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GLAXOSMITHKLINE USES AN OFTEN-OVERLOOKED WINDOWS TOOL FOR COMPUTER POWER MANAGEMENT — AND SAVES BIG

Free solution will reduce annual energy expenses by nearly \$1 million

GlaxoSmithKline, the global healthcare group, was looking for new ideas. So in late 2009, CIO Bill Louv challenged his staff to put forward their most promising information technology management innovations. The 10 best proposals would be presented to an IT executive panel, with a chance at sponsorship to move forward.

GSK business analyst Matt Bartow was digging for ideas when he came across an article in Computerworld magazine about computer energy use. The article, "PC Energy Use: Still Unmanaged," spurred him to look into what default sleep settings were used at GSK. What he found was that the settings in use were minimal. Monitors were set to sleep after 20 minutes of inactivity, but no settings were in place to put inactive computers into a low-power sleep mode.

Bartow drafted a proposal for implementing a companywide computer power management (CPM) policy and for improving GSK's existing monitor power management policy. He emphasized how the effort would not only save the company money, but significantly reduce its environmental impact. The CPM/MPM proposal was selected for presentation, and subsequently given the green light by GSK's IT executive panel.

Bartow then teamed up with Michael Freedberg, director of Enterprise Personal Computing Solutions, to develop a pilot of the project.

Estimating the Savings

One of the team's first challenges was to figure out how much money CPM would save the company. With the help of the ENERGY STAR Low Carbon IT website (www.energystar.gov/lowcarbonit), GSK developed preliminary savings estimates and confirmed them with input from ENERGY STAR technical support contractors. The team also consulted savings estimates from the analyst group Forrester.

Though these estimates ultimately proved relatively accurate, they were based on typical commercial computer usage patterns observed by researchers at US EPA and Lawrence Berkeley National Laboratory. Matt wanted to base his estimates specifically on how computers were used at GSK, so he included questions about computer use in his post-pilot survey. The responses enabled the team to convert this knowledge into estimated CO2 reduction and cost savings.

Activating Power Management Settings in Windows XP

You can set power management settings through a logon script using the command line utility `powercfg.exe`, which is included with Microsoft Windows XP (SP2). It can be used to configure most power options. An XP workstation has multiple power schemes, each with its own custom settings, but only one can be the "active" scheme.

In Windows XP, only Local Administrators and Power Users have the rights (by default) to change these settings. It is possible, however, to give members of the Users group enhanced rights to the registry. Adding these rights will also give users the ability to change their Power Policies via the Power Options applet in Control Panel.

For more information and examples of a batch script for Windows XP, see http://www.energystar.gov/index.cfm?c=power_mgt.pr_power_mgt_powerconfig on the ENERGY STAR website.



To confirm these estimates, the team compared them to those of a manufacturing facility in the United Kingdom. The U.K. facility's estimates of kilowatts used per hour were roughly the same, so the U.S. team felt its estimates were vindicated.

Pilot Program and Survey

In March 2010, the company began its CPM pilot program, which lasted two weeks and was conducted across different user groups. The company solicited volunteers, and received 550 responses. The volunteers received a link via e-mail or were directed to a webpage to perform the installation of a utility that would modify their computers' power profile.

The company considered using one of the many commercially available software tools dedicated to managing computer power settings, but chose instead to work with something they already had on hand: a command line utility called `powercfg.exe`, which is included in Microsoft Windows XP, Service Pack 2. One clear advantage of this solution, of course, was that it did not require any additional investment in software. For more information on `powercfg.exe`, see the sidebar, "Activating Power Management Settings in Windows XP."

The company's post-pilot survey was critical for a successful CPM implementation. Of the 550 people participating in the pilot, more than half responded to the survey. These 225-plus responses confirmed what Matt Bartow and Michael Freedberg had assumed: that CPM had very little to no negative impact on employees' work.

In addition, the survey was used to gauge typical computer usage patterns at GSK, which would enable Matt and Michael to better estimate cost savings from their computer power management initiative. What GSK learned is that many users were leaving their desktops powered on at night and during the weekends.

Following the pilot, GSK's IT department collaborated with the corporate sustainability team to recruit additional volunteers. Using the team's internal website, IT was able to get 4,000 additional employees to voluntarily use the computer power management utility. A full rollout began in late July and wrapped up in August 2010, bringing CPM to a total of 92,000 computers.

