Cl **1** *SC* **1.3** *P* **53** *L* **53** # 435

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **R** *(withdrawn)*

Footnote 6 refers to OSFP1600, but OSFP is a normative reference not just for OSFP1600 but also for the original OSFP, which is used in the base standard (e.g. clause 136).

Similarly, Footnote 7 refers to QSFP-DD1600, but QSFP-DD is a normative reference for the base standard.

SuggestedRemedy

Delete "1600" in both footnotes.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **116** *SC* **116.2.9** *P* **155** *L* **37** # 732

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *(Common) ILT terminology*

Un-introduced, undefined jargon: inter-sublayer link, network path, peer, DATA mode. Also I suspect that "transmitter states, receiver states" misuse "transmitter" "receiver".

SuggestedRemedy

Rewrite this, with appropraite references, or remove 178B. Similarly in e.g. 169.2.10, 174.2.12

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Indeed there are several terms used in the subclause that are defined only in Annex 178B or are not defined at all. Some clarification would be helpful here.
In the second paragraph references to transmitters, receivers, states, and modes are defined in the referenced Annex 178B. Comment #191 proposes a specific qualification to the term "DATA mode".

Change the first paragraph in 116.2.9 to the following:
"Inter-sublayer link training (ILT) facilitates the orderly start-up of an inter-sublayer link (ISL) and coordinates the start-up of a series of ISLs along a path. ILT, ISL, and path are defined in 178B.3 ."
Delete the second paragraph.
Update 169.2.10 and 174.2.12 in a similar way.
Implement with editorial license.

Cl **116** *SC* **116.2.9** *P* **155** *L* **42** # 163

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 116.2.9 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #732.

Cl **116** *SC* **116.2.9** *P* **155** *L* **44** # 733

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *ɔmmon) ILT description types*

is supported by - yuk

SuggestedRemedy

These PHY types include an ILT sublayer:
Also in 169.2.10 and 174.2.12.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Note that ILT is not a sublayer, but rather it is a function within a PMD or AUI component.
Resolve using the response to comment #53.

Cl **116** *SC* **116.2.9** *P* **155** *L* **45** # 164

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *ɔmmon) ILT description types*

ILT is supported by any PHY that uses a 200GAUI-1 or 400GAUI-2. What's listed here are PMDs that support ILT.

SuggestedRemedy

If the intent is to list the PMDs that support ILT, change 'PHY' to 'PMD'. If the intent was to indicate PHYs that can support ILT, replace the sentence that introduces the dashed list with "ILT is supported by any 200GBASE-R PHY that uses a 200GAUI-1. any 400GBASE-R PHY that uses a 400GAUI-2, or any PHY that uses one of the following PMD types:"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #53.

Cl **116** *SC* **116.2.9** *P* **155** *L* **155** # 53

D'Ambrosia, John Futurewei, U.S. Subsidiary of Huawei

Comment Type **TR** *Comment Status* **A** *ɔmmon) ILT description types*

This subclause mistakenly notes ILT for PHY types solely based on what the PMD can do. A PHY may also support ILT if using 200Gb/s based AUIs or the physical layer can support ILT if an extender based on a 200 Gb/s AUI is used.
The same is also true for 169.2.10, and 174.2.12

SuggestedRemedy

Implement language on Page 6 of https://www.ieee802.org/3/dj/public/adhoc/electrical/25_0605/dambrosia_3dj_elec_02_250605.pdf with editorial license for each of the subclauses noted.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The suggested remedy appears to point to the wrong contribution. The correct URL is: https://www.ieee802.org/3/dj/public/adhoc/electrical/25_0605/dambrosia_3dj_elec_01_250605.pdf

Slide 3 of dambrosia_3dj_elec_01_250605 proposes text relating to inclusion of ILT in the form:
Physical layer implementations support ILT if any of the following is included:
PMDs: <list of PMD types>
AUIs: <list of AUI types>

However, ILT is a function within a PMD or AUI component. Referencing it in terms of the entire Physical Layer implementation may imply more than intended. It is sufficient to merely guide readers in right direction.

Instead use the form:
ILT is used by the following PMD and AUI types:
<list of PMD types and AUI types>

Change the ILT/PHY support statements in 116.2.9 third paragraph, 169.2.10 second paragraph, and 174.2.12 second paragraph to the form shown above including the PMD and AUI types listed in slide 3 of dambrosia_3dj_elec_01_250605.

Implement with editorial license.

Cl **169** *SC* **169.2.10** *P* **190** *L* **35** # 681

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *(Common) ILT terminology*

ILT jargon again.

SuggestedRemedy

See an earlier comment

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #732.

Cl **169** *SC* **169.2.10** *P* **190** *L* **41** # 166

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 169.2.10 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #732.

Cl **169** *SC* **169.2.10** *P* **190** *L* **42** # 297

Brown, Matt Alphawave Semi

Comment Type **T** *Comment Status* **A** *ɔmmon) ILT description types*

ILT is supported not just in the PHYs, but also in the xMII extenders and not limited to the PHY types listed here.

SuggestedRemedy

Change to:
A physical layer implementation supports ILT if any of the following are implemented: 800GBASE-KR4, 800GBASE-CR4, 800GBASE-DR4, 800GBASE-FR4-500, 800GBASE-DR4-2, 800GBASE-FR4, 800GBASE-LR4, 800GAUI-4 C2C, 800GAUI-4 C2M.
Update 116.2.9 and 174.2.12 similarly.
Implement with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #53.

