object if and only if it is for a  
    protocol being processed by the local forwarding process  
    for this VLAN. This object includes received bridge  
    management frames classified as belonging to this VLAN  
    (e.g., GMRP, but not GVRP or STP."  
REFERENCE  
    "IEEE 802.1Q/D11 Section 12.6.1.1.3(a)"  
 ::= { dot1qPortVlanStatisticsEntry 1 }
```

```
dot1qTpVlanPortOutFrames OBJECT-TYPE  
SYNTAX      Counter32  
MAX-ACCESS  read-only
```


STATUS current

DESCRIPTION

"The number of valid frames transmitted by this port to its segment from the local forwarding process for this VLAN. This includes bridge management frames originated by this device that are classified as belonging to this VLAN (e.g., GMRP, but not GVRP or STP)."

REFERENCE

"IEEE 802.1Q/D11 Section 12.6.1.1.3(d)"

::= { dot1qPortVlanStatisticsEntry 2 }

dot1qTpVlanPortInDiscards OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of valid frames received by this port from its segment that were classified as belonging to this VLAN and that were discarded due to VLAN-related reasons. Specifically, the IEEE 802.1Q counters for Discard Inbound and Discard on Ingress Filtering."

REFERENCE

"IEEE 802.1Q/D11 Section 12.6.1.1.3"

::= { dot1qPortVlanStatisticsEntry 3 }

dot1qTpVlanPortInOverflowFrames OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of times the associated dot1qTpVlanPortInFrames counter has overflowed."

REFERENCE

"ISO/IEC 15802-3 Section 14.6.1.1.3"

::= { dot1qPortVlanStatisticsEntry 4 }

dot1qTpVlanPortOutOverflowFrames OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of times the associated dot1qTpVlanPortOutFrames counter has overflowed."

REFERENCE

"ISO/IEC 15802-3 Section 14.6.1.1.3"

::= { dot1qPortVlanStatisticsEntry 5 }

dot1qTpVlanPortInOverflowDiscards OBJECT-TYPE

```

SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of times the associated
    dot1qTpVlanPortInDiscards counter has overflowed."
REFERENCE
    "ISO/IEC 15802-3 Section 14.6.1.1.3"
::= { dot1qPortVlanStatisticsEntry 6 }

```

```

dot1qPortVlanHCStatisticsTable OBJECT-TYPE
SYNTAX      SEQUENCE OF Dot1qPortVlanHCStatisticsEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A table containing per-port, per-VLAN statistics for
    traffic on high-capacity interfaces."
::= { dot1qVlan 7 }

```

```

dot1qPortVlanHCStatisticsEntry OBJECT-TYPE
SYNTAX      Dot1qPortVlanHCStatisticsEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "Traffic statistics for a VLAN on a high-capacity
    interface."
INDEX       { dot1dBasePort, dot1qVlanIndex }
::= { dot1qPortVlanHCStatisticsTable 1 }

```

```

Dot1qPortVlanHCStatisticsEntry ::=
SEQUENCE {
    dot1qTpVlanPortHCInFrames
        Counter64,
    dot1qTpVlanPortHCOutFrames
        Counter64,
    dot1qTpVlanPortHCInDiscards
        Counter64
}

```

```

dot1qTpVlanPortHCInFrames OBJECT-TYPE
SYNTAX      Counter64
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of valid frames received by this port from
    its segment that were classified as belonging to this
    VLAN. Note that a frame received on this port is
    counted by this object if and only if it is for a

```

protocol being processed by the local forwarding process for this VLAN. This object includes received bridge management frames classified as belonging to this VLAN (e.g., GMRP, but not GVRP or STP)."

REFERENCE

"IEEE 802.1Q/D11 Section 12.6.1.1.3(a)"

::= { dot1qPortVlanHCStatisticsEntry 1 }

dot1qTpVlanPortHCOutFrames OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of valid frames transmitted by this port to its segment from the local forwarding process for this VLAN. This includes bridge management frames originated by this device that are classified as belonging to this VLAN (e.g., GMRP, but not GVRP or STP)."

REFERENCE

"IEEE 802.1Q/D11 Section 12.6.1.1.3(d)"

::= { dot1qPortVlanHCStatisticsEntry 2 }

dot1qTpVlanPortHCInDiscards OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of valid frames received by this port from its segment that were classified as belonging to this VLAN and that were discarded due to VLAN-related reasons. Specifically, the IEEE 802.1Q counters for Discard Inbound and Discard on Ingress Filtering."

REFERENCE

"IEEE 802.1Q/D11 Section 12.6.1.1.3"

::= { dot1qPortVlanHCStatisticsEntry 3 }

