IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

Cl 00 SC 0 P 1 L 1 # 0
Healey, Adam
LSI Corporation

Comment Type T Comment Status D

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".

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 00 SC 0 P 1 L 1 # 0
Koenen, David
Hewlett Packard

Comment Type T Comment Status X

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

Proposed Response Response Status O
Proposed revision history with each reissue

Cl 00 SC 0 P 1 L 1 # 0
Zimmerman, George
Solarflare Communications

Comment Type E Comment Status X
Please update the revision history or delete it

Proposed Response Response Status O
update revision history with each reissue

Cl 00 SC 0 P 1 L 1 # 0
Pillai, Velu
Broadcom

Comment Type TR Comment Status D

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

SuggestedRemedy

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 00 SC 0 P 1 L 1 # 0
Teener, Michael
Broadcom

Comment Type T Comment Status X

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.

Proposed Response Response Status W
For discussion at Task force meeting

Cl 00 SC 0 P 1 L 1 # 0
Koenen, David
Hewlett Packard

Comment Type T Comment Status X

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.

Proposed Response Response Status O
Cl 14 SC 14.8 P 25 L 51 # 111
Zimmerman, George Solarflare Communications

Comment Type: T Comment Status: D
marking 10BASE-T or 10BASE-Te support precludes devices that support both

Suggested Remedy:
change to 10BASE-T and/or 10BASE-Te support

Proposed Response: Response Status: W
PROPOSED ACCEPT.

Cl 22 SC 22.2.1 P 28 L 14 # 151
Bennett, Michael LBNL

Comment Type: E Comment Status: D
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.

Suggested Remedy:
Insert (LPI) after “idle” in the sentence as shown:

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

Proposed Response: Response Status: W
PROPOSED ACCEPT.

Cl 22 SC 22.2.1.3.3 P 29 L 33 # 150
Bennett, Michael LBNL

Comment Type: E Comment Status: D
The paragraph would be easier to read if the first sentence terminated after CARRIER_STATUS.

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

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

Proposed Response: Response Status: W
PROPOSED ACCEPT.

Cl 22 SC 22.7a.2 P 34 L 10 # 156
Bennett, Michael LBNL

Comment Type: T Comment Status: D
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

Suggested Remedy:
Change reference to the correct subclause:

... governed by Resolved Transmit Tw defined in 78.4.1.4

Proposed Response: Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.

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: D
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

Suggested Remedy:
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.

Proposed Response: Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.

Also change reference to a link.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

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**Comment Type:**
- **T:** Technical
- **E:** Editorial
- **G:** General

**Comment Status:**
- **D:** Dispatched
- **A:** Accepted
- **R:** Rejected
- **O:** Open
- **W:** Written
- **C:** Closed
- **U:** Unsatisfied
- **Z:** Withdrawn

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

**COMMENT STATUS:**
- D/dispatched
- A/accepted
- R/rejected

**RESPONSE STATUS:**
- O/open
- W/written
- C/closed
- U/unsatisfied
- Z/withdrawn

**SORT ORDER:** Clause, Subclause, page, line

---

**Comment on IEEE P802.**

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

Grimmwood, Mike Broadcom

**Comment Type:** T **Comment Status:** X

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 fails to wake within lpi_rx_tw_timer_done increment a wake error counter.

**Suggested Remedy**

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

**Proposed Response**

Response Status: O

---

**Comment on IEEE P802.**

**Cl 25 SC 25.2.11.2.1 P 60 L 51 # 112**

Zimmerman, George Solarflare Communica

**Comment Type:** ER **Comment Status:** D

TP-TMD typo, should be TP-PMD

**Suggested Remedy**

replace with TP-PMD (2 instances)

**Proposed Response**

Response Status: W

PROPOSED ACCEPT.

---

**Comment on IEEE P802.**

**Cl 35 SC 35.2.2.4 P 69 L 12 # 180**

Pillai, Velu Broadcom

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

signalled

**Suggested Remedy**

signaled

**Proposed Response**

Response Status: W

PROPOSED ACCEPT.

---

**Comment on IEEE P802.**

**Cl 36 SC 36.2.5.1.3 P 76 L 40 # 106**

Koenen, David Hewlett Packard

**Comment Type:** T **Comment Status:** D

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

**Suggested Remedy**

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

**Proposed Response**

Response Status: W

PROPOSED ACCEPT IN PRINCIPLE.

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

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

---

**Comment on IEEE P802.**

**Cl 36 SC 36.2.5.2.8 P 86 L 16 # 84**

Healey, Adam LSI Corporation

**Comment Type:** T **Comment Status:** D

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.

