Ref. #	Topic	Subtopic	Comment Summary	EPA Response
1	Definition	High End Performance Configuration	One stakeholder recommended that EPA use the word "nominal" in the definition of High-end Performance Configuration to clearly specify the processor frequency that should be used for the calculation.	EPA appreciates the comment, but does not believe the suggested addition would add clarity to the High-end Performance Configuration. In Draft 2, EPA proposed revisions to the High-end Performance and Low-end Performance configurations to further clarify their intended boundaries.
2	Definition	Storage Devices	One stakeholder agreed that the Storage Device definition in the Server Requirements should be consistent with the definition in the Data Center Storage Version 1.0 Specification.	EPA thanks the stakeholder for their support.
3	Definition	Computer Servers and Storage products	Two stakeholders discussed the creation of separate definitions for servers and storage. One stakeholder recommended adding two definitions to the product types: micro-servers and storage servers. Micro-servers use processors with low power and low performance characteristics and are typically configured with multiple nodes in a 2U to 4U configuration. This stakeholder recommends creating a storage server definition and developing a separate, single value active efficiency metric using different weightings than those proposed for the general server active efficiency metric. Another stakeholder recommended creating two separate product type definitions for storage and servers, as storage products should not be tested with SERT.	Storage products are already defined in the specification and explicitly excluded from scope. EPA welcomes additional stakeholder feedback on how to better handle computer servers that ship with an abnormally high number of storage devices. Micro-servers are currently implicitly in scope and EPA has not received product data to suggest that they should be separated from other commodity blade and rack servers for either idle or active state energy requirements. EPA welcomes additional data that can further support this assertion.
4	Definition	Low End Performance Configuration	Two stakeholders commented on the Low-end Performance Configuration definition and requirements. One stakeholder stated that the definition needs to specify the lowest performance processor, rather than lowest socket power. Another stakeholder recommended dropping the Low-end Performance Configuration from Version 3.0 test cases, as this configuration is too subjective. This stakeholder also intends to analyze the minimum power and Low-end Performance Configurations to demonstrate that a single Low-end configuration will satisfactorily define the Low-end Performance Configuration of a given server product.	EPA has revised the Low-end Performance Configuration to specify the lowest performance processor available in the product family.
5	Definition	Managed Servers	Two stakeholders commented on the managed server definition. The first stakeholder recommended keeping the differentiation between managed and unmanaged servers to ensure all products available on the market are covered by this specification. The second stakeholder stated that, while the removal of the managed server definition and its two sub-clauses appeared to be appropriate, they want to verify that this elimination does not cause products with management controllers to be excluded from the specification.	EPA removed the managed server definition in Draft 2. Any unmanaged servers that are still sold in applicable markets will be subject to same requirements proposed in Version 3.0 as managed servers. The product's managed vs. unmanaged characteristic will have no impact on its ENERGY STAR requirements in Version 3.0.
6	Definition	HDD and SSD	One stakeholder recommended using the term "hard disk drives" rather than "disk drives" in the 'storage device' definition.	EPA has maintained the storage device term as it covers hard disk drives as well as solid state drives.

Ref. #	Topic	Subtopic	Comment Summary	EPA Response
7	Efficiency Requirements	Power Supply Requirements	Six stakeholders commented on the power supply requirements. Three stakeholders recommended making the PSU efficiency requirements more stringent. The first stakeholder recommended basing the requirements on 80Plus platinum levels. The second stakeholder recommended giving greater weight to low load points and creating an efficiency requirement at the ten percent load point. The third stakeholder also recommends setting more stringent requirements for 10% and 20% load than for 50% and 100% to better reflect the average load of servers in real-world. This stakeholder also proposes a 10% load requirement for multi-output PSUs and a more stringent requirement for 50% load. The fourth stakeholder agrees that the minimum level of power supply efficiency for single output power supplies should be set at 80plus Platinum levels or the equivalent, but recommends setting the multi-power supplies requirements at 80plus gold or the equivalent. The fifth stakeholder asked why the power factor criteria were much lower than the data published on 80Plus and asked why this low requirement was used. A sixth stakeholder asks about the voltage at which power supplies must be tested to qualify for a global server certificate.	EPA has harmonized with 80Plus platinum equivalent power factor requirements at the 50% load, which is the only requirement where ENERGY STAR was out of alignment. EPA is not currently proposing a requirement at 10% load for multi-output PSUs as there is no 80Plus value to harmonize with. EPA received stakeholder feedback on possible levels to use at the 10% load point, but did not receive supporting data to support those levels. EPA's preference is to remain aligned with 80Plus as it does in the other ENERGY STAR IT specifications, but welcomes any additional data that shows a more aggressive approach may be warranted.
