Comments on IEEE P802.

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

Mar 2009

Cl 40 SC 40.4.2.4 P 103 L 42 # 1
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.

Cl 40 SC 40.6.1.2.6 P 110 L 48 # 2
McIntosh, James Vitesse

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

Suggested Remedy
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).

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 40 SC 40.4.6 P 108 L 25 # 3
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 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.

Cl 40 SC 40.1.3 P 90 L 10 # 4
McIntosh, James Vitesse

Comment Type TR Comment Status D
The signal loc_lpi_req should an input to the PCS Transmit function in Fig. 40-3 and Fig 40-5.

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

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 40 SC 40.3.1.3.4 P 98 L 46 # 5
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):

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

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 40 SC 40.3.3.1 P 100 L 4 # 6
McIntosh, James Vitesse

Comment Type TR Comment Status D
The variable rem_lpi_req values should be TRUE or FALSE, instead of ON or OFF.

Suggested Remedy
Change to "TRUE or FALSE".

Proposed Response Response Status W
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.
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.

**Suggested Remedy**

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

**PROPOSED ACCEPT.**

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 ACCEPT IN PRINCIPLE.**

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

**Suggested Remedy**

change "normal" to "non-EEE supported"

this should be repeated for any other instances.

**PROPOSED ACCEPT IN PRINCIPLE.**

Editor will re-write and not use normal or baseline.
Proposed Response

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

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-KX4 EEE, 10GBASE-KX4 EEE, 10GBASE-T EEE, 10GBASE-T EEE, 1000BASE-T EEE, 1000BASE-T 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.

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.

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE.

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.

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

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

PROPOSED ACCEPT.

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.

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

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

PROPOSED ACCEPT.

D'Ambrosia, John
Force10 Networks

Registrar: Rick
Broadcom

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

PROPOSED ACCEPT IN PRINCIPLE.

Tidstrom, Rick
Broadcom
**Comments on IEEE P802.**

**IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments**  
Mar 2009

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**Comment ID # 23**

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Tidstrom, Rick  
Broadcom

**Comment Type**  
ER

**Comment Status**  
D

**ipli_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.

**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**  
PROPOSED ACCEPT.

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**Comment ID # 24**

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Tidstrom, Rick  
Broadcom

**Comment Type**  
TR

**Comment Status**  
D

**lpi_wake_time**

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.

**Suggested Remedy**

- 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**  
PROPOSED ACCEPT IN PRINCIPLE.

---

**Comment ID # 25**

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Tidstrom, Rick  
Broadcom

**Comment Type**  
TR

**Comment Status**  
D

**lpi_wake_time**

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

**Suggested Remedy**

- 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.

**Proposed Response**  
PROPOSED ACCEPT.

See also comment #107

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**Comment ID # 26**

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Tidstrom, Rick  
Broadcom

**Comment Type**  
TR

**Comment Status**  
D

**wakeup_xgmii_signalling**

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

**Suggested Remedy**

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

  rx_raw <= I.

**Proposed Response**  
PROPOSED ACCEPT.

See also comment #107

---

**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:** Comment ID

**Page 5 of 45**
Comment ID # 27

**Comment Type**: TR

**Comment Status**: D

```
Tidstrom, Rick
Broadcom
```

**Comment**: 
```
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 transition condition from SEND_SLEEP to SENDQUIET, but is not defined anywhere within the standard.

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

**Suggested Remedy**: 
```
Add a definition of tx_lpi_full_refresh to sub-clause 55.3.5.2.2 as referenced on page 171, line 20.
```

**Proposed Response**: 
```
PROPOSED ACCEPT IN PRINCIPLE.
```

**Response Status**: W

Comment ID # 28

**Comment Type**: TR

**Comment Status**: D

