

and Management Parameters for 10 Mb/s Operation and Associated Power Delivery over a Single Balance

CI 30 SC 30.3.9.2.3 P 39 L 4 # i-266

Thompson, Geoffrey Independent Consultant

Comment Type TR Comment Status D PLCA

As far as I know, the actual viability of a 255 node network has not been established. It is certainly true that a 255 node PLCA network is not within our goal set (Ref: Obj. 11b) and it has been asserted in an ad hoc that such a high node count would interfere with long established 802.3 error detection mechanisms. Therefore, even though a generous address space (255) is appropriate so that it will not have to be revisited, 255 is not an appropriate default value.

SuggestedRemedy

In accordance with our objectives, change the default value to 8.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by comment i-189.

Response to Comment i-189 is:

At page 39, line 12 insert " The default value is 255.;" to " The default value is 0.;"

At page 39, line 22 insert " The default value is 255." after "This value is assigned to define the ID of the local node on the PLCA network."

CI 30 SC 30.3.9.2.3 P 39 L 12 # i-189

Beruto, Piergiorgio Canova Tech S.r.l.

Comment Type T Comment Status D PLCA

aPLCANodeCount has a default value of 255. This makes no sense at all since this attribute is used to set the maximum number of nodes that will get a transmit opportunity on the local collision domain, as specified in Clause 148. This is one of the parameters that have to be set prior to enable PLCA operations, as stated in 148.4.5.1.

On the other hand, aPLCALocalNodeID has no default value, which also makes no sense as value 255 is used to prevent PLCA from starting a cycle of transmit opportunities as shown in figure 148-3 in the transition from DISABLE to RESYNC state.

SuggestedRemedy

At line 12 change " The default value is 255.;" to " The default value is 0.;"

At line 22 add " The default value is 255." after "This value is assigned to define the ID of the local node on the PLCA network."

Proposed Response Response Status W

PROPOSED ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

CI 78 SC 78.5 P 71 L 49 # i-315

Kabra, Lokesh Synopsys, Inc.

Comment Type T Comment Status D EEE

As per equations given in Figure 78-5 of 802.3-2018, $Tw_sys_tx(min) = Tw_sys_rx(min) + Tphy_shrink_tx(max) + Tphy_shrink_rx(max)$ ". The values given in Table 78-4 does not satisfy this equation

SuggestedRemedy

Change value for Tw_sys_tx from 220 to 450

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by comment i-62.

Response to comment i-62 is:

PROPOSE ACCEPT.

Use the following values within Table 78-4 for 10BASE-T1L: Tw_sys_tx: 270 us, Tw_phy: 250.5 us, Tphy_shrink_tx: 10 us, Tphy_shrink_rx: 240 us, Tw_sys_rx: 20 us

CI 146 SC 146.1 P 104 L 15 # i-296

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type T Comment Status D PMA Electrical

As there are 2 link segment implementations (one for 2.4 Volt and one for 1 Volt) this sentence needs to be defined differently. As this occurs at a lot of places it is proposed to define everything to 2.4V 1000m link only

SuggestedRemedy

Add at line 16 after " this clause are met" For insertion loss take Equation 146-10.

Proposed Response Response Status W

PROPOSED REJECT.

Existing text references the normative requirements in this clause. The normative requirements for the link segment would be relative to the transmit output voltage modes that the PHY supports. When the (optional) 2.4 Vpp mode is supported and selected, that would be Equation 146-10, but when the (mandatory) 1.0 Vpp mode is supported, that would be 146-11.

This is clear in 146.7.1.1

CI 146

SC 146.1

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Cl 146 SC 146.3.3.1.1 P 118 L 35 # i-346

Law, David Hewlett Packard Enterprise

Comment Type T Comment Status D PCS

It is not clear to me on reading the draft if 4B3T encoding is only when Sdn[3:0] is being encoded in to ternary triplet as defined in Table 146-1 '4B3T encoding' or if it includes all the encoding defined in Figure 146-5 'PCS transmit state diagram' which also include ternary triplets such as COMMA and ESD4.

If it is the former, only the encoding defined in Table 146-1, the text 'A triplet of ternary symbols generated by the PCS Transmit function after 4B3T encoding.' in the tx_symb_triplet variable definition will need to be updated as tx_symb_triplet is also assigned values such as COMMA (see SSD COMMA1 VECTOR state) and ESD4 (see ESD VECTOR state).

SuggestedRemedy

See comment.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change "A triplet of ternary symbols generated by the PCS Transmit function after 4B3T encoding." in the tx_symb_triplet variable definition (146.3.3.1.1, P118 L35)" to "A triplet of ternary symbols generated by the PCS Transmit function. These include 4B3T encoded data and assigned values (see 146.3.3.2.6)."

Cl 146 SC 146.3.3.1.3 P 119 L 18 # i-349

Law, David Hewlett Packard Enterprise

Comment Type TR Comment Status D PMA

As illustrated in Figure 146-2 '10BASE-T1L PHY interfaces' and 146-3 'PCS reference diagram', and defined in IEEE Std 802.3-2018 subclause 22.2.2.1, TX_CLK is sourced from the PHY to the RS, not the other way round. Despite this, I was unable to find a specification of TX_CLK in Clause 146. Suggest that TX_CLK is generated by symb_triplet_timer and that symb_triplet_timer be generated from symb_timer.

SuggestedRemedy

[1] Change the description of the symb_timer to read 'A continuous free-running timer. PMA_UNITDATA.request messages are issued by the PCS concurrently with symb_timer_done.'

[2] Change the description of the symb_triplet_timer to read 'A continuous free-running timer that shall expire synchronously with every third expiration of symb_timer. TX_CLK (see 22.2.2.1) shall be generated from symb_triplet_timer with the rising edge of TX_TCLK generated synchronously with symb_triplet_timer_done.'

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

(commenter's proposed resolution + change to 146.4.5.4)

[1] Change the description of the symb_timer to read 'A continuous free-running timer. PMA_UNITDATA.request messages are issued by the PCS concurrently with symb_timer_done.'

[2] Change the description of the symb_triplet_timer to read 'A continuous free-running timer that shall expire synchronously with every third expiration of symb_timer. TX_CLK (see 22.2.2.1) shall be generated from symb_triplet_timer with the rising edge of TX_TCLK generated synchronously with symb_triplet_timer_done.'

[3] Change 146.4.5.4 (P139 L43) to add new first paragraph:

"The clock recovery provides a synchronous clock for sampling the signal on the pair. While it may not drive the MII directly, the Clock Recovery function is the underlying root source of RX_CLK."

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CI 146 SC 146.3.3.1.5 P 120 L 7 # i-351

Law, David Hewlett Packard Enterprise

Comment Type T Comment Status D State Diagram

In some cases, the result of a function is assigned to a variable, for example, the action in the ESD DISPRESET VECTOR state is tx_symb_triplet <= DISPRES(tx_disparity), yet in other cases, there is no assignment, for example, the action in the SEND IDLE state is ENCODE(Sdn[3:0], tx_disparity).

Suggest that there should be a consistent assignment of the result of a function to a variable within actions in state diagrams. Based on this:

[1] Change 'ENCODE(Sdn[3:0], tx_disparity)' to read 'tx_symb_triplet <= ENCODE(Sdn[3:0], tx_disparity)' in the SEND IDLE and TRANSMIT DATA in Figure 146-5 'PCS transmit state diagram'.

[2] Change 'DECODE (Rxn-5, rx_disparity)' to read 'RXD[3:0] <= DECODE (Rxn-5, rx_disparity)' in the DATA, FOURTH SSD, CHECK ESD COMMA2, CHECK ESD DISPRESET3, ESD, BAD ESD2, BAD ESD3, RX ERROR, CHECK ESD ESD4 and the BAD END states in Figure 146-8 'PCS receive state diagram (part a)' and Figure 146-9 'PCS receive state diagram (part b)'.

SuggestedRemedy

Suggest that there should be a consistent assignment of the result of a function to a variable within actions in state diagrams. Based on this:

[1] Change 'ENCODE(Sdn[3:0], tx_disparity)' to read 'tx_symb_triplet <= ENCODE(Sdn[3:0], tx_disparity)' in the SEND IDLE and TRANSMIT DATA in Figure 146-5 'PCS transmit state diagram'.

[2] Change 'DECODE (Rxn-5, rx_disparity)' to read 'RXD[3:0] <= DECODE (Rxn-5, rx_disparity)' in the DATA, FOURTH SSD, CHECK ESD COMMA2, CHECK ESD DISPRESET3, ESD, BAD ESD2, BAD ESD3, RX ERROR, CHECK ESD ESD4 and the BAD END states in Figure 146-8 'PCS receive state diagram (part a)' and Figure 146-9 'PCS receive state diagram (part b)'.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
ENCODE and DECODE both update not only the triplet but the disparity. Commenter's suggested remedy is modified to reflect this.

[1] Change 'ENCODE(Sdn[3:0], tx_disparity)' to read '{ tx_symbol_triplet, tx_disparity } <= ENCODE(Sdn[3:0], tx_disparity)' in the SEND IDLE and TRANSMIT DATA in Figure 146-5 'PCS transmit state diagram'.

[2] Change 'DECODE (Rxn-5, rx_disparity)' to read '{ RXD[3:0], rx_disparity } <= DECODE (Rxn-5, rx_disparity)' in the DATA, FOURTH SSD, CHECK ESD COMMA2, CHECK ESD DISPRESET3, ESD, BAD ESD2, BAD ESD3, RX ERROR, CHECK ESD ESD4 and the BAD END states in Figure 146-8 'PCS receive state diagram (part a)' and Figure 146-9

'PCS receive state diagram (part b)'.

CI 146 SC 146.3.3.2 P 124 L 43 # i-284

McCarthy, Mick Analog Devices Inc.