```
-- -----
-- The VLAN Learning Constraints Table
-- -----
```

dot1qLearningConstraintsTable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot1qLearningConstraintsEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table containing learning constraints for sets of Shared and Independent VLANs."

REFERENCE

```

    "IEEE 802.1Q/D11 Section 12.10.3.1"
 ::= { dot1qVlan 8 }

```

```

dot1qLearningConstraintsEntry OBJECT-TYPE
    SYNTAX      Dot1qLearningConstraintsEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A learning constraint defined for a VLAN."
    INDEX       { dot1qConstraintVlan, dot1qConstraintSet }
    ::= { dot1qLearningConstraintsTable 1 }

```

```

Dot1qLearningConstraintsEntry ::=
    SEQUENCE {
        dot1qConstraintVlan
            VlanIndex,
        dot1qConstraintSet
            Integer32,
        dot1qConstraintType
            INTEGER,
        dot1qConstraintStatus
            RowStatus
    }

```

```

dot1qConstraintVlan OBJECT-TYPE
    SYNTAX      VlanIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The index of the row in dot1qVlanCurrentTable for the
        VLAN constrained by this entry."
    ::= { dot1qLearningConstraintsEntry 1 }

```

```

dot1qConstraintSet OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The identity of the constraint set to which
        dot1qConstraintVlan belongs.  These values may be chosen
        by the management station."
    ::= { dot1qLearningConstraintsEntry 2 }

```

```

dot1qConstraintType OBJECT-TYPE
    SYNTAX      INTEGER {
        independent(1),
        shared(2)
    }

```

MAX-ACCESS read-create
 STATUS current
 DESCRIPTION

"The type of constraint this entry defines.

independent(1) - the VLAN, dot1qConstraintVlan,
 uses a filtering database independent from all
 other VLANs in the same set, defined by
 dot1qConstraintSet.

shared(2) - the VLAN, dot1qConstraintVlan, shares
 the same filtering database as all other VLANs
 in the same set, defined by dot1qConstraintSet."

::= { dot1qLearningConstraintsEntry 3 }

dot1qConstraintStatus OBJECT-TYPE

SYNTAX RowStatus
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION

"The status of this entry."

::= { dot1qLearningConstraintsEntry 4 }

dot1qConstraintSetDefault OBJECT-TYPE

SYNTAX Integer32 (0..65535)
 MAX-ACCESS read-write
 STATUS current
 DESCRIPTION

"The identity of the constraint set to which a VLAN
 belongs, if there is not an explicit entry for that VLAN
 in dot1qLearningConstraintsTable.

The value of this object MUST be retained across
 reinitializations of the management system."

::= { dot1qVlan 9 }

dot1qConstraintTypeDefault OBJECT-TYPE

SYNTAX INTEGER {
 independent(1),
 shared(2)
 }

MAX-ACCESS read-write
 STATUS current
 DESCRIPTION

"The type of constraint set to which a VLAN belongs, if
 there is not an explicit entry for that VLAN in
 dot1qLearningConstraintsTable. The types are as defined
 for dot1qConstraintType.

The value of this object MUST be retained across

