TECHNICAL PAPER

Sustainability with Intel vPro® platform and Intel® Active Management Technology (Intel® AMT)

"Intel vPro® platform-based PCs can really help our remote clients—especially the ability to power on and off remotely. One of our clients, for instance, has their internet located more than a mile away from their office site because that's where the fibre was—and so we're doing point-to-point connection via a dish for them. We set up an Intel NUC Mini PC there so that we can power on and power off, and recycle, and our clients don't need to run over there."

Gregory Durnan
CEO, Acacia Information Technology

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Introduction

Many workers unknowingly waste organization money through one simple act: leaving their PCs on when they are not being used, especially overnight and during the weekends. As many as half of U.S. employees who use a PC at work typically don't shut their computers down at the end of the workday, wasting significant dollars. Collectively, U.S. organizations waste $2.8 billion every year powering 108 million unused PCs.[1]

Awareness among organizations of green technology and climate change issues is growing. Increasingly, implementing green IT both reduces the carbon footprint and provides return on investment. Green IT aims to minimize the negative impact of IT operations on the environment by operating and disposing of computers and computer-related products in an environmentally friendly manner.

Researchers estimated that 40 per cent of computers were left on overnight, wasting valuable energy,[2] as much as half the total energy consumption. Most people think putting their PC to sleep or into hibernate mode saves energy, but that's not necessarily the case. A computer can still use anywhere between 1 and 60 kilowatts per hour when it's asleep.[3] (An average computer consumes about 50-60 watts.[4]) Turning off PCs is a simple yet essential way to save energy.

Taking into consideration the increasing power rates, managing PC power can drive considerable cost-savings. For every 20,000 computers, turning off inactive PCs can add up to 1 million kilowatt hours (kWh) of energy consumption annually. At average energy rates of $.10 per kWh, that is $100,000 of savings. According to the EPA, office computers that use energy management solutions such as Intel® Active Management Technology (Intel® AMT) require 50% less energy when compared with office machines without energy management software, saving $25 - $75 per PC.[5]

What is Intel® Active Management Technology?

Intel AMT is a feature of the Intel vPro® platforms based on select Intel® Core™ and Intel® Xeon® processors. This feature has been available for over a decade. Platforms equipped with Intel AMT can be managed remotely, regardless of their power state or the state of the operating system.

With Intel AMT, the Intel vPro platform provides a flexible and powerful remote management solution. Intel AMT supports both in-band (OS is operational) and out-of-band (OS is not operational or PC is turned off) management and control.

Intel AMT enables IT or managed service providers to manage and repair PC assets, workstations, entry servers, and connected internet of things (IoT) devices using the same infrastructure and tools across platforms. Used in combination with Intel processors and network controllers, Intel AMT forms a critical part of a hardware-enhanced system manageability, security, and power management.

Intel AMT helps improve remote diagnostics, streamline PC imaging, conserve energy, and reduce power costs. Intel AMT provides simple scheduling to power down systems not in use and then wake up systems before users arrive at work. It also keeps systems available to turn on for overnight diagnostics, upgrades, and patch deployment. Thus, IT teams can efficiently manage electricity consumption without affecting employee productivity. Intel AMT detects and solves situations that interfere with regular PC power down and power up. Intel AMT can even manage PCs via a web interface in order to ensure optimum energy conservation of PC fleets, *even those* outside the firewall.

With the host wake up feature it is possible to set an alarm clock within Intel AMT to wake up the host processor when it is in a sleep state or when it is powered off. Setting different times to power on many PCs saves network bandwidth. And the power on/power down feature works for both wired and wireless connected PCs. The wake-up mechanism performs the equivalent of a remote-control power on command.