**Suggested Remedy**

Per comment.

**Proposed Response**

Response Status: W

PROPOSED ACCEPT IN PRINCIPLE.

Refer to #146

---

**Comment on IEEE P802.**

**Cl 36 SC 36.2.5.2.8 P 86 L 16 # 84**

Proposed Response

Response Status: W

PROPOSED ACCEPT IN PRINCIPLE.
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.

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

PROPOSED ACCEPT.

Note also register 7.64

Comment Status D
Response Status W

Pillai, Velu Broadcom

CL 40 SC 40.3.1.1 P 98 L 46

McIntosh, James Vitesse

Comment Type TR
Comment Status D

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

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

\[
\text{cext_errn} = \text{tx_errorn if } ((\text{tx_enablen} = 0) \land (\text{TXDn}[7:0] != 0x0F) \land (\text{TXDn}[7:0] != 0x01)) \land 0 \text{ else}
\]

PROPOSED 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.

PROPOSED 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.

PROPOSED 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.

PROPOSED ACCEPT.
Comments on IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

McIntosh, James Vitesse

Comment Type: ER  Comment Status: D
Typo: "acheived" should be "achieved".

Suggested Remedy:
Change to "achieved".

Proposed Response  Response Status: W
PROPOSED ACCEPT.

McIntosh, James Vitesse

Comment Type: T  Comment Status: D
In Fig. 40-15b, the two transitions 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 transition (C) if appropriate. This will result in a slight simplification of the state diagram.

Suggested Remedy:
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 expression 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.

Proposed Response  Response Status: W
PROPOSED ACCEPT.

Grimwood, Mike Broadcom

Comment Type: E  Comment Status: D
In Table 40-3 for Register 3.22 the type NR is not defined.

Suggested Remedy:
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.

Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.

Register 3.21 has been deleted, add clause number 45.2.3.9a

Editorial licence granted for the precise text to be written.
Comments on IEEE P802.

Table 45-1

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

**Suggested Remedy**
Register 3.21 should be removed from the table.

**Proposed Response**
PROPOSED ACCEPT.

---

McIntosh, James
Vitesse

Comment Type TR
Comment Status D

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

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

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.

---

Pillai, Velu
Broadcom

Comment Type E
Comment Status D

1 = Tx PCS is currently receiving LP idle

**Suggested Remedy**
1 = Tx PCS is currently receiving LP idle

**Proposed Response**
PROPOSED ACCEPT.

---

Kasturia, Sanjay
Teranetics

Comment Type E
Comment Status D

Replace TBD by proper reference

**Suggested Remedy**

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.

Change references to links
15 Cl 46 SC 46 P 126 L 10 # 15

D’Ambrosia, John Force10 Networks

Comment Type E Comment Status D
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)."

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 46 SC 46.3.1.5a P 127 L 45 # 21

Tidstrom, Rick Broadcom

Comment Type ER Comment Status D
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>.

Proposed Response Response Status W
PROPOSED 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 D
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>.

Proposed Response Response Status W
PROPOSED 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 D
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 suggest possible PCS power savings or deleted from variable list and state diagrams.

Proposed Response Response Status W
PROPOSED 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 # 96

Healey, Adam LSI Corporation

Comment Type T Comment Status D
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.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

See #145

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line
Cl | SC | P | L | # |
---|----|---|---|---|
48 | 48.2.6.2.5 | 143 | 17 | 145 |
| | | | | Barrass, Hugh | Cisco |
Comment Type | T | Comment Status | D |
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.

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

Proposed Response | Response Status | W |
| PROPOSED ACCEPT. |

Note also register 7.64

Cl | SC | Fig 48-9 | P | L | # |
---|----|-------|---|---|---|
48 | 49 | 137 | 25 | 208 |
| | | | | Pillai, Velu | Broadcom |
Comment Type | TR | Comment Status | D |
Transition from RECEIVE to LPIDLE_MODE with ![LPIDLE]!, but in order to stay in LPIDLE_MODE and RECEIVE LP1 the state machine is expecting continuous ![LPIDLE]! at the PCS service interface.

Suggested Remedy
Staying in that state needs to be qualified with ![rx_lpi_mode]!.

Proposed Response | Response Status | W |
| PROPOSED REJECT. |

Similar to #207

Cl | SC | 49 | P | L | # |
---|----|---|---|---|---|
49 | 49.2.12.2.2 | 149 | 30 | 165 |
| | | | | Koenen, David | Hewlett Packard |
Comment Type | T | Comment Status | D |
Constant ![LPIDLE]! is never used.

