

Draft 2 Version 2.0 Servers Specification Comment Responses

Ref. #	Topic	Comment	Response
15	1S 2S	A significant issue continues to exist for the idle power criteria of two-socket servers that ship with only one processor. Customer demand and sales volumes for 2S/1P servers are very high, and 1S/1P servers have orders of magnitude smaller sales volumes and are deployed in different application environments. The ENERGY STAR program needs to reflect that reality and add to Table 3 a Category E for 2S/1P unmanaged servers and Category F for 2S/1P managed servers with the recommended Base Idle Power allowances shown below (based on empirical test results): 85W /135W	EPA intends to treat all two socket systems in the same manner for qualification. For qualification purposes, all two socket systems shall be tested and qualified using fully populated sockets. A 2S/1P system may be included in the same family as its corresponding 2S/2P representative unit, but cannot be qualified as a 2S/1P system. This concept applies to 3 socket and 4 socket systems as well.
32	1S 2S	[Stakeholder] supports EPA's proposal to maintain idle power limits in addition to active mode efficiency. Given that most servers typically operate at low average loads, and spend a significant amount of time in idle mode, an idle load limit remains essential to ensure servers are designed to minimize energy use at or near their typical operating point.	No response required.
33	1S 2S	We encourage EPA to modestly reduce idle power limits from version 1.0, instead of maintaining them to the same levels as version 1.0 as currently proposed in draft 2. While we recognize that version 1.0 pass-rates are not high enough to justify significant reductions, we believe that the 5-point product family structure should help increase the pass-rate. Setting lower limits will continue the trend of reduction in idle power by computer servers which is necessary for data centers to do their part in the pursuit of science-based greenhouse gas reduction targets.	Regarding modest reduction of Idle limits, the data available to EPA for both market penetration and via ENERGY STAR qualification activity, does not justify modification of allowances beyond what was proposed in Draft 2. It is anticipated that Version 2.0 will result in data collection and a broader dataset to allow for additional review of power limits in future versions.
77	1S 2S (Memory Adder)	The memory adder reduction for memory from 2.0W per GB to 0.75W per GB, is aggressive for smaller or partially filled systems prepared for expansion. As ENERGY STAR may recall, the added memory adders were to address system level support functions such as buffering or expanded memory support functions. These additional system features have improved since Version 1.0 in integration and controls such that a more linear (idle power per GB) attribute can be achieved. Though 0.75W per GB will be challenging for smaller systems with expansion capabilities, 0.75W would be an appropriate aspirational target for a 2013 ENERGY STAR program.	See Index #58
16	1S 2S (PSU Adder)	[Stakeholder] advocates keeping the version 1.1 idle power allowance for additional power supplies (20W per additional power supply). The slight increase in version 2.0 power supply efficiency requirements does not translate into significant wattage savings at idle.  The idle power allowance of 0.75 watts per GB is a statistical median value for 4GB DIMMs at idle and not a value that guarantees that all similar DIMMs can pass an audit, so it would force customers to buy higher capacity DIMMs. A more prudent and statistically valid choice for a screening threshold would be <b>0.8 watts per GB</b> .	In response to the power supply adder, See Index #49  In response to the memory adder, See Index #58
62	1S 2S (PSU Adder)	The EPA raised the question on whether or not the "Additional Power Supply Adder" should be revised in Version 2 (Line 409). [Stakeholder] believes that a 20W adder remains appropriate. This adder was used in the analysis of the data collected for Version 2, as well as Version 1. The data set is consistent with the original analysis and supports the 20W adder. Please note that the adder is based on PSU (redundancy) technologies and topologies, which haven't changed. As observed in the original assessment the value does not typically scale to the system configuration.	In response to the power supply adder, See Index #49

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49	1S 2S (PSU Adder)	[Stakeholder] is evaluating its power supply data to offer a methodology to EPA to calculate power supply adders and to propose an appropriate power supply adder to EPA. This information will be provided to EPA by July 13, 2012.	EPA has received stakeholder data on current power supply performance and is proposing a 20 watt per power supply adder for Version 2.0.
79	1S 2S (PSU Adder)	The EPA raised the question on whether or not the "Additional Power Supply Adder" should be revised in Version 2.0 (Line 409). The Green Grid believes that a 20W adder remains appropriate. This adder was used in the analysis of Version 2.0, as well as Version 1.0. The data set is consistent with the original analysis and supports the 20W adder. Please note that the adder is based on PSU (redundancy) technologies and topologies, which haven't changed. As observed in the original assessment the value does not typically scale to the system configuration.	See Index #49
54	Active Mode Data	[Stakeholder] encourages EPA to collect the SERT worklet data for qualified products in a blinded, public database, with the exception noted above for reporting of the ccsj and flood worklets as the alternative to or an option within the additional power-performance benchmark data required under 4.1.2.vi. Because the SERT metric is new, the relative and absolute value of the worklets have not been determined, and there is a high degree of interest in the stakeholder community to evaluate and assess the SERT worklets for a variety of purposes, [Stakeholder] believes that it is best to blind the initial data set to prevent attempts to compare manufacturers systems and/or to establish and assess identified product performance against a single metric before the data set has been adequately vetted and evaluated by EPA, SPEC, and other interested and informed stakeholders.	See Index #81
61	Active Mode Data	For active mode data collection and information only assessments, [Stakeholder] recommends that the data be visible to the public ONLY as an anonymous data set. Holding the data anonymous allows investigation of the data and trends without premature assessments of these numbers or association with energy efficiency. Consolidation of this information into a single grading method would be expected after analysis of the collected data and in preparation for future versions of ENERGY STAR for Computer Servers.  To facilitate the data set remaining anonymous, the certifying body (CB) would submit the SERT benchmark without the supplier or manufacturer identification, and without any information that would identify the supplier. The actual supplier or manufacturer identification for this information would be held by the CB.	See Index #81

