Proposed responses

IEEE P802.3az D2.2 Energy Efficient Ethernet comments

Proposed Response

Cl 36 SC 36.2.5.2.2 P 83 L 13
Barnette, James Vitesse Semiconductor

Comment Type TR Comment Status D

Branches from LPI_IDLE_D, LPI_K, RX_WAKE, and RX_WTF, are not sufficiently specified when multiple conditions occur simultaneously.

Suggested Remedy

Branches from LPI_IDLE_D near line 13:

On the branch from LPI_IDLE_D to RX_LINK_FAIL, change the condition from "signal_detect = OK * rx_ts_timer_done" to "signal_detect = OK * rx_ts_timer_done*. On the branch from LPI_IDLE_D to off-page node F, change the condition from "xmit = DATA * SUDI(!K28.5)] to "signal_detect = OK * !rx_ts_timer_done * xmit = DATA * SUDI(!K28.5)]. On the branch from LPI_IDLE_D to LPI_K, change the condition from "xmit = DATA * SUDI + SUDI(!K28.5)] to "signal_detect = OK * !rx_ts_timer_done * (xmit = DATA * SUDI + SUDI(!K28.5)]."

Branches from LPI_K near line 19:

On the branches from LPI_K to off-page nodes D, F, and C as well as the branch back to LP_IDLE_D, insert the condition "signal_detect = OK * <cond>" where <cond> is replaced by the previously-stated condition.

Branches from RX_WAKE near line 32:

On the branch to RX_WTF, insert the condition "signal_detect = OK * !(code Sync_status = OK * SUDI(!K28.5]*EVEN)] * ... into the condition for this branch. On the branch to RX_WAKE_DONE, insert the condition "signal_detect = OK * ..."). into the condition for this branch.

Similarly, in branches from RX_WTF near line 36:

On the branch to RX_LINK_FAIL, insert the condition "signal_detect = OK * !rx_tq_timer_done) entering state RX_LINK_FAIL (via the "I" connector) signal "rx_quiet" is not set back to FALSE.

In case this condition (and transition) is ever met rx_quiet will never be set to FALSE again. A receiver would never be able to get data again since the receiver (e.g. a deserializer) would be powered down all the time - only a reset would help.

Suggested Remedy

When entering state RX_LINK_FAIL signal "rx_quiet" must be reset (rx_quiet <= FALSE; this would be an additional assignment to the already existing assignment "rx_lpi_active <= FALSE").

Proposed Response Response Status W

PROPOSED ACCEPT.

Similarly, in branches from RX_WTF near line 36:

On the branch to RX_LINK_FAIL, insert the condition "signal_detect = OK * !rx_pl_timer_done) into the condition for this branch. On the branch to RX_WAKE_DONE, insert the condition "signal_detect = OK * ..."). into the condition for this branch.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Use changes as suggested for branches from LPI_IDLE_D. Use the following for the other two:

Branches from RX_WAKE near line 32:

On the branch to RX_WTF, insert the condition "signal_detect = OK * ..."). into the condition for this branch. On the branch to RX_WAKE_DONE, insert the condition "signal_detect = OK * !rx_pl_timer_done) ..."). into the condition for this branch.

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 # 2 1/22/2010 9:50:00 PM
It is not clear that the two state machines need to be "synchronized." The transmit state machine will continue to send LPI or IDLE according to the state of the XGMII. The LPI transmit state machine will control tx_quiet for sleep, refresh and wake phases.

Incorporate TX_L and TX_WN states similar to Clause 55 Figure 55-15a.

Suggested Remedy

Create variables:

- `tx_lpi_active`: "A boolean variable set to TRUE when PHY is in LPI mode and set to FALSE when PHY is not in LPI mode."
- `tx_lpi_req`: "A boolean variable set to TRUE when PHY client is requesting LPI and is otherwise set to FALSE."

Copy definitions of LPBLOCK_T and IBLOCK_T from Clause 55.

In Figure 49-14:

- In state TX_INIT add line "tx_lpi_req=FALSE"
- In state TX_L add lines "tx_coded=LPBLOCK_T" "tx_lpi_req=TRUE"
- Delete transitions:TX_L to TX_C
- Add state TX_W with lines:"tx_lpi_req=FALSE" "tx_coded=IBLOCK_T"
- Add transitions as follows:
  - TX_L to TX_W: !(T_TYPE(tx_raw)=LI)
  - TX_W to TX_C: !(tx_lpi_active)(T_TYPE(tx_raw)=C)
  - TX_W to TX_E: !(tx_lpi_active)(T_TYPE(tx_raw)=(E+D+S+T))

In Figure 49-16:

- In TX_ACTIVE add line "tx_lpi_active=FALSE"
- In TX_SLEEP add line "tx_lpi_active=TRUE"
- Replace all instances of each as follows:
  - "T_TYPE(tx_raw)=LI} with "tx_lpi_req"
  - "T_TYPE(tx_raw)=LI" with "!tx_lpi_req"

Proposed Response

PROPOSED REJECT.

Condition for energy_detect=OK is not specified.

Suggested Remedy

Change description to:

The energy_detect parameter takes on one of two values: OK or FAIL. A value of OK indicates that the PMA detects a signal. A value of FAIL indicates that the PMA does not detect a signal. A value of OK does not guarantee that a valid signal is being presented to the PMA client.

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE.

See comment #5 for response.
Comment Type: T  Comment Status: D

Condition for energy_detect=OK is not specified. Nor is it defined where the states come from.

Since PMA_ENERGY_DETECT.indication is identical to PMD_SIGNAL.indication, the intermediate energy_detect variable/signal is not required.

Suggested Remedy:
Change description of PMA_ENERGY_DETECT.indication(energy_detect) to:
"The energy_detect parameter takes on one of two values OK or FAIL as indicated by PMD_SIGNAL.indication(SIGNAL_OK). A value of OK indicates that the PMD detects a signal. A value of FAIL indicates that the PMD does not detect a signal. A value of OK does not guarantee that a valid signal is being presented to the PMA client."

Change when generated as follows:
The PMA generates this primitive whenever the PMD_SIGNAL.indication(SIGNAL_OK) primitive is received.

Proposed Response: PROPOSED ACCEPT IN PRINCIPLE.

See also comment #4

The condition for OK needs stating and the relation between signal_ok and energy_detect should be stated. However the energy_detect is boolean. Change the paragraph as follows:

The energy_detect parameter is boolean and reflects the state of the SIGNAL_OK received from the PMD. A value of TRUE indicates that the PMA is receiving a signal from the PMD, reflecting that PMD_SIGNAL.indication is indicating OK. A value of FALSE indicates that the PMA is not receiving a signal from the PMD, reflecting that PMD_SIGNAL.indication is indicating FAIL. Note that a value of TRUE does not guarantee that a valid signal is being presented to the PMA client.