```

        reinitializations of the management system."
 ::= { dot1qVlan 10 }

```

```

-- -----
-- dotlvProtocol subtree
-- -----

```

```
dotlvProtocolGroupTable OBJECT-TYPE
```

```
    SYNTAX      SEQUENCE OF DotlvProtocolGroupEntry
```

```
    MAX-ACCESS  not-accessible
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "A table that contains mappings from Protocol
        Templates to Protocol Group Identifiers used for
        Port-and-Protocol-based VLAN Classification."
```

```
    REFERENCE
```

```
        "IEEE 802.1v clause 8.6.4"
```

```
 ::= { dotlvProtocol 1 }

```

```
dotlvProtocolGroupEntry OBJECT-TYPE
```

```
    SYNTAX      DotlvProtocolGroupEntry
```

```
    MAX-ACCESS  not-accessible
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "A mapping from a Protocol Template to a Protocol
        Group Identifier."
```

```
    INDEX      { dotlvProtocolTemplateFrameType,
                  dotlvProtocolTemplateProtocolValue }

```

```
 ::= { dotlvProtocolGroupTable 1 }

```

```
DotlvProtocolGroupEntry ::=
```

```
    SEQUENCE {
```

```
        dotlvProtocolTemplateFrameType
```

```
        INTEGER,
```

```
        dotlvProtocolTemplateProtocolValue
```

```
        OCTET STRING,
```

```
        dotlvProtocolGroupId
```

```
        Integer32,
```

```
        dotlvProtocolGroupRowStatus
```

```
        RowStatus
    }
```

```
dotlvProtocolTemplateFrameType OBJECT-TYPE
```

```
    SYNTAX      INTEGER {
```

```
        ethernet (1),
```

```
        rfc1042 (2),
```

```
        snap8021H (3),
```

```
        snapOther (4),
    }
```

```

        llcOther (5)
    }
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "The data-link encapsulation format or the
    'detagged_frame_type' in a Protocol Template."
REFERENCE
    "IEEE 802.1v clause 8.6.2"
 ::= { dot1vProtocolGroupEntry 1 }

```

dot1vProtocolTemplateProtocolValue OBJECT-TYPE

```

SYNTAX OCTET STRING (SIZE (2 | 5))
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "The identification of the protocol above the data-link
    layer in a Protocol Template. Depending on the
    frame type, the octet string will have one of the
    following values:

    For 'ethernet', 'rfc1042' and 'snap8021H',
    this is the 16-bit (2-octet) IEEE 802.3 Type Field.
    For 'snapOther',
    this is the 40-bit (5-octet) PID.
    For 'llcOther',
    this is the 2-octet IEEE 802.2 Link Service Access
    Point (LSAP) pair: first octet for Destination Service
    Access Point (DSAP) and second octet for Source Service
    Access Point (SSAP)."
```

REFERENCE

```

    "IEEE 802.1v clause 8.6.2"
 ::= { dot1vProtocolGroupEntry 2 }

```

dot1vProtocolGroupId OBJECT-TYPE

```

SYNTAX Integer32 (0..2147483647)
MAX-ACCESS read-create
STATUS current
DESCRIPTION
    "Represents a group of protocols that are associated
    together when assigning a VID to a frame."
REFERENCE
    "IEEE 802.1v clause 8.6.3, 12.10.2.1"
 ::= { dot1vProtocolGroupEntry 3 }

```

dot1vProtocolGroupRowStatus OBJECT-TYPE

```

SYNTAX RowStatus
MAX-ACCESS read-create

```

```

STATUS      current
DESCRIPTION
    "This object indicates the status of this entry."
 ::= { dotlvProtocolGroupEntry 4 }

```

```

dotlvProtocolPortTable OBJECT-TYPE
SYNTAX      SEQUENCE OF DotlvProtocolPortEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A table that contains VID sets used for
     Port-and-Protocol-based VLAN Classification."
REFERENCE
    "IEEE 802.1v clause 8.4.4"
 ::= { dotlvProtocol 2 }

```