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81	Active Mode Data	For active mode data collection and information only assessments, the industry recommends that the data be visible to the public as an anonymous data set. The actual supplier or manufacturer identification for this information would be held by the certifying bodies (CB). Holding the data anonymous allows investigation of the data and trends without premature assessments of these numbers or association with energy efficiency. Consolidation of this information into a single grading method would be expected after analysis of the collected data and in preparation for Version 3.0 of ENERGY STAR for Computer Servers.	Public disclosure of active mode data via the SERT program is a core component of EPA's plans for Version 2.0. EPA does not consider it acceptable to launch a Version 2.0 program with an anonymous dataset as this would compromise a key benefit to the ENERGY STAR consumer.  EPA does welcome stakeholder input on how: 1) Agency and Vendor community can work together to make use of the window between finalization of the ENERGY STAR Specification and Effective Date; 2) short of implementing an anonymous dataset after Version 2.0 is in effect, to address the concerns underlying this comment.
14	Blade Servers	[Stakeholder] supports the decision to treat the qualification criteria of blade servers (and multi-node servers) much like the specification treats 3 and 4 socket servers.	No response required.
50	Blade Servers	EPA needs to include language in this section clarifying that the reported idle mode and full mode values should be calculated by dividing the chassis and blade power measurement for the fully and half populated chassis at idle and full load by the number of blades populating the chassis and reporting the lowest value of the full and half chassis measurements. In addition, EPA needs to clarify that the power measurements for the full and half populated chassis at idle and full mode need to be reported under section 4.	EPA has clarified the Blade data reporting criteria to make the intended testing conditions clear.
75	Blade Servers	We concur with ENERGY STAR's findings that there is insufficient data to support any change to the base idle criteria on 1 and 2 socket servers or establishing an idle requirement for bladed or 3-4 socket systems. Given the expense and complexity, the ENERGY STAR Version 2.0 proposal to collect active mode and idle data is prudent.	No response required.
5	Blade System Requirements	We request that a list of qualifying blade chassis should be accepted in a partner's <b>website</b> . As a blade server can be installed in a new chassis developed after the blade server, it should not be limited to a documentation packaged with the server.	EPA thanks the stakeholder for this comment and proposes to allow lists of qualifying blade chassis to be accepted in a partner's website.
7	Blade Testing	Full population of maximum configured blade server can be sometimes very difficult to prepare at a product development stage. We request that option to test on fewer blades should be accepted.	See Index #23.
23	Blade Testing	The cost to fully populate a chassis of 16 fully-configured blades is going to be very high (several million dollars). The preferred approach would be to only require populating two identical blade servers in a blade enclosure. There is no direct comparison between blade and rack-mount servers, so a well-documented test with a few blades in the enclosure should provide adequate data transparency.  If a full rack set of tests is required, then we suggest that all but one of the blade servers be kept at a minimal configuration, and only one blade server be required to be changed to perform the "four corners" (plus typical) configuration testing for product families; which would vastly reduce both the time and parts costs for certifying each blade product family. The focus can then be on the one blade that changes.	After reviewing stakeholder feedback, EPA has decided to that the sole requirement is reporting Idle and Full Load data with a half-populated Blade Chassis. It is EPA's belief that this provides consistency for all Partners and will produce more comparable data for future review. An optional provision for submittal of full chassis data is included.

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24	Blade Testing	Having to test both full blade enclosures and half-full blade enclosures will double the testing cost and provides no additional beneficial data.	It was not the intent to require both full and half chassis testing, merely to provide guidance on both scenarios while discussions continued on the required approach for Version 2.
25	Blade Testing	<p>This section specifies requirements for loading a blade server enclosure to one half its maximum population, yet there are no specifics in section 7 for actually testing this configuration. What is the reason and necessity for also testing a half loaded enclosure? As a more cost-effective alternative, testing a half-full chassis is much preferable to testing a full chassis. Since we won't be comparing blade servers directly to non-blade servers, there is no reason to test a full chassis.</p> <p>The 5-15 minute window of time to let a server boot to an idle state is overly prescriptive. It is unknown if 15 minutes is enough time for a large enclosure of blade servers, that might need to sequence the server start-up times in order to keep circuit breaker current below their rated levels. The sentence reads like it cannot be longer than 15 minutes, when it should be the undefined length of time needed to let the server(s) boot and all become ready to run applications.</p>	The Test Method was written to provide guidance for either a Full- or Half-populated blade chassis to be tested, with the decision to pursue one or the other left for discussion upon review of the specification.
65	Blade Testing	<p>The test method released with Version 2.0 allows for blade testing with either a full-chassis or half-chassis. [Stakeholder] would request that the EPA select the half-chassis configuration for the data collection effort of the ENERGY STAR for Computer Servers Version 2.0, and not require full-chassis configuration.</p> <p>The reason that half-chassis is preferred to the full-chassis is due to the cost of resources. For the highly-configured family configurations (High-end Performance and Maximum Power), the cost of the equipment could extend into multi millions of dollars. The ability to fund this activity may not be achievable for most cases. [Stakeholder] would prefer that all data be assessed evaluated equally, and that the standard is that all blade systems be required to test and submit at half-chassis population. However, if some partners would like to additionally submit full-chassis data for future evaluation, [Stakeholder] would not object.</p>	See Index #76.
76	Blade Testing	For bladed system testing, we recommend that either ½ (half) populated systems or fully populated configurations be allowed. Data from a ½ populated configuration would be sufficient to quantify the shared power constructs in the bladed system. System configurations and test conditions should be described in the power performance data sheet.	Consistent with this comment, EPA has selected half-populated testing as the requirement in Version 2.0. Full chassis testing is optional should Partners wish to additionally provide it.
18	Data Measurement and Output	No issues at this time	No response required.
55	Data Measurement and Output	[Stakeholder] requests that EPA provide an additional option to the proposed reporting on a 10 second frequency: allow the system to report data up to every 30 seconds where the data is provided with a time stamp. By providing a time stamp on the power reported power data, the data collection/analysis system can match up multiple readings to get a consistent view of the data center power profile while enabling the collection system to poll on a less frequent basis.	EPA recognizes that time stamping is a beneficial development in the collection and reporting of data and proposes that systems which implement time stamping of environmental data may collect data at a rate of ≥ 1 measurement every 30 seconds. EPA welcomes stakeholder feedback on this proposal.

