Cl **00** *SC* **00** *P* *L* # 16

Claseman, George — Micrel

Comment Type **TR** *Comment Status* **R** *4P*

4P operation is not described. If this is not specifed in 802.3at, an industry standard or proprietary scheme could emerge displacing this amendment. It is undesirable to make another revision on PoE (PoE ++) to repair this.

SuggestedRemedy

Send this back to the TF to complete the work on 4P. This has impact on the PSE, PD, management and L2 power management. Let's do it right this time.

Response *Response Status* **U**

REJECT.

This is a comment against D3.0 that was correctly submitted but mistakenly left out of the comment DB. This is how we handled the 4P comments in D3.0:

REJECT.
The group feels that finishing 2P is the priority and 4P will be address after that time, since the concept is that 4P = 2 x 2P.

Cl **33** *SC* **33.2.6.1** *P* **55** *L* **35** # 17

Reshef, Tamir — Microsemi Corp

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

Vos and Ios are not well specified.
How do you measure it at the PD?

SuggestedRemedy

See the definitions for Ios and Vos as illustrated in Figure 33C-17 in draft d3.0 and generate new drawing that illustrate only the location and definition of Voffset and Ioffset.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

OBE 41

Cl **33** *SC* **33.2.3** *P* **44** *L* **50** # 34

Darshan, Yair — Microsemi Corporation

Comment Type **TR** *Comment Status* **R** *4P*

Draft 3.1

The standard should not preclude implementations that are using both alternative A and B due to the following reasons:

a) It is out of scope of the standard to limit implementations that meets standard requirements.
b) There are no interoperability issues if PD gets power from 2x 2 pairs power source if all pairs are comming from the same port/segment/PSE type 2. It is the load responsibility (PD) to meet the 2P specification for each 2P.
(4P ad hoc recomendations)

SuggestedRemedy

Change from:

"A PSE shall implement Alternative A or Alternative B, or both.
While a PSE may be capable of both Alternative A and Alternative B, PSEs shall not operate both Alternative A and Alternative B on the same link segment simultaneously".

To:
"A PSE shall implement Alternative A or Alternative B, or both.
While a PSE may be capable of both Alternative A and Alternative B, PSEs shall not deliver power on both Alternative A and Alternative B simultaneously on the same segment
If Alternative A and Alternative B are operated from different link segments or different power systems or from Type 1 PSE.
For Type 2 PSEs, simultaneous operation of Alternative A and Alternative B on the same link segment is out of scope of the standard."

In addition, in 33.3.1 page 50 line 42 modify the text to be:
"NOTE-PDs that implement only Mode A or Mode B are specifically not allowed by this standard. PDs that may simultaneously receive power from both Mode A and Mode B are out of scope of this standard."

Response *Response Status* **U**

REJECT.

See comment #16

Cl **33** *SC* **33.3.1** *P* **71** *L* **42** # 35

Darshan, Yair — Microsemi Corporation

Comment Type **TR** *Comment Status* **R** *PD A&B*

Draft D3.1:

The note in line 42 precludes the ability to reduce power loss over the cable and increase overall system efficiency.
Rational:
Using a Type 2 PD that requires a total of 24W (example) on a 2P can also take a toatal of 24W over all 4 pairs with simple PD implementation.
In this case this PD can work on 2P PSE or on 2x2P PSEs with the same PD behaviour which is transparent to the user.

In addition let's assume that in this case both pairs are comming from the same box and the same power supply. This is a classical case in which by using all pairs we effectively reduce the channel power loss and allows interoperable and relaible operation.

If Icable meet the specification of 2P then I<Icable certaily meets the same specification so preventing feeding the current all over the 4 pairs doesnt make sense.

This is implementation that is inline with the global effort for reducing power loss and in my opinion we are not authrized to preclude implementations that meet the numbers and state machines of this standard.

SuggestedRemedy

Change from:

"NOTE-PDs that implement only Mode A or Mode B are specifically not allowed by this standard. PDs that simultaneously require power from both Mode A and Mode B are specifically not allowed by this standard."

to:
"NOTE-PDs that implement only Mode A or Mode B are specifically not allowed by this standard. PDs that simultaneously may recieve power from both Mode A and Mode B is out of scope of the standard"

Response *Response Status* **U**

REJECT.
1) Comment is technically incorrect. This sentence does not preclude 24W over 4 pairs.
2) The rest of the comment glosses over a set of complex issues involving how the PSE would determine it was acceptable to power all four pairs.
3) The comment glosses over the special considerations needed in the PD to accommodate this new mode of operation.
4) The Task Force has specifically made it clear that 2 separate PDs per four pair cable must be accomodated.
5) Recommended solution does not address 2, 3, 4 and is not possible to implement in the context of a standard.

