Cl **9** *SC* **9.4.2** *P* **53** *L* **26** # R2-22

Tse, Richard Microchip Technology, Inc.

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

This comment addresses the rejected comment R2-1 from draft D3.1, for which additional analysis was requested to find modifications that could gain consensus..

The suggested remedy was created by a team that consisted of individuals from the D3.1 comment resolution meeting that expressed interest in tackling this issue.

SuggestedRemedy

In 90.3, remove the following sentence from the 2nd paragraph:
"The MDI of this standard corresponds to the timestamp generation reference plane in IEEE Std 1588 and IEEE Std 802.1AS."

In 90.3, attach the following text at the end of the last paragraph of the subclause:
"The MDI of this standard serves as the model for the timestamp generation reference plane in IEEE Std 1588 and IEEE Std 802.1AS. This is true for PHYs that have a constant path data delay and is modeled by the xMII timestamp measurement plane (see 90.5) and the reported transmit and receive path data delay values (see 90.7). However, for PHYs that contain functions with transmit intrinsic delay variations that are mirrored by corresponding receive intrinsic delay variations (see 90A.7), the timestamp generation reference plane is still modeled by the xMII timestamp measurement plane and the reported transmit and receive path data delay values because, as described in 90.7.1, 90A.4, and 90A.7, the correct results are produced for the end-to-end delay measurements."

In 90.4.3.1.1, add the following sentence as a new paragraph before the paragraph that starts with "The use of the beggining of the SFD...":::
"The information given by the DDMP parameter may be used by a TimeSync Client to get bit time resolution for the timestamp capture for the DDMP in the xMII word."

In 90.4.3.2.1, add the following sentence as a new paragraph before the paragraph that starts with "The use of the beggining of the SFD...":
"The information given by the DDMP parameter may be used by a TimeSync Client to get bit time resolution for the timestamp capture for the DDMP in the xMII word."

In 90A.7, change the paragraph that follows Figure 90A-5 to the following:
"It is recommended to use this method to model all PHY delay variations of this nature. When using this method, it is also recommended to remain consistent with the FEC (see 90.7.1) and the multiple PCS lane distribution/merging functions (see 90.7.1 and 90A.4) and allocate the maximum value of the intrinsic delay to the transmit PHY and the minimum value of the intrinsic delay to the receive PHY. A couple of common PHY functions that have delay variations of this nature but that are not dealt with specifically in this standard are 64B/66B encoding/decoding and pulse amplitude modulation (PAM) encoding/decoding. There might be others."

Response *Response Status* **C**

ACCEPT.

Cl **30** *SC* **30.13.1.15** *P* **24** *L* **17** # R2-6

Ward, Lisa Rohde & Schwarz

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

quick editorial comment that is not critical and could be done during the final editorial review before publication: there seems to be a missing parenthesis after instances in the following sentence: "If a Clause 45 MDIO Interface to PCS is present, then the value stored in this attribute is equal to
the value stored in the following instantiated MDIO register (for each MMD, in case of multiple
instances"

SuggestedRemedy

Insert parenthesis after "instances" : "If a Clause 45 MDIO Interface to PCS is present, then the value stored in this attribute is equal to
the value stored in the following instantiated MDIO register (for each MMD, in case of multiple
instances):"

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3.67** *P* **33** *L* **49** # R2-16

Tse, Richard Microchip Technology, Inc.

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

A number of cross references to 90.7 were not updated when 90.7.1, 90.7.2, and 90.7.3 were created.

SuggestedRemedy

page 33 line 49 and 52, two instances of 90.7 should be 90.7.1.
page 34 line 48 and 51, two instances of 90.7 should be 90.7.1.
page 71 line 51, should be 90.7.1
page 72 line 12, should be 90.7.1
page 73 line 7, should be 90.7.2
page 73 line 32, should be 90.7.2
page 74 line 15, should be 90.7.3

Response *Response Status* **C**

ACCEPT.

