Cl **00** *SC* **0** *P* *L* # 210

Teener, Michael Broadcom

Comment Type **T** *Comment Status* **R**

The EEE PHY requirements need to consider to AVB time synchronization requirements (and/or syncE, 1588, etc. as appropriate). In particular, we need to make sure that 1) we can still get an accurate measure of SOF on TX even when delayed by PHY startup, 2) the startup delay must be minimized to avoid extra “bunching”. The amount of delay should be in the single digit microseconds, and 3) the requirements for SyncE also require that the local clocks in the PHYs on each end of a link not drift very much with respect to each other during the idle state.

SuggestedRemedy

Consider requirements 1, 2 and 3 above and their impact on the respective EEE PHYs.

Response *Response Status* **C**

REJECT.

The task force followed the suggested remedy to "consider …" and discussed each item in some detail.

Please note there are no changes planned for the next draft in response to this comment as there were no specific changes in the suggested remedy and none came out of the task force deliberation at the meeting. Please see below for a summary of the discussion:

regarding (1)
It will be the responsibility of a new project (802.1AS support) to propose a reference point for time stamping. We recommend that the reference point be put below the RS to make the solution identical for EEE and legacy operation (there is some level of jitter in legacy PHYs too below the RS).

Regarding (2)
The task force has worked hard to minimize the startup delay though the numbers we have come up with for several of the PHYs do not meet the commenters target of "single digit microseconds".

Regarding (3), please share any data or specifications you may have on clock drift.

Cl **00** *SC* **0** *P* *L* # 212

Traeber, Mario Infineon Technologies

Comment Type **T** *Comment Status* **R**

Currently its not defined clearly in the Draft when the LPI agent is allowed to issue an LPI request. There might be times when this is causing undesired effects for some PHY modes, e.g. during a link-up. Some of the PHYs are protected by nature of the state-machines (e.g. 1000bT) but some are not (e.g. 100bTX). The comment is focused on specifying a way to define this by either securing the PHYs (e.g. allowing the PHY to ignore an LPI request from the LPI Agent at special times) or to define a status control mechanism such that the LPI Agent would not do that during undesirable periods of time.

SuggestedRemedy

Response *Response Status* **C**

REJECT.

No specific remedy suggested. The commenter has flagged an issue that may need some examination.

Cl **00** *SC* **0** *P* **1** *L* **1** # 93

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

Draft 1.0 comment #48, even though accepted, was never implemented in the draft.

The comment was ...
"I'm not sure where to anchor this comment, but Annex 28D should also be amended to outline extensions of Clause 28 for Energy Efficient Ethernet and I propose that Clause 28 extensions for EEE include:
1. Auto-Negotiation is mandatory for a EEE PHY (this is currently not the case for 100BASE-TX)
2. The exchange of additional next pages for EEE capability and mode negotiation extends the time required to complete Auto-Negotiation. To reduce this time, a EEE PHY may use the extended next page mechanism introduced by IEEE 802.3an-2006 (it is not currently an option for 100BASE-TX)."

The suggested remedy was...
"Add amendment to Annex 28D per comment."

...and the adopted response was "ACCEPT".

SuggestedRemedy

Add amendment to Annex 28D per comment.

Response *Response Status* **C**

ACCEPT.

Cl **01** *SC* **Editors Note** *P* **15** *L* **24** # 110

Zimmerman, George Solarflare Communica

Comment Type **E** *Comment Status* **A**

Please update the revision history or delete it

SuggestedRemedy

update revision history with each reissue

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editors have been instructed to update revision history. There may not be updates for clauses that see no changes.

Cl **14** *SC* **14.8** *P* **25** *L* **51** # 111

Zimmerman, George Solarflare Communica

Comment Type **T** *Comment Status* **A**

marking 10BASE-T or 10BASE-Te support precludes devices that support both

SuggestedRemedy

change to 10BASE-T and/or 10BASE-Te support

Response *Response Status* **C**

ACCEPT.

Cl **22** *SC* **22.2.1** *P* **28** *L* **14** # 151

Bennett, Michael LBNL

Comment Type **E** *Comment Status* **A**

The sentence "The definition of low power idle" has the first use of the term low power idle. The acronym, LPI is used later in the clause without definition.

SuggestedRemedy

Insert (LPI) after "idle" in the sentence as shown:

The definition of low power idle (LPI) ...

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Definition may be added in Clause 1

Cl **22** *SC* **22.2.1.3.3** *P* **29** *L* **33** # 150

Bennett, Michael LBNL

Comment Type **E** *Comment Status* **A**

The paragraph would be easier to read if the first sentence terminated after CARRIER_STATUS.

SuggestedRemedy

Replace the comma with a period and change the case of the beginning of the enxt sentence as shown below:

For LPI operation, in full duplex mode RX_DV and CRS have no influence on CARRIER_STATUS. A transition ...

Response *Response Status* **C**

ACCEPT.

Cl **22** *SC* **22.7a.2** *P* **34** *L* **10** # 156

Bennett, Michael LBNL

Comment Type **T** *Comment Status* **A**

The sentence refers to a definition in clause 78:

... governed by Resolved Transmit Tw defined in 78.4.2.3

But the Resolved Transmit definition is in clause 78.4.1.4

SuggestedRemedy

Change reference to the correct subclause:

... governed by Resolved Transmit Tw defined in 78.4.1.4

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change reference as suggested (with any adjustments if changes to 78 cause a renumbering) and also change reference to a link.

Cl **22** *SC* **22.7a.2.2** *P* **34** *L* **37** # 157

Bennett, Michael LBNL

Comment Type **T** *Comment Status* **A**

tw_timer
A timer that counts, in microseconds, the time expired since the deassertion of LPI. The terminal count of the timer is the value of the Resolved Transmit Tw as defined in 78.4.2.3.

Resolved Transmit definition is in subclause 78.4.1.4

SuggestedRemedy

change reference to 78.4.1.4:

The terminal count of the timer is the value of the Resolved Transmit Tw as defined in 78.4.1.4.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change reference as suggested (with any adjustments if changes to 78 cause a renumbering) and also change reference to a link.

Cl **24** *SC* **24.2.4.4** *P* **48** *L* **30** # 62

Grimwood, Mike Broadcom

Comment Type **T** *Comment Status* **A**

Figure 24-11b Receive state diagram, part b shows a transition to RX_LPI_LINK_FAIL upon expiration of lpi_rx_tw_timer_done. The intent of this comment is to provide a consistent mode of operation as was included in Clause 40 in which this transition is replaced with a new timer, lpi_link_fail_timer such that the transition to link failure is deferred and instead failures to wake within lpi_rx_tw_timer_done increment a wake error counter.

SuggestedRemedy

Introduce changes to count 100BASE-TX LPI wake failures and to defer the transition to RX_LPI_LINK_FAIL including the following:

Change Figure 24-11b introducing the timer lpi_link_fail_timer for the transition from RX_WAKE to RX_LPI_LINK_FAIL.

Introduce lpi_link_fail_timer with a value of 90 us to 110 us.

Introduce a 100BASE-TX wake error counter such that this counter is incremented each time lpi_rx_tw_timer_done transitions from FALSE to TRUE.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following changes will be made:

Add a timer lpi_link_fail_timer with value 90us - 110us.
Replace the timer lpi_rx_tw_timer with lpi_link_fail_timer on the transition branch from RX_WAKE to RX_LPI_LINK_FAIL.
Change the default value of lpi_tx_ts_timer, lpi_rx_ts_timer, and lpi_tx_tr_timer to 200us - 220us.
Use the wake error counter as defined in register MMD 3.22 to track the number of timer expiration of lpi_rx_tw_timer.
Adequately stop the lpi_rx_wake_timer to avoid the false count.

Note: The timer in the last sentence above has been listed incorrectly and should be "lpi_rx_tw_timer"

Cl **25** *SC* **25.2.11.2.1** *P* **60** *L* **51** # 112
Zimmerman, George Solarflare Communica

Comment Type **ER** *Comment Status* **A**

TP-TMD typo, should be TP-PMD

SuggestedRemedy

replace with TP-PMD (2 instances)

Response *Response Status* **C**

ACCEPT.

Cl **35** *SC* **35.2.2.4** *P* **69** *L* **12** # 180
Pillai, Velu Broadcom

Comment Type **E** *Comment Status* **A**

signalled

SuggestedRemedy

signaled

Response *Response Status* **C**

ACCEPT.

Cl **36** *SC* **36.2.5.1.3** *P* **76** *L* **40** # 166
Koenen, David Hewlett Packard

Comment Type **T** *Comment Status* **A**

rx_lpi_mode and tx_lpi_mode are not used to set or control any feature or function.

SuggestedRemedy

Either add a suggestion statement (should) to trigger power savings in the PCS or delete them from variables and state diagrsms.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

These variables are redundant, given the use of tx_quiet & rx_quiet.

Delete the variable definitions and references to them in the state machines.

Cl **36** *SC* **36.2.5.2.8** *P* **86** *L* **16** # 94
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

All Energy Efficient Ethernet PHYs operating over the twisted pair medium (xBASE-T) have settled on a single value for the wake time. All Backplane Ethernet PHYs offer an selection of four wake times. For consistency across all of the PHYs, it is encouraged that T_WR in Table 36-3b be reduced to a single value.

SuggestedRemedy

Per comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer to #146

Cl **36** *SC* **36.2.5.2.8** *P* **86** *L* **17** # 146
Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

All of the PHYs defined are defined to work with fixed wake times - except backplane. Even though the backplane PHYs are the simplest of the PHYs being defined.

All backplane PHYs should use fixed wake times based only on PHY type.

SuggestedRemedy

Change TABLE 36-3b, middle row, from 10 - 20 to 10 - 11. Delete the footnote.

Response *Response Status* **C**

ACCEPT.

Note also register 7.64

Cl **36** *SC* **Fig 36-7a** *P* **80** *L* **1** # 207

Pillai, Velu Broadcom

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

LP_IDLE and LPI_K needs to see continuous detect_lpidle

SuggestedRemedy

Staying in these state needs to be qualified with ôrx_lpi_modeö.

Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

It's not clear what the problem is. In general, the s/m will stay in a state unless the exit conditions are met, so there is no need to cater for conditions when SUDI is not valid or other additional robustness.

Rx_lpi_mode is deleted by #166.

Cl **40** *SC* **40.1.3** *P* **90** *L* **10** # 4

McIntosh, James Vitesse

Comment Type **TR** *Comment Status* **A**

The signal loc_lpi_req should an input to the PCS Transmit function in Fig. 40-3 and Fig 40-5.

SuggestedRemedy

Add dashed line for loc_lpi_req as an input to the PCS Transmit function in Fig. 40-3 and Fig 40-5.

Response *Response Status* **C**

ACCEPT.

Cl **40** *SC* **40.3.1.3.4** *P* **98** *L* **46** # 5

McIntosh, James Vitesse

Comment Type **TR** *Comment Status* **A**

The (TXDn != 0x01) term for cext_errn was lost in removing the scrambled loc_lpi_mode logic.

SuggestedRemedy

Restore the cext_errn equation to (as it was in Draft 1.0):

cext_errn = tx_errorn if ((tx_enablen = 0) and (TXDn[7:0]!=0x0F)
and (TXDn[7:0]!=0x01))
0 else

Response *Response Status* **C**

ACCEPT.

Cl **40** *SC* **40.3.3.1** *P* **100** *L* **4** # 6

McIntosh, James Vitesse

Comment Type **TR** *Comment Status* **A**

The variable rem_lpi_req values should be TRUE or FALSE, instead of ON or OFF.

SuggestedRemedy

Change to "TRUE or FALSE".

Response *Response Status* **C**

ACCEPT.

Also change the values of the loc_update_done and rem_update_done variables to "TRUE or FALSE" in 40.2.13 and 40.2.14 respectively and correct the format of the heading "Semantics of the primitive" under 40.2.14.

Cl **40** *SC* **40.3.4** *P* **101** *L* **4** # 7

McIntosh, James Vitesse

Comment Type **TR** *Comment Status* **A**

The PMA_RXSTATUS.indication (NOT_OK) term in transition to IDLE in Fig. 40-10a should probably be qualified with lpi_mode=OFF. I suspect that we do not intend for the state machine to transition from LP_IDLE to IDLE while lpi_mode=ON when PMA_RXSTATUS.indication becomes NOT_OK temporarily during the new EEE states.

SuggestedRemedy

Change PMA_RXSTATUS.indication (NOT_OK) to (PMA_RXSTATUS.indication (NOT_OK) * lpi_mode=OFF).

Response *Response Status* **C**

ACCEPT.

Cl **40** *SC* **40.4.2.4** *P* **103** *L* **42** # 1

McIntosh, James Vitesse

Comment Type **ER** *Comment Status* **A**

Typo: "acheived" should be "achieved".

SuggestedRemedy

Change to "achieved".

Response *Response Status* **C**

ACCEPT.

Cl **40** *SC* **40.4.6** *P* **108** *L* **25** # 3

McIntosh, James Vitesse

Comment Type **T** *Comment Status* **A**

In Fig. 40-15b, the two transtions out of WAKE_TRAINING with loc_rcvr_status=OK * rem_rcvr_status=OK can be combined into a single transition to UPDATE without any loc_lpi_req or rem_lpi_req qualifiers. The state machine will fall through to SEND IDLE OR DATA from UPDATE using the loc_lpi_req=FALSE + rem_lpi_req=FALSE transtion (C) if appropriate. This will result in a slight simplification of the state diagram.

SuggestedRemedy

Remove the transitions to UPDATE and SEND IDLE OR DATA from WAKE_TRAINING in Fig. 40-15b and replace with a single transition to UPDATE with the expresion loc_rcvr_status=OK * rem_rcvr_status=OK. Remove the "stop lpi_wake_timer" command in the SEND IDLE OR DATA state as this is handled in the UPDATE state.

Response *Response Status* **C**

ACCEPT.

Cl **40** *SC* **40.5.1.1** *P* **110** *L* **24** # 52

Grimwood, Mike Broadcom

Comment Type **E** *Comment Status* **A**

In Table 40-3 for Register 3.22 the type NR is not defined.

