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From:	Tanzer, Herbert J [herb.tanzer@hp.com]
Sent:	Friday, May 21, 2010 7:28 PM
To:	storage@energystar.gov
Cc:	Tanzer, Herbert J

Subject: Hewlett-Packard Response to ENERGY STAR Data Center Storage Draft 1 Version 1.0 Specification

Re: Hewlett Packard Response to ENERGY STAR Data Center Storage Draft 1 Version 1.0 Specification, issued April 9, 2010

From: Hewlett-Packard Company, Enterprise Storage and Servers Business Unit, Storage Works Division

This document may be published on the ENERGY STAR website.

Hewlett-Packard (HP) is generally in support of the SNIA and TGG Responses to the Storage Specification. HP is one of many member companies that have collaborated on these responses. HP would like to add additional emphasis on the following items. Thank you. For follow-up, the primary contact at HP is: Herb Tanzer, Storage Architect, herb.tanzer@hp.com, 719-548-3415

1. Definitions
For the most part, the Definitions align to the SNIA Dictionary and are therefore acceptable.
165-178: Storage Product - a very important definition that should be aligned with the SNIA definition (not yet in the SNIA dictionary)

320-357: Defining a "Ready Idle" state is a valuable addition in that this should become the de-facto Idle state for Arrays (which typically perform routine housekeeping tasks when not Active) and for Tape Libraries. Including a "Hardware Idle" state definition in which there is no background housekeeping has limited utility in that this is uncommon for an in-use array storage product.

372-384: Product Family - in order to minimize the testing for each storage product, it is desired to have a clear definition of a product family in terms of Maximum, Minimum, and Typical configurations. Due to configuration complexity and possible SKUs in a product family, there needs to be a definition effort to fix a common set of features for a product (taxonomy), and vary a smaller set of features that impact energy (e.g., drive type / count) to characterize MIn/Max/Typ configurations.

2. Qualifying Products
437: For Version 1.0, it is recommended to limit qualifying products to the taxonomy categories: Online 2 and 3, and Removable Media Library 2 and 3. These are high-volume, relatively smaller storage systems, for which multiple data sets have been submitted to SNIA and the EPA. This allows time to test and validate the Specification on these less complex systems before moving on to larger and more complex categories in Version 2.0

449-456: "Hybrid" Systems may eventually need a concise definition. For Version 1.0, it

is suggested that the existing taxonomy is adequate, and the (hybrid) system should be characterized by the slowest media and the maximum time to data.

3. Energy Efficiency Criteria
447-496: PSU Efficiency Criteria - Datacenter storage PSU's are typically auto-ranging from low-line to high-line, are both single-output and multi-output, and sometimes include a large fan for cooling the storage product. For efficiency testing, storage PSU's should not include the fan as part of the test. Due to longer product life cycle of storage compared to server product, it may be necessary to rate storage PSU's at level lower. However, there should be differentiation in the rating between multi-output and single output (the latter are expected to be more efficient). SNIA participants have submitted a sample set of currently shipping multi-output PSU's for efficiency testing by ECOS; it is recommended that the same be done to collect data for single-output PSU's.

511-524: Active and Idle State Efficiency Criteria - It is recommended that EPA adopt the SNIA profiles consisting of: preconditioning, 6 active tests and idle for online/near online and precondition, 1 active and idle for Removable Media Library. At a minimum, metrics reporting should be done for idle, and separate averages (method tbd) for random active and sequential active.

519-524: Idle State Efficiency Criteria - If Idle is properly defined as "Ready Idle" -- which implies background housekeeping is possible, then Ready Idle can be a suitable proxy for Active. For Online, Ready Idle operation generally consumes 80-85% as much power as does the most intense Active state. Ready Idle is much easier to specify than Active and thus appropriate for V1.0. Ready Idle could facilitate (make easy) Verification testing of production systems.

5. Standard Performance Data Measurement and Output Requirements
577-578: HP is generally in favor of power and temperature measurement and reporting. But the implementation, measurement accuracy, and sampling requirements as stated should be a goal for V2.0. The recommendation for V1.0 is to implement a rack-level intelligent PDU for power reporting.

6. Testing
610-612: More stringent requirements for Verification and Testing are expected from the EPA. It is recommended that the storage manufacturer be allowed to use either in-house or industry labs. Testing needs to be under auditor observation or self-test with submitted results to an independent auditor. The cost of the storage system and the complexity of performance workloads can be inhibitors to using an outside lab for testing.