8	Efficiency Requirements	Active State	Two stakeholders commented on the active state efficiency requirements. The first stakeholder stated that the active requirement metric is closer to typical real life usage than the idle state efficiency criteria. The second stakeholder provided three documents which detail an approach for setting and validating active state efficiency thresholds using SERT data. This stakeholder recommends a weighting of 60% CPU, 35% Memory, and 5% storage worklets, using the geometric mean to aggregate scores to create a single, combined efficiency metric.	EPA has adopted the proposed 60% CPU, 35% memory, 5% storage worklet weighting in the proposed active metric requirement in Draft 2. EPA strongly believes in the value of balanced machines and therefore still intends to require both idle and active state energy requirements for the majority of covered server products. After reviewing the dataset, EPA found that there is an acceptable number of products (e.g. the top quartile of the market) that meet both sets of proposed requirements.

Ref. #	Topic	Subtopic	Comment Summary	EPA Response
9	Efficiency Requirements	Composite Efficiency Metric	Four stakeholders commented on the proposal of a composite efficiency metric. Three stakeholders agreed that a composite efficiency metric should be created using SERT data. The first proposed creating a composite efficiency metric from SERT data that covers the full range of 0% to 100% utilization, which can be used as a gauge to judge the overall efficiency of a product. The second stakeholder recommended combining performance, power and efficiency for each component workload (tested using SERT worklets) into an average server power, performance and efficiency metric. This stakeholder believes that idle power is an important issue whether or not it is integrated into a single metric. They understand that a single metric would offer more flexibility, but could be potentially seen as favoring products with low idle power. The third stakeholder commented that, if EPA chooses to retain an idle power limit for servers, they recommended separating the requirements for idle and active efficiency. This stakeholder states that the use of an idle limit in a composite requirement will result in the exclusion of servers with high efficiency as rated by the active efficiency metric. The fourth stakeholder recommends keeping the Active and Idle State criteria separate, due to the potential for introducing tradeoffs that would not accurately model energy performance in a customer environment.	EPA has used SERT data to inform the proposed active state energy requirements. EPA is proposing to keep the idle and active state energy requirements separate from each other, but that products with applicable idle state requirements need to meet both requirements to certify.

Ref. #	Topic	Subtopic	Comment Summary	EPA Response
10	Efficiency Requirements	Idle	Two stakeholders generally support the proposed idle state criteria, but request the following increases in strigency: - Base and RAM allowances are not sufficiently stringent. There may be a correlation between CPU cores and baseload, which means additional allowances are necessary to avoid penalizing high performance configurations. Suggest that high performance configurations may be excluded from the scope as it currently stands because high performance servers tend to be more efficient in use. One solution may be to categorize servers by performance categories rather than sockets to determine base idle allowance. - Develop more stringent idle energy requirements in order to effectively capture the top quartile of efficient products. Studies have shown that 10-30% of servers are inactive, which demonstrates the need to capture the efficiency of these inactive servers in the scope of this specification. Three stakeholders believe the the proposed idle state criteria are too stringent in the following areas, or should not exist at all: - Idle limits for non-resilient servers are too aggressive, EPA should consider scaling the idle requirement based on CPU scores. - Idle limits are too aggressive and will result in servers with high active efficiency being excluded from scope. Propose an idle adder for specific TDP levels or for the compute capacity. Also recommend extending the Integrated IO adder limits. Agree with EPA's observation that there is insufficient data to set idle power limits for four socket servers. Allso generally do not support the setting of idle power limits. -One socket idle limit is set too low. They also commented that the 10 watt idle adder for large power supplies is too low, due to losses incurred by power supplies during the idle phase.	