Cl **45**   *SC* **45.2.7.12**   *P* **22**   *L* **9**   # 220

Marris, Arthur   Cadence

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

The order that the 100G port types is listed is different from Table 73-5 which lists the port's priorities.

SuggestedRemedy

Swap KP4 and KR4 in Table Table 45-189 so that bit 9 is for 100GBASE-KP4 and bit 10 for 100GBASE-KR4.

Do similar change in Table 45-190 and Table 45-191 for consistancy.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make the proposed changes and…

Swap KP4 & KR4 in 73-4 (Technology Ability Field)

Cl **45**   *SC* **45.2.7.13**   *P* **23**   *L* **9**   # 96

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *EEE option*

Comment #128 on D1.0 proposed that the two wake modes for EEE should be made optional. There was insufficient discussion at the time to conince the BRC to make the change. However, since that time some convincing arguments have been made:

Requiring simple modules (PMA/PMD only) to support line quiescence could consume more energy than would be saved during LPI. Furthermore, modules built before the definition of EEE could support Fast Wake but not normal wake.

Because Fast Wake is the simplistic implementation of EEE (that requires no changes to the PMA/PMD/FEC) it makes sense for Fast Wake to be the default behavior for EEE PHYs, with normal wake being an optional extra mode. Changes will be required in multiple places to support this operation, the resolution of this comment should serve as a reference.

SuggestedRemedy

Add a row and adjust the reserved row accordingly:

7.60.14 - Fast Wake only - 1 = Advertise that the PHY supports only Fast Wake mode : 0 - Do not advertise that the PHY supports only Fast Wake mode

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Straw poll in ad-hoc & TF

(Chicago rules) If EEE supported…
Both modes required (ad hoc: 1, TF: 0)
Fast Wake mandatory, quiescent mode optional (ad hoc: 5, TF: 23)
Quiescent mode mandatory, fast wake optional (ad hoc: 1, TF: 3)
Both modes independently optional (ad hoc: 0, TF: 0)

Add a row and adjust the reserved row accordingly:

7.60.14 - Both EEE modes - 1 = Advertise that the PHY supports both EEE modes : 0 - Do not advertise that the PHY supports both EEE modes (the PHY supports only Fast Wake).

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 Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **45**
SC **45.2.7.13**

Page 1 of 30
9/25/2012 1:11:57 AM

Cl **45**　　　*SC* **45.2.7.13.1a**　　　*P* **24**　　　*L* **41**　　　# 97

Barrass, Hugh　　　　　　　　Cisco

Comment Type　**T**　　　*Comment Status*　**A**　　　　*EEE option*

If the new optional behavior is accepted there needs to be a description of the new register bit.

SuggestedRemedy

Insert an extra new subclause 45.2.7.13.1a before the existing one and renumber the rest.

45.2.7.13.1a Fast Wake only (7.60.14)

Support for Fast Wake only, as defined in 82.2.18.2.2, shall be advertised if this bit is set to one. This bit is not set for PHYs less than 40 Gb/s and for PHYs that support both wake mode. Note that this bit defaults set for PHYs greater than or equal to 40 Gb/s.

Response　　　　　*Response Status*　**C**

ACCEPT IN PRINCIPLE.

45.2.7.13.1a Both EEE modes (7.60.14)

Support for both EEE modes, as defined in 82.2.18.2.2, shall be advertised if this bit is set to one. This bit is not set for PHYs less than 40 Gb/s and for PHYs that support only Fast Wake mode.

Cl **45**　　　*SC* **45.2.7.14**　　　*P* **25**　　　*L* **29**　　　# 105

Barrass, Hugh　　　　　　　　Cisco

Comment Type　**T**　　　*Comment Status*　**A**　　　　*EEE option*

If the new optional behavior is accepted there needs to be a new register bit.

SuggestedRemedy

Add a row and adjust the reserved row accordingly:

7.61.14 - Fast Wake only - 1 = Link partner is advertising that the PHY supports only Fast Wake mode : 0 - Link partner is not advertising that the PHY supports only Fast Wake mode

Response　　　　　*Response Status*　**C**

ACCEPT IN PRINCIPLE.

Add a row and adjust the reserved row accordingly:

7.61.14 - Both EEE modes - 1 = Link partner is advertising that the PHY supports both EEE modes : 0 - Link partner is not advertising that the PHY supports both EEE modes.

Cl **74**　　　*SC* **74.7.4.4**　　　*P* **37**　　　*L* **1**　　　# 68

Barrass, Hugh　　　　　　　　Cisco

Comment Type　**T**　　　*Comment Status*　**R**　　　　*EEE FEC*

Clause 74 needs to be changed so that compatibility with .3ba PHYs can be maintained.

The FEC block needs to be aligned so that RAMs are at the start of a block to allow rapid block lock.

SuggestedRemedy

Add the following at the end of clause 74.7.4.4

For PHYs operating at 40 Gb/s and above that include the optional Energy Efficient Ethernet (EEE) capability with the normal wake mode option (see Clause 78, 78.3), the FEC encoder shall force the start of a new FEC block following the transition of tx_mode from QUIET to another state. The FEC blocks following this transition shall start with a Rapid Alignment Marker (RAM) that includes a down_count divisible by 4 (see 82.2.8a).

Response　　　　　*Response Status*　**C**

REJECT.

The minimal change to Clause 74 is preferred. The use of scrambler bypass may not be optimal, but the impact is small compared to the disruption of changes to Clause 74 FEC.

Cl **74**　　　*SC* **74.7.4.8**　　　*P* **37**　　　*L* **1**　　　# 69

Barrass, Hugh　　　　　　　　Cisco

Comment Type　**T**　　　*Comment Status*　**R**　　　　*EEE FEC*

Clause 74 needs to be changed so that compatibility with .3ba PHYs can be maintained.

The rapid block lock needs to take into account RAMs for 40/100G

SuggestedRemedy

Change the first part of subclause 74.7.4.8 from "If the optional EEE capability is supported" to "If the optional EEE capability is supported for PHYs operating at 10Gb/s"

Add a new paragraph at the end of the subclause:

If the optional EEE capability is supported for PHYs operating at or above 40Gb/s a similar FEC rapid block lock is required. When transitioning out of the sleep state, the remote FEC encoder starts FEC blocks with Rapid Alignment Markers inciuing a down_count divisible by 4.

Response　　　　　*Response Status*　**C**

REJECT.

The minimal change to Clause 74 is preferred. The use of scrambler bypass may not be optimal, but the impact is small compared to the disruption of changes to Clause 74 FEC.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general　　　*Cl* **74**　　　Page 2 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn　　*SC* **74.7.4.8**　　　9/25/2012 1:12:05 AM
SORT ORDER: Clause, Subclause, page, line

Cl **78**   *SC* **78.1**   *P* **37**   *L* **30**   # 331
Estes, Dave   UNH - IOL

Comment Type   **E**   *Comment Status* **A**   40G
The paragraph does not mention 10BASE-Te, 40GBASE-CR4, or 40GBASE-KR4

SuggestedRemedy
Add these PHYs in their respoective positions in the paragraph

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

See #107, 108

Cl **78**   *SC* **78.1**   *P* **37**   *L* **30**   # 216
Sela, Oren   Mellanox Technologie

Comment Type   **T**   *Comment Status* **A**   40G
Need to add the 40GBASE-CR4 and 40GBASE-KR4 PHYs t othe overview

SuggestedRemedy
Change:
"...PHY. For operation over twinax cable, EEE supports may be supported by the
100GBASE-CR10 and the 100GBASE-CR4 PHY
To:
"...PHY. For operation over twinax cable, EEE supports may be supported by the
40GBASE-CR4, 100GBASE-CR10 and the 100GBASE-CR4 PHY
Change:
"For operation over electrical backplanes, EEE may be supported by the 1000BASE-KX
PHY, the 10GBASE-KX4 PHY, the 10GBASE-KR PHY, the 100GBASE-KR4 PHY, and the
100GBASE-KP4 PHY
To:
"For operation over electrical backplanes, EEE may be supported by the 1000BASE-KX
PHY, the 10GBASE-KX4 PHY, the 10GBASE-KR PHY, the 40GBASE-KR4 PHY, the
100GBASE-KR4 PHY, and the 100GBASE-KP4 PHY"

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

See #107, 108

Cl **78**   *SC* **78.1**   *P* **37**   *L* **32**   # 107
Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   40G
Following the decision to include all 40/100 PHYs...

SuggestedRemedy
Change "100GBASE-CR10" to "40GBASE-CR4 PHY, the 100GBASE-CR10 PHY"

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

Cl **78**   *SC* **78.1**   *P* **37**   *L* **34**   # 108
Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   40G
Following the decision to include all 40/100 PHYs...

SuggestedRemedy
Change "the 100GBASE-KR4 PHY," to "the 40GBASE-KR4 PHY, the 100GBASE-KR4
PHY,"

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

Cl **78**   *SC* **78.1.4**   *P* **38**   *L* **21**   # 425
Dawe, Piers   IPtronics

Comment Type   **E**   *Comment Status* **A**
Make the document easier to use with consistent ordering.

SuggestedRemedy
Order Table 78-1 in the reverse order to Table 73-5 Priority Resolution.

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

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **78**   Page 3 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **78.1.4**   9/25/2012 1:12:05 AM
SORT ORDER: Clause, Subclause, page, line

Cl **78**　　*SC* **78.2**　　　　*P* **39**　　*L* **1**　　　# 347
Estes, Dave　　　　　　　　UNH - IOL

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

Table 78-2 doesn't include EEE parameters for XLAUI/CAUI

SuggestedRemedy

Add XLAUI/CAUI parameters to table 78-2

Response　　　　　*Response Status* **C**

ACCEPT IN PRINCIPLE.

Add 1 row for XLAUI/CAUI, all parameters TBD.

Cl **78**　　*SC* **78.5**　　　　*P* **38**　　*L* **44**　　　# 445
Dawe, Piers　　　　　　　　IPtronics

Comment Type **TR**　*Comment Status* **A**　　　　*EEE option*

Change
For PHYs with an operating speed of 100 Gb/s (that implement EEE) two modes of LPI operation are supported.

