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

July 2013
Rev 005

Yair Darshan, Microsemi
ydarshan@microsemi.com

List of attendees

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

- July 2- 2013 meeting (Name /Employer / Affiliation)
  - Brian Buckmeier/ Bel Fuse INC / Bel Fuse INC
  - Chad Jones/ Cisco / Cisco
  - Christian Beia / ST / ST
  - Claude Promonet / Cisco / Cisco
  - Dave Dwelley / Linear Tech / Linear Tech
  - David Law/ HP / HP
  - David Abramson / TI / TI
  - David Tremblay / HP/ HP
  - Fred Schindler / Seen Simply / Seen Simply
  - Gaoling Zou / Maxim Integrated / Maxim
  - Hua Rui / Huawei / Huawei
  - Jeff Heath/ Linear Tech / Linear Tech
  - Koussalya Balasubramanian / Cisco / Cisco
  - Peter Johnson / Sifos / Sifos
  - Rick Frosch / Phihong / Phihong
  - Rimboim Pavlick / Microsemi / Microsemi
  - Sesha Panguluri/ Broadcom Corp / Broadcom
  - Yair Darshan / Microsemi / Microsemi
  - Wendt, Matthias / Philips / Philis
  - Victor Renteria / Bel Stewart / Bel Stewart
  - Zhuang Yan / Huawei / 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

- 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

- <u>PSE. Clause 33.2.3:</u>

    - A PSE shall implement Alternative A, Alternative B, or both. While a PSE may be capable of both Alternative A and Alternative B, PSEs <u>shall not operate both</u> Alternative A and Alternative B <u>*on the same link segment*</u> **simultaneously**.

#	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 PSE over 2P. May work with 4P PSE over 4P.

#	Description	PSEs Type			
	PD Type	Type 1	Type 2	4P Device	
		.af	.at	4P	
1	Type 1	Work (2 Pair)	Work (2 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)	
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)	
4	4P < 12.95W	Work (2 Pair)	Work (2 Pair)	Work[1] (4 Pair)	
5	12.95W < 4P < 25.5W	Power up as Type 1 or notify underpowered[3] (2 Pair)	Work (2 Pair)	Work[1] (4 Pair)	
6	25.5W < 4P ≤ TBD W	Power up as Type 1 or notify underpowered[3] (2 Pair)	Power up as Type 2 or notify underpowered[3] (2 Pair)	Work[1] (4 Pair)	

Notes to be added to Compatibility Matrix Table

Notes:

1: A 4P PSE will be smart enough to determine 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 action of a 4P PD that requires more than the power a Type 1 or Type 2 PSE can provide shall be determined at the Task Force.

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.
7	Rev 005	July 2 - 2013	Reviewing mainly slides 9-11. Addressing kousi comments on slides 7 and 8.	See Rev 005.