MEETING 2 MINUTES:

Call to Order UPAMD Power Subgroup meeting – Paul Panepinto 7am Pacific 21 October 2010

I. Introductions/Attendance
Anand, Ignatius, Bob, Tom, Edgar and Paul participated.

Paul wanted to state for the record, that we feel that this group has never engaged in price-fixing or anti-trust activity and that has always participated within the guidelines of the IEEE rules. A concern was raised since the group wishes to ensure relative implementation costs (not the prices any vendor may charge) are minimal to ensure all those that want to implement the standard are not burdened. The request for input was reworded to ensure that no further question or concern remained.

II. Approval of 10/07/2010 Power Subgroup Meeting Notes
Edgar approved and Bob seconded the previous meeting minutes.

III. Approval of Agenda
Bob motioned to approve the agenda and Ignatius seconded.

IV. IEEE Call for Patents. See http://standards.ieee.org/board/pat/pat-slideset.ppt
Was read and discussed.

V. Review analyses of different acceptable voltage options
The group spoke in great detail about the options and raised many interesting points about tradeoffs. We used the template as a guide for discussion.

Paul asked about whether people preferred the voltage requirement be on voltage at the source (power adapter connector) or the sink (electronic product's power connector. Tom said that the preference may be more easily made after other issues are settled. Edgar said that the power supply can dynamically compensate for voltage drop using communication from the sink, if communication is fast enough. Another compensation option that did not require communication is to specify the maximum resistance a cable can have, regardless of length. Another option is to step voltage up at the source based upon the voltage and current needed by the sink (higher current will incur greater losses.)

3 options were included in the template – single voltage output with a tight tolerance at the sink; single voltage output with a broad tolerance at the sink; any voltage at the sink in the supported voltage range (6V-24V, for example.) A fourth option was reintroduced that involved multiple, fixed voltages (12V, 24V, 48V).

Tom said that he prefers a single voltage with a tight tolerance, but doesn't care too much about whether the tolerance is tight or broad and reiterated his faith in the KISS principle. Tom feels that if you design a single, standard voltage, product designers will develop to that standard.

Edgar agreed that if the group voted for a single, fixed voltage, that does not prohibit future revisions of the standard to add new, supported voltages.

Bob said having 3, fixed choices may be a compromise between single, fixed voltages and any supported voltage in a range. Paul asked if the group knew anything about the PoweredUSB solution and a few people knew of the effort. Paul asked if there were any lessons learned about why PoweredUSB never reached broad adoption and guessed the physical connector was too large for most potential adopters.

Paul asked the group for their preferences on tight vs. broad tolerances if a single voltage were to be the standard. Tom said an advantage of a broad tolerance is that you could have much longer DC power cables, but the disadvantage in a tight tolerance is that it incurs more energy loss if the sink must deal with a broad range of acceptable input voltages. Someone said that long DC cables are not needed, since one can always make the AC cable longer.

Ignatius said that a long DC cable is not a good option. A maximum loss is needed and we need to ensure the voltage drop on the comms wire won't affect the ability to communicate. Edgar said that the power losses for the communication wire are small in comparison to the DC power cord.

Bob was asked to comment on the potential to use a single voltage, but of higher level, say 48V, for example. Using a higher voltage will require less current and that can lead to thinner wires and less heat in the adapter and sink. That's why cars are thinking of going to a 42V max float voltage system. This was not done before, because the first input capacitor and first input transistor need to withstand the higher voltage. That costs a few cents more. The transistor for the switching regulator using a higher voltage will cost a little more. Perhaps a 60V transistor vs. a 30V transistor may add 1% difference in cost of the transistor.

The gains made by reducing losses due to lower currents using higher voltage may more than completely be offset by losses in the need to step down from 60V to low voltages needed by many devices. Going from 60V to 3.3V is worse than going from 19V to 3.3V. This loss may somewhat be mitigated by the use of a distribution voltage that then gets stepped down further. 60V to 24V distribution down to whatever voltage is needed, for example. Also, you may generate more heat stepping down from a higher voltage.

Tom said that from a system power delivery perspective (ignoring connector size and relative cost) you'd have 10+ pins and many voltage options, eliminating the need for DC-DC conversions. But, that is not realistic. Edgar said, you will always need DC-DC regulation at the sink. Tom said a typical notebook PC takes 19V in and uses DC-DC converters to create 5V, 3.3V and 1.2V outputs. Other low voltages outputs including 0.9, 1.1 and 0.7 are possible.

Paul asked about the preference for or against a requirement for active feedback for voltage drop. Edgar said you can specify 4 mOhms per ft. plus 5-10 mOhms per foot on 20-guage wire for a 20' cable might give you a budget of 100 mOhms budget that would mean a 10% loss – a considerable loss. But, the power supply could increase voltage above the single voltage in the spec according to a formula, knowing there will be cable losses.

Tom was going to complete the form and Paul was going to send the template to Edgar who will edit and return it.

VI. Prioritize preferences for voltage options and put to a vote
VII. Begin drafting criteria for voltage requirements and restrictions
VIII. Time permitting, define voltage and power requirements for communications channel
IX. Adjourn
Tom moved to adjourn the meeting at 8:15am Pacific.