SuggestedRemedy

To
PHYs with an operating speed of 100 Gb/s that implement EEE support the "fast wake" mode of LPI operation and may additionally support the "normal wake" mode. The two modes are not used simultaneously.

Response　　　　　*Response Status* **C**

ACCEPT IN PRINCIPLE.

See #96 (& many others) for resolution.

Cl **78**　　*SC* **78.5**　　　　*P* **38**　　*L* **44**　　　# 444
Dawe, Piers　　　　　　　　IPtronics

Comment Type **TR**　*Comment Status* **A**　　　　*EEE option*

This says "For PHYs with an operating speed of 100Gb/s (that implement EEE) two modes of LPI operation are supported." So it's both or nothing.

Implementing traditional EEE in a PHY divided by a CAUI involves extra pattern-recognition circuitry that would consume extra power. Gaining lock with the FEC-encoded lanes takes time even with rapid algnment markers. Turning transmitters and receivers with EQ on and off rapidly adds to the signal integrity challenge. The energy/bit in 100G PHYs is vastly less than 10/100/1000 Meg PHYs but there is still energy to be saved above the MAC. In a high-speed core network that never really goes quiet, energy would have to be saved in very short time slots. For other networks that do go truly quiet at night, the link can be powered down by traditional means whether EEE is present or not.

SuggestedRemedy

Have three ability choices: no EEE, fast EEE only or capable of both EEE modes. Adjust Table 45-190, EEE advertisement register, and Table 45-191, EEE link partner ability, to manage this.
Consider quantitatively (million tons of CO2) whether the slow EEE mode is worththile, particularly for existing PHY types where fast EEE will be added and the link can be shut down above the MAC for long quiet periods anyway.

Response　　　　　*Response Status* **C**

ACCEPT IN PRINCIPLE.

See #96 (& many others) for resolution.

Cl **78**　　*SC* **78.5**　　　　*P* **38**　　*L* **44**　　　# 332
Estes, Dave　　　　　　　　UNH - IOL

Comment Type **E**　*Comment Status* **A**　　　　*40G*

Is 40G excluded from Fast wake?

SuggestedRemedy

If Fast wake should be supported for EEE then add 40 Gb/s to this paragraph.

Response　　　　　*Response Status* **C**

ACCEPT IN PRINCIPLE.

See #109

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general　　　　　*Cl* **78**　　　　Page 4 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn　　*SC* **78.5**　　　9/25/2012 1:12:05 AM
SORT ORDER: Clause, Subclause, page, line

Cl **78**　　*SC* **78.5**　　　　*P* **38**　　*L* **44**　　# 110
Barrass, Hugh　　　　　　　　Cisco

Comment Type **T**　　*Comment Status* **A**　　　　*EEE option*

If the new optional behavior is accepted then the "may" should be used.

SuggestedRemedy

Change "are supported" to "may be supported"

Response　　　　*Response Status* **C**

ACCEPT.

Cl **78**　　*SC* **78.5**　　　　*P* **38**　　*L* **44**　　# 109
Barrass, Hugh　　　　　　　　Cisco

Comment Type **T**　　*Comment Status* **A**　　　　*40G*

Following the decision to include all 40/100 PHYs...

SuggestedRemedy

Change 100 Gb/s to 40 Gb/s and 100 Gb/s

Response　　　　*Response Status* **C**

ACCEPT.

Cl **78**　　*SC* **78.5**　　　　*P* **38**　　*L* **48**　　# 111
Barrass, Hugh　　　　　　　　Cisco

Comment Type **T**　　*Comment Status* **A**　　　　*EEE option*

If the new optional behavior is accepted then there needs to be a description.

SuggestedRemedy

Add a sentence at the end of the paragraph:

Fast wake is mandatory for PHYs that implement EEE; normal wake is an additional option.

Response　　　　*Response Status* **C**

ACCEPT.

Cl **78**　　*SC* **78.5**　　　　*P* **39**　　*L* **31**　　# 112
Barrass, Hugh　　　　　　　　Cisco

Comment Type **T**　　*Comment Status* **A**　　　　*40G*

Following the decision to include all 40/100 PHYs...

SuggestedRemedy

In Table 78-4 add two rows for 40GBASE-CR4 and 40GBASE-KR4

Response　　　　*Response Status* **C**

ACCEPT.

Cl **78**　　*SC* **78.5.2**　　　*P* **39**　　*L* **46**　　# 113
Barrass, Hugh　　　　　　　　Cisco

Comment Type **T**　　*Comment Status* **A**　　　　*40G*

Following the decision to include all 40/100 PHYs...

SuggestedRemedy

Change the title of subclause to:

40 Gb/s and 100 Gb/s PHY extension using XLAUI and CAUI

Response　　　　*Response Status* **C**

ACCEPT.

Cl **78**　　*SC* **78.5.2**　　　*P* **39**　　*L* **46**　　# 344
Estes, Dave　　　　　　　　UNH - IOL

Comment Type **T**　　*Comment Status* **A**　　　　*40G*

This section should also include the XLAUI

SuggestedRemedy

Change all references of CAUI to XLAUI/CAUI

Response　　　　*Response Status* **C**

ACCEPT.

See #113, 114

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general　　　　*Cl* **78**　　　Page 5 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn　　*SC* **78.5.2**　　9/25/2012 1:12:05 AM
SORT ORDER: Clause, Subclause, page, line

Cl **78**   *SC* **78.5.2**   *P* **39**   *L* **48**   # 114
Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *40G*
Following the decision to include all 40/100 PHYs...

SuggestedRemedy
Change the first part of the sentence from

"100 Gb/s PHYs may be extended using CAUI"

to

"40 Gb/s and 100 Gb/s PHYs may be extended using XLAUI and CAUI"

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

Change the first part of the sentence from

"100 Gb/s PHYs may be extended using CAUI"

to

"40 Gb/s and 100 Gb/s PHYs may be extended using XLAUI and CAUI"

and replace CAUI with XLAUI/CAUI in the remainder of the paragraph.

Cl **78**   *SC* **78.5.2**   *P* **39**   *L* **53**   # 448
Dawe, Piers   IPtronics

Comment Type   **TR**   *Comment Status* **A**
Management is optional, and if there is management, the Clause 45 method is itself
optional. So the PMA Egress AUI Stop Enable (PEASE) bit (1.n.n) may not exist even if
the associated PMA control variable does exist.

SuggestedRemedy
Write the spec in terms of the variables being true or false. The MDIO bits follow along
according to the mapping tables. Applies to 81.3a.2.1 and 83.3 also.

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

These are all defined in terms of PMA control variables but this clause needs to be
reworded to reflect that:

Change "the PMA Egress AUI Stop Enable (PEASE) bit (1.n.n)" to "PMA Egress AUI Stop
Enable (PEASE, see 83.3; MDIO register bit 1.n.n)"

Change "the PMA Ingress AUI Stop Enable (PIASE) bit (1.n.n)" to "PMA Ingress AUI Stop
Enable (PIASE, see 83.3; MDIO register bit (1.n.n)"

Cl **78**   *SC* **78.5.2**   *P* **39**   *L* **53**   # 189
Slavick, Jeff   Avago Technologies

Comment Type   **T**   *Comment Status* **A**
Defintions for how PEASE and PIASE (CAUI shutdown control bits) affect EEE timing
exist. However the MDIO bits don't in Clause 45

SuggestedRemedy
Create MDIO register bits for PEASE and PIASE.
Also create bits for indicating the capability for PEASE and PIASE

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

Create register bits for LPI_FW; PEASE, PIASE; PEASA; PIASA - see 83.6 - in PMA/PMD
register space

1.1810 - EEE Control Register
1.1811 - EEE Status Register

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **78**   Page 6 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **78.5.2**   9/25/2012 1:12:06 AM
SORT ORDER: Clause, Subclause, page, line

Cl **78** *SC* **78-5** *P* **39** *L* **25** # 348
Estes, Dave UNH - IOL

Comment Type **TR** *Comment Status* **A** *40G*

Table 78-4 does not include any LPI timing parameters for 40G

SuggestedRemedy

Add 40G timing parameters to table 78-4

Response *Response Status* **C**

ACCEPT.

See #112

Cl **80** *SC* **80.1.2** *P* **42** *L* **17** # 6
Anslow, Pete Ciena

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

The editing instruction says "Delete the entire section 80.1.2 in the base document."
Firstly, all editing instructions in this amendment relate to the base document, this does not
need to be stated.
When applied to the base document, this will have the effect of renumbering 80.1.3
through 80.1.5 to be 80.1.2 through 80.1.4.
The modifications to what were formerly 80.1.3 through 80.1.5 just below should reflect this
change.

Note, the same issue for 60.1.2 is the subject of a separate comment.

SuggestedRemedy

Change the editing instruction to "Delete 80.1.2 and renumber subsequent clauses
accordingly."
For 80.1.3 through 80.1.5, move the editing instructions above the titles, renumber to
80.1.2 through 80.1.4 and amend the editing instruction to refer to:
"80.1.x (now renumbered to 80.1.y)"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The resolution to #432 neatly avoids this issue by retaining a vestigial subclause.

For future cases where a subclause might be deleted, there are two options:
a) Leave a vestigial placeholder (subclause heading) with the note that the content of this
subclause has been deleted.
b) Delete the subclause and include editing instructions to renumber accordingly.

The group recommends option a) for future cases.

Cl **80** *SC* **80.1.2** *P* **42** *L* **17** # 328
Estes, Dave UNH - IOL

Comment Type **E** *Comment Status* **R**

In the past the objectives were updated not deleted.

SuggestedRemedy

Update the objectives to include the new PHY types and the support for EEE and RS-FEC.

Response *Response Status* **C**

REJECT.

The TF expressed support for deleting the objectives clause with the intent that it should
start a new tradition for projects in 802.3.

