IEEE802.3bt 4-Pair Power over Ethernet Task Force
Dual PD interface with different class

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Objectives

- To show why PD that was implemented as single PD with internal dual interface and/or dual loads can have different class signature and the benefit of it.

- To show that it easy to address it by 4P PSE with similar methods done today.

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History - 1

- ## It was shown in the presentation:

Part A: Existing compliant PD implementations
Part B: Proposal for detecting Type 1/2 capable of 4P operation
Layer 1 Method to Detect 4PPoE Capable Legacy Type 1 & 2 PD
http://www.ieee802.org/3/bt/public/sep14/tremblay_01_0914.pdf

That we have basically a PD with two **basic different internal implementation** that are both obey to the IEEE802.3-2012 specifications defined at the PI and are used today in the market.

We name them:

Option 1 PD (single load)

Option 2 PD (dual interface and/or dual load)

Per IEEE802.3-2012, Rsig/Class are defined to be the same if measured on Mode A or Mode B.

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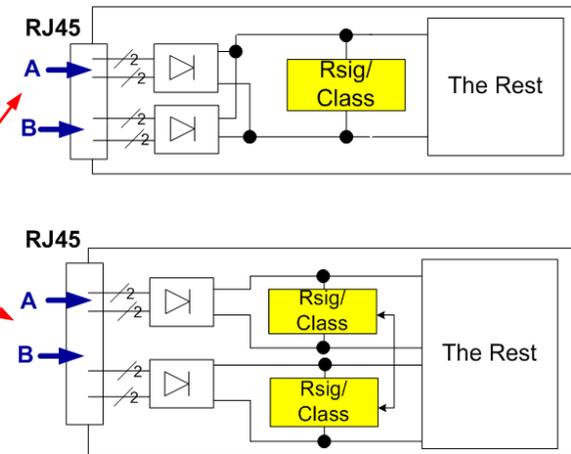
History - 2

- We also saw that after connection check (doing the procedure that detects if it is option 1 or 2 PD)
  - It is easy to address Option 1 PD
  - It is also easy to address Option 2 PD as separate internal two PD loads
- This concept allow very simple implementation that uses existing functions in the standard.

- The news are that it allows in option 2, different class value for each pair set due to the fact that it is treated as two separate loads. (E.G: 25W on A, 5W on B for outdoor cameras)
- This is applied today in the market which allows flexible PD implementation with significant advantages.

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What Option 2 PD can do? And how PSE responds?

- The discussion is on Option 2 PDs that can operated in 4P.

  - Same class on A and on B
    - PSE allocate power according to 2xPclass ➔ Normal behavior

  - Different classes on A and on B
    - PSE allocate power according Class A + Class B. ➔ Desired (optional) behavior
    - PSE allocate power according 2xmax{Class A,Class B).
    - Disadvantage: Power budget is left on the table (big numbers>>1W)
      - Remedy: Adjust later by LLDP/User Config/Other dynamic methods
    - How do we know that the dual PD is a single load or dual load so power budget will be 1x or 2x according to the real case?
    - By connection check. It tells us if it is separate loads or two loads.

- The net benefit of different classes in dual PD implementations is that we are not wasting power budget.

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Conclusions

- The option of different class signature on each pairs set A and B has the advantage of better power budget management through L1 .

- It easy to address it by 4P PSE with similar methods done today.
  - No significant additional hardware or functions are required
  - No added complexity

- Option 2 PDs (dual interface/load) with different class on A and B pairs, should be supported by 802.3bt
  - It increases the implementation flexibility
  - Larger market

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Q&A

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# Proposal to detect Type 1 or 2 PDs that are capable of working with 4P power.