Comment Type T Comment Status D PCS

The delimiters SSD4 and ESD4/ESD_ERR4, as defined in Table 146-3, are always the same. If a PHY is transmitting a stream of packets of constant length and with a fixed interpacket gap, there will therefore be a non-zero value in the auto-correlation sequence of the transmitted signal. This will produce a harmonic in the transmit power spectrum. This could be avoided by randomizing the sign of the delimiters.

SuggestedRemedy

Add scheme to randomize the sign of the delimiters.

Proposed Response Response Status W

PROPOSED REJECT.
TFTD.

Commenter's proposed remedy is unclear, as is the magnitude of the issue.

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Cl 146 SC 146.3.3.2.1 P 121 L 27 # i-354

Law, David Hewlett Packard Enterprise

Comment Type T Comment Status D PCS

Subclause 146.3.3.2.1 'Side-stream scrambler polynomial', subclause 146.3.3.2.2 'Generation of Syn[3:0]' in combination of subclause 146.3.3.2.3 'Generation of scrambled bits Sdn[3:0]' define the requirements in respect to the generation of Sdn[3:0] which is input to the ENCODE() function in the SEND IDLE and TRANSMIT DATA states of Figure 146-5 'PCS transmit state diagram'.

Subclause 146.3.3.2.4 'Generation of ternary triplet in mode SEND_N and SEND_I', subclause 146.3.3.2.5 'Generation of ternary triplet in mode SEND_Z' and subclause 146.3.3.2.6 'Generation of symbol sequence' then describes the encoding that is actually performed by Figure 146-5 'PCS transmit state diagram'. Since subclause 146.1.3 'Conventions in this clause' states that 'Should there be a discrepancy between a state diagram and descriptive text, the state diagram prevails.' the state diagram requirements override the subclause 146.3.3.2.4 shall statements.

SuggestedRemedy

- [1] Change the block '4B3T ENCODER' in Figure 146-6 'PCS transmit symbol generation' to read 'PCS transmit state diagram'.
- [2] Add TX_CLK as an input to the 'PCS transmit state diagram' block as this is used as the tx_symb_triplet clock.
- [3] Insert a new subclause 146.3.3.3 titled 'Generation of scrambled bits Sdn[3:0]' that reads 'The scrambled bits Sdn[3:0] used by the ENCODE function defined in 146.3.3.1.2 are generated as follows.'
- [4] Renumber subclause 146.3.3.2.1 to 146.3.3.3.1, subclause 146.3.3.2.2 to 146.3.3.3.2 and subclause 146.3.3.2.3 to 146.3.3.3.3.
- [5] Insert a new subclause 146.3.3.4 titled 'Generation of ternary triplet' that reads 'The PCS transmit state diagram generates ternary triplets as follows.'
- [6] Renumber subclause 146.3.3.2.4 to 146.3.3.4.1, subclause 146.3.3.2.5 to 146.3.3.4.2 and subclause 146.3.3.2.6 to 146.3.3.4.
- [7] Reword subclause 146.3.3.4.1, 146.3.3.4.2 and 146.3.3.4 to be descriptive rather than normative.

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 146 SC 146.3.3.2.5 P 123 L 45 # i-358

Law, David Hewlett Packard Enterprise

Comment Type TR Comment Status D State Diagram

There seems to be a disconnect between Figure 146-5 'PCS transmit state diagram' which outputs tx_symb_triplet, Figure 146-6 'PCS transmit symbol generation' that outputs tx_symb_triplet from a '4B3T ENCODER', and the text in subclause 146.3.3.2.5. While Figure 146-6 shows tx_mode as an input to the 4B3T ENCODER that produces tx_symb_triplet, and subclause 146.3.3.2.5 says that 'The ternary triplet (TAn, TBn, TCn) shall be a zero vector (0, 0, 0) when tx_mode = SEND_Z.' the states diagrams in 146-4 and 146-5 would seem to produce a different result.

If tx_mode = SEND_Z the Figure 146-4 'PCS data transmission enabling state diagram' will be in the 'DISABLE DATA TRANSMISSION' state, setting both tx_enable_mii and tx_error_mii to FALSE. In turn, if tx_enable_mii = FALSE the Figure 146-5 'PCS transmit state diagram' will, if necessary return to and, remain in the 'SEND IDLE' state. This will result in tx_symb_triplet being set to the result of ENCODE(Sdn[3:0], tx_disparity) and not (0, 0, 0) as required by subclause 146.3.3.2.5.

This appears to be a discrepancy between the state diagram and text requirements in respect to tx_symb_triplet, and since subclause 146.1.3 'Conventions in this clause' states that 'Should there be a discrepancy between a state diagram and descriptive text, the state diagram prevails.' tx_symb_triplet has to be set to ENCODE(Sdn[3:0], tx_disparity) and not (0, 0, 0). I don't believe that this is intended.

SuggestedRemedy

- [1] Add the following definition to subclause 146.3.3.1.5 'Constants':

ZERO

A vector of three zero symbols sent when tx_mode = SEND_Z as specified in subclause 146.3.3.2.5.

- [2] Replace the action ENCODE(Sdn[3:0], tx_disparity) in the SEND IDLE state of Figure 146-5 'PCS transmit state diagram' with:

```
IF(tx_mode = SEND_Z) THEN
    tx_symb_triplet <= ZERO
    tx_disparity <= 2
ELSE
    ENCODE(Sdn[3:0], tx_disparity)
END
```

Proposed Response Response Status W

PROPOSED ACCEPT.

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Cl 146 SC 146.3.4.1.3 P 127 L 25 # i-163

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type T Comment Status D State Diagram

The definition of RSTCD is unclear. From the phrase "Receive Symbol Triplet Conversion Done". This appears to be a symbol timer for triplets of received symbols, similar to symb_triplet_timer in 146.3.3.1.3. The text only says it is synchronized with the PCS receive clock. Also, this timer is not explicitly started anywhere.

SuggestedRemedy

Change RSTCD to Received_symbol_triplet_conversion_timer. Insert after sentence ending "RX_CLK." (new line, after line 25) "Continuous timer: The condition Received_symbol_triplet_conversion_timer_done (RSTCD) becomes true upon timer expiration.

Restart time: Immediately after expiration, timer restart resets the condition

Received_symbol_triplet_conversion_timer_done (RSTCD).

Duration: Three symbol times (see 146.5.4.5)" Also, add new subclause 146.3.4.1.4

Abbreviations, with text: "RSTCD Received_symbol_conversion_timer_done."

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 146 SC 146.3.4.1.3 P 127 L 25 # i-93

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type T Comment Status D State Diagram

Period and behavior for timer RSTCD are not defined the timer behind RSTCD is not defined.

SuggestedRemedy

Define a new timer:

rcv_symb_triplet_timer - The rcv_symb_triplet_timer shall be generated synchronously with the PCS receive clock RX_CLK.

Continuous timer: The condition rcv_symb_triplet_timer_done becomes true upon timer expiration.

Restart time: Immediately after expiration, timer restart resets the condition

rcv_symb_triplet_timer_done.

Duration: Three symbol times (see 146.5.4.5)

Modify existing text for RSTCD as: Abbreviation for Receive Symbol Triplet Conversion Done, which is equivalent to the timer condition rcv_symb_triplet_timer_done.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Define a new timer:

rcv_symb_triplet_timer - The rcv_symb_triplet_timer shall be generated synchronously on every third clock from the PMA....

<< NEED TO RESOLVE HOW TO SYNCH AND HOW TO SPECIFY THIS>>>
DEFER...

RX_CLK (see 22.2.2.1) shall be generated from rcv_symb_triplet_timer with the falling edge of RX_CLK generated synchronously with rcv_symb_triplet_timer_done.

Continuous timer: The condition rcv_symb_triplet_timer_done becomes true upon timer expiration.

Restart time: Immediately after expiration.

Duration: Three symbol times (see 146.5.4.5)

Modify existing text for RSTCD as: Abbreviation for Receive Symbol Triplet Conversion Done, which is equivalent to the timer condition rcv_symb_triplet_timer_done.

and Management Parameters for 10 Mb/s Operation and Associated Power Delivery over a Single Balance

Cl 146 SC 146.3.4.1.3 P 128 L 41 # i-98

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type T Comment Status D State Diagram

Within the PCS receive state diagram the BAD DELIMITER state is called by a wrong SSD and also by a wrong ESD. Within BAD DELIMITER state a false carrier indication is sent over the MII. According to other Clauses within 802.3 a false carrier indication is only sent over the MII, if a wrong SSD, but not if a wrong ESD is detected.

SuggestedRemedy

Rename the BAD DELIMITER state to BAD SSD. Remove the "B" input arc from BAD SSD state. Add a new state BAD ESD right from the BAD SSD state and add the "B" input arc to this new BAD ESD state. Connect the output of the BAD ESD state to the IDLE state with branch condition "check_idle". Content of the BAD ESD state is: "RX_ER <= TRUE, RX_DV <= FALSE, RXD[3:0] <= 0000, receiving <= TRUE"

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 146 SC 146.3.4.1.3 P 128 L 45 # i-318

Beruto, Piergiorgio Canova Tech S.r.l.

Comment Type T Comment Status D State Diagram

tag [INDEX]
The function CHECK_DISP(RXn-5, rx_disparity) should be checking RXn-4, not RXn-5. If it checks RXn-5, it is checking the value of RXn in the SSD state, which, according to the entry arc is SSD4.
The same offset error occurs multiple times also in the DECODE function.

SuggestedRemedy

In Figure 146-8, in all states, replace all occurrences of "RXn-5" to "RXn-4".
In Figure 146-9, in all states, replace all occurrences of "RXn-5" to "RXn-4".

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 146 SC 146.4.3 P 133 L 35 # i-409

Kim, Yongbum NIO

Comment Type TR Comment Status D PMA

"The sequence of symbols assigned to tx_symb_vector is needed to perform echo cancellation." is not sufficient. It should also include reference to the MASTER and SLAVE PMA clock recovery function.

