



## Real-World Guide

# Enterprise Mobile Security: 4th Generation Intel® Core™ vPro™ Processors

Helping IT Managers Increase Productivity with Added Protection

### Why You Should Read This Document

This guide explains how 4th generation Intel® Core™ vPro™ processor-based platforms can help you strengthen security and increase productivity in today's enterprise. Enhancements in this new processor are designed to protect mobile users and data on a full spectrum of devices, including Ultrabook™ 2 in 1 devices, tablets, and more. Built-in<sup>1</sup> protection is based on a multilayered security foundation that:

- Reduces the threat of viruses and malware by creating a protected environment at start-up
- Provides hardware-based authentication that includes a "no password" VPN experience
- Improves data protection with accelerated automatic encryption and anti-theft capabilities
- Strengthens monitoring and remediation with remote support for any device, in any state

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# Mobile Users Bring New Risks

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Armed with the right credentials and the right device, employees now have the flexibility to work anytime, from any location. Innovative technologies, ever-proliferating sources of data inputs, and expectations around connectivity are reshaping computing. And while this can be a boon to business productivity, it also presents a new, complex set of security risks.

IT organizations must secure and manage a multitude of mobile devices in an environment of constant change. The threat landscape continues to grow dramatically, with sophisticated malware that's frequently targeting enterprise data. And since users are now defining the network perimeter, it's always moving.

In this new enterprise environment, you must find a way to protect an unknown number of mobile devices running on multiple platforms and operating systems, while keeping users productive and the business secure.

## The Purpose of This Guide

The purpose of this guide is to show how 4th generation Intel® Core™ vPro™ processor-based platforms can strengthen and simplify security while increasing productivity across today's enterprise. Enhancements in this new platform are designed to protect mobile users and deliver the capabilities they need to stay productive on a full spectrum of devices. The powerful built-in security<sup>1</sup> of the 4th generation Intel Core vPro processor is based on a multilayered security foundation that addresses threat management, identity and access, data protection, and monitoring and remediation.

This technology is now available in a range of business-class form factors, from Ultrabook™ 2 in 1 devices and tablets to compact all-in-one PCs. These sleek, innovative devices deliver the flexibility and mobility your users want with the performance and manageability you've come to rely on from Intel.

# Protect Data and Devices

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Protecting data and devices in a changing enterprise environment is no small task. It requires a comprehensive security solution that can guard against advanced threats while protecting users across a range of devices. 4th generation Intel Core vPro processors are designed to address the top IT security concerns for the enterprise: threat management, identity and access, data protection, and monitoring and remediation.

## Threat Management

For IT, more devices mean there's more to protect. And the environment is all the more threatening. Sophisticated malware and viruses continue to accelerate with no sign of slowing down. In fact, recent studies done by McAfee revealed some alarming facts from 2012:<sup>2</sup>

- New malware samples grew by 50 percent.
- Mobile malware increased by 44 times.
- New ransomware samples soared to over 200,000 per quarter.

These growth rates say a lot about what's to come. And while many organizations are using traditional software-only security solutions, it may no longer be enough. Rootkit attacks, one of the most malicious forms of malware, can be difficult to detect with traditional antivirus strategies. These attacks give a hacker root-level access to a computer, which can occur without detection and proceed to infect key system components such as hypervisors. There's also the risk of escalation-of-privilege attacks, in which a hacker can gain elevated network access to compromise sensitive business data across the organization.

## Protected Launch Environment

Protecting today's virtual and physical IT environments against these advanced threats requires a different approach. Intel Core vPro technology actively helps to prevent viruses and malware from entering your network by creating a protected environment at start-up.

Intel Virtualization Technology<sup>3</sup> (Intel VT) and Intel Trusted Execution Technology<sup>4</sup> (Intel TXT) work below the operating system to validate the behavior of key client system components during boot-up and ongoing operations. Intel VT boosts security for virtual environments and works together with McAfee\* Deep Defender\* to protect against stealthy attacks like rootkits. And Intel OS Guard<sup>4</sup> protects against escalation-of-privilege attacks by working constantly with automated protection that prevents viruses from taking hold deep in your system.

