ITI Green Grid Response
ENERGY STAR® Data Center Storage V2.0 Discussion Guide Questions
August 19, 2019

These are the questions raised in the ENERGY STAR Data Center Storage Discussion Guide July 2019 and the ENERGY STAR Version 2.0 Data Center Storage Discussion Guide Webinar July 24, 2019. The Green Grid SERT and Storage Working Group responses follow each of the questions.

Simplification

1. Do stakeholders agree with the rationale behind this proposal which emphasizes efficiency of the controller and associated software?

TGG/ITI agrees with The EPA's analysis and observations regarding the focus on efficiency of the controller and associated software. EPA efforts and foresight in this area are greatly appreciated by industry.

2. Are there alternative approaches that stakeholders would like EPA to consider when developing the Draft 1 specification?

Industry fully supports EPA's approach in this area as it removes significant testing and cost burden that has not shown any value in the previous versions of storage specifications.

3. Do stakeholders agree with the simplified testing approach? Are there scenarios that stakeholders foresee that are not covered by this approach?

Industry fully supports EPA's approach in this area as it removes significant testing and cost burden that has not shown any value in the previous versions of storage specifications. 4. Is there a reason to suspect the more recent linear behavior observed in storage product's performance/watt over a large range of device counts will not continue through the life of Version 2.0?

We do not see any reason for this behavior to change over the expected time frame of this specification revision.

Variations and Drive Requirements

1. Would removal of Sections 3.6.1 and 3.6.2 cause any confusion or conflict with other elements of the specification?

We do not foresee any issues with this proposal. It is a further simplification that we believe is reasonable and removes cost and test burden that have proven to provide no value in assessing the energy efficiency of storage systems in the previous version of the specification.

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2. Does the removal of any of this content create unanticipated gaps or loopholes in other requirements in the specification?

Industry's current assessment has not uncovered any unanticipated gaps or loopholes as a result of these proposed changes.

Revisions and Additions

Questions – Internal Power Supplies

1. What is the typical efficiency of IPSs used in today's storage products?

Currently 80Plus Gold in Multi-output (MO) & 80Plus Platinum in Single output (SO) are becoming achievable for storage products and industry is moving in that direction.

2. What, if any, hindrances are there to moving to 80Plus Platinum or Titanium?

Currently 80Plus Titanium is out of reach and will be for the next 2-3 years largely due to longer development and safety approval cycles of the custom power supplies used in these products. Multi-Output currently has no definitive plan for achieving 80PlusTitanium efficiency levels due to the approximately 1% additional losses for the extra regulator stages in the power supply. Availability of 80PlusTitanium is also a significant challenge for low power (<500W) single output power supplies. Currently the single output 80Plus Titanium PSUs that have recently become available for servers are all high powered and are ranging from 96% to 96.5% efficiency. Until it becomes possible to achieve greater than 97% efficiency for single output PSUs, multi output PSUs will not be able to achieve 80PlusTitanium efficiency levels.

3. How do the savings of requiring greater IPS efficiency for a limited number of IPS load points representing the most common load conditions compare to those requiring Platinum or Titanium across all load points?

Our preference is to stay with the standard 80Plus requirements. The PSU vendors now understand these requirements and their reference designs are all set up to meet these. Any variation from existing 80 Plus power supply levels will cause significant disruption in power supply availability in those areas where storage and server systems are able to leverage the same PSU designs. Design modifications to achieve such targeted efficiency improvements would likely require a lead time of 12 to 24 months for design changes, design validation and world-wide safety approvals. Industry is currently transitioning to 80Plus Gold for Multi-output and 80PlusPlatinum for single output in the EU beginning March of 2020. Another transition later in 2020 or early in 2021 is not on the horizon and would cause undue burden on industry.

4. What load points of those currently tested (10%, 20%, 50%, 100%) best represent a typical operating load for a storage product?

It is estimated that High Availability systems range from 20%-45% operating load and non-High Availability systems range from 40%-80%. TGG/ITI does not see any value in this product class for defining efficiency at load points not already defined in the 80Plus standard. Industry would prefer that requirements not deviate from the 80Plus standards. Industry would much prefer that the 80 Plus standards be changed instead of requiring modified versions of those standards. Power supply

designs at these efficiency levels have insufficient margin to allow for multiple versions or implementations with modified efficiencies at specific load points.

Questions – COMs

1. Are there any other COMs that EPA should be considering beyond thin provisioning, data deduplication, compression, and delta snapshots?

We are not aware of any additional COMs beyond that which the EPA is already addressing in the existing specification.

2. Are there file I/O based storage COMs that EPA is not covering that should be included in the specification?

File systems and block systems use the same COMs and there are no additional COMs to be addressed as a result of adding file-based systems.

3. Would it be clearer to stakeholders if EPA required thin provisioning for all products and maintained the current number of required COMs (with thin provisioning no longer applicable)

No, because lower end systems may not have or a need thin provisioning. Many Online 2 and Online 3 systems are being built for targeted applications where only one or 2 of the COMs would be appropriate, and it would un-necessarily burden the system to have additional COMs available that would never be used.

4. Is it appropriate for EPA to consider making all listed COMs available at the point of sale in the Draft 1 specification?

No, for the same reason as stated above. Requiring additional COMs for the higher end systems (Online 4 and above) might make more sense. Increasing the number of COMs required as the system increases in complexity is a more logical approach.

Questions – Energy Efficiency Requirements

1. Do stakeholders have any additional energy and performance data they can share on non-certified products to aid in level setting?

This need is especially great for file I/O based storage products where EPA currently has a limited data set

We do not have any additional data available at this time beyond that already submitted to the ENERGY STAR QPL data set.

2. Are there any other considerations EPA should factor into setting efficiency requirements for storage products in Version 2.0?

Industry believe the EPA has done an excellent job of evaluating appropriate factors for setting efficiency limits and is not currently aware of anything not currently being addressed.

Additional Information

- Vdbench Questions: These questions should be addressed by SNIA.
- Emerald 4.0 Questions: These questions should be addressed by SNIA.

Version 2.0 Revision Schedule

- EPA expects to release a Draft 1 specification by late summer 2019
- EPA expects Draft 2 will release in the fall of 2019
- EPA expects the final specification to be published in early 2020 with an effective date nine months after finalization

Question: Are there any market issues that impact the anticipated timing of the proposed development timeline above that warrant consideration?

The only market issue of significance in this space would be federal government purchasing cycles and the currently proposed schedule does not seem to interfere with that cycle.