Comment Type: E  Comment Status: D

SLEEP may be immediately followed by either REFRESH or QUIET.

Suggested Remedy:
Replace:
Following these frames the link partner ceases transmission and is quiet.

With:
Following these frames the link partner begins a QUIET/REFRESH cycle, where the link is normally quiet.

Proposed Response: PROPOSED ACCEPT.
The rx_lpi_active primitive is inconsistently defined. It says that it takes on the value in SM in Figure 16 (TRUE or FALSE) and defines to possible values as ACTIVE and NOT_ACTIVE.

Suggested Remedy
Change "ACTIVE" to "TRUE".
Change "NOT_ACTIVE" to "FALSE".

PROPOSED ACCEPT.

For consistency, change /LI/ name to match name in Clause 49 (page 160, line 9).

Suggested Remedy
Change "lp_idle" to "LPI".
Alternately, change Clause 49 "LPI" to "lp_idle".

PROPOSED ACCEPT IN PRINCIPLE.

The lpi_tx_mode is ignored specifically when the is not in the PCS_Data state in the PHY control state diagram (Figure 55.24).

Suggested Remedy
Change "During PMA training the lpi_tx_mode variable is ignored." to
"During PMA training (PHY is not in PCS_Data state) the lpi_tx_mode variable is ignored."

PROPOSED ACCEPT IN PRINCIPLE.

"When the PHY is not in the PCS_Data state the lpi_tx_mode variable is ignored."
Proposed responses

13 Cl 55 SC 55.3.2.3 P 190 L 38 # 13
Brown, Matt
Applied Micro (AMCC)

Comment Type: E
Comment Status: D
Change "PCS_Status=OK is asserted" to "PCS_Status is set to OK".

Note that PCS_Status primitive uses OK and NOT_OKAY. The pcs_status variable in the PHY control state diagram (Figure 55-24 in 802.3-2008) However, the pcs_status variable definition (section 55.3.6.1 in 802.3-2008) specifies values TRUE and FALSE.

Suggested Remedy
Change "PCS_Status=OK is asserted" to "PCS_Status is set to OK".
Change instance on Page 191, line 6, as well.

Proposal Status: Response Status: W
PROPOSED ACCEPT.

14 Cl 55 SC 55.3.4a.3 P 194 L 20 # 14
Brown, Matt
Applied Micro (AMCC)

Comment Type: T
Comment Status: D
rx_lpi_req variable no longer used

Suggested Remedy
Remove definition for rx_lpi_req.

Proposal Status: Response Status: W
PROPOSED ACCEPT.

15 Cl 55 SC 55.3.4a.3 P 194 L 20 # 15
Brown, Matt
Applied Micro (AMCC)

Comment Type: T
Comment Status: D
tx_lpi_error variable no longer used

Suggested Remedy
Remove definition for tx_lpi_error.

Proposal Status: Response Status: W
PROPOSED ACCEPT.

16 Cl 55 SC 55.3.4a.3 P 194 L 20 # 16
Brown, Matt
Applied Micro (AMCC)

Comment Type: T
Comment Status: D
Use of timer state in global boolean expression is a bit messy since it's state is ambiguous until started the first time.

Suggested Remedy
Create variable "tx_lpi_alert_active".
In figure 55-16b...
in TX_NORMAL and SEND_WAKE add line "tx_lpi_alert_active=FALSE"
in SEND_ALERT add line "tx_lpi_alert_active=TRUE"
Create variable definition:
"tx_lpi_alert_active -- A boolean variable that is set true when the PHY is transmitting ALERT signaling. Set false otherwise."

On page 194 line 40 and 53 replace "!tx_lpi_qr_active*!lpi_tx_alert_time_done" with "tx_lpi_alert_active".

Proposal Status: Response Status: W
PROPOSED ACCEPT.

17 Cl 55 SC 55.3.4a.3 P 194 L 20 # 17
Brown, Matt
Applied Micro (AMCC)

Comment Type: T
Comment Status: X
Use of timer state in global boolean expression is a bit messy since it's state is ambiguous until started the first time.

Suggested Remedy
Create variable "tx_lpi_alert_active".
In figure 55-16b...
in TX_NORMAL and SEND_WAKE add line "tx_lpi_alert_active=FALSE"
in SEND_ALERT add line "tx_lpi_alert_active=TRUE"
Create variable definition:
"tx_lpi_alert_active -- A boolean variable that is set true when the PHY is transmitting ALERT signaling. Set false otherwise."

On page 194 line 40 and 53 replace "!tx_lpi_qr_active*!lpi_tx_alert_time_done" with "tx_lpi_alert_active".

Proposal Status: Response Status: W
Same as #16?
Timer values for LPI states must be precise number of symbols in length. Often timers have some tolerance.

Suggested Remedy
Line 23...
Change "equal to 9 LDPC frame periods" to "equal to exactly 9 LDPC frames"
Line 27...
Change "equal to 4 LDPC frame periods" to "equal to exactly 4 LDPC frames"
Lines 31 and 36...
Change "equal to lpi_wake_time LDPC frame periods" to "equal to exactly lpi_wake_time LDPC frames"

PROPOSED ACCEPT.

Stating that the timer period equals a value implies exactly equals; no tolerance is specified.

Suggested Remedy
Create variable "rx_lpi_wake".
In figure 55-16a...
in RX_INIT, RX_WE, and RX_C add line "rx_lpi_wake=FALSE"
in RX_W add line "rx_lpi_wake=TRUE"
Create variable definition...
"rx_lpi_wake -- A boolean variable that is set true when the PHY Rx is in the WAKE state and sending IDLE to the XGMII. Set false otherwise."

Delete note in Figure 55-14.

PROPOSED ACCEPT.
Proposed responses

IEEE P802.3az D2.2 Energy Efficient Ethernet comments

Jan 2010

Proposed Response  #22
Comment Type T  Comment Status D
reference to TX_L should be RX_L

Suggested Remedy
Replace TX_L with RX_L.

PROPOSED ACCEPT.

Brown, Matt  Applied Micro (AMCC)

Proposed Response  #23
Comment Type T  Comment Status D
In Figure 55-16 and Figure 55-16a, the variable rx_lpi_active is never initialized to FALSE.

Suggested Remedy
In Figure 55-16, RX_INIT state add line *rx_lpi_active=FALSE*.

PROPOSED ACCEPT.

Brown, Matt  Applied Micro (AMCC)

Proposed Response  #24
Comment Type T  Comment Status D
Since this section specifies the timing requirements, the requirement for slave loop timing should be moved here from Section 55.3.4a.1 (page 191, line 51) or re-stated here.

Suggested Remedy
Add line from 55.3.4a.1. "An EEE capable PHY shall support loop timing and loop timing shall be enabled on the slave PHY." Maybe statement in 44.3.4a.1 should refer to this section.

