Save Energy Costs

Without Compromise

Capgemini* Services leveraging Intel® Centrino® Pro and Intel® vPro™ Processor Technology[1], with Microsoft* Windows* Vista

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Executive Summary

Capgemini*,[2] is providing a unique "green" solution to help companies reduce costs and improve corporate social responsibility. This solution is being delivered through the hardware-based capabilities of Intel® Centrino® Pro and Intel® vPro™ processor technology.[1] Capgemini can now help customers:

- *Reduce power costs for PCs*
- *Improve energy conservation in a way that makes financial sense*
- *Realize cost savings without compromising service, performance or productivity*

Capgemini is a recognized global leader in IT consulting, technology, and outsourcing.[3] Working closely with Intel and Microsoft, Capgemini has developed an integrated desktop system management solution that reduces power usage and enables remote management of notebooks with Intel Centrino Pro processor technology and desktop PCs with Intel vPro processor technology. The hardware-based capabilities enable Capgemini to perform updates, troubleshoot PCs, isolate systems, and remediate problems without leaving the service center. These capabilities are available anytime, even when PC power is off, an operating system (OS) is unresponsive, management agents are missing, or hardware (such as a hard drive) has failed.

Intel's latest processors can offer a power reduction of up to 40% compared to previous generations of processors.[4] The Capgemini solution is a prebuilt integration of Intel Centrino Pro and Intel vPro processor technology and the Microsoft Windows Vista™ Operating System.*,[5] The result is an advanced system management capability that further optimizes power savings without additional cost. This integrated solution helps reduce costly site visits and increases security for PCs. With access to Capgemini's scale and tens of thousands of people and servers located worldwide, customers get a reduced total cost of ownership with increased performance and availability.

PC power costs can be reduced by an average of 50% and by up to 70% compared to Intel® Pentium® 4 machines running the Windows XP* operating system.[5,6] Power savings of up to 70% are possible as compared to a situation when the enterprise must have all PCs powered on overnight for patch management and security updates.[6] As stated, the 50% average savings assumes companies have no policy and an average number of PCs are always on.

Improving energy conservation and network security through remote manageability

Today's challenges

- Reduce carbon footprint
- Save money on power bills
- Increase user productivity and availability by reducing downtime

Enterprises are increasingly concerned with energy conservation — not just with reducing IT service costs for PCs. For example, to help reduce energy consumption, businesses often require that people power down PCs before leaving for the day.

Unfortunately, IT staff can not usually remotely manage, update, quarantine, or remediate PCs that are powered off. Instead, service providers must often perform tasks during work hours — when they can interfere with worker productivity — or dispatch field technicians to PCs that were not available from the service center, in order to perform costly, on-site services.

Energy conservation can reduce cost

Intel Centrino Pro and Intel vPro processor technology are making it easy to support "green" or environmental initiatives. Intel and Capgemini studies have shown that combined with intelligent system management and Windows Vista power-management features, the hardware-based capabilities of Intel Centrino Pro and Intel vPro processor technology can:

- **Reduce a customer's carbon footprint,** or carbon emissions, to better comply with industry and government regulations

- **Eliminate wasted idle-power hours** by allowing people to power PCs down when not in use, yet still allow IT staff to remotely and securely power systems back up as needed for service.

- **Eliminate site visits** and their respective travel costs and resource requirements.

- **Improve performance per watt by 26% to 40%** over previous generation PCs via 64-bit Intel® Core™2 Duo processors.[4]

- **Take advantage of smaller, quieter form factors** — an important key to meeting increasingly stringent requirements for energy and acoustics from government regulatory bodies and other organizations.

Start saving up to 70% of your PC power budget

The latest Intel processors can already deliver a 40% reduction in power use in comparison with the last generation, but how can power savings be further optimized? [4]

According to DEFRA (Department for Environment, Food and Rural Affairs), each kWh of electricity consumed in the UK equates to 0.43 kg of carbon dioxide emissions.[7] With 25% to 30% of people leaving their PCs powered on overnight or over the weekend, there can be as much as 12 to 15 hrs of idle power used up per night per PC -- that's a lot of wasted energy and unnecessary carbon dioxide emissions.[8, 9]

The biggest opportunity to reduce carbon footprint and power consumption for PCs is to power them down when they are not in use. For example, a business with 10,000 PCs could reduce emissions by over 2,200 tons per year.[9] With electricity prices at about 15 pence per kWh (US$0.11), reducing power consumption for 12 to 15 hrs a night could result in savings of up to £500,000 (US$367,000) for an enterprise having 10,000 desktop PCs.[9]

The challenge is finding a way to keep PCs powered down when not in use, while still allowing remote access for security and management tasks.