```

dotlvProtocolPortEntry OBJECT-TYPE
SYNTAX      DotlvProtocolPortEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A VID set for a port."
INDEX       { dotldBasePort,
              dotlvProtocolPortGroupId }
 ::= { dotlvProtocolPortTable 1 }

```

```

DotlvProtocolPortEntry ::=
SEQUENCE {
    dotlvProtocolPortGroupId
        Integer32,
    dotlvProtocolPortGroupVid
        Integer32,
    dotlvProtocolPortRowStatus
        RowStatus
}

```

```

dotlvProtocolPortGroupId OBJECT-TYPE
SYNTAX      Integer32 (1..2147483647)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "Designates a group of protocols in the Protocol
     Group Database."
REFERENCE
    "IEEE 802.1v clause 8.6.3, 12.10.1.2"
 ::= { dotlvProtocolPortEntry 1 }

```

```

dotlvProtocolPortGroupVid OBJECT-TYPE

```



```

SYNTAX      Integer32 (1..4094)
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The VID associated with a group of protocols for
     each port."
REFERENCE
    "IEEE 802.1v clause 8.4.4, 12.10.1.2"
::= { dot1vProtocolPortEntry 2 }

```

```
dot1vProtocolPortRowStatus OBJECT-TYPE
```

```

SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object indicates the status of this entry."
::= { dot1vProtocolPortEntry 3 }

```

```

-- -----
-- IEEE 802.1Q MIB - Conformance Information
-- -----

```

```

qBridgeConformance OBJECT IDENTIFIER ::= { qBridgeMIB 2 }
qBridgeGroups OBJECT IDENTIFIER ::= { qBridgeConformance 1 }
qBridgeCompliances OBJECT IDENTIFIER ::= { qBridgeConformance 2 }

```

```

-- -----
-- units of conformance
-- -----

```

```
qBridgeBaseGroup OBJECT-GROUP
```

```

OBJECTS {
    dot1qVlanVersionNumber,
    dot1qMaxVlanId,
    dot1qMaxSupportedVlans,
    dot1qNumVlans,
    dot1qGvrpStatus
}

```

```
STATUS      current
```

```
DESCRIPTION
```

```

    "A collection of objects providing device-level control
     and status information for the Virtual LAN bridge
     services."

```

```
::= { qBridgeGroups 1 }
```

```
qBridgeFdbUnicastGroup OBJECT-GROUP
```

```
OBJECTS {
    dot1qFdbDynamicCount,
    dot1qTpFdbPort,
    dot1qTpFdbStatus
}
STATUS          current
DESCRIPTION
    "A collection of objects providing information about all
    unicast addresses, learned dynamically or statically
    configured by management, in each Filtering Database."
 ::= { qBridgeGroups 2 }

qBridgeFdbMulticastGroup OBJECT-GROUP
    OBJECTS {
        dot1qTpGroupEgressPorts,
        dot1qTpGroupLearnt
    }
    STATUS          current
    DESCRIPTION
        "A collection of objects providing information about all
        multicast addresses, learned dynamically or statically
        configured by management, in each Filtering Database."
    ::= { qBridgeGroups 3 }

qBridgeServiceRequirementsGroup OBJECT-GROUP
    OBJECTS {
        dot1qForwardAllPorts,
        dot1qForwardAllStaticPorts,
        dot1qForwardAllForbiddenPorts,
        dot1qForwardUnregisteredPorts,
        dot1qForwardUnregisteredStaticPorts,
        dot1qForwardUnregisteredForbiddenPorts
    }
    STATUS          current
    DESCRIPTION
        "A collection of objects providing information about
        service requirements, learned dynamically or statically
        configured by management, in each Filtering Database."
    ::= { qBridgeGroups 4 }

qBridgeFdbStaticGroup OBJECT-GROUP
    OBJECTS {
        dot1qStaticUnicastAllowedToGoTo,
        dot1qStaticUnicastStatus,
        dot1qStaticMulticastStaticEgressPorts,
        dot1qStaticMulticastForbiddenEgressPorts,
        dot1qStaticMulticastStatus
    }
}
```

