ENERGY STAR®

Version 3.0 Computer Servers

Draft 1 Specification

U.S. Environmental Protection Agency

August 12, 2016

Agenda

1. Introduction
2. Version 3.0 Draft 1 Specification
3. Open Comment & Next Steps

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Webinar Details

- Webinar slides and related materials will be available on the Computer Servers Product Development Web page:
  - www.energystar.gov/RevisedSpecs
  - *Follow link to "Version 3.0 is in Development" under "Enterprise Servers"*

- Audio provided via teleconference:

Call in: +1 (877) 423-6338 (U.S.)
+1 (571) 281-2578 (International)
Code: **436598** #

  - Phone lines will remain open during discussion
  - Please mute line unless speaking
  - Press *6 to mute and *6 to un-mute your line

Introductions

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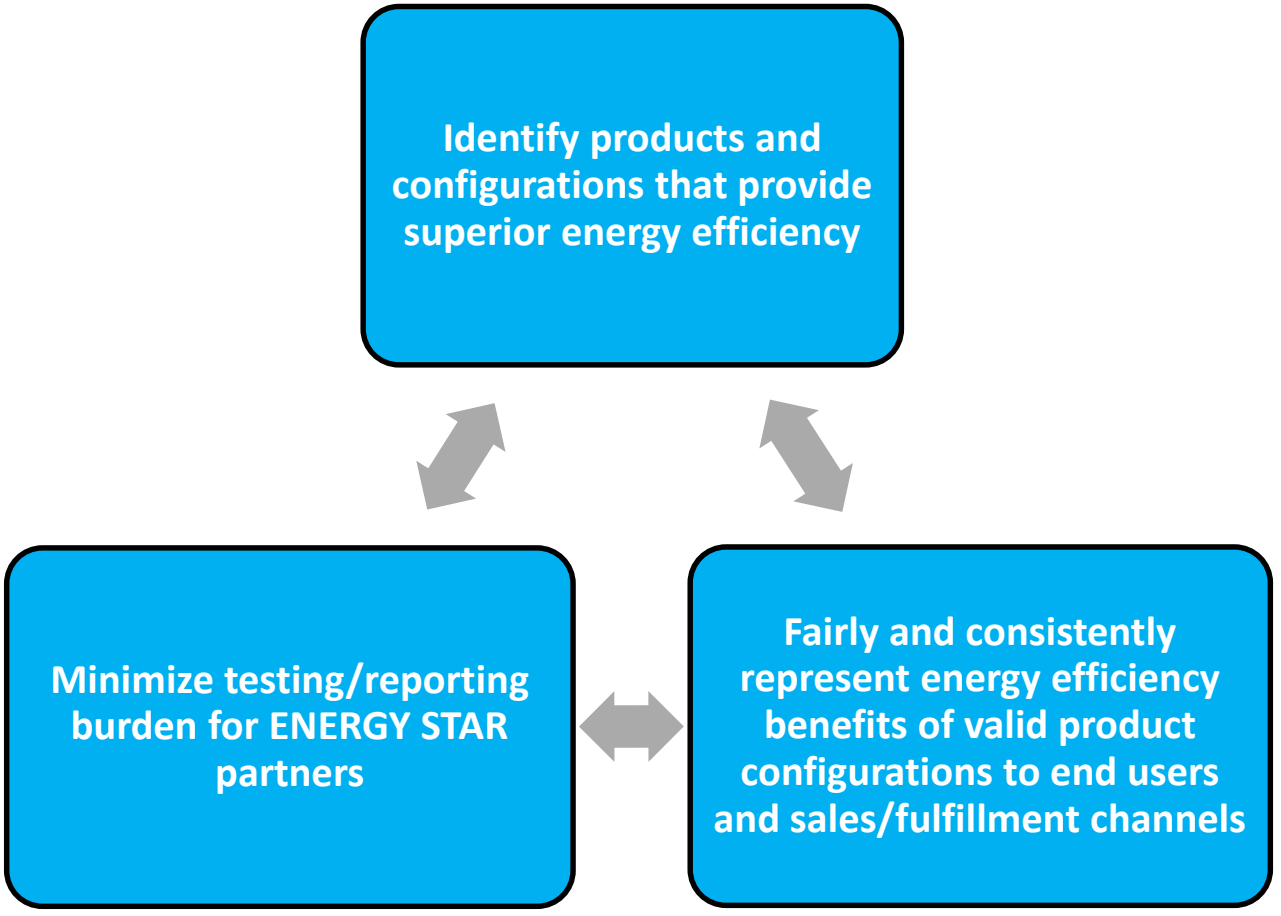
ICF International

