

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460



OFFICE OF
AIR AND RADIATION

March 21st, 2013

Dear Data Center Storage Manufacturer or Other Interested Party:

The U.S. Environmental Protection Agency (EPA) welcomes your input on the attached Draft 4 Version 1.0 ENERGY STAR[®] Data Center Storage specification. Comments on Draft 4 are due to EPA **no later than April 19th**.

Since the release of Draft 3, EPA has worked with a wide range of stakeholders to revise and clarify the approach associated with this new ENERGY STAR product category. Due to the complexity of the specification, a detailed list of notable changes is included below. Please refer to the attached specification and test method documents to review these changes, as well as a number of more minor alterations from Draft 3 that are not listed below.

Draft 4 includes the Version 2.0 SNIA Emerald[™] test specification, enabling the testing of systems with caching, which expands the ability of manufacturers to demonstrate system performance. EPA is aware of ongoing testing to verify the performance of some aspects of the Version 2.0 Emerald test specification and will analyze the results of this testing to decide if a reversion to the Version 1.0 Emerald test specification is necessary in the Final Draft of the ENERGY STAR Data Center Storage specification.

Draft 4 also enables a greater range of qualifying systems through the optional expanded maximum qualified configuration and the inclusion of scale-out systems in scope. It also removes the proposed 10% PSU load point requirements to reduce unnecessary testing burden and cleans up the storage device replacement requirements to make them clearer, simpler, and more effective. Please see the list below for details on many of the changes in the document:

- Definitions:
 - 1.E: Computer server definition updated to align with the Final Draft Version 2.0 ENERGY STAR Computer Server specification.
 - 1.I.3 and 1.I.4: Clarified the definitions of maximum and minimum ENERGY STAR qualified configurations to avoid confusion with actual, sellable max and min configurations of a product. Also added additional clarifications on drawer rounding for Online 3 and 4 systems.
 - 1.I.5: Added an optional expanded maximum qualified configuration, to complement the existing expanded minimum and allow stakeholders to qualify a larger range of products if performance is maintained. Changed the allowable performance deviation from the Optimal Configuration from 10% to 15%.
 - 1.I.9: Clarification added to Capacity Optimization configurations. A Capacity Optimization configuration may only be submitted as an addition to one or more other optimizations.
 - 1.J.1 and 1.J.2: Replaced definitions of scale-up (now "centralized controller storage") and scale-out (now "distributed controller storage") to provide a clearer differentiation between the two dominant system architectures in the current market.
- Scope:
 - 2.1.1.iv.a: To allow newer storage architectures to qualify, the RAID-only requirement from Draft 3 is replaced by a more general requirement to use controllers with advanced data recovery capabilities.

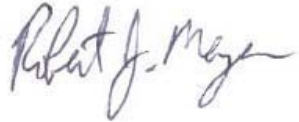
- 2.1.1.iv.c: After discussions with stakeholders, scale-up (centralized controller storage) and scale-out (distributed controller storage) systems are now both in scope.
- Qualification Criteria:
 - 3.2.1.i: Removed the 10% PSU load efficiency requirements. Existing data shows that most PSUs can meet the levels proposed in Draft 3 but are not routinely tested at the 10% load point, necessitating burdensome additional testing for components that are already efficient. Stakeholders may optionally submit this data if they choose.
 - 3.3.1: Clarified that manufacturers that qualify Online 4 systems using modeled data must make a performance/watt modeler available to qualified purchasers of their products.
 - 3.4.1.i: Revised the Parity RAID requirement to allow controllers with advanced data recovery capabilities.
 - 3.4.1.ii: Clarified that systems using passive cooling are not required to meet the adaptive cooling requirement.
 - 3.4.2: The minimum number of COMs required to be made available has been changed to Online2: 0, Online3: 1, and Online4: 1, as there are a number of efficient systems on the market that have only one COM available.
 - 3.5.3: Table 5 and associated language has been updated to use the Version 2.0 SNIA Emerald™ specification, including the new Hot Band workload.
 - 3.5.4: Workload weighting requirements in Table 6 have been revised to include the new Hot Band workload. Further discussions with stakeholders have led to the revision of the remaining weightings in this table to make them more representative of deployed system workloads.
 - 3.5.5 and 3.5.6: Additional clarifications for testing scale-up (centralized controller storage) and scale-out (distributed controller storage) systems have been added. Clarifying language for verifying the presence of COMs has also been added to reduce unnecessary testing.
 - 3.5.7: New language proposing specific test requirements for scale-out (distributed controller storage) systems has been added.
 - 3.6: Based on stakeholder feedback, the storage device replacement requirements have been reorganized and simplified to make them clearer and more useful to both the EPA and manufacturers.
 - 3.7.1: Based on stakeholder feedback and data, EPA removed the standard performance data measurement and output requirements for Online 2 systems. The cost of implementing these features is currently too high in proportion to the cost of the system itself.
 - 3.7.3: The language on sampling requirements has been transferred from the Version 2.0 Computer Server Final Draft specification, with modifications to make inlet air temperature reporting optional.
- Test Method:
 - To harmonize with the SNIA Emerald specification, EPA has removed dc testing requirements, added three-phase requirements, and harmonized test frequency requirements with the ENERGY STAR Version 2.0 Computer Servers test method.
 - To incorporate the new Hot Banding workload, the test method now references SNIA Emerald Power Efficiency Measurement Specification Version 2.0 Rev 1.
 - After discussion with stakeholders, EPA has removed the 24-hour idle test requirement and harmonized with the SNIA Emerald specification.

EPA will host a webinar on April 2nd at 1:00 PM EST. The agenda will be focused on changes introduced in Draft 4. **Please RSVP to storage@energystar.gov no later than March 29th** with the subject "RSVP – Storage Draft 4 specification meeting."

Stakeholders are encouraged to review the Draft 4 specification and send comments to storage@energystar.gov no later than April 19th. For further information on specification development activities to date, visit the ENERGY STAR Product Development website at www.energystar.gov/NewSpecs and follow the link for "Data Center Storage."

Thank you for your continued support of the ENERGY STAR program. Please direct any specific questions to RJ Meyers, EPA, at Meyers.Robert@epa.gov, or 202-343-9923; or John Clinger, ICF International, at John.Clinger@icfi.com, or 215-967-9407.

Sincerely,

A handwritten signature in black ink that reads "Robert J. Meyers". The signature is written in a cursive style with a large initial "R" and a long, sweeping underline.

Robert Meyers
Data Center Product Manager
ENERGY STAR for Storage