Cl **169** *SC* **169.2.10** *P* **190** *L* **43** # 167

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *ɔmmon) ILT description types*

ILT is in principle supported by any 800GBASE-R PHY that uses a 200G/lane AUI. The dashed list here is the PMDs that can support ILT.

SuggestedRemedy

If the intent is to list the PMDs that support ILT, change 'PHY' to 'PMD'. If the intent was to indicate PHYs that can support ILT, replace the sentence that introduces the dashed list with "ILT is supported by any 800GBASE-R PHY that uses an 800GAUI-4 or one of the following PMD types:"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #53.

Cl **169** *SC* **169.4** *P* **196** *L* **12** # 341

de Koos, Andras — Microchip Technology

Comment Type **T** *Comment Status* **R** *(Common) PLI Delay*

The main reason for specifying the max delay constraints is to accommodate PAUSE reach - given the delays in the near-end and far-end physical layers, and given the buffer depth on the near-end, there is a maximum length of medium that can be supported while guaranteeing no buffer overflow when using link PAUSE.
What are the max delays through the near-end and far-end physical layers? It is not at all clear.
Would the near-end buffer device be designed with some awareness of the near-end physical layer's composition? Maybe, maybe not.
There is never any awareness of the far-end physical layer's componsition. Crucially, the far end may or may not have an MII extender, which adds 2*800ns due to the extra PCSs (plus the delays through the extra PMA layers).
As written, the standard is not very helpful in figuring out the maximum possible delay through the entirety of the physical layer given the range of possible physical layer stacks.
To be fair, this deficiency has existed since MII-Extenders were introduced for 200G and 400G PHYs. Before MII extenders, the range of physical layer stacks were quite limited, so the delay error-bars due to an extra AUI+PMA, for example, were small.

Same comment can apply to 200Gb/s, 400Gb/s and 1.6Tb/s clauses.

SuggestedRemedy

Consider adding the values that an implementor needs, i.e. the worst-case delay (i.e. over ALL possible physical layer stacks) through the entire physical layer, per PMD type.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **171** *SC* **171.1a** *P* **212** *L* **14** # 685

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *(Common) MII FLR*

An 800GMII/1.6TMII Extender is expected to meet the frame loss ratio specifications in 174A.4": is partly out of scope

SuggestedRemedy

A 800GMII Extender using SM-PMAs or a 1.6TMII Extender is expected to meet the frame loss ratio specifications in 174A.4

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The constraint is necessary to ensure the FLR budget between a pair of MACs is met.
The specific FLR is inherently met with significant margin if the xAUI-n in the xMII extender are compliant the coresponding specifications.
However, it would be helpful to point this out.
Add an informative note in 171.1a as follows:
"Note--The 800GMII or 1.6TMII Extender inherently meets the expected frame loss ratio if the 800GAUI-n or 1.6TAUI-n are compliant."

Also, in 174A.3 to 174A.7, add a reference to the summary tables in 174A.12.

Cl **174** *SC* **174.2.5** *P* **249** *L* **39** # 693

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *Common) PMD instantiations*

instantiations - are like placements in IC design one PMA, one placement, one instantiation. 176B.7 describes combinations of PMAs

SuggestedRemedy

Change instantiations to combinations

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The xAUI-n are often introduced as and referred to as “physical instantiations” of the PMA service interface. Thus the word "instantiation" is appropriate based on that convention.

Annex 176B provides guidance on how a set of xAUI-n is to be instantiated within a physical layer implementation and, in particular, how each is delimited with particular PMA types. Changing the word away from "instantiation" would require a great deal of rework.

However, the wording in this regard within 176B.7 can be improved.

Change: "The 1.6TAUI-n instantiations are described in 176B.7."
To: “The 1.6TAUI-n may be instantiated within a Physical Layer implementation as described in 176B.7.”

Make a similar update in 169.2.4a.

Implement with editorial license.

Cl **174** *SC* **174.2.12** *P* **250** *L* **42** # 177

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 174.2.12 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #732.

Cl **174A** *SC* **174A** *P* **677** *L* **21** # 292

Brown, Matt Alphawave Semi

Comment Type **TR** *Comment Status* **A** *(Common) Error ratio figure*

Diagrams showing the various paths or domains described in 174A.3 through 174A.7 would be very helpful to the reader of the annex.

SuggestedRemedy

Add a diagrams illustrating the paths described in 174A.3 through 174A.7.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

In 174A.12, add the figure on slides 7, 10, and 11 in the following contribution:
https://www.ieee802.org/3/dj/public/25_07/brown_3dj_03_2507.pdf

Add a similar figure for the xMII extender.

For the MAC to MAC FLR, draw the arrow from the interface between the RS and MAC. Also, add the FLR arrow in the optical and electrical PHY diagrams.

Implement with editorial license.

Cl **174A** *SC* **174A.3** *P* **677** *L* **35** # 590

Shrikhande, Kapil Marvell

Comment Type **T** *Comment Status* **A** *(Common) (bucket)*

In the subclause title "Error ratio allocation for an Ethernet network path", the term "network path" is a bit vague. Network path may mean a multi-hop network path (e.g. End Host to Switch to End host). Should search for a more descriptive term to use instead of "network path". Since the error allocation is from the PLS service interface of one RS to the PLS service interface of the other RS, suggest using "RS-to-RS" ? or MAC-to-MAC ? This is similar to PHY-to-PHY, PCS-to-FEC, etc. terminology used in other sections of this annex.