Suggested Remedy
Delete definition of ![LPIDLE]!.

Proposed Response | Response Status | W |
| PROPOSED 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 | SC | 49.2.13.2.1 | P | L | # |
---|----|---|---|---|---|
49 | 49.2.13.2.1 | 149 | 16 | 80 |
| | | | | Healey, Adam | LSI Corporation |
Comment Type | T | Comment Status | D |
rx_lpi_mode and tx_lpi_mode not used anywhere to set or control any feature or function.

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

Proposed Response | Response Status | W |
| PROPOSED ACCEPT |

Cl | SC | 49 | P | L | # |
---|----|---|---|---|---|
49 | 49.2.13.2.2 | 149 | 16 | 119 |
| | | | | Barras, Hugh | Cisco |
Comment Type | E | Comment Status | D |
Remove editor's note at beginning of clause

Suggested Remedy
Remove editor's note at beginning of clause

Proposed Response | Response Status | W |
| PROPOSED ACCEPT. |
Cl 49 SC 49.2.13.2.2 P 149 L 22 # 160
Koenen, David Hewlett Packard

Comment Type E Comment Status D
Typo in 1st paragraph “used to by”

SuggestedRemedy
“used by”

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 49 SC 49.2.13.2.2 P 149 L 30 # 81
Healey, Adam LSI Corporation

Comment Type T Comment Status D
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.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

See #165

Cl 49 SC 49.2.13.2.2 P 149 L 33 # 82
Healey, Adam LSI Corporation

Comment Type T Comment Status D
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.

Proposed Response Response Status W
PROPOSED 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 D
**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.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Cl 49 SC 49.2.13.2.2 P 149 L 43 # 168
Koenen, David Hewlett Packard

Comment Type T Comment Status D
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.

Proposed Response Response Status W
PROPOSED 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.
If a block contains 4 /LI/ characters and 4 /I/ characters (as might occur during a normal transition 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.

Suggested Remedy
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)."

Suggested Remedy

PROPOSED ACCEPT.

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

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

PROPOSED ACCEPT IN PRINCIPLE.

Suggested Remedy

PROPOSED ACCEPT.

 WL should be subscript in TWL

Suggested Remedy
Change WL of TWL to subscript

PROPOSED ACCEPT.

subscript needed on TWL

Suggested Remedy
Change WL to subscript.

PROPOSED ACCEPT.
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.

**Suggested Remedy**

Per comment.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

See #132, #133 and others

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

**Suggested Remedy**

Change the names to PMA_RXQUIET & PMA_TXQUIET

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

**Proposed Response**

PROPOSED ACCEPT.

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

**Suggested Remedy**

Change the names to PMA_RXQUIET & PMA_TXQUIET

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

**Proposed Response**

PROPOSED ACCEPT.

**Proposed Response**

PROPOSED ACCEPT.
Comments on IEEE P802.

IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

Mar 2009

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**Comment Type:** T  **Comment Status:** D  **Proposed Response:** W

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?

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

---

**Comment Type:** T  **Comment Status:** D  **Proposed Response:** W

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

**Suggested Remedy:**
Change transition condition from TX_D to TX_E to be: 
\[ T_{TYPE}(tx_{raw}) = (E + C + S + LI) \]

---

**Comment Type:** T  **Comment Status:** D  **Proposed Response:** W

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

**Suggested Remedy:**
Change "are" to "is"

---

**Comment Type:** T  **Comment Status:** D  **Proposed Response:** W

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

**Suggested Remedy:**
Add state transition from RX_T to RX_LI with the transition condition R_TYPE(rx_codes) = LI.

---

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).
Comment Type  T  Comment Status  D
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.

Suggested Remedy
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 data service 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.

Proposed Response  W
PROPOSED ACCEPT.
The variable signal_detect is not defined. It should be signal_ok.

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

**Proposed Response**
PROPOSED ACCEPT.

---

Is it 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 achieved.

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

**Suggested Remedy**
Remove RX_DEACT state and delete the definition of rx_deact_timer.

**Proposed Response**
PROPOSED ACCEPT.
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 achieve 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 achieve lock after a prolonged period.

**Suggested Remedy**

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 presumably 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_link_fail_timer in the RX_WAKE state. Add the condition "+ lpi_link_fail_timer_done" to the transition from RX_WAKE to RX_ACTIVE.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

See #128
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.

