Cl **00** *SC* **0** *P* *L* # r04-1

Berger, Catherine

Comment Type **G** *Comment Status* **A** *EZ*

This draft meets all editorial requirements.

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **147** *SC* **147.1** *P* **190** *L* **12** # r04-3

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **R** *Modes*

[CSD/Compatibility] [CSD/Broad Market Potential][CSD/Distinct Identity]
Related to unresolved comment i-411, somewhat related to r03-32, and others.

This clause has three separate PHYs that should not be considered ass one PHY with two options.
1. Full-Duplex P2P PHY: Performs echo cancellation, full-duplex over one transmission line. This is an optional PHY in CL147.
2. Half-Duplex P2P PHY: Traditiionally used with multi-port CL9 repeaters, this allows exactly two node network (one link, two link partners) and only such network, because the Clause 9 repeater is not supported as per proposed text in CL9. This is not a network. Two and only two node connection is a dedicated link. This is only mandatory PHY operation in CL147.
3. Half-Duplex Shared Medium PHY: Does NOT perform echo cancellation, half-duplexover shared medium. This is an optional PHY in CL147.

And the text says #1 and #3 are NOT interoperable -- CL147.1 says "..there are two mutually exclusive optional operating modes..." (line 14).

The only mandatory PHY (Half-Duplex P2P) is useless. Better performance PHY (Full-Duplex P2P) exist and only one could argue for the distinct identity. Neither supports repeaters; both supports bridges. CRG wrongly argues that "a bridge considered to be an element in common network".

Two other PHYs are optional, but they are not optional to each other (mutually exclusive), yet all three PHYs are referred to as type 10BASE-T1S. This clause organization is grossly in error.

In addition, if the media termination is considered, where the P2P PHY (#1) would have line termination, where Half-Duplex shared medium PHY (#3) would have high-impedance tap (where the transmission line termination common to all), these modes are not optional operations of one device in-place.

Each distinct PHY should has its own type designation (possibly its own clause, but only for clarity), #2 Half-duplex P2P PHY should be deleted for the stated reason of not being useful as a 'network'.

SuggestedRemedy

The same suggested remedy from i-411 is still appropriate:
"Pick the one PHY that meets CSD and objectives as written, or split this clause into at least two (one for P2P and one for Shared medium) separate PHY clauses and re-state the respective CSD as appropirate."

Response *Response Status* **U**

REJECT.
This comment is a restatement of comment i-411 with reference to comment r03-32.

The commenter acknowledges this, and, in large part copies from the text of comment i-411.
The CRG disagrees with the commenter and reaffirms the response to comment i-411 as appropriate for this comment, given below:
“REJECT.
CRG disagrees with the commenter. The clause contains one PHY with three modes, with a common-denominator for interoperability. CRG disagrees with the commenter on interest in the mandatory mode of operation (half-duplex point-to-point). There are multiple methods of inter-linking point-to-point half-duplex segments, without the use of clause 9 repeaters using multiple topologies of choice, allowing larger networks (with more than 2 stations). A bridge is considered to be an element in common networks.”

Motion: Accept the editor's proposed response (reject the comment with the rationale above, reaffirming the response to comment i-411).
M: Steve Carlson
S: David Brandt
Y: 20
N: 1
A: 0
MOTION PASSES (Technical >= 75%)

Cl **147** *SC* **147.3.5** *P* **209** *L* **38** # r04-2

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **R** *PCS*

[CSD/Compatibility] [Collision Detect, no assurance thereof] [Grossly incomplete specification]
Related to unresolved comment i-417.

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) detected data corruption at the MDI == collision, and
2) require, without specification, find two or more
stations transmitting somewhere in the network and assert COL and CRS during that time as in "The method for detecting a collision is implementation dependent but the following requirements have to be fulfilled: a) The PHY shall assert COL when it is transmitting, and one or more other stations are also transmitting at the same time."

Data corruption may be caused by collision event, random error, or other correlated signal imparement (such as additive reflections from the shared medium high-impedance taps). This project incorrectly equates all 'detected data corruption at the MDI' as collision. Data error <> collision.

If the data corruption (erronously) is deemed to be collision at the detecing node, there is no assurance that other nodes would also detect data corruption, thus collision. As stated in i-417, with references to 147.5.4, "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....<snip>....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"

This draft does not fully assure 100% collision detection -- does not meet CSD/Compatibility criterium.
This draft does not specify, merely require, collision detection is assured; therefore grossly incomplete.

SuggestedRemedy

Proposed change cannot be stated, since the draft put forth, even after recirculation

cycles, remain incomplete.
Specification on how 100% collision detect occurs in a PHY, and without knowing all other PHY transmission status, must be written so that it could be reviewed. This project did NOT complete its work by not including the collision detection mechanism. CRG states, with references how they may be done. If those refereces are parts of the baseline technology specification, then the project must include those. So, only fitting proposed change is for CRG to complete the specification by adding architectural and functional behavior for collision detection. Otherwise interoperability is not assured.

Response *Response Status* **U**

REJECT.
This comment is a restatement of a portion of comment i-417. The commenter acknowledges this, and, in large part directly quotes or copies from the text of comment i-417.
Comment i-417 contained two issues, one of which the CRG accepted in principle and the other, restated in this comment, the CRG disagreed with the commenter.
The CRG disagrees with the commenter and reaffirms the response to the referenced issue in comment i-417, as appropriate to this comment given below:
“2. CRG disagrees with the remainder of the commenter's statements.
Various results have been presented to the Task Force, showing reliable collision detection on link segments using a variety of methods.
http://www.ieee802.org/3/cg/public/May2019/griffiths_3cg_01b_0519.pdf showed voltage domain collision detection. Additionally, analysis has been presented in 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 voltage 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.”

MOTION - Accept the above response, reject the comment with the rationale proposed.
M: Chad Jones
S: Peter Jones
Y: 20
N: 1
A: 0
Motion PASSES (Technical >= 75%)