Cl **Patents** *SC* **Patents** *P* **3** *L* **46** # i-316

Crayford, Ian Network Generation L

Comment Type **GR** *Comment Status* **R** *IP*

*** Comment submitted with the file 94180000003-802.3bt - Crayford Ballot Comments.xls attached ***

This is a general comment regarding Intellectual Property.
The use of PoE has been the subject of multiple litigations from NPEs (Non Practicing Entities), otherwise known as "Patent Trolls".
Two in particular, Chrimar Systems and Network 1, have litigated against a significant group of companies in the Ethernet industry who ship products that implement PoE.
Since 802.3bt increases the available power, this will no doubt attract new companies to utilize PoE in many new applications.
What assurances have been made by companies who believe they have intellectual property that relates to 802.3bt (by at least Chrimar Systems and Network 1), such that licensing under RAND terms can be secured?

SuggestedRemedy

Issue a much stronger warning indicating the use of 802,3bt may result in alleged infringement of Intellectual Property,

Response *Response Status* **W**

REJECT.

The process for requesting an LOA for the IEEE P802.3bt project has been followed in respect to the two holders of potentially essential patent claims named in this comment, as well as for all other holders of potentially essential patent claims identified during this project.

The IEEE is not responsible for: (a) identifying Essential Patent Claims for which a license may be required; (b) determining the validity, essentiality, or interpretation of Patent Claims; or (c) determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory; or (d) determining whether an implementation is a Compliant Implementation. See subclause 6.2 'Policy' of the IEEE-SA Standards Board Bylaws <http://standards.ieee.org/develop/policies/bylaws/sect6-7.html#6.2>.

Discussion or other communications regarding: (a) the status or substance of ongoing or threatened litigation; and (b) the essentiality, interpretation, or validity of Patent Claims; is prohibited during IEEE-SA standards-development meetings or other duly authorized IEEE-SA standards-development technical activities. See subclause 6.2 'Policy' of the IEEE-SA Standards Board Bylaws <http://standards.ieee.org/develop/policies/bylaws/sect6-7.html#6.2> and subclause 5.3.10.2 'Discussion of litigation, patents, and licensing' of the IEEE-SA Standards Board Operations Manual <https://standards.ieee.org/develop/policies/opman/sect5.html#5.3.10.2>.

The text contained in the 'Notice and Disclaimer of Liability Concerning the Use of IEEE Standards Documents' in respect to patents is mandated by subclause 6.3.1 'Public notice' of the IEEE-SA Standards Board Operations Manual <https://standards.ieee.org/develop/policies/opman/sect6.html#6.3.1> and as such suggestions for change to this text should be directed to the IEEE-SA Standards Board Patent Committee Administrator at <patcom@ieee.org>.

Cl **25** *SC* **25.4.5** *P* **29** *L* **29** # i-206

Mcclellan, Brett Marvell Semiconducto

Comment Type **ER** *Comment Status* **R** *Editorial*

link parameters are specified in 25.4.9 not 25.4.8

SuggestedRemedy

change "25.4.8" to "25.4.9"

Response *Response Status* **W**

REJECT.

This comment is out of scope. The commenter is encouraged to file a maintenance request.

[Editor's note added after comment resolution completed.

for information on maintenance requests see: http://ieee802.org/3/maint/index.html]

Cl **30** *SC* **30.12.2.1.18l** *P* **43** *L* **6** # i-320

Law, David Hewlett Packard Enter

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

The behaviour defined for the attributes aLldpXdot3LocPowerTypex and aLldpXdot3RemPowerTypex doesn't see to match the 'Power typex' TLV field that these attributes map to (see Table 79-9 and 79-10). Specifically, the behaviour doesn't include any reference to the single-signature and dual-signature values that Table 79-6d 'System setup field' defines for the 'Power typex' field. Rather than try to further expand the behaviour text to decode bits it would seem a better approach, since these are new attributes being added by IEEE P802.3bt, to change their syntax from 'BIT STRING [SIZE (4)]' to 'ENUMERATED value list'.

SuggestedRemedy

Suggest that:

[1] The 'APPROPRIATE SYNTAX:' text for the attributes aLldpXdot3LocPowerTypex and aLldpXdot3RemPowerTypex should be changed to read:

An ENUMERATED value list that has the following entries:
type4dualPD Type 4 dual-signature PD
type4singlePD Type 4 single-signature PD
type3dualPD Type 3 dual-signature PD
type3singlePD Type 3 single-signature PD
type2PD Type 2 PD
type1PD Type 1 PD
type4PSE Type 4 PSE
type3PSE Type 3 PSE
type2PSE Type 2 PSE
type1PSE Type 1 PSE

[2] The 'BEHAVIOUR DEFINED AS:' text for the attribute aLldpXdot3LocPowerTypex should be changed to read:

A read-only attribute that returns a value to indicate if the local system is a Type 1, Type 2, Type 3, or Type 4 PSE or PD, and in the case of a Type 3 or Type 4 PD, if it is single-signature or dual-signature.;

[3] The 'BEHAVIOUR DEFINED AS:' text for the attribute aLldpXdot3RemPowerTypex (subclause 30.12.3.1.18j, page 52, line 16) should be changed to read:

A read-only attribute that returns a value to indicate if the remote system is a Type 1, Type 2, Type 3, or Type 4 PSE or PD, and in the case of a Type 3 or Type 4 PD, if it is a single-signature or dual-signature.;

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Make following changes:

[1] The 'APPROPRIATE SYNTAX:' text for the attributes aLldpXdot3LocPowerTypex and aLldpXdot3RemPowerTypex should be changed to read:

An ENUMERATED value list that has the following entries:
type4dualPD Type 4 dual-signature PD
type4singlePD Type 4 single-signature PD
type3dualPD Type 3 dual-signature PD
type3singlePD Type 3 single-signature PD
type2PD Type 2 PD
type1PD Type 1 PD
type4PSE Type 4 PSE
type3PSE Type 3 PSE
type2PSE Type 2 PSE
type1PSE Type 1 PSE

[2] The 'BEHAVIOUR DEFINED AS:' text for the attribute aLldpXdot3LocPowerTypex should be changed to read:

A read-only attribute that returns a value to indicate if the local system is a Type 1, Type 2, Type 3, or Type 4 PSE or PD, and in the case of a Type 3 or Type 4 PD, if it is a single-signature PD or a dual-signature PD.;

[3] The 'BEHAVIOUR DEFINED AS:' text for the attribute aLldpXdot3RemPowerTypex (subclause 30.12.3.1.18j, page 52, line 16) should be changed to read:

A read-only attribute that returns a value to indicate if the remote system is a Type 1, Type 2, Type 3, or Type 4 PSE or PD, and in the case of a Type 3 or Type 4 PD, if it is a single-signature PD or a dual-signature PD.;

Cl **30** *SC* **30.12.3.1.18q** *P* **53** *L* **38** # i-363

Thompson, Geoffrey Individual

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

Incorrect distinction between analog and digital parameter (i.e. measure vs. count).

SuggestedRemedy

Change text to read: "A GET attribute that indicates the number of seconds the ..."

Response *Response Status* **W**

ACCEPT.

Cl **33** *SC* **33.4.9.1.1** *P* **65** *L* **27** # i-207

Mcclellan, Brett — Marvell Semiconducto

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

typo, change 33-48 to 33-18.

SuggestedRemedy

change 33-48 to 33-18.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

change 33-48 to 33-18

This resolution is identical to comment #235.

Cl **33** *SC* **33.4.9.1.1** *P* **65** *L* **33** # i-208

Mcclellan, Brett — Marvell Semiconducto

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

NEXT loss in 33-18 for PSE midspan is 40dB at 100MHz, however 2.5/5GBASE-T budgets 43dB for connectors. 2.5G and higher needs a separate equation.

SuggestedRemedy

line 25 change "2.5GBASE-T" to "1000BASE-T"
line 27 delete "For 5GBASE-T, NEXT loss for Midspan PSE devices shall meet the values determined by Equation (145-32) when measured for the transmit and receive pairs from 1 MHz to 250 MHz."
line 29 change "5GBASE-T" to "1000BASE-T"
line 39 insert new paragraph "For 5GBASE-T, NEXT loss for Midspan PSE devices shall meet the values determined by Equation (33-18aa) when measured for the transmit and receive pairs from 1 MHz to 100 MHz. For 5GBASE-T, NEXT loss for Midspan PSE devices shall meet the values determined by Equation (33-18aa) when measured for the transmit and receive pairs from 1 MHz to 250 MHz. For operation with 2.5GBASE-T and 5GBASE-T, for frequencies that correspond to calculated values greater than 65 dB, the requirement reverts to the minimum requirement of 65 dB."
insert a new equation,(33-18aa), copied from (33-18) with accompanied 'NEXTconn' and 'f' definitions, except that "40" is changed to "43"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Line 25 change "2.5GBASE-T" to "1000BASE-T"
line 27 delete "For 5GBASE-T, NEXT loss for Midspan PSE devices shall meet the values determined by Equation (33-XX) when measured for the transmit and receive pairs from 1 MHz to 250 MHz."
line 29 change "5GBASE-T" to "1000BASE-T"
line 39 insert new paragraph "For 2.5GBASE-T, NEXT loss for Midspan PSE devices shall meet the values determined by Equation (33-18aa) when measured for the transmit and receive pairs from 1 MHz to 100 MHz. For 5GBASE-T, NEXT loss for Midspan PSE devices shall meet the values determined by Equation (33-18aa) when measured for the transmit and receive pairs from 1 MHz to 250 MHz. For operation with 2.5GBASE-T and 5GBASE-T, for frequencies that correspond to calculated values greater than 65 dB, the requirement reverts to the minimum requirement of 65 dB."
insert a new equation,(33-18aa), copied from (33-18) with accompanied 'NEXTconn' and 'f' definitions, except that "40" is changed to "43"

Cl **33** *SC* **33.4.9.1.3** *P* **66** *L* **35** # i-210
Mcclellan, Brett Marvell Semiconducto

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

The return loss limit at 20MHz violates the RL spec in 126.7.2.3 for 2.5G and 5G (17dB).

SuggestedRemedy

create a separate table entry for 2.5GBASE-T with the following limits based on Cat5E:
1 MHz<f<=31.5 MHz 30 dB
31.5 MHz<f<=100 MHz 20-20log10(f/100)

Response *Response Status* **W**

ACCEPT.