Suggested Remedy
Per comment.

PROPOSED ACCEPT IN PRINCIPLE.

Grimwood, Mike
Broadcom

Comment Type T
Comment Status D

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

Suggested Remedy
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/ may only be added following low-power idle.

PROPOSED ACCEPT IN PRINCIPLE.

Healey, Adam
LSI Corporation

Comment Type E
Comment Status D

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

Suggested Remedy
Per comment.

PROPOSED ACCEPT IN PRINCIPLE.

Healey, Adam
LSI Corporation

Comment Type T
Comment Status D

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

PROPOSED ACCEPT IN PRINCIPLE.
**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.

**Suggested Remedy**

- 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.

**PROPOSED ACCEPT IN PRINCIPLE.**

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

- Add variables scrambler_reset and scrambler_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.

**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.

**Suggested Remedy**

- 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.

**PROPOSED ACCEPT IN PRINCIPLE.**

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

Following the a period of quiet transmission, the receiver is expected to achieve block synchronization within the wakeup time specified. 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.
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 \(\text{rx}_\text{li}_\text{mode}\).

**Suggested Remedy**
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 \(\text{rx}_\text{li}_\text{mode}\).

**Proposed Response**
Proposed REJECT.

The state machine will stay in a state unless it has a valid exit condition.

---

**Comment Type**: TR  **Comment Status**: D

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

to
R_TYPE(rx_coded) = LI

**Suggested Remedy**
Need signals from the CL72 LPI Receive State machine

**Proposed Response**
PROPOSED ACCEPT.

---

**Comment Type**: T  **Comment Status**: D

**Comment**: 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.

**Suggested Remedy**
Need signals from the CL72 LPI Receive State machine

**Proposed Response**
PROPOSED 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

---

**Comment Type**: T  **Comment Status**: D

**Comment**: 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.

**Suggested Remedy**
Edit clause 51 to pass the messages through.

**Proposed Response**
PROPOSED ACCEPT.
Cl  55  SC 55.1.3.3   P 161  L 16  #  25
Tidstrom, Rick  Broadcom

Comment Type TR  Comment Status D
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.


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.

Proposed Response  Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Cl  55  SC 55.1.3.3   P 161  L 26  #  24
Tidstrom, Rick  Broadcom

Comment Type TR  Comment Status D
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.

Proposed Response  Response Status W
PROPOSED ACCEPT.

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

Comment Type E  Comment Status D
PICs identifier PCT15d is repeated.

SuggestedRemedy
Change to PCT15e and renumber/letter subsequent entries.

Proposed Response  Response Status W
PROPOSED ACCEPT.

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

Comment Type E  Comment Status D
Change indications are missing even though PCT1a is new to EEE.

SuggestedRemedy
Add change indications for PCT1a table entry.

Proposed Response  Response Status W
PROPOSED ACCEPT.
Cl 55 SC 55.3.2.2.10 P 166 L 30 # 98
Parnaby, Gavin Solarflare Communica

Comment Type E Comment Status D
Should this clause be 55.3.2.2.9a?

SuggestedRemedy

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

The editor will check and 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 D
The clause number is incorrect.

SuggestedRemedy
It should be 55.3.2.2.9

Proposed Response Response Status W
PROPOSED ACCEPT.

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

Comment Type E Comment Status D
Typo.

SuggestedRemedy
Change 7.63 us to 7.36 us.

Proposed Response Response Status W
PROPOSED ACCEPT.

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

Comment Type T Comment Status D
Ipl_wake_time after sleep can be up to 14 frames since 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.

Proposed Response Response Status W
PROPOSED ACCEPT.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

The editor will determine the correct value and insert it into the table.
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.

Suggested Remedy

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.

Proposed Response

Response Status W

PROPOSED ACCEPT.

CL 55 SC 55.3.5.1 P 169 L 33 # 33
Kasturia, Sanjay Teranetics

Comment Type TR

Comment Status D

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

Suggested Remedy

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.

Proposed Response

Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

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

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.

Suggested Remedy:
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/).