Cl **90** *SC* **90.2** *P* **50** *L* **12** # R2-1

Brown, Matthew Huawei Technologies Canada

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

The editing instruction is specifically for the first paragraph in 90.2.

SuggestedRemedy

Delete the second paragraph and lettered list.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

There is also a small change in the lettered list, so changed the editorial instructions to read "Change the first paragraph and the lettered list in 90.2 as shown below:"

Cl **90** *SC* **90.4** *P* **51** *L* **2** # R2-2

Brown, Matthew Huawei Technologies Canada

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

In an editing instruction for the replace instruction, only the new text, figure, etc. is shown, otherwise use the change instruction should be used.

SuggestedRemedy

Delete the old version of Figure 90-1 as shown with a red X through it.

Response *Response Status* **C**

ACCEPT.

Cl **90** *SC* **90.5** *P* **56** *L* **15** # R2-4

Brown, Matthew Huawei Technologies Canada

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

In an editing instruction for the replace instruction, only the new text, figure, etc. is shown, otherwise use the change instruction should be used.

SuggestedRemedy

Delete the old version of Figure 90-2 as shown with a red X through it.

Response *Response Status* **C**

ACCEPT.

Cl **90** *SC* **90.7** *P* **63** *L* **12** # R2-30

Regev, Alon Keysight Technologies

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

*** Comment submitted with the file Discussion on p802.3cx D3.1 comment R1-2 28Nov2022.pptx attached ***

The language "the beginning of the SFD or the beginning of the first symbol after the SFD" is ambiguous on all interfaces other than xMII (for example, the MDI). There are symbols that may include both part of the SFD and part of the destination address. There are cases where in-between the SFD and the DA we have symbols related to control or overhead associated with the enocding and it's not clear which symbol to use. I am attaching a presentation introducing the issue

SuggestedRemedy

Richard Tse has proposed an approach and a draft text. I support the approach in his submission.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Addressed by comment R2-22

Cl **90** *SC* **90.7.3** *P* **65** *L* **24** # R2-27

Rodrigues, Silvana Huawei Technologies Co., Ltd

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

Based on my understanding, the deskew buffer is used for the alignment of PMA/PMD lanes, see the figure 90A-1 of page 75, so it's proposed to use PMA/PMD instead of PCS for the second paragraph of 90.7.3.

SuggestedRemedy

Replace "PCS" with "PMA/PMD" in the second paragraph of 90.7.3 (line 24 to line 28)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

In 90.7.3 changed "Lane skew is possible on a transmitter with multiple PMA/PMD lanes when the PMA/PMD lanes have different static latencies such that their alignment markers appear staggered as they depart the device at the MDI output." to "Lane skew is possible on a transmitter with multiple PCS and PMA/PMD lanes when these lanes have different static latencies such that their alignment markers appear staggered as they depart the device at the MDI output."

in 90.7.3 in the second paragraph, replaced all instances of "PCS lanes" with "lanes".

Cl **90** *SC* **90.8.3** *P* **67** *L* **8** # R2-17

Tse, Richard Microchip Technology, Inc.

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

TS_TX_MM1 is a replacement of TS_T2.

SuggestedRemedy

Mark the changes in changing TS_T2 to TS_TX_MM1

Response *Response Status* **C**

ACCEPT.

Cl **90** *SC* **90.8.3** *P* **67** *L* **20** # R2-19

Tse, Richard Microchip Technology, Inc.

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

The description for TS_TX_MM3 is only valid for when the DDMP = beginning of symbol after SFD. An additional PICS item, which is a modification of TS_T3, is needed for when the DDMP = beginning of SFD.

SuggestedRemedy

1. To keep the ordering of having DDMP=SFD before DDMP=symbol after SFD, rename TS_TX_MM3 to TS_TX_MM4.

2. Change the previous TS_T3 PICS item into TS_TX_MM3, with change bars and with the following Feature and Description:
Feature: The value of MM parameter of the TS_TX.indication primitive, the beginning of the SFD is selected as the DDMP
Description: When the MAC Merge sublayer is instantiated and the beginning of the SFD is selected as the DDMP, the value of the MM parameter of the TS_TX.indication primitive is set to EMAC if an SMD-E is detected and to PMAC if an SMD-S is detected.

