

Improving Asset Inventories and Reducing IT Costs with Intel® vPro™ Technology

EDS investigated new hardware-based capabilities that are built into PCs with Intel® vPro™ technology. EDS concluded that these capabilities could significantly improve remote inventory, management, security, and update tasks, especially for PCs that are powered down, whose operating system is not working, or which do not have management agents installed. EDS expects to use the embedded capabilities in these PCs to achieve greater visibility of a customer's assets, from initial deployment through end-of-lease agreements. This will help EDS streamline and automate more processes, improve service-level agreements, reduce manual inventories, and increase service offerings to customers.

Executive Summary

In today's business environments, the task of deploying, maintaining, and updating PCs is not only challenging, but increasingly complex. As a world leader in integrated information technology (IT) outsourcing, EDS provides customers with comprehensive management services for the PC environment. EDS is now investigating ways to improve and expand its services further by integrating new hardware-based capabilities into its management processes for business PCs.

PCs with Intel vPro technology include built-in, hardware-based capabilities that can allow EDS to remotely manage, maintain, and update PCs that have traditionally been inaccessible from the IT management console. EDS can now remotely communicate with these PCs, even if system power is off, the operating system (OS) is inoperative, or software agents are not yet installed.

The capabilities in these PCs can allow EDS to resolve more problems within the first call to the help desk, so that many desk-side visits can be eliminated. With improved remote update capabilities, EDS can also offer customers better PC stability and security. Users should see less interruption of work, and businesses can reduce losses from user downtime and security threats.

As an early adopter of this new technology, EDS expects to be at the forefront of the industry in taking advantage of these remote manageability and improved security capabilities to help clients meet business and IT objectives.



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EDS Workplace Management Services using PCs with Intel® vPro™ Technology

Reducing manual inventories, improving service-level agreements, and increasing user productivity with remote management and improved security for PCs.

Today's IT challenges

When managing PCs, IT organizations spend significant resources on routine tasks, such as asset tracking, maintenance, and updates. Although IT organizations can automate many management tasks, currently they cannot manage or secure PCs if power is off, the operating system (OS) is down, or management agents are missing. Instead, IT technicians must make a time-consuming desk-side visit to manage these PCs. Once desk-side, the technician may need to boot a machine, reinstall agents, or update software before management processes can begin.

IT administrators are also often unaware of a percentage of systems on the network, and so cannot remotely manage those assets through the PC lifecycle. Nor is there currently a mechanism to remotely verify for a customer that all contracted systems have actually been deployed. Instead, costly manual inventories are required to verify assets before and after services are initiated for a client, and at the end of a lease agreement. Or, the IT outsourcer must accept without verification an asset list from the client or from a PC supplier as the complete list of assets delivered and deployed across the corporation.

IT administrators have a critical need for tools that allow immediate asset tracking for PCs that do not yet have a management agent installed. IT administrators also need tools that allow remote installation of software agents and applications, remote problem resolution, and remote updates, regardless of PC power state or the health of the OS. Finally, administrators need these tools to be user-independent. They need to limit user involvement in management tasks, so that user productivity is not adversely affected, and so that IT tasks can be completed more effectively from the management console.

The solution: EDS Workplace Management Services¹ and PCs with Intel® vPro™ technology

PCs with Intel vPro technology give IT service providers, such as EDS, a way to remotely manage PCs that are powered down or problematic and PCs that do not yet have management agents installed. EDS can now inventory, maintain, and update these systems from the management console regardless of power state, even in the absence of an OS.

The capabilities in these PCs can allow EDS to perform more effective asset tracking and eliminate many costly manual inventories. With improved visibility and remote management of PCs with Intel vPro technology, critical updates and security patches can achieve greater saturation in a shorter period of time. Many traditional desk-side visits for both hardware and software problem resolution can also be eliminated. This can translate into reduced service costs and shorter repair and remediation times. Ultimately, businesses will see less disruption in day-to-day activities, while the cost of deploying and maintaining technology can be reduced.