Proposed Response: Response Status: W
PROPOSED ACCEPT.
<table>
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<th>Cl</th>
<th>SC</th>
<th>Subclause</th>
<th>Page</th>
<th>Line</th>
<th>Comment Status</th>
<th>Comment Type</th>
<th>Proposed Response</th>
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<th>Commenter</th>
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<th>Response Status</th>
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<tbody>
<tr>
<td>55</td>
<td>55</td>
<td>55.3.5.3</td>
<td>P171</td>
<td>L4</td>
<td>D</td>
<td>T</td>
<td>Is the InfoField used during Refresh? This comment assumes not and proposes a clarification.</td>
<td>Proposed Accept</td>
<td>Grimwood, Mike Broadcom</td>
<td>Add text to state that infofields are not used during refresh signaling.</td>
<td>W</td>
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<tr>
<td>55</td>
<td>55</td>
<td>55.3.5.3</td>
<td>P171</td>
<td>L7</td>
<td>D</td>
<td>T</td>
<td>2-level PAM refresh symbols are generated using the PMA side-stream scrambler polynomials described in subclause 55.3.4.</td>
<td>Proposed Accept</td>
<td>Grimwood, Mike Broadcom</td>
<td>Add text to state that infofields are not used during refresh signaling.</td>
<td>W</td>
</tr>
<tr>
<td>55</td>
<td>55</td>
<td>55.3.5.3</td>
<td>P171</td>
<td>L4</td>
<td>D</td>
<td>T</td>
<td>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.</td>
<td>Proposed Accept</td>
<td>Parnaby, Gavin Solarflare Communications</td>
<td>'After the PHY Control state diagram reaches the PCS_Data state infofields are not transmitted.'</td>
<td>W</td>
</tr>
</tbody>
</table>
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.

**Suggested Remedy**

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.’

**Proposed Response**

PROPOSED ACCEPT.

---

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.

**Suggested Remedy**

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.

**Proposed Response**

PROPOSED ACCEPT.

See also comment #26
Cl  55  SC 55.3.5.4  P 179  L 16  # 105
Parnaby, Gavin  Solarflare Communications

Comment Type  TR  Comment Status  D

   tx_lpi_full_refresh is not defined

SuggestedRemedy
   Define tx_lpi_full_refresh in the state diagram variable list

Proposed Response  Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.

Cl  55  SC 55.3.5.4  P 179  L 40  # 28
Tidstrom, Rick  Broadcom

Comment Type  TR  Comment Status  D

   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

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl  55  SC 55.4.4  P 182  L  # 108
Parnaby, Gavin  Solarflare Communications

Comment Type  TR  Comment Status  D

   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

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl  55  SC 55.5.3  P 185  L 3  # 52
Kasturia, Sanjay  Teranetics

Comment Type  TR  Comment Status  D

   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

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl  55  SC 55.6.1  P 186  L 50  # 101
Parnaby, Gavin  Solarflare Communications

Comment Type  ER  Comment Status  D

   There is no e)

SuggestedRemedy
   Delete reference to e)

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl  55  SC 55-19  P 170  L  # 103
Parnaby, Gavin  Solarflare Communications

Comment Type  T  Comment Status  D

   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.

Proposed Response  Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.

   We need to take care with the no partial refreshes requirement in this case.
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.

Suggested Remedy

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.

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE.

If possible, the EEE TF would like the 40GBASE-KR4 to adopt and incorporate a similar EEE mode either now or in the future.

Use of "KX PHY" in sentence.

Suggested Remedy

suggested re-wording -

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

Proposed Response

PROPOSED ACCEPT.
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Comment Type</th>
<th>Subclause</th>
<th>Page</th>
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<tr>
<td>70</td>
<td>70.6.4</td>
<td>E</td>
<td></td>
<td>201</td>
<td>7</td>
<td></td>
<td>Use something less ambiguous, such as &quot;non-ee operation&quot;</td>
<td>D</td>
<td>W</td>
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<td>D</td>
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<td>70.8.5</td>
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<td>201</td>
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<td>Change &quot;normal&quot; to &quot;non-EEE supported&quot;</td>
<td>D</td>
<td>W</td>
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<tr>
<td>70</td>
<td>Table 70-3</td>
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TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Clause, Subclause, page, line
Comments on IEEE P802.

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

Comment Type E Comment Status D
use of the word baseline is confusing

SuggestedRemedy
replace "baseline" with "non-eee"

Proposed Response Response Status W
PROPOSED 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 D
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.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Cl 71 SC 71.6.4a P 209 L 24 # 198
Pillai, Velu Broadcom

Comment Type TR Comment Status D
According to pillai_02_0109 (Motion #4), remove the references to VSA, VSD, TSD and TSA in Table 7.1.6.