Cl **33** *SC* **33.4.9.1.3** *P* **66** *L* **37** # i-211
Mcclellan, Brett Marvell Semiconducto

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

at 100MHz the limit of 14dB is only 4dB margin vs the 2.5/5G spec

SuggestedRemedy

create a separate table entry for 5GBASE-T with the following limits based on Cat6:
1 MHz<f<=50 MHz 30 dB
50 MHz<f<=250 MHz 24-20log10(f/100)

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Create a separate table entry for 5GBASE-T with the following limits based on Cat5E:
1 MHz<f<=31.5 MHz 30 dB
31.5 MHz<f<=250 MHz 20-20log10(f/100)

Cl **33** *SC* **33.4.9.2.3** *P* **67** *L* **40** # i-212
Mcclellan, Brett Marvell Semiconducto

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

(variants 5 through 10 in 33.4.9.1) there are only 5 variants

SuggestedRemedy

change "(variants 5 through 10 in 33.4.9.1)" to "(variants 3 through 5 in 33.4.9.1)"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change as follows:
"Midspan PSEs intended for operation with 2.5G/5G/10GBASE-T (variants 3 through 5 in 33.4.9.1 and 33.4.9.2) are ..."

This resolution is identical to comment #37.

Cl **33** *SC* **33.4.9.2.5** *P* **68** *L* **11** # i-214
Mcclellan, Brett Marvell Semiconducto

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

for all specified frequencies, The frequency range in Table 33-20b exceeds the frequency requirements for 2.5GBASE-T and 5GBASE-T and may be reduced.

SuggestedRemedy

delete "for all specified frequencies"
insert "For other than 5GBASE-T or 10GBASE-T operation, PSAFEXT loss for Midspan PSE devices shall meet the values determined by Table 33-20b from 1 MHz to 100 MHz. For 5GBASE-T capable midspans, PSAFEXT loss
for Midspan PSE devices shall meet the values determined by Table 33-20b from 1 MHz to 250 MHz. For 10GBASE-T capable midspans, PSAFEXT loss for Midspan PSE devices shall meet the values determined by Table 33-20b from 1 MHz to 500 MHz."
Delete the frequency column of Table 33-20c

Response *Response Status* **W**

ACCEPT.

Cl **40** *SC* **40.6.1.1** *P* **71** *L* **12** # i-234
Zimmerman, George Aquantia, ADI, Comm

Comment Type **TR** *Comment Status* **A** *Other Clauses*

(related to this clause) Now that 2.5G/5GBASE-T and 10GBASE-T are added to the PHYs supporting PoE, the same line needs to be added to clauses 55 (10G) and 126 (2.5G/5G).

SuggestedRemedy

Bring Clauses 55 and 126 into the draft, and insert new first paragraph in 55.5.1 and 126.5.1 - "A PHY with a MDI that is a PI (see 33.1.3) shall meet the isolation requirements defined in 33.4.1 or 145.4.1.", Change first sentence of current first paragraph of 55.5.1 and 126.5.1 changing "The PHY" to "A PHY with a MDI that is not a PI" so that it reads: "A PHY with a MDI that is not a PI shall provide electrical isolation between the port device circuits, including frame ground (if any) and all MDI leads."

Response *Response Status* **W**

ACCEPT.

Cl **79** *SC* **79.3.2** *P* **74** *L* **15** # i-216
Mcclellan, Brett Marvell Semiconducto

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

PI is used without definition in Clause 79.

SuggestedRemedy

Change "PI" to "Power Interface (PI)"

Response *Response Status* **W**

ACCEPT.

Cl **79** *SC* **79.3.2.1** *P* **75** *L* **8** # i-324

Law, David — Hewlett Packard Enter

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

Note 1 to Table 79-3 states 'Port class information is implied by the support of the PSE or PD groups.'. As far as I can see there is no mention of a PD group in the last version of IETF RFC 3621 or in IEEE Std 802.3.1-2013 which deprecated IETF RFC 3621.

This table originated as Table G.1 in IEEE Std 802.1AB-2005, and was incorporated in to IEEE Std 802.3 by the IEEE Std 802.3bc-2009 Ethernet Organizationally Specific Type, Length, Values (TLVs) amendment, which added Clause 79. Based on this it seems that this note was generated as a result of comment 124 on IEEE P802.1AB draft D11 <http://www.ieee802.org/1/files/private/ab-drafts/d12/80211AB-D11-dis.pdf#Page=91>. The comment reads:

COMMENT TYPE: T
CLAUSE: Annex G..3.1
PAGE: 133
LINE: 9
COMMENT START:
The right columns look like missing information.
COMMENT END:
SUGGESTED CHANGES:
Either:
1) Fill the information in.
2) Insert an N/A notation
3) Insert an em dash, which should then be described in the glossary (802.17 did this).
SUGGESTED CHANGES END:

Disposition of Comment 124

Add notes -
For Port Class the information is implied by the support of the PSE or PD MIB groups For MDI power support the information is implied by support of the power over Ethernet MIB. Refer to the RFC

The latest version of IETF RFC 3621, version 08 dated 22nd June 2003 <https://tools.ietf.org/html/draft-ietf-hubmib-power-ethernet-mib-08> states 'The document proposes an extension to the Ethernet-like Interfaces MIB with a set of objects for managing a Power Source Equipment (PSE).'. Looking at the first version however, version 00 dated 25th June 2001, this text reads 'The document proposes an extension to the Ethernet-like Interfaces MIB [RFC2665] with a set of objects for managing a power Ethernet Powered Device (PD) and/or Power Source Equipment (PSE).'. This text changed between version 04 date 19th December 2002 <https://tools.ietf.org/html/draft-ietf-hubmib-power-ethernet-mib-04> and version 05 dated 21st May 2003 <https://tools.ietf.org/html/draft-ietf-hubmib-power-ethernet-mib-05>. Based on this it seems the IETF RFC 3621 drafts supported both PSE and PD management up to 21st May 2003.

