

Preamble

[a] This interpretation request references IEEE Std 802.3-2005. Since IEEE Std 802.3-2005 has now been superseded by IEEE Std 802.3-2008 we will not be providing a response in respect to IEEE Std 802.3-2005 but instead be providing an interpretation of IEEE Std 802.3-2008.

[b] Interpretations are a unique form of commentary on the standard. They are not statements of what the standard should have done or meant to say. Interpretations cannot change the meaning of a standard as it currently stands. Even if the request points out an error in the standard, the interpretation cannot fix that error. The interpretation can suggest that this will be brought up for consideration in a revision or amendment (or, depending on the nature of the error, an errata sheet might be issued).

However, an interpretation has no authority to do any of this. It can only discuss, address, and clarify what the standard currently says. The challenge for the interpreters is to distinguish between their expertise on what 'should be,' their interests in what they 'would like the standard to be,' and what the standard says. Interpretations are often valuable, though, because the request will point out problems that might otherwise have gone unaddressed.

Question 1.1 (1)

To which part(s) is (are) the described specification of IPG values (96 bits) applied: sender side, receiver side, or both?

The standard is unambiguous. Sub clause 4.2.7.2 'Transmit state variables' states that 'The following items are specific to packet transmission. (See also 4.4.)' and then goes on to define the constant 'interPacketGap = ...; {In bit times, minimum gap between packets, see 4.4}'. The value of the constant interPacketGap is defined in Table 4-2 'MAC parameters' for the various MAC data rates.

It should be noted that the constant value 'interPacketGap' defined in Clause 4 is distinct from the term 'Inter-Packet Gap' defined in sub clause 1.4.192.

Question 1.1 (2)

At which point is the allowable IPG value (96 bits) in the table of 4.4.2 specified? (GMII in GbE case?) Figure 1 shows a basic network scenario and LAN CSMA/CD layer structure that includes a 1000-Mb/s repeater unit. According to Note3 below the table in 4.4.2, IPG values seem to be regulated at GMII at the DTE. Point A seems to be applicable; however, points B, C, and D do not seem to be applicable. There do not seem to be clear descriptions in the main body of 4.4.2 regarding at which point the values are regulated.

The standard is unambiguous. Sub clause 4.4.2, Table 4-2, defines the value of the constant 'interPacketGap' for the various MAC data rates. As stated in sub clause 4.2.7.2 'Transmit state variables' the constant 'interPacketGap' defines the 'minimum gap between packets'. Sub clause 4.2.8 'Frame transmission' in 'process Deference' uses the constant 'interPacketGap' in full duplex operation, and the constants 'interPacketGapPart1' and 'interPacketGapPart2' derived from the constant 'interPacketGap', in half duplex, to control the minimum

transmit gap between packets from the MAC. The use of the constant 'interPacketGap' to control the minimum gap between packets is further described in sub clause 4.2.3.2.1 'Deference'.

The 96 bit value defined in sub clause 4.4.2 therefore applies at MAC transmit, which is defined at the PLS service Interface. In the specific case of 1Gb/s MAC data rate, since the Reconciliation Sublayer (RS) does not define any allowed change in the value of the Inter-Packet Gap this value also applies at the GMII in the transmit direction. Note that this is not necessarily true for all other MAC data rates.

Question 1.1 (3)

Is the following condition assumed for the allowable value for 96-bit IPG in GbE? That is, the signal is sent or received at the point that would be given in answer to question (2) with continuous 96-bit IPG values. If not, what conditions were assumed?

The standard is unambiguous. For a MAC rate of 1 Gb/s, the value defined for the constant 'interPacketGap' is used as a minimum value. The Inter-Packet Gap at any time at the transmit side of the PLS service interface may be equal to, or any value greater than, the constant 'interPacketGap'.

Question 1.2 (1)

Is the following condition assumed for the allowable value for 64-bit IPG in GbE? That is, the signal is sent or received at the GMII with continuous 64-bit IPG values. If not, what conditions were assumed?

The standard is unambiguous. As described in answer to Question 1.1 (2), for 1Gb/s MAC data rate the minimum permitted Inter-Packet Gap at GMII transmit signals is 96 bits. As stated in Sub clause 4.4.2 note 3 the minimum Inter-Packet Gap at the GMII receive signals may be as small as 64 bits. In both cases Inter-Packet Gap may be equal to, or any value greater than, the minimum value stated.

Your interpretation has highlighted a deficiency in the standard. The use of 'interPacketGap' in Note 3 is not correct and should be Inter-Packet Gap as a constant cannot shrink. This will be addressed in the next revision of the standard through our maintenance process.

Question 1.2 (2)

*Was the minimum value of a 64-bit IPG decided on the basis of the discussion in the following minutes*2 of the IEEE 802.3 meeting? (This question is related to 1.1 (2) because the "nominal IPG" that is described in the following minutes seems to be related to the IPG value in the table in 4.4.2., that is 96-bit)*

As described in the beginning of this interpretation response, the interpretation process can only comment on the standard and not what is in the minutes.

Question 1.2 (3)

How and where can "preamble growth", described in the minute above, remove 8 bits?

Note: It is conjectured that it is related to section 41.2.1.3.2 Preamble regeneration and section B.1.5.3 Interpacket Gap (IPG) shrinkage.

As described in the beginning of this interpretation response, the interpretation process can only comment on the standard and not what is in the minutes.

Question 1.2 (4)

Why and where can "variable network delays" that is clearly described as one of the factors in 4.4.2 Note3 cause IPG shrinkage? How was the factor considered when the minimum IPG value 64-bit in the Note3 was calculated? That is a factor that is not clearly described or explained in the above minutes of 1.2.(2).

The variable network delays term captures a number of factors that could introduce shrinkage.

As described in the beginning of this interpretation response, the interpretation process can only comment on the standard and not what is in the minutes. Further, we can only interpret what the standard says not what the intent is/was of that requirement.

Question 1.3 (1)

What is meant by "Note" in the IEEE rules (Mandatory, Arbitrary, Recommendation, or another term)?

A "Note" is defined in the IEEE style manual (http://standards.ieee.org/guides/style/2009_Style_Manual.pdf). In the 2009 edition this is in section 18.1 of the manual and has been reproduced below for your convenience:

"18.1 Notes

Explanatory statements may be used in the text for emphasis or to offer informative suggestions about the technical content of the standard. These notes provide additional information to assist the reader with a particular passage and shall not include mandatory requirements. A note in the text is an informative part of the approved standard; therefore, important information on safety, health, or the environment shall not be included. A note should follow that paragraph to which it belongs, and shall be set apart from the text by introducing the statement with the capitalized word "NOTE-." Within each subclause, multiple notes in sequence should be numbered "NOTE 1-", "NOTE 2-", etc. (See Annex B for examples.)"

Question 1.3 (2)

Is there any difference in meaning between "interFramGap", which seems to be described only in section 4.4.2, and "Inter-Packet Gap (IPG)", which is clearly specified in section 1.4 Definitions?

Note: In this document, "IPG" is tentatively used as a unified definition.

The standard is unambiguous. "interFrameGap" shall be interpreted as "interPacketGap" per the footnote on Table 4-2. "interPacketGap" is a Pascal constant that is defined in Sub clause 4.2.7.2 as described in

the answer to Question 1.1 (1). "Inter-Packet Gap (IPG)" is defined in section 1.4.

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