

Cl 45 SC 45.2.1 P76 L43 # R2-77

Bruckman, Leon

NVIDIA

Comment Type E Comment Status D (B) (L)

The D3.2 Table of Contents and subclause title for 45.2.1.169d was updated to "PMA/PMD interface lane training status 1 (Register 1.1477)" to distinguish it from new subclause 45.2.1.169e. However, Register 1.1477 in Table 45-3 still reads "PMA/PMD interface lane training status" without the "1" suffix, inconsistent with the updated subclause title.

SuggestedRemedy

In Table 45-3, change the description for Register 1.1477 from "PMA/PMD interface lane training status" to "PMA/PMD interface lane training status 1" to match the 45.2.1.169d subclause title.

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 45 SC 45.2.1 P76 L43 # R2-1

Hajduczenia, Marek

RG Nets

Comment Type T Comment Status D (B) (L)

Table 45-3 was not updated to match the D3.2 changes to registers 1.1477 and 1.1478. (a) Line 43 lists 1.1477 as "PMA/PMD interface lane training status", but D3.2 retitled it "PMA/PMD interface lane training status 1" in the heading of 45.2.1.169d (page 103) and in the TOC (page 17). (b) Line 44 still lists 1.1478 as "Reserved" with no subclause reference, although D3.2 adds subclause 45.2.1.169e "PMA/PMD interface lane training status 2 (Register 1.1478)" on page 104, defines bits 1.1478.7:0 (Receiver OK lane 7:0), and cites 1.1478.7:0 for rx_ok in the variable-to-register mapping table on page 912. The adjacent rows in the same table block were edited in D3.2 (168c/168d/168e/168f ren numbered to 169c/169d/169f/169g), and the next row 1.1479 already points to 45.2.1.169f, so 169e is the only missing entry. This also affects the resolution of D3.1 comment R1-188, which added register 1.1478 without the corresponding Table 45-3 row.

SuggestedRemedy

On page 76 line 43, change the Register name for 1.1477 to "PMA/PMD interface lane training status 1". On page 76 line 44, change the row "1.1478 Reserved" to "1.1478 PMA/PMD interface lane training status 2 45.2.1.169e".

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 45 SC 45.2.1 P76 L44 # R2-75

Bruckman, Leon

NVIDIA

Comment Type TR Comment Status D (B) (L)

Register 1.1478 is listed as "Reserved" in Table 45-3 despite D3.2 adding subclause 45.2.1.169e "PMA/PMD interface lane training status 2 (Register 1.1478)" with a full bit-field definition in Table 45-133e. Any reader consulting Table 45-3 for Register 1.1478 will incorrectly conclude it is reserved and find no cross-reference to 45.2.1.169e.

SuggestedRemedy

In Table 45-3, change the entry for Register 1.1478 from: "1.1478 Reserved" to: "1.1478 PMA/PMD interface lane training status 2 45.2.1.169e"

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 45 SC 45.2.1 P78 L9 # R2-76

Bruckman, Leon

NVIDIA

Comment Type TR Comment Status D (B) (L)

Table 45-3 lists the PMA transmit test block error bin counters as "1.2900 through 1.3707" and the receive counters as "1.3708 through 1.3715." The normative text in 45.2.1.272 (page 127, lines 43-45) explicitly states the transmit direction registers span from 1.2900 to 1.3307 and the receive direction registers span from 1.3308 to 1.3715. Arithmetic confirms: 17 bins x 8 PMALs x 3 registers = 408 registers per direction; 2900+408-1=3307 (transmit end); 3308+408-1=3715 (receive end). The values "1.3707" and "1.3708" appear to be transpositions of "1.3307" and "1.3308."

SuggestedRemedy

In Table 45-3, change: "1.2900 through 1.3707 PMA transmit test block error bin counters" to "1.2900 through 1.3307 PMA transmit test block error bin counters" and "1.3708 through 1.3715 PMA receive test block error bin counters" to "1.3308 through 1.3715 PMA receive test block error bin counters."

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 45 SC 45.2.1 P78 L9 # R2-2

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status D (B) (L)

The resolution of D3.1 comment R1-3 was not correctly implemented. The single D3.1 row "1.2900 through 1.3715 | PMA test block error bin counters" was split into two rows, but with the wrong boundary: page 78 line 9 reads "1.2900 through 1.3707 | PMA transmit test block error bin counters | 45.2.1.272" and line 10 reads "1.3708 through 1.3715 | PMA receive test block error bin counters | 45.2.1.272". Every other location in D3.2 uses the 1.3307/1.3308 boundary: 45.2.1.272 on page 127 lines 43 to 45 states the transmit direction registers span from 1.2900 to 1.3307 and the receive direction registers from 1.3308 to 1.3715 - Table 45-212v on page 128 begins the receive registers at 1.3308.15:0 - and the register-name annex on pages 350 and 351 gives test_block_error_bin_rx_0_<0:15> at 1.3308 to 1.3355 through test_block_error_bin_rx_7_16p at 1.3713 to 1.3715. As printed, the transmit row spans 808 registers and the receive row only 8, whereas each direction requires 408. The affected table is Table 45-3 (PMA/PMD registers), reproduced in the 45.8 register-address summary.

SuggestedRemedy

In Table 45-3 on page 78, change the transmit row range from "1.2900 through 1.3707" to "1.2900 through 1.3307", and the receive row range from "1.3708 through 1.3715" to "1.3308 through 1.3715".

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 45 SC 45.2.1 P101 L1 # R2-78

Bruckman, Leon

NVIDIA

Comment Type TR Comment Status D (B) (L)

The amendment instruction reads "Insert 45.2.1.168a through 45.2.1.168f after 45.2.1.168 as follows:" but the content that follows now comprises 45.2.1.168a plus 45.2.1.169b through 45.2.1.169g (seven subclauses). The instruction was not updated when D3.2 renumbered the subclauses from 168b-168f to 169b-169g and added new 45.2.1.169e. An editor applying this amendment would be misled into creating subclauses 168b-168f and would not know to insert 169b-169g.

SuggestedRemedy

Change the amendment instruction from "Insert 45.2.1.168a through 45.2.1.168f after 45.2.1.168 as follows:" to "Insert 45.2.1.168a and 45.2.1.169b through 45.2.1.169g after 45.2.1.168 as follows:"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

The subclause numbering is wrong and needs to be corrected.

On page 101:

Change:

"Insert 45.2.1.168a through 45.2.1.168f after 45.2.1.168 as follows:"

To:

"Insert 45.2.1.168a through 45.2.1.168g after 45.2.1.168 as follows:"

Renumber 45.2.1.169b through 45.2.1.169g so they become 45.2.1.168b through 45.2.1.168g

CI 45 SC 45.2.1.161 P97 L16 # R2-185

Osorio, Luz

Nokia

Comment Type TR Comment Status D MDIO RTS (B) (CA)

remote_rts variable it's set to R/W

SuggestedRemedy

Change variable to RO

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

The referenced bit does not represent the management variable remote_rts, rather it reflects the content of the training frame for each lane. Note that comment R2-134 proposes to list remote_rts as a management variable and assign an MDIO bit for remote_rts. Resolved using the response to comment R2-134.

<i>Cl</i> 45	<i>SC</i> 45.2.1.165	<i>P</i> 99	<i>L</i> 18	# R2-184
Osorio, Luz		Nokia		
<i>Comment Type</i>	TR	<i>Comment Status</i>	D	<i>RTS (B) (CA)</i>
local_rts variable it's set to R/W				
<i>SuggestedRemedy</i>				
Change variable to RO				
<i>Proposed Response</i>	<i>Response Status</i> W			
PROPOSED ACCEPT IN PRINCIPLE.				
This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the the change proposed in the suggested remedy is an improvement to the draft.				
In Table 178B-4 - Status variables and MDIO mapping for PAM4 interfaces:				
Change the assignment of local_rts to MDIO register bit 1.1476.9 and the clause reference to 45.2.1.169c				
In 45.2.1.169c:				
Change the bit 1.1476.9 row to read:				
Bit(s): 9				
Name: Local ready to send				
Description:				
1 = true				
0 = false				
Read/Write: "RO"				
Implement with editorial license.				
[Editor's note: the resolution affects clauses 45 and 178B]				

Cl 45	SC 45.2.1.168a	P101	L1	# R2-3
Hajduczenia, Marek		RG Nets		
Comment Type	E	Comment Status	D	(B) (L)
The D3.2 renumbering of the inserted Clause 45 subclauses from 45.2.1.168b through 45.2.1.168f to 45.2.1.169b through 45.2.1.169g was not applied to the first inserted subclause or to the editing instruction. Page 101 line 1 still reads "Insert 45.2.1.168a through 45.2.1.168f after 45.2.1.168 as follows:", but the subclauses that follow are 45.2.1.168a, 45.2.1.169b, 45.2.1.169c, 45.2.1.169d, 45.2.1.169e, 45.2.1.169f, and 45.2.1.169g. The cited range matches none of the inserted material, the stated insertion point is inconsistent with the 169x numbers, and 45.2.1.169a does not appear anywhere in D3.2. The orphaned 45.2.1.168a also propagates to the TOC (page 17 line 20), the Subclause cell for register 1.1459 in Table 45-3 (page 76 line 39), and the max_wait_timer_duration row of the Annex 178B variable-to-register cross-reference table (page 911 line 38).				
SuggestedRemedy				
Renumber 45.2.1.168a (ILT max wait timer duration register, Register 1.1459) to 45.2.1.169a and update every occurrence: the subclause heading on page 101 line 3, the TOC entry on page 17 line 20, the Subclause cell in Table 45-3 on page 76 line 39, and the max_wait_timer_duration row on page 911 line 38. Change the editing instruction on page 101 line 1 to read "Insert 45.2.1.169a through 45.2.1.169g after 45.2.1.169 as follows:".				
Proposed Response	Response Status W			
PROPOSED ACCEPT IN PRINCIPLE.				
It is the subclause numbering that is wrong.				
On page 101:				
Change:				
"Insert 45.2.1.168a through 45.2.1.168f after 45.2.1.168 as follows:"				
To:				
"Insert 45.2.1.168a through 45.2.1.168g after 45.2.1.168 as follows:"				
Renumber 45.2.1.169b through 45.2.1.169g so they become 45.2.1.168b through 45.2.1.168g				

Cl 45	SC 45.2.1.169c	P102	L24	#	R2-159
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Comment Type **T** *Comment Status* **D** (B) (L)

SuggestedRemedy

<i>Proposed Response</i>	<i>Response Status</i>	W
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C/ 119 *SC* 119.2.5.8.2 *P*197 *L*31 # R2-140

<i>Comment Type</i>	TR	<i>Comment Status</i>	D	<i>stateless decoder (L)</i>
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By this statement the definition of the stateless decoder prevents it from generating Local Fault ordered sets any time except in reset.

This means loss of signal will not be reported to the link partner as remote fault, and the link partner transmission will not be paused.

This breaks the existing behavior of fault signaling, which was not the intent.

It makes sense that if the PCS has lost alignment marker lock it will generate local faults, as in the case of the state-diagram decoder (see align_status in Figure 119-15).

SuggestedRemedy

Change the next sentence from
 "When PCS reset is asserted, RXD<63:0> and RXC<7:0> are set to the constant
 LBLOCK_R"
 to
 "When align_status is false or PCS reset is asserted, RXD<63:0> and RXC<7:0> are set to
 the constant LBLOCK_R".

Proposed Response	Response Status	W
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PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment correctly points out an error that needs to be corrected.

<i>Cl</i> 119	SC 119.2.5.8.2	<i>P</i> 197	<i>L</i> 32	# R2-152
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Comment Type	TR	Comment Status	D	stateless decoder (L)
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The definition of the stateless decoder only sets RXD/RXC to LBLOCK_R (local fault) during PCS reset, but the local fault code should be sent to the RS sublayer whenever the PCS has not established AM lock and deskewed all PCS lanes (align_status is false). When the PCS first comes out of reset or restarts the AM lock process due to too many errors on the link, the RS needs to receive the local fault code to correctly transmit "remote fault" in the opposite direction to the link partner.

SuggestedRemedy

In 119.2.5.8.2, change the second sentence

from:

"When PCS reset is asserted, RXD<63:0> and RXC<7:0> are set to the constant LBLOCK_R (see 119.2.6.2.1)."

to:

"When PCS reset is asserted or align_status is false (see 119.2.6.2.2), RXD<63:0> and RXC<7:0> are set to the constant LBLOCK_R (see 119.2.6.2.1)."

Proposed Response	Response Status	W
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PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment correctly points out an error that needs be corrected.

Change the text in 119.2.5.8.2

from:

"The stateless decoder generates 200GMII/400GMII transfers based only on the current 66-bit block and PCS reset. When PCS reset is asserted, RXD<63:0> and RXC<7:0> are set to the constant LBLOCK_R (see 119.2.6.2.1). When PCS reset is not asserted, RXD<63:0> and RXC<7:0> are decoded from rx_coded<65:0> as defined in 119.2.3."

to:

"The stateless decoder generates 200GMI/400GMI transfers based only on the current 66-bit block and the PCS variables align_status and reset (see 119.2.6.2.2). When reset is true or align_status is false, RXD<63:0> and RXC<7:0> are set to the constant LBLOCK_R (see 119.2.6.2.1); otherwise, RXD<63:0> and RXC<7:0> are decoded from rx_coded<65:0> as defined in 119.2.3."

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

Cl 119 SC 119.7.4.1 P201 L14 # R2-89

Nicholl, Gary Cisco Systems, Inc.

Comment Type TR Comment Status D (B) (L)

When 802.3dj added the option to support a stateless 64B/66B encoder, the PICS table in 119.7.4.1 was updated to add new PICS items TF2 and TF3, with TF2 being mandatory if the state-diagram encoder is used and TF3 being mandatory if the stateless encoder is used.

A similar change was made in the PICS table in 119.7.4.2 with the addition of new PICS items RF7 and RF8, with RF7 being mandatory if the state-diagram decoder is used and RF8 being mandatory if the stateless decoder is used.

When these changes were introduced, it appears to have been overlooked that the base standard already contains two other PICS items in Clause 119 related to the 64B/66B encoder and decoder state diagrams: SM5 and SM6 (see 119.7.4.9). These PICS items are now redundant, as they have effectively been replaced by TF2 and RF7, respectively.

Furthermore, SM5 and SM6 are inconsistent with TF2 and RF7 because they unconditionally require implementation of the state-diagram encoder and decoder, even when the optional stateless encoder and decoder are implemented. This creates conflicting PICS requirements

The simplest solution is to delete PICS items SM5 and SM6

SuggestedRemedy

Pull in subclause 119.7.4.9 from the base standard and delete PICS items SM5 and SM6.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment correctly points out an error that needs be corrected.

Implement the suggested remedy with editorial license.

Cl 120F SC 120F.1 P733 L44 # R2-38

Hajduczenia, Marek RG Nets

Comment Type E Comment Status D (B) (E)

In the legend of the replacement Figure 120F-1, the entry reads "1.6TAUI-16 = 1.6 Tb/s 16--LANE ATTACHMENT UNIT INTERFACE" with a doubled hyphen. The same typo present in D3.1 was corrected to "16-LANE" in the replacement Figure 120G-1 on page 739 of D3.2, but was left uncorrected here, so the two otherwise-identical legends are now inconsistent. (The legend text carries no ballot line number - line 44 is the nearest numbered line above it.)

SuggestedRemedy

In the legend of Figure 120F-1, change "16--LANE" to "16-LANE" so the entry reads "1.6TAUI-16 = 1.6 Tb/s 16-LANE ATTACHMENT UNIT INTERFACE", matching the legend of Figure 120G-1 on page 739.

Proposed Response Response Status W

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

Cl 169 SC 169.3.2 P212 L34 # R2-105

Ran, Adele Cisco Systems, Inc.

Comment Type E Comment Status R (withdrawn) (CG)

"FEC:—for primitives issued on the interface between the FEC sublayer (see 169.2.4b), and the PMA, PCS, or PHY 800GXS above, called the FEC service interface" Superfluous commas, and inconsistent with the previous items and with 80.3.2, 105.4.2, 116.3.2, and 174.3.2.

SuggestedRemedy

Change to

"FEC:—for primitives issued on the interface between the FEC sublayer (see 169.2.4b) and the PMA, PCS, or PHY 800GXS above called the FEC service interface"

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

CI 172 SC 172.7.4.1 P270 L25 # R2-153

Opsasnick, Eugene

Broadcom Inc.

Comment Type ER Comment Status D (B) (L)

PICS item TF1 was recently changed from !SE:M to O/1. The Support column should also have been updated accordingly. Conditional Mandatory items use "Yes or N/A", but Optional items should use "Yes or No"

SuggestedRemedy

In PICS table in section 172.7.4.1, change Support column of item TF1
from: "Yes [] N/A []"
to: "Yes [] No []"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment correctly points out an error that needs to be corrected.

Resolved using the response to comment R2-90.

CI 172 SC 172.7.4.1 P270 L29 # R2-154

Opsasnick, Eugene

Broadcom Inc.

Comment Type ER Comment Status D (B) (L)

PICS item TF2 was recently changed from SE:M to O/1. The Support column should also have been updated accordingly. Conditional Mandatory items use "Yes or N/A", but Optional items should use "Yes or No"

SuggestedRemedy

In PICS table in section 172.7.4.1 change Support column of item TF2
from: "Yes [] N/A []"
to: "Yes [] No []"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment correctly points out an error that needs to be corrected.

Resolved using the response to comment R2-90.

CI 172 SC 172.7.4.1 P270 L33 # R2-155

Opsasnick, Eugene

Broadcom Inc.

Comment Type ER Comment Status D (B) (L)

PICS item TF3 was recently added as an optional item. This item should use "Yes or No" in the Support column, not "Yes or N/A".

SuggestedRemedy

In PICS table in section 172.7.4.1 change Support column of item TF3
from: "Yes [] N/A []"
to: "Yes [] No []"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment correctly points out an error that needs to be corrected.

Resolved using the response to comment R2-90.

CI 172 SC 172.7.4.2 P271 L20 # R2-149

Opsasnick, Eugene

Broadcom Inc.

Comment Type ER Comment Status D (B) (L)

PICS item RF12 was recently changed from !SD:M to O/2. The Support column should also have been updated accordingly. Mandatory items use "Yes or N/A", but Optional items should use "Yes or No"

SuggestedRemedy

In PICS table in section 172.7.4.2, change Support column of item RF12
from: "Yes [] N/A []"
to: "Yes [] No []"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment correctly points out an error that needs to be corrected.

Resolved using the response to comment R2-90.

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

Cl 172 SC 172.7.4.2 P271 L24 # R2-150

Opsasnick, Eugene Broadcom Inc.

Comment Type ER Comment Status D (B) (L)

PICS item RF13 was recently changed from ISD:M to O/2. The Support column should also have been updated accordingly. Mandatory items use "Yes or N/A", but Optional items should use "Yes or No"

SuggestedRemedy

In PICS table in section 172.7.4.2, change Support column of item RF13 from: "Yes [] N/A []" to: "Yes [] No []"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment correctly points out an error that needs to be corrected.

Resolved using the response to comment R2-90.

Cl 172 SC 172.7.4.2 P271 L27 # R2-90

Nicholl, Gary Cisco Systems, Inc.

Comment Type ER Comment Status D (B) (L)

The support column for PICS items RF12, RF13 and RF14 should be "Yes [], No []" and not "Yes [], N/A []". A similar issue exists for PICS items TF1, TF2 and TF3 in 172.7.4.1.

SuggestedRemedy

In subclause 172.7.4.2, update the support column for PICS items RF12, RF13 and RF14 to "Yes [], No []".

In subclause 172.7.4.1, update the support column for PICS items TF1, TF2 and TF3 to "Yes [], No []".

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment correctly points out an error that needs to be corrected.

Implement the suggested remedy with editorial licence.

Cl 172 SC 172.7.4.2 P271 L27 # R2-151

Opsasnick, Eugene Broadcom Inc.

Comment Type ER Comment Status D (B) (L)

PICS item RF14 is missing an entry in the Support column.

SuggestedRemedy

In PICS table in section 172.7.4.2, add the following text in the Support column of item RF14 "Yes [] No []"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment correctly points out an error that needs to be corrected.

Resolved using the response to comment R2-90.

CI 174A SC 174A.9.5 P752 L33 # R2-142

Maniloff, Eric

Ciena Corporation

Comment Type TR Comment Status D BLER histogram (CG)

174A.9.5 is inconsistent with the definition and use of histogram bin 16 elsewhere in Annex 174A.

174A.9.2 defines test_block_error_bin_i_16p as the counter for test blocks with 16 or more test-symbol errors. 174A.9.3 correspondingly defines $H_m(i)(16)$ as the probability of 16 or more test-symbol errors. This interpretation is also preserved by the saturated-bin convolution in 174A.9.4.

Furthermore, 174A.9.6 and 174A.9.7 use the final histogram bin, $H_e(16)$, as the measured BLER. Since BLER is the ratio of uncorrectable FEC codewords, this bin must include all test blocks with 16 or more errors.

However, Equation 174A-5 calculates $H_{max}(16)$ using the binomial probability for exactly 16 errors. This excludes test blocks with 17 or more errors and therefore does not define the mask for the uncorrectable-codeword bin described in 174A.9.2 and 174A.9.3.

Equation 174A-5 should specify that the binomial expression applies to bins 0 through 15, while the value for bin 16 is the cumulative probability of 16 or more errors. Tables derived from this mask should also identify the final value as "16 or more" or "16+," rather than exactly 16 and update these values.

For example this changes the last row of Table 180-20 to: [3.8E-13, 8.3E-13, 1.1E-22, 6.9E-28]

Suggested Remedy

Revise Equation 174A-5 and the associated text in 174A.9.5 so that the histogram mask uses exact probabilities for bins 0 through 15 and a cumulative probability for bin 16.

For $k = 0$ through 15, calculate $H_{max}(k)$ as the probability of exactly k test-symbol errors using the existing binomial expression.

For $k = 16$, calculate $H_{max}(16)$ as the probability of 16 or more test-symbol errors by summing the binomial probabilities for all error counts from 16 through n .

Revise the associated tables and descriptions to identify the final histogram value as "16 or more" or "16+," rather than exactly 16. This will make Equation 174A-5 consistent with the 17-bin histogram definition in 174A.9.2 and 174A.9.3, the saturated-bin convolution in 174A.9.4, and the use of $H_e(16)$ as the BLER in 174A.9.6 and 174A.9.7.

Update values for row 16 in: Table 178–11, Table 179–14, Table 180-20, Table 185–16

Proposed Response Response Status W

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and

D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

The masks calculated in 178A.9.5 are to set limits for the histograms measured according to 178A.9.6. The comment accurately points out that the mask defined in 178A.9.5 is an approximation calculating a limit based on a theoretical count of 16 test symbol errors per test block rather than based on 16 or more test symbols per test block. As a result, for a single-lane PMD the limit is 8% pessimistic. This "pessimism" can be viewed provided an ever so slight amount of margin. However, when testing a compliant device within a practical length of time it is nearly impossible that any count of 16 or more. Instead, the value for bit 16 is determined through extrapolation which has significantly higher error than the noted calculation error. It is therefore makes little difference whether $h_{max}(16)$ is calculated in the same what as the theoretical counter bin.

The calculation of the mask is unambiguous.

Given that the "inaccuracy" identified by the comment is inconsequential relative to the accuracy of the measurement and the small "inaccuracy" adds a little bit of margin, improving our confidence for interoperation, no changes to the draft are warranted.

Pending review of the following related contribution:

<URL>/maniloff_3dj_01_2609

[Editor's note: changed clause/subclause/page/line from 0/0/blank/blank to 174A/174A.9.5/752/33]

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

CI **175** SC **175.1.5** P**292** L**50** # **R2-113**

WANG, Xuebo

Huawei Technologies Co., Ltd

Comment Type **TR** Comment Status **D** (B) (L)

The current version says that "inst" can be PMA or FEC. However, for now, there are no defined FEC sublayers that are directly connected to 1.6TBASE-R PCS. Figure 175-7 on Page 302 has the same issue.

Suggested Remedy

Delete "or FEC", or remove the note "inst: PMA or FEC" and change "inst" to "PMA". Make the same change to Figure 175-7.

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment correctly points out that the only sublayer currently allowed below the 1.6T PCS is a PMA, and a small change would be an improvement to the draft.

The option of changing all occurrences of "inst" to "PMA" would be a large and undesirable change to several subclauses within this clause. It is anticipated that future 802.3 amendments may likely add options for an Inner FEC sublayer below the 1.6T PCS as has been added to the 800G PCS in 802.3dj. Using the more generic "inst" for the interface definition below the PCS makes the 1.6T PCS clause more amenable to future amendments.

In Figures 175-2 and 175-7, change the legend at the bottom of the figures from:

"inst: PMA or FEC"

to:

"inst: PMA"

In 175.1.4, change the second sentence,

from:

"The lower interface of the PCS connects to a PMA or Inner FEC through the service interface below the PCS as necessary to support a PMD."

to:

"The lower interface of the PCS connects to a PMA through the service interface below the PCS to support a PMD."

In 175.2.1, change the 2nd paragraph,

from:

"When communicating with the 1.6TMII, the PCS uses an eight octet-wide, synchronous data path, with packet delineation being provided by transmit control signals (TXC<n> = 1) and receive control signals (RXC<n> = 1). When communicating with the PMA or Inner FEC sublayer, the 1.6TBASE-R PCS uses 16 encoded bit streams also known as PCS lanes. Per direction (receive or transmit), the PCS lanes originate from a common clock but may vary in phase and skew dynamically. The PMA and Inner FEC operate independently of packet

boundaries. The PCS provides the functions necessary to map packets between the 1.6TMII format and the service interface below the PCS."

to:

"When communicating with the 1.6TMII, the PCS uses an eight octet-wide, synchronous data path, with packet delineation being provided by transmit control signals (TXC<n> = 1) and receive control signals (RXC<n> = 1). When communicating with the sublayer below the PCS, the 1.6TBASE-R PCS uses 16 encoded bit streams also known as PCS lanes. Per direction (receive or transmit), the PCS lanes originate from a common clock but may vary in phase and skew dynamically. The PCS provides the functions necessary to map packets between the 1.6TMII format and the service interface below the PCS."

CI **176** SC **176.1** P**348** L**25** # **R2-5**

Hajduczenia, Marek

RG Nets

Comment Type **E** Comment Status **D** (B) (L)

Subject-verb disagreement in text newly added in D3.2 at page 348 lines 25 and 29: "The transmit path data delay for the m:n and n:n PMAs are reported..." and "The receive path data delay for the m:n and n:n PMAs are reported...". The subject is the singular "delay", so the verb should be "is reported". The parallel n:m PMA sentences in the same paragraph (lines 27 and 30) correctly use "is reported".

Suggested Remedy

On page 348, change "for the m:n and n:n PMAs are reported" to "for the m:n and n:n PMAs is reported" on line 25 and on line 29.

