The EEE PHY requirements need to consider 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.

Response

REJECT.

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

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

Regarding (1)

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

Regarding (2)

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

Regarding (3), please share any data or specifications you may have on clock drift.
<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>A</td>
<td>Please update the revision history or delete it</td>
<td>Accept in principle.</td>
<td>C</td>
</tr>
<tr>
<td>T</td>
<td>A</td>
<td>marking 10BASE-T or 10BASE-Te support precludes devices that support both</td>
<td>Accept.</td>
<td>C</td>
</tr>
<tr>
<td>E</td>
<td>A</td>
<td>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.</td>
<td>Accept in principle.</td>
<td>C</td>
</tr>
<tr>
<td>T</td>
<td>A</td>
<td>The sentence refers to a definition in clause 78:</td>
<td>Accept in principle.</td>
<td>C</td>
</tr>
</tbody>
</table>

**Comment Status:** A/accepted  R/rejected  C/closed  Z/withdrawn

**Response Status:** O/open  W/written  C/closed  U/unsatisfied
**Comment**

**Comment Type**: T

**Comment Status**: A

**tw_timer**

A timer that counts, in microseconds, the time expired since the deassertion of LPI. The terminal count of the timer is the value of the Resolved Transmit Tw as defined in 78.4.2.3. Resolved Transmit definition is in subclause 78.4.1.4

**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.

**Response**

**Response Status**: C

ACCEPT IN PRINCIPLE.

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

---

**Comment**

**Comment Type**: T

**Comment Status**: A

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

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

**Response**

**Response Status**: C

ACCEPT IN PRINCIPLE.

The following changes will be made:

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

Note: The timer in the last sentence above has been listed incorrectly and should be "lpi_rx_tw_timer"
IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

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

Comment Type ER    Comment Status A
TP-TMD typo, should be TP-PMD

SuggestedRemedy
replace with TP-PMD (2 instances)

Response    Response Status C
ACCEPT.

Cl 35    SC 35.2.2.4    P 69    L 12    # 150
Pillai, Velu    Broadcom

Comment Type E    Comment Status A
signalled

SuggestedRemedy
signaled

Response    Response Status C
ACCEPT.

Cl 36    SC 36.2.5.1.3    P 76    L 40    # 165
Koenen, David    Hewlett Packard

Comment Type T    Comment Status A
rx_lpi_mode and tx_lpi_mode are not used to set or control any feature or function.

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

Response    Response Status C
ACCEPT IN PRINCIPLE.

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

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

Cl 36    SC 36.2.5.2.8    P 86    L 16    # 84
Healey, Adam    LSI Corporation

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

SuggestedRemedy
Per comment.

Response    Response Status C
ACCEPT IN PRINCIPLE.

Refer to #146

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

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

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

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

Response    Response Status C
ACCEPT.

Note also register 7.64
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Page</th>
<th>L</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>36</td>
<td>80</td>
<td>1</td>
<td>TR</td>
<td>R</td>
<td>LP_IDLE and LPI_K needs to see continuous <code>detect_lpidle</code> in the state machine.</td>
<td>Staying in these state needs to be qualified with <code>rx_lpi_mode</code>.</td>
<td>REJECT.</td>
<td>WITHDRAWN</td>
</tr>
<tr>
<td>40</td>
<td>40</td>
<td>98</td>
<td>46</td>
<td>TR</td>
<td>A</td>
<td>loc_lpi_req should be an input to the PCS Transmit function in Fig. 40-3 and Fig 40-5.</td>
<td>Add dashed line for loc_lpi_req as an input to the PCS Transmit function in Fig. 40-3 and Fig 40-5.</td>
<td>ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>40</td>
<td>100</td>
<td>4</td>
<td>TR</td>
<td>A</td>
<td>rem_lpi_req values should be TRUE or FALSE, instead of ON or OFF.</td>
<td>Change to &quot;TRUE or FALSE&quot;.</td>
<td>ACCEPT.</td>
<td></td>
</tr>
</tbody>
</table>

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

Rx_lpi_mode is deleted by #166.

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

Change PMA_RXSTATUS.indication (NOT_OK) to (PMA_RXSTATUS.indication (NOT_OK) * lpi_mode=OFF). ACCEPT.
## Comments & responses

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

**Mar 2009**

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>40.4.2.4</td>
<td>ER</td>
<td></td>
<td>Typo: &quot;acheived&quot; should be &quot;achieved&quot;.</td>
<td>Change to &quot;achieved&quot;.</td>
</tr>
<tr>
<td>40</td>
<td>40.4.6</td>
<td>T</td>
<td></td>
<td>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.</td>
<td>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 &quot;stop lpi_wake_timer&quot; command in the SEND IDLE OR DATA state as this is handled in the UPDATE state.</td>
</tr>
<tr>
<td>45</td>
<td>45.2.3</td>
<td>ER</td>
<td></td>
<td>Replace TBD with proper clause references</td>
<td></td>
</tr>
</tbody>
</table>

**Response**

**Response Status**

- **A** - Accepted
- **C** - Closed
- **O** - Open
- **W** - Written
- **R** - Rejected
- **Z** - Withdrawn

**Comment Status**

- **A** - Accepted
- **D** - Dispatched
- **M** - Main
- **N** - Note
- **P** - Preliminary
- **R** - Rejected
- **S** - Suggestion
- **U** - Unsatisfied
- **Z** - Withdrawn

**Type**

- **TR** - Technical Required
- **ED** - Editorial Required
- **GR** - General Required

**Sort Order**

- **Clause, Subclause, page, line**
Comment Type: E  Comment Status: A

Table 45-1

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

Suggested Remedy

Register 3.21 should be removed from the table.