## Hardware-Based Root of Trust for Virtual Environments

4th generation Intel® Core™ vPro™ processors offer a new kind of protection by augmenting Intel TXT with Intel Boot Guard.<sup>4</sup> This technology further enhances security throughout the boot process by establishing a root of trust at the hardware level, with the ability to extend safe boot capabilities to your virtual machines.

- Measures the launch environment against a baseline using hardware support
- Validates the behavior of key components at startup to prevent attacks
- Hardens the hypervisor layer



## McAfee Delivers Better Protection for Client Endpoints

McAfee\* Deep Defender\* software is part of the McAfee Complete Endpoint Protection suites. This solution is designed to protect your systems against the full threat spectrum, from zero-day exploits to hacker attacks. This single, extensible security management platform protects a range of systems, including the Windows\*, Apple\*, and Linux\* operating systems, and a full range of mobile device brands and form factors.

## Identity and Access

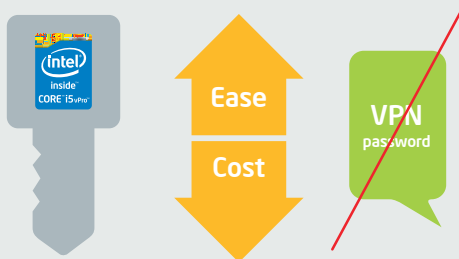
In today's mobile business environment, strengthening authentication is a critical part of protecting your network. Whether you're securing VPN access or protecting access to software-as-a-service (SaaS) applications, a simple user name and password solution is no longer enough.

Many organizations have long deployed powerful authentication solutions using tokens or smart cards, or via software-only provisioning. However, recent data breaches have exposed vulnerabilities even with these baseline forms of account protection.

### Protected User Entry with Public Key Infrastructure (PKI)

4th generation Intel® Core™ vPro™ processors make it even easier to manage and protect mobile users. A “no-password” mobile VPN experience safeguards your network and simplifies password management for users. It lets your users stay focused on the task at hand without the burden of having to remember and reenter multiple passwords.

- Private key for authentication and encryption stored in the firmware
- Lower cost, greater ease of use than smart cards
- Works with “no password” VPN



### Intel® IPT: Safety in Numbers

Screen-scraping attacks occur when malware scrapes a PC's display, typically to track access codes or password information. Intel® Identity Protection Technology (IPT) protects against these attacks at the hardware level by verifying a human presence at a PC. The technology works by displaying to the end user a secure PIN pad with randomly placed numbers. Because this PIN pad is created by the graphics hardware in the processor, it's invisible to the operating system—and therefore never exposed to the software layer or made vulnerable to hacking.

### Hardware-Based Authentication

Intel vPro processor technology offers two-factor authentication that provides a simple way for web sites and business networks to validate that an actual user—not malware—is logging in from a trusted PC. This hardware-based support helps protect enterprise access points while reducing costs and complexity over traditional hardware-token or smart-card methods.

For example, Intel Identity Protection Technology<sup>5</sup> (Intel IPT) delivers hardware-secured VPN access by incorporating private keys, one-time password (OTP) tokens, and public key infrastructure (PKI) certificates. By eliminating the need for a separate physical token, it streamlines the VPN login process and, more importantly, ensures that the PCs accessing your VPN are those assigned to your employees. Because the credentials are secured inside the platform, the information cannot be compromised or removed from a particular PC.

## Data Protection

When your employees are on the move, so is your corporate data. Data protection is perhaps the most critical part of IT security, and the risk of data loss today is higher than ever. There's the obvious possibility of a lost or stolen device, but there's also the risk posed by cloud-based data and applications accessed by multiple devices and platforms. If the devices are the weak link, then the data and applications they contain are just as vulnerable. Aside from the threat of compromised business data, there is also the risk of violating legal agreements and compliance regulations for data privacy.

When you have sensitive business data in the cloud combined with mobile devices, you need fast, reliable technology in place to protect it. Encryption is a well-established method of protecting data, and is especially important for information covered by compliance regulations and standards such as Sarbanes-Oxley. The downside of encryption technologies is that they often require compromising system performance for security.

