



# Intel® Centrino® 2 with vPro™ Technology

Best for business: security and manageability on the chip.

- Brings hardware-based technologies that deliver enhanced maintenance and management capabilities with Intel® vPro™ Technology.<sup>1</sup> Readily integrates with leading management software solutions and delivers proactive security in an open LAN – even outside the corporate firewall.
- Enjoy more than twice the CPU performance when doing processor-intensive tasks like multitasking compared to the previous generation of Intel® Centrino® processor technology-based laptops.<sup>2</sup>
- Designed for longest possible battery life<sup>3</sup> with the energy-saving features Intel® Intelligent Power Capability and Deep Power Down Technology.
- Up to 5x faster wireless performance than 802.11a/b/g solutions with Intel® Next-Gen Wireless-N.<sup>4</sup>

Intel® Centrino® 2 with vPro™ technology features hardware-based proactive security and built-in maintenance and management capabilities that readily integrate with software management solutions to help lower IT costs and improve IT efficiency. Powered by the Intel® Core™2 Duo processor engine for outstanding mobile dual-core performance, it delivers great battery life and enhanced wireless connectivity.



- Intel® Core™2 Duo processor
- Mobile Intel® GS45 Express Chipset Family with Intel® Graphics
- Intel® vPro™ technology
- Intel® Next-Gen Wireless-N (Intel® WiFi Link 5000 series)
- Intel® 82567LM Gigabit Network Connection
- Intel® Turbo Memory (Optional)

Building on a common technology foundation, notebooks and desktop PCs with Intel® vPro™ technology offer a unified approach for managing and protecting computers throughout your organization. With the latest IT management consoles, you can monitor and maintain your notebooks and desktops over a wired or secure wireless network even if the PC is powered off or down. You can also remotely power up, reboot, diagnose, and repair wireless notebooks – even if the OS is unresponsive or management agents are missing. With Intel hardware capabilities, you get powerful proactive security, built-in manageability, and energy-efficient performance for both your notebook and desktop PCs.

Notebooks with Intel vPro technology are part of the Intel® Stable Image Platform Program<sup>5</sup> (Intel® SIPP), so you can avoid unexpected changes that might force software image revisions or hardware requalifications. This helps your team more effectively plan replacement cycles and reduce the number of deployed PC configurations.

All this in a variety of notebook designs so you can choose the right one for your business.

Discover more about Intel Centrino 2 with vPro technology now at [www.intel.com/go/vpro](http://www.intel.com/go/vpro).

Blog with the experts that have deployed Intel vPro technology at [www.intel.com/go/vproexpert](http://www.intel.com/go/vproexpert).