Response

Response Status: C

ACCEPT.

---

Comment Type: TR  Comment Status: A

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

Suggested Remedy

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

Response

Response Status: C

ACCEPT IN PRINCIPLE.

---

Comment Type: E  Comment Status: A

1 = Tx PCS is currently receiving LP idle

Suggested Remedy

1 = Tx PCS is currently receiving LP idle

Response

Response Status: C

ACCEPT.

---

Comment Type: ER  Comment Status: R

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

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

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

Suggested Remedy

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

Response

Response Status: C

REJECT.

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

---

Comment Type: E  Comment Status: D

Replace TBD by proper reference

Suggested Remedy

Proposed Response

Response Status: W

PROPOSED ACCEPT IN PRINCIPLE.

Change references to links
IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

**Comment**

Cl 46 SC 46 P126 L 10 # 15

D’Ambrosia, John Force10 Networks

**Comment Type** E

**Comment Status** A

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

**Suggested Remedy**

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

**Response**

Response Status C

ACCEPT.

Cl 46 SC 46.3.1.5a P127 L 45 # 21

Tidstrom, Rick Broadcom

**Comment Type** ER

**Comment Status** A

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

**Suggested Remedy**

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

**Response**

Response Status C

ACCEPT IN PRINCIPLE.

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

Cl 46 SC 46.3.2.4a P130 L 6 # 22

Tidstrom, Rick Broadcom

**Comment Type** ER

**Comment Status** A

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

**Suggested Remedy**

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

**Response**

Response Status C

ACCEPT IN PRINCIPLE.

Change to RXD

as for #21

Cl 48 SC 48.2.6.1.3 P135 L 46 # 167

Koenen, David Hewlett Packard

**Comment Type** T

**Comment Status** A

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

**Suggested Remedy**

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

**Response**

Response Status C

ACCEPT IN PRINCIPLE.

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

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

Cl 48 SC 48.2.6.2.5 P143 L 17 # 145

Barrass, Hugh Cisco

**Comment Type** T

**Comment Status** A

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

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

**Suggested Remedy**

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

**Response**

Response Status C

ACCEPT.

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

**Suggested Remedy**
Per comment.

**Response**

**Response Status** C

**ACCEPT IN PRINCIPLE.**

See #145

---

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 ôrx_lpi_modeö.

**Response**

**Response Status** C

REJECT.

This comment was WITHDRAWN by the commenter.
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.

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.

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

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

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

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

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

---

**BP training**

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

**Suggested Remedy**

Replace:

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

with:

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

**Response**

ACCEPT IN PRINCIPLE.

---

Replace:

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

with:

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

**Response**

ACCEPT IN PRINCIPLE.

---

Replace:

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

with:

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

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

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

**Response**
Accept in principle.

---

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);"

**Response**
Accept.

---

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.

**Response**
Accept.

---

The vector contains one of the following:

- eight valid control characters other than /O/, /S/, /T/, /E/ and /LI/ (note that /LI/ is only excluded if the optional Low Power Idle function is supported);

**Suggested Remedy**
To:

- eight valid control characters other than /O/, /S/, /T/, /E/ and all eight of which are not /LI/ (note that the eight /LI/ characters are only excluded if the optional Low Power Idle function is supported);

**Response**
Accept.

---

The vector contains one of the following:

- eight valid control characters other than /O/, /S/, /T/, /E/ and all eight of which are not /LI/ (note that the eight /LI/ characters are only excluded if the optional Low Power Idle function is supported);

**Response**
Accept.

---

Pillai, Velu
Broadcom

NUM: 201
Cl 49 SC 49.2.13.2.3 P 148 L 1

Comment Type T
Comment Status A

For T_BLOCK_TYPE
change:

C; The vector contains one of the following:

- eight valid control characters other than /O/, /S/, /T/, /E/ and /LI/ (note that /LI/ is only excluded if the optional Low Power Idle function is supported);

**Suggested Remedy**

To:

- eight valid control characters other than /O/, /S/, /T/, /E/ and all eight of which are not /LI/ (note that the eight /LI/ characters are only excluded if the optional Low Power Idle function is supported);

**Response**
Accept.

---

Koenen, David
Hewlett Packard

NUM: 163
Cl 49 SC 49.2.13.2.5 P 150 L 2

Comment Type ER
Comment Status A

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

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

**Response**
Accept.

---

Pillai, Velu
Broadcom

NUM: 201
Cl 49 SC 49.2.13.2.3 P 148 L 1

Comment Type T
Comment Status A

For T_BLOCK_TYPE
change:

C; The vector contains one of the following:

- eight valid control characters other than /O/, /S/, /T/, /E/ and /LI/ (note that /LI/ is only excluded if the optional Low Power Idle function is supported);

**Suggested Remedy**

To:

- eight valid control characters other than /O/, /S/, /T/, /E/ and all eight of which are not /LI/ (note that the eight /LI/ characters are only excluded if the optional Low Power Idle function is supported);

**Response**
Accept.

---
Comment Type: E
Comment Status: A

Koenen, David
Hewlett Packard

subscript needed on TWL

Suggested Remedy
Change WL to subscript.