```
Tidstrom, Rick
Broadcom
```

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

**Suggested Remedy**: 
```
Add transition from SEND_WAKE to SEND_ERROR with transition condition of:

lpi_wake_timer_done = false *

tx_lpi_error = true
```

**Proposed Response**: 
```
PROPOSED ACCEPT.
```

**Response Status**: W

Comment ID # 29

**Comment Type**: T

**Comment Status**: D

```
Kasturia, Sanjay
Teranetics
```

**Comment**: 
```
Replace TBD with appropriate entry
```

**Suggested Remedy**: 
```
PROPOSED ACCEPT IN PRINCIPLE.
```

**Proposed Response**: 
```
PROPOSED ACCEPT.
```

**Response Status**: W

Comment ID # 30

**Comment Type**: TR

**Comment Status**: D

```
Kasturia, Sanjay
Teranetics
```

**Comment**: 
```
Replace TBD with appropriate entry
```

**Suggested Remedy**: 
```
PROPOSED ACCEPT IN PRINCIPLE.
```

**Proposed Response**: 
```
PROPOSED ACCEPT.
```

**Response Status**: W

Comment ID # 31

**Comment Type**: T

**Comment Status**: D

```
Kasturia, Sanjay
Teranetics
```

**Comment**: 
```
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
```

**Suggested Remedy**: 
```
As per comment
```

**Proposed Response**: 
```
PROPOSED ACCEPT.
```

**Response Status**: W

Comment ID # 32

**Comment Type**: TR

**Comment Status**: D

