



Clientless Power Management: Enforcing Green IT Compliance

Executive Summary

Each year, more and more new office computers are put to use. This causes a dramatic increase in global energy consumption, putting strain on the environment and corporate budgets. But the steady rise in energy consumption cannot be attributed solely to the number of computers purchased. How computers are used also adds to the increasing energy burden. This is a point organizations can and should consider. The usage factor will lead IT executives to convincing conclusions about the cost benefits of power management.

Research shows that most computers are not used the majority of time they are running. This waste of power consumption causes unnecessary business expenditures. It also contributes to an increase in the burning of fossil fuels. Pollutants such as sulfur and carbon dioxide are released into the air, causing respiratory disease, smog, acid rain, and global climate change.

How Much Energy Does A Computer System Use?

A typical desktop PC may require approximately 100 watts of electrical power. A 15-17 inch monitor may add 50-150 watts. Larger monitors consume even more energy (35 watts for LCD monitor).

Most energy companies charge customers on a kilowatt-hour basis. A kWh (kilo **W**att **h**our) is the amount of power consumed/generated over a period of one hour. For example, a 100 watt light bulb left on for 10 hours consumes 1kWh, that is, 100 watts x 10 hours = 1,000 watt hours = 1kWh (= 3.6 Mega Joules).

Leaving It On vs. Turning It Off

How users operate their computers significantly and quantifiably affects energy costs. The worst case scenario is continuous operation. Operating a 200 watt PC system day and night every day would lead to annual electricity

“Available on nearly every Windows PC, ‘sleep’ features cut energy costs by \$25-\$75 per PC annually.”

www.energystar.gov

costs of more than \$200 (at \$0.12/kWh). In contrast, operating the computer only during normal business hours (40 hrs/wk), reduces the annual energy cost to about \$48.

The obvious financial benefits of computer use might make the above cost figures not seem so significant. But, when these costs are multiplied by thousands or tens of thousands of computers in a network, the energy and cost savings add up quickly.

For example, according to Energy Star estimates (Fig. 1), a 10,000 endpoint organization in New York City, utilizing recommended best practices for energy management, stands to save over \$1M annually while reducing CO2 emissions by nearly 15K tons. All of this can be accomplished by simply putting computers in a lower power state when they are not in use.

Figure 1

ENERGY STAR Computer Power Management Savings Calculator						
	Savings Estimate		3-Year Totals			
	Energy Saved Annually (kWh)	Dollars Saved Annually	\$ Savings	Pollution Prevented: CO2 (in tons)	Equivalent to:	
					Acres of trees planted	Number of cars removed
Savings from monitors going into sleep mode:	3,050,837.3	\$493,320.39	\$1,369,009.00	7,024.6	1,448.36	1,167.16
Savings from notebook displays going into sleep mode:	98,557.1	\$15,936.68	\$44,225.73	226.9	46.79	37.71
<i>Total savings from monitor sleep mode:</i>	<i>3,149,394.4</i>	<i>\$509,257.07</i>	<i>\$1,413,234.73</i>	<i>7,251.5</i>	<i>1,495.15</i>	<i>1,204.87</i>
Savings from desktops going into system standby or hibernate mode:	3,181,993.1	\$514,528.28	\$1,427,862.82	7,326.5	1,510.63	1,217.34
Savings from notebooks going into system standby or hibernate mode:	92,659.9	\$14,983.11	\$41,579.50	213.3	43.99	35.45
<i>Total savings from system standby and hibernate mode:</i>	<i>3,274,653.0</i>	<i>\$529,511.39</i>	<i>\$1,469,442.32</i>	<i>7,539.9</i>	<i>1,554.62</i>	<i>1,252.79</i>
Total savings from monitor and computer sleep settings:	6,424,047.4	\$1,038,768.46	\$2,882,677.05	14,791.4	3,049.77	2,457.65
<i>Total Savings:</i>	<i>6,424,047.4</i>	<i>\$1,038,768.5</i>	<i>\$2,882,677.0</i>	<i>14,791.4</i>	<i>3,049.77</i>	<i>2,457.65</i>

