

# gement Parameters for 10 Mb/s Operation and Associated Power Delivery over a Single Balanced Pair of

CI 01 SC 1.4.389a P 29 L 16 # 196  
Kim, Yong NIO

Comment Type TR Comment Status A Big Ticket Item - Definitions

This could be a pile on comment. .avoid physical collision on the medium. There is a definition for collision and contention. What is "physical collision" on the medium conveyed in the definitions.

## SuggestedRemedy

change "physical collision" to "collision". Or expand why the word "physical" is needed.

Response Response Status W

ACCEPT IN PRINCIPLE.

Replace, "A method for generating transmit opportunities for 10BASE-T1S multidrop PHYs operating on mixing segments in order to avoid physical collisions on the medium. (See IEEE Std 802.3, Clause 148.)"

with, "A method for generating transmit opportunities for 10BASE-T1S operating on mixing segments. (See IEEE Std 802.3, Clause 148.)"

CI 22 SC 22.2.2.4 P 33 L 13 # 198  
Kim, Yong NIO

Comment Type TR Comment Status R Big Ticket Item - Definitions

Also 22.2.2.5, 22.2.2.8 22.8.3.2 CL22 MII is an existing exposed interoperability test point. Any material changes to its function effect interoperability to installed base. EEE related modifications prior connects to EEE services client, not MAC. These proposed changes directly effect interoperability to existing installed base to MAC services.

## SuggestedRemedy

Reverse all proposed modifications to CL22 that effect shall shatement that existed prior. A good test for this would be that there is no modifications to the PICS table with status "M". See Slides 4~6 in [http://www.ieee802.org/3/cg/public/Nov2018/Kim\\_3cg\\_01a\\_1118.pdf](http://www.ieee802.org/3/cg/public/Nov2018/Kim_3cg_01a_1118.pdf) for a complex context.

Response Response Status W

REJECT.

Commenter fails to identify a specific compatibility problem or specific PICS items. Compatibility is satisfied and has been demonstated. Refer to [http://www.ieee802.org/3/cg/public/Jan2019/baggett\\_3cg\\_01\\_0119.pdf](http://www.ieee802.org/3/cg/public/Jan2019/baggett_3cg_01_0119.pdf), <http://www.ieee802.org/3/cg/public/July2018/PLCA%20overview.pdf> (slides 16 through 21), and [http://www.ieee802.org/3/cg/public/Jan2019/Tutorial\\_cg\\_0119\\_final.pdf](http://www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf) (slides 29, 34, and 35) for examples.

Other than PICS item SF17, which has been modified to exclude the new PHYs in this draft, there are no changes to add new Mandatory PICS items other than those conditioned on new options (see 22.8.2.3).

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CI 30 SC 30.2.2.1 P 34 L 13 # 199  
Kim, Yong NIO

Comment Type TR Comment Status R 3ig Ticket Item - Management

PHY is NOT the same as Physical Layer in layer definition. PHY has xMII on one side and MDI on the other (1.4.391). RS in Physical Layer but not in PHY. So by definition, oPLCA CANNOT be in oPHYEntity. Note: look at other RS related entities in Fig 30-3 to see the consistency

## SuggestedRemedy

Change the text so that the oPLCA is iin oMAC (not oPHY), and make other appropriate changes

Response Response Status W

REJECT.

PLCA management was moved under the PHY entity in response to satisfied TR comment 301 on initial working group ballot.

Additional information: The Reconciliation Sublayer extensions specified in Clause 65 for point-to-point emulation extend the Reconciliation Sublayer to support multiple MACs above a single PHY, see Figure 65-1 'RS location in the OSI protocol stack'. These extensions effectively add a set of functions above the PLS service interface at the 'top' of the existing Reconciliation Sublayer specified in Clause 35 to provide support for multiple instances of the PLS service interface. These functions include replacing some of the preamble on transmit with information protected by a CRC8, and examining this information on receive to determine which of the multiple MACs a packet is forwarded to. These are in effect a set of functions operating between the existing Reconciliation Sublayer and the multiple MACs, and as a result, the oOMPEmulation object to support these additional functions has to be placed between the multiple oMACEntity objects and the single oPHYEntity object. Note the many-to-one mapping from the oMACEntity object to the oOMPEmulation object in Figure 30-3 DTE System entity relationship diagram.

This is not the case for Energy-Efficient Ethernet or Time Synchronisation which did not impact the interface presented to the MAC. As a result, the additional attributes were either placed in the oPHYEntity object, this was the case for Energy-Efficient Ethernet, or in an object contained within the oPHYEntity object, this the case for Time Synchronisation where the oTimeSync object was added. It is for the same reasons that the oPLCA object should be contained within the oPHYEntity object too.

CI 30 SC 30.2.3 P 35 L 37 # 200  
Kim, Yong NIO

Comment Type TR Comment Status R 3ig Ticket Item - Management

PHY is NOT the same as Physical Layer in layer definition. PHY has xMII on one side and MDI on the other (1.4.391). RS in Physical Layer but not in PHY. So by definition, oPLCA CANNOT be in oPHYEntity. Note: look at other RS related entities in Fig 30-3 to see the consistency

## SuggestedRemedy

Move oPLCA from below oPHY and locate it below oMAC

Response Response Status W

REJECT.

PLCA management was moved under the PHY entity in response to satisfied TR comment 301 on initial working group ballot.

