# 4PID – Proposed Baseline Text

IEEE 802.3: 4PPOE Task Force

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# Baseline Text Proposal (variables -1)

33.2.4.4 Variables

***Add new variables as follows:***

both_alts_valid This variable is provided for Type 3 and Type 4 PSEs.

Values: TRUE – do_detection yields “valid” on both pair-sets

FALSE – do_detection does not yield “valid” on both pair-sets

PD_signature This variable is provided for Type 3 and Type 4 PSEs to determine whether the two pair-sets are connected to a single signature or a dual signature PD.

Values: **SINGLE**: A single signature PD configuration is connected through the two pair-sets at the PI.

**DUAL**: A dual signature PD configuration is connected to the two pair-sets

INVALID: Either the connection check has not yet been performed or the results of the check are inconclusive, e.g., due to open circuit.

*Editor’s Note (to be removed prior to publication): These definitions need to be refined by comments. These should be reviewed as connection check text is adopted, and appropriate definitions for concepts such as single/dual signature PD should be added to 1.4.*

# Baseline Text Proposal (variables - 2)

33.2.4.4 Variables

***Insert new variables as follows: (cont'd)***

pd_4pair_candidate This variable is provided for Type 3 and Type 4 PSEs to determine whether a connection is a candidate to receive power on both pair-sets. This variable is used to do physical layer 4PID, and is a function of the results of detection and connection check.

Values:

FALSE: Do not proceed to 4-pair classification (see 33.2.5)

TRUE: Proceed to 4-pair classification*

*Editor's Note (to be removed prior to publication): State machine to include early exit at any point prior to power up. Language above suggests 4PID prior to classification, commenters are encouraged to provide language consistent with 4PID by power-up.*

*NOTE – power on all 4 pairs, if applied, is subsequent to successful classification, and subject to maximum operating values of pair current as defined by Table 33-11.

# Baseline Text Proposal (variables - 3)

(continued from previous page)

maintain_4pair_power This variable is provided for Type 3 and Type 4 PSEs to determine whether to continue providing 4 pair power. It is initially set to the value of pd_4pair_candidate. It may be reset by LLDP message from the PD after initial startup, as a result of enforcement of class power draw, or at vendor discretion.

Values:

FALSE: Remove power from at least one pair-set.

TRUE: Power may be maintained on both pair-sets

*Editor's Note (to be removed prior to publication): classification enforcement text and LLDP messaging text will need to be drafted with the condition of setting maintain 4pair_power=FALSE*

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deny_dual_sig_4pair_power Boolean variable that controls the denial of 4 pair power when connection check returns a value of DUAL. It is true when denying power is necessary including when set from the MDIO.

# Baseline Text Proposal (functions - 1)

33.2.4.6 Functions

***Change function do_detection as follows:***

do_detection

This function returns the following variables:

signature: This variable indicates the presence or absence of a PD.

Values:

- open_circuit: The PSE has detected an open circuit. This value is optionally returned by a PSE performing detection using Alternative B, or by Type 3 and 4 PSEs performing detection over each pair-set, if either pair-set yields an open circuit.
- valid: The PSE has detected a PD requesting power.
- both_alts_valid: A Type 3 or Type 4 PSE has detected a PD requesting power on both pair-sets.
- invalid: Neither open_circuit, nor valid PD detection signature has been found.

*(text continues unchanged, including mr_valid_signature variable, adding the additional function on the next page)*

# Baseline Text Proposal (functions - 2)

33.2.4.6 Functions

***Add new function, do_connection_check as follows:***

do_connection_check

This function returns the following variables:

PD_signature: This variable indicates the type of PD signature connected to the PI, with respect to 4 pair operation.

Values:

- open_circuit: The PSE has detected an open circuit.
- SINGLE: The PSE has determined there is a single signature PD configuration connected to the PI.
- DUAL: The PSE has determined there is a dual signature PD configuration connected to the PI.
- invalid: Either the PSE has detected an open_circuit on one of the pair-sets, or is otherwise unable to determine whether the PD is a single-signature or dual-signature configuration.