Review of ENERGY STAR IT Goals



Written Feedback

- Please send feedback to servers@energystar.gov

Comment Deadline
Friday, August 26, 2016

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Definitions

- EPA has largely retained definitions where appropriate from the Version 2.1 computer servers specification.
- List of definitions subject to proposed changes in Draft1 include:
  - Managed Server
  - Product Category
  - Storage Device
  - RAS Features
  - Product Family

Definitions

Managed Server:

- EPA has no examples of unmanaged servers in the current data set
  - Leads to lack of differentiation based on managed vs. unmanaged for idle and active state efficiency requirements
- EPA feels the managed definition has become obsolete if it is no longer used as a characteristic of differentiation, but welcomes stakeholder feedback to the contrary.

Product Category:

- EPA is proposing to remove this definition as it is considered redundant and not used within the specification.

Definitions

Storage Device:

- EPA is proposing to consolidate the HDD and SSD definitions from Version 2.1 into a single Storage Device definition which harmonizes with the definition found in the ENERGY STAR Version 1.0 Data Center Storage specification.
- New definition captures non-volatile technologies not covered by the previous HDD and SSD definitions.

RAS Features:

- EPA has removed references to manageability as it is no longer a unique functionality of products in the data set.

Definitions

Product Family:

- EPA has clarified that differences in product color are acceptable within a product family.
- EPA is also looking for feedback on the potential to reduce the number of configuration test points for certification, while maintaining sufficient flexibility to allow manufacturers to sell compliant non-tested configurations. While EPA has received stakeholder feedback on the desire to reduce testing burden, there is concern that partners will not be able to represent their product families adequately with three tested configurations.
- EPA welcomes data that supports that any of the existing test configurations are clearly redundant.

Scope

- EPA is not proposing any additions or subtractions to the product scope of Version 3.0 at this time.
- Welcome stakeholder feedback on any product types not currently covered that warrant consideration for inclusion that can be effectively tested with the current ENERGY STAR Computer Servers Test Method.

Power Supply Requirements

- EPA is proposing new PSU efficiency levels equivalent to 80Plus platinum.
- Several stakeholders have shared in the two “off-season” computer server meetings that most computer server products at least offer a platinum equivalent power supply option.
- EPA has found that 63% of the configurations tested for Version 2.0/2.1 certification already make use of platinum equivalent level power supplies.
- **Reminder**: EPA does not require 80Plus certification of PSUs for ENERGY STAR certification, rather that the required efficiences are met and that supporting test data is provided to CBs.

Power Supply Requirements

Table 1: Efficiency Requirements for PSUs

Power Supply Type	Rated Output Power	10% Load	20% Load	50% Load	100% Load
Multi-output (Ac-Dc)	All Output Levels	N/A	90%	92%	89%
Single-output (Ac-Dc)	All Output Levels	83%	90%	94%	91%

Active State Efficiency Requirements

- EPA is proposing to include the collection of XML files generated by the SERT tool, capturing additional information to allow more efficient analysis and level setting in future revisions.
- Over the past several months, EPA has been engaged in discussions with many stakeholders, including TGG and SPEC, to determine potential options for Active State efficiency metrics that make use of SERT data generated in Version 2.0/2.1.
  - A combined TGG/SPEC recommended approach is expected within the next month. Upon receiving, EPA will post this recommendation on the ENERGY STAR computer servers PD webpage with the rest of the Draft 1 stakeholder written comment responses.

<u>EPA will propose Active State Efficiency Requirements in Draft 2</u>

Active State Efficiency Requirements

- EPA is requesting feedback in the following areas:

1. Should Active State and Idle State criteria remain separated as is currently proposed in Draft 1, or are there technical merits to combining them?
2. What guidance can industry provide end-users to better correlate SERT worklet scores with their real life workloads and applications? EPA would like to work with industry to develop and/or disseminate guidance for purchasers as part of the Version 3.0 process.
3. Is current definition of Computer Server sufficient to differentiate storage heavy computer server products from storage products?
4. Are current family configurations, testing procedures, and storage worklets sufficient to reveal differences in storage subsystem energy efficiencies with storage heavy computer products?