```
Kasturia, Sanjay
Teranetics
```

**Comment**: 
```
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.
```

**Suggested Remedy**: 
```
As per comment
```

**Proposed Response**: 
```
PROPOSED ACCEPT.
```

**Response Status**: W

---

**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**: Comment ID
Comments on IEEE P802.
IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments Mar 2009

CI 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

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.

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.

CI 45  SC 45.2.3  P 116  L 25  # 35
Kasturia, Sanjay Teranetics

Comment Type ER  Comment Status D

Replace TBD with proper clause references

SuggestedRemedy

Proposed Response  Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Register 3.21 has been deleted, add clause number 45.2.3.9a

CI 49  SC 49.2.13.2.5  P 150  L 32  # 36
Wong, Don Cisco

Comment Type E  Comment Status D
WL should be subscript in TWL

SuggestedRemedy
Change WL of TWL to subscript

Proposed Response  Response Status W
PROPOSED ACCEPT.

CI 78  SC 78.3  P 237  L 3234  # 37
Dietz, Bryan Alcatel-Lucent

Comment Type T  Comment Status D

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."

Proposed Response  Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

See response to comment #117.
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

Improve grammar

Adjusting Tw_sys allows systems to support sleep modes that require longer times to wake up.

PROPOSED ACCEPT IN PRINCIPLE.
**Proposed Response**

Change "following" to "after leaving" and "Low Power Idle" to "Low Power Idle mode".

**PROPOSED ACCEPT.**

---

**Proposed Response**

Rephrase last sentence for clarity.

"The Transmitting link partner expects that the Receiving link partner will be able to accept data after the time delay Transmit Tw_sys."

**PROPOSED ACCEPT IN PRINCIPLE.**

---

**Proposed Response**

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.

**PROPOSED 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.
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 receive 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 xMII) 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."
Change indications are missing even though PCT1a is new to EEE.

Proposed Response
Add change indications for PCT1a table entry.

PROPOSED ACCEPT.

PICs identifier PCT15d is repeated.

Proposed Response
Change to PCT15e and renumber/letter subsequent entries.

PROPOSED ACCEPT.

Typo.

Proposed Response
Change 7.63 us to 7.36 us.

PROPOSED ACCEPT.

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

Proposed Response
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.

PROPOSED ACCEPT IN PRINCIPLE.
Proposed Response

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.

Comment Type: T  Comment Status: D

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

Suggested Remedy

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.

PROPOSED 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.

Comment Type: T  Comment Status: D

The precise conditions for setting rx_lpi_req require clarification.

Suggested Remedy

Change:

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.

To:

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.

PROPOSED 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 49  SC 49.2.13.2.3  P 148  L 1  # 56
Grimwood, Mike Broadcom
Comment Type: T  Comment Status: D

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);"

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

- \( R_{\text{BLOCK\_TYPE}} = \text{LI} \)
- \( R_{\text{BLOCK\_TYPE}} = \text{I} \)
- \( T_{\text{BLOCK\_TYPE}} = \text{LI} \)
- \( T_{\text{BLOCK\_TYPE}} = \text{I} \)

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 \( R_{\text{BLOCK\_TYPE}} \) and \( T_{\text{BLOCK\_TYPE}} \) (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 0x1e, and eight control characters of 0x06 (/LI/).

**Proposed Response**

PROPOSED ACCEPT.
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<td>#61</td>
<td>55</td>
<td>169</td>
<td>45</td>
<td>T</td>
<td>D</td>
<td>Grimwood, Mike Broadcom</td>
<td>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.</td>
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<td>30</td>
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<td>X</td>
<td>Grimwood, Mike Broadcom</td>
<td>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.</td>
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<td>D</td>
<td>Healey, Adam LSI Corporation</td>
<td>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 &quot;wake error counter&quot; 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.</td>
</tr>
<tr>
<td>#64</td>
<td></td>
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<td>T</td>
<td>O</td>
<td></td>
<td>Introduce changes to count 100BASE-TX LPI wake failures and to defer the transition to RX_LPI_LINK_FAIL following the including:</td>
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<td></td>
<td>Change Figure 24-11b introducing the timer lpi_link_fail_timer for the transition from RX_WAKE to RX_LPI_LINK_FAIL.</td>
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<td></td>
<td>Introduce lpi_link_fail_timer with a value of 90 us to 110 us.</td>
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<td></td>
<td>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.</td>
</tr>
<tr>
<td>#128</td>
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<td>T</td>
<td>O</td>
<td></td>
