

Pinpoint Energy Hogs

Save Money & Improve Efficiency By Cutting Down On Power-Hungry Energy Drains

KEEPING THE DATA CENTER RUNNING is not an inexpensive task. It takes energy to run both servers and the power and cooling systems that keep them going, and energy costs money—money that is part of an overall budget that must also account for other expenses in the data center. If inefficient servers and other devices are wasting energy, then, that means there's less money in your budget for staff and upgrades. Here are some tips for how to give those energy hogs the axe so you can use your dollars elsewhere.

✓ Monitor Your Energy Usage

A key step is to make your data center's energy usage visible, says Paul Bieganski, CTO of Packet Power (www.packetpower.com).

"A good monitoring system should make it easy to allocate energy usage by application, budget category, etc.," Bieganski says. "Letting end users know the cost (both monetary and environmental) to run their systems can make them more open to energy efficiency initiatives."

Don't fall into the trap of limiting your analysis to certain types of equipment while ignoring others. "Monitor everything," says Robert Faulkner, sales engineer with Server Technology (www.servertech.com). "The data center is not just servers. Be sure to capture power data from all pieces of equipment. The big three—servers, storage, and network equipment—are all drawing power."

Also, Faulkner says, it's important to monitor continuously. "Spot measurement on a weekly basis just doesn't cut it," he says. "Peak usage needs to be caught in action by continually polling for power consumption over time. Are there usage peaks at 4 p.m. or on Wednesday or on the first of the month? How can you know if you aren't gathering this data?"

✓ Police Your Infrastructure

"Next up, ensure energy-efficient practices for power and cooling infrastructure," says Jim Hall, marketing manager for Staco Energy Products (www.stacoenergy.com).

"Balance out the hot spots," Bieganski advises. "High power users generate a lot of heat."

Indeed, inefficient IT gear packs a one-two punch: Inefficiency means that more energy is being lost as waste heat instead of doing useful work, and once that waste heat is generated, your cooling system must work that much harder to regulate the temperature of your server room or data center.

"Use temperature monitoring to identify areas where your cooling systems are having trouble removing heat," Bieganski says. "Then add new power load to areas in the data center that have both underused power and sufficient cooling available to meet the need."

"Your power chain starts with utility, switchgear, UPS, and related auxiliary equipment, backed up by batteries and generators, [which are] all consumers of energy. Consider all of these components, and size each to ensure all are optimized for efficient operation of your

power infrastructure," Hall advises. "Calculate your capacity to match the resulting expected loading from your energy efficiency improvement efforts. Chiller capacity is a key consideration as you optimize your cooling practices."

Another thing to consider is the delta temperature of the cooling system. The delta temp is the difference in temperature between the coolant on the cold and hot sides of a cooling system such as a CRAC (computer room air conditioning) system.

"Low CRAC delta temp is not always an indication of using too much energy, but it is an indication that CRACs are not effectively cooling," says Dan Moscola, product marketing manager at Vigilent (www.vigilent.com). "Low delta T decreases cooling efficiency and is a result of mixing caused by excessive airflow."

According to Moscola, "Units that are not effectively cooling actually act as heaters to the data center. Efficiencies can be increased by creating a more direct way for the hot air to get back to the CRAC. Most data centers are designed with too many CRACs so shutting off the ones that are not effective will improve energy efficiency and lower the average data center inlet temperatures."

✓ Virtualize & Consolidate

If you find yourself faced with obsolete or underutilized hardware, "decommission where possible, and virtualize others," Hall advises. "During this phase, always consider [a device's] age."

"Don't ignore the little guys," Bieganski says. "The best way to save power is often to run fewer servers at higher utilization."

Running fewer systems with heavier loads translates to virtualization. But what should you virtualize? "Use a power monitoring system to check for circuits that are lightly used and have flat usage profiles across time," Bieganski says. "Then, virtualize the associated devices where possible."

"Not all applications are targets for virtualization," Hall says, but he advises to take advantage of those that are.

✓ Slaughter The Energy Hogs

Hall recommends removing legacy servers. The idea here is to look for more efficient equipment, which, by definition, can do the same work while using less electricity. "Legacy energy-hog IT equipment should be replaced, where

possible, with Energy Star-rated gear," Hall says.

Bieganski recommends that you replace high-power devices that have a low power factor as measured. "A power factor below 95% on a circuit with reasonable load may indicate a device that is both power-hungry and inefficient," Bieganski says. "Check that rack for older technology that should be upgraded."

In your quest to root out inefficient devices, you may even find old gear that's

active, but no longer necessary. "Changes in IT equipment happen so frequently now that it has become difficult to track what servers are actually processing useful information," Hall says.

"It is common for forgotten servers to be left on racks running and consuming energy," Moscola says. "The benefit of identifying and removing these servers is energy savings two times the IT load you are removing, because you also gain savings from a reduced cooling load." **P**

Easiest Tip To Implement:

✓ Use Your Downtime

"Seize the opportunity to optimize efficiency during your data center consolidations. Although this is a complex and daunting task, including several key requirements can result in huge improvements in the use of energy," says Jim Hall, marketing manager for Staco Energy Products (www.stacoenergy.com).

"When taking your inventory of servers and other IT equipment, make certain you measure loading for each, as well as age and operating characteristics," Hall says. "Align your plans with efficiency and loading."

Most Budget-Savvy Tip:

✓ Remember The Bottom Line

As you seek out ways to curb energy costs, be aware that some methods can save your business money in other ways, too.

"Most of our customers deploy power monitoring at the circuit level, which is far less expensive than monitoring at the device level," says Paul Bieganski, CTO of Packet Power (www.packetpower.com).

BONUS TIPS:

✓ Get buy-in.

For your energy savings playbook to work, it's critical to get all relevant staff on the same page. "Monitoring is great, but if those personnel that can affect power usage are not in agreement with its level of importance, nothing can change," says Robert Faulkner, sales engineer with Server Technology (www.servertech.com).

✓ Tweak power settings and schedules.

"After identifying what devices are drawing the most power and when they are drawing that power, it is time to act," says Faulkner. "Perhaps certain devices can be upgraded with more efficient supplies. Perhaps certain jobs can be moved from 4 p.m. to 1 a.m. or from Wednesday to Saturday."