



Evaluating Microsoft Windows* 8 Security on Intel® Architecture Tablets

- Tablets running on Intel® architecture with Microsoft Windows* 8 are both enterprise-ready and consumer-friendly
- Intel IT benefits from enhanced device management and information security capabilities
- Employees benefit from an improved user experience

Intel IT is currently evaluating the information security and privacy protection features of Intel® architecture-based tablets running Windows* 8 Enterprise.¹ Our initial evaluations indicate that, together, Windows 8 and Intel® architecture provide a compelling platform for mobile devices in the enterprise, balancing enhanced information security capabilities with consumer-friendliness. We evaluated both an Intel® Atom™ processor-based tablet and an Intel® Core™ vPro™ processor-based tablet.

During our testing, we determined the combination of Windows 8 and Intel architecture offers flexible device management with enhanced security features, such as domain joining and group policies, and out-of-band management capabilities on Intel Core vPro processor-based tablets, when compared with those currently deployed in Intel's environment. Both tablets we tested offer support for alternative authentication options, such as biometrics, and support for legacy enterprise applications. The Intel Core vPro processor-based tablet also offers hardware-assisted security through Intel® Identify Protection Technology and support of Intel® Anti-Theft Technology.

¹ We tested Windows* 8 Enterprise. Other versions of Windows 8, such as Windows 8 Professional, will be made available to certain segments of Intel employees. For a discussion of Windows 8 Enterprise, refer to microsoft.com/en-us/windows/enterprise/products-and-technologies/windows-8/enterprise-edition.aspx. For the rest of this paper, we will refer to Windows 8 Enterprise as Windows 8.



Figure 1. The features and benefits that we investigated comprise four categories.

Table 1. System specifications for tested tablets

	Tablet with Intel® Core™ i5-3427U processor	Tablet with Intel® Atom™ processor Z2760
Processor Speed	2.3 GHz	1.8 GHz
RAM	4-GB DDR3 1600 MHz	2-GB LPDDR2 800 MHz
Chipset	Intel® QM77 Express Chipset	System on chip
Graphics	Intel® HD Graphics 4000	Imagination Technologies PowerVR® SGX545
SATA Support	mSATA 128 GB	eMMC 64 GB
Intel® vPro™ Technology Support	Intel® Active Management Technology 8.0	Not applicable

Background

Since 2009, Intel IT has supported consumerization through our bring-your-own-device (BYOD) programs. To further these programs, we continually look for devices that increase employee productivity and can be managed as needed in the corporate environment. In preparation for the expansion of our support for consumerization, we evaluated two tablets for the enterprise, focusing on information security and manageability features and the benefits of these features within the enterprise environment.

Evaluation of Security

Our evaluation of Intel® architecture-based tablets running Windows® 8 is part of Intel IT’s ongoing research into new combinations of technology that balance employee productivity and job satisfaction, IT cost control, and manage risk to enterprise security.

Methodology

We tested Windows 8 running on two tablets with Intel® processors.

- A tablet with an Intel® Atom™ processor
- A tablet with a 3rd generation Intel® Core® vPro™ processor

Table 1 lists the system specifications for the tablets.

Specifically, we investigated capabilities that would enhance information security associated with small form factor (SFF) devices. We also performed a baseline comparison to existing SFF solutions in the areas of device hardware security, OS-level security features, and application ecosystem security.

Our approach involved an ecosystem review and a hands-on product evaluation. The ecosystem review gave us information about available products and solutions, while the hands-on testing allowed us to validate that the solutions provided the capabilities we need and improvements over existing solutions that have been implemented.

Results

The features and benefits that we investigated comprise four categories.

- Device management, as it relates to enhanced security
- Improvements in authentication
- Support for legacy applications
- Protection for lost or stolen devices

In general, we found that Intel® architecture-based tablets running Windows 8 are both enterprise-ready and consumer-friendly. In each of the four categories of capabilities we investigated, the tablets matched or exceeded the security capabilities of those currently deployed in Intel’s environment.

Although the Intel Core vPro processor-based tablets provided the most security and manageability capabilities and benefits, the Intel Atom processor-based tablet also offered significant capabilities and benefits. Table 2 summarizes our findings, which the following sections describe in more detail.