Cl **33** *SC* **33.2.9** *P* **61** *L* **16** # 58

Anslow, Peter — Nortel Networks

Comment Type **TR** *Comment Status* **R** *battery*

Requiring 50 V minimum from a Type 2 PSE means that it cannot be operated from commonly available 48 V supplies. See Thompson comment #482

SuggestedRemedy

Change the following:
Table 33-11, Item 1 Vport min PSE Type 2 to 44 volts
Table 33-11, Item 2 min value, PSE Type 2 to 44 volts
Table 33-18, Item 1 Vport min PSE Type 2 "50" value to "44" becoming "44-(RCh×ICable)"
Table 33-18, Item 3 Voverload min PSE Type 2 "50" value to "44" becoming "44-(RCh×ICable×400/350)"

In addition, it makes no sense to have different voltage ranges for Type 1 vs. Type 2 PDs as each has to be able to operate with the both types of PSEs during start-up. In particular a Type 2 PSD has to operate at the low voltage of a Type 1 during start-up while establishing the Data Link Layer communication

Response *Response Status* **U**

REJECT.

See 198 for lack of support to lower the PD power. This proposal lowers the power even further than comment 198.

show of hands for people in favor of lowering power of the PD to slightly lower than 22W:
for: 0
against: 20

You are also missing a subtle point that when a type 2 is behaving as a type 1 at boot up, it has to operate over the type 1 range; therefore there are no difference in the operating ranges of a PD.

Additionally, the same resolution to D3.0 comment 482 applies.

During the May 2006 Interim, the IEEE 802.3at task force voted to adopt 50 V as the minimum Vport.
Y: 37 N:0 A: 1
This was done after extensive evaluation of the system tradeoffs. One result of the discussions was the revelation that battery back up systems have only supplied about 10% of their available power when the voltage has reach 44V, therefore a boost system would be required to best utilize the available power fomr the battery backup system. It was determined that boosting to 50V was no more of a burden than boosting to 44V.

Multual identification of the PSE and PD type is possible. A Type 2 PD may provide useful functionality on a legacy system or it may indicate that it is under powered.

A type 2 PD range fits within a type 1 PD operating voltage range. Therefore, a type 1 (legacy) PD can be powered by a type 2 PSE.

A PSE normally would not change its voltage range when it provides power to different PD types.

Cl **33** *SC* **33.2.11.1.2** *P* **68** *L* **1** # 97

LANDRY, MATTHEW SILICON LABS

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

There really isn't a need for both IMin1 and IMin2, as the key values can be combined into a single parameter.

SuggestedRemedy

Replace IMin1 and IMin2 with a new parameter, IMin, 5mA min, 10 mA max.

Replace the first 3 sentences of the section with the following:
A PSE shall consider the DC MPS component to be present if IPort is greater than or equal to IMin max for a minimum of TMPS. A PSE shall consider the DC MPS component to be absent if IPort is less than or equal to IMin min. A PSE may consider the DC MPS component to be either present or absent if IPort is in the range of IMin.

Response *Response Status* **U**

Accept

Cl **33** *SC* **33.3.6** *P* **78** *L* **12** # 194

Thompson, Geoff Nortel

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

Overall comment.
I believe that the system (i.e. PSE, cabling and PD) is over specified. Given our system configuration once you specify two fo the elements, you have defined the results for the third and additional "shalls" just get in the way and provide the potential for technical conflict.

SuggestedRemedy

A number of solutions are possible. I suggest making PSE and cabling normative and just make the PD tolerate the results. That would require changing 33.3.7, page 78, line 12 to read something like:
"The power supply of the PD shall operate within the system constraints of the specified PSE and cabling systems. Those resulting values are provided in Table 33-18 for reference."

Response *Response Status* **U**

REJECT.

The TF has purposely engineered margin into the specifications of the PSE and PD by rigidly specifying each end, with the added bonus of ensuring interoperability. The Table has worst case values and a PD that conforms will be ensured to interoperate.

Vote to reject
y- 14 n-1

Cl **00** *SC* **00** *P* *L* # 195

Thompson, Geoff Nortel

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

PD equipment that is covered in the Code of Conduct on Energy Consumption of Broadband Equipment (from the EUROPEAN COMMISSION DIRECTORATE-GENERAL, JOINT RESEARCH CENTRE, Institute for the Environment and Sustainability, Renewable Energies Unit) will need to stay within the bounds of Type 1 power limits.

SuggestedRemedy

Remove all specifications for Type 2 devices and reformulate the standard to only support devices which meet the EC Code of Conduct on Energy Consumption of Broadband Equipment.