New tools to reduce power consumption

Capgemini has found that system management leveraging Intel Centrino Pro and Intel vPro technology with Microsoft Windows Vista offers an excellent opportunity to reduce energy consumption:

- **Windows Vista power management** provides more efficient sleep states after 60 minutes of idle time. Even if someone leaves the PC powered on overnight, the system will by default go into a sleep state after an hour to help save power. Microsoft testing has shown that the default power-management settings could save businesses up to 46% in power bills.[9]

- **Secure, remote power-up capability of Intel Centrino Pro or Intel vPro technology.** Capgemini staff can now remotely and securely power up a PC without leaving the service center. This means people can power down PCs at night, and Capgemini staff can remotely power the PCs back up as needed for updates and patching, then return

"Capgemini has experienced considerable power savings in our laboratories using Intel vPro processor technology. The benefits of being able to manage devices independent of operating system or even power will find synergies throughout our global client base."

- David Fitzpatrick, Vice President, Capgemini Desktop and Distributed Services

systems to the power state in which people left them: on, off, hibernating, or sleeping. Capgemini estimates that powering up PCs off-hours only when needed could help customers who don't do this currently save an average of 50% and up to 70% on power bills.[6]

- **Perform tasks whilst PCs are powered off.** Intel Centrino Pro and Intel vPro technology deliver out-of-band access to the PC regardless of PC power state or the state of the OS. With out-of-band access to the PC, IT staff can now perform many management and monitoring tasks even while the PC is powered off. These tasks include discovery, hardware-asset inventory, monitoring event logs, and checking BIOS configuration information.

Figure 1 shows the improvements in efficiency delivered by Intel Centrino Pro and Intel vPro technology as compared to previous generation of PCs. Table 1 also shows the potential savings in various countries for companies with 10,000 desktops using the Capgemini solution.[9] For example, with current UK electricity prices, the Capgemini solution could save an organization with 10,000 desktops up to £500,000 (US$367,000) a year.[9] Table 2 lists some of the efficiency improvements delivered by Intel Centrino Pro and Intel vPro technology over previous generation PCs.

By integrating Intel Centrino Pro and Intel vPro technology and Windows Vista, Capgemini will help customers realize even greater energy savings around the clock. In turn, this will help corporations meet conservation goals and save money on their power budget.
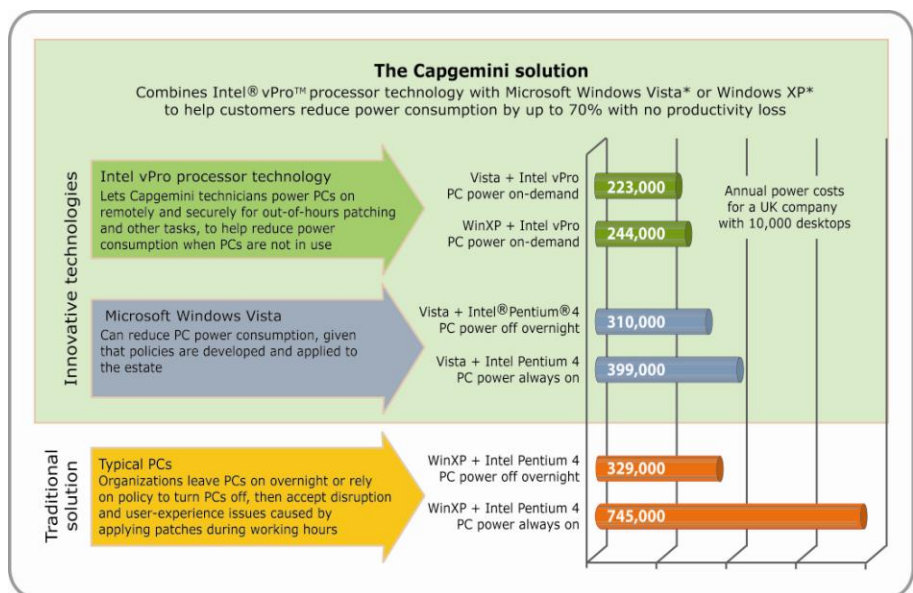
Figure 1. Improved efficiencies.