- **High Level Flow Chart of L1**

  LLDP IS ADRESSED IN SEPARATE DIAGARMA

  Supporting of pre 802.3bt option 2, Type 1 and Type 2 PDs that are not presenting invalid signature on the unpowered pairs is required to enable these PDs to operate at 4P which is the purpose of this adhoc work.
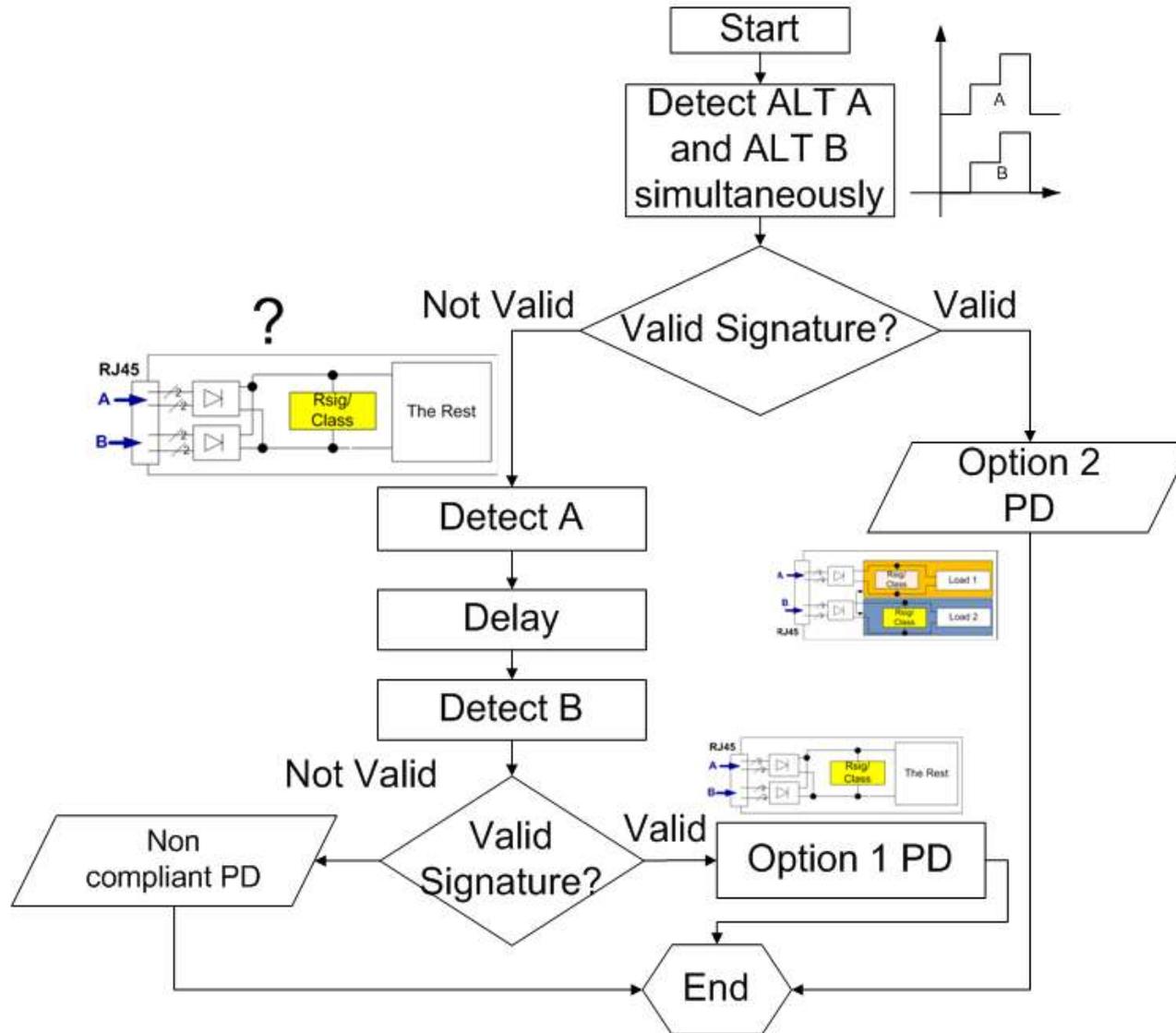
  Denying power if 4P fails, creates interoperability issue since the PD works with 2P. As a result, denying 2P is not an option.

