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IEEE Std 802.1u-2001
(Amendment to IEEE Std 802.1Q, 1998 Edition)

IEEE Standard for
Local and metropolitan area networks—

Virtual Bridged Local Area Networks—
Amendment 1: Technical and editorial corrections

Sponsor

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Abstract: This amendment to IEEE 802.1Q, 1998 Edition is intended to document maintenance items identified in the text of IEEE Std 802.1Q, 1998 Edition. IEEE Std 802.1u-2001 identifies any proposed changes to IEEE Std 802.1Q, 1998 Edition that have arisen as a consequence of maintenance activity. The changes are documented in the usual form for an amendment to IEEE 802® standards; i.e., as an explicit set of editing instructions that, if correctly applied to the text of IEEE Std 802.1Q, 1998 Edition, will create a corrected document.
Keywords: *local area networks, MAC Bridge management, media access control bridges, virtual LANs*

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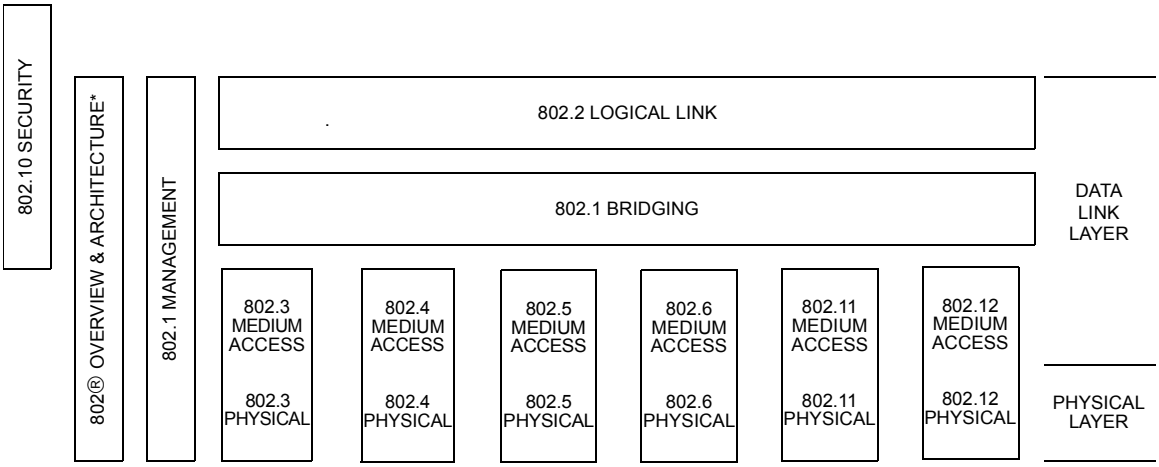
Introduction

[This introduction is not a part of IEEE Std 802.1u-2001, IEEE Standard for Local and metropolitan area networks—Virtual Bridged Local Area Networks—Amendment 1: Technical and editorial corrections.]

This amendment to IEEE 802.1Q, 1998 Edition is intended to document maintenance items identified in the text of IEEE Std 802.1Q, 1998 Edition. IEEE Std 802.1u-2001 identifies any proposed changes to IEEE Std 802.1Q, 1998 Edition that have arisen as a consequence of maintenance activity. The changes are documented in the usual form for an amendment to IEEE 802® standards; i.e., as an explicit set of editing instructions that, if correctly applied to the text of IEEE Std 802.1Q, 1998 Edition, will create a corrected document.

This standard is part of a family of standards for local and metropolitan area networks. The relationship between the standard and other members of the family is shown below. (The numbers in the figure refer to IEEE standard numbers.)



* Formerly IEEE Std 802.1A.

This family of standards deals with the Physical and Data Link Layers as defined by the International Organization for Standardization (ISO) Open Systems Interconnection Basic Reference Model (ISO/IEC 7498-1:1994). The access standards define several types of medium access technologies and associated physical media, each appropriate for particular applications or system objectives. Other types are under investigation.

