

DOCKETED

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ITI Technet Comments April 15th Aggios Workshop Demo

Submitted for Chris Hankin by Donna Sadowy

Additional submitted attachment is included below.

TO: CEC/Docket Unit
FROM: Chris Hankin, Information Technology Industry Council
SUBMITTED ON: August 18, 2015
DOCKET NUMBER: 14-AAER-02

April 15th Aggios Workshop Demo.

Submitted on behalf of ITI and Technet

ITI and Technet would like to clarify a misconception that currently exists in the Docket. In several written comments submitted, for example on May 29th, it is stated that the AGGIOS computer optimization demonstration at the April 15, 2015 workshop showed "... that mainstream desktops can be optimized to meet proposed standard levels...." As was clarified at the June 10, 2015 Deep Dive meeting, the demonstration actually did no such thing. Not only did it not achieve the power levels required to meet the proposed CEC idle power requirements but there has been absolutely no verification that the modified system will perform with the same end user expected functionality nor has there been any level of application compatibility testing performed. It is highly probable that an implementation of the AGGIOS proposed software changes would result in unacceptable end user response times and significant operational instability in the PC systems on which it is implemented.

Additional explanation follows:

Feasibility for Desktops

The Aggios power supply approach does not scale to traditional or higher performance desktop systems. Small mobile on desktop systems that utilize mobile components can use validated AC adapter and notebook power supply topology as suggested by the Aggios demo. However, performance desktop PCs with PCIe slots for add-in cards require auxiliary power supply connectors that are based on traditional "silver box" power supply architecture.

User Acceptance

Scaling of energy consumption based on workload is not a universal solution because of potential negative impacts on user acceptance and functionality. Increased latency, associated with turning HDDs off, and spinning HDD platters up and down, is not acceptable to users because of the long (>10 second) resume times that are associated with this activity.

For example:

HDD	Resume time, power-on to ready (sec)	Resume time, standby to ready (sec)	Resume time, ready to spindle stop (sec)
Seagate, 3TB and 4TB, 3.5" HDD ¹	15 (typ), 18 (max)	15 (typ), 18 (max)	10 (typ), 11 (max)

1: <http://www.seagate.com/www-content/product-content/desktop-hdd-fam/en-us/docs/100710254g.pdf>

Based on feedback from our customers, waiting ≥ 10 seconds to allow for spinning HDDs up and down would be perceived as a serious and significant loss in desktop PC functionality. We understand that this is not the intent of the regulation.

Because HDDs cannot be continuously spun up and down without loss of functionality, an adder for desktop HDDs, similar to what's provided in Energy Star Version 6.1 is appropriate. For popular 3.5 inch HDDs, with 2-4 TB capacity, idle power of approximately 8W is being reported <http://www.wdc.com/wdproducts/library/?id=444&type=8&cn=2879-771434> This doesn't take into account any OS or application access to the HDD during short or long idle.

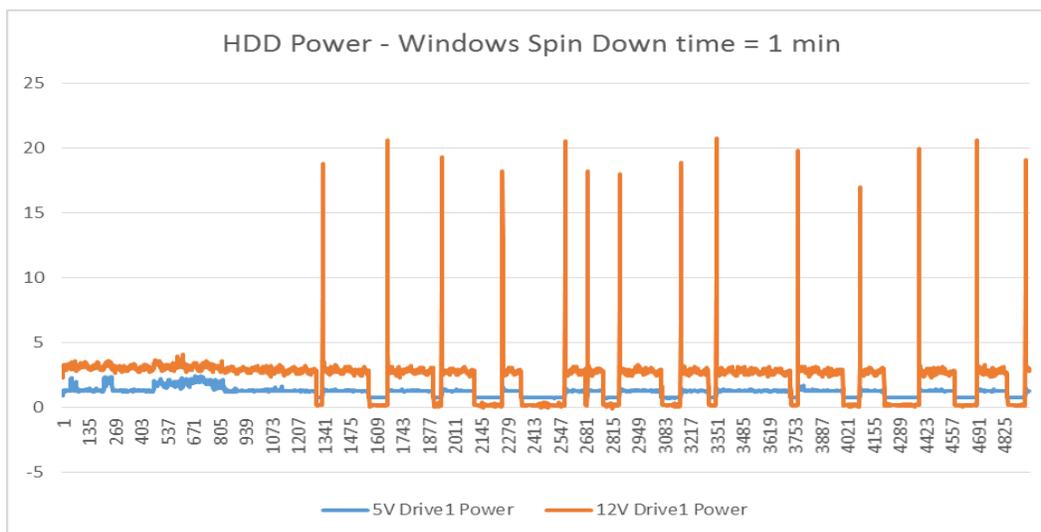
The impact of ongoing spinning of HDDs up and down on desktop reliability or energy consumption are additional considerations that were not addressed in the Aggios report.

Reliability

Reliability concerns may be associated with continuously spinning HDDs down and up for power management purposes. For example, public information from suppliers of HDDs indicate approximately 50,000 to 300,000 head load/unload cycles in their reliability specifications. This issue needs to be considered.

Power/Energy Considerations

Industry's follow-up evaluation of the Aggios report is finding that some power issues were not identified. For example, power spikes are seen when HDDs are spun up (below). The power spikes during spin up can be more than the average HDD power, so that over 5 minutes, the energy consumed during spin-up is about the same as leaving the HDD in normal operational mode. This finding is missed in a discussion of power savings while spinning down HDDs.



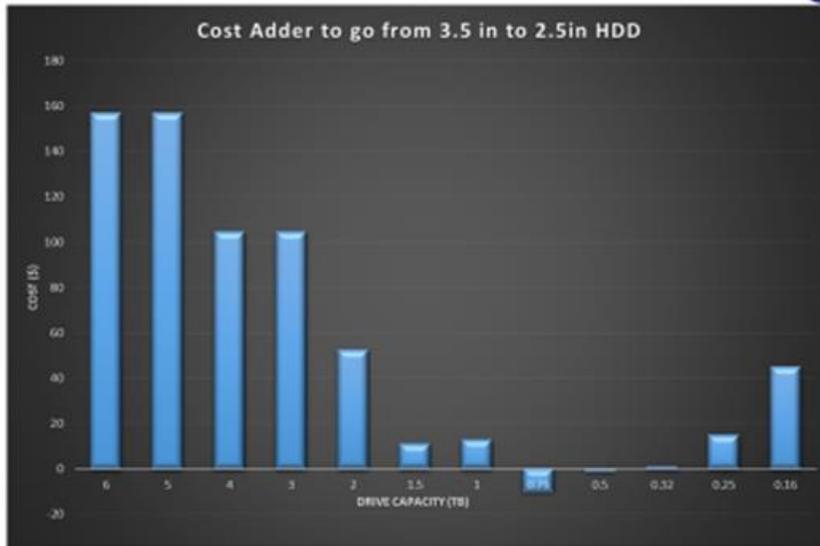
The test results provided in the figure above were collected on a Western Digital Blue 1TB hard drive with the hard drive spin down time set to one minute in Windows.

Cost

Cost impacts associated with changing PC system components are addressed in ITI TechNet collateral that's already been docketed. An example of one potential cost impact that is associated with making changes to HDDs is provided below.



Cost of changing to 2.5in HDD in desk top systems



- Uses lowest cost advertised on Amazon.com for available HDD's
- Western Digital and Seagate current production drives considered
- Customers needing large Capacity will experience between 50 and 150.00 per unit cost increase

As additional data is collected in regards to these and other issues, Industry will evaluate the submission of additional information to the docket.