SuggestedRemedy

Define NR in the footer of Table 40-3.

Response *Response Status* **C**

ACCEPT.

Cl **40** *SC* **40.6.1.2.6** *P* **110** *L* **48** # 2

McIntosh, James Vitesse

Comment Type **ER** *Comment Status* **A**

We still have a few inadvertant Clause 46 references that should be to Clause 40. Please find and fix these.

SuggestedRemedy

Change 46.6.1.2.6 to 40.6.1.2.6 (page 110, line 48).
Also, change 46.6.1.3.4 to 40.6.1.3.4 (page 111, line 41) and change 46.6.1.2.7 to 40.6.1.2.7 (page 111, line 47).

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3** *P* **116** *L* **22** # 95

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

40.5.1.1, Table 40-3, defines register 3.22 to be the "1000BASE-T wake error counter". This is not reflected in Clause 45.

SuggestedRemedy

Define the counter in Clause 45 per the Clause 40 definition, or define a generic counter to be used by all PHYs that Clause 40 may, in turn, reference.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Define 3.22 to be the Wake Error Counter. Add a new subclause to describe the register in general terms so that it can be used by any PHY that supports the function.

Editorial licence granted for the precise text to be written.

Cl **45** *SC* **45.2.3** *P* **116** *L* **25** # 35

Kasturia, Sanjay Teranetics

Comment Type **ER** *Comment Status* **A**

Replace TBD with proper clause references

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Register 3.21 has been deleted, add clause number 45.2.3.9a

Cl **45** *SC* **45.2.3** *P* **116** *L* **27** # 20

Tidstrom, Rick Broadcom

Comment Type **E** *Comment Status* **A**

Table 45-1

Table references register 3.21, EEE reduced energy capability register, which has been removed from the standard.

SuggestedRemedy

Register 3.21 should be removed from the table.

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3** *P* **116** *L* **28** # 8

McIntosh, James Vitesse

Comment Type **TR** *Comment Status* **A**

Register 3.22 is in Table 40-3 on page 110, but has been left out of Clause 45.

SuggestedRemedy

Please add register 3.22 to Table 45-1 and any other appropriate table and text thereafter.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #95

Cl **45** *SC* **45.2.3.2** *P* **118** *L* **26** # 186

Pillai, Velu Broadcom

Comment Type **E** *Comment Status* **A**

1 = Tx PPCS is currently receiving LP idle

SuggestedRemedy

1 = Tx PCS is currently receiving LP idle

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3.9a** *P* **119** *L* **29** # 14

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **R**

It is not clear why the suffix "EEE" is added at the end of PHY name.

1. In Table 45-88a there is a column entitled "Name" which implies that the column contains names of PHY types. However, the names listed are not actual PHY types: 10GBASE-KR EEE, 10GBASE-KX4 EEE, 1000BASE-KX EEE, 10GBASE-T EEE, 1000BASE-T EEE, and 100BASE-TX EEE. This is repeated in subclause titles.

2. the same use of "EEE" suffix is also used in table 45-145 and subsequent subclause titles.

SuggestedRemedy

Use actual names of PHYs. If it is desired to use the EEE to indicate the capability, then put EEE in brackets.

Response *Response Status* **C**

REJECT.

The "Name" heading for the column does not imply that is the PHY name, it implies that is the register bit name. A brief look at every other register description in Clause 45 will verify this. Where the PHY is referenced (in the description), the correct name is used.

Cl **45** *SC* **45.2.3.9a.3** *P* **120** *L* **7** # 29

Kasturia, Sanjay Teranetics

Comment Type **E** *Comment Status* **D**

Replace TBD by proper reference

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change references to links

Cl **46** *SC* **46** *P* **126** *L* **10** # 15

D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **A**

suggested rewording of sentence - "The XGMII may also support low power idle signaling as defined for Energy Efficient Ethernet for some PHY types (see Clause 78)."

SuggestedRemedy

change sentence to
"The XGMII may also support low power idle signaling for PHY types supporting Energy Efficient Ethernet (see Clause 78)."

Response *Response Status* **C**

ACCEPT.

Cl **46** *SC* **46.3.1.5a** *P* **127** *L* **45** # 21

Tidstrom, Rick Broadcom

Comment Type **ER** *Comment Status* **A**

Indicates that Low Power Idle should be asserted on all four lanes, but refers to TXD<7:0>.

SuggestedRemedy

Change from TXD<7:0> to TXD<31:0>.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change to TXD

This makes more sense in the context and matches Table 46-3

Cl **46** *SC* **46.3.2.4a** *P* **130** *L* **6** # 22

Tidstrom, Rick Broadcom

Comment Type **ER** *Comment Status* **A**

Indicates that Low Power Idle should be asserted on all four lanes, but refers to RXD<7:0>.

SuggestedRemedy

Change from RXD<7:0> to RXD<31:0>.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change to RXD

as for #21

Cl **48** *SC* **48.2.6.1.3** *P* **135** *L* **46** # 167

Koenen, David Hewlett Packard

Comment Type **T** *Comment Status* **A**

rx_lpi_mode and tx_lpi_mode are not used to set or control any feature or function.

SuggestedRemedy

They should either be used to suggesst possible PCS power savings or deleted from variable list and state diagrams.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #166

These variables are redundant, given the use of tx_quiet & rx_quiet.

Delete the variable definitions and references to them in the state machines.

Cl **48** *SC* **48.2.6.2.5** *P* **143** *L* **17** # 145

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

All of the PHYs defined are defined to work with fixed wake times - except backplane. Even though the backplane PHYs are the simplest of the PHYs being defined.

All backplane PHYs should use fixed wake times based only on PHY type.

SuggestedRemedy

Change TABLE 48-10, middle row, from 8 - 18 to 8 - 9. Delete the footnote.

Response *Response Status* **C**

ACCEPT.

Follow this change through with any required change in register 7.64 in clause 45

Cl **48** *SC* **48.2.6.2.5** *P* **143** *L* **17** # 96

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

All Energy Efficient Ethernet PHYs operating over the twisted pair medium (xBASE-T) have settled on a single value for the wake time. All Backplane Ethernet PHYs offer an selection of four wake times. For consistency across all of the PHYs, it is encouraged that T_WR in Table 48-10 be reduced to a single value.

SuggestedRemedy

Per comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #145

Cl **48** *SC* **Fig 48-9** *P* **137** *L* **25** # 208

Pillai, Velu Broadcom

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

Transition from RECEIVE to LPIDLE_MODE whith {||LPIDLE||], but in order to stay in LPIDLE_MODEand RECEIVE LPI the state machine is expecting continuous {||LPIDLE||] at the PCS service interface.

SuggestedRemedy

Staying in that state needs to be qualified with ôrx_lpi_modeö.

Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

Similar to #207

Cl **49** *SC* **0** *P* *L* # 164

Koenen, David Hewlett Packard

Comment Type **T** *Comment Status* **A** *backplane*

The draft is missing a description of how and when the 10GBase-KR FEC will synchronize and lock during wake sequence.

SuggestedRemedy

Add description in Clause 49 and/or 74 of how and when FEC will synchronize and lock during 10GBase-R PCS Wake from LPI.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Changes to address this comment will be put into Clauses 49 and 74;

Specific changes are captured in responses to comment #s 147, 125, 168, 87, 132, 126, 127, 63, 130, 131, 133

Cl **49** *SC* **49** *P* **145** *L* **36** # 119

Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **A**

Remove editor's note at beginning of clause

SuggestedRemedy

Remove editor's note at beginning of clause

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49** *P* **145** *L* **38** # 147

Barrass, Hugh Cisco

Comment Type **TR** *Comment Status* **A**

The use of training frames during refresh & wake for backplane PHYs is unnecessary and adds too much complexity.

Scrambled idle codes are sufficient to retrain receivers and the resynchronization of FEC or 66b block boundaries can be achieved by using a reset of the scrambler.

SuggestedRemedy

Delete sections that control training frames and replace with descriptions that use scrambled idles and scrambler reset - see presentation for more description.

This comment is an umbrella comment, detailed comments marked **BP training** cover specific changes required.

Response *Response Status* **C**

ACCEPT.

Changes are specified in responses to comments # 125, 168, 87, 132, 126, 127, 63, 130, 131, 133 and 128.

Cl **49** *SC* **49.2.12.2.2** *P* **149** *L* **30** # 165

Koenen, David Hewlett Packard

Comment Type **T** *Comment Status* **A**

rx_lpi_mode and tx_lpi_mode not used anywhere to set or coontrol any feature or function.

SuggestedRemedy

Tie this into a power saving suggestion (should statement) in the PCS or delete it.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #166

These variables are redundant, given the use of tx_quiet & rx_quiet.

Delete the variable definitions and references to them in the state machines.

Cl **49** *SC* **49.2.13.2.1** *P* **149** *L* **16** # 80

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

Constant ||LPIDLE|| is never used.

SuggestedRemedy

Delete definition of ||LPIDLE||.

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.2.2** *P* **149** *L* **22** # 160

Koenen, David Hewlett Packard

Comment Type **E** *Comment Status* **A**

Typo in 1st paragraph "used to by"

SuggestedRemedy

"used by"

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.2.2** *P* **149** *L* **30** # 81

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

The variable rx_lpi_mode appears to be assigned values of TRUE and FALSE in the Receive state diagram (Figure 49-15) and used for nothing else.

SuggestedRemedy

Define how this information is to be used by other functions or delete the variable definition and the variable assignments in Figure 49-15.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #165

The variable & its definition will be deleted

Cl **49** *SC* **49.2.13.2.2** *P* **149** *L* **33** # 82

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

The variable tx_lpi_mode appears to be assigned values of TRUE and FALSE in the Transmit state diagram (Figure 49-14) and used for nothing else.

SuggestedRemedy

Define how this information is to be used by other functions or delete the variable definition and the variable assignments in Figure 49-14.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #165

Cl **49** *SC* **49.2.13.2.2** *P* **149** *L* **41** # 125

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

BP training

Without training frames, there is no need to signal REFRESH/WAKE. Change tx_quiet definition to match other clauses.

SuggestedRemedy

Replace:

set to REFRESH when the transmitter is to send refresh signaling, set to WAKE when the transmitter is to send wake signaling and set to FALSE otherwise. When set to TRUE, the PMD will disable the transmitter as described in 71.6.6. When set to REFRESH or WAKE the PMD will send training signals as described in 71.6.12.

with:

and is set to FALSE otherwise. When set to TRUE, the PMD will disable the transmitter as described in 71.6.6.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace:

set to REFRESH when the transmitter is to send refresh signaling, set to WAKE when the transmitter is to send wake signaling and set to FALSE otherwise. When set to TRUE, the PMD will disable the transmitter as described in 71.6.6. When set to REFRESH or WAKE the PMD will send training signals as described in 71.6.12.

with:

and is set to FALSE otherwise. When set to TRUE, the PMD will disable the transmitter as described in 72.6.6.

Update the reference if necessary.

Cl **49** *SC* **49.2.13.2.2** *P* **149** *L* **43** # 168

Koenen, David Hewlett Packard

Comment Type **T** *Comment Status* **A**

The definition for tx_quiet should be stated more generically for support of both KR and legacy Optical PMDs. References to 71.6.6 adn 71.6.12 are to -KX4 not -KR and should be deleted or corrected.

SuggestedRemedy

Fix or delete reference to 71.6.x and make more generic to include Optical PMDs.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #125.

Change reference to 72.6.5. The reference should be included as that is the only PMD defined for this PCS in this project.

Also change reference in 48.2.6.1.3 to 71.1.6 to fix a similar error in Clause 48.

Cl **49** *SC* **49.2.13.2.3** *P* **148** *L* **1** # 56

Grimwood, Mike Broadcom

Comment Type **T** *Comment Status* **A**

If a block contains 4 /LI/ characters and 4 /I/ characters (as might occur during a normal transtion to wake), is the R_BLOCK_TYPE = C or E?

This comment assumes that this should be C, but the current definition of C does not make this clear.

SuggestedRemedy

Change: "Values: C; The vector contains a sync header of 10 and one of the following: a) A block type field of 0x1e and eight valid control characters other than /E/ and /LI/ (note that /LI/ is only excluded if the optional Low Power Idle function is supported);"

To: "Values: C; The vector contains a sync header of 10 and one of the following:a) A block type field of 0x1e and eight valid control characters, none of which is /E/ and all eight of which are not /LI/. (note that the eight /LI/ characters are only excluded if the optional Low Power Idle function is supported);"

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.2.3** *P* **148** *L* **33** # 201

Pillai, Velu Broadcom

Comment Type **TR** *Comment Status* **A**

For T_BLOCK_TYPE

change:

C; The vector contains one of the following:
a) eight valid control characters other than /O/, /S/, /T/, /E/ and /LI/ (note that /LI/ is only excluded if the optional Low Power Idle function is supported);

SuggestedRemedy

To:

C; The vector contains one of the following.
a) eight valid control characters other than /O/, /S/, /T/, /E/ and all eight of which are not /LI/ (note that the eight /LI/ characters are only excluded if the optional Low Power Idle function is supported);

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #56

Cl **49** *SC* **49.2.13.2.5** *P* **150** *L* **2** # 163

Koenen, David Hewlett Packard

Comment Type **ER** *Comment Status* **A**

rx_ and tx_ timer definitions reference the PMD entering or exiting state. Shouldn't this be the PCS entering this state?

SuggestedRemedy

Change rx_ and tx_ timer on this page from PMD to PCS.

Response *Response Status* **C**

ACCEPT.

7 instances.

Cl **49** *SC* **49.2.13.2.5** *P* **150** *L* **32** # 161

Koenen, David Hewlett Packard

Comment Type **E** *Comment Status* **A**

subscript needed on TWL

SuggestedRemedy

Change WL to subscript.