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8	Definitions (Computer Server)	<p>Defining a Computer Server as one that is targeted for “enterprise applications” means that the specification is not intended for servers that are designed for other purposes (even if they may be deployed with enterprise applications). This specification also needs to comprehend that Computer Servers that are designed for enterprise applications are often deployed into non-enterprise applications (e.g. High Performance Computing) and so an enterprise server deployed into a non-enterprise application should still be able to carry the ENERGY STAR certification.</p>	<p>EPA has defined the scope of the specification as covering products that are "sold and marketed" as computer servers. As long as these products are sold as servers and meet the definition in section 1)A)1) then they are eligible to be tested for ENERGY STAR. The details of their deployment is beyond the scope of the specification.</p> <p>Using the HPC example, EPA's current definition allows ENERGY STAR servers to be sold to a third party that is building a HPC. However, a manufacturer building a HPC to sell cannot sell that HPC as ENERGY STAR, even if all the servers that went into it meet ENERGY STAR requirements. The end product being sold is what is (or is not) labeled.</p> <p>EPA looks forward to discussing this issue further with concerned stakeholders and also wishes to note that, if there are specific cases where the specification's guidelines are in need of clarification or minor alteration, EPA can issue a clarification memo or revise to v2.1, etc.</p>
36	Definitions (Computer Server)	<p>EPA proposal to remove the ECC/Buffered Memory requirements for systems with more than 50 nodes (lines 23 to 33): ECC/Buffered memory is an integral aspect of an enterprise level computer server and the ECC/Buffered memory function provides important functional capability and affects the power profile of an enterprise server. EPA should not remove the ECC/Buffered memory requirement from the server definition and should not recognize server systems without ECC/Buffered memory.</p>	<p>See Index #66.</p>
66	Definitions (Computer Server)	<p>Error correction on the memory subsystem is a key common attribute of a computer server. As the internal memory sizes and communication speeds increase, error correction is needed to ensure server availability, reliability, and uptime for data center operations. The hardware infrastructure and resulting energy profile reflects these requirements. Client computing based systems which don't contain error correction can tolerate repeat transactions, system reboot, and other inefficient activity recovery methods. These systems should not be included in the ENERGY STAR computer server specification. Servers based on personal computing components without memory subsystem error correction are already addressed as a small scaled server in the ENERGY STAR for Computers specification.</p>	<p>EPA has removed the proposed ECC exemption for systems larger than 50 nodes sharing the same chassis in response to changing stakeholder requests and comments.</p>

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67	Definitions (Computer Server)	<p>We disagree with the proposed exemption for 50-node or larger systems. Multi-node systems without error correction and handling in the memory subsystem have not demonstrated the ability to support current data center and enterprise application requirements. In fact, the increase in applications' memory size and response time requirements may severely impact systems without error correction causing a decrease in application uptime and increase the base energy footprint of the systems to support the applications. With the possibility of increasing the energy profile of the data center and limited live industry efficacy of this configuration we advise that the no exemption be made</p>	See Index #66.
42	Definitions (Large Server System)	<p>Proposed addition: A "Large Server System" would be defined as a server product with 4 or less processor sockets where the total server system occupies more than 5 U of rack space and is designed to function as a mainframe server. This additional server type would serve as the basis for an exemption of this system type in Section 2.2: Excluded Products.</p> <p>[Stakeholder] has a product which has 2 or 4 processor socket configurations where the minimum configuration occupies 19 U, with a Central Electronic Complex (CEC), an I/O drawer with 32 I/O adapters and Power systems and other support equipment. The maximum configuration will occupy 36 U, with two to four I/O drawers, one or more CEC units, and various communications systems. The size of the system and the extensive, associated peripherals give these server systems a much larger power profile than a typical x86 (4) processor system. The systems have a much smaller sales volume than x86 based systems and are targeted at a specific, defined niche of the enterprise server market. For these reasons, it is not valid to make a comparison between these systems and the more traditional 4 processor systems which occupy 5 U or smaller enclosures.</p>	EPA will not be considering computer server products that act as a mainframe server in Version 2.0. EPA has included a proposed definition of Large Server products in the specification and welcomes stakeholder input on the definition and the exclusion of Large Servers from the scope of Version 2.0.
9	Definitions (Resilient)	<p>We have identified system attributes which drive a higher level of base power use (please refer to Section 3 of this reply). As criteria for identifying a Resilient Server, the recommendation is to require any qualifying server to meet the Reliability, Availability, Serviceability (RAS) Capabilities criterion (see Section 3) and also satisfy 2 of the remaining 3 features or attributes. The use of a specified number of "menu items" for RAS capabilities, high power processor socket attributes and the 6 main Resilient Server criteria, is necessitated because different servers and processor types will have different attributes depending on the proposed applications and system component capabilities. It is important to provide flexibility in conforming to the requirements while setting requirements that differentiate Managed Servers from Resilient Servers.</p>	See Index #37.