### Accelerated Encryption and Anti-Theft Technologies

Intel Core vPro processor technology addresses both security and performance without interfering with user productivity. Intel Advanced Encryption Standard New Instructions<sup>6</sup> (Intel AES-NI) uses

hardware-based acceleration to encrypt data up to four times faster,<sup>7</sup> and it works quietly in the background without slowing performance. It's also more secure because the encryption blocks are executed in the hardware within the microprocessor, reducing the possibility of side-channel attacks. In addition, the acceleration provided by Intel AES-NI allows the system to execute larger key sizes faster and increase security for data transfers.

The technology also delivers stronger protection for your online transactions, such as authentication over the Internet or e-commerce activities. Intel Secure Key<sup>8</sup> safely generates highly secure encryption keys via the hardware platform. The numbers are generated from a high-volume entropy source, making them unpredictable and therefore superior to many other sources available today.

With Intel Anti-Theft Technology<sup>4</sup> 5.0, you get an embedded intelligent client that works proactively to protect your data in the event of theft or loss. The client will automatically disable itself locally if it detects someone attempting to hack into it, even before the user has realized that the device has been lost or stolen. And if the PC is discovered lost or stolen but no hacking attempt is made, you can remotely access and disable it.

### Accelerated Full-Disk Encryption

4th generation Intel® Core™ vPro™ processors support even faster automatic encryption via the Intel Solid-State Drive<sup>9</sup> (Intel SSD) Pro series. Intel SSD is designed to support the remote configuration, management, and recovery of your encrypted data.

Improves performance and reduces software license costs



Improves protection and helps reduce reuse/disposal costs with secure erase capabilities



Includes support for industry-standard remote password management



## Monitoring and Remediation

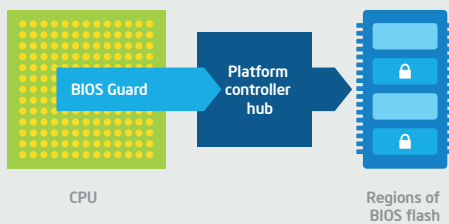
The last line of defense for the enterprise is monitoring and remediation, which extends across all aspects of IT security management. The days of face-to-face help-desk visits are quickly becoming a thing of the past, and it's time for a flexible, responsive solution.

With the comprehensive remote monitoring and remediation capabilities of Intel Core vPro processors, you can gain greater control and simplify security management for all users, regardless of location. Powerful remote support tools let you stay one step ahead of critical security threats with the ability to push updates to any device at any time. And remote remediation tools make it easier to diagnose and fix mobile PCs, whether it's to identify a minor problem or manage a security breach.

### Added Protection Against BIOS Attacks

Enhancements in 4th generation Intel® Core™ vPro™ processors offer advanced protection against attacks. Intel Platform Protection Technology with BIOS Guard protects system BIOS against stealth attacks and unauthorized updates.

- Protects BIOS flash from modification without manufacturer authorization
- Protects BIOS during system updates
- Helps defend platform against denial-of-service attacks
- Automatically enabled for users running the Windows\* 8 operating system



## 24-7 Access to System Information

- Remotely poll wired and wireless PCs, regardless of power state.
- Write asset data into protected memory, including hardware asset data and software version information.
- Identify and remediate noncompliant PCs to simplify compliance management.

## Remote Control of Any Device

With Intel Active Management Technology<sup>10</sup> (Intel AMT), you can access and control any device and resolve issues through all states of operation, including reboot. You can remotely track and manage thousands of devices to update, disable, lock, wipe, or restore using McAfee ePolicy Orchestrator\* (McAfee ePO\*) Deep Command\* software together with Intel AMT. McAfee ePO Deep Command is an extension of McAfee's leading endpoint security management tools.

With these technologies, you can proactively manage threats by pushing security updates to users before a breach occurs, or diagnose, isolate, and repair infected clients. The best part is you can do all this with minimal impact to the user. If you have a mobile user that can't log on, you can reboot and manage their device remotely. "Invisible" remediation tools let you resolve the problem while the user continues to work without interruption.

# Manage Any Device Remotely

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Yet another aspect of managing mobile devices is the ability to streamline IT efficiencies beyond security. When IT can work quickly and conveniently on everyday tasks, users can be more productive. And when both groups can work faster, it benefits the business.