While the IEEE P802.3AB comment was processed in October 2004, after PD management was removed from RFC 3621, it may be possible that this had not been noted, or it may have been assumed that RFC 3621 which is titled 'Power Ethernet MIB' supported both PDs and PSEs. Regardless, it seems that the intent of the note was to describe how to determine how to set this bit by reference to attributes in the IETF RFC.

Since (a) this note references a non-existent PD group in the MIB; (b) we don't mandate implementation of any particular management protocol, or any management, a PSE may or may not implement the PSE group in the MIB, and (c) in the reminder of subclause 79.3.2 'Power Via MDI TLV' we generally defined the bits through text rather than a cross reference to Objects, suggest that we do the same for the MDI power capabilities/status field.

SuggestedRemedy

Suggest that:

[1] The entire 'Object reference' column of Table 79-3 'MDI power capabilities/status field' is deleted.

[2] The two remaining notes for Table 79-3 'MDI power capabilities/status field' are deleted.

[3] New subclauses are added to describe the "MDI power capabilities/status" fields that read as follows:

79.3.2.1.1 Port class

The "Port class" field transmitted shall indicate if the port is a PSE or a PD.

79.3.2.1.2 PSE MDI power support

The "PSE MDI power support" field shall indicate if MDI power is supported.

79.3.2.1.3 PSE MDI power state

The "PSE MDI power state" field transmitted by a PSE shall indicate if the PSE function is enabled or disabled. When disabled all PSE functions are disabled and behaviour is as if there was no PSE functionality. The value of the "PSE MDI power state" transmitted by a PD is undefined.

79.3.2.1.4 PSE pairs control ability

The "PSE pairs control ability" field transmitted by a PSE shall indicate if the PSE has the capability to control which PSE Pinout Alternative (see 33.2.3 and 145.2.4) is used for PD detection and power. If capable the PSE Pinout Alternative used can be controlled through the pethPsePortPowerPairs attribute (see IEEE Std 802.3.1). If not the PSE Pinout Alternative used cannot be controlled through the pethPsePortPowerPairs attribute.

Response *Response Status* **W**

ACCEPT.

Cl **79** *SC* **79.3.2.1** *P* **75** *L* **13** # i-217

Mcclellan, Brett Marvell Semiconducto

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

Note 2 was deleted, but "Note 3" was not renumbered.

SuggestedRemedy

change "Note 2" to "Note 3" on lines 13 and 23

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Suggest that:

[1] The entire 'Object reference' column of Table 79-3 'MDI power capabilities/status field' is deleted.

[2] The two remaining notes for Table 79-3 'MDI power capabilities/status field' are deleted.

[3] New subclauses are added to describe the "MDI power capabilities/status" fields that read as follows:

79.3.2.1.1 Port class

The "Port class" field transmitted shall indicate if the port is a PSE or a PD.

79.3.2.1.2 PSE MDI power support

The "PSE MDI power support" field shall indicate if MDI power is supported.

79.3.2.1.3 PSE MDI power state

The "PSE MDI power state" field transmitted by a PSE shall indicate if the PSE function is enabled or disabled. When disabled all PSE functions are disabled and behaviour is as if there was no PSE functionality. The value of the "PSE MDI power state" transmitted by a PD is undefined.

79.3.2.1.4 PSE pairs control ability

The "PSE pairs control ability" field transmitted by a PSE shall indicate if the PSE has the capability to control which PSE Pinout Alternative (see 33.2.3 and 145.2.4) is used for PD detection and power. If capable the PSE Pinout Alternative used can be controlled through the pethPsePortPowerPairs attribute (see IEEE Std 802.3.1). If not the PSE Pinout Alternative used cannot be controlled through the pethPsePortPowerPairs attribute.

This resolution is identical to comment #324.

Cl **79** *SC* **79.3.2.3** *P* **76** *L* **21** # i-323

Law, David Hewlett Packard Enter

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

This text reads 'Class 5 and above is communicated by the Power Class field ...'. I don't believe this is correct, I believe that the Class 5 and above is communicated by the 'Power Classx' field. In addition, suggest that TLV field names should always be placed in inverted commas.

SuggestedRemedy

Suggest that the text 'Class 5 and above is communicated by the Power Class field ...' should be changed to read 'Class 5 and above is communicated by the "Power Classx" field ...'.

Response *Response Status* **W**

ACCEPT.

Cl **79** *SC* **79.3.8** *P* **83** *L* **36** # i-218

Mcclellan, Brett Marvell Semiconducto

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

"subtype=2" is NOT defined for Power Via MDI Measurements
The subtype for Power Via MDI Measurements was left TBD (see other comment)

SuggestedRemedy

change "subtype=2" to "subtype=8"

Response *Response Status* **W**

ACCEPT.

Cl **145** *SC* **145.1.3** *P* **97** *L* **49** # i-371

Thompson, Geoffrey Individual

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

This is not the "definition" of Icable, it is the specification.

SuggestedRemedy

Change the word "defined" to "specified".

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
ACCEPT IN PRINCIPLE.

Change as follows:

"I Cable, specified in Table 145-1, is the current on one twisted pair in the balanced twisted-pair cable. ."

"I Cable is the highest nominal current on a pair for a system without pair-to-pair current unbalance. ."

This resolution is identical to comment #45.

