AUSTRIAN ENERGY AGENCY

EFFICIENT-SERVERS

Comments on Energy Star Program Requirements for Computer Servers Draft 4

75 Energy Star in product information

We agree with the decision that no physical label has to be attached on the servers. We welcome the detailed requirements regarding provision of Energy Star related information for complying products on the website and in printed documentation of manufacturers. We also appreciate the clear specifications regarding the power and performance data sheet. This implies that the relevant technical data and power data will be available on the websites as soon as the Energy Star label is used for a product or product family. We also appreciate the approach to address product families to make the requirements feasible for manufacturers (further below).

307 Addressing fully fault tolerant servers in Tier 2

We doubt that it would be very effective to address the niche segment of fully fault tolerant servers in a subsequent tier. We would rather propose to address the product segment of storage equipment and network equipment which is relevant for a significant part of the power demand of IT hardware in data centers.

309 Managed servers

The capability of redundant power supplies and an installed dedicated management controller are not very special features but found in many server models today. Thus the statement that these servers are “primarily used for mission critical applications” may not be strictly true. A different wording may be appropriate.

429 Product family

The approach of defining product families is appreciated in general. It is clear that different mainboards and different types of processors (regarding model and number of cores) also automatically would mean different product families.

However on aspect which is less evident is the mandatory segmentation by processor speed. Typically the same server model is offered on the market with processor versions running at several different speeds. Consequently it is not clear why a number of models slightly differing in processor clock rates should not be allowed to belong to one product family in case they all comply with the Energy Star idle criterion. It should be expected in most cases that maximum clock speed of the CPU is related to idle power demand.
At the moment it seems that the definition of the product family is a bit more tightened than necessary.

We think that the finalization of the product family approach could benefit from considering typical product families and product lines for example used in online-hardware configurators of manufacturers.

491 Current side discussion on extra criteria for multiple core (8core) servers:

There has been a side discussion addressing the issue if additional criteria/requirements for servers based on 8core CPUs should be provided.

It may be a valid argument that 8 core chips are quite energy efficient under substantial workload (consolidated systems etc.). Therefore it would also make sense to address this technology in a subsequent tier together with 4 socket systems etc.

However the current 8core technology is not used in the product segment of volume servers. It is applied starting from midrange servers upwards which actually are not addressed in the current specifications.

To make this more clear it could also be an option to add a few words to the definition of the scope specifying that the current version is only addressing systems with 1-4 CPU and 1-4 Cores/chip. Other technologies (as they are not belonging to the volume server segment) may be addressed in subsequent tiers.

521 Blade servers

We support the proposal that Blade Servers are addressed by Energy Star. Nevertheless we expect that a consideration in the current version of the criteria would significantly delay the process and therefore it may be advisable to address the topic for tier2. We also think that the approach for Blades requires criteria respectively information for different chassis configurations (numbers of blades per chassis). Considering a 100% and 50% configuration may be a good starting point. The proposed one blade per chassis configuration is irrelevant in practise but can add some information for assessing overall efficiency and defining criteria. We also support the idea of additionally assessing the power draw of the chassis.

574 Power supply efficiency requirements

We agree with the new efficiency requirements for power supplies and appreciate the approach to have a stronger differentiation of wattage levels and an approach which avoids penalizing small power supplies.

632 Base system idle power requirements

The data set used for the definition of these levels probably also reflects other differences which have not been identified and specified. The difference between the levels for C and D most likely can not be attributed to the service processor and chipset alone is also linked to other factors not being considered specifically.
Considering only the criteria specified it would also not be clear why the additional allowance for the service processor and redundant power supply capability should be 10W for single processor servers and 50W for double processor servers. It rather has to be assumed that the “managed server category” compared to standard servers also implies higher configuration in terms of more powerful CPUs.

Furthermore the additional allowances from A to C (respectively single processor standard to dual processor standard, 45W) and B to C (respectively single processor managed to dual processor managed, 100W) are quite different.
Overall the differences do not seem to be explained by the few factors considered here (standard versus managed) but by other configuration criteria as possibly processor type etc. so the current coarse classification also involves other factors not explicitly considered.

Nevertheless the current approach should be appropriate if supported by enough product data since a further segmentation by other technical parameters can be avoided.

Overall it is important that the idle criterion is only considered as a first step in the process and a further development of criteria/benchmarks addressing significant workloads is supported in the near future. This will be an important basis to deal with equipment designed to operate at higher loads (consolidated, virtualized systems).

There is a mistake in the categorization since category B probably should be “managed single installed processor”.

633 Additional allowances for components

We think that 8W is not a bad level to start with and a reduction (e.g.6 W) could be considered for a next tier.

There is currently some trend that volume servers are also offered without an internal hard drive in the basic configuration. Systems are booted with a flash memory. Therefore it could also be an option to define the base level for the categories without internal drive adding 8W for any drive installed.

Allowances for additional memory should deserve some attention. Power consumption is more strongly dependant on number of memory modules than on specific number of GB. To base additional allowance on GB only is therefore not an optimized approach.
FB-DIMMS have normally an Idle Power of 6-10 Watt, relatively independent of the capacity (1 - 8 GB). Consequently a lower number of modules is more energy efficient and it would therefore be more effective to set requirements in a way that supports the use of fewer modules. However the issue also has to be reconsidered as soon as advanced power management at memory level will be available.

The allowance for an additional power supply seem to be rather generous. Thus there is a lack of incentive for appropriate dimensioning of power supplies. A rough evaluation based on the data in the “*Draft 4 Idle data set*” would support the recommendation to reduce this allowance to 10–15W depending on the specific idle level category to encourage the use of better sized power supplies. More details on this proposal can be found in the Annex.