PROPOSED ACCEPT.

Brown, Matt  Applied Micro (AMCC)

Proposed Response  #25
Comment Type T  Comment Status D
Figure 55-16a. Note in upper right is incorrect. The entire diagram is required for EEE.

Suggested Remedy
Remove note or change to "The portion of the state machine in this figure is required for EEE capability."

PROPOSED ACCEPT.

Brown, Matt  Applied Micro (AMCC)

Proposed Response  #26
Comment Type TR  Comment Status D
SLEEP state should not begin until beginning of frame.

Suggested Remedy
Change transition criteria from TX_NORMAL to SEND_SLEEP to "tx_lpi_req?dpc_frame_done".
(Similar to transitions to SEND_ALERT state.)

PROPOSED ACCEPT.

Brown, Matt  Applied Micro (AMCC)

Proposed Response  #27
Comment Type T  Comment Status D
Figure 55-16a. Note in upper right is incorrect. The entire diagram is required for EEE.

Suggested Remedy
Remove note or change to "The portion of the state machine in this figure is required for EEE capability."

PROPOSED ACCEPT.

Use "It is required to implement the portion of the state machine in this figure for PHYs with the EEE capability."

Brown, Matt  Applied Micro (AMCC)
Proposed responses

**Cl 55 SC 55.3.5.4 P202 L26 # 28**
Brown, Matt  
Applied Micro (AMCC)

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

Figure 55-16a. RX_WE is a zero time state.

**Suggested Remedy**
Add note the figure that RX_WE is a zero-time state.

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

PROPOSED REJECT.

This doesn't seem necessary. I can't see it being done anywhere else.

**Cl 55 SC 55 P179 L9 # 29**
Brown, Matt  
Applied Micro (AMCC)

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

The referenced adhoc proposal recommends inclusion of counters to track the number of times a fast retrain is invoked. By the same logic, a counter for normal retrains is also required.

**Suggested Remedy**
Create a new counter normal_retrain_counter.

Definition: "Counts the number of times a normal re-train occurs. The counter is increment each time the SILENT state in Figure 55-24 is entered. The counter is reset when read or when entering the DISABLE_10GBASE-T_TRANSMITTER state in Figure 55-24. The counter is readable in MDIO register x.x."

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

PROPOSED REJECT.

This seems out of scope for 802.3az.

**Cl 55 SC 55.3.4a.3 P193 L27 # 30**
Brown, Matt  
Applied Micro (AMCC)

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

clarify "long training sequence"

**Suggested Remedy**
Replace "long training sequence" with "training sequence without periodic re-initialization".

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

PROPOSED ACCEPT.

**Cl 74 SC 74.5.1 P231 L19 # 31**
Brown, Matt  
Applied Micro (AMCC)

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

Missing underscore in names. Inconsistent with other instances.

**Suggested Remedy**
Change:
FEC_TXQUIET to FEC_TX_QUIET
FEC_RXQUIET to FEC_RX_QUIET
FEC_LPIACTIVE to FEC_LPI_ACTIVE

Make similar changes sections where necessary.

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

PROPOSED ACCEPT.

**Cl 74 SC 74.5.1 P231 L32 # 32**
Brown, Matt  
Applied Micro (AMCC)

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

rx_lpi_active is not sent to lower layers

**Suggested Remedy**
Change
"rx_quiet", tx_quiet and rx_lpi_active to control"
to
"rx_quiet and tx_quiet to control".

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

PROPOSED ACCEPT.

**Cl 74 SC 74.5.1.4 P231 L43 # 33**
Brown, Matt  
Applied Micro (AMCC)

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

energy_detect is not a boolean variable is has values OK and FAIL

**Suggested Remedy**
Redefine as follows:
"The energy_detect parameter takes on one of two values OK or FAIL as indicated by PMA_SIGNAL.indication(SIGNAL_OK). A value of OK indicates that the PMD detects a signal. A value of FAIL indicates that the PMD does not detect a signal. A value of OK does not guarantee that a valid signal is being presented to the PMA client."

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

PROPOSED ACCEPT.
Proposed responses

IEEE P802.3az D2.2 Energy Efficient Ethernet comments Jan 2010

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<td>The rx_lpi_active parameter is a boolean variable sent from the PCS that is set to TRUE when LPI mode is active at the receiver and set to FALSE otherwise.</td>
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<td>rx_quiet effect of receipt looks like PCS definition. Specify FEC behavior.</td>
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According to Pillai_1109_01.pdf and resolution for comment #85 rx_quiet becomes rx_mode. Hence the description changes to:
"the rx_mode parameter is a variable sent from the PCS. It is set to QUIET while the receiver is in the RX_QUIET state and is set to DATA otherwise.."

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<td>When rx_quiet is TRUE the FEC decoder logic may deactivate functional blocks to conserve energy. When rx_quiet is FALSE the FEC decoder logic operate normally. The value rx_quiet is passed to the client layer through PMA_RX_QUIET(rx_quiet).request.</td>
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Changing the suggested remedy to accommodate rx_mode instead of rx_quiet

When rx_mode is QUIET the FEC decoder logic may deactivate functional blocks to conserve energy. When rx_mode is DATA the FEC decoder logic operate normally. The value rx_mode is passed to the client layer through PMA_RX_MODE(rx_mode).request.
Proposed responses

IEEE P802.3az D2.2 Energy Efficient Ethernet comments

Jan 2010

CI 74  SC 74.5.1.7  P 232  L 27  #  [38]
Brown, Matt  Applied Micro (AMCC)

Comment Type E  Comment Status D
RE-word.

Suggested Remedy

Change:
"The tx_quiet parameter can take on one of two values: TRUE or FALSE. A boolean variable sent from the PCS..."

To:
"The tx_quiet parameter is a boolean variable sent from the PCS..."

Proposed Response  Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

According to Pillai_1109_01.pdf and resolution for comment #85, tx_quiet becomes tx_mode. Hence the description changes to:

"the tx_mode parameter is a variable sent from the PCS. It is set to QUIET while the transmitter is in the TXQUIET state, it is set to ALERT while the transmitter is in the TX_ALERT state and is set to DATA otherwise."

---

CI 74  SC 74.5.1.7.2  P 233  L 3  #  [39]
Brown, Matt  Applied Micro (AMCC)

Comment Type T  Comment Status X

rx_quiet effect of receipt looks like PCS definition. Specify FEC behavior.

Suggested Remedy

Change definition to:
When rx_quiet is TRUE the FEC encode logic may deactivate functional blocks to conserve energy. When rx_quiet is FALSE the FEC decoder logic operate normally. The value rx_quiet is passed to the client layer through PMA_TXQUIET(tx_quiet).request.