## Intel's Best Technologies for Business Notebooks

Feature	Benefit
<b>Intel® vPro™ Technology</b>	
The best Intel-based mobile PC for business brings you hardware-based technologies that deliver proactive security and enhanced maintenance and management capabilities.	Strengthened security measures plus greater manageability capabilities that lower the total cost of servicing, maintaining and managing both wired and wireless notebook PCs.
<b>Intel® Active Management Technology (Intel® AMT) 4.0<sup>1</sup></b>	<ul style="list-style-type: none"> <li>Added protection against viruses and attacks via programmable defense filters and from unsolicited tampering via continuous agent presence checking.</li> <li>Better security compliance with faster, more accurate asset inventory and faster time to patch saturation.</li> <li>User-initiated secure communication tunnel to IT, for improved diagnostics, repair, and management – even outside the corporate firewall.<sup>6</sup></li> <li>Support for 802.1x, Cisco SDN* and Microsoft NAP*</li> <li>More secure, hardware-assisted remote management features to shut down, wake up, and update PCs more easily off hours.</li> </ul>
<b>Intel® Virtualization Technology (Intel® VT)<sup>7</sup></b>	Run multiple OSs – with their associated applications – simultaneously inside “virtual machines.”
<b>Intel® Trusted Execution Technology (Intel® TXT)<sup>8</sup></b>	Reduced overhead and better isolation of each virtual machine helps simplify virtualization, make it easier to build lightweight virtual machine monitors (VMMs), and make virtualization more efficient and secure.
<b>Industry-Standard Trusted Platform Module 1.2 (TPM 1.2)</b>	Build and maintain a chain of trust from hardware to an Intel TXT-enabled OS or application.
	Hardware-rooted process that establishes a root of trust, which allows software to build a chain of trust from the “bare-metal” hardware to a fully functional VMM.
<b>Intel® Core™2 Duo Processor</b>	Provides a hardware-assisted safe place to store information (such as keys), store and report integrity metrics, and a set of cryptographic operations that execute in a protected place.
	Security measures such as hard-drive encryption are more effective and more reliable.
<b>Intel® Advanced Smart Cache</b>	Revolutionary mobile, dual-core processor architecture puts two complete execution cores in the same processor.
	Industry-leading performance and responsiveness to run multiple demanding applications simultaneously with the same great energy efficiency, enabling great battery life. <sup>3</sup>
<b>Intel® 64 Architecture<sup>9</sup></b>	A shared L2 cache allows both cores access to the full L2 memory area, and allows shared data to be accessed from cache, minimizing bus traffic. It also allows one core to use the entire cache when the other core is inactive. Provides twice the bandwidth to L1 caches compared to Intel® Core™ Duo processor.
	More efficient cache and bus design enables better performance, responsiveness and power savings.
<b>Power-Optimized 1066 MHz Front Side Bus</b>	Allows the user to take advantage of 64-bit applications as they become available. Process more in RAM, resulting in less data caching to and from HDD to enable greater performance.
	Headroom for the user to take advantage of 64-bit applications as the ecosystem continues to grow.
<b>Intel® FSB Frequency Switching</b>	Increased processor system bus speed.
	Provides increased data bus bandwidth, vs. prior generations, for up to four full instructions simultaneously (previous generation could only handle three instructions).
	At minimal workloads, Intel FSB Frequency Switching helps to lower FSB data transfer rate.
	Enhanced Intel SpeedStep® technology directly benefits from Intel FSB Frequency switching because the reduced CPU frequency allows a lower operating voltage to be used in minimal workloads. This ultimately leads to lower power consumption.

## Intel's Best Technologies for Business Notebooks

Feature	Benefit
<b>Intel® Core™2 Duo Processor continued</b>	
<b>Intel® Intelligent Power Capability</b>	Ultra fine-grained control over the CPU's logic circuitry to turn on only the parts that are needed.
<b>Intel® Dynamic Power Coordination</b>	Helps manage voltage and power consumption. One core can demand high performance while the other core can independently transition to a low-power state.
<b>Built on Industry Standards</b>	Built on industry standards to give you many choices in selecting OEMs and software vendors.
<b>Improved Security</b>	Better security built right into the chipset through Execute Disable Bit. <sup>10</sup>
<b>Mobile Intel® Graphics Media Accelerator X3100</b>	
	Next-generation graphics includes software enhancements and support for new and enhanced battery conservation features that minimize power consumption, enabling great battery life.
<b>Intel® Clear Video Technology</b>	Video technology that delivers enhanced video quality.
<b>Enhanced Support for a high-definition experience</b>	
	Support for digital interface with integrated audio and HDCP content protection. <sup>11</sup>
<b>Intel® Next-Gen Wireless-N (Intel® WiFi Link 5000 series)</b>	
	Connects to most available industry-standards-based wireless LAN (802.11b, 802.11a, and 802.11g and Draft 802.11n) infrastructures. <sup>11</sup>
	Up to 5x faster compared to 802.11a/g products with data rates up to 450 Mbps. <sup>4</sup> Support for legacy and latest high throughput WLAN technologies provides connectivity options for multiple environments.
<b>Up to 2x<sup>4</sup> greater range with MIMO and antenna diversity support</b>	
	MIMO technology leverages multipath behavior by using multiple, "smart" transmitters and receivers with an added "spatial" dimension to increase performance and range.
<b>Great battery life with optimized power modes</b>	
	Reduced WLAN power consumption can help deliver great platform battery life.
<b>Intel® 82567LM Gigabit Network Connection</b>	
	Single-port Gigabit Ethernet Physical Layer Transceiver (PHY) that connects to its MAC through a dedicated interconnect. It is based on Intel's Gigabit PHY technology, and supports operation at data rates of 10/100/1000 Mbps.