Response
Response Status: C
ACCEPT.

Comment Type: E
Comment Status: A

Wong, Don
Cisco

WL should be subscript in TWL

Suggested Remedy
Change WL of TWL to subscript

Response
Response Status: C
ACCEPT.

Comment Type: T
Comment Status: A

Healey, Adam
LSI Corporation

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.

Response
Response Status: C
ACCEPT IN PRINCIPLE.

See #132, #133

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

Comment Type: T
Comment Status: A

Barrass, Hugh
Cisco

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).

Response
Response Status: C
ACCEPT.

Also see response to comment #133
<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BP training</strong></td>
<td>A</td>
<td>Without training frames, there is no need to signal REFRESH/WAKE. Change tx_quiet definition to match other clauses.</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td><strong>BP training</strong></td>
<td>A</td>
<td>Delete sentence starting &quot;When REFRESH or WAKE this indicates...&quot;</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td><strong>BP training</strong></td>
<td>A</td>
<td>Change states TX_REFRESH &amp; TX_WAKE both terms should read &quot;tx_quiet &lt;= false&quot;</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td><strong>BP training</strong></td>
<td>A</td>
<td>In Figure 49-14, the transition condition from TX_D to TX_E should include LI since it is not included in C.</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td><strong>BP training</strong></td>
<td>A</td>
<td>The state diagram will not transition out of the RX_T state so long as R_TYPE(rx_coded) = LI.</td>
<td>ACCEPT.</td>
</tr>
</tbody>
</table>

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 TX_T state so long as T_TYPE(tx_raw) = LI.

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

Response
Response Status: C
ACCEPT.

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

Only 1 state is added - singular

Suggested Remedy
Change "are" to "is"

Response
Response Status: C
ACCEPT.

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.

Response
Response Status: C
ACCEPT.
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
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<th>Comment Status</th>
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<th>Written</th>
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<th>Withdrawn</th>
<th>Mar 2009</th>
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<td>49</td>
<td>49.2.13.3.1</td>
<td>153</td>
<td>10</td>
<td>TR</td>
<td>A</td>
<td>Delete tx_lpi_mode if not used anywhere.</td>
<td>TR</td>
<td>ACCEPT.</td>
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<td>49</td>
<td>49.2.13.3.1</td>
<td>153</td>
<td>3</td>
<td>E</td>
<td>A</td>
<td>In Figure 49-17, replace &quot;=&quot; with the appropriate symbol. Check arrowheads for the consistent use of the correct size.</td>
<td>E</td>
<td>ACCEPT.</td>
<td></td>
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<tr>
<td>49</td>
<td>49.2.13.3.1</td>
<td>153</td>
<td>6</td>
<td>E</td>
<td>A</td>
<td>In Figure 49-16, replace &quot;=&quot; with the appropriate symbol. Check arrowheads for the consistent use of the correct size.</td>
<td>E</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:** Clause, Subclause, page, line
In the LPI Receive state diagram (Figure 49-17), the use of rx_block_lock as a criteria for exit from the RX_WAKE state implies that the process described by the state diagram in Figure 49-12 is used to re-establish lock. It has been established that this process consumes an undesirable portion of the total wake time and that means to accelerate the lock process is desired.

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

Suggested Remedy

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

ACCEPT IN PRINCIPLE.

See #131

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 (isignal_ok * rx_tq_timer_done).
   This will cause block_lock to be assigned the value of rx_block_lock, which presumably false since isignal_ok is TRUE, and hence has the same effect as entering the old RX_LINK_FAIL state.

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

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

ACCEPT IN PRINCIPLE.

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

Healey, Adam
LSI Corporation

Comment Type E Comment Status A
Correct bad cross-references:

"The timer values for these state machines are shown in Table 49-2a for transmit and Table 49-3b for receive."

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

Suggested Remedy
Per comment.

Response Response Status C
ACCEPT.

Koenen, David
Hewlett Packard

Comment Type TR Comment Status A
Delete rx_lpi_mode if not used.

Suggested Remedy
Delete rx_lpi_mode in this state machine.