Proposed Response Response Status **W**

PROPOSED REJECT.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

CI **176**

SC **176.1**

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CI 176 SC 176.1 P348 L25 # R2-4

Hajduczenia, Marek

RG Nets

Comment Type T Comment Status R (L)

The D3.2 rewrite of the intrinsic-delay paragraph in 176.10 (page 348 lines 24 to 34) deleted the sentence "As recommended in 90A.7, the maximum delay value is allocated to the transmit path and the minimum delay value to the receive path.", which was present in D3.1 at page 347 lines 25 to 26. 176.10 still reports the eight_max/_min path data delay status variables at page 348 lines 36 to 41 (PMA_delay_ns_TX_max/_min, PMA_delay_ns_RX_max/_min and the subns equivalents), but nothing remaining in 176.10 specifies how the maximum and minimum delay values are apportioned between the transmit and receive paths. The parallel clause 177.9 (page 378 line 30) and the corresponding text at page 615 line 19 and page 690 lines 23 and 47 all retain the sentence, so the deletion also creates an inconsistency between otherwise-parallel subclauses.

SuggestedRemedy

Restore the allocation statement in 176.10. After "...sum of the transmit and receive delays is a constant value." on page 348 line 25, insert "As recommended in 90A.7, the maximum delay value is allocated to the transmit path and the minimum delay value to the receive path." If the D3.2 differentiation between the m:n/n:n and n:m PMAs requires distinct allocation rules, add equivalent wording defining the max/min allocation for each of the m:n, n:n, and n:m PMA cases.

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 176 SC 176.12.3 P353 L41 # R2-172

Nicholl, Gary

Cisco Systems, Inc.

Comment Type ER Comment Status D (B) (L)

PICS items *PMDO and *PMDE are conditional optional. The support column should be "Yes [], No [], N/A []"

SuggestedRemedy

Change the support column for PICS items *PMDO and *PMDE from "Yes [], No []" to "Yes [], No [], N/A []"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment correctly points out an error in the PICS items and provides the appropriate remedy.

Implement the suggested remedy with editorial license.

CI 176 SC 176.12.3.1 P354 L9 # R2-173

Nicholl, Gary

Cisco Systems, Inc.

Comment Type E Comment Status D (B) (L)

The bottom line of the PICS table in 176.12.3.1 should be thick (same as the top and edge lines of the table). The same issue exists for the PICS table in 176.12.3.2.

SuggestedRemedy

Update the format of the PICS tables in 176.12.3.1 and 176.12.3.2 to make the bottom line of the tables the same thickness as the lines at the top and edges of the table.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment does highlight an formatting issue with the PICS tables.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

CI 176C SC 176C.6.4.4 P808 L16 # R2-208

Djahanshahi, Hormoz

Microchip Technology Inc.

Comment Type E Comment Status D (B) (E)

In Table 176C-5, there is a typo in the BERadded value, i.e., "2.841x10⁻⁵" should have been "2.841x10⁻⁴", as per original submitted proposal in https://www.ieee802.org/3/dj/public/24_09/brown_3dj_04_2409.pdf, slide #7. Alternatively, we can recalculate from BERadded=BERtotal-BERmax= 2.921x10⁻⁴ - 8x10⁻⁶ = 2.841x10⁻⁴.

Also, we can see in subclause 176C.2, the correct BERadded is provided as "2.841x10⁻⁴".

SuggestedRemedy

Change text to "BERadded=2.841x10⁻⁴" in Table 176C-5

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the change proposed in the suggested remedy is an improvement to the draft. Implement the suggested remedy.

CI 176C SC 176C.7 P812 L25 # R2-39

Hajduczenia, Marek

RG Nets

Comment Type T Comment Status D (B) (E)

In Table 176C-8, the "Minimum channel signal to common-mode ratio, SCMRCH" row cites 176C.7.3.2 in the Reference column. Subclause 176C.7.3.2 is "Channel modal ERL" (page 816) - SCMRCH is specified in 176C.7.4 "Channel signal to common-mode ratio" (page 816 line 49). The equivalent rows in Table 178-16 (page 405) and the Clause 179 channel summary table (page 448) correctly cite 178.10.5 and 179.11.5. The row is also out of numeric order relative to the preceding 176C.7.3.3 row. The Reference column of this table was edited in D3.2 (the AC-coupling row was set to 176C.7.5), so this stale reference was missed. The row sits on an unnumbered table-cell line - line 25 is the nearest numbered line above.

SuggestedRemedy

In Table 176C-8 on page 812, change the Reference cell of the "Minimum channel signal to common-mode ratio, SCMRCH" row from "176C.7.3.2" to "176C.7.4".

Proposed Response Response Status W

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

CI 176C SC 176C.7.5 P817 L1 # R2-40

Hajduczenia, Marek

RG Nets

Comment Type E Comment Status D (B) (E)

The heading of the newly inserted subclause 176C.7.5 reads "AC Coupling" (unhyphenated, second word capitalized). This is inconsistent with the parallel headings 178.10.4 "AC-coupling" (page 411) and 179.9.1 "AC-coupling" (page 427), with the body text of 176C.7.5 itself on page 817 line 3 ("The channel AC-coupling specifications are identical to those of 178.10.4."), with Table 176C-8 on page 812 ("Maximum AC-coupling 3 dB corner frequency"), with PICS item CC4 on page 821 ("Channel AC-coupling"), and with the sentence-case style of sibling headings 176C.7.1 through 176C.7.4. The same string is propagated to the TOC entry on page 48 line 28.

SuggestedRemedy

Change the heading on page 817 line 1 from "176C.7.5 AC Coupling" to "176C.7.5 AC-coupling", and update the corresponding table-of-contents entry on page 48 line 28 to match.

Proposed Response Response Status W

PROPOSED REJECT.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

CI **176C** SC **176C.9.4.3** P**821** L**14** # **R2-41**

Hajduczenia, Marek

RG Nets

Comment Type **E** Comment Status **D** (B) (E)

D3.2 adds new subclause 176C.7.5 (AC-coupling) and updates the AC-coupling row of Table 176C-8 to reference it, but the parallel PICS item CC4 (Channel AC-coupling) in 176C.9.4.3 still cites the parent subclause 176C.7. All sibling PICS rows in the same table cite leaf subclauses (CC1 to 176C.7.1, CC2 to 176C.7.2, CC3 to 176C.7.3), so CC4 is the only row pointing at the parent. This is a missed consequential edit from the change that created 176C.7.5. The affected PICS item is CC4.

SuggestedRemedy

In the Channel PICS table of 176C.9.4.3 on page 821 line 14, change the Subclause cell for item CC4 (Channel AC-coupling) from "176C.7" to "176C.7.5".

Proposed Response Response Status **W**

PROPOSED REJECT.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

CI **176D** SC **176D.6.4** P**828** L**16** # **R2-128**

Dudek, Michael

Marvell

Comment Type **TR** Comment Status **D** SNDR (E)

This is a re-statement of un-satisfied comment I-312. The SNDR specification requirement for the C2M Host output needs to be met at the end of the 32dB channel with large NEXT aggressor. There is no channel beyond this point so having an SNDR requirement here that is more stringent than the preset 2 value for CR (which still expects to have significant additional loss before reaching the Rx) is unnecessary.

SuggestedRemedy

Change the value from "Table 179-9" to "27.5dB" (the Preset 2 value for CR).

Proposed Response Response Status **W**

PROPOSED REJECT.

This comment is a restatement of comment I-312, and the suggested remedy is effectively the same.

Comment I-312 was rejected due to no consensus to make a change. It was noted that the proposed change raised concerns in the CRG and there was no data to support it (see <https://www.ieee802.org/3/dj/comments/D3p0/8023dj_D3p0_comments_final_id.pdf#page=88>).

No new data has been provided to substantiate the suggested remedy.

CI **176D** SC **176D.8.2** P**834** L**47** # **R2-127**

Dudek, Michael

Marvell

Comment Type **TR** Comment Status **D** Peak voltage (E)

Having only 2 samples per UI with synchronous sampling is likely to miss the peak signal if there is significant overshoot.

SuggestedRemedy

Change to 4 samples per UI. Or reword as "sampled synchronously with an effective rate of at least 4 samples per UI or sampled asynchronously."

Proposed Response Response Status **W**

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

This comment is a restatement of comment I-291, with an equivalent suggested remedy.

Comment I-291 (which was non-binding) was rejected due to no consensus to make a change (see <https://www.ieee802.org/3/dj/comments/D3p0/8023dj_D3p0_comments_final_id.pdf#page=83>).

No new data has been provided to substantiate the suggested remedy.

CI 176D SC 176D.8.11 P838 L26 # R2-42

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status D (B) (E)

The NOTE newly added in D3.2 to 176D.8.11 (page 838 lines 26 to 29), and its twin in 176C.6.4.4 (page 807 lines 47 to 51), recommend a histogram-extrapolation method that differs from every other "In order to predict whether a receiver meets the BLER requirement in a short test time" NOTE in the draft. The ten pre-existing NOTES (pages 399, 440, 492, 494, 523 twice, 554, 555, 587 twice), unchanged from D3.1, use a linear fit of $\log_{10}(H_m(i)(k))$ for $k = n-2$ to n over "the three highest bins having a count of 10 or more", together with a check that the histogram slope is not increasing. The new NOTE instead uses a linear fit of the slope of $\log_{10}(H_m(k))$ for $k = 0$ to n with $H_m(n)$ set to $3/N$ and the intercept $H_m(0)$ set to 1, and omits the slope-increase check. In addition, the new NOTE is self-inconsistent: it defines n such that $H_m(k) = 0$ for all $k \geq n$ and sets $H_m(n)$ to $3/N$ for the fit, but then states "The fit is performed only for values of k that have $H_m(k) > 0$ ", which literally excludes the $k = n$ anchor point it just constructed. The same NOTE appears in 176C.6.4.4.

Suggested Remedy

Harmonize the extrapolation guidance. Either replace the new NOTE in 176D.8.11 (page 838 lines 26 to 29) and in 176C.6.4.4 (page 807 lines 47 to 51) with the wording already used in the other Error ratio requirements subclauses, or, if the $k = 0$ to n method is intentionally preferred, apply it consistently to all twelve NOTES and state the rationale. In either case, correct the self-inconsistency by amending the last sentence to read "The fit is performed only for values of k that have $H_m(k) > 0$, together with the substituted point at $k = n$."

Proposed Response Response Status W

PROPOSED REJECT.

The NOTE text used in Annex 176C and Annex 176D (for AUI-C2C and AUI-C2M respectively) suggests a different extrapolation method from the ones used in other places (PMD clauses).

The difference is deliberate, based on the fact that the error rates allocated for AUIs are significantly lower than the ones allocated for PMDs.

As a result, with practical test times, good parts are expected to have no counts in bins 4 and above ($k \geq 4$). Therefore the extrapolation method used for PMDs (which requires "bins having a count of 10 or more") would cause extrapolation from bin 1 or bin 0, where the distribution is not expected to follow a linear trend. This was considered inappropriate and thus the method in the NOTE added to the PMD clauses was not applied to the AUI annexes. See the response to comment I-106

(<https://www.ieee802.org/3/dj/comments/D3p0/8023dj_D3p0_comments_final_id.pdf#page=33>), and also comment I-226 in the same report and the presentations referenced therein.

The NOTE in the AUI annexes was adopted by the response to comment R1-201, which was adopted with consensus indicated by a straw poll (see <https://www.ieee802.org/3/dj/comments/D3p1/8023dj_D3p1_comments_final_id.pdf#page=51> and the presentations referenced therein).

The guidance is therefore different and the text should not be changed.

The NOTE text states that "For the linear fit, $H_m(n)$ is set to $3/N$ " before "The fit is performed only for values of k that have $H_m(k) > 0$ ". Therefore, $k=n$ is included by definition.

If the text were interpreted as if $H_m(n)$ is not included, the assignment of $H_m(n)$ to $3/N$ would have no effect. Additional emphasis as suggested in the comment is not necessary.

CI 177 SC 177.4.2 P362 L47 # R2-98

Ran, Adele

Cisco Systems, Inc.

Comment Type T Comment Status D (B) (L)

The input to the convolutional interleaver in Figure 177-4 is labeled "FEC:IS_UNITDATA_i.request". This is a primitive that conveys one bit at a time. But the convolutional interleaver works on 40-bit blocks ("Data from the deskewed PMA lane is fed into each delay line one RS-FEC symbol-quartet at a time") and these blocks result from further processing of the FEC:IS_UNITDATA_i.request bit stream (variable delay caused by the deskew function, and "Delay odd PCS lanes" for 800GBASE-R). "FEC:IS_UNITDATA_i.request" is incorrect and misleading.

Figure 177-12 is the inverse operation, and has "To FEC:IS_UNITDATA_i.indication" as the output - this is not incorrect because no further processing is required. But if Figure 177-4 is modified, consider applying the same change in 177-12.

An alternative to the suggested remedy is to use the graphic representation of Figure 184-4 instead of text.

Suggested Remedy

In Figure 177-4 change the input label from "FEC:IS_UNITDATA_i.request" to "4 RS-FEC symbols".

Consider applying a similar change in Figure 177-12 for the output label.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the change proposed in the suggested remedy is an improvement to the draft.

Change "FEC:IS_UNITDATA_i.request" in Figure 177-4 to "RS-FEC symbol-quartets". Change "To FEC:IS_UNITDATA_i.indication" in Figure 177-12 to "RS-FEC symbol-quartets".

Implement with editorial license.

Cl 177 SC 177.4.5 P365 L1 # R2-187
Swenson, Norman Nokia Corporation, Norman Swenson Consulting, Point
Comment Type ER Comment Status D (B) (L)
In equations 177-4, 177-5, and 177-6, the g in g(0), g(1), ..., should be boldface to be consistent with the notation in equation 177-2; in each case g() is a column vector.
Suggested Remedy
Make g boldface in the indicated equations wherever g(0), g(1), ..., appears.
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Use bold font for letter "g" in Equation 177-4, 177-5 and 177-6 to match Equation 177-2.
[Editor's note: changed page number for 364 to 365]

Cl 177 SC 177.6.2.3 P373 L3 # R2-106
Ran, Adeo Cisco Systems, Inc.
Comment Type T Comment Status D (B) (L)
"The Inner FEC shall support a test mode, where a PRBS31 test pattern is encoded by the Inner FEC (see 176.7.4)"
This subclause describes a test pattern checker function (or mode), but the first sentence describes it as if it were a generator function.
The cross reference 176.7.4 is to "PMA test patterns", not the right reference for this signal.
Suggested Remedy
Change the sentence to
"The Inner FEC shall support a test mode, where the received signal corresponds to the PRBS31 encoded by Inner FEC test pattern (see 177.6.1.1)".
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.
While the proposed change could improve readability, the existing text is correct except for the cross-reference.
Change the cross-reference in the first sentence from:
"(see 176.7.4)"
to:
"(see 177.6.1.1)"

Cl 177 SC 177.11.4.1 P384 L31 # R2-6
Hajduczenia, Marek RG Nets
Comment Type T Comment Status D (B) (L)
In the Transmit function PICS table of 177.11.4.1, newly added item TF11 "PRBS31 checker" cites 177.6.2.1, which is "PRBS31 test pattern checker" under 177.6.2 Test pattern checking, a receive-path function. Page 372 lines 40 to 42 state that the Inner FEC test pattern checkers are "used to check the signal on each receive input lane from the PMD service interface", and 177.6.2.1 requires checkers at the output of the PAM4 decoder. A receive function is therefore listed in the Transmit function table, while the Receive function table in 177.11.4.2 has no entry for 177.6.2.1. Items TF7 through TF11 and RF7 are all new in D3.2.

Suggested Remedy
Delete item TF11 (PRBS31 checker, 177.6.2.1) from the Transmit function table of 177.11.4.1 and add it to the Receive function table of 177.11.4.2 as a new item (e.g. RF7 "PRBS31 test pattern checker", 177.6.2.1, status M, Support "Yes []"), renumbering the existing RF7 (PRBS31-encoded-by-Inner-FEC RX mode, 177.6.2.3) to RF8. Align the feature wording with the subclause title "PRBS31 test pattern checker".
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Implement the suggested remedy with editorial license.

Cl 177 SC 177.11.4.2 P384 L46 # R2-7
Hajduczenia, Marek RG Nets
Comment Type T Comment Status D (B) (L)
In the Receive function PICS table of 177.11.4.2, the newly added item RF7 ("PRBS31-encoded-by-Inner-FEC RX mode", subclause 177.6.2.3, Status M) has an empty Support column. All other items in the Clause 177 PICS tables, including RF1 through RF6 in the same table and the companion transmit-side item TF8 (177.6.1.1) added by the same edit, show "Yes []" in the Support column. As written the row cannot be completed by an implementer. This item was added in response to D3.1 comment R1-49 - the substance was implemented but the Support cell was left blank.
Suggested Remedy
In the Receive function PICS table of 177.11.4.2 on page 384, add "Yes []" to the Support column of item RF7, matching items RF1 through RF6 and item TF8 in 177.11.4.1.
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Resolved using the response to comment R2-174.

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

Cl 177 SC 177.11.4.2 P384 L46 # R2-174

Nicholl, Gary

Cisco Systems, Inc.

Comment Type ER Comment Status D (B) (L)

The support column for PICS item RF7 is blank. It should be "Yes []".

SuggestedRemedy

Add "Yes []" to the support column for PICS item RF7 .

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment identifies an error in the draft that should be corrected.

Implement the suggested remedy.

Cl 177 SC 177.11.4.2 P384 L47 # R2-107

Ran, Adeo

Cisco Systems, Inc.

Comment Type E Comment Status D (B) (L)

Item RFs is missing "Y []" in the "support" column.

SuggestedRemedy

Add it.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Resolved using the response to comment R2-174.

Cl 178 SC 178.9.2.6 P397 L17 # R2-108

Ran, Adeo

Cisco Systems, Inc.

Comment Type TR Comment Status D (B) (E)

"measured with the transmitter equalization set to NO EQUALIZATION"

NO EQUALIZATION is an enumerated value for the coefficient request (178B.7.4.6). But in this case it is not a single coefficient - its a preset value, so should be PRESET 1 (no equalization), as in 179.9.4.2.2.

SuggestedRemedy

Change to

"measured with the transmitter equalization set to PRESET 1 (no equalization)".

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 178 SC 178.9.3.4.1 P401 L34 # R2-8

Hajduczenia, Marek

RG Nets

Comment Type T Comment Status D (B) (E)

D3.2 corrected 178.9.2.5 (page 396 line 53) from "shall meet the specification dvf (min)" to "shall be within the range specified for dvf in Table 178-6", because Table 178-6 specifies dvf as a range (0 to 0.1 V) with no minimum value. The parallel statement in 178.9.3.4.1 (page 401 line 34) still reads that the difference steady-state voltage dvf "is less than or equal to the minimum specified in Table 178-6", referring to a nonexistent minimum and conflicting with the corrected 178.9.2.5. The identical stale wording remains in 176C.6.4.4.1 (page 809 line 44) referencing Table 176C-2, whose dvf is also given as a range (0 to 0.1 V).

SuggestedRemedy

On page 401 line 34, change "is less than or equal to the minimum specified in Table 178-6" to "is within the range specified for dvf in Table 178-6". Apply the corresponding change on page 809 line 44: "is within the range specified for dvf in Table 176C-2".

Proposed Response Response Status W

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

The comment addresses the receiver test setup subclause. In this subclause, the transmitter used in the setup is required to have the minimum swing allowed (or lower), in order to test the performance of the PMD receiver under test at this extreme condition. This is different from 178.9.2.5, which is the specification for the PMD transmitter.

The dvf parameter is specified as a range, which has both a minimum and a maximum. Therefore the text "is less than or equal to the minimum specified in Table 178-6" is correct as written and unambiguous.

The same goes for 176C.6.4.4.1.

Cl 178 SC 178.9.3.7 P404 L39 # R2-9

Hajduczenia, Marek

RG Nets

Comment Type E Comment Status D (B) (E)

The resolution of D3.1 comment R1-108 specified changing the citation to "Table 178-8, Table 178-14, and Table 178-15". The reference to 178-15 was added but the word "Table" was omitted, so page 404 line 39 reads "in Table 178-8, Table 178-14, and 178-15 and with the value of Tfx equal to twice the delay from TP5v to...". This is inconsistent with the parallel transmitter text in 178.9.2.3 (page 396 line 11), which correctly reads "Table 178-8, Table 178-14, and Table 178-15", and with the citations on page 402 line 2 and page 406 lines 4 and 42. The bare "178-15" reads as a subclause or equation number.

Suggested Remedy

On page 404 line 39, change "in Table 178-8, Table 178-14, and 178-15 and with the value of Tfx" to "in Table 178-8, Table 178-14, and Table 178-15, and with the value of Tfx".

Proposed Response Response Status W

PROPOSED REJECT.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

Cl 178 SC 178.14.3 P414 L14 # R2-176

Nicholl, Gary

Cisco Systems, Inc.

Comment Type ER Comment Status D (B) (E)

PICS items KR1, KR2, KR4, KR8, PHY and *MD are all conditional optional. The support column should be "Yes [], No [], N/A []"

Suggested Remedy

Change the support column for PICS items KR1, KR2, KR4, KR8, PHY and *MD in 178.14.3 from "Yes [], No []" to "Yes [], No [], N/A []"

Proposed Response Response Status W

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the change proposed in the suggested remedy is an improvement to the draft.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

Cl 178 SC 178.14.3 P414 L26 # R2-10

Hajduczenia, Marek

RG Nets

Comment Type E Comment Status D (B) (E)

The D3.2 merge of PICS items AUI200G ("200 Gb/s per lane AUI-n C2C", Annex 176C) and AUIL200G ("Less than 200 Gb/s per lane AUI-n C2C", Annex 120F/120D/120B) into the single item AUIC2C was completed in the Clause 179 PICS (page 459 line 39, Feature = "AUI-n C2C") but left incomplete in the Clause 178 PICS. On page 414 line 26 the item label was changed to AUIC2C and the Value/Comment updated to "PMD is separated from the PCS by an AUI-C2C specified in Annex 120B, Annex 120D, Annex 120F, or Annex 176C", but the Feature cell still carries the leftover text "200 Gb/s per lane AUI-n C2C". Annex 120B, 120D and 120F specify AUIs at less than 200 Gb/s per lane, so the Feature label contradicts the item's own Value/Comment.

SuggestedRemedy

In 178.14.3 on page 414 line 26, change the Feature cell of item AUIC2C from "200 Gb/s per lane AUI-n C2C" to "AUI-n C2C", matching the AUIC2C row in the Clause 179 PICS on page 459 line 39.

Proposed Response Response Status W

PROPOSED REJECT.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

Cl 178B SC 178B P910 L1 # R2-114

Ran, Adeo

Cisco Systems, Inc.

Comment Type E Comment Status R (withdrawn) (CA)

In Figure 178B-15 there are transitions to "B" (TRAINING state) from all other states (total of 7), all with the same condition, "!c_isl_ready". This means c_isl_ready=false will cause a transition to TRAINING regardless of state. The diagram can be simplified by adding "!c_isl_ready" to the open arrow into TRAINING, which takes precedence over all other conditions.

Further simplifications may be possible by considering the transitions into "A" (total of 5), which are all dependent on "c_isl_ready * !c_adjacent_intf_rx_ready", and changing the transitions into "C" (total of 3) into regular arrows. If a change is made, this should be considered.

SuggestedRemedy

In the open arrow into TRAINING, add "+ !c_local_rts".
Delete all transitions to "B" and the "B" label.
Change the two transitions into TRAINING_COMPLETE (which are conditional on c_isl_ready) to UCT.
Remove c_isl_ready from all other conditions.

Consider applying the suggested changes for the transitions into A and C.

A contribution with the proposed modified diagram will be provided.

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

Cl 178B SC 178B.2 P874 L30 # R2-162

Slavick, Jeff

Broadcom Inc

Comment Type T Comment Status D (B) (CA)

We state the RTS function is described in two sub clauses, which is true there are two different RTS functions and later in the overview we talk about PAM4 and coherent, so perhaps it'll be best to denote that 178B.6 is for PAM4 ISLs and 178B.10 is for coherent.

SuggestedRemedy

Change "The RTS function is described in 178B.6 and 178B.10."
To: "The RTS function is described for PAM4 ISLs in 178B.6 and for coherent ISLs in 178B.10."

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl **178B** SC **178B.2** P**874** L**31** # **R2-163**

Slavick, Jeff Broadcom Inc

Comment Type **T** Comment Status **R** (CA)

The ILT function really provides methods and help facilitate establishing communication over the ISL. But the first sentence talks about it "controlling" and the second about how it provides optimization of the link, but really it's just coordinating those things and providing the tools to achieve optimizing the link performance.

SuggestedRemedy

Change "For PAM4 ISLs, the ILT function is an internal function of an AUI component or a PMD that controls the establishment of communication with a peer interface within an inter-sublayer link (ISL). The ILT function provides optimization of data signaling and coordinates the transition to DATA mode on an ISL. The ILT function is defined in 178B.7."

To "For PAM4 ISLs, the ILT function is an internal function of an AUI component or a PMD that facilitates the establishment of communication with a peer interface within an inter-sublayer link (ISL). The ILT function provides methods for optimization of data signaling and coordinates the transition to DATA mode on an ISL. The ILT function is defined in 178B.7 for PAM4 ISLs."

Response Response Status **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **178B** SC **178B.4** P**876** L**25** # **R2-43**

Hajduczenia, Marek RG Nets

Comment Type **TR** Comment Status **D** (B) (CA)

The first APSU bullet requires an ISL's interfaces and sublayers to "implement the RTS function (see 178B.6 and 178B.10)". 178B.6 is the RTS function for PAM4 interfaces (page 878) and 178B.10 the RTS function for coherent interfaces (page 905) - these are mutually exclusive per interface type. The bullet at lines 44 to 45 on the same page treats the two cases as alternatives, and the PICS in 178B.13 makes MC1 (APSU for PAM4 interfaces, 178B.5) and MC2 (APSU for optical coherent, 178B.10) an O/1 exclusive choice. The conjunctive "and" literally demands both.

SuggestedRemedy

On page 876 line 25, change "implement the RTS function (see 178B.6 and 178B.10)" to "implement the RTS function (see 178B.6 or 178B.10, as applicable)".

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

The comment seems to refer to line 6.

Change: "implement the RTS function (see 178B.6)"

To: "implement the RTS function (see 178B.6 for PAM4 ISL's and 178B.10 for coherent ISLs)"

Cl **178B** SC **178B.4** P**876** L**44** # **R2-44**

Hajduczenia, Marek RG Nets

Comment Type **E** Comment Status **D** (B) (CA)

In the text inserted into 178B.4 by the resolution of D3.1 comments R1-140 and R1-142, the cross-reference is missing a space: "the RTS and ILT functions defined in178B.6 and 178B.7". The parallel reference in the very next sentence (line 45) correctly reads "defined in 178B.10", and this is the only missing-space cross-reference of this form in the draft.

SuggestedRemedy

On page 876 line 44, change "the RTS and ILT functions defined in178B.6 and 178B.7" to "the RTS and ILT functions defined in 178B.6 and 178B.7".