Cl **80** *SC* **80.1.2** *P* **42** *L* **25** # 432
Dawe, Piers IPtronics

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

Deleting the objectives doesn't avoid all work. We need to tell the reader that 40/100G is
rated at 10^-12 BER. Some clauses specifically refer to the objectives, e.g. "It is possible
for a poor quality link to provide sufficient light for a SIGNAL_DETECT = OK indication and
still not meet the 10^-12 BER objective."

SuggestedRemedy

If we want to go without the long list and don't want to open three more clauses, have a
short subclause:
80.1.2 BER objective
It is an objective of 40 Gigabit and 100 Gigabit Ethernet to provide a bit error ratio (BER)
better than or equal to 10^-12 at the MAC/PLS service interface.

Response *Response Status* **C**

ACCEPT.

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 Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **80**
SC **80.1.2**

Page 7 of 30
9/25/2012 1:12:06 AM

Cl **80**	*SC* **80.1.4**	*P* **43**	*L* **47**	*#* 343

Estes, Dave   UNH - IOL

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

The wording is incorrect because it implies that the PCS lanes are 2-level PAM or multi-level PAM, when it is really the PMA/PMD that does the multi-level PAM.

SuggestedRemedy

Change lines 47-53 to:

40GBASE-R or 100GBASE-R represents a family of Physical Layer devices using a physical coding sublayer for 40 Gb/s or 100 Gb/s operation over multiple PCS lanes based on 64B/66B block encoding (see Clause 82) and a PMD implementing 2-level pulse amplitude modulation (PAM).

100GBASE-P represents Physical Layer devices using a physical coding sublayer for 100 Gb/s operation over multiple PCS lanes based on 64B/66B block encoding (see Clause 82) and a PMD implementing multi-level pulse amplitude modulation (PAM).

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

See also #449 & #23 for justification for other changes.

Change lines 47-53 to:

40GBASE-R or 100GBASE-R represents a family of Physical Layer devices using the Clause 82 Physical Coding Sublayer for 40 Gb/s or 100 Gb/s operation over multiple PCS lanes (see Clause 82) and a PMD implementing 2-level pulse amplitude modulation (PAM). Some 100GBASE-R Physical Layer devices also use the transcoding and FEC of Clause 91.

100GBASE-P represents Physical Layer devices using the Clause 82 Physical Coding Sublayer for 100 Gb/s operation over multiple PCS lanes (see Clause 82) and a PMD implementing more than 2-level pulse amplitude modulation (PAM). Some 100GBASE-P Physical Layer devices also use the transcoding and FEC of Clause 91.

Cl **80**	*SC* **80.1.4**	*P* **43**	*L* **48**	*#* 438

Dawe, Piers   IPtronics

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

Seeing as we don't define pulse amplitude modulation (PAM) and don't need it outside Clause 94, it would be better not to use the term.

SuggestedRemedy

Change 2/4-level pulse amplitude modulation or 4-level PAM to just 2/4-level modulation, each time (only 8 instances).

Response   *Response Status* **C**

REJECT.

PAM is a defined abbreviation in Clause 1.5

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 Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **80**
SC **80.1.4**

Page 8 of 30
9/25/2012 1:12:06 AM

Cl **80**   *SC* **80.1.4**   *P* **43**   *L* **49**   # 449
Dawe, Piers   IPtronics

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

Although they may use a small part of Clause 82, it is not the case that 100GBASE-CR4 or 100GBASE-KR4 use 64B/66B block encoding: this is removed (transcoded) before the PMD so is never present on the line (unlike with KR FEC which is optional). They use 256b/257b block encoding.
It would be better to use language more like the definitions section:
1.4.51 100GBASE-R: An IEEE 802.3 family of Physical Layer devices using the physical coding sublayer defined in Clause 82 for 100 Gb/s operation. (See IEEE Std 802.3, Clause 82.)

SuggestedRemedy

Change to:
40GBASE-R or 100GBASE-R represents a family of Physical Layer devices using the Clause 82 Physical Coding Sublayer for 40 Gb/s or 100 Gb/s operation over multiple PCS lanes based on 2-level pulse amplitude modulation (PAM) and low-overhead block encoding. Some 100GBASE-R Physical Layer devices also use the transcoding and FEC of Clause 91.

Also change to:
1.4.51 100GBASE-R: An IEEE 802.3 family of Physical Layer devices using the physical coding sublayer defined in Clause 82, and in some cases the transcoding and FEC of Clause 91, for 100 Gb/s operation. (See IEEE Std 802.3, Clause 82 and Clause 82.)

Or we could revisit the PHY names, but it seems OK to have the three coding schemes with the same 3.125% overhead (64B/66B, KR FEC, 256b/257b) all use the same letter R.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

See also #343 & #23

The point regarding 64B/66B is well made, but the changes to Clause 1.4.51 are not justifiable. Re-opening the PHY naming discussions may not be popular with the Task Force.

See #343 for the detailed wording.

Cl **80**   *SC* **80.1.4**   *P* **43**   *L* **52**   # 23
Anslow, Pete   Ciena

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

The definition of 100GBASE-P only distinguishes itself from 100GBASE-R by changing "2-level pulse amplitude modulation (PAM)" to "multi-level pulse amplitude modulation (PAM)". Since multi-level includes 2, this seems inadequate.

SuggestedRemedy

Change 100GBASE-P to match the definition of 100GBASE-KP4 in 1.4:
"4-level pulse amplitude modulation (PAM)"

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

See also #343 & #449

The more generic wording may be useful in the future. Change "multi-level" to "more than 2 level" and also include the wording changes captured in #343.

Cl **80**   *SC* **80.1.4**   *P* **44**   *L* **3**   # 174
Anslow, Pete   Ciena

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

The editing instruction says to add three rows, but does not say where in the table they should be added. This will make life difficult for subsequent amendments.

Currently the 40G PHYs come first and the 100G PHYs are listed in reach order:
CR10, SR10, LR4, ER4

SuggestedRemedy

Make the insertion points explicit and such to preserve reach order (for KR4 and KP4 use clause order):
KR4, KP4, CR4, CR10, SR10, LR4, ER4

Response   *Response Status* **C**

ACCEPT.

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 Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **80**
SC **80.1.4**

Page 9 of 30
9/25/2012 1:12:06 AM

Cl **80**   *SC* **80.1.5**   *P* **45**   *L* **47**   # 427
Dawe, Piers   IPtronics

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

Make the document easier to use with consistent ordering.

SuggestedRemedy

Order Table 80-2a in the opposeite order to 78-5 priority resolution then short to long.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Comment #173 justifies a different order

Cl **80**   *SC* **80.1.5**   *P* **45**   *L* **8**   # 173
Anslow, Pete   Ciena

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

Table 80-2 in IEEE Std 802.3-2012 was structured with the clauses along the top in clause order.

Now that it has been split into Tables 80-2 and 80-2a, clause 78 has been added out of order

Also, the PHYs were previously arranged in reach order

SuggestedRemedy

Change the order of the columns in Tables 80-2 and 80-2a to put 78 between 74 and 81

Change the order of the rows in Table 80-2a to preserve reach order (for KR4 and KP4 use clause order):
KR4, KP4, CR4, CR10, SR10, LR4, ER4

Response   *Response Status* **C**

ACCEPT.

Cl **80**   *SC* **80.2.3**   *P* **46**   *L* **11**   # 431
Dawe, Piers   IPtronics

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

10PASS-TS, 1000BASE-PX10, 1000BASE-PX20, 10GBASE-PR-D, 10GBASE-PR-U and 10/1GBASE-PRX-D already use Reed-Solomon FEC, so we can't call this fourth kind "The Reed-Solomon FEC" or "Reed-Solomon Forward Error Correction (RS-FEC) sublayer". We need something distinctive. Also, we recognise RS as Reconciliation Sublayer.

SuggestedRemedy

Change its name to 256B/257B FEC, or Clause 91 FEC.

Response   *Response Status* **C**

REJECT.

The naming used in Clause 91 was agreed by the TF. Using different terminology in this instance would introduce confusion. Within this context the use of Reed-Solomon FEC is unambiguous.

Cl **80**   *SC* **80.3.1**   *P* **46**   *L* **44**   # 70
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

The behavior of the LPI receive function needs to be redefined. A large number of specific changes will be required to achieve this in the manner proposed in the submitted presentation. This comment may be used as a reference should the proposed method be accepted, rejected or modified.

rx_mode needs to change direction, also energy_detect and rx_lpi_active need to be added.

SuggestedRemedy

Change:

IS_RX_MODE.indication

To:

IS_RX_MODE.request
IS_ENERGY_DETECT.indication
IS_RX_LPI_ACTIVE.request

Response   *Response Status* **C**

ACCEPT.

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 Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **80**
SC **80.3.1**

Page 10 of 30
9/25/2012 1:12:06 AM

Cl **80**   *SC* **80.3.1**   *P* **46**   *L* **48**   # 71

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Fix the descriptions of the primitives.

SuggestedRemedy

Delete the 2nd sentence of paragraph, replace with:

The IS_RX_MODE.request primitive is used to communicate the state of the PCS LPI
receive function to other sublayers. The IS_RX_LPI_ACTIVE.request primitive is used to
communicate to the FEC that the PCS is using its receive LPI function. The
IS_ENERGY_DETECT.indication primitive is used to communicate that the PMD has
detected the return of energy on the interface following a period of quiescence.

Response   *Response Status* **C**

ACCEPT.

Cl **80**   *SC* **80.3.2**   *P* **47**   *L* **5**   # 115

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *40G*

Following the decision to include all 40/100 PHYs...

SuggestedRemedy

Change Fig 80-2 in the same way as 80-3.

Response   *Response Status* **C**

ACCEPT.

Cl **80**   *SC* **80.3.2**   *P* **48**   *L* **13**   # 76

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Fig 80-3 - fix LPI interface between PCS & FEC

SuggestedRemedy

Between PCS & FEC:

Change direction FEC:IS_RX_MODE.request
Add FEC:IS_ENERGY_DETECT.indicate
Add FEC:IS_RX_LPI_ACTIVE.request

Response   *Response Status* **C**

ACCEPT.