Response Response Status C
ACCEPT.
<table>
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<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
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<td>A</td>
<td>Per comment.</td>
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<tr>
<td>T</td>
<td>A</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>
</tr>
<tr>
<td>T</td>
<td>A</td>
<td>Add variables scrambler_reset and scrambler_reset_enable.</td>
</tr>
<tr>
<td>T</td>
<td>A</td>
<td>Add a message FEC_SCRAMBLER_RESET.</td>
</tr>
<tr>
<td>T</td>
<td>A</td>
<td>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.</td>
</tr>
<tr>
<td>E</td>
<td>A</td>
<td>Underline the paragraph starting &quot;If the optional Low Power Idle...&quot;</td>
</tr>
</tbody>
</table>

**Response**

**Response Status**

**ACCEPT.**
**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 receiver may use the knowledge that the link partner's transmitter has reset the scrambler at the beginning of the first 66b block following the transition from TRUE to FALSE for tx_quiet. The idle sequence following this event will form a fixed pattern for the duration of the wake period.

**Response**

**Response Status C**

ACCEPT IN PRINCIPLE.

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

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

**Response**

**Response Status C**

ACCEPT.

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

Change other transitions accordingly.
CL 49  SC Fig 49-17  P 154  L 1  # 205
Pillai, Velu  Broadcom

Comment Type  T  Comment Status  R
CL49 LPI RX State diagram (Fig 49-17):
This state machine will receive LI to take it from Active to LPI mode. But for a KR PHY it
will not receive any valid R_TYPE during refresh or wake. Hence this state machine will not
work as it is.
Suggested Remedy
Need signals from the CL72 LPI Receive State machine
Response  Response Status  C
REJECT.

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

See #137
See also #88 for signal_ok

Cl 49  SC Fig 49-17  P 154  L 1  # 203
Pillai, Velu  Broadcom

Comment Type  TR  Comment Status  A
In this LPI receive state diagram, all the R_TYPEs are defined as R_TYPE(rx_raw). But it
should be R_TYPE(rx_coded).
Suggested Remedy

Response  Response Status  C
ACCEPT.

Cl 51  SC 51  P 157  L 54  # 133
Barrass, Hugh  Cisco

Comment Type  T  Comment Status  A
The messages PMD_RXQUIET & PMD_TXQUIET need to pass through the PMA & go to
the PMD.
Also (assuming **BP training**) message PCS TRAINING DONE needs to pass through.
Suggested Remedy
Edit clause 51 to pass the messages through.
Response  Response Status  C
ACCEPT.
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"

Response

ACCEPT IN PRINCIPLE.

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

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

Suggested Remedy

PCT15d is repeated.

Suggested Remedy

Add change indications for PCT1a table entry.

Response

ACCEPT.

Suggested Remedy

The clause number is incorrect.

Suggested Remedy

It should be 55.3.2.2.9

Response

ACCEPT.
Kasturia, Sanjay Teranetics

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

SuggestedRemedy

Response  Response Status: C
ACCEPT IN PRINCIPLE.

The cross reference is 36.2.4.7, Table 36-3.

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

Grimwood, Mike Broadcom

Comment Type: E  Comment Status: A
Typo.

SuggestedRemedy

Change 7.63 us to 7.36 us.

Response  Response Status: C
ACCEPT.

Grimwood, Mike Broadcom

Comment Type: T  Comment Status: A
Ipi_wake_time
Ipi_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.

Response  Response Status: C
ACCEPT.

Same as comment #23

Tidstrom, Rick Broadcom

Comment Type: T  Comment Status: A
Ipi_wake_time
Table 55-2
For Ipi_wake timer after sleep values listed as 13 frames and 4.16 usec are incorrect because they only include 4 alert frames + 9 wake frames.

SuggestedRemedy

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

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

Response  Response Status: C
ACCEPT.
Comments & responses
IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments
Mar 2009

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

Comment Type TR

Comment Status A

Comment Type TR
"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.

Response
ACCEPT IN PRINCIPLE.

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

Cl 55 SC 55.3.5.1 P 169 L 45 # 61
Grimwood, Mike Broadcom

Comment Type T

Comment Status A

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

Suggested Remedy

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

Response
ACCEPT IN PRINCIPLE.

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

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

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

Cl 55 SC 55.3.5.1 P 170 L 12 # 211
Grimwood, Mike Broadcom

Comment Type T

Comment Status A

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

Suggested Remedy

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

Response
ACCEPT.
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 0x1e, and eight control characters of 0x06 (/LI/).

**Response**

ACCEPT.

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

**Suggested Remedy**

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_alert_timer, lpi_wake_time, lpi_rx_wake_timer, lpi_tx_wake_timer, tx_ldpc_frame_cnt, rx_ldpc_frame_cnt.

**Response**

ACCEPT.
The precise conditions for setting rx_lpi_req require clarification.

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

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

Response Response Status C
ACCEPT.

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

Comment Type T
Comment Status A

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

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

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

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

Response Response Status C
ACCEPT.

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

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

Response Response Status C
ACCEPT IN PRINCIPLE.

