Changes to ANSI/IEEE Std 802.3-2002, Clause 3

EDITORIAL NOTES - The editing instructions contained in this amendment/corrigendum define how to merge the material contained herein into the existing base standard and its amendments to form the comprehensive standard.

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

Editors' Notes: To be removed prior to final publication.

References:

None.

Definitions:

None.

Abbreviations:

None.

Issues:

None.

Revision History:

Draft 0.1   November 2004   Preliminary draft for IEEE 802.3 Frame Expansion SG review in San Antonio.

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3. Media access control frame structure

3.1 Overview

Change the following section to read as follows:

This clause defines in detail the frame structure for data communication systems using the CSMA/CD MAC. It defines the syntax and semantics of the various components of the MAC frame.

Two frame formats are specified in this clause:

a) A basic MAC frame format, and

b) An extension of the basic MAC frame format for ~~Tagged~~ Envelope MAC frames, i.e., frames that carry ~~QTag Prefixes~~ prefixes and optionally suffixes.

3.1.1 MAC frame format

Replace Figure 3-1 with the figure below:
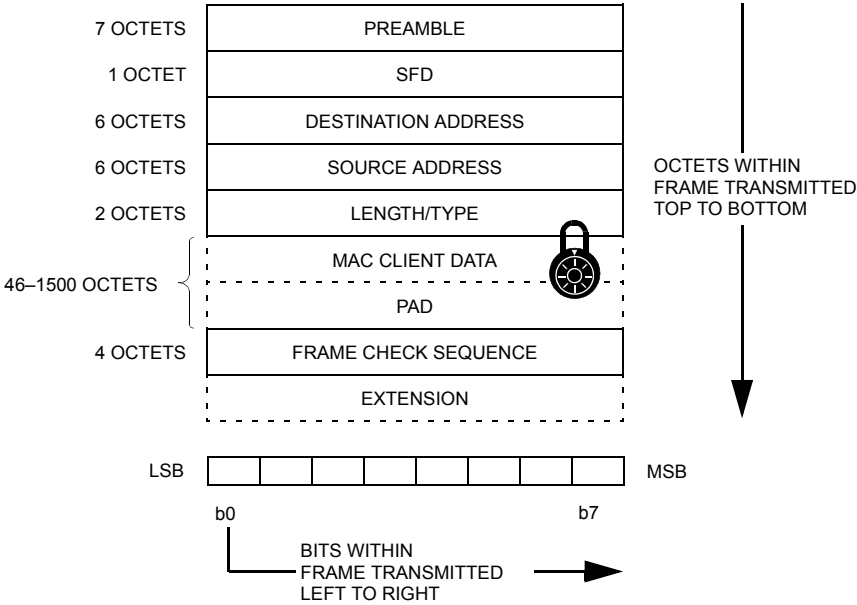
Figure 3–1—MAC frame format

Change the following section to read as follows:

3.2.6 Length/Type field

This two-octet field takes one of two meanings, depending on its numeric value. For numerical evaluation, the first octet is the most significant octet of this field.

a) If the value of this field is less than or equal to ~~the value of maxValidFrame~~ 1500 decimal (~~as specified in 4.2.7.1~~ equal to 05ee hexadecimal), then the Length/Type field indicates the number of MAC client data octets contained in the subsequent data field of the frame (Length interpretation).

b) If the value of this field is greater than or equal to 1536 decimal (equal to 0600 hexadecimal), then the Length/Type field indicates the nature of the MAC client protocol (Type interpretation).[1] The Length and Type interpretations of this field are mutually exclusive.

When used as a Type field, it is the responsibility of the MAC client to ensure that the MAC client operates properly when the MAC sublayer pads the supplied data, as discussed in .

Regardless of the interpretation of the Length/Type field, if the length of the data field is less than the minimum required for proper operation of the protocol, a PAD field (a sequence of octets) will be added at the end of the data field but prior to the FCS field, specified below. The procedure that determines the size of the PAD field is specified in 4.2.8. The Length/Type field is transmitted and received with the high order octet first.

