EPA Technical Workshop on Energy Efficient Servers and Datacenters in the United States

February 16, 2007

Santa Clara Convention Center

Summary of Identified Data Needs

This document summarizes key data inputs necessary to inform the EPA's study on energy efficient servers and data centers in response to H.R. 5646. The data needs listed below were identified at the February 16th Technical Workshop at the Santa Clara Convention Center based on working group discussions. The study team welcomes all information sources and leads that can help us address the key data needs listed in the six categories listed below.

To provide data or information to address these data needs, please contact:

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To view background information on the EPA server and data center efficiency study, visit:

www.energystar.gov/datacenters

1: Estimation of growth trends in IT equipment and data centers

Historical data (2000 – present) and projected data (over next 5 years) are needed for:

- Installed base and shipments of servers, storage devices, and network equipment
  - By end use sector (Federal vs. non-Federal)
  - By end use category (data center vs. workgroup computing)
  - By U.S. region
  - By equipment class (e.g., volume vs. high-end servers, tape vs. hard disk drives, routers vs. switches)
- Trends in IT equipment utilization (average % of peak capability)
- Trends in virtualization
- Floor area of U.S. data centers
- Trends in underlying demand for data services fueling server computing and data center growth in the United States
- Trends in data center computing density (W/ft^2, etc.)

2: Estimation of energy use by IT equipment and data centers and analysis of trends toward more efficient components and servers

Historical data (2000 – present) and projected data (over next 5 years) are needed for:

- Energy used by servers
  - By server class
  - Idle to peak load energy use relationship
  - Projected trends based on component and server efficiency improvements
    - Microchip energy use trends
    - Power supply energy efficiency trends

- Energy used by storage devices
    - By type of storage device
    - Idle to peak load energy use relationship
    - Projected trends based on energy efficiency improvements

- Energy used by network equipment
    - By type of network device
    - Projected trends based on energy efficiency improvements

- Benchmark data on total data center energy use

- Total data center energy use/IT equipment energy use ratios
    - Ideally, broken down further by IT equipment type

- Key trends in energy use of infrastructure systems (power conversion, backup power, cooling, etc.)

3: Estimation of cost savings due to improved IT equipment and data center energy efficiency

- Quantitative and qualitative information (including case studies) on non-energy related cost savings and benefits (e.g., improved performance, reduced capital expenditures, etc.) of improved energy efficiency

4: Analysis of the potential cost savings and benefits to the energy supply chain through the adoption of energy efficient data centers and IT equipment

- Utilization and power load shapes for various types of data center operations

- Regional breakdown of server and data center operations

5: Analysis of the potential impacts of energy efficiency on product performance

- Quantitative and qualitative information (including case studies) on potential positive and negative impacts of energy efficiency on product performance, including computing functionality, reliability, speed, and features, and overall cost

6: Analysis of the benefits of the use of distributed generation (DG)/cogeneration (e.g., CHP)/fuel cells

- Quantitative and qualitative information on industry experience with DG/CHP, the perceived role of DG/CHP, the perceived benefits/barriers/issues, power reliability requirements, reliability strategies and approaches, and current use and cost of back-up power systems