



White Paper
Intel® Centrino® Pro
Processor Technology
Intel® vPro™
Processor Technology

Intel® Centrino® Pro and Intel® vPro™ Processor Technology

Remotely manage both wired and wireless PCs from the same IT console to increase security and simplify system management

A new generation of notebook and desktop PCs provides proactive security, enhanced maintenance, and improved remote management. Notebook PCs with Intel® Centrino® Pro processor technology and desktop PCs with Intel® vPro™ processor technology deliver down-the-wire security and manageability capabilities – even if hardware (such as a hard drive) has failed, the operating system is unresponsive, software agents are disabled, a desktop PC's power is off, or a notebook's management agents have been disabled. Desktop PCs also include support for virtual appliances that allows IT managers to isolate and protect critical security and management applications in a tamper-resistant environment. In addition, the new generation of notebook and desktop systems delivers significantly improved performance for compute-intensive tasks – all in a power-efficient package that is Microsoft Windows Vista* ready.



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Executive Summary

Notebook PCs with Intel® Centrino® Pro processor technology and desktop PCs with Intel® vPro™ processor technology¹ deliver new, built-in security and remote management capabilities to meet critical business challenges. IT administrators can now more quickly identify and contain more security threats, take more accurate asset and hardware/software inventories remotely, resolve more software and OS problems faster and without leaving the service center, and accurately diagnose hardware problems down-the-wire.

The new security and management capabilities of these wired and wireless systems are based in hardware, not software. The advantage for IT is that the capabilities are available to authorized IT technicians down-the-wire, even for PCs that have traditionally been difficult to manage or unavailable to the IT management console. IT technicians can now secure and manage wireless notebooks across a variety of wireless networks – even if the OS is unresponsive or software agents are missing; and secure and manage wired notebook and desktop PCs, even if power is off, hardware has failed, or the OS is unresponsive. The result is increased compliance, more accurate inventories, fewer service depot visits and deskside visits, and less interruption to business.

The new generation of Intel-based notebook and desktop PCs deliver significantly improved performance for compute-intensive applications and multitasking – all in a power-efficient package that is Microsoft Windows Vista* ready. Desktop PCs with Intel vPro processor technology also include additional, hardware-based capabilities that give IT administrators the option of a lighter-weight form of virtualization² for mainstream business. IT technicians can now run critical security applications in a simplified, self-contained, dedicated virtual partition – or “virtual appliance” – even while users are working on their own compute-intensive tasks in the user OS.

IT can now spend less time on routine tasks, and can focus resources where they are most needed for better manageability and security of both notebook and desktop PCs.

Intel® Centrino® Pro and Intel® vPro™ processor technology

A new generation of notebook and desktop PCs delivers down-the-wire proactive security, enhanced maintenance, and remote management

Today's IT challenges

Information technology (IT) managers have a critical need for capabilities that make it easier to secure and manage notebook and desktop PCs. Key IT challenges today include:

- A dramatic increase in malicious attacks on PCs.
- A critical need to reduce user downtime caused by malicious attacks; problem PCs; maintenance; security updates; application upgrades; and other IT tasks.
- Financial and legal pressure to accurately inventory assets.
- Escalating demand for IT services that strain IT budgets.

Software-only management and security solutions for PCs have been unable to work around a fundamental limitation: they cannot secure or manage a PC that is powered off or whose operating system (OS) is unresponsive. With today's need for increased security and for establishing well-managed environments, the cost of managing PCs has become a significant percentage of the total cost of ownership of technology. A critical capability that would help IT do more with the resources they have is the ability to remotely manage and effectively secure both notebook and desktop PCs regardless of wired or wireless state, power state, or the health of the OS.

Improve security and simplify remote management

Intel Centrino Pro and Intel vPro processor technology¹ are designed to address the top IT challenges in security and manageability. This new generation of notebook and desktop PCs delivers tamper-resistant security and management capabilities that are based in hardware, not software. The advantage of the hardware-based capabilities over traditional software-based solutions is in allowing remote access to PCs that have traditionally been unavailable to the management console.

Intel® Centrino® Pro and Intel® vPro™ processor technology¹

Notebook and desktop PCs based on these advanced processor technologies deliver validated, fully integrated systems that help IT organizations improve security and remote management for both wired and wireless systems, yet still give users excellent performance for compute-intensive applications and multitasking – a unique combination of capabilities, only from Intel.

Intel® Centrino® Pro processor technology	Intel® vPro™ processor technology
Intel® Core™2 Duo processor T, L, and U 7000 ^A sequence	Intel® Core™2 Duo processor E6000 ^A sequence
Mobile Intel® 965 Express Chipset with ICH8M-enhanced	Intel® Q965 Express Chipset with ICH8DO
Intel® Active Management Technology ¹ (Intel® AMT)	Intel® Active Management Technology ¹ (Intel® AMT)
Intel® Virtualization Technology ² (Intel® VT)	Intel® Virtualization Technology ² (Intel® VT)
Support for 802.11a/b/g wireless protocols, with available support for draft n	Support for virtual "appliance" applications
64-bit enabled ³	64-bit enabled ³
Execute Disable Bit ⁴	Execute Disable Bit ⁴
Intel® Stable Image Platform Program (Intel® SIPP)	Intel® Stable Image Platform Program (Intel® SIPP)
Windows Vista* Ready	Windows Vista* Ready
Windows Vista* BitLocker* Ready	Windows Vista* BitLocker* Ready

Notebooks with Intel Centrino Pro processor technology and desktop PCs with Intel vPro processor technology deliver:

- **Hardware-based security capabilities**, to help improve compliance down-the-wire, ensure that third-party security software is available when needed, and remotely identify viruses, worms, and other threats faster and stop those threats more effectively.
- **Remote problem-resolution capabilities**, to help accurately diagnose hardware problems and troubleshoot and resolve more software and OS problems – including OS rebuilds – without leaving the service center.
- **Remote hardware and software inventory capabilities**, even if the OS is unresponsive or a system is powered off.
- **Remote asset inventory (discovery) capabilities**, to more accurately identify notebooks with Intel Centrino Pro processor technology and desktop PCs with Intel vPro processor technology on the network.