SuggestedRemedy

Replace "network path" in the subclause title with "RS-to-RS".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Ultimate the path is from MAC to MAC. Also, RS can easily be misinterpreted as meaning RS-FEC.
Change "network path" to "MAC-to-MAC path".

Cl **174A** *SC* **174A.5** *P* **678** *L* **10** # 106

Bruckman, Leon Nvidia

Comment Type **TR** *Comment Status* **A** *(Common) Error ratio figure*

A figure will make this much more clear

SuggestedRemedy

Add a figure to show the link in 174A.5, 174A.6 and 174A.7

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the repsonse to comment #292.

Cl **174A** *SC* **174A.8** *P* **679** *L* **25** # 401

Mi, Guangcan Huawei Technologies Co., Ltd

Comment Type **TR** *Comment Status* **R** *(Common) block error ratio*

two method were proposed for block error evaluation. Either by examining the block error histogram being below the Hmax histogram mask, or checking block error ratio being smaller than 1.45e-11. however, when using the Hmax to calculate its corresponding block error ratio, I arrived at 1.55e-11, which is not passing the block error ratio requirement.

SuggestedRemedy

I am strongly confused by this now. no suggested remedy at this time. I will reach out to Adam for help.

Response *Response Status* **C**

REJECT.
The suggested remedy does not provide suffcient detail to implement.

Cl **174A** *SC* **174A.8.1.5** *P* **682** *L* **23** # 137

Noujeim, Leesa Google

Comment Type **T** *Comment Status* **R** *(Common) block error ratio*

Eqn 174A.5 is derived from randomly distributed error probabilities (at the specified BER) and so makes no allowance for burstiness of errors; this results in unreasonably tight mask limits especially for the higher bins.

SuggestedRemedy

Adjust the mask to increase the allowed ratio in bins 8-15, and reduce in bins ~1-4 accordingly

Response *Response Status* **C**

REJECT.
As noted in the opening paragraph, this test confirms a pass but does not necessarily indicate a fail. It indicates that if the lane fails this test then it is necessary to test with the more precise metric as defined in 174A.8.1.6.
Any other curve would be based upon some correlation assumption and would fail some cases with uncorrelated errors that should pass.
The suggested remedy does not provide sufficient detail to implement.

Cl **174A** *SC* **174A.8.1.5** *P* **682** *L* **26** # 38

Liu, Cathy Broadcom Inc.

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

The assumption of the equation 174A-6 of BER=1/2 of PAM4 symbol error ratio SER is not always true. When pre-coding is applied, or inner hamming decoding is applied, the assumption will not be hold which results in the error mask is higher.

SuggestedRemedy

Either we ingor the special cases with pre-coding or inner code decoding, but add a note to clarify the assumption. Or we can apply two cases to the equation 174A-6 as following: RSSER = 1 –(1 – 2BER)^5 for no precoding and inner code decoding; and RSSER = 1 –(1 – BER)^5 for precoding or inner code decoding.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **174A** *SC* **174A.12** *P* **686** *L* **22** # 409

Mi, Guangcan — Huawei Technologies Co., Ltd

Comment Type **TR** *Comment Status* **R** *(Common) block error ratio*

Table 174A-1, FLR was changed from 6.2e-11 to 6e-11. The reasoning seems to be the 0.2e-11 was allocated to the xMII extenders and PCS to FEC links illustrated in Table 174A-3. However, in reality, no such case as cascading two sets of two-part AUI link would exist. The title of Table 174A-1 "optical PHYs with no FEC sublayer or with an inner FEC sublayer" also indicating that Table 174A-3 does not apply. Essentially, Table 174A-1 doesn't apply to 800GBASE-ER1 and 800GBASE-ER1-20 with xMII extenders, but is using the allocation for such cases.

The change maynot affect the performance of a Ethernet device much, but may cause some confusion of the readers.

SuggestedRemedy

Change back to 6.2e-11 for Table 174A-1. Add another errro allocation table for the case of ER coherent PMDs

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **175** *SC* **175.1.3** *P* **261** *L* **5** # 588

Shrikhande, Kapil — Marvell

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

Will be better to state that transcoding is from four 66b blocks to 257 bit blocks. This follows the previous bullet which states that encoding is from eight 1.6TMII data octets to 66-bit blocks.

SuggestedRemedy

Change the second bullet to "Transcoding from (to) four 66-bit blocks to (from) 257-bit blocks (256B/257B)".

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **176C** *SC* **176C.6.4.5.3** *P* **729** *L* **48** # 532

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **A** *(Common) precoding*

The C2C receeiver should be able to determine whether pre-coding is used.

SuggestedRemedy

Change "test transmitter equalizer using the ILT function" to "test transmitter equalizer and precoder using the ILT function" Also for KR on page 368 line 22

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #534.

Cl **176D** *SC* **176D.8.12.4** *P* **758** *L* **35** # 533

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **A** *(Common) precoding*

The C2M receeiver should be able to determine whether pre-coding is used.

SuggestedRemedy

Change "PRBS31Q pattern" to "PRBS31Q pattern with the precoder enabled or disabled as the receiver would select using the ILT protocol"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #534.

Cl **178** *SC* **178.8.9** *P* **361** *L* **26** # 190

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *rical) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 178.8.9 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #191.