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37	Definitions (Resilient)	<p>[Stakeholder] has done an extensive amount of work both internally and in conjunction with the Green Grid ENERGY STAR server working group to refine the resilient server definition and establish a clear distinction between server systems with lower power/functionality processors and limited resiliency and scalability and server systems that are highly resilient and scalable.</p> <p>[Stakeholder] has analyzed its server products and determined that it is important to include the resilient and scalable server category, and thereby avoid excluding of higher power servers which provide resiliency and scalability characteristics which are valued for mission critical computing activities, including highly virtualized computing environments and computationally intensive computing applications.</p>	See Index #39
6	Effective Date	We hope products qualified by Version 1.1 will be accepted as ENERGY STAR qualified after the effective date. If it is not acceptable, we expect twelve month transition period.	The ENERGY STAR program does not implement automatic grandfathering of products from previous program versions.
20	Effective Date	The effective date for the version 2.0 specification should be at least 9 months after the release date of the specification, and should allow products shipped during that interim period to test and claim certification with either ENERGY STAR version 1.1 criteria or version 2.0 criteria.	The effective date for Version 2.0 will be 9 months after the final release date of the specification. Products may continue to be tested and labeled to v1.1 for the first half of this period (4.5 months). EPA is deliberating on the start date for testing to v2.0. The standard approach is to give manufacturers the option to test to the new version as soon as it is final, but issues surrounding the availability of SERT must be taken into consideration.
34	Effective Date	[Stakeholder] encourages EPA to finalize version 2.0 as soon as possible in order to accelerate the adoption of the program by the server industry. If the SERT benchmark is not ready in time, we encourage EPA not to wait for SERT and include active mode efficiency reporting in a version 2.1 when SERT becomes available.	EPA will not be considering launch of Version 2.0 without active mode reporting.
21	For Future Revisions	Using SERT data collected during version 2.0 submissions as the basis for choosing idle and active mode pass-fail criteria for version 3.0 would not accurately portray the energy efficiency profile of the entire server market. ENERGY STAR has a stated goal of choosing the top quartile of market performers. Since version 2.0 submissions only provide data from servers in the current top quartile, then any expectations set by only using that data would skew the reality of the market.	EPA appreciates this comment and will recognize the context of the data received as part of the Version 2.0 process. It is hoped that the significant efforts taken by the development team at SPEC to develop a streamlined and repeatable testing tool will allow for the industry to consider testing of systems outside of the specific set submitted for ENERGY STAR qualification.
28	General	In summary, [Stakeholder] is very supportive of the direction EPA is taking with the Server 2.0 specification. The main changes in version 2.0 will facilitate participation in the program without compromising energy performance levels of qualifying servers, helping increase market penetration of energy efficient servers.	No response required.