SuggestedRemedy

Change the text to read
"In addition to the PMA Clock Recovery function (see 146.4.6), the sequence of symbols assigned to tx_symb_vector is needed to perform echo cancellation."

Proposed Response Response Status W

PROPOSED REJECT.
The commenter asks for a tutorial and the standard is not a tutorial - no change required.

Commenter is incorrect.
The only information which is inherently needed is the transmitted symbol stream. The echo can be removed in any implementation-dependent manner. The standard is not intended to be a tutorial on signal processing or constrain possible solutions. For example, a receiver could estimate the timing separately from the data, or cancel in the continuous time domain.
Additionally, 146.4.6 states it is only for the SLAVE to recover the clock. MASTER does not have a clock recovery function.

Cl 146 SC 146.4.4 P 137 L 1 # i-285

McCarthy, Mick Analog Devices Inc.

Comment Type T Comment Status D EEE

10BASE-T1L LPI signalling is driven primarily by MII data traffic. No attempt has been made to introduce a scheme that synchronizes LPI quiet/refresh cycling between MASTER and SLAVE PHYs. There is little predictability to LPI quiet/refresh cycling because of this, making implementation more complex.

SuggestedRemedy

Add LPI quiet/refresh cycling, synchronized using loc_lpi_req signalling during link startup. A PHY implementation could use this scheme to know when link partner will be sending an LPI refresh state.
See attached document.

Proposed Response Response Status W

PROPOSED REJECT.
Only 1000BASE-T1 has synchronization for LPI quiet-refresh, whereas the other BASE-T PHYs with a similar quiet-refresh cycle (10GBASE-T and the other MultiGBASE-T PHYs) do not. Adding synchronization of quiet/refresh cycling would be the addition of a new, non-essential feature to 802.3cg without quantified benefit.

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Cl 146 SC 146.4.4.2 P 136 L 14 # i-104
 Graber, Steffen Pepperl+Fuchs GmbH
 Comment Type T Comment Status D State Diagram
 The timer shall expire 100 ms after being started. (it has been missed to transfer the tolerance of the timer of +/- 1 ms from the original presentation to the draft).
 SuggestedRemedy
 The timer shall expire 100 ms +/- 1 ms after being started.
 Proposed Response Response Status W
 PROPOSED ACCEPT.

Cl 146 SC 146.4.4.2 P 136 L 17 # i-105
 Graber, Steffen Pepperl+Fuchs GmbH
 Comment Type T Comment Status D EEE
 Modify the LPI timers for 10BASE-T1L to support a wider range of implementations and better synchronization by using precise timers, synchronous with the symbol transmit rate.
 SuggestedRemedy
 Change the expiration times in the following way: lpi_sleep_timer (line 20): "The timer shall expire 250 us (625 triple ternary symbols) after being started.", lpi_quiet_timer (line 23): "The timer shall expire 6000 us (15 000 triple ternary symbols) after being started.", lpi_refresh_timer (line 27): "The timer shall expire 250 us (625 triple ternary symbols) after being started.", lpi_wake_timer (line 30): "The timer shall expire 250 us (625 triple ternary symbols) after being started."
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 Change the expiration times in the following way: lpi_sleep_timer (line 20): "The timer shall expire 250 us after being started.", lpi_quiet_timer (line 23): "The timer shall expire 6000 us after being started.", lpi_refresh_timer (line 27): "The timer shall expire 250 us after being started.", lpi_wake_timer (line 30): "The timer shall expire 250 us after being started."

Cl 146 SC 146.4.4.2 P 137 L 17 # i-107
 Graber, Steffen Pepperl+Fuchs GmbH
 Comment Type T Comment Status D EEE
 Initializing of variable "loc_lpi_req" in TRAINING state is missing. This is necessary because loc_lpi_req is used in the PCS scrambler definition, which can change the SEND_I encoding used in SEND IDLE, thus this variable needs to be initialized before starting to transmit idle data.
 SuggestedRemedy
 Add "loc_lpi_req <= FALSE" to TRAINING state.
 Proposed Response Response Status W
 PROPOSED ACCEPT.

Cl 146 SC 146.5.5.3 P 144 L 28 # i-297
 Schicketanz, Dieter University of Applied Science Reutlingen
 Comment Type T Comment Status D PMA Electrical
 There are 2 link equations either use one or define for both.
 SuggestedRemedy
 Insert after 146.7 with II from equation 146-10
 Proposed Response Response Status W
 PROPOSED REJECT.
 The existing reference to 146.7 is clear. When the link is using the optional 2.4 Vpp mode, the insertion loss limit of a link compliant to 146.7 is equation 146-10, when the transmitters are in 1.0 Vpp mode, the limit is equation 146-11.

Cl 146 SC 146.11.4.4 P 165 L 26 # i-126
 Graber, Steffen Pepperl+Fuchs GmbH
 Comment Type T Comment Status D PICS
 Clause 146.11.4.4 requires mandatory ticking of most of the items (besides LMF2) for a PHY. The link segment Clause provides requirements for the link segment (which are in principle not testable by the PHY) and not for the PHY itself. The PHY needs to be designed to work in conjunction with the (worst-case) link segment definition, but not meet the link segment definition by itself.
 SuggestedRemedy
 Please add for each support field also a N/A [] option (so that ticking this N/A field is allowed for a PHY), as e.g. done in IEEE802.3bp or make otherwise clear, that the PHY itself does not need to fulfil the link segment spec itself, but only need to work with a link segment meeting the link segment specification with the BER specified for the PHY.
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 Add new row to table of Major Capabilities and Options (146.11.3) P159 L21:
 Item: *INS
 Feature: Installation / cabling
 Subclause: 146.7
 Value/Comment: Items marked with INS include installation practices and cabling specifications not applicable to a PHY manufacturer.
 Status: O
 Support: Yes [] No []
 Change Status of items in 146.11.4.4 (Link Segment Characteristics) to INS:M (LMF2 becomes INS:O, RTDL:M)
 Make similar changes to 147.12.3 and 147.12.4.6 and 147.12.4.7

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Cl 147 SC 147.3.2.4 P 179 L 10 # i-247

Thompson, Geoffrey Independent Consultant

Comment Type TR Comment Status D PCS

The non-data entries in his table should be conditional on access method and marked as such.

SuggestedRemedy

Those codes not used in CSMA/CD should be marked as "Reserved" when in CSMA/CD mode.

Proposed Response Response Status W

PROPOSED REJECT.

As a PHY, proper implementation of layering requires support of the codes provided via the MII, and the table indicates encoding of the various codes which may be present at the MII, as specified in Clause 22 of this amendment.

Commenter would break layering by specifying the PHY act differently based on what he posits as a MAC-layer parameter in other comments.

Cl 147 SC 147.3.3.4 P 181 L 23 # i-281

Huszak, Gergely Kone

Comment Type T Comment Status D State Diagram

Descrambler needs 17 bits to lock and that is achieved by receiving 5 symbols. Descrambler is fed by 4B symbols, so DECODE must be called to be able to do the feeding.

According to the current specification of the PCS_RX FSM, DECODE is called only in DATA state.

If it is done this way, the first 5 actual data symbols would be garbage, as descrambler is not yet locked.

A fix is to spec PCS_RX so, that this DECODE-and-feed task is already run in PRE state, so that by the time DATA state is reached, meaningful descrambling could be done, using the descrambler locked previously.

Moreover it is not specified what descrambler is to be fed, when DECODE fails.

SuggestedRemedy

1. Add the following sentence to the end of the paragraph that ends 181/23 (replacing its closing dot): ", and the return value of this function is implementation-dependent."
2. Add the following new condition to the end of the current content of PCS_RX/PRE:

```
====
IF precnt > 3 THEN
<tab>DECODE(RXn-3)
END
====
```

Note: the index "-3" in RXn-3 already incorporates the comment that is submitted by Piergiorgio Beruto tagged INDEX

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 147 SC 147.3.3.6 P 183 L 5 # i-319

Beruto, Piergiorgio Canova Tech S.r.l.

Comment Type T Comment Status D State Diagram

tag [INDEX]

The function DECODE(RXn-4) should be checking RXn-3, not RXn-4.

If it checks RXn-4, it would decode one less nibble than it ought to when evaluating the arc to GOOD_ESD state.

SuggestedRemedy

In Figure 147-8 In the DATA state change RXn-4 to RXn-3.

Proposed Response Response Status W

PROPOSED ACCEPT.

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Cl 147 SC 147.3.3.6 P 183 L 12 # i-278

Huszak, Gergely

Kone

Comment Type T Comment Status D State Diagram

Conditions on DATA->BAD_ESD and DATA->GOOD_ESD should be mutually exclusive, but those are not. Implementations would work, due to the usual if - else construct, however this leaves space for implementation-dependent divergence in PHY behavior.

SuggestedRemedy

1. Change the condition on DATA->BAD_ESD from:

```
====
RSCD *
(((RXn-2 = ESD + RXn-2 = ESDBRS) * RXn-1 != ESDOK) + RXn-3 = SILENCE)
=====
```

to:

```
====
RSCD *
(((RXn-2 = ESD + RXn-2 = ESDBRS) * RXn-1 != ESDOK * RXn-3 != ESD * RXn-3 !=
ESDBRS) + RXn-3 = SILENCE)
=====
```

2. Change the condition on DATA->DATA from:

```
====
RSCD *
!(((RXn-2 = ESD + RXn-2 = ESDBRS) * RXn-1 != ESDOK) + RXn-3 = SILENCE) *
!((RXn-3 = ESD + RXn-3 = ESDBRS) * RXn-2 = ESDOK)
=====
```

to:

```
====
RSCD *
!(((RXn-2 = ESD + RXn-2 = ESDBRS) * RXn-1 != ESDOK * RXn-3 != ESD * RXn-3 !=
ESDBRS) + RXn-3 = SILENCE) *
!((RXn-3 = ESD + RXn-3 = ESDBRS) * RXn-2 = ESDOK)
=====
```

Note: Separate comment on changing all the indexes in the RXn-# notation on all 3 exist conditions from DATA was submitted. Consider these comments together.