Keeping Sleeping PCs Updated and Secure

While many large organizations face the added challenge of remotely waking up their sleeping computers in order to install periodic Windows security patches and software updates, GSK did not. Because a substantial portion of their computers are laptops that users might take home on any given night, GSK patches PCs during normal business hours. To ensure minimal disruption, they allow end-users to initially defer updates until a more convenient time (e.g., lunchtime or during a meeting).

GSK manages software updates and patches with Microsoft Systems Management Server (SMS) 2003, which it has outfitted with an in-house "wrapper" that provides end users the option of selecting an early install or deferring the installation of software updates. For CPM, the company created a wrapper in a standard scripting tool that works in conjunction with `powercfg.exe` (the native Windows power management utility) and pushed the update to systems using SMS. The sleep settings used are 20 minutes for monitors, 15 minutes for the hard disk, with a 60-minute system standby and 120-minute hibernation.

One notable advantage for GSK is its global standardization on client computer operating systems, hardware and software. The company outfits all of its PCs with Windows XP, SP3. These machines are also Energy Star qualified models, which means they consume less power in active and in sleep modes than typical models. As a result, GSK's desktop computers consume only about 46 watts when active (compared to nearly 70 watts for a standard model), while laptops consume roughly 14 watts (compared to more than 21 watts for a standard model).¹

Groups and Global Tools

Of course, not all systems can be put to into sleep mode. GSK excluded systems that are in use 24/7 from CPM, such as laboratory computers that control research equipment or perform overnight data processing, as well as computers that stream video communications throughout the global organization. In addition, there are LCD monitors in common areas such as cafeterias

and elevators that were excluded. Conveniently, IT staff did not have to set up new Active Directory user groups in order to accommodate these exclusions. Instead, they were able to leverage standard "focused exclusions" already utilized by SMS 2003 for patches and updates.

An additional challenge that the company faced involved its global defragmentation tool, which had been deployed earlier in the year. Because not all end users have administrator rights on their PCs, employees could not run the defrag tool at their own convenience. To ensure that the defrag tool ran only when it would not interfere with user productivity, the department cleverly launched the defrag tool in conjunction with a screen saver. This ensured that the defrag tool only ran after the machine was idle for 15 minutes. Only one problem: if the monitor was set to sleep after 15 minutes, it could interfere with the defrag tool, which kicked off at the same time. The solution was to set the monitor to go into standby after an additional 5 minutes (a total of 20 minutes of inactivity). After the defragmentation is complete, the system will go into standby and then hibernate after the system has been inactive for 60 and 120 minutes, respectively.

The Big Payoff

GSK expects to save a lot of money from its CPM efforts. The company estimates it will save \$989,317 a year, or \$10.75 per computer. ENERGY STAR technical support contractors note that these figures probably understate actual savings, because GSK's baseline estimate of power consumption (that is, energy use prior to computer power management) was based on end-user responses to survey questions about how frequently they shut down their PCs. People tend to overstate how often they turn off their PCs, when in reality they frequently forget. In addition, since turning off your computer is generally perceived as the "right thing to do," people tend to — consciously or subconsciously — exaggerate how often they do it. A 2004 Lawrence Berkeley National Lab Report² found that only 36% of computers got turned off each night in a sampling of commercial offices. (A more accurate way to measure baseline energy consumption is to meter the power used by a sample set of computers selected at random. Of course this is not always possible.)

How does GSK's power management initiative stack up for the environment? The company's efforts will save an estimated 5,291 metric tons of CO₂ per year — that's almost 157 pounds of CO₂ per user annually. According to EPA estimates, this is the equivalent of taking 1,012 passenger vehicles off the road (based on annual CO₂ emissions from consuming 595,178 gallons of gasoline). Or, equal to ridding the planet of the amount of carbon sequestered each year by 1,128 acres of pine or fir forest. You can use the ENERGY STAR Low Carbon IT savings calculator to estimate your own CPM savings here: www.energystar.gov/lowcarbonit.

¹ Based on EPA data and field measurements conducted by Lawrence Berkeley National Laboratory and ECOS consulting. Figures for desktop computers do not include power consumed by monitors.

² "After-hours Power Status of Office Equipment and Inventory of Miscellaneous Plug-Load Equipment," Lawrence Berkeley Laboratory, 2004. See <http://enduse.lbl.gov/info/53729-abstract.html>.