Recognizing the changing nature of this segment of the market, the small number of resilient server models in the ENERGY STAR dataset, and the limited differentiation in the idle state performance of these products, EPA is not able to confidently develop idle levels for this product type at this time. Therefore the resilient idle levels proposed in Draft 1 have been removed. EPA is maintaining a reporting requirement for idle state for these products in order to maintain access to this for those interested customers. Further, resilient servers are subject to the new active state power requirements. After further discussions with stakeholders, along with analyzing an expanded product data set since the development of Draft 1, EPA has determined that the 0.25 watts / GB memory adder was not sufficiently aggressive. EPA has proposed to modify this adder to 0.125 watts / GB above 4GB of installed memory. EPA would like to remind stakeholders that the idle state energy requirements are part of a combined approach with active state energy requirements to recognize the top quartile of the market. Driving the pass rates from just idle state towards 25% leaves no room for active state requirements. Conversely, EPA has reviewed the latest data set and can confirm that 90% of the top 100 most efficient server configurations in active state can also meet their proposed idle state energy requirements (including a mix of low end, typical, and high end performance configurations).

Ref. #	Topic	Subtopic	Comment Summary	EPA Response
11	APA requirements	Idle	Four stakeholders commented on the APA idle power requirement. The first stakeholder commented that the APA idle limit of 30 watts may be too low due to higher power demands resulting from smaller line widths and internal losses. This stakeholder also commented that instances where APA chips directly attached to the mother board will render the current verification for APA idle power use unworkable. This stakeholder proposes allowing manufacturers to work with their APA suppliers to determine idle requirements based on test data or to completely turn off the APA chip during idle tests. The second stakeholder recommended excluding servers with direct attached APAs from scope, handling them as a different class of servers, or providing them with a custom idle adder to account for the APA and an active power reduction. The third stakeholder agreed that the 30 watt APA idle limit seems high, due to data that suggests the average idle is under 10 watts. However, this stakeholder understands that idle power is dependent on OS and software and recommends additional testing to clarify this. The final stakeholder commented that the 30 watt limit is too low to cover a broad range of GPUs, and proposes that APAs are treated the same as three and four socket servers (measured and reported but no set limits).	The publically available data EPA has reviewed does not show that the 30 watt idle limit is too low. EPA requests additional supporting data from stakeholders to support these claims. EPA has revised the APA definition and added two new sub-definitions to better address recent advancements, such as FPGA technology, in server designs where the APA is directly attached to the motherboard or integrated into the CPU package. The newly defined integrated APAs have been removed from scope.
12	Deployed Power Assessment		One stakeholder provided information regarding their analysis on ranking different weightings and utilization profiles for the efficiency metric. The stakeholder ensured that the workload required 100 times the maximum performance of a tested server. This avoids quantization effects and allows the server efficiency to be calculated based on the number of servers needed for a given workload. Key performance metrics for weighting factors and load profiles are correlation between product rankings, correlation between deployed power and server efficiency ranking, and average rank mismatch/movement between weighting factors and load profiles.	As mentioned above, EPA is balancing active and idle state energy requirements in order to ensure there is sufficient availability of products that excel in both active and idle state efficiency on the certified product list.
13	ASHRAE Thermal Class		One stakeholder recommended analyzing which ASHRAE thermal class in which the server can function.	ENERGY STAR does not have any supporting data to set levels on this characteristic. However, EPEAT was able to collect suitable data to incorporate it into their soon to be finalized server thermal class criteria.
14	DC Servers		One stakeholder commented that DC servers may increase efficiency, and that EPA should look into incentivizing this server type accordingly.	The SERT tool cannot currently test DC servers, and as a result EPA has no product data for DC servers. As a result, DC servers cannot be considered for inclusion in scope at this time. EPA is open to investigating this area further if stakeholders can work with SPEC to include DC server testing within SERT.