793 Exclusion of 3 and 4S Systems

The exclusion of 3S and 4S systems seems to make some sense for the moment especially since currently only idle power is addressed and availability of data is limited. However 3S and 4S-servers should be addressed more comprehensively as soon as a benchmark/criterion to address active power is available.
1S and 2S systems are still the broad mass market. It is unclear however why the power management criteria defined for 3S and 4S servers are not applied for 1S and 2S servers as well.

845 Reporting requirements

The "*Power and Performance data sheet*" overall is comprehensive.
EPA is indicating that the provision of benchmark data based on SPECpower data is not mandatory but data from at least one benchmark which can be chosen by the manufacturer has to be provided.
It may be more effective to define one benchmark or criterion which is mandatory for the assessment of the full power load (100%). Otherwise results based on different benchmarks provided by manufacturers will not be comparable and consequently not very useful for the buyer.

929 Tier2 Requirements

It could be an idea also to start addressing storage or network equipment in subsequent tiers.

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Annex: Evaluation of the additional power allowances for additional hard drives

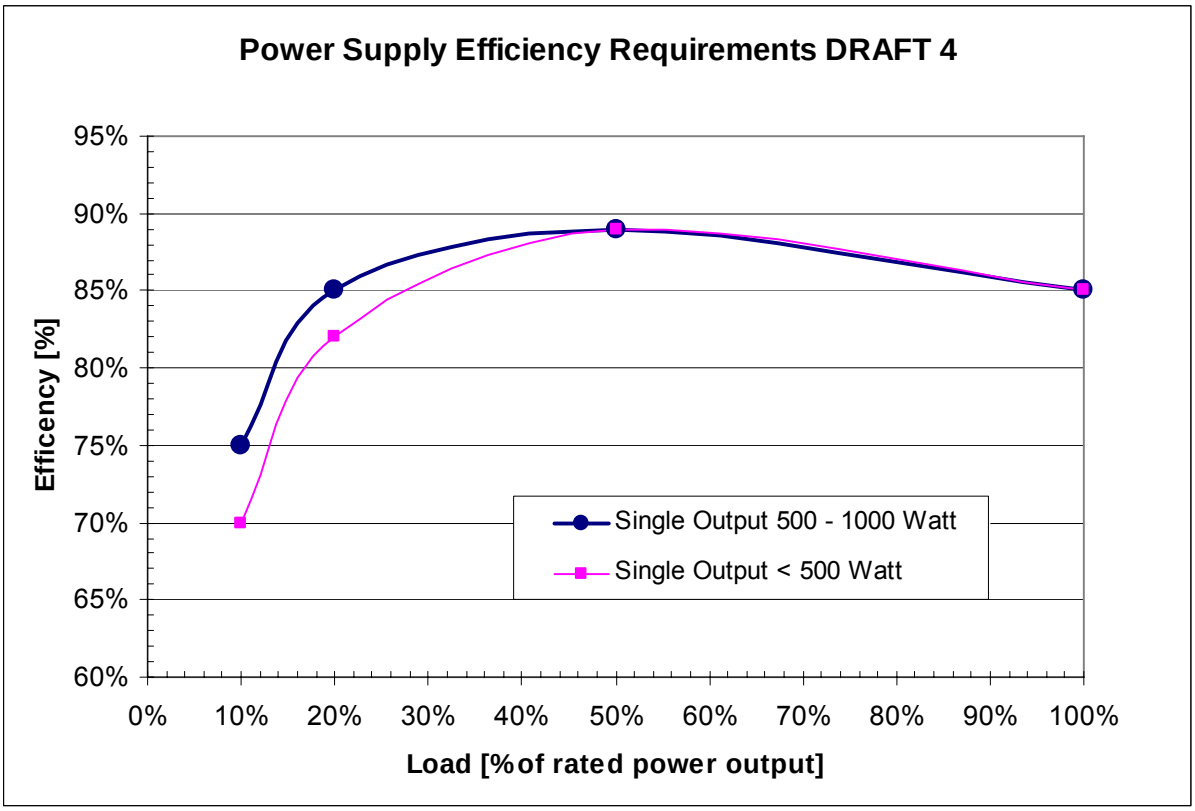

Fig: Power supply efficiency requirements in DRAFT 4 (smoothed curve between load points)

Table: Data used for evaluation

	On Idle [W]	Typ. PSU load in idle non redundant / red. [%]	PSU rated power [W] (sel.)	η [%] non red	η [%] red	PSU Output [W]	On Idle [W] red. PSU	ΔP On Idle [W]
Category A	55	12.5/ 6.2	400	74	65	40.7	62.6	7.6
Category B	65	17 / 8.5	400	80	67	52,0	77.6	12.6
Category C	100	20.5 / 10.2	500	85	75	85,0	113.3	13.3
Category D	150	27 / 13.5	550	87	81	130.5	161.1	11.1

Remark:
Typical PSU load values were taken from the Idle power data set [1] according to different idle levels of servers. In a next step a “typical” rated power for PSU were chosen for every category each. Based on the rated power of this representative power supplies and current efficiency requirements (values between defined points were interpolated via a smoothed curve, see Fig. above) numbers were picked for actual load points each. With these values for non redundant as well as redundant power supplies new On Idle values were derived for redundant PSU operation. The differences between the original (non redundant) and calculated (redundant) On Idle values are in the range of 7.6 – 13.3 Watt only (given the above mentioned assumptions).

[1] http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/servers/Draft4_Idle_Dataset.xls