Cl **80**   *SC* **80.3.2**   *P* **48**   *L* **15**   # 454

Dawe, Piers   IPtronics

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

KR FEC for 100GBASE-CR10 remains optional.

SuggestedRemedy

Change
NOTE 1-CONDITIONAL BASED ON PHY TYPE
to
NOTE 1-CONDITIONAL, OPTIONAL OR OMITTED DEPENDING ON PHY TYPE
Same in Figure 80-4 and Figure 80-5.
In figures 81-1 and 82-1, leave note 1 as base spec for 40G, create note 3 for 100G FEC:
NOTE 3-CONDITIONAL, OPTIONAL OR OMITTED DEPENDING ON PHY TYPE

Response   *Response Status* **C**

REJECT.

Conditional covers optional or ommited.

Cl **80**   *SC* **80.3.2**   *P* **48**   *L* **21**   # 77

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Fig 80-3 - fix LPI interface between FEC & PMA

SuggestedRemedy

Between FEC & PMA:

Change direction FEC:IS_RX_MODE.request
Add FEC:IS_ENERGY_DETECT.indicate

Response   *Response Status* **C**

ACCEPT.

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 Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **80**
SC **80.3.2**

Page 11 of 30
9/25/2012 1:12:06 AM

Cl **80**   *SC* **80.3.2**   *P* **48**   *L* **28**   # 78
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*
For change of LPI Rx function

Fig 80-3 - fix LPI interface between PMA(20:10) & PMA(10:n)

SuggestedRemedy
Between PMA(20:10) & PMA(10:n):

Change direction FEC:IS_RX_MODE.request
Add FEC:IS_ENERGY_DETECT.indicate

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

Cl **80**   *SC* **80.3.2**   *P* **48**   *L* **36**   # 79
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*
For change of LPI Rx function

Fig 80-3 - fix LPI interface between PMA & PMD

SuggestedRemedy
Between PMA & PMD:

Change direction FEC:IS_RX_MODE.request

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

Cl **80**   *SC* **80.3.2**   *P* **49**   *L* **13**   # 80
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*
For change of LPI Rx function

Fig 80-3a - fix LPI interface between PCS & FEC

SuggestedRemedy
Between PCS & FEC:

Change direction FEC:IS_RX_MODE.request
Add FEC:IS_ENERGY_DETECT.indicate
Add FEC:IS_RX_LPI_ACTIVE.request

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

Cl **80**   *SC* **80.3.2**   *P* **49**   *L* **16**   # 441
Dawe, Piers   IPtronics

Comment Type **T**   *Comment Status* **A**
The 256b/257b PCS/FEC sublayer is mandatory for 100GBASE-CR4/KR4/KP4 so no need
for note 1 (compare Figure 80-5a).

SuggestedRemedy
Delete note 1. Also in Figure 91-1.

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

Cl **80**   *SC* **80.3.2**   *P* **49**   *L* **21**   # 129
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*
For change of LPI Rx function

Fig 80-3a - fix LPI interface between FEC & PMA

SuggestedRemedy
Between FEC & PMA:

Change direction FEC:IS_RX_MODE.request
Add FEC:IS_ENERGY_DETECT.indicate

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

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 Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **80**
SC **80.3.2**

Page 12 of 30
9/25/2012 1:12:06 AM

Cl **80**   *SC* **80.3.2**   *P* **49**   *L* **28**   # 61
Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *LPI Rx*
For change of LPI Rx function

Fig 80-3a - fix LPI interface between PMA & PMD

SuggestedRemedy
Between PMA & PMD:

Change direction FEC:IS_RX_MODE.request

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

Cl **80**   *SC* **80.3.3.5**   *P* **47**   *L* **36**   # 72
Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *LPI Rx*
For change of LPI Rx function

Change rx_mode definition

SuggestedRemedy
Change title - IS_RX_MODE.request

Delete 1st sentence. Add:
The IS_RX_MODE.request primitive communicates the rx_mode parameter generated by
the PCS LPI receive function to other sublayers.

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

Cl **80**   *SC* **80.3.3.5**   *P* **47**   *L* **39**   # 440
Dawe, Piers   IPtronics

Comment Type   **T**   *Comment Status* **R**
Should this be simplified by combining IS_RX_MODE.indicate (should be
IS_RX_MODE.indication) and IS_SIGNAL.indication?

SuggestedRemedy
?

Response   *Response Status* **C**
REJECT.

The changes proposed in comment #70 redefine the operation of RX_MODE making such
a combination impossible.

Cl **80**   *SC* **80.3.3.5.1**   *P* **47**   *L* **44**   # 73
Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *LPI Rx*
For change of LPI Rx function

Change rx_mode direction

SuggestedRemedy
Change indicate to request

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

Cl **80**   *SC* **80.3.3.5.1**   *P* **47**   *L* **47**   # 74
Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *LPI Rx*
For change of LPI Rx function

No ALERT for rx_mode

SuggestedRemedy
Delete ALERT.

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

Cl **80**   *SC* **80.3.3.5.2**   *P* **47**   *L* **51**   # 75
Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *LPI Rx*
For change of LPI Rx function

Change origin of rx_mode

SuggestedRemedy
Change "received signal" to "PCS LPI receive function"

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

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **80**   Page 13 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **80.3.3.5.2**   9/25/2012 1:12:07 AM
SORT ORDER: Clause, Subclause, page, line

Cl **80**   *SC* **80.3.3.6**   *P* **49**   *L* **53**   # 62

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Need definitions for rx_lpi_active

SuggestedRemedy

Add subclause 80.3.3.6

80.3.3.6 IS_RX_LPI_ACTIVE.request
The IS_RX_LPI_ACTIVE.request primitive communicates to the FEC that the PCS LPI
receive function is active. Without EEE capability, the primitive is never invoked and has no
effect.

80.3.3.6.1 Semantics of the service primitive
IS_RX_LPI_ACTIVE.request(rx_lpi_active)

The parameter rx_lpi_active is boolean.

80.3.3.6.2 When generated
This primitive is generated by the PCS LPI receive function.

80.3.3.6.3 Effect of receipt
The specific effect of receipt of this primitive is defined by the FEC sublayer that receives
this primitive. In general, when rx_lpi_active is true the FEC sublayer uses rapid block lock
to reestablish FEC operation following a period of quiescence.

Response   *Response Status* **C**

ACCEPT.

Cl **80**   *SC* **80.3.3.7**   *P* **49**   *L* **54**   # 63

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Need definitions for energy_detect

SuggestedRemedy

Add subclause 80.3.3.7

80.3.3.7 IS_ENERGY_DETECT.indicate
The IS_ENERGY_DETECT.indicate primitive is used to communicate that the PMD has
detected the return of energy on the interface following a period of quiescence.. Without
EEE capability, the primitive is never invoked and has no effect.

80.3.3.7.1 Semantics of the service primitive
IS_ENERGY_DETECT.indicate(energy_detect)

The parameter energy_detect is boolean.

80.3.3.7.2 When generated
This primitive is generated by the PMA, reflecting the state of the signal_detect parameter
received from the PMD.

80.3.3.7.3 Effect of receipt
The specific effect of receipt of this primitive is defined by the PCS sublayer that receives
this primitive. This parameter is used to indicate that activity has returned on the interface
following a period of quiescence.

Response   *Response Status* **C**

ACCEPT.

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 Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **80**
SC **80.3.3.7**

Page 14 of 30
9/25/2012 1:12:07 AM

Cl **80**   *SC* **80.4**   *P* **50**   *L* **3**   # 178
Anslow, Pete   Ciena

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

The editing instruction says to add four rows, but does not say where in the table they
should be added. This will make life difficult for subsequent amendments.

Currently the 40G layers come first and the 100G layers are listed stack, then in reach
order:
CR10, SR10, LR4, ER4

SuggestedRemedy

Make the insertion points explicit and such to preserve existing order (for KR4 and KP4 use
clause order):
MAC&RS&MC, PCS, BASE-R FEC, RS-FEC, PMA, KR4, KP4, CR4, CR10, SR10, LR4,
ER4

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

Cl **81**   *SC* **81.1**   *P* **55**   *L* **22**   # 329
Estes, Dave   UNH - IOL

Comment Type   **E**   *Comment Status* **R**

Figure 81-1

NOTE 1 will now be the same as NOTE 2

SuggestedRemedy

Delete NOTE 2 and change all references to be NOTE 1

Response   *Response Status* **C**
REJECT.

Although the comment is correct, the consolidation of the 2 notes may be more easily
achieved during the revision.

Cl **81**   *SC* **81.1**   *P* **55**   *L* **28**   # 116
Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *40G*

Following the decision to include all 40/100 PHYs...

SuggestedRemedy

Change CGMII to XLGMII and CGMII

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

Cl **81**   *SC* **81.1.5**   *P* **55**   *L* **28**   # 330
Estes, Dave   UNH - IOL

Comment Type   **E**   *Comment Status* **A**   *40G*

Bullet point g) does not include XLGMII

SuggestedRemedy

Change "The CGMII may" to "The XLGMII/CGMII may"

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

Change to "The XLGMII and CGMII may" - see comment #116

Cl **81**   *SC* **81.3.4**   *P* **58**   *L* **32**   # 499
Dawe, Piers   IPtronics

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

If when a cable is disconnected, a PHY sublayer indicates Local Fault, this forces the PHY
to come out of LPI, consume more power, and blast out EMI (if a copper PHY) while
transmitting RF (pun intended), "continuously". For ever?
Or will some PHY types give up after a while and go back to AN DME?
I looked in the base spec but could not see if a normal loss of signal event because a
cable is disconnected or the far transmitter is shut down counts as "local fault" or not.
Where is this made clear?

SuggestedRemedy

It looks like we may want coding for "low power remote fault".

Response   *Response Status* **C**
REJECT.