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.2.5** *P* **150** *L* **32** # 36

Wong, Don Cisco

Comment Type **E** *Comment Status* **A**

WL should be subscript in TWL

SuggestedRemedy

Change WL of TWL to subscript

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.2.6** *P* **150** *L* **35** # 87

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

The messages PMD_RXQUIET.request and PMD_TXQUIET.request imply that they are PMD service interface primitives. It seems that, to be consistent with the layer model, this information should be delivered to the sublayer below the PCS which may be either the Clause 51 PMA sublayer or the optional Clause 74 10GBASE-R FEC sublayer.

In addition this information is more closely associated with the text in 49.1.5 and Figure 49-4 should be relocated accordingly.

Finally, the precedent set by Clause 49 is that the detailed service interface primitives are defined in the Clauses 51 and 74. Hence, the new service interface primitives used by Clause 49 Energy Efficient Ethernet should be defined in both Clauses 51 and 74 respectively.

SuggestedRemedy

Per comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #132, #133

The editor will reconcile the inconsistencies in the definition of the service interface that cover message passing and signalling.

Cl **49** *SC* **49.2.13.2.6** *P* **150** *L* **38** # 132

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

The messages PMD_RXQUIET & PMD_TXQUIET are mis-named. They need to go through the PMA.

SuggestedRemedy

Change the names to

PMA_RXQUIET & PMA_TXQUIET

Change PCS/PMA to PCS (2 instances) and PMD to PMA/PMD (2 instances).

Response *Response Status* **C**

ACCEPT.

Also see response to comment #133

Cl **49** *SC* **49.2.13.2.6** *P* **150** *L* **43** # 126

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

BP training

Without training frames, there is no need to signal REFRESH/WAKE. Change tx_quiet definition to match other clauses.

SuggestedRemedy

Delete sentence starting "When REFRESH or WAKE this indicates..."

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.2.6** *P* **150** *L* **51** # 120

Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **A**

Remove editor's note regarding BER & block lock

SuggestedRemedy

Remove editor's note regarding BER & block lock

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3** *P* *L* # 127

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

BP training

Without training frames, there is no need to signal REFRESH/WAKE. Change tx_quiet definition to match other clauses.

SuggestedRemedy

Change states TX_REFRESH & TX_WAKE

both terms should read "tx_quiet <= false"

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3** *P* **150** *L* **51** # 79

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

This editor's note appears to be out of date. Changes to the Lock state diagram (Figure 49-12) have already been made. Are changes to the BER monitor state diagram required?

SuggestedRemedy

Update or remove editor's note. Note that it also appears to be anchored in the wrong place.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #120

Cl **49** *SC* **49.2.13.3** *P* **151** *L* **31** # 97

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

In Figure 49-14, the transition condition from TX_D to TX_E should include LI since it is not included in C.

SuggestedRemedy

Change transition condition from TX_D to TX_E to be:
T_TYPE(tx_raw) = (E + C + S + LI)

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3** *P* **151** *L* **38** # 84

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

The state diagram will not transition out of the RX_T state so long as R_TYPE(rx_coded) = LI.

SuggestedRemedy

Add state transition from RX_T to RX_LI with the transition condition R_TYPE(rx_coded) = LI.

Response *Response Status* **C**

ACCEPT.

Page number 152.

Note that this assumes that we allow a transition to LPI immediately following T (the alternative would be to disallow that & force an idle following T).

Cl **49** *SC* **49.2.13.3** *P* **151** *L* **40** # 83

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

The state diagram will not transition out of the TX_T state so long as T_TYPE(tx_raw) = LI.

SuggestedRemedy

Add state transition from TX_T to TX_LI with the transition condition T_TYPE(tx_raw) = LI.

Response *Response Status* **C**

ACCEPT.

Note that this assumes that we allow a transition to LPI immediately following T (the alternative would be to disallow that & force an idle following T).

Cl **49** *SC* **49.2.13.3** *P* **151** *L* **47** # 121

Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **A**

Only 1 state is added - singular

SuggestedRemedy

Change "are" to "is"

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3** *P* **152** *L* **28** # 78

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

In Figure 49-15, the transition condition from RX_D to RX_E should include LI since it is not included in C.

SuggestedRemedy

Change transition condition from RX_D to RX_E to be:
(...)+R_TYPE(rx_coded) = (E + C + S + LI)

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3** *P* **154** *L* **33** # 128

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

To support wake time fault, there needs to be another state - after RX_WAKE, the PHY must detect a situation where the PHY does not reach a state where data service can be established with an acceptable BER.

SuggestedRemedy

Add a term "* training_done" for the two transitions out of RX_WAKE (not the one with rx_tw_timer_done).

Add a new state ASSERT_WTF

Make a transition from RX_WAKE to ASSERT_WTF:
rx_tw_timer_done * rx_block_lock = OK

Make a transition from ASSERT_WTF to RX_ACTIVE
R_TYPE(rx_raw) != LI

Make a transition from ASSERT_WTF to RX_SLEEP
R_TYPE(rx_raw) = LI

In state ASSERT_WTF, add action "assert_WTF"

In 49.2.13.2.3 Functions, add

assert_WTF
An unexpected event has caused the PHY to complete the wake process without reaching a state where dats aervice can be established with an acceptable BER (add link to clause 45 counter)

In 49.2.13.2.6 Messages, add

PCS_TRAINING_DONE.indication(training_done)
A signal sent by the PMD that, when TRUE, indicate that the receiver is operating normally and should support a data service with an acceptable BER. When FALSE indicates that some form of training is in process following an interruption to normal link operation such as low power idle. PHY devices that do not support optional functions requiring this signal shall set the value as TRUE.

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3.1** *P* **153** *L* **10** # 174
Koenen, David Hewlett Packard

Comment Type **TR** *Comment Status* **A**

Delete tx_lpi_mode if not used anywhere.

SuggestedRemedy

Delete tx_lpi_mode.

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3.1** *P* **153** *L* **3** # 86
Healey, Adam LSI Corporation

Comment Type **E** *Comment Status* **A**

In Figure 49-17, replace "<=" with the appropriate symbol. Check arrowheads for the consistent use of the correct size.

SuggestedRemedy

Per comment.

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3.1** *P* **153** *L* **6** # 85
Healey, Adam LSI Corporation

Comment Type **E** *Comment Status* **A**

In Figure 49-16, replace "<=" with the appropriate symbol. Check arrowheads for the consistent use of the correct size.

SuggestedRemedy

Per comment.

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3.1** *P* **154** *L* **18** # 88
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

The variable signal_detect is not defined. It should be signal_ok.

SuggestedRemedy

Consistent with its usage in other Clause 49 state diagrams, replace "signal_detect = TRUE" with "signal_ok" and "signal_detect = FALSE" with "!signal_ok".

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3.1** *P* **154** *L* **20** # 89
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

Is is really necessary to "de-bounce" signal_detect = FAIL (which should be !signal_ok)?

The value of signal_ok is a) communicated from the PMA sublayer to indicate that the PMD detects the presence of a signal AND that the PMA is able to synchronize to that signal or b) from the optional FEC sublayer to indicate, in addition to the PMA criteria, that FEC block lock has been acheived.

Neither of these criteria seems likely to be tricked by the power-down transient of the link partner transmitter.

SuggestedRemedy

Remove RX_DEACT state and delete the definition of rx_deact_timer.

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3.1** *P* **154** *L* **33** # 90

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

In the LPI Receive state diagram (Figure 49-17), the use of rx_block_lock as a criteria for exit from the RX_WAKE state implies that the process described by the state diagram in Figure 49-12 is used to re-establish lock. It has been established that this process consumes an undesirable portion of the total wake time and that means to accelerate the lock process is desired.

It is currently not indicated in the draft what the lock criteria is for this acclerated process or relationship of this new process to the "conventional" lock process.

SuggestedRemedy

Define rx_block_lock in terms of the accelerated lock criteria and employ that same criteria to initialize the "conventional" Lock state diagram (Figure 49-12) such that (rx_)block_lock = TRUE.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #131

Cl **49** *SC* **49.2.13.3.1** *P* **154** *L* **40** # 63

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

The RX_LINK_FAIL state, the time lpi_link_fail_timer, and rx_lpi_fail variable serve no useful purpose in the in the LPI Receive state diagram (Figure 49-17).

1. When Auto-Negotiation is enabled, setting block_lock = FALSE in the RX_LINK_FAIL state will cause hi_ber = TRUE and, in turn, cause Auto-Negotiation to re-start. There is no point in dwelling in the RX_LINK_FAIL state for any period of time. Even when Auto-Negotiation is disabled, there is no obvious reason to dwell in this state after setting block_lock = FALSE.

2. The value of rx_lpi_fail is set to TRUE in the RX_LINK_FAIL state and FALSE upon entry into the RX_ACTIVE state, but it is used nowhere else and has no obvious purpose.

3. It is not desirable the break the link in the event of a failure to acheive rx_block_lock within rx_tw_timer. Expiration of rx_tw_timer should correspond to the increment of a "wake error counter" in the same manner as currently defined for 1000BASE-T. Expiration of an lpi_link_fail_timer should be used to break the link if the PHY fails to acheive lock after a prolonged period.

SuggestedRemedy

1. Delete the definition of the lpi_fail_timer and its associated uses in the LPI Receive state diagram.

2. Delete the definition of the variable rx_lpi_fail and the associated assignments in the LPI Receive state diagram.

3. Delete the RX_LINK_FAIL state.

4. Replace the transition from RX_QUIET to RX_LINK_FAIL with a transition from RX_QUIET to RX_ACTIVE with the transition condition (!signal_ok * rx_tq_timer_done). This will cause block_lock to be assigned the value of rx_block_lock, which presuambly false since !signal_ok is TRUE, and hence has the same effect as entering the old RX_LINK_FAIL state.

5. Remove rx_tw_timer_done from the transition conditions from RX_WAKE to RX_ACTIVE and RX_SLEEP. Stop rx_tw_timer upon entry in RX_ACTIVE and RX_WAKE.

6. Define lpi_link_fail_timer to have a duration of 250 microseconds +/- 10%. Start lpi_fail_timer in the RX_WAKE state. Add the condition "+ lpi_fail_timer_done" to the transition from RX_WAKE to RX_ACTIVE.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #128

Combine these changes with #128. Delete RX_LINK_FAIL, rx_lpi_fail and lpi_fail_timer (as in 1,2&3). Define lpi_link_fail_timer as in 6. Transition from RX_QUIET to RX_ACTIVE as in 4. Transitions from RX_WAKE to ASSERT_WTF as well as RX_SLEEP & RX_ACTIVE (with fault condition as in 5).

Cl **49** *SC* **49.2.13.3.1** *P* **154** *L* **48** # 91

Healey, Adam LSI Corporation

Comment Type **E** *Comment Status* **A**

Correct bad cross-references:

"The timer values for these state machines are shown in Table 49û2a for transmit and Table 49û3b for receive."

The tables are 49-2 and 49-3 respectively.

SuggestedRemedy

Per comment.

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3.1** *P* **154** *L* **8** # 175

Koenen, David Hewlett Packard

Comment Type **TR** *Comment Status* **A**

Delete rx_lpi_mode if not used.

SuggestedRemedy

Delete rx_lpi_mode in this state machine.

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.13.3.1** *P* **155** *L* **18** # 129

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

All of the PHYs defined are defined to work with fixed wake times - except backplane. Even though the backplane PHYs are the simplest of the PHYs being defined.

All backplane PHYs should use fixed wake times based only on PHY type.

SuggestedRemedy

Change TABLE 49-3, middle row, from 11 - 17 to 11 - 12. Delete the footnote.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make the appropriate change in clause 45 for register 7.64

Also add an additional row to table 49-3 for PHYs that include the optional FEC feature which need an additional 2microsec

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Cl **49** *SC* **49.2.13.3.1** *P* **155** *L* **21** # 92

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

All Energy Efficient Ethernet PHYs operating over the twisted pair medium (xBASE-T) have settled on a single value for the wake time. All Backplane Ethernet PHYs offer an selection of four wake times. For consistency across all of the PHYs, it is encouraged that T_WR in Table 49-3 be reduced to a single value.

SuggestedRemedy

Per comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #129

Cl **49** *SC* **49.2.14.1** *P* **155** *L* **28** # 64

Healey, Adam LSI Corporation

Comment Type **E** *Comment Status* **A**

Indicated changed text with underscore. However, since the changes to this subclause consistute the insertion of "Rx LP idle indication" and "Tx LP idle indication, isn't the correct editorial instruction "Insert"?

SuggestedRemedy

Per comment.

Response *Response Status* **C**

ACCEPT.

Underline "Rx LP idle indication" and "Tx LP idle indication" paragraphs. Editing instruction is correct.

Cl **49** *SC* **49.2.4.7** *P* **146** *L* **35** # 55

Grimwood, Mike Broadcom

Comment Type **T** *Comment Status* **A**

Clarify /LI/ insertion and deletion in low-power mode.

SuggestedRemedy

After line 35, add the following paragraph:

Low-power Idle control characters (/LI/) are transmitted when low power idle control characters are received from the XGMII. Low-power Idle characters may be added or deleted by the PCS to adapt between clock rates. /LI/ insertion and deletion shall occur in groups of 4. /LI/s may only be added following low-power idle.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Append after sentence on line 37:

Low power idle control characters (/LI/) are transmitted when low power idle control characters are received from the XGMII. Low power idle characters may be added or deleted by the PCS to adapt between clock rates in a similar manner to idle control characters. /LI/ insertion and deletion shall occur in groups of 4. /LI/s may only be added following other low power idle characters.

Cl **49** *SC* **49.2.6** *P* **146** *L* **38** # 130

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

BP training

A more effective means of rapidly synchronizing 66b block boundaries may be achieved by forcing a reset of the scrambler on a TRUE to FALSE transition of tx_quiet.

SuggestedRemedy

Edit subclause 49.2.6

Add paragraph at the end of subclause:
To aid block synchronization in the receiver, the scrambler shall be reset prior to the first bit of the first 66b block following a transition of tx_quiet from TRUE to FALSE.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Edit subclause 49.2.6

Add paragraph at the end of subclause:
To aid block synchronization in the receiver, the registers of scrambler shall be held at logic zero while scrambler_reset is TRUE.