<td>Delete the definition of the lpi_fail_timer and its associated uses in the LPI Receive state diagram. Delete the definition of the variable rx_lpi_fail and the associated assignments in the LPI Receive state diagram. Delete the RX_LINK_FAIL state. 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 presumabably false since isignal_ok is TRUE, and hence has the same effect as entering the old RX_LINK_FAIL state. 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. 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 &quot;+ lpi_link_fail_timer_done&quot; to the transition from RX_WAKE to RX_ACTIVE.</td>
</tr>
</tbody>
</table>
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).

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<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
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<tbody>
<tr>
<td>72</td>
<td>SC 72.1</td>
<td>217</td>
<td>37</td>
<td>65</td>
</tr>
</tbody>
</table>

Healey, Adam  
LSI Corporation

Comment Type: E  
Comment Status: D

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"?

Suggested Remedy:  
Per comment.

PROPOSED ACCEPT IN PRINCIPLE.

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

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<tr>
<th>Cl</th>
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<tbody>
<tr>
<td>72</td>
<td>SC 72.3a</td>
<td>217</td>
<td>9</td>
<td>64</td>
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</table>

Healey, Adam  
LSI Corporation

Comment Type: T  
Comment Status: D

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.

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

PROPOSED ACCEPT IN PRINCIPLE.

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.

PROPOSED ACCEPT.

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<td>72</td>
<td>SC 72.3b</td>
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<td>41</td>
<td>66</td>
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</tbody>
</table>

Healey, Adam  
LSI Corporation

Comment Type: T  
Comment Status: D

Define relevant Clause 51 PMA requirements in Clause 51.

Suggested Remedy:
Delete 72.3b.

PROPOSED ACCEPT IN PRINCIPLE:
This section may be deleted, but there may not be any requirements added to Clause 51.
Comments on IEEE P802.

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 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 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 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.

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 criteria of 72.6.4b.

Proposed Response
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 Response
PROPOSED ACCEPT IN PRINCIPLE.

May not need these any longer if training frames not used.
Cl 72 SC 72.6.11.3.1 P 223 L 7 # 73
Healey, Adam LSI Corporation
Comment Type T Comment Status D
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 Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Cl 72 SC 72.6.11.3.1 P 222 L 52 # 74
Healey, Adam LSI Corporation
Comment Type T Comment Status D
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 Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Pending acceptance by TF for replacing Training frames for refresh & wake.

Cl 72 SC 72.6.4a P 218 L 39 # 75
Healey, Adam LSI Corporation
Comment Type T Comment Status D
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.
Suggested Remedy
Re-arrange to correctly describe the desired behavior.
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Cl 72 SC 72.6.11.2 P 221 L 43 # 76
Healey, Adam LSI Corporation
Comment Type T Comment Status D
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 Response Status W
PROPOSED ACCEPT.

Cl 72 SC 72.6.10.1 P 219 L 35 # 77
Healey, Adam LSI Corporation
Comment Type E Comment Status D
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.

Cl 49 SC 49.2.13.3 P 152 L 28 # 78
Healey, Adam LSI Corporation
Comment Type T Comment Status D
In Figure 49-15, the transition condition from RX_D to RX_E should include LI since it is not included in C.
Suggested Remedy
Change transition condition from RX_D to RX_E to be: (...)+R_TYPE(rx_coded) = (E + C + S + LI)
Proposed Response Response Status W
PROPOSED ACCEPT.
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.

PROPOSED ACCEPT IN PRINCIPLE.
See #120

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.

Suggested Remedy
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 ACCEPT IN PRINCIPLE.
See #165

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.

Suggested Remedy
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 ACCEPT IN PRINCIPLE.
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).

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

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

PROPOSED 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 49.2.13.3.1 P 153 L 6 # 85
Healey, Adam LSI Corporation
Comment Type E Comment Status D
In Figure 49-16, replace "<=" with the appropriate symbol. Check arrowheads for the consistent use of the correct size.
SuggestedRemedy Per comment.
Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 49 SC 49.2.13.3.1 P 153 L 3 # 86
Healey, Adam LSI Corporation
Comment Type E Comment Status D
In Figure 49-17, replace "<=" with the appropriate symbol. Check arrowheads for the consistent use of the correct size.
SuggestedRemedy Per comment.
Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 49 SC 49.2.13.3.1 P 154 L 18 # 88
Healey, Adam LSI Corporation
Comment Type T Comment Status D
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".
Proposed Response Response Status W
PROPOSED ACCEPT.
Comment ID: 90

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

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.

