ENERGY STAR Servers:
Version 2.0
Final Draft Webinar

January 31, 2013

Robert Meyers, U.S. Environmental Protection Agency
Bryan Berringer, U.S. Department of Energy

Agenda

Topic
Introduction / Meeting Goals
Definitions
Power Supply and Blade/Multi-node Requirements
Active State Efficiency Criteria
Idle State Efficiency Criteria
Revised APA and PPDS Requirements
Revised Sampling and Testing Requirements
Test Method Updates
Timeline and Closing Questions

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Meeting Introduction

- EPA thanks all stakeholders who have participated thus far in the development of the ENERGY STAR specification for Computer Servers
  - Stakeholder participation is critical to the specification development
  - EPA looks forward to finalizing the specification based on stakeholder feedback

EPA-DOE ENERGY STAR Team

EPA: Brand and Specification Manager	DOE: Test Procedure Manager
• New Products • Performance Levels • Marketing & Outreach • Monitoring & Verification • Product Database	• Federal Test Procedures • Metrics • Monitoring & Verification

Presenters

- Robert Meyers – EPA
- John Clinger – ICF International
- Akshay Odugoudar – Navigant Consulting Inc.

Webinar Goals

1. Overview of revisions to the specification and test method following stakeholder comments
2. Opportunity for questions and comments with the goal of resolving all outstanding issues

Note: All slides will be posted to the ENERGY STAR Computer Servers website

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Definitions

- New
  - Buffered DDR Channel
- Revised
  - High Performance Computing Systems (HPC)
  - Auxiliary Processing Accelerator (APA)

New Definition

- Buffered DDR Channel
  - Added to provide definition of a new adder in Table 4. Applicable to resilient servers only.

Revised Definitions

- High Performance Computing Systems (HPC)
  - Based on stakeholder feedback, EPA has revised the language in requirement 8a in this definition to provide a clearer distinction between high performance computing and high performance computers.
- Auxiliary Processing Accelerator (APA)
  - Moved from Section 3.9 to the definitions section of the specification for consistency.
  - Definition will remain general to accommodate varied implementations

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Power Supply Requirements

- EPA has removed Dc-Dc requirements from Table 1 and Table 2 in the specification as there is currently no procedure to test dc computer servers in the Version 2.0 Computer Servers Test Method.
- EPA and DOE will revisit including Dc-Dc computer servers in the Version 3.0 specification revision process.

Blade and Multi-Node System Criteria

- EPA has clarified that multi-node servers are subject to the same qualification criteria as blade servers in Section 3.4 in the Final Draft.

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Active State Efficiency Criteria

EPA has decided that there will be a 9 month period of time after Version 2.0 is published in which SERT data submitted to EPA will be published anonymously.

This period will provide a window for EPA and stakeholders to evaluate SERT results before presenting them to the consumer at the effective date.

After 9 months, all SERT test data for ENERGY STAR certified computer servers will be made public and attached to the corresponding products tested.

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Idle State Efficiency Criteria – 1S and 2S Servers

- EPA has removed Full Load efficiency criteria and data disclosure
  - Covered by SERT in Version 2.0.
- EPA is requiring that Idle State data used for certification purposes continues to be measured using the manual idle measurement procedures as defined in Section 6.1 of the ENERGY STAR Computer Servers Test Method Draft Final (Rev. Jan-2013).
  - Based on stakeholder concerns about the potential impact on idle state measurement values when idle is measured in a “cold” system prior to exposure to heavy workloads versus when tested in a “warm” system where the fan power consumption may be higher.

Idle State Efficiency Criteria – 1S and 2S Servers

- EPA has clarified that the Additional I/O Device allowance may be applied to interfaces beyond Ethernet.
  - Ethernet (including subsets such as FoE and iSCSI)
  - SAS
  - SATA
  - Fibre Channel
  - Infiniband
  - Must meet requirements viii and ix in Section 3.6.1.

Idle State Efficiency Criteria – 1S and 2S Servers

- EPA has included a Resilient category in Table 3 based on stakeholder provided data and additional internal analysis.
- Only applicable to computer server products that meet all of the requirements in the Resilient Server Definition found in Appendix B of the Eligibility Criteria.

Table 3: Base Idle State Power Allowances for 1S and 2S Servers

Category	Maximum Possible Number of Installed Processors (# P)	Managed Server	Base Idle State Power Allowance, P_{BASE} (watts)
A	1	No	47.0
B	1	Yes	57.0
C	2	No	92.0
D	2	Yes	142.0
Resilient	2	Yes	205.0

Idle State Efficiency Criteria – 1S and 2S Servers

- Buffered DDR Channel adder
  - Necessary to allow highly configured two socket resilient server configurations to be assessed fairly for certification.
  - Based on stakeholder provided data and additional internal investigation
  - Proposing a 4.0 watt per Buffered DDR Channel adder for every installed channel greater than 8.

Additional Buffered DDR Channel	Installed buffered DDR Channels greater than 8 channels (Resilient Servers only)	4.0 watts per Buffered DDR Channel

Idle State Efficiency Criteria – Blade Servers

- Blade server testing
  - System with asymmetric power domains shall round up to the nearest power domain as decided by the manufacturer when adhering to the half-populated Blade Chassis testing requirement. The number of blades tested during the half-chassis test shall be reported in the PPDS.
- Manufacturers are still free to test fully populated blade chassis, in addition to half chassis, if they wish to provide this information to purchasers.