Proposed Response  Response Status W

Chaining the suggested remedy to accommodate tx_mode instead of tx_quiet

When tx_mode is QUIET the FEC encoder logic may deactivate functional blocks to conserve energy. When tx_mode is DATA the FEC encoder logic operate normally. The value tx_mode is passed to the client layer through PMA_TXMODE(tx_mode).request.

---

Comment Type T  Comment Status D
SLIP is an action, moving the candidate start of block location.
Also, pull the 2nd sentence of the following paragraph into this paragraph.

Suggested Remedy

Change paragraph to:
When rx_lpi_active is TRUE, FEC Rapid block lock mechanism will attempt to determine the FEC start of block location based on the deterministic pattern. When the rapid block lock is locked, the determined start of block location is used as the FEC lock state diagram candidate start of block location until the rapid block lock loses lock. Assuming the rapid block lock determined the correct start of block location, the FEC lock state diagram will achieve lock without requiring subsequent slips. The rapid lock algorithm is implementation dependent and outside the scope of this standard.

Delete second sentence of paragraph on line 22.

Proposed Response  Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

When rx_lpi_active is TRUE and rx_mode is set to DATA, FEC Rapid block lock mechanism will attempt to determine the FEC start of block location based on the deterministic pattern. When the rapid block lock is locked, the determined start of block location is used as the FEC lock state diagram candidate start of block location until the rapid block lock loses lock. Assuming the rapid block lock determined the correct start of block location, the FEC lock state diagram will achieve lock without requiring subsequent slips. The rapid lock algorithm is implementation dependent and outside the scope of this standard.

Delete second sentence of paragraph on line 22.
The note is talking both about transmit injection and receiver lock detection. The note is out of place here and should be in the PCS Tx section (Clause 49).

**Suggested Remedy**

Delete first line or move it to sub-clause 49.2.6.
Delete 2nd line and move it to previous paragraph.

**PROPOSED ACCEPT IN PRINCIPLE.**

First line is already mentioned in sub-clause 49.2.6 in different words. It is up to the Clause 49 editor to change the suggested remedy.

2nd line is covered in comment #40.

---

**Proposed Response**

**Response Status** W

**PROPOSED ACCEPT IN PRINCIPLE.**

An XAUI link supports LPI signalling, but does not support the QUIET/REFRESH cycling.

**Suggested Remedy**

Specify an MDIO bit field XAUI_EEE_QUIET_ENABLE to determine if QUIET state is support. If TRUE, transmit will turn off tx_mode is QUIET. If FALSE, transmit will not turn off if tx_mode is QUIET.

**PROPOSED ACCEPT IN PRINCIPLE.**

This is already covered through comment #43, filed by the same commenter.

---

**Proposed Response**

**Response Status** W

**PROPOSED ACCEPT IN PRINCIPLE.**

This needs to be reflected in the text of this clause:

An XGMII Extender with the optional Energy Efficient Ethernet (EEE) capability may enter a low power state to conserve energy during periods of low link utilization. **The ability to support transition to a low power state is indicated by register 4.20.0 (for a PHY XS) or 5.20.0 (for a DTE XS).** Transition to the low power state is enabled by register 4.0.9 (for a PHY XS) or 5.20.0 (for a DTE XS). **The assertion of Low Power Idle (LPI) at the XGMII is encoded in the transmitted symbols. Detection of LPI encoding in the received symbols is indicated as LPI at the XGMII. When LPI is received, an Energy Efficient XGMII Extender sends sleep symbols, then, **if enabled**, ceases transmission and deactivates XAUI transmit signals to conserve energy. When the receiver sees the sleep symbols it transitions to a quiet state. The XGMII Extender periodically transmits during the quiet period to allow the attached XGMII Extender to refresh its receiver state (e.g. timing recovery, adaptive filter coefficients) and thereby track long term variation in the timing of the link or the underlying channel characteristics.** If, during the quiet or refresh periods, normal inter-frame idle is asserted at the XGMII, the XGMII Extender re-activates transmit functions and initiates transmission. This transmission will be detected by the attached XGMII Extender, causing it to also exit the low power state.
For consistency, change /LI/ name to match name in Clause 55 (page 188, line 18).

**Suggested Remedy**

- Change "LPI" to "lp_idle".
- Alternately, change Clause 55 "lp_idle" to "LPI".

**Proposed Response**

PROPOSED REJECT.

There is no requirement for naming consistency between separate PCS clauses.

---

Provide specification for EEE service primitives:
- ENERGY_DETECT.indication(energy_detect) -- equate to energy_detect variable
- TX_MODE.request(tx_mode) -- equate to tx_mode variable
- RX_MODE.request(rx_mode) -- equate to rx_mode variable
- RX_LPI_ACTIVE.request(rx_lpi_active) -- equate to rx_lpi_active variable

**Proposed Response**

PROPOSED REJECT.

The primitive definitions are in Clause 51. As they are for all of the inter-sublayer interfaces (such as tx_data).

---

Not clear what LPI is.

**Suggested Remedy**

- Change "Low Power Idle(LPI) is an option" to "Low Power Idle (LPI) control characters."

**Proposed Response**

PROPOSED REJECT.

The sentence is clear. The ability to transmit or receive Low Power Idle (LPI) is an option.
Proposed responses

IEEE P802.3az D2.2 Energy Efficient Ethernet comments

Jan 2010

Brown, Matt
Applied Micro (AMCC)

Comment Type T Comment Status D
Scramble behavior here should align with than in scramble_bypass definition.

Suggested Remedy
"To aid block synchronization in the receiver for EEE capability when Clause 74 FEC is in use, the scrambler input shall bypass the scrambler while scrambler_bypass is TRUE."

To:
To aid block synchronization in the receiver for EEE capability when Clause 74 FEC is in use, the PCS will pass the unscrambled data from the scrambler input rather than the scrambled data from the scrambler output. The scrambler will continue to operate normally shifting input data into the delay line.

Proposed Response Response Status W
PROPOSED ACCEPT.

Brown, Matt
Applied Micro (AMCC)

Comment Type T Comment Status D
The energy_detect variable state is determined from energy_detect primitive from FEC and/or PMA. The primitive has the values OK and FAIL, whereas the energy detect variable is expected to have the values TRUE and FALSE. Redefine energy_detect variable and update LPI Receive state diagram (Figure 49-17).

Suggested Remedy
Change variable name from energy_detect to energy_detect_ok. Make changes throughout section to references to this variable (not the primitive) including Figure 49-17.

Change definition of energy_detect ok to:
A Boolean variable indicating when the PMD detects signal energy. The variable is set to TRUE when the energy_detect primitive indicates OK and is set to FALSE when the energy_detect primitive indicates FAIL.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

See also comments #4 & #5 (Clause 51).

To energy_detect variable that is defined and used in this clause is boolean, therefore no change is needed to Clause 49. However, the commenter correctly identified the error in Clause 51 that is remedied by comment #4 & #5.

