

Dual-signature LLDP v120

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Introduction

This is a revised concept for PSE and PD requirements for LLDP power negotiation, for dual-signature PDs. The issue is complex due to the many potential scenario's: Type 1/2 versus Type 3/4, 2-pair versus 4-pair, handovers between 2-pair and 4-pair...

The draft today does not provide guidance on what to do in particular situations. The requirements are scattered through the field descriptions. Information is also duplicated in LLDP fields.

The guiding principle should be to:

- ▶ Request whatever is appropriate for the given situation
- ▶ Minimize different scenario's (someone think of the programmers)
- ▶ Well defined handover between 2-pair and 4-pair
- ▶ No duplicate/redundant fields

Terminology

LLDP power negotiation requires two fields that work in pair. These are the **PD requested power** and **PSE allocated power** fields. PDs fill out the requested power fields with the power they want, whereas the PSE fills out the allocated power field with what the PD may draw.

Three such pairs of fields have been defined:

- ▶ **PD requested power** and **PSE allocated power** which serve 2-pair modes and single-signature. Will be referred to as the Y-fields.
- ▶ **PD requested power Mode A** and **PSE allocated power Alternative A** which serve Alternative/Mode A for dual-signature PDs. Will be referred to as the A-fields.
- ▶ **PD requested power Mode B** and **PSE allocated power Alternative B** which serve Alternative/Mode B for dual-signature PDs. Will be referred to as the B-fields.

The simple stuff

The following devices:

- ▶ Type 1/2 PSEs
- ▶ Type 1/2 PDs
- ▶ 4-pair PSEs connected to single-signature PDs
- ▶ 2-pair Type 3/4 PSEs
- ▶ Single-signature (Type 3/4) PDs

will exclusively use the Y fields and either not send out, or set to zero, the A and B fields.

Change versus D2.5: None

Dual-signature: 4-pair mode

PD

The dual-sig PD will fill out the requested power in the A and B fields. The Y field will be set to zero (as it doesn't apply to this case).

PSE

The PSE will use the A and B fields for power allocation. The allocated power for the Y field will be set to zero.

Change versus D2.5: Y field is set to zero, rather than sum of A and B

Dual-signature: 2-pair mode

PD

The dual-sig PD will fill out the requested power in the A and B fields. The Y field will be set to the requested power for the powered Mode (to interoperate with Type 1/2 PSEs).

PSE

All PSEs will use the Y field when in 2-pair mode for power allocation. The A and B fields are set to zero, or not sent out (for some Type 1/2 PSEs).

Change versus D2.5: None

Dual-signature: 2-pair \Rightarrow 4-pair mode

PD

Since the PD has already filled out the A and B fields, all it needs to do is set the Y field to zero when it detect a switchover to 4-pair.

PSE

In two-pair mode the PSE uses the Y field to allocate power. When it switches over to 4-pair the Y field will be set to zero, and the A and B fields set according to the allocated power on each Alternative.

Dual-signature: 4-pair \Rightarrow 2-pair mode

Note: such a switch is typically due to a fault on a pairset (overload) or the PD failing MPS on a pairset.

PD

When switching back to 2-pair mode, the PD will request power using the Y field and keep the A and B fields per the requested power on each Mode. The Y field represents the power it needs over the powered Mode.

PSE

In two-pair mode the PSE uses the Y field to allocate power. When switching back to 2-pair mode, the A and B fields will be set to zero and the PSE will use the allocated power Y fields.

Summary

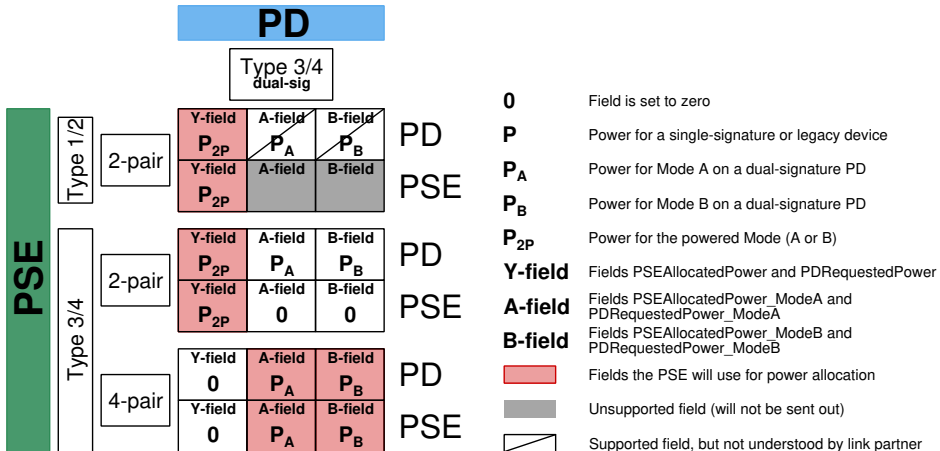
The core change compared to D2.5 is that fields that are not applicable, are set to zero. This prevents duplicate information being sent. Duplicate fields have potential to confuse.

Another change would be to allow dual-signature PDs to request power on a pairset that is unpowered. This is a valid use-case, currently disallowed by a requirement.

Plan is to provide normative requirement in one subclause on how to fill out the fields depending on the situation. State machines may need some tweaking to match with the desired behavior.

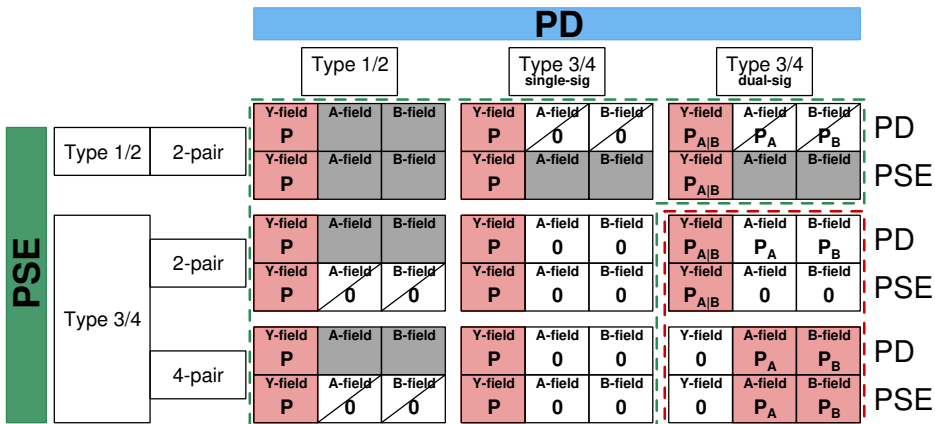
The PSE maximum available power field in 79.3.2.6e needs a text tweak to clarify that for dual-signature it needs to report total power.

Dual-signature overview








Full overview



Overview legenda

0	Field is set to zero
P	Power for a single-signature or legacy device
P_A	Power for Mode A on a dual-signature PD
P_B	Power for Mode B on a dual-signature PD
P_{A B}	Power for Mode A or Mode B on a dual-signature PD (whichever is powered on)
Y-field	Fields PSEAllocatedPower and PDRequestedPower
A-field	Fields PSEAllocatedPower_ModeA and PDRequestedPower_ModeA
B-field	Fields PSEAllocatedPower_ModeB and PDRequestedPower_ModeB
	Fields the PSE will use for power allocation
	Unsupported field (will not be sent out)
	Supported field, but not understood by link partner