SuggestedRemedy

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 71 SC Table 71-3 P 209 L 8 # 194
Pillai, Velu Broadcom

Comment Type TR Comment Status D
LP Idle state indication Status register 1 1.1.3 PMD_LPI_active

SuggestedRemedy
Delete LPI status indication row in Table 71-3

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 72 SC 72 P 216 L 29 # 148
Barrass, Hugh Cisco

Comment Type TR Comment Status D
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.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE. Pending acceptance of this new proposal from TF.
<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>KR-PHY will not generate sleep training symbols.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td>Change &quot;10GBASE-KR PHY sends sleep symbols&quot; to &quot;10GBASE-KR PHY forwards sleep symbols&quot;</td>
</tr>
<tr>
<td>Proposed Response</td>
<td>Response Status</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. See response to comment #66.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Update text to be consistent with the currently defined operation of the PHY.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td>Replace paragraph with the following:</td>
</tr>
<tr>
<td>Proposed Response</td>
<td>Response Status</td>
<td>PROPOSED ACCEPT.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>The tx_quiet now has 3 enumerated values and the use of assert/de-assert is not appropriate anymore.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td>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 conserve energy</td>
</tr>
<tr>
<td>Proposed Response</td>
<td>Response Status</td>
<td>PROPOSED ACCEPT.</td>
</tr>
</tbody>
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<table>
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<th>Typo RTXQUIET</th>
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<td></td>
<td>change to TXQUIET</td>
</tr>
<tr>
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<td>Response Status</td>
<td>PROPOSED ACCEPT.</td>
</tr>
<tr>
<td>Cl</td>
<td>SC</td>
<td>PAGE</td>
</tr>
<tr>
<td>----</td>
<td>----</td>
<td>------</td>
</tr>
<tr>
<td>72</td>
<td>72.3a</td>
<td>217</td>
</tr>
<tr>
<td>72</td>
<td>72.3a</td>
<td>217</td>
</tr>
<tr>
<td>72</td>
<td>72.3b</td>
<td>217</td>
</tr>
<tr>
<td>72</td>
<td>72.3b</td>
<td>218</td>
</tr>
</tbody>
</table>

**Suggested Remedy**

- **BP training**
- There is no register in the PMD space for LPI status
- Delete LPI status indication row in Table 72-3
- Change value of rx_quiet from true to TRUE
- Change to TRUE.

**Proposed Response**

- PROPOSED ACCEPT.
- PROPOSED ACCEPT.
**BP training**

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

Suggested Remedy

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

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Pending acceptance of this by TF.

---

**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.**

Suggested Remedy

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

Proposed Response Response Status W

PROPOSED 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.

---

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

Suggested Remedy

Remove definitions from 72.6.10.2.4.4 -72.6.10.2.4.5

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Pending acceptance by TF for new method for Refresh and wake.

---

**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.**

Suggested Remedy

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.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

See response to comment # 139
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.

**Suggested Remedy**
Remove the Last Training Frame bit or specify its use by other PMD functions or sublayers.

The latter would require the definition of new service interface primitive(s) to convey the information.

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.
See response to comment #139.

---

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.

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

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.
See response to comment #139.

---

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

**Suggested Remedy**
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.*

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.
Section 72.6.11 to be moved into 72.6.10.

---

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

**Suggested Remedy**
Delete 72.6.11.2, including the table 72-5a.

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.
Pending acceptance by TF.

---

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

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

**Proposed Response**
PROPOSED ACCEPT.
BP training

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

Suggested Remedy
Delete 72.6.11.3 and 72.6.11.4

PROPOSED ACCEPT IN PRINCIPLE.
Pending acceptance by TF for new method.

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).

Suggested Remedy
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.

PROPOSED ACCEPT IN PRINCIPLE.
Pending acceptance by TF for replacing Training frames for refresh & wake.

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.

Suggested Remedy
Update variable definition accordingly.

PROPOSED ACCEPT IN PRINCIPLE.
Pending acceptance of this by the TF.

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

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

PROPOSED ACCEPT IN PRINCIPLE.
Pending acceptance of this by the TF.
In order to handle a Wake request right during the "last refresh".

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

PROPOSED REJECT.

The TX and RX state diagrams may be entirely deleted if training frames not use.

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.

Suggested Remedy
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.

PROPOSED ACCEPT IN PRINCIPLE.
Signal_detect to be redefined with sense_signal properties.

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.

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

PROPOSED ACCEPT IN PRINCIPLE.
May not need these any longer if training frames not used.
**BP training**
The signal detect function needs to act like a classic signal detect to support operation in the PMA & PCS during LPI.

**Suggested Remedy**
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 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.

