

SNIA Response to the *ENERGY STAR® Program Requirements for Data Center Storage, Partner Commitments, Draft 2 Version 1.0*

This document presents the response of the SNIA Green Storage Technical Working Group to the *ENERGY STAR® Program Requirements for Data Center Storage, Partner Commitments, Draft 2 Version 1.0*.

Response dated 11/16/11

About SNIA

The SNIA is a not-for-profit global organization, made up of some 400 member companies spanning virtually the entire storage industry. The SNIA's mission is to lead the storage industry worldwide in developing and promoting standards, technologies, and educational services to empower organizations in the management of information. To this end, the SNIA is uniquely committed to delivering standards, education, and services that will propel open storage networking solutions into the broader market. For additional information, visit the SNIA web site at www.snia.org.

The SNIA responses represent the technical work and viewpoints of the Green Storage Initiative (GSI) <http://www.snia.org/forums/green> and the Green Storage Technical Working Group (TWG) http://www.snia.org/tech_activities/work/twgs/. Collectively, the TWG and GSI represent over 30 companies. The website for the GSI lists company names which are a subset of this group. Collectively, the SNIA is a voice for the \$50B-60B year storage and information management industry.

Contacting SNIA for further discussion about this response can be arranged through SNIA leaders Patrick Stanko, Leah Schoeb, and or Wayne Adams, with contact info on file with the ENERGYSTAR Program Management Team.

Section 1 Definitions

SNIA appreciates using the dictionary. Note these requests to revise the definitions:

- Lines 143-149: Please verify that use of the words *devices* and *storage elements* is consistent for Storage System Connectivity sections 1.B.2 and 1.B.3.
- Lines 265-270: In the *deep idle* definition, the last line is not needed. Please delete "Deep Idle capability must be a user-selected, 270 optional feature of the Storage Product."
- Lines 232-253: Only the *raw capacity* definition is needed for this revision of the specification; all other capacity definitions are not needed. If you wish, delete definitions

F.1-4 (lines 234-248) from the definition of *Capacity*. F5 *Raw (Addressable) Capacity* then becomes F1.

- Lines 235-236: If you keep all the *capacity* definitions, for *Assigned Capacity*, please change *capacity optimization* to *thin provisioning*—change "For capacity-optimizing systems, an assigned capacity number represents..." to "For thin provisioning, an assigned capacity number represents..."

Section 2 Qualifying Products

2.1 Included Products

Lines 388-390: SNIA agrees with the reduced scope of looking only at Online-2, -3, and -4 for the first tier.

Lines 391-394: SNIA believes that before NAS can be included, more research is needed on active measurements collection requirements. SNIA recognizes that NAS could be included for the first tier if idle is used as the only measurement required to reach a threshold. If an incorrect active measurement driver/benchmark is used, it could complicate inclusion of NAS in the second tier. Without a change to the preconditioning of the measurement specification, NAS could not be included.

Section 3 Qualification Criteria

3.2 Power Supply Requirements

Lines 416-422: SNIA understands the need to improve the power efficiency of the power supplies in storage products, but the storage industry is behind servers in this area. Storage has a few challenges to overcome with power supply efficiency ratings. First, the design and life cycle of storage is longer than servers, particularly the drive shelf.

In general, the power supply used in the drive shelf is a multi-output redundant power supply. With that in mind, SNIA supports the silver rating for single output power supplies but is uncertain that the multi-output power supplies can achieve this rating. A more realistic level should be bronze. SNIA would like to match the 80Plus rating with no additional testing beyond the 80Plus requirement.

Lines 439 to 455 (Note): SNIA suggests the following wording:

Only storage controllers and storage media enclosures need to meet power supply requirements specified in the Data Center Storage ENERGY STAR® specification. All other components are exempt from specific and related ENERGY STAR® and power supply requirements.