Optional Feature	Benefit
<b>Intel® Turbo Memory<sup>12</sup></b>	
	Extended memory. Nonvolatile cache device supporting Windows Vista* ReadyDrive and ReadyBoost functions. Allows application swap from main memory into NVCache rather than to HDD. Boot and application loading acceleration reduces latency for data transfer from hard disk for random read/writes.

<sup>1</sup> Intel® vPro™ technology includes 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. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. It may also require modifications of implementation of new business processes. With regard 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/platform-technology/intel-amt/>.

<sup>2</sup> As measured by SPEC®CPU2006 comparing latest generation Intel® Core™2 Duo Processor T9500 & T8100 with a comparable frequency single-core Intel® Pentium® M Processor. Actual performance may vary. See <http://www.intel.com/performance/mobile/benchmarks.htm> for important additional information. SPEC, SPECint, SPECfp, SPECrate, SPECweb, SPECjbb are trademarks of the Standard Performance Evaluation Corporation. See: <http://www.spec.org> for more information on the benchmarks.

<sup>3</sup> System performance, battery life, power savings, high-definition quality, video playback, wireless performance, and functionality will vary depending on your specific operating system, hardware, chipset, connection rate, site conditions, and software configurations. References to enhanced performance including wireless refer to comparisons with previous generation Intel technologies. Wireless connectivity and some features may require you to purchase additional software, services or external hardware. 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 [www.intel.com/products/centrino/index.htm](http://www.intel.com/products/centrino/index.htm) and [www.intel.com/performance/mobile/benchmarks.htm](http://www.intel.com/performance/mobile/benchmarks.htm) for more information on performance, wireless, power savings and energy efficiency.

<sup>4</sup> Up 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 [www.intel.com/performance/mobile/index.htm](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.

<sup>5</sup> Intel® Stable Image Platform Program (Intel® SIPP) - Check with your PC vendor for availability of platforms that meet SIPP guidelines.

<sup>6</sup> Systems using Client Initiated Remote Access (CIRA) require wired LAN connectivity and may not be available in public hot spots or "click to accept" locations. For more information on CIRA visit, [www.intel.com/products/centrino2/vpro/index.htm](http://www.intel.com/products/centrino2/vpro/index.htm).

<sup>7</sup> Intel® Virtualization Technology 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.

<sup>8</sup> No computer system can provide absolute security under all conditions. Intel® Trusted Execution Technology is a security technology under development by Intel and requires for operation a computer system with Intel® Virtualization Technology, an Intel Trusted Execution Technology-enabled processor, chipset, BIOS, Authenticated Code Modules, and an Intel or other compatible measured virtual machine monitor. In addition, Intel Trusted Execution Technology requires the system to contain a TPMv1.2 as defined by the Trusted Computing Group and specific software for some uses. See <http://www.intel.com/technology/security/> for more information.

<sup>9</sup> 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. Consult with your system vendor for more information.

<sup>10</sup> 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.

<sup>11</sup> Some features and security solutions may not be supported by your PC's operating system and may require additional software and/or certain hardware as well as wireless LAN infrastructure support. Check with your PC manufacturer for details.

<sup>12</sup> Tests run on 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. Boot-time performance depends on BIOS and POST execution times as well as hard drive performance. Power savings will depend upon the system power management settings as well as the specific hard drive used. See [http://www.intel.com/performance/mobile/Intel\\_Turbo\\_Memory.htm](http://www.intel.com/performance/mobile/Intel_Turbo_Memory.htm) for more information.

All Intel® Centrino® brand family-based notebooks, using Intel graphics, meet Microsoft's Windows Vista® Capable PC program requirements. Check with your PC manufacturer for details on discrete graphics solutions. Microsoft program requirements, availability and timelines are subject to change.

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