Ref. #	Topic	Subtopic	Comment Summary	EPA Response
15	Memory		Three stakeholders commented on the definition and requirements related to memory controllers. One stakeholder commented that their memory controller and buffer will be located on the processor chip rather than a memory buffer card in future generation server models. This stakeholder recommends altering the definition of resilient servers to ensure this new design is captured in scope. A second stakeholder questions whether setting memory allowances per gigabyte is appropriate, and suggests alternatives so setting memory adders such as scaling logarithmically with capacity instead of linearly, to account for the exponential growth in memory capacity, and/or to set allowances by memory module (DIMM) instead of per gigabyte. The third stakeholder recommends adding clarifying language to the memory definition to ensure all memory and storage devices are covered. The stakeholder also recommends adding to the Buffered DDR channel definition to include the requirement for the presence of memory buffer hardware. Finally, this stakeholder supports the reduction of the memory adder.	EPA is currently learning more about recent changes in the resilient server market, including large shifts in architecture and how they may impact the resilient server definition, as well as supporting resilient server definitions such as Buffered DDR channel. EPA will be working with stakeholders to further refine these definitions as part of the next draft. EPA's idle state energy analysis shows that the newly proposed, more aggressive memory adders for idle state energy requirements sufficiently differentiate commodity servers. EPA welcomes additional data stakeholders may have on alternative scaling approaches, as well as any supporting energy measurement data of server memory on a DIMM scale.
16	Low-end vs. High-end configuration		One stakeholder recommends setting separate efficiency thresholds for low-end and high-end configurations. This stakeholder performed several calculations to determine efficiency scores for each configuration type, and found that high-end configurations have significantly higher efficiency scores compared to low-end configurations	EPA is proposing that all configurations within a family meet their respective active state energy efficiency requirement which is based on form factor. EPA does not believe that it is appropriate or relevant to identify separate criteria for low-end and high-end configurations. Low-end configurations that cannot meet their respective active energy requirements will therefore be ineligible for ENERGY STAR certification unless they have improved efficiency preformance.
17	APA/GPU Requirements	FPGA	One stakeholder states that they expect to see FPGA die included in a system. The FGPA device should be addressed in accordance with 3.10.1 or APA requirements, depending on where the FPGA die is located.	EPA thanks the stakeholder for this comment and has addressed APA in comment #11 above.
18	Power Management Reporting		One stakeholder commented that the Power and Performance Data Sheet on the ENERGY STAR website is outdated and should be updated.	EPA agrees and will ensure that any remaining references to the PPDS are removed.
19	Supervisor Power Management		One stakeholder commented that EPA needs to clarify the intended minimum power management capabilities required to meet the Supervisor Power Management requirement.	EPA welcomes feedback from stakeholders on the specific areas that should or should not be enabled in a product's as shipped configuration for OS based power management.
20	Market Data		One stakeholder commented that they would like to have access to broader market intelligence and additional data to evaluate labeled products for inclusion in programs.	EPA will be looking further into potential national energy savings for ENERGY STAR servers towards the conclusion of Version 3.0 development.
21	Public Dataset		One stakeholder requests that the dataset used to develop proposed Idle State levels and adders be made publicly available.	EPA is working to convert the data set into a format that can be shared publically, and intends for it to be posted publically by the time Version 3.0 if finalized, sooner if possible. In the interim, stakeholders can reach out to The Green Grid directly for access to the latest data set they are managing on behalf of industry.
22	SERT	XML File Submission	One stakeholder commented that they support the requirement that manufacturers submit the SERT XML output file to EPA.	EPA thanks stakeholders for their support.

Ref. #	Topic	Subtopic	Comment Summary	EPA Response
23	SERT	Capacity(3)	One stakeholder assessed the best method to combine Floor(2) and Capacity(2) scores by equal weighting and implementing a Capacity(3) modification to the assessment and integration of capacity interval data.	EPA has not been provided access to the Capacity3 modification, nor SERT V2.0.0 in general, and as such cannot approve its use for ENERGY STAR servers Version 3.0 at this time. EPA hopes to gain access to the updated SERT tool so that it can be reviewed and approved for incorporation in the next draft.