Energy Star Computer Power Management Calculator available at: www.energystar.gov/ia/products/power_mgt/LowCarbonITSavingsCalc_v26_with_5_0v2.xls

Small Investment, Enormous Return

Energy conservation has been called the “least-cost energy strategy,” and for good reason. Energy conservation can save anywhere between tens of thousands to millions in energy costs annually depending on the size the organization. But energy conservation does more than just save money. It reduces environmental, social and political costs as well.

Numerous adverse environmental, social and political consequences are associated with energy production and consumption:

- ▶ Air pollution, acid rain, global warming
- ▶ Oil spills and other water pollution
- ▶ Loss of wilderness areas, construction of new power plants
- ▶ Foreign energy dependence and the risk of international conflict over energy supplies

“90% of desktops do not utilize power management settings.”

Lawrence Berkeley National Labs

Energy conservation can reduce global CO₂ emissions caused by computer usage by 54 million tons a year by 2010 (Businessweek.com: CEO Guide to Green Computing). That's the equivalent of taking 11 million cars off the road each year!

When Not in Use, Turn Off the Juice

The following are time-tested suggestions that may reduce energy consumption by 60% or more while retaining the productivity and other benefits of the computer, including network connectivity.

Consider the following power saving techniques (easy to implement with most computers' existing power setting functions):

- ▶ Turn off computers and/or peripherals when they are not in use. Turning machines on and off will not harm the equipment.
- ▶ Do not run computers continuously unless they are being used continuously.
- ▶ Turn off computer systems at night and on weekends.
- ▶ Look for ways to reduce the amount of time a computer is on without adversely affecting productivity.

According to findings by Lawrence Berkeley National Labs, 90% of desktops do not utilize power management settings. In today's IT environment, nearly half the power of an average PC is wasted in the form of escaped heat. This unnecessary waste can be avoided through proper power management enforcement.

Enable Power Management without Sacrificing Performance

Today, new computers comply with strict energy saving standards, thanks to Energy Star, a joint project of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy. Energy Star computers can automatically power down to low power states when not in use. Such energy efficiency can be achieved without sacrificing a machine's performance.

Energy Star's business case for enforcing power management on desktops and laptops:

- ▶ Cut PC electricity use by over 50%, saving \$25–75 per PC annually
- ▶ Reduce office cooling loads, saving an additional \$5–10 per PC annually, and as much as \$10–25 or more in warm climates

The EPA estimates that placing computers in “sleep mode” reduces energy use by 60 to 70 percent. That's enough annual electricity savings to power Vermont, New Hampshire and Maine, cut electricity bills by \$2 billion and

Total PC power consumption per year for a well-managed 2,500-PC-strong organization is 50% lower than for an unmanaged one.”

Gartner
Research ID:G00150422

reduce carbon dioxide emissions by the equivalent of five million cars. “Hundreds of leading organizations have activated system standby and hibernate settings. GE, University of Wisconsin-Oshkosh, North Thurston Public Schools and others are saving as much as \$75 per computer annually.” (www.energystar.gov)

Promisec Enforces Green IT

Being “green” in the computing world saves money. It’s that simple. A well-planned and executed Green IT strategy is the most cost-effective way to streamline operations.

Promisec helps with planning and enforcement. With Promisec, IT professionals can pre-define a range of power management settings. These pre-configured settings are comprehensively enforced as consumption is significantly reduced. Promisec installs no software client on the endpoints preventing any unauthorized changes to settings. Green IT policy is properly executed and cost- saving expectations are achieved.

