802.3dj D1.2 Comment Resolution Common Track

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Introduction

- This slide package was assembled by the 802.3dj editorial team to provide background and detailed resolutions to aid in comment resolution.
- Specifically, these slides are for the various common track comments.

Block error ratio method simplification Comment 78

Cl 174A	*SC* 174A.6.1.4	*P*643	*L*31	# 78

Ran, Adee — Cisco Systems, Inc.

Comment Type T *Comment Status* D *(bucket)*

The description of the process can be simplified by initializing the distribution to that of BER_added (step c) and then iterating with i from 0 to p-1 (instead of treating i=0 as initial value). This would remove two steps (a and d) and yield the same result with fewer intermediate variables..

SuggestedRemedy

Rewrite the process as suggested.

Proposed Response *Response Status* W

PROPOSED ACCEPT IN PRINCIPLE.
The suggested change is indeed an improvement to the draft. The method is simplified without changing the result.
For illustration, the method rewritten as suggested is shown on the slide for Comment 78 in the following file:
https://www.ieee802.org/3/dj/public/24_11/brown_3dj_03_2411.pdf
Implement the suggested remedy with editorial license.

174A.6.1.4 Block error ratio method using PMA-based measurements

The test method measures the performance of all physical lanes in a PMD or xAUI-n as a group using error checkers and counters in the PMA. If this test passes, then PHY or xMII Extender will meet the expected codeword error ratio.

Determine the block error ratio as follows:

a) Initialize $H_m(k)$ to $H_m^{(0)}(k)$.
b) For $i = 1$ to $p-1$, iteratively assign $H_m(k)$ the result of Equation (174A–3) substituting $H_m(k)$ for $H_x(k)$ and $H_m^{(i)}(k)$ for $H_y(k)$.
c) Assign the result of Equation (174A–1) with BER = BER_{added} to $H_a(k)$.
d) Assign the result of Equation (174A–3) substituting $H_m(k)$ for $H_x(k)$ and $H_a(k)$ for $H_y(k)$ to $H_e(k)$.
e) Compute the block error ratio (*KER*) using Equation (174A–4).

$$H(k) = \sum_{j=0}^{k} H_x(j) H_y(k-j) \qquad (174A–3)$$

$$KER = \sum_{k>15} H_e(k) \qquad (174A–4)$$

The expected block error ratio is met if *KER* is less than the codeword error ratio limit specified in 174A.4 for an xMII Extender or 174A.5 for a PHY-to-PHY link.

The procedure revised as suggested by the comment would be as follows:

Determine the block error ratio as follows:
a) Assign the result of Equation (174A–1) with BER = BER_{added} to $H_m(k)$.
b) For i = 0 to p–1, iteratively assign $H_m(k)$ the result of Equation (174A–3) substituting $H_m(k)$ for $H_x(k)$ and $H_m^{(i)}(k)$ for $H_y(k)$.
c) Compute the block error ratio (KER) using Equation (174A–4).

Block error counters in PMA Comment 135

Cl 176	*SC* 176.7.4	*P* 281	*L* 8	# 135

Brown, Matt — Alphawave Semi

Comment Type T *Comment Status* D *pma counters*

176A.5 defines test methodologies for measuring block errors without the use of a PCS. This methodology generates and check a PRBS31Q sequence in the PMA. New counters are required for each lane attached to a PMD or AUI component associated with the PRBS31Q error checker.

SuggestedRemedy

Define new counters as summarized in 174A.6.1.1.

Proposed Response *Response Status* W

PROPOSED ACCEPT IN PRINCIPLE.
The comment refers to 176A.5, but should rather refer to 174A.6.
Pending review of slide(s) for comment #135 in the following editorial contribution:
https://www.ieee802.org/3/dj/public/24_11/brown_3dj_03_2411.pdf

174A.6.1.1 PMA block error counters

Test symbols are defined as non-overlapping groups of 5 consecutive PAM4 symbols or, equivalently, 10 consecutive bits.

A test block is defined as a set of $544 / p$ test symbols composed of every fourth test symbol in a set of $4 \times 544 / p$ consecutive test symbols, where p is the number of physical lanes.

17 bin counters, tbecount(k), are defined as follows:

— for k in the range 0 to 15, tbecount(k) counts test blocks with k test symbol errors
— tbecount(16) counts test blocks with 16 or more test symbol errors

Counter, tbtcount, counts the total number of test blocks analyzed. It may be determined from the sum of tbecount(k).

Define one set of counters for each PMA lane (i) attached to an Inner FEC sublayer, a PMD sublayer, or an AUI component.

17 counters are defined for each PMA lane (i)
test_block_error_count_k_i
k is the number of test symbols in the test block, k = 0 to 16
i is the lane number, i = 0 to n-1, where n is the number of lanes

Test_block_error_count_16_i is a special case counting test blocks with 16 or more (not just 16) test symbol errors

Note that tbt_count can be determined from the sum of all test_block_error_count_k_i for each lane i

Counting is defined in 174A.6.1.1