Cl **145** *SC* **145.1.3.1** *P* **102** *L* **30** # i-48

Yseboodt, Lennart Philips Lighting

Comment Type **ER** *Comment Status* **R** *Cabling*

"Type 3 and Type 4 operation requires Class D or better cabling as specified in ISO/IEC 11801:2002."

Redundant reference to Type. Also, not completely true, a Type 3 system operating at Class 3 will still work over 20 ohm cable.
Trying to explain that nuance in this sentence seems unneccesairy.

SuggestedRemedy

"Class D or better cabling as specified in ISO/IEC 11801:2002 is required to support operation as specified in this Clause."

Response *Response Status* **U**

REJECT.

This comment references a sentence that does not exist in the draft.

Cl **145** *SC* **145.2.4** *P* **107** *L* **40** # i-49

Yseboodt, Lennart Philips Lighting

Comment Type **TR** *Comment Status* **R** *Pres: Darshan12*

A PD's diode bridge is the dominant, and most unpredicatable, contributor to pair-to-pair current unbalance.
Diode specifications generally do not include information or guarantees about the maximum spread in forward voltage between samples.
This makes it hard to get to a provable correct design that will always meet the current unbalance spec.
It is however not impossible, analysis over the course of this project has shown that diode forward voltage differences of more than 60mV are extremely rare. This number has been used to calculate the unbalance budget for the PD.

What isn't taken into account is diode aging. As diodes are exposed to current and temperature, their forward voltage will begin to drift.
A pair of parallel diodes exposed to roughly the same current may be expected to age in the same way (this is uncertain, but let's accept it for the moment).

If 4-pair PSEs are allowed to provide power in polarity configurations that can result in ONE pairset having the other polarity between two PSEs,
this would mean that a PD that has been exposed to a certain current configuration, would find itself powered in a way that has one 'aged' diode conduct, and another 'new' diode in parallel. By 'new' I refer to a diode that has not seen any significant current over it's lifetime.

At the moment of writing this comment, it is unknown what the magnitude of this issue is. Test to determine this are planned.

SuggestedRemedy

1. Quantify this issue for the November meeting
2. Appropriate solition, if needed to be presented then

Response *Response Status* **U**

REJECT.

A remedy was not provided with this comment.

Cl **145** *SC* **145.2.5.3** *P* **109** *L* **42** # i-253

Peker, Arkadiy Microsemi Corporation

Comment Type **TR** *Comment Status* **A** *PSE SD*

This comment is an update to the comment that requires to delete Figure 145B-3:
Per the definition of CC_DET_SEQ=0 for dual-signature, the detection need to be parallel and not staggered and this contradicts figure 145B-3 that is shown as one of the staggered detection versions. So we have two options to resolve this:
a) To delete figure 145B-3 to sync with CC_DET_SEQ=0 definition for dual-signature PDs and also update state machine which will be complicated task at this point of time. OR,
b) (Preferred) Keep Figure 145B-3, and change the ""CC_DET_SEQ=0 definition that to allow staggered detection in addition to parallel detection which currently is supported by the state machine."

SuggestedRemedy

Change "Connection Check is followed by staggered detection for a single-signature PD and parallel detection for a dual-signature PD."
To: Connection Check is followed by staggered detection for a single-signature PD and parallel or staggered detection for a dual-signature PD."

Response *Response Status* **W**

ACCEPT.

Cl **145** *SC* **145.2.5.4** *P* **110** *L* **27** # i-52

Yseboodt, Lennart Philips Lighting

Comment Type **ER** *Comment Status* **A** *PSE SD*

For variable alt_pwrd_pri, the values are described:
"FALSE: The PSE is not to apply power to the Primary Alternative.
TRUE: The PSE has detected, classified, and will power a PD on the Primary Alternative; or power is being forced on the Primary Alternative in TEST_MODE."

Why are we describing half of the state machine for the 'TRUE' value ?

SuggestedRemedy

Replace TRUE by:
TRUE: The PSE is to apply power to the Primary Alternative.

Same change for _sec.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Adopt choice 1 below as new definitons of variable:

Choice 1
"FALSE: The PSE is not to apply power to the Primary Alternative.
TRUE: The PSE has detected, classified, and will power a PD on the Primary Alternative, is powering the Primary Alternative, or power is being forced on the Primary Alternative in TEST_MODE."

Cl **145** *SC* **145.2.5.4** *P* **113** *L* **40** # i-249

Peker, Arkadiy — Microsemi Corporation

Comment Type **TR** *Comment Status* **A** *PSE SD*

In the variable option_probe_alt_sec definition:
"option_probe_alt_sec
This variable indicates if the PSE will continue to detect and conditionally class on the Secondary Alternative in the event an invalid detect or class result is found on the Primary Alternative. This variable applies to CC_DET_SEQ = 3.
Values:
FALSE: PSE does not probe the Secondary Alternative if an invalid signature is found on the Primary Alternative.
TRUE: PSE does probe the Secondary Alternative if an invalid signature is found on the Primary Alternative." we have few issues:
1) The definition text says "in the event an invalid detect or class result is found" is not reflected in the text that defines the TRUE and FALSE. Only the "invalid detection" is addressed.
2) The text " if an invalid signature is found" in the TRUE and FALSE definition is not logically accurate and can lead to wrong interpretation. It should be " if an invalid signature will be found" since this variable can be set in system config phase or on the fly, but the current definition may be interpreted as this parameter can be configured only on the fly as function of the result of primary detection signature result if valid or not."