These are new capabilities for IT outsourcers, and EDS is already investigating ways to deliver the benefits of these new hardware-based capabilities to clients.

Hardware-based capabilities – always available

PCs with Intel vPro technology include powerful Intel® Active Management Technology (Intel® AMT) capabilities built into system hardware and “firmware.”² The most significant advantage of these capabilities is that they are always available to authorized IT technicians, regardless of PC power state or the health of the OS.

- **Remote communication**, which runs “under” the OS (refer to Figure 1) through a hardware/firmware stack, so that authorized IT technicians can communicate with the PC and upload critical system information, even if the OS is down or PC power is off. The communication channel is secured through HTTP authentication and Transport Layer Security (TLS).
- **Always-available alerting**, so the PC can send alerts and SNMP (simple network management protocol) traps to the management console anytime. This gives EDS policy-based visibility of fan speeds, temperatures, case intrusions, hardware failures, OS lock-ups, and other critical events as they occur.
- **Persistent event logs**, so IT technicians can have access to the list of events that occurred before a hardware or software problem became apparent. The event log is accessible even if the PC is powered down or the OS becomes inoperative.

- **Access to hardware asset information**, so IT technicians can identify compatibility issues and determine the manufacturer and model of specific parts that need replacing.
- **Access to preboot BIOS settings**, for verifying configuration information and changing settings as needed to help resolve problems.
- **Remote power-up**, so IT technicians can power up, power down, or reset PCs from the management console. Security for this capability is provided through TLS, HTTP authentication, and enterprise-level authentication using Microsoft Active Directory.*
- **Remote boot**, through integrated drive electronics redirect (IDE-R), so authorized IT technicians can redirect the boot device for a problem PC to a clean image at the help desk or an image on another remote drive. IDE-R is more secure than pre-execution boot environment (PXE) or wake-on-LAN.
- **Console redirection**, through built-in serial-over-LAN (SOL) capabilities, so IT technicians can walk the PC through a troubleshooting session without user intervention, and without leaving the management console.