With Promisec (an Energy Star Partner), savings add up quickly:

- ▶ Reduction in unnecessary energy consumption by 600 kWh or more per PC annually
- ▶ Savings of \$25-75 per PC annually (add the Energy Star reference)
- ▶ Reduction in CO2 emissions over ½ ton per PC per year
- ▶ Prolonged hardware life cycle: monitor, hard-drive or computer placed into “sleep” mode when inactive
- ▶ Reduction in cooling costs and noise
- ▶ Prolonged battery life for laptops (when not plugged in)

Typically, energy savings during the first few months will offset initial costs. Plus, the overall life of the endpoints will be extended, reducing the frequency of purchasing new computers.

Promisec Clientless Power Management

Promisec works remotely and automatically with no client deployed on the endpoint. This approach has two obvious advantages that ensure complete enforcement. First, as mentioned above, Promisec cannot be tampered with or disabled at the endpoint because there is nothing installed at the endpoint. Second, IT administrators do not have to worry about any commonly experienced system conflicts with other agents. This is a problem that can prevent certain machines from waking up for a patch. Promisec will make sure all machines are awake for a scheduled patch.

If regular patch deployment is scheduled for 2:00am on a Saturday, Promisec automatically wakes up machines for “patch” time and then

Why Go Clientless?

- ▶ Unprecedented visibility
- ▶ More efficient, saves time
- ▶ No agent installation and maintenance
- ▶ No extra resources
- ▶ No risk and burden associated with implementing another agent

returns them to “sleep” or “hibernate” mode. IT departments are assured that all endpoints were awake for the patch. If an endpoint was not properly patched for any reason, Promisec immediately sends an alert so that the problem can be remediated. This is an essential advantage of using a complete management solution that includes power management in its feature set.

Promisec Power Management is a “set and forget” solution that enables organizations to comply with strict Green IT standards. IT managers get peace of mind that all power settings are firmly in place.

Promisec’s 7 Steps (in 24 hours) to effective Power Management

Today

1. Find all the machines awake on the network.
2. Measure the actual Power Management usage per machine via Promisec’s clientless engine.
3. Dial in your savings by testing how each configuration will save power across the enterprise, not just on a small sample test bed of metered machines.
4. Apply the new policy to all appropriate machines and schedule as many wake-up calls as needed to support your IT, security and business needs.

Tonight

5. Use pre-defined Power Management configurations or customize your own.
6. Enforce power settings on every endpoint.

Tomorrow

7. Experience real quantifiable savings.

Why Go Clientless?

Why deploy another agent to enforce existing power settings that can be centrally managed without a client?

The answer is obvious. There is no agent installation and maintenance, no extra resources and none of the risk and burden associated with implementing another agent. Clientless Power Management is also more efficient and saves valuable time.

Promisec Clientless Power Management is a straightforward Power Management solution. Promisec enforces power settings with unprecedented visibility and the fastest, most efficient and accurate results

“Promisec’s installation was almost point and click and it was done. Being able to manage remote machines en masse has been a tremendous boon for us.

We really were not able to do a lot of the things we do now without Promisec.”

Jon Miller
CISO
New York City, HRA

in the industry. With no deployment on the endpoints, Promisec can be installed in minutes (not the standard 6 months), has zero impact on productivity and delivers savings from day one.

With Promisec Clientless Power Management, you can easily and remotely:

- ▶ Turn off monitors and hard disks
- ▶ Place systems into standby or hibernation modes
- ▶ Schedule power management options to meet your offline maintenance (i.e. patch-management) needs
- ▶ Diagnose power consumption and costs
- ▶ Enforce your specifically designed settings

Measure, monitor, manage and enforce Green IT strategies across the enterprise without an agent or WoL.

IT Maintenance, Power Management and the Challenge to Security

The advantages of implementing a power management solution are clear, but what about essential security and maintenance tasks? To prevent business interruption, these duties sometimes need to be performed during off hours when power managed computers are powered down.

An effective power management solution must include an effective “wake-up” feature.

Typically, network maintenance happens at night so as not to interfere with day-to-day business operations. Of course, in order for these tasks to occur, endpoint machines must be powered on during off hours for patches and updates.