SuggestedRemedy

Change the TRUE and FALSE definition from:
"FALSE: PSE does not probe the Secondary Alternative if an invalid signature is found on the Primary Alternative.
TRUE: PSE does probe the Secondary Alternative if an invalid signature is found on the Primary Alternative."
To:
"FALSE: PSE does not probe the Secondary Alternative if an invalid detection signature or classification will be found on the Primary Alternative.
TRUE: PSE does probe the Secondary Alternative if an invalid detection signature or classification will be found on the Primary Alternative"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change TRUE and FALSE definitions to:
FALSE: PSE does not probe the Secondary Alternative if an invalid detection signature is found on the Primary Alternative or classification is invalid on the Primary Alternative.
TRUE: PSE does probe the Secondary Alternative if an invalid detection signature is found on the Primary Alternative or classification is invalid on the Primary Alternative.

Cl **145** *SC* **145.2.5.7** *P* **127** *L* **33** # i-196

Peker, Arkadiy — Microsemi Corporation

Comment Type **TR** *Comment Status* **R** *PSE SD*

The text allows the PSE to do detection and if there is any implementation specific system error, to go to IDLE. This is not covered by the state machine. As a result in the exit from DETECT_EVAL to IDLE , we need to add to the condition the variable error_condition.

SuggestedRemedy

"Change from:
""(pse_alternative = both) * ((det_temp = only_one) * (sig_pri NE valid) +(det_temp = both_neither) * (sig_sec NE valid) + (((CC_DET_SEQ = 0) + (CC_DET_SEQ = 3)) * (det_temp = only_one) * tdet2det_timer_done)) + (pse_alternative = a) * (sig_pri NE valid) +(pse_alternative = b) * (sig_pri = open_circuit)""
To:
""error_condition + (pse_alternative = both) * ((det_temp = only_one) * (sig_pri NE valid) +(det_temp = both_neither) * (sig_sec NE valid) + (((CC_DET_SEQ = 0) + (CC_DET_SEQ = 3)) * (det_temp = only_one) * tdet2det_timer_done)) + (pse_alternative = a) * (sig_pri NE valid) +(pse_alternative = b) * (sig_pri = open_circuit)""""

Response *Response Status* **W**

REJECT.

There is a global entry based on error_condition into IDLE that covers this.

Cl **145** *SC* **145.2.5.7** *P* **129** *L* **42** # i-194

Peker, Arkadiy — Microsemi Corporation

Comment Type **TR** *Comment Status* **R** *PSE SD*

I could not find in the text allowance for the PSE to do detection and classification and if there is any implementation specific system error, to go to IDLE. I couldn't find how currently it is covered by the state machine. As a result in the state CLASS_EVAL I propose to add exit to IDLE with the condition error condition.

SuggestedRemedy

Add exit from the state CLASS_EVAL to IDLE with the condition error condition.

Response *Response Status* **W**

REJECT.

There is a global entry into IDLE based on the variable error_condition.

Cl **145** *SC* **145.2.6** *P* **141** *L* **29** # i-203

Peker, Arkadiy — Microsemi Corporation

Comment Type **TR** *Comment Status* **A** *PSE Detection*

We have the following text: "Also, a PSE may successfully detect a PD but then opt not to power the detected PD.". We need similar text for the classification i.e. "A PSE may successfully detect and classify a PD but then opt not to power that PD. " to be added at the end of clause 145.2.7 page 148 after line 38.

SuggestedRemedy

Add the following text in 145.2.7 page 148 after line 38: "A PSE may successfully detect and classify a PD but then opt not to power that PD. "

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change existing sentence to: "Also, a PSE may successfully detect a PD or detect and classify a PD, but then opt not to power the detected PD."

Cl **145** *SC* **145** *P* **142** *L* **10** # i-1

Anslow, Peter — Ciena Corporation

Comment Type **TR** *Comment Status* **R** *Editorial*

The IEEE-SA Standards Style Manual 13.3.2 says "An em dash (--) should be used to indicate the lack of data for a particular cell in a table."
Comment #29 against P802.3bt D2.4 was: "Several tables in Clause 145 have blank cells in the min or max columns, which should contain an em-dash", but this was rejected with the rebuttal:
"The lack of em-dashes is intentional. The em-dash would convey that there is no relevant information, while the lack of the em-dash conveys that there is no specific number."
This makes no sense.
The first example of this issue is in Table 145-7. "Connection check to detection time" Tcc2det has a maximum value of 0.4 s, but the min column is blank. According to the IEEE style manual the cell should contain an em dash, which would indicate that there is no minimum requirement for this time. If there is some requirement on the minimum (not just a number) then an indication of this should be made via an entry in the cell such as "See 145.x.x". If this is not the case, then the cell should contain an em dash.

SuggestedRemedy

Make sure all tables have an entry of em-dash or pointer to the requirement in currently blank min or max columns.
In particular, Tables 145-7, 145-8, 145-9, 145-10, 145-14, 145-16, 145-20, 145-27, 145-28, 145-30, 145-31, 145-32.

Response *Response Status* **U**

REJECT.

We will work with editorial staff to try to clarify the style guide. Here is our opinion:

There is a distinction between an em-dash, which indicates 'a lack of data', and leaving a cell blank. Eg. For parameters that convey a range, having a blank 'Min' cell, does NOT indicate there is lack of data, rather that the minimum value is open-ended. An em-dash would convey an incorrect message. Em-dashes
have been put in all cells where it is appropriate.

