



PD Standardization

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Problem Statement

- Upon review of the 802.3bt Draft 1.5, we have noted Dual-signature PDs have introduced a lot of unresolved complexity
- The multiplicity of PD types increases interoperability risk

What if Dual-signature PDs Are Left Out-of-Scope?

- Delete 142 text segments
- Delete 4 pages of existing state machine diagrams
- Cancel creation of 2 pages of state machine diagrams (class)
- Remove 13 Editor “TODOs”
 - Represents 33% - 13 of 40 Technical TODOs
- Simplify requirements constructed as:
 - If Type 1 or 2 PSE
 - Else if Type 3 or 4 PSE, ~~connected to Single-signature PD~~
 - ~~Else if Type 3 or 4 PSE, connected to Dual-signature PD~~
 - If classes match
 - Else if classes mismatch

*50% reduction in total requirement branches
66% reduction in new requirement branches*

Presentation Objectives

- Identify impacts of Dual-signature PDs on standard
- Revisit justification of Dual-signature PDs
- Do NOT question single vs dual channel PSEs
- Do NOT question Connection Check requirement

Impact of Dual-signature PDs on DC MPS – An Example

Is this paragraph about all PSEs? Type 1 and 2? 3 and 4?

33.2.9.1.2 PSE DC MPS component requirements

A PSE shall consider the DC MPS component to be present if $I_{\text{Port-2P}}$ or the sum of $I_{\text{port-2P}}$ of both pairs of the same polarity is greater than or equal to $I_{\text{Hold max}}$ for a minimum of T_{MPS} . A PSE shall consider the DC MPS component to be absent if $I_{\text{Port-2P}}$ or the sum of $I_{\text{port-2P}}$ of both pairs of the same polarity is less than or equal to $I_{\text{Hold min}}$. A PSE may consider the DC MPS component to be either present or absent if $I_{\text{Port-2P}}$ or the sum of $I_{\text{port-2P}}$ of both pairs of the same polarity is in the range of I_{Hold} .

The values of $I_{\text{Port-2P}}$ or the sum of $I_{\text{port-2P}}$ of both pairs of the same polarity and the corresponding values of I_{Hold} shall meet the conditions specified in Table 33–11.

A Type 3 or Type 4 PSE, when connected to a single-signature PD, shall monitor either the sum of $I_{\text{port-2P}}$ of both pairs of the same polarity or the pairset with the highest $I_{\text{Port-2P}}$ current value and use the appropriate I_{Hold} level shown in Table 33–11. Power shall be removed from the PI when DC MPS has been absent for a duration greater than T_{MPDO} .

A Type 3 or Type 4 PSE, when connected to a dual-signature PD shall monitor each pairset and use the appropriate I_{Hold} level shown in Table 33–11. The PSE shall remove power from any pairset on which the DC MPS has been absent for a duration greater than T_{MPDO} .

The specification for T_{MPS} in Table 33–11 applies only to the DC MPS component. The PSE shall not remove power from the port when $I_{\text{Port-2P}}$ or the sum of $I_{\text{port-2P}}$ of both pairs of the same polarity is greater than or equal to $I_{\text{Hold max}}$ continuously for at least T_{MPS} every $T_{\text{MPS}} + T_{\text{MPDO}}$, as defined in Table 33–11. This allows a PD to minimize its power consumption.

Statements have been introduced in a manner that does not clearly differentiate Type 1 and 2 from Type 3 and 4, Single and Dual signature PDs. Requirements are overlapping in ways that become difficult to meet.

What are the “absent” requirements for a Type 3 and 4 PSE? Are they as shown in Paragraph 1?

Dual-signature PDs have introduced a lot of complexity

Original IEEE 802.3 DTE Power Study Group Objectives

Objectives for DTE Power Study Group

November 10, 1999 as approved by DTE Power via MDI SG.

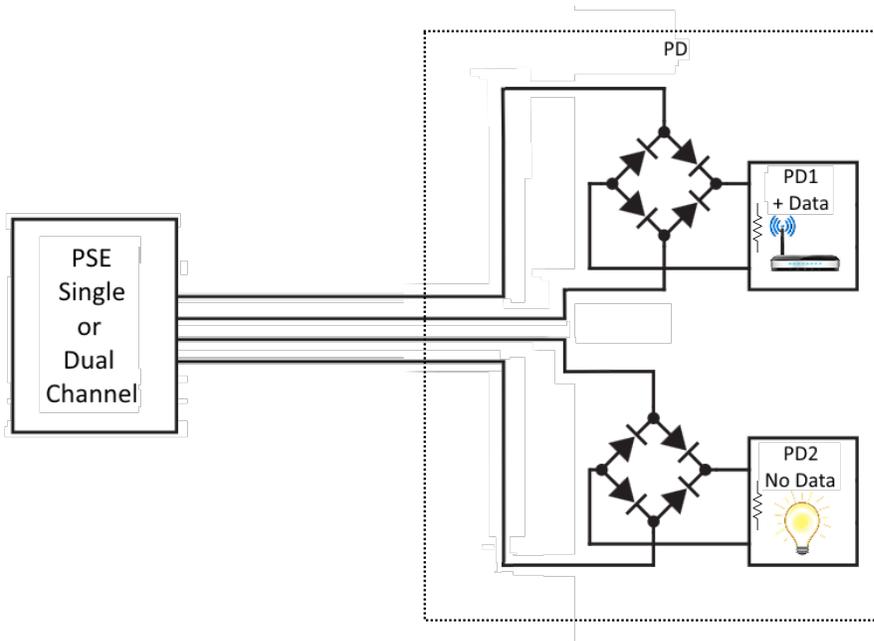
(1) Economically provide power over a twisted-pair link segment to a single Ethernet device. To be included:

10BASE-T,
100BASE-TX.