Capgemini has developed a solution that leverages Microsoft Windows Vista* and Intel® vPro™ processor technology to ensure that power is on-demand, allowing out-of-hours patching and offering power reduction of up to 70% with no productivity loss as compared to previous generation PCs and operating systems.[9]

Table 1. Potential savings for an organization with 10,000 desktops[9]

Country	Cost per KWh[9]	Annual potential savings with the Capgemini solution of up to:[9]
Netherlands	16 Euro cents	€533,000
U.K.	15 p	£500,000
U.S.	11 ¢	$367,000

Table 2. Improved efficiencies of Intel® Centrino® Pro and Intel® vPro™ technology over previous generation PCs[a]

Category	Efficiency improvement with Intel® Centrino® Pro and Intel® vPro™ technology[a]
Boot time for notebooks	20% faster [a, b, 10]
Launching applications on notebooks	2x faster [a, b, 10]
CPU energy efficiency	40% more efficient [6]
Notebook energy efficiency	26% more efficient [6]
Compliance	All categories of 2008 Energy Star are enabled [11]

[a] Power savings and improved efficiencies are in comparison to previous generation PCs running Microsoft Windows XP*, with Intel® Pentium™ 4 processors.
[b] Using the optional Intel® Turbo Memory, which stores large amounts of information closer to your processor to help reduce boot time and enable faster application loading when running Microsoft Windows Vista*.

Better remote service, fewer problems, and improved user experience

This energy saving solution also allows Capgemini to use a single management console to secure and manage both notebook and desktop PCs even when power is off,[1] an OS is unavailable, hardware (such as a hard drive) has failed, or management agents are missing. The Capgemini solution includes:

- Microsoft Windows Vista*

- Microsoft System Center or Microsoft Systems Management Server* 2003 R2 (SMS 2003*) with Intel® Active Management Technology Add-on for SMS 2003

- Intel Centrino Pro processor technology for notebook PCs

- Intel vPro processor technology for desktop PCs

Intel Centrino Pro and Intel vPro technology include hardware-based management capabilities. A new level of improved security and remote management complements traditional agent-based techniques used to deploy new PCs. This includes techniques used to isolate suspect systems, remotely powering up PCs for critical updates and off-hours patching, remote troubleshooting and diagnosis of problems, patch management, or deployment of software — even when an OS is unresponsive or hardware has failed.

When accessed through System Center, these hardware-based capabilities reduce energy consumption for customers. At the same time Capgemini can increase automation, deliver improved remote services off-hours and enhance mean time to repair while minimizing business interruption and maximizing productivity. Extending mass deployment to target devices independent of power state means that Capgemini can deliver this solution as a prebuilt transformation service faster and with greater accuracy. The ultimate goal is to make it easier to design, deploy, manage, and support desktop infrastructure, and reduce the total cost of owning technology.

New tools for your security toolbox

PCs with Intel Centrino Pro and Intel vPro technology include many hardware-based capabilities designed to improve security, including remote power on/off/reset, "always available" policy-based alerting, agent presence checking, hardware-based filters for network traffic, and isolation circuitry. When used with System Center, these capabilities help Capgemini improve security for PCs, reduce risk for businesses, and lower the cost of securing the customer's network, applications, and data.

For example, the secure, remote power-up capability is both more secure and more efficient than wake-on-LAN (WOL). Because the hardware-based capability is built right into PCs, it enables management applications with new features, such as the ability to update PCs that have not traditionally been available for remote management. Because the capability is also OS-neutral and available anytime, Capgemini has a way to remotely manage a variety of OSs in environments that may not have been configured for WOL.

Capgemini IT staff can now extend system management to automate updates, upgrades, and patching for PCs that have been powered off. System Center simply polls PCs for their power state, powers up PCs that are off, installs the update, and gracefully powers the PCs back down.

Integrating the secure remote power-on capability of Intel Centrino Pro and Intel vPro technology into the system management solution means Capgemini can improve customers' security services by speeding up application and security updates and patching for PCs that have traditionally been unavailable remotely. Capgemini improves client uptime and availability through a more reliable network, but could also help customers save significantly on power bills, since people no longer need to leave their PCs on overnight for patching.

Intel optimizes performance for Microsoft Windows Vista*

Windows Vista is a heavily threaded OS that helps people perform indexing, text-based searching, and other compute-intensive tasks much faster. To maximize Windows Vista performance, PCs with Intel Centrino Pro and Intel vPro technology are optimized for multithreading and multitasking. Support for multithreading and graphics include:

- **Intel® Core™2 Duo processor for 64-bit multithreaded performance.**[12] This processor is optimized for improved multitasking and multithreading with compute-intensive applications, and it delivers significantly improved performance over previous-generation notebook and desktop PCs. Capgemini IT staff can now run critical tasks such as virus scans and e-mail synchronization in the background without bogging down foreground applications.

- **64-bit graphics support: No need for a discrete graphics card.**[12] PCs with Intel Centrino Pro and Intel vPro technology have built-in 64-bit graphics for an outstanding Windows Vista Aero* experience. There is no need for a discrete graphics card with these PCs. This helps reduce the need to build and maintain additional components, which in turn lowers the cost of technology.