Cl **178B** *SC* **178B** *P* **786** *L* **6** # 484

D'Ambrosia, John — Futurewei, U.S. Subsidiary of Huawei

Comment Type **TR** *Comment Status* **A** *(Common) ILT scope*

ISL is a major new capability, and needs to be clearer than currentlyspecified.
For example, the title indicates "Inter-sublayer link training for electrical and optical interfaces". However, it is the understanding of the commentor that this clause covers link training for the interfaces as well as the total path.
Additionally, as this is a new capability, it is not clear that there won't be differences for link training between AUIs and PMDs.

SuggestedRemedy

Separate Annex 178B into 3 Annexes - one for the total path, one for the AUIs, and one for PMDs. Clauses with tables pointing to Annex 178B would need to be updated to point to the correct clause

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #220.

Cl **178B** *SC* **178B** *P* **786** *L* **12** # 424

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **A** *(Common) ILT scope*

There should be a distinction between "ILT", which is a protocol on a single ISL, and the end-to-end (RS-to-RS) path bring-up procedure. The latter is an ability that is enabled by the former, but is system-level result, while ILT is a local mechanism.

Additional terminology may be helpful, e.g. "Physical layer startup procedure".

SuggestedRemedy

Add a definition of "Physical layer startup procedure" and update the text in multiple places to distinguish it from "ILT" used over a single ISL. Implement with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #220.

Cl **178B** *SC* **178B.2** *P* **786** *L* **18** # 220

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *(Common) ILT scope*

The overview of ILT is confusing. ILT has two aspects - there is per-ISL training, and there is the end-to-end path startup behavior. These need to be more clearly separated in the overview text. The "continuous exchange of fixed-length training frames" is not entirely accurate - that may be what happens during the training phase, but is certainly not what happens once the training is completed.

SuggestedRemedy

Rewrite the paragraph as follows:
ILT describes a set of processes that serve two purposes: facilitating timing recovery and optimizing performance on individual ISLs, and coordination of ISLs along a path to enable a smooth path start-up. The individual link training is performed via the exchange of fixed-length training frames between peer interfaces of an ISL that enable the transmitter to optimize the performance of the ISL. Path start-up is performed via the exchange of status indications across the set of ISLs that exist between the path endpoints.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the changes to 178B.2 and 178B.5 as proposed on slides 32 and 33 of the following contribution:
https://www.ieee802.org/3/dj/public/25_07/brown_3dj_03a_2507.pdf

Implement with editorial license.

Cl **178B** *SC* **178B.2** *P* **786** *L* **18** # 374

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *(Common) ILT scope*

3 major functions are included in the ILT: Electrical LT, Optical LT, and inter-sublayer link signal or RTS. Designating everting as ILT is rather confusing throughout the draft.

SuggestedRemedy

I suggest the following definition:
All electrical link training called "ELT"
All optical link training called "OLT"
Inter-sublayer signaling RTS called "ILT" or could be called "ILM" (inter-sublayer link messaging)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #220.

Cl **178B** *SC* **178B.2** *P* **786** *L* **19** # 498

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **A** *(Common) ILT scope*

The english isn't good.

SuggestedRemedy

Change "in a ISL or multi-ISL paths" to "in a ISL path or multi-ISL paths"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #220.

Cl **178B** *SC* **178B.3** *P* **786** *L* **33** # 52

D'Ambrosia, John — Futurewei, U.S. Subsidiary of Huawei

Comment Type **E** *Comment Status* **A** *(Common) ILT scope*

Given the introduction of inter-sublayer link training to the Ethernet world, it would be helpful if the term inter-sublayer link (ISL) was displayed graphically for the reader.

SuggestedRemedy

Implement figure on Page 3 of https://www.ieee802.org/3/dj/public/adhoc/electrical/25_0605/dambrosia_3dj_elec_02_250605.pdf with editorial license

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The suggested remedy appears to point to the wrong contribution. The correct URL is: https://www.ieee802.org/3/dj/public/adhoc/electrical/25_0605/dambrosia_3dj_elec_01_250605.pdf

An updated figure is provided on slide 22 of the following editorial contribution: https://www.ieee802.org/3/dj/public/25_07/brown_3dj_03_2507.pdf

This figure illustrates the architecture concepts as defined in Draft 2.0. Other comments may change some of these features.

Add a figure where appropriate based on the figure in slide 22 of brown_3dj_03_2507.

Update the figure as required to suit the adopted responses of other comments.

Implement with editorial license.

Cl **178B** *SC* **178B.3** *P* **786** *L* **34** # 222

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT scope*

The definition of ISL is somewhat awkward. The two PMDs are not really 'adjacent sublayers' in the same sense that a pair of PMAs within a PHY implementation are. Also, the definition should be consistent as to whether the sublayers are or are not part of the ISL. As written, it suggests that the ISL is either the AUI (not including the PMAs) or a pair of PMDs plus the medium.

SuggestedRemedy

Change the text to read:
The xAUI-n between a pair of adjacent PMA sublayers, or the MDI between a pair of PMD sublayers.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the defintion of ISL to:
"An ISL is either an xAUI-n (a pair of AUI components and the AUI channel between) or a pair of PMDs (in different PHYs) and the medium between."

Implement with editorial license.

Cl **178B** *SC* **178B.3** *P* **786** *L* **36** # 112

Mascitto, Marco — Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT scope*

The ISL should be defined as the link between two adjacent sublayers and excludes the sublayers themselves. ISLs can be between two adjacent sublayers in the same Physical layer implementation (e.g., connecting PMAs in a single PHY) or between adjacent sublayers in two autonomous systems (e.g., connecting the two PHY PMDs via a medium).