The standards defining the technologies noted above are as follows:

• IEEE Std 802[1]: *Overview and Architecture*. This standard provides an overview to the family of IEEE 802 Standards. This document forms part of the IEEE 802.1 scope of work.

[1]The 802 Architecture and Overview Specification, originally known as IEEE Std 802.1A, has been renumbered as IEEE Std 802. This has been done to accommodate recognition of the base standard in a family of standards. References to IEEE Std 802.1A should be considered as references to IEEE Std 802.

• ANSI/IEEE Std 802.1B and 802.1K [ISO/IEC 15802-2]:	*LAN/MAN Management*. Defines an Open Systems Interconnection (OSI) management-compatible architecture, and services and protocol elements for use in a LAN/MAN environment for performing remote management.
• ANSI/IEEE Std 802.1D	*Media Access Control* (*MAC) Bridges*. Specifies an architecture and protocol for the [ISO/IEC 15802-3]: interconnection of IEEE 802 LANs below the MAC service boundary.
• ANSI/IEEE Std 802.1E [ISO/IEC 15802-4]:	*System Load Protocol*. Specifies a set of services and protocol for those aspects of management concerned with the loading of systems on IEEE 802 LANs.
• ANSI/IEEE Std 802.1F	*Common Definitions and Procedures for IEEE 802 Management Information*.
• ANSI/IEEE Std 802.1G [ISO/IEC 15802-5]:	*Remote Media Access Control (MAC) Bridging*. Specifies extensions for the interconnection, using non-LAN systems communication technologies, of geographically separated IEEE 802 LANs below the level of the logical link control protocol.
• ANSI/IEEE Std 802.1H [ISO/IEC TR 11802-5]	*Recommended Practice for Media Access Control (MAC) Bridging of Ethernet V2.0 in IEEE 802 Local Area Networks*.
• ANSI/IEEE Std 802.1Q	*Virtual Bridged Local Area Networks*. Defines an architecture for Virtual Bridged LANs, the services provided in Virtual Bridged LANs, and the protocols and algorithms involved in the provision of those services.
• ANSI/IEEE Std 802.2 [ISO/IEC 8802-2]:	*Logical Link Control*.
• ANSI/IEEE Std 802.3 [ISO/IEC 8802-3]:	*CSMA/CD Access Method and Physical Layer Specifications*.
• ANSI/IEEE Std 802.4 [ISO/IEC 8802-4]:	*Token Bus Access Method and Physical Layer Specifications*.
• ANSI/IEEE Std 802.5 [ISO/IEC 8802-5]:	*Token Ring Access Method and Physical Layer Specifications*.
• ANSI/IEEE Std 802.6 [ISO/IEC 8802-6]:	*Distributed Queue Dual Bus Access Method and Physical Layer Specifications*.
• ANSI/IEEE Std 802.10:	*Interoperable LAN/MAN Security*. Currently approved: Secure Data Exchange (SDE).
• ANSI/IEEE Std 802.11: [ISO/IEC 8802-11]	*Wireless LAN Medium Access Control (MAC) Sublayer and Physical Layer Specifications.*
• ANSI/IEEE Std 802.12: [ISO/IEC 8802-12]	*Demand Priority Access Method, Physical Layer and Repeater Specification*.
• IEEE Std 802.15:	*Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Wireless Personal Area Networks.*

• IEEE Std 802.16: *Standard Air Interface for Fixed Broadband Wireless Access Systems*.

• IEEE Std 802.17: *Resilient Packet Ring Access Method and Physical Layer Specifications.*

In addition to the family of standards, the following is a recommended practice for a common physical layer technology:

• IEEE Std 802.7: *IEEE Recommended Practice for Broadband Local Area Networks*.

The reader of this standard is urged to become familiar with the complete family of standards.

Conformance test methodology

An additional standards series, identified by the number IEEE 1802, has been established to identify the conformance test methodology documents for the IEEE 802 family of standards. Thus the conformance test documents for IEEE 802.3 are numbered IEEE 1802.3, the conformance test documents for IEEE 802.5 will be 1802.5, and so on. Similarly, ISO will use ISO/IEC 18802 to number conformance test standards for ISO/IEC 8802 standards.