Add variables scrambler_reset and srambler_reset_enable.

Add a message FEC_SCRAMBLER_RESET.

Add a states to TX LPI s/m - only enter the state if scrambler_reset_enable = TRUE. Enter state after tx_tw_timer_done, spend 1uS in the state before transitioning to TX_ACTIVE.

Change tx_tw_timer definition to Twl - 1 uS.

Cl **49** *SC* **49.2.9** *P* **146** *L* **50** # 122

Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **A**

The LPI paragraph needs to be underlined (it's an insertion).

SuggestedRemedy

Underline the paragraph starting "If the optional Low Power Idle..."

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **49.2.9** *P* **146** *L* **52** # 131

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

BP training

The receiver will be required to rapidly synchronize the 66b block boundaries following LPI. The precise details do not need to be specified but an informative description would be useful.

SuggestedRemedy

Append after "LPI receive state diagram."

Following the a period of quiet transmission, the receiver is expected to achieve block synchronization within the wakeup time specified. The reciever may use the knowledge that the link partner's transmitter has reset the scrambler at the beginning of the first 66b block following the transition from TRUE to FALSE for tx_quiet. The idle sequence following this event will form a fixed pattern for the duration of the wake period.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Scrambler reset will be driven by an explicit signal, reword the paragraph.

Following a period of low power idle, the receiver is required to achieve block synchronization within the wakeup time specified (See Figure 49-17). The implementation of the block synchronization state machine should use techniques to ensure that block lock is achieved with minimal numbers of slip attempts. For PHYs that include the scrambler reset function, the receiver may use the knowledge that the link partner's transmitter has reset the scrambler as part of the wake sequence. The idle sequence following this event will form a fixed pattern for the duration of the wake period.

Cl **49** *SC* **Fig 49-15** *P* **152** *L* **1** # 204

Pillai, Velu Broadcom

Comment Type **TR** *Comment Status* **A**

CL49 RX state diagram (Fig 49-15):
R_TYPE will be LI to transition from RX_C to RX_LI, but in order to stay in RX_LI the state machine is expecting continuous LI at the PCS service interface.
This is an issue in CL36 and CL48 PCS receive state machines as well.
The transition to and from RX_LI can be conditional to a valid R_TYPE, but staying in that state needs to be qualified with "rx_lpi_mode".

SuggestedRemedy

The transition to and from RX_LI can be conditional to a valid R_TYPE, but staying in that state needs to be qualified with "rx_lpi_mode".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

To the transition that loops around the state RX_LI add a term signal_detect=!OK

Change other transitions accordingly.

Cl **49** *SC* **Fig 49-15** *P* **152** *L* **19** # 202

Pillai, Velu Broadcom

Comment Type **TR** *Comment Status* **A**

On line 19 and 37
Change
R_TYPE(rx_raw) = LI

to

R_TYPE(rx_coded) = LI

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **49** *SC* **Fig 49-17** *P* **154** *L* **1** # 205

Pillai, Velu Broadcom

Comment Type **T** *Comment Status* **R**

CL49 LPI RX State diagram (Fig 49-17):
This state machine will receive LI to take it from Active to LPI mode. But for a KR PHY it will not receive any valid R_TYPE during refresh or wake. Hence this state machine will not work as it is.

SuggestedRemedy

Need signals from the CL72 LPI Receive State machine

Response *Response Status* **C**

REJECT.

The modified function of KR PMD eliminates the training frames and forwards LI during refresh (and I during wake).

See #137

See also #88 for signal_ok

Cl **49** *SC* **Fig 49-17** *P* **154** *L* **1** # 203

Pillai, Velu Broadcom

Comment Type **TR** *Comment Status* **A**

In this LPI receive state diagram, all the R_TYPEs are defined as R_TYPE(rx_raw). But it should be R_TYPE(rx_coded).

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **51** *SC* **51** *P* **157** *L* **54** # 133

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

The messages PMD_RXQUIET & PMD_TXQUIET need to pass through the PMA & go to the PMD.

Also (assuming **BP training**) message PCS_TRAINING_DONE needs to pass through.

SuggestedRemedy

Edit clause 51 to pass the messages through.

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.1.3.3** *P* **161** *L* **16** # 25

Tidstrom, Rick Broadcom

Comment Type **TR** *Comment Status* **A**

Not sure if this is the correct sub-clause, but the standard does not define the behavior of the transmitter when it enters Low Power Idle, and the free running LPI controls are supposed to transfer a partial refresh. A partial refresh would be defined as one less than four frames in length.

Reference: parnaby_01_1108.pdf, page 14.

SuggestedRemedy

Add a paragraph describing the transition from Sleep to Quiet/Refresh, and that partial refreshes are not to be transmitted, but instead replaced with Quiet frames.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The required behavior is already specified by the state diagram. Some descriptive text will be added.

Cl **55** *SC* **55.1.3.3** *P* **161** *L* **26** # 24

Tidstrom, Rick Broadcom

Comment Type **TR** *Comment Status* **A**

Line 26 states:
"In the transmit direction the transition to the lower power transmit mode begins when the PCS transmit function detects an LPI control character in Lane 0 of two consecutive transfers of TXD[31:0] that will be mapped into a single 64B/65B block."

This contradicts Table 46-3 on page 127, line 14, which states that assert low power idle is required in all lanes.

Also reference comment #25 for D1.1, which defines Low Power Idle as occurring on all four lanes.

SuggestedRemedy

Change line 26 from lane 0 to all four lanes as shown below"

In the transmit direction the transition to the lower power transmit mode begins when the PCS transmit function detects an LPI control character in all four lanes of two consecutive transfers of TXD[31:0] that will be mapped into a single 64B/65B block.

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.1.3.3** *P* **161** *L* **48** # 209
Bennett, Michael LBNL

Comment Type **T** *Comment Status* **A**

The following sentence suggests the data rate is changing:

This quiet-refresh cycle continues until the link partner
transmits the alert signal, initiating a transition back to the full data rate.

The same is true on line 50:

local receiver time to prepare for the full 10G data-rate.

Referring to changes in data rate rather than changes in power consumption may confuse the reader regarding the concept of low power idle

SuggestedRemedy

On line 48, replace "full data rate" with "full power operation"

On line 50, replace "the full 10G data-rate" with "full power operation"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

On line 48, replace "full data rate" with "normal operational mode"

On line 50, replace "the full 10G data-rate" with "normal operational mode"

Cl **55** *SC* **55.12.3** *P* **188** *L* **53** # 50
Grimwood, Mike Broadcom

Comment Type **E** *Comment Status* **A**

PICs identifier PCT15d is repeated.

SuggestedRemedy

Change to PCT15e and renumber/letter subsequent entries.

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.12.3** *P* **188** *L* **8** # 49
Grimwood, Mike Broadcom

Comment Type **E** *Comment Status* **A**

Change indications are missing even though PCT1a is new to EEE.

SuggestedRemedy

Add change indications for PCT1a table entry.

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.3.2.2.10** *P* **166** *L* **30** # 98
Parnaby, Gavin Solarflare Communica

Comment Type **E** *Comment Status* **A**

Should this clause be 55.3.2.2.9a ?

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The editor will update the clause numbering.

Cl **55** *SC* **55.3.2.2.2** *P* **166** *L* **12** # 99
Parnaby, Gavin Solarflare Communica

Comment Type **ER** *Comment Status* **A**

The clause number is incorrect.

SuggestedRemedy

It should be 55.3.2.2.9

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.3.2.2.2** *P* **166** *L* **23** # 30
Kasturia, Sanjay Teranetics

Comment Type **T** *Comment Status* **A**

Replace TBD with appropriate entry

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The cross reference is 36.2.4.7, Table 36-3.

The values are K28.5/D6.5 , K28.5/D26.4

Cl **55** *SC* **55.3.2.2.21** *P* **167** *L* **39** # 51
Grimwood, Mike Broadcom

Comment Type **E** *Comment Status* **A**

Typo.

SuggestedRemedy

Change 7.63 us to 7.36 us.

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.3.2.2.21** *P* **167** *L* **50** # 53
Grimwood, Mike Broadcom

Comment Type **T** *Comment Status* **A** *lpi_wake_time*

lpi_wake_time after sleep can be up to 14 frames sine there is a worst-case delay of up to 1 frame to begin transmitting Alert on a frame boundary.

SuggestedRemedy

In table 52-2, 4th column,

change 13 to 14

and in the 5th column,

change 4.16 to 4.48.

Change text in paragraph preceding table 52-2 accordingly.

Response *Response Status* **C**

ACCEPT.

Same as comment #23

Cl **55** *SC* **55.3.2.2.21** *P* **167** *L* **50** # 23
Tidstrom, Rick Broadcom

Comment Type **T** *Comment Status* **A** *lpi_wake_time*

Table 55-2

For lpi_wake timer after sleep values listed as 13 frames and 4.16 usec are incorrect because they only include 4 alert frames + 9 wake frames.

SuggestedRemedy

The time should also include one partial frame that occurs when Idle is received just after an LDPC frame has completed.

The values should be 14 frames and 4.48 usec due to 1 partial frame + 4 alert frames + 9 wake frames.

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.3.5.1** *P* **169** *L* **33** # 33

Kasturia, Sanjay Teranetics

Comment Type **TR** *Comment Status* **A**

Editor's note says:
"This synchronization method works well for loop-timed links. Non-loop-timed links require further attention."
Either verify that the synchronization method works for non-loop-timed links or make loop-timing mandatory and eliminate references to the non-loop-timed option

SuggestedRemedy

The non-loop-timed mode is a legacy of past compromises in the development of the standard and not a useful option hence the simple solution is to eliminate it.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The editor will add text to state that non-loop-timed links are not supported by EEE.

Cl **55** *SC* **55.3.5.1** *P* **169** *L* **45** # 61

Grimwood, Mike Broadcom

Comment Type **T** *Comment Status* **A**

Currently LPI slave synchronization is accomplished at the transition to PCS_Test. By instead performing slave synchronization at the transition to PMA_Training, partial frame ambiguity can be eliminated and can simplify the specification and resulting implementations. Performing synchronization at the transition to PMA_Training ensures that the slave's final PHY frame and final InfoField will be complete.

SuggestedRemedy

Modify the text in section 55.3.5.1 to perform LPI slave synchronization at the transition to PMA_Training_Init_S instead of at the transition to PCS_Test.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the 2nd and 3rd paragraphs of: 55.3.5.1 LPI Synchronization
to read:

As in normal training the master and slave signal the time they will transition to PCS_Test using the transition counter following the procedure described in 55.4.2.5.14 (Editor's note: convert the reference to an active crossreference). The transition to PCS_Test at both master and slave shall occur immediately after the PMA training frame with transition count of zero has been completely transmitted.

When both PHYs support the EEE capability, the slave PHY is responsible for synchronizing its PMA training frame to the master's PMA training frame during the transition to PMA_Training_Init_S. The slave shall ensure that its PMA training frames are synchronized to the master's PMA training frames within 1 LDPC frame, measured at the slave MDI on pair A. In addition, the slave shall initialize its transition counter so that it transitions to PCS_Test within 1 LDPC frame of the master PHY's transition to PCS_Test, measured at the slave PHY's MDI on pair A. This mechanism ensures that the refresh offset is bounded to a small value at both MDI interfaces, thus ensuring there is no overlap of master and slave signals during the symmetric low power mode.

Cl **55** *SC* **55.3.5.1** *P* **170** *L* **12** # 211

Grimwood, Mike Broadcom

Comment Type **T** *Comment Status* **A**

From draft 1.1 to draft 1.2 table 55-4 was separated into two tables, 55-4 and 55-5. In this translation, the synchronization logic for Master and Slave were swapped, conflicting with Draft 1.1 and the approved synchronization baseline in parnaby_01_1108.pdf.

SuggestedRemedy

Keeping the table headers the same, swap Tables 55-4 and 55-5.

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.3.5.2.4** *P* **173** *L* **42** # 58

Grimwood, Mike Broadcom

Comment Type **T** *Comment Status* **A** *R_BLOCK_TYPE*

Changes to section 55.3.5.2.4 (Functions) are needed in order to properly define the following:

R_BLOCK_TYPE = LI
R_BLOCK_TYPE = I
T_BLOCK_TYPE = LI
T_BLOCK_TYPE = I

These types are used in the PCS state diagrams of 55.3.5.4 but are not explicitly defined.

SuggestedRemedy

Add the following descriptions for both R_BLOCK_TYPE and T_BLOCK_TYPE (IEEE802.3an-2006 55.3.5.2.4 pages 96, 97):

Values:

I: If the optional Low Power Idle function is supported then I type is a special case of the C type where the vector contains a data/ctrl header of 1, a block type field of 0x1e, and eight control characters of 0x07 (/I/).

LI: If the optional Low Power Idle function is supported then LI type is a special case of the C type where the vector contains a data/ctrl header of 1, a block type field of ox1e, and eight control characters of 0x06 (/LI/).

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.3.5.2.4** *P* **97** *L* # 109

Parnaby, Gavin Solarflare Communica

Comment Type **TR** *Comment Status* **A** *R_BLOCK_TYPE*

R_BLOCK_TYPE and T_BLOCK_TYPE /I/ and /LI/ need to be defined.

SuggestedRemedy

Add definitions for /I/ and /LI/.

Also look at state machine transitions involved /C/, since I believe this currently includes /I/ and /LI/.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 58 and replace the first condition with the following text:

C: The vector contains a data/ctrl header of 1 and one of the following:
A block type field of 0x1E and 8 valid control characters none of which are /E/ and, if the low power idle function is supported, all of which are not /LI/ and all of which are not /I/.

Cl **55** *SC* **55.3.5.23** *P* **173** *L* **8** # 54

Grimwood, Mike Broadcom

Comment Type **T** *Comment Status* **A**

Timer values need to have "shall" in their requirements to be picked up in the PICS.