**Healey, Adam LSI Corporation**

**Proposed Response**

PROPOSED ACCEPT.

---

Comment ID: 91

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

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.

**Suggested Remedy**

Per comment.

**Proposed Response**

PROPOSED ACCEPT.

---

Comment ID: 92

**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 49-3 be reduced to a single value.

**Suggested Remedy**

Per comment.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

See #129
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.

Proosed Response Response Status W PROPOSED ACCEPT.

SuggestedRemedy
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 a 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.

Proposed Response Response Status W PROPOSED ACCEPT IN PRINCIPLE.

Comment Type T Comment Status D

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)

Proposed Response Response Status W PROPOSED ACCEPT.
<table>
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<th>Comment #</th>
<th>CL 55 SC 55.3.2.2.10</th>
<th>P 166</th>
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<th>P 176</th>
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<td>55-16 and 55-17 are in the wrong order</td>
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<td>PROPOSED ACCEPT.</td>
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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, bringing the LPI period to an end.

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

PROPOSED ACCEPT IN PRINCIPLE.

We need to take care with the no partial refreshes requirement in this case.
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<th>#</th>
<th>Comment ID</th>
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<th>Comment Status</th>
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<td></td>
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<td></td>
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<td>TR</td>
<td>D</td>
<td>alert_timing</td>
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<tr>
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<td>TR</td>
<td>D</td>
<td>alert_timing</td>
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<tr>
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<td></td>
<td>TR</td>
<td>D</td>
<td>alert_timing</td>
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Comment 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: Comment ID
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<th>Comment</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>14</td>
<td>25</td>
<td>51</td>
<td>D</td>
<td>T</td>
<td>marking 10BASE-T or 10BASE-Te support precludes devices that support both</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>112</td>
<td>25</td>
<td>60</td>
<td>51</td>
<td>D</td>
<td>ER</td>
<td>TP-TMD typo, should be TP-PMD</td>
<td>replace with TP-PMD (2 instances)</td>
<td>PROPOSED ACCEPT.</td>
</tr>
<tr>
<td>113</td>
<td>78</td>
<td>233</td>
<td>11</td>
<td>D</td>
<td>TR</td>
<td>&quot;optional operational mode&quot;. 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 &quot;optional operational mode&quot;. In this clause, it is not. To be compliant with Clause 78 EEE is a required operational mode.</td>
<td>delete the word optional</td>
<td>PROPOSED ACCEPT.</td>
</tr>
<tr>
<td>114</td>
<td>78</td>
<td>233</td>
<td>11</td>
<td>D</td>
<td>ER</td>
<td>Is &quot;low power idle mode&quot; supposed to be a subset of &quot;Energy Efficient Ethernet mode&quot;? If so, what else does &quot;energy efficient ethernet mode&quot; contain? It seems that two terms are being used for substantially the same purpose.</td>
<td>clarify the difference or converge the terminology</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
</tr>
<tr>
<td>115</td>
<td>78</td>
<td>235</td>
<td>24</td>
<td>D</td>
<td>TR</td>
<td>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.</td>
<td>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.</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
</tr>
</tbody>
</table>
The list of effected IEEE standards is incomplete.

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

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

EEE does not define new operational modes for XMII/GMII/MII.

No need to revisit the technical mechanisms for autoneg. It creates synchronous maintenance issues later.

- Proposed Remedy: delete descriptions of how autoneg is done for the various clauses

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.

Autonegotiation is referenced, but the clauses aren't in the draft.

- Proposed Remedy: Need to define and add autonegotiation clauses

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

- Proposed Remedy: Underline the paragraph starting "If the optional Low Power Idle..."
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Client</th>
<th>Subclause</th>
<th>Page</th>
<th>Line</th>
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<tr>
<td>123</td>
<td>Barrass, Hugh</td>
<td>72.3a</td>
<td>217</td>
<td>27</td>
<td>E</td>
<td>D</td>
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<tr>
<td>124</td>
<td>Barrass, Hugh</td>
<td>72.3a</td>
<td>217</td>
<td>22</td>
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<td>D</td>
<td>PROPOSED ACCEPT.</td>
</tr>
<tr>
<td>125</td>
<td>Barrass, Hugh</td>
<td>49.2.13.2.2</td>
<td>149</td>
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<td>T</td>
<td>D</td>
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</tr>
<tr>
<td>126</td>
<td>Barrass, Hugh</td>
<td>49.2.13.2.6</td>
<td>150</td>
<td>43</td>
<td>T</td>
<td>D</td>
<td>PROPOSED ACCEPT.</td>
</tr>
</tbody>
</table>

**Comment #123**

Change to TXQUIET