```
STATUS          current
DESCRIPTION
    "A collection of objects providing information about
    unicast and multicast addresses statically configured by
    management, in each Filtering Database or VLAN."
 ::= { qBridgeGroups 5 }
```

qBridgeVlanGroup OBJECT-GROUP

```
OBJECTS {
    dot1qVlanNumDeletes,
    dot1qVlanFdbId,
    dot1qVlanCurrentEgressPorts,
    dot1qVlanCurrentUntaggedPorts,
    dot1qVlanStatus,
    dot1qVlanCreationTime
}
STATUS          current
DESCRIPTION
    "A collection of objects providing information about
    all VLANs currently configured on this device."
 ::= { qBridgeGroups 6 }
```

qBridgeVlanStaticGroup OBJECT-GROUP

```
OBJECTS {
    dot1qVlanStaticName,
    dot1qVlanStaticEgressPorts,
    dot1qVlanForbiddenEgressPorts,
    dot1qVlanStaticUntaggedPorts,
    dot1qVlanStaticRowStatus,
    dot1qNextFreeLocalVlanIndex
}
STATUS          current
DESCRIPTION
    "A collection of objects providing information about
    VLANs statically configured by management."
 ::= { qBridgeGroups 7 }
```

qBridgePortGroup OBJECT-GROUP

```
OBJECTS {
    dot1qPvid,
    dot1qPortAcceptableFrameTypes,
    dot1qPortIngressFiltering,
    dot1qPortGvrpStatus,
    dot1qPortGvrpFailedRegistrations,
    dot1qPortGvrpLastPduOrigin
}
STATUS          deprecated
DESCRIPTION
```

"A collection of objects providing port-level VLAN control and status information for all ports."
 ::= { qBridgeGroups 8 }

qBridgeVlanStatisticsGroup OBJECT-GROUP

OBJECTS {
 dot1qTpVlanPortInFrames,
 dot1qTpVlanPortOutFrames,
 dot1qTpVlanPortInDiscards
}
STATUS current
DESCRIPTION
 "A collection of objects providing per-port packet statistics for all VLANs currently configured on this device."
 ::= { qBridgeGroups 9 }

qBridgeVlanStatisticsOverflowGroup OBJECT-GROUP

OBJECTS {
 dot1qTpVlanPortInOverflowFrames,
 dot1qTpVlanPortOutOverflowFrames,
 dot1qTpVlanPortInOverflowDiscards
}
STATUS current
DESCRIPTION
 "A collection of objects providing overflow counters for per-port packet statistics for all VLANs currently configured on this device for high-capacity interfaces, defined as those that have the value of the corresponding instance of ifSpeed greater than 650,000,000 bits/second."
 ::= { qBridgeGroups 10 }

qBridgeVlanHCStatisticsGroup OBJECT-GROUP

OBJECTS {
 dot1qTpVlanPortHCInFrames,
 dot1qTpVlanPortHCOutFrames,
 dot1qTpVlanPortHCInDiscards
}
STATUS current
DESCRIPTION
 "A collection of objects providing per-port packet statistics for all VLANs currently configured on this device for high-capacity interfaces, defined as those that have the value of the corresponding instance of ifSpeed greater than 650,000,000 bits/second."
 ::= { qBridgeGroups 11 }

qBridgeLearningConstraintsGroup OBJECT-GROUP

```
OBJECTS {
    dot1qConstraintType,
    dot1qConstraintStatus
}
STATUS      current
DESCRIPTION
    "A collection of objects defining the Filtering Database
    constraints all VLANs have with each other."
::= { qBridgeGroups 12 }
```

qBridgeLearningConstraintDefaultGroup OBJECT-GROUP