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29	General	<p>We support the key changes in draft 2 version 2.0:</p> <ul style="list-style-type: none"> <li>- Introduction of a 5-point product family structure;</li> <li>- Introduction of active mode efficiency reporting.</li> </ul> <p>We also support EPA's proposal to maintain idle power limits, full load disclosure, power supply efficiency and power management requirements. We encourage EPA to modestly reduce idle power limits from version 1.0, instead of maintaining them to the same levels as version 1.0 as currently proposed in draft 2.</p>	<p>EPA thanks the stakeholder for this comment.</p> <p>Regarding modest reduction of Idle limits, the data available to EPA for both market penetration and via ENERGY STAR qualification activity, does not justify modification of allowances beyond what was proposed in Draft 2. It is anticipated that Version 2.0 will result in data collection and a broader dataset to allow for additional review of power limits in future versions.</p>
35	General	<p>EPA's proposal to continue to require power management enablement as the power criteria for 4 socket processor systems and the choice to initiate blade systems into the ENERGY STAR program, while collecting data on SERT power/performance metrics to inform an active energy metric for Version 3, is an appropriate and workable next step for the ENERGY STAR V2.0 requirements</p>	<p>No response required.</p>
63	GPGPU	<p>[Stakeholder] supports the EPA's inclusion of GPGPUs in the scope of ENERGY STAR. We agree with the method of including one additional test point for inclusion into a product family.</p>	<p>No response required.</p>
78	GPGPU	<p>We recommended that "GPGPU" be revised to "Add-in Compute". GPGPU's represent a specific implementation of this feature, whereas non-GPU compute cards are also entering into the market to support these applications. A generic description would allow the market to determine applicability of the functions.</p> <p>In the other considerations and adders, we appreciate the recognition of and the testing provisions for added compute functions being configured to computer servers. Testing compliance without the added function and reporting idle after incorporating the feature will accommodate this trend and collect information on the impact.</p>	<p>EPA has revised "GPGPU" to "Auxiliary Processing Accelerators" (APAs) to provide a greater scope for general purpose add-in expansion cards.</p> <p>EPA thanks the stakeholder for this comment.</p>
41	HPC	<p>[Stakeholder] agrees that High Performance Computing (HPC) Systems should be separately defined, and where system characteristics are sufficiently different from a managed or resilient and scalable server, HPC systems should be excluded from the ENERGY STAR requirements. The [Stakeholder's] technical team will evaluate possible HPC definitions and is prepared to work with EPA and industry groups such as Green Grid to establish an appropriate HPC definition for the ENERGY STAR Computer Server Requirements.</p>	<p>See Index #8</p>
68	HPC	<p>We still believe that HPC systems form a category that may deserve special consideration. HPC systems are servers utilized in large clusters targeted to maximize performance for scientific research and large scale modeling. Although some HPC clusters are based on general purpose servers, many power management features are disabled to enhance performance. Disabling power management features and the additional hardware installed significantly changes the power profile of these systems. We will continue to work with the industry to provide a distinctive set of criteria to classify these servers.</p>	<p>EPA awaits stakeholder's feedback.</p>
13	Power Management	<p>Section 3.3.1 needs to include "or the operating system" when discussing allowable methods of enabling processor power management.</p>	<p>EPA thanks the stakeholder for this recommendation and has revised Section 3.3.1 accordingly.</p>



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4	Power Supplies	The version of power supply efficiency test protocol is updated to Rev. 6.6. It may require power supplies evaluated to an older version to be re-tested. We request that 80 PLUS ® certified power supplies to an older version should be accepted as long as 10 % load power efficiency was measured.	The specification has been clarified in this regard.
11	Power Supplies	Section 3.2 uniformly discusses power supply units (PSUs) as being “in the chassis”. A more generic and preferable approach would be to require that PSUs supplying power to a chassis must meet the requirements of Table 2. This change would support power supply solutions that are aggregated at a multi-server level, but might not be classifiable as either multi-node or blade servers.	EPA will maintain the current language in Section 3.2 but welcomes additional data on example products whose power supplies are aggregated at a multi-server level but cannot be classified as either multi-node or blade servers.
12	Power Supplies	Section 3.2.3 needs to include dual-node and multi-node servers, which also use power supplies similar to pedestal, tower and/or rack mount servers.	The references for "Blade Servers" have been changed to include Multi-node as well.
46	Power Supplies	Because EPA is maintaining the idle criteria for 1 and 2 processor socket systems and the power management criteria for 4 processor socket systems in the proposed Version 2, systems that have been qualified under version 1 with gold or platinum power supplies will continue to be qualified under Version 2. However, the power supplies were tested under Version 1 using Revision 6.6 of the test protocol. [Stakeholder] asks that EPA explicitly allow gold and platinum power supplies which were qualified under version 6.5 of the testing protocol for server products to continue to be “grandfathered” under Version 2. Power supplies for new server systems qualified after the final publication of the Version 2 requirements would have to be qualified under version 6.6 of the testing protocol.	See Index #4.
2	Product Family	We would like to confirm that models with 2.5 inch HDD and those with 3.5 inch HDD can be included in a single Product Family.  If our understanding is not correct, we request that definition should be modified.	EPA confirms that small and large form factor HDDs can be used within a single Product Family.
3	Product Family	We also would like to confirm that two socket models with only one processor installed and those with two processors installed can be included in a single Product Family.  If our understanding is not correct, we request that definition should be modified.	EPA received stakeholder feedback questioning whether two socket models with only one processor installed can be included in the same family as that system with two processors installed. Both configurations are considered to be in the same family, but all measurements and data collection shall be made with fully populated sockets. In this case, the two processor configuration shall be used for qualification purposes, but the system can be sold with one processor under the same family.
30	Product Family	We support the introduction of a 5-point product family structure and agree with EPA that this new structure will reduce the amount of product testing necessary to obtain ENERGY STAR qualification while providing sufficient information to purchasers.	No response required.
43	Product Family	[Stakeholder] is very supportive of the EPA's revised product family definition. By simplifying the definition and allowing a range of processor socket power and core count and PSU output power to be included within a product family, it enables a manufacturer to better group product family data, simplify the communication of ENERGY STAR® qualification to customers, reduce the quantity of testing required to qualify a product while accurately representing the range of power use and performance for a given product model line or machine type.	No response required.