Additional information: The Reconciliation Sublayer extensions specified in Clause 65 for point-to-point emulation extend the Reconciliation Sublayer to support multiple MACs above a single PHY, see Figure 65-1 'RS location in the OSI protocol stack'. These extensions effectively add a set of functions above the PLS service interface at the 'top' of the existing Reconciliation Sublayer specified in Clause 35 to provide support for multiple instances of the PLS service interface. These functions include replacing some of the preamble on transmit with information protected by a CRC8, and examining this information on receive to determine which of the multiple MACs a packet is forwarded to. These are in effect a set of functions operating between the existing Reconciliation Sublayer and the multiple MACs, and as a result, the oOMPEmulation object to support these additional functions has to be placed between the multiple oMACEntity objects and the single oPHYEntity object. Note the many-to-one mapping from the oMACEntity object to the oOMPEmulation object in Figure 30-3 DTE System entity relationship diagram.

This is not the case for Energy-Efficient Ethernet or Time Synchronisation which did not impact the interface presented to the MAC. As a result, the additional attributes were either placed in the oPHYEntity object, this was the case for Energy-Efficient Ethernet, or in an object contained within the oPHYEntity object, this the case for Time Synchronisation where the oTimeSync object was added. It is for the same reasons that the oPLCA object should be contained within the oPHYEntity object too.

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CI 30 SC 30.3.9.2.7 P 39 L 47 # 205  
Kim, Yong NIO

Comment Type TR Comment Status R PLCA Burst

aPLCABurstTimer has at least two issues. 1) name seem to indicate timer burst, but the definition says wait timer before terminating burst. Should rename to reduce confusion. 2) With infinitely fast statemachines and atomic frame transfers, and RS being above the xMII counters in bit times makes little sense. Obviously exposed interfaces are exceptions. If the intention is to allow building a non-complaint PHY that includes PLCA in the PHY, then this timer may be relevant in implementations (not to the specification which is done in architectural frame work). I assum this is not the intent. If this is the intent, please go through appropriate process.

## SuggestedRemedy

WRT to 1) please consider chaning the timer name to more descriptive name, if 2) is rejected. If 2) is accepted, then please ignore 1) comment.

Response Response Status W

REJECT.

This appears to be two comments in one.

1 (re:timer naming): Commenter provides insufficient information for remedy.  
aPLCABurstTimer is consistent with the timer named in clause 148.  
2 (re: process): Commenter provides insufficient information for remedy. Commenter is incorrect; the timer is in the physical layer and not the MAC.

CI 147 SC 147.1 P 167 L 17 # 206  
Kim, Yong NIO

Comment Type TR Comment Status A Big Ticket Item - Multidrop

Only place the "multidrop mode" is defined is in 147.1 and says "a half duplex shared-medium mode, referred to as multidrop mode, capable of operating with multiple link partners connected to a mixing segment" I know this term has been in use for a long time in the .3cg draft development. But I don't see any benefit to introducing a new term. Traditionally we had mixing and link segments, and we have half-duplex point to multi-point (P2MP), and full duplex point to point (P2P) operations. I do not see any reason to introduce a new term that does not seem to have sufficient difference from traditional terms in function. Even in CL147 spec -- see 147.3.3.2, duplex\_mode was sufficient.

## SuggestedRemedy

Please consider careful search and replacement of "multidrop" "and multidrop over mixing segment" with point to multipoint (P2MP), or in many cases just "half-duplex", or "half-duplex over mixing segment". I don't see how it is reader-friendly to have so many terms to refer to the same thing. Painful now, but we have to live with the specified text [almost] forever.

Response Response Status W

ACCEPT IN PRINCIPLE.  
P167 L24: Delete "multidrop"  
P167 L46: Delete "multidrop"  
P213 L39: Change "multidrop network" to "mixing segment"  
P218 L26: Change "multidrop network" to "mixing segment"  
P224 L16: Change "multidrop network" to "mixing segment"  
P49 L45 & L47: Change "multidrop operation over a mixing segment network" to "multidrop mode"  
P49 L48: Change "multidrop operation" to "multidrop mode"

Add editor's note at top of 147.1:  
Editor's note (to be removed following draft 2.3) - Commenters are encouraged to consider possible alternate names for "multidrop mode" using existing 802.3 terminology which are descriptive and compact.

# gement Parameters for 10 Mb/s Operation and Associated Power Delivery over a Single Balanced Pair of

CI 147 SC 147.3.7 P 184 L 5 # 209  
Kim, Yong NIO

Comment Type TR Comment Status A Editorial

Optional support for RS layer, separatated from the PHY via xMII and PCS does not seem to have any existing interface to convey message primitives referred to here. Please describe HOW it is conveyed from PHY to RS.

## SuggestedRemedy

Please point out the message passing interface that conveys these additional and optional messages between PHY and RS -- in which case, this comment will be withdrawn. Or describe how these messages are conveyred.

Response Response Status W

ACCEPT IN PRINCIPLE.  
(commenter appears confused by an editorial error which left optional support of PLCA RS separated from the text it applied to)  
Accomodated by comment #190.  
Resolution of comment #190 is:  
ACCEPT IN PRINCIPLE.  
Move all text at page 188/31-48 (effectively the headers and content of sub-clauses "147.3.8.3 Generation of BEACON indication" and "147.3.8.4 Generation of COMMIT indication") before sub-clause "147.3.8 Optional support for PCS status generation", turning those into "147.3.7.1 Generation of BEACON indication" and "147.3.7.2 Generation of COMMIT indication"

CI 147 SC 147.1 P 167 L 12 # 210  
Kim, Yong NIO

Comment Type TR Comment Status R Big Ticket Item - CSD

Really a CSD issue: Among the 10BASE-T1S three mode of operation -- mandatory - half-duplex P2P, optional - half-duplex P2MP, optional - full-duplex P2P, one could argue the mandatory mode of operation, thus only one required to claim conformance, has the least broad market potential. Just as a reminder -- half duplex P2P broad market, typically associated with star-wired multi-port repeater has been rejected by rejecting operation with CL9 repeaters.