Brown, Matt
Applied Micro (AMCC)

Comment Type T Comment Status D
After signal changes from ALERT to DATA, the energy_detect may possibly indicate no energy. The purpose of using the ALERT signal was to provide a higher energy signal so that we may energy_detect threshold higher to prevent false energy detect from noise.

As a result, when in RX_WAKE and RX_WTF states, it is very possible and expected that energy_detect will go FALSE before block lock is achieved.

Since energy_detect is VERY reliable with the ALERT signal, a transition to RX_WAKE indicates either a REFRESH or WAKE signal not a false detection of noise or ringing.

Suggested Remedy
Remove the following transitions:
RX_WAKE to RX_QUIET
RX_WTF to RX_QUIET

Proposed Response Response Status W
PROPOSED ACCEPT.

Brown, Matt
Applied Micro (AMCC)

Comment Type T Comment Status D
Capitalization of constants TRUE and FALSE is inconsistent.

Suggested Remedy
In all text and figures, where the word represents a value or state, replace:
"true" with "TRUE"
"false" with "FALSE"

Proposed Response Response Status W
PROPOSED ACCEPT.

Brown, Matt
Applied Micro (AMCC)

Comment Type T Comment Status D
All variables here are specific to EEE based on sentence on line 20.

Suggested Remedy
Replace "For EEE capability, this" with "This".

Proposed Response Response Status W
PROPOSED ACCEPT.
Proposed responses

Comment Type: E
Comment Status: D

It is common to refer to PCS receiver not PCS's receiver.

Suggested Remedy

Change "PCS's receiver" to "PCS receiver".

7 instances on page 165

PROPOSED ACCEPT.

---

Comment Type: T
Comment Status: D

In transition RX_ACTIVE to RX_SLEEP need to qualify with RX_BLOCK_LOCK.

Suggested Remedy

Change transition criteria to:

```
rx_block_lock*(block_lock=rx_block_lock) R_TYPE(rx_coded)=LI
```

PROPOSED ACCEPT IN PRINCIPLE.

---

Comment Type: TR
Comment Status: D

The next page bit number references don't match up with the EEE advertisement register bit numbering as was specified in the resolution to Comment #193 against Draft 2.1 at the November Plenary.

Also, since this refers to register 7.61 the bit designations need to be changed from 7.60.x to 7.61.x.

Suggested Remedy

In table 45-157b,

```
For 7.60.3 (7.61.3) change next page bit number from "U2" to "U3"
For 7.60.2 (7.61.2) change next page bit number from "U1" to "U2"
For 7.60.1 (7.61.1) change next page bit number from "U0" to "U1"
```

PROPOSED ACCEPT.
Proposed responses

Comment Type: TR

55.3.5.4

P 199

L 18

# 59

Grimwood, Michael

Broadcom

Comment Status: D

IASE-T lpi_req during training

Proposed Response

If LPI is signaled while the PHY is training, during the PCS_Test state, the local PHY may transition to QUIET before the Link Partner PHY is ready.

The PHY Control and Transmit PCS state diagrams need to be modified to check whether the local PHY is training and, if it is, ignore the LPI request.

Suggested Remedy

At the end of section 55.4.5.1, introduce a new variable, loc_lpi_en.

In the Fig 55-24 PHY Control state diagram, loc_lpi_en is set to FALSE upon entry into state PCS_Test and is set to TRUE upon entry into PCS_Data.

In the Transmit PCS state diagram, inhibit transitions to LPI (TX_L) when loc_lpi_en is FALSE.

Document the communications between the PHY Control block and the Transmit PCS block by updating the functional and reference diagrams and defining the PMA service primitive associated with the variable, loc_lpi_en.

A presentation will be submitted for review at the January 2010 interim meeting in New Orleans detailing the specific changes required.

PROPOSED ACCEPT IN PRINCIPLE.

Review detailed changes in the task force.

Comment Status: D

Response Status: W

PROPOSED ACCEPT.

Comment Type: TR

78.1.1.2.1

P 237

L 8

# 60

Grimwood, Michael

Broadcom

Comment Status: D

Indicate that LPI requests are undefined when the PHY is indicating Local Fault or Remote Fault.

Suggested Remedy

The effect of receipt of this primitive is undefined if link_status is not OK (see 28.2.6.1.1) or if LPI_REQUEST=ASSERT within 1 second of the change of link_status to OK.

To:

The effect of receipt of this primitive is undefined if link_status is not OK (see 28.2.6.1.1), or if LPI_REQUEST=ASSERT within 1 second of the change of link_status to OK, the PHY is indicating Local Fault, or the PHY is indicating Remote Fault.

PROPOSED ACCEPT.
Proposed responses

If the 10GBASE-T PHY receives an LPI request while it is in PCS_TEST, it should defer acting upon this request until PCS_TEST is complete. With this mechanism, the LPI requestor may not know precisely when the PHY acted upon the LPI request and therefore there may be ambiguity with respect to whether or not the CASE-1 wake time may be used.

To avoid this ambiguity, state that the CASE-1 wake time only applies if the PHY has not indicated Local Fault for at least 10 msec. This time period allows enough time for PCS_TEST to complete.

Suggested Remedy

Change:

Case-1 of the 10GBASE-T PHY applies when the PHY is requested to transmit the Wake signal before transmission of the Sleep signal to the Link Partner is complete.

To:

Case-1 of the 10GBASE-T PHY applies when the PHY is requested to transmit the Wake signal before transmission of the Sleep signal to the Link Partner is complete and if the PHY has not indicated Local Fault at any time during the previous 10 ms.

PROPOSED ACCEPT.
It has been pointed out by IEEE staff editors that, per IEEE style, equations should be replaced rather than highlighting changes using strikethroughs and underscores.

**Suggested Remedy**

Remove change highlighting (strikethrough and underscore) from the equations in this subclause and add replacement instructions before each equation.

**PROPOSED ACCEPT.**

---

**Comment Type:** ER  **Comment Status:** D  
RX.Active, the transition with the condition "block_lock != rx_block_lock" goes nowhere. There is a missing connectin to the right of the Figure 49-17.

**Suggested Remedy**

Draw in a feedback line to the RX.Active state, which matches the earlier D2.2 version of the diagram.

**PROPOSED ACCEPT.**

---

**Comment Type:** ER  **Comment Status:** D  
In RX.Sleep, the transition with the condition "block_lock != rx_block_lock *~rx_to_timer_done * R_TYPE(rx_coded) = IDLE" goes nowhere. There is a missing line connection, to the right of the Figure 49-17.

**Suggested Remedy**

Draw in a feedback line to the RX.Active state, which matches the earlier D2.2 version of the diagram.

