



Server Efficiency and the Importance of Developing a Metric

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ENERGY STAR Overview



- ENERGY STAR is a voluntary government/industry partnership that helps businesses and consumers make energy-efficient choices, making it easy to save energy, money and protect the environment
- In 2004, helped Americans **save \$10 billion** on energy bills nationwide and enough electricity to **power 20 million** homes
- Reduced greenhouse gas emissions equal to **removing 21 million** cars from the road for a year
- ENERGY STAR Web site: www.energystar.gov

Benefits of Energy Efficiency



- Environmental
 - Lower greenhouse gas emissions and criteria pollutants
 - Lower water use
- Economic
 - Lower cost compared to new generation and transmission
 - Downward pressure on natural gas prices
 - Lower wholesale electricity prices
 - Improved local economy and service to low income and seniors
- Utility System Benefits
 - Quick fix with permanent, long term benefits
 - Improved security of electricity and gas systems
 - Lower baseload and peak demand
- Risk Management
 - Diversified a utility's supply portfolio
 - Reduce environmental regulatory risk to utilities

EPA Interest in Servers



- Globally traded product
 - Worldwide installed base: 20 – 25 million
 - Worldwide 2005 revenue: \$51 billion
 - Worldwide 2005 shipments: 7 million
- Installed base projected to grow by 5 million by '09
- Currently, no standardized way to inform the marketplace on server energy efficiency

Data Sources: IDC, IT Jungle

EPA's Interest (cont.)



- ENERGY STAR Commercial Building Energy Performance Rating System relates energy efficiency to whole building operations
- Computer data center operations include:
 - Power supply
 - Server racks
 - Cooling systems
- Ideally – a building level metric would gauge the energy efficiency of all three operations
- Without metrics for server efficiency we can only compare energy use of cooling and power supply systems at a building level

Product Ripe for Energy Savings



- Annual power & cooling bill for 100 servers is about \$40,000*
- “If performance per watt is to remain constant over the next few years, power costs could easily overtake hardware costs...” Luiz Andre Barroso, Google (2005)
- Applying existing energy saving technologies and practices would result in 2/3 energy savings (RMI Charrette 2003)
 - Whether it’s 10 or 50% significant savings would realized through efforts to improve energy efficiency
- Again, there is no standard way to measure efficiency and compare products

* Quote from “Servers swamp data centers as chip vendors push ahead”, *Computer World*, February 6, 2006

Influencing the Market



Goal: provide the buyer with enough information to make an informed purchasing decision

- Promote dialogue among various industry stakeholders to develop a test procedure and metric for server efficiency
- Introduce test procedure and server metric to the marketplace --- encourage competition based on energy efficiency

Influencing the Market (cont.)



- Potential pathways to implementation/adoption:
 - Test procedure certification – global standard (e.g. IEC)
 - Utility programs/incentives
 - Federal and/or state procurement (U.S. and abroad)
 - Incorporate into green building initiatives
 - Voluntary market-based program (e.g. ENERGY STAR)

EPA's Role Moving Forward



- Continue to follow and participate in industry efforts to develop a test procedure and metric
- Serve as an information vehicle for all interested parties:
 - Inform ENERGY STAR international counterparts
 - Coordinate with ENERGY STAR Buildings efforts
 - Maintain database of interested parties and disseminate information as needed
 - Post updates via the Server and Data Center Web site at www.energystar.gov/serverconference