```
OBJECTS {
    dot1qConstraintSetDefault,
    dot1qConstraintTypeDefault
}
STATUS      current
DESCRIPTION
    "A collection of objects defining the default Filtering
    Database constraints for VLANs that have no specific
    constraints defined."
::= { qBridgeGroups 13 }
```

qBridgeClassificationDeviceGroup OBJECT-GROUP

```
OBJECTS {
    dot1vProtocolGroupId,
    dot1vProtocolGroupRowStatus
}
STATUS      current
DESCRIPTION
    "VLAN classification information for the bridge."
::= { qBridgeGroups 14 }
```

qBridgeClassificationPortGroup OBJECT-GROUP

```
OBJECTS {
    dot1vProtocolPortGroupVid,
    dot1vProtocolPortRowStatus
}
STATUS      current
DESCRIPTION
    "VLAN classification information for individual ports."
::= { qBridgeGroups 15 }
```

qBridgePortGroup2 OBJECT-GROUP

```
OBJECTS {
    dot1qPvid,
    dot1qPortAcceptableFrameTypes,
    dot1qPortIngressFiltering,
    dot1qPortGvrpStatus,
```

```

        dot1qPortGvrpFailedRegistrations,
        dot1qPortGvrpLastPduOrigin,
        dot1qPortRestrictedVlanRegistration
    }
    STATUS          current
    DESCRIPTION
        "A collection of objects providing port-level VLAN
        control and status information for all ports."
    ::= { qBridgeGroups 16 }

```

```

-- -----
-- compliance statements
-- -----

```

```

qBridgeCompliance MODULE-COMPLIANCE
    STATUS deprecated
    DESCRIPTION
        "The compliance statement for device support of Virtual
        LAN Bridge services.

        RFC2674 was silent about the expected persistence of the
        read-write objects in this MIB module. Applications MUST
        NOT assume that the values of the read-write objects are
        persistent across reinitializations of the management
        system and MUST NOT assume that the values are not
        persistent across reinitializations of the management
        system."

```

MODULE

```

    MANDATORY-GROUPS {
        qBridgeBaseGroup,
        qBridgeVlanGroup,
        qBridgeVlanStaticGroup,
        qBridgePortGroup
    }

```

```

    GROUP          qBridgeFdbUnicastGroup

```

DESCRIPTION

```

        "This group is mandatory for bridges that implement
        802.1Q transparent bridging."

```

```

    GROUP          qBridgeFdbMulticastGroup

```

DESCRIPTION

```

        "This group is mandatory for bridges that implement
        802.1Q transparent bridging."

```