3. Change the Feature and Description of the newly named TS_TX_MM4 with a qualification of DDMP = beginning of SFD::
Feature: The value of MM parameter of the TS_TX.indication primitive, the beginning of the symbol after the SFD is selected as the DDMP
Description: When the MAC Merge sublayer is instantiated and the beginning of the symbol after SFD is selected as the DDMP, the value of the MM parameter of the TS_TX.indication primitive is set to EMAC if an SMD-E preceded the DDMP and to PMAC if an SMD-S preceded the DDMP.

4. To support item 2 above, add the following text after the 2nd paragraph in 90.5.1:
"The value of the MM parameter of the TS_TX.indication primitive shall be set to EMAC if an SMD-E is detected and to PMAC if an SMD-S is detected."

5. For the last sentence in the the last paragraph in 90.5.1, eliminate the qualifying condition of MM instantiation since this was already established at the beginning of this paragraph and its inclusion in this sentence implies that the other qualifying condition of the paragraph, that DDMP = beginning of symbol after SFD, is no longer valid. The modifiied sentence is as shown below.
"The value of the MM parameter of the TS_TX.indication primitive shall be set to EMAC if an SMD-E preceded the DDMP and to PMAC if an SMD-S preceded the DDMP."

Response *Response Status* **C**

ACCEPT.

Cl **90** *SC* **90.8.3** *P* **67** *L* **29** # R2-18

Tse, Richard Microchip Technology, Inc.

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

TS_RX_MM1 is a replacement of TS_R2.

SuggestedRemedy

Mark the changes in changing TS_R2 to TS_RX_MM1

Response *Response Status* **C**

ACCEPT.

Cl **90** *SC* **90.8.3** *P* **67** *L* **41** # R2-20

Tse, Richard Microchip Technology, Inc.

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

The description for TS_RX_MM3 is only valid for when the DDMP = beginning of symbol after SFD. An additional PICS item, which is a modification of TS_R3, is needed for when the DDMP = beginning of SFD. .

SuggestedRemedy

1. To keep the ordering of having DDMP=SFD before DDMP=symbol after SFD, rename TS_RX_MM3 to TS_RX_MM4.

2. Change the previous TS_R3 PICS item into TS_RX_MM3, with change bars and with the following Feature and Description:
Feature: The value of MM parameter of the TS_RX.indication primitive, the beginning of the SFD is selected as the DDMP
Description: When the MAC Merge sublayer is instantiated and the beginning of the SFD is selected as the DDMP, the value of the MM parameter of the TS_RX.indication primitive is set to EMAC if an SMD-E is detected and to PMAC if an SMD-S is detected.

3. Change the Feature and Description of the newly named TS_RX_MM4 with a qualification of DDMP = beginning of symbol after SFD:
Feature: The value of MM parameter of the TS_RX.indication primitive, the beginning of the symbol after the SFD is selected as the DDMP
Description: When the MAC Merge sublayer is instantiated and the beginning of the symbol after SFD is selected as the DDMP, the value of the MM parameter of the TS_RX.indication primitive is set to EMAC if an SMD-E preceded the DDMP and to PMAC if an SMD-S preceded the DDMP.

4. To support item 2 above, add the following text after the 2nd paragraph in 90.5.2:
"The value of the MM parameter of the TS_RX.indication primitive shall be set to EMAC if an SMD-E is detected and to PMAC if an SMD-S is detected."

5. For the last sentence in the last paragraph in 90.5.2, eliminate the qualifying condition of MM instantiation since this was already established at the beginning of this paragraph and its inclusion in this sentence implies that the other qualifying condition of the paragraph, that DDMP = beginning of symbol after SFD, is no longer valid. The modified sentence is as shown below.
"The value of the MM parameter of the TS_RX.indication primitive shall be set to EMAC if an SMD-E preceded the DDMP and to PMAC if an SMD-S preceded the DDMP."

