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HAWAII BATTLES HIGH ENERGY COSTS WITH EZ GPO IN ZENWORKS ENVIRONMENT

Manual PC shut-downs were a good start for the state of Hawaii, but rolling out a centrally managed computer power management program put the final touch on a critical money-saving measure

Note: The mention of any company name or product does not constitute endorsement by EPA or by the State of Hawaii.

Hawaii has the highest electricity rates in the country. Just ask the state government. In 2009, its Department of Accounting and General Services received an electricity bill so high, employees worried they could not make payment. So they took steps to save energy, such as turning off the air-conditioning. And the Information and Communication Services division began a PC power management program for roughly 180 computers that now saves the state nearly $7,000 a year. By purchasing only energy-efficient ENERGY STAR qualified computers, the division saves an additional $4,000 annually.[1]

Getting there was a windy road, until technical support from ENERGY STAR—available for free via the ENERGY STAR Low Carbon IT Campaign—helped the state of Hawaii overcome several implementation challenges.

Training—and Retraining—Employees

The Information and Communication Services Division contained 180 computers, all running Windows XP. The first effort to reduce their energy consumption was retraining employees to turn off their computers at the end of the day. Rowena Adachi, the IT specialist who oversaw the effort, says that employees were generally compliant, and that these initial efforts delivered significant savings. That was the good news.

Energy Savings: The Big Picture

Power management features—commonly known as "sleep" settings—automatically place monitors and computers into a low power sleep mode after a pre-set period of inactivity.[2] Touching the mouse or keyboard wakes up monitors and PCs within seconds, allowing users to resume work without delay.

Computer power management features don't just save money: they're good for the environment. Because saving energy prevents pollution associated with generating electricity, the state of Hawaii's executive branch will prevent roughly 70 tons of carbon dioxide emissions over 3 years—equivalent to planting over 14 acres of trees.[3]

"To maximize power savings, EPA recommends setting computers to enter system standby or hibernate after 30 to 60 minutes of inactivity. To save even more energy, set monitors to enter sleep mode after 5 to 20 minutes of inactivity. The lower the setting, the more power you save."

[1]Based on estimates by Rowena Adachi using the EPA savings calculator.

[2] A typical desktop computer uses 60 to 85 watts when active and only 2-4 watts in sleep mode (system standby or hibernate). A CRT monitor uses about 60 watts and a LCD about 35 watts. Both use only 1-3 watts in sleep mode.

[3]Based on EPA estimates.

Widespread compliance is not typical. Usually, only about one-third of computer users consistently turn off their machines. And, as we will see later, compliance can cause its own problems.

In addition, people tend to think using a screensaver reduces energy use. In fact, running a screensaver can cause a computer's processor to ramp up, thereby increasing energy use.

Because some employees were only shutting off their monitor and not their PC, Adachi's staff gave them each a power strip to ensure no electricity was used during off-hours. But this posed a problem later when IT wanted to roll out true computer power management (CPM) and monitor power management (MPM). That's because Adachi's staff had done such a good job of training employees to turn off their power strips that now they had difficulty retraining them to leave them on when software patches or virus scans were scheduled to run.

Typically, sleeping computers aren't a barrier. IT staff can use a feature called Wake-on-LAN to roust PCs from their slumber. But because power strips were turned off, Wake-on-LAN was unable to wake up the PCs.

Roadblocks to Wake-On-LAN

Implementing Wake-On-LAN presented a few challenges for the Information and Communication Services division. Some of the hardware in the field was old and initially would not take the WOL settings because the BIOS' needed to be updated or the network card drivers were outdated. In a few select cases the computer operating system (OS) itself was not setup to accommodate WOL settings.

Another culprit was older hardware that was running a newer OS, but did not have updated drivers that would have dictated how the device should interact with the OS. In these cases, sleep settings could be applied to the OS, but sleep failed because the OS could not tell the computer hardware to go a low-power state.

As an alternative to implementing Wake-On-LAN, client computers can be configured to apply software patches and updates when they become available on the network, such as during the user log-in process. Or, a feature called Windows Task Scheduler can wake sleeping PCs at a designated time to download and install updates. Using logon scripts, you can set computers to install updates or patches, and modify their network configuration.

Most software updates are deployed as follows: The computer is powered on from sleep or off; it connects to the network, queries the domain controller for network settings, and then may be told to install software updates.

Adachi concluded that her department could no longer rely on the imperfect memories of employees to both reduce energy bills and ensure that routine IT maintenance tasks were performed. Hawaii needed a more sophisticated approach.

Moving Beyond Manual Power Management

Following a suggestion in a user forum, Adachi attended a webinar hosted by the EPA to learn about ENERGY STAR's free EZ GPO software tool. EZ GPO was designed to work seamlessly with Microsoft Windows Server and Active Directory, providing IT managers with tools ("group policies") for activating PC sleep settings, including system standby and hibernate modes.