In addition to power management, IT teams can use Intel AMT to:

- Provide remote access to a device to reduce maintenance and support costs and avoid desk-side visits
- Improve system deployment, rebuild, and upgrade processes. Out-of-band Keyboard/Video/Mouse (KVM) remote control maintains KVM connection through reboot cycles when powering on PCs
- Use Intel AMT power control to help keep devices updated with the latest patches by allowing the IT department's patch deployment software to work on off-hours and avoid working hours reboots, even for remote employees
- Provide a more secure and effective decommissioning process for lost or retired devices, by accelerating removal of sensitive stored data with technologies such as Intel® Remote Secure Erase, available on Intel® SSD Pro drives. Remote Secure Erase also makes it easy to reuse/repurpose PCs for continued value in the corporation[6]

And now with Intel® Endpoint Management Assistant (Intel® EMA), IT organizations can reach Intel vPro devices beyond the corporate firewall and into the cloud, helping address today's challenges, no matter where the Intel vPro device is located.

"Though Intel vPro with Intel AMT is a great tool to remotely monitor and PC management, it also has various features which can be utilized to the maximum by an enterprise the size of Sharaf Retail. The biggest advantage of the tool is the ability to control the device especially when it is powered off. The ability to schedule the power on and power-offs can result in greater power savings and can reduce the footprint of the organization in a great way."

AS Pillai
General Manager IT, Sharaf Retail

Reduce Your Carbon Footprint with Remote Management of PC Fleets

In addition to off-hours power management, Intel AMT has remote manageability, which can reduce the CO^2 emissions of travel to remote sites or shipping of broken systems. These features include remote scheduled maintenance, backups, and diagnostics in addition to enabling overnight patch deployment.

Intel EMA means organizations can remotely manage a single system or multiple endpoints across most work sites—for remediation or power on for patching. Remotely patching or changing a boot sequence to restore a PC not only reduces a technician's time and travel costs, but also helps minimize the impact of updates on daytime