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 147 SC 147.3.3.10 P 185 L 10 # i-414

Kim, Yongbum

NIO

Comment Type TR Comment Status D PCS

Generation of Commit indication states PHY shall notify RS of received Commit by the means of MII interface in 22.2.2.8. This statement makes support of PLCA RS in 10BASE-T1S PHY not optional. PLCA RS is advertised as optional RS. The use of COMMIT (in proposed changes to CL22) requires support of the optional RS, but this clause does not specify the optional RS behavior. This and two other shalls in this subclause makes it mandatory implementation in all 10BASE-T1S PHYs.

SuggestedRemedy

Delete CL147.3.3.10 requirements.

Proposed Response Response Status W

PROPOSED REJECT.

Commenter is incorrect.

The decoding and signaling of the COMMIT and BEACON indications, and presentation of the signaling onto the MII does not make support of PLCA mandatory.

When the PLCA is not enabled or not supported, RS operation shall conform to C22, which would cause the signals to be ignored because the state diagrams they effect are not implemented.

See also 215/51 ("148.4.2 Reconciliation Sublayer operation").

Cl 147 SC 147.3.5 P 184 L 27 # i-248

Thompson, Geoffrey

Independent Consultant

Comment Type TR Comment Status D PCS

The text of this sub-clause does not meet the fundamental functional requirements of a busssed CSMA/CD system (Ref.: cl. 8.2 c)). It is just flat out incorrect. The last sentence of the 1st paragraph is technically incorrect. Statement a) is technically incorrect. Statement b) is true but technically insignificant to the operation of a MAC.

SuggestedRemedy

Add a full specification for Collison Detect that meets the full Ethernet requirements for function, reliability and timing.

Proposed Response Response Status W

PROPOSED REJECT.

The proposed change in the comment does not contain sufficient detail so that the CRG can understand the specific changes that satisfy the commenter.

Commenter fails to adequately explain the problem and does not provide a sufficient remedy.

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Cl 147 SC 147.3.5 P 184 L 30 # i-417
 Kim, Yongbum NIO
 Comment Type TR Comment Status D PCS

[CSD/Compatibility] [Collision Detect, no assurance thereof]
 In IEEE 802.3 project where CSMA/CD ("half-duplex") is supported, the collision detection method always has been specified, AND the assurance of 100% collision detection has been obvious, i.e. DC bias voltage rise from two or more transmitters using current source into a known resistance, or simple logical AND function of PMA TXD enable and RXD enable. This project, however, does not specify any collision detection method except to say 1) data corruption == collision, and 2) require, without specification, find two or more stations transmitting somewhere in the network and assert CRS during that time.

We all know what collision condition is, 'two or more simultaneous transmission into a shared collision domain' or there about. It is the responsibility of the project to specify how this is done, and also assure us that collision detection confidence is at least at PAR with prior projects. This project does not specify the collision detection method; therefore, it is incomplete.

That said, there are tactical issues with the current draft, and I do not wish to indicate that fixing any of these tactical issues would be satisfactory to requiring 100% assurance of collision detect. But here goes.
 1) "corrupted signal while transmitting" == collision. This has an obvious flaw that one station may see random bit-error (e.g. from a local noise hit) and detect collision and back-off, the other station does not see a collision 'corrupted signal while transmitting' and completes transmission. Some receivers may see errored frames, some may not see errored frame. Result = non-deterministic behavior and lost packet.
 2) Local strong TX and remote weak TX may not assure corruption.
 - Max Attenuation: Attenuation of the TX signal on the nominal-length worst-case channel is 65% (3.7 db)
 - Max TX power of local, so +20% P-P from 147.5.4.1 transmit output voltage is 1V +/- 20% P-P. + minimum droop and power spectral density (highest power allowed).
 - Min TX power of remote, so -20% P-P, with max droop.
 so power diff give another ~66%. Or ~43% max interference from remote, and it could be as little as ~35% considering droop.

In addition, COL assertion within 256 bit times from the beginning of a transmission seems insufficient -- a minimum collision duration is 96 bit times. A min collision + IPG would allow a new transmission to occur at 192 bit times from the initial collision. So allowing collision to assert up to 256 bit time later, would potentially affect the subsequent packet transmission.

Without receiver specification we have NO CLUE how receiver would behave -- whether or not data corruption would be detected from the worst case remote TX interference.. And we've opted for TX and channel spec and leave RX to implementors to "recover" tx data over channel.

From 147.3.5 Collision Detection:
 "When operating in half-duplex mode, the 10BASE-T1S PHY shall detect when a

transmission initiated locally results in a corrupted signal at the MDI as a collision. When collisions are detected, the PHY shall assert the signal COL on the MII for the duration of the collision or until TX_EN signal is FALSE. The method for detecting a collision is implementation dependent but the following requirements have to be fulfilled. a) The PHY shall assert COL within 256 bit times from the beginning of a transmission when one or more stations are transmitting at the same time.
 b) The PHY shall assert CRS in the presence of a signal resulting from a collision between two or more stations."

Suggested Remedy

The draft is incomplete without 100% collision detection specification. 100% defined to be as obvious as prior 802.3 CSMA/CD PHY projects. Please complete the draft by including collision detection specification.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
 Comment appears to comment on multiple issues.
 1. With regards to the 256 bit times delay in asserting COL, at 184/35-37 change this:
 =====
 The PHY shall assert COL within 256 bit times from the beginning of a transmission when one or more stations are transmitting at the same time.
 =====
 to this:
 =====
 The PHY shall assert COL when one or more stations are transmitting at the same time.
 =====
 effectively removing "within 256 bit times from the beginning of a transmission".
 This proposed resolution to comment #-45 clarifies the possible misinterpretation of this requirement.
 2. CRG disagrees with the rest of commenter's statements.
 Analysis has been presented (see http://www.ieee802.org/3/cg/public/adhoc/beruto_3cg_collision_detection.pdf) to address issues of existence, feasibility and reliability of collision detect (CD).
 The highlights of this analysis relevant to this comment are:
 - Target level of reliability (less-than-or-equal-to one miss-categorization per lifetime of universe) can be achieved based on the current specs.
 - In the analogue domain, in presence of the specified Gaussian noise, reliable CD can be achieved. The commenter's calculation seems to confirm most of these (see commenter's figure compared to pages 4 and 5 of the study), but CRG has difficulty following commenter's calculations in full.
 - Using the properties of the DME, the self-synchronizing scrambler and network geometry (reach, exclusion of the repeaters) and other properties of the Ethernet frame, the same can be achieved.
 - At least one implementation exists that meet these requirements in specified noise environment.
 THE PROPOSED RESPONSE OF #-45 IS AS FOLLOWS:
 >>>>
 PROPOSED ACCEPT.
 Change the "event" in Row 6 (Lines 43-45) from:
 "COL input to CRS asserted"

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to:
 "MDI input to COL asserted"
 ==
 Change the "Output timing reference" in Row 6 (Lines 43-45) from:
 "Rising edge of CRS"
 To:
 "Rising edge of COL"
 ==
 Change the "event" in Row 7 (Lines 46-47) from:
 "COL input to CRS deasserted"
 to:
 "MDI input to COL deasserted"
 ==
 Change the "Output timing reference" in Row 7 (Lines 46-47) from:
 "Rising edge of CRS"
 To:
 "Rising edge of COL"
http://www.ieee802.org/3/cg/comments/Comment_i-45_Baggett_3cg_Table_147-6_typo_errors.pdf
 <<<<

Cl 147 SC 147.3.7.1 P 185 L 19 # i-413

Kim, Yongbum NIO
 Comment Type ER Comment Status D PCS

"... a BEACON is received..." the word "BEACON" is used without any x-reference, and the nature of 'BEACON' (signal?, state?, interface?, etc) is found in other clauses.

SuggestedRemedy

Please insert x-ref to 'BEACON'.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change this:

====

When the PHY is not in multidrop mode and a BEACON is received either over the MII or from the line

====

to this:

====

When the PHY is not in multidrop mode and a BEACON request is received from the MII (See Table 22-2) or a BEACON code-group is received from the line (See Table 147-1)

====

Cl 147 SC 147.3.7.1 P 185 L 19 # i-412

Kim, Yongbum NIO
 Comment Type TR Comment Status D PCS

WRT to "When the PHY is not in multidrop mode and a BEACON is received either over the MII or from the line, the state diagram in Figure 147-10 enters the DISABLE_HB state and stays there until PCS Reset is asserted,...". This statement makes support of PLCA RS in 10BASE-T1S PHY (current all three of 10BASE-T1S PHYs) not optional. PLCA RS is advertised as optional RS. The recognition of BEACON (in proposed changes to CL22) requires support of the optional RS, but this clause does not specify the optional RS beavior. This and two other shalls in this subclause makes it mandatory implementation in all 10BASE-T1S PHYs.

SuggestedRemedy

Delete CL147.3.7.1 requirements.

Proposed Response Response Status W

PROPOSED REJECT.

Commenter is incorrect.

The decoding and signaling of the COMMIT and BEACON indications, and presentation of the signaling onto the MII does not make support of PLCA mandatory.

When the PLCA is not enabled or not supported, RS operation shall conform to C22, which would cause the signals to be ignored because the state diagrams they effect are not implemented.

See also 215/51 ("148.4.2 Reconciliation Sublayer operation").

Cl 147 SC 147.3.7.1.1 P 185 L 51 # i-415

Kim, Yongbum NIO
 Comment Type TR Comment Status D PCS

WRT to "...rx_cmd <= 'COMMIT' when a COMMIT indication is generated as specified".

This statement makes support of PLCA RS in 10BASE-T1S PHY not optional. PLCA RS is advertised as optional RS. The use of COMMIT (in proposed changes to CL22) requires support of the optional RS, but this clause does not specify the optional RS beavior. This and two other shalls in this subclause makes it mandatory implementation in all 10BASE-T1S PHYs.