Proposed Response Response Status **W**

PROPOSED REJECT.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

CI **178B** SC **178B.5** P**877** L**4** # **R2-45**

Hajduczenia, Marek

RG Nets

Comment Type **TR** Comment Status **D** RTS (B) (CA)

The D3.2 rewrite of 178B.5 replaced the D3.1 sentence "The RTS function uses inputs from the adjacent interface (via the service interface), its peer interface..." with a bulleted list whose first item broadens the adjacent-side input to "the adjacent interface and signal indication logic (SIL) in one or more sublayers between the local interface and its adjacent interface (via the service interface)". The parallel overview of the same RTS behaviour in 178B.6 (page 878 lines 39 to 40), a subclause also edited in D3.2, still states the input narrowly as "the SIGNAL_OK parameter from the adjacent interface". The two descriptions of the same input disagree about where SIGNAL_OK originates, and the newly introduced SIL concept appears in only one of the two places.

SuggestedRemedy

Align the 178B.6 overview with the new 178B.5 text. On page 878 lines 39 to 40, change "Wait for the adjacent interface to be ready for DATA mode, as indicated by the SIGNAL_OK parameter from the adjacent interface being equal to READY or OK." to "Wait for the adjacent interface to be ready for DATA mode, as indicated by the SIGNAL_OK parameter received on the service interface, from the adjacent interface or from the SIL of an intervening sublayer, being equal to READY or OK." Alternatively, if SIL is not intended as a distinct input source, revert the SIL addition in the first bullet of 178B.5.

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, related changes would be an improvement to the draft.

The text in 178B.5 is explaining in great detail how the SIGNAL_OK traverse from one side of a retimer to the other. The phrase "from the adjacent interface" used in 178B.6 is used to differentiate between the SIGNAL_OK that ultimately comes from the adjacent interface rather than the one that goes to the adjacent interface as illustrated in Figure 178B-4. Figure 178B-4 clearly illustrates what is meant by "SIGNAL_OK from the adjacent interface". It would be helpful to point the reader to the figure. On page 878 line 40, change "by the SIGNAL_OK parameter from the adjacent interface" to "by the SIGNAL_OK parameter from the adjacent interface (see Figure 178B-4)".

CI **178B** SC **178B.5** P**878** L**23** # **R2-122**

de Koos, Andras

Microchip Technology Inc

Comment Type **E** Comment Status **R** (CA)

In the same way that there is a nice signal diagram between the per-interface ILT and RTS functions (Figure 178B-4), it would be helpful to have a similar diagram showing the signaling between the per-lane ILT functions and the per-interface ILT function. Or add the per-lane ILT to/from per interface ILT signaling to Figure 178B-4 itself. The signaling should not be any more complicated than what already exists between the RTS function and the per-interface ILT function.

SuggestedRemedy

Consider adding the signaling between the per-interface ILT function and the per-lane ILT function(s) to Figure 178B-4.

Response Response Status **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

CI **178B** SC **178B.6** P**878** L**38** # **R2-165**

Slavick, Jeff

Broadcom Inc

Comment Type **T** Comment Status **D** RTS (B) (CA)

This list is dashed which means unordered, but really it's a series of steps, thus should be numbered.

SuggestedRemedy

Changed the list to be ordered rather than dashed (unordered).

Proposed Response Response Status **W**

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

Cl 178B	SC 178B.7	P879	L5	# R2-121
de Koos, Andras		Microchip Technology Inc		
Comment Type	ER	Comment Status	D	(B) (CA)
Typo:				
"...all the per-lane ILT functions (see 178B.7.1) "				
per-lane ILT functions are defined in 178B.7.2.				
SuggestedRemedy				
Correct the cross-reference				
Proposed Response		Response Status W		
PROPOSED ACCEPT IN PRINCIPLE.				
This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.				
However, the change proposed in the suggested remedy is an improvement to the draft. Implement the suggested remedy.				

Cl	178B	SC	178B.7	P	879	L	9	#	R2-166
Slavick, Jeff				Broadcom Inc					
Comment Type		TR	Comment Status		R	Variables (CA)			
The tx_mode state is not really an indicator of the "mode" that ILT is operating in. Especially with the addition of the recovery states.									
SuggestedRemedy									
Presentation to be provided.									
Response		Response Status		Z					
REJECT.									
This comment was WITHDRAWN by the commenter.									

Cl	178B	SC	178B.7	P	879	L	11	#	R2-138
Law, David				Hewlett Packard Enterprise					
Comment Type		T	Comment Status		D	Variables (CA)			
The second paragraph of subclause 178B.7 'ILT function for PAM4 interfaces' says 'The ILT function has three modes of operation based on the tx_mode variable (see 178B.8.3.1):' and then lists the second as 'LOCAL_PATTERN mode (tx_mode = LOCAL_PATTERN): a pattern is transmitted to the peer Interface'. The pre-antepenultimate paragraph then says 'LOCAL_PATTERN mode is used when training is disabled (mr_training_enable = false)'. This appears to be unchanged text from IEEE P802.3dj draft D3.1. A new variable, tx_lp_on_adj_los_ability, appears to have been added to subclause 178B.8.2.1 'Variables' by IEEE P802.3dj D3.2, which '... indicates the interface supports sending LOCAL_PATTERN when the training control state diagram (Figure 178B-14b) is in the PATH_UP state ...'. Based on this, and the associated ADJ_LOS_LP and ADJ_LOS_RECOVERY states in Figure 178B-10b, 'Training control state diagram, part 2', the text in subclause 178B.7 needs to be updated, as LOCAL_PATTERN mode/tx_mode = LOCAL_PATTERN is also used when training is enabled.									
SuggestedRemedy									
Suggest that the text 'LOCAL_PATTERN mode is used when training is disabled (mr_training_enable = false).' is changed to read 'LOCAL_PATTERN mode is used when training is disabled (mr_training_enable = false) if adjacent loss of signal mode is LOCAL_PATTERN (mr_adj_los_mode = LOCAL_PATTERN) when the training control state diagram (Figure 178B-10b) is in the PATH_UP state and local_rts becomes false.									
Proposed Response		Response Status W							
PROPOSED REJECT.									
The paragraph in 178B.7 that begins with "LOCAL_PATTERN mode is used" is describing one situation in which that setting of tx_mode = LOCAL_PATTERN occurs. It does not state it is the only occurrence. While the suggested may improve the clarity of the draft, the text as written is correct.									

Cl 178B SC 178B.7 P879 L37 # R2-167

Slavick, Jeff Broadcom Inc

Comment Type T Comment Status R (withdrawn) (CA)

The LP control register (45.2.1.161) has fields that are R/W and the last sentence in 45.2.1.161 states that when training is disabled these are writable bits and read only when training is enabled.. This appears to be a method by which management was provided to configure the transmitter.

Cl 136 does not call out when the given state machines that support LinkTraining are present or not. However, in the second to last paragraph 178B.7 the standard does explicitly state that the training frame lock and coefficient updates state diagrams are not present when mr_training_enable = false.

I do not believe we have provided an alternate method to program transmitter when training is disabled and in order to support what has been present in the standard we would need the coefficient update state diagram to be optionally present to support using MDIO reg 1120 to configure the transmitter state.

SuggestedRemedy

Change: "The training control state diagram (Figure 178B-10a and Figure 178B-10b) and its associated variables are used by both TRAINING mode and LOCAL_PATTERN mode of operation. The state diagrams in Figure 178B-11 and Figure 178B-12 and their associated variables, apply only when training is enabled (mr_training_enable = true)."

To: "The training control state diagram (Figure 178B-10a and Figure 178B-10b) and its associated variables are used by both TRAINING mode and LOCAL_PATTERN mode of operation. The training frame lock state diagrams in (Figure 178B-12) and Figure 178B-13 and their associated variables, apply only when training is enabled (mr_training_enable = true). The coefficient update state diagram and its associated variables apply when training is enabled and may be used to configure the Tx parameters when training is disabled."

In 178B.8.3.1 add the following to the end of the first sentence of ic_sel, coef_sel and coef_req:

"when training is enabled and may be set by management when training is disabled."

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

Cl 178B SC 178B.7 P879 L38 # R2-137

Law, David Hewlett Packard Enterprise

Comment Type T Comment Status R (withdrawn) (CA)

The last sentence of subclause 45.2.1.161 'BASE-R PAM4 PMD training LP control, lane 0 through lane 7 registers (Register 1.1120 through 1.11273)' says 'When training is not disabled, the bits in registers 1.1120 through 1.11273 are read only; however, when training is disabled the R/W bits become writeable.'. It appears this is to allow the transmitter coefficients to be selected (Initial condition request/ic_sel) and adjusted (Coefficient select/coef_sel and Coefficient request bits/coef_req) locally through this register when training is disabled. This seems to be confirmed by subclause 178B.7.2 'Per-lane ILT function' which says, 'When in LOCAL_PATTERN mode, the pattern transmitted is specified in the clause or annex that defines the interface.', and 'The transmitter parameters are configured through management control variables.'.

The penultimate sentence of subclause 178B.7 'ILT function for PAM4 interfaces', however, says 'The state diagrams in Figure 178B-11 and Figure 178B-12 and their associated variables apply only when training is enabled (mr_training_enable = true).' This doesn't seem correct, as it would prevent the Figure 178B-12 'Coefficient update state diagram' from operating when training is disabled. If that were the case, the coef_sel and coef_req values set through the 'BASE-R PAM4 PMD training LP control' registers would be ignored. Further, the ic_sel, coef_sel, and coef_req variables are only described as being derived from the control field of the received training frames.

SuggestedRemedy

[1] Change the penultimate sentence of subclause 178B.7 to read 'The training control state diagram (Figure 178B-10a and Figure 178B-10b) and its associated variables are used by both TRAINING mode and LOCAL_PATTERN mode of operation. The training frame lock state diagram (Figure 178B-12) and its associated variables apply only when training is enabled (mr_training_enable = true). The coefficient update state diagram and its associated variables apply when training is enabled and may be used to configure the Tx parameters when training is disabled.'.

[2] Change the text '... derived from the ... bits from the control field of the received training frames (see 178B.7.4).' in the subclause 178B.8.3.1 'Variables' definition for the ic_sel, coef_sel, and coef_req variables to read '... derived from the ... bits from the control field of the received training frames (see 178B.7.4) when training is enabled and may be set by management when training is disabled.'.

As an example, the updated coef_req variable description would read:

Enumerated variable derived from the "coefficient request" bits from the control field of the received training frames (see 178B.7.4) when training is enabled and may be set by management when training is disabled. This variable is assigned one of the following values: HOLD, DECREMENT, INCREMENT, NO EQUALIZATION.

Response Response Status Z

REJECT.

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

This comment was WITHDRAWN by the commenter.

Cl 178B SC 178B.7 P879 L42 # R2-135

Law, David Hewlett Packard Enterprise

Comment Type T Comment Status D (B) (CA)

The last paragraph of subclause 178B.7 'ILT function for PAM4 interfaces' says 'Recovery from the ISL_FAIL state in the training control state diagram (Figure 178B-10b) requires management to assert mr_restart_training or reset ...'. Subclause 178B.8.2.1 'Variables', however, defines the 'mr_restart' variable as a 'Boolean variable used by management to restart the RTS and ILT functions.' which is used by the state diagrams (note mr_restart_training vs mr_restart). Clause 136 uses mr_restart_training, as does subclause 45.2.1.95.1, although it appears to reference only mr_restart_training in Clause 76.

SuggestedRemedy

Use only either mr_restart_training or mr_restart.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the change proposed in the suggested remedy is an improvement to the draft.

Change mr_restart_training to mr_restart.

Implement the suggested remedy with editorial license.

Cl 178B SC 178B.7.7 P889 L44 # R2-156

Slavick, Jeff Broadcom Inc

Comment Type TR Comment Status R (withdrawn) (CA)

Per comment I-368 we inserted a new state named WAIT_DATAPATH into the ILT function. This state is holding state between "training" finishing and "data mode" being enabled. In this state we send either training frames or local_pattern. The state of the polarity correction function should be present in this state too.

SuggestedRemedy

Change "tx_mode = DATA" to "tx_mode is FILL or DATA"

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

Cl 178B SC 178B.7.8 P889 L51 # R2-157

Slavick, Jeff Broadcom Inc

Comment Type TR Comment Status D ILT (CA)

In CL136 you only ever made changes in TRAIN_LOCAL and needed to respond to change requests in TRAIN_LOCAL and TRAIN_REMOTE.

ILT has added two more states, RECOVERY and ISL_READY, in which training frames could be sent or received with change requests.

So for ILT we need to respond to requests in RECOVERY and ISL_READY as well as TRAIN_LOCAL and TRAIN_REMOTE. ILT needs to permit the ability to generate requests in RECOVERY to escape (undo), in addition to in TRAIN_LOCAL.

SuggestedRemedy

Change the allowed states in 2nd paragraph to be "TRAIN_LOCAL or RECOVERY"

Delete the 3rd and 4th paragraphs of 178B.7.8.

Add the following after the 1st paragraph of 178B.7.10

"When the training control state diagram (Figure 178B-10a and Figure 178B-10b) is in any state other than TRAIN_LOCAL and RECOVERY, the interface shall not send any request to the peer interface.

While the training control state diagram (Figure 178B-10a and Figure 178B-10b) is in any state other than TRAIN_LOCAL, TRAIN_REMOTE, ISL_READY and RECOVERY the interface shall ignore requests from the peer interface."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

The following related contribution was reviewed by the 802.3dj task force at the September 1 Clause 178B ad hoc meeting.

https://www.ieee802.org/3/dj/public/adhoc/178b/26_0901/slavick_178b_01a_2600901.pdf

Pending CRG consideration of slavick_178b_01_260901.

Cl 178B SC 178B.8.2.1 P893 L43 # R2-123

de Koos, Andras Microchip Technology Inc

Comment Type E Comment Status R (CA)

Style question : when there is a NOTE relating to a variable's description, should it not have the same indentation as the variable's description?

Can find examples of both indented and un-indented NOTES in 802.3-2022, unfortunately (see variables list in Clauses 119 and 82, respectively).

SuggestedRemedy

Consider indenting the NOTES to match the indentation of the variables' description.

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 178B SC 178B.8.2.1 P894 L5 # R2-46

Hajduczenia, Marek RG Nets
Comment Type T Comment Status D Variables (B) (CA)

The D3.2 definition of mr_adj_los_mode no longer states what the variable does - the D3.1 statement that it controls the behaviour of the training control state diagram was deleted and not replaced by any cross-reference. The neighbouring management variables mr_restart and mr_training_enable state their effect. The functional description now appears only under adj_los_mode in 178B.8.3.1 (page 897), with no pointer from 178B.8.2.1. (The definition sits on unnumbered lines between line 4 and line 9 - line 4 is the nearest numbered line above.)

SuggestedRemedy

Append a cross-reference to the mr_adj_los_mode definition, e.g. "This variable, together with tx_lp_on_adj_los_ability and tx_sq_on_adj_los_ability, determines the value of adj_los_mode (see 178B.8.3.1)."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
Implement suggested remedy with editorial license.

CI 178B SC 178B.8.2.1 P894 L42 # R2-110

Ran, Adeo Cisco Systems, Inc.
Comment Type T Comment Status D Restart (CA)

rx_fail_on_los is defined as an ability (per the register bit, as noted in the editor's note), but in fact it is a "disability" - the receiver can't do anything but fail upon a LOS event. Even if this is treated as an "inverted ability bit", it is possible that the receiver can, by design, recover without failing (so rx_fail_on_los is false), but management prefers to force a restart on every failure. This is not supported by the current definition (read-only).

The common way to specify management variables is ability + enable as separate variables. The suggested remedy adds these management variables while keeping the semantic of rx_fail_on_los, so the state diagram is not changed.

SuggestedRemedy

Add the following variable definitions:
rx_los_recovery_ability: Boolean variable that indicates that when the training control state diagram (Figure 178B-10b) is in the PATH_UP state, the receiver can recover from loss of signal (rx_ok = false) without a restart of the ILT function. The value of this variable is implementation dependent.
mr_rx_los_recovery_enable: Boolean variable that is set by management to enable recovery from loss of signal. The default value is false.

Change the definition of rx_fail_on_los to:
rx_fail_on_los: Boolean variable that is true when either rx_los_recovery_ability or mr_rx_los_recovery_enable is false, and false otherwise.
Delete the editor's note after the definition.

In Table 178B-3, add a row for mr_rx_los_recovery_enable | 178B.8.2.1 | 1.1479.11 | 45.2.1.169f.
In Table 178B-4, replace rx_fail_on_los with rx_los_recovery_ability (keep mapping the MDIO register 1.1479.15)
In 45.2.1.169f, in the definition of bit 15, swap the 0 and 1 definitions (such that 1 indicates ability), and add a row for bit 11: Receiver recovery | 0=mr_rx_los_recovery_enable is false; 1=mr_rx_los_recovery_enable is true | R/W. Keep only bit 12 as reserved.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Implement suggested remedy except define mr_rx_los_recovery_enable as follows.

"mr_rx_los_recovery_enable: Boolean variable that is set by management to enable recovery from loss of signal without a restart of the ILT function. The default value is false."

Implement all with editorial license.

Pending review of related slides in the following editorial contribution:
<URL>/brown_3dj_03_2609.pdf

Cl 178B	SC 178B.8.2.1	P894	L43	# R2-158
Slavick, Jeff		Broadcom Inc		
Comment Type	TR	Comment Status	D	Restart (CA)
rx_fail_on_los having a default does not make sense. Really should be an ability which forces rx_fail_on_los to true and a control register which can force the tranistion to FAIL to occur when the ability to recover is possible.				
SuggestedRemedy				
Rename rx_fail_on_los in 178B.8.2.1 to rx_requires_restart_on_los and remove the last sentence from the definition "Default for..."				
Create new mr_rx_fail_on_los variable in 178B.8.2.1 "Boolean variable set by management. When true, the ILT function will transition to the ISL_FAIL state upon a loss of signal event (rx_ok becomes false) when in the training control state diagram (Figure 178B-10b) is in the PATH_UP state."				
Assign bit 11 in Table 45-133e as the MDIO register to map to the mr_rx_fail_on_los. 1 = true, 0 = false				
In 178B.8.3.1 add new variable "rx_fail_on_los" with a definition of "Boolean variable which controls if the training control state diagram (Figure 178B-10b) will go immediately to ISL_FAIL when in the PATH_UP state and rx_ok becomes false. The value of the variable is the logical or of rx_requires_restart_on_los and mr_rx_fail_on_los"				
Proposed Response		Response Status W		
PROPOSED ACCEPT IN PRINCIPLE.				
Resolved using the response to comment R2-110				

Cl 178B	SC 178B.8.2.1	P894	L47	# R2-47
Hajduczenia, Marek		RG Nets		
Comment Type	TR	Comment Status	D	Restart (CA)
The rx_fail_on_los variable definition added in response to D3.1 comment R1-248 ends with "The value of this variable is implementation dependent. Default for this variable is true." However rx_fail_on_los is mapped in the 178B.12 status-variable table (page 912) to bit 1.1479.15, which Table 45-133f (page 105, 45.2.1.169f) defines as "Receiver recovery ability" with access RO. A default value is not meaningful for a read-only ability bit. The editor acknowledges this in an unresolved Editor's note at page 894 lines 49 to 51 ("The register bit for rx_fail_on_los is defined as a read-only ability bit. Therefore defining a default is not meaningful. Proposals to address this are encouraged."), which must not remain in a draft submitted for recirculation. The two parallel new ability variables tx_lp_on_adj_los_ability (page 895 lines 10 to 12, bit 1.1479.13, RO) and tx_sq_on_adj_los_ability (page 895 lines 14 to 16, bit 1.1479.14, RO) correctly state only "The value of this variable is implementation dependent."				
Suggested Remedy				
On page 894 line 47, delete the sentence "Default for this variable is true." so that the rx_fail_on_los definition ends with "The value of this variable is implementation dependent.", matching tx_lp_on_adj_los_ability and tx_sq_on_adj_los_ability. Delete the Editor's note at page 894 lines 49 to 51 in its entirety. If a management-settable default is genuinely intended, instead change 1.1479.15 in Table 45-133f on page 105 from RO to R/W and retain the default statement.				
Proposed Response		Response Status W		
PROPOSED ACCEPT IN PRINCIPLE.				
Resolved using the response to comment R2-110				

Cl 178B SC 178B.8.3 P896 L40 # R2-48

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status D (B) (CA)

The resolutions of D3.1 comments R1-182 and R1-183 restructured the opening paragraphs of 178B.8.3 to a per-lane subject, but the restructuring also deleted the trailing clause "and their associated variables, functions, counters and timers defined in this subclause", which was present in D3.1 and retained in the agreed remedy. The paragraphs now read "Each lane of an interface using the E1 format implements one instance of each of the training control, the training frame lock and the coefficient update state diagrams." and "Each lane of an interface using the O1 format implements one instance of each of the training control and the training frame lock state diagrams." The phrase does not appear anywhere else in D3.2, so 178B.8.3 no longer states that the associated variables, functions, counters and timers are instantiated per lane. The parallel per-interface subclause 178B.8.2 (page 893 lines 34 to 35) retains the equivalent wording, so the two subclauses are now inconsistent. (The paragraphs sit on unnumbered lines following the 178B.8.3 heading - line 32 is the nearest numbered line above.)

SuggestedRemedy

Restore the trailing clause in both paragraphs of 178B.8.3: "Each lane of an interface using the E1 format implements one instance of each of the training control, the training frame lock and the coefficient update state diagrams, and their associated variables, functions, counters and timers defined in this subclause." and "Each lane of an interface using the O1 format implements one instance of each of the training control and the training frame lock state diagrams, and their associated variables, functions, counters and timers defined in this subclause."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

It seems this was an D3.2 implementation error that should be rectified.

Implement the suggested remedy with editorial license.

Cl 178B SC 178B.8.3 P896 L48 # R2-99

Ran, Adeo

Cisco Systems, Inc.

Comment Type E Comment Status R (withdrawn) (CA)

"If <...> then the interface shall cause the PMA or Inner FEC to <...> and otherwise cause the PMA or Inner FEC to <...>"

Mismatched clauses (shall and subject are missing in the "otherwise" part), resulting in difficulty to parse.

Similarly in the next paragraph:

"If <...> then the interface shall inform the PMA or Inner FEC that <...> and otherwise inform the PMA or Inner FEC that <...>"

SuggestedRemedy

Change the structure of the sentences to

"If <...> then the interface shall cause the PMA or Inner FEC to <...>. Otherwise the interface shall cause the PMA or Inner FEC to <...>"

"If <...> then the interface shall inform the PMA or Inner FEC that <...>. Otherwise the interface shall inform the PMA or Inner FEC that <...>"

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 178B SC 178B.8.3.1 P898 L6 # R2-49

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status D rx_ok (CA)

The D3.2 split of the D3.1 variable local_rx_ready into the new rx_ok (page 899, which took over the substantive "receiver is ready / no further adjustments required" definition and all the state-diagram conditions) plus a retained-but-redefined local_rx_ready leaves local_rx_ready inconsistent with its remaining consumers. Its definition is now reduced to "Boolean variable that indicates the state of the receiver. Its value is set by the training control state diagram (Figure 178B-10a).", which does not say which state of the receiver is indicated, nor the conditions for true and false. In Figure 178B-10a, local_rx_ready is set true only on entry to TRAIN_REMOTE and set false on entry to SEND_TRAINING, RX_READY (nearest numbered line, page 901 line 42) and TRAIN_FAIL - Figure 178B-10b never assigns it. It is therefore false throughout RX_READY, PATH_READY, WAIT_DATAPATH and PATH_UP, i.e. during normal data transmission. Three consumers were not updated and still cite local_rx_ready: isl_ready (178B.8.2.1, page 893, "set to true when local_rx_ready and remote_rx_ready are true for all lanes"), PMD_signal_detect_i (179.8.5, page 426 line 35, "the logical AND of the variables local_rx_ready and remote_rx_ready"), and register bit 1.1476.8 "isl ready" (45.2.1.169c, page 102 lines 24 and 26). Since isl_ready is also a condition in the RTS update state diagram (Figure 178B-9, page 896 lines 10 and 22) and on the ISL_READY exit (page 901 line 38), as drafted isl_ready and PMD_signal_detect_i can never remain true in the operational states. Separately, the SEND_LOCAL branch of Figure 178B-10a (entered from QUIET on "!mr_training_enable * quiet_timer_done") never assigns local_rx_ready at all, leaving it undefined whenever mr_training_enable is false, although PMD_signal_detect_i and management bit 1.1420.15 read it with no mr_training_enable guard.

SuggestedRemedy

Resolve the split consistently. Either (a) do not clear local_rx_ready on entry to RX_READY (and TRAIN_FAIL and the PATH states as applicable) so that it stays true from TRAIN_REMOTE through PATH_UP, and give it a substantive definition on page 898 stating the conditions for true and false - or (b) if local_rx_ready is intended only as the transmitted "receiver ready" status bit of the training frame, restate the consumers in terms of rx_ok: change isl_ready in 178B.8.2.1 (page 893) to "set to true when rx_ok and remote_rx_ready are true for all lanes of the interface", change PMD_signal_detect_i in 179.8.5 (page 426 line 35) to "the logical AND of the variables rx_ok and remote_rx_ready", and update the 1.1476.8 descriptions in 45.2.1.169c (page 102 lines 24 and 26). In either case add "local_rx_ready <= false" to the action block of the SEND_LOCAL state in Figure 178B-10a (page 901 line 13) so the variable is defined on the non-training path.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
Make the following changes to Figure 178B-10a/10b.
In the SEND_TRAINING and TRAIN_FAIL states, delete "local_rx_ready <= false".
In the INITIALIZE and ISL_FAIL states, add "local_rx_ready <= false".
In the RX_READY state, add "local_rx_ready <= true".

Pending review of related slides in the following editorial contribution:
<URL>/brown_3dj_03_2609.pdf

CI 178B SC 178B.8.3.1 P898 L13 # R2-86

WANG, Xuebo

Huawei Technologies Co., Ltd

Comment Type TR Comment Status D (Bp) (CA)

The definition of the variable local_tf_lock could be clearer. The current definition says that local_tf_lock is true when [...] and the training frame marker position has been identified on a lane of the interface. Actually, identifying the training frame marker position can only be achieved by a receiver. This point should be made clear to readers for better understanding. A precedent that can be referred to is the definition of the variable frame_lock in subclause 72.6.10.3.1.

SuggestedRemedy

Change the statement "[...] the training frame marker position has been identified on a lane of the interface" to "[...] the training frame marker position has been identified by a receiver on a lane of the interface".

Proposed Response Response Status W

PROPOSED REJECT.
This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.
The draft is correct as written.

CI 178B SC 178B.8.3.1 P898 L43 # R2-164

Slavick, Jeff

Broadcom Inc

Comment Type TR Comment Status D (B) (CA)

The remote_mc_mode variable is or is not assigned value, assignment is not optional.