Simplify and reduce the cost of your infrastructure

Capgemini has integrated the Intel and Microsoft technologies into its prebuilt, scalable, and standardized desktop services. Incorporating Intel vPro technology and Microsoft Windows Vista deployment frameworks into its mass deployment capabilities means Capgemini can transform customers to take advantage of the power, security, performance, and productivity benefits of this solution fast. Add the high availability and low mean time to repair gained from leveraging Capgemini's scale and delivery experience, and the result is a simplified desktop environment lowering cost.

Summary

Capgemini offers enterprises the ability to save energy costs without comprise. By using the hardware-based capabilities of Intel Centrino Pro and Intel vPro technology an average of 50% and up to 70% savings in PC power costs are possible.[6] Capgemini also expects the hardware-based capabilities of these PCs to enhance many security and management processes, helping to provide increasingly responsive services. The combination of Capgemini services, Microsoft Vista and management tools, and Intel Centrino Pro and Intel vPro technology offers customers a unique scalable solution to save energy costs.

For more information

PCs with Intel Centrino Pro and Intel vPro technology provide IT administrators with critical, hardware-based security and manageability capabilities not available in software-only solutions. When provisioned with third-party software, these PCs can be managed directly from the management console, regardless of their power state or the health of their OS.[1]

For more information about Intel Centrino Pro and Intel vPro technology, visit **www.intel.com/go/businesspc**

For more information about Capgemini services, visit **www.capgemini.com**

For more information about Microsoft products, visit **www.microsoft.com**

Company Info

Capgemini, one of the world's foremost providers of consulting, technology and out-sourcing services, helps businesses implement growth strategies, leverage technology, and thrive through the power of collaboration. Capgemini employs over 82,000 people worldwide, and reported 2007 global revenues of 8.7 billion Euros.

Microsoft Corporation, founded in 1975, is a worldwide leader in software, services, and solutions that help people and business realize their potential.

Intel, the world leader in silicon innovation, has continuously developed the technology, products, and initiatives that enable the computer and Internet revolution that is changing the world. Founded in 1968 to build semiconductor memory products, Intel today is the world's largest chip maker, and a leading manufacturer of computer, networking, and communications products.

1 Intel® Centrino® Pro processor technology and Intel® vPro™ processor technology include powerful Intel® Active Management Technology (Intel® AMT). Intel AMT requires the computer system to have an Intel AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. With regards to notebooks, Intel AMT may not be available or certain capabilities may be limited over a host OS-based VPN or when connecting wirelessly, on battery power, sleeping, hibernating or powered off. For more information, see http://www.intel.com/technology/manage/iamt.

2 All information about Capgemini was provided by Capgemini.

3 June 2007: Capgemini ranked the No. 1 Global Outsourcing Vendor according to "Black Book of Outsourcing" average survey position, 2004-2007.

4 Source: Intel® Core™2 Duo fact sheet, 2006, Intel.

5 All information about Microsoft was provided by Microsoft.

6 Source: Capgemini Evaluation of Intel® Active Management Technology, October and November, 2006. Other IT service providers may see different results, depending on their service environment.

7 Source: DEFRA's Guidelines for Company Reporting on Greenhouse Gas Emissions: http://www.defra.gov.uk/environment/business/envrp/gas/index.htm.

8 Source: The Microsoft white paper, "Power consumption and management: Windows Vista versus Windows XP," March 2007, Microsoft.

9 Source: Capgemini evaluation, "Instinct 2.0 Desktop Power Saving," May 2007.

10 Tests run on customer reference boards and preproduction latest generation Intel® Centrino® processor technology with optional Intel® Turbo Memory enabled against like systems without Intel® Turbo Memory. Results may vary based on hardware, software and overall system configuration. All tests and ratings reflect the approximate performance of Intel products as measured by those tests. All testing was done on Microsoft Vista* Ultimate (build 6000). Application load and runtime acceleration depend on Vista*'s preference to pre-load those applications into the Microsoft ReadyBoost* cache. See http://www.intel.com/performance/mobile/benchmarks.htm for more information.

11 When using Intel client measurement metric on the desktop, refer to Intel Methodology Whitepaper: http://www.intelcapabilitiesforum.net/EEP_whitepaper?m=v \. *ENERGY STAR denotes a system level energy specification, defined by the US Environmental Protection Agency, that relies upon all of the system's components, including processor, chipset, power supply, HDD, graphics controller and memory to meet the specification. For more information, see http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CO*

12 64-bit computing on Intel architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations.

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