NOTE—Clause 12 of IEEE Std 802a-2003 (an amendment to IEEE Std 802) defines a set of Type values and associated mechanisms for use in prototype and vendor-specific protocol development.

Change the following section to read as follows:

3.2.7 Data and PAD fields

The data field contains a sequence of n octets. Full data transparency is provided in the sense that any arbitrary sequence of octet values may appear in the data field up to a maximum number specified by the implementation of the standard that is used. A minimum frame size is required for correct CSMA/CD protocol operation and is specified by the particular implementation of the standard. If necessary, the data field is extended by appending extra bits (that is, a pad) in units of octets after the data field but prior to calculating and appending the FCS. The size of the pad, if any, is determined by the size of the data field supplied by the MAC client and the minimum frame size and address size parameters of the particular implementation. ~~The maximum size of the data field is determined by the maximum frame size and address size parameters of the particular implementation~~.

The length of PAD field required for MAC client data that is n octets long is max [0, minFrameSize – $(8 \times n + 2 \times addressSize + 48)$] bits. The maximum possible size of the data field is ~~maxUntaggedFrameSize – (2 × addressSize + 48)/8~~ 1500 decimal octets. See 4.4 for a discussion of implementation parameters; see 4.2.3.3 for a discussion of the minFrameSize.

Change the following section to read as follows:

3.5 Elements of the ~~Tagged~~ <u>Envelope</u> MAC Frame

Figure — shows the format of a<u>n</u> ~~Tagged~~ <u>Envelope</u> MAC Frame. This format is an extension of the MAC Frame specified in 3.1.1 and 3.2. The octet and bit ordering of the fields are identical to that specified in 3.1.1 and 3.3. The extensions ~~for tagging~~ are as follows:

a) A ~~4-octet QTag~~ <u>variable length</u> Prefix is inserted between the end of the Source Address and the MAC Client Length/Type field of the MAC frame. ~~The QTag Prefix comprises two fields:~~
  1) ~~A 2-octet constant Length/Type field value consistent with the Type interpretation and equal to the value of the 802.1Q Tag Protocol Type (802.1QTagType, see).~~
  2) ~~A 2-octet field containing Tag Control Information.~~
b) Following the ~~QTag~~ Prefix is the MAC Client Length/Type field, MAC Client Data, <u>and</u> Pad <u>fields</u> (if necessary)~~, FCS, and Extension (if necessary) fields~~ of the basic MAC frame.
c) ~~The length of the frame is extended by 4 octets by the QTag Prefix.~~ <u>Following the MAC Client Data and Pad fields (if necessary) is an optional, variable length Suffix field.</u>

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[1]Type field assignments are administered by the Registration Authority, IEEE Standards Department (see Footnote 1 for address).

