

4PPoE Architecture Proposal 3.0

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Three Core Sections of Clause 33

- Channel definition (PI to PI): 33.1
 - Not covered in this presentation
- PSE definition: 33.2
- PD definition: 33.3
- Additional Electrical (33.4) and Environmental (33.7) essentially unaffected
- Management (33.5), DLL (33.6), and PICS (33.8) will follow PSE and PD changes

Goals

- Modify text to allow four-pair power PSEs
 - Type 1: keep as is + enable 4P “green” power
 - Type 2: keep as is + enable 4P “green” power
 - Define new Type(s):
 - Provides 4-pair power
 - Uses Green Mode with AT PDs where possible
 - Maximizes interoperability with existing PoE++ solutions

Legalize Four-Pair Power

- Add new Alternative to 33.2.1, Figures 33-4... 33-7, and Table 33-2
 - Modify PSE to touch all 4 pairs (PDs already touch all 4 pairs)
 - Define a single new Alternative polarity (like Alt-B)
 - Edit PSE state machine 33.2.4.7 to add new Alternative
- Change 33.2.3: allow PSE to power using new Alternative
- Change 33.3.1: allow PD to receive Mode A and Mode B power simultaneously

Why a New Alternative?

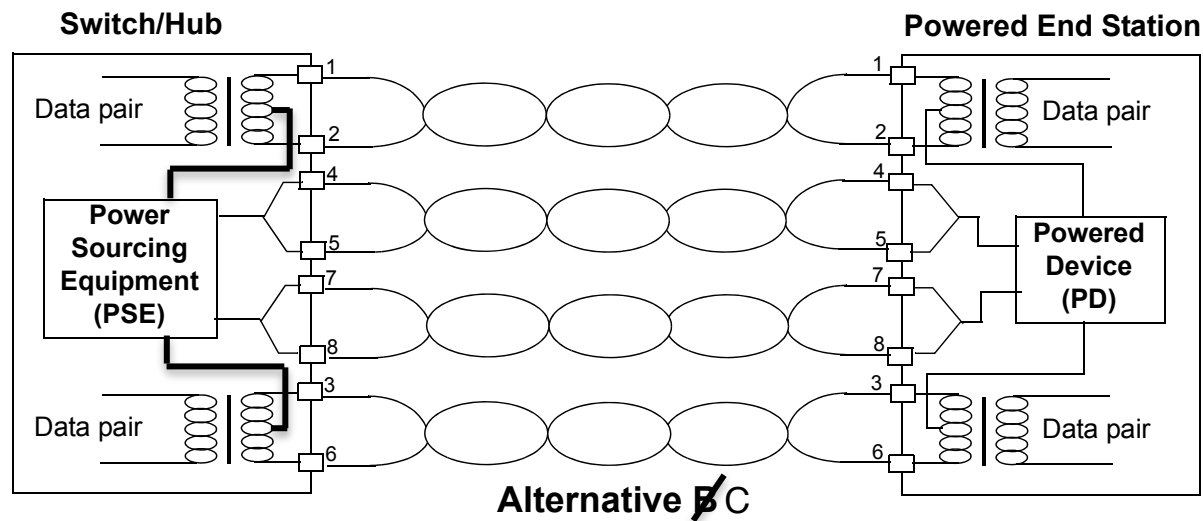
- Keeping just Alternative A and Alternative B is a complete solution, but...
 - Figures 33-4...33-7 are much clearer if a new Alt C is specified
 - Table 33-2 is clearer if a new Alt C is specified
 - Single 4P polarity is easier to define with Alt C
 - Text covering midspan backoff is simpler with a new Alt C (no change to 33.2.5.5)
 - State Machine 33-9 additions are simpler if Alt-C is added
- Defining Alternative C has no technical impact on the spec but makes the text clearer and easier to understand
- Alternative C does not preclude using Alternative A and Alternative B simultaneously
 - 33.2.1 proposal on next page allows either or both

Four-Pair Baseline Text

- 33.2.1:
 - Alternative A, ~~and~~ Alternative B, **and Alternative C** Endpoint PSEs and Midspan PSEs are illustrated in Figure 33–4, Figure 33–5, Figure 33–6, and Figure 33–7.
PSEs can be compatible with 10BASE-T, 100BASE-TX, and/or 1000BASE-T. PSEs may support either **any of** Alternative A, Alternative B, or ~~both~~ **Alternative C**.
- 33.2.3:
 - A PSE shall implement Alternative A, Alternative B, or ~~both~~ **Alternative C**. ~~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.~~
- 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.~~
- 33.2.4.7:
 - Minor state machine edits to add new Alternative(s)

Four-Pair Baseline Text

- Fig 33-4 (others similar):



Four-Pair Baseline Text

- Table 33-2:

Conductor	Alternative A (MDI-X)	Alternative A (MDI)	Alternative B (All)	<i>Alternative C (All)</i>
1	Negative Vpse	Positive Vpse		<i>Negative Vpse</i>
2	Negative Vpse	Positive Vpse		<i>Negative Vpse</i>
3	Positive Vpse	Negative Vpse		<i>Positive Vpse</i>
4			Positive Vpse	<i>Positive Vpse</i>
5			Positive Vpse	<i>Positive Vpse</i>
6	Positive Vpse	Negative Vpse		<i>Positive Vpse</i>
7			Negative Vpse	<i>Negative Vpse</i>
8			Negative Vpse	<i>Negative Vpse</i>

New Types

- Modify 33.2.7 to require a 4P PSE to attempt to power all four pairs if a 4P PD is connected via a valid four-pair channel
- Add new sections 33.2.6.3 and 33.3.5.3 to describe Type 3/Type 4 classification
 - Classification details (3-event or something else) TBD
 - Define new class power levels TBD, adjust Table 33-11 and 33-18 limits accordingly
 - Modify both state machines for new class behavior

PSE, PD Baseline Text

- 33.2.7.X:
 - ***A Type 3 or Type 4 PSE shall attempt to provide power on all 4 pairs when connected via a valid 4 pair channel to a PD that requests 4-pair power.***
 - (new turn-on stagger limits TBD)
- 33.2.6.3:
 - (new PSE Type 3/4 Class details TBD)
- 33.3.5.3:
 - (new PD Type 3/4 Class details TBD)
- Tables 33-11, 33-18
 - (new power levels TBD)
- State Machines 33.2.4.7, 33.3.3.5
 - (new Type 3/4 Class details TBD)