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Contents

IEEE Standard for
Local and metropolitan area networks—

Virtual Bridged Local Area Networks—
Amendment 1: Technical and editorial corrections

EDITORIAL NOTE—This amendment to IEEE Std 802.1Q, 1998 Edition defines the changes necessary in order to address maintenance items that have been brought to the attention of the IEEE 802.1 Working Group. These changes are defined as a series of additions to, and modifications of, the existing text of IEEE Std 802.1Q, 1998 Edition; this amendment therefore assumes all material, including references, abbreviations, definitions, procedures, services, and protocols defined in the base text. Text shown in ***bold italics*** in this amendment defines the editing instructions necessary in order to incorporate the modifications and additions into the base text. Three editing instructions are used: ***change, delete,*** and ***insert. Change*** is used to make a change to existing material. The editing instruction specifies the location of the change, and describes what is being changed either by using ~~strikethrough~~ (to remove old material) or underscore (to add new material). ***Delete*** removes existing material. ***Insert*** adds new material without changing the existing material. Insertions may require renumbering. If so, renumbering instructions are given in the editing instruction. Editorial notes will not be carried over into future editions of IEEE Std. 802.1Q.

2. References

Revise all ISO [IEEE] and ISO/IEC [IEEE] references in Clause 2, so that the primary reference for these standards is the IEEE standard number and name, with the ISO standard number retained in parentheses. Change all references to these standards throughout the remaining clauses and subclauses accordingly, so that the IEEE standard number is cited.

Insert a reference to IEEE Std 802.1t-2001 as follows:

IEEE Std 802.1t-2001, IEEE Standard for Information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Common specifications—Part 3: Media Access Control (MAC) Bridges—Amendment 1.

Change the wording of footnote 3 as follows:

[3]IEEE publications are available from the Institute of Electrical and Electronics Engineers, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA. IEEE publications can be ordered on-line from the IEEE Standards Website at http://www.standards.ieee.org/.

Change the wording of footnote 6 as follows:

[6]ISO [IEEE] and ISO/IEC [IEEE] documents are available from ISO Central Secretariat, 1 rue de Varembé, Case Postale 56, CH-1211, Genève 20, Switzerland/Suisse; and from the Institute of Electrical and Electronics Engineers, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA. ISO [IEEE] and ISO/IEC [IEEE] documents can be ordered on-line from the IEEE Standards Website at http://www.standards.ieee.org/.

5. Conformance

5.2 Options

Add the following as items l and m):

l) Support the ability to configure the value of the Restricted_Group_Registration parameter (10.3.2 in IEEE Std 802.1t-2001) for each Port of the Bridge;

m) Support the ability to configure the value of the Restricted_VLAN_Registration parameter (11.2.3.2.3) for each Port of the Bridge.

7. Support of the MAC service in VLANS

7.1.2.1 Data indication primitives

In item d), change "user_ priority" to "user_priority"; i.e., remove the space following the underscore.

7.1.2.2 Data request primitives

Change the first paragraph as shown:

On invocation of a data request primitive by a user of the E-ISS, an ~~M-UNITDATA~~M_UNITDATA.request primitive is invoked, with parameter values as follows:

Add the following subclause as 7.3:

7.3 Positioning of VLAN Tagging and Untagging in end stations

Within an end station that supports VLAN operation, the functions responsible for performing the addition of VLAN tags prior to transmission of MAC frames and for removing VLAN tags on reception of MAC frames are considered to be placed above the MAC service boundary, as illustrated in Figure 7-2. Frames that are internal to the operation of the MAC, i.e., frames whose source and destination are below the MAC service boundary, are not tagged.