**Proposed Response**
PROPOSED REJECT.
VSA and TSA were voted out of the spec. See comment #179.

---

**Comment Type:** T  **Comment Status:** D
**Comment:** 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.

**Suggested Remedy**
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.

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.
Cl 72  SC  Table 72-3  P  218  L 10  # 197
Pillai, Velu  Broadcom

Comment Type  TR  Comment Status  D
LP Idle state indication Status register 1  1.1.3  PMD_LPI_active

Suggested Remedy
LP Idle state indication Status register 1  3.1  PMD_LPI_active

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl 73  SC  73.1  P  L  # 195
Pillai, Velu  Broadcom

Comment Type  TR  Comment Status  D
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

Suggested Remedy
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.

Proposed Response  Response Status  W
PROPOSED 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  D
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}

Suggested Remedy
Suggested 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}

Proposed Response  Response Status  W
PROPOSED 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.

Assuming that 146, 145 & 129 are accepted, then 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"
| CI | SC | Subclause | Page | Line | Comment Type | Comment Status | Commenter | Proposed Response | Suggested Remedy | Response Status |  |
|---|---|---|---|---|---|---|---|---|---|---|
| 78 | 78.1.1 | P233 | L10 | 113 | TR | D | Zimmerman, George | “optional operational mode”. By necessity, all clauses in 802.3 are optional. For compliance with clause 25, 40, 55, or other PHY clauses, 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. | delete the word optional | W | PROPOSED ACCEPT. |
| 78 | 78.1.2 | P233 | L45 | 40 | E | D | Dietz, Bryan | typo | Add missing period at end of item b. | W | PROPOSED ACCEPT. |
Comments on IEEE P802.

IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

Mar 2009

Cl 78 SC 78.1.3 P 234 L 6 # 11

D' Ambrosia, John Force10 Networks

Comment Type E Comment Status D
Reword - "Low Power Idle mode is optional mode..."

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

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 78 SC 78.1.3 P 235 L 12 # 181

Pillai, Velu Broadcom

Comment Type E Comment Status D
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.

Suggested Remedy

Proposed Response Response Status W
PROPOSED 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 D
After a a system specified recovery

Suggested Remedy
After a system specified recovery

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 78 SC 78.1.3 P 235 L 24 # 115

Zimmerman, George Solarflare Communications

Comment Type TR Comment Status D
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.

Suggested Remedy
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.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Open for Task Force discussion.
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.

**Suggested Remedy**

Add some informative text stating the above within Clause 78.

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.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

This should be discussed by the Task Force.

It looks like commenter assumes that PHY-to-MAC link is not in LPI mode. What if it is?
Comments on IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

Cl 78 SC 78.2.3 P 237 L 11 # 42
Dietz, Bryan Alcatel-Lucent
Comment Type E Comment Status D
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 xxMI interface and when the first codewords are permitted on the xxMI interface."
Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 78 SC 78.2.3 P 237 L 11 # 183
Pillai, Velu Broadcom
Comment Type E Comment Status D
Description for Tw_phy and Tw_sys looks very similar, except for Tw_sys > Tw_phy. Should we put more text to it?
SuggestedRemedy
Tw_sys and Tw_phy description seem to be distinguished enough but editor is open to improvements. Commenter to suggest remedy
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Cl 78 SC 78.3 P 237 L 24 # 117
Zimmerman, George Solarflare Communications
Comment Type ER Comment Status D
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
Proposed Response Response Status W
PROPOSED 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 D
Is there a reason for mentioning Clause 37 Auto Negotiation in 802.3az standard?
SuggestedRemedy

Proposed Response Response Status W
PROPOSED 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 # 188
Pillai, Velu Broadcom
Comment Type ER Comment Status D
1000-KX needs to be 1000BASE-KX.
Line numbers 32 and 35.
SuggestedRemedy