SuggestedRemedy

Delete CL147.3.7.1.1 requirements.

Proposed Response Response Status W

PROPOSED REJECT.

Commenter is incorrect.

The decoding and signaling of the COMMIT and BEACON indications, and presentation of the signaling onto the MII does not make support of PLCA mandatory.

When the PLCA is not enabled or not supported, RS operation shall conform to C22, which would cause the signals to be ignored because the state diagrams they effect are not implemented.

See also 215/51 ("148.4.2 Reconciliation Sublayer operation").

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Cl 147 SC 147.4.2 P 191 L 11 # i-253

Thompson, Geoffrey Independent Consultant

Comment Type ER Comment Status D PMA

In Fig. 147-13 the two figures are confusing because they are vastly different time scales. One figure shows the actual (idealized) signal transitions and the other shows the LF envelope of the signal.

SuggestedRemedy

Resolve the issue within the figure. I suggest grey-scaling within the transmission. (Unless what is being depicted on the second fig. Is 2 time scales, then their should be a two wiggly vertical discontinuity break in the middle of T1)

Proposed Response Response Status W

PROPOSED REJECT.

Commenter has not provided necessary and sufficient information for the problem and the fix it may deserve.

Cl 147 SC 147.5.1 P 193 L 1 # i-254

Thompson, Geoffrey Independent Consultant

Comment Type ER Comment Status D PMA Electrical

This clause and its sub-clauses don't say anything useful to specify the conformance requirements for 10BASE-T1S Physical Layer implementation. Saying something "may" be relevant also means it "may not" be relevant. It also means it is not an element of a conformance requirement.

SuggestedRemedy

Replace with: Applications for the specified device commonly have additional requirements that limit its conducted radio frequency emission and its susceptibility to electromagnetic interference coupling to the cabling system. Such requirements are beyond the scope of this standard.

Proposed Response Response Status W

PROPOSED REJECT.

The proposed change in the comment does not contain sufficient detail so that the CRG can understand the specific changes that satisfy the commenter.

It is unclear exactly which part of the text the commenter wishes to replace.

Replacing the entire subclause and its subclauses would remove useful information for the application of the physical layer devices specified in this clause.

Cl 147 SC 147.5.2 P 193 L 33 # i-136

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type T Comment Status D Test Mode

Test mode 3 - Transmitter distortion test and PSD mask (there is no transmitter distortion test, only a transmit PSD mask specification within Clause 147)

SuggestedRemedy

Test mode 3 - Transmitter PSD mask

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 147 SC 147.5.5.1 P 196 L 40 # i-255

Thompson, Geoffrey Independent Consultant

Comment Type ER Comment Status D PMA Electrical

"...and sent to the MII during normal..." Because of the inclusion PLCA as being within the scope of this project the term MII is ambiguous in the context of this draft as there are two reconciliation sublayers. This a result of the further confusion between the "PHY" and the "Physical Layer". Originally the RS was supposed to a functionally transparent block which only (a) did not interfere with access at all and (b) allowed the old physical interface (AUI) to move to a more logical division point (MII) in line with the evolution of technology over the twenty years from 1973 to 1993.

SuggestedRemedy

Either define two terms, one for each RS (e.g. DMII, AMII) or clearly state which RS is intended in each use of MII in this project's draft.

Proposed Response Response Status W

PROPOSED REJECT.

Commenter is incorrect pointing out that the term MII is ambiguous in the context of this draft. The MII is the interface between the PHY and the RS, which both belong to the Physical Layer. In the context of C147 the MII is supposed to work with either C22 RS or Clause 148 RS (PLCA) seamlessly. C148 RS is specified to behave exactly as C22 RS when PLCA function is disabled.

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Cl 147 SC 147.5.6 P 197 L 18 # i-256

Thompson, Geoffrey Independent Consultant

Comment Type TR Comment Status D PMA Electrical

I don't understand how the following text can be true: "The PMA local loopback function is optional" ...on a PMA where transmit is connected to receive.

SuggestedRemedy

Please clarify. I think you mean "The PMA local loopback test function is optional."

Proposed Response Response Status W

PROPOSED REJECT.

The CRG disagrees with the commenter - text is clear - the PMA local loopback function is optional.

What this test mode does in

- half-duplex mode, is overriding part of the condition on the single-ended arrow that point into WAIT_SYNC in "Figure 147-7-PCS Receive state diagram", allowing receiving back transmitting station's own data.

- full-duplex mode, is suspending functionality that would prevent the transmitting station from receiving its own data.

Cl 147 SC 147.5.6 P 197 L 24 # i-257

Thompson, Geoffrey Independent Consultant

Comment Type TR Comment Status D PMA Electrical

The word "unterminated" here implies that loopback only works if there is no compliant link segment and other MAU connected but there is a requirement of some sort for some circuit characteristics at the MDI to guarantee the echo.

SuggestedRemedy

Clarify and specify

Proposed Response Response Status W

PROPOSED REJECT.

In full-duplex PMA loopback only works with unterminated link segment (If the line is terminated, then you don't get any signal back, the reflection coefficient is 0).

PMA loopback mode is meant for serving diagnostics purposes, used in a special mode, therefore collision is not a concern there.

Cl 147 SC 147.5.6 P 197 L 27 # i-258

Thompson, Geoffrey Independent Consultant

Comment Type TR Comment Status D PMA Electrical

The paragraph seems to assume that what is on the receive PMA is sufficiently well-formed to be to be decoded and converted to data. Since it is the sum of two or more signals that is not a valid assumption.

SuggestedRemedy

Add the following text: "During a collision (i.e. either a transmit collision or a receive collision) no assumptions whatsoever can be made about the validity or decodability of the waveform present at the input of the receiver."

Proposed Response Response Status W

PROPOSED REJECT.

Commenter is incorrect, as this subclause refers to PMA loopback mode, not to collision detection.

Text here makes no assumption with regards to the received signal (its shape, validity and so on) in the presence of collision.

The PMA Loopback is used for diagnostic purposes, and it is optional, thus current text is correct.

Cl 147 SC 147.5.6 P 197 L 31 # i-259

Thompson, Geoffrey Independent Consultant

Comment Type TR Comment Status D PMA Electrical

Paragraph 4 is not true. Add conditional text to make it true.

SuggestedRemedy

Precede the current text with: "In the absence of collision..."

Proposed Response Response Status W

PROPOSED REJECT.

This subclause is about "PMA Local Loopback", so it is a means for the MAC client to verify underlying circuitry. In case of collision, COL is raised and MAC client can act accordingly.

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Cl 147 SC 147.6 P 197 L 38 # i-260

Thompson, Geoffrey Independent Consultant
 Comment Type TR Comment Status D Management

I don't understand how the last sentence of this paragraph works in an actual implementation. I think a compliant (as opposed to interoperable in some fixed configuration) implementation is required to have control bits. Ifso, there has to be a way to test their existence and function. I don't see how you get there from the present text.

SuggestedRemedy

Put in a testable requirement to access the configurable aspects.

Proposed Response Response Status W

PROPOSED REJECT.
 The identical language is used in several 802.3 clauses with respect to control, in particular in clause 45 which governs the registers.
 Commenter is incorrect. While the implementation of the MDIO interface is optional, and an equivalent mechanism is recommended, the implementation is NOT required to have the control bits. An equivalent means of control and configuration (e.g., with a different encoding of bits, or with strap pins) would be permitted. The existing text allows this.

Cl 147 SC 147.8.1 P 199 L 52 # i-402

Kim, Yongbum NIO
 Comment Type TR Comment Status D Mixing Segment

The mixing segment shall meet the insertion loss characteristics specified for link segments in 147.7.1 between any two MDI attachment points. And from 147.8 "A mixing segment is specified based on cabling that supports up to at least 8 nodes and 25 m in reach". From both of this statement, this specification is requiring 28 (combination of any two) measurement taken. And any added nodes requires all combinations to be measured again, and with no assurances that the prior conformant MDI may fall out of range.

SuggestedRemedy

Provide better medium specification and cable design considerations that can be followed assured scaleable MDI and medium construction.

Proposed Response Response Status W

PROPOSED REJECT.
 The proposed change in the comment does not contain sufficient detail so that the CRG can understand the specific changes that satisfy the commenter.
 Further, the CRG disagrees with the commenter, as the commenter mistakes 147.8 explanatory text with the specification ("is specified" vs. "shall meet.").
 It is common practice for cabling systems to be specified to be compliant by design rather than necessarily measured for each instance. Further, the characteristics required have been specified based on measurements indicating that they support the described topologies, an existence proof that design is feasible.

Cl 147 SC 147.8.2 P 200 L 52 # i-403

Kim, Yongbum NIO
 Comment Type TR Comment Status D Mixing Segment

The mixing segment shall meet the return loss characteristics specified for link segments in 147.7.2 between any two MDI attachment points. And from 147.8 "A mixing segment is specified based on cabling that supports up to at least 8 nodes and 25 m in reach". From both of this statement, this specification is requiring 28 (combination of any two) measurement taken. And any added nodes requires all combinations to be measured again, and with no assurances that the prior conformant MDI may fall out of range.

SuggestedRemedy

Provide better medium specification and cable design considerations that can be followed assured scaleable MDI and medium construction.

Proposed Response Response Status W

PROPOSED REJECT.
 The proposed change in the comment does not contain sufficient detail so that the CRG can understand the specific changes that satisfy the commenter.
 Further, the CRG disagrees with the commenter, as the commenter mistakes 147.8 explanatory text with the specification ("is specified" vs. "shall meet.").
 It is common practice for cabling systems to be specified to be compliant by design rather than necessarily measured for each instance. Further, the characteristics required have been specified based on measurements indicating that they support the described topologies, an existence proof that design is feasible.

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Cl 148 SC 148 P 214 L 1 # i-393

Kim, Yongbum

NIO

Comment Type TR Comment Status D PLCA_SCOPE

[CSD] CSD/Economic Feasibility statements in CSD document is not valid for CL148 PLCA operation.