d) Following the optional Suffix field is the FCS and Extension (if necessary) fields of the basic MAC frame.
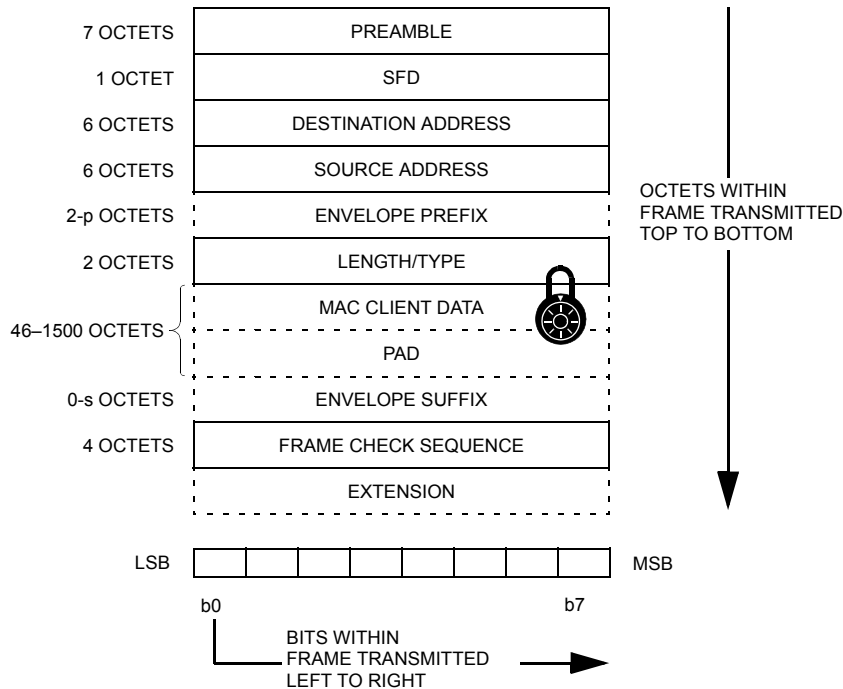
Replace Figure 3-3 with the figure below:

Figure 3–3— ~~Tagged~~ Envelope MAC frame format

Delete the following note:

~~NOTE—The normative definition of the Tag Control Information field shown in Figure — can be found in IEEE P802.1Q. Also, while Figure 3-1 uses the convention that the most significant bit of an octet is the rightmost bit, Figure — uses the opposite convention, i.e., the most significant bit is shown in the leftmost position. The latter convention is consistent with the specification of IEEE P802.1Q. This is a pictorial difference only; there is no difference in the actual order of bits transmitted on the LAN.~~

Change the following section to read as follows:

3.5.4 ~~Length/Type~~ Prefix field

The ~~Length/Type~~ Prefix field of an ~~tagged~~ Envelope MAC frame, at a minimum, contains a two-octet Length/Type field that always uses the Type interpretation.~~, and contains the 802.1Q Tag Protocol Type: a constant equal to 0x81-00.~~ The Prefix may contain additional fields defined by the specific Type interpretation. The length of the Prefix field p is 2 to max[2, TBD – suffixSize].

Delete the following section:

~~3.5.5 Tag Control Information field (informative)~~

~~The Tag Control Information field is subdivided as follows:~~
~~a) A 3-bit User Priority field,~~
~~b) A Canonical Format Indicator (CFI), and~~
~~c) A 12-bit VLAN Identifier.~~

~~The structure and semantics within the Tag Control Information field are defined in IEEE P802.1Q.~~

Change the following section to read as follows:

3.5.6 MAC Client Length/Type field

The MAC Client Length/Type field contains the original Length/Type field from the MAC frame prior to insertion of the ~~QTag~~ Prefix. ~~The QTag Prefix offsets this field exactly 4 octets from its position in an untagged MAC frame.~~

Change the following section to read as follows:

3.5.7 Data and PAD fields

The Data and PAD fields are identical in structure and semantics to the Data and PAD fields of the basic MAC frame described in , except in the following respect: For ~~tagged~~ Envelope MAC frames, the value of n in the PAD field calculation may be either the length of the MAC Client Data or the combined length of MAC Client Data~~.~~ ~~and QTag~~ Prefix and Suffix fields.

Insert the following section to read as follows:

3.5.8 Suffix field

The optional Suffix field contains envelope information. The existence of the optional Suffix field is indi-cated by one or more Prefix fields. The length of the Suffix field s is 0 to max[0, TBD − prefixSize].

Change the following section to read as follows:

3.5.9 ~~3.5.8~~ Frame Check Sequence (FCS) field

The FCS field is identical in structure and semantics to the FCS field of the basic MAC frame, described in 3.2.8.

Change the following section to read as follows:

3.5.10 ~~3.5.9~~ Extension field

The Extension field is identical in structure and semantics to the Extension field of the basic MAC frame, described in 3.2.9.

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