The new capabilities make it easier to automate more diagnostics, repair, and remediation tasks, further improving service efficiencies and freeing resources for other projects.

Wired and wireless PCs

Managing notebook and desktop PCs requires that technicians be aware of the state of the system. For example, before servicing a PC, a technician should know whether the system is AC-powered or battery-powered, on or off, awake or asleep. Being able to identify and change – if appropriate – the state of the PC allows the technician to identify when it is most advantageous to service a notebook or power up a desktop to perform work off-hours, when it won't interrupt the user.

Authorized technicians can use the new security and remote management capabilities of Intel Centrino Pro and Intel vPro processor technology for:

- **Wired systems.** Whenever a system – notebook or desktop – is plugged into a power source (AC power) and connected to the corporate network with an Ethernet cable, the security and management capabilities of Intel Centrino Pro and Intel vPro processor technology are fully enabled.

These notebook and desktop PCs can be managed similarly through the standard features of your third-party management software. Even when an AC-powered, wired notebook is asleep, virtually all management capabilities are available. The capabilities for AC-powered PCs are available to authorized technicians even when PC power is off, the OS is inoperative, hardware (such as a hard drive) has failed, or software agents are missing.

- **Wireless notebooks.** Notebooks can be remotely secured and managed within the corporate network, anytime they are in an active state (“awake”). This helps make sure that IT processes use battery power only when the system is powered up and awake. Capabilities for these systems are available even if the OS is unresponsive, software agents are compromised or missing, or hardware (such as a hard drive) has failed.⁴
- **Wireless notebooks outside the corporate network.** Some capabilities – such as agent presence checking, access to hardware/software asset information, and alerting – are available even if the wireless notebook is outside the corporate network and connected over a host OS-based virtual private network (VPN).

Figure 1, on the next page, shows the various states in which notebook and desktop PCs can be remotely managed using Intel Centrino Pro and Intel vPro processor technology. Refer to the discussion, *Managing the wireless notebook*, on page 8, for a list of capabilities available in wired and wireless states, active and sleep states, and various power states.

⁴Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number for details.

[†]Enabling Execute Disable Bit functionality requires a PC with a processor with Execute Disable Bit capability and a supporting operating system. Check with your PC manufacturer on whether your system delivers Execute Disable Bit functionality.

¹Intel® Centrino® Pro processor technology and Intel® vPro™ processor technology include powerful Intel® Active Management Technology (Intel® AMT). Intel AMT requires the platform 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>.

²Intel® Virtualization Technology (Intel® VT) requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM), and for some uses, certain platform software enabled for it. Functionality, performance, or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

³64-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. Consult with your system vendor for more information.

⁴Wireless access to the powerful capabilities of Intel® Centrino® Pro processor technology requires WPA, WPA2/802.11i security.

⁵Wireless connectivity and some features may require you to purchase additional software, services or external hardware. References to enhanced wireless performance as measured by Adjacent Channel Interference (ACI)*, refer to comparisons with previous generation Intel® technology. Availability of public wireless LAN access points is limited, wireless functionality may vary by country and some hotspots may not support Linux-based Intel Centrino processor technology systems. See <http://www.intel.com/products/centrino/index.htm> for more information.

⁶Up to 2x greater range and up to 5x better performance with optional Intel® Next-Gen Wireless N technology enabled by 2x3 Draft N implementations with 2 spatial streams. Actual results may vary based on your specific hardware, connection rate, site conditions, and software configurations. See <http://www.intel.com/performance/mobile/index.htm> for more information. Also requires a Connect with Intel® Centrino® processor technology certified wireless n access point. Wireless n access points without the Connect with Intel Centrino processor technology identifier may require additional firmware for increased performance results. Check with your PC and access point manufacturer for details.

⁷In order to experience the new benefits of wireless-n on notebooks with Intel® Centrino® Pro processor technology, users must be connected to a wireless 802.11n network. Existing 802.11a, 802.11b and 802.11g networks/access points will not provide the new benefits.

⁸For detailed information about the security methodologies and technologies used to secure the capabilities of Intel® Centrino® Pro processor technology and Intel® vPro™ processor technology, refer to the Intel® Active Management Technology Deployment and Reference Guide, Intel, 2006 at www.intel.com/business/vpro.

⁹Source: Various white papers, such as "Cutting-Edge Performance and Remote Manageability Reduce Training-Room Costs," published January 2007, Intel; "Reducing Manual Processes with Improved Remote Security, Inventory, and Problem Resolution," Intel, 2006; and other white papers available on the Intel Web site at www.intel.com/go/businesspp.

¹⁰Source: Intel white paper: "Reducing Costs with Intel® Active Management Technology," published August 2005. To download the white paper, visit www.intel.com/go/iamt.

¹¹Tests 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.

¹²For more information about system requirements for Windows Vista,* refer to <http://www.microsoft.com/windows/products/windowsvista/buyorupgrade/capable.mspx>.

¹³Any disk encryption technology may limit certain remote management capabilities. See your software vendor for information on interaction of disk encryption software and remote management.

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