Wake on LAN (WoL) is a technology designed to wake up sleeping computers. In the mid-nineties, WoL began to address energy conscious users and companies who turned off computers at night. The promise of WoL would allow for routine maintenance while enabling the growing trend toward computer power savings.

WoL’s innovation set a standard to support this trend, as an abundant new market emerged for power management vendors. But the technology’s inherent limitations have conflicted with security and IT concerns, causing a slew of enforcement and operational challenges.

Technical challenges of Wake-on-LAN (WoL): what vendors don't want you to know

WoL technology broadcasts specially coded network ("magic") packets to machines that are equipped and enabled to respond to the packets. The problem is that there may be infrastructural conflicts with magic packets on the network. This can result in entire groups of computers not being woken up to receive a necessary patch. There are two main reasons why these conflicts occur.

First, when a "packet," or message, is sent out to wake machines for maintenance tasks, the packet must travel through a series of switches, firewalls and routers. WoL relies on this broadcast packet that may not be supported and therefore not forwarded by the network architecture.

The second limitation of magic packets is that hardware (communication card) on some machines may not be configured for and supported by WoL. Furthermore, despite recent advancements in hardware manufacturing, Network Card settings (to enable WoL) and unpredictable bios upgrades continue to delay companies from truly receiving the full value of Power Management savings. Various vendors downplay this fact. However, ask them to remediate any non-responsive machines at no additional cost and the hidden challenges of WoL strategies are quickly revealed.

Wake on LAN: Risks, Burden and Added Resources

Wake on LAN comes with a host of potential risks and extra required resources. WoL requirements that are meant to strengthen its inherent operational and security flaws may to some degree improve its effectiveness. But, these requirements need constant maintenance and additional staff. This added maintenance increases the probability of human and technical error.

Moreover, WoL creates a heavy burden on network resources and additional expenses that can cancel out savings gained from Power Management implementation.

The risks associated with WoL magic packets decrease their actual value to the network. Packets are sent out in the form of an IP broadcast that must be read by a correct MAC address in a network card in order for the packet to carry out its objective. Magic packets are sent via the data link or OSI-2 layer, which is not secure and can be used or abused by anyone on the same LAN.

Risk of adding a Port Forward Rule for an IP broadcast through firewalls

Firewalls may also prevent clients within the public WAN from accessing the broadcast address of the private LAN. To be able to allow broadcasting

The cost of WoL implementation and maintenance often cancels out the desired Green IT savings.

Promisec maximizes savings while comprehensively enforcing Green IT compliance.

through firewalls (and routers), the organization must add a Port Forward Rule, which can lower the security level and expose a network to risks such as Denial of Service (DoS) attacks. This type of attack can render a computer and computer network completely useless; a sufficient reason network teams have for disabling broadcast forwarding.

Transport Layer Security (TLS) encryption

Reliance on MAC addresses also requires the implementation of a special database, an extra resource that requires time, money and additional personnel. Additional security features and protocols such as Transport Layer Security (TLS) encryption have been developed to improve WoL's inherent security flaws. But, as mentioned above, TLS, like other WoL add-ons must be maintained and still does not resolve all of WoL's security flaws.

How Promisec "Wake-up" Works

Promisec Clientless Power Management offers an alternative to the industry standard Wake-on-LAN approach to waking up machines in "standby" or "hibernation" mode. From a single point, Promisec configures wake-up times in advance without the need for "magic packets." The solution goes directly to the endpoints without the administrator having to change any configuration in the routers, switches, firewalls, or other hardware. This takes out the error inherent in WoL's approach and avoids standard system conflicts. Promisec provides complete and secure network coverage that WoL cannot guarantee.

As discussed before, WoL's broadcasting method requires security add-ons that cost extra time and money to maintain, and still do not provide a totally secure environment for waking up machines. Promisec's clientless architecture avoids WoL's security vulnerabilities and the costs involved to address them.