See response to comment #60
<table>
<thead>
<tr>
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<th>P</th>
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<th>Parnaby, Gavin</th>
<th>Solarflare Communications</th>
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<td>176</td>
<td>L</td>
<td>100</td>
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<td>SuggestedRemedy: correct the order</td>
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<td>Response: REJECT.</td>
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<td>They are in the correct order.</td>
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<td>178</td>
<td>L</td>
<td>106</td>
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<td>Comment Status: A</td>
</tr>
<tr>
<td>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).</td>
<td></td>
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<tr>
<td>Any other alert detection timing does not give the PHY wake_time frames to recover the signal.</td>
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<tr>
<td>SuggestedRemedy: Add text to say 'The PMA asserts alert_detect after the entire alert signal (3.5 LDPC frames of alert, and 0.5 frames of silence) has been detected.'</td>
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<td>See also comment #26</td>
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<th>Broadcom</th>
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<td>178</td>
<td>17</td>
<td>26</td>
<td>Comment Type: TR</td>
<td>Comment Status: A</td>
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<tr>
<td>In state RX_W, the state machine assigns rx_raw &lt;= LI.</td>
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<tr>
<td>SuggestedRemedy: The assignment for rx_raw should be changed from LI to I to eliminate wake shrinkage. Change as shown:</td>
<td></td>
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<tr>
<td>rx_raw &lt;= I.</td>
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<td>Note: Also need a mechanism to communicate LF.</td>
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<tr>
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<tr>
<td>See response to comment #107</td>
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</table>
**Comment Type**: TR

**Comment Status**: A

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

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

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

**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.

**Response**

Response Status: C

ACCEPT.

See also comment #105, #103

---

**Comment Type**: TR

**Comment Status**: A

*tx_lpi_full_refresh* is not defined

**Suggested Remedy**

Define *tx_lpi_full_refresh* in the state diagram variable list

**Response**

Response Status: C

ACCEPT IN PRINCIPLE.

See response to comment #25
There is no e)
Delete reference to e)
ACCEPT.

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

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

Comment Type T  Comment Status A

There is no register in the PMD space for LPI status

Suggested Remedy

Delete LPI status indication row in Table 70-3

Response Response Status C

ACCEPT IN PRINCIPLE.

Response

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

Comment Type T  Comment Status A

There is no register in the PMD space for LPI status

Suggested Remedy

Delete LPI status indication row in Table 70-3

Response Response Status C

ACCEPT.

Comment Type E  Comment Status A

spelling error - "singal"

Suggested Remedy

change spelling to "signal"

Response Response Status C

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

Suggested Remedy

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

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

Suggested Remedy

Vtw 800 mV
Ttd 500ns
Tta 500ns

But it should be 3.1

Suggested Remedy

replace "baseline" with "non-eee"

Response

ACCEPT.

Editor will find appropriate substitute.
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.

Suggested Remedies

Suggested rewording -

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

Response Response Status C

ACCEPT.

According to pillai_02_0109 (Motion #4), remove the references to VSA, VSD, TSD and TSA in Table 71-3

Suggested Remedies

LP Idle state indication Status register 1 1.1.3 PMD_LPI_active

Suggested Remedies

LP Idle state indication Status register 1 3.1 PCS_LPI_active

Response Response Status C

ACCEPT.

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

Suggested Remedies

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

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 Remedies

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

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

Response Response Status C

ACCEPT.

See barrass_1_0309.pdf for detail.
KR-PHY will not generate sleep training symbols.

**Suggested Remedy:**
- Change "10GBASE-KR PHY sends sleep symbols" to "10GBASE-KR PHY forwards sleep symbols"

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

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

---

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.

**Suggested Remedy:**
- Change: If Energy Efficient Ethernet is supported, the PCS transmit function tells this PMD's transmit function when to enter in low power mode by asserting the tx_quiet primitive via the PMD_RTXQUIET.request. The PCS tells the PMD to exit low power idle mode by deasserting tx_quiet. While tx_quiet is asserted the PCS, PMA and PMD should deaktivate all or part of its functional blocks to conserver energy
- to:
  - If Energy Efficient Ethernet is supported, the PCS transmit function tells this PMD's transmit function when to enter in low power mode by setting the tx_quiet primitive to TRUE via the PMD_RTXQUIET.request. The PCS tells the PMD to exit low power idle mode by setting tx_quiet to REFRESH or WAKE. While tx_quiet is TRUE the PCS, PMA and PMD should deaktivate all or part of its functional blocks to conserver energy.

**Response:**
- **Response Status:** C
- ACCEPT.

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

**Suggested Remedy:**
- Change:  'edit instruction says 70.3
- Change to 72.3

**Response:**
- **Response Status:** C
- ACCEPT.

---

**Typo RTXQUIET**

**Suggested Remedy:**
- change to TXQUIET

**Response:**
- **Response Status:** C
- ACCEPT.
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<th>72.3a</th>
<th>P 217</th>
<th>L 37</th>
<th># 171</th>
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<td>Suggested Remedy</td>
<td>PMD_RXALERT.indication(rx_alert) is not needed anymore.</td>
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<tr>
<td>Delete it</td>
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<tr>
<td>Suggested Remedy</td>
<td>change value of rx_quiet from true to TRUE</td>
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<td>Response</td>
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<tr>
<td>Suggested Remedy</td>
<td>BP training: The FEC block is synchronized by using the known sequence following deassertion of tx_quiet.</td>
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<tr>
<td>Delete the paragraph starting &quot;to synchronize...&quot;</td>
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<tr>
<td>Suggested Remedy</td>
<td>LPI status indication row in Table 72-3</td>
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<tr>
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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: Clause, Subclause, page, line  
Page 34 of 50  
3/16/2009  9:09:50 PM
**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).