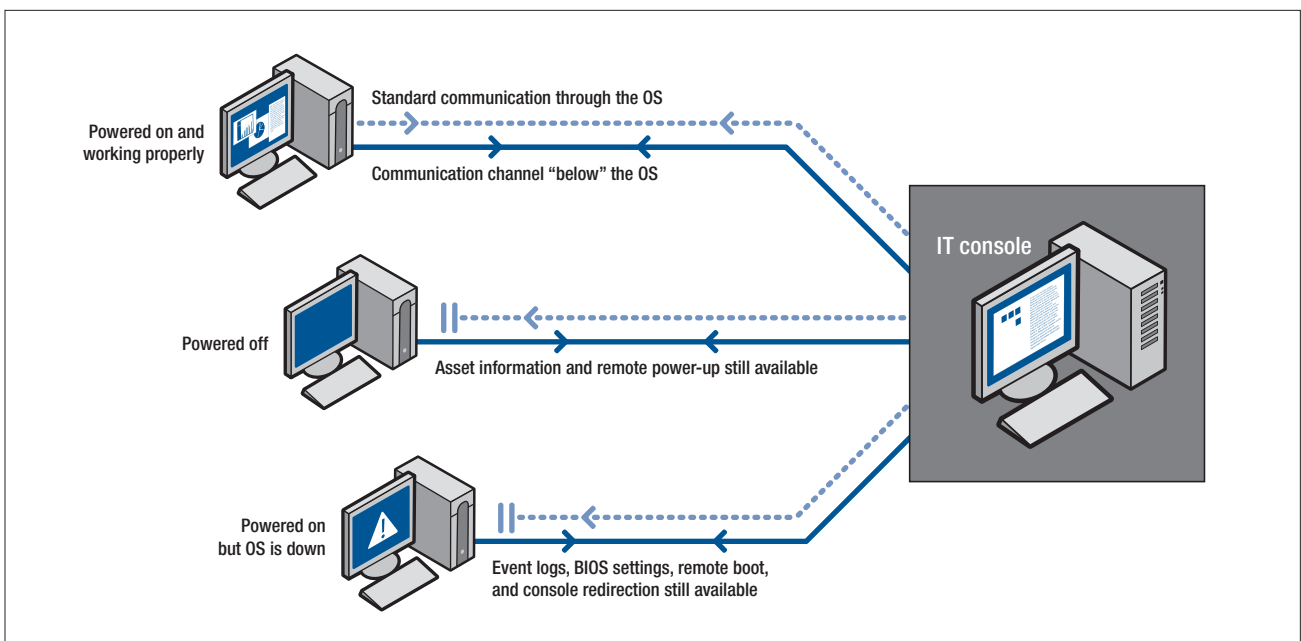


Figure 1: Remote communication channel. The hardware-based communication channel runs outside the OS, so it remains available even when the PC is powered off or its OS is not available.

Testing and validating Intel® AMT capabilities

EDS has been testing Intel AMT capabilities in an office environment (refer to sidebar on page 5) to investigate ways of integrating the capabilities of PCs with Intel vPro technology into IT processes. The data, results, and extrapolations presented in this white paper are from the EDS knowledge base and the 2006 EDS Study of Intel AMT Capabilities.³

Improving PC and hardware inventories

In today's business environment, "missing" assets can translate into loss of data and security issues. The primary problem is that IT administrators have not been able to remotely locate new or previously deployed machines that are powered down during an audit cycle, or whose management agents are disabled or not yet installed. The result can be costly, time-consuming manual audits to validate asset lists and ensure compliance with government and other regulations.

PCs with Intel vPro technology now allow EDS to achieve greater visibility of assets from initial deployment through the end of the lease cycle.

EDS test environment for Intel AMT-enabled PCs

EDS has been testing the Intel AMT capabilities of PCs with Intel vPro technology in an office set up with 17 PCs. The office setup emulates a typical business environment that EDS might manage today. The help desk for this environment is located in a small lab in a different room, in order to simulate a remote management console.

The EDS test environment consists of the full EDS Workplace Management Services (WMS), a standard build that uses a single image which can be easily deployed for PCs. WMS consists of:

- Full Microsoft Active Directory implementation based on Microsoft Windows* Server 2003 Enterprise Edition.
- Microsoft Systems Management Server 2003* (SMS), with the Intel® Active Management Technology add-on for Microsoft SMS 2003. The add-on (or "plug-in") provides integrated Intel AMT capabilities to the SMS Management Console Software.
- Microsoft Remote Installation Services.
- Microsoft Exchange 2003.*
- DNS (domain name servers) and DHCP (dynamic host configuration protocol) capabilities.

PC configurations in the test environment

EDS tested and verified the Intel AMT capabilities on 17 desktop systems. All PCs were based on Intel AMT-enabled hardware. Nine PCs included an Intel® Pentium® 4 processor. Eight PCs were configured with an Intel® Desktop Board D945GTP, and an Intel® Pentium® D processor. Minimum processor speeds were 3.0 GHz, with a range of 512 MB of RAM to 4 GB.

Multiple PC states tested

Intel AMT capabilities were tested on PCs in multiple "states": PCs with a management agent installed, PCs without an agent installed, and PCs whose OS state was unknown. Capabilities were also tested on PCs in various power states: powered on and in use, powered on but hibernating (sleep state), powered off, and unknown.

