

Date: June 2, 2010

To: Storage@energystar.gov

From: Wayne M. Adams
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SNIA Board of Directors, Chairman

SNIA appreciates the opportunity to provide comments on the EPA's ENERGY STAR Program Requirements for Data Center Storage, Draft 1 Version 1.0.

The SNIA is a global industry association representing membership for storage and data management industry segments, www.snia.org. SNIA has been collaborating with the EPA on the ENERGY STAR Data Center Storage program for several quarters. SNIA's focus on Green IT, as it relates to storage systems started in 2007. <http://www.snia.org/forums/green/>

SNIA has been proactive in drafting an Energy Measurement Specification, collecting and analyzing measured energy consumption for a breadth of data center class storage configurations, delivering Green IT and Storage education, and forging global industry alliances and relationships for related datacenter efforts.

SNIA recognizes many SNIA members may also submit recommendations for the draft 1 Data Center Storage specification. The SNIA comments are a collective view of its membership and may not represent every facet of any individual member recommendation. However, we believe most submissions from SNIA member companies align well with the SNIA collective view.

Sincerely,

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This draft of the Data Center Storage specification takes a step toward providing a good frame work, definitions, and taxonomy of storage systems. The following comments are aligned with each section of the specification. In sections where there are many items to be determined (indicated as TBD), SNIA has provided comments where it could, and looks forward to further discussion with the EPA to complete specification development.

Definitions:

SNIA thanks the EPA for aligning with the SNIA Fall 2009 Dictionary for use of definitions as well as adopting the SNIA storage system taxonomy. It is important for this specification to use industry-wide definitions. The SNIA Dictionary is the result of input from all stakeholders in the storage network industry. Some definitions are still a work in progress within the SNIA organization and will become part of the dictionary once approved by SNIA. SNIA will work with the EPA and other stakeholders to enhance the storage dictionary to keep it current with the ever-changing storage landscape.

EPA uses the term “product” instead of the term “system” that SNIA uses. EPA should consistently use the term product throughout the specification. SNIA desires further discussion with the EPA on a storage product definition; to most SNIA member companies, a product is one or more SKUs that comprise a deliverable storage system.

SNIA’s Green Technical Working Group (TWG) has a subgroup working on a definition of data storage efficiency. At this time it is still a work in progress and once the SNIA Green TWG subgroup is finished and the definition approved we will provide it to all the stakeholders in the storage industry. The subgroup also has developed heuristics for several capacity optimizing technologies, which it hopes to publish in the near future.

The word hybrid has been used by the EPA to define both mixed storage media types within a single taxonomy category and storage systems comprised of media from two or more different taxonomy categories. We suggest not using the word hybrid; instead, these products should simply be placed into the taxonomy categories for which the product can satisfy the max time to data for any piece of data on the system.

SNIA agrees that the concept of hardware idle for online storage is not worth pursuing. SNIA has defined the ready idle state of a storage system to be the capability of executing external host IO requests in less than the defined max time to data, while no such requests are in process. This provides the ability to measure a storage system’s power required to keep the data available to the network.

SNIA through its Green Storage Initiative (GSI) and Technical Working Group (TWG) is working on a definition for storage products and families. There are many variables to storage which the EPA and stakeholders need to address in order for the Data Center Storage specification to correctly provide a useful spec. The EPA’s Maximum and Minimum configurations are defined based on power. For the industry this could mean many different things for a product family, i.e. capacity, throughput, RAS, frames, etc. A typical configuration may change from month to month and could be anything between the minimum and maximum configurations. SNIA does not understand what base configuration definition is used for in this specification

Qualifying products

SNIA suggests the Version 1.0 ENERGY STAR Data Center Storage specification include only the following taxonomy categories and classifications: Online 2, Online 3, Removable 2, and Removable 3. Using these categories for Version 1.0 would provide an achievable specification with an immediate impact in the market. Online 4 and 5 and Removable 4 and 5 systems have not been closely analyzed by SNIA and as such could affect the outcome of the specification in an unfavorable way. Additionally, the true power cost of RAS functionality needs further understanding by the industry and EPA.

Energy efficiency criteria

Power supply

SNIA proposes the following changes to sections 3.1 of the draft specification:

“To qualify for ENERGY STAR, only the PSUs used to power storage media (tape drives, disk drives, robotics, etc.) and storage controllers must meet or exceed the applicable efficiency requirements specified in Table 2.”

There are many power supplies within a storage product, such as switches and UPSs, that have little overall power draw and over which the manufacturer of the storage product will have little or no control.

At the present time storage power supply efficiencies are not up to the same levels as data center servers. Hence, SNIA does not recommend requiring the same efficiency levels for storage as for data center servers. Storage product development and life times have longer cycles than standard servers, and storage power supplies have to cover a wide range of loading depending on configurations and field upgrades. SNIA recommends the EPA focus on the 20% to 100% load levels for power supply efficiency and power factor.

Active state

SNIA is working on a specification to measure storage performance and power in the active state, defined as storage responding to host requests. SNIA looks forward to working with the EPA on this topic.

Idle state

SNIA has a specification for measuring storage capacity and power in the ready idle state as previously defined. This test could be a good overall proxy as it measures the power required to keep data available. This test could also be a good proxy for the proposed EPA and DOE ENERGY STAR program verification process.

Power management

SNIA is not prepared to endorse these check box metrics, as they seem to apply much more to single-CPU, single-disk environments. SNIA would like to have continued discussion on what power states are applicable to storage.

Standard information reporting requirements

SNIA believes that this section was a copy from the server specification and that the fifth item in the list of required reporting requirements does not match realities in the storage industry. The idle and active metrics suffice, in SNIA's opinion, to demonstrate a storage system's power efficiency.

Standard performance data measurement and output requirements

Most of the storage industry does not have the capability to report inlet power and ambient temperature of a storage system. SNIA recommends the EPA consider further discussion with stakeholders and users of storage systems about use cases in order to properly define a useful requirement in this area.

Testing

Definition of "negligible" is needed for third party components.