The project CSD states that "

The cost factors for Ethernet components and systems are well known. The proposed project may introduce new cost factors which can be quantified.

-The reduction in the number of legacy networks requiring specialized components, expertise, and gateways in the targeted markets is anticipated to result in a significant drop in both installation and operational costs."

While the cost factors for Ethernet is well known, this project introduces the new requirements that has not been a part of Ethernet. This project requires each node to be assigned a unique and sequential (as in little to no gaps in number sequence) node identifier to be assigned to each PHY, and allocate and assign a special node identifier value of zero to a 'master node' that is responsible for sending special 'beacon' frame. This project requires that the configuration is assured (outside of this draft standard) that node identifier of zero is present, and only one of such node identifier is present. This operation described in this project cannot reasonably assume that this new behavior requirement could inherit "well known Ethernet cost factors". Also this project cannot reasonably assert "drop in both installation and operational costs" when additional configuration of node assignment and behaviors are required and without any specification on how they are done.

CSD/Economic Feasibility with regard to other clauses, other than CL148, are not in question.

Suggested Remedy

CSD/Economic Feasibility with regard to CL148 PLCA operation is no longer valid and grossly incorrect. Appropriate changes to the CSD/Economic Feasibility to be made and to be approved.

Proposed Response Response Status W

PROPOSED REJECT.

Commenter improperly refers to CSDs which are not in scope for a Standards Association Ballot.

Additionally, commenter is incorrect. A number of individuals with a broad spectrum of affiliations agreed on an objective for this. The Criteria for Standards Development (e.g., broad market potential) apply to the entire standard:

====

Each proposed IEEE 802 LMSC standard shall have broad market potential. At a minimum, address the following areas:

- a) Broad sets of applicability.
- B) Multiple vendors and numerous users.

====

The existing 802.3cg broad market potential speaks to 10 Mb/s single-pair Ethernet in industrial, automotive, and intra-system applications, and the number and breadth of

individuals and companies which have expressed interest in the standard.

Furthermore the commenter is technically incorrect in his assertions:

[1] PLCA node IDs do not need to be sequential

[2] There is no such description of master node in the draft

[3] The BEACON is not a frame, it is a 20 bit long signal on the line which carries no information apart from its own presence. It is conceptually not different from IDLE signals which most physical layers use to retrieve clocking information from.

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Cl 148 SC 148 P 214 L 1 # i-390

Kim, Yongbum

NIO

Comment Type TR Comment Status D PLCA_SCOPE

[PAR] PLCA Reconciliation Sublayer (RS) contain specifications that handles contention avoidance and collision handling as well as access control. Media Access Control (MAC) specification is not a part of this Physical Layer project, as stated in this PAR scope:

"5.2.b. Changes in scope of the project: Specify additions to and appropriate modifications of IEEE Std 802.3 to add 10 Mb/s Physical Layer (PHY) specifications and management parameters for operation, and associated optional provision of power, using a single balanced pair of conductors.", whereas the MAC definition is in CL 4.1.1 of IEEE 802.3-2018 states:

"...The MAC sublayer defines a medium-independent facility...b) Media Access Management

- 1) Medium allocation (collision avoidance)
- 2) Contention resolution (collision handling).."

Furthermore, Reconciliation Sublayer, as defined in the same parent document IEEE 802.3-2018, in 1.4.425 states "1.4.425 Reconciliation Sublayer (RS): A mapping function that reconciles the signals at the Media Independent Interface (MII) to the Media Access Control (MAC)-Physical Signaling Sublayer (PLS) service definitions. (See IEEE Std802.3, Clause 22.)". PLCA RS claims to be an RS, but does NOT simply map PLS to MII, but performs 1) Medium allocation (collision avoidance) -- as the title says ("physical layer Collision Avoidance), 2) Contention resolution (collision handling). PLCA performs Medium Access control function (MAC).

SuggestedRemedy

Align this draft to the approved PAR (14-May-2018)by deleting CL148 in its entirety (pages 214 through 234, inclusive) and any changes associated with such deletion. Alternatively, submit a new PAR that substantially reflect this project content, including a MAC specification in the scope, and provide approved PAR with such revised scope. If a new PAR is submitted with MAC specification in scope, then re-open and seek technical contributions with regards to the new scope.

Proposed Response Response Status W

PROPOSED REJECT.

Commenter incorrectly posits that the Clause 148 PLCA RS is a new MAC. It does not meet the requirements for a MAC, and, leaves the MAC functionality with Clause 4, which, in fact, it could not work without. Commenter incompletely quotes IEEE Std 802-2014 4.1, paragraph 6 leading to incorrect conclusions.

See www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf.

See also http://www.ieee802.org/3/cg/public/adhoc/brandt_020619_3cg_01a_adhoc.pdf

Cl 148 SC 148 P 214 L 1 # i-48

Grow, Robert

RMG Con

Comment Type GR Comment Status D PLCA_SCOPE

This clause specifies functionality that is outside the scope of the PAR. The result of out of scope content is that all interested parties may not have been aware of actual content and as a result enticed to join the ballot group.

SuggestedRemedy

Either delete the clause and related content, or revise the PAR, reform the ballot group, and restart Standards Association ballot.

Proposed Response Response Status W

PROPOSED REJECT.

The commenter does not state the reasons that led him to this conclusion. Looking at a similar comment from the same commenter (i-47), the editor assumes he is referring to the incorrect assumption that PLCA is a new MAC.

Response to comment i-47 is:

PROPOSED REJECT.

The CRG disagrees with the commenter that PLCA is a MAC protocol.

Several evidence has been provided, and a tutorial has been given, to prove that PLCA is in fact a normal physical layer function.

See http://www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf

The fundamental reason for PLCA to be a physical layer function is that it only works in conjunction with the CSMA/CD MAC specified in Clause 4 (without any modification to Clause 4 itself).

PLCA provides carrierSense and collision detection information to the MAC by the means of the existing PLS_CARRIER.indication and PLS_SIGNAL.indication primitives which is what the Reconciliation Sublayer (which is part of the physical layer) is supposed to accomplish.

The commenter's statement "it doesn't change the fact that the functions are medium access control" rightfully deserves an appropriate answer, which is more conceptual rather than purely technical.

The PLCA working principle is to detect collisions (concurrent transmission of multiple stations on a shared network segment) in a logical sense. As an example, 10BASE-2 and 10BASE-5 detect concurrent transmissions by checking the DC voltage level on the shared media, that is detecting the superposition of multiple (not decodable) signals on the line. PLCA detects the very same concurrent transmissions by aligning the data conveyed by the local MAC to the unique transmit opportunity of the node and checking for concurrent reception of a packet. In such a way the collision does not result in "corrupting" the signal on the media. That is, the packet currently being transmitted is not interrupted, thus yielding the advertised network performance enhancement.

This is also in line with the ISO/OSI principle by which a layer may enhance the service it provides to the upper layer.

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See http://www.ieee802.org/3/cg/public/adhoc/brandt_020619_3cg_01a_adhoc.pdf

Moreover the commenter is unclear as PLCA + CSMA/CD is obviously not identical to 802.4 Token Bus, and it is unclear what specification the commenter is referring to. For example, PLCA does not define any handshake protocol between nodes, it does not generate packets and there is no concept of arbitration of the media. Additionally, CSMA/CD nodes with PLCA enabled interoperate properly with non-PLCA enabled nodes on the same network segment (without yielding the advertised gain in performance in this case). That would not be possible if nodes with PLCA enabled were not, in fact, using the CSMA/CD MAC protocol. See http://www.ieee802.org/3/cg/public/Sept2018/beruto_3cg_mixing_PLCA_with_non_PLCA_enabled_nodes_r1.2.pdf.

Cl 148 SC 148 P 214 L 1 # 47

Grow, Robert

RMG Con

Comment Type TR

Comment Status D

PLCA_SCOPE

The PLCA protocol is a MAC protocol. It is virtually identical to a token bus protocol (shared medium) I specified years ago. This clause violates 802.3 layering, and though considerable effort has been made to place this in the Reconciliation Sublayer, it doesn't change the fact that the functions are medium access control.

Suggested Remedy

Delete Clause 148 and related text.

Proposed Response

Response Status W

PROPOSED REJECT.

The CRG disagrees with the commenter that PLCA is a MAC protocol.

Several evidence has been provided, and a tutorial has been given, to prove that PLCA is in fact a normal physical layer function.

See http://www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf

The fundamental reason for PLCA to be a physical layer function is that it only works in conjunction with the CSMA/CD MAC specified in Clause 4 (without any modification to Clause 4 itself).

PLCA provides carrierSense and collision detection information to the MAC by the means of the existing PLS_CARRIER.indication and PLS_SIGNAL.indication primitives which is what the Reconciliation Sublayer (which is part of the physical layer) is supposed to accomplish.

The commenter's statement "it doesn't change the fact that the functions are medium access control" rightfully deserves an appropriate answer, which is more conceptual rather than purely technical.

The PLCA working principle is to detect collisions (concurrent transmission of multiple stations on a shared network segment) in a logical sense. As an example, 10BASE-2 and 10BASE-5 detect concurrent transmissions by checking the DC voltage level on the shared media, that is detecting the superposition of multiple (not decodable) signals on the line. PLCA detects the very same concurrent transmissions by aligning the data conveyed by the local MAC to the unique transmit opportunity of the node and checking for concurrent reception of a packet. In such a way the collision does not result in "corrupting" the signal on the media. That is, the packet currently being transmitted is not interrupted, thus yielding the advertised network performance enhancement.

This is also in line with the ISO/OSI principle by which a layer may enhance the service it provides to the upper layer.

