Autoclass cancellation v110

Info (not part of baseline)

The Autoclass classification process was primarily defined for PoE lighting applications. Per the requirements, a PD that requests Physical Layer Autoclass is required to consume it's maximum power right after power up. This allows the PSE to measure the power it is sourcing and adjust the power budget accordingly.

A usecase that I did not give proper consideration is that of lighting PDs that are unable to turn on when reaching power up. A simple example would be PoE fixtures used in a hotel. These have a feature that keeps their state to the previous state after a power cycle. If there is a mains failure in the middle of the night, it would not do for every single fixture to go to full power when mains power is restored. In stead these devices store and apply their "previous state" which is OFF.

This presents a problem for Autoclass PDs. By remaining OFF, the Autoclass PSE will grant them Class 1 power. This would prevent the PD from reaching it's required output power when it eventually needs to turn on.

While there are some mitigation measures that a PD can take, none are really satisfactory. What is needed is way for in this condition the PD to "cancel" Autoclass even during the Physical Layer process.
Currently the PSE is required to having a minimum allocation of Class 1 power, even if less is drawn during the measurement period. Proposed is to change this such that PSE allocates the assigned Class in stead of Class 1 power in case less than Class 1 power is drawn during the measurement period.

145.2.8 PSE classification of PDs and mutual identification

Change text in 145.2.8 as follows:

If the PD connected to the PSE performs Autoclass (see 145.2.8.2 and 145.3.6.2), the PSE may set the minimum supported output power based on $P_{Autoclass}$, the power drawn during the Autoclass measurement window. $P_{Autoclass}$ shall be increased by at least P_{ac_margin}, as defined in Table 145–15, in order to account for potential increase in link section resistance due to temperature increase, up to the value defined in Table 145–11 of the Class assigned to the PD~~, and with a minimum power allocation of Class 1~~. If $P_{Autoclass}$ is less than or equal to 4 W then the minimum supported output power shall be P_{Class} per the assigned Class.

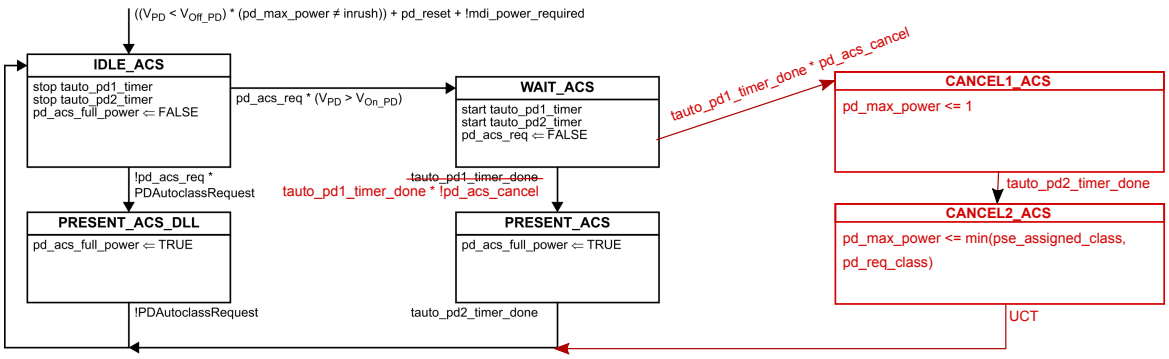
145.3.3.3.2 Variables

Insert new variable as follows:

pd_acs_cancel
This variable indicates that the PD wants to abort the Autoclass procedure. See 145.3.6.2.
Values:
FALSE: The PD does not abort the Physical Layer Autoclass procedure.
TRUE: THe PD aborts the Physical Layer Autoclass procedure.

145.3.3.3.5 State diagrams

Change Figure 145–26 as follows:



145.3.6.2 Autoclass (optional)

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After power up, a PD that implements Autoclass shall draw its highest required power, $P_{Autoclass\_PD}$, subject to the requirements on P_{Class_PD} in 145.3.8.2, throughout the period bounded by T_{AUTO_PD1} and T_{AUTO_PD2}, measured from when V_{PD} rises above V_{On_PD}. The PD is restricted to a maximum power draw of $P_{Autoclass\_PD}$ until the PD successfully negotiates a higher power level through Data Link Layer classification as defined in 145.5. A PD that draws less than Class 1 power during the period bounded by T_{AUTO_PD1} and T_{AUTO_PD2} indicates to the PSE that the power allocation should be determined by the assigned Class. By doing this the PD can abort the Physical Layer Autoclass procedure.

145.3.8.2 Input average power

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A PD that has enabled Autoclass during Physical Layer classification and drew a power higher than Class 1 power during the period bounded by T_{AUTO_PD1} and T_{AUTO_PD2} or has requested Autoclass through DLL, shall not draw more power than $P_{Autoclass\_PD}$, unless the PD successfully negotiates a different power level, up to the PD requested Class, through Data Link Layer classification as defined in 145.5.