3.3 Active State Efficiency Criteria

Lines 457-460: Results should be disclosed to ENERGY STAR® but anonymized to the public. The first tier was to be used to collect data to evaluate the metrics and find a criteria for ENERGY STAR®. To make this a viable exercise, the EPA should require a system to be tested

at the sweet spot for idle and at least two active metric sweet spots. There are tradeoffs between capacity and performance that must be considered when setting up a storage system; these tradeoffs need to be well understood before an active metric criteria can be established. A further discussion is needed on the product family to help minimize the testing requirements.

3.4 Idle State Efficiency Criteria

Line 476: The pros and cons of using an idle efficiency criteria for the first tier are:

Pros:

- It is a simple proxy that is available to meet the timeline.
- Previous data investigations show at least 80% of power consumption at idle.
- It covers Block and NAS systems.
- The act of storing and protecting data for immediate use is useful work.

Cons:

- Performance oriented systems may not get ENERGY STAR® (function of drive type and read cache size and algorithm).
- RAS and COM features credit (scrubbing, de-duplication computation, auto tiering, etc.)
- Additional categorization for equivalent product family and best foot forward (e.g., drive type and capacity)

SNIA believes that more idle data is needed to draw an accurate threshold.

3.5 Power Management Requirements

Lines 488-493: Section 3.5.1 is not relevant to storage systems and is not needed in the specification. SNIA recommends that you delete Section 3.5.1.

SNIA approves the use of power calculators by the vendors to show possible energy usage. However, vendors can only provide a range of plus minus of 20% and cannot warrant that power consumed by a configuration would be below or equal to a predicted value.

3.6 Energy Efficiency Feature Requirements

Add Parity Raid to the COM list in Table 4; not all online classifications may be able to support this as is because the market does not require it, for example Online-2. Some systems use Grid instead of RAID.

How does the EPA expect industry to prove adaptive cooling in storage systems to the CB's?

Industry cannot support having COM features shipped as enabled. These features are added to the sales of storage systems only after the customer has evaluated the desired feature to verify that applications using the storage system would not be impacted. These things are visible because customers had to pay to have them.

Line 517: In Table 4, *power-down* should be replaced by *spin-down*. Change “Allow for unallocated storage elements to be placed into a power-down state.” to “Allow for unallocated storage elements to be placed into a spin-down state.”

Not all Online classifications should have the same amount of X out of Y requirements because of different market segment requirements.

3.8 Standard Performance Data measurement and Output Requirements

Line 548-557: SNIA falls back to its original position (presented at the July 2011 meeting) that power and temperature reporting should not be a requirement in the first tier of the specification. At a maximum, power could be reported, but SNIA does not understand why—for storage systems—that power should not be reported at more than 30-second intervals using average power. Please note that for the industry to do this, storage systems will have to utilize smart PDUs to get an overall power of the system. Online 2 should be exempt from the power requirement.

SNIA does not support temperature reporting for storage systems. The makeup of storage, having controllers and drive shelves, may not be the best place to implement inlet temperature.

Section 4 Testing

Line 589: Section 4.1

Thank you for referencing the *SNIA Emerald™ Power Efficiency Measurement Specification*. Please add the TM symbol to *Emerald* in the specification title.

4.2 Number of Units Required for Testing

Lines 591-600: This is bookending; the industry would have a hard time supporting this amount of testing requirements. SNIA is using sweet spot, and would like additional clarification as to what the EPA is uncomfortable with concerning a sweet spot proposal.

Section 5 Effective Date

Line 617: SNIA understands the need to have an effective date in the first quarter of 2012. However, this date could be in jeopardy because of several key questions that need to be answered:

- First, the inclusion of NAS needs to be determined, and it can only be addressed with further review of a benchmark used to measure the active metric.
- Second, the product family definition and precise measurement methodology need to be finalized. Since the performance of many systems depends on configuration of the system, there are many tradeoffs to consider. To make this a successful program, the industry will need to work with the EPA to develop a method of gathering the data needed by the EPA and ENERGY STAR®. The final issues will be CB and AB training on the developed test and measurement methodology.