```

    GROUP          qBridgeServiceRequirementsGroup

```

DESCRIPTION

"This group is mandatory for bridges that implement extended filtering services. All objects must be read-write if extended-filtering services are enabled."

GROUP qBridgeFdbStaticGroup

DESCRIPTION

"This group is optional."

GROUP qBridgeVlanStatisticsGroup

DESCRIPTION

"This group is optional as there may be significant implementation cost associated with its support."

GROUP qBridgeVlanStatisticsOverflowGroup

DESCRIPTION

"This group is optional as there may be significant implementation cost associated with its support. It is most relevant for high-capacity interfaces where the SNMP agent supports only SNMPv1."

GROUP qBridgeVlanHCStatisticsGroup

DESCRIPTION

"This group is optional as there may be significant implementation cost associated with its support. It is most relevant for high-capacity interfaces."

GROUP qBridgeLearningConstraintsGroup

DESCRIPTION

"This group is mandatory for devices implementing both Independent VLAN Learning (IVL) and Shared VLAN Learning (SVL) modes of operation of the filtering database, as defined by IEEE 802.1Q."

GROUP qBridgeLearningConstraintDefaultGroup

DESCRIPTION

"This group is mandatory for devices implementing both Independent VLAN Learning (IVL) and Shared VLAN Learning (SVL) modes of operation of the filtering database, as defined by IEEE 802.1Q."

OBJECT dot1qPortAcceptableFrameTypes

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required as this is an optional capability in IEEE 802.1Q."

OBJECT dot1qPortIngressFiltering

MIN-ACCESS read-only
 DESCRIPTION
 "Write access is not required as this is an optional
 capability in IEEE 802.1Q."

OBJECT dot1qConstraintSetDefault
 MIN-ACCESS read-only
 DESCRIPTION
 "Write access is not required as this is an optional
 capability in IEEE 802.1Q."

OBJECT dot1qConstraintTypeDefault
 MIN-ACCESS read-only
 DESCRIPTION
 "Write access is not required as this is an optional
 capability in IEEE 802.1Q."

::= { qBridgeCompliances 1 }

qBridgeCompliance2 MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"The compliance statement for device support of Virtual
 LAN Bridge services."

This document clarifies the persistence requirements for
 the read-write objects in this MIB module. All
 implementations claiming compliance to qBridgeCompliance2
 MUST retain the values of those read-write objects that
 specify this requirement."

MODULE

MANDATORY-GROUPS {
 qBridgeBaseGroup,
 qBridgeVlanGroup,
 qBridgeVlanStaticGroup,
 qBridgePortGroup2
 }

GROUP qBridgeFdbUnicastGroup

DESCRIPTION

"This group is mandatory for bridges that implement
 802.1Q transparent bridging."

GROUP qBridgeFdbMulticastGroup

DESCRIPTION

"This group is mandatory for bridges that implement
 802.1Q transparent bridging."

GROUP qBridgeServiceRequirementsGroup

DESCRIPTION

"This group is mandatory for bridges that implement extended filtering services. All objects must be read-write if extended-filtering services are enabled."

GROUP qBridgeFdbStaticGroup

DESCRIPTION

"This group is optional."

GROUP qBridgeVlanStatisticsGroup

DESCRIPTION

"This group is optional as there may be significant implementation cost associated with its support."

GROUP qBridgeVlanStatisticsOverflowGroup

DESCRIPTION

"This group is optional as there may be significant implementation cost associated with its support. It is most relevant for high-capacity interfaces where the SNMP agent supports only SNMPv1."

GROUP qBridgeVlanHCStatisticsGroup

DESCRIPTION

"This group is optional as there may be significant implementation cost associated with its support. It is most relevant for high-capacity interfaces."

GROUP qBridgeLearningConstraintsGroup

DESCRIPTION

"This group is mandatory for devices implementing both Independent VLAN Learning (IVL) and Shared VLAN Learning (SVL) modes of operation of the filtering database, as defined by IEEE 802.1Q."

GROUP qBridgeLearningConstraintDefaultGroup

DESCRIPTION

"This group is mandatory for devices implementing both Independent VLAN Learning (IVL) and Shared VLAN Learning (SVL) modes of operation of the filtering database, as defined by IEEE 802.1Q."

GROUP qBridgeClassificationDeviceGroup

DESCRIPTION

"This group is mandatory ONLY for devices implementing VLAN Classification as specified in IEEE 802.1v."

GROUP qBridgeClassificationPortGroup
DESCRIPTION
 "This group is mandatory ONLY for devices implementing
 VLAN Classification as specified in IEEE 802.1v."

OBJECT dot1qPortAcceptableFrameTypes
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required as this is an optional
 capability in IEEE 802.1Q."

OBJECT dot1qPortIngressFiltering
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required as this is an optional
 capability in IEEE 802.1Q."

OBJECT dot1qConstraintSetDefault
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required as this is an optional
 capability in IEEE 802.1Q."

OBJECT dot1qConstraintTypeDefault
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required as this is an optional
 capability in IEEE 802.1Q."

OBJECT dot1vProtocolGroupId
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required as this is an optional
 capability in IEEE 802.1v."

OBJECT dot1vProtocolGroupRowStatus
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required as this is an optional
 capability in IEEE 802.1v."

::= { qBridgeCompliances 2 }

END

6. Acknowledgements

Much of the groundwork for this document was performed by the IEEE 802.1 working group during the definition of the IEEE 802.1D updates [802.1D] and IEEE 802.1Q [802.1Q].

The authors wish to thank the members of the Bridge Working Group, and David Harrington, Anders SW Christensen, Andrew Smith, Paul Langille, Anil Rijhsinghani, and Keith McCloghrie in particular for their comments and suggestions, which improved this effort.

Editing for the final version was done by David Levi.

The new textual conventions related to VLAN-IDs were produced as a result of a review of the use of VLAN-ID in several MIB modules. Further investigation found that VLAN-ID objects were defined in a few other MIB modules. The editor would like to thank all who contributed to the discussion that resulted in these new textual conventions. Specifically, Bert Wijnen, Les Bell, Andrew Smith, Mike Heard, Randy Presuhn, Dan Romascanu, Eduardo Cardona, Tom Petch, Juergen Schoenwaelder, Richard Woundy, Tony Jeffree, and William Murwin. We also received input and feedback from IEEE confirming that the values 0 and 4095 are not used for identifying a specific VLAN-ID and so can be used to represent none or a wildcard (see Appendix A).

7. Security Considerations

There are a number of management objects defined in this MIB module with a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations. These tables and objects and their sensitivity/vulnerability are described below.

The following tables and objects in the P-BRIDGE-MIB can be manipulated to interfere with the operation of priority classes. This could, for example, be used to force a reinitialization of state machines, thus causing network instability. Another possibility would be for an attacker to override established policy on port priorities, thus giving a user (or an attacker) unauthorized preferential treatment.

- dot1dTrafficClassesEnabled
- dot1dGmrpStatus
- dot1dPortPriorityTable
- dot1dUserPriorityRegenTable