SuggestedRemedy

For lpi_tx_sleep_timer, change:

"This timer has a period equal to 9 LDPC frames"

to:

"This timer shall have a period equal to 9 LDPC frames"

Provide similar modifications for other timers and counters: lpi_quiet_time, lpi_refresh_time, lpi_tx_alert_timer, lpi_wake_time, lpi_rx_wake_timer, lpi_tx_wake_timer, tx_ldpc_frame_cnt, rx_ldpc_frame_cnt.

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.3.5.3** *P* **171** *L* **38** # 57

Grimwood, Mike Broadcom

Comment Type **T** *Comment Status* **A**

The precise conditions for setting rx_lpi_req require clarification.

SuggestedRemedy

Change:
Set to TRUE when the 64B/65B decoder output signal indicates the link partner is requesting that the PHY operate in the lower power receive mode and set to FALSE otherwise.

To:
Set to TRUE when the 64B/65B decoder receives a block of 8 /LI/ characters indicating that the link partner is requesting that the PHY operate in the lower power receive mode and set to FALSE otherwise.

Response *Response Status* **C**

ACCEPT.

The precise conditions for setting rx_lpi_req are defined in the TX_L state of the PCS 64B/65B Transmit state diagram. The editor will make the suggested change to the text to clarify the conditions.

Cl **55** *SC* **55.3.5.3** *P* **171** *L* **4** # 60

Grimwood, Mike Broadcom

Comment Type **T** *Comment Status* **A** *refresh_infofields*

Is the InfoField used during Refresh? This comment assumes not and proposes a clarification.

This comment assumes that the inversion on pair A every 256 intervals (intended to delineate LDPC frame boundaries) is performed.

SuggestedRemedy

Change this sentence:
2-level PAM refresh symbols are generated using the PMA side-stream scrambler polynomials described in subclause 55.3.4.

To:

2-level PAM refresh symbols are generated using the PMA side-stream scrambler polynomials described in subclause 55.3.4 and exactly as is shown in Figure 55-13 with the exception that the InfoField consists of a sequence of 128 zeros.

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.3.5.3** *P* **171** *L* **7** # 59

Grimwood, Mike Broadcom

Comment Type **T** *Comment Status* **A**

When scrambler re-initialization is used for initial training, it should continue to be used up to the PCS_Test state (rather than PCS_Data) since at PCS_Test the PHY has successfully completed training.

SuggestedRemedy

Change:

If scrambler reinitialization was used for initial training, it shall be disabled after the PHY Control state diagram reaches the PCS_Data state.

To:

If scrambler reinitialization is used for initial training, it shall be disabled and the scramblers shall begin free-running when the PHY Control state diagram enters the PCS_Test state.

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.3.5.3** *P* **171** *L* **7** # 104

Parnaby, Gavin Solarflare Communica

Comment Type **TR** *Comment Status* **A** *refresh_infofields*

Add text to state that infofields are not used during refresh signaling.

SuggestedRemedy

Add text
'After the PHY Control state diagram reaches the PCS_Data state infofields are not transmitted.'

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #60

Cl **55** *SC* **55.3.5.4** *P* **176** *L* # 100

Parnaby, Gavin Solarflare Communica

Comment Type **ER** *Comment Status* **R**

55-16 and 55-17 are in the wrong order

SuggestedRemedy

correct the order

Response *Response Status* **C**

REJECT.

They are in the correct order.

Cl **55** *SC* **55.3.5.4** *P* **178** *L* # 106

Parnaby, Gavin Solarflare Communica

Comment Type **TR** *Comment Status* **A** *alert_timing*

For the state timing shown on page 178 to work correctly we need a requirement that the alert is signalled by the PMA after the full alert signal has been detected (so that the lpi_rx_wake_timer encompasses the true wake signal).

Any other alert detection timing does not give the PHY wake_time frames to recover the signal.

SuggestedRemedy

Add text to say 'The PMA asserts alert_detect after the entire alert signal (3.5 LDPC frames of alert, and 0.5 frames of silence) has been detected.'

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.3.5.4** *P* **178** *L* # 107

Parnaby, Gavin Solarflare Communica

Comment Type **TR** *Comment Status* **A** *wake_xgmii_signalling*

To meet wake shrinkage requirements, I think we need to change rx_raw<=LI in RX_W to rx_raw<=I.

This guarantees that the 9 frames of wake are forwarded by the PHY.

It does create an issue if i) the alert is asserted incorrectly or ii) the PHY wakes up with errors.

SuggestedRemedy

change rx_raw<=LI in RX_W to rx_raw<=I.

Make the transition from RX_W to RX_C (lpi_rx_wake_timer_done = true * (R_TYPE(rx_coded)=I + R_TYPE(rx_coded)=LF))

Make the transition from RX_W to RX_E (lpi_rx_wake_timer_done = true * !(R_TYPE(rx_coded)=I + R_TYPE(rx_coded)=LF))

This remedy may be changed by the shrinkage ad hoc.

Response *Response Status* **C**

ACCEPT.

See also comment #26

Cl **55** *SC* **55.3.5.4** *P* **178** *L* **17** # 26

Tidstrom, Rick Broadcom

Comment Type **TR** *Comment Status* **A** *wake_xgmii_signalling*

In state RX_W, the state machine assigns rx_raw <= LI.

SuggestedRemedy

The assignment for rx_raw should be changed from LI to I to eliminate wake shrinkage. Change as shown:

rx_raw <= I.

Note: Also need a mechanism to communicate LF.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #107

Cl **55** *SC* **55.3.5.4** *P* **179** *L* **15** # 27

Tidstrom, Rick Broadcom

Comment Type **TR** *Comment Status* **A**

tx_lpi_full_refresh = true is part of a transition condition from SEND_SLEEP to SEND_REFRESH, but is not defined anywhere within the standard.

tx_lpi_full_refresh = false is part of a transtion condition from SEND_SLEEP to SEND_QUIET, but is not defined anywhere within the standard.

This signal is used to prevent a partial refresh from being transmitted.

SuggestedRemedy

Add a definition of tx_lpi_full_refresh to sub-clause 55.3.5.2.2 as referenced on page 171, line 20.

Response *Response Status* **C**

ACCEPT.

See also comment #105, #103

Cl **55** *SC* **55.3.5.4** *P* **179** *L* **16** # 105

Parnaby, Gavin Solarflare Communica

Comment Type **TR** *Comment Status* **A**

tx_lpi_full_refresh is not defined

SuggestedRemedy

Define tx_lpi_full_refresh in the state diagram variable list

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #25

Cl **55** *SC* **55.3.5.4** *P* **179** *L* **40** # 28

Tidstrom, Rick Broadcom

Comment Type **TR** *Comment Status* **A**

There is not a transition condition from state SEND_WAKE to SEND_ERROR when a non-Idle character is received while transmitting Wake frames.

SuggestedRemedy

Add transition from SEND_WAKE to SEND_ERROR with transition condition of:

lpi_wake_timer_done = false *
tx_lpi_error = true

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.4.4** *P* **182** *L* # 108

Parnaby, Gavin Solarflare Communica

Comment Type **TR** *Comment Status* **A**

Add some text stating requirements for MDI/MDIX configuration during LPI

SuggestedRemedy

Add text 'EEE capable PHYs shall ensure that MDI/MDIX configuration applies to refresh signaling.' to the end of 55.4.4

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55.5.3** *P* **185** *L* **3** # 32

Kasturia, Sanjay Teranetics

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

Test modes for testing EEE related functions are included in the draft as Editor's notes. Move these from Editor's notes into the text of the draft.

SuggestedRemedy

As per comment

Response *Response Status* **C**

REJECT.

Task force decide unanimously to remove the editor's note.

Cl **55** *SC* **55.6.1** *P* **186** *L* **50** # 101

Parnaby, Gavin Solarflare Communica

Comment Type **ER** *Comment Status* **A**

There is no e)

SuggestedRemedy

Delete reference to e)

Response *Response Status* **C**

ACCEPT.

Cl **55** *SC* **55-19** *P* **170** *L* # 103

Parnaby, Gavin Solarflare Communica

Comment Type **T** *Comment Status* **A**

SEND_QUIET and SEND_REFRESH can be merged. At the moment the states are a parallel mechanism to the tx_refresh_active & active_pair controls defined in Tables 55-4 and 55-5. This is confusing and it allows the possibility that the timers could get out of sync with the logic defined in 55.3.5.1.

SuggestedRemedy

Combine the SEND_QUIET and SEND_REFRESH states into a SEND_QR state. In this state tx_refresh_active and tx_active_pair are configured as shown in Tables 55-4 and 55-5.

If we want to preserve avoiding sending partial refreshes at the start of LPI then I think we need to add another state.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Will add a new state to cover the no partial refreshes requirement in this case.

Cl **69** *SC* **47** *P* **197** *L* **46** # 16

D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **R**

The following statement is too broad, as EEE does not apply to 40GBASE-KR4.

Backplane Ethernet optionally supports Energy Efficient Ethernet to reduce energy consumption. The Energy Efficient Ethernet capabilities are advertised during Auto-Negotiation.

SuggestedRemedy

Suggested rewording -

Backplane Ethernet PHYs that operate at 10 Gb/s and below optionally support Energy Efficient Ethernet to reduce energy consumption. The Energy Efficient Ethernet capabilities are advertised during Auto-Negotiation.

Response *Response Status* **C**

REJECT.

The text as it stands is correct. There is no need to put in this limitation as this is an option and is covered by autonegotiation.

Cl **70** *SC* **70.3a** *P* **200** *L* **18** # 17

D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **A**

Use of "KX PHY" in sentence.

SuggestedRemedy

suggested re-wording -

"The 1000BASE-KX PHY will use the 1000BASE-X PCS LPI modes described in 36.2.5.2.8."

Response *Response Status* **C**

ACCEPT.

Cl **70** *SC* **70.5** *P* **200** *L* # 189

Pillai, Velu Broadcom

Comment Type **T** *Comment Status* **A**

Table 70-3, Table 71-3 and Table 72-3 are all MDIO/PMD status variable mapping.
But LP Idle state indication is coming from the PCS register space (Reg 3.1). So should we take it from this table and put it in a different MDIO/PCS status table?

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

There is no reason to include these table any longer as there will be no changes to them so they will be removed.

Cl **70** *SC* **70.5** *P* **200** *L* **40** # 144

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

There is no register in the PMD space for LPI status

SuggestedRemedy

Delete LPI status indication row in Table 70-3

Response *Response Status* **C**

ACCEPT.

Cl **70** *SC* **70.6.4** *P* **201** *L* **10** # 18

D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **A**

spelling error - "singal"

SuggestedRemedy

change spelling to "signal"

Response *Response Status* **C**

ACCEPT.

Cl **70** *SC* **70.6.4** *P* **201** *L* **7** # 152

Bennett, Michael LBNL

Comment Type **E** *Comment Status* **A**

Need to find a different word as "baseline" may be confusing. Also we should be consistent about the word used, e.g. line 34, the term "normal" operation is used.

SuggestedRemedy

use something less ambiguous, such as "non-eee operation"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Editor will find appropriate substitute.

Cl **70** *SC* **70.6.4** *P* **201** *L* **9** # 19

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **A**

Since PMD support for EEE in 1000BASE-KX is optional, this sentence is confusing.-

PMD signal detect is optional for 1000BASE-KX baseline operation but mandatory for support of Energy Efficient Ethernet.

SuggestedRemedy

Suggested rewording -

For 1000BASE-KX operation PMD signal detect is optional, but is mandatory if Energy Efficient Ethernet is supported.

Response *Response Status* **C**

ACCEPT.

Cl **70** *SC* **70.6.4a** *P* **201** *L* **18** # 179
Pillai, Velu Broadcom

Comment Type **TR** *Comment Status* **A**

According to pillai_02_0109 (Motion #4), remove the references to VSA, VSD, TSD and TSA in
70.6.4a
Table 70.6
70.7.2

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete VSA and VSD.
TSD and TSA remain
Replace the "Need value" with actual values or TBDs.

Cl **70** *SC* **70.7.1** *P* **203** *L* **18** # 196
Pillai, Velu Broadcom

Comment Type **TR** *Comment Status* **A**

Table 70-4 should have the values from pillai_02_0109 (Motion #4).

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Vtw 800 mV
Ttd 500ns
Tta 500ns

Cl **70** *SC* **70.8.5** *P* **201** *L* **34** # 9
D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **A**

why is non-EEE mode considered "normal"? What is "normal" should be dictated by the market.

SuggestedRemedy

change "normal" to "non-EEE supported"

this should be repeated for any other instances.bv

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the sentence on page 201 on line 34 to read:

The PMD transmit disable function is mandatory if EEE is supported and is otherwise optional.

Make the same change in Clause 71.6.6

Cl **70** *SC* **Table 70-3** *P* **200** *L* **40** # 193
Pillai, Velu Broadcom

Comment Type **TR** *Comment Status* **A**

Register/bit number : 1.1.3

But it should be 3.1

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **71** *SC* *P* **208** *L* **41** # 153
Bennett, Michael LBNL

Comment Type **E** *Comment Status* **A**

use of the word baseline is confusing

SuggestedRemedy

replace "baseline" with "non-eee"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Editor will find appropriate substitute.

Cl **71** *SC* **71.6.4** *P* **208** *L* **42** # 13

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **A**

Since PMD support for EEE in 10GBASE-KX4 is optional, this sentence is confusing.-

PMD signal detect is optional for 10GBASE-KX4 baseline operation but mandatory for support of Energy Efficient Ethernet.

SuggestedRemedy

Suggested rewording -

For 10GBASE-KX4 operation PMD signal detect is optional, but is mandatory if Energy Efficient Ethernet is supported.

Response *Response Status* **C**

ACCEPT.

Cl **71** *SC* **71.6.4a** *P* **209** *L* **24** # 198

Pillai, Velu Broadcom

Comment Type **TR** *Comment Status* **A**

According to pillai_02_0109 (Motion #4), remove the references to VSA, VSD, TSD and TSA in
71.6.4a
Table 71.6

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

VSA and VSD will be deleted. TSD and TSA will remain.