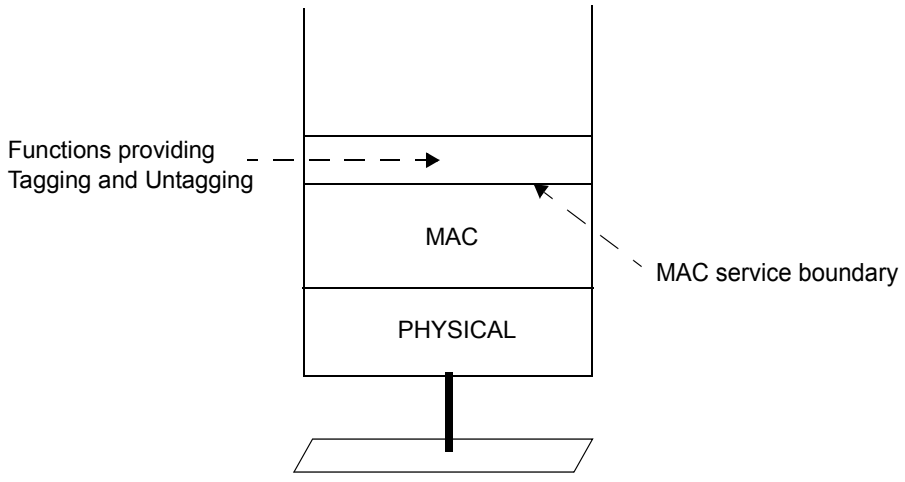

Figure 7-2—Positioning of the tagging and untagging functions in end stations

NOTE 1—Examples of frames whose source and destination are below the MAC service boundary (and that are, therefore, always transmitted untagged) include LAC PDUs, Marker PDUs, and MAC Control frames in IEEE Std 802.3, and MAC (as opposed to LLC) frames in IEEE Std 802.5. Future maintenance actions on the MAC standards should reflect the requirements stated in this subclause.

NOTE 2—The architecture shown in Figure 7-2 is based upon the LAN and MAN Reference Model described in IEEE Std 802.

8. Principles of Operation

8.5 Frame Reception

8.5.1 Regenerating user priority

Add the following NOTE after NOTE 1, renumbering subsequent NOTEs:

NOTE 2—User priority is regenerated only for frames that do not carry tag headers; see 7.1.2.1.

8.11 The Filtering Database

Change the third paragraph after item g), splitting it into three items and renumbering subsequent items, as shown:

Three entry types are used to represent dynamic filtering information~~.~~:

h) Dynamic Filtering Entries are used to specify the Ports on which individual MAC Addresses have been learned. They are created and updated by the Learning Process (8.10), and are subject to aging and removal by the Filtering Database.

i) Group Registration Entries support the registration of group MAC Addresses. They are created, updated, and removed by the GMRP protocol in support of Extended Filtering Services (8.11.4; ISO/IEC 15802-3, 6.6.5; ISO/IEC 15802-3, Clause 10), subject to the state of the *Restricted_Group_Registration* management control (10.3.2.3 in IEEE Std 802.1D). If the value of this control is TRUE, then the creation of a Group Registration Entry is not permitted unless a Static Filtering Entry exists that permits dynamic registration for the Group concerned.

j) Dynamic VLAN Registration Entries are used to specify the Ports on which VLAN membership has been dynamically registered. They are created, updated, and removed by the GVRP protocol, in support of automatic VLAN membership configuration (Clause 11), subject to the state of the *Restricted_VLAN_Registration* management control (11.2.3.2.3). If the value of this control is TRUE, then the creation of a Dynamic VLAN Registration Entry is not permitted unless a Static VLAN Registration Entry exists that permits dynamic registration for the VLAN concerned.

8.11.4 Group Registration Entries

Add the following text at the end of 8.11.4:

The creation of Group Registration Entries is subject to the Restricted_Group_Registration management control (10.3.2.3 in IEEE Std 802.1D). If the value of this control is TRUE, a dynamic entry for a given Group may only be created if a Static Filtering Entry already exists for that Group, in which the Registrar Administrative Control value is Normal Registration.