## SuggestedRemedy

Consider deleting the P2P half-duplex mandatory and upgrade one of the other modes to mandatory, OR justify why P2P half-duplex still has broad market potential claiied in CSD. OR, the intent is for P2P half-duplex to be mandatory, and at least one of the two remaining modes mandatorily implemented, then correct the text and objectives as appropriate (and CSD if appropriate). [Remember each of these "mode" is a new PHY.]. By doing mandatory to be 1 + 2 or 1 + 3 but not 1 alone, you may also avoid broad market potential challenge on 1 only

Response Response Status W

REJECT.  
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.  
====  
As written (and commonly) they do not mention objective by objective, or else they would have to be modified every time an objective is changed. The objectives are chosen to fit within the broader CSDs, by the applicability and the multiple interest groups. 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. These have voted to approve adding the objective for P2P.

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CI 45 SC 45.2.3.68d.1 P 55 L 27 # 211  
Kim, Yong NIO

Comment Type TR Comment Status A PLCA

PLCA Support (3.2292.15) means there is a 10BASE-T1S PHY and 10BASE-T1S PLCA PHY. So is the PLCA RS function or RS, PCS, and possibly PMA function? Based on this setting, it seems to indicate that PLCA is not limited to RS. It would be good to clarify where all the layers PLCA optinoal feature/function/option reside

## SuggestedRemedy

Either delete this, or clarify which layer PLCA resides.

Response Response Status W

ACCEPT IN PRINCIPLE.

Replace, "indicates the PCS does not support PLCA RS required functions"

with, "indicates the PCS does not support the encodings of BEACON and COMMIT".

CI 45 SC 45.2.3.68f P 56 L 18 # 212  
Kim, Yong NIO

Comment Type ER Comment Status A PLCA

Description says "...remote jabber errors received.." Should say "collision"

## SuggestedRemedy

My preference is "collsions" not "physical collision" (I have a separate commnet WRT this)

Response Response Status W

ACCEPT IN PRINCIPLE.

Replace, "16 bits field counting the number of remote jabber errors received since last read of this register"

with, "16 bit field counting each time a transmission initiated locally results in a corrupted signal at the MDI since last read of this register"

CI 45 SC 45.2.3.68f.1 P 56 L 25 # 213  
Kim, Yong NIO

Comment Type ER Comment Status A PLCA

"..i.e., excluding the ones triggered by the optional PLCA RS).. makes little sense. How do you exclude events in RS in PHY, and also "triggered" is vague. Please clarify.

## SuggestedRemedy

Please clarify how RS layer events could be excluded in PHY (via references may be) or some other way.

Response Response Status W

ACCEPT IN PRINCIPLE.

Replace, "Bits 3.2294.15:0 reports the number of physical collisions (i.e., excluding the ones triggered by the optional PLCA RS) occurred since last time register 3.2294 was read."

with, "Bits 3.2294.15:0 count up each time a transmission initiated locally results in a corrupted signal at the MDI."

CI 45 SC 45.2.3.68f P 56 L 18 # 214  
Kim, Yong NIO

Comment Type TR Comment Status R PLCA

I see the benefits of # of collisions experienced for a given packet transmit attempts -- indicates some qualitative measure of congestion. I don't see the value nor relevance of counting collisions since beginning of time. I cannot locate (easily, anyway) justification for adding this counter -- and even more so in PHY/PCS rather than in the MAC.

## SuggestedRemedy

Please delete this counter, or reject this comment and point me to the rationale and utility of this counter.

Response Response Status W

REJECT.

When optional PLCA RS is enabled, the MAC will count the number of collisions reported by the RS via the PLS\_SIGNAL.indication primitive. Having a register that counts the number of corrupted transmissions at the MDI detected at the PCS or PMA sublayer is, as commenter says, a useful indication for diagnosing misconfiguration problems and to evaluate the line quality.

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CI 45 SC 45.2.13.4 P 64 L 64 # 220  
Kim, Yong NIO

Comment Type TR Comment Status R PLCA Burst

Related to my other comment on 30.2.9.2.7 (and should consider together), 1) name seem to indicate timer burst, but the definition says wait timer before terminating burst. Should rename to reduce confusion. 2) With infinitely fast statemachines and atomic frame transfers, and RS being above the xMII counters in bit times makes little sense. Obviously exposed interfaces are exceptions. If the intention is to allow building a non-complaint PHY that includes PLCA in the PHY, then this timer may be relevant in implementations (not to the specification which is done in architectural frame work). I assum this is not the intent. If this is the intent, please go through appropriate process.

## SuggestedRemedy

WRT to 1) please consider chaning the timer name to more descriptive name, if 2) is rejected. If 2) is accepted, then please ignore 1) comment.

Response Response Status W

REJECT.

This appears to be two comments in one.

1 (re:timer naming): Commenter provides insufficient information for remedy. aPLCABurstTimer is consistent with the timer named in clause 148.  
2 (re: process): Commenter provides insufficient information for remedy. Commenter is incorrect; the timer is in the physical layer and not the MAC.