The local and remote fault behavior is unchanged from the current standard. Since this
should be an unusual circumstance it is not useful to optimize EEE behavior for this. An
energy (or RF) conscious system implementer might take notice of internal alarms
following an error condition and minimize wasted energy (or RF pollution) accordingly.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **81**   Page 15 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **81.3.4**   9/25/2012 1:12:07 AM
SORT ORDER: Clause, Subclause, page, line

Cl **81**   *SC* **81.3.4**   *P* **58**   *L* **33**   # 333
Estes, Dave   UNH - IOL

Comment Type   **E**   *Comment Status*   **R**
Prior to transmitting LF, the RS could be sending MAC data, LPI, or Idle. After receiving faults the device could go back to sending MAC data, LPI, or Idle.

SuggestedRemedy
Change "When this Local Fault status reaches an RS, the RS stops sending MAC data or LPI," to "When this Local Fault status reaches an RS, the RS stops sending MAC data, LPI, or Idle,"

Change "When the RS no longer receives fault status messages, it returns to normal operation, sending MAC data or LPI." to "When the RS no longer receives fault status messages, it returns to normal operation, sending MAC data, LPI, or Idle."

Response   *Response Status*   **C**
REJECT.

In the base standard for all RS clauses, the term "MAC data" is used to cover whatever is being sent from the MAC - payload data, IFG, etc. That is why it states that a MAC frame "may" be truncated.

Cl **81**   *SC* **81.3a**   *P* **59**   *L* **10**   # 160
Ran, Adee   Intel

Comment Type   **TR**   *Comment Status*   **A**   *40G*
With the addition of 40GBASE-KR4 and 40GBASE-CR4 optional support for EEE, references to CGMII and CAUI in this subclause should also refer to XLGMII and XLAUI respectively.

SuggestedRemedy
Change "CGMII" to "XLGMII/CGMII" in:
Page 59 lines 10,12
Page 61 lines 32,33

Change "CAUI" to "XLAUI/CAUI" in:
Page 60 line 43
Page 61 lines 37,38

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

Instead of XLGMII/CGMII, use XLGMII and CGMII

Instead of XLAUI/CAUI, use XLAUI and CAUI

Cl **81**   *SC* **81.3a.2.1**   *P* **60**   *L* **43**   # 334
Estes, Dave   UNH - IOL

Comment Type   **E**   *Comment Status*   **A**   *40G*
tw_timer only references the CAUI.

SuggestedRemedy
Add XLAUI to the definition

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

Change CAUI to XLAUI and CAUI

Cl **81**   *SC* **81.3a.3.1**   *P* **61**   *L*   # 118
Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status*   **A**   *40G*
Following the decision to include all 40/100 PHYs...

SuggestedRemedy
Change CAUI to XLAUI and CAUI - 2 locations.

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

Cl **81**   *SC* **81.3a.3.1**   *P* **61**   *L* **29**   # 335
Estes, Dave   UNH - IOL

Comment Type   **E**   *Comment Status*   **A**
This subclause only references the CGMII and the CAUI

SuggestedRemedy
Add references to the XLGMII and the XLAUI

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

Resolved by #117 & #118

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **81**   Page 16 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **81.3a.3.1**   9/25/2012 1:12:07 AM
SORT ORDER: Clause, Subclause, page, line

Cl **81**   *SC* **81.3a.3.1**   *P* **61**   *L* **31**   # 117
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *40G*
　 Following the decision to include all 40/100 PHYs...

SuggestedRemedy
　 Change CGMII to XLGMII and CGMII - 2 locations.

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

Cl **82**   *SC* **82**   *P* **80**   *L* **10**   # 202
Slavick, Jeff   Avago Technologies

Comment Type **T**   *Comment Status* **R**
　 Figure 82-17 LPI Receive state diagram. There is no need to have a RX_TIMER state
　 since the self loop from RX_SLEEP -> RX_SLEEP changes nothing.

SuggestedRemedy
　 Remove the RX_TIMER state and move the actions of RX_TIMER into RX_SLEEP.
　 Remove the loop from RX_SLEEP -> RX_SLEEP.

　 In clause 49 there is a self loop of RX_SLEEP -> RX_SLEEP which causes the rx_tq_timer
　 to restart continously until you begin to see data leave. So leaving the RX_SLEEP ->
　 RX_SLEEP loop in place is an option.

Response   *Response Status* **C**
　 REJECT.

　 The extra state was added to avoid the continual restarting of the timer (which would make
　 it redundant). See comment #184 in D1.0.

Cl **82**   *SC* **82**   *P* **80**   *L* **8**   # 203
Slavick, Jeff   Avago Technologies

Comment Type **T**   *Comment Status* **A**
　 Figure 82-17 LPI Receive state diagram.   The transiton from RX_ACTIVE -> RX_TIMER
　 requires that block_lock * rx_block_lock * R_TYPE(rx_coded) = LI. The transition from
　 RX_ACTIVE -> RX_ACTIVE occurs when block_lock != rx_block_lock and align_status !=
　 rx_align_status. rx_align_status has to wait for all PCS lanes to achieve rx_block_lock
　 before it can deskew and be set to true. I believe we want remain in RX_ACTIVE until
　 we're aligned and receiving LI blocks.

SuggestedRemedy
　 Change the transition from RX_ACTIVE -> RX_TIMER to be:
　 align_status * rx_block_lock * R_TYPE(rx_coded) = LI

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

　 Since rx_align_status takes into account the block_lock for all PCS lanes, it is more
　 efficient to make the transition:

　 align_status * rx_align_status * R_TYPE(rx_coded) = LI

Cl **82**   *SC* **82.1.3**   *P* **63**   *L* **27**   # 337
Estes, Dave   UNH - IOL

Comment Type **E**   *Comment Status* **R**
　 Figure 82-1

　 NOTE 1 will now be the same as NOTE 2

SuggestedRemedy
　 Delete NOTE 2 and change all references to be NOTE 1

Response   *Response Status* **C**
　 REJECT.

　 Although the comment is correct, the consolidation of the 2 notes may be more easily
　 achieved during the revision.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **82**   Page 17 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **82.1.3**   9/25/2012 1:12:08 AM
SORT ORDER: Clause, Subclause, page, line

Cl **82**   *SC* **82.1.5**   *P* **65**   *L* **33**   # 64

Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Need to fix block diag

SuggestedRemedy

Change direction inst:IS_RX_MODE.request
Add inst:IS_ENERGY_DETECT.indicate
Add inst:IS_RX_LPI_ACTIVE.request

Response   *Response Status* **C**

ACCEPT.

Cl **82**   *SC* **82.2.18.2.2**   *P* **68**   *L* **12**   # 81

Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Need to add definition for energy_detect

SuggestedRemedy

Add energy detect:

A parameter generated by the PMA/PMD sublayer to reflect the state of the received signal
.In the PMD this has the same definition as parameter signal_detect and is passed through
without modification by the PMA (and FEC).

Response   *Response Status* **C**

ACCEPT.

Cl **82**   *SC* **82.2.18.2.2**   *P* **68**   *L* **15**   # 119

Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *EEE option*

If the new optional behavior is accepted then LPI_FW variable will capture the behavior.

SuggestedRemedy

Change "and false otherwise" to "and false when the transmitter is to use the optional
normal wake mechanism"

Add a second sentence "This variable defaults true and may only be set to false if the
optional normal wake mode is supported. "

Response   *Response Status* **C**

ACCEPT.

Cl **82**   *SC* **82.2.18.2.2**   *P* **68**   *L* **16**   # 346

Estes, Dave   UNH - IOL

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

The possible values for received_tx_mode are not defined

SuggestedRemedy

Define the possible values for received_tx_mode

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Define the possible values to be the same as for tx_mode - i.e.

The value of this variable is inferred from the coding of the RAMs of the incoming data
stream and may take the values defined for tx_mode.

Cl **82**   *SC* **82.2.18.2.2**   *P* **68**   *L* **29**   # 338

Estes, Dave   UNH - IOL

Comment Type   **E**   *Comment Status* **A**   *LPI Rx*

There are three possible values for rx_mode

SuggestedRemedy

Change "four values" to "three values"

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Comment #82 reduces this to two values.

Cl **82**   *SC* **82.2.18.2.2**   *P* **68**   *L* **30**   # 82

Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Need to change definition for rx_mode

SuggestedRemedy

Change definition to:

A variable reflecting the state of the LPI receive function as described by the LPI receive
state diagram (Fig 82-17). The parameter has one of two values DATA and QUIET.

Response   *Response Status* **C**

ACCEPT.

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 Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **82**
SC **82.2.18.2.2**

Page 18 of 30
9/25/2012 1:12:08 AM

Cl **82**   *SC* **82.2.18.2.2**   *P* **68**   *L* **31**   # 184

Slavick, Jeff   Avago Technologies

Comment Type **E**   *Comment Status* **A**   *LPI Rx*

Text states rx_mode is one of four values, but only 3 are listed.

SuggestedRemedy

Change the word four to three.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

#82 changes definition to only two modes.

Cl **82**   *SC* **82.2.18.2.3.1**   *P* **71**   *L* **36**   # 188

Slavick, Jeff   Avago Technologies

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

In Table 82-5a tx_mode is set to SLEEP in the sleep state.

SuggestedRemedy

Change the Tsl descriptions to be:
Local Sleep Time when entering the TX_SLEEP state and LPI_FW=FALSE
and
Local Sleep Time when entering the TX_SLEEP state and LPI_FW=TRUE

Response   *Response Status* **C**

REJECT.

The parameter description is couched in terms of the time from <event> to <event> - and is correct in those terms.

Cl **82**   *SC* **82.2.18.3.1**   *P* **72**   *L* **5**   # 83

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Need to change the timing reference in Table 82-5b.

SuggestedRemedy

Change "rx_mode to be set to ALERT or DATA" to "energy_detect to be set to true"

Response   *Response Status* **C**

ACCEPT.

Cl **82**   *SC* **82.2.18.3.1**   *P* **79**   *L* **40**   # 191

Slavick, Jeff   Avago Technologies

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

Time spent in TX_WAKE does not allow for all RAMs to be sent for all data rates.

