4PID Revisited

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4PID Goals

- Identify Type 1 and 2 PDs that can accept 4P power
  - 4PID is a workaround for mutual ID since T1/2 predate 4P
  - All Type 3+ PDs will be designed to accept 4P power: will have positive mutual ID via class
- 4PID should be detected using Layer 1, ideally before classification and powerup (but not mandatory)
- LLDP can override any L1 4PID results

4PID Challenges

- Type 1/2 PD specs were not designed with 4P in mind
- 802.3-2012 does not define any single characteristic that can reliably detect 4P capability
- Existing pre-BT 4P devices use a variety of methods to indicate 4P capability
- It may be helpful to determine what a bad 4PID signature might be…

Bad 4PID

- 25k at one pair set, not at the other
  - Use 2P only or deny power
- 25k when checked simultaneously, 50k at each pair set when checked separately
  - 2x 50k “PD-like object”
  - Deny power – this is not a PD (likely 2 PSEs on a Y-cable)
- 12.5k Option 1 PD
  - Bad IEEE signature: deny power
- Spec must be written to reject these signature combinations as 4PID

What Else Is There?

- Option 1 vs. Option 2 PD architecture
  - Checked by comparing simultaneous detection with separate detection
- Option 1 PDs are OK with 4P… but see next slide
- Option 2 requires further checking

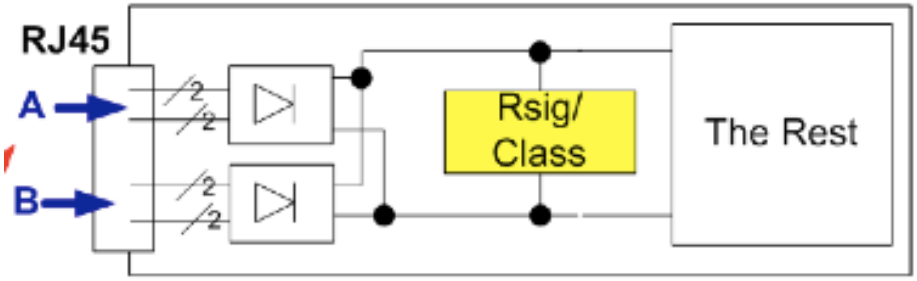
How Confident Are We?

- No guarantees! Existing Type 1/2 PDs aren't specified for 4PID, and a PD maker could do nearly anything. But…
- Option 1 PDs: good confidence
  - All Option 1 PDs have a single load
  - Virtually all Option 1 PDs are 4P OK
- Option 2 PDs: less confidence
  - Can be single or dual load, could be legacy 4P device or Y-cable with 2x 2P PDs
  - Best to treat each pair set independently

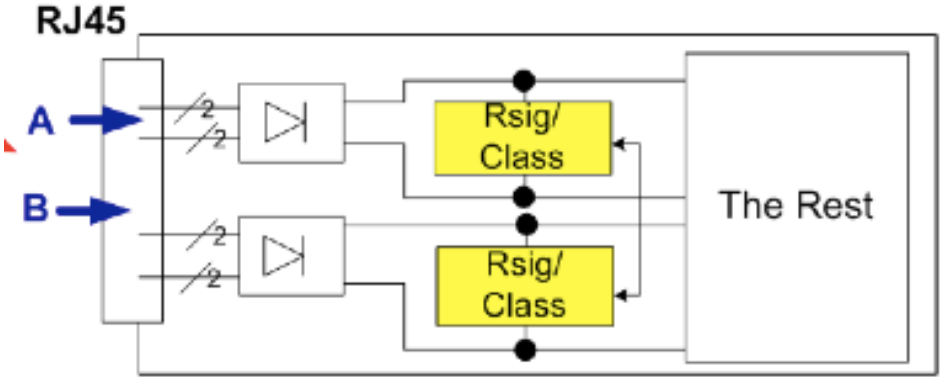
So What Do We Do?

- Option 1:
  - 4P OK
  - Class current can be measured at either pair, applied to entire PD
- Option 2: treat as two separate PDs
  - 4P not OK, treat as 2x AT or deny power
  - Requires checking class and limiting power independently at each pair set

Annex A: PD Types (borrowed from Yair)



Option 1 One signature, single load



Options 2/2a/2b Two independent signature circuits (two PD chips), can be single or dual loads

Annex B: Why is a Single Load PD 4P OK?

- Single load: One master power feed draws power from all inputs and supplies the rest of the PD circuitry
  - Power draw is controlled by this supply, and will be the same regardless of how many pairs are powered
- Dual load: Two power feeds draw from the separate Alt A, B inputs
  - Difficult to predict power draw with 4P
  - Safer to treat as 2x AT devices