See http://www.ieee802.org/3/cg/public/adhoc/brandt_020619_3cg_01a_adhoc.pdf

Moreover the commenter is unclear as PLCA + CSMA/CD is obviously not identical to 802.4 Token Bus, and it is unclear what specification the commenter is referring to. For example, PLCA does not define any handshake protocol between nodes, it does not

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

Cl 148

SC 148

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5/23/2019 6:37:58 PM

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generate packets and there is no concept of arbitration of the media. Additionally, CSMA/CD nodes with PLCA enabled interoperate properly with non-PLCA enabled nodes on the same network segment (without yielding the advertised gain in performance in this case). That would not be possible if nodes with PLCA enabled were not, in fact, using the CSMA/CD MAC protocol. See http://www.ieee802.org/3/cg/public/Sept2018/beruto_3cg_mixing_PLCA_with_non_PLCA_enabled_nodes_r1.2.pdf.

Cl 148 **SC 148.1** **P 214** **L 12** # i-265

Thompson, Geoffrey Independent Consultant

Comment Type **ER** **Comment Status** **D** **PLCA_SCOPE**

The first sentence refers to PLCA as though it is already a familiar, well understood and well specified protocol that is familiar to the reader by the time he gets to clause 148 of IEEE Std. 802.3. Such is hardly the case.

SuggestedRemedy

Add the following text to the last paragraph: "PLCA modifies the CSMA/CD shared media access method so that assured access is provided via the collision free round robin protocol specified in this clause." This is a necessary but not sufficient addition. We'll leave further detail requirements to later in the clause..

Proposed Response **Response Status** **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change "This clause specifies the optional Physical Layer Collision Avoidance (PLCA) capabilities.
PLCA is defined for half-duplex mode of operation only. The PLCA RS is specified for operation with the PHY defined in Clause 147 (10BASE-T1S).
PLCA is designed to work in conjunction with CSMA/CD and can be dynamically enabled or disabled via management interface."

to

"This clause specifies a reconciliation sublayer to provide optional Physical Layer Collision Avoidance (PLCA) capabilities. The PLCA RS is specified for operation with Clause 147 (10BASE-T1S) PHYs operating in half-duplex multidrop mode. When used as a reconciliation sublayer, it aligns data from the MAC with transmission opportunities of the physical layer and maps the physical layer signals to PLS primitives towards the MAC. The use of PLCA-enabled physical layers in CSMA/CD half-duplex shared-medium networks provides enhanced performance relative to CSMA/CD without PLCA by avoiding corruption of signals on the media itself. PLCA-enabled nodes can coexist with nodes without PLCA enabled on the same mixing segment, all using 802.3 CSMA/CD."

Cl 148 **SC 148.2** **P 214** **L 38** # i-419

Seaman, Michael MICK SEAMAN

Comment Type **G** **Comment Status** **D** **PLCA_PRIORITIES**

The utility of PLCA would be considerably improved, and emerging application areas (e.g. industrial, automotive) if the BEACON mechanisms provided simple support for priority. Two priority levels would be sufficient to support a deterministic (known bounded latency) service in addition to best effort. Four priority levels may be desirable, though I would not advocate more without detail uses case analysis.

SuggestedRemedy

Specify the BEACON to allow inclusion of a priority indication as a follow on project if not part of the present effort.

Proposed Response **Response Status** **W**

PROPOSED REJECT.
Big Ticket Item - PLCA_PRIORITIES.

Communication of 802.1 priorities to the physical layer in an 802.3 PHY would require modification of the 802.3 MAC Service Access Point definition, and hence the MAC layer. While potentially desirable, this would be outside the scope of a physical layer project and the approved PAR.

Cl 148 **SC 148.2** **P 214** **L 42** # i-269

Thompson, Geoffrey Independent Consultant

Comment Type **ER** **Comment Status** **D** **PLCA_ID**

There needs to be a little more discussion of local_ID assignment, how it doesn't appear externally and that it is fully contained within the segment.

SuggestedRemedy

Add the following text at the end of the first paragraph: The local_ID assignment value doesn't appear externally or in the payload packet format. The local_ID assignment value is fully contained within the local bussed segment.

Proposed Response **Response Status** **W**

PROPOSED ACCEPT IN PRINCIPLE.
Add the following text at the end of the first paragraph at line 43: The node ID assignment value does not appear externally or in the payload packet format. The node ID assignment value is fully contained within the local collision domain.

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Cl 148 SC 148.2 P 214 L 42 # i-268

Thompson, Geoffrey Independent Consultant

Comment Type TR Comment Status D PLCA_ID

This lack of a complete specification for full functionality is completely unprecedented for 10 Mb/s Ethernet and a major shortcoming. Plug and work, historically, has been a major factor in the success of Ethernet in face of the competition (which usually required a bunch of configuration before it would go on-line). Two examples of this in the history of Ethernet come to mind: (1) In the early days of 10 Mb/s full duplex and 100BASE-T early implementations of AutoNegotiation did not work very well. The failure of the promised plug 'n' play was a major marketing issue. (2) In the very first (3 Mb/s) version of Ethernet, DTEs only had 8 bit addresses. They had to have their addresses manually configured with push-on test leads as part of their installation process. This made the customer (most of whom were EEs or Computer Scientists) installation not possible and a technician had to be involved. Major network management problem.

Suggested Remedy

Come up with and require availability of an automatic configuration app. No reason one shouldn't be able to use the CSMA/CD capability to (1) identify the stations on the local segment and (2) hand out the unique assigned node ID to each DTE.

Proposed Response Response Status W

PROPOSED REJECT.

Commenter provides insufficient information for a sufficient response.

Defining an "automatic configuration app" may be a desirable feature, but appears to involve higher layer protocols and algorithms for configuration of the specified management parameters, which the CRG believes would be outside the scope of the

Cl 148 SC 148.4.5.1 P 221 L 9 # i-373

Law, David Hewlett Packard Enterprise

Comment Type TR Comment Status D State Diagram

There appears to be a conflict, or at least a lack of clarity, between the Figure 148-3 'PLCA Control state diagram' and the Figure 148-4 'PLCA DATA state diagram' in respect to which controls the encoding being placed on the MII transmit signals TXD, TX_EN and TX_ER by the PLCA RS.

As an example, when the PLCA Control state diagram is in the SEND_BEACON state, one of the actions is tx_cmd <= BEACON, which based on subclause 148.4.5.2 should result on the BEACON encoding defined in Table 22-1 being placed on TXD, TX_EN and TX_ER. At the same time that the PLCA Control state diagram is in the SEND_BEACON state, it would appear that the PLCA DATA state diagram is in the IDLE state, and the actions within the IDLE state include TXD <= 0000 and TX_EN <= FALSE. Hence we have the two different state diagrams requiring different values to be placed on TXD and TX_EN at the same time resulting in a conflict.

Perhaps the intent is to have both state diagrams assign values to TXD and TX_EN, but that isn't clear to me as one state diagram uses tx_cmd and the other TXD and TX_EN.

In addition, the states within the PLCA Control state diagram that have actions assigning values to tx_cmd, and therefore potentially changing the values of TXD and TX_EN, are not synchronised to TX_CLK through the MCD variable in that way that actions that assign values to TXD and TX_EN are in the 'PLCA DATA state diagram'. Not synchronising state changes in the PLCA Control state diagram change the value of tx_cmd could result in transitions in TXD and TX_EN that do not meet the timing requirements of IEEE Std 802.3-2018 subclause 22.3.1 'Signals that are synchronous to TX_CLK'.

Finally, it isn't clear to me why TX_ER would be an input to Figure 148-4 'PLCA DATA state diagram'. I was wondering if it was meant to be a plca_txer variable derived from the MAC service interface, similar to the plca_txen, but the MAC service interface doesn't provide the ability for the MAC to pass transmit errors to the RS.

One, I assume unintended, consequence of the use of TX_ER is that when the PLCA RS with local_nodeID=0 is transmitting a BEACON, and therefore TX_ER = 1 (see Table 22-1), and then a transmission from the local MAC is started, it would appear that this transmission is discarded. This is due to the PLCA DATA state diagram transitioning from the IDLE state to the HOLD state due to plca_txen, then to the ABORT state, which sets packetPending to FALSE discarding the packet, as a result of the transition condition (recv_timer_not_done * MCD * !committed * TX_ER * !receiving) being true.

Suggested Remedy

[1] Clarify the source of TXD and TX_EN as either the Figure 148-3 'PLCA Control state diagram' or the Figure 148-4 'PLCA DATA state diagram'. If the intent is that both should source TXD and TX_EN, suggest that tx_cmd should be replaced with TXD, TX_EN and TX_ER in the respective PLCA Control state diagram states.

[2] Ensure that MCD is used in any condition that results in a change of value in TXD,

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TX_ER or TX_ER in the PLCA Control state and PLCA DATA state diagrams.

[3] Clarify the use of TX_ER in the transition condition from the HOLD to the ABORT state in the PLCA DATA state diagram.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

At page 223, line 23 replace

"tx_cmd Command to be conveyed to the PHY via MII. When set to NONE, no special signaling shall be conveyed. When set to BEACON or COMMIT, respective commands shall be conveyed to MII as specified in 148.4.4.1.1 and 148.4.4.1.2.

Values: NONE, BEACON or COMMIT"

with:

"tx_cmd Command for the PLCA DATA State Diagram to convey to the PHY via the MII. Values: NONE, BEACON or COMMIT"

At page 225, line 36, replace "TX_ER" with "plca_txer".

Apply the following changes, in this order exactly:

1. In figure 148-4 replace all occurrences of "TX_ER" with "plca_txer".
2. In figure 148-4, in the NORMAL state, add "TX_ER <= plca_txer"
3. In figure 148-4, in the IDLE state, add "TX_ER <= ENCODE_TXER(tx_cmd). Replace "TXD <= 0000" with "TXD <= ENCODE_TXD(tx_cmd)"
4. In figure 148-4, in the RECEIVE, PENDING and WAIT_MAC states, add "TX_ER <= ENCODE_TXER(tx_cmd). Add "TXD <= ENCODE_TXD(tx_cmd)"
5. In figure 148-4, in the HOLD, ABORT, TRANSMIT and FLUSH states, add "TX_ER <= plca_txer".
6. In figure 148-4, in the HOLD and ABORT states, add "TXD <= 0000".