4th generation Intel Core vPro processors provide comprehensive controls for the remote management of all devices, regardless of location. Enhancements are designed to bring operational efficiencies to IT and employees—from faster, uninterrupted service and performance improvements to reduced overall costs.

- **Enhanced Keyboard-Video-Mouse Remote Control** gives you full remote control to diagnose, repair, and update systems. Work with greater screen resolution and fidelity from any location at any time, even if systems are powered off or the operating system is unresponsive.

- **Intel Setup and Configuration Software (Intel SCS)** helps with fast and simple device configuration.<sup>11</sup> You can use this technology to discover, configure, and maintain a secure connection, as well as unlock the features of Intel vPro technology on every managed device on your network.
- **Intel vPro Technology Module for Windows PowerShell\* software** allows for customized management and enhanced automation with unique scripts. This module gives you direct access to Intel AMT so that you can fix problems on the fly, with no wait time. It reduces help-desk visits, improves user productivity, and helps reduce total cost of ownership (TCO). Windows PowerShell software can also adapt to different system types and data formats.

# Work with Compatible Technology

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The benefits of Intel Core vPro processor technology extend beyond security and manageability to ease of use. This compatible technology is designed to fit easily within your existing IT infrastructure, allowing you to lessen the impact on IT resources, cut training time for users, and help reduce TCO.

Regardless of which mobile devices you choose, those based on Intel processors and the Windows\* 8 operating system will fit well with your systems. The technology is compatible with your existing x86 applications, peripherals, and device drivers, so it can integrate seamlessly into an environment based on a Windows operating system, such as Windows 7 Enterprise. Moreover, users can get up and running quickly on a familiar platform that minimizes the need for additional training and IT support.

## Reducing the Need for Additional Mobile Device Management Solutions

While many IT organizations equate mobile devices with the need for mobile device management (MDM) solutions—and some businesses already have these solutions in place—there's an alternative. Intel-based devices running Windows 8 Enterprise software deliver an end-to-end device management solution through management consoles such as the Microsoft\* System Center Configuration Manager (SCCM). Because the technology works directly with existing management and security solutions, there's no need to purchase additional software. And it works with the full spectrum of devices, including tablets, notebooks, and desktops.



## Simplifying Enterprise Application Integration

Another aspect of compatibility is the deployment of enterprise applications. Writing different versions for multiple devices, platforms, and operating systems can be expensive and hard to manage, especially when you factor in updates. However, some environments require writing to specific operating systems to take maximum advantage of features.

There are three typical types of application solutions—native, hybrid, and HTML5—and all three have their purpose, depending on your business needs. HTML5, the most flexible of the three, is an advanced open standard that enables you to write once and have it run across multiple devices, platforms, and operating systems within your enterprise. Then you can deploy that experience across your business faster, with the ability to reach more users in less time and at a lower cost.

# Get Performance That Keeps Pace with Users

Enhancements to 4th generation Intel Core vPro processors also offer performance capabilities that can keep up with the way your users work.<sup>12</sup> They can get started quickly with the ability to wake devices in a flash<sup>13</sup> and access dynamic data and apps that are always up-to-date. And they have the freedom to leave the power supply behind, with longer battery life that makes it easy for users to work where and how they want.

With the productivity enhancements in this latest generation of processor, you can increase productivity across your business with the ability to:

**Multitask twice as fast.**<sup>7,14</sup> Move effortlessly between apps, such as from e-mail to a web browser to a video or spreadsheet and back again, and work quickly, with support for Flash\* pages and browser plug-ins.

**Collaborate easily—and with no wires.** Give presentations and share work with colleagues using secure, high-quality videoconferencing capabilities.<sup>15</sup> Wireless projection<sup>16</sup> makes it easier to create an immersive and spontaneous sharing environment, complete with graphics performance capabilities that are 20 times better.<sup>7,17</sup>

**Simplify data management.** Powerful business intelligence (BI) capabilities let you work effortlessly with complex data sets. Intel Transactional Synchronization Extensions New Instructions<sup>18</sup> (Intel TSX-NI) boosts performance for multi-threaded applications, such as those that enable BI and collaboration.

