IEEE802.3 4P Study Group
Compatibility Matrix Ad-Hoc

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Agenda

- Verifying that patent policy was reviewed by the meeting attendees

- Discussing the content of this presentation and getting feedback from the group.

- Addressing comments received prior the ad-hoc meeting

- Discussing David Abramson proposal

Patent Policy

- Verifying that the patent policy slides at
http://www.ieee802.org/3/patent.html were reviewed by
attendees.

Objective

- To generate PSE-PD compatibility Matrix for legacy and new devices

- To propose text for objective that covers it similar to 802.3at objective #14.

Proposed Strategy

- To Review the current IEEE802.3 standard and
  - Generate a list of PDs and PSEs that are allowed by current IEEE802.3 standard (See slide 7)

  - Generate a list of 4P PDs or 4P PSEs that are not allowed by the current IEEE802.3 standard. (See 8)

  - Generate a list of 4P PDs or 4P PSEs that allowed by the current IEEE802.3 standard.(See slide 7,8)

- To address all above devices in a matrix form and to decide if it needs to be operated or requires special treatment. (See slide 9)

Terms used in this presentation

- IEEE802.3 Type 1 PSE/PD (was 802.3af PSE/PD)

- IEEE802.3 Type 2 PSE/PD (was 802.3at PSE/PD)

- Type 1 or Type 2 PDs that was designed to "receive power over MODE A and MODE B simultaneously" but not "requiring power simultaneously".

  - Examples:

    – PDs that can work at reduced mode and have extended set of features when receive more power and have the ability to know it.

    – PDs that receive Type 1 or Type 2 power but the power is spread over all 4 pairs for achieving lower cable loss

The above is covered by the Matrix on page 9 whenever a PD may work on 2/4 pairs.

IEEE802.3 Current Specifications regarding simultaneous operation of all 4 pairs

- **PSE. Clause 33.2.3:**

  - A PSE shall implement Alternative A, 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**.

- **PD. Clause 33.3.1:**

  - 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.

- **Based on the above text:**

- Products 1, 2 and 3 are allowed by the standard

- Do all of them were implemented is a different question and may not be relevant for our discussion since we are focusing now on what is allowed by the standard and how we are backwards compatible to it.

- Group to discuss the above statements and what use case is relevant.

	#	ALT A and ALT B on the same Link Segment[1]	Simultaneous operation[1]	Allowed by Standard
PSE operation of both ALT A and B	1	No	No	Yes
	2	No	Yes	Yes
	3	Yes	No	Yes
	4	Yes	Yes	No

Conclusions from Current Specifications - PD

- **Group to discuss the following table**

#	PD configuration	Allowed by Standard
1	PD Mode A only	NO
2	PD Mode B only	NO
3	PD that requires power from Mode A or Mode B (current Type 1 or Type 2 PD which is 4P interface PD)	YES
4	PD that simultaneously requiring power from mode A and B (4P PD) i.e. PD can not operate otherwise	NO
5	PD that simultaneously receiving power from mode A and B (4P PD)	YES

Proposed Compatibility Matrix (See notes next slide)

#	PD Type Description	PSEs Type			
		802.3 Type 1	802.3 Type 2	New 4P device. 30W<Pout≤60W[4]	New 4P device. 60W<Pout ≤TBD
		.af	.at	.bt - A	.bt - B
1	IEEE802.3 Type 1 PD	Work (2 Pair)	Work (2 Pair)	Work[1] (2/4 Pair)	Work[1] (2/4 Pair)
2	IEEE802.3 Type 2 PD <12.95W	Work (2 Pair)	Work (2 Pair)	Work[1] (2/4 Pair)	Work[1] (2/4 Pair)
3	IEEE802.3 12.95W<Type 2 PD <25.5W	(*) Power up as Type 1 or notify underpowered[2] (2 Pair)	Work (2 Pair)	Work[1] (2/4 Pair)	Work[1] (2/4 Pair)
4	New 4P Device<12.95W	Work (2 Pair)	Work (2 Pair)	Work[1] (4 Pair)	Work[1] (4 Pair)
5	12.95W < New 4P Device < 25.5W	(*)	Work (2 Pair)	Work[1] (2/4 Pair)	Work[1] (2/4 Pair)
6	25.5W < New 4P Device ≤ 51W	(*)	(**) Power up as Type 2 or notify underpowered[3] (2 Pair)	Work[1] (4 Pair)	Work[1] (4 Pair)
7	51W < New 4P Device ≤ TBD W	(*)	(**)	Power up as **New 4P device. Pout=31W** or notify underpowered[3] (4 Pair)	Work[1] (4 Pair)

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Notes to be added to previous table

Notes:

1: A new 4P PSE should be smart enough to determine, without help from the PD, whether to send power down 2 or 4 pairs. A new 4P PSE will negotiate with PD to determine the power level supported (0-->??W). Negotiation means between PSE and PD should be backwards compatible with Type 1 and Type 2 devices.

2. Current wording for Type 2 PD powered by Type 1 PSE: "A Type 2 PD that does not successfully observe a 2-Event Physical Layer classification or Data Link Layer classification shall conform to Type 1 PD power restrictions and shall provide the user with an active indication if underpowered. The method of active indication is left to the implementer."

3 The general case is "if higher power type PD is connected to lower power Type PSE, The PD shall conform to the equivalent lower power type PD power restrictions and shall provide the user with an active indication if underpowered. The method of active indication is left to the implementer"

4. PSE POWER TYPES columns (A) and (B) represent potential different use cases that need to be investigated and is designated as different PSE power type due to the intent of not forcing that all 4P PSEs will have to support Pout>60W while 4P PSE Type that supports 30W to 60W is sufficient.

(Example: 802.3at power over all4 pairs allows up to 51W PDs support. Other 4P PSE type can support higher power than 60W and having single 4P power type category that covers 30W to >60W, <TBD doesn't make sense if most of its power will not be used. This is equivalent of having Type 2 only and not Type 1 and Type 2 for different applications)

Discussion

Thank You

Revision History

#	Rev	Date	Comment	Changes
1	Original Draft	June 4, 2013		
2	Rev 001	June 19, 2013	David Abramson/TI: To simplify the table, update foot notes, power levels to correspond to previous PD types, not negotiated power levels.	PSE types names changed accordingly, Matrix table PDs type rows were reduced. The notes of the matrix table were modified to reflect some of David inputs. See note 4 that explains why I believe we need to differentiate between at list two 4P PSE power levels.
3	Rev 001	June 19, 2013	Jeff Heath/LT: To avoid using text implying implementation etc.	All relevant text that may imply implementation concepts were removed.