**Response**

**Response Status** C

**ACCEPT.**

---

**Comment Type** ER

**Comment Status** R

inconsistent text -

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

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

**Suggested Remedy**

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

**Response**

**Response Status** C

**REJECT.**

The qualifying "If" at the beginning of the sentence makes it unnecessary to use "option" at the end.
Comment Type: T  Comment Status: A
The Wake bit appears to be transmitted and received by the PMD, but not used by any PMD function or the basis of any variable passed to another sublayer.

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

Response  Response Status: C
ACCEPT IN PRINCIPLE.

The section has been deleted.
See response to comment # 139

---

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

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

Response  Response Status: C
ACCEPT IN PRINCIPLE.

Text has been deleted
See response to comment # 139

---

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

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

Response  Response Status: C
ACCEPT IN PRINCIPLE.

See response to comment #139.

---

Comment Type: T  Comment Status: A
**BP training**
The overview needs to be updated to reflect the simplified operation.

SuggestedRemedy
Replace the section with:

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

Response  Response Status: C
ACCEPT.
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.

Response
Response Status C
ACCEPT.

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.

Response
Response Status C
ACCEPT.

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.

Response
Response Status C
ACCEPT IN PRINCIPLE.

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

Response
Response Status C
ACCEPT IN PRINCIPLE.

The section is being deleted
See comment #139.
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<th>Comment Status</th>
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<tr>
<td>190</td>
<td></td>
<td>LAST_WAKE: 0 1 1</td>
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<tr>
<td>190</td>
<td></td>
<td>LAST_REF: 1 0 1</td>
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<td>190</td>
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<td>WAKE: 0 1 0</td>
<td></td>
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<tr>
<td>190</td>
<td></td>
<td>REFRESH: 1 0 0</td>
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<td>190</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>190</td>
<td></td>
<td>Does not handle a bit error. Which might put the state machine in a stuck state.</td>
<td></td>
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<td>190</td>
<td></td>
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<tr>
<td>190</td>
<td></td>
<td>SuggestedRemedy</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>190</td>
<td></td>
<td>No solution right now. Will provide it during the meeting.</td>
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<tr>
<td>190</td>
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<tr>
<td>190</td>
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<td>Response Status</td>
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<tr>
<td>190</td>
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<td>C</td>
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<tr>
<td>190</td>
<td></td>
<td>REJECT.</td>
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<td></td>
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<tr>
<td>190</td>
<td></td>
<td>These training bit will go away if not use training is not used during LPI.</td>
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<table>
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<tr>
<td>172</td>
<td></td>
<td>No longer necessary to support training frames in LPI State Diagrams.</td>
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<tr>
<td>172</td>
<td></td>
<td>SuggestedRemedy</td>
<td></td>
<td></td>
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<tr>
<td>172</td>
<td></td>
<td>Modify state diagram to remove training and just enable/disable transmitter where appropriately directed by tx_quiet.</td>
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<td>172</td>
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<td>Response Status</td>
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<tr>
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<td>Section is being deleted.</td>
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<tr>
<td>191</td>
<td></td>
<td>In order to handle a Wake request right during the &quot;last refresh&quot;.</td>
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<td>191</td>
<td></td>
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<tr>
<td>191</td>
<td></td>
<td>SuggestedRemedy</td>
<td></td>
<td></td>
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<tr>
<td>191</td>
<td></td>
<td>An arc from TX_LAST_REF to TX_WAKE, if tx_quiet = WAKE.</td>
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<tr>
<td>191</td>
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<td>C</td>
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<tr>
<td>191</td>
<td></td>
<td>REJECT.</td>
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<td>191</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>191</td>
<td></td>
<td>The TX and RX state diagrams are being entirely deleted as training frames will not be used in waking up from LPI.</td>
<td></td>
<td></td>
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</table>

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

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

Response Response Status |
| C                      |
| REJECT.                |
| This section will be deleted. |

Section is being deleted.

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

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

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

Response Response Status |
| C                      |
| REJECT.                |
| This section will be deleted. |
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.

**Response**
REJECT.

Section is being deleted.

---

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

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 Assertion Threshold to a differential signal level less than the Signal Detect Deassertion Threshold of VSD as specified in Table 72-9.

**Response**
ACCEPT IN PRINCIPLE.

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

72.6.4a PMD signal detect function during low power operation

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

If Energy Efficient Ethernet is supported the PMD shall set SIGNAL_DETECT to a value of FALSE within TSD after deactivation of a compliant transmitter.
Cl 72  SC 72.6.4a  P 218  L 39  # 75
Healey, Adam
LSI Corporation

Comment Type: T  Comment Status: A

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

Suggested Remedy
Re-arrange to correctly describe the desired behavior.

Response
Response Status: C
ACCEPT IN PRINCIPLE.