**PROPOSED ACCEPT.**
Confidence: Law, David 3Com

Proposed responses

Cl 14 SC 14.1.1.1 P 15 L 49 # 69

Law, David 3Com

Comment Type T  Comment Status D

I believe that 10BASE-Te is a MAU and not a PHY. See subclause 14.1.1'Overview' which states that 'This clause also specifies the functional, electrical, and mechanical characteristics of the Energy Efficient version of 10BASE-T, the type 10BASE-Te MAU, and one specific medium for use with that MAU.' 10BASE-T is also a MAU. A MAU is not the same as a PHY - see Figure 1-1 in IEEE Std 802.3-2008.

Suggested Remedy

Change 'A 10BASE-Te PHY interoperates with a 10BASE-T PHY if the minimum cabling requirements of a 10BASE-Te PHY are met.' to read 'A 10BASE-Te MAU interoperates with a 10BASE-T MAU if the minimum cabling requirements of a 10BASE-Te MAU are met.

Also change subclause 78.1 (page 235, line 20) that reads 'In addition to the above, EEE defines a 10 Mb/s PHY (10BASE-Te) with reduced transmit amplitude requirements. The 10BASE-Te PHY is fully interoperable with 10BASE-T PHYs over 100 m of class D (Category 5) or better cabling as specified in ISO/IEC 11801:1995.' to read 'In addition to the above, EEE defines a 10 Mb/s MAU (10BASE-Te) with reduced transmit amplitude requirements. The 10BASE-Te MAU is fully interoperable with 10BASE-T MAUs over 100 m of class D (Category 5) or better cabling as specified in ISO/IEC 11801:1995.'

Proposed Response  Response Status W

PROPOSED ACCEPT.

Cl 22 SC 22.2.1 P 22 L 5 # 71

Law, David 3Com

Comment Type TR  Comment Status D

EEE requires the use of the MAC defined in Annex 4A.

Suggested Remedy

Change the text 'The definition of LPI signaling assumes the use of the MAC defined in Annex 4A.' to read 'Support for EEE requires the use of the MAC defined in Annex 4A.'

Proposed Response  Response Status W

PROPOSED ACCEPT.

Editors to ensure that changes are made in clauses 22, 35, 46 and 78.

Cl 24 SC 24.2.3.1 P 35 L 39 # 70

Law, David 3Com

Comment Type T  Comment Status D

According to Table 22-2 a binary value 0001 of receive nibble-wide Data signals (RXD), together with the de-assertion of RX_DV and the assertion of RX_ER on the MII is used to indicate "Assert LPI" (see page 26, line 10).

Suggested Remedy

Change '.. used to indicate "receive LPI", as ..' to read '.. used to indicate "Assert LPI", as ..'

Proposed Response  Response Status W

PROPOSED ACCEPT.

Cl 00 SC 0 P L # 72

Law, David 3Com

Comment Type ER  Comment Status D

It has been agreed with staff that where a subclause is inserted prior to the existing first subclause it is labelled [existing subclause - one level][a through z]. Where a subclause is inserted after an existing subclause - assuming it is not the last - the new subclause it is labelled [subclause number][a through z].

For example to insert two subclauses before 43.2.1 the subclauses would be numbered 43.2.1a and 43.2.1b. Two subclauses added after the last subclause 43.2.2 would be numbered 43.2.3 and 43.2.4.

At the moment we are not consistent in IEEE P802.3ba and IEEE P802.3az. In some cases the draft isn't consistent with itself.

Suggested Remedy

Use consistent subclause insertion numbering including style guide and approach agreed with staff.

Proposed Response  Response Status W

PROPOSED ACCEPT.
Surely the whole point of adding XNPs for 10GBASE-T was to use them for this sort of configuration operation.

Please reconsider response to 20192

The BRC will discuss whether there is sufficient support to overturn the resolution in previous drafts.

Do we need to add a description here of what happens if the PHY is in LPI on the transmit side and in the normal operational mode on the receive side, and it receives LF from the link partner?

I believe that, according to 46.3.4, the RS should respond to LF by sending RF on the transmit path. This would wake the transmit side of the link if it were in LPI.

Add text stating that the fault signaling takes precedence - transmitting the RF will wake up the PHY.

Should this description be added to clause 78?

Bring 46.3.4 into the draft. Modify the second paragraph:

Sublayers within the PHY are capable of detecting faults that render a link unreliable for communication. Upon recognition of a fault condition a PHY sublayer indicates Local Fault status on the data path. When this Local Fault status reaches an RS, the RS stops sending MAC data ** or LPI **, and continuously generates a Remote Fault status on the transmit data path (possibly truncating a MAC frame being transmitted). When Remote Fault status is received by an RS, the RS stops sending MAC data, and continuously generates Idle control characters. When the RS no longer receives fault status messages, it returns to normal operation, sending MAC data ** or LPI **.
Proposed responses

IEEE P802.3az D2.2 Energy Efficient Ethernet comments

Proposed Response

# 75
Cl  SC  P  L  #
46  46.4a  135  47
Parnaby, Gavin Solarflare Communicat

Comment Type   T   Comment Status   D

The MAC should be prevented from requesting a transition into LPI within 1 ms of sending or receiving fault signaling, to prevent LPI requests occurring during PCS_Test while the PHY is retraining. This would prevent any frames being lost during LPI transitions following PCS_Test.

The current text states that LPI requests should be prevented unless the link has been operational for at least 1 second, but this only traps the case when the link retrains after autoneg.

Suggested Remedy
Add text stating that transitions to LPI should be prevented within 1 ms of sending or receiving fault signaling.

Proposed Response   Response Status   W
PROPOSED REJECT.

There is already a restriction on LPI dependent on link state (46.1.7). Additional restrictions are not necessary and have no effect on frame loss.

# 76
Cl  SC  P  L  #
55  55.3.5.4  201  5
Parnaby, Gavin Solarflare Communicat

Comment Type   TR   Comment Status   D

Add the 10GBASE-T ad hoc output (link monitor and fast retrain capabilities) to the draft.

Suggested Remedy
Add text stating that transitions to LPI should be prevented within 1 ms of sending or receiving fault signaling.

Proposed Response   Response Status   W
PROPOSED ACCEPT.

Comment Type   TR   Comment Status   D

Definition of code_sync_status should be same as what is there in 802.3-2008 for sync_status.

Suggested Remedy
A parameter set by the PCS Synchronization process to reflect the status of the link as viewed by the receiver.