SuggestedRemedy

Change "may be " to "is"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
The assignment of one of the values is mandatory not optional. Appropriate language from the definition of local_tp_mode can be used.
In the definition of remote_mc_mode change:
"Enumerated variable that corresponds to the "modulation and precoding status" bits in the status field of received training frames. It may be assigned one of the following values:"
To:
"Enumerated variable that corresponds to the "modulation and precoding status" bits in the status field of received training frames and is assigned one of the following values:"

CI 178B SC 178B.8.3.1 P899 L34 # R2-50

Hajduczenia, Marek

RG Nets

Comment Type ER Comment Status D (B) (CA)

The resolution of D3.1 comment R1-9 committed to adding a terminating period to the FILL entry in the tx_mode value list in 178B.8.3.1. That edit was not made: the FILL entry ("FILL: transmit either training frames or LOCAL_PATTERN") is unchanged from D3.1 and still lacks a period. Instead, the terminating periods were removed from the three sibling entries (TRAINING, LOCAL_PATTERN, DATA), which had them in D3.1. The list is now uniformly periodless, which may reflect harmonization with the new periodless c_tx_mode list in 178B.11.2.1, but the agreed edit is absent.

SuggestedRemedy

Either implement the agreed disposition by adding a terminating period to the FILL entry ("FILL: transmit either training frames or LOCAL_PATTERN.") and restoring the periods on the TRAINING, LOCAL_PATTERN and DATA entries - or, if the periods were deliberately removed to harmonize with the c_tx_mode value list in 178B.11.2.1, state that in the comment response so the record reflects the change actually made.

Proposed Response Response Status W

PROPOSED REJECT.

According to the "2021 IEEE SA Standards Style Manual" in "13.3 Lists" it states in regards to lists: "Closing punctuation should be omitted for phrases."

Rather than adding period to one of the entries, the period was removed from all entries to comply with the style manual.

CI 178B SC 178B.8.3.5 P901 L23 # R2-182

Osorio, Luz

Nokia

Comment Type TR Comment Status R (withdrawn) (CA)

The transition back from RECOVERY uses lane_training_status to determine if it failed before ISL_READY. It should be set back to IN_PROGRESS upon RECOVERY exit to maintain its meaning

SuggestedRemedy

Add lane_training_status = IN_PROGRESS assignment in TRAIN_LOCAL

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 178B SC 178B.10 P906 L2 # R2-168

Slavick, Jeff

Broadcom Inc

Comment Type T Comment Status D (B) (CA)

This list is dashed which means unordered, but really it's a series of steps, thus should be numbered.

SuggestedRemedy

Changed the list to be ordered rather than dashed (unordered).

Proposed Response Response Status W

PROPOSED REJECT.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

CI 178B SC 178B.11.1 P906 L28 # R2-169

Slavick, Jeff

Broadcom Inc

Comment Type T Comment Status R (CA)

There are no stop timer events in the coherent state diagrams so this sentence is not necessary.

SuggestedRemedy

Remove "A timer is reset and stops counting upon entering a state where "stop x_timer" is stated." from 178B.11.1

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 178B SC 178B.11.2 P908 L3 # R2-170

Slavick, Jeff

Broadcom Inc

Comment Type TR Comment Status D (B) (CA)

Figure 178B-14 and Figure 178B-15 do not have a PATH_READY state.

SuggestedRemedy

In Figure 178B-14 rename the LOCAL_RTS state to PATH_READY
In Figure 178B-15 rename the BOTH_DIR_RTS state to PATH_READY

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl **178B** SC **178B.11.2.1** P**906** L**31** # **R2-132**

Law, David Hewlett Packard Enterprise

Comment Type **E** Comment Status **D** c_tx_mode (B) (CA)

Subclause 178B.11.2.1 defines the transmit not-ready-to-send signal enumeration of the c_tx_mode variable as NOT-RTS (NOT dash RTS). Yet, the TRAINING_COMPLETE state of Figure 178B-15 'RTS without squelch state diagram' assigns c_tx_mode to NOT_RTS (NOT underscore RTS).

SuggestedRemedy

Use a consistent spelling of the enumeration. Since we generally use underscores in state diagram names, suggest that:

[1] The text 'NOT-RTS: transmit the not-ready-to-send signal ...' in subclause 178B.11.2.1 on page 907, line 30 is changed to read 'NOT_RTS: transmit the not-ready-to-send signal ...'.

[2] The text 'When c_tx_mode = TRAINING, NOT-RTS, RTS, or FILL ...' in subclause 186.2.6 on page 668, line 21 is changed to read 'When c_tx_mode = TRAINING, NOT_RTS, RTS, or FILL ...'.

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

Implement suggested remedy with editorial license.

Cl **178B** SC **178B.11.2.1** P**907** L**3** # **R2-92**

Ran, Adeo Cisco Systems, Inc.

Comment Type **T** Comment Status **R** c_tx_mode (CA)

c_tx_mode has 6 possible values: QUIET, TRAINING, RTS, NOT-RTS, FILL, and DATA, but 4 of them are equivalent

185.5.11 says "When c_tx_mode is TRAINING, RTS, or FILL, the PMD transmits PRBS31 encoded by the 800GBASE-LR1 Inner FEC".

186.2.6 says "When c_tx_mode = TRAINING, NOT-RTS, RTS, or FILL, the payload of the ER1 FEC frame is filled with the scrambled idle test pattern defined in 186.2.3.12".

Thus there is no functional difference between TRAINING, RTS, FILL, and NOT-RTS (the latter only used in 186.2.6). These values only represent (partially) the state of the state diagrams. While it might be considered useful for debugging, the state can be inferred from other variables (as is done in all other state diagrams).

The transmitter has three effective states: quiet, data, and a locally generated pattern. Since the same "fill" signal is used for both training and LOS scenarios, I suggest using the more generic name FILL for the unified value.

SuggestedRemedy

In the definition of c_tx_mode in 178B.11.2.1, delete the values TRAINING, RTS, and NOT-RTS.

In Figure 178B-14, change the assignments in TRAINING, LOCAL_RTS, and WAIT_DATAPATH to "c_tx_mode ← FILL".

In Figure 178B-15, change the assignments in TRAINING, TRAINING_COMPLETE, LOCAL_RTS, and WAIT_DATAPATH to "c_tx_mode ← FILL".

In 185.5.11, change "When c_tx_mode is TRAINING, RTS, or FILL" to "When c_tx_mode is FILL".

In 186.2.6, change "When c_tx_mode = TRAINING, NOT-RTS, RTS, or FILL" to "When c_tx_mode is FILL".

Response Response Status **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

CI 178B SC 178B.11.2.1 P907 L30 # R2-51

Hajduczenia, Marek

RG Nets

Comment Type E Comment Status D c_tx_mode (B) (CA)

The c_tx_mode enumerated value for the not-ready-to-send signal is spelled inconsistently. The variable definition in 178B.11.2.1 on page 907 spells it "NOT-RTS" with a hyphen, and 186.2.6 on page 668 line 21 likewise uses "NOT-RTS", but the new state diagram Figure 178B-15 on page 910 line 12 assigns "c_tx_mode <= NOT_RTS" with an underscore. All of this text is new in D3.2. The underscore form matches the convention used for other multi-word enumerated values, e.g. IN_PROGRESS in c_rts_status (page 907 line 23). (The definition sits on an unnumbered definition-list line - line 24 is the nearest numbered line above.)

SuggestedRemedy

Use a single spelling throughout. Change "NOT-RTS" to "NOT_RTS" in the c_tx_mode definition in 178B.11.2.1 on page 907 and in the sentence on page 668 line 21, matching Figure 178B-15.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
Resolved using the response to comment R2-132

[Editor's note: change line from 24 to 30]

CI 178B SC 178B.11.2.1 P907 L31 # R2-179

Huber, Thomas

Nokia

Comment Type ER Comment Status R c_tx_mode (CA)

The enumerated value NOT-RTS is a poor choice of name, especially since there is also a value RTS (so whenever the value is something other than RTS, it is "not RTS" from a logic perspective). The state when c_tx_mode is set to NOT-RTS is that training is complete and the upstream adjacent interface is not ready.

SuggestedRemedy

Change NOT-RTS to ADJ-NOT-RDY. Make corresponding change in 186.2.6

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 178B SC 178B.11.3 P909 L0 # R2-171

Slavick, Jeff

Broadcom Inc

Comment Type TR Comment Status D State diagrams (B) (CA)

There is no SWITCH_CLOCK state in Figure 178B-14

SuggestedRemedy

Within Figure 178B-14:
Insert a SWITCH_CLOCK state with content of C_USE_TX_CLOCK(recovered) and start c_forward_clock_timer. It's entry is from the QUIET state with a criteria of c_quiet_timer_done * c_adjacent_intf_rx_ready * c_uses_recovered_clock. Its exit is to TRAINING with a criteria of c_forward_clock_timer_done.
Add to the path from QUIET to TRAINING the criteria of "!c_uses_recovered_clock"
In the INITIALIZE state add "C_USE_TX_CLOCK(local)"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

The comment correctly points out that Figure 178B-14 does not include the SWITCH_CLOCK and thus the cross-reference in the definition of c_forward_clock_timer should be deleted.

On page 907 line 50, change "RTS state diagram (Figure 178B-14 or Figure 178B-15)" To "RTS without squelch state diagram (Figure 178B-15)"

Implement with editorial license.

CI 178B SC 178B.11.3 P910 L7 # R2-119

Ran, Adele

Cisco Systems, Inc.

Comment Type TR Comment Status R (withdrawn) (CA)

In Figure 178B-15, if c_local_rts becomes false after PATH_UP is reached (an "adjacent LOS" situation), it causes a transition to "A" (REVERT_TO_LOCAL_CLOCK). After this transition, c_tx_mode is still DATA, but c_local_rts=false means the client is not ready to send - so there is no data to be transmitted on the service interface (and also, the local clock is used).

Since this state diagram does not include squelch and there is no training signal, the transmitter signal should indicate "NOT-RTS".

SuggestedRemedy

Add an assignment of c_tx_mode to "NOT-RTS" in REVERT_TO_LOCAL_CLOCK.
Note that another comment suggest merging "NOT-RTS" with other values. If accepted, the merged value should be used.

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

Cl 178B	SC 178B.11.3	P910	L12	# R2-120
Ran, Adeo		Cisco Systems, Inc.		
Comment Type	E	Comment Status	D	c_tx_mode (B) (CA)
In state TRAINING_COMPLETE, the assigned value is "NOT_RTS", but the enumerated values of c_tx_mode include "NOT-RTS".				
Note that another comment suggests merging NOT-RTS with other values.				
SuggestedRemedy				
If "NOT-RTS" remains a possible value, change the assigned value to NOT-RTS.				
Proposed Response	Response Status		W	
PROPOSED ACCEPT IN PRINCIPLE.				
Resolved using the response to comment R2-132.				

Cl 178B	SC 178B.12	P911	L3	# R2-52
Hajduczenia, Marek		RG Nets		
Comment Type	E	Comment Status	D	(B) (CA)
The introductory sentence of 178B.12 cites only "Table 178B-3 and Table 178B-4" (the PAM4 interface tables), while the following sentence at lines 5 to 6 correctly cites all four management tables, Table 178B-3 through Table 178B-6. D3.2 split the D3.1 management tables into PAM4 and coherent versions, but the update was applied only to the MDIO-mapping sentence. As written, the control and status variables for coherent interfaces are not identified as variables related with this annex.				
SuggestedRemedy				
Change the sentence on page 911 line 3 to "The control and status variables related with this annex are listed in Table 178B-3, Table 178B-4, Table 178B-5, and Table 178B-6.", adjusting the table numbers to whatever final numbering results from resolving the duplicate table numbering in Annex 178B.				
Proposed Response	Response Status		W	
PROPOSED ACCEPT IN PRINCIPLE.				
Implement the suggested remedy with editorial license.				

Cl 178B	SC 178B.12	P911	L14	# R2-79
Bruckman, Leon		NVIDIA		
Comment Type	TR	Comment Status	D	(B) (CA)
D3.2 introduces duplicate table numbers in Annex 178B. Table 178B-3 now appears twice: once as "Control field structure for the O1 format" (178B.7.4, page 886) and again as "Control variables and MDIO mapping for PAM4 interfaces" (178B.12, page 911). Similarly, Table 178B-4 appears as "Status field structure for the E1 format" (178B.7.5, page 887) and "Status variables and MDIO mapping for PAM4 interfaces" (178B.12, page 912). Table 178B-5 appears as "Status field structure for the O1 format" (178B.7.5, page 888) and "Control variables and MDIO mapping for coherent interfaces" (178B.12, page 913). In D3.1, the MDIO mapping tables were numbered 178B-6 and 178B-7. D3.2 renumbered and split them into 178B-3 through 178B-6, creating collisions with the pre-existing field-structure tables. All cross-references to "Table 178B-3", "178B-4", and "178B-5" throughout the document (Clauses 179, 180, 181, 182, 183, Annexes 176C, 176D) are now ambiguous.				
SuggestedRemedy				
Renumber the MDIO mapping tables in 178B.12 to non-conflicting numbers (e.g., restore 178B-6 through 178B-9 as in D3.1, or renumber the field-structure tables to 178B-2 through 178B-5 and the MDIO tables to 178B-6 through 178B-9). Update all cross-references accordingly.				
Proposed Response	Response Status		W	
PROPOSED ACCEPT IN PRINCIPLE.				
Resolved using the response to comment R2-13.				

CI **178B** SC **178B.12** P**911** L**14** # **R2-13**

Hajduczenia, Marek

RG Nets

Comment Type **TR** Comment Status **D** (B) (CA)

Duplicate table numbers in Annex 178B make all citations to Table 178B-3, Table 178B-4 and Table 178B-5 ambiguous. D3.2 split the D3.1 management-variable tables (uniquely numbered Table 178B-6 and Table 178B-7) into four tables and renumbered them starting at 178B-3, colliding with the pre-existing field-structure tables in 178B.7: Table 178B-3 is both "Control field structure for the O1 format" (page 886) and "Control variables and MDIO mapping for PAM4 interfaces" (page 911) - Table 178B-4 is both "Status field structure for the E1 format" (page 887) and "Status variables and MDIO mapping for PAM4 interfaces" (page 912) - Table 178B-5 is both "Status field structure for the O1 format" (page 888) and "Control variables and MDIO mapping for coherent interfaces" (page 913). No table is numbered 178B-7. Affected citations include page 456 lines 14 and 17, page 495 line 43, page 525 line 5, page 557 line 40, page 589 line 14, page 640 line 26 (185.10), page 691 line 47 (186.7.2), page 817 lines 10 and 12, page 844 lines 30 and 35, page 911 lines 3 and 6, page 884 line 41, page 887 lines 11 to 12, page 899, PICS items IL10, IL11 and IL12 on page 917, and PICS items M2 and M3 on page 918. Duplicate table numbers within a single annex are invalid irrespective of the ambiguity they create. The ambiguous citations occur in 179.14 and throughout Annex 178B.12.

Suggested Remedy

Renumber the four management-variable tables in 178B.12 so they do not collide with the 178B.7 field-structure tables, i.e. Table 178B-6 (control variables and MDIO mapping for PAM4 interfaces), Table 178B-7 (status variables and MDIO mapping for PAM4 interfaces), Table 178B-8 (control variables and MDIO mapping for coherent interfaces), and Table 178B-9 (status variables and MDIO mapping for coherent interfaces). Update every citation of the management tables accordingly, including page 456 lines 14 and 17, page 495 line 43, page 525 line 5, page 557 line 40, page 589 line 14, page 640 line 26, page 691 line 47, page 817 lines 10 and 12, page 844 lines 30 and 35, page 911 lines 3 and 6, and PICS items M2 and M3 on page 918. Leave the citations to the field-structure tables on pages 884, 887 and 899 and PICS items IL10, IL11 and IL12 on page 917 unchanged.

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

[Editor's note: changed page from 456 to 911]

CI **178B** SC **178B.12** P**911** L**32** # **R2-161**

Slavick, Jeff

Broadcom Inc

Comment Type **TR** Comment Status **D** MDIO (B) (CA)

Per ic_sel definition this is the variable derived from the incoming training frames, while ic_req is assigned per the coefficient update state diagram.

Suggested Remedy

Change ic_req to ic_sel in Table 178B-3

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

Resolved using the response to comment R2-136

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

CI 178B SC 178B.12 P911 L32 # R2-136

Law, David Hewlett Packard Enterprise

Comment Type T Comment Status D MDIO (B) (CA)

Subclause 45.2.1.161 (register 1.1120) says, 'The BASE-R PAM4 PMD training LP control, lane 0 through lane 7 registers reflect the contents of the first 16-bit word of the training frame most recently received for each lane.'. Table 178B-3 'Control variables and MDIO mapping for PAM4 interfaces', however, maps ic_req, which is an output of Figure 178B-12 'Coefficient update state diagram', to the Initial condition request bits in register 1.1120 instead.

This doesn't meet the register description of 'reflecting the contents of the first 16-bit word' of the received training frame and would also prevent the use of register 1.1120 to drive the coefficient update state diagram when training is disabled. This is because ic_sel, not ic_req, is an input variable to the coefficient update state diagram.

On review of IEEE Std 802.3-2022 subclause 136.8.11.7.1 'Variables', I see that it is ic_req that is '... derived from the "initial condition request" bits from the control field of the received training frames ...' and there is no ic_sel variable. It therefore seems that the definition of ic_req was changed in IEEE P802.3dj, and that ic_sel was added to replace its function of reflecting the received "initial condition request" bits.

As a result, based on the register description, being able to use the register to drive the coefficient update state diagram when training is disabled, and since it appears that ic_req was replaced with ic_sel in the variables and coefficient update state diagram compared to Clause 136, I believe ic_req should also be replaced with ic_sel in Table 178B-3 'Control variables and MDIO mapping for PAM4 interfaces'.

SuggestedRemedy

Change 'ic_req' to read 'ic_sel' in the 1.1120.13:11 bits row of Table 178B-3 'Control variables and MDIO mapping for PAM4 interfaces'.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the change proposed in the suggested remedy is an improvement to the draft.

Implement the suggested remedy with editorial license.

CI 178B SC 178B.12 P911 L40 # R2-160

Slavick, Jeff Broadcom Inc

Comment Type T Comment Status D MDIO (B) (CA)

The following variables have MDIO register bits they can be mapped to but are not in the mapping table:
remote_mc_mode
k

SuggestedRemedy

Add the following mappings to Table 178B-3:
remote_mc_mode | 178B.8.3.1 | 1.1120.9:8 | 45.2.1.161

Add the following mapping to Table 178B-4:
k | 178B.7.5.7 | 1.1420.5:3 | 45.2.1.167

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, proposed changes in the suggested remedy are an improvement to the draft. Implement the suggested remedy with editorial license.

CI 178B SC 178B.12 P911 L41 # R2-186

Osorio, Luz

Nokia

Comment Type TR Comment Status D (B) (CA)

There is no consistency in the mapping of the following variables between control (R/W) and status (RO). There is benefit in having management access to these variables for debug reasons or specific applications.

ic_req (set to R/W)

coef_req (set to R/W)

coef_sel (set to R/W)

local_mc_mode (set to RO)

local_tp_mode (set to RO)

Suggested Remedy

Set these variables to R/W by pointing to the control register (45.2.1.161)

local_mc_mode

local_tp_mode

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the changes proposed in the suggested remedy are an improvement to the draft.

Move local_mc_mode and local_tp_mode with their variable and MDIO references to Table 178B-4—Status variables and MDIO mapping for PAM4 interfaces.

CI 178B SC 178B.12 P912 L18 # R2-183

Osorio, Luz

Nokia

Comment Type ER Comment Status D (B) (CA)

Table 178B-4, the variable reference for the management variable "training" is incorrect. It should 178B.8.3.1 (7th row)

Suggested Remedy

In table 178B-4, change the variable reference from 178B.8.2.1 to 178B.8.3.1

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the the change proposed in the suggested remedy is an improvement to the draft. Implement the suggested remedy.

CI 178B SC 178B.12 P912 L21 # R2-133

Law, David

Hewlett Packard Enterprise

Comment Type E Comment Status D (B) (CA)

The 'd' in the text '1.1420.8d' in the 'MDIO register/bit number' entry for ic_sts should be superscripted as it is a footnote.

Suggested Remedy

See comment.

Proposed Response Response Status W

PROPOSED REJECT.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

CI 178B SC 178B.12 P912 L26 # R2-53

Hajduczenia, Marek

RG Nets

Comment Type T Comment Status D (B) (CA)

In Table 178B-4 the new rx_ok row cites MDIO register/bit number "1.1478.7:0c". Footnote c states "Bit reference is provided for lane 0, bits for lanes 1 to 7 are located in the same register." That footnote presupposes a lane-0-only citation, but 1.1478.7:0 already spans all eight lanes: Table 45-133e (45.2.1.169e, page 104) defines 1.1478.7 as Receiver OK lane 7 through 1.1478.0 as Receiver OK lane 0. The footnote therefore has no referent. Every other footnote-c entry in the same table follows the lane-0 convention: polarity_correction is "1.1476.0c" and lane_training_status is "1.1477.1:0c" (Table 45-133d assigns 1.1477.1:0 to lane 0, up to 1.1477.15:14 for lane 7).

Suggested Remedy

In Table 178B-4 on page 912 line 26, change the rx_ok MDIO register/bit number from "1.1478.7:0c" to "1.1478.0c" so the citation is the lane 0 bit and footnote c applies consistently. Alternatively, if the intent is to cite the whole eight-lane field, delete the footnote c marker from this row.

Also, remove the golden color background for associated MDIO register/bit reference

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the the change proposed in the suggested remedy is an improvement to the draft.

In Table 178B-4 on page 912 line 26, change the rx_ok MDIO register/bit number from "1.1478.7:0c" to "1.1478.0c"

Implement the suggested remedy.

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

CI **178B** SC **178B.12** P**912** L**32** # **R2-134**

Law, David

Hewlett Packard Enterprise

Comment Type **T** Comment Status **D** MDIO RTS (B) (CA)

Table 178B-4 'Status variables and MDIO mapping for PAM4 interfaces' maps the remote_rts variable to bit 1.1120.10, the 'Not ready to send' bit in the subclause 45.2.1.161 'BASE-R PAM4 PMD training LP control, lane 0 through lane 7' registers. Subclause 45.2.1.161 says, 'The BASE-R PAM4 PMD training LP control, lane 0 through lane 7 registers reflect the contents of the first 16-bit word of the training frame most recently received for each lane.'

Subclause 178B.8.2.1 'Variables', however, defines the remote_rts variable as a 'Boolean variable that indicates the value of local_rts variable in the peer interface. If mr_training_enable is true then remote_rts is set to true when the received training frames on all lanes of the interface have the not ready to send bit (see 178B.7.4.2) set to zero, otherwise it is set to false. If mr_training_enable is false then remote_rts is always true.'. In addition, as noted in subclause 178B.7.1 'Per-interface ILT function', the remote_rts variable is generated by the per-interface ILT function.

As a result, the remote_rts variable is an interface variable rather than a lane variable and does not 'reflect the contents of the first 16-bit word of the training frame most recently received' on the respective lane. It therefore seems that the mapping of the remote_rts variable to bit 1.1120.10 in Table 178B-4 should be removed. The 1.1120.10 'Not ready to send' bit would therefore be derived from the 'Not ready to send' bit in the control field (the first 16-bit word) of the training frame based on the register definition in subclause 45.2.1.161. If there is a desire to reflect the remote_rts variable in a register, a 'Remote Ready to Send' bit could be added to subclause 45.2.1.169c 'PMA/PMD interface training status (Register 1.1476)'.

SuggestedRemedy

[1] Remove the mapping of the remote_rts variable to bit 1.1120.10 in Table 178B-4.

[2] If desired, add a 'Remote Ready to Send' bit to register 1.1476 that is mapped to the remote_rts variable as follows by changing the bit 1.1476.9 row to read:

Bit(s): 9

Name: Remote Ready to Send

Description: 1 = mr_training_enable is true and the not ready to send bit (see 178B.7.4.2) is set to zero for all lanes.

0 = mr_training_enable is false or the not ready to send bit is set to one for any lane.

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the the change proposed in the suggested remedy is an improvement to the draft.

In Table 178B-4 -- Status variables and MDIO mapping for PAM4 interfaces:

Change the assignment of remote_rts to MDIO register bit 1.1476.15 and the clause reference to 45.2.1.169c

In 45.2.1.169c:

Change the bit 1.1476.15 row to read:

Bit(s): 15

Name: Remote ready to send

Description:

1 = true

0 = false

Read/Write: "RO"

Implement with editorial license.

[Editor's note: Affects multiple clauses including 178, 45]

CI **178B** SC **178B.12** P**912** L**38** # **R2-180**

Huber, Thomas

Nokia

Comment Type **T** Comment Status **R** (withdrawn) (CA)

It would be useful to include tx_disable and tx_mode as status variables in the MDIO interface.

SuggestedRemedy

Add c_tx_mode to table 178B.4, referring back to 178B.8.3.1. Assign register bits in clause 45 for these variables as well.

Response Response Status **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

CI **178B** SC **178B.12** P**913** L**28** # **R2-181**

Huber, Thomas

Nokia

Comment Type **T** Comment Status **R** (withdrawn) (CA)

It would be useful to include c_tx_mode as a status variable in the MDIO interface.

SuggestedRemedy

Add c_tx_mode to table 178B.6, referring back to 178B.11.2.1. Assign a register bit in clause 45 for this variable as well.

Response Response Status **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl 178B SC 178B.13.5 P917 L41 # R2-83

Bruckman, Leon

NVIDIA

Comment Type E Comment Status D (B) (CA)

PICS items SM3 ("RTS with squelch state") and SM4 ("RTS without squelch state") in 178B.13.5 reference "178B.11" (a section heading). The corresponding items SM1 and SM2 reference specific subclauses "178B.11.1" and "178B.11.2". SM3 and SM4 should reference "178B.11.3" (the subclause containing the normative "shall" language for these states), consistent with the pattern established by SM1/SM2.

SuggestedRemedy

Change the Reference column for SM3 and SM4 in 178B.13.5 from "178B.11" to "178B.11.3."

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 179 SC 179.4 P422 L18 # R2-11

Hajduczenia, Marek

RG Nets

Comment Type E Comment Status D (B) (E)

The resolution of D3.1 comment R1-302 expanded "the PMD client (PMA)" to "the PMD client (PMA immediately above the PMD)" but left the original closing parenthesis in place, producing a doubled parenthesis: "...exchange of encoded data between the PMD and the PMD client (PMA immediately above the PMD)". The PMD translates...". The three parallel sentences carrying the same D3.2 insertion (page 390 line 24, page 466 line 5, page 504 line 48) each have a single closing parenthesis.

SuggestedRemedy

On page 422 line 18, delete the extra closing parenthesis so the sentence reads "...the exchange of encoded data between the PMD and the PMD client (PMA immediately above the PMD). The PMD translates the encoded data to and from signals suitable for the specified medium."