Cl **145** *SC* **145.2.7** *P* **146** *L* **41** # i-79

Yseboodt, Lennart — Philips Lighting

Comment Type **TR** *Comment Status* **R** *PSE Power*

Topic: SLIDING
"Measurements should be averaged using any sliding window with a width of 1 s."

This sentence follows after the definition of PClass and PClass-2P. That whole section is informative in nature.
- Why is this a should ?
- Measurements of what ? PClass is a capability.
- The actual power requirement of a PSE is encoded in ICon-2P.

SuggestedRemedy

Remove quoted sentence.

Response *Response Status* **U**

REJECT.

This is the only mention of averaging for Pclass and needs to be included somewhere in the specification.

Cl **145** *SC* **145.2.8.5** *P* **156** *L* **51** # i-204

Peker, Arkadiy — Microsemi Corporation

Comment Type **TR** *Comment Status* **R** *Pres: Darshan9*

"Equation 145-8 contains the parts that allow us to calculate the value of Icon-2P in case of operating over 2-pairs and for the dual-signature case.
However, for the most important use case which is operating over 4-pairs.
Equation 145-8 contains the part ""Icon-2P=min(Icon - IPort-2P-other, ICon-2P-unb) when operating over 4-pairs.
-Icon is defined in Equation 145-9.
-Icon-2P_unb is defined in Table 145-16 item 5.
There is no information to find the value of Icon-2P_other in order to calculate the value of Icon-2P. As a result, the spec is broken."

SuggestedRemedy

Adopt darshan_09_0917.pdf

Response *Response Status* **U**

REJECT.

No consensus for change.

Cl **145** *SC* **145.2.8.5.1** *P* **158** *L* **47** # i-392

Thompson, Geoffrey — Individual

Comment Type **ER** *Comment Status* **A** *Pres: Yseboodt2*

This seems like an attempt to control the system imbalance (which is controlled by the combined specifications of the three elements, one of which is externally specified) from within the PSE spec.

SuggestedRemedy

This is all valuable tutorial material that would be valuable for further work on the topic so it should be moved (with suitable editing) to an informative annex.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Adopt yseboodt_02_0917_Figure_145_22.pdf

This resolution is identical to comment #110.

[Editor's note added after comment resolution completed.

The full URL for the file FILE_NAME.pdf is
http://www.ieee802.org/3/bt/public/sep17/yseboodt_02_0917_Figure_145_22.pdf]

Cl **145** *SC* **145.2.8.5.1** *P* **161** *L* **2** # i-393

Thompson, Geoffrey — Individual

Comment Type **ER** *Comment Status* **A** *Pres: Yseboodt2*

Figure 145-22. This figure is very valuable in understanding the overall problem of resistance imbalance in a PoE system, however it doesn't help with the problem of designing a PSE when one has no control of the link section or the PD.

SuggestedRemedy

Tutorial material that would be valuable for further work on the topic. It should be moved to an informative annex.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Adopt yseboodt_02_0917_Figure_145_22.pdf

This resolution is identical to comment #110.

[Editor's note added after comment resolution completed.

The full URL for the file FILE_NAME.pdf is
http://www.ieee802.org/3/bt/public/sep17/yseboodt_02_0917_Figure_145_22.pdf]

Cl **145** *SC* **145.2.8.8** *P* **162** *L* # i-22

Waters, Keith — Schneider Electric

Comment Type **TR** *Comment Status* **R** *Certification*

I have concerns that PSE section 145.2.8.8 does not show any testing or certification listing requirements. This is a potential product and fire safety issue and needs to be addressed.

SuggestedRemedy

Add: Testing and a third party certification listing shall be required to verify the PSE operates per the requirements in this section.

Response *Response Status* **W**

REJECT.

This comment is out of scope.

The purpose of IEEE P802.3bt is to define interoperability, it is not to define product requirements. In respect to safety subclause 145.6.1 'General safety' of IEEE P802.3bt states 'All equipment subject to this clause shall conform to IEC 60950-1 or IEC 62368-1. In particular, the PSE shall be classified as a Limited Power Source in accordance with IEC 60950-1 or IEC 62368-1 Annex Q. Equipment shall comply with all applicable local and national codes related to safety.'. It is these referenced local and national codes that define the requirements, not IEEE P802.3bt. The need for certification is determined by the marketplace or regulation, and may vary by geography.

Cl **145** *SC* **145.2.8.7** *P* **162** *L* # i-21

Waters, Keith — Schneider Electric

Comment Type **TR** *Comment Status* **R** *Certification*

I have concerns that PSE section 145.2.8.7 does not show any testing or certification listing requirements. This is a potential product and fire safety issue and needs to be addressed.

SuggestedRemedy

....at least 1 second width. Testing and a third party certification listing shall be required to confirm overload current protection will operate correctly.

Response *Response Status* **W**

REJECT.

This comment is out of scope.

The purpose of IEEE P802.3bt is to define interoperability, it is not to define product requirements. In respect to safety subclause 145.6.1 'General safety' of IEEE P802.3bt states 'All equipment subject to this clause shall conform to IEC 60950-1 or IEC 62368-1. In particular, the PSE shall be classified as a Limited Power Source in accordance with IEC 60950-1 or IEC 62368-1 Annex Q. Equipment shall comply with all applicable local and national codes related to safety.'. It is these referenced local and national codes that define the requirements, not IEEE P802.3bt. The need for certification is determined by the marketplace or regulation, and may vary by geography.