Proposed Response   Response Status   W
PROPOSED ACCEPT.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Page</th>
<th>Line</th>
<th>Type</th>
<th>Status</th>
<th>Comment Text</th>
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<tbody>
<tr>
<td>80</td>
<td>36</td>
<td>24</td>
<td>ER</td>
<td>D</td>
<td>Missing closing paranthesis after idle_d</td>
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<td></td>
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<tr>
<td>81</td>
<td>36</td>
<td>36</td>
<td>TR</td>
<td>D</td>
<td>Description for tx_ts_timer, tx_tq_timer and tx_tr_timer starts as: This timer is started when the PCS receiver enters. It should be. This timer is started when the PCS transmitter enters.</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>PROPOSED ACCEPT.</td>
</tr>
<tr>
<td>81</td>
<td>36</td>
<td>48</td>
<td>TR</td>
<td>D</td>
<td>To be consistent across all the EEE PHYs, change the state name from START_RX_SLEEP to RX_SLEEP. Also on page 76, line 31.</td>
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<td>If the editor decides to keep the name, then on page 76, line 28 change the name RX_SLEEP to START_RX_SLEEP.</td>
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<tr>
<td>82</td>
<td>36</td>
<td>5</td>
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<td>D</td>
<td>Editor forgot to change the tx_quiet and rx_quiet to tx_mode and rx_mode.</td>
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<td></td>
<td>Refer to Pillai_1109_01.pdf and modify appropriately.</td>
</tr>
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<tr>
<td>83</td>
<td>49</td>
<td>16</td>
<td>TR</td>
<td>D</td>
<td>Arrow head for TX_ACTIVE back to TX_ACTIVE needs to touch the vertical line.</td>
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<td>Comment Status</td>
<td>Proposed Response</td>
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<td>#87</td>
<td>TR</td>
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<td>Fix the diagram</td>
<td>W</td>
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<td>W</td>
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<tr>
<td>93</td>
<td>72</td>
<td>224</td>
<td>TR</td>
<td>D</td>
<td>None of the changes listed in Pillai_1109_01.pdf got added/modified into CL72.</td>
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<tr>
<td>94</td>
<td>49</td>
<td>170</td>
<td>TR</td>
<td>D</td>
<td>In draft 2.2 a new state got added to Fig 49-17. In certain cases this transition from RX_WAKE to RX_SCR_BYPASS can cause issues.</td>
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<tr>
<td>95</td>
<td>49</td>
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<td>TR</td>
<td>D</td>
<td>The draft is not addressing the situation in which how a transmitter will handle an LPI request if the link partner is transmitting Local fault.</td>
</tr>
<tr>
<td>96</td>
<td>40</td>
<td>89</td>
<td>E</td>
<td>D</td>
<td>The response to comment 427 on the initial WG ballot was supposed to be applied here to remove &quot;more commonly known as&quot;</td>
</tr>
<tr>
<td>97</td>
<td>14</td>
<td>21</td>
<td>ER</td>
<td>D</td>
<td>Since the decision was that 10BASE-T includes 10BASE-Te, it is unclear whether a maker of a 10BASE-Te MAU also checks the 10BASE-T box yes.</td>
</tr>
</tbody>
</table>
**Proposed responses**

IEEE P802.3az D2.2 Energy Efficient Ethernet comments

Jan 2010

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**Comment ID #98**

**Cl 28C**

**SC 28C.12**

**P 258**

**L 38**

Thaler, Pat

Broadcom

**Comment Type** T

**Comment Status** D

This says that 45.2.7.13a defines what is sent in bits U10:U0 so there are no remaining U field bits (which is the only field in the unformatted page).

The bits should all be defined in one place (45.2.7.13a) so that this doesn't need to be updated two places if another bit is used sometime. My comment on 15.2.7.13a would update it to cover all the bits.

This comment also applies to 73A.4

**Suggested Remedy**

Delete ", the remaining field bits...on receipt".

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT.

Change for 28C.12 and 73A.4.

See also comment #99

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**Comment ID #99**

**Cl 45**

**SC 45.2.7.13a**

**P 128**

**L 25**

Thaler, Pat

Broadcom

**Comment Type** TR

**Comment Status** D

This bit assignments still aren't right. Bits 3 through 1 of the register should map to U3 through U1 of the U field. I.e. each bit in the register should map to the corresponding bit of the U field. This was agreed in the resolution of my comment 416 on the first ballot and in the response to 193 in the first recirculation.

This comment also applies to 45.2.7.14a which should use the same mapping.

**Suggested Remedy**

Change the mapping of bits 3 through 1 to U3 through U1 respectively in both tables.

I would also prefer that the resolution in response to 416 be fully implemented - the register bits 0 through 15 should map to U0 through U15 (all bits apply to Clause 73 and only bits 0 through 10 apply to Clause 28) with the unused values reserved. That allows the mapping for the register to U bits to be established now for when additional bits are added latter.

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT IN PRINCIPLE.

Change 3:1 to U3 through U1 to rectify editorial mistake implementing comment #193. Make the change in both tables: 45-157a and 45-157b

Add a new paragraph after the current one in 45.2.7.13a:

Bits 10:0 of register 7.60 map to bits U10 through U0 respectively of the unformatted next page following a EEE technology message code as defined in 28C.12. Bits 15:0 of register 7.60 map to bits U15 through U0 respectively of the unformatted next page following a EEE technology message code as defined in 73A.4. Devices using Clause 28 autonegotiation may ignore bits defined for Clause 73 autonegotiation and devices using Clause 73 autonegotiation may ignore bits defined for Clause 28 autonegotiation.

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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

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Page 24 of 29
Most of the clean-up of terminology for LPI and EEE has been done, but there are still a few cases where the EEE capability is referred to as low power idle.

In the state machine definitions of clause 55, "When the low power idle function is <not> supported," appears a number of times including in 55.3.5.2.4 Functions where there is no low power idle function. These should all refer to EEE which is the name of the optional capability.

Suggested Remedy
If low power idle is not supported should be "If EEE is not supported".
"the low power idle function" should be "EEE"

Check for any other instances of supported being applied to low power idle or LPI and correct. LPI is the signal and LPI mode is the state where that signal is used. EEE is the optional capability.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

Also make changes on page 179, 195, 196, 206.

Some text still implies that a type 10BASE-Te MAU is not a type 10BASE-T one, but it needs to be for backwards compatibility in places like autonegotiation. 10BASE-Te should be treated as a subtype of 10BASE-T.

Suggested Remedy
In the title of Clause 14, change "and type 10BASE-Te" to "including type 10BASE-Te".

14.1.1 in the note say: "Support for both 10BASE-Te and non-10BASE-Te signal levels in a single device is not expected." Or you could use legacy 10BASE-T where you need to differentiate from 10BASE-Te.

14.1.1.3 - the first paragraph doesn't explicitly exclude 10BASE-Te. The paragraph needs language to exclude 10BASE-Te: either replace 10BASE-T with "10BASE-T except 10BASE-Te" or "legacy 10BASE-Te"

14.3, The additional sentence "This subclause also ..." is not needed since 10BASE-T includes 10BASE-Te when not otherwise specified.

14.3.1.2 the paragraph about insertion loss for a legacy 10BASE-T MAU needs to explicitly exclude 10BASE-Te.