Response *Response Status* **U**

REJECT.

Although some Ethernet equipment is covered under the Code of Conduct on Energy Consumption of Broadband Equipment, it is by no means comprehensive and many types of Ethernet equipment fall outside of the scope of that specific Code of Conduct. For example, equipment covered by the Code of Conduct on Data Centres, published by the same body is not expected to be covered by the Broadband Code of Conduct.

Furthermore, if the commenter examines the Code of Conduct on Energy Consumption of Broadband Equipment he will find that power delivered by the PSE is specifically excluded by section A.5 ("Power delivered to other equipment (e.g. over USB or PoE) shall not be included in power consumption assessment").

Lastly, the Code of Conduct on Energy Consumption of Broadband Equipment specifies ONU equipment that exceeds 12.95W (e.g. 10Gb/s point-to-point or point-to-multipoint interfaces). It may be expected that some implementations of such devices will include power supplied over Ethernet from the home gateway device to the optical interface at the demarcation point. As such, this is a prime application of PoE that helps justify the broad market potential for the project.

Cl **33** *SC* **33.2.9** *P* **61** *L* **16** # 198

Thompson, Geoff Nortel

Comment Type **TR** *Comment Status* **R** *battery*

Also line 20
It makes no sense to require different voltage ranges for Type 1 vs. Type 2 PSE supplys except to the extent required to maintain far end voltage at the supplied (larger) current. That design freedom shuld be left to the implementor. See also next comment

SuggestedRemedy

Change item 1 Vmin from "50" to "37 + (Rch + Icable)"
Change item 2 Vmin from "50" to "37 + (Rch + Icable)"

Response *Response Status* **U**

REJECT.

Accepting the comment has the (perhaps) unintended effect of lowering the PD power to 22W.

Straw poll taken from room:
are you in favor to lowering the PD power to 22W
20 people opposed to lowering the power to 22W
zero people in favor of lowering the power to 22W

rationalization follows:

The remedy appears to have errors in it. I assume the proposer wants PSEs to provide a PSE voltage (lower than present values) that the PDs need, that is dependent on system parameters (cable length, cable quality, Ipd, PD type).

This would be very difficult to test. I suggest the task force vote to determine if they want to give the proposer time to correct their text, or reject this because these changes may significantly complicate this specification.

-------- Here is what I believe was intended ------

The proposed remedy adds a voltage to a resistance and a current. Assume the remedy should be:
Vmin = 37 + Rch * Icable

Here 37 is suppose to be the Vpd. The proposal would be incorrect for type 2 PDs.

Type 1 PD Vpd = 37

Type 2 PD Vpd = 50 - Rch * Icable

A minimum voltage could be calculated for a type 2 PD (Vpd = 50 - 12.5*0.6 = 42.5 V) and then the formula used could become:

Vmin = Vpd_min + Rch * Icable.

This formula is only valid during average power demand. Different values would result when PD Ipeak was drawn.
Type 1 PD Vpd = 44 - 0.4*20 = 36 V

Type 2 PD Vpd = 50 - 0.6*400/350*12.5 = 41.4 V

This gets more complicated when Ipeak changes and a quadratic formula needs to be used to calculate currents.

Cl **33** *SC* **33.3.7** *P* **78** *L* **25** # 199

Thompson, Geoff Nortel

Comment Type **TR** *Comment Status* **R** *battery*

Also, line 34
It makes no sense to have different voltage ranges for Type 1 vs. Type 2 PDs as each has to behave identically during the start-up when Data Link Layer communication is being established. Specifically a Type 2 PSD has to operate at the low voltage of a Type 1 during this phase of operation

SuggestedRemedy

In Table 33-18, item 1, eliminate the Type 2 entry and have the Vmin parameter be 37 for all PDs under all conditions.

In Table 33-18, item 2, eliminate the Type 2 entry and have the Vmin parameter be 36 for all PDs under all conditions.

Response *Response Status* **U**

REJECT.

The differing minimum input voltages ensure maximum power delivery for each PD type. Higher operating voltages result in less cable loss making the system more efficient.

Also, see comment 58 for additional arguments against this solution.

Table 33-18 item 1 is for static operating input voltages, and includes the rated input power. This is correct. However it is desirable that a type 2 PD start like a type 1 PD if installed in an ".af" worst-case environment. This appears to be covered by the following:

Section 33.3.2 (P72 l5) indicates that a type 2 PD must conform to type 1 power restrictions.

33.3.5.2 (P77 l15) states a T2 PD only seeing a T1 PSE should conform to T1 electricals of T33-18.

33.3.7.3 states that a T2 PD should behave like a T1 PD during/after inrush/poweron.