At page 228, line 10, add:

"plca_txer the conditions for generating plca_txer are the same as defined in 22.2.1.6 and 22.2.2.5 for the TX_ER MII signal. Values: TRUE or FALSE"

Replace content of subclause 148.4.6.3 with the following text:

"ENCODE_TXER

This function takes as its argument the tx_cmd variable defined in 148.4.5.2.

It returns TRUE if tx_cmd is BEACON or COMMIT. Otherwise it returns the value of the plca_txer variable, defined in 148.4.6.2

ENCODE_TXD

This function takes as its argument the tx_cmd variable defined in 148.4.5.2.

If tx_cmd is BEACON, the return value is the TXD encoding defined in Table 22-1 for the BEACON request.

If tx_cmd is COMMIT, the return value is the TXD encoding defined in Table 22-1 for the COMMIT request.

Otherwise, the return value is 0000.

"

Replace content of subclause 148.4.3.6 with the following text:

"Generation of TX_ER shall comply with the PLCA Data State Diagram specified in 148.4.6.1"

Apply the following modifications to the PICS:

At page 232, line 39, replace "Specified in 22.2.1.6" with "Specified in "148.4.6.1"

At page 233, line 44, delete the CON3 line.

Cl	148	SC	148.4.5.4	P	224	L	32	#	i-376
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Law, David

Hewlett Packard Enterprise

Comment Type	TR	Comment Status	D	Timers
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This subclause specifies the duration of the beacon_timer as 20 bit times. IEEE Std 802.3-2018 subclause 1.4.160 'bit time' states that 'The bit time is the reciprocal of the bit rate. For example, for 100BASE-T the bit time is 10-8 s or 10 ns.'. As a result in a duration of beacon_timer is exactly 20 x reciprocal(10 Mb/s) = 2000 ns. This would seem to result in a requirement for infinite precision and make a beacon_timer of 2000 + 10-15 ns non-conformant.

Suggested Remedy

Provide a tolerance for the beacon_timer, burst_timer, commit_timer (subclause 148.4.6.4), hb_send_timer (subclause 147.3.7.1.2), hb_timer (subclause 147.3.7.1.2) and link_hold_timer (subclause 147.3.7.2.3)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

At page 224, line 32, append: "Tolerance: +/- 1/2 bit time"

At page 224, line 38, append: "Tolerance: +/- 1/2 bit time"

At page 224, line 52, append: "Tolerance: +/- 1/4 bit time"

At page 228, line 55, append: "Tolerance: +/- 1/2 bit time"

At page 186, line 16, append: "Tolerance: +/- 1/2 bit time"

At page 186, line 20, append: "Tolerance: +/- 100 us"

At page 189, line 35, append: "Tolerance: +/- 100 us"

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CI 148 SC 148.4.5.4 P 224 L 45 # i-320

Baggett, Tim Microchip Technology, Inc.

Comment Type E Comment Status D Timers

*** Comment submitted with the file 100633500003-baggett_3cg_plca_timing_01_0519.pdf attached ***

More specific guidance may be provided to the system integrator in selecting a proper value for the PLCA to_timer when implementing a mixing segment that exceeds the "up to at least 25m" length or medium with different velocity of propagation. The following text change describes in additional detail the effects the medium propagation and PHY delays have in determining the transmit opportunity time.

See baggett_3cg_plca_timing_01_0519.pdf

Suggested Remedy

Change the description of to_timer in lines 45-52 to read as follows:

The transmit opportunity timer maps to aPLCATransmitOpportunityTimer. The timer value should meet Equation (148-2). to_timer shall be set equal across the mixing segment for PLCA to work properly.

Duration: integer number between 1 and 255, expressed in bit times.

$to_timer > \max(2 * t_propdelay) + \max(TX_EN \text{ sampled to MDI output}) + \max(MDI \text{ input to CRS asserted}) + \max(MDI \text{ input to CRS deasserted}) - \min(MDI \text{ input to CRS deasserted})$ (148-2)

where:

t_propdelay is the propagation delay between any two nodes on the mixing segment, and the delay specifications are the maxima and minima for the PHY type on the mixing segment (for 10BASE-T1S, see 147.11).

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change the description of to_timer in lines 45-52 to read as follows:

The transmit opportunity timer maps to aPLCATransmitOpportunityTimer. The timer value needs to meet Equation (148-2). to_timer shall be set equal across the mixing segment for PLCA to work properly.

Duration: integer number between 1 and 255, expressed in bit times.

$to_timer > \max(2 * t_propdelay) + \max(TX_EN \text{ sampled to MDI output}) + \max(MDI \text{ input to CRS asserted}) + \max(MDI \text{ input to CRS deasserted}) - \min(MDI \text{ input to CRS deasserted})$ (148-2)

where:

t_propdelay is the propagation delay between any two nodes on the mixing segment, and the delay specifications are the maxima and minima for the PHY type on the mixing segment (for 10BASE-T1S, see 147.11).

With respect to the suggested remedy the "should" statement at the beginning of the sentence has been replaced with a "needs to be" to be coherent with proposed resolution of comment i-272.

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See http://www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf

Cl 148 SC 148.4.6 P 214 L 22 # i-418

Kim, Yongbum NIO
 Comment Type TR Comment Status D PLCA_SCOPE

[CSD/Compatibility] [Installed base compatibility] [PAR -- scope did not include MAC function in the project scope]
 In PLCA data state diagram, COLLIDE state and related functional behaviors create a condition where in half-duplex, CSMA/CD, MAC transmits a packet, into a substantially busy network, but the collision condition does not result in a collision on the shared media. The collision signal is asserted only for the local node for the TX to collide-&-retry, while the simultaneous received signal that caused the collision is expected to be received as if there is no collision. The remote transmitter is not notified of contention on the network. This is a new behavior for an half-duplex MAC.

Legacy and installed base of Ethernet MACs expect to operate in 'architecturally' separate TX and RX, i.e. full-duplex datapath, while in half-duplex mode. Explicit allowance for implementations to optimize the datapath resources to only support simplex datapath operation is found in 4.1.2 where only obvious externally testable condition was inserted into the CL4 spec:

"4.1.2 CSMA/CD operation. Transmit frame operations are independent from the receive frame operations. A transmitted frame addressed to the originating station will be received and passed to the MAC client at that station. This characteristic of the MAC sublayer may be implemented by functionality within the MAC sublayer or full duplex characteristics of portions of the lower layers."

And the clear architectural model vs implementations here in 1.1.3.1: "...The architectural model is based on a set of interfaces that may be different from those emphasized in implementations. One critical aspect of the design, however, shall be addressed largely in terms of the implementation interfaces: compatibility."

This new behavior specified in CL148 PLCA data state diagram is not compatible with many installed bases of 802.3 nodes with appropriate exposed MII interoperability test point that is also a physical interface with specified connectors. Also as forementioned, the contention management and collision handling are MAC functions, not a part of Physical Layer that Reconciliation Sub-layer belongs to.

Additional info could be found here : (slides 14~18 of):
http://www.ieee802.org/3/cg/public/Nov2018/Kim_3cg_01a_1118.pdf

SuggestedRemedy

This clause CL148 PLCA RS should be deleted. Alternatively re-architected to avoid introducing new normative behaviors to the installed base with exposed interoperability interfaces.

Proposed Response Response Status W

PROPOSED REJECT.
 Commenter fails to show compatibility issues with conformant implementations and incorrectly posits PLCA is a new MAC.

Cl 148 SC 148.4.6.1 P 225 L 9 # i-274

Thompson, Geoffrey Independent Consultant
 Comment Type E Comment Status D Editorial

Clarify

SuggestedRemedy

Change to:...transmit opportunity on the media is detected.

Proposed Response Response Status W

PROPOSED REJECT.

Defer

The CRG disagrees with the commenter. The current text does not need clarification.

The RS does not detect activity on the media, but maps detected activity conveyed in MII signals from the PMA/PCS to MAC/PLS primitives.

Cl 148 SC 148.4.6.1 P 226 L 26 # i-426

Brandt, David Rockwell Automation
 Comment Type T Comment Status D State Diagram

The exit condition on the left side of the IDLE state is incorrect. If !plca_en occurred, we would return to the NORMAL state.

SuggestedRemedy

From:
 receiving * !plca_en * tx_cmd = NONE

To:
 receiving * !plca_txen * tx_cmd = NONE

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
 Accommodated by resolution of comment i-193

Proposed Resolution of comment i-193 is:
 PROPOSED ACCEPT IN PRINCIPLE.
 Replace "receiving * !plca_en * tx_cmd = NONE" with "receiving * (!plca_txen) * (tx_cmd = NONE)"

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CI 148 SC 148.4.7.4 P 230 L 13 # i-277

Thompson, Geoffrey Independent Consultant

Comment Type **TR** Comment Status **D** Timers

Also Figure 148-5. The timer is very weakly defined. It only specifies the duration of the timer, not whether it is reset by a plca_reset nor whether it is reset by being "done and entering another state or anything else. Further, when the state is returned to ACTIVE from HYSTERESIS there is no modification to the timer setting so the operation of the timer degrades should there be noise on the !plca_active input no matter how far apart the noise events are.

Suggested Remedy

Fully specify the operation of the timer.

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.
delete "stop plca_status_timer" from "ACTIVE" state in Figure 148-5.

The behaviour of the timers is specified in 148.1.1.2. They operate in the manner described in 40.4.5.2. This means that "start timer_xxx" implies a reset of the timer, while "stop timer_xxx" has no effect on an already "done" timer.

The timer status is only checked in the HYSTERESIS state, and it is reset on entry of the same state. This means that its status has no effect when the PLCA Status State Diagram is in any state other than HYSTERESIS.

In other words, this diagram represents an hold-on filter over the plca_active variable.