SuggestedRemedy

Replace "The ISL may be an xAUI-n between a pair of PMA sublayers within the same Physical Layer implementation or a pair of PMDs and the medium between"

with

"The ISL may be an xAUI-n between a pair of PMA sublayers within the same PHY. The ISL may be an MDI between a pair of PMD sublayers, each of which is instantiated in separate PHYs".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #222.

Cl **178B** *SC* **178B.3** *P* **786** *L* **38** # 115

Mascitto, Marco — Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT scope*

Add single and multi-ISL definiton here to help with 178B.5.

SuggestedRemedy

Add: "A single-ISL path comprises exactly two sublayers connected by a single ISL. A multi-ISL path comprises three or more sublayers connected in series by ISLs".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #220.

Cl **178B** *SC* **178B.4** *P* **787** *L* **30** # 375

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **A** *(Common) ILT function*

Figure 178B-1 is trying to convey two different messages and combining the two function as shown is confusing

SuggestedRemedy

Some suggested improvements
Call them figure 1A and 1B
Figrue 1A is for AUI so it needs two ILT functions in the box (left and right)
Figure 1B better to show as following:
-Receive function connected to Transmit Function left-right (output SLi)
-Receive function to Transmit Function right-left (input DLi)
-Duplicate per-lane ILT function one for Egress and one for Ingress

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

ILT is one function. Only in the case of a retimer we have two functions. An AUI may include a single ILT function if it is not part of a retimer.

The transmit and receive functions of ILT are closely related, separating them may cause more confusion than adding clarity.

However, some clarification in the figure is warranted.

In Figure 178B-1, add a box indicating the boundaries of an AUI component or PMD.

Label the vertical dashed line as the service interface.

Cl **178B** *SC* **178B.5** *P* **787** *L* **37** # 290

Brown, Matt — Alphawave Semi

Comment Type **TR** *Comment Status* **A** *(Common) ILT scope*

The term inter-sublayer link training (or ILT) by name defines a protocol over an inter-sublayer link (or ISL). Each ISL is one of several possible physical links between a pair of MAC sublayers. It is possible only a subset of the ISLs supports ILT. Annex 178B also defines a path start-up protocol which uses the outcome of ILT on each of the physical links, where supported, to determine when the path between a pair of PCSs or between a pair of extender suppliers is ready, allowing for some ISLs that do not support ILT. However, the combination of these two layers of functionality are references only as ILT. This is confusing!

SuggestedRemedy

Within Annex 178B, clearly differentiate these two processes (inter-sublayer link training and path-start-up protocol) as being separate from each other, rather than ILT being a combination of these two. ILT would refer to the process with operates on a specific ISL and with PSP the process that links the states of all ISL on a path. Throughout the draft specify and references these two functions separately.
A contribution will be provide to explore this further.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #220.

Cl **178B** *SC* **178B.5** *P* **787** *L* **39** # 116

Mascitto, Marco — Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT scope*

Improve clarity.

SuggestedRemedy

Replace: "ILT enables independent ISL training in a multi-ISL path that includes AUI components and PMDs. It also supports operation over paths that include ISLs that do not implement ILT".

With

"ILT supports independent training of ISLs in a multi-ISL path. ILT also operates over paths that include ISLs that do not support ILT".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The referenced text should be improved. Comment #220 proposes to improvement the description and termilogy for the ILT functionality.

Resolve this comment based on the resolution to comment #220.

Cl **178B** *SC* **178B.5** *P* **787** *L* **43** # 226

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *(Common) ILT description*

The bullet list that attempts to explain how path start-up works is not succeeding. It is not clear if "ready to send" is related to the local_rts and remote_rts indications or if it is something different. It seems like it must be something different, since the third bullet says you can only send local_rts or remote_rts across an ISL that is ready to send. The last two bullets seem to introduce a notion of "device" that is undefined. The concept of an ISL includes a physical instantiation of an AUI or a medium, so the intended meaning of 'device' is reasonably clear (i.e., the endpoint of an ISL), but it would be better to avoid using 'devices' in the description and focus on ISLs and their endpoints.

SuggestedRemedy

The intended behavior is not really clear, so it's hard to provide a specific remedy. It think the intention is that local_rts originates at the A end PCS and traverses all sublayers and ISLs until it reaches the Z end PCS. Upon receiving local_rts, the Z end PCS signals remote_rts to the A end PCS. (and of course vice versa for Z-->A). So local_rts makes its way down the stack in one system, across the medium, and up the stack in the peer system. In order for local_rts (or remote_rts) to go across an ISL, that ISL must be in a 'ready to send' condition that has nothing to do with the 'local_rts' or 'remote_rts' variables, but instead depends on ILT (for ISLs that support ILT) or some other mechanism (for those that don't support ILT) to determine if the ISL is 'ready to send'. If that is correct, write text accordingly to explain this, and modify the terminology or provide better definitions so that it's clear that "ISL ready to send" is not the same thing as local_rts or remote_rts. If the intended behavior is something else, rewrite the text to be more clear about what is intended.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: "local_rts indicates that an AUI component or PMD is ready to send and receive normal data and propagates from the PCS at one end of the path towards the PCS at the other end of the path."
To: "local_rts indicates that an AUI component or PMD is ready to send and receive normal data (it reached the ISL_READY state in Figure 178B-8) and propagates from the PCS at one end of the path towards the PCS at the other end of the path."