Initially, Adachi assumed that she could not use EZ GPO because her organization did not utilize Windows Servers or Microsoft Active Directory. But during the EPA webinar, Adachi learned that she could use EZ GPO after all. Don Norwood, a technical support contractor with the EPA, instructed her on how to use EZ GPO with ZENWorks to create workstation group policies. Down the road, his help would prove valuable to the CPM implementation, providing a registry key printout so Adachi knew every key that EZ GPO would modify.

Testing and Rollout

The next step was more pragmatic than technical: determining which computers to put in standby, and which ones to bypass. The department surveyed employees to find out which computers should not be put in standby for various reasons, such as VPN access. From there, user groups could be set in ZENWorks using the group policy templates provided by EZ GPO.

When conducting the user survey, Adachi learned that many employees were performing automated backups in the evening. If computers automatically dropped into sleep mode before the backup routine kicked off, the backups would not run. Rather than end up with a slew of computers not using computer power management (CPM), the solution was to have those people back up their documents to the servers. That way, IT would only have to back up the servers and not all of the individual PCs. For those people who used VPN, however, their PCs could not be put in standby mode.

A handful of computers had to be excluded from CPM because they were too old. Some were home PCs that had been converted for business use and would not work with Wake-on-LAN. Some machines would wake from sleep mode, but despite having BIOS and/or NIC driver updates, would simply go back to sleep. For these computers, Adachi relied on the user to turn off the PC and monitor.

How to Set Up and Run EZ GPO with ZENWorks

EZ GPO provides the templates for running computer power management and monitor power management in a ZENWorks environment.

Here's how it works: On each client machine sits a binary file. Within that MSI file there are two executables: EZGPOtool.exe and PMservice.exe. The former is activated when a user is logged in; the latter can be activated if no user is logged in.

An administrator will obtain the EZGPO.zip, which includes testing files, documentation, and the tool itself. The tool is actually split into two and, later, three parts.

One of the first things the administrator will find inside the zip archive is an Administrative Template (ADM file), which is installed on the controlling server itself. Once installed on the server, it will allow the administrator the ability to control power management via the Group Policy Object Editor.

Also in the zip archive is a client installation folder that contains a file named EZGPO_Installer.msi. This MSI file, which is a Windows Installer File, allows the server administrator to deploy or push the MSI file down to the client machines which will extract and install the files automatically to a specific location on the client machine.

The two files that are extracted are PMSERVICE.exe, which runs as a service on the machine and checks its settings against the server-side policy settings; the other is called EZGPO_TOOL.exe, which performs the same function, but runs as the user on the machine.

In either scenario, one of the two binary files (PMSERVICE if no user is logged in, or EZGPOTOOL if a user is logged in) will check the server to see which settings should be applied to itself. Therefore it is imperative that you install the MSI file only on the client machines and not on the server.

In a standard Windows enterprise environment what will occur is the following:

- Administrator installs and sets up the Group Policy.

- Administrator deploys the client files to the client machines, which in turn install the files into their required locations.

- The client machines check with the server to read the Group Policy settings. If a user is logged into the client machine, the client machine will use EZGPO_TOOL.exe and employ the settings it finds. If no user is logged in, the client machine will run PMSERVICE.exe and employ the settings it finds.

What made this issue difficult for Rowena Adachi is that the controlling server was not a Windows server, so she instead had to use ZENWorks (which is another Directory Controller Suite) instead. She also had to take apart the binary files to see which locations and settings within the registry would have been applied had she been using a Windows Directory Controller and apply those settings by hand or by scripting to each individual machine.

In a few cases, getting WOL to work reliably was a challenge, but in the end, most of the 180 computers were configured for the monitor to sleep after 10 minutes and the computer to enter standby after 60 minutes. However, the IT staff set up 10 of the machines with MPM only because of remote access or other considerations. In addition, 16 other computers were set up with MPM only because they lacked Wake-on-LAN capability, and thus could not go into standby mode since there was no way to wake them for patching.

Though the power profile of every computer and monitor could not be centrally managed, doing so with the majority delivered significant savings—and gave IT the peace of mind of knowing software updates and virus scans could be performed reliably. The executive branch slept easier, knowing it could pay its electricity bill.

Since implementing the CPM project, Rowena Adachi has significantly increased her responsibilities. As IT Specialist IV at the Department of Public Safety, Management Information Systems Office, she now supports over 900 users.

For More Information

To learn how to activate power management features on your network, please visit www.energystar.gov/lowcarbonit or contact Steve Ryan, US EPA ENERGY STAR Program: 202-343-9123, ryan.steven@epa.gov.