Response *Response Status* **C**

ACCEPT.

Cl **90A** *SC* **90A.5** *P* **74** *L* **8** # R2-3

Brown, Matthew Huawei Technologies Canada

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

This statement (copied below) appears to be a normative statement. Normative statements are not permitted in an informative clause or annex.
"If a PHY does not perform insertion or removal of alignment markers, codeword markers, or Idles, then the TX/RX NUM_BIT_CHANGE signals are not needed and are fixed to the value zero."

SuggestedRemedy

If this is specified normatively in a normative clause then reference the subclause. If not, add a normative statement in a normative clause.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Removed “and are fixed to the value zero.” from the sentence as it is not needed, but appears to make the statement normative.

Cl **90A** *SC* **90A.6** *P* **75** *L* **27** # R2-28

Rodrigues, Silvana Huawei Technologies Co., Ltd

Comment Type **G** *Comment Status* **A**

The lables of Figure 90A-1 seems not fully consistent, I propose to revise them.

SuggestedRemedy

1. Change "PCS transmitter (TX) lane delay" to "PCS transmitter lane delay"
2. Change "Lane delay through the medium PMD/" to "Lane delay through the medium"
3. Change "PMA/FEC/deskew receiver (RX) lane" to "PMA/PMD receiver lane delay"
4. Change "delay PCS receiver lane delay" to "PCS receiver lane delay"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

1. Change "PCS transmitter (TX) lane delay" to "PCS transmitter lane delay"
2. Change "Lane delay through the medium PMD/" to "Lane delay through the medium"
3. Change "PMA/FEC/deskew receiver (RX) lane" to "receiver and deskew lane delay"
4. Change "delay PCS receiver lane delay" to "post-deskew lane delay"

Cl **90A** *SC* **90A.7** *P* **75** *L* **40** # R2-21

Tse, Richard Microchip Technology, Inc.

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

The following terms are used in 90A.
"intrinsic delay variation(s)"
"intrinsic varying delay(s)"
"varying intrinsic delay(s)"
All terms are technically correct, but for consistency, only one of these terms should be used.

SuggestedRemedy

Because the main concept that is meant to be relayed by these terms is not that the intrinsic delay is varying but that the delay variation or varying delay is intrinsic to the function, I believe "intrinsic delay variation" and "intrinsic varying delay" are both better than "varying intrinsic delay".
Between "intrinsic varying delay" and "intrinsic delay variation", the latter is better because it is well described in the first paragraph of 90A.4.

Replace "varying intrinsic delay" and "intrinsic varying delay" with "intrinsic delay variation" throughout 90A.

Response *Response Status* **C**

ACCEPT.

Cl **90A** *SC* **90A.7** *P* **76** *L* **25** # R2-5

Brown, Matthew Huawei Technologies Canada

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

In Figure 90A-3, Figure 90A-4, and Figure 90A-5 there is no description/label or units on either x or y axis.

SuggestedRemedy

Add description and units to x and y axes for each figure.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Added the following labels to axes:

X: time
Y: delay

Since actual units (seconds, ms, etc.) are not relevant (figures are only explaining the concept, nothing else), units were NOT added.

Cl **90A** *SC* **90A.7** *P* **77** *L* **46** # R2-29

Rodrigues, Silvana Huawei Technologies Co., Ltd

Comment Type **G** *Comment Status* **A**

The lables of Figure 90A-5 seems not fully consistent, I propose to revise them.

SuggestedRemedy

1. Change the second label with "total delay" to "total receiver delay"
2. Change the third label with "total delay" to "sum of total transmitter delay and receiver delay"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Changed the second label with "total delay" to "total receiver delay". No changes to the third label.

