Intel® Core™2 Processors with vPro™ Technology and Windows® 7: Get More Done Faster

The combination of Intel Core 2 processors with vPro technology and Windows 7 can help you spend smart, do more, and be more secure.

<table>
<thead>
<tr>
<th>Business Challenge</th>
<th>Technology Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help users get more work done faster, protect PCs and the network from attacks or malicious code, and reduce IT administrative overhead and the associated costs.</td>
<td>Intel Core 2 processors with vPro technology and Windows 7–based desktop and notebook PCs.</td>
</tr>
</tbody>
</table>

Windows® 7 was designed from the ground up to handle today’s tasks and workloads quickly and securely, while making the IT manager’s job easier. Intel® Core™ microarchitecture and Intel® vPro™ technology complement the new operating system by building high-performance, trusted computing and management mechanisms into the hardware. Whether working at a desk on the corporate network or on a notebook at home or in a hotel room, today’s information-centric employees must be able to quickly and securely access files on the corporate network. IT personnel must be able to exercise control over the computers that log on to that network, whether they’re connected to the LAN or connected remotely over the Internet. Windows 7 running on Intel Core 2 processors with vPro technology work together to help make all this easier.

Intel vPro Technology and Windows 7: Better for Business with Enhancements in Performance, Security, Manageability, and Additional Features

Technical decision makers are faced with many challenges in today’s economy: help users get more work done faster and with fewer difficulties, protect the network and individual systems from attacks or malicious code, and reduce administrative overhead and the associated costs. The underlying hardware platform can provide a foundation for making the best use of new software capabilities. Intel Core 2 processors with vPro technology complement Windows 7 by building effective, trusted computing and management into the hardware.
The release of Windows 7 provides an ideal opportunity for a PC refresh. By refreshing the PC fleet to new desktops and notebooks with Intel Core 2 processors with vPro technology, IT can benefit from up to a 50 percent reduction in operational costs, do more with enhanced multitasking, and be more secure by avoiding the 53 percent increase in security incidences seen in four-year-old PCs.1 Intel vPro technology eases the management of PCs, and when activated, can save up to 40 minutes or more of end user productivity during an operating system upgrade.2 In addition, new PCs can do even more with shorter boot times and new productivity tools.

Intel vPro technology support built into Microsoft® System Center Configuration Manager 2007 can also significantly reduce migration overhead with remote inventory of PCs regardless of the power state and with remote power on, out-of-band configuration, and improved management tools. This makes it possible to carry out company-wide Windows 7 migrations from the service center with minimal impact on user productivity.

Windows 7 enables you to run many legacy applications seamlessly with Windows Virtual PC and Windows XP Mode or Microsoft Enterprise Desktop Virtualization (MED-V). However, hardware virtualization assist is required to run Windows Virtual PC. PCs with Intel vPro technology include Intel® Virtualization Technology (Intel® VT), which meets the hardware virtualization assistance requirement. In addition, some PCs that don’t use Intel vPro technology may have Intel processors that support Intel VT. In both cases, Intel VT must be enabled in the BIOS. Organizations that want the best of the management and virtualization worlds will standardize on PCs with Intel vPro technology.

Energy-efficient technologies built into Intel Core 2 processor–enabled notebooks and desktops3 and power management features that are included in Windows 74 reduce your energy costs. The combination of Intel vPro technology and Windows 7 helps reduce the total cost of ownership and increase the return on investment.

Intel vPro Technology PCs provide the best Windows 7 experience.

• Intel vPro technology, when activated, helps ease the management of PCs and can save up to 40 minutes or more of end user productivity during the Windows 7 upgrade.2
• Run legacy applications seamlessly with Intel Virtualization Technology and Windows Virtual PC.

Performance Enhancements

Intel Core 2 processors employ Intel Core microarchitecture5 on a revolutionary 45-nm die process that benefits from hafnium-based high-k metal gates. Intel Core microarchitecture speeds computing by using the following technologies:

• Intel Wide Dynamic Execution. Intel Wide Dynamic Execution delivers more instructions per clock cycle. Fewer clock cycles means that less power is required to complete a task, which can help reduce execution times and increase energy efficiency.

• Intel Advanced Smart Cache. Intel Advanced Smart Cache increases the probability that each execution core can access data from the faster, more efficient processor cache subsystem. This enables each core to dynamically use up to 100 percent of L2 cache, while obtaining data from the cache at higher throughput rates when compared to Intel's previous generation Smart Cache.

• Intel Smart Memory Access. Intel Smart Memory Access hides memory latency, and this can optimize data bandwidth to the memory subsystem and help improve system performance.

• Intel Advanced Digital Media Boost. Intel Advanced Digital Media Boost improves performance when Streaming SIMD Extension (SSE, SSE2, and SSE3) instructions are executed. These instructions enable Intel Core processors to deliver superior performance and energy efficiency to a broad range of 32-bit and 64-bit applications, including graphics, video encoding, 3-D imaging, and high-performance line-of-business applications.