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44	Product Family	<p>[Stakeholder] wishes to clarify EPA's addition of a "Low-end Performance Configuration". Based on [Stakeholder's] product configurations, [we] would define the system characteristics of each of the 4 corners of the product family as follows:</p> <p><u>Minimum Power configuration:</u> Minimum processor power, core count and populated socket count for the machine type.</p> <p><u>Low-end Performance configuration:</u> Our intent had been to test a minimally configured system with the maximum processor power, core count, and minimum populated socket count for the machine type. This may not directly fit the definition of a low performance system. We are also concerned that in some cases the Minimum Power and Low-end Performance Configuration would arguably be the same for a given machine type. <b>We would propose that EPA change the statement "...represents the lowest-price or lower-performance computing platform..." to "...represents a lower-price or low-performance computing platform..."</b>. This provides companies more leeway in selecting the configuration to establish one of the two low power corners of the product family.</p> <p><u>High-end Performance Configuration:</u> Our intent had been to configure this system with fully populated sockets with processors with the lowest socket power and core count. As with the Low-End Performance configuration, <b>we request that EPA change the descriptive text for this configuration to "...represents a higher price or higher performance computing platform..."</b>.</p> <p><u>Maximum Power Configuration:</u> This configuration would be a server with fully populated sockets with processors with the highest power socket power and core count, as well as a component configuration which will draw higher power than all or most other configurations available for the product family.</p>	<p>EPA thanks stakeholders for this feedback and proposes to change the language as requested to allow stakeholders to provide sufficient differentiation between performance and power based configurations.</p>
45	Product Family	<p>Given the definitions EPA has provided for the product family, even with the adjustments requested above, it is highly likely that some qualified configurations will exist outside of the power profile envelope defined by the "Product Family Tested Product Configurations". [Stakeholder] recognizes that it is our responsibility to validate that all products that we market and sell as "ENERGY STAR qualified" meet the applicable requirements, but we also want to verify that EPA intends that qualified products can exist outside of the power profile defined by the 5 tested product configurations.</p>	<p>It is EPA's intent that products qualified under a set of data for a product family, exist within the power profile defined by the 5 tested product configurations. Should there be additional configurations outside of the power profile that are individually capable of meeting ENERGY STAR requirements, they may be tested individually or as part of another product family.</p>
59	Product Family	<p>[Stakeholder] supports the definition of a product family given by the EPA. The updated definition more accurately depicts how servers are configured and used in today's environment.</p>	<p>No response required.</p>

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60	Product Family	<p>When discussing the Product Family Tested Configurations (Sec. 1.H.2), we have the following comments.</p> <p>- [Stakeholder] is concerned with the wording of the Low-end Performance Configuration and the Highend Performance Configuration. The use of the words “Lowest” and “Highest” in the definitions could restrict the choice of configuration, and cause overlap with the Minimum and Maximum Power configurations. We would suggest that the EPA use the wording “lower-price or lower-performance” and “higher-price or higher-performance” in the definitions of Section 1.2.a.1 &amp; 1.2.a.2.</p>	See Index #72.
70	Product Family	We agree that the 5 point testing profile will adequately define the product family classification for compliance.	No response required.
71	Product Family	<p>For 1 socket servers, the variability and customizations are fewer and 3 data points should be sufficient. Assuming 3 socket power options and 2 core count options for the processor, one can configure</p> <p>a) the minimum power/low-end performance system with the low power and lower core count processor and minimum usable memory, I/O and a single hard drive;</p> <p>b) the typical configuration with the mid-range powered processor and high core count and a typical component configuration; and,</p> <p>c) the maximum power and high-end performance configuration with the highest processor power and core count and the maximum component configuration.</p> <p>For a 1 socket system, 3 data points would suitably bracket the product family. The additional two configurations would not add any materially different information from what is collected from the three described configurations. Both the 5 point and 3 point sampling methods are significant improvements to the current method and would limit product testing costs and encourage increased participation in the program. For this reason, <b>we support and encourage ENERGYSTAR to proceed with the 5 point test definition for 2 socket server product family and 3 point test for 1 socket systems.</b></p>	EPA believes that one socket servers support similar variations in compatible CPUs, memory DIMMS and capacity, range of HDD/SSDs, and range of additional auxiliary processing accelerators as two and four socket systems. Therefore EPA will maintain 5 point testing for all types of computer server products in Version 2.0.
72	Product Family	<p>We are concerned about the wording used in the Low-end and High End Performance Configuration definitions. Using the terms highest and lowest in the definition unnecessarily restricts the choice of configurations for this area and risks creating significant overlap and lack of differentiation with the Minimum and Maximum Power Configurations.</p> <p>Instead, the Green Grid recommends that you use the terms “lower-price or lower performance” and “higher price or higher performance” configuration to describe these two definitions and provide the manufacturers sufficient latitude to differentiate the performance and power based configurations.</p>	See Index #44

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73	Product Family	Even with the adjustments requested above, it is highly likely that some qualified configurations will exist outside of the power profile envelope defined by the "Product Family Tested Product Configurations". The Green Grid recognizes that it is the manufacturer's responsibility to validate that all products marketed and sold as ENERGY STAR qualified meet the applicable requirements, but EPA needs to assure manufacturers that it understands that the proposed configuration definitions may result in qualified products that exist outside of the power profile defined by the 5 tested product configurations but still qualify and meet ENERGY STAR requirements.	See Index #45.
56	Qualifying a Product	[Stakeholder] potentially has concerns with the stated requirements for managing qualified configuration(s) which are a subset of all the configurations in a Machine Type or Model group. [Stakeholder] has recognized this difficulty, both for the server and storage product categories, and has been evaluating options for managing, reporting and identifying subsets of product configurations. Currently, we have not identified an efficient means to manage qualified products in this situation. [Stakeholder] will provide EPA additional comments on this topic by July 13, 2012.	EPA recognizes the challenge of categorizing Computer Server products. The product family concept was developed to address this issue. EPA expects that partners should be able to identify the subset of configurations that qualify for ENERGY STAR and that the methodology of fulfilling this requirement may vary from vendor to vendor.  EPA welcomes additional clarifications or concerns on this issue as related to the servers specification.
26	Resilient Servers	[Detailed proposal on Resilient Servers received]	See Index #39
27	Resilient Servers	Based on this analysis, we believe that in order for EPA to properly characterize the server market, it important to add a category for two and four processor socket Resilient Servers. There are material differences in the power profile between Managed Servers and Resilient Servers and the source of the difference, greater infrastructure and component power demands, can be clearly identified. Resilient Servers need the additional infrastructure to support the resiliency features identified. There is a place in the market for both types of systems, but the ENERGY STAR requirements need to recognize that both types of systems can deliver energy efficient computing.	See Index #39
38	Resilient Servers	The data collected by EPA for 2 and 4 socket systems indicates that servers designed for higher RAS and to support higher levels of virtualization and connectivity also carry higher infrastructure costs that increase system power use. These infrastructure costs are sufficiently different between high volume managed servers and the proposed resilient and scalable server category to materially differentiate the power profile of the two server types and necessitate separate, distinct power criteria to assess the energy efficiency of the two server categories.	See Index #39