Editor will rewrite as directed by the suggested remedy.

Cl 72  SC 72.6.4a  P 218  L 41  # 176
Koenen, David
Hewlett Packard

Comment Type: TR  Comment Status: A

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

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.

Response
Response Status: C
ACCEPT IN PRINCIPLE.

Delete the paragraph under 72.6.4a. Move the paragraph under 72.6.4b to 72.6.4a and change sense_signal to signal Detect where appropriate.

Also see response to comment #137
Cl 73 SC 73.1 Comment Type TR Comment Status R

Pillai, Velu Broadcom

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.

RESPONSE STATUS: C

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

Cl 73 SC Annex 73A Comment Type TR Comment Status A

Pillai, Velu Broadcom

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}

Response Status: C

ACCEPT IN PRINCIPLE.

See #146, #145, #129

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

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

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

**Response**
ACCEPT.

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

---

**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.

**Suggested Remedy**
delete the word optional

**Response**
ACCEPT.

The EEE operational mode supports ...

---

**Typo**
Add missing period at end of item b).

**Response**
ACCEPT.
D'Ambrosia, John
Force10 Networks

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

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

Response:  Response Status: C
ACCEPT.

Pillai, Velu
Broadcom

Comment Type: E  Comment Status: A
Then the PHY enters Active_st and..

Nothing wrong with it, but to be consistent with the rest of text, it should be
Then the PHY enters Active_st state and..

Suggested Remedy

Response:  Response Status: C
ACCEPT IN PRINCIPLE.
Word "state" will be added after "Active_st"

Zimmerman, George
Solarflare Communications

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

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.

Response:  Response Status: C
REJECT.
See response to comment #102
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, bringing 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.

* e.g.

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

**Response**

REJECT.

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

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

Comment Status: A

Description for \( T_{\text{phy}} \) and \( T_{\text{sys}} \) looks very similar, except for \( T_{\text{sys}} > T_{\text{phy}} \). Should we put more text to it?

Suggested Remedy

Tw_sys and \( T_{\text{phy}} \) description seem to be distinct enough but editor is open to improvements.

Change the descriptions to:

\( T_{\text{phy}} \): Parameter employed by the system which corresponds to the behavior of the PHY. It is the period of time between reception of an IDLE signal on the xxMII interface and when the first data codewords are permitted on the xxMII interface. A wake time of a compliant PHY does not exceed \( T_{\text{phy}}(\text{min}) \).

\( T_{\text{sys}} \): Parameter employed by the system which corresponds to the behavior of the system. It is the period of time between transition from LP_IDLE to IDLE signaling on the xxMII interface and when the first data codewords are permitted on the xxMII interface. For proper system operation, following relationship must hold: \( T_{\text{sys}} \geq T_{\text{phy}} \).

Please note that the qualifiers should be subscripts.

Comment Type: E

Suggested Remedy

"Period of time between reception of the IDLE signal on the xxMII interface and when the first data codewords are permitted on the xxMII interface." Should read "Period of time between reception of the IDLE signal on the xxMII interface and when the first data codewords are permitted on the xxMII interface."

Response

ACCEPT IN PRINCIPLE.

Comment Type: ER

Comment Status: A

when first codewords are permitted on the xxMII interface

Suggested Remedy

when first codewords are permitted on the xxMII interface

Response

ACCEPT.

Comment Type: E

Comment Status: A

Is there a reason for mentioning Clause 37 Auto Negotiation in 802.3az standard?

Suggested Remedy

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

Response

ACCEPT IN PRINCIPLE.

Overtaken by events. Paragraph has been rewritten.
<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Name of &quot;1000-KX&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>This was found throughout repeated instances through clause 78</td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>should be &quot;1000BASE-KX&quot;</td>
</tr>
<tr>
<td>Response</td>
<td>ACCEPT.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>1000-KX needs to be 1000BASE-KX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER</td>
<td>Line numbers 32 and 35.</td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td>ACCEPT.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Remove sentence &quot;DME provides a DC âto the network devices.&quot; EEE does not change the way backplane autonegotiation works and does not need to justify or explain technique used.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>Add the word &quot;the&quot; to the end of the line. Should read &quot;without breaking the communication link&quot;.</td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>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>Response</td>
<td>ACCEPT IN PRINCIPLE.</td>
</tr>
</tbody>
</table>

See response to comment #117 which deletes the text that is the focus of the comment.
Add clarification per ad-hoc meeting.

SuggestedRemedy

"Implementations that do not use the EEE Data Link Layer capabilities shall ignore the EEE TLV if received in a LLDP message. Both link partners will then use the default value of Tw_sys defined by the PHY."

Response

ACCEPT IN PRINCIPLE.

The commenter is correct in his observation. Ignoring the TLV is inherent to how LLDP works. Additional text not necessary as this is how LLDP works.

No change will be made to the draft.

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."

Response

ACCEPT IN PRINCIPLE.