# Baseline Text proposal (state diagram -1)

***Modify Figure 33-9: State Diagram to include:***

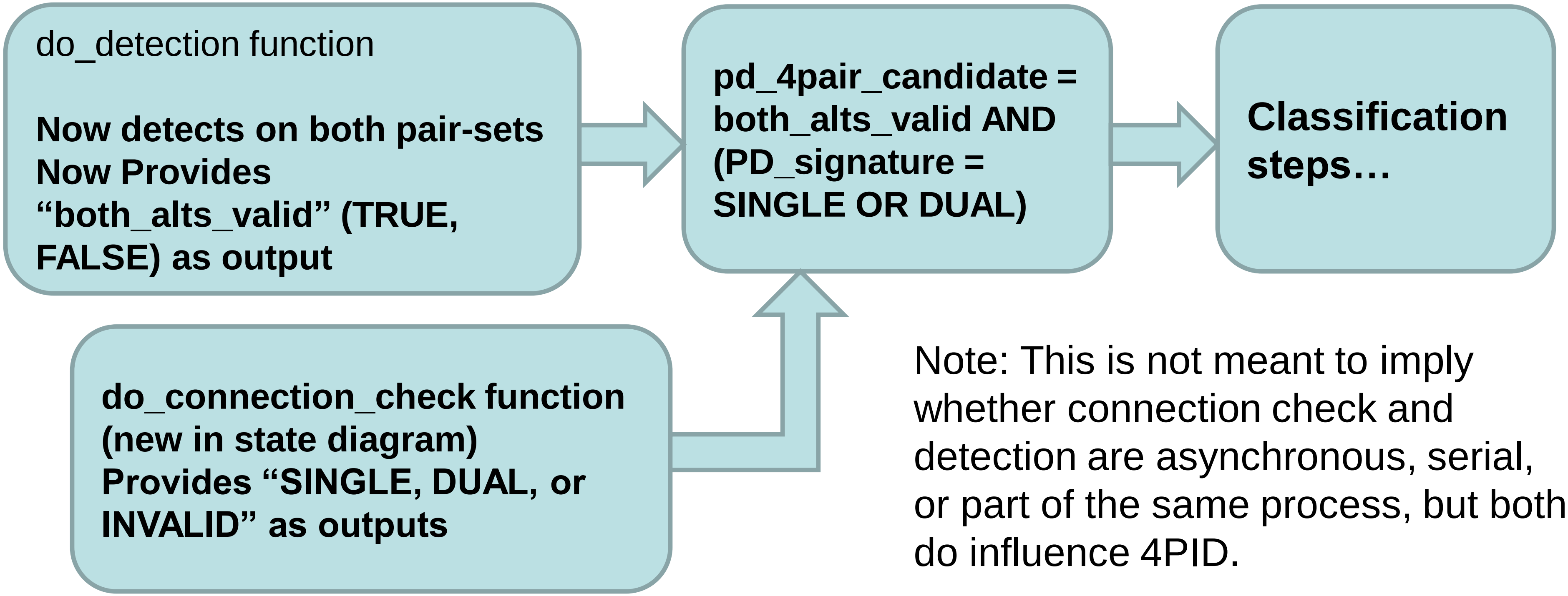
Process to include something to do connection check, (not in this presentation)

following DETECT_EVAL and prior to any classification

After connection check, set variable pd_4pair_candidate as follows:

(both_alts_valid) * [ PD_signature = SINGLE +

(PD_signature = DUAL) * *(!deny_dual_sig_4p_power)* ]



do_detection function

**Now detects on both pair-sets**
**Now Provides “both_alts_valid” (TRUE, FALSE) as output**

**pd_4pair_candidate = both_alts_valid AND (PD_signature = SINGLE OR DUAL)**

**Classification steps…**

**do_connection_check function (new in state diagram)**
**Provides “SINGLE, DUAL, or INVALID” as outputs**

Note: This is not meant to imply whether connection check and detection are asynchronous, serial, or part of the same process, but both do influence 4PID.

# Baseline Text proposal (state diagram – 2)

***Modify Figure 33-9: State Diagram to include:***

(1) Set maintain_4pair_power to initial value of pd_4pair_candidate at POWER_UP state.

(2) Add an additional exit condition !maintain_4pair_power from the POWER_ON state to the POWER_DENIED state as follows:

Change Exit D from POWER_ON state from:

power_not_available*!short_detected*!ovld_detected*tmpdo_timer_not_done*!option_vport_lim

To:

power_not_available*!short_detected*!ovld_detected*tmpdo_timer_not_done*!option_vport_lim + !maintain_4pair_power

***Insert the following notes following Figure 33-9 State Diagram:***

NOTE: if maintain_4pair_power is false, then power must be removed from at least one pair set.

# Baseline text proposal (PD)

***Insert the following to clause (PD clause) as follows:***

On type 1 and type 2 PDs wishing to avoid 4 pair power for longer than a minimal amount of time, the PD may signal this by a message via LLDP to the PSE setting the 'maintain_4pair_power' variable to FALSE.

# Baseline Text Proposal (4PID)

***Add new subclause 3.2.5.6 as follows:***

33.2.5.6 4PID requirements

Type 3 and Type 4 PSEs shall determine whether an attached PD with classes 0 to 4 is a candidate to receive power on both pair sets prior to applying 4 pair power. This determination is referred to as a 4PID.

4PID shall be initially determined as a logical function of the detection state of both Alternative A & Alternative B pair sets, the result of the connection check and the results of other system information, as described in clause 33.2.5.0a. It shall be stored in the variable pd_4pair_candidate, defined in clause 33.2.4.4.

# Baseline Text Proposal (PSE Control register)

***Change row of Table 33-21, PSE Control Register, and insert new row below it, and above row for bit 11.5, as shown:***

| **Bit(s)** | **Name(s)** | **Description** | **R/W[1]** |
|---|---|---|---|
| 11.15:~~6~~7 | Reserved | Ignore when read | RO |
| 11:6 | Deny Dual Signature PD 4 Pair Power | 1 = Deny 4 pair power when connection check returns DUAL<br>0 = Do not deny 4 pair power when connection check returns DUAL | R/W |

***Change 33.5.1.1.1 as shown:***

## 33.5.1.1.1 Reserved bits (11.15:~~6~~7)

Bits 11.15:~~6~~7 are reserved for future standardization. ….

***Insert 33.5.1.1.1a :***

## 33.5.1.1.1a Deny Dual Signature PD 4 Pair Power (11.6)

The provision of 4 pair power to dual signature PDs by physical layer 4 pair ID shall be inhibited by setting bit 11.6 to one. Writing a one to this register bit shall set deny_dual_sig_4pair_power to TRUE, and writing a zero to this register bit shall set deny_dual_sig_4pair_power to FALSE.

# Still to do (outside 4PID)

- Draft class enforcement text for 4 pair PSEs
- Add LLDP TLVs for resetting maintain_4pair_power variable