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Environmental Protection Agency
ENERGY STAR Program

We appreciate the EPA's efforts at standardizing energy efficiency and consumption of computing devices, as reflected in this ENERGY STAR Computer Server Draft 2. We are pleased to submit our comment for your review.

Sincerely yours,
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We have reviewed the Energy Star Draft 2 Computer Server Specification and have the following reply.

Dell is generally concerned with the developments of the Energy Star standard targeted at Servers. Dell considers cooperation and support of the Energy Star standards to be an essential component in the ongoing efforts to reduce the impact of climate change. We consider the EPA and specifically the Energy Star program our partner in this effort. Dell's principal concerns are limited to a few areas and they are: time to implementation, complexity and/or idle mode limits.

Due to the complexity and diversity of application; the development cycle for servers is different, distinctly different from desktops, laptops and workstations. Servers in general are targeted for use in data centers, buildings or rooms specifically designed with custom environmental surroundings. Servers run and operate a broader range of applications and are essential to the modern business. Servers may be booted to several different and well known operating systems or hypervisors and may load several operating systems simultaneously to become active and then be placed into use with applications. The nine month cycle proposed for introduction is insufficient for deploying a standard of this magnitude and complexity across the server industry.

We disagree with the EnergyStar for Computer Servers Standard with respect to and focus on idle mode limits without context. Idle mode measurements without context of configuration and maximum power will drive Energy Star servers to the lowest configuration for delivering the limits. The challenge to data center managers will be trading off many lower configuration servers against fewer high performance servers. And in a data center of hundreds to thousands of servers; many lower configuration servers may translate to higher energy consumption.

Without context server "Idle Power" measurements do not provide an adequate measure of energy efficiency or consumption. Idle Power as a standalone criterion should not be used for the following reasons:

- a) Idle Power level on a server has a very broad range across servers types, operating systems, and application.
- b) Idle power differs significantly based on hardware configuration.

Categories characteristic of servers required for "idle" mode limits represents but not limited to a confluence of the following characteristics:

- 1) Chassis Type (1U, 2U and Blade)
- 2) Operating Systems (Linux, Windows, Hypervisors, etc.) and No Operating System
- 3) Chipset, Processor and Socket Configurations, Stepping, Silicon Architecture
- 4) Memory Size and slots
- 5) Disks, No Disks, Raid Configuration, solid state disk technology
- 6) Communications Ports (Number of Ethernet/Optical Data Interfaces)
- 7) PCI Express Configuration

The above characteristics summed into a single standard measurement “idle” without context provides.

Unappreciated and unrecognized are server power management features characterize a greater impact on power consumption than ‘idle” mode limits alone. The data center may run at high “idle” limits today; however with the consolidation and virtualization activities underway that is not a given for the future. Indeed the industry trend indicates higher utilization of data center resources and movement to thin provisioning.

Absolute “idle” limits will not alone deliver superior performance per watt capability. We strongly recommend a review that provides context of maximum power versus idle mode limits. Significant complexity can be reduced to a few categories of servers that could be identified allowing architectural tradeoffs to attain lower “idle” mode levels versus max consumption and still deliver improved performance per watt.

Dell supports revealing standardized data measurements. The system for collecting and reviewing the data is also important. It is necessary to understand that the operating system reports processor utilization, and systems may report power consumption, air temperature and the like, latency in workload, and network loading may delay the availability of revealed information

Thank you again for the opportunity to review and provide input to the Energy Star for Computer Servers Draft 2.