```
dot1dTrafficClassTable
dot1dPortGarpTable
dot1dPortGmrpTable
```

The following tables and objects in the Q-BRIDGE-MIB could be manipulated to interfere with the operation of virtual LANs. This could, for example, be used to force a reinitialization of state machines to cause network instability, or changing the forwarding and filtering policies.

```
dot1qGvrpStatus
dot1qForwardAllTable
dot1qStaticUnicastTable
dot1qStaticMulticastTable
dot1qVlanStaticTable
dot1qPortVlanTable
dot1qLearningConstraintsTable
dot1vProtocolGroupTable
dot1vProtocolPortTable
```

Some of the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP. These are the tables and objects and their sensitivity/vulnerability.

The objects dot1dDeviceCapabilities and dot1dPortCapabilitiesTable in the P-BRIDGE-MIB could be used by an attacker to determine which attacks might be useful to attempt against a given device.

The following read-only tables and objects in the Q-BRIDGE-MIB could be used by an attacker to determine which attacks might be useful to attempt against a given device, could be used by an attacker to detect whether their attacks are being blocked or filtered, or could be used to understand the logical topology of the network.

```
dot1qMaxVlanID
dot1qMaxSupportedVlans
dot1qNumVlans
dot1qFdbTable
dot1qTpFdbTable
dot1qTpGroupTable
dot1qVlanCurrentTable
dot1qPortVlanStatisticsTable
```

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPsec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB module.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [RFC3410], section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

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Appendix A. Email from Tony Jeffrey from IEEE

-----Original Message-----

From: Tony Jeffree [mailto:tony@jeffree.co.uk]

Sent: Friday, 6th of June 2003 17:16

To: Wijnen, Bert (Bert) [mailto:bwijnen@lucent.com]

Subject: RE: VLAN ID

Bert et al -

We have concluded that the use of 4095 as a wildcard is acceptable to 802.1, and we will make any necessary changes to 802.1Q in due course to relax the current stated restriction. However, we need to know whether that is all that needs to be done to 802.1Q - i.e., is there any need to change our definitions of the managed objects in the document (Clause 12) to reflect the interpretation of 4095 as a wildcard, or is this simply an issue for the SNMP machinery to handle?

Regards,
Tony

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