IEEE802.3 4P Study Group

Compatibility Matrix Ad-Hoc

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Rev 004

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List of attendees

- June 20-2013 meeting
  - Chad Jones/ Cisco
  - Christian Beia / ST
  - David Law/ HP
  - David Abramson / TI
  - David Tremblay / HP
  - Fred Schindler / Seen Simply
  - Gaoling Zou / Maxim Integrated
  - Hua Rui / Huawei
  - Jeff Heath/ Linear
  - Koussalya Balasubramanian / Cisco
  - Rimboim Pavlick / Microsemi
  - Sesha Panguluri/ Broadcom Corp
  - Yair Darshan / Microsemi
  - Zhuangyan zhuang / Huawei

Agenda

- Verify that patent policy was reviewed by the meeting attendees
- Discussing the content of this presentation and getting feedback from the group.
- Address 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 shown below for reference.

PD Operation based on PSE

	IEEE Std 802.3af PSE	**PoEP PSE**
IEEE Std 802.3af PD	Operates	Operates
PoEP PD < 12.95W	Operates	Operates[Note 1]
PoEP PD > 12.95W	PD shall provide user active indication	Operates[Note 1]

Note 1: Operates with extended power classification

- The proposals will not imply implementation

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 8)
  - Generate a list of 4P PDs or 4P PSEs that are not allowed by the current IEEE802.3 standard. (See 9)
  - Generate a list of 4P PDs or 4P PSEs that allowed by the current IEEE802.3 standard.(See slide 8,9)
- To present the above devices in a matrix form and determine combinations that need to operate and those that need special treatment. (See slide 10)

Terms used in this presentation

- IEEE802.3 Type 1 PSE/PD
- IEEE802.3 Type 2 PSE/PD
- New 4P PSE/PD

Matrix on page 10 will list the proposed compatibility and interoperability of the devices listed above.

IEEE802.3 PSE Requirements Covering 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**.
  - This ad-hoc is not collecting implementations that may or may not exist based on IEEE Std 802.3-2012. The ad hoc is focus on what may exist and how 4P PSE/PD affects interoperability.

#	PSE capable of powering ALT A and ALT B on the same Link Segment?	Simultaneous ALT A and ALT B operation?	Allowed by Standard
1	No	No	Yes
2	No	Yes	Out Of Scope
3	Yes	No	Yes
4	Yes	Yes	No

IEEE802.3 PD Requirements Covering 4 pairs

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 the following table was constructed.

#	PD Mode configuration	Required by Standard	Allowed by Standard
1	PD implementing Mode A only	NO	
2	PD implementing Mode B only	NO	
3	PD that requires power from Mode A or Mode B *but not simultaneously* (current Type 1 or Type 2 PD)	YES	
4	PD that simultaneously requiring power from mode A and B i.e. PD can not operate otherwise	NO	
5	PD that simultaneously receives power from mode A and B	No	YES

Proposed Compatibility Matrix (See notes next slide)

Example how to read the table: Line 2: PD Type 2 with power<12.95W should work with Type 1, Type 2, 4P-1, 4P-2 PSEs over 2P. May work with 4P-1 and 4P-2 PSEs.

#	Description	PSEs Type			
	PD Type	**Type 1**	**Type 2**	**4P Device[4] Pout of 60W**	**4P Device[4] 60W<Pout ≤TBD**
		.af	**.at**	**4P-A**	**4P-B**
1	Type 1	Work (2 Pair)	Work (2 Pair)	Work[1] (2 Pair A or B). may work (4 Pair)	Work[1] (2 Pair A or B). may work (4 Pair)
2	Type 2 <12.95W	Work (2 Pair)	Work (2 Pair)	Work[1] (2 Pair). may work (4 Pair)	Work[1] (2 Pair). may work (4 Pair)
3	12.95W< Type 2 < 25.5W	Power up as Type 1 or notify underpowered[2] (2 Pair)	Work (2 Pair)	Work[1] (2 Pair). may work (4 Pair)	Work[1] (2 Pair). may work (4 Pair)
4	4P < 12.95W	Work (2 Pair)	Work (2 Pair)	Work[1] (4 Pair)	Work[1] (4 Pair)
5	12.95W < 4P-1< 25.5W	Power up as Type 1 or notify underpowered[2] (2 Pair)	Work (2 Pair)	Work[1] (4 Pair)	Work[1] (4 Pair)
6	25.5W < 4P-A[4] ≤ 51W	Power up as Type 1 or notify underpowered[2] (2 Pair)	Power up as Type 2 or notify underpowered[2,3] (2 Pair)	Work[1] (4 Pair)	Work[1] (4 Pair)
7	51W < 4P-B[4] ≤ TBD	Power up as Type 1 or notify underpowered[2] (2 Pair)	Power up as Type 2 or notify underpowered[2,3] (2 Pair)	Power up as 4P-A (<51W) or notify underpowered[2,3] (2 Pair)	Work[1] (4 Pair)

May be merged.

Notes to be added to Compatibility Matrix Table

Notes:

1: A 4P PSE should be smart enough to determine, without help from the PD, whether to send power down 2 or 4 pairs. A 4P PSE will negotiate with PD to determine the power level supported (0-->??W). PSE and PD negotiation 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. The 4P PSE/PD devices are addressed as two distinct power ranges.4P-A PSE with twice the Type 2 power i.e. 60W and 4P-B with output power>60W and less than TBD. It allows not forcing that all 4P PSE devices to supply the maximum power of >60W. The same is applied for the 4P PD. 4P-A PD will consume maximum of 51W and 4P-B PD will consume >51W and less than TBD. It is possible that 4P-A PD and 4P-B PD will be merge to a single 4P PD Type in which the PD maximum power levels will be addressed by PSE-PD negotiations.

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.
4	Rev 002	June 20, 2013	Ad-hoc meeting comments	Group inputs up to slide 8 table item 3 were addressed and updated during the meeting
5	Rev 003	June 27, 2013	Reviewing the presentation by David Law, Fred Schindler and Yair Darshan to make it clearer prior 2nd ad-hoc meeting.	See attached word document with detailed changes and the rational of it.
6	Rev 003a Rev 004	July 1-2, 2013	Reviewing Kousi comments Updating 1st meeting attendees list	Documents were updated accordingly per email response.