Idle State Efficiency Criteria – Multi-Node Servers

- EPA has added a new section to clarify Idle State efficiency criteria specifically for multi-node servers in this Final Draft.
- The multi-node server criteria are similar to blade server criteria, but require that the multi-node servers be tested with a fully-populated chassis.

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Revised APA Requirements

- Maximum idle power of 46 watts ***per*** APA shipped with a qualified configuration.
- Idle State power consumption of each APA sold with a qualified configuration shall be reported in the PPDS.
- APA testing requirements apply to all computer servers, including Blade and Multi-node servers.
- Tests with APAs should be conducted on the maximum configuration of the product family.

Power and Performance Data Sheet

- EPA thanks stakeholders for their comments on the draft PPDS template released with Draft 3.
- Based on stakeholder responses, EPA proposes that manufacturers report the air inlet temperature of the SUT at three times:
  - When the system is off prior to the start of testing
  - At the conclusion of the manual idle state test
  - At the conclusion of the active state testing.
  - These values will be reported in the thermal results section of the PPDS.

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Sampling Requirements

- EPA has revised the language in Section 5.4.
- The technical requirements and intent of the language remain the same. All changes are intended to improve clarity.

Testing Requirements

- EPA received stakeholder feedback on computer server products which can only function with one processor but use two socket hardware.
- EPA is proposing to test these systems with one socket populated but require them to meet the two socket idle state power allowance.

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Test Method Updates

- Final Draft Test Method includes four updates
  - Active state testing using SERT
  - Longer idle state testing
  - Three-phase voltage and frequency added
  - Multi-node server configuration

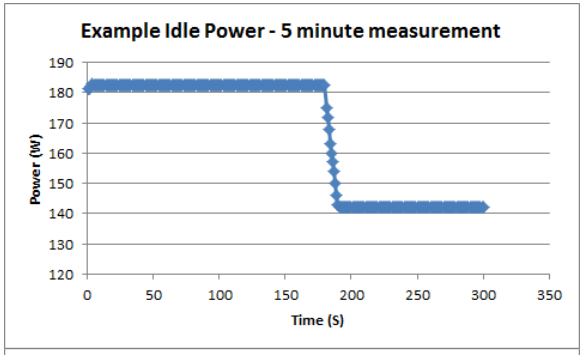
Update 1
Active State Testing Using SERT

- Active state server testing and reporting using Server Efficiency Rating Tool (SERT)
- Test Setup and Test Conduct Sections modified to be consistent with SERT requirements
- Includes list of SERT result files to be reported

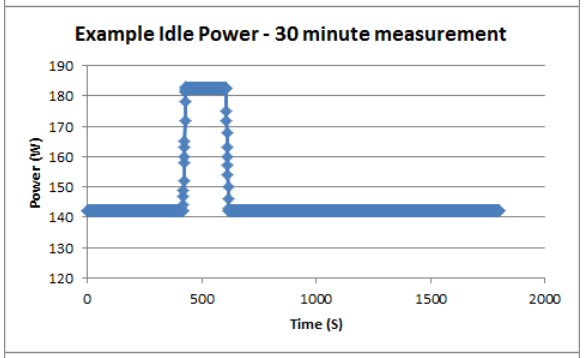
Update 2
Longer Idle State Testing

- Increased Idle state test period from 5 minutes to 30 minutes
  - Captures the effect of any maintenance cycles initiated by the server
  - Longer measurement periods average out the effect of these maintenance cycles

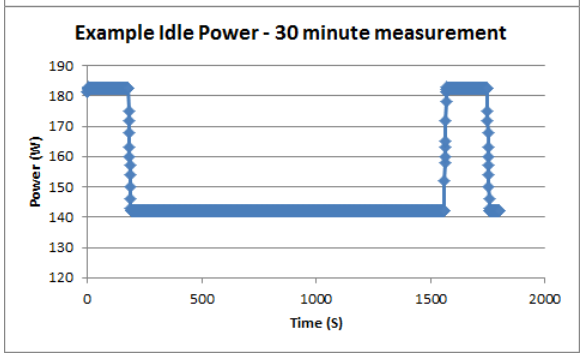
Update 2
Longer Idle State Testing



Case 1



Case 2



Case 3

EXAMPLE ONLY

Rated Idle State Power: 142 watts

Maintenance Cycle: 180 watts

Test Case	Measurement Time (minutes)	Average Idle Power (W)	% Increase From Rated Idle
Case 1	5	167	18%
Case 2	30	146	3%
Case 3	30	150	6%

Update 3
Three-phase voltage & frequency

- 208 V ac, 60 Hz three-phase requirements added
  - Common three-phase voltage and frequency in the U.S.

- SERT supports three-phase servers testing

Update 4
Multi-node servers configuration

- Multi-node servers shall be tested in the full chassis configuration
  - Consistent with qualification requirements
  - Typically purchased and deployed in full chassis configuration

Summary

Topic	Draft 3	Final Draft
Active State test tool	Manufacturer Discretion	SERT
Idle State measurement period	5 minutes	30 minutes
Three phase power requirements	None	208 V ac 60 Hz
Multi-node system configuration	None	Full chassis

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Topic	Time Frame
Final Draft Distributed	January 9, 2013
End of Final Draft Comment Period	January 25, 2013
Stakeholder Webinar	January 31, 2013
Final Specification Published	February 20, 2013
Version 2.0 Information Session	First week in March – exact date TBD
SERT Data Review	Late Q3
Effective Date	November 20, 2013

Open Comment

- EPA would now like to open the line for any comments.

Thank you!

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