Cl **71** *SC* **71.6.4a** *P* **209** *L* **8** # 143

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

There is no register in the PMD space for LPI status

SuggestedRemedy

Delete LPI status indication row in Table 71-3

Response *Response Status* **C**

ACCEPT.

Cl **71** *SC* **Table 71-3** *P* **209** *L* **8** # 194

Pillai, Velu Broadcom

Comment Type **TR** *Comment Status* **A**

LP Idle state indication Status register 1 1.1.3 PMD_LPI_active

SuggestedRemedy

LP Idle state indication Status register 1 3.1 PCS_LPI_active

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* *P* *L* # 199

Pillai, Velu Broadcom

Comment Type **TR** *Comment Status* **A**

According to pillai_02_0109 (Motion #4), remove the references to VSA, VSD, TSD and TSA in Table 72.9

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

VSA and VSD will be removed. TSD and TSA will remain.

Cl **72** *SC* **72** *P* **216** *L* **29** # 148

Barrass, Hugh Cisco

Comment Type **TR** *Comment Status* **A**

The use of training frames during refresh & wake for backplane PHYs is unnecessary and adds too much complexity.

Scrambled idle codes are sufficient to retrain receivers and the resynchronization of FEC or 66b block boundaries can be achieved by using a reset of the scrambler.

SuggestedRemedy

Delete sections that control training frames and replace with descriptions that use scrambled idles and scrambler reset - see presentation for more description.

This comment is an umbrella comment, detailed comments marked **BP training** cover specific changes required.

Response *Response Status* **C**

ACCEPT.

See barrass_1_0309.pdf for detail.

Cl **72** *SC* **72.1** *P* **217** *L* **14** # 169

Koenen, David Hewlett Packard

Comment Type **T** *Comment Status* **A**

KR-PHY will not generate sleep training symbols.

SuggestedRemedy

Change "10GBASE-KR PHY sends sleep symbols"
to
"10GBASE-KR PHY forwards sleep symbols"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #66 which changes the text that is the subject of the comment and this change may not be required.

Cl **72** *SC* **72.1** *P* **217** *L* **9** # 66

Healey, Adam LSI Corporation

Comment Type **E** *Comment Status* **A**

Update text to be consistent with the currently defined operation of the PHY.

SuggestedRemedy

Replace paragraph with the following:

A 10GBASE-KR PHY may optionally enter a low power state to conserve energy during periods of low link utilization. This capability is more commonly known as Energy Efficient Ethernet. The presence of "Assert low power idle" at the XGMII is encoded in the transmitted symbols. Detection of low power idle encoding in the received symbols is indicated as "Assert low power idle" at the XGMII. Upon the detection of "Assert low power idle" at the XGMII, an Energy Efficient 10GBASE-KR PHY sends sleep symbols for a defined period, then ceases transmission and deactivates transmit functions to conserve energy. The PHY periodically transmits during this quiet period to allow the remote PHY to refresh its receiver state (e.g. timing recovery, adaptive filter coefficients) and thereby track any long term variation in the timing of the link or the underlying channel characteristics. If normal inter-frame is asserted at the XGMII while the PHY is in low power mode, the PHY re-activates transmit functions and initiates transmission. This transmission will be detected by the remote PHY receiver, causing it to also exit the low power mode.

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.3a** *P* **217** *L* **22** # 124

Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **A**

edit instruction says 70.3

SuggestedRemedy

Change to 72.3

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.3a** *P* **217** *L* **27** # 170

Koenen, David Hewlett Packard

Comment Type **T** *Comment Status* **R**

The tx_quiet now has 3 enumerated values and the use of assert/de-assert is not appropriate anymore.

SuggestedRemedy

Change: If Energy Efficient Ethernet is supported, the PCS transmit function tells this PMDÆs transmit function when to enter in low power mode by asserting the tx_quiet primitive via the PMD_RTXQUIET.request. The PCS tell the PMD to exit low power idle mode by deasserting tx_quiet. While tx_quiet is asserted the PCS, PMA and PMD should deactivate all or part of its functional blocks to conserver energy

to:
If Energy Efficient Ethernet is supported, the PCS transmit function tells this PMDÆs transmit function when to enter in low power mode by setting the tx_quiet primitive to TRUE via the PMD_RTXQUIET.request. The PCS tells the PMD to exit low power idle mode by setting tx_quiet to REFRESH or WAKE. While tx_quiet is TRUE the PCS, PMA and PMD should deactivate all or part of its functional blocks to conserver energy.

Response *Response Status* **C**

REJECT.

Text that is the subject of the comment will be deleted - see response to comment #65

Cl **72** *SC* **72.3a** *P* **217** *L* **27** # 123

Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **A**

Typo RTXQUIET

SuggestedRemedy

change to TXQUIET

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.3a** *P* **217** *L* **37** # 171
Koenen, David Hewlett Packard

Comment Type **T** *Comment Status* **A**
PMD_RXALERT.indication(rx_alert) is not needed anymore.

SuggestedRemedy
Delete it.

Response *Response Status* **C**
ACCEPT.

Cl **72** *SC* **72.3a** *P* **217** *L* **37** # 65
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**
This subclause essentially defines optional PMD service interface primitives for Energy Efficient Ethernet. This information should be in 72.2. Also note that PMD_RXALERT.indication(rx_alert) is not described in 49.2.13.2.6 and rx_alert is not assigned by any PMD function. It should not be included in the list of new primitives.

SuggestedRemedy
Delete 72.3a and define optional PMD service interface primitives for Energy Efficient Ethernet in 72.2.

Response *Response Status* **C**
ACCEPT.

Cl **72** *SC* **72.3b** *P* **217** *L* **41** # 67
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**
Define relevant Clause 51 PMA requirements in Clause 51.

SuggestedRemedy
Delete 72.3b.

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

This section will be deleted from clause 72.

Clause 51 requirements will be added if necessary (see response to comment # 133)

Cl **72** *SC* **72.3b** *P* **217** *L* **46** # 162
Koenen, David Hewlett Packard

Comment Type **E** *Comment Status* **A**
change value of rx_quiet from true to TRUE

SuggestedRemedy
change to TRUE.

Response *Response Status* **C**
ACCEPT.

Cl **72** *SC* **72.3b** *P* **218** *L* **1** # 135
Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**
BP training

The FEC block is synchronized by using the known sequence following deassertion of tx_quiet.

SuggestedRemedy
Delete the paragraph starting "to synchronize..."

Response *Response Status* **C**
ACCEPT.

Cl **72** *SC* **72.3b** *P* **218** *L* **16** # 136
Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**
There is no register in the PMD space for LPI status

SuggestedRemedy
Delete LPI status indication row in Table 72-3

Response *Response Status* **C**
ACCEPT.

Cl **72** *SC* **72.6.10** *P* **219** *L* **28** # 139

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

BP training

The PMD is not using training frames for LPI, therefore no change is needed for 72.6.10

SuggestedRemedy

Delete all text under 72.6.10 (i.e. no change to the base standard).

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.10.1** *P* **219** *L* **35** # 10

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **R**

inconsistent text -

"If the PHY supports Energy Efficient Ethernet option, it will also bring it in and out of Low Power Idle."

other text in clauses 70 - 72 discuss supporting Energy Efficient Ethernet ("option" is not mentioned).

SuggestedRemedy

Any references to supporting EEE should be changed to "EEE option"

Response *Response Status* **C**

REJECT.

The qualifying "If" at the beginning of the sentence makes it unnecessary to use "option" at the end.

Cl **72** *SC* **72.6.10.1** *P* **219** *L* **35** # 77

Healey, Adam LSI Corporation

Comment Type **E** *Comment Status* **A**

This subclause implies that the low power idle is part of the PMD Control function so all low power idle functions should also be part of this subclause.

SuggestedRemedy

Integrate the content of 72.6.11 with 72.6.10, including state diagrams and associated variable definitions.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editor will need to make changes to the 72.6.10.1 overview to add LPI function. Other LPI functions can inserted within or at the end of this section.

Cl **72** *SC* **72.6.10.2.3.3** *P* **219** *L* **53** # 177

Koenen, David Hewlett Packard

Comment Type **TR** *Comment Status* **A**

The training frames need not indicate Wake, Refresh and Last Frame. Refresh and wake can be accomplished by forwarding /LI/ symbols.

SuggestedRemedy

Delete the Wake, refresh, and Last Frame settings in this paragraph and in Table 72-5.

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.10.2.4.4a** *P* **220** *L* **48** # 178

Koenen, David Hewlett Packard

Comment Type **TR** *Comment Status* **A**

Refresh, Wake and Last Frame not needed. /LI/ can be forwarded instead.

SuggestedRemedy

Remove definitions from 72.6.10.2.4.4 -72.6.10.2.4.5

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.10.2.4.4b** *P* **221** *L* **1** # 69

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

The Wake bit appears to be transmitted and received by the PMD, but not used by any PMD function or the basis of any variable passed to another sublayer.

SuggestedRemedy

Remove the Wake bit or specify its use by other PMD functions or sublayers. The latter would required the definition of new service interface primitive(s) to convey the information.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The section has been deleted.

See response to comment # 139

Cl **72** *SC* **72.6.10.2.4.4c** *P* **221** *L* **9** # 70

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

The Last Training Frame bit appears to be transmitted and received by the PMD, but not used by any PMD function or the basis of any variable passed to another sublayer.

SuggestedRemedy

Remove the Last Training Frame bit or specify its use by other PMD functions or sublayers. The latter would required the definition of new service interface primitive(s) to convey the information.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Text has been deleted.

See response to comment # 139

Cl **72** *SC* **72.6.10.2.4a** *P* **220** *L* **47** # 68

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

The Refresh bit appears to be transmitted and received by the PMD, but not used by any PMD function or the basis of any variable passed to another sublayer.

SuggestedRemedy

Remove the Refresh bit or specify its use by other PMD functions or sublayers. The latter would required the definition of new service interface primitive(s) to convey the information.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Text has been deleted
See response to comment #139.

Cl **72** *SC* **72.6.11.1** *P* **221** *L* **32** # 140

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

BP training

The overview needs to be updated to reflect the simplified operation.

SuggestedRemedy

Replace the section with:

The PMD Low Power Idle function responds to PCS requests to transition between quiet and active states. Implementation of the function is optional. Energy Efficient Ethernet capability will be advertised during the Backplane Auto-negotiation as described in 45.2.7.13. The local receiver transitions are controlled by the remote link partner's transmitter and can change independently of the local transmitter states and transitions.

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.11.2** *P* **221** *L* **41** # 141
Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

BP training

There is no timing in the PMD, so this section is not required.

SuggestedRemedy

Delete 72.6.11.2, including the table 72-5a.

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.11.2** *P* **221** *L* **43** # 76
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

It is redundant to have a table (Table 72-5a) with "Min." and "Max" columns in addition to specifying a +/-10% tolerance.

SuggestedRemedy

Remove the phrase "shall be within +/- 10%" and include both minimum and maximum values in Table 72-5a.

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.11.3** *P* **221** *L* **48** # 142
Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

BP training

There is no timing in the PMD, so this section is not required.

SuggestedRemedy

Delete 72.6.11.3 and 72.6.11.4

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.11.3.1** *P* **222** *L* **52** # 74
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

Per the current LPI transmit state diagram (Figure 72-6), synchronization of 10GBASE-R FEC via the assignment of a variable is not likely to be a complete solution or consistent with the layering model. Modifications to Clause 74 are required, as well as inter-sublayer communications required by such modifications. Recall that there is no direct communication path from the PMD to the FEC (the PMA is in between).

SuggestedRemedy

Delete that tx_fec variable and the "Start tx_fec" option from LPI transmit state diagram. Instead, add appropriate amendments to the Clause 74 and update the inter-sublayer interfaces accordingly.

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **72.6.11.3.1** *P* **223** *L* **1** # 200
Pillai, Velu Broadcom

Comment Type **TR** *Comment Status* **A**

tx_quiet has only two values: TURE or FLASE. But the state machine assigns TRUE, FLASE, REFRESH and WAKE.

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The section is being deleted in response to the resolution of comment #139

Cl **72** *SC* **72.6.11.3.1** *P* **223** *L* **7** # 73
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

The definition of tx_quiet is inconsistent with its use in the LPI Transmit state diagram (Figure 72-6). For consistency, it should be an enumerated variable with the values of FALSE, REFRESH, TRUE, and WAKE.

SuggestedRemedy

Update variable definition accordingly.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The section is being deleted
See comment #139.

Cl **72** *SC* **72.6.11.3.3** *P* *L* # 190
Pillai, Velu Broadcom

Comment Type **T** *Comment Status* **R**

LAST_WAKE: 0 1 1
LAST_REF: 1 0 1
WAKE: 0 1 0
REFRESH: 1 0 0

Does not handle a bit error. Which might put the state machine in a stuck state.

SuggestedRemedy

No solution right now. Will provide it during the meeting.

Response *Response Status* **C**

REJECT.

These training bit will go away if not use training is not used during LPI.

Cl **72** *SC* **72.6.11.4** *P* **224** *L* **1** # 172
Koenen, David Hewlett Packard

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

No longer necessary to support training frames in LPI State Diagrams.

SuggestedRemedy

Modify state diagram to remove training and just enable/disable transmitter where appropriately directed by tx_quiet.

Response *Response Status* **C**

REJECT.

Section is being deleted.

Cl **72** *SC* **72.6.11.4.1** *P* **224** *L* **1** # 191
Pillai, Velu Broadcom

Comment Type **T** *Comment Status* **R**

In order to handle a Wake request right during the "last refresh".

SuggestedRemedy

An arc from TX_LAST_REF to TX_WAKE, if tx_quiet = WAKE.

Response *Response Status* **C**

REJECT.

The TX and RX state diagrams are being entirely deleted as training frames will not be used in waking up from LPI.

Cl **72** *SC* **72.6.11.4.2** *P* **225** *L* **3** # 173
Koenen, David Hewlett Packard

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

Training frames may no longer apply as can use /LI/ symbols to train during fresh and wake.

SuggestedRemedy

Modify state diagram to take direction from signal_detect, PCS/PMA and rx_quiet to enter/exit quiet states.

Response *Response Status* **C**

REJECT.