8.11.5 Dynamic VLAN Registration Entries

Add the following text at the end of 8.11.5:

The creation of Dynamic VLAN Registration Entries is subject to the Restricted_VLAN_Registration management control (11.2.3.2.3). If the value of this control is TRUE, a dynamic entry for a given VLAN may only be created if a Static VLAN Registration Entry already exists for that VLAN, in which the Registrar Administrative Control value is Normal Registration.

8.11.10 Permanent Database

Add a second NOTE at the end of this subclause, and renumber the existing NOTE, as follows:

NOTE 1—This aspect of the Permanent Database can be viewed as providing a "boot image" for the Filtering Database, defining the contents of all initial entries, before any dynamic filtering information is added.

NOTE 2—Subclause 10.3.2.3 in IEEE Std 802.1D defines an initial state for the contents of the Permanent Database, required for the purposes of GMRP operation.

9. Tagged frame format

9.1 Overview

Change items e) and f), retaining the existing NOTE, as follows:

e) Tag Control Information (TCI) as described in 9.3.2. The TCI consists of the following elements:

   1) User_priority, as described in 9.3.2.1. This field allows the tagged frame to carry user_priority information across Bridged LANs in which individual LAN segments may be unable to signal priority information (e.g., IEEE 802.3/Ethernet segments).

   2) Canonical Format Indicator (CFI), as described in 9.3.2.2. This field is used

      i) In Token Ring/source-routed FDDI MAC methods, to signal the bit order of address information carried in the encapsulated frame; and

      ii) In IEEE 802.3/Ethernet and transparent FDDI MAC methods, to signal the presence or absence of ~~a RIF field~~ an Embedded Source-Routing Information Field (E-RIF), and, in combination with the Non-canonical Format Indicator (NCFI) carried in the RIF, to signal the bit order of address information carried in the encapsulated frame.

      NOTE 1—The meaning of Canonical format as applied to MAC Addresses, and the implications of the format of addresses on the requirements for frame translation, are discussed in Annex F.

   3) VLAN Identifier (VID), as described in 9.3.2.3. This field uniquely identifies the VLAN to which the frame belongs.

f) In IEEE 802.3/Ethernet and FDDI MAC methods, an ~~Embedded Source-Routing Information Field (~~E-RIF~~)~~ is included, if required by the state of the CFI flag in the TCI. If present, in addition to providing the ability to carry source-routing information, this field includes a further flag, the NCFI, that signals the bit order of address information carried in the encapsulated frame. The structure of this field, as used in this context, is described in 9.3.3.

Change item n) as follows:

n) The removal of the tag header, retaining the RIF in the appropriate position in the final untagged frame, or restoring an embedded RIF to the appropriate position in the final untagged frame, if necessary;

9.3 Structure of the Tag Header

9.3.2 Tag Control Information (TCI) format

9.3.2.3 VID format

Modify NOTE 2 as follows:

NOTE 2—There is a distinction made here between the range of VID *values* (0 through N) that an implementation can support as identifiers for its active VLANs, and the maximum number of active VLANs (V) that it is able to support at any one time. An implementation that supports a maximum of, say, only 16 active VLANs (V=16) can support VIDs for those VLANs that are chosen from anywhere in the full VID number space (i.e., support N=4094), or from a subset of that number space (i.e., support N<4094). Therefore N is always greater than or equal to V. As the support of a limited range of VIDs (i.e., N < 4094) may result in difficulties in an environment where different values of N are supported by different Bridges in the same Bridged LAN, it is recommended that new implementations of this standard support the use of the full range of VIDs (i.e., N=4094), even if the number of active VLANs (V) that the implementation supports is less than 4094.

10. Use of GMRP in VLANs

10.3 Context identification in GMRP PDUs

Insert new item d) immediately following the current item c), renumbering subsequent items accordingly:

d) If the VLAN classification of the frame is outside the range of VIDs supported by the implementation (9.3.2.3), then the frame is discarded.