Cl **145** *SC* **145.3.5** *P* **183** *L* **22** # i-143

Yseboodt, Lennart — Philips Lighting

Comment Type **TR** *Comment Status* **R** *Pres: Yseboodt8*

"A single-signature PD shall present a valid detection signature, as defined in Table 145-20, on a given Mode when no voltage or current is applied to the other Mode, and shall present an invalid detection signature on that Mode when any voltage between 10.1 V and 57 V is applied to the other Mode. These requirements apply to both Mode A and Mode B."

The requirement only holds for corrupting voltages above 10.1V, whereas connection check entirely operates below 10.1V.
See http://www.ieee802.org/3/bt/public/may17/yseboodt_09_0517_signature.pdf for problem description.

SuggestedRemedy

Change first paragraph of 145.3.5 to read:
"A single-signature PD shall present a valid detection signature, as defined in Table 145-20, on a given Mode when no voltage or current is applied to the other Mode, and shall not present a valid detection signature on that Mode when any voltage between 3.7 V and 57 V is applied to the other Mode. These requirements apply to both Mode A and Mode B.
NOTE - A detection signature is only considered valid when it meets Table 145-20 over the entire PD detection voltage range of 2.7 V to 10.1 V."

Response *Response Status* **U**

REJECT.

There was no consensus for change.

Cl **145** *SC* **145.4.2** *P* **200** *L* # i-23

Waters, Keith — Schneider Electric

Comment Type **TR** *Comment Status* **R** *Certification*

I have concerns that section 145.4.2 does not show any testing or certification listing requirements in regard to fault tolerance. This is a potential product and fire safety issue
and needs to be addressed.

SuggestedRemedy

Add to standard: Testing and a third party certification listing shall be required.

Response *Response Status* **W**

REJECT.

This comment is out of scope.

The purpose of IEEE P802.3bt is to define interoperability, it is not to define product requirements. In respect to safety subclause 145.6.1 'General safety' of IEEE P802.3bt states 'All equipment subject to this clause shall conform to IEC 60950-1 or IEC 62368-1. In particular, the PSE shall be classified as a Limited Power Source in accordance with IEC 60950-1 or IEC 62368-1 Annex Q. Equipment shall comply with all applicable local and national codes related to safety.'. It is these referenced local and national codes that define the requirements, not IEEE P802.3bt. The need for certification is determined by the marketplace or regulation, and may vary by geography.

Cl **145** *SC* **145.4.2** *P* **200** *L* **29** # i-382

Thompson, Geoffrey — Individual

Comment Type **TR** *Comment Status* **R** *AES*

System fault tolerance specifications should be specified here.

SuggestedRemedy

Change the opening text to read: "Each conductor pair of the link section or a PI of a PoE system shall meet the fault tolerance requirements of ...

Response *Response Status* **U**

REJECT.

We specify everything at the PI, we can't put requirements on conductor pairs of the link section.

Cl **145** *SC* **145.4.9** *P* **206** *L* **22** # i-390

Thompson, Geoffrey Individual

Comment Type **ER** *Comment Status* **R** *AES*

Much of the text in this clause is superficial, unnecessary and/or redundant.

SuggestedRemedy

Clean up the text and remove any text that is not an additional requirement specific to midspans.

Response *Response Status* **U**

REJECT.

No consensus for change.

Cl **145** *SC* **145.4.9** *P* **206** *L* **22** # i-391

Thompson, Geoffrey Individual

Comment Type **TR** *Comment Status* **R** *AES*

Reduce the midspan aspects of the spec to two simple statements, the effect a midspan can have on the acceptance test for a permanent link and effect a midspan can have on the acceptance test for a cord that meets standards allowances.

SuggestedRemedy

Prune the text so that the cabling acceptance tests (to be called out by reference) are the control.

Response *Response Status* **U**

REJECT.

No consensus for change.

Cl **145** *SC* **145.4.9.1.1** *P* **208** *L* **31** # i-220

Mcclellan, Brett Marvell Semiconducto

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

NEXT loss for PSE midspan is 40dB at 100MHz, however 2.5/5GBASE-T budgets 43dB for connectors.

SuggestedRemedy

change "40" to "43"

Response *Response Status* **W**

ACCEPT.

Cl **145** *SC* **145.4.9.1.3** *P* **209** *L* **41** # i-221

Mcclellan, Brett Marvell Semiconducto

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

The return loss limit at 20MHz violates the RL spec in 126.7.2.3 for 2.5G and 5G (17dB).

SuggestedRemedy

create a separate table entry for 2.5GBASE-T with the following limits based on Cat5E:
1 MHz<f<=31.5 MHz 30 dB
31.5 MHz<f<=100 MHz 20-20log10(f/100)

Response *Response Status* **W**

ACCEPT.

Cl **145** *SC* **145.4.9.1.3** *P* **209** *L* **42** # i-222

Mcclellan, Brett Marvell Semiconducto

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

at 100MHz the limit of 14dB is only 4dB margin vs the 2.5/5G spec

SuggestedRemedy

create a separate table entry for 5GBASE-T with the following limits based on Cat6:
1 MHz<f<=50 MHz 30 dB
50 MHz<f<=250 MHz 24-20log10(f/100)

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

create a separate table entry for 5GBASE-T with the following limits based on Cat5E:
1 MHz<f<=31.5 MHz 30 dB
31.5 MHz<f<=250 MHz 20-20log10(f/100)