This section will be deleted.

Cl **72** *SC* **72.6.11.4.2** *P* **225** *L* **4** # 71
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **R**

Per the current LPI Receive state diagram (Figure 72-7), a 10GBASE-KR PHY can never wake from low power mode.

1. Entry into RX_SLEEP causes signal_detect to be set to FALSE
2. signal_detect = FALSE corresponds to !signal_ok at the PCS (incorrectly shown as signal_detect = FALSE in the current draft) which results in rx_quiet being set to TRUE.
3. The transition to RX_WAKE requires rx_quiet to be set to FALSE, which cannot occur so long as signal_detect = FALSE.

Hence the state diagram deadlocks in RX_SLEEP. However, it is also odd that signal_detect is never reset to TRUE. This issue that, in low power mode, signal_detect should represent a function comparable to sense_signal as defined in 72.6.4b.

SuggestedRemedy

Modify state diagram, defining or re-defining variables as appropriate, to ensure signal_detect is set according the sense_signal critera of 72.6.4b.

Response *Response Status* **C**

REJECT.

This section will be deleted.

Cl **72** *SC* **72.6.11.4.2** *P* **225** *L* **6** # 72

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **R**

In the LPI Receive state diagram (Figure 72-7), saved coefficient are never restored (e.g. rx_coeff are never set to rx_saved). However, this level of detail could be considered implementation specific and should be beyond the scope of the standard.

SuggestedRemedy

Remove rx_saved assignment from the state diagram and delete the definition of the rx_saved and rx_coeff variables.

Response *Response Status* **C**

REJECT.

Section is being deleted.

Cl **72** *SC* **72.6.4a** *P* **218** *L* **39** # 137

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

BP training

The signal detect function needs to act like a classic signal detect to support operation in the PMA & PCS during LPI.

SuggestedRemedy

Replace current text in 72.6.4a & 72.6.4b with the following:

72.6.4a PMD signal detect function during low power operation

If Energy Efficient Ethernet is supported, the PMD needs to revert to a classic operation for SIGNAL_DETECT. This indicates when the electrical signal level at the input of the receiver is within certain threshold voltages. The PMD shall provide SIGNAL_DETECT function which sets SIGNAL_DETECT to a value of TRUE within TSA after a step increase in the differential peak-to-peak voltage exceeding the Signal Detect Assertion threshold of VSA as specified in
Table 72-6.

The SIGNAL_DETECT parameter shall be set to FAIL within a maximum of TSD after a step decrease in the differential peak-to-peak input voltage from a value greater than the Signal Detect Assertion Threshold to a differential
signal level less than the Signal Detect Deassertion Threshold of VSD as specified in Table 72-9

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace current text in 72.6.4a & 72.6.4b with the following:

72.6.4a PMD signal detect function during low power operation

If Energy Efficient Ethernet is supported the PMD shall set SIGNAL_DETECT to a value of TRUE within TSA after activation of a compliant transmitter.

If Energy Efficient Ethernet is supported the PMD shall set SIGNAL_DETECT to a value of FALSE within TSD after deactivation of a compliant transmitter.

Cl **72** *SC* **72.6.4a** *P* **218** *L* **39** # 75

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **A**

The text in this subclause is stale as the references to features in the LPI Receive state diagram (Figure 72-7) no longer exist. The desired behavior of signal_detect in low power mode is correctly summarized in terms of the sense_signal function defined in 72.6.4b.

SuggestedRemedy

Re-arrange to correctly describe the desired behavior.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editor will rewrite as directed by the suggested remedy.

Cl **72** *SC* **72.6.4a** *P* **218** *L* **41** # 176

Koenen, David Hewlett Packard

Comment Type **TR** *Comment Status* **A**

Signal_detect will not be generated by a LPI state machine but by receiver voltage levels. Also Sense Signal is not needed anymore as Signal Detect will suffice.

SuggestedRemedy

Delete the paragraph under 72.6.4a. Move the paragraph under 72.6.4b to 72.6.4a and change to sense signal to signal_detect where appropriate.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete the paragraph under 72.6.4a. Move the paragraph under 72.6.4b to 72.6.4a and change sense signal to signal_detect where appropriate.

Also see response to comment #137

Cl **72** *SC* **72.6.5** *P* **219** *L* **19** # 138

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

BP training

Transmit should be disabled by tx_quiet.

SuggestedRemedy

Change bullet item d)

Replace tx_disable with tx_quiet.

Response *Response Status* **C**

ACCEPT.

Cl **72** *SC* **Fig 72-7** *P* **225** *L* **1** # 206

Pillai, Velu Broadcom

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

CL49 LPI RX State diagram (Fig 49-17):
This state machine will receive LI to take it from Active to LPI mode. But for a KR PHY it will not receive any valid R_TYPE during refresh or wake. Hence this state machine will not work as it is.

SuggestedRemedy

I thinnk we should go back to the Draft 1.1 version and then correct it for missing items.

Response *Response Status* **C**

REJECT.

This state machine will be deleted.

Cl **72** *SC* **Table 72-3** *P* **218** *L* **10** # 197

Pillai, Velu Broadcom

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

LP Idle state indication Status register 1 1.1.3 PMD_LPI_active

SuggestedRemedy

LP Idle state indication Status register 1 3.1 PMD_LPI_active

Response *Response Status* **C**

REJECT.

This section of text is being deleted.

See response to comment #189

Cl **73** *SC* **73.1** *P* *L* # 195

Pillai, Velu Broadcom

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

Right now in Clause 73.1 the use of AN is optional. But not in EEE mode. Hence 73.1 should change from

73.1 Auto-Negotiation introduction
While implementation of Auto-Negotiation is mandatory for Backplane Ethernet PHYs, the use of Auto-Negotiation is optional. Parallel detection shall be provided for legacy devices that do not support
Auto-Negotiation.

to

SuggestedRemedy

While implementation of Auto-Negotiation is mandatory for Backplane Ethernet PHYs, the use of Auto-Negotiation is optional, but mandatory for the support of Energy Efficient Ethernet. Parallel detection shall be provided for legacy devices that do not support Auto-Negotiation.

Response *Response Status* **C**

REJECT.

This requirement is in Clause 78 - see 78.1.2, p.234 l.1 and 78.3.

Cl **73** *SC* **Annex 73A** *P* **242** *L* **1** # 192

Pillai, Velu Broadcom

Comment Type **TR** *Comment Status* **A**

Louie_011209 did not get added to Annex 73A.

Note: Page 4 of that baseline presentation has a bug. In an unformatted next page has a bug. Bit 11-15 are used. Hence instead of
Unformatted next page:
EEE wake timer requirement [48:1] = {32'b0, NP, 3'b0, 7.64.11:0}
lp EEE wake timer requirement [48:1] = {32'b0, NP, 3'b0, 7.65.11:0}

SuggestedRemedy

Sugested change is

Unformatted next page:
EEE wake timer requirement [48:1] = {20'b0, 7.64.11:0, NP, Ack, MP, Ack2, T, 11'b0}
lp EEE wake timer requirement [48:1] = 20'b0, 7.65.11:0, NP, Ack, MP, Ack2, T, 11'b0}

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #146, #145, #129

In both Annexes 73A & 28C the details of the message pages are defined in Clause 45. This fits in with the style of the existing clauses.

Only one unformatted message page will be required. Therefore change "two" to "one" on p.248, l. 35. Also change Annex 28C similarly.

In Clause 45.2.7.13a change "PHYs that negotiate extended next page support or that use auto-negotiation for backplane Ethernet"

Cl **74** *SC* **74** *P* **232** *L* **54** # 134
Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **A**

BP training

The FEC clause needs editing to support LPI.

Messages must pass through and block lock must be edited.

SuggestedRemedy

Make changes to clause based on presentation submitted for BP training.

Response *Response Status* **C**

ACCEPT.

The FEC alignment & messages need work that will cause changes to clause 74.

Cl **78** *SC* **78.1.1** *P* **233** *L* **10** # 113
Zimmerman, George Solarflare Communica

Comment Type **TR** *Comment Status* **A**

"optional operational mode". By necessity, all clauses in 802.3 are optional. For compliance with clause 25, 40, 55, or other PHY cluases, it is correct to refer to EEE as an "optional operational mode". In this clause, it is not. To be compliant with Clause 78 EEE is a required operational mode.

SuggestedRemedy

delete the word optional

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.1.1** *P* **233** *L* **11** # 114
Zimmerman, George Solarflare Communica

Comment Type **ER** *Comment Status* **A**

Is "low power idle mode" supposed to be a subset of "Energy Efficient Ethernet mode"? If so, what else does "energy efficient ethernet mode" contain?
It seems that two terms are being used for substantially the same purpose.

SuggestedRemedy

clarify the difference or converge the terminology

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

EEE (Energy Efficient Ethernet) is a name of the standard. LPI (Low Power Idle) is a selected method to achieve EEE objectives. Editor to clarify differences.

Example of what EEE contains in addition to LPI - 10BASE-Te.

Cl **78** *SC* **78.1.1** *P* **233** *L* **15** # 154
Bennett, Michael LBNL

Comment Type **E** *Comment Status* **A**

Missing "The" at the beginning of the sentence.

SuggestedRemedy

Insert "The" as shown:

The EEE operational mode supports ...

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.1.2** *P* **233** *L* **45** # 40
Dietz, Bryan Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Typo

SuggestedRemedy

Add missing period at end of item b).

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.1.3** *P* **234** *L* **6** # 11

D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **A**

Reword - "Low Power Idle mode is optional mode..."

SuggestedRemedy

reword as
"Low Power Idle mode is an optional mode..."

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.1.3** *P* **235** *L* **12** # 181

Pillai, Velu Broadcom

Comment Type **E** *Comment Status* **A**

Then the PHY enters Active_st and ..

Nothing wrong with it, but to be consistent with the rest of text, it should be

Then the PHY enters Active_st state and..

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Word "state" will be added after "Active_st"

Cl **78** *SC* **78.1.3** *P* **235** *L* **23** # 182

Pillai, Velu Broadcom

Comment Type **E** *Comment Status* **A**

After a a system specified recovery

SuggestedRemedy

After a system specified recovery

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.1.3** *P* **235** *L* **24** # 115

Zimmerman, George Solarflare Communica

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

On reflection, it seems that our protocol lacks a fail-safe. If a receiver, for some reason, senses a faster environmental change in the link than can be adapted for using the refreshes (or rather, senses it's SNR is degrading), it has no way to reach out for help and re-establish the steady stream of idles. This gives it no choice but to proceed down a path to bringing the link down - something that is probably preventable.

SuggestedRemedy

Task force to discuss - add a new code (to be substituted for idle in the stream) and state transitions to allow receiver (for each PHY type that might have this issue) to force a WAKE transition.

Response *Response Status* **C**

REJECT.

See response to comment #102

Cl **78** *SC* **78.1.3** *P* **235** *L* **25** # 102

Parnaby, Gavin Solarflare Communica

Comment Type **T** *Comment Status* **R**

It would be valuable if a LPI-capable PHY were able to request that the system transition from the low power mode (e.g. if the SNR is dropping).

I believe that a mechanism for this already exists but it is not stated explicitly in the draft. I think we should add text pointing out this mechanism.

Using 10GBASE-T as an example: If a PHY detects dropping SNR and therefore wants to exit LPI, then it should assert local fault. The MAC will detect this and transmit LF to the link partner. Then the MAC at the link partner will detect the remote fault and start transmitting idles, bring the LPI period to an end.

This works whether the LPI state is symmetric or asymmetric (in the symmetric case the local MAC needs to send alert/wake to the link partner before it can transmit LF).

If the SNR degradation occurs relatively slowly this could preserve the link without a restart.

It may be desirable to add counters or some other mechanism to monitor this exit condition.

SuggestedRemedy

Add some informative text stating the above within Clause 78.

e.g.

A mechanism exists that allows PHYs to force a link to exit the lower power mode. If a PHY detects that the SNR on a link is rapidly degrading, it informs the local MAC that a local fault exists. This triggers the MAC to send local fault characters to the link partner. The reception of these characters by the remote MAC causes the remote MAC to transmit IDLEs, which brings the lower power mode to an end and gives the local PHY the opportunity to retrain in the normal operational mode.

Response *Response Status* **C**

REJECT.

Task force discussion resulted in a decision to set up an ad hoc to examine fault handling and recovery.

The suggested remedy was not adopted and there will be no change to the draft.

Cl **78** *SC* **78.1.3** *P* **235** *L* **3** # 41

Dietz, Bryan Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Improve grammar

SuggestedRemedy

Add comma after "quiet" to read "then neither PHY can go quiet, however Low Power à"

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.1.4** *P* **236** *L* **10** # 116

Zimmerman, George Solarflare Communica

Comment Type **TR** *Comment Status* **A**

The list of effected IEEE standards is incomplete

SuggestedRemedy

add 10GBASE-R, 10GBASE-X, XGMII, 100BASE-X, 1000BASE-X, GMII and MII

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The list is naming PHY's, not IEEE standards/protocols.

Change table title to say "Relation between EEE PHYs and IEEE protocols"

Cl **78** *SC* **78.2.2** *P* **236** *L* **48** # 185

Pillai, Velu Broadcom

Comment Type **E** *Comment Status* **A**

Please fix the tab for the text.

SuggestedRemedy

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.2.3** *P* **237** *L* **11** # 183

Pillai, Velu Broadcom

Comment Type **T** *Comment Status* **A**

Description for Tw_phy and Tw_sys looks very similar, except for Tw_sys > Tw_phy. Should we put more text to it?

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Tw_sys and Tw_phy description seem to be distinct enough but editor is open to improvements.

Change the descriptions to:

Tw_phy: Parameter employed by the system which corresponds to the behavior of the PHY. It is the period of time between reception of an IDLE signal on the xxMII interface and when the first data codewords are permitted on the xxMII interface. A wake time of a compliant PHY does not exceed Tw_phy(min).