Twl when LPI_FW = TRUE is 240ns minimum
100G-KR4 inserts 1 RAM every other FEC frame and each FEC frame takes 52ns to transmit. This means the minimum time for Twl needs to be 312ns to guarantee you can send 3 RAMs.
100G-CR10 and 40G-CR4 send 36 66b blocks in 240ns, but 100G-CR10 has to share a PMD lane over two PCS lanes, so that means 18 66b blocks. So 100G-CR10 requires 24 66b blocks to insert 3 RAMs which is 307.2ns

Twl when LPI_FW = FALSE is 3.9us minimum
For 100G-KR4 that's 75 FEC frames, so a maximum of 37 RAMs
100G-CR4 it's 9 FEC frames, so a maximum of 36
40G-CR4 it's 19 FEC frames, so a maximum of 76

SuggestedRemedy

Change the value in Table 82-5a for Twl when LPI_FW = TRUE to be 312ns minimum, 332ns maximum
Change down_count value used when LPI_FW = FALSE in TX_WAKE state(s) to be 36

Response   *Response Status* **C**

ACCEPT.

Note that this will increase the fast wake time from the value proposed in the baseline. An alternative approach might be to force the PCS to send a RAM immediately after entry into the WAKE state (causing the LP PCS to require a small resynchronization).

Cl **82**   *SC* **82.2.18.3.1**   *P* **80**   *L*   # 84

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Need to add rx_mode assignments in Rx LPI state diagram - Fig 82-17.

SuggestedRemedy

In state RX_ACTIVE, assign rx_mode = DATA

Response   *Response Status* **C**

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **82**   Page 19 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **82.2.18.3.1**   9/25/2012 1:12:08 AM
SORT ORDER: Clause, Subclause, page, line

Cl **82**   *SC* **82.2.18.3.1**   *P* **80**   *L* **16**   # 87

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Need to change state transition conditions in Rx LPI state diagram - Fig 82-17.

SuggestedRemedy

Transitions:

RX_SLEEP > RX_SLEEP; RX_SLEEP > RX_ACTIVE - replace rx_mode = DATA with rx_align_status
RX_SLEEP > RX_QUIET - replace rx_mode = QUIET with !rx_align_status
RX_QUIET > RX_LINK_FAIL - replace rx_mode = QUIET with !energy_detect
RX_QUIET > RX_WAKE - replace rx_mode != QUIET with energy_detect
RX_WAKE > RX_TIMER; RX_WAKE > RX_ACTIVE - replace rx_mode = DATA with rx_align_status
RX_WTF > RX_TIMER; RX_WTF > RX_ACTIVE - replace rx_mode = DATA with rx_align_status

Response   *Response Status* **C**

ACCEPT.

Cl **82**   *SC* **82.2.18.3.1**   *P* **80**   *L* **25**   # 85

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Need to add rx_mode assignments in Rx LPI state diagram - Fig 82-17.

SuggestedRemedy

In state RX_QUIET, assign rx_mode = QUIET

Response   *Response Status* **C**

ACCEPT.

Cl **82**   *SC* **82.2.18.3.1**   *P* **80**   *L* **32**   # 86

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Need to add rx_mode assignments in Rx LPI state diagram - Fig 82-17.

SuggestedRemedy

In state RX_WAKE, assign rx_mode = DATA

Response   *Response Status* **C**

ACCEPT.

Cl **82**   *SC* **82.2.3.6**   *P* **65**   *L* **48**   # 223

Gustlin, Mark   Xilinx

Comment Type **T**   *Comment Status* **A**   *40G*

Since the assumed scope is 40GE also, change:
"when LPI control characters are received from the CGMII."
to
"when LPI control characters are received from the CGMII or XLGMII."

SuggestedRemedy

Per comment.

Response   *Response Status* **C**

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **82**   Page 20 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **82.2.3.6**   9/25/2012 1:12:08 AM
SORT ORDER: Clause, Subclause, page, line

Cl **82**   *SC* **82.2.8a**   *P* **66**   *L* **11**   # 195
Slavick, Jeff   Avago Technologies

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

No definition for how to transition from normal AM to RAM.

SuggestedRemedy

Add a sentance that states the following to 82.2.8a

"After the LPI transmit state machine transitions from TX_ACTIVE to TX_SLEEP the first RAM is inserted into a continuous stream of LPI blocks after PCSL0 has sent an LPI block and the low two bits of am_counter equal 3"

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

The am_counter is used by the receiver, not the transmitter. However, in order for the RAMs to coincide with the start of an FEC block, the distance between the last normal AM and the first RAM must be a multiple of 4.

Change to:
"After the LPI Transmit state diagram transitions from TX_ACTIVE to TX_SLEEP, the first RAM shall be inserted after at least one block of /LI/ has been transmitted on PCS lane 0. In order to force the RAMs to coincide with the start of an FEC block, the distance between the first RAM and preceding normal alignment marker shall be a multiple of 4 66-bit blocks."

Cl **82**   *SC* **82.2.8a**   *P* **66**   *L* **14**   # 194
Slavick, Jeff   Avago Technologies

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

Figure 82-9a.
down_count is decremented each time you send a RAM and the down_count_done variable is set true when the count reaches 0. Therefore the last RAM transmitted is sent with a down_count = 1.

SuggestedRemedy

Change down_count = 1 and down_count = 0 to down_count = 2 and down_count = 1 in Figure 82-9a.

If a path from TX_SLEEP to TX_ACTIVE is added in the LPI transmit state machine, then the change listed above is not correct. The change would then be to change the references to RAM and last RAM since the last RAM you send in TX_SLEEP would have a down_count value of 255 when going from TX_SLEEP to TX_ACTIVE.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the down_count as suggested. A path from TX_SLEEP to TX_ACTIVE should not be added as the link partner will always require the wake sequence in order to re-align its PCS function.

Cl **82**   *SC* **82.2.8a**   *P* **66**   *L* **15**   # 224
Gustlin, Mark   Xilinx

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

Figure 82.9a is meant to show the blocks being transmitted form right to left, with the small block being the sync header (sync header is sent first). But in this context, the transition from RAMs to normal AMs is backwards, the normal AMs should be to the left of the RAMs with the countdown being reversed.

SuggestedRemedy

Fix the figure to be consistent with the sync header being transmitted first and the transition to normal AMs being after RAMs.

Response   *Response Status* **C**

ACCEPT.

Normal AM left-most; 16383 blocks; then down_count = 0; etc.

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 Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **82**
SC **82.2.8a**

Page 21 of 30
9/25/2012 1:12:08 AM

Cl **82**   *SC* **82.2.8a**   *P* **66**   *L* **43**   # 227

Gustlin, Mark   Xilinx

Comment Type   **T**   *Comment Status* **A**   *40G*

In this paragraph table 82-2 is talked about for 100GE, but since we are also assuming for now that 40GE is also in scope for EEE, please add in referecnes to table 82-3 for 40GE encoding of AMs.

SuggestedRemedy

Per the comment.

Response   *Response Status* **C**

ACCEPT.

Cl **82**   *SC* **82.2.8a**   *P* **66**   *L* **5**   # 187

Slavick, Jeff   Avago Technologies

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

The first bit of data sent after the ALERT state is exited should be a RAM. This is desired since both FEC modules need to align the RAM as the first chunk of data in the FEC frame.

SuggestedRemedy

Add text to 82.2.8a stating that no alignment markers are sent during the QUIET and ALERT states.   Remove count_down assignments in Figure 82-16 for those states.   Add text to 82.2.8a stating that a RAM shall be the first block sent on each PCS lane when the ALERT state is exited.

Response   *Response Status* **C**

REJECT.

Sending count_down assignments corresponding to QUIET and ALERT is useful for a detached FEC/PMA/PMD device that could use those values to infer the state of tx_mode.

The PCS does not cease sending RAMs (or scrambled LPI blocks) during QUIET and ALERT. Comment #68 enforces the alignment of RAMs with FEC blocks.

Cl **82**   *SC* **82.2.8a**   *P* **66**   *L* **8**   # 193

Slavick, Jeff   Avago Technologies

Comment Type   **T**   *Comment Status* **A**   *40G*

40G runs the PCS lanes at twice the frequency as 100G. So the number of RAMs inserted by a 40G PCS for a given time duration is twice that of the 100G PCS.   Since we want RAMs to be sent for the entire duration of the TX_WAKE state to allow for cascaded alignment machines (FEC & PCS) to both see RAMs we need to compensate for this.

SuggestedRemedy

Change the frequency at which RAMs are inserted by a 40G PCS to match that of the 100G PCS by changing the following sentence:
"The RAMs shall be inserted after every 7 66-bit blocks on each PCS lane."
to
"The RAMs shall be inserted after every 7 66-bit blocks on each 100G PCS lane and every 15 66-bit block on each 40G PCS lane."

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the frequency at which RAMs are inserted by a 40G PCS to match that of the 100G PCS by changing the following sentence:
"The RAMs shall be inserted after every 7 66-bit blocks on each PCS lane."
to
"The RAMs shall be inserted after every 7 66-bit blocks on each 100G PCS lane and every 15 66-bit blocks on each 40G PCS lane."

Cl **82**   *SC* **82.2.8a**   *P* **67**   *L* **2**   # 200

Slavick, Jeff   Avago Technologies

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

The last RAM sent in the WAKE state is sent with a down_count value of 1. So the example values listed are incorrect.

SuggestedRemedy

Change
(therefore the last 5 RAMs on PCS lane 0 would have CD3 values: 0xC5, 0xC2, 0xC3, 0xC0, 0xC1; for PCS lane 1 these would be: 0x99, 0x9E, 0x9F, 0x9C, 0x9D).
To
(therefore the last 5 RAMs sent by a 100GBASE-R PCS on PCS lane 0 would have CD3 values: 0xC4, 0xC5, 0xC2, 0xC3, 0xC0; for PCS lane 1 these would be: 0x98, 0x99, 0x9E, 0x9F, 0x9C).

Response   *Response Status* **C**

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **82**   Page 22 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **82.2.8a**   9/25/2012 1:12:08 AM
SORT ORDER: Clause, Subclause, page, line

Cl **82** *SC* **82.2.8a** *P* **67** *L* **5** # 455

Dawe, Piers   IPtronics

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

"The CD field ... may also be used by a detached transmit PMA sublayer to infer the state of the PCS."
Not!
If a PMA could do understand RAMs, it would be a PCS. Far too complicated.

