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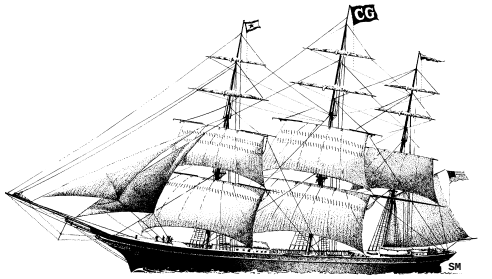

Navigating Information Technology Horizons℠

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The Greening of the Data Center

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If you have shopped for a washing machine, an air conditioner, a refrigerator, or even a ceiling fan in the last few years you may have noticed that the product carries an *ENERGY STAR* rating that measures its energy efficiency. The ENERGY STAR program was started in 1992 as a joint effort of the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA). ENERGY STAR is a voluntary labeling program that helps consumers and businesses determine the most energy-efficient products.

Home appliances are not the only products that have ENERGY STAR labels. Laptops and desktops can have ENERGY STAR ratings. How many of us have just one laptop or desktop at home? In my house, there are two PCs, three laptops, three printers, and, of course, two older PCs kept in the basement for spare parts. For most of us in high tech, I would guess the answer is that very few of these homes have one lone PC. Here are some interesting facts from the ENERGY STAR program.

- *A PC that qualifies for an ENERGY STAR rating uses 70% less electricity than computers without enabled power management features.*
- *When left inactive, ENERGY STAR computers enter a low-power mode that uses less than 15 watts of power*

ENERGY STAR estimates that home offices that run efficient PC, monitors, and printers can save enough electricity to light an entire home for more than 4 years. With the cost of electricity on the rise in New England, that last statement certainly caught my attention. However, what about all of the large data centers in New England in the United States, and scattered all over the world? They have a lot more equipment than I have and all of that equipment needs a lot of electricity to power and cool it. Imagine a day when IT equipment buyers are more concerned about the energy consumption of a disk drive, server, or switch than acquisition cost. Actually, that day may not be as far off as you think.

Enter the Data Center

The U. S. House of Representatives recently approved a bill, called *H.R. 5646*, that calls for the EPA to start a six-month study on the energy efficiency of data centers. It is now in the hands of the Senate for their approval. In fact, prior to the passage of this bill, the EPA has considered instituting a program to enroll data center equipment in the Energy Star program. The EPA is reacting to the concerns of many IT executives. Energy costs are becoming a big problem in many data centers today.

The cost to power and cool computer rooms is not a new problem, but like many trends in IT,

it has become an area of focus *again*. Years ago, data center equipment was much larger, heavier and ran a lot hotter. The heat generated by mainframes had to be dissipated by water, not air. RFPs for equipment acquisition always contained questions about the kVAs and BTUs required to power and cool equipment. But in the later "boom" years, equipment was smaller and less expensive to run, so power issues were no longer considered an issue.

Today, power is an important concern again. Data centers have more equipment that ever. Enterprises need more and more servers to support applications. Data is growing and being kept on storage for longer periods of time. Electrical costs are rising. Data centers are now experiencing hot spots created by high-density blade servers. Water cooling is now back in vogue – water-cooled racks are now available to help dissipate heat from densely mounted servers.

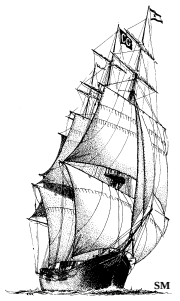
IT vendors are not turning a blind eye to the problem. The *Green Grid*, formed in April of this year, is composed of well-known vendors such as AMD, APC, Cadence Design Systems, Dell, Egenera, HP, IBM, Rackable Systems, SprayCool, Sun Microsystems, and VMware[1] . Their charter is to develop and promote energy efficiency for data centers and information service delivery.

Manufacturers are developing lower energy-consuming devices. The data center of the future should be more energy efficient. But what can you do in the meantime?

1. Take an inventory of all applications and equipment. You may be surprised to find some applications that are no longer needed, or equipment that is idle.
2. Consolidate workloads onto large servers, if possible, to reduce power consumption.
3. Consider hiring an expert to review the airflow within the computer room and recommend improvements to reduce hot spots.
4. Clean up the computer room above and below the raised floor. Misplaced boxes on the floor and tangled cables under the floor can restrict airflow.
5. Evaluate where data is stored. Does data residing on disk today need to remain on disk? Can infrequently accessed data be migrated to energy- friendly tape? Can data reduction techniques - that now have become mainstream - reduce storage requirements and reduce energy costs?
6. Think energy when purchasing new equipment. Every enterprise should demand power and cooling information for all new computer acquisitions on RFPs. Don't assume that similar equipment has the same energy requirements.

Summary

The actions of the EPA, organization such as the Green Grid, and the development of more efficient equipment by vendors promises a greener data center in the future. We encourage all enterprises to demand more-efficient equipment and support those manufacturers that deliver on the promise. **When purchasing equipment, consider performance, acquisition cost, *and energy costs*. It helps your bottom line and it helps the rest of the world as well.**



1 Egenera and Cadence Design Systems are no longer founding members.

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About the Author

***Dianne McAdam* is Director of Enterprise Information Assurance for the Clipper Group**. She brings over three decades of experience as a data center director, educator, technical programmer, systems engineer, and manager for industry-leading vendors. Dianne has held the position of senior analyst at Data Mobility Group and at Illuminata. Before that, she was a technical presentation specialist at EMC's Executive Briefing Center. At Hitachi Data Systems, she served as performance and capacity planning systems engineer and as a systems engineering manager. She also worked at StorageTek as a virtual tape and disk specialist; at Sun Microsystems, as an enterprise storage specialist; and at several large corporations as technical services directors. Dianne earned a Bachelor's and Master's degree in mathematics from Hofstra University in New York.

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