Idle State Efficiency Requirements

- EPA is proposing to consolidate Idle State criteria for **all** one and two socket products into a single section (Section 3.6).
- Base allowances:
  - Investigated separating one socket servers by whether they are blade or non-blade, but data did not support such differentiation.
    - As a result blade/multi-node are not differentiating factors for one socket products.
  - The data set did show an increase in energy consumption of blade and multi-node servers in two socket servers. As a result that differentiation is included in the two socket requirements, along with resiliency which is covered in both one socket and two socket categories.

Idle State Efficiency Requirements

- Additional Adder Allowances:
  - Halved additional power supply adder from 20 watts to 10 watts aligning with observed trends in increased power supply efficiency at low loads in the computer server market.
  - Halved the storage device adder from 8 watts to 4 watts, recognizing improvements in storage device efficiency across several other ENERGY STAR product areas.
  - Changed additional memory adder from 0.75 W/GB above 4GB installed memory to 0.25 W/GB above 4GB installed memory. This addresses the state of the art efficiency data received in the Version 2.0 development process showing best in class server memory technology three years ago could achieve these lower levels.

Idle State Efficiency Requirements

- EPA intends to set Idle State efficiency levels so that when combined with the upcoming Active State efficiency levels in Draft 2, the combined approach will result in recognizing the top quartile of the computer server market.
- The proposed Idle State efficiency requirements in Draft 1 result in the following reductions compared to Version 2.1:
  - Average of 40 watt reduction in P_{IDLE_MAX} allowance for one socket rack servers
  - Average of 78 watt reduction in P_{IDLE_MAX} allowance for two socket rack servers.

Idle State Efficiency Requirements

Table 3: Base Idle State Power Allowances for all One Socket Servers

Category	Resilient	Base Idle State Power Allowance, P_{BASE} (watts)
A	No	37.0
B	Yes	130

Table 4: Base Idle State Power Allowances for all Two Socket Servers

Category	Blade or Multi-Node	Resilient	Base Idle State Power Allowance, P_{BASE} (watts)
C	No	No	85.0
D	Yes	No	105
E	No	Yes	297

Idle State Efficiency Requirements

Table 5: Additional Idle Power Allowances for Extra Components

System Characteristic	Applies To:	Additional Idle Power Allowance
Additional Power Supplies	Power supplies installed explicitly for power redundancy(v)	10 watts per Power Supply
Storage Devices	Per installed storage device	4.0 watts per Storage Device
Additional Memory	Installed memory greater than 4 GB(vi)	0.25 watts per GB(vi)
Additional Buffered DDR Channel	Installed buffered DDR Channels greater than 8 channels (Resilient Servers only)	4.0 watts per Buffered DDR Channel
Additional I/O Devices(vii), (viii), (ix)	Installed Devices greater than two ports of ≥ 1 Gbit, onboard Ethernet	< 1Gbit: No Allowance = 1 Gbit: 2.0 watts / Active Port > 1 Gbit and < 10 Gbit: 4.0 watts / Active Port ≥ 10 Gbit: 8.0 watts / Active Port

Idle State Efficiency Requirements

- EPA does not currently have enough data to support setting Idle State efficiency requirements for three and four socket servers.
    - EPA welcomes additional Idle State data on these products to help generate appropriate idle requirements for them.
- The titles of Sections 3.8 and 3.9 have been modified slightly compared to Version 2.0./2.1, but the content within the sections and how they function remains unchanged at this time.

APA Requirements

- EPA is proposing to reduce the peak Idle State energy consumption requirement for each installed APA from 46 watts down to 30 watts.
- Publically available test data of several current and last generation higher-end GPUs was reviewed (cards typically ranging in price from $500-1000)
    - While measured average idle values range from 7-15 watts, the real-time data reviewed shows peaks up to 30 watts and dips as low as 5 watts.
- This proposed change balances the desire to encourage the usage of latest generation technology with the best performance/watt, recognizing that APAs can achieve more efficient computing than general purpose server without APAs for certain workloads.

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Open Comment & Questions

- EPA would now like to open up the line for any general comments or questions from stakeholders

Timeline & Next Steps

August 26, 2016	• Draft 1 Submission deadline
Q3-Q4 2016	• Finalize Active Metric Approach
Q4 2016	• Draft 2 Release
Q2 2017	• Draft 3 Release
Q3 2017	• Finalize Specification

Written Feedback

- Please send feedback to servers@energystar.gov

Comment Deadline
Friday, August 26, 2016

Thank You!

- Questions on specification development can be sent to:

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