• Intel solid-state drive (SSD)6 and Windows 7 TRIM command support. The Intel solid state drives (SSDs) enable superior read/write performance and throughput and drastically outperform traditional hard disk drives. Windows 7 is engineered to reduce the frequency of writes and flushes to further improve performance time. Windows 7 supports the SSD TRIM command to reduce the chance of SSD performance degradation over time. Windows 7 disables defragmenting, Superfetch, ReadyBoost, and boot and application launch prefetching on SSDs.7

Security Enhancements

Viruses, worms, Trojans, drive-by malware, and social engineering exploits threaten the integrity of the services and data that help drive business success. Attacks can come from removable devices, network connections, e-mail, Web sites, and numerous internal and external sources. With Intel vPro technology, IT can:

• Push updates over the wire—regardless of the PC power state.
  Intel vPro technology includes a secure, encrypted power-up capability that helps IT prepare systems for updates.

• Filter threats and isolate PCs based on IT policy. With Intel vPro technology, IT can use third-party software to define policies that will trigger hardware-based network isolation of a PC. Desktop PCs with Intel vPro technology also include hardware-based filters that monitor the rate of outbound traffic to help identify suspicious behavior, including both fast-moving and slow-moving worms.

• Send alerts even if a system is off the corporate network.
  Notebook and desktop PCs with Intel vPro technology have policy-based alerting built into the system.
• Perform automatic checking for agents. Notebook and desktop PCs with Intel vPro technology use a regular, programmable “heartbeat” presence check, which is built into the Intel Management Engine. If an agent hasn’t checked in before a heartbeat timer expires, the agent is presumed removed, tampered with, or disabled and can be remediated automatically.

• Enable out-of-band management on Network Access Protection (NAP)-protected networks. With the latest PCs with Intel vPro technology, network security credentials can be embedded in the hardware. This includes an Intel® Active Management Technology (Intel® AMT) posture plug-in, which collects security posture information (such as firmware configuration and security parameters), and the Intel AMT Embedded Trust Agent.

• Block buffer overflows with Intel Execute Disable Bit. The Intel Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when it is combined with a supporting operating system, such as Windows 7.

Windows 7 offers complementary technologies that help protect the PC fleet by introducing new operating system platform security features such as AppLocker™, BitLocker™, and the Windows Biometric Service.

Manageability Enhancements

Intel Core 2 processors with vPro technology that are running Windows 7 introduce a number of manageability capabilities that can help reduce the total cost of ownership by increasing automation, improving productivity, and providing flexible administrative control to meet compliance requirements. At the same time, these manageability improvements can increase the company’s return on investment.

• Manage PCs regardless of the power state. With the ability to remotely wake, power up, maintain, and manage a PC anytime, IT can ensure that key tasks are performed when they are needed and at times that don’t affect user productivity.

• Push updates down the wire regardless of the power state. With Intel vPro technology, users can still power off their PCs before leaving for the night or for the weekend, saving energy costs. IT can remotely power on these PCs from the service center to install critical application and operating system updates if needed.

• Receive alerts even if the system is powered off or is disabled. Intel vPro technology enables out-of-band alerts so that IT can be notified rapidly and automatically when a system falls out of compliance, when hardware is about to fail, or when applications hang.

• Resolve more problems remotely. Intel vPro technology delivers powerful tools, such as remote/redirected boot, console redirection, persistent event logs, and access to pre-boot BIOS, that let IT more accurately diagnose hardware and software problems from the service center.

• Improve remote inventory for wired and wireless systems. Notebook and desktop PCs with Intel vPro technology give technicians access to asset information from virtually anywhere. This information is stored in protected, persistent memory that is contained on a chip.

• Windows 7 manageability features. Windows 7 introduces its own new and powerful tools that complement Intel platform technologies, such as Windows PowerShell™ 2.0, Windows Troubleshooting Platform, and Problem Steps Recorder.

Additional Features

Intel Core 2 processors with vPro technology that are running Windows 7 provide significant benefits beyond security and manageability.

• Improve mobility and extend manageability. DirectAccess™ uses Internet Protocol security (IPsec) and IPv6 to enable an encrypted, private tunnel between a PC and the DirectAccess server. PCs can be managed over a DirectAccess connection in the same way that PCs on the corporate network are managed, by using the same management and security tools.

• Ensure application compatibility. Intel Core 2 processors with vPro technology work together with Windows 7 to enable numerous features designed to maintain application compatibility. Intel VT is available with Intel vPro technology–based PCs as well as with many non-Intel vPro technology–based PCs. Intel VT enables Windows Virtual PC, Windows XP Mode, and MED-V to create a virtual environment on the PC for running legacy applications.

• Reduce costs and stay productive longer with Windows 7 and Intel Power Management. Microsoft and Intel have collaborated on studies about power usage in PCs, enabling PC OEMs to build more power-efficient PCs.

• Simplify migration with Intel vPro technology and Windows 7 deployment tools. Intel vPro technology, Windows 7 deployment tools, and Microsoft System Center Configuration Manager can work together to streamline migration to Windows 7.

Summary

Intel Core 2 processors with vPro technology work in tandem with Windows 7 to boost performance, reduce power use, increase security, and make PCs more manageable. Intel vPro technology enables PCs to be more manageable and gives IT more control over the PCs on which it is activated, even if the wired or wireless computer is powered off, has a disabled operating system, or suffers from a failed hard disk.

Overall, the combination of Intel Core 2 processors with vPro technology and the operating system improvements included with Windows 7 can help reduce the total cost of ownership and increase the return on both hardware and operating system investments.