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39	Resilient Servers	<p>The proposal for a resilient and scalable server definition is [attached]. The proposal sets out 6 major criteria, Processor RAS and Scalability, Memory RAS and Scalability, Power Supply RAS, Thermal Cooling RAS, System Resiliency, and System Scalability. With the exception of the Power Supply RAS and Thermal Cooling RAS, each criterion has a set of characteristics of which a server must have some minimum number to qualify as a Resilient and scalable and Scalable Server.</p> <p>[Stakeholder] has assessed these criteria against systems with and without Resiliency and Scalability characteristics and validated that the criteria distinguishes between the two types of servers. See columns G and H of the spreadsheet file for the characteristics exhibited by each system type. Lower power, non-scalable/resilient systems will have some RAS and scalability features and it is expected that the resilient/scalable characteristics will need to be updated with each new version of the requirements as server system technologies and functionality evolve and advance.</p>	<p>EPA has reviewed industry proposals for a resilient and scalable server definition and has incorporated the recommendations into Appendix B.</p> <p>EPA seeks further data on power consumption of various features incorporated in resilient and scalable server systems to determine whether two socket resilient and scalable servers require an additional Idle and Max Power threshold level in Version 1.0.</p>
40	Resilient Servers	<p>[Stakeholder] proposes that EPA add the resilient and scalable server category to table 3 (page 10 of draft 2) and provide a category specific Resilient and Scalable Server Base Idle Allowance to account for the additional infrastructure and higher processors socket power of this server type and provide additional adders for resilient and scalable components such as Raid 5 controllers and memory buffers. [Stakeholder] is working to provide available test and vendor data to EPA by July 13, 2012 to provide a basis for setting a Base Idle Allowance and additional component adders for resilient and scalable systems.</p>	See Index #39
57	Resilient Servers	Detailed proposal provided	See Index #39
69	Resilient Servers	<p>A resilient and scalable server is designed with extensive RAS and scalability features, including error self-correction to ensure data resiliency and accuracy. Resiliency, RAS, self-correction, data accuracy and scalability features are integrated in the micro architecture of the CPU and chipset functions. Resilient and scalable servers are engineered with additional, redundant and more complex components in their underlying infrastructure in support of the resiliency features, which in turn require more energy to operate, distinguishing them from a computer server without equivalent level of RAS and scalability features.</p> <p>We recommended that resilient and scalable servers be placed into a different category because of this reason. A resilient and scalable server should be a system that contains the following characteristics: [ Detailed proposal provided]</p>	See Index #39
10	Scope	<p>[Stakeholder] supports the inclusion of multi-node servers for participation in ENERGY STAR version 2.0 for Computer Servers. It is not clear from the stated inclusions and exclusions whether multi-node servers are included. The Multi-node Server testing and certification process is very similar to that of Blade Servers and should have similar certification criteria.</p> <p>[Stakeholder] supports the inclusion of Resilient Servers with similar qualification criteria to 3S/4S Computer Servers. It is not clear in this section if Resilient Servers are eligible or excluded.</p>	While Multi-node Servers were intended to be included in the program scope, this was not clearly communicated in Draft 2. This has been remedied in the revised Included Products language.