Table 2. Security features and benefits for Intel® architecture-based tablets running Microsoft Windows® 8

Feature	Windows® 8 and Intel® Atom™ Processor	Windows® 8 and Intel® Core™ vPro™ Processor	Benefit
Domain join and group policy	▪	▪	Enhanced authentication and control
Intel® Active Management Technology		▪	Out-of-band management
Support for third-party browser add-ons	▪	▪	Enhanced security
Support for alternative authentication options	▪	▪	Improved user experience
Intel® Identity Protection Technology	▪	▪	Hardware-assisted security featuring seamless user authentication and secure VPN access
▪ One-time password		▪	Better user experience; no separate hardware or software required to generate tokens
▪ Public key infrastructure		▪	Enhanced malware protection
Legacy application support	▪	▪	Ability to continue to benefit from previous investment
Intel® Anti-Theft Technology		▪	Better protection of corporate assets; remote wipe and remote recovery

Device Management

Intel architecture-based tablets running Windows 8 provide a robust device management environment that not only enhances security, but also can help create a better user experience.

Both tablets we tested support directory services integration, which includes capabilities for domain join and group policy. Domain join enables us to use Kerberos authentication for web site access (see sidebar). This authentication protocol improves our ability to control site access and enforce specific controls. Group policy, combined with built-in OS and third-party configuration management tools, helps us ensure the device meets minimum security specifications and enables us to quickly push updates to target systems and confirm their receipt. We also have the ability to enforce known states of configurations. For example, if a user changes the device configuration, the group policy automatically resets the device to an approved configuration.

The most significant difference between the Intel Atom processor-based tablet and the Intel Core vPro processor-based tablet is the availability of Intel® Active Management Technology (Intel® AMT) on the Intel Core vPro processor-based tablet. Intel AMT enables capabilities such as out-of-band management and out-of-band remote keyboard-video-mouse (KVM) support.

With out-of-band management, we can remotely configure, diagnose, isolate, and repair a compromised or infected device, even if it is unresponsive. Hardware-based remote control allows IT to manage the remote computer regardless of its OS or power state. Remote drive mounting enables better diagnostics and the removal of viruses.

With out-of-band KVM, we can support pre-boot authentication capabilities, such as a hard-drive password and whole disk encryption. It also enables us to enforce the display of legal notices when the device starts. Out-of-band KVM can also be used to remotely fix problems if the OS fails or the user has connectivity problems, such as the failure of a WLAN driver.

Authentication

All Intel architecture-based tablets running Windows 8 include Intel® Identity Protection Technology (Intel® IPT), which is a hardware-assisted layer of security that provides enhanced authentication and support for directory services integration. In addition, Windows 8 supports third-party add-ons that can help prevent cross-site scripting and mitigate web browser vulnerabilities. Windows 8 also allows replacement of the default browser with a more secure product that can continually update against known attacks.

Intel architecture-based tablets enable us to balance user experience and security by supporting alternative authentication options. For example, because typing can be cumbersome and error-prone on SFF devices, users may choose to use a fingerprint reader or facial recognition software to authenticate when on-the-go. Other authentication options include picture passwords and the ability to attach a physical keyboard to the device.

On the Intel Core vPro processor-based tablet, Intel IPT with a one-time password (OTP) is a built-in hardware token. Intel IPT with OTP eliminates the need for a separate physical token, thus simplifying the two-factor VPN logon process. The result is a seamless user experience with virtually no delays.

In addition, on Intel Core vPro processor-based tablets, Intel IPT embeds a public key infrastructure (PKI) certificate in the chipset. Use of a PKI is standard practice in the enterprise and enables large-scale implementations. It also provides better security than solutions that depend solely on passwords for authentication.

Support for Legacy Applications

Many enterprises continue to run legacy applications built on previous versions of an OS. At Intel, for example, we have integrated development environments and manufacturing applications. Both the tablets we tested support execution of these legacy applications. In addition, the ability to add controls such as antivirus and anti-malware protection minimizes the risk that legacy applications may present. This protection enables Intel business units to continue to benefit from previous hardware, software, and application investments, such as enterprise resource planning systems.

