

IT BEST PRACTICES: DATA CENTER POWER REDUCTION

Authored by:
**California Information Technology
Managers Academy, Class XVI**



"California IT – A Commitment to Green"

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BACKGROUND

Inefficient use of data centers increases operational costs and carbon dioxide (CO₂) emissions by consuming excessive energy. Department that do not utilize data center facilities with high levels of energy efficiency increase power consumption within the State of California.

BENEFITS

The State of California can achieve annual energy savings by leveraging green data centers with high levels of energy efficiency. In a conventional data center, from 35% to as much as 50% of the electrical energy consumed is used for cooling versus 15% in best-practice green data centers [1].

An Environmental Protection Agency (EPA) report in August 2007 stated that data centers in the United States have the potential to save up to \$4 billion in annual electricity costs through more energy efficient equipment and operations, and the broad implementation of best management practices [2].

Another estimate reports that decisions made in the design and operation of a new datacenter can result in savings of 20-50% of the electrical bill, and, if deploying a systematic approach, up to 90% of the electrical bill can be avoided [3].

RECOMMENDED STRATEGIES FOR IMPLEMENTATION

- Consolidate servers into energy efficient data centers.
- Consolidate applications onto fewer servers, using shared architecture where possible.
- Identify unneeded or older hardware, and eliminate, power off, or replace it.
- Implement virtualization to reduce the number of physical servers.
- Maintain a temperature between 65 and 80.6 degrees.
- Reduce the use of lighting using methods such as motion sensors or time of day controls.
- Use efficient floor layouts such as hot-aisle/cold-aisle configurations, proper use of vented tiles, and reducing inappropriate obstructions and breaches.



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- Use efficient air flow methods such as under floor air distribution, and rack panels to restrict bypass airflow (blanking panels).
- Participate in Energy Star performance rating for data centers when released [4].
- Implement tools to measure energy usage [5] [6].



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