Tw_sys: Parameter employed by the system which corresponds to the behavior of the system. It is the period of time between transition from LP_IDLE to IDLE signaling on the xxMII interface and when the first data codewords are permitted on the xxMII interface. For proper system operation, following relationship must hold: Tw_sys >= Tw_phy.

Please note that the qualifiers should be subscripts.

Cl **78** *SC* **78.2.3** *P* **237** *L* **11** # 42

Dietz, Bryan Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Missing word in sentence

SuggestedRemedy

Insert words "of the" before "IDLE" and delete word "appearing" . Should read "Period of time between reception of the IDLE signal on the xxMII interface and when the first codewords are permitted on the xxMII interface."

Response *Response Status* **C**

ACCEPT.

Overtaken by events. Paragraph has been rewritten.

Cl **78** *SC* **78.2.3** *P* **237** *L* **12** # 187

Pillai, Velu Broadcom

Comment Type **ER** *Comment Status* **A**

when first codewords are permitted on the xxMII interface

SuggestedRemedy

when first data codewords are permitted on the xxMII interface

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.3** *P* **237** *L* **24** # 117

Zimmerman, George Solarflare Communica

Comment Type **ER** *Comment Status* **A**

No need to revisit the technical mechanisms for autoneg. It creates synchronous maintenance issues later

SuggestedRemedy

delete descriptions of how autoneg is done for the various clauses

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editor will remove technical description of how autoneg mechanisms are working. Clause 78.3 will still have references to the clauses 28, 37, and 73.

Cl **78** *SC* **78.3** *P* **237** *L* **27** # 184

Pillai, Velu Broadcom

Comment Type **E** *Comment Status* **A**

Is there a reason for mentioning Clause 37 Auto Negotiation in 802.3az standard?

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Yes, there is a reason to mention Clause 37 Auto Negotiation in 802.3az standard? See comment #45 from Adam Healey against Draft 0.9

Cl **78** *SC* **78.3** *P* **237** *L* **32** # 12
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **A**
Name of "1000-KX"

This was found throughout repeated instances through clause 78

SuggestedRemedy
should be "1000BASE-KX"

Response *Response Status* **C**
ACCEPT.

Cl **78** *SC* **78.3** *P* **237** *L* **32** # 188
Pillai, Velu Broadcom

Comment Type **ER** *Comment Status* **A**
1000-KX needs to be 1000BASE-KX.

Line numbers 32 and 35.

SuggestedRemedy

Response *Response Status* **C**
ACCEPT.

Cl **78** *SC* **78.3** *P* **237** *L* **3234** # 37
Dietz, Bryan Alcatel-Lucent

Comment Type **T** *Comment Status* **A**
Remove sentence "DME provides a DC àto the network devices." EEE does not change the way backplane autonegotiation works and does not need to justify or explain technique used.

SuggestedRemedy
Remove sentence "DME provides a DC àto the network devices."

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

See response to comment #117 which deletes the text that is the focus of the comment.

Cl **78** *SC* **78.3** *P* **237** *L* **43** # 118
Zimmerman, George Solarflare Communica

Comment Type **TR** *Comment Status* **R**
Autonegotiation is referenced, but the clauses aren't in the draft

SuggestedRemedy
Need to define and add autonegotiation clauses

Response *Response Status* **C**
REJECT.

The autoneg clauses haven't changed so they don't need to be added to the draft.

There are changes to the parameters used in the autoneg and those changes are in the draft.

Cl **78** *SC* **78.3** *P* **237** *L* **46** # 43
Dietz, Bryan Alcatel-Lucent

Comment Type **E** *Comment Status* **A**
Missing word. Also add extra sentence for clarification.

SuggestedRemedy
Add the word "the" to the end of the line. Should read "without breaking the communication link".

Add the following sentence to the end of the paragraph: "Adjusting Tw_sys allows systems to support sleep modes that require longer times to wake up."

Response *Response Status* **C**
ACCEPT IN PRINCIPLE.

word "the" will be added to the end of the line 46 so it reads "without breaking the communication link".

Cl **78** *SC* **78.4** *P* **238** *L* **20** # 47

Dietz, Bryan Alcatel-Lucent

Comment Type **ER** *Comment Status* **A**

Add clarification per ad-hoc meeting.

SuggestedRemedy

Insert new paragraph between last two paragraphs of this section.
"Implementations that do not use the EEE Data Link Layer capabilities shall ignore the EEE TLV if received in a LLDP message. Both link partners will then use the default value of Tw_sys defined by the PHY."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The commenter is correct in his observation. Ignoring the TLV is inherent to how LLDP works. Additional text not necessary as this is how LLDP works

No change will be made to the draft.

Cl **78** *SC* **78.4** *P* **238** *L* **9** # 159

Diab, Wael Broadcom

Comment Type **TR** *Comment Status* **A**

D1.2.1 changed the requirement for layer 2 from mandatory to optional. For 100M and some low end systems, the rationale is that LLDP engines may not always be present, hence the broadmarket is best served with an optional feature. While more and more 100M and triple speed systems are implementing LLDP for a variety of reasons including AVB, PoEP, Link Agg etc. it seems reasonable to keep LLDP optional. 10G systems, however, are very sophisticated systems that implement a stack of protocols including LLDP. There seems to be little reason to make the LLDP optional on such systems.

SuggestedRemedy

Please change

"The Data Link Layer capabilities are optional for all devices."

to

"The Data Link Layer capabilities shall be implmented for devices that are 10 Gbps or high. The Data Link Layer capabilities are optional for all devices and may be implemented."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "The Data Link Layer capabilities are optional for all devices."
TO

"The Data Link Layer capabilities shall be implemented for devices operating at link rates equal to or greater than 10 Gbps and may be implemented for all other devices."

Cl **78** *SC* **78.4.1** *P* **239** *L* **6** # 31

Kasturia, Sanjay Teranetics

Comment Type **T** *Comment Status* **A**

Replace TBD with appropriate entry

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Unlike the other TBDs, the 802.3 subtype for LLDP will be issued by the .3 Chair or his designate at the initiation of SASB ballot as we have traditionally done with all management code point TBDs

The TBD will be replaced by "TBA" indicating that this is something that will be allocated later at the initiation of sponsor ballot.

Cl **78** *SC* **78.4.1.1** *P* **239** *L* **31** # 44

Dietz, Bryan Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Minor editorial tweak.

SuggestedRemedy

Change "following" to "after leaving" and "Low Power Idle" to "Low Power Idle mode".

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.4.1.1** *P* **239** *L* **3435** # 45

Dietz, Bryan Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Rephrase last sentence for clarity.

SuggestedRemedy

Change last sentence in paragraph to read "The Transmitting link partner expects that the Receiving link partner will be able to accept data after the time delay Transmit Tw_sys."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

"The Transmitting link partner expects that the Receiving link partner will be able to accept data after the time delay Transmit Tw_sys (expressed in microseconds)"

Cl **78** *SC* **78.4.1.2** *P* **239** *L* **4043** # 38

Dietz, Bryan Alcatel-Lucent

Comment Type **T** *Comment Status* **A**

Clarification from ad-hoc.

SuggestedRemedy

Interchange and edit last two sentences of this paragraph to read:
"Receive Tw_sys (2 octets wide) is the time (expressed in microseconds) that the receiving link partner is requesting the transmitting link partner to wait before it starts transmitting data following the Low Power Idle. The default value for Receive Tw_sys is the Tw_phy defined for the PHY that is in use for the link. The Receive Tw_sys value can be larger than the default, and the extra wait time may be used by the receive link partner for power saving mechanisms that require longer wake-up time than the PHY-layer definitions."

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.4.1.3** *P* **239** *L* **49** # 46

Dietz, Bryan Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

Replace word "registered" with "processed". The word "registered" may imply merely that the data was stored. However, later text and the state diagrams show that the data was processed before it was echoed.

SuggestedRemedy

Replace word "registered" with "processed".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Clearer terminology can be used. The intent is to show that the link partner is now "aware" of the remote partner's information. Use the words "registered and processed".

Cl **78** *SC* **78.4.1.4** *P* **240** *L* **29** # 48

Dietz, Bryan Alcatel-Lucent

Comment Type **ER** *Comment Status* **A**

Replace the entire first paragraph with the following to clarify the intended functioning of the following state diagrams per ad-hoc meeting 2/23.

The transmitting link partner controls when data is sent. After leaving Low Power Idle mode, the transmitting link partner waits before sending a frame. This provides enough time for the receiving link partner to transition out of LPI mode and get ready to receive the frame without loss or corruption.

" The transmitting link partner must wait for TX Tw_sys microseconds after leaving LPI mode before sending a frame.
" The receiving link partner must be ready to receive a frame RX Tw_sys microseconds after leaving LPI mode.
" The transmit Tw_sys must be equal to or greater than the receive Tw_sys for proper operation. The purpose of the EEE TLV and state machines is to resolve the correct Tw_sys values.

The state diagrams in sections 78.4.4.5 provide the following features on each direction of the bidirectional link.

" The initial Tw_sys defaults to the Tw_sys values required by the PHYs. This provides loss- and corruption-free EEE operation without exchanging TLVs.
" The state machines initialize the MIB transmit and receive Tw_sys values to larger values if supported by the overall system. These values can provide longer delays that allow deeper sleep modes for the system outside of the PHYs.
" The state machines monitor and control the EEE MIB variables exchanged by LLDP. The state machines find the longest "resolved Tw_sys" supported at that time by both the transmitter and receiver. This can provide the largest total system power savings.
" The state machines will update the resolved Tw_sys value when the transmit Tw_sys is increased or decreased.
" The state machines will update the resolved Tw_sys value when the received Tw_sys is increased or decreased.
" The Transmit Tw_sys is considered "resolved" when a local partner's state machine resides in the "RUNNING STATE" as described in section 78.4.4 and the echoed values match the local device's values for that path.

SuggestedRemedy

The transmitting link partner controls when data is sent. After leaving Low Power Idle mode, the transmitting link partner waits before sending a frame. This provides enough time for the receiving link partner to transition out of LPI mode and get ready to receive the frame without loss or corruption.

" The transmitting link partner must wait for TX Tw_sys microseconds after leaving LPI mode before sending a frame.
" The receiving link partner must be ready to receive a frame RX Tw_sys microseconds after leaving LPI mode.
" The transmit Tw_sys must be equal to or greater than the receive Tw_sys for proper operation. The purpose of the EEE TLV and state machines is to resolve the correct Tw_sys values.

The state diagrams in sections 78.4.4.5 provide the following features on each direction of the bidirectional link.

" The initial Tw_sys defaults to the Tw_sys values required by the PHYs. This provides loss- and corruption-free EEE operation without exchanging TLVs.
" The state machines initialize the MIB transmit and receive Tw_sys values to larger values if supported by the overall system. These values can provide longer delays that allow deeper sleep modes for the system outside of the PHYs.
" The state machines monitor and control the EEE MIB variables exchanged by LLDP. The state machines find the longest "resolved Tw_sys" supported at that time by both the transmitter and receiver. This can provide the largest total system power savings.
" The state machines will update the resolved Tw_sys value when the transmit Tw_sys is increased or decreased.
" The state machines will update the resolved Tw_sys value when the received Tw_sys is increased or decreased.
" The Transmit Tw_sys is considered "resolved" when a local partner's state machine resides in the "RUNNING STATE" as described in section 78.4.4 and the echoed values match the local device's values for that path.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Looks like commenter was looking at line 3 not 29. The commenter points out that the forward looking references may be confusing to a first time reader, further, some of the text adds useful description as to how the SMs work, hence it has been split into the various sections as described below:
- Delete Section 78.4.1.4
- Move the following text that was in Section 78.4.1.4 along with the appended text as described below to precede the current text in 78.4.4.5 and insert a line break after it: "Control for placing data on the medium rests with the transmitting side, hence Tw_sys is enforced by the transmitter. Thus, for a given path between a set of link partners (i.e. a transmitter and its associated receiver), the transmitting link partner shall wait for the time indicated by the Transmit Tw_sys after deasserting Low Power Idle (at the xxMII) before sending data frames. Similarly the receiving link partner shall be ready to accept data based on its echoed value of Transmit link partner's Tw_sys. This ensures that the link partners transition out of LPI mode and receive frames without loss or corruption."
- Insert a paragraph break and the following text after the first sentence in Section 78.4.5: "The initial Tw_sys defaults governing the EEE operation of the link default to the wake values required by the PHYs. This provides for EEE operation and functionality on initialization and prior to the exchange and processing of the TLVs."

Cl **78** *SC* **78.4.1.4** *P* **240** *L* **3** # 149

Barrass, Hugh Cisco

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

System Tw can be resolved using one simple and static equation. This would simplify the standard, the implementation and testing.

Careful examination of the proposed equation and rule shown below will show that this covers every corner case.

SuggestedRemedy

The attached presentation describes the details of the proposal.

In summary, the four parameters defined in the TLV can be combined in the following equation:

Resolved system Tw = min(remote Rx Tw, max(local Tx Tw, remote echo Tx Tw))

The only additional rule required is that the system shall not change a parameter unless the current local value matches the remote echoed value.

Response *Response Status* **C**

REJECT.

Cl **78** *SC* **78.4.4.3** *P* **242** *L* **28** # 39

Dietz, Bryan Alcatel-Lucent

Comment Type **E** *Comment Status* **A**

The word "state" is misspelled in the table header.

SuggestedRemedy

Change to "state".

Response *Response Status* **C**

ACCEPT.

Cl **78** *SC* **78.4.4.5** *P* **243** *L* **24** # 34

Kasturia, Sanjay Teranetics

Comment Type **T** *Comment Status* **A**

Symbol in box on the left titled "remote change" seems to have been garbled. It is showing up as a question mark.
TempRxVar ? RemRxSystemValue

Replace ? with an assignment statement

SuggestedRemedy

As per comment

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Refer to diab_01_0309.pdf

Cl **78** *SC* **78.5** *P* **246** *L* **15** # 155

Bennett, Michael LBNL

Comment Type **E** *Comment Status* **A**

... parameters for supported PHYss has an extra "s"

SuggestedRemedy

remove the extra "s"

Response *Response Status* **C**

ACCEPT.