CI 00 SC 0 P 0 L 0 # 223  
Kim, Yong NIO

Comment Type TR Comment Status A Big Ticket Item - Definitions

Use of the word "collision" and use of term "logical collision" "local collision", and "physical collision. This is a pile on comment to unresolved D2.0 draft comment. Use of terms other than just "collisoion" in .3cg bothered me. This time, I went through some research. 1.1.2.1 Half duplex operation states "...if... message collides...to ensure propogation of collision through out the system." states collision is system wide. 1.4.202 collsion: A condition that results from concurrent transmission from multiple data terminal equipment (DTE) sources within an single collision domain. And 1.4.203 collision domain: A single, half duplex mode CSMA/CD network. If two or more Media Access Control (MAC) sublayers are within the same collsion domain and both transmit at the same time, a collision will occur. MAC sublayers separated by a repater..." All of these prompt whether .3cg's use of "logical collsion" or "local collision" are proper use of the word collision. "physical collision" should just be "collsion". In addition, the use of "logical collision" to describe an event that is not an observable event on the medium is confusing to 802.3 readers, who associates collision to an event on the shared medium.

## SuggestedRemedy

Please consider careful global search and replace of "physical coillsion" to just "collsion" and use some other term for "logical collision" and "local collision" if that remains in the draft. Cannot commup with a good suggestion for the alternate word, since the "local collision" function within .3cg in my mind is access control mechanism.

Response Response Status W

ACCEPT IN PRINCIPLE.

Note: the terms "logical collision" and "physical collision" are removed from the draft by these changes and other comments:

P224 L6: Delete "This is called a logical collision."

P225, L10: Replace, "and a logical collision is triggered" with, "and a collision is triggered"

P183, L17: Replace, "When operating in half-duplex mode, the 10BASE-T1S PHY shall detect physical collisions on the media during data transmission." with, "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."

P213, L44-45: Delete, "At any time, only the owner of the current transmit opportunity is allowed to send data over the medium, therefore avoiding physical collisions."

P218, L26: Delete, "PLCA Control state diagram is responsible for synchronizing transmit opportunities across the multidrop network to avoid physical collisions."

P224, L42: Delete, ", which would normally result in a physical collision"

P225, L1: Replace, "The variable delay line is a small buffer that is necessary in order to

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avoid physical collisions by delaying transmission to the MII until the exclusive transmit opportunity for the node arrives." with, "The variable delay line is a small buffer that aligns transmission with the transmit opportunity."

Cl 146 SC 146.8.1 P 153 L 3 # 231  
Kim, Yong NIO

Comment Type TR Comment Status A MDI

This says "this section defines the MDI for 10BASE-T1L", but it does NOT. MDI is a \*mandatory\* "shall"-stated Medium Dependant Interface for 10BASE-T1L. Tjhis section does NOT specify MDI. It provides (abeit useful) suggestions and diagrams but no specification. Please decide whether this project has an MDI (or set of MDIs). And if MDI is indeed specified, please change the CL title to include MDI (currently just ....PMA)

### SuggestedRemedy

Either specify "the MDI for 10BASE-T1L" or not, and make downstream consequential changes. If not specified, then perhaps use "MDI considerations" not "MDI specifications"

Response Response Status W

ACCEPT IN PRINCIPLE.

Change from "This section defines the MDI for 10BASE-T1L."

to,

"This subclause describes connectors which may be used at the MDI. It also specifies electrical requirements, including fault tolerance, at the MDI.

Cl 147 SC 147.3.2.2 P 176 L 22 # 237  
Kim, Yong NIO

Comment Type TR Comment Status R PCS

Based on my reading, tx\_cmd encoding has been changed to be implemented regardless of PLCA RS layer option. Unnessary specifications.

### SuggestedRemedy

Reverse the change and make any corrections WRT to T and I.

Response Response Status W

REJECT.

tx\_cmd is implemented regardless of the PLCA RS layer option, and T & I are necessary to implement heartbeat (147.3.8)

Cl 147 SC 147.3.3.2 P 179 L 50 # 241  
Kim, Yong NIO

Comment Type TR Comment Status R PCS

"If Multidrop mode MDIO register bit 1.2297.10 is set to one and multidrop mode is supported according to bit 1.2298.10 then duplex\_mode is set to DUPLEX\_HALF" does not cover the case of half-duplex and P2P -- the mandatory operation.

### SuggestedRemedy

Please add text to include P2P half, or exclude. 2 out of three modes are covered at present.

Response Response Status W

REJECT.

Commenter is incorrect, as all cases are covered in the full paragraph. "If Multidrop mode MDIO register bit 1.2297.10 is set to one and multidrop mode is supported according to bit 1.2298.10 then duplex\_mode is set to DUPLEX\_HALF." (commenter's quoted text - says multidrop mode supported and enabled sets duplex mode to DUPLEX\_HALF). Text then continues, "Else, if Auto-Negotiation is enabled then duplex\_mode is set by the priority resolution defined in 98B.4." - this covers point to point and half-duplex when Auto-Negotiation is active. Then it continues and covers all other cases - "Otherwise, this variable is set by MDIO register bit 3.2291.8. If MDIO is not implemented, duplex\_mode is set by the means of an equivalent interface."

Cl 147 SC 147.3.5 P 183 L 21 # 242  
Kim, Yong NIO

Comment Type TR Comment Status R PCS

"The method for detecting a collision is implementation dependent but the following requirements have to be fulfilled:" is grossly insufficient. Collision detection method must be specified and reliability of collision detection must be validated.

### SuggestedRemedy

Without collision detection specification, this draft is grossly incomplete. I expect technically complete draft to include specifications on collision detect.

Response Response Status W

REJECT.

Commenter provides insufficient information for remedy. The standard specifies behavior, not implementation, and behavioral requirements for the collision detection are provided. Similarly, the standard does not specify how to equalize the received signal or how to cancel echoes, but states the transmitter electrical parameters, link segment transmission parameters, and receiver behavior (e.g., frame loss ratio and noise level tests) necessary for the implementation to meet.