**Find resources quickly.** With indoor/outdoor location-based services, you can quickly find and connect to locally available IT assets, and users can locate useful resources such as printers and conference rooms.

**Work with faster desktop virtualization.** Your users can get what they need quickly with Intel Virtual Machine Control Structure (Intel VMCS)<sup>3,4,10</sup> Shadowing and nesting. This technology provides fast, flexible, and secure desktop virtualization so that you can better control data, applications, and operating system migrations.

## Devices Ready When You Are



Devices based on the 4th generation Intel® Core™ vPro™ processor are ready on the fly, thanks to two innovative new technologies.

- Intel Rapid Start Technology<sup>1</sup> provides instant-on access after waking, for quick application use and the convenience of added battery life for mobile platforms.
- Intel Smart Connect Technology<sup>2</sup> keeps e-mail, social networks, and other apps constantly updated so that users can get right to work.

1. Requires a select Intel processor, Intel software and BIOS update, and Intel Solid-State Drive (SSD). Depending on system configuration, your results may vary. Contact your system manufacturer for more information.

2. Requires a select Intel processor, Intel software and BIOS update, Intel wireless adapter, and Internet connectivity. Solid-state memory or drive equivalent may be required. Depending on system configuration, your results may vary. Contact your system manufacturer for more information.

# An Overview: Feature Enhancements

Processor	New Features	Capabilities
	Intel® vPro™ technology with Location-Based Services	Helps find the nearest printer or conference room, and helps IT locate assets onsite.
	Intel Pro Wireless Display	Enables secure wireless sharing from your device to a conference room TV or projector.
	Intel Transactional Synchronization Extensions New Instructions (Intel TSX-NI)	Boosts performance of multi-threaded applications, like business intelligence and collaboration applications.
	Intel Setup & Configuration Software (SCS) with Solid-State Drive Toolbox (SSD Toolbox)	Enables easy remote setup and configuration of Intel vPro technology and Intel SSDs.
	Intel Solid-State Drive (SSD) Pro family	Protects data with automatic encryption and remote management capabilities.
	Intel Identity Protection Technology with Public Key Infrastructure (PKI)	Removes the burden of VPN passwords, while safeguarding your network.
	Intel Identity Protection Technology with One Time Password (OTP)	Enables secure VPN access with hardware-protected one-time password.
	Intel Platform Protection Technology with Boot guard (Boot guard)	Protects against execution of boot-block-level malware.
	Intel Platform Protection Technology with BIOS Guard (BIOS Guard)	Protects the BIOS from malware and unauthorized updates.
	Intel Platform Protection Technology with Trusted Execution Technology (TXT)	Protects virtual and physical environments from malware and rootkits.
	Intel Virtual Machine Control Structure Shadowing (Intel VMCS Shadowing)	Enables a more responsive and secure experience on virtualized desktops.
	Intel Iris™ graphics	Provides a stunning visual experience—no extra graphics card required.

# Intel Resources for Learning More

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To learn more about 4th generation Intel Core vPro processors, visit [intel.com/vpro](http://intel.com/vpro).

You can also visit the following web sites:

- McAfee Deep Defender: [mcafee.com/deepdefender](http://mcafee.com/deepdefender)
- McAfee ePO Deep Command: [mcafee.com/deepcommand](http://mcafee.com/deepcommand)

## Additional Resources

### **4th Generation Intel® Core™ Processors: Overview**

Watch this video for a quick overview of the new feature enhancements in the 4th generation Intel Core vPro processors.

[intel.com/content/www/us/en/processors/core/4th-gen-core-overview-animation.html](http://intel.com/content/www/us/en/processors/core/4th-gen-core-overview-animation.html)

### **4th Generation Intel® Core™ vPro™ Processor Crimeware Protection**

Watch this video to discover how the embedded security features in 4th generation Intel Core vPro processors deliver comprehensive protection across the business.