This needs to be done for every time that there is a requirement that is different for 10BASE-Te. The paragraph near the beginning of 14.3.1.2 that contains the reference to Figure 14-7 is an example where it was done right.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

In the title of Clause 14, change "and type 10BASE-Te" to "including type 10BASE-Te".

14.1.1 - Change not to read:
"Support for both 10BASE-T and 10BASE-Te signal levels in a single device is not required".

14.1.1.3 - Change text on page 16, line 5 from:
"The performance specifications of the 10BASE-T simplex ..." to:
"The performance specifications of the 10BASE-T except 10BASE-Te simplex ..."

14.3 - Delete additional sentence "This subclause also defines the ."

14.3.1.2 Change page 17, line 8 from:
"For a type 10BASE-T MAU, insertion ." to:
"For a type 10BASE-T MAU that is not a type 10BASE-Te MAU, insertion ."

Change text on page 18, line 34 from:
The response to 384 on the first Working Group ballot has not been fully implemented.
FEC does not have "frames", it has blocks.

Suggested Remedy
All instances of "frame" in Clause 74 should be replaced with "block".

PROPOSED ACCEPT.
Change "frame" to "block" at the following locations:
Page 233, line 11, 15 and 19.

Delivered as TR, changed to T

This is a "pile on" to comment #20192. Annex 28C and Clause 45.2.7.13a and clause 45.2.7.14a require new EEE next pages and new message codes that add 1/2 second during autonegotiation. This is unnecessary time.

Submitted as TR, changed to T

Use the existing NP and XNP to control advertising of BASE-T EEE

PROPOSED REJECT.

The BRC will discuss whether there is sufficient support to overturn the resolution in previous drafts.
Comment Type: T  Comment Status: D

The comparison document only shows added text (in blue). This means that deletions from the draft cannot easily be seen.

Suggested Remedy
Please show additions and deletions (in strikeout and red) in the comparison document as other projects have done.

Proposed Response  Response Status: W

PROPOSED REJECT.

The way document compare works in Frame, the file that shows deletions messes up all the numbering so it is not very useful.

Comment Type: T  Comment Status: D

Maintenance request #1206 The objective d) is correct as it is written. The objective reflects what is in the TP-PMD standard which is what this clause uses for 100BASE-TX. The TP-PMD standard is specifically written to focus on Category 5 UTP and 150 ohm STP cabling, see Annex E of ANSI X3.263-1995.

The objectives are meant to serve as goals at the start of a project. Being able to run over UTP was important because there are more impairments due to noise, crosstalk, and EMC; compared to screened or shielded systems. So distinguishing UTP as a minimum objective is correct. It is the lowest common denominator.

I also don’t believe you should change objectives that were true at the time.

Suggested Remedy
Reject maintenance request #1206

Proposed Response  Response Status: W

PROPOSED REJECT.

See comment #107

Comment Type: TR  Comment Status: D

Comment #110 on D2.1 requested a change from Tw_sys to Tw_sys_tx to update the L2 nomenclature to the one adopted by the wake-shrinkage ad-hoc. Nevertheless, the scope of replacing Tw_sys with Tw_sys_tx was limited to only 78.4, leaving other dependent area on L2 with the incorrect older nomenclature. For L2 purposes the scope ought to be more than 78.4, specifically for 79 and to check if C30 or C30 annexes need updating.

Suggested Remedy
For the purposes of Layer 2, update the entire draft to match the nomenclature change done in comment #110 on D2.1. Specifically, change Tw_sys to Tw_sys_tx for the Layer 2 negotiated parameter references in C78.4, C79 and C30, where applicable and wherever else applicable.

Proposed Response  Response Status: W

PROPOSED ACCEPT.
### Proposed responses

#### #110

**Comment Type** | **TR**  
---|---
**Comment Status** | **D**

Part of the adopted resolution to comment #110 on D2.1, a change in the assignment in the init state to be LOCAL INITIAL TX VALUE and LOCAL INITIAL RX VALUE. This inadvertently had the opposite effect of what we were trying to do as it leaves the start values to the system instead of the times defined by Table 78.4.

**Suggested Remedy**

There are two ways that could resolve this. Either:

(a) Rather than change assignments in init state, change Tw_phy to Tw_sys_tx in 78.4.2.2 PHY WAKE VALUE and 79 where it occurs. I believe this occurs in 3 places total (2 in 79 and 1 in 78.4.2.2).

or

(b) initializing everything to PHY WAKE VALUE

The second proposal maybe simpler as it reduces two constants in the draft. Nevertheless, I included both for discussion in case there was something missed.

**Proposed Response** | **Response Status** | **W**
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**Proposed ACCEPT IN PRINCIPLE.**

Implement option (b) in the suggested remedy

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#### #111

**Comment Type** | **TR**  
---|---
**Comment Status** | **D**

Comment #111 on D2.1 requested a change so that the negotiated Tw_sys_tx parameter should be rounded up to the nearest integer usec to fit within the byte length fields available. This was necessary since there were no decimal points when we first introduced the parameters, however, the wake shrinkage adhic settled on numbers that had fractional amounts which would eat up the length of the TLVs.

The issue with the adopted resolution is that it was specific to a sentence in that section. All negotiated and exchanged parameters in Layer 2 do not have fractional values and that should be clearly stated throughout any references to negotiated Tw_sys_tx.

**Suggested Remedy**

For the purposes of Layer 2, all values need to be rounded to the nearest usec (i.e. not just for initialization params).

Statements can be inserted in C78.4, C79 and C30 where applicable and wherever else applicable.

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

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#### #112

**Comment Type** | **TR**  
---|---
**Comment Status** | **D**

Figure 55-15a.

If a normal retrain occurs while a PHY transmitter is in LPI mode, there is no specified mechanism to abort the LPI mode (TX_L state) in the PCS 64B/65B transmit state diagram.

**Suggested Remedy**

Provide a mechanism to cause transition to TX_INIT when normal retrain (exit from PCS_DATA state in Figure 55-24) occurs.

**Proposed Response** | **Response Status** | **W**
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**PROPOSED ACCEPT IN PRINCIPLE.**

The editor proposes using tx_mode != SEND_N as a transition into the TX_L state. This guarantees that any retrain attempt resets the state machine.

Add tx_mode != SEND_N as a transition condition into TX_L.
Figure 55-15a. If a normal retrain occurs while a PHY receiver is in LPI mode, there is no specified mechanism to abort the LPI mode (RX_L state) in the PCS 64B/65B transmit state diagram.

**Suggested Remedy**

Provide a mechanism to cause transition to RX_INIT state when normal retrain (exit from PCS_DATA state in Figure 55-24) occurs.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

The editor proposes using tx_mode != SEND_N as a transition into the RX_L state. This guarantees that any retrain attempt resets the state machine.

Add tx_mode != SEND_N as a transition condition into RX_L.