SuggestedRemedy

I don't know if there is a remedy apart from use fast EEE, not slow EEE, so this PMA doesn't need to know.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

There is no requirement for a PMA to understand RAMs, however it is a possibility that producers of modules or silicon may wish to use. With the modifications to EEE optionality, it is made clear that PMA implementations do not necessarily need to modify their behavior to support EEE. The most likely case where a detached sublayer might wish to infer tx_mode from the RAMs would be the case of a detached FEC/PMA/PMD - where the FEC would easily be able to decode RAMs.

Change "may also be used by a detached transmit PMA sublayer to infer the state of the PCS."

To "may also be used by a device with a detached PMA or FEC sublayer to infer the state of the PCS."

Cl **82** *SC* **82.2.8a** *P* **67** *L* **7** # 228

Gustlin, Mark   Xilinx

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

I think it would be good to clarify this statement:
"BIP statistics are only updated when the receiver is in the DATA state."
It only applies to when EEE is being supported, and here the recevier means the rx_mode of the LPI state machine?

SuggestedRemedy

Per the comment, add additional text to clarify this statement.
Add in that it applies only when EEE is supported and it refers to the LPI RX SM.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Comment #345 addresses the reference to LPI Rx s/m.

Add "If the EEE capability is supported," at the beginning of the sentence.

Cl **82** *SC* **82.2.8a**♂ *P* **66** *L* **10** # 214

Sela, Oren   Mellanox Technologie

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

The use of count down to communicate the tx_mode should be an optional extension

SuggestedRemedy

Change:
The count down field is also used to communicate
some of the states of the tx_mode when it is not being used to coordinate the transition
To:
The count down field may also be used to communicate some of the states of the tx_mode when it is not being used to coordinate the transition

Response   *Response Status* **C**

REJECT.

The link partner uses the count down field in received RAMs to derive received_tx_mode

Cl **82** *SC* **82.2.8a**♂ *P* **67** *L* **8** # 215

Sela, Oren   Mellanox Technologie

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

It is not clear if BIP should be calculated from the last RAM to the first normal AM or should the first BIP be calculated from the first "normal" AM to the second normal AM?

SuggestedRemedy

Add the following text -
The BIP statistics will be first update when transitioning from RAMs to normal AMs on the second received normal AM

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add the following text -
The BIP statistics will be first updated after transitioning from RAMs to normal AMs on the first received normal AM

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general *Cl* **82** Page 23 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed Z/withdrawn *SC* **82.2.8a**♂ 9/25/2012 1:12:08 AM
SORT ORDER: Clause, Subclause, page, line

Cl **82** *SC* **82.3.1.** *P* **72** *L* **25** # 456

Dawe, Piers   IPtronics

Comment Type **TR** *Comment Status* **A** *EEE option*

1. Need to be able to switch EEE on or off.
2. For 40G/100G, fast wake should be the first kind of EEE. So, need second variable to allow slow EEE mode.

SuggestedRemedy

Replace this variable and bit with two, one to enable EEE (which will enable the "slow" or "electrical idle" mode, and a second to enable the "fast" mode.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

1) There is no need to "switch EEE on or off" in the PHY. For all speeds, EEE is negotiated and then controlled from the RS. If EEE support is not negotiated then the RS is prohibited from asserting LPI.

2) If the optional behavior proposed in comment #96 is accepted then LPI_FW selects between normal and fast wake operation. The default for LPI_FW is true.

Cl **82** *SC* **82.7.6.6** *P* **82** *L* **6** # 120

Barrass, Hugh   Cisco

Comment Type **T** *Comment Status* **A** *EEE option*

If the new optional behavior is accepted then the PICS must reflect this.

SuggestedRemedy

Add row (1st in table):

LP-01 : Support for both wake modes : 82.2.18.2.2 : Variable LPI_FW may be true or false : LPI:O

Response *Response Status* **C**

ACCEPT.

Cl **82** *SC* **82-16** *P* **79** *L* # 217

Sela, Oren   Mellanox Technologie

Comment Type **T** *Comment Status* **A** *EEE FEC*

The 100GBASE-CR10, 40GBASE-CR4 and 40GBASE-KR4 PHYs may have CL74 FEC enabled. Since for the CL74 doesn't have any requirement on the position of the alignment markers with respect to the FEC block the RAMs are not sufficient to acquire fast FEC lock and scrambler bypass is required in a similar way as for 802.3az.

During the scrambler bypass state the RAMs should be disable to allow for only LPI or Idles to be sent, this can be done by setting down_count_done to TRUE in the scrambler bypass state as in the suggested remedy or by editing 82.2.8a from: LPI transmit states other than TX_ACTIVE or TX_SCR_BYPASS and down_count_done = FALSE

The change should only be applicable for non FW mode

SuggestedRemedy

Add a new Boolean variables - scr_baypass_enable and scr_bypass. Should use the same description as in 802.3az.
After TX wake add 2 more states - TX_CRS_BYPASS, TX_DESKEW
The transition to TX_CRS_BYPASS should be: LPI_FW = FALSE * tx_tw_timer_done * scr_bypass_enable.
The transition from TX_CRS_BYPASS to TX_DESKEW should be - one_us_timer_done
For the 2 arcs from TX_WAKE to TX_ACTIVE and TX_SLEEP should add "* (!scr_bypass_enable + LPI_FW = TRUE)"
There should be 2 arcs from TX_DESKEW: 1) one_us_timer_done*T_TYPE(tx_raw) = LI - go to TX_SLEEP. 2) one_us_timer_done*T_TYPE(tx_raw) != LI - go to TX_ACTIVE

TX_SCR_BYPASS should have the following content:
scrambler_bypass <= true
Start one_us_timer
timerdown_count_enable <= FALSE
down_count <= 20
down_count_done = TRUE

TX_DESKEW should have the following content:
scrambler_bypass <= true
Start one_us_timer
timerdown_count_enable <= TRUE
down_count <= 19
down_count_done = FALSE

Also table 78-4 will need to add for the 100GBASE-CR10, 40GBASE-CR4 and 40GBASE-KR4 2 cases for the timing in the Normal wake mode

Need to add new TX_MODE - SCR_BAYPASS and TX_DESKEW:80.3.3.4.1 page 47, 85.2 page 87

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general *Cl* **82** Page 24 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed Z/withdrawn *SC* **82-16** 9/25/2012 1:12:08 AM
SORT ORDER: Clause, Subclause, page, line

Response   *Response Status* **C**

    ACCEPT IN PRINCIPLE.

    The comment is valid, however the proposed remedy does not adequately cater for the requirements of the FEC rapid lock and the lane deskew of the PCS.

    The commenter and other interested people will work to produce a more complete solution and propose it for the next draft.

    Add new Boolean variables - scr_bypass_enable and scr_bypass. Use the same description as in 802.3az.

    Also table 78-4 will need to add for the 100GBASE-CR10, 40GBASE-CR4 and 40GBASE-KR4, 2 cases for the timing in the Normal wake mode (with and without Cl. 74 FEC).

Cl **83**   *SC* **83**   *P* **83**   *L* **51**   # 123

Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *EEE option*

    If the new optional behavior is accepted then PMA only needs to support the option.

SuggestedRemedy

    After "optional Energy Efficient Ethernet (EEE) capability" insert "with the normal wake mode option"

Response   *Response Status* **C**

    ACCEPT.

Cl **83**   *SC* **83.3**   *P* **83**   *L* **40**   # 122

Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *EEE option*

    If the new optional behavior is accepted then PMA only needs to support the option.

SuggestedRemedy

    After "optional Energy Efficient Ethernet (EEE) capability" insert "with the normal wake mode option"

Response   *Response Status* **C**

    ACCEPT.

Cl **83**   *SC* **83.3**   *P* **83**   *L* **44**   # 88

Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *LPI Rx*

    For change of LPI Rx function

    rx_mode needs to change direction, also energy_detect needs to be added.

SuggestedRemedy

    Change:

    IS_RX_MODE.indication

    To:

    IS_RX_MODE.request
    IS_ENERGY_DETECT.indication

Response   *Response Status* **C**

    ACCEPT.

Cl **83**   *SC* **83.3**   *P* **83**   *L* **48**   # 89

Barrass, Hugh   Cisco

Comment Type   **T**   *Comment Status* **A**   *LPI Rx*

    For change of LPI Rx function

    Fix the descriptions of the primitives.

SuggestedRemedy

    Delete 2nd sentence.

    Add:
    The IS_RX_MODE.request primitive is used to communicate the state of the PCS LPI receive function to other sublayers. The IS_ENERGY_DETECT.indication primitive is used to communicate that the PMD has detected the return of energy on the interface following a period of quiescence.

Response   *Response Status* **C**

    ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **83**   Page 25 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **83.3**   9/25/2012 1:12:08 AM
SORT ORDER: Clause, Subclause, page, line

Cl **83**   *SC* **83.7.3**   *P* **85**   *L* **12**   # 124
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *EEE option*
If the new optional behavior is accepted then PMA only needs to support the option.

SuggestedRemedy
After "Implementation of LPI" insert "with the normal wake mode option"

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

Cl **83A**   *SC* **83A.3.2a**   *P* **202**   *L* **28**   # 67
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *EEE option*
If the new optional behavior is accepted then XLAUI/CAUI only needs to support the option.

SuggestedRemedy
After "optional Energy Efficient Ethernet (EEE) capability" insert "with the normal wake mode option"

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

Cl **83A**   *SC* **83A.3.4.7**   *P* **203**   *L* **32**   # 494
Dawe, Piers   IPtronics

Comment Type **TR**   *Comment Status* **A**   *late EEE option*
"The global energy detect function is mandatory for EEE capability": only for slow EEE, and then only if this CAUI supports slow EEE ("for" is ambiguous).

Is it possible for a CAUI that doesn't support slow-mode EEE to allow a PMD that does, to use it?