Proposed Response Response Status W

PROPOSED REJECT.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

Cl 179 SC 179.9.5.2 P440 L9 # R2-12

Hajduczenia, Marek

RG Nets

Comment Type E Comment Status D (B) (E)

The 174A.9.6/174A.9.7 renumbering in D3.2 was applied to this citation by mechanical substitution, leaving the list out of numeric order: page 440 line 9 reads "either 174A.9.5, 174A.9.7, or 174A.9.6 with parameters provided in Table 179-13". D3.1 read "either 174A.9.5, 174A.9.6, or 174A.9.7". The identical artifact appears at page 838 line 23 (176D.8.11). All other citations of this method list in D3.2 are in ascending order, and the parallel clauses 180.9.14, 180.9.15, 181.9.14, 181.9.15, 182.9.14, 182.9.15, 183.9.14 and 183.9.15 were instead rewritten to "either 174A.9.5 or 174A.9.6" with an added prohibition sentence, so these two subclauses are also technically inconsistent with the rest of the draft in retaining 174A.9.7 as a permitted primary method.

SuggestedRemedy

On page 440 line 9 and page 838 line 23, change "either 174A.9.5, 174A.9.7, or 174A.9.6" to "either 174A.9.5, 174A.9.6, or 174A.9.7". If the intent was to align these subclauses with the treatment applied in Clauses 180 through 183, instead change to "either 174A.9.5 or 174A.9.6" and add the corresponding sentence used there.

Proposed Response Response Status W

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

A similar issue exists on page 838 line 23.

In both locations, the appropriate update would be to change "either 174A.9.5, 174A.9.7, or 174A.9.6" to "either 174A.9.5, 174A.9.6, or 174A.9.7".

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

Cl 179 SC 179.9.5.2 P440 L33 # R2-207

Djahanshahi, Hormoz

Microchip Technology Inc.

Comment Type E Comment Status D (B) (E)

In Table 179-13, the last entry is "BER", but in all other clauses and annexes this is "BERmax"

SuggestedRemedy

Change BER to BERmax in Table 179-13

Proposed Response Response Status W

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

Cl 179 SC 179.9.5.3.3 P442 L23 # R2-131

Ghiasi, Ali

Ghiasi Quantum LLC,Marvell Semiconductor, Inc.

Comment Type TR Comment Status R (E)

the draft list set of parameters for COM test channel calibration "the limits in Table 179-15. The COM is calculated using the method and parameters of 179.11.4 with the following considerations:". It is not clear if parameters below are exceptions or just list of paramters to consider.

Specifically item "e" defines SNDR with Np=85, if its just consideration then Dp would be assumed to be 0 but if its an exception then Dp=4

SuggestedRemedy

Suggest replace consideration with parameters and make for item e specify Dp=0 if these aren't exception.

If the parameters were intended to be exception then replace consideration with exceptions.

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

Cl 179B SC 179B.3.1 P926 L30 # R2-54

Hajduczenia, Marek

RG Nets

Comment Type T Comment Status R (E)

Text added in D3.2 in response to D3.1 comment R1-150 states on page 926 lines 29 to 30 that the MDI connector configuration used to define the reference insertion loss is the "Single Row Surface Mount Technology Connector and Cage" defined in the OSFP1600 specification (see 179C.2.3). The cross-reference does not resolve: 179C.2.3 (OSFP1600, page 945 lines 31 to 41) does not define, name or mention a "Single Row Surface Mount Technology Connector and Cage" - it requires compliance with the OSFP MSA "Octal Small Form Factor Pluggable Module, Rev 5.22" specification and points to Figure 179C-5, Figure 179C-6 and Table 179C-4. The term appears nowhere else in D3.2. A normative requirement therefore rests on an unresolvable citation. Additionally, page 926 line 32 contains a duplicated article: "Usage of the the Single Row Surface Mount Technology Connector and Cage for cable assembly test fixtures is recommended."

SuggestedRemedy

On page 926 lines 29 to 30, cite the source that defines the configuration rather than 179C.2.3, e.g. "...is the Single Row Surface Mount Technology Connector and Cage defined in the OSFP Octal Small Form Factor Pluggable Module, Rev 5.22 specification (the OSFP1600 mechanical specification referenced in 179C.2.3)." Alternatively add the configuration name explicitly to 179C.2.3 so the existing cross-reference resolves. Also delete the duplicated "the" on page 926 line 32.

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

Cl 179B SC 179B.3.1 P926 L30 # R2-100

Ran, Adeo

Cisco Systems, Inc.

Comment Type T Comment Status D Test Fixtures (E)

"Differences between the insertion loss of an actual test fixture and the reference insertion loss, including those arising from other MDI connectors, shall be accounted for in the measurements"

179B.2.1 includes similar text for test fixtures used for host testing (HCB).

The need to account for difference between reference and actual test fixtures is real. The addition of variability between MDI connectors exacerbates the problem. But there is still no guidance for the reader how to accomplish this "accounting", which is not trivial. As a result, this accounting is not done in many cases; host, module, and cable assembly measurements are subject to test fixture variability.

The contribution <https://www.ieee802.org/3/dj/public/26_07/heck_3dj_01_2607.pdf> described a possible way to account for the difference, which includes converting the reference insertion loss (real scalar function of frequency) to a reference s21 (complex scalar function of frequency). The corresponding comment was withdrawn, but the ideas in the presentation are correct: the "accounting" requires actual and reference s-parameters, not just loss.

In practice, the actual S-parameters for HCBs are provided by vendors or can be measured. However, reference S-parameters are not provided. There can be various values (complex matrix functions of frequency that would match the reference test fixture loss, and leaving the choice to the reader's interpretation leaves the problem unsolved. It would be good to provide a set of S-parameters, separate for the HCB and for the MCB, that can be used by everyone.

SuggestedRemedy

A contribution is planned with two sets of S-parameters that approximate the reference loss of the HCB and MCB, and an analytic model that generates them.

These S-parameters can be provided as examples in the 802.3 downloads folder.

Proposed Response Response Status W

PROPOSED REJECT.

The following contribution was reviewed by the 802.3dj task force at the August 27 Joint ad hoc meeting
https://www.ieee802.org/3/dj/public/adhoc/optics/0826_OPTX/ran_3dj_adhoc_01_260827.pdf

Pending CRG discussion.

Cl 179B SC 179B.3.1 P926 L31 # R2-55

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status D (B) (E)

In D3.1 the insertion-loss accounting sentences in 179B.2.1 and 179B.3.1 were identical and non-normative ("are to be accounted for in the measurements"). D3.2 rewrote only 179B.3.1 to "...shall be accounted for in the measurements" (page 926 lines 31 to 32) while leaving the parallel sentence in 179B.2.1 unchanged (page 926 lines 2 to 3). Two parallel provisions covering the same obligation for the two test fixtures now carry different normative strength, leaving it ambiguous whether the TP2/TP3 fixture accounting is required. Compare the parallel text in 179B.2.1.

SuggestedRemedy

Align the two provisions. Either change 179B.2.1 (page 926 line 2) to read "Differences between the insertion loss of an actual test fixture and the reference insertion loss shall be accounted for in the measurements.", or revert 179B.3.1 (page 926 line 31) to the non-normative "are to be accounted for in the measurements".

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

The comment points out an inconsistency between the subclauses that define the individual test fixtures with regards to the differences from the reference IL.

The suggested remedy includes two options, aligning the text in 179B.2.1 to the text in 179B.3.1 (recently modified to "shall be") or reverting the change in 179B.3.1 (back to "are to be").

The change was made as a result of comment R1-150 (see <https://www.ieee802.org/3/dj/comments/D3p1/8023dj_D3p1_comments_final_id.pdf#page=38>). However, the new text is inconsistent with previous test fixture Annexes (110B, 162B) and similar statements in PMD clauses (85, 92, 93, 94). Also, "accounting for the differences" is not a compliance requirement of the test fixture itself - it is guidance for the user of the test fixture. The wording "are to be accounted for" is more suitable for this purpose.

In 179B.3.1, change "shall be accounted for" to "are to be accounted for".

Cl 179B SC 179B.3.1 P926 L35 # R2-104
 Ran, Adeo Cisco Systems, Inc.
Comment Type E Comment Status D (B) (E)
 "Usage of the the Single Row Surface" - extra "the"
SuggestedRemedy
 Change to "Usage of the Single Row Surface"
Proposed Response Response Status W
 PROPOSED REJECT.
 Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.
 This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

Cl 179B SC 179B.4.2 P926 L32 # R2-84
 Bruckman, Leon NVIDIA
Comment Type E Comment Status D (B) (E)
 Duplicate word in 179B.4.2: "Usage of the the Single Row Surface Mount Technology (SMT) connector." The word "the" appears twice consecutively.
SuggestedRemedy
 Delete the duplicate "the": change "Usage of the the Single Row Surface Mount Technology (SMT) connector" to "Usage of the Single Row Surface Mount Technology (SMT) connector."
Proposed Response Response Status W
 PROPOSED REJECT.
 Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.
 This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

Cl 179B SC 179B.5.4 P937 L26 # R2-85
 Bruckman, Leon NVIDIA
Comment Type T Comment Status D (B) (E)
 PICS item TF3 "Mated test fixtures ERL" references "179B.4.2" which, after D3.2 restructuring, is now just a section heading. The ERL >= 10.3 dB normative requirement is now in 179B.4.2.1. This means TF3 does not point to any normative "shall" statement.
SuggestedRemedy
 Change the Reference column for TF3 from "179B.4.2" to "179B.4.2.1."
Proposed Response Response Status W
 PROPOSED REJECT.
 Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.
 This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

Cl 179B SC 179B.5.4 P937 L26 # R2-56
 Hajduczenia, Marek RG Nets
Comment Type T Comment Status D (B) (E)
 PICS item TF3 "Mated test fixtures ERL / Greater than or equal to 10.3 dB" cites subclause 179B.4.2. In D3.2, 179B.4.2 was converted into a container heading ("Mated test fixtures return loss") and the ERL requirement ("The mated test fixtures ERL shall be greater than or equal to 10.3 dB, with Tfx equal to 0.15 ns") was moved into the new 179B.4.2.1 (page 930 lines 8 to 13). The TF3 citation therefore no longer points to the requirement. Sibling rows TF5 and TF6 were updated for the same restructuring (179B.4.4 and 179B.4.3 in D3.1 to 179B.4.2.3 in D3.2), so TF3 is an incomplete follow-through.
SuggestedRemedy
 In the Subclause cell of PICS item TF3 on page 937 line 26, change "179B.4.2" to "179B.4.2.1".
Proposed Response Response Status W
 PROPOSED REJECT.
 Although the suggested remedy is an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.
 This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

Cl **179B** SC **179B.5.4** P**937** L**29** # **R2-82**

Bruckman, Leon

NVIDIA

Comment Type **E** Comment Status **R** (E)

PICS item TF4 "Mated test fixtures" (reference 179B.4.3) has an empty Value/Comment column in D3.2. In D3.1, TF4 included the value/comment "Per Equation (179B-8)". Equation (179B-8) still exists in 179B.4.3 in D3.2. The loss of this value reference leaves TF4 without a compliance criterion.

Suggested Remedy

Restore the Value/Comment for TF4 to "Per Equation (179B-8)" as it appeared in D3.1.

Response Response Status **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179B** SC **179B.5.4** P**937** L**29** # **R2-57**

Hajduczenia, Marek

RG Nets

Comment Type **T** Comment Status **R** (E)

In the PICS table of 179B.5.4, the Value/Comment cell for item TF4 (Mated test fixtures common-mode to differential-mode insertion loss, 179B.4.3) is empty in D3.2. In D3.1 this cell read "Per Equation (179B-8)". Subclause 179B.4.3 is unchanged and imposes two mandatory requirements: the channel signal to common-mode ratio SCMRCH greater than 12 dB using the procedure of 179.11.5, and the common-mode to differential-mode insertion loss meeting Equation (179B-8). Item TF4 therefore carries status M with no stated requirement, and no PICS item covers the SCMRCH condition. All neighbouring items (TF1, TF2, TF3, TF5, TF6, TF7) do state a Value/Comment.

Suggested Remedy

Populate the Value/Comment cell for TF4 to cover both requirements of 179B.4.3, e.g. "SCMRCH greater than 12 dB and per Equation (179B-8)" - alternatively restore "Per Equation (179B-8)" in TF4 and add a separate PICS item for the SCMRCH requirement.

Response Response Status **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179B** SC **179B.5.4** P**937** L**32** # **R2-58**

Hajduczenia, Marek

RG Nets

Comment Type **E** Comment Status **D** (B) (E)

In the PICS proforma table of 179B.5.4, the Value/Comment cells for items TF5 (line 32) and TF6 (line 35) read "Per Table (179B-2)". Parentheses around the number are the IEEE 802.3 convention for equations only (cf. TF1, "Per Equation (179B-3)") - tables are cited without parentheses. Item TF7 in the same table correctly cites "Table 179B-4", and all other "Per Table ..." PICS entries in the draft omit the parentheses. These two cells were rewritten in D3.2 (in D3.1 they read "Per Equation (179B-6)" and "Per Equation (179B-7)").

Suggested Remedy

In the TF5 row (line 32) and TF6 row (line 35) on page 937, change "Per Table (179B-2)" to "Per Table 179B-2".

Proposed Response Response Status **W**

PROPOSED REJECT.

Although the comment proposes an improvement to the draft it is an editorial issue that may be addressed by referral to the IEEE SA Editorial staff.

The reference is to Equation (179B-2) but the cross-reference format is incorrect. With the proper format the reference should be as "Equation (179B-2)".

This change is referred to IEEE SA Editorial staff for consideration during preparation for publication.

CI **180** SC **180.5.1** P**468** L**27** # **R2-197**
Dawe, Piers J G NVIDIA
Comment Type **TR** Comment Status **D** signal detect (OI)

As previously pointed out, Figure 180-2 (block diagram) indicates that signal detect is disconnected from SIGNAL_OK, contrary to all optical PMDs. 180.5.5 says "This standard imposes no response time requirements on the generation of the PMD_signal_detect_i variable." It turns out that they are connected and timing is important: see 178B.8.3.1 as revised: rx_ok "it shall be set to false when an input signal corresponding to tx_disable = true in the peer is received for 100 ms (the minimum duration of the quiet_timer) or longer". As the criterion for tx_disable = true is Average launch power of OFF transmitter <= -15 dBm, which is the criterion in Table 180-5, Signal detection criteria for each lane: "Average optical power at TP3 <= -15 dBm", signal detect IS required, AND its timing is required (which is new and would surprise optical engineers if they read it). I am aware that other things have to be right for SIGNAL_OK at the service interface to be OK. Also I am aware that both 180 and 178A say that various implementations of the signal detect function are permitted by this standard / the specific conditions for setting this variable to true or false are implementation dependent. Also that the timings for reporting to management might trail behind a state machine. Nevertheless, Clause 180 is seriously misleading. Part of the problem may be a belief that IMDD signal detect must be based on average optical power, or that now that 178B post-processes traditional optical power detection with other criteria, we may be using one name for two things. It is useful to distinguish between "is there a signal?" and "is everything ready?" so we should try to be clear.

SuggestedRemedy

Revise Figure 180-2 and 180.5.5 to be consistent with 178B.8.3.1, with appropriate cross-references.
Similarly in other optical clauses.

Proposed Response Response Status **W**

PROPOSED REJECT.

This comment is a restatement of comment I-433, against Draft 3.0 and comments R1-289, R1-290, R1-292, and R1-293 against draft 3.1 as recorded in the following reports:
https://www.ieee802.org/3/dj/comments/D3p0/8023dj_D3p0_comments_final_id.pdf
https://www.ieee802.org/3/dj/comments/D3p1/8023dj_D3p1_comments_final_id.pdf

This new comment provides a different set of arguments that are addressed as follows.

Subclause 180.5.5 defines the criteria for signal detection of each lane and mapping that detection to management variable PMD_signal_detect_i (effectively, 1 means power high enough, 0 means power not high enough).

180.5.4 specifies how the per-lane signal detect variables are aggregated into a single global management variable Global_PMD_signal_detect.

Subclause 180.5.5 further notes "This standard imposes no response time requirements on the generation of the PMD_signal_detect_i variable." This limitation is specifically on

updating the variable defined in this subclause.

These subclauses do not require or suggest that either management variable is used for the purpose of APSU (ILT and/or RTS).

For the purposes of APSU, the variable rx_ok indicates when a signal is good enough or not. It explicitly states the mechanism for detection is implementation specific: "The specific conditions for setting this variable to true or false are implementation dependent." There is no limitation on how the rx_ok variable is updated. There is a requirement that (paraphrasing) after the transmitter signal is disabled for 100 ms rx_ok shall be set to false. An implementation would have to ensure that it responds appropriately fast whatever mechanism it uses, perhaps the same as that used for signal_detect. This should be sufficiently obvious to one skilled in the definition and implementation of such systems.

The comment does not provide sufficient evidence to support making any related changes. Further, the suggested remedy does not provide sufficient detail to implement.

Pending review of the following related contribution:
<URL>/dawe_3dj_03_2609.pdf

CI **180** SC **180.5.2** P**469** L**8** # **R2-109**

Ran, Adeo

Cisco Systems, Inc.

Comment Type **E** Comment Status **D** editorial-primitive (B) (OI)

"When operating in DATA mode, the PMD transmit function shall convert the n symbol streams requested by the PMD service interface PMD:IS_UNITDATA_0.request primitive to PMD:IS_UNITDATA_n-1.request primitive into n separate optical signals"

The first "primitive" is grammatically out of place, creating a sentence that is difficult to parse

There are 24 instances of "PMD service interface messages PMD:IS_UNITDATA" in 802.3-2022, and I found only 2 instances of IS_UNITDATA with "primitive" - so this change deviates from precedence and shouldn't have been made. There are still instances of "message" in this amendment too.

But if it is made, there is a clean way to do that, based on precedent clauses (e.g. 92.7.2, 138.5.2, 150.5.2, and 167.5.2) and even the phrasing used in 180.3, which use "i" as an index.

There are similar-form sentences in 180.5.3, and in corresponding subclauses in 181, 182, and 183.

SuggestedRemedy

In 180.5.2, change the quoted sentence to
"When operating in DATA mode, the PMD transmit function shall convert the n symbol streams requested by the PMD service interface primitives PMD:IS_UNITDATA_i.request (i=0 to n-1) into n separate optical signals".

In 180.5.3, change from "for delivery to the PMD service interface using the PMD:IS_UNITDATA_0.indication primitive to PMD:IS_UNITDATA_n-1.indication primitive" to

"for delivery to the PMD service interface primitives PMD:IS_UNITDATA_i.indication (i=0 to n-1)".

Consider changing "primitives" to "messages" to be consistent with precedent clauses and with other places in this amendment.

Make the corresponding changes in 180.5.3, 181.5.2, 181.5.3, 182.5.2, 182.5.3, 183.5.2, and 183.5.3.

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

Implement the following with editorial license:

P469, L7~9:

When operating in DATA mode, the PMD transmit function shall convert the n symbol streams requested by the PMD service interface primitives PMD:IS_UNITDATA_i.request (i=0 to n-1) into n separate optical signals.

P469, L29:

for delivery to the PMD service interface primitives PMD:IS_UNITDATA_i.indication (i=0 to n-1)

Also the same changes in CL 181~183.

3E P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comme

Cl 180	SC 180.5.12	P471	L18	# R2-103
Ran, Adee		Cisco Systems, Inc.		
Comment Type	E	Comment Status	D	editorial-RTS (B) (CA)
"A PMD shall provide the ready-to-send (RTS) function and the ILT function with a training frame of O1 format, specified in Annex 178B" In D3.2, Annex 178B includes two RTS functions - one for PAM4 and one for coherent, and one ILT function that was renamed to be specific to PAM4. Therefore specific references are required. Also applies to 179.8.9, 181.5.12, 182.5.12, and 183.5.12, and with different wording, to the NOTE in 176C.3 and 176D.3. SuggestedRemedy Change to "A PMD shall provide the RTS function for PAM4 interfaces specified in 178B.6 and the ILT function for PAM4 interfaces specified in 178B.7 with the O1 training frame format". Apply the same change in 181.5.12, 182.5.12, and 183.5.12. Apply a similar change in 179.8.9 except use E1 instead of O1. In the NOTE text in 176C.3 and 176D.3, change from "include the inter-sublayer link training (ILT) function with E1 format and the ready-to-send (RTS) function, as specified in Annex 178B" to "include the RTS function for PAM4 interfaces specified in 178B.6 and the ILT function for PAM4 interfaces specified in 178B.7 with the E1 training frame format". Proposed Response Response Status W PROPOSED ACCEPT IN PRINCIPLE. In 180.5.12, change the reference of "RTS function" to "the ready-to-send (RTS) function of PAM4 interfaces specified in 178B.6 and the ILT function for PAM4 interfaces specified in 178B.7 with the O1 training frame format". Apply same changes to references of RTS functions in CL181~183. Apply a similar change in 179.8.9 except use E1 instead of O1. In the NOTE text in 176C.3 and 176D.3, change from "include the inter-sublayer link training (ILT) function with E1 format and the ready-to-send (RTS) function, as specified in Annex 178B" to "include the RTS function for PAM4 interfaces specified in 178B.6 and the ILT function for PAM4 interfaces specified in 178B.7 with the E1 training frame format". Implement with editorial license. [Editor's note: Affects multiple clauses including 179 through 183]				

Cl 180	SC 180.7.1	P473	L8	# R2-199
Dawe, Piers J G		NVIDIA		
Comment Type	TR	Comment Status	D	PMD spec (OI)
D3.0 comment 442 and D3.1 comment R1-298: as line rates are increased, maintaining a particular extinction ratio becomes increasingly challenging (this will be even worse at 400G). However, MPI can get worse at low extinction ratio, when it happens (rarely - fading) although for PAM4 this is a fairly weak function. On the other hand ECQ improves with low extinction ratio (linearity), differently for different technologies but it always happens (not fading). Also, RF power and supply voltage can be reduced at lower extinction ratio, and/or modulators can be made smaller or faster. We have addressed this before, in 100GBASE-DR where we reduced the minimum from 5 dB to 3.5 dB for a 0.3 increase in OMA-TDECQ (see https://ieee802.org/3/cd/public/July17/dawe_3cd_01_0717.pdf), then in 100GBASE-FR1, 100GBASE-LR1 and later PMDs when we specified 3.5 dB across the board. It is time to take the next step in this long-running secular trend. Notice D3.0 comment 72, proposing reducing the OMA for DR by 0.6 dB, had some support. So it is reasonable to take the simple approach of increasing the budget by 0.2 dB by improving the sensitivity by only 0.2 dB, not changing the max OMA and average power limits. By the way, if an additional 0.2 dB seems large when Table 190-9 says "includes an allocation of 0.1 dB for MPI penalty" some transmitter-related MPI penalty is measured in TDECQ, and some is needed to preserve the insertion loss vs. discrete reflectances trade-off in e.g. Table 180-12 and 182-12. The 0.1 dB in the draft for no additional reflectances is barely changed, but I am not proposing changing Table 180-12 or 182-12. In 2017 we estimated 0.3 dB extra for going from 5 dB to 3.5 dB extinction ratio, consistent with this proposal. https://ieee802.org/3/dj/public/26_07/dawe_3dj_01_2607.pdf provides background. SuggestedRemedy In Table 180-7 (transmitter), change Extinction ratio, each lane (min) from 3.5 dB to 3 dB; In Table 180-8 (receiver), change Receiver sensitivity (OMAuter), each lane (max) from -3.4 to -3.6, and from -4.3 + TECQ to -4.5 + TECQ and change Stressed receiver sensitivity (OMAuter), each lane (max) from -0.9 dBm to -1.1 dBm; Revise Figure 180-4, Receiver sensitivity (OMAuter), each lane (max), and Figure 180-5 (Tx and Rx vs. ECQ), to reflect this change; In Table 180-9 (budget), change, change Power budget (for max TDECQ) from 6.7 dB to 6.9 dB, change Allocation for penalties (for max TDECQ) from 3.7 dB to 3.9 dB; In table footnote b, change "The channel insertion loss of 3 dB shown in this illustrative link power budget is valid for a maximum MPI penalty of 0.1 dB, which depends on the number and value of discrete reflectances present in the link." to "The channel insertion loss of 3 dB shown in this illustrative link power budget is valid for a maximum MPI penalty of 0.3 dB. MPI penalty depends on the number and value of discrete reflectances present in the link."; In table footnote c, change "an allocation of 0.1 dB for MPI penalty" to "an allocation of 0.1 dB to 0.3 dB for MPI penalty" and change "6.7 - channel insertion loss" to "6.9 - channel insertion loss". Apply this to clauses 180 for DR and 182 for DR-2.				

Proposed Response Response Status **W**

PROPOSED REJECT.

This comment is a resubmission of Draft 3.1 Comment R1-298 in the following comment report:

https://www.ieee802.org/3/dj/comments/D3p1/8023dj_D3p1_comments_final_clause.pdf

The response to comment R1-298 includes the following straw poll, indicating strong consensus of leaving the spec as is written in D3.1.

Straw Poll TF-10 (decision) of Draft 3.1 comment resolution at the 2026 July Plenary meeting is :

I support adopting the first option proposed in the suggested remedy of comment R1-298.

Yes: 12

No: 44

No new substantive evidence or rationale is provided in the comment.

It is not clear the proposed changes will indeed improve the quality of the draft.

Pending review of the following related contribution:

<URL>/dawe_3dj_01_2609

CI **180** SC **180.7.1** P**473** L**9** # **R2-200**

Dawe, Piers J G

NVIDIA

Comment Type **TR** Comment Status **D** Tx transition time (OI)

D3.0 comments 443, 319-321 and D3.1 comment R1-299: The transmitter transition time limit was scaled from 34 ps at 50G where a linear receiver e.g. 5-tap FFE was considered, and somehow rounded down from 8.5 to 8 ps for DR, then not adjusted when the DFE was added. However, for 800GBASE-LR4, the limit is 13 ps for a 7% faster line rate. Today at 200G, transmitter bandwidth relative to the line rate is more challenging, and receivers have DSP, much longer than 5 taps, with design learnings from copper where the signals are *much* slower, so they tolerate slow signals very well. $34/2/2 = 8.5$ ps max is no longer appropriate; $34/2/2/(1-DFE_{max}) = 12.7$ ps would be suitable scaling (as for 800GBASE-LR4). As to a relationship between (bandwidth and shape) -> group delay response -> difficult to equalise and error floor: kimber_3dj_01a_2603 swept a BT filter BW, without Tx FIR, with a fixed extinction ratio. Other filters and transmitters would have given other results. As this is a specification; we specify outcomes, not possible causes. A signal that the ECQ equaliser finds difficult to equalise, because of its group delay (phase) response for example, gets a bad rating anyway.

Transmitter transition time is not very accurate because it is based on single edges subject to ISI and relies on the definition of OMA, which is less reliable than we hoped and based on other parts of the pattern.

The relation between bandwidth and transition time depends on the filter type. A transmitter implementer with poor bandwidth or filter shape can get a pass on transition time by cranking up the emphasis, which makes the signal worse but compliant. This spec item encourages bad behaviour. The ECQ limit, main tap max, and overshoot limit, catch undesirable signals but in a more reasonable, balanced way. We don't need a much tighter limit for transition time than 800GBASE-LR4 has, as well.

SuggestedRemedy

Change 8 ps to 10 ps or 12.7 ps for all IMDD except 800GBASE-LR4.