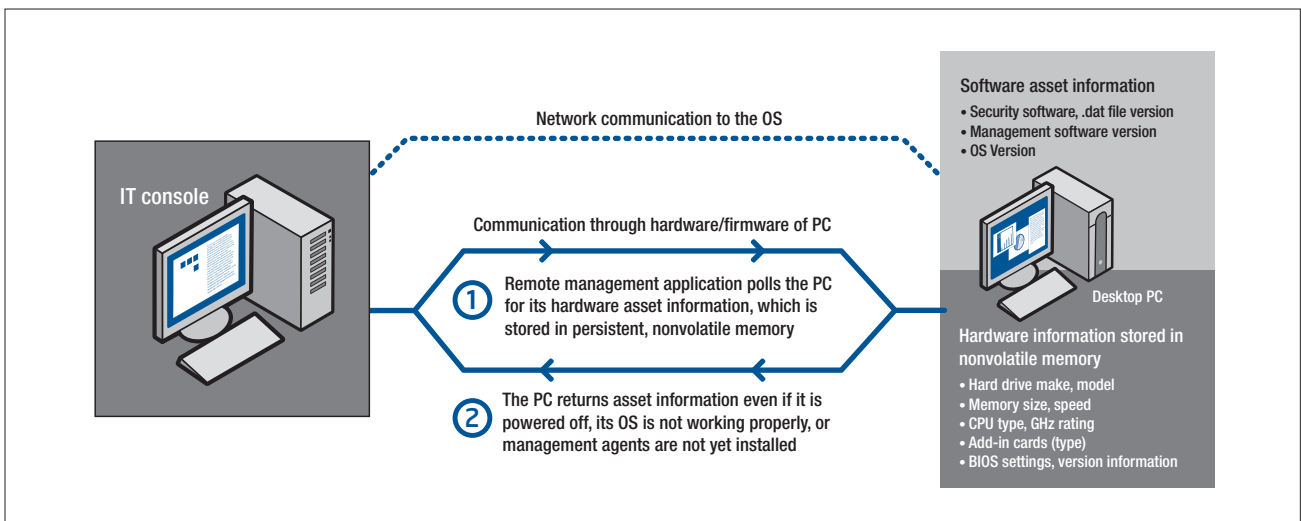


Figure 2: Remote inventory for hardware assets. EDS can inventory PCs as soon as they are connected to a power source and plugged into the network.

Remote discovery and provisioning for PCs

When initiating services for a client, an IT outsourcer must verify the actual asset base against the initial client estimate of assets. This must be done with minimal impact to the client network. Usually this means the outsourcer cannot push management software to PCs to help with the process. In almost all cases, the IT outsourcer must perform a manual inventory to verify a client's assets – a process that is both time-consuming and prone to errors.

Test case for discovering Intel AMT-enabled PCs

To test the ability of IT technicians to find all PCs with Intel vPro technology on a network, EDS performed a remote audit of all systems connected to the test environment subnet. In this scenario, seven PCs were powered down, seven PCs were powered on and working, and three PCs were powered on but did not yet have a management agent installed.

For test purposes, EDS changed the automatic-discovery feature in the software management tool (SMS) to default to a periodic five-minute polling process. (In a real-world setting, EDS usually polls a network once a day for PCs.)

The technician:

2 min	Directed Microsoft SMS to run three types of inventory polls simultaneously and automatically:	
5 min total	5 min for SMS poll	SMS automatic discovery feature, to query systems with an SMS agent installed.
	5 min for Active Directory poll	Microsoft Active Directory automatic-discovery feature, to query systems in the active directory.
	2 min, 45 sec for Intel AMT poll	SMS discovery feature on a range of IP addresses to scan for Intel AMT-enabled systems that were powered down, had no agent installed, or were otherwise inaccessible to typical software-only management tools.
5 min	Used SMS to pull data from Active Directory and Intel AMT discovery results, to create an inventory report based on all system criteria.	

The technician was able to remotely poll the PCs on the network, discover all systems, and generate an accurate inventory report within 12 minutes.

The test also showed that PCs with Intel vPro technology responded to the SMS management console at an earlier stage of the process. When managing an environment that includes these PCs, EDS expects to remotely discover these systems much faster and with higher accuracy than less-capable PCs.