11. VLAN topology management

11.1 Static and Dynamic VLAN configuration

Change the first paragraph as follows:

The combined functionality provided by the ability to configure Static VLAN Registration Entries in the Filtering Database, coupled with the use of the Restricted_VLAN_Registration control (11.2.3.2.3) and the ability of GVRP to dynamically create and update Dynamic VLAN Registration Entries, offers the following possibilities with respect to how VLANs are configured on a given Port:

11.2 GARP VLAN Registration Protocol

11.2.3 Definition of the GVRP Application

11.2.3.2 Provision and support of the VLAN registration service

11.2.3.2.2 VLAN membership registration

Change the second paragraph of 11.2.3.2.2 as follows:

On receipt of a GID_Join.indication (ISO/IEC 15802-3, 12.3.2.2) whose attribute_type is equal to the value of the VID Attribute Type (11.2.3.1.2), the GVRP Application element indicates the reception Port as Registered in the Port Map of the Dynamic VLAN Registration Entry for the VID indicated by the attribute_value parameter. If no such entry exists, ~~and~~ there is sufficient room in the Filtering Database, and the VID is within the range of values supported by the implementation (see 9.3.2.3), then an entry is created. If not, then the indication is not propagated and the registration fails.

Insert the following paragraph between the second and third paragraphs of 11.2.3.2.2:

The creation of new Dynamic VLAN Registration Entries can be restricted by use of the Restricted_VLAN_Registration control (11.2.3.2.3). If the value of this control is TRUE, then creation of a new dynamic entry is permitted only if there is a Static VLAN Registration Entry for the VLAN concerned, in which the Registrar Administrative Control value is Normal Registration.

11.2.3.2.3 Administrative controls

Change the first paragraph of 11.2.3.2.3 as follows:

The provision of static control over the declaration or registration state of the state machines associated with the GVRP Application is achieved by means of the ~~Registrar administrative control~~Registrar Administrative Control parameters provided by GARP (ISO/IEC 15802-3, 12.9.1). These ~~administrative control~~ parameters are represented as Static VLAN Registration Entries in the Filtering Database (8.11.2). Where management capability is implemented, these ~~controls~~parameters can be manipulated by means of the management functionality defined in 12.7.

Insert the following paragraph at the end of 11.2.3.2.3:

Further administrative control over dynamic VLAN registration can be achieved, if supported, by means of a per-Port Restricted_VLAN_Registration control parameter. If the value of this control is TRUE for a given Port, the creation or modification of Dynamic VLAN Registration Entries as a result of GVRP exchanges on that Port shall be restricted only to those VLANs for which Static VLAN Registration Entries exist in which the Registrar Administrative Control value is Normal Registration. If the value of the Restricted_VLAN_Registration control is FALSE, dynamic VLAN registration is not so restricted. The recommended default value of this parameter is FALSE. Where management capability is implemented, the value of the Restricted_VLAN_Registration control can be manipulated by means of the management functionality defined in 12.10. If management of this parameter is not supported, the value of this parameter shall be FALSE for all Ports.

12. VLAN Bridge Management

12.2 Managed objects

Add the following as items g) and h):

g) GVRP participants (12.10, Clause 11);

h) GMRP participants (12.11, Clause 10 in IEEE Std 802.1D).

12.3 Data types

Insert the following as items i) through k):

i) Port Number, an Unsigned value assigned to a Port as part of a Port Identifier. Valid Port Numbers are in the range 1 through 4095;

j) Port Priority, an Unsigned value used to represent the priority component of a Port Identifier. Valid Port Priorities are in the range 0 through 240, in steps of 16;

k) Bridge Priority, an Unsigned value used to represent the priority component of a Bridge Identifier. Valid Bridge Priorities are in the range 0 through 61440, in steps of 4096.

12.8 Bridge Protocol Entity

12.8.1 The Protocol Entity

12.8.1.2 Set Bridge Protocol parameters

12.8.1.2.3 Outputs

Replace the existing text as follows:

~~None.~~

a) Operation status. This takes one of the following values:

   1) Operation rejected due to invalid Bridge Priority value (12.3); or

   2) Operation accepted.