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CI 147 SC 147.3.5 P 183 L 26 # 243  
Kim, Yong NIO

Comment Type TR Comment Status R PCS

"The PHY shall assert CRS in presence of a signal resulting from a collision between two or more stations." combined with a) WRT col, mandates a behavior that cannot be conformance tested. Assert CRS before COL, after COL, how long after collision condition on the medium, and when to deassert, by when? Could it deassert 256 bit time later?

## SuggestedRemedy

this specifciation is grossly incomplete. Please complete it. I expect technically complete draft to include specifications on carrier sense from collision.

Response Response Status W

REJECT.  
CRS is already specified in Clause 22.2.2.11 - It is asserted before or coincidently with COL and de-asserted after or coincidently with COL. See figure 22-11.  
COL is defined in 22.2.2.12 to be asserted for the duration of the collision on the line. Its assertion shall occur within one slotTime as specified in Clause 4 to avoid a late collision error. See e.g. Figure 4-5.

CI 147 SC 147.3.6 P 183 L 30 # 244  
Kim, Yong NIO

Comment Type TR Comment Status A PCS

"When operating in half-duplex mode, the 10BASE-T1S PHY shall sense when the media is busy and convey this information to the MAC asserting the signal CRS on the MII as specified in 22.2.2.11." is grossly insufficient for CSMA/CD to work. How, when, and condition, signal assert and deassert time, etc should all be specified.

## SuggestedRemedy

this specifciation is grossly incomplete. Please complete it. I expect technically complete draft to include specifications on carrier sense behavior.

Response Response Status W

ACCEPT IN PRINCIPLE.  
On page 183, lines 30-32, replace,  
"the 10BASE-T1S PHY shall sense when the media is busy and convey this information to the MAC asserting the signal CRS on the MII"  
  
with,  
"the 10BASE-T1S PHY senses when the media is busy and conveys this information to the MAC by asserting the signal CRS on the MII"

CI 147 SC 147.3.8 P 184 L 7 # 245  
Kim, Yong NIO

Comment Type TR Comment Status A PCS

Reading into "Heart-beat (HB)" -- the function REQUIRES support of BEACON, etc, in PLCA option in RS, to work properly. This means PLCA option is NOT an option if Augo-neg is implemented and enabled.

## SuggestedRemedy

Please clarify whether PLCA RS layer is an option or mandatory. The current draft says optional in most places.

Response Response Status W

ACCEPT IN PRINCIPLE.

On page 184, lines 17-18, replace,  
"The HB generation is disabled when the PHY is configured for operation over a mixing-segment network or a PLCA BEACON indication is detected on the line."

with,  
"The HB generation is disabled when the PHY is configured for operation over a mixing segment or a BEACON is detected."



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CI 147 SC 147.3.8 P 184 L 7 # 246  
Kim, Yong NIO

Comment Type TR Comment Status R PCS

Related to my other comment WRT half-duplex P2P mode WITHOUT repeater support makes little sense WRT broadmarket potential and suggest deleting that mode, and if that is considered positively, then consider replacing H-B with active idle for full-duplex P2P mode and have it align with 10BASE-T1L. H-B is being added in D2.2 in support of a mode that makes little market sense.

## SuggestedRemedy

Please conditionally (delete P2P HD) consider this suggestion (replacement of HB)

Response Response Status W

REJECT.

Comment #210 was rejected. The resolution to comment #210 is:

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.

====

As written (and commonly) they do not mention objective by objective, or else they would have to be modified every time an objective is changed. The objectives are chosen to fit within the broader CSDs, by the applicability and the multiple interest groups. 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. These have voted to approve adding the objective for P2P.

CI 147 SC 147.3.8.3 P 188 L 33 # 248  
Kim, Yong NIO

Comment Type TR Comment Status A EZ

"In compliance to 148.4.4.2.1, when PLCA RS operations are supported and enabled, the PHY shall notify the RS of a received BEACON indication by the means of MII interface as specified in 22.2.2.8." This could be read that 10BASE-T1S PHY support of PLCA related signals are NOT optional. If this is the intent, PLEASE explicitly state it (probably somewhere near 147.1) If not, then adjust the text to reflect optional nature of PLCA RS support.

## SuggestedRemedy

Please consider and do one of the two choices.

Response Response Status W

ACCEPT IN PRINCIPLE.

Replace,  
"when PLCA RS operations"

with,  
"when optional PLCA RS operations"

CI 147 SC 147.3.8.4 P 188 L 42 # 249  
Kim, Yong NIO

Comment Type TR Comment Status A EZ

"In compliance to 148.4.4.2.2, when PLCA RS operations are supported and enabled, the PHY shall notify the RS of a received COMMIT indication by the means of MII interface as specified in 22.2.2.8." This could be read that 10BASE-T1S PHY support of PLCA related signals are NOT optional. If this is the intent, PLEASE explicitly state it (probably somewhere near 147.1) If not, then adjust the text to reflect optional nature of PLCA RS support.

## SuggestedRemedy

Please consider and do one of the two choices. Could be considered together with my comment to 147.3.8.3

Response Response Status W

ACCEPT IN PRINCIPLE.

Replace,  
"when PLCA RS operations"

with,  
"when optional PLCA RS operations"

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CI 147 SC 147.6.1 P 196 L 41 # 252  
Kim, Yong NIO

Comment Type TR Comment Status R AutoNeg

"Auto-Negotiation may be performed as part of the initial set-up of the link and allows negotiation of the duplex mode of operation." and AN for half-duplex P2P related text should be deleted, IFF, such mode is deemed to not meet broad market potential (per my other comment)

## SuggestedRemedy

Please conditionally (delete P2P HD) consider deleting the referenced sentence.

Response Response Status W

REJECT.

Comment #210 was rejected. The resolution to comment #210 is:

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.