Because PCs with Intel vPro technology include an “always-available” communication channel, they can respond to the EDS inventory process. EDS can now acquire hardware information even if these systems do not yet have management agents or an OS installed (refer to Figure 2 on page 5), as long as the systems are connected to a power source and plugged into the network. This allows EDS to achieve full visibility of these PCs.

For example, a company might buy 6,000 PCs with Intel vPro technology. EDS can now remotely poll the IP address range for the subnet where the new PCs reside. EDS can then use the remote-boot capability in these PCs to change a system's boot device to a remote IT image for provisioning. As soon as the standard management agent is pushed to the machine, EDS can perform other inventory, build, and maintenance tasks as needed.

User uptime can be improved because they are no longer needed to help walk a new system through the configuration steps. Costs can be reduced for deployment of new PCs. Most importantly, EDS can now acquire an accurate initial accounting of assets as they have been deployed for the client.

Accurate hardware inventory for asset management

EDS plans to take advantage of the built-in capabilities of PCs with Intel vPro technology to improve hardware asset inventories, product recalls, and warranty management. For example, a product recall might be necessary for faulty hard drives. To identify which PCs require replacement drives, an IT outsourcer would typically have to perform an inventory, including a manual inventory for systems that do not respond to the remote inventory poll.

On PCs with Intel vPro technology, EDS can now perform this type of audit automatically and remotely. An IT technician simply polls all Intel AMT-enabled PCs to obtain their hardware asset inventory. (This information is stored in the nonvolatile memory in the PC and is available to authorized IT technicians.) The technician can then upload the hardware information into the SMS database for comparison. Management software can then quickly identify systems that need a replacement hard drive. In this case, the only desktide visit required is to replace the faulty drive.

EDS expects this type of improved, more accurate remote visibility of hardware assets to translate into better planning, more efficient upgrades, faster deployments, and improved management of field-replaceable unit (FRU) inventories.

Improving end-of-lease inventories and costs

According to the EDS knowledge base, the typical customer lists about six percent of their assets as missing at the end of a three-year lease. Missing assets might have been reallocated, in repair, discarded, or stolen. Regardless of the reason they are missing, these assets must be bought out at the end of a lease. Some of these assets are later identified or recovered, and brought back into the network. However, they cannot be returned to the hardware vendor for reimbursement after the lease grace period. This can result in significant costs to the client and/or IT outsourcer.

For example, EDS examined the audit records for one client which has 43,000 PCs. At the end of a 2005 lease agreement, the client reported 370 PCs as lost or stolen, 95 PCs damaged, and over 2500 PCs unaccounted for. The total cost to buy out over 2900 missing, damaged, lost, or stolen assets was approximately \$1.5 million. Approximately 40% to 50% of the missing machines have never been located.

When using PCs with Intel vPro technology, EDS can significantly improve the bottom line for end-of-life services for systems. EDS can now more accurately inventory PCs, from initial deployments through their full life cycle. At the same time, remote-boot and console-redirection capabilities help EDS diagnose damaged machines more accurately. This will help EDS make the best financial decision for customers about the cost-benefit of repairing machines or buying them out at the end of a lease agreement. When managing PCs with Intel vPro technology, EDS expects to significantly improve both asset tracking and end-of-lease costs.

Reducing deskside visits for problem resolution

In today's environments, swapping out a problem PC is often the fastest way to get a user up and working again. However, according to the EDS knowledge base, a physical swap can take up to 30 minutes. Updating software and loading the user-specific build usually requires an additional 75 minutes, depending upon network complexity and PC configurations. EDS expects to streamline this process and improve user uptime by taking advantage of the built-in capabilities of PCs with Intel vPro technology for remote problem resolution.

Test case for inventorying hardware assets remotely

To test the ability of IT technicians to remotely inventory hardware assets on PCs with Intel vPro technology, EDS conducted an inventory poll on PCs in various states. In this scenario, seven PCs were powered down, seven PCs were powered on and working, two PCs were powered