Kerberos Protocol

Kerberos is a network authentication protocol designed to provide strong authentication for client/server applications. Kerberos uses cryptography to protect security keys, which enables a client to prove its identity to a server across an insecure network connection. Cryptography is also used to protect further communications across the network connection, helping to ensure data integrity.

If an application cannot use Kerberos authentication to authenticate its users, it is possible to use Kerberos protocol transition to switch from an alternate authentication mode, such as use of a one-time password or certificate authentication, to Kerberos authentication.

Protection for Lost or Stolen Devices

The Intel Core vPro processor-based tablet supports Intel® Anti-Theft Technology (Intel® AT). Intel AT supports remote wipe and recovery of devices, even when they are not connected to a network. Remote disabling of a device is accomplished using an adjustable timeout period. If the device does not connect within a specified period of time, the device is automatically disabled. For example, an SFF device could have a shorter time-out period than a mobile business PC because the SFF device will almost always have network connectivity. Intel AT can prevent the OS from loading, even if the hard drive is replaced or reformatted. Intel AT can also be used to disable access to data encryption keys and block access to valuable data on the hard drive, even if the drive is moved to a different system.

The unique remote restore capability displays a customizable recovery message on the disabled device. The message includes contact information to help return the device to its rightful owner. Once returned, either a local passphrase or a recovery token provided by a Service Desk technician can restore the hardware or data to the device.

Next Steps

Based on the positive results of our evaluation, we intend to conduct several proofs of concept of both BYOD and corporate-purchased Intel architecture-based tablets running Windows 8. We also plan to

continue to investigate the capabilities of biometrics, and their corresponding privacy implications, in our security environment.

We plan to accelerate deployment of Windows 8 throughout the enterprise on all form factors, including Ultrabook™ devices (touch-enabled, standard keyboard-and-mouse, and convertibles), tablets, notebooks, laptops, and desktop PCs. Our deployment will start with early adopters and BYOD users, and then we will encourage employees with Ultrabook devices to upgrade. Following that, we will expand deployment to include Windows 8 Enterprise as a standard PC refresh option.

Conclusion

Based on an ecosystem review and a hands-on product evaluation, we determined that Intel architecture-based tablets running Windows 8 can enhance information security associated with SFF devices.

We tested Windows 8 on Intel architecture-based tablets and found security enhancements in four categories: flexible device management, hardware-assisted security through Intel IPT, support for legacy enterprise applications, and the availability of Intel AT.

Overall, the tablets we tested balanced enterprise readiness with consumer-friendliness, with the Intel Core vPro processor-based tablets offering the most security and manageability benefits to both the enterprise and users.

AUTHORS

Toby Kohlenberg

Senior Information Security Technologist
Intel IT

Lynette Nguyen

Information Security Specialist
Intel IT

Roy Ubry

Staff Engineer
Intel IT

Intel® Identity Protection Technology (Intel® IPT): No system can provide absolute security under all conditions. Requires an Intel IPT-enabled system, including a 2nd generation Intel® Core™ processor-enabled chipset, firmware and software, and 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>.

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: www.intel.com/technology/vpro.

Ultrabook™ devices are offered in multiple models. Some models may not be available in your market. Consult your Ultrabook device manufacturer. For more information and details, visit www.intel.com/ultrabook.

Intel® Anti-Theft Technology (Intel® AT): No system can provide absolute security under all conditions. Requires an enabled chipset, BIOS, firmware and software, and a subscription with a capable Service Provider. Consult your system manufacturer and Service Provider for availability and functionality. Intel assumes no liability for lost or stolen data and/or systems or any other damages resulting thereof. For more information, visit www.intel.com/go/anti-theft.

Security features enabled by Intel® AMT require an enabled chipset, network hardware and software and a corporate network connection. 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. Setup requires configuration and may require scripting with the management console or further integration into existing security frameworks, and modifications or implementation of new business processes. For more information, see www.intel.com/technology/manage/iamt.

Intel may make changes to specifications and product descriptions at any time, without notice. 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 PC manufacturer for more details.

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

Intel, the Intel logo, Intel Atom, Intel Core, Intel vPro, and Ultrabook are trademarks of Intel Corporation in the U.S. and other countries.

* Other names and brands may be claimed as the property of others.

Copyright © 2013 Intel Corporation. All rights reserved.

Printed in USA



0113/ERAI/KC/PDF

328138-001US