=====

As written (and commonly) they do not mention objective by objective, or else they would have to be modified every time an objective is changed. The objectives are chosen to fit within the broader CSDs, by the applicability and the multiple interest groups. 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. These have voted to approve adding the objective for P2P.

CI 147 SC 147.9.1 P 198 L 48 # 257  
Kim, Yong NIO

Comment Type TR Comment Status A MDI

This says "this section defines the MDI for 10BASE-T1S", but it does NOT. MDI is a "mandatory" "shall"-stated Medium Dependant Interface for 10BASE-TSL. This section does NOT specify MDI. It provides (abait useful) suggestions and diagrams but no specification. Please decide whether this project has an MDI (or set of MDIs). And if MDI is indeed specified, please change the CL title to include MDI (currently just ....PMA)

## SuggestedRemedy

Either specify "the MDI for 10BASE-T1S" or not, and make downstream consequential changes. If not specified, then perhaps use "MDI considerations" not "MDI specifications"

Response Response Status W

ACCEPT IN PRINCIPLE.

Text commenter refers to does not exist.

Insert new paragraph in 147.9 to align with 146.8 per comment 231:

"This subclause describes connectors which may be used at the MDI. It also specifies electrical requirements, including fault tolerance, at the MDI."

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CI 148 SC 148.2 P 213 L 48 # 259  
Kim, Yong NIO

Comment Type TR Comment Status A PLCA

the node with ID = 0 (PLCA Coordinator) specification is absent. Searching for coordinator finds this reference and AN section, and no where any specification WRT to the coordinator function.

## SuggestedRemedy

Without the coordinator function, how it is assigned, the draft is incomplete. CSD concern.  
Also see slide 11~13 of  
[http://www.ieee802.org/3/cg/public/Nov2018/Kim\\_3cg\\_01a\\_1118.pdf](http://www.ieee802.org/3/cg/public/Nov2018/Kim_3cg_01a_1118.pdf)

Response Response Status W

ACCEPT IN PRINCIPLE.

Resolved by comment #262. The resolution to comment #262 is:

ACCEPT IN PRINCIPLE.

Replace, "Transmit opportunities are generated in a round-robin fashion every time the node with ID = 0 (PLCA coordinator) signals a BEACON on the medium, indicating the start of a new cycle."

with, "Transmit opportunities are generated in a round-robin fashion. The node with ID = 0 signals a BEACON on the medium. Reception of a BEACON indicates the start of a new cycle of transmit opportunities."

Replace, "cycle" with, "cycle of transmit opportunities" at P219 L26, and P219 L29.

Replace, "PLCA cycle" with, "cycle of transmit opportunities" on P218 L41.

CI 148 SC 148.2 P 213 L 45 # 261  
Kim, Yong NIO

Comment Type ER Comment Status A Editorial

"avoiding physical collisions" should just be "avoiding collisions". Collisions on the medium. There is no other kind. The other collision "local collision" referred to in CL148 is more of access control and asserting COL signal in order to do access control. Readers of 802.3 understand collision, and introducing two new terms would be confusing without any derived benefit.

## SuggestedRemedy

Consider and do so (accepting this comment means careful global search and repace of "physical collision")

Response Response Status W

ACCEPT IN PRINCIPLE.  
Resolve with #223.

Resolution of comment #223 is:

There are 3 parts to this comment, so all 3 will be addressed.

A. "local collision" - There is no such thing as a local collision in the draft. There is only the 'local collision domain', where local refers to the domain, not the collision. The term collision domain is used as defined in 1.4.203.

B. "logical collision" - In this case, the term collision will suffice. Delete use of "logical collision" in the only two places it occurs:

148.4.6.1, P224 L6: Delete "This is called a logical collision."

148.4.6.1, P225, L10: Change "and a logical collision is triggered" to "and a collision is triggered"

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CI 148 SC 148.2 P 213 L 48 # 262  
Kim, Yong NIO

Comment Type TR Comment Status A Editorial

What is "new cycle" and later "PLCA cycle"? The term is used without definition or clear reference. Also this text indicates BEACON indicates start of new cycle, but RESYNC also starts new cycle from node ID <> 0, in presumably exception handling case. Shouldn't we know how node ID =0 function (coordinator) behaves to implementj a system?

## SuggestedRemedy

Define or specifiy [PLCA] cycle somewhere and provide a reference to it.

Response Response Status W

ACCEPT IN PRINCIPLE.

Replace, "Transmit opportunities are generated in a round-robin fashion every time the node with ID = 0 (PLCA coordinator) signals a BEACON on the medium, indicating the start of a new cycle."

with, "Transmit opportunities are generated in a round-robin fashion. The node with ID = 0 signals a BEACON on the medium. Reception of a BEACON indicates the start of a new cycle of transmit opportunities."

Replace, "cycle" with, "cycle of transmit opportunities" at P219 L26, and P219 L29.

Replace, "PLCA cycle" with, "cycle of transmit opportunities" on P218 L41.

CI 148 SC 148.2 P 213 L 39 # 264  
Kim, Yong NIO

Comment Type TR Comment Status R PLCA

"The working principle of PLCA is that transmit opportunities on a multidrop network are granted in sequence based on a node ID unique to the local collision domain (set by the management entity)." I agree with sense of this sentence WRT to PLCA, and PLCA looks to be an alternate medium access control.

## SuggestedRemedy

CSD concern. Also see slide 7~10 of [http://www.ieee802.org/3/cg/public/Nov2018/Kim\\_3cg\\_01a\\_1118.pdf](http://www.ieee802.org/3/cg/public/Nov2018/Kim_3cg_01a_1118.pdf)

Response Response Status W

REJECT.

Commenter provides insufficient information for a remedy. PLCA is not a MAC.