Proposed Response Response Status **W**

PROPOSED REJECT.

This comment is a resubmission of Draft 3.1 Comment R1-299 in the following comment report:

https://www.ieee802.org/3/dj/comments/D3p1/8023dj_D3p1_comments_final_clause.pdf

and Draft 3.0 Comment I-319 in the following comment report

https://www.ieee802.org/3/dj/comments/D3p0/8023dj_D3p0_comments_final_clause.pdf

A straw poll was conducted when addressing the comment.

Previous evidence indicated a preference for a smaller transition time, there is no evidence for a longer transition time.

No new substantive evidence or rationale is provided in the comment.

Pending review of the following related contribution:

<URL>/simms_3dj_01_2609

Cl 180	SC 180.7.1	P473	L9	# R2-195
christensen, steen		NVIDIA Corporation		
Comment Type	TR	Comment Status	D	Tx transition time (OI)
Risetime of 8ps is overly restrictive for modern receivers. With DFE and standard FFE design a risetime of e.g. 10ps is absolutely acceptable and will allow for more types - and cheaper transmitters.				
SuggestedRemedy				
Proposed Response	Response Status W			
PROPOSED REJECT.				
Based on the comment, it appears that the intention of the comment is to change the transition time (max) from 8ps to 10ps.				
Resolved using the response to comment R2-200.				

Cl 180	SC 180.9.1	P479	L24	# R2-14
Hajduczenia, Marek		RG Nets		
Comment Type	TR	Comment Status	D	test pattern (B) (OI)
Table 180-13 (page 479 line 24) still carries footnote marker "a" on pattern 5 (Scrambled idle). Footnote a reads "Precoding (see 176.7.1.2) is added to this pattern as necessary (see 180.9.14 and 180.9.15)." In D3.2 the Table 180-14 rows for "Receiver sensitivity" (180.9.14) and "Stressed receiver sensitivity" (180.9.15) were changed from "3 or 5" to "3", so pattern 5 is no longer permitted for either of the two subclauses the footnote cites. Pattern 5 now appears only for Wavelength and SMSR (180.9.3), Average optical power (180.9.4), and aggressor receive lanes in 180.9.6.1, none of which involve precoding. The same defect exists in the parallel Table 181-11 (page 518), whose footnote a cites 181.9.14 and 181.9.15 after the identical "3 or 5" to "3" edit in Table 181-12.				
SuggestedRemedy				
Remove footnote marker "a" from the pattern 5 (Scrambled idle) row of Table 180-13 (page 479 line 24) and from the pattern 5 row of Table 181-11 (page 518), leaving footnote a attached only to pattern 3 (PRBS31Q). Alternatively, if pattern 5 is intended to remain usable for receiver sensitivity testing, restore "3 or 5" in the Receiver sensitivity and Stressed receiver sensitivity rows of Table 180-14 (page 480 lines 8 and 12) and Table 181-12 (page 518 lines 43 and 46).				
Proposed Response	Response Status W			
PROPOSED ACCEPT IN PRINCIPLE.				
This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.				
However, the changes to address this issue would be an improvement to the draft.				
Delete footnote reference "a" from pattern 5. apply the same change to CL 181, 182, 183.				

Cl 180	SC 180.9.6	P483	L20	# R2-188
Swenson, Norman		Nokia Corporation,Norman Swenson Consulting,Point		
Comment Type	TR	Comment Status	D	TDECQ-normalization (OI)
x_n is used to describe the test pattern and also used to define the MMSE on pg 484 line 3. But the SSPRQ test pattern referred to in 176.7.4.5 (which points to 120.5.11.2.3) is a sequence from an unbalanced alphabet {0,1,2,3}, and the MMSE optimization is based on a balanced alphabet, such as {-3, -1, 1, 3} or {-1, -1/3, 1/3, 1}. Footnote b under Table 180-16 is consistent with an alphabet normalized to {-1, -1/3, 1/3, 1}. This requires that we differentiate between the SSPRQ test sequence and the normalized, balanced version x_n used in the equalizer optimization.				
<i>SuggestedRemedy</i>				
This affects Clause 180.9.6.3 and 180.9.6.4 in a number of places. A presentation will cover the proposed edits.				
Proposed Response	Response Status W			
PROPOSED ACCEPT IN PRINCIPLE.				
Pending review of the following related contribution:				
<URL>/swenson_3dj_01_2609.pdf				

Cl 180	SC 180.9.6	P485	L33	# R2-190
Swenson, Norman		Nokia Corporation,Norman Swenson Consulting,Point		
Comment Type	ER	Comment Status	D	TDECQ-name (OI)
This relates to unsatisfied comment R1-262 which proposed that a new name be given for TDECQ since it has changed significantly from previous clauses. If a new name is not given, a note cautioning the reader is in order to prevent confusion with other TDECQ values with an identical name but computed in entirely different manners.				
SuggestedRemedy				
Insert a note:				
Note - Clause 180 TDECQ is computed differently than TDECQ in previous clauses. When it is not clear from context, the TDECQ in this clause should be referred to as "Clause 180 TDECQ".				
Futher justification will be provided in a presentation.				
Proposed Response	Response Status W			
PROPOSED REJECT.				
This change is not necessary. There are precedences in IEEE 802.3 of updating the measurement method for a specific metric, while the metric name is kept the same :				
1) TDECQ for 100G/lane MMF optics in 802.3db, where a fiber emulation filter is included in the measurement.				
2) COM for 200G/lane electrical signlaing, where MLSD is introduced in the reference receiver.				
Further, the documented optimization method is one possible method of optimization; other methods are always allowed. It is not necessary to use a different name of TDECQ or call a TDECQ value to be clause 180 TDECQ .				
Pending review of the following related contribution:				
<URL>/swenson_3dj_03_2609.pdf				

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

CI **180** SC **180.9.6.3** P**482** L**22** # **R2-206**

Dawe, Piers J G NVIDIA

Comment Type **TR** Comment Status **D** TDECQ coeff vector (OI)

The vector w is not a set, it is a vector or "tuple" where repeats are allowed and the order matters (but credit for putting w in bold).

SuggestedRemedy

Change "set" to "vector" and remove the curly brackets at line 32.

Proposed Response Response Status **W**

PROPOSED REJECT.

It is not wrong to call this a set. This is only used to convey the concept of having a set of taps with weights. Though it is defined in a specific order, that order is not necessary for any defined operation, but rather it is used for brevity in defining.

Pending review of the following related contribution:
https://www.ieee802.org/3/dj/public/26_09/swenson_3dj_01_2609.pdf

CI **180** SC **180.9.6.3** P**483** L**9** # **R2-141**

Maniloff, Eric Ciena Corporation

Comment Type **T** Comment Status **D** TDECQ equalizer name (OI)

The following sentence: "The reference equalizer is a T-spaced, discrete-time equalizer with 15 feed-forward taps and a single decision feedback tap," isn't correct, since the feedback is not based on the decision.

SuggestedRemedy

Replace "decision feedback" with "test pattern feedback"

Proposed Response Response Status **W**

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

x(n) is emulating an error free feedback. The text says "the feedback is modeled as correct, i.e., xn is the pattern used to generate the input r(t)", which is effectively saying the signal is a feedback signal.

Pending review of the following related contribution:
<URL>/swenson_3dj_01_2609.pdf

CI **180** SC **180.9.6.3** P**483** L**13** # **R2-205**

Dawe, Piers J G NVIDIA

Comment Type **TR** Comment Status **D** TDECQ (OI)

802.3 is not a test specification (the 802.3 companion test specification was withdrawn).

We are not supposed to be writing a model of a DSP. We are supposed to be defining TECQ and TDECQ, which are measured with a scope. Different. The scope does not do T-spaced sampling, for example.

Previously, and for ECQ in other clauses, we had "One way of doing this, using estimated PAM4 symbol error ratio as the figure of merit for the equalized signal, is described below." and "Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration." So it was clear that the normative value is the best value (which does not take long to find, in spite of assertions that it must). We said that a short cut that reads high may be used, where reading high does not weaken the spec. Which would have been the case even if not stated.

But this says: "For a given sampling phase phi0 and assumed RMS value sigmaG for Gaussian noise eta(t), determine the equalizer coefficients w and b(1), subject to the limits in Table 180-16, that result in the minimum mean squared error (MMSE) between yn and x(n). Alternative optimization methods may be used to determine equalizer tap weights if they report comparable values of TDECQ." This tries to make the inaccurate high-reading over-prescriptive method normative.

There are other flaws in this but the whole concept is misguided; they should be removed when the damage in this draft is undone.

SuggestedRemedy

What a mess. Replace the whole of 180.9.6 with the normal stable ECQ definition, following 168.7.5 (the latest sound version, I believe) with the few known relevant modifications for signalling rate and number FFE taps and the addition of the DFE.

Proposed Response Response Status **W**

PROPOSED REJECT.

This comment is a resubmission of Draft 3.1 Comment R1-287 in the following comment report:
https://www.ieee802.org/3/dj/comments/D3p1/8023dj_D3p1_comments_final_clause.pdf

No new substantive evidence or rationale is provided in the comment.
Further, the suggested remedy is not a detailed proposal the editorial team can implement.

Pending review of the following related contribution:
<URL>/dawe_3dj_06_2609.pdf

CI **180** SC **180.9.6.3** P**483** L**53** # **R2-144**
 Maniloff, Eric Ciena Corporation
 Comment Type **TR** Comment Status **D** TDECQ-normalization (OI)
 Figure 180-10 - TDECQ reference equalizer functional model fails to appropriately convey that in order to produce a signal y_n of amplitude OMATDECQ, the delayed signal x_n to be multiplied by the normalized feedback tap $-b(1)$ has to be of amplitude $\pm$ OMATDECQ/2
 SuggestedRemedy
 In figure 180-10, define the amplitude of x_n . For example replace x_n by I_n where I_n is the ideal reference properly scaled. On line 21, introduce I_n in the text: " I_n is the pattern x_n with an amplitude of $\pm$ OMATDECQ/2."
 Proposed Response Response Status **W**
 PROPOSED ACCEPT IN PRINCIPLE.
 Resolved using the response to comment R2-188.

CI **180** SC **180.9.6.3** P**484** L**13** # **R2-15**
 Hajduczenia, Marek RG Nets
 Comment Type **T** Comment Status **D** TDECQ-normalization (OI)
 The minimum for "Main tap coefficient limit" $w(0)$ was changed in D3.2 from 0.8 to "0.9 - $b(1)$ ", but footnote b of the same table is unchanged and still states that $b(1)$ is referenced to OMATDECQ/2. The $w(0)$ row bounds an absolute feed-forward coefficient, unlike the $w(i)/w(0)$ rows immediately below which are explicitly normalized, and nothing in 180.9.6.3 or Figure 180-10 normalizes the equalizer input $z(t)/r(t)$ to OMATDECQ. The normalization under which $b(1)$ is to be subtracted from 0.9 to bound the absolute $w(0)$ is therefore undefined. The affected table is Table 180-16.
 SuggestedRemedy
 Clarify the normalization of $b(1)$ as used in the new $w(0)$ minimum. Either amend footnote b (or add a note to the "Main tap coefficient limit" row) to state the normalization in which $b(1)$ is taken when it appears in the $w(0)$ limit, or restate the minimum in a form explicitly consistent with footnote b's OMATDECQ/2 reference.
 Proposed Response Response Status **W**
 PROPOSED ACCEPT IN PRINCIPLE.
 The normalization relative to OMA_TDECQ of $w(0)$ is indicated by footnote a, the sum of all 15 feed-forward taps $w(i)$ is 1. Therefore it would have been normalized to OMA_TDECQ.
 Resolved using the response to comment R2-188.

CI **180** SC **180.9.6.3** P**484** L**25** # **R2-204**
 Dawe, Piers J G NVIDIA
 Comment Type **TR** Comment Status **D** TDECQ ref EQ coeff (OI)
 D3.0 comment 468: causal vs. anticausal pulse shapes are not equivalent.
 This pre-post equalizer coefficient difference limit $|w(1)/w(0) - b(1) - w(-1)/w(0)|$ seeks to keep the attack and decay of the signal pulse similar. Yet the evidence from https://iee802.org/3/dj/public/25_05/chayeb_3dj_01_2505.pdf#page=8 and 9, plotted in https://iee802.org/3/ds/public/Interim_May_27-28-2026/dawe_3ds_01_260527.pdf, shows that for a real receiver, the situation is very far from symmetrical; relatively fast attack ($c(-1)$ close to zero) and slow decay ($c(+1)$ strongly -ve) is tolerated well (naturally), but the opposite is not. A constrained optimiser can find a solution by choosing a bad sampling phase - but the reported ECQ would be bad.
 SuggestedRemedy
 Remove the absolute bars $| \cdot |$. Add a minimum limit, -0.4, remembering that there are acceptable signals off the bottom of the plot in [dawe_3ds_01_260527](https://iee802.org/3/ds/public/Interim_May_27-28-2026/dawe_3ds_01_260527.pdf).
 Proposed Response Response Status **W**
 PROPOSED REJECT.
 This comment is a resubmission of Draft 3.1 Comment R1-282 in the following comment report:
https://www.ieee802.org/3/dj/comments/D3p1/8023dj_D3p1_comments_final_clause.pdf
 Although this comment provides a slightly modified limit value, no new evidence supporting the removal of the absolute bars has been provided.
 Pending review of the following related contribution:
 <URL>[dawe_3dj_05_0926.pdf](https://www.ieee802.org/3/dj/comments/D3p1/8023dj_D3p1_comments_final_clause.pdf)

Cl 180 SC 180.9.6.4 P485 L3 # R2-194

Swenson, Norman Nokia Corporation,Norman Swenson Consulting,Point

Comment Type TR Comment Status D TDECQ-optimization (OI)

Some commenters have argued that minimizing mean squared error at ϕ_0 may not attain the optimal tap settings for minimizing TDECQ, which can change results measured using global optimization appearing in earlier drafts of the standard. We can potentially achieve lower TDECQ values by minimizing the sum of the mean squared errors measured at $\phi_0 - 0.05T$ and $\phi_0 + 0.05T$, or the sum at $\phi_0 - 0.05T$, ϕ_0 , and $\phi_0 + 0.05T$. This was suggested on pg. 4 of swenson_3dj_01a_2607.pdf.

SuggestedRemedy

Change "that result in the minimum mean squared error (MMSE) between y_n and x_n " to "that result in the minimum sum of the mean squared error between x_n and y_n measured at $\phi_0 - 0.05T$, $\phi_0 - 0.05T$, and $\phi_0 - 0.05T$." A presentation will show results comparing the different methods.

Proposed Response Response Status W

PROPOSED REJECT.

The methodology as it stands is sufficiently accurate. Unless there is sufficient evidence showing a significant change in the outcome of TDECQ, no change is needed.

Pending review of the following related contribution:
<URL>/swenson_3dj_01_0926.pdf

Cl 180 SC 180.9.6.4 P485 L7 # R2-189

Swenson, Norman Nokia Corporation,Norman Swenson Consulting,Point

Comment Type TR Comment Status D TDECQ-eye diagram (OI)

In simplifying the text in 3.2, we removed discussion of how the continuous time waveform appearing in the eye diagram is generated when the equalizer is a discrete-time equalizer which only outputs one value per unit interval, in order not to dictate how the eye diagram is generated. However, we still need some description of how the samples at $\phi_0 \pm 0.05T$ are captured, and we also need a continuous time waveform to invoke the method defined in 180.9.5 to measure OMA_TDECQ. We can introduce a continuous-time waveform here without being restrictive on how it is generated. The time at which x_n changes value also requires clarification.

SuggestedRemedy

A presentation will cover the proposed edits here and near pg. 486 Line 1.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Pending review of the following related contribution:
<URL>/swenson_3dj_01_2609.pdf

Cl 180 SC 180.9.6.4 P485 L7 # R2-16

Hajduczenia, Marek RG Nets

Comment Type T Comment Status D TDECQ-eye diagram (OI)

The D3.2 rewrite of this paragraph deleted the description of how the illustrative eye diagram is constructed (coefficients fixed at the determined values, sampling phase ϕ_0 swept from $\phi_0 - T/2$ to $\phi_0 + T/2$, scatter plot of y_n plotted for each ϕ_0), but retained the dependent sentence "The feedback symbol x_n changes at phase $\phi_0 - T/2$." That sentence now refers to a phase sweep that is no longer described anywhere in the subclause, and nothing states what the horizontal axis of Figure 180-11 (labelled $\phi_0 - T/2$ to $\phi_0 + T/2$) spans or how the plotted points are obtained.

SuggestedRemedy

Either restore a construction sentence after "...at sampling phase ϕ_0 .", e.g. "With the coefficients fixed at the determined values, the sampling phase ϕ_0 is swept from $\phi_0 - T/2$ to $\phi_0 + T/2$ and the scatter plot of y_n is plotted for each phase ϕ_0 ." - or delete the now-orphaned sentence "The feedback symbol x_n changes at phase $\phi_0 - T/2$."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Resolved using the response to comment R2-189.

Cl 180 SC 180.9.6.4 P485 L35 # R2-126

Dudek, Michael Marvell

Comment Type T Comment Status D TDECQ-phase position (OI)

Comment R1-198 had suggested that the word "nominally" was deleted from the time position of the regions based on the assumption that the time position of the regions was not going to be optimized relative to ϕ_0 . The result of other comments has the time position being optimized and so the time position will not be as stated.

SuggestedRemedy

Change "each centered 0.05UI" to "each centered nominally 0.05UI"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Although the text is incorrect as written, the proposed word "nominally" is misleading.

Instead, the word "initially" is more appropriate because the methodology first (initially) defines the explicit ranges of the two regions corresponding to the 0.05 UI before and after, and then states that these regions can be adjusted. To avoid any contradiction in the methodology, the intent is to imply a two-step process: the initial region phases are explicitly defined in the paragraph, followed by a second step to adjust the regions if needed.

Change "each centered 0.05UI" to "each initially centered 0.05UI".

Cl 180 SC 180.9.6.4 P485 L41 # R2-17

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status D TDECQ-Pave (B) (OI)

Pave is used in normative Equation (180-4), Equation (180-5) and Equation (180-6) but is nowhere defined in D3.2. D3.1 identified it as "the average optical power of the eye diagram (Pave)" - D3.2 changes this to the bare "the average optical power Pave" while the surrounding text was reworked from eye-diagram/histogram language to sample-region language. The draft no longer states whether Pave is the average of the equalized samples y_n , of the captured waveform $r(t)$, or the transmitter average optical power of 180.9.4. Pave sets all three threshold levels, so the ambiguity is material.

SuggestedRemedy

On page 485 lines 41 to 42, change "are determined from the OMATDECQ and the average optical power Pave as defined in Equation (180-4)..." to "are determined from the OMATDECQ and Pave, the average optical power of the equalized captured waveform y_n , as defined in Equation (180-4)..." or otherwise state explicitly the waveform on which Pave is computed.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Add the definition of P_{ave} to the where list after OMA_TDECQ, and pointing to 180.9.4, i.e. using the method stated in 180.9.14.

Implement with editorial license.

Cl 180 SC 180.9.6.4 P486 L19 # R2-18

Hajduczenia, Marek

RG Nets

Comment Type T Comment Status D TDECQ-Pth (B) (OI)

Equation (180-7) on page 486 uses the threshold symbols Pth1, Pth2 and Pth3 before they are defined. The preceding text on page 485 defines only the nominal threshold levels $P_{0,th1}$, $P_{0,th2}$ and $P_{0,th3}$ (Equations (180-4) to (180-6)), and the "where" list following Equation (180-7) at page 486 line 34 defines only Ceq. The actual thresholds Pth1, Pth2 and Pth3 are first introduced at page 487 line 12 ("When the SER is estimated, the actual thresholds, Pth1, Pth2, and Pth3, are adjusted by up to +/-2% of OMATDECQ from $P_{0,th1}$, $P_{0,th2}$, and $P_{0,th3}$ "). Equations (180-10) and (180-11) on page 487 depend on Equation (180-7) and inherit the undefined symbols. This use-before-definition was introduced by the D3.2 rewrite of 180.9.6.4 in response to D3.1 comment R1-103: in D3.1 the symbols Pth1/Pth2/Pth3 were defined directly in Figure 180-11 and introduced in prose ahead of their first use.

SuggestedRemedy

Introduce the actual thresholds at first use. Either add to the "where" list following Equation (180-7) on page 486 an entry such as "Pth1, Pth2, and Pth3 are the actual threshold levels, adjusted from the nominal levels $P_{0,th1}$, $P_{0,th2}$, and $P_{0,th3}$ as described following Equation (180-11)" - or move the sentence at page 487 lines 12 to 13 forward so that it precedes Equation (180-7).

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

P486 Line 33, after the bullet of Ceq, add a second bullet:

P_{th_i} , are the threshold levels used for calculating SER. $i = 1,2,3$

Implement with editorial license.

CI 180 SC 180.9.6.4 P487 L14 # R2-19

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status D TDECQ-optimization (OI) (B)

The D3.2 edit removed the quantified convergence tolerance for the TDECQ sigmaG iteration. D3.1 read "is not within 1% of the target PAM4 SER" and "falling within 1% of the target PAM4 SER" - D3.2 now reads "is not equal to the target PAM4 SER of 4.56×10^{-4} " and "as close as practical to the target PAM4 SER". An iterative numerical search over continuous sigmaG with re-optimization of equalizer tap coefficients can never yield SER exactly equal to 4.56×10^{-4} , so the loop as written has no defined termination condition, and "as close as practical" supplies no numerical criterion. This makes a normative test procedure non-reproducible between implementations.

SuggestedRemedy

On page 487 lines 13 to 16, restore a quantified tolerance: "If max(SERL, SERR) is not within 1% of the target PAM4 SER of 4.56×10^{-4} , the process is iterated by changing sigmaG and reoptimizing the equalizer tap coefficients. TDECQ is calculated using the optimized sigmaG that results in max(SERL, SERR) falling within 1% of the target PAM4 SER." If a different tolerance is intended, state it numerically - do not leave "as close as practical" as the sole convergence criterion.

Proposed Response Response Status W

PROPOSED REJECT.

The change was adopted with resolution to Draft 3.1 comment R1-103 in the following report:
https://www.ieee802.org/3/dj/comments/D3p1/8023dj_D3p1_comments_final_clause.pdf

Prior to D3.2 there was no guidance on how close sigma_G to should be except that it should be exact which is not practical. Current text, updated in D3.2, provides some guidance in this regard: "TDECQ is calculated using the optimized sigma_G that results in max(SERL, SERR) as close as practical to the target PAM4 SER."

The current draft as written provides sufficient guidance for the user to implement the sigma_G optimization. A user may choose to set a low accuracy and get faster convergence time, while another user may choose to set a higher requirement on accuracy, and spend longer time in converging. The exact accuracy of the MMSE optimization is up to the user of the draft.

CI 180 SC 180.9.8 P488 L2 # R2-129

Ghiasi, Ali

Ghiasi Quantum LLC,Marvell Semiconductor, Inc.

Comment Type TR Comment Status D TFT-xAUI (OI)

Draft doesn't state what should the input xAUI-n pattern be, currently allow to use any test pattern one wishes to use!

SuggestedRemedy

Please add following text: The pattern of the xAUI-n input signal may be PRBS31Q, scrambled idle, or a valid xBASE-R signal.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Implement same changes to clause 181, 182, and 183.

Note that the outcome of this comment is pending the decision to comment R2-14, where scrambled idle may be deleted from the test pattern list in this subclause.

[Editor's note: changed page from 487 to 488]

Cl **180** SC **180.9.8** P**488** L**8** # **R2-20**

Hajduczenia, Marek

RG Nets

Comment Type **T** Comment Status **D** TFT (OI)

D3.2 changed "The test block error histograms are measured using the method described in 174A.9.3." to "The transmitter block error histograms are measured using the method described in 174A.9.3." "Transmitter block error histogram" is not a defined term and occurs exactly once in the draft. 174A.9.3 defines "test block error histograms", and the surrounding 180.9.8 text uses the defined term "transmitter functional symbol error histogram" and the counter test_block_error_bin_i_k. The sentence is also redundant with 180.9.8.2 (page 490 lines 9 to 11), which already states that the transmitter functional symbol error histogram is measured using a FnRx per 180.9.8.1, the method defined in 174A.9.3, and the test pattern in Table 180-14 - the D3.2 edit repointed the 180.9.8.2 sentence to 174A.9.3 (in D3.1 it self-referenced 180.9.8.2), creating a duplicate statement of the measurement method.

SuggestedRemedy

Delete the sentence on page 488 line 8. The measurement method is stated correctly and completely in 180.9.8.2 on page 490 lines 9 to 11, which must be retained because it also carries the FnRx, test pattern and measurement time requirements. If a separate statement is wanted at page 488 line 8, use the term defined in the cited subclause: "The test block error histograms are measured using the method described in 174A.9.3."

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.
Delete the sentence on page 488 line 8.

Pending review of the following related contribution:

<URL>/cole_3dj_01_2609.pdf
... and the relevant slides in <URL>/issenhuth_3dj_01_0926

Resolve in conjunction with comment R2-124.

Cl **180** SC **180.9.8.1** P**488** L**44** # **R2-124**

Issenhuth, Tom

Huawei Technologies Co., Ltd,Issenhuth Consulting,

Comment Type **T** Comment Status **D** TFT (OI)

After offline consensus building it was decided that some minor editorial changes would enhance the understanding of the TFT test

SuggestedRemedy

Editorial slides documenting the proposed changes will be provided.

These changes are intended to be editorial and not technical changes.

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

Pending review of the following related contribution:

<URL>/cole_3dj_01_2609.pdf
... and the relevant slides in <URL>/issenhuth_3dj_01_0926

Cl 180 SC 180.9.8.1 P489 L48 # R2-125

Dudek, Michael

Marvell

Comment Type TR Comment Status D TFT (OI)

We should not be suggesting in the standard that anything is a "false fail". If something fails the standard it is a fail. Also what are the "relative characteristics" of the device used as the reference receiver and the transmitter under test. The characteristics are very different for a Tx and an Rx.

SuggestedRemedy

Reword NOTE 2. Change "The correction factor given by ORx_TECQ_correction might be moderately pessimistic depending upon the relative characteristics of the device used as the reference receiver and the transmitter under test. A failure of the TFT accurately identifies a transmitter that is not generally interoperable. However, the test might falsely fail a generally interoperable transmitter, which might be addressed by a moderate increase in transmitter OMAouter to pass TFT." to

"The correction factor given by ORx_TECQ_correction might be moderately pessimistic depending upon the characteristics of the functional receiver and the transmitter under test. A failure of the TFT accurately identifies a transmitter that is not generally interoperable. However, a transmitter OMAouter moderately above the specified minimum value might be needed to pass TFT."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change to :

"The correction factor given by ORx_TECQ_correction might be moderately pessimistic depending upon the characteristics of the device used as the reference receiver and the transmitter under test. A failure of the TFT accurately identifies a transmitter that is not generally interoperable. However, the test might fail a generally interoperable transmitter, which might be addressed by a moderate increase in transmitter OMAouter to pass TFT."