**Comment #124**

**BP training**

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

**Comment #125**

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

**Comment #126**

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

**Response Status** W

PROPOSED ACCEPT.

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

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT.

Note also register 7.64
<table>
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<td>49</td>
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<td>146</td>
<td>38</td>
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<td>D</td>
<td><strong>BP training</strong></td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
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<td></td>
<td>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.</td>
<td>W</td>
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<td></td>
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<td></td>
<td>Add variables scrambler_reset and scrambler_reset_enable.</td>
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<td></td>
<td>Add a message FEC_SCRAMBLER_RESET.</td>
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<td></td>
<td>Change tx_tw_timer_timer definition to Twl - 1 uS.</td>
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</tbody>
</table>

**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.

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.

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.

<table>
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<tr>
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<td>52</td>
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<td><strong>BP training</strong></td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
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<td>Scrambler reset will be driven by an explicit signal, reword the paragraph.</td>
<td>W</td>
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<td>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.</td>
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<td></td>
<td>Change tx_tw_timer_timer definition to Twl - 1 uS.</td>
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<table>
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<td>132</td>
<td>49</td>
<td>49.2.13.2.6</td>
<td>150</td>
<td>38</td>
<td>132</td>
<td>T</td>
<td>D</td>
<td>The messages PMD_RXQUIET &amp; PMD_TXQUIET are mis-named. They need to go through the PMA.</td>
<td>PROPOSED ACCEPT</td>
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<td>Change the names to</td>
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<td>PMA_RXQUIET &amp; PMA_TXQUIET</td>
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<td></td>
<td></td>
<td></td>
<td>Change PCS/PMA to PCS (2 instances) and PMD to PMA/PMD (2 instances)</td>
<td></td>
</tr>
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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: Comment ID**
Cl  51  SC  51  P 157  L 54  # 133
Barrass, Hugh  Cisco
Comment Type  T  Comment Status  D
Comment
The messages PMD_RXQUIET & PMD_TXQUIET need to pass through the PMA & go to the PMA.

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

Suggested Remedy
Edit clause 51 to pass the messages through.

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl  74  SC  74  P 232  L 54  # 134
Barrass, Hugh  Cisco
Comment Type  T  Comment Status  D
**BP training**
The FEC clause needs editing to support LPI.

Messages must pass through and block lock must be edited.

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

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl  72  SC  72.3b  P 218  L 16  # 136
Barrass, Hugh  Cisco
Comment Type  T  Comment Status  D
**BP training**
There is no register in the PMD space for LPI status

Suggested Remedy
Delete LPI status indication row in Table 72-3

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl  72  SC  72.6.4a  P 218  L 39  # 137
Barrass, Hugh  Cisco
Comment Type  T  Comment Status  D
**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 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 Deassertion Threshold of VSD as specified in Table 72-9

Proposed Response  Response Status  W
PROPOSED REJECT.

VSA and TSA were voted out of the spec. See comment #179.
IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

Cl. 72 SC 72.6.5 P 219 L 19 # 138
Barrass, Hugh Cisco
Comment Type T Comment Status D
**BP training**
Transmit should be disabled by tx_quiet.
Suggested Remedy
Change bullet item d)
Replace tx_disable with tx_quiet.
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Cl. 72 SC 72.6.10 P 219 L 28 # 139
Barrass, Hugh Cisco
Comment Type T Comment Status D
**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.

Cl. 72 SC 72.6.11.1 P 221 L 32 # 140
Barrass, Hugh Cisco
Comment Type T Comment Status D
**BP training**
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 Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Section 72.6.11 to be moved into 72.6.10.

Cl. 72 SC 72.6.11.2 P 221 L 41 # 141
Barrass, Hugh Cisco
Comment Type T Comment Status D
**BP training**
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 Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Pending acceptance by TF.
**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 Response**

Response Status: W

PROPOSED ACCEPT IN PRINCIPLE.

Pending acceptance by TF for new method.

---

**Comment Type**

T

**Comment Status**

D

**Comment**

There is no register in the PMD space for LPI status

**Suggested Remedy**

Delete LPI status indication row in Table 71-3