12.8.2 Bridge Port

12.8.2.3 Set Port Parameters

12.8.2.3.3 Outputs

Replace the existing text as follows:

~~None.~~

a) Operation status. This takes one of the following values:

   1) Operation rejected due to invalid Port Priority value (12.3); or

   2) Operation accepted.

12.10 Bridge VLAN managed objects

12.10.1 Bridge VLAN Configuration managed object

Add the following as item g):

g) Configure Restricted_VLAN_Registration parameters (12.10.1.7).

12.10.1.1 Read Bridge VLAN Configuration

12.10.1.1.3 Outputs

Add the following item as item c) 5):

5) the state of the Restricted_VLAN_Registration parameter (11.2.3.2.3), TRUE or FALSE.

Change the definition of the Notify VLAN registration failure operation as follows:

12.10.1.6 Notify VLAN registration failure

12.10.1.6.1 Purpose

To notify a manager that GVRP (11.2.3) has failed to register a given VLAN owing to lack of resources in the Filtering Database for the creation of a Dynamic VLAN Registration Entry (8.11.5), or owing to the Restricted_VLAN_Registration parameter being set to TRUE.

12.10.1.6.2 Inputs

None.

12.10.1.6.3 Outputs

a) The VID of the VLAN that GVRP failed to register;

b) The Port number of the Port on which the registration request was received;

c) The reason for the failure:

1) Lack of Resources; or

2) Registration Restricted; or

3) Unsupported VID value.

Add the following subclauses in order to define the Configure Restricted_VLAN_Registration parameters operation:

12.10.1.7 Configure Restricted_VLAN_Registration parameters

12.10.1.7.1 Purpose

To configure the Restricted_VLAN_Registration parameter (11.2.3.2.3) associated with one or more Ports.

12.10.1.7.2 Inputs

a) For each Port to be configured, a Port number and the value of the Restricted_VLAN_Registration parameter. The permissible values of this parameter are (as defined in 11.2.3.2.3) as follows:

   1) TRUE;

   2) FALSE.

12.10.1.7.3 Outputs

None.

Insert the following as new subclause 12.11:

12.11 GMRP entities

The following managed objects define the semantics of the management operations that can be performed upon the operation of GMRP in a Bridge:

a) The GMRP Configuration managed object (12.11.1).

12.11.1 GMRP Configuration managed object

The GMRP Configuration managed object models operations that modify, or enquire about, the overall configuration of the operation of GMRP. There is a single GMRP Configuration managed object per Bridge.

The management operations that can be performed on the GMRP Configuration managed object are as follows:

a) Read GMRP Configuration (12.11.1.1);

b) Notify Group registration failure (12.11.1.2);

c) Configure Restricted_Group_Registration parameters (12.11.1.3).

12.11.1.1 Read GMRP Configuration

12.11.1.1.1 Purpose

To obtain general GMRP configuration information from a Bridge.

12.11.1.1.2 Inputs

None.

12.11.1.1.3 Outputs

a) For each Port:

   1) The Port number;

   2) The state of the Restricted_Group_Registration parameter (10.3.2.3 in IEEE Std 802.1D), TRUE or FALSE.

12.11.1.2 Notify Group registration failure

12.11.1.2.1 Purpose

To notify a manager that GMRP has failed to register a given Group owing to lack of resources in the Filtering Database for the creation of a Group Registration Entry (8.11.4).

12.11.1.2.2 Inputs

None.

12.11.1.2.3 Outputs

a) The MAC address of the Group that GMRP failed to register;

b) The Port number of the Port on which the registration request was received.

c) The reason for the failure:

   1) Lack of Resources; or

   2) Registration Restricted.

12.11.1.3 Configure Restricted_Group_Registration parameters

12.11.1.3.1 Purpose

To configure the Restricted_Group_Registration parameter (10.3.2.3 in IEEE Std 802.1D) associated with one or more Ports.

12.11.1.3.2 Inputs

a) For each Port to be configured, a Port number and the value of the Restricted_Group_Registration parameter. The permissible values of this parameter are (as defined in 10.3.2.3 in IEEE Std 802.1D) as follows:

   1) TRUE;

   2) FALSE.