Change: "When a device both sends local_rts and receives remote_rts in both directions"
To: "When an AUI component or PMD both sends local_rts and receives remote_rts in both directions"

Change: "When all devices are in data mode, communication on the path is established."
To: "When all AUI components and PMDs in the path are in DATA mode, communication on the path is established."

Replace "device" throughout the Annex with "AUI component or PMD", where appropriate.

Implement with editorial license.

Cl **178B** *SC* **178B.5.1** *P* **788** *L* **15** # 228

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **R** *(Common) ILT description*

This clause appears to be about the process for training each lane of an ISL, so it's not clear why local_rts or remote_rts belong here (since they are about the end-to-end path - although the state diagrams clause suggests that each ISL maybe has its own local_rts and remote_rts - but that would mean that local_rts and remote_rts are not signals that propagate from PCS to PCS). While the intended meaning of 'device' is clear, it would be better to describe the protocol in terms of ISLs and the endpoints of ISLs.

SuggestedRemedy

Clarify what condition it is that causes the propagation_timer to be started… presumably it's not related to local_rts and remote_rts (or if it is, the definitions of local_rts and remote_rts need to be modified to make it clear that they apply to each lane of each ISL, not just to PCS-to-PCS communication).

Response *Response Status* **C**

REJECT.

Condition to start the propagation_timer is well defined in the referenced Figure 178B–8 "Training control state diagram".

Note that in 178B.14.1 it states "Should there be a discrepancy between a state diagram and descriptive text, the state diagram prevails."

Cl **178B** *SC* **178B.5.1** *P* **788** *L* **16** # 118

Mascitto, Marco Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT*

In this subclause, I assume we are describing the interface behavior of Inter-sublayer Links (ISLs) and not the behavior of the overall ILT path from PCS to PCS (or XS to XS). If this assumption is correct, use of the term "device" is confusing.

SuggestedRemedy

Replace the word "device" with "sublayer".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #226.

Cl **178B** *SC* **178B.5.3** *P* **789** *L* **44** # 421

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **R** *(Common) ILT extender*

The text about training xMII extenders does not address the communication of the status variables isl_ready and remote_rts between interfaces (PMD to AUI and vice versa) when there is a PHY XS and PCS between them.
Ideally, this communication should be the same as the one defined in 178B.14.2.1 using adjacent_signal_ok, but the case of an extender is not covered by NOTE that describes what "adjacent" is.

Since this behavior is specific to PHYs attached to extenders, it should be specified in this subclause, preferably with a diagram.

SuggestedRemedy

Add a NOTE in 178B.5.3 stating that, for the purpose of adjacent_signal_ok, the adjacent interface of a PMD in a PHY attached to an xMII extender is the service interface of the PHY XS; and the adjacent interface of the AUI component above the PHY XS is the service interface of the PMD.
Add a figure to illustrate the communication of adjacent_signal_ok between the PMD and the AUI (across the PCS and PHY XS, and possibly other sublayers).

Response *Response Status* **C**

REJECT.

The CRG reviewed slides 24 to 28 in the following contribution:
https://www.ieee802.org/3/dj/public/25_07/brown_3dj_03a_2507.pdf

Straw poll TF-1 (below) shows strong consensus to define startup signaling that extends RS to RS.

However, the proposed solution does not provide sufficient detail to implement at this time. For instance, it is missing details for exchanging signals across the PCS service interface.

A detailed contribution on this subject is encouraged.

Straw poll #TF-1 (directional)
I support the direction of extending path start-up signaling (as proposed in D2.0 comment #421) from Reconciliation sublayer to Reconciliation sublayer.
Yes: 23
No: 1
Abstain: 20

Cl **178B** *SC* **178B.8** *P* **797** *L* **20** # 111

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **A** *(Common) ILT frames*

The ILT bit is not used anyway in Annex 178B.

SuggestedRemedy

Change bit 14 in the status field in Tables 178B-4 and 178B-5 to "Reserved"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Based on straw poll there is support to make the proposed change.

Implement the suggested remedy.
Also, delete the ILT bit definition in 178B.8.2.

Implement with editorial license.

Straw poll #TF-2 (directional)
I support changing the ILT bit (bit 14 in E1 and O1 status frame) to reserved.
Yes: 12
No: 7
Abstain: 17

Cl **178B** *SC* **178B.14.2.1** *P* **803** *L* **46** # 123

Mascitto, Marco — Nokia

Comment Type **E** *Comment Status* **A** *(Common) ILT adjecency*

This is not very clear. I would suggest adding the definition of "adjacent service interface" in subclause 178B.3.

SuggestedRemedy

I would suggest adding the definition of "adjacent service interface" to subclause 178B.3 and referencing a diagram, like the one on Slide 3 of "Making Sense out of ILT" (J. D'Ambrosia, M. Brown, 802.3dj Joint Ad hoc Mtg - 05 Jun 2025).

Adjacent service interface
The service interface adjoining a PMD or AUI component to a PMA.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Slide 20 of the following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/25_07/brown_3dj_03a_2507.pdf

Although a figure similar to the one provided on slide 20 would be helpful, a contribution with full details is required.

Implement the suggested wording changes on slide 20 of brown_3dj_03a_2507.

Implement with editorial license.