[intel.com/content/www/us/en/enterprise-security/enterprise-security-4th-gen-core-vpro-crimeware-protection-video.html](http://intel.com/content/www/us/en/enterprise-security/enterprise-security-4th-gen-core-vpro-crimeware-protection-video.html)

### **Increasing Productivity for Mobile Users**

This planning guide shows how the right mobile devices can improve productivity across your business with the added security you need to protect sensitive data and devices on the go. [intel.com/enterprisemobilityplanningguide](http://intel.com/enterprisemobilityplanningguide)

### **Inside IT: Balancing Security and a Great User Experience**

Listen to Toby Kohlenberg, Intel IT senior information security technologist, discuss Intel's new Trust Model and the challenges of balancing security with a great user experience.

[intel.com/content/www/us/en/it-management/intel-it-best-practices/inside-it-balancing-security-user-experience-podcast.html](http://intel.com/content/www/us/en/it-management/intel-it-best-practices/inside-it-balancing-security-user-experience-podcast.html)

### **Getting a Headstart on Location-Based Services in the Enterprise**

Give employees the ability to quickly find the resources they need and support a continuous experience across platforms, devices, and operating systems with location-based services.

[intel.com/content/www/us/en/it-management/intel-it-best-practices/getting-a-headstart-on-location-based-services-in-the-enterprise.html](http://intel.com/content/www/us/en/it-management/intel-it-best-practices/getting-a-headstart-on-location-based-services-in-the-enterprise.html)