Proposed Response Response Status W
PROPOSED ACCEPT.
<table>
<thead>
<tr>
<th>Cl 78</th>
<th>SC 78.3</th>
<th>P 237</th>
<th>L 32</th>
<th># 12</th>
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<td>D'Ambrosia, John</td>
<td>Force10 Networks</td>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td><strong>Comment Status</strong></td>
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<tr>
<td>Name of &quot;1000-KX&quot;</td>
<td></td>
<td>This was found throughout repeated instances through clause 78</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td>should be &quot;1000BASE-KX&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Proposed Response</strong></td>
<td></td>
<td><strong>Response Status</strong></td>
<td>W</td>
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<th>SC 78.3</th>
<th>P 237</th>
<th>L 3234</th>
<th># 37</th>
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<td>Dietz, Bryan</td>
<td>Alcatel-Lucent</td>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td>Remove sentence &quot;DME provides a DC à to the network devices.&quot; EEE does not change the way backplane autonegotiation works and does not need to justify or explain technique used.</td>
<td></td>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td>Remove sentence &quot;DME provides a DC à to the network devices.&quot;</td>
</tr>
<tr>
<td><strong>Proposed Response</strong></td>
<td></td>
<td><strong>Response Status</strong></td>
<td>W</td>
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<th>SC 78.3</th>
<th>P 237</th>
<th>L 43</th>
<th># 118</th>
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<td>Zimmerman, George</td>
<td>Solarflare Communic</td>
<td><strong>Comment Type</strong></td>
<td>TR</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td>Autonegotiation is referenced, but the clauses aren't in the draft</td>
<td></td>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td>Need to define and add autonegotiation clauses</td>
</tr>
<tr>
<td><strong>Proposed Response</strong></td>
<td></td>
<td><strong>Response Status</strong></td>
<td>W</td>
<td></td>
</tr>
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<td><strong>PROPOSED ACCEPT IN PRINCIPLE.</strong></td>
<td></td>
<td></td>
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<th>SC 78.3</th>
<th>P 237</th>
<th>L 46</th>
<th># 43</th>
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<td>Alcatel-Lucent</td>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td>Missing word. Also add extra sentence for clarification.</td>
<td></td>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td>Add the word &quot;the&quot; to the end of the line. Should read &quot;without breaking the communication link&quot;. Add the following sentence to the end of the paragraph: &quot;Adjusting Tw_sys allows systems to support sleep modes that require longer times to wake up.&quot;</td>
</tr>
<tr>
<td><strong>Proposed Response</strong></td>
<td></td>
<td><strong>Response Status</strong></td>
<td>W</td>
<td></td>
</tr>
<tr>
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<th>SC 78.4</th>
<th>P 238</th>
<th>L 20</th>
<th># 47</th>
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<td><strong>Comment Type</strong></td>
<td>ER</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td>Add clarification per ad-hoc meeting.</td>
<td></td>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td>Insert new paragraph between last two paragraphs of this section. &quot;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.&quot;</td>
</tr>
<tr>
<td><strong>Proposed Response</strong></td>
<td></td>
<td><strong>Response Status</strong></td>
<td>W</td>
<td></td>
</tr>
<tr>
<td><strong>PROPOSED ACCEPT IN PRINCIPLE.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.


Comment Type: T  Comment Status: D  
Replace TBD with appropriate entry

Suggested Remedy:

Proposed Response  Response Status: W
PROPOSED 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.

Comment Type: E  Comment Status: D
Minor editorial tweak.

Suggested Remedy:

Proposed Response  Response Status: W
PROPOSED ACCEPT.

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."

Proposed Response  Response Status: W
PROPOSED ACCEPT.

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.

Suggested Remedy:

Proposed Response  Response Status: W
PROPOSED 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".

Proposed Response  Response Status: W
PROPOSED 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)"
"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.

Proposed Response

PROPOSED 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."
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.

Suggested Remedy

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:

$$\text{Resolved system } Tw = \min(\text{remote Rx } Tw, \max(\text{local Tx } Tw, \text{remote echo } Tx \ Tw) )$$

The only additional rule required is that the system shall not change a parameter unless the current local value matches the remote echoed value.

Proposed Response Response Status W

PROPOSED REJECT.

This issue has been discussed several times. In the January 2009 meeting this was brought up when the baseline was adopted and the group unanimously voted to go with the SM framework in the baseline. The L2 ad-hoc received the comment / presentation, heard the comment / presentation and overwhelmingly voted to stick with the SM framework when the straw poll was conducted.

The word "state" is misspelled in the table header.

Proposed Response Response Status W

PROPOSED ACCEPT.

The symbol in box on the left titled "remote change" seems to have been garbled. It is showing up as a question mark.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Good catch. The transfer process from PPT to FM garbled the symbols. This and other similar corrections were captured in the detailed review by the ad-hoc and will be presented in the report to the TF. In addition, the editorial team will convert the SMs to framemaker for future maintainability of the document.

The word "state" is misspelled in the table header.

Proposed Response Response Status W

PROPOSED ACCEPT.

... parameters for supported PHYs has an extra "s"

Proposed Response Response Status W

PROPOSED ACCEPT.

remove the extra "s"