With Promisec, there is no periodic maintenance and no extra resources or requirements. This means no extra maintenance costs. The cost of WoL implementation and maintenance often cancels out the desired power management savings. Promisec maximizes savings while comprehensively enforcing Green IT compliance.

Today, Power Management has helped IT strengthen its evolving role as an added value to business. But, to maximize its potential, organizations must employ an effective method for waking machines that does not present additional challenges to day-to-day IT operations and enforcement.

EPA Recommendations

The EPA recommends placing computers into a "standby" or "hibernate" setting after 30 to 60 minutes of inactivity. EPA standards place monitors into sleep mode after 5 to 20 minutes of inactivity for even greater savings.

Promisec offers two predefined policies aligned with the EPA's recommendations and a "light" option designed for daily business needs commonly observed in most enterprises. A fourth option enables organizations to customized settings for even more specific needs. With Promisec's "customized" option, power management configurations can be aligned for specific groups, business units or floors.

Choose the Power Management Plan for You:

(Each plan returns its own specific cost savings)

	Monitor turns off	Hard drive turns off	System standby	System hibernate
Light	45 min.	1 hr.	2 hrs.	3 hrs.
Medium	30 min.	45 min.	1 hr.	2 hrs.
Maximum	15 min.	30 min.	45 min.	1 hr.
Customized*				

*Customized: by groups, business units or floors; integrated with Active Directory to enable the flexibility of deployment.

Power Management: Part of Promisec's Complete Clientless Endpoint Management (CEM) Suite

Promisec Clientless Power Management is part of Promisec's complete suite of CEM software solutions. The unprecedented visibility and control of Promisec CEM gives Promisec Power Management a clear advantage over stand-alone power management solutions.

Promisec CEM monitors all network endpoints 24/7, returns fast and accurate reports and provides tools to remediate threats. Security, compliance and policy issues are identified and resolved in minutes. Promisec Power Management leverages these capabilities, delivering the most effective solution on the market.

Visibility to See Green and Save Green

Unlike Microsoft Group Policy and leading agent-based solutions, Promisec does not miss anything on any workstation in a distributed network. Technical or user errors or tampering are immediately visible. Plus, Promisec provides a daily progress report on savings with Power Management implementation.

Conclusion

Promisec Clientless Power Management is streamlining corporate networks by providing a more cost-effective and efficient approach to reducing power consumption. Promisec's clientless "set and forget" solution ensures that pre-configured power settings remain firmly in place. While supporting and enforcing Green IT compliance, organizations save millions in long term energy costs.

Today, enterprises no longer have to rely on the standard WoL for waking up machines. Promisec's clientless alternative easily adapts to any organizational infrastructure enabling comprehensive coverage. Promisec therefore ensures 100% patch deployment, strengthening the network's security posture.

The advantages of adopting a strict power management policy are clear: cost and energy savings and environmental conservation and preservation. But while adopting a sensible policy is crucial, enforcement presents its own set of challenges. The right technology should strictly enforce power management compliance without the risk of technical or end user interference. Promisec eliminates this risk delivering maximum energy and cost savings.

With clientless power management, Promisec helps to maintain the financial health of the organization and the environmental health of the planet.

About Promisec®

Promisec, Inc. provides clientless endpoint management (CEM) software solutions that give corporate IT administrators unprecedented visibility, speed and control over internal network endpoints, in-depth real-time intelligence to identify threats, and the tools to neutralize them. The company's products, Promisec Spectator® and Promisec INNERspace™, are used by a wide range of SMBs and Global 2000 organizations. With 24/7 or on-demand clientless monitoring, compliance and remediation, Promisec protects against business disruption caused by internal network threats while optimizing IT operations and enabling organizations to confidently place trust in their most important assets - their people. Founded in 2004, Promisec's headquarters are located in Israel with offices in New York and Paris.

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