**Proposed Response**

Response Status: W

PROPOSED ACCEPT.

Note also register 7.64

---

**Comment Type**

T

**Comment Status**

D

**Comment**

There is no register in the PMD space for LPI status

**Suggested Remedy**

Delete LPI status indication row in Table 70-3

**Proposed Response**

Response Status: W

PROPOSED ACCEPT.

Note also register 7.64
<table>
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<td>#</td>
<td>147</td>
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<td>Barrass, Hugh</td>
<td>Cisco</td>
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**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.

**Suggested Remedy**

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**

PROPOSED ACCEPT.

---

<table>
<thead>
<tr>
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<td>#</td>
<td>148</td>
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<tr>
<td>Barrass, Hugh</td>
<td>Cisco</td>
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**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.

**Suggested Remedy**

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**

PROPOSED ACCEPT IN PRINCIPLE. Pending acceptance of this new proposal from TF.

---

<table>
<thead>
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<td>149</td>
</tr>
<tr>
<td>Barrass, Hugh</td>
<td>Cisco</td>
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</tbody>
</table>

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

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**

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.

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<table>
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<tr>
<td>CI</td>
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</tr>
<tr>
<td>Bennett, Michael</td>
<td>LBNL</td>
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</table>

**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**

PROPOSED ACCEPT.
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 ACCEPT.

Comment Status D
Response Status W

---

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.

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

PROPOSED ACCEPT IN PRINCIPLE.

---

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 ACCEPT IN PRINCIPLE.

Also change reference to a link.
Comment Type: T
Comment Status: D

Cl22 SC22.7a.2.2 P34 L37 #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.

---

Comment Type: TR
Comment Status: D

Cl78 SC4 P238 L9 #159
Diab, Wael Broadcom

Comment Type: TR
Comment Status: D

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.

Suggested Remedy:
- Please change "The Data Link Layer capabilities are optional for all devices." to "The Data Link Layer capabilities shall be implemented for devices that are 10 Gbps or high.
  The Data Link Layer capabilities are optional for all devices and may be implemented."

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

Change "The Data Link Layer capabilities are optional for all devices." TO "The data link layer capabilities are optional and may be implemented for backplane devices, devices where the negotiated link speed is 10 Mbps, devices where the negotiated link speed is 100 Mbps and devices where the negotiated link speed is 1000 Mbps. The data link layer capabilities are mandatory and shall be implemented for all other devices."

---

Comment Type: E
Comment Status: D

Cl49 SC49.2.13.2.2 P149 L22 #160
Koenen, David Hewlett Packard

Comment Type: E
Comment Status: D

Typo in 1st paragraph "used to by"

Suggested Remedy:
- "used by"

Proposed Response:
Response Status: W
PROPOSED ACCEPT.
Comments on IEEE P802.

**Cl 49** SC 49.2.13.2.5 P 150 L 32 # 161
Koenen, David Hewlett Packard

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

subscript needed on TWL

**Suggested Remedy**

Change WL to subscript.

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

PROPOSED ACCEPT.

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

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

change value of rx_quiet from true to TRUE

**Suggested Remedy**

to TRUE.

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

PROPOSED ACCEPT.

**Cl 49** SC 49.2.13.2.5 P 150 L 2 # 163
Koenen, David Hewlett Packard

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

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 Response** **Response Status** W

PROPOSED ACCEPT.

**Cl 00** SC 0 P L # 164
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.

**Suggested Remedy**

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 49** SC 49.2.12.2.2 P 149 L 30 # 165
Koenen, David Hewlett Packard

**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 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 36** SC 36.2.5.1.3 P 76 L 40 # 166
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 tx_quiet & rx_quiet.

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

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.

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.
### Comments on IEEE P802.

<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>171</td>
<td>T</td>
<td>D</td>
<td>Delete it.</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>172</td>
<td>TR</td>
<td>D</td>
<td>Modify state diagram to remove training and just enable/disable transmitter where appropriately directed by tx_quiet.</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Pending acceptance of this by the TF.</td>
<td></td>
</tr>
<tr>
<td>174</td>
<td>TR</td>
<td>D</td>
<td>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.</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Pending acceptance of this by TF.</td>