Refer to [http://www.ieee802.org/3/cg/public/Jan2019/Tutorial\\_cg\\_0119\\_final.pdf](http://www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf)

Strawpoll #6: I support rejecting this comment with the rationale: "Commenter provides insufficient information for a remedy. PLCA is not a MAC.

Refer to [http://www.ieee802.org/3/cg/public/Jan2019/Tutorial\\_cg\\_0119\\_final.pdf](http://www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf)"

Task Force: Y:19 N:1 A:6  
802.3 Voters: Y:15 N:1 A:1

CI 148 SC 148.2 P 213 L 52 # 265  
Kim, Yong NIO

Comment Type TR Comment Status R PLCA

CSMA/CD -- Carrier Sense, Multiple Access, Collision Detect. Multiple Access has to do with fairness to access the network. How does invidually and optionally enabling multiple transmit opportunities preserve fairness? I did not see any presenations in the .3cg project area nor in this draft

## SuggestedRemedy

CSD concern, WRT to compatibility (at the network system level, on fairness part of Ethernet).

Response Response Status W

REJECT.

Commenter provides insufficient information to identify comment with the text, and insufficient information for a remedy. The referenced text cannot be a CSD violation impacting compatibility because it is informative.

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CI 148 SC 148.4.4.1.1 P 217 L 32 # 267  
Kim, Yong NIO

Comment Type ER Comment Status R Editorial

148.4.4 says "Requirements for the PHY". The text in 148.4.4.1.1 says "The BEACON function is specified in 148.4.5.1.", And 148.4.5.1 specifies Beacon control function overall. It does NOT clearly contain requiremetns for support of BEACON in PHY.

## SuggestedRemedy

Provide a better referece to only the PHY requirement that supports the PLCA function.

Response Response Status W

REJECT.

Commenter is incorrect. The remainder of 148.4.4.1.1 contains 2 "shall" requirements on the PHY (see comment #270). The reference to 148.4.5.1 mentioned in 148.4.4.1.1 is an informative reference tying the reader to how the BEACON works in the Figure 148-3 state diagram.

CI 148 SC 148.4.4 P 217 L 24 # 268  
Kim, Yong NIO

Comment Type TR Comment Status R PLCA

148.1 states "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)". So perhaps 148.4.4. should reference relevant clauses in 147 -- it would be specific and reader friendly, and avoid making non-normative statements such as "PHYs are free to map the BEACON request to any suitable line coding as long as the requirements defined herein are met." in line 41. And similar comment to COMMIT, etc.

## SuggestedRemedy

I do not see the [incomplete] generic PHY mapping, when PLCA is tightly coupled with 10BASE-T1S half-duplex PHY.

Response Response Status W

REJECT.

Commenter fails to provide sufficient information to implement a remedy.

The text commented on is out of scope for recirculation as text was unchanged.

CI 148 SC 148.4.5.1 P 218 L 32 # 269  
Kim, Yong NIO

Comment Type TR Comment Status A PLCA

"To achieve error free operation the PLCA node should be configured appropriately before transmit functions are enabled." -- While this is good thought, it is not useful unless the spec completes the thought on how we achieve that. Please delete the unnessary text or add text to make this statement more useful

## SuggestedRemedy

Please delete, or add text on how.

Response Response Status W

ACCEPT IN PRINCIPLE.

Insert the following after the referenced sentence,

"Appropriate configuration includes:

- a) each local\_nodeID is unique to the local collision domain,
- b) there is one and only one node with local\_nodeID = 0 on the local collision domain,
- c) the transmit opportunity timer (to\_timer) is set equal across all the nodes on the local collision domain,
- d) plca\_node\_count is set on the node with local\_nodeID = 0 to the number of nodes on the local collision domain"

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CI 148 SC 148.4.5.2 P 223 L 3234 # 273  
Kim, Yong NIO

Comment Type TR Comment Status R Burst Mode

CSMA/CD -- Carrier Sense, Multiple Access, Collision Detect. Multiple Access has to do with fairness to access the network. How does invidually and optionally enabling multiple transmit opportunities preserve fairness? The range of 0..255 includes potential transport protocol timeouts by starving other nodes.

## SuggestedRemedy

CSD concern, WRT to compatibility (at the network system level, on fairness part of Ethernet, and timeout concerns in upper layer transport protocols in use. Define number narrowly to practical lower bound, if this # is kept in the draft.

Response Response Status W

REJECT.  
While comment mentions fairness, CSD, and compatibility, commenter provides insufficient information to connect this to the referenced text and remedy which is related to the bounds for the variable max\_bc.

In many ways, PLCA Burst mode operation is similar to half-duplex Burst mode present in 100BASE-T.

The range of 0..255 is a reasonable number. This can be explained because the max\_bc is related to the product of the ratio between the maximum allowed packet size and the minimum allowed packet size on the network, which is ~24, and the number of nodes. Therefore for an 8 node network, max\_bc could reasonably be as big as 192.

Burst mode is designed to intentionally unbalance the fairness in favor of specific nodes to achieve better performance in specific cases. PLCA Burst mode cannot starve nodes in the network. In conclusion this is a desired (optional) feature, not a side-effect of PLCA.

Burst mode is described here  
"http://www.ieee802.org/3/cg/public/Nov2018/beruto\_3cg\_PLCA\_burst\_mode\_revB%20.pdf"  
" and one of its possible use cases is described here  
"http://www.ieee802.org/3/cg/public/Nov2018/xu\_3cg\_01b\_1118.pdf"

CI 148 SC 148.4.6.4 P 228 L 51 # 274  
Kim, Yong NIO

Comment Type TR Comment Status R PLCA

Use of commit\_timer is not merited. All packets are atomically transferred above the RS. This type of counter would only be relevant if this function is implemented in PHY. If the intent is support the function in the PHY side of PCS, then make it explicit. BTW, the name is a bit misleading too. The burst\_wait\_timer or such would be more descriptive (if this comment is rejected).