  See next slide how we find if it is PD option 1 or PD option 2
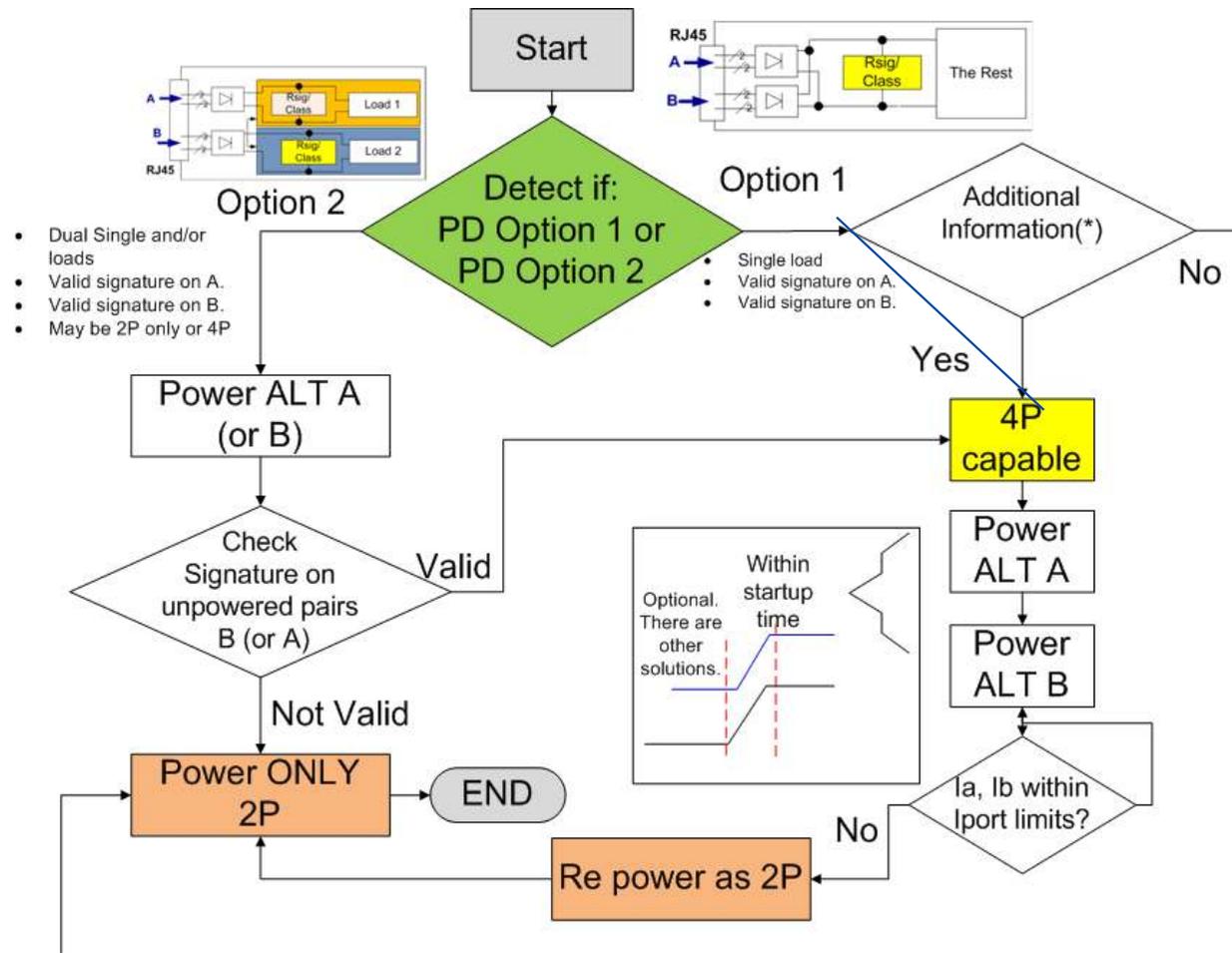
Detect if PD option 1 or Option 2

Detect if:
PD Option 1 or
PD Option 2

- If PD is option 1, signature will fail if done simultaneously.

- There are other ways to detect if PD is option 1 or 2 (single load connection check) and are not addressed here.

Detect if:
PD Option 1 or
PD Option 2

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