Cl **178B** *SC* **178B.14.2.1** *P* **803** *L* **47** # 448

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **A** *(Common) ILT adjecency*

The second case in the NOTE says: "For ILT in an AUI component above a PMA, the adjacent service interface is the interface below the AUI component". That is the PMA's service interface. It may be easier to understand if it is stated.
Also, a figure illustrating the two cases would be helpful.

SuggestedRemedy

Change "the adjacent service interface is the interface below the AUI component" to "the adjacent service interface is the PMA service interface (below the AUI component)".
Add a figure, with editorial license.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #123.

Cl **178B** *SC* **178B.15** *P* **813** *L* **1** # 422

Ran, Adee — Cisco Systems

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

"If the MDIO Interface is not implemented, an alternate mechanism to access management variables shall be provided"

Specifically for AUI-C2M, the most prevalent management interface is expected to be CMIS rather than MDIO. We expect CMIS to provide access to these management variables. CMIS should be referenced, at least informatively.

SuggestedRemedy

Append the following sentence: "For example, for modules using AUI-C2M, the Content Management Interoperability Services (CMIS) interface may be used as an alternate mechanism". Add a footnote with a reference to the CMIS specification (undated, since the current version does not address ILT yet).

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **179** *SC* **179.8.2** *P* **391** *L* **31** # 191

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 179.8.2 referred to the PATH_UP state.

SuggestedRemedy

Change "When operating in DATA mode, …" to "When operating in the PATH_UP state (see Figure 178B-8),…"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The two modes of the PMD transmit function are explicitly defined in the first paragraph of 179.8.2: "The PMD transmit function has two operating modes: DATA and TRAINING. The operating mode is controlled by the ILT function (see 179.8.9)". These modes are referenced in multiple places in the draft (although they are not currently defined by all PMDs).

The suggested remedy refers to a state of the training state diagram, but there is a variable, tx_mode, that explicitly controls the "DATA mode" behavior. This variable can be referenced to improve clarity.
Also, DATA and TRAINING modes of the transmit function should be defined for all PMDs that include an ILT function, and all references to these modes should be linked to the transmit function.

In the first paragraph of 179.8.2, change "The operating mode is controlled by the ILT function (see 179.8.9)" to "The operating mode is controlled by the tx_mode variable of the ILT function (see 179.8.9): it is DATA when tx_mode=data, and TRAINING otherwise".
Add similar paragraphs in 180.5.2, 181.5.2, 182.5.2, and 183.5.2 (possibly also 185.5.2 and 187.5.2 if ILT is added to these clauses).
Add an explicit reference to the transmit function in all instances of "DATA mode" and "TRAINING mode" across the draft, where appropriate.

Slide 15 and 16 in the following contribution provide extra background and implementation examples:
https://www.ieee802.org/3/dj/public/25_07/brown_3dj_03_2507.pdf

Implement with editorial license.

Cl **179** *SC* **179.8.9** *P* **393** *L* **6** # 192

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 179.8.9 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #191.

Cl **179** *SC* **179.9.5.3** *P* **406** *L* **26** # 534

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **A** *(Common) precoding*

It should be explicit that the test pattern for Interference tolerance for CR can be precoded.

SuggestedRemedy

Add a footnote to PRBS31Q in table 179-11. Footnote to say "With precoding enabled or disabled as the receiver would select using the start-up protocol described in 179.8.9."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Precoding and PRBS31Q generation and checking are functions of the PMA. The definition of PRBS31Q in 176.7.4.2 includes optional precoding, so it is not required to add it here explicitly.
However, precoding should be available for the receiver under test, just like transmit equalizer control. It is currently not stated in the test procedure.

In 179.9.5.3.5, change from
"the device under test (DUT) configures the pattern generator transmit equalizer to the coefficient settings it would select using the start-up protocol described in 179.8.9"
to
"the device under test (DUT) configures the pattern generator transmit equalizer coefficients and precoding to the settings it would select using the training protocol described in 179.8.9"
Make similar changes in 178.9.3.4.3, 176C.6.4.5.3, and 176D.8.12.4.
Implelent with editorial license.
[CC 178, 179, 176C, 176D]

Cl **179C** *SC* **179C.2.1** *P* **839** *L* **45** # 483

D'Ambrosia, John — Futurewei, U.S. Subsidiary of Huawei

Comment Type **TR** *Comment Status* **A** *(Common) MDI References*

Editor's Note states the following:
The reference for SFP224 does not currently include 200G per lane specifications but it's expected to include before publication of this standard.
It is not clear that the referenced SFP224 specification will include 200G per lane specifications.
The current state of development in SFF-1031 or SFP-DD is unclear.
The IEEE P802.3dj standard could not be approved in this state.
Similar comment for 179C.2.2, 179C.2.3

SuggestedRemedy

Two options are offered, as the state of development in noted organizations is unclear.
1. If development is underway in noted organizations, modiffy the note to indicate that if the specification is not received for consideration by the Task Force by Jan 2026, the note will be removed and the MDI will be noted in a non-specific manner.
2. Remove any references to the SFF specification and make the section generic.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The comment identifies an issue regarding the completeness of the references to the MDI connector types defined in Annex 179C.

For each of the references noted in the comment, add the following editor's note:
"When this draft was published this reference was not available. If this reference is not available for review by the P802.3dj Task Force prior to the January 2026 IEEE 802.3 interim meeting then the reference will be deleted and related MDI specifications will be deleted or appropriately modified (proposal required)."

Put this note in 179C.2.1, 179C.2.2, 179C.2.3, as well as for the related references in subclause 1.3.

Implement with editorial license.