Change "The Data Link Layer capabilities are optional for all devices." TO

"The Data Link Layer capabilities shall be implemented for devices operating at link rates equal to or greater than 10 Gbps and may be implemented for all other devices."
Cl 78  SC 78.4.1  P 239  L 6  # 31
Kasturia, Sanjay  Teranetics

Comment Type T  Comment Status A
Replace TBD with appropriate entry

SuggestedRemedy

Response  Response Status C
ACCEPT IN PRINCIPLE.

Unlike the other TBDs, the 802.3 subtype for LLDP will be issued by the .3 Chair or his designate at the initiation of SASB ballot as we have traditionally done with all management code point TBDs.

The TBD will be replaced by "TBA" indicating that this is something that will be allocated later at the initiation of sponsor ballot.

Cl 78  SC 78.4.1.1  P 239  L 31  # 44
Dietz, Bryan  Alcatel-Lucent

Comment Type E  Comment Status A
Minor editorial tweak.

SuggestedRemedy

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

Response  Response Status C
ACCEPT.

Cl 78  SC 78.4.1.1  P 239  L 3435  # 45
Dietz, Bryan  Alcatel-Lucent

Comment Type E  Comment Status A
Rephrase last sentence for clarity.

SuggestedRemedy

Change last sentence in paragraph to read "The Transmitting link partner expects that the Receiving link partner will be able to accept data after the time delay Transmit Tw_sys.""  

Response  Response Status C
ACCEPT IN PRINCIPLE.

"The Transmitting link partner expects that the Receiving link partner will be able to accept data after the time delay Transmit Tw_sys (expressed in microseconds)"

Cl 78  SC 78.4.1.2  P 239  L 4043  # 58
Dietz, Bryan  Alcatel-Lucent

Comment Type T  Comment Status A
Clarification from ad-hoc.

SuggestedRemedy

Interchange and edit last two sentences of this paragraph to read:  
"Receive Tw_sys (2 octets wide) is the time (expressed in microseconds) that the receiving link partner is requesting the transmitting link partner to wait before it starts transmitting data following the Low Power Idle. The default value for Receive Tw_sys is the Tw_phy defined for the PHY that is in use for the link. The Receive Tw_sys value can be larger than the default, and the extra wait time may be used by the receive link partner for power saving mechanisms that require longer wake-up time than the PHY-layer definitions."

Response  Response Status C
ACCEPT.

Cl 78  SC 78.4.1.3  P 239  L 49  # 46
Dietz, Bryan  Alcatel-Lucent

Comment Type E  Comment Status A
Replace word "registered" with "processed". The word "registered" may imply merely that the data was stored. However, later text and the state diagrams show that the data was processed before it was echoed.

SuggestedRemedy

Replace word "registered" with "processed".

Response  Response Status C
ACCEPT IN PRINCIPLE.

Clearer terminology can be used. The intent is to show that the link partner is now "aware" of the remote partner's information. Use the words "registered and processed".

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 78  SC 78.4.1.3  Page 48 of 50  3/16/2009  9:09:51 PM
The transmitting link partner controls when data is sent. After leaving Low Power Idle mode, the transmitting link partner waits before sending a frame. This provides enough time for the receiving link partner to transition out of LPI mode and get ready to receive the frame without loss or corruption.

"The transmitting link partner must wait for TX Tw_sys microseconds after leaving LPI mode before sending a frame."

"The receiving link partner must be ready to receive a frame RX Tw_sys microseconds after leaving LPI mode."

"The transmit Tw_sys must be equal to or greater than the receive Tw_sys for proper operation. The purpose of the EEE TLV and state machines is to resolve the correct Tw_sys values."

"The state diagrams in sections 78.4.4.5 provide the following features on each direction of the bidirectional link."

"The initial Tw_sys defaults to the Tw_sys values required by the PHYs. This provides loss- and corruption-free EEE operation without exchanging TLVs."

"The state machines initialize the MIB transmit and receive Tw_sys values to larger values if supported by the overall system. These values can provide longer delays that allow deeper sleep modes for the system outside of the PHYs."

"The state machines monitor and control the EEE MIB variables exchanged by LLDP. The state machines find the longest "resolved Tw_sys" supported at that time by both the transmitter and receiver. This can provide the largest total system power savings."

"The state machines will update the resolved Tw_sys value when the transmit Tw_sys is increased or decreased."

"The state machines will update the resolved Tw_sys value when the received Tw_sys is increased or decreased."

"The Transmit Tw_sys is considered "resolved" when a local partner's state machine resides in the "RUNNING STATE" as described in section 78.4.4 and the echoed values match the local device's values for that path.

Response: 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 $T_w$ 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:

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

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

**Response**

**Response Status** C

REJECT.

---

The word "state" is misspelled in the table header. **Suggested Remedy** Change to "state".

**Response**

**Response Status** C

ACCEPT.

---

Symbol in box on the left titled "remote change" seems to have been garbled. It is showing up as a question mark. **Suggested Remedy** Replace ? with an assignment statement

**Response**

**Response Status** C

ACCEPT IN PRINCIPLE.

Refer to diab_01_0309.pdf

---

... parameters for supported PHYs has an extra "s" **Suggested Remedy** remove the extra "s"

**Response**

**Response Status** C

ACCEPT.