Pending review of the following related contribution:

<URL>/cole_3dj_01_2609.pdf

... and the relevant slides in <URL>/issenhuth_3dj_01_0926

Resolve in conjunction with comment R2-124.

Cl 180 SC 180.9.8.1 P489 L49 # R2-21

Hajduczenia, Marek

RG Nets

Comment Type E Comment Status D TFT (OI)

NOTE 2, added in D3.2, uses the abbreviation "TFT" twice in running text (page 489 lines 49 and 51), but TFT is never defined in body text. It is introduced only in the subclause heading "180.9.8 Transmitter functional test (TFT)", the matching TOC entry, and PICS item OM8 on page 501, and it does not appear in the list of new abbreviations inserted into 1.5 on page 62. Under IEEE style a heading is not the defining occurrence of an abbreviation. The first paragraph of 180.9.8 (page 487 line 47) spells the term out and parenthetically defines the companion abbreviation FnRx, but not TFT.

SuggestedRemedy

Extend the first paragraph of 180.9.8 (page 487 line 47) to read "The transmitter functional test (TFT) uses a functional receiver (FnRx) defined in 180.9.8.1 to measure a transmitter functional symbol error histogram defined in 180.9.8.2." Alternatively, spell out "transmitter functional test" in both places in NOTE 2 and delete "(TFT)" from the 180.9.8 heading, the TOC entry, and PICS item OM8 on page 501.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Two options for the CRG to consider,

- 1) delete instances of TFT, and replacing TFT with "transmitter functional test" everywhere.
- 2) Use TFT everywhere in place of the full text "transmitter functional test" as appropriate

Apply to CL180~183. Implement with editorial license.

Pending review of the following related contribution:

<URL>/cole_3dj_01_2609.pdf

... and the relevant slides in <URL>/issenhuth_3dj_01_0926

Resolve in conjunction with comment R2-124.

CI 180 SC 180.9.8.1 P489 L49 # R2-201

Dawe, Piers J G

NVIDIA

Comment Type TR Comment Status D TFT (OI)

This says "A failure of the TFT accurately identifies a transmitter that is not generally interoperable". But the TFT method can fail *any* transmitter, because it requires $1.75e-12$ in bin 8 (Table 180-17) while a receiver is required to deliver $< \text{about } 3.9e-5$ in bin 8 (Table 180-20), and there is no requirement to be any particular amount better than that.

SuggestedRemedy

Revise the method to use a calibrated receiver, or recognise that this is a screen for transmitter-receiver pairs that play nicely with each other (a useful thing to have but not a traditional spec item), rename "transmitter functional test" to "transmitter-receiver functional test", and remove the row from Table 180-7, transmit characteristics, because the transmitter because no transmitter has the ability to ensure a pass.

Proposed Response Response Status W

PROPOSED REJECT.

The difference between the error histogram mask between Table 180-17 and Table 180-20 is a result of the introduction of test margin, not a mistake.

This test margin shifts the input optical power of the functional receiver to higher than the receiver sensitivity, therefore provides higher SNR of the input signal to the receiver. The increased SNR allows any errors are dominated by the transmitter contribution rather than the receiver.

The targeted BER threshold of the receiver is changed to $2.4e-5$, which corresponds to the histogram mask of Table 180-17 assuming random error.

Pending review of the following related contribution:

<URL>/cole_3dj_01_2609.pdf

<URL>/dawe_3dj_07_2609.pdf

... and the relevant slides in <URL>/issenhuth_3dj_01_0926.pdf

CI 180 SC 180.9.8.2 P490 L4 # R2-22

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status R TFT (OI)

The resolution of D3.1 comment R1-313 committed to specifying that BERadded equals 0 in the second sentence of 180.9.8.2. The sentence was reworded in D3.2 from "using ORx operating BER = 2.4×10^{-5} and $p = 1$ " to "using BERmax (ORx operating BER target) of 2.4×10^{-5} and $p = 1$ ", but no statement that BERadded equals 0 appears in 180.9.8, 180.9.8.1 or 180.9.8.2. Since 174A.9.5 defines $\text{BERmax} = \text{BERtotal} - \text{BERadded}$, readers cannot confirm that the Table 180-17 Hmax(k) values were computed with BERadded of 0.

SuggestedRemedy

On page 490 line 4, amend the second sentence of 180.9.8.2 to read: "The limit Hmax(k) is calculated using the method in 174A.9.5 using BERmax (ORx operating BER target) of 2.4×10^{-5} , BERadded of 0, and $p = 1$."

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 180 SC 180.9.8.2 P490 L10 # R2-130

Ghiasi, Ali

Ghiasi Quantum LLC,Marvell Semiconductor, Inc.

Comment Type TR Comment Status R test pattern (OI)

Transmitter functional histogram test pattern is supposed to be given in Table 180-14, but looking at table 180-14 entry for Transmitter functional test is missing

SuggestedRemedy

Please add to Table 180-14 entry for : Trnasmitter functional test and list pattern pattern 6

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 180 SC 180.9.14 P492 L4 # R2-23

Hajduczenia, Marek

RG Nets

Comment Type E Comment Status R Rx sensitivity (OI)

Table 180-14 and Table 181-12 now list a single test pattern ("3") for Receiver sensitivity, changed in D3.2 from "3 or 5", but the body text of 180.9.14 (page 492 line 4) and 181.9.14 (page 522 line 33) still uses the plural construction "using one of the test patterns specified for receiver sensitivity in Table 180-14 [Table 181-12]". With only one pattern listed the plural is incorrect. The parallel clause 182.9.14 (page 554 line 4) uses the singular "using a test pattern for receiver sensitivity in Table 182-14".

SuggestedRemedy

On page 492 line 4, change "using one of the test patterns specified for receiver sensitivity in Table 180-14" to "using the test pattern specified for receiver sensitivity in Table 180-14". Make the same singular correction on page 522 line 33 with respect to Table 181-12.

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 180 SC 180.9.14 P492 L15 # R2-24

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status D Rx sensitivity (B) (OI)

The sentence newly added in D3.2, "When testing using 174A.9.5 or 174A.9.6, the compliance shall not be further verified using 174A.9.7," conflicts with the referenced test methods. 174A.9.5 (page 752 lines 39 to 40) states "If this test fails, then the performance may be further verified using the method in 174A.9.6 or 174A.9.7", and 174A.9.6 (page 753 lines 6 to 7) states "If this test fails, then the performance may be further verified using the method in 174A.9.7". Neither annex sentence carries any qualifying or scoping language, and 174A.9.7 remains an explicitly permitted method in 179.9.5.2 (page 440 line 9) and 176D.8.11 (page 838 line 23), so the annex permission cannot be read as implicitly restricted to non-Clause-180-to-183 PMDs. A normative "shall not" in the PMD clause therefore directly negates a "may" in the method it invokes. The same sentence appears at page 492 line 15, page 494 line 21, page 522 line 49, page 523 line 33, page 554 line 16, page 555 line 15, page 586 line 54, and page 587.

SuggestedRemedy

Resolve the conflict in one direction and apply it consistently. Preferred: qualify the annex permissions so they defer to the referencing clause, e.g. in 174A.9.5 (page 752 lines 39 to 40) "...may be further verified using the method in 174A.9.6 or, where permitted by the referencing clause, 174A.9.7", and in 174A.9.6 (page 753 lines 6 to 7) "...may, where permitted by the referencing clause, be further verified using the method in 174A.9.7". Alternatively, delete the added prohibition sentence from all eight locations and rely on the method list in each subclause to define the permitted methods. If the statement is only guidance, recast it as a NOTE without "shall".

Proposed Response Response Status W

PROPOSED REJECT.

This choice of language was purposeful; annex 174A gives ability to verify elsewhere, but for this test we are overriding this; it is not guidance. The draft is accurate as written.

CI 180 SC 180.9.14 P492 L16 # R2-198

Dawe, Piers J G

NVIDIA

Comment Type TR Comment Status D Rx sensitivity (OI)

802.3 specifies equipments by their behaviour at external interfaces. It does not require a particular implementation; all implementations should be held to the same standard so that they are interoperable and the spec does not exhibit favouritism. Additionally it provides example specifications for some internal interfaces such as AUI C2M, but these are not required.

D3.2 erroneously disallows methods 174A.9.7 (BLER method for all lanes using PMA measurements) and 174A.11 (using PCS measurements). The former is incorrect because errors are shared by a common FEC), and also, measuring an individual lane and extrapolating as far as 6.9e-28 is subject to errors that can be reduced by pooling the lane measurements as described in 174A.9.7. The latter is incorrect because it's at the PCS where the errors matter, and there may be no AUI in a product.

Compare 174A.10, Error ratio tests for 800GBASE-LR1... where "the number of lanes p = 1" although there are four signals rx_signal_xi, rx_signal_xq, rx_signal_yi, rx_signal_yq whose errors could have been counted separately. That might be interesting for diagnostics but it is not appropriate as a spec limit.

In general (for the receive side), we should consider errors at or near the PCS first, and fall back to counters nearer to the PMD when necessary. Because this is an equipment spec not a component spec.

As explained before, receiver implementers who don't like the all-lane methods can conservatively use 174A.9.5 or 174A.9.6, if they allow for extra scatter. Qualifying a module for 8 x DR1 is a different matter anyway (different BLER block time on a lane).

The all-lanes calculation is still conservative because each receiver lane is tested with minimum victim and maximum optical crosstalk aggressor, and they can't all be like that, and because each transmitter lane is specified separately so they are all at least as good as minimum that the receiver is tested against.

SuggestedRemedy

Revert the changes that eliminated 174A.9.7 and 174A.11 in the IMDD clauses.

Proposed Response Response Status W

PROPOSED REJECT.

The CRG agreed on the resolution of comment R1-195 against 3.1 to fix the ambiguity in the receiver sensitivity measurement method and make it appropriate for a per-lane metric. Reverting the change as proposed in the Suggested Remedy would bring us back to an ambiguous definition of receiver sensitivity.

The resolution of comment R1-195 is in the following comment report:
https://www.ieee802.org/3/dj/comments/D3p1/8023dj_D3p1_comments_final_clause.pdf

Pending review of the following related contribution:
 <URL>dawe_3dj_04_2609.pdf

CI 180 SC 180.9.14 P492 L18 # R2-191

Rubin, Amir

NVIDIA

Comment Type TR Comment Status D Rx sensitivity (OI)

Quotation:

"NOTE—In order to predict whether a receiver meets the BLER requirement in a short test time, extrapolation of the measured histogram (see 174A.9.3) to Hm(16) can be performed. One way of doing this is using a linear fit of $\log_{10}(Hm(k))$ for $k = (n - 2)$ to n , where these values of k are the three highest bins having a count of 10 or more. If the slope of the histogram over the measured bins is increasing, it might be an indication of not meeting the BLER requirement. To verify that the slope is not increasing, the values of $(\log_{10}(Hm(k)) - \log_{10}(Hm(4))) / (k - 4)$ should be less than $(\log_{10}(Hm(4)) - \log_{10}(Hm(2))) / 2$ for each k greater than 4."

The problem with this section is that the linear model of $\log_{10}$ of portion of uncorrelated errors is too biased towards false failures of marginal links for being used for the extrapolation of the value of bin 16. It is also with excessive scatter over random scenarios.

SuggestedRemedy

NOTE—In order to predict whether a receiver meets the BLER requirement in a short test time, extrapolation of the measured histogram (see 174A.9.3) to Hm(16) can be performed. This can be done by using binomial distribution model for uncorrelated errors as follows: For the highest bin having count of 10 or more, find which RS SER in equation 174A-5 would lead to that count from the total amount of FEC blocks. Then estimate Hm(16) by accumulating equation 174A-5 with the found RS SER over bins 16 and above. For avoiding false passing of the test, it is recommended to add the maximal error of the algorithm for finding the RS SER. For example, if bisection method is used, consider the last step as the maximal error and add it to the found RS SER.

Alternatively, plug the target RS SER for the scenario into equation 174A-5 and see if the count of the highest bin having count of 10 or more is not higher than that value.

Proposed Response Response Status W

PROPOSED REJECT.

The current informative extrapolation method detailed in the note was adopted based on CRG consensus of D3.0 comment resolution, which was supported by the data and analysis in the following contribution:
https://www.ieee802.org/3/dj/public/26_05/maniloff_3dj_01b_2605.pdf

The comment claims the adopted method has defect, but failed to provide evidence of such claim. A different extrapolation method is proposed in the suggested remedy. However, no measurement data or analysis as evidence was provided to justify the proposed change.

Pending review of the following related contribution:
 <URL>rubin_3dj_01_2609

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

Cl 180 SC 180.9.14 P492 L34 # R2-202
Dawe, Piers J G NVIDIA
Comment Type E Comment Status D Rx LRS signal (OI)
This table would be more accessible to a reader if it were laid out conventionally.
SuggestedRemedy
Rather than a single value column, use separate Min and Max columns (similar to Table 180-16 or Table 179-15 for examples) so that there are 6 body rows not 9.
Proposed Response Response Status W
PROPOSED REJECT.
This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.
Further, the draft is accurate as written. The suggested remedy does not improve the clarity of the draft.
Pending review of the following related contribution:
<URL>/cole_3dj_01_2609.pdf

Cl 180 SC 180.9.14 P492 L46 # R2-25
Hajduczenia, Marek RG Nets
Comment Type E Comment Status D Rx LRS signal (B) (OI)
The parameter name in the new final row of Table 180-18 reads "Average launch power of each non test signal lane (max)". "non test signal" is missing its hyphens and is not a well-formed compound modifier. This is inconsistent with the hyphenation used throughout the draft (non-inverted, non-zero, non-overlapping, non-equalizable) - there is no other instance of an unhyphenated "non <word>" in D3.2. The row is new in D3.2.
SuggestedRemedy
In the last row of Table 180-18, change the parameter name to "Average launch power of each non-test-signal lane (max)". Optionally add a footnote noting that this row applies only to PMD types with more than one lane, since Table 180-18 is also invoked from 181.8, 182.8 and 183.8, one of which covers a single-lane PMD.
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
In Table 180-18 change the parameter description in the last row from "Average launch power of each non test signal lane (max)" to "Average launch power of each aggressor lane (max)", so that it is consistent with Table 180-8.
Pending review of the following related contribution:
<URL>/cole_3dj_01_2609.pdf

Cl 180 SC 180.9.15 P494 L4 # R2-196
christensen, steen NVIDIA Corporation
Comment Type TR Comment Status D Rx sensitivity (OI)
2GHz tone for making the transmitter used in compliance testing is too restrictive for many receivers. Noise is expected to be spread across the full spectrum. It should not be expected to have such transmitters in systems.
SuggestedRemedy
Proposed Response Response Status W
PROPOSED REJECT.
No suggested remedy was provided to implement.
Pending review of the following related contributions:
<URL>/dawe_3dj_02_2609.pdf
<URL>/dawe_3dj_03_2609.pdf

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

CI **180** SC **180.9.15** P**510** L**28** # **R2-203**
Dawe, Piers J G NVIDIA
Comment Type **TR** Comment Status **D** Rx SRS (OI)

The frequency of the sinusoidal interferer was changed from minimum 100 MHz to minimum 200 MHz, but it's still a single frequency (comment R1-304). The minimum remains at 2 GHz, same as it was at 10 Gb/s. Back then, for PAM2, without equalisers or FEC, that was a range from 4% to 39% of Nyquist; now it's 0.4% to 1.9%. Most unequalisable distortion, and reflections and crosstalk have spectra like the victim or weighted to higher frequencies, not lower. Also a stressed signal with significant sinusoidal interferer can have bimodal levels (which didn't really matter for PAM2 without equaliser). So, both the spectrum and the distribution are unrealistic and not suitable to subject real receivers to. The sampling scope aliases the real SI frequency to some other frequency which can be much higher than Nyquist and the software FFE will amplify it according to the apparent frequency, not the real one, causing a calibration error which can be surprisingly large. A PAM2 interferer has a better spectrum than the sinusoid but the same bimodal issue.

SuggestedRemedy

1. Change from a sine tone to a QPRBS generator (not synchronous to the victim) with a signalling rate similar to the victim and passed through the same or similar filtering to the victim.
2. Apply a maximum limit to the bounded interference (now QPRBS), or apply a minimum limit from filtering, e.g. minimum 1.9 dB from filtering alone.
3. In 121.8.10.1, we say "care should be taken to avoid harmonic relationships between the sinusoidal interferer, the sinusoidal jitter, the signaling rate, and the pattern repetition rate". Modify this as necessary for the different interferer and after taking advice from scope experts, describe how the frequency of the interferer and the sampling rate of the scope should be related.

Proposed Response Response Status **W**

PROPOSED REJECT.
This comment is a resubmission of Draft 3.1 Comment R1-304 in the following comment report:
https://www.ieee802.org/3/dj/comments/D3p1/8023dj_D3p1_comments_final_clause.pdf

The comment reiterates the technical reasoning as provided in Comment R1-304 of Draft 3.1 and the contribution:
https://www.ieee802.org/3/dj/public/26_07/dawe_3dj_02_2607.pdf

However, the proposed remedy is still not sufficiently well developed to adopt in its current form, e.g., signaling rate of the QPRBS generator is not specified, the maximum limit to the bounded interference is not specified.

No new substantive information on the desired outcome is provided in the suggested remedy

Pending review of the following related contributions:
<URL>/dawe_3dj_02_2609.pdf

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

CI **180** SC **180.12.4.1** P**498** L**51** # **R2-26**
Hajduczenia, Marek RG Nets
Comment Type **T** Comment Status **D** PICS (B) (OI)

The PICS item for conversion of optical signals was reworded in D3.2 (D3.1 read "signals to four electrical signals", D3.2 reads "signals to symbol streams") but the stale lane count "four" in "Conversion of four optical signals" was left uncorrected. The cited subclause 180.5.3 (page 469 lines 28 to 31) states that the PMD Receive function converts "the n parallel optical signals" received from the MDI into separate symbol streams, and Clause 180 covers 200GBASE-DR1 (n=1), 400GBASE-DR2 (n=2), 800GBASE-DR4 (n=4) and 1.6TBASE-DR8 (n=8). A mandatory (M) PICS item requiring conversion of "four" optical signals is therefore incorrect for three of the four port types. The identical stale "four" survives the same rewording in the parallel rows: page 498 item F6 (180.12.4.1), page 527 item F7 (181.12.4.1), page 560 item F6 (182.12.4.1, cross-referencing 182.5.3 on page 539 line 28), and page 591 item F7 (183.12.4.1).

SuggestedRemedy

Change the Feature text in all four rows to "Conversion of the n optical signals to symbol streams", matching the wording of 180.5.3, 181.5.3, 182.5.3 and 183.5.3: page 498 item F6, page 527 item F7, page 560 item F6, and page 591 item F7.

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change feature of F6 in P498 and P560 to Conversion of n optical signals to symbol streams , n = 1,2,4,8

CI **181** SC **181.9.14** P**522** L**39** # **R2-116**
Issenhuth, Tom Huawei Technologies Co., Ltd,Issenhuth Consulting,
Comment Type **T** Comment Status **D** TFT (B) (OI)

The resolution of comment #R1-128 deleted the text ", except that the test fiber is not used". The comment only addressed 180.9.14 and did not request the same change in 181, 182 and 183.

SuggestedRemedy

In 181.9.14 change "The TECQ of the conformance test signal is measured according to 181.9.7, except that the test fiber is not used." to "The TECQ of the conformance test signal is measured according to 181.9.7."

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.
However, the change proposed in the suggested remedy is an improvement to the draft. Implement the suggested remedy with editorial license.

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

CI 181 SC 181.12.4.1 P528 L3 # R2-27

Hajduczenia, Marek

RG Nets

Comment Type E Comment Status D PICS (B) (OI)

The reworded Value/Comment for PICS item F9 states that Global_PMD_signal_detect "is an indicator of the presence of an optical signal on all lanes", but the referenced subclause 181.5.4 (page 507 line 28) states it "is a global indicator of the presence of optical signals on all 4 lanes". The D3.2 rewrite dropped both "global" and the lane count that D3.1 carried, so the PICS entry no longer restates the referenced requirement. The generic wording is appropriate in Clauses 180, 182 and 183, whose bodies use "all n lanes", but not in Clause 181. The affected PICS item is F9.

SuggestedRemedy

Change the Value/Comment of PICS item F9 on page 528 to match 181.5.4: "Global_PMD_signal_detect is a global indicator of the presence of optical signals on all 4 lanes".

Proposed Response Response Status W

PROPOSED REJECT.

The draft is accurate as written. Changing to the proposed remedy doesn't add clarity to the draft.

CI 182 SC 182.9.14 P554 L7 # R2-117

Issenhuth, Tom

Huawei Technologies Co., Ltd,Issenhuth Consulting,

Comment Type T Comment Status D Rx Sensitivity (B) (OI)

The resolution of comment #R1-128 deleted the text ", except that the test fiber is not used". The comment only addressed 180.9.14 and did not request the same change in 181, 182 and 183.

SuggestedRemedy

In 182.9.14 change "The TECQ of the conformance test signal is measured according to 182.9.7, except that the test fiber is not used." to "The TECQ of the conformance test signal is measured according to 182.9.7."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the change proposed in the suggested remedy is an improvement to the draft. Implement the suggested remedy [with editorial license].

CI 182 SC 182.9.14 P554 L7 # R2-28

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status D Rx Sensitivity (B) (OI)

The resolution of D3.1 comment R1-128 corrected the TECQ measurement cross-reference in 180.9.14 (D3.2 page 492 line 7 now reads "The TECQ of the conformance test signal is measured according to 180.9.7."), but the identical defect in the parallel clause 182.9.14 was not corrected. Page 554 line 7 still reads "The TECQ of the conformance test signal is measured according to 182.9.6, except that the test fiber is not used." Subclause 182.9.6 is "Transmitter and dispersion eye closure for PAM4 (TDECQ)" (page 551 line 20) - the TECQ measurement method is defined in 182.9.7 "Transmitter eye closure for PAM4 (TECQ)" (page 552 line 23). Secondly, 181.9.14 (page 522 line 39) and 183.9.14 (page 586 line 44) retain the "except that the test fiber is not used" wording removed from 180.9.14, although their cross-references are already correct.

SuggestedRemedy

In 182.9.14 on page 554 line 7, change to "The TECQ of the conformance test signal is measured according to 182.9.7." For consistency with the R1-128 resolution applied to 180.9.14, also delete ", except that the test fiber is not used" in 181.9.14 (page 522 line 39) and 183.9.14 (page 586 line 44).

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the change proposed in the suggested remedy is an improvement to the draft. Implement the suggested remedy with editorial license.

CI 182 SC 182.9.15 P555 L13 # R2-29

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status D (B) (OI)

The parallel receiver-sensitivity sentences in 182.9.14 and 182.9.15 diverge without technical justification following the D3.2 edit. 182.9.14 (page 554 lines 13 to 14) was updated to read "meets the BLER requirements in 182.2, measured at the PMA using the test method in either 174A.9.5 or 174A.9.6", but 182.9.15 (page 555 lines 12 to 13) was left as "meets the requirements in 182.2 using the test method in either 174A.9.5 or 174A.9.6", missing both "BLER" and "measured at the PMA".

SuggestedRemedy

On page 555 lines 12 to 13, change "meets the requirements in 182.2 using the test method in either 174A.9.5 or 174A.9.6" to "meets the BLER requirements in 182.2, measured at the PMA using the test method in either 174A.9.5 or 174A.9.6", matching 182.9.14.

Proposed Response Response Status W

PROPOSED 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 U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

CI 182

SC 182.9.15

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2026-09-03 4:12:16 PM

IEEE P802.3dj D3.2 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Ethernet 2nd SA recirculation ballot comment

CI 182 SC 182.12.4.6 P563 L17 # R2-81

Bruckman, Leon

NVIDIA

Comment Type TR Comment Status D PICS (B) (OI)

Table in 182.12.4.6 contains two PICS items both labeled "OM8": the first is "Transmitter functional symbol error histogram" (182.9.8) and the second is "Transmitter overshoot and undershoot" (182.9.9). The second OM8 and all subsequent items (OM9 through OM12) are offset by 1: OM8 should be OM9, OM9 should be OM10, etc. The same duplicate numbering exists in 183.12.4.4 (page 594).

SuggestedRemedy

In 182.12.4.6, renumber the duplicate OM8 ("Transmitter overshoot and undershoot") to OM9 and renumber all subsequent items OM9->OM10, OM10->OM11, OM11->OM12. Apply the same correction in 183.12.4.4.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the change proposed in the suggested remedy is an improvement to the draft.

In 182.12.4.6 and 183.12.4.4 change duplicate 'OM8' for "Transmitter functional symbol error histogram" to 'OM7'.

Implement with editorial license.

CI 183 SC 183.5.7 P570 L33 # R2-115

Issenhuth, Tom

Huawei Technologies Co., Ltd,Issenhuth Consulting,

Comment Type T Comment Status D TX disable (B) (OI)

183.5.7 is missing a third paragraph that is in 180.5.7, 181.5.7 and 182.5.7.

SuggestedRemedy

To keep all the IMDD optical clauses aligned, in 183.5.7 add a new third paragraph "If a PMD_fault is detected, then the PMD may set the Global_PMD_transmit_disable variable to one, turning off the optical transmitter in each lane."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the change proposed in the suggested remedy is an improvement to the draft. Implement the suggested remedy [with editorial license].

CI 183 SC 183.9.14 P586 L44 # R2-118

Issenhuth, Tom

Huawei Technologies Co., Ltd,Issenhuth Consulting,

Comment Type T Comment Status D Rx Sensitivity (B) (OI)

The resolution of comment #R1-128 deleted the text ", except that the test fiber is not used". The comment only addressed 180.9.14 and did not request the same change in 181, 182 and 183.

SuggestedRemedy

In 183.9.14 change "The TECQ of the conformance test signal is measured according to 183.9.7, except that the test fiber is not used." to "The TECQ of the conformance test signal is measured according to 183.9.7."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the change proposed in the suggested remedy is an improvement to the draft. Implement the suggested remedy with editorial license.

CI 184 SC 184.5.6 P603 L25 # R2-111

Ran, Adele

Cisco Systems, Inc.

Comment Type E Comment Status D (B) (L)

"BCH FEC codeword" (twice in this subclause) is inconsistent with the rest of the clause, which uses "BCH codeword". There is no other instance of "BCH FEC".

SuggestedRemedy

Change "BCH FEC codeword" to "BCH codeword", twice.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the change proposed in the suggested remedy is an improvement to the draft.

Implement the suggested remedy.

CI 184 SC 184.5.11 P607 L8 # R2-87

Ran, Adee

Cisco Systems, Inc.

Comment Type E Comment Status R (withdrawn) (L)

"2-bit pair" is redundant and arguably incorrect - Table 184-5 shows bit pairs, not pairs of 2 bits. Compare to 177.4.6 "8:1 bit-pair interleaving".

This term also appears in 184.6.3 with an additional issue:

"The DP-16QAM demapper function shall map the four bit streams from the receive signal processing to 2-bit pairs"

The "four bit streams" are not defined anywhere; the "Receive signal processing" subclause mentions two streams of 16QAM symbols.