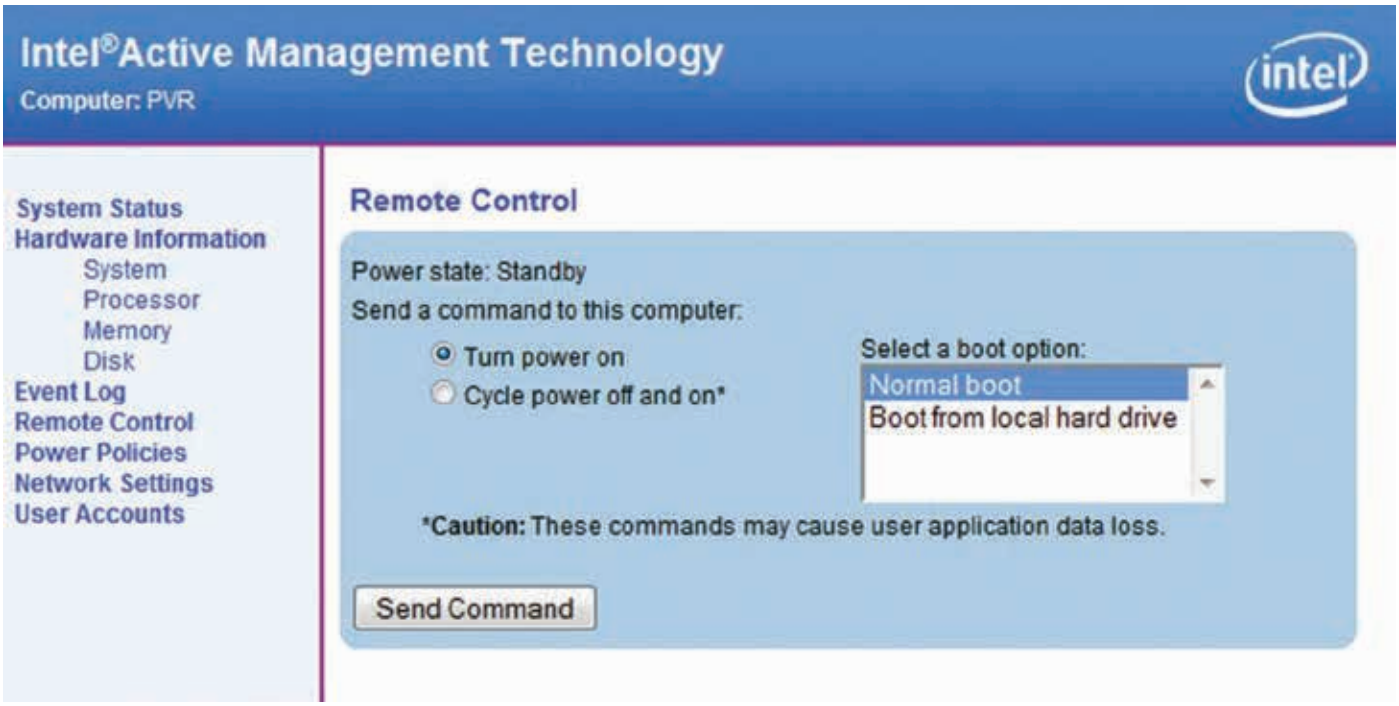

Figure 1. Intel AMT gives you control over how you conserve energy, including remotely waking or booting your devices on specific schedules

productivity. Intel AMT management capabilities integrate with other power management tools, including Microsoft SCCM to help resolve issues remotely and more securely, both when Windows is running or when Windows is down, a task previously only completed by dispatching a technician. Intel AMT can manage PCs from users who are working from home or remote office.

In total, these platform manageability features can reduce carbon footprints and help improve sustainability.

Intel Recommendations

- Deploy managed computing endpoints with a flexible solution that incorporates both in-band and out-of-band capabilities
- Standardize on the Intel vPro platform for computing endpoints that deliver impressive energy management, performance, stability, manageability, and security features
- Activate manageability features in Intel vPro platforms to help reduce energy costs
- Access the Intel vPro Platform TCO Estimator to simulate endpoint deployments and see how much you can potentially save

Learn more at: http://estimator.intel.com/vpro/

Summary

In many businesses, many computers are left on when not in use and wasting energy. A medium-sized business can save thousands of dollars a year by shutting down their computers overnight.[7] This makes computer energy use a rich target for cost savings and energy conservation strategies. Save energy by only powering devices during business hours.

Intel AMT is an enterprise-class PC management hardware and software solution that can help organizations reduce computer energy usage. With Intel AMT, organizations can contribute meaningfully to their green initiatives through reduced carbon emissions, while never having to worry about impacting business continuity or user productivity.

Intel AMT is a remote PC manageability system that demonstrates measurable ROI, easy to enable, and is capable of transparently saving both computer energy use and technician time and travel.[8]

Intel AMT, which is included on Intel vPro devices, enables remote access to a device for power management, enhanced security, diagnostic, and management functions, even if the PC is powered down, the operating system is unavailable, or there is a disk failure. It is supported by free open

source tools and commercial tools from Intel for activation and deployment and can be integrated with existing management tools and platforms.

Intel vPro platforms with Intel AMT and the subsequent activation of their remote management capabilities can deliver lower energy costs and meaningful return on investment for businesses of all sizes. By helping to reduce energy costs, Intel vPro platforms can help a business support a sustainability program.

Learn More

- Intel vPro® Platform: Intel.com/vPro
- Intel® Active Management Technology: Intel.com/AMT

[1] Source: Alliance to Save Energy, *PC Energy Report 2009*, https://www.climatesaverscomputing.org/wordpress/wp-content/uploads/2011/06/1E_PC_Energy_Report_2009_US.pdf

[2] Source: Kim Vicente, *The Human Factor: Revolutionizing the Way People Live*, 2013, Page 114

[3] Source: Vivint Solar https://www.vivintsolar.com/blog/how-much-electricity-does-a-computer-use

[4] Source: EPA https://www.energystar.gov/products/low_carbon_it_campaign/faqs

[5] Source: EPA https://www.epa.gov/sites/production/files/documents/es_and_pm.pdf

[6] Source: Remote Secure Erase with Intel® Active Management Technology, https://software.intel.com/content/www/us/en/develop/articles/remote-secure-erase-with-intel-active-management-technology.html

[7] Source: Dan Gookin, *PCs for Dummies*, 2009, Page 55

[8] Source: The Economic Case for Intel vPro® Platform, https://www.intel.com/content/www/us/en/architecture-and-technology/vpro/total-cost-of-ownership-white-paper.html

Intel technologies may require enabled hardware, software or service activation.

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Results have been estimated or simulated.

Your costs and results may vary.

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