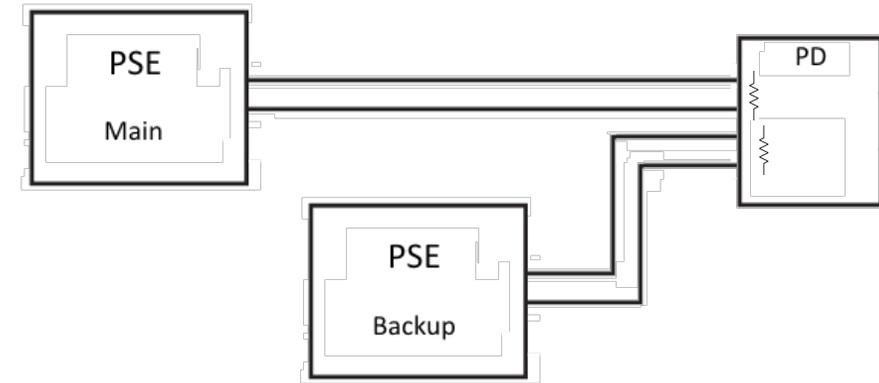
To be considered:

1000BASE-T.

Items Not Covered by IEEE Objectives NOR Intent



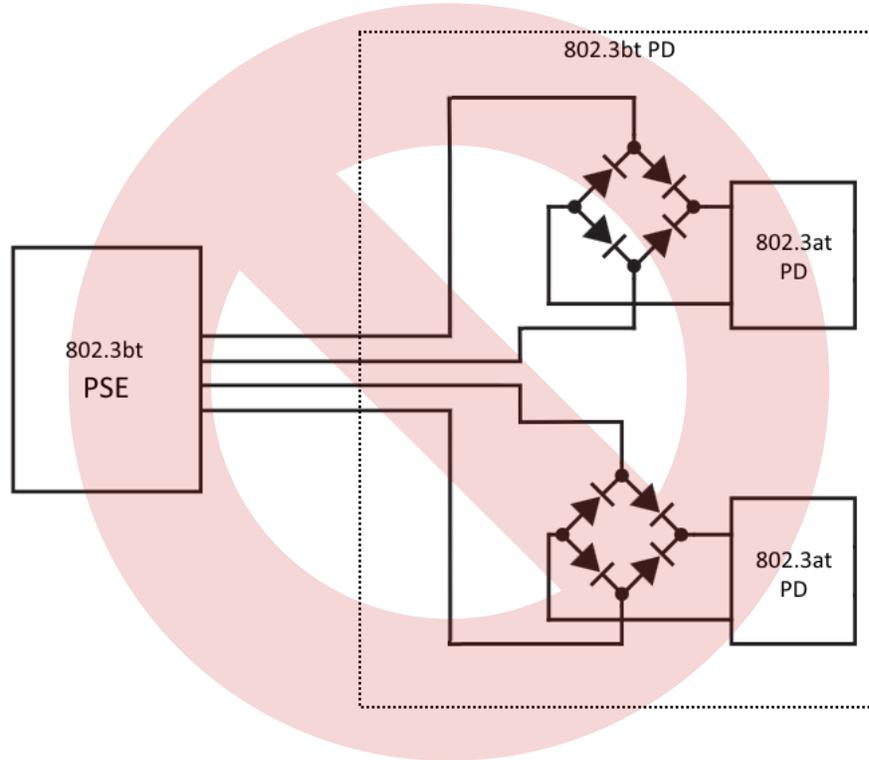
Is the IEEE developing a standard to support PDs composed of:
a sub-PD with data and
a sub-PD without data



Is the IEEE developing a standard to support PSEs arranged in a redundant configuration?

Do Not Bend the IEEE Standard to Include Configurations Which Lie Outside Objectives

Time to Market Not Improved by Re-use of 802.3at PDs



802.3at PDs cannot be used to form a 802.3bt Dual-signature PD

802.3at PDs lack proper class signaling scheme
- Must be redesigned

IEEE 802.3 4PPoE Objectives

- Support for operation over the following channels that have DC loop resistance of no greater than 25 ohms:
 - Class D or better 4-pair copper medium from ISO / IEC 11801:2002, including Amendments 1 & 2
 - Class D or better media from ISO / IEC 11801:1995
 - Category 5e or better cable and components as specified in ANSI/TIA-568-C.2
 - Category 5 cable and components as specified in ANSI/TIA/EIA-568-A

Adopted by the IEEE 802.3 4PPoE Study Group May 2013

Objective is clear
Channels strictly defined per referenced standards

Ethernet Cables



Standardized Ethernet Cable



Non-standardized Ethernet Cables

Non-standard connections
are identified during
Connection Check
and dealt with accordingly



**Objective is to deliver power over standardized Ethernet cables
as defined in the 4PPoE Objectives**

Conclusion

- Ask the committee to re-examine it's commitment to Dual-signature PDs
- Existing 802.3at Dual-signature PDs are out-of-scope and will remain out-of-scope
- Dropping Dual-signature PDs will move the standard forward
- No changes proposed to PSE Connection Check requirements
- Interoperability risks mitigated