SuggestedRemedy

P607 L8: Change "shall convert every 2-bit pairs" to "shall convert every bit pair".

P607 L12: Change "the resulting 2-bit pair to four-level signal mapping" to "the resulting bit pair to four-level signal mapping".

Table 184-5: In the table title and top row, change "2-bit pair" to "bit pair".

P608 L28: Change "shall map the four bit streams from the receive signal processing to 2-bit pairs" to "shall map the two 16QAM symbol streams from the receive signal processing to four streams of bit pairs".

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 185 SC 185.5.7 P628 L23 # R2-88

Ran, Adee

Cisco Systems, Inc.

Comment Type E Comment Status R editorial (OC)

"The global PMD transmit disable function enables the optical transmitter to be disabled"

Awkward phrasing.

Similar subclauses across the standard use the word "allows" instead: "allows all of the optical transmitters to be disabled" (12 instances in 802.3-2022, 4 in 802.3dj) or for single-lane, "allows the optical transmitter to be disabled" (9 instances in 802.3-2022, 1 in 802.3dj - 187.5.7).

SuggestedRemedy

Change "enables" to "allows".

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 185 SC 185.5.7 P628 L27 # R2-91

Ran, Adee

Cisco Systems, Inc.

Comment Type E Comment Status D editorial (B) (OC)

"If either Global_PMD_transmit_disable is set to 1 or the variable c_tx_mode = QUIET (see 185.5.11)"

inconsistent and awkward wording.

SuggestedRemedy

Change to

"If either Global_PMD_transmit_disable is set to 1 or c_tx_mode (see 185.5.11) is QUIET"

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 185 SC 185.5.7 P628 L27 # R2-30

Hajduczenia, Marek

RG Nets

Comment Type E Comment Status D editorial (B) (OC)

The sentence rewritten in D3.2 uses the numeral form "is set to 1", while the immediately following unchanged sentence in the same subclause (page 628 line 32) reads "set the Global_PMD_transmit_disable variable to one" and 185.5.8 (line 37) reads "set PMD_fault variable to one". D3.1 used "is set to one" here - the numeral was introduced by the edit, creating inconsistent value notation for the same variable within adjacent paragraphs.

SuggestedRemedy

On page 628 line 27, change "If either Global_PMD_transmit_disable is set to 1 or the variable c_tx_mode = QUIET (see 185.5.11)" to "If either Global_PMD_transmit_disable is set to one or the variable c_tx_mode = QUIET (see 185.5.11)".

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 185	SC 185.5.11	P628	L51	# R2-101
Ran, Adeo		Cisco Systems, Inc.		
Comment Type	E	Comment Status	D	RTS (B) (CA)
"A PMD shall provide the RTS function using the RTS with squelch state diagram (see 178B.11) as specified in Annex 178B" The referenced subclause includes two state diagrams. The relevant one for clause 185 is Figure 178B-14. There is no reference to the coherent RTS function definition (178B.10). "Annex 178B" is redundant.				
SuggestedRemedy				
Change to "A PMD shall provide the RTS function for coherent interfaces (see 178B.10) using the RTS with squelch state diagram (Figure 178B-14)".				
Proposed Response	Response Status W			
PROPOSED ACCEPT IN PRINCIPLE.				
Implement the suggested remedy with editorial license.				

Cl 185	SC 185.8.1	P634	L20	# R2-112
Ran, Adeo		Cisco Systems, Inc.		
Comment Type	E	Comment Status	D	Test patterns (B) (OC)
For pattern 8 (PRBS31 pattern encoded by 800GBASE-LR1 Inner FEC), the reference to 184.5.3 ("Permutation") is incorrect. The test pattern generator is defined in 184.7.				
SuggestedRemedy				
Change the reference to 184.7.				
Proposed Response	Response Status W			
PROPOSED ACCEPT IN PRINCIPLE.				
This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.				
However, the change proposed in the suggested remedy is an improvement to the draft. Implement the suggested remedy with editorial license.				

Cl 185	SC 185.8.1	P634	L32	# R2-143
Maniloff, Eric		Ciena Corporation		
Comment Type	T	Comment Status	D	Test patterns (OC)
Coherent test patterns should include Pattern7, valid 800GBASE-R data. A valid 800GBASE R signal encoded by the 800GBASE-LR1 Inner FEC is suitable for all items.				
SuggestedRemedy				
Add pattern 7 to all entries in Table 185-11				
Proposed Response	Response Status W			
PROPOSED REJECT.				
This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.				
Even though Pattern 7 could be used for measurement of the "other" parameters, defining Pattern 5 as the only pattern for testing the "other" parameters is sufficient.				

Cl 185	SC 185.11.4.1	P643	L35	# R2-31
Hajduczenia, Marek		RG Nets		
Comment Type	E	Comment Status	D	PICS (B) (OC)
D3.2 deleted the PICS item "Integration with management functions" (with cross-reference to the clause Overview) from the PMD functional specifications PICS of Clauses 180 (page 498), 181 (page 527), 182 (page 560) and 183 (page 591), renumbering the remaining F items. The identical item was left in place in the corresponding PICS of Clause 185 (page 643 line 35, "F2 Integration with management functions / 185.1 / O") and Clause 187 (page 720 line 35, "F2 ... / 187.1 / O"). Neither 185.1 nor 187.1 contains any statement about integration with management functions, so the same rationale applies and the six PMD clause PICS proformas are now inconsistent. The same deletion affects the parallel PICS table in 187.11.4.1.				
<i>SuggestedRemedy</i>				
In 185.11.4.1 (page 643 line 35) delete the row "F2 Integration with management functions / 185.1 / O" and renumber the remaining F items, updating any references to those item labels. Apply the same change in 187.11.4.1 (page 720 line 35).				
Proposed Response	Response Status W			
PROPOSED ACCEPT IN PRINCIPLE.				
This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.				
However, the change proposed in the suggested remedy is an improvement to the draft. Implement the suggested remedy with editorial license.				

CI 185 SC 185.11.4.1 P644 L3 # R2-32

Hajduczenia, Marek

RG Nets

Comment Type E Comment Status D PICS (B) (OC)

D3.2 removed "(optional)" from the 185.5.7 heading (page 628 line 21) and made the transmitter-off behaviour mandatory whenever c_tx_mode = QUIET (page 628 lines 27 to 29), driven by the mandatory RTS-with-squelch state diagram of 185.5.11 (page 628 line 51, "A PMD shall provide the RTS function using the RTS with squelch state diagram (see 178B.11)"). The Clause 185 PICS was not updated to match: item F8 "Global PMD transmit disable function" still has Status "MD:O", so no PICS item captures the now-mandatory squelch/transmitter-off requirement, and a PMD could answer "No" to F8 while still being required to implement 185.5.11. The affected PICS item is F8.

SuggestedRemedy

Update PICS item F8 in 185.11.4.1 to reflect the mandatory behaviour: either change F8's Status to M for the transmitter-off/squelch behaviour required by 185.5.7 and 185.5.11 while retaining a separate MD:O item for the optional Global_PMD_transmit_disable control variable, or, if optionality was intended, restore "(optional)" to the 185.5.7 heading and reword 185.5.7 accordingly.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change the status of PICS item F8 in 185.11.4.1 from "O" to "M".

CI 186 SC 186.2.2 P650 L8 # R2-95

Ran, Adeo

Cisco Systems, Inc.

Comment Type E Comment Status R (withdrawn) (L)

"from the client sublayer above" - unnecessarily wordy, and has no precedence in 802.3 - it's either ""client sublayer" or "sublayer above" (9 times each). In this amendment there are 35 other instances of "client sublayer" without "above".

The "client sublayer" was defined as "above the 800GBASE-ER1 FEC sublayer" in the first sentence of the subclause. This is sufficient. The remaining instances (3 in this subclause) should be just "client sublayer".

Also in 184.3, where there are two instances - only the first should be kept.

SuggestedRemedy

in 186.2.2, change the 2nd, 3rd, and 4th instances of "client sublayer above" to "client sublayer".

In 184.3, change the 2nd instance of "client sublayer above" to "client sublayer".

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 186 SC 186.2.2 P650 L22 # R2-93

Ran, Adeo

Cisco Systems, Inc.

Comment Type TR Comment Status D ER1 payload (CA)

In Table 186-1 the last column "Payload" contains values that are inconsistent with other specifications of ER1.

("Payload" is not defined in the text preceding the table, but based on the text in 186.2.3.3, the payload is what is mapped into the tributary frame)

In the first row, the value is "FEC:IS_UNITDATA.request" but this is a name of a service interface primitive, which communicates the input from the client (PCS or PMA). It does not describe the payload, because the payload is the output of the "Pre-mapping distribution" block (based on Figure 186-3) which has gone through the "inverse RS-FEC transmit" processing.

The 2nd through 4th rows have "Scrambled Idle", but there is no definition of scrambled idle in this clause. If the input is scrambled idle as generated by the PCS, then scrambling is removed by the inverse RS-FEC transmit processing, and the input to the mapping will be unscrambled idle characters. But there is no specified functionality to generate idle characters in clause 186.

The 5th row has "LF", which is not defined anywhere in the draft. I assume it means Local Fault, an ordered set that is defined in the Reconciliation Sublayer. It is mentioned in 186.2.4.7.3 (without definition or reference), part of the receive function. But the _transmit_ function is not supposed to send local faults to the link partner... that would contradict the established use of this ordered set.

Note that "local fault" in 186.2.4.7.3 should be the 257-bit blocks created by transcoding the Local Fault ordered sets. Also, the replacement by local fault is repeated twice, in 186.2.4.7.3 and in 186.2.4.8, but occurs only once - the second instance is redundant.

Furthermore, 186.2.6 states that for some values of c_tx_mode, "the payload of the ER1 FEC frame is filled with the scrambled idle test pattern defined in 186.2.3.12". But 186.2.3.12 does not define a scrambled idle test pattern - it defines an encoded PRBS31 (there is no scrambled idle generator function in this sublayer).

Furthermore, when SIGNAL_OK of FEC:IS_SIGNAL.request is FAIL (meaning the adjacent interface has no data and is not training) it will be reflected into the RTS function by c_adjacent_signal_ok=FAIL, and thus c_adjacent_intf_rx_ready=false and c_local_rts=false. These values prevent the RTS state diagram (Figure 178B-15) from progressing past TRAINING_COMPLETE, but it is either there or in TRAINING, so c_tx_mode will be either TRAINING or NOT-RTS. These values are both specified in 186.2.6 to generate the test pattern defined in 186.2.3.12 (encoded PRBS31), not local fault.

In summary, the payload depending on FEC:IS_SIGNAL.request(SIGNAL_OK) is either the output of the "Pre-mapping distribution" block, or the encoded PRBS31 test pattern generator; this would match Figure 186-3. There is no "scrambled idle" or "LF" generator in the transmit direction.

SuggestedRemedy

In Table 186-1:
Add the following footnote to the "Payload" heading: "Input to the GMP mapping function (see 186.2.3.3)".
In the first row, change the value "FEC:IS_UNITDATA.request" to "FEC flows" (matching the text in 186.2.3.3) or "Output of Pre-mapping distribution" (matching Figure 186-3).
In the 2nd through 5th row, change the value to "Output of Test-pattern generator".

In 186.2.6, change from
"the payload of the ER1 FEC frame is filled with the scrambled idle test pattern defined in 186.2.3.12"
to
"the payload of the ER1 FEC frame is filled with the test pattern defined in 186.2.3.12".

In 186.2.4.7.3, change "the payload area of the frame is replaced with local fault ordered sets" to "the payload area of the frame is replaced with 257-bit blocks corresponding to four Local Fault ordered sets (see 81.3.4 and 172.2.4.4)".

In 186.2.4.8, delete the (redundant) sentence "If the payload type or multiplex structure identification overhead (see 186.2.4.7.3) did not match the expected value, the 257-bit data blocks extracted from the GMP frame are replaced with LF ordered sets"

A contribution explaining the problems and the proposed changes will be provided.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The following related contribution was reviewed at the 802.3dj Annex 178B ad hoc meeting on 18 August 2026:
https://www.ieee802.org/3/dj/public/adhoc/178b/26_0818/ran_178b_01a_260818.pdf

The comment is discussing the pattern inserted into the payload area of the 800GBASE-ER1 tributary frame when mission data is not available from an AUI (or more generally from the upstream sublayer). This is not describing a test to be run, it is simply a pattern to fill the frame (i.e., the GMP mapper needs something to map). The 800GBASE-ER1 tributary frame will then have FEC applied, and a scrambler will be applied, so the details of the pattern that is inserted are not particularly important. As such, there is no need to prescribe exactly what pattern must be inserted. It is anticipated that typical implementations would insert a PRBS pattern or a stream of 257b idle control blocks.

Pending review of related slides in the following editorial contribution:
<URL>/brown_3dj_03_2609.pdf

<i>Cl</i> 186	<i>SC</i> 186.2.3.3	<i>P</i> 652	<i>L</i> 14	<i>#</i> R2-33
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Hajduczenia, Marek

RG Nets

<i>Comment Type</i>	TR	<i>Comment Status</i>	D	<i>ER1 payload (CA)</i>
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The sentence newly inserted at page 652 lines 6 to 7 states that "either the 8 FEC flows or a locally generated signal is mapped into the payload area", but the unmodified shall statement at line 14 still requires unconditionally that "The GMP mapper shall insert the serialized stream of 257-bit blocks corresponding to each FEC flow into the payload area of a 800GBASE-ER1 tributary frame." The normative requirement therefore contradicts the new descriptive text. In addition, the new "Payload" column of Table 186-1 calls for Scrambled Idle or LF to be transmitted for the non-OK SIGNAL_OK states, yet no normative text in 186.2.3 specifies how that locally generated Scrambled Idle or LF signal is produced or mapped into the payload area - the only Clause 186 mention of LF substitution is receive-side (page 665 line 28).

SuggestedRemedy

Revise the shall statement at page 652 line 14 to cover both cases, e.g. "The GMP mapper shall insert into the payload area of a 800GBASE-ER1 tributary frame either the serialized stream of 257-bit blocks corresponding to each FEC flow or the locally generated signal, as determined by Table 186-1." Additionally, add normative text in 186.2.3, or a cross-reference to an existing definition, specifying how the locally generated Scrambled Idle and LF signals identified in the Payload column of Table 186-1 are generated and encoded into 257-bit blocks for mapping. Update PICS as needed.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolved using the response to comment R2-93.

Cl 186 SC 186.2.3.11 P661 L16 # R2-96

Ran, Adeo Cisco Systems, Inc.

Comment Type E Comment Status D (B) (L)

Figure 186-10 contains the label "tx_fec_scrambled" which is not defined in clause 186 or anywhere in the draft.

186.2.3.9, which defines the scrambler, does not define any variables.

SuggestedRemedy

Delete the label "tx_fec_scrambled".

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the change proposed in the suggested remedy is an improvement to the draft. The vector tx_fec_scrambled is not defined anywhere, is not adding any useful information to the figure, and could cause confusion if left in the figure (because it is not defined).

Implement the suggested remedy.

Cl 186 SC 186.2.4.7.2 P664 L5 # R2-97

Ran, Adeo Cisco Systems, Inc.

Comment Type T Comment Status R (withdrawn) (L)

"The STAT octet present in every 800GBASE-ER1 tributary frame shall be monitored"

There is no specification of what to do with the received value. "Monitored" is an undefined requirement.

Based on 186.2.3.5.2, the information in this octet is "remote PHY fault", which is essentially the "local fault" of the link partner. Whether it is monitored or not does not seem to affect interoperability and should not be a normative requirement.

SuggestedRemedy

Change this sentence to "The STAT octet present in every 800GBASE-ER1 tributary frame includes the remote PHY fault indication (see 186.2.3.5.2)".

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

Cl 186 SC 186.2.4.7.6 P665 L6 # R2-34

Hajduczenia, Marek RG Nets

Comment Type TR Comment Status D (B) (L)

The resolution of D3.1 comment R1-59, which re-based the CSTAT bit references to the 0-based numbering of Figure 186-6, was implemented only on the transmit side. 186.2.3.5.11 (page 659 lines 5 to 8) now places am_sf<0> in CSTAT<5>, am_sf<1> (ORed with IFEC_degraded_SER) in CSTAT<7>, and am_sf<2> in CSTAT<6>. The mirror-image receive text in 186.2.4.7.6 (page 665 lines 6 to 10) is unchanged from D3.1 and still extracts am_sf<0> from CSTAT<6>, am_sf<2> from CSTAT<7>, and am_sf<1> from CSTAT<8>.

The transmitter and receiver therefore disagree in both bit indices and am_sf mapping, and CSTAT<8> lies outside the 8-bit 0-based CSTAT field of Figure 186-6. The lead-in on page 665 line 4 also states "The information in bits 5-7", which contradicts the CSTAT<6> CSTAT<7> CSTAT<8> bullets below it. As written, an implementation built from 186.2.4.7.6 cannot interoperate with one built from 186.2.3.5.11.

SuggestedRemedy

In 186.2.4.7.6 on page 665, change the three bullets to align with 186.2.3.5.11: "The value in CSTAT<5> is replicated to am_sf<0> of the two flows" - "The value in CSTAT<6> is replicated to am_sf<2> of the two flows" - "The value in CSTAT<7> is logically ORed with FEC_degraded_SER and replicated to am_sf<1> of the two flows".

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment points out an error that needs to be fixed.

Implement the suggested remedy with editorial license.

Cl 186 SC 186.2.4.7.6 P665 L6 # R2-80

Bruckman, Leon

NVIDIA

Comment Type TR Comment Status D (B) (L)

D3.2 updated 186.2.3.5.11 (transmit CSTAT) to shift the bit assignments from CSTAT<6/7/8> to CSTAT<5/6/7>: am_sf<0> -> CSTAT<5>, am_sf<2> -> CSTAT<6>, am_sf<1> -> CSTAT<7>. However, 186.2.4.7.6 (receive CSTAT) was not updated and still reads: CSTAT<6> -> am_sf<0>, CSTAT<7> -> am_sf<2>, CSTAT<8> -> am_sf<1>. The transmit and receive CSTAT bit assignments are now inconsistent: the transmitter encodes am_sf into bits 5-7 but the receiver attempts to decode from bits 6-8. A link implemented per this specification would fail to correctly transfer the am_sf<2:0> alignment marker subfield information.

SuggestedRemedy

Update 186.2.4.7.6 to match the transmit mapping in 186.2.3.5.11: change "CSTAT<6> is replicated to am_sf<0>" to "CSTAT<5> is replicated to am_sf<0>", "CSTAT<7> is replicated to am_sf<2>" to "CSTAT<6> is replicated to am_sf<2>", and "CSTAT<8> is logically ORed" to "CSTAT<7> is logically ORed". Update the reference to "bits 5-7" accordingly.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment points out an error that needs to be fixed.

Resolved using the response to comment R2-34.

[Editor's note: changed page number from 664 to 665]

Cl 186 SC 186.2.6 P668 L14 # R2-35

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status D (B) (L)

The newly inserted 186.2.6 states "The ER1 FEC shall provide the ready-to-send (RTS) function using the RTS without squelch state diagram (see 178B.11) as specified in Annex 178B." This mandatory requirement has no corresponding item in the Clause 186 PICS proforma - the Major capabilities/options table in 186.8.3.1 (page 696) lists only MD, DC, LBL, LBR, AML and TS. Comparable mandatory APSU requirements elsewhere in the draft do have PICS items (PMDAPSU for 178.8.9 on page 414 and for 179.8.9 on page 459, AUIPSU for 176C.6.3 on page 819).

SuggestedRemedy

Add an item to the Major capabilities/options table in 186.8.3.1 on page 696, consistent with the PMDAPSU entries in Clauses 178 and 179, e.g. Item "FECAPSU", Feature "APSU functions in the ER1 FEC", Subclause "186.2.6", Value/Comment "Provides the RTS function using the RTS without squelch state diagram of 178B.11", Status "M", Support "Yes []".

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

CI 186 SC 186.2.6 P668 L14 # R2-36

Hajduczenia, Marek

RG Nets

Comment Type TR Comment Status D (B) (CA)

186.2.6 requires the 800GBASE-ER1 FEC sublayer to use the "RTS without squelch state diagram", but the criterion for choosing between the two variants, given in the referenced subclause 178B.11 (page 906 lines 19 to 22), is expressed solely in terms of PMD behaviour: "A coherent PMD that squelches the output when the PMD is not ready to send uses the RTS with squelch state diagram ... A coherent PMD that does not squelch the output ... uses the RTS without squelch state diagram." Clauses 186 and 187 contain no statement that the 800GBASE-ER1 PMD does not squelch its output, so the selection made in 186.2.6 is not traceable to the stated criterion. This contrasts with the 800GBASE-LR1 case, where the PMD itself provides the RTS function (185.5.11, page 628 line 51) and squelching is explicitly specified (page 629 line 1).

SuggestedRemedy

Reword the criterion in 178B.11 (page 906 lines 19 to 22) in terms of the coherent interface rather than the PMD, consistent with 178B.11.2 (page 906 lines 36 to 37), e.g. "A coherent interface whose PMD squelches the output when not ready to send uses the RTS with squelch state diagram (Figure 178B-14) - otherwise it uses the RTS without squelch state diagram (Figure 178B-15)." Alternatively, add a statement in 187.5.11 (page 707) that the 800GBASE-ER1 PMD does not squelch its output when not ready to send.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
Resolved using the response to comment R2-102.

CI 186 SC 186.2.6 P668 L14 # R2-102

Ran, Adeo

Cisco Systems, Inc.

Comment Type E Comment Status D (B) (CA)

"The ER1 FEC shall provide the ready-to-send (RTS) function using the RTS without squelch state diagram (see 178B.11) as specified in Annex 178B."
The referenced subclause includes two state diagrams. The relevant one for clause 186 is Figure 178B-15.
There is no reference to the coherent RTS function definition (178B.10).
"Annex 178B" is redundant.

SuggestedRemedy

Change to "A PMD shall provide the RTS function for coherent interfaces (see 178B.10) using the RTS without squelch state diagram (Figure 178B-15)".

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change the text to:

"The ER1 FEC shall provide the ready-to-send (RTS) function for coherent interfaces (see 178B.10) using the RTS without squelch state diagram (Figure 178B-15)."

CI 186 SC 186.2.6 P668 L17 # R2-177

Huber, Thomas

Nokia

Comment Type ER Comment Status D (B) (CA)

The signaling of RTS status is between peer interfaces and is performed by the transmit function. This should be made more clear.

SuggestedRemedy

Change "The RTS status is signaled via the MNT bits..."
to

"In the transmit function, the RTS status is signaled to the peer node via the MNT bits..."

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 186 SC 186.2.6 P668 L18 # R2-178

Huber, Thomas

Nokia

Comment Type ER Comment Status D (B) (CA)

Setting c_rts_status is part of the receive function; this should be more clear.

SuggestedRemedy

Change "The variable c_rts_status is set..."
to

"In the receive function, the variable c_rts_status is set ..."

Proposed Response Response Status W

PROPOSED ACCEPT.

CI **186** SC **186.2.6** P**668** L**20** # **R2-37**

Hajduczenia, Marek

RG Nets

Comment Type **TR** Comment Status **D** ER1 payload (CA)

The new subclause 186.2.6, added in D3.2 in response to D3.1 comment R1-68, states that for c_tx_mode = TRAINING, NOT-RTS, RTS, or FILL "the payload of the ER1 FEC frame is filled with the scrambled idle test pattern defined in 186.2.3.12." This is wrong on two counts. (1) 186.2.3.12 (page 661 lines 31 to 35) defines only a PRBS31 test pattern with initial state of all ones as specified in 49.2.8, and its generation is conditioned on tx_test_mode = 1 - no scrambled idle pattern is defined anywhere in Clause 186. The scrambled idle test pattern is defined in 172.2.4.11 (page 303 lines 3 to 5). Table 187-10 (page 713) already gets this right, citing "172.2.4, 186.2.3.12" for the scrambled idle pattern and "186.2.3.12" alone for PRBS31. (2) 186.2.3.12 fills the payload area of each of the eight 800GBASE-ER1 tributary frames before the GMP mapping process, not "the payload of the ER1 FEC frame". In addition, the three "Scrambled Idle" entries in the new Payload column of Table 186-1 (page 650) carry no cross-reference at all, leaving an undefined normative term.

SuggestedRemedy

In 186.2.6 at page 668 lines 20 to 22, replace the sentence with wording that cites the defining subclause and the correct payload area, e.g. "When c_tx_mode = TRAINING, NOT-RTS, RTS, or FILL, the payload area of each of the eight 800GBASE-ER1 tributary frames is filled with the scrambled idle test pattern defined in 172.2.4.11, encoded by the 800GBASE-ER1 FEC sublayer." If PRBS31 is intended, as in the parallel LR1 text at 185.5.11 (page 629 line 3), cite 186.2.3.12 and name PRBS31 explicitly. Add the corresponding cross-reference to the three "Scrambled Idle" entries in the Payload column of Table 186-1 on page 650.

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolved using the response to comment R2-93.

CI **186** SC **186.8.3.2** P**696** L**38** # **R2-175**

Nicholl, Gary

Cisco Systems, Inc.

Comment Type **ER** Comment Status **D** (B) (L)

The entry in the support column for PICS item TF6 is incorrect. This is a conditional mandatory item, so the support column should be "Yes [], N/A []" and not "Yes [], No []". A similar issue exists with PICS item RF10 in 186.8.3.3.

SuggestedRemedy

Change the support column for PICS item TF6 in 186.8.3.2 from "Yes [], No []" to "Yes [], N/A []".

Change the support column for PICS item RF10 in 186.8.3.3 from "Yes [], No []" to "Yes [], N/A []".

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot. However, the comment identifies an error in the draft that should be corrected.

Implement the suggested remedy.

CI 187 SC 187.8.1 P713 L9 # R2-94

Ran, Adeel

Cisco Systems, Inc.

Comment Type ER Comment Status D Test patterns (B) (OC)

Incorrect references for test patterns 5 and 7:

Pattern 5, "Scrambled idle encoded by the 800GBASE-ER1 FEC sublayer", is generated by the 800GBASE-R PCS but then descrambled and re-encoded by the 800GBASE-ER1 Transmit function. The existing references are 172.2.4 (the PCS transmit function) and 186.2.3.12, which defines a PRBS31-based test pattern generator. There is no scrambled idle generator function in clause 186.

Pattern 7, "Valid 800GBASE-R signal encoded by the 800GBASE-ER1 FEC sublayer", also has a reference to 186.2.3.12, which is irrelevant.

Suggested Remedy

For pattern 5, change the reference from 172.2.4 to 172.2.4.11 (external) for the scrambled idle generator, and add 186.2.3 for the 800GBASE-ER1 transmit function.

For pattern 7, delete the reference to 186.2.3.12, and add instead 186.2.3 for the 800GBASE-ER1 transmit function.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3dj D3.1 and D3.2 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

However, the comment identifies an error in the draft that should be corrected.

For pattern 5 change "Defined in" column to "172.2.4.11, 186.2.3"

For pattern 7 change "Defined in" column to "172.2.4, 186.2.3"