4PID – Proposed Baseline Text

IEEE 802.3: 4PPOE Task Force

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Baseline Text – extend detection

(text in <u>red</u> is new, other changes are already in draft 0.4)

33.2.5 PSE detection of PDs

Change the text in section 33.2.5 as follows:

In any operational state, the PSE shall not apply operating power to ~~the PI~~ <u>a pair-set</u> until the PSE has successfully detected a valid signature <u>over that pair-set</u>. ~~PD requesting power~~

<u>Specifically, Type 3 and Type 4 PSEs shall apply the detection probe to both pair-sets prior to applying power to 4 pairs.</u>

<u>*Editor's Note (to be removed prior to publication): additional text on Type 3 and Type 4 PSEs is redundant, but is suggested for clarity regarding 4PID.*</u>

The PSE probes the link section…

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

NOTE: All compliant PDs should yield both_alts_valid=TRUE provided there are no faults

signature_type   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 possible dual signature PD.

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

                                 DUAL: A possible dual signature PD 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.

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*

*NOTE – power on all 4 pairs, if applied, is subsequent to successful classification, and subject to current monitoring.

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: Apply power to 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.

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, <u>or by PSEs performing detection using both pair-sets, if either pair-set yields an open circuit.</u>

>>> valid: The PSE has detected a PD requesting power.

>>> <u>both_alts_valid: A Type 3 or Type 4 PSE has detected a PD requesting power on both pair-sets.</u>

>>> 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:

signature_type:	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 connected to the PI.

DUAL: The PSE has determined there is a dual signature PD 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 type.

Editor's Note: Consider incorporating connection_check variable and function within the do_detection function.

Baseline Text proposal (state diagram -1)

IF A REGISTER BIT IS DESIRED, THIS IS HOW IT GOES, OTHERWISE BLANK

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) * [signature_type = SINGLE +

(signature_type = 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 (signature_type = 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:

Set maintain_4pair_power to initial value of pd_4pair_candidate at POWER_UP state.

Add an additional exit from the POWER_ON state to the POWER_DENIED state
(can be added to exit D as an "OR")

Exit arc condition is !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.

Editor's Note (to be removed prior to publication): We have a choice whether we want to have an additional state before we go into POWER_ON, which is controlled by a timer, or, the simpler approach here, which is it to have allow maintain_4pair_power to be signaled at any time.

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 3.2.5.6.4 as follows:

33.2.5.6 4PID requirements

Type 3 and Type 4 PSEs shall determine whether an attached PD is a candidate to receive power on both pair sets simultaneously prior to the classification of a PD as specified in clause 33.2.6. 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 and the result of the connection check, 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

Still to do (outside 4PID)

- Draft class enforcement text for 4 pair PSEs

- Add LLDP TLVs for resetting maintain_4pair_power variable

- If a register bit for deny_dual_sig_4pair_power is needed, allocate it to Table 33-21, and describe it as:

  - When set to 1, this bit denies 4 pair powering if connection-check returns a result of DUAL.