Cl **90A** *SC* **90A.7** *P* **78** *L* **1** # R2-15

Tse, Richard Microchip Technology, Inc.

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

Per the discussion in the comment resolution meeting on Nov 15, 2022, corrections and improvements to the newly text at the end of 90A.7 are given in this comment.

An acknowledgement is given to Andras de Koos for his contribution to this comment.

SuggestedRemedy

A). In the first paragraph, rearrange "transmit" and "receive" so the terms "transmit function" and "receive function" are used. This keeps it consistent with the rest of 90A.7.

The example shown in Figure 90A–3, Figure 90A–4, and Figure 90A–5 have the maximum delays of all transmit functions and the minimum delays of all receive functions aligned at the beginning of time. This ideal alignment will occur periodically if at least one of the following scenarios is true:

B). Delete list item 3). It is just an example of list item 2).
Also, per A), continue use of the terms "transmit functions and "receive functions".

1) The alignment of the transmit (or receive) functions is enforced by a specified relationship between them
2) The transmit (or receive) functions' periods are unrelated, i.e. the maxima (and minima) of the transmit (or receive) functions' latency are guaranteed to coincide eventually.

C). The concepts discussed in the last 2 paragraphs can be described together. Continue using the terms "transmit functions" and "receive functions". Replace those 2 paragraphs with the following::

When there is no fixed alignment between transmit (or receive) functions, and the functions' periods are related by a simplified ratio of N/M, where N ≤ M, the maximum (or minimum) aggregated delay of the functions is not the simple sum of their individual maximum (or minimum) delays. Instead, the maximum (or minimum) aggregated delay depends on the in-situ alignment of the functions. How this aggregated delay is determined and accounted for in the transmit (or receive) path data delay value is beyond the scope of this standard. Note, however, that the maximum potential difference between the actual aggregated delay and the summation of the individual delays of the functions can be calculated. In this scenario, the maxima (or minima) of the first functions' variable latency coincides to the maxima (or minima) of the second function's variable latency to within 1/(2N) of the shorter function's period. Whether the potential delay difference between the aggregated delay and the sum of the individual function delays is small enough to satisfy the timing requirements is up to the individual application

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

A). In the first paragraph, rearranged "transmit" and "receive" so the terms "transmit function" and "receive function" are used. This keeps it consistent with the rest of 90A.7. The new text is shown below:

The example shown in Figure 90A–3, Figure 90A–4, and Figure 90A–5 have the maximum delays of all transmit functions and the minimum delays of all receive functions aligned at the beginning of time. This ideal alignment will occur periodically if at least one of the following scenarios is true:

B). Deleted list item 3). It is just an example of list item 2). Also, per A), continue use of the terms "transmit functions and "receive functions". The new text is shown below:

1) The alignment of the transmit (or receive) functions is enforced by a specified relationship between them
2) The transmit (or receive) functions' periods are unrelated, i.e. the maxima (and minima) of the transmit (or receive) functions' latency are guaranteed to coincide eventually.

C). The concepts discussed in the last 2 paragraphs can be described together. Continue using the terms "transmit functions" and "receive functions". Replaced those 2 paragraphs with the following new text:

When there is no fixed alignment between transmit (or receive) functions, and the functions' periods are related by a simplified ratio of N/M, where N ≤ M, the maximum (or minimum) aggregated delay of the functions is not the simple sum of their individual maximum (or minimum) delays. Instead, the maximum (or minimum) aggregated delay depends on the in-situ alignment of the functions. How this aggregated delay is determined and accounted for in the transmit (or receive) path data delay value is beyond the scope of this standard. Note, however, that the maximum potential difference between the actual aggregated delay and the summation of the individual delays of the functions can be calculated. In this scenario, the maxima (or minima) of the first functions' variable latency coincides to the maxima (or minima) of the second function's variable latency to within 1/(2N) of the shorter function's period. Whether the potential delay difference between the aggregated delay and the sum of the individual function delays is small enough to satisfy the timing requirements is up to the individual application