12.11.1.3.3 Outputs

None.

Annex A

(normative)

PICS proforma

Change the contents of Table A.12 by inserting a new row 22i, renumbering subsequent rows, and inserting a new row 22o, as follows:

A.12 GARP and GMRP

Item	Feature	Status	References	Support
	If Item 2b is not supported, mark N/A and continue at item (~~22i~~22j).			N/A [ ]
(22a)	Is the GMRP Application address used as the destination MAC Address in all GMRP protocol exchanges?	2b:M	{D}10.4.1, {D}Table 12-1	Yes [ ]
(22b)	Are GMRP protocol exchanges achieved by means of LLC Type 1 procedures, using the LLC address for Spanning Tree protocol?	2b:M	{D}12.4, {D}12.5, {D}Table 7-8	Yes [ ]
(22c)	Are GMRP protocol exchanges achieved using the GARP PDU formats, and the definition of the attribute type and value encodings defined for GMRP?	2b:M	10, {D}10.3.1, {D}12.4, {D}12.5, {D}12.11	Yes [ ]
(22d)	Does the implementation support the operation of the Applicant, Registrar, and Leave All state machines?	2b:M	{D}12.8	Yes [ ]
(22e)	Does the Bridge propagate registration GMRP information only on Ports that are part of the active topology of the GIP Context for the VLAN on which the registration was received?	2b:M	10, {D}12.3.3, {D}12.3.4	Yes [ ]
(22f)	Are GARP PDUs received on Ports that are in the Forwarding State forwarded, filtered or discarded in accordance with the requirements for handling GARP Application addresses?	2b:M	{D}7.12.3, {D}12.5	Yes [ ]
(22g)	Does the GMRP application operate as defined in Clause 10 of ISO/IEC 15802-3, as modified by Clause 10 of this standard?	2b:M	10, {D}10, {D}10.3	Yes [ ]
(22h)	Are received GARP PDUs that are not well formed for any GARP Applications supported, discarded?	2b:M	10, {D}10.3.1, {D}12.4, {D}12.5, {D}12.10, {D}12.11	Yes [ ]
(22i)	Does the implementation support the use of the Restricted Group Registration parameter for each Port?	2b:O	5.2, P802.1t 10.3.2	Yes [ ] No [ ]

A.12 GARP and GMRP (*Continued*)

Item	Feature	Status	References	Support
(~~22i~~22j)	Are all GARP PDUs that are (a) Received on Ports that are in the Forwarding State, and are (b) Destined for GARP applications that the Bridge does not support, forwarded on all other Ports that are in Forwarding?	M	8.14.3, {D}12.5	Yes [ ]
(~~22j~~22k)	Are any GARP PDUs that are (a) Received on any Port, and (b) Destined for GARP applications that the Bridge does not support, submitted to any GARP Participants?	X	8.14.3, {D}12.5	No [ ]
(~~22k~~22l)	Are any GARP PDUs that are (a) Received on any Ports that are not in the Forwarding State, and are (b) Destined for GARP applications that the Bridge does not support, forwarded on any other Ports of the Bridge?	X	8.14.3, {D}12.5	No [ ]
(~~22l~~22m)	Are any GARP PDUs that are (a) Received on any Ports that are in the Forwarding State, and are (b) Destined for GARP applications that the Bridge supports, forwarded on any other Ports of the Bridge?	X	8.14.3, {D}12.5	No [ ]
(~~22m~~22n)	Are all GARP PDUs that are: (a) Received on any Port, and (b) Destined for GARP applications that the Bridge supports, submitted to the appropriate GARP Participants?	M	8.14.3, {D}12.5	Yes [ ]
22o	Are all GARP PDUs received on disabled Ports discarded?	M	P802.1t 12.2	Yes [ ]

Insert a new row (29i) at the end of Table A.13, as follows:

(29i)	Does the implementation support the use of the Restricted VLAN Registration parameter?	O	5.2, 11.2.3.2.2, 11.2.3.2.3	Yes [ ] No [ ]