# Endnotes

1. No computer system can provide absolute security under all conditions. Built-in security features available on select Intel Core processors may require additional software, hardware, services, and/or an Internet connection. Results may vary depending upon configuration. Consult your system manufacturer for more details. For more information, visit [intel.com/technology/security](http://intel.com/technology/security).
2. *Infographic: The State of Malware 2013*. McAfee Labs. [mcafee.com/us/security-awareness/articles/state-of-malware-2013.aspx](http://mcafee.com/us/security-awareness/articles/state-of-malware-2013.aspx)
3. Intel Virtualization Technology requires a computer system with an enabled Intel processor, BIOS, and virtual machine monitor (VMM). Functionality, performance, or other benefits will vary depending on hardware and software configurations. Software applications may not be compatible with all operating systems. Consult your PC manufacturer. For more information, visit [intel.com/go/virtualization](http://intel.com/go/virtualization).
4. No computer system can provide absolute security. Requires an enabled Intel processor, enabled chipset, firmware, and software, and may require a subscription with a capable service provider (may not be available in all countries). Intel assumes no liability for lost or stolen data and/or systems or any other damages resulting thereof. Consult your service provider for availability and functionality. For more information, visit [intel.com/go/anti-theft](http://intel.com/go/anti-theft). Consult your system manufacturer and/or software vendor for more information.
5. No system can provide absolute security under all conditions. Requires an Intel Identity Protection Technology-enabled system, including a 2nd gen or higher Intel Core processor-enabled chipset, firmware and software, and a participating web site. Consult your system manufacturer. Intel assumes no liability for lost or stolen data and/or systems, or any resulting damages. For more information, visit <http://ipt.intel.com>.
6. No computer system can provide absolute security. Requires an enabled Intel processor and software optimized for use of the technology. Consult your system manufacturer and/or software vendor for more information.
7. Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests such as SYSmark\* and MobileMark\* are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.
8. No computer system can provide absolute security. Requires an enabled Intel processor and software optimized for use of the technology. Consult your system manufacturer and/or software vendor for more information.
9. No computer system can provide absolute security under all conditions. Built-in security features available on select Intel Solid-State Drives may require additional software, hardware, services, and/or an Internet connection. Results may vary depending upon configuration. Consult your system manufacturer for more details.
10. Requires activation and a system with a corporate network connection, an Intel AMT-enabled chipset, and network hardware and software. For notebooks, Intel AMT may be unavailable or limited over a VPN based on a host operating system or when connecting wirelessly, on battery power, sleeping, hibernating, or powered off. Results dependent upon hardware, setup, and configuration. For more information, visit [intel.com/amt](http://intel.com/amt).
11. Intel vPro technology is sophisticated and requires setup and activation. Availability of features and results will depend upon the setup and configuration of your hardware, software, and IT environment. To learn more, visit [intel.com/technology/vpro](http://intel.com/technology/vpro).
12. Requires a system with Intel Turbo Boost Technology. Intel Turbo Boost Technology and Intel Turbo Boost Technology 2.0 are only available on select Intel processors. Consult your system manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit [intel.com/go/turbo](http://intel.com/go/turbo).
13. Requires a select Intel processor, Intel software and BIOS update, and Intel Solid-State Drive (SSD). Depending on system configuration, your results may vary. Contact your system manufacturer for more information.
14. Available on select Intel Core processors. Requires an Intel Hyper-Threading Technology-enabled system; consult with your PC manufacturer. Performance will vary depending on the specific hardware and software used. For more information, including details on which processors support Intel HT Technology, visit [intel.com/info/hyperthreading](http://intel.com/info/hyperthreading).
15. Built-in visual features are not enabled on all PCs, and optimized software may be required. Check with your system manufacturer. Learn more at [intel.com/go/biv](http://intel.com/go/biv).
16. Requires an Intel Wireless Display-enabled PC, tablet, smart phone, compatible adapter, and TV. 1,080 p and Blu-ray\* or other protected content playback only available on select Intel processors with built-in visuals enabled. Consult your PC manufacturer. For more information, see [intel.com/go/widi](http://intel.com/go/widi).
17. Desktop and Ultrabook claims based on lowest-performance-data number when comparing desktop and Ultrabook benchmarks. Configurations and performance tests as follows: (Ultrabook 4 YR) Comparing preproduction 4th generation Intel Core i5-4200U Processor (4T/2C, 3 MB cache, up to 2.60 GHz), On OEM Platform BIOS: OEM Graphics: Intel HD Graphics (driver v. 9.18.10.3071) Resolution 1920x1200 Memory: 4 GB (2x2 GB) Dual Channel 1600 11-11-11-28 SDD: Liteonit\* LMT-128M6M 128 GB OS: Windows 8 6.2 Build 9200 System Power Management Policy: Balance Wireless: On and connected Intel Core 2 Duo Processor P8600 (2.40 GHz, 2T/2C, 3M Cache, 1.066 MHz FSB). On OEM Platform BIOS: OEM Graphics: Intel GMA X4500HD (driver v. 8.15.10.2555) Resolution 1366x768 Memory: 4 GB (2x2 GB) Micron\* DDR3 1066 7-7-7-20 HDD: Intel Hitachi\* HTS543232L9A300 320 GB 5400 rpm 16 MB cache OS: Windows 7 Ultimate 6.1 Build 7601 System Power Management Policy: Windows Default LCD Size: 15.5" Business productivity claims based on SYSmark 2012 (find out more info at [www.bapco.com](http://www.bapco.com)), which is the mainstream office productivity, data/financial analysis, system management, media creation, 3-D modeling, and web development benchmark tool used to characterize the performance of the business client. SYSmark 2012 features user-driven workloads and usage models developed by application experts. Multitasking claims based on PCMark\* 7 (find out more at [www.futuremark.com](http://www.futuremark.com)), a hardware performance benchmark for PCs running Windows 7, and Windows 8 RTM—includes a collection of various single- and multi-threaded CPU, graphics, and HDD test sets with a focus on Windows application tests. Graphics Performance workload consists of 3DMark\* Cloud Gate (find out more at [www.futuremark.com](http://www.futuremark.com))—an industry standard 3-D graphics performance benchmark. For more information, go to [intel.com/performance](http://intel.com/performance).
18. Multi-threaded applications need to be optimized for Intel Transactional Synchronization Extensions New Instructions in order to take advantage of the technology.

## More from the Intel® IT Center

This guide, *Enterprise Mobile Security: 4th Generation Intel® Core™ vPro™ Processors*, is brought to you by the Intel® IT Center, Intel's program for IT professionals. The Intel IT Center is designed to provide straightforward, fluff-free information to help IT pros implement strategic projects on their agenda, including virtualization, data center design, intelligent clients, and cloud security. Visit the Intel IT Center for:

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- Real-world case studies that show how your peers have tackled the same challenges you face
- Information on how Intel's own IT organization is implementing cloud, virtualization, security, and other strategic initiatives
- Information on events where you can hear from Intel product experts as well as from Intel's own IT professionals

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