Cl **45** *SC* **45.2.1.76a.6** *P* **122** *L* **4** # 1

Booth, Brad Applied Micro (AMCC)

Comment Type **TR** *Comment Status* **X**

The fast retrain enable bit has the ability to override a negotiated state of operation.
Changing this bit after a negotiated operating mode should not cause that mode to fail.
In review of these bits and those in the autonegotiation register set, there are some modifications that should help prevent the above condition from occurring.

SuggestedRemedy

Delete bit 1.147.3 from Table 45-53a.
Change bit 1.147.0 in Table 45-53a to be Fast retrain enabled (note the "d" at the end).
Change bit from R/W to be RO.
Replace all the paragraphs and notes in 45.2.1.76a.6 to read:
When read as a one, bit 1.147.0 indicates that during the most recent autonegotiation fast retrain was selected. When read as a zero, bit 1.147.3 indicates that fast retrain was not selected. See 45.2.7.10.5a.
On page 135 in Table 45-148 and in subheading 45.2.7.10.5a, change "Fast retrain ability" to be "Fast retrain advertised ability". Add sentence at the end of the paragraph in 45.2.7.10.5a, that reads:
See also 45.2.1.76a.6.

Proposed Response *Response Status* **O**

Cl **55** *SC* **55.4.2.5.15** *P* **220** *L* **53** # 5

Parnaby, Gavin Solarflare Communicat

Comment Type **TR** *Comment Status* **X** *THP*

Leaving the THP on during coefficient exchange is not a good choice.
The increased number of decision levels makes training more difficult in the presence of a severe noise environment. This reduces the value of the fast retrain capability.
Coefficient exchange with non-precoded PAM2 is used during the normal training and is more robust.

SuggestedRemedy

Change the text in the first paragraph of 55.4.2.5.15 as follows
'PHYs that support the fast retrain capability shall implement the fast retrain state diagram shown in Figure 55-27b. PHYs may request a fast retrain by setting the variable loc_fr_req to TRUE. This causes the transmission of an easily-detected link failure signal specified in 55.4.2.2.2. After completing the link failure signal the PHY shall transition to the PMA_Coeff_Exch state, disabled its THP, and send PAM2 signaling within a time period equivalent to 9 LDPC frame periods.
After the detection of the link failure signal, a PHY shall transition to the PMA_Coeff_Exch state and respond with PAM2 signaling within a time period equivalent to 9 LDPC frame periods after receiving the link failure signal. The PAM2 signaling shall be transmitted with THP disabled.'
Add THP_Tx<=zeros to PMA_INIT_FR in Figure 55-24.

Proposed Response *Response Status* **O**

Cl **55** *SC* **55.4.2.5.15** *P* **220** *L* **53** # 4

Bennett, Michael Lawrence Berkeley Na

Comment Type **T** *Comment Status* **X** *THP*

This comment is submitted by Mike Bennett on behalf of George Zimmerman

The first paragraph (lines 53-54) describes what happens when the PHY transmits the link failure signal and explicitly says 'shall….keep its THP turned on with its previously-exchanged coefficients, and send PAM2 signaling…'; this text was added after the meeting in Geneva.
The second paragraph (top page 221, lines 1-4) describes what happens after the PHY receives the link failure signal only says 'a PHY shall transition to the PMA_Coeff_Exch state and respond with PAM2 signaling'. No requirement is stated that the PHY 'shall' respond with THP encoded signaling. This second paragraph is in line with unchanged text in the base standard (802.3-2008) 55.4.2.5.14, (bottom of page 497, top of page 498) paragraph beginning with "Following coefficient exchange", states that following coefficient exchange, "THP is enabled… (and later) "at the closure of the THP loop…", indicating clearly that THP was neither enabled nor closed prior to coefficient exchange.
The PICS items (16c/16d) also reflect the wording from the second paragraph, i.e. no mention of THP.
Fixing these issues results in several changes to the text and the base text to remove ambiguity. In addition to introducing several points of textual ambiguity both with the base standard and 802.3az (only 2 of which I've found, but there are likely more), the addition of THP on fast retrain was a technical error in that it decreases performance (up to 50% greater error rate) and introduces extra training steps in most useful cases, where the new target THP is significantly different from the original.

SuggestedRemedy

Replace "keep its THP turned on with the previously exchanged coefficients" with "disabling its THP, as it would be during normal training in this state"

Proposed Response *Response Status* **W**

This comment is submitted by Mike Bennett on behalf of George Zimmerman

Cl **55** *SC* **55.4.2.5.15** *P* **220** *L* **53** # 3

Dove, Daniel HP - Hewlett-Packard

Comment Type **TR** *Comment Status* **X** *THP*

Comment: The first paragraph (lines 53-54) describes what happens when the PHY transmits the link failure signal and explicitly says 'shall….keep its THP turned on with its previously-
exchanged coefficients, and send PAM2 signaling…'; this text was added after the meeting in Geneva.
The second paragraph (top page 221, lines 1-4) describes what happens after the PHY receives the link failure signal only says 'a PHY shall transition to the PMA_Coeff_Exch state and respond with PAM2 signaling'. No requirement is stated that the PHY 'shall' respond with THP encoded signaling. This second paragraph is in line with unchanged text in the base standard (802.3-2008) 55.4.2.5.14, (bottom of page 497, top of page 498) paragraph beginning with "Following coefficient exchange", states that following coefficient exchange, "THP is enabled… (and later) "at the closure of the THP loop…", indicating clearly that THP was neither enabled nor closed prior to coefficient exchange.
The PICS items (16c/16d) also reflect the wording from the second paragraph, i.e. no mention of THP.
Fixing these issues results in several changes to the text and the base text to remove ambiguity. In addition to introducing several points of textual ambiguity both with the base standard and 802.3az (only 2 of which I've found, but there are likely more), the addition of THP on fast retrain was a technical error in that it decreases performance (up to 50% greater error rate) and introduces extra training steps in most useful cases, where the new target THP is significantly different from the original.

SuggestedRemedy

Replace "keep its THP turned on with the previously exchanged coefficients" with "disabling its THP, as it would be during normal training in this state"

Proposed Response *Response Status* **O**

Cl **55** *SC* **55.4.5.1** *P* **229** *L* **14** # 2

Booth, Brad Applied Micro (AMCC)

Comment Type **ER** *Comment Status* **X**

Figures 55-25 and 55-26 have the following note:
NOTE- For PHYs which do not support the fast retrain capability, the variable fast_retrain_flag is set to FALSE
The note does not relate to the figure, but rather to the variable.

SuggestedRemedy

Move the note to be part of the fast_retrain_flag variable description.

Proposed Response *Response Status* **O**