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31	SERT and Active Mode Efficiency	<p>We welcome industry's progress in developing the Server Efficiency Rating Tool (SERT) but reserve our evaluation of the relevance of the tool until we have been able to assess test data. We need to make sure that the tool results reflect server efficiency at loads typical of typical use. Most servers operate at relatively low load levels (typically 5-15% in non-virtualized environments, 20-50% in virtualized environments). We will be looking for SERT results to accurately reflect server efficiency at these load levels.</p> <p>In the mean time, we support EPA's approach to require active mode efficiency testing and disclosure through SERT in version 2.0, with a view to potentially set performance criteria in next version. This will enable the gathering of comprehensive data and the validation of the relevance of SERT for ENERGY STAR purposes.</p>	No response required.
17	Standard Information Reporting	<p>[Stakeholder] supports the ability to have a broader selection of processors and other system attributes grouped into a single "Product Family", so that fewer product families are needed to cover each server model. However, we assert that four test configurations are adequate to describe and certify a product family, instead of five. The "typical" configuration for the fifth test is arbitrarily chosen by each vendor doing the test, whereas the four corner tests will be similar from one vendor to the next.</p>	EPA believes that the Typical test point allows the manufacturer to showcase a key configuration among the rest of the test points - possibly a high volume system. It remains one of the test points in the family structure.
47	Standard Information Reporting	<p>EPA has provided requirements in the referenced sections to provide documentation in the shipping product packaging for qualified blade servers and for systems which ship without an installed operating system. [Stakeholder] <b>requests that EPA allow companies to provide the required instructions and blade system documentation on their ENERGY STAR webpage and/or in their on-line product documentation to simplify the process of providing this documentation to our customers.</b></p> <p>Requiring documentation in the packaging is inappropriate for several reasons:</p> <ol style="list-style-type: none"> <li>1. Enterprise server systems are installed in the data center by specialist technicians who are typically working against specific, defined instructions and installation protocols established by the data center operator. As such, they typically do not follow instructions provided with the products, they are not the individuals that are concerned about whether the installation is ENERGY STAR compliant, and oftentimes the software set-up is performed remotely over the network by a different technician.</li> <li>2. Companies are moving to electronically available documentation for all of their products to reduce resource consumption, improve version management, and simplify availability to the customer. Requiring documentation in the packaging runs counter to this trend.</li> <li>3. There are many challenges to managing fulfillment systems to insure that ENERGY STAR specific product documentation is added to ENERGY STAR qualified purchases, particularly where a given qualified product family is a subset of a machine type or model. It is more efficient and effective to meet these documentation requirements through an electronic documentation system.</li> </ol>	See Index #5.

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51	Standard Information Reporting	[Stakeholder] recommends that the Idle and Full Load be reported as measured by SERT. The SERT system records and reports the idle and maximum power values measured from the full SERT test process.	The intent is that automation of the Idle and Full Load measurements by the SERT tool is the preferred option. However, provisions for manual measurement remain in place to account for measurement exercises occurring outside of a full SERT run (e.g., sample testing by a manufacturer independent of ENERGY STAR qualification)
52	Standard Information Reporting	<p>Given that companies are required to test for and provide SERT worklet metrics to EPA under the Version 2 requirements, <b>[Stakeholder] recommends that the requirement for testing an additional power/performance benchmark be removed from this section.</b> We would propose one of two options for SERT Reporting:</p> <p>a. As currently proposed, all the SERT worklet metrics for each tested configuration have to be reported. These worklet scores should be allowed to provide performance information for the systems and 4.1.2.vi should be removed from the requirements.</p> <p>b. Companies are concerned that because SERT worklets are new and companies and data center operators are not familiar with the metrics it will be counter productive to publish the full benchmark set until a broader dataset can be collected and analyzed to determine how best to assess server energy efficiency from the metrics. To this end, we are proposing separately that the full set of SERT metrics not be published. To satisfy the benchmark reporting requirement 4.1.2.vi, [Stakeholder] proposes that companies publish the test results from the ccsj and flood worklets to provide an indication of the system performance capabilities. Companies should also be required to have the SERT worklet data available to provide to customers during the Request for Quotation or Request for Information process.</p> <p>EPA has not supplied the acceptable “list of power-performance benchmarks” (line 485) for additional benchmark testing. Without seeing the list, we cannot determine if the request has any validity to it, given our comments above. If EPA decides separately to maintain the SERT worklet scores in a blind database, companies should be allowed to report the ccsj and flood worklets as one of the options in the “EPA list of power-performance benchmarks”. [Stakeholder] strongly submits that companies should not be required to perform multiple instances of power-performance testing under the ENERGY STAR requirements.</p>	<p>EPA proposes to remove the requirement for testing with an additional power/performance benchmark outside of SERT results.</p> <p>EPA maintains the position that all SERT results shall be submitted and made publically available. This approach is consistent with the approach defined by SPEC in the development of SERT, that results are not intended to be made selectively public on a workload by workload basis.</p>
53	Standard Information Reporting	Companies should be required to report whether the computer server is unmanaged, managed, or resilient/scalable server. This should be added to the requirements in this section.	The specification has been clarified in this regard.
64	Standard Information Reporting	[Stakeholder] would request that the EPA allow for any benchmark selected by the partner, and not restrict the benchmarks to an EPA list. If the EPA is going to insist on a list of benchmarks, [Stakeholder] would request that the list be provided ASAP.	See Index #52.



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80	Standard Information Reporting	The Power Performance Data Sheet will require an update to provide extra data fields to accommodate the new categories of product, the product family definition, and additional active mode data points being reflected. We encourage that automation and error checking be incorporated into the PPDS and QPI forms. SPEC's SERT™ is expected to contain automated device discovery as part of the tool suite. The results of the discovery routine can aid in minimizing data entry error. Additionally, the industry could provide commonly used configuration identifiers that could be part of default drop down menu's, further limiting the entry errors.	EPA agrees with this recommendation and welcomes the industry's input as the power and performance datasheet is updated for Version 2.0. EPA also shares the industry's support for automated data collection.
82	Standard Information Reporting	Since companies will already provide SERT worklet performance data to EPA under the Version 2.0 plans, the Green Grid recommends that the requirement for testing an additional power/performance benchmark (Section 4.1.2.vi) be removed. We propose that two of the SERT worklets, ccsj and Flood, could be used to satisfy the intent behind Power-Performance Benchmark reporting.	See Index #52.