## SuggestedRemedy

Delete this timer and adjust the state machines with the traditional model of atomic transfer of whole packet.

Response Response Status W

REJECT.

The RS is below the MAC where packets are not atomically transferred.

CI 147 SC 147.4.3 P 190 L 44 # 277  
Kim, Yong NIO

Comment Type TR Comment Status R PMA

Full-duplex operation over one pair should have echo-cancellation (cancel TX from RX) onto/from media. I cannot find any reference to this function. 100BASE-T1 std, in 96.4.3 has text of "PMA Receive has Signal Equalization and Echo Cancellation sub-functions. These sub-functions are used to determine the receiver performance and generate loc\_rcvr\_status..."

## SuggestedRemedy

Please provide a reference to echo cancellation function. And it would be good to have a reference to that function in CL 147.4.3 introductory paragraph (not there now).

Response Response Status W

REJECT.

Comment is out of scope (on unchanged text) and does not change requirements or address a problem, only adds informative tutorial text on receiver design.

Additionally, while reference to echo cancellation occurs in other 802.3 clauses, calling out such a signal processing function in the standard opens the reader to specifying parameters of this function which are not needed for interoperability. Further, the additional text would be with regards to an implementation description rather than interoperability.

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CI 146 SC 146.4.3 P 133 L 32 # 278  
Kim, Yong NIO

Comment Type TR Comment Status R PMA

Full-duplex operation over one pair should have echo-cancellation (cancel TX from RX) onto/from media. I cannot find any reference to this function. 100BASE-T1 std, in 96.4.3 has text of "PMA Receive has Signal Equalization and Echo Cancellation sub-functions. These sub-functions are used to determine the receiver performance and generate loc\_rcvr\_status..."

## SuggestedRemedy

Please provide a reference to echo cancellation function. And it would be good to have a reference to that function in CL 146.4.3 introductory paragraph (not there now).

Response Response Status W

REJECT.

Comment is out of scope (on unchanged text) and does not change requirements or address a problem, only adds informative tutorial text on receiver design.

Additionally, while reference to echo cancellation occurs in other 802.3 clauses, calling out such a signal processing function in the standard opens the reader to specifying parameters of this function which are not needed for interoperability. Further, the additional text would be with regards to an implementation description rather than interoperability.

CI 148 SC 148 P 213 L 1 # 322  
Thompson, Geoff GraCaSI S.A.

Comment Type TR Comment Status R PLCA

10 Mb/s half duplex Ethernet offers the lowest level of performance in the market success Ethernet family (ignoring 1BASE5 which was not a market success). 802.3 and the networking market have developed successful improved performance variations of Ethernet over the years. Each of these improvements was judged before the project was authorized to meet the CSD or its predecessor, the Five Criteria. There has never been a project approved in 802.3 for the performance space between 10M CSMA/CD and either 10M Full Duplex or 100M CSMA/CD. The addition of a new access method to "improve" our worst performer was done for this project with no mention of this major addition to the scope and features of this project with no mention of it whatsoever in the project paperwork (PAR, CSD original Project Objectives). Further, the addition of PLCA to the draft clearly constitutes a new medium access control (MAC) protocol which overrides the shared media access method and the basic peer nature of Ethernet thus, the mechanism for it belongs in the Media Access Control (MAC) sublayer according to 802 tradition and to IEEE 802 Overview and Architecture. Further, the non-peer nature of PLCA is specifically contrary to the 802 Overview and Architecture (Ref: Std 802 4.1 para. 6) and thus violates the Compatibility criteria of the CSD. It is clear that when the project was started there either was no anticipated requirement for a new access method or the addition of a new access method was sandbagged, presumably because it could then be added to the project without being subjected to the rigors of the CSD examination. Standardized 10 Mb/s CSMA/CD has proved itself adequate for hundreds of millions of installations. Where it is not adequate the legitimate 802 process and the market have chosen full duplex and/or higher speed is the appropriate path within the standard for higher performance.

## SuggestedRemedy

Bring the project back into the bounds of the PAR scope and into compliance with 802 and the layer model by removing clause 148 and all other changes in the draft supporting PLCA elsewhere in the draft. I believe that this includes removing all reconciliation sub-layer functionality from the draft as no reconciliation should be required between a 10 Mb/s PHY and the legacy CSMA/CD MAC.

Response Response Status U

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 regarding peer-to-peer networking. Additionally, commenter's suggested remedy appears to assert that the Clause 148 reconciliation sublayer is required. It is not; use of the Clause 148 PLCA RS is optional.

See [www.ieee802.org/3/cg/public/Jan2019/Tutorial\\_cg\\_0119\\_final.pdf](http://www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf).

Strawpoll #4: I support rejecting this comment with the rationale: "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

## gement Parameters for 10 Mb/s Operation and Associated Power Delivery over a Single Balanced Pair of

without. Commenter incompletely quotes IEEE Std 802-2014 4.1, paragraph 6 leading to incorrect conclusions regarding peer-to-peer networking. Additionally, commenter's suggested remedy appears to assert that the Clause 148 reconciliation sublayer is required. It is not; use of the Clause 148 PLCA RS is optional.

See [www.ieee802.org/3/cg/public/Jan2019/Tutorial\\_cg\\_0119\\_final.pdf](http://www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf)."

Task Force: Y:30 N:2 A:6  
802.3 Voters: Y:18 N:2 A:1