SuggestedRemedy
Change to
The global energy detect function is mandatory for a PMA connected to a CAUI that supports slow-mode EEE capability.

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

In keeping with other comments change to:

The global energy detect function is mandatory for EEE capability with the normal wake mode option and XLAUI/CAUI shutdown

---

Cl **84**   *SC* **84**   *P* **86**   *L* **20**   # 90
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *40G*
Following the decision to include all 40/100 PHYs...

SuggestedRemedy
Make all the changes to 84 that match the equivalent changes in Clause 85

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

Cl **85**   *SC* **85.1**   *P* **87**   *L* **33**   # 457
Dawe, Piers   IPtronics

Comment Type **TR**   *Comment Status* **A**   *EEE option*
1. This is the PMD clause. If you want descriptive text about PHYs as a whole, look at Clause 80.
2. If a PHY has fast mode EEE, it doesn't concern the PMD. Only the slow mode does.
3. We should be able to give a more specific reference, to slow mode LPI.
Wordsmithing attempt below: there may be better official names for fast and slow modes.

SuggestedRemedy
Change
A 100GBASE-CR10 PHY with the optional Energy Efficient Ethernet (EEE) capability may optionally enter the Low Power Idle (LPI) mode to conserve energy during periods of low link utilization (see Clause 78).
to
A 100GBASE-CR10 PMD with the Energy Efficient Ethernet (EEE) slow mode optional capability may optionally enter the slow Low Power Idle (LPI) mode to conserve energy during periods of low link utilization (see 78.x).

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

The remedy to #125 achieves the same.

Cl **85**   *SC* **85.1**   *P* **87**   *L* **33**   # 219
Sela, Oren   Mellanox Technologie

Comment Type **T**   *Comment Status* **A**   *40G*
40GBASE-CR4 can also enter low power idle

SuggestedRemedy
change "A 100GBASE-CR10 PHY" to "100GBASE-CR10 and 40GBASE-CR4 PHYs"

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

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 Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **85**
SC **85.1**

Page 26 of 30
9/25/2012 1:12:08 AM

Cl **85**   *SC* **85.1**   *P* **87**   *L* **33**   # 125
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *EEE option*
If the new optional behavior is accepted then PMD only needs to support the option.

SuggestedRemedy
After "optional Energy Efficient Ethernet (EEE) capability" insert "with the normal wake mode option"

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

Cl **85**   *SC* **85.13.3**   *P* **90**   *L* **13**   # 66
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *EEE option*
If the new optional behavior is accepted then PMD only needs to support the option.

SuggestedRemedy
After "Implementation of LPI" insert "with the normal wake mode option"

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

Cl **85**   *SC* **85.2**   *P* **87**   *L*   # 126
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *EEE option*
If the new optional behavior is accepted then PMD only needs to support the option.

SuggestedRemedy
After "optional Energy Efficient Ethernet (EEE) capability" insert "with the normal wake mode option"

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

Cl **85**   *SC* **85.2**   *P* **87**   *L* **46**   # 91
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*
For change of LPI Rx function

rx_mode needs to change direction

SuggestedRemedy
Change:

IS_RX_MODE.indication

To:

IS_RX_MODE.request

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

Cl **85**   *SC* **85.2**   *P* **87**   *L* **50**   # 93
Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *EEE FEC*
For compatibility with legacy FEC

Add note regarding tx_mode passed through FEC.

SuggestedRemedy
Add note to the end of the paragraph:

Note: if Clause 74 FEC is in use, only the values DATA, QUIET and ALERT may be passed through the FEC to the PMD.

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

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 Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **85**
SC **85.2**

Page 27 of 30
9/25/2012 1:12:09 AM

Cl **85**   *SC* **85.2**   *P* **87**   *L* **52**   # 92

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Fix the descriptions of the primitives.

SuggestedRemedy

Replace the 2 sentences with:

The RX_MODE parameter is used to communicate the state of the PCS LPI receive function and takes the value QUIET or DATA.

Response   *Response Status* **C**

ACCEPT.

Cl **85**   *SC* **85.7.2**   *P* **88**   *L* **5**   # 458

Dawe, Piers   IPtronics

Comment Type **TR**   *Comment Status* **A**   *EEE option*

A PMD can't generate a pattern. It doesn't even have a clock. Any pattern must come from the adjacent PMA, which might get it from the Clause 91 PCS/FEC.
What alert pattern do we use for EEE fast mode?

SuggestedRemedy

Change
If the optional Energy Efficient Ethernet (EEE) capability is supported (see Clause 78) then when tx_mode is set to ALERT, the PMD will transmit a repeating 16-bit pattern, hexadecimal 0xFF00.
to
If the optional Energy Efficient Ethernet (EEE) slow mode capability is supported (see Clause 78) then when the adjacent PMA sets tx_mode to ALERT, it sends a repeating 16-bit pattern, hexadecimal 0xFF00, to the PMD, which the PMD transmits.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

See also #127

Change to

If the optional Energy Efficient Ethernet (EEE) capability with the normal wake mode option is supported (see Clause 78) then when tx_mode is set to ALERT, the adjacent PMA sends a repeating 16-bit pattern, hexadecimal 0xFF00, to the PMD, which the PMD transmits.

Cl **85**   *SC* **85.7.2**   *P* **88**   *L* **5**   # 127

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *EEE option*

If the new optional behavior is accepted then PMD only needs to support the option.

SuggestedRemedy

After "optional Energy Efficient Ethernet (EEE) capability" insert "with the normal wake mode option"

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change paragraph as suggested in #458

Cl **85**   *SC* **85.7.2**   *P* **88**   *L* **6**   # 461

Dawe, Piers   IPtronics

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

Changing tap weights quickly and repeatedly and turning up the volume is not good for complexity, signal integrity or power consumption. I have not seen any analysis showing if this is necessary or worthwhile.

SuggestedRemedy

Do the analysis.
Delete "When tx_mode is ALERT, the transmitter equalizer taps are set to the preset state specified in 85.8.3.3.1."

Response   *Response Status* **C**

REJECT.

This behavior is identical to that defined for 10GBASE-KR which shares most requirements and functionality with 40GBASE-CR4 and 100GBASE-CR10. The onus should be on a commenter to demonstrate that the change in tap weights is not required for ALERT function.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **85**   Page 28 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **85.7.2**   9/25/2012 1:12:09 AM
SORT ORDER: Clause, Subclause, page, line

Cl **85**	*SC* **85.7.4**	*P* **88**	*L* **14**	*#* 94

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *LPI Rx*

For change of LPI Rx function

Add function for global signal detect.

SuggestedRemedy

Delete editor's note. Add the following:

At the end of the first paragraph add:
When the PHY supports the optional EEE capability, PMD_SIGNAL.indication is also used
to indicate when the ALERT signal is detected, which corresponds to the beginning of a
refresh or a wake.

At the beginning of the second and third paragraphs add:
When the PHY does not support the EEE capability or if the PHY supports the EEE
capability and rx_mode is set to DATA

At the end of the third paragraph add:

When the PHY supports the EEE capability, SIGNAL_DETECT is set to FAIL following a
transition
from rx_mode = DATA to rx_mode = QUIET. When rx_mode = QUIET, SIGNAL_DETECT
shall be set to
OK within 500 ns following the application of a signal at the receiver input that is the output
of a channel that satisfies the requirements of all the parameters of both interference
tolerance test channels defined in 72.7.2.1 when driven by a square wave pattern with a
period of 16 unit intervals and peak-to-peak differential output amplitude of 720 mV. While
rx_mode = QUIET, SIGNAL_DETECT changes from FAIL to OK only after a valid ALERT
signal is applied to the channel.

Response   *Response Status* **C**

ACCEPT.

Cl **85**	*SC* **85.7.4**	*P* **88**	*L* **20**	*#* 462

Dawe, Piers   IPtronics

Comment Type **TR**   *Comment Status* **A**   *LPI Rx*

re "Following the reception of a data stream containing RAMs with the code indicating
tx_mode = SLEEP, rx_mode shall be set to QUIET":
This is only a PMD. It deosn't even have a clock, let alone the ability to parse RAMs.

SuggestedRemedy

It would have to be the Clause 91 PCS/FEC or Clause 82 PCS that parses the RAMs and
passes a (another) primitive down the stack to the PMD Rx.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

This section is deleted and replaced by comment #94

Cl **85**	*SC* **85.7.4**	*P* **88**	*L* **21**	*#* 459

Dawe, Piers   IPtronics

Comment Type **TR**   *Comment Status* **A**   *LPI Rx*

re "rx_mode shall be set to QUIET and shal remain in that state until a signal is detected at
the receiver input that is the output of a channel that satisfies the requirements of all the
parameters of both interference tolerance test channels defined in 72.7.2.1 when driven by
a square wave pattern with a period of 16 unit intervals and peak-to-peak differential output
amplitude of 720 mV.":
This is only a PMD, not a test lab!

SuggestedRemedy

See e.g. Table 86-5, SIGNAL_DETECT value definition, for an example of a signal detect
truth table.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

This section is deleted and replaced by comment #94

Cl **85**	*SC* **85.7.6**	*P* **88**	*L* **33**	*#* 128

Barrass, Hugh   Cisco

Comment Type **T**   *Comment Status* **A**   *EEE option*

If the new optional behavior is accepted then PMD only needs to support the option.

SuggestedRemedy

After "mandatory if EEE" insert "with the normal wake mode option"

Response   *Response Status* **C**

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **85**   Page 29 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **85.7.6**   9/25/2012 1:12:09 AM
SORT ORDER: Clause, Subclause, page, line

Cl **85**   *SC* **85-1**   *P* **87**   *L* **28**   # 218

Sela, Oren   Mellanox Technologie

Comment Type   **T**   *Comment Status* **A**   *40G*

   change "Not Applicable" to "Optional" for 40GBASE-CR4

SuggestedRemedy

   per comment

Response   *Response Status* **C**

   ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **85**   Page 30 of 30
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   *SC* **85-1**   9/25/2012 1:12:09 AM
SORT ORDER: Clause, Subclause, page, line