Cl **180** *SC* **180.5.12** *P* **437** *L* **28** # 193

Huber, Thomas — Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 180.5.12 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #191.

Cl **180** *SC* **180.7.2** *P* **440** *L* **33** # 391

Rodes, Roberto — Coherent

Comment Type **TR** *Comment Status* **R** *(Common) Block error ratio*

The receiver sensitivity specification currently relies on a complex block error ratio calculation. However, the methodology is unclear regarding the required test duration to meet the specification, and it lacks guidance on how to perform a 'statistical projection'. As receiver sensitivity is a primary specification for a PMD receiver, its test and verification procedures should be clear and practical to execute, while ensuring a reasonable level of confidence. Supporting presentation will be provided

SuggestedRemedy

replace note c by:"Measured using the conformance test signal at TP3 (refer to Section 180.8), with an error ratio allocation one decade lower than specified in 174A.12 for PMD-to-PMD." Apply also to clauses 181, 182 and 183

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **180** *SC* **180.9.1** *P* **445** *L* **31** # 530

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **A** *(Common) precoding*

PRBS31Q with pre-coding should be listed as a possible test pattern. Also it would be better to reference the description of the 200G per lane PRBS31Q test pattern in 176.7.4.2 rather than the older reference in

SuggestedRemedy

Add PRBS31Q with precoding as an additional test pattern (8) in table 180-13. In table 180-14 add this pattern as an option wherever patter 3 is used. The reference for the test pattern definition should be 176.7.4.2. Change the test pattern generator generator for PRBS31Q from 120.5.11.2.2 to 176.7.4.2. Make equivalent changes to Clause 181.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The comment points out that the reference for the PRBS31Q (pattern 3) test pattern should be 176.7.4.2. The same applies to the square wave (176.7.4.6), PRBS13Q (176.7.4.3), and SSPRQ (176.7.4.5) patterns.

The comment also correctly points out that there is no direction to provide precoding to pattern 3 or pattern 5 (scrambled idle) when required by the receiver.

The comment proposes to address this by adding a new pattern: <PRBS31Q with precoding>. However, a new pattern <scrambled idle with precoding> would also be required, as well.

In operation, precoding is requested as enabled or disabled through the ILT process. Further, given that ILT is mandatory, a receiver might rely upon the ILT process (e.g., starting with a particular training frame pattern) to achieve the best performance. Regardless, a statement is needed in 180.9.12 and 180.9.13 about applying precoding when needed/requested by the receiver.

Change the references for the test patterns as noted above in Table 180-13 and Table 181-11.

Also, add a footnote to Pattern 3 and 5 pointing out that addition precoding may be added pointing to 176.7.1.2 as well as the receiver sensitivity and stressed receiver sensistivity subclauses.

In 180.9.12, 180.9.13, 181.9.12, and 181.9.13, add a statement that precoding, as provided by the PMA, is enabled if requested by the receiver. Also include a reference to 176.7.1.2 which defines precoding.

Add the following sentence in 180.9.12, 180.9.13, 181.9.12, and 181.9.13
"Precoding (see 176.7.1.2) shall be enabled if the receiver requests precoding during ILT."

Implement with editorial license.

Cl **180** *SC* **180.9.12** *P* **450** *L* **38** # 531

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **A** *(Common) precoding*

Whether the precoding is used for Receiver sensitivity and stressed receiver sensitivity should be explicitly stated.

SuggestedRemedy

On line 38 inset the setence . "A precoded pattern shall be used if the receiver requests precoding during ILT." between "….. Table 180-14" and "The …." Also after Table 180-14 on line 2 of page 451. Make equivalent changes to Clause 181.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #530.

Cl **181** *SC* **181.5.12** *P* **460** *L* **24** # 195

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 181.5.12 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #191.

Cl **181** *SC* **181.8.3** *P* **468** *L* **45** # 522

Dudek, Mike Marvell

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

It would be good to provide a reference to Annex 180A in this section.

SuggestedRemedy

Add a paragraph similar to that in the equivalent section of clause 180. "Annex 180A specifies the details of the MDIs for 200GBASE-DR1-2, 400GBASE-DR2, 800GBASE-DR4-2,
and 1.6TBASE-DR8-2."

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **181** *SC* **181.8.3** *P* **468** *L* **46** # 524

Dudek, Mike Marvell

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

Lines 47 to 54 on page 444 in clause 180 provide details of the MDI that also apply to the clause 181 MDI's. Specifying which connectors should be used.

SuggestedRemedy

Either add this information in clause 181.8.3 or move that information into Annex 180A.3

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **182** *SC* **182.5.12** *P* **487** *L* **41** # 196

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 182.5.12 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #191.

Cl **183** *SC* **183.5.12** *P* **510** *L* **33** # 198

Huber, Thomas Nokia

Comment Type **T** *Comment Status* **A** *mon) DATA/TRAINING mode*

While it is clear what "DATA mode" is intended to mean here in the context of ILT, that term has specific meaning for 1000BASE-T PHYs that differs from what is intended here (see 1.4.278) Annex 178B.5 indicates that in the context of ILT, "data mode" means the variable tx_mode has the value 'data', which is associated with being in the PATH_UP state per figure 178B-8. As such, it would be more clear if the text in 183.5.12 referred to the PATH_UP state.

SuggestedRemedy

Change "coordinate the transition to DATA mode." to "coordinate the transition to the PATH_UP state (see Figure 178B-8)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Resolve using the response to comment #191.