<td></td>
</tr>
</tbody>
</table>

**Comment ID # 171**

PMD_RXALERT.indication(rx_alert) is not needed anymore.

**Proposed Response**

Delete it.

**Response Status**

W

---

**Comment ID # 172**

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

**Proposed Response**

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

**Response Status**

W

---

**Comment ID # 174**

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.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE. Pending acceptance of this by TF.
Proposed Response

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

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

PROPOSED ACCEPT IN PRINCIPLE.
Pending acceptance of this new method of refresh and wake.

Proposed Response

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

Suggested Remedy
Remove definitions from 72.6.10.2.4.4a - 72.6.10.2.4.5

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

Proposed Response

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

Suggested Remedy
Word "state" will be added after "Active_st"

Proposed Response

After a system specified recovery

Suggested Remedy
After a system specified recovery

PROPOSED ACCEPT.
Comments on IEEE P802.

IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments
Mar 2009

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?

Suggested Remedy

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Tw_sys and Tw_phy description seem to be distinguished enough but editor is open to improvements. Commenter to suggest remedy

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?

Suggested Remedy

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 78.2.2 P 236 L 48 # 185
Pillai, Velu Broadcom

Comment Type E Comment Status D
Please fix the tab for the text.

Suggested Remedy

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 45 SC 45.2.3.2 P 118 L 26 # 186
Pillai, Velu Broadcom

Comment Type E Comment Status D
1 = Tx PPCS is currently receiving LP idle

Suggested Remedy

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 78 SC 78.2.3 P 237 L 12 # 187
Pillai, Velu Broadcom

Comment Type ER Comment Status D
when first codewords are permitted on the xxMII interface

Suggested Remedy

Proposed Response Response Status W
PROPOSED ACCEPT.

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.

Suggested Remedy

Proposed Response Response Status W
PROPOSED ACCEPT.
Comments on IEEE P802.

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

Mar 2009

Cl 70  SC 70.5  P 200  L  # 189
Pillai, Velu  Broadcom

Comment Type  T  Comment Status  D

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?

Suggested Remedy

Proposed Response  Response Status  W

Proposed ACCEPT IN PRINCIPLE.

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

Cl 72  SC 72.6.11.3.3  P 224  L  # 190
Pillai, Velu  Broadcom

Comment Type  T  Comment Status  D

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.

Suggested Remedy

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

Proposed Response  Response Status  W

PROPOSED REJECT.

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

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"

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

Comment Type  TR  Comment Status  D

Register/bit number : 1.1.3
But it should be 3.1

Suggested Remedy

Proposed Response  Response Status  W

PROPOSED ACCEPT.

The TX and RX state diagrams may be entirely deleted if training frames not use.
Comments on IEEE P802.

Proposed Response

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
LP Idle state indication Status register 1 3.1 PCS_LPI_active
Proposed Response Response Status W
PROPOSED ACCEPT.

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
SuggestedRemedy
LP Idle state indication Status register 1 3.1 PCS_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.

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.

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 70 SC 70.7.1 P 203 L 18 # 198
Pillai, Velu Broadcom
Comment Type TR Comment Status D
Table 70-4 should have the values from pillai_02_0109 (Motion #4).

SuggestedRemedy

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 00 SC P L # 199
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 71.6.4a Table 71.6

SuggestedRemedy

Proposed Response Response Status W
PROPOSED ACCEPT.
Proposed Response

Comment 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: Comment ID

Comment ID #  200
Page 43 of 45  3/3/2009  10:41:54 PM
CL 49  SC  Fig 49-15  P 152  L 1  # 204

Comment Type  TR  Comment Status  D

Pillai, Velu  Broadcom

Comment Type  TR  Comment Status  D

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.

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 rx_lpi_mode.

Proposed Response  Response Status  W

PROPOSED REJECT.

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

CL 49  SC  Fig 49-17  P 154  L 1  # 205

Pillai, Velu  Broadcom

Comment Type  T  Comment Status  D

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  Response Status  W

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

CL 48  SC  Fig 48-9  P 137  L 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 LPI 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
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

Suggested Remedy

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

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

Proposed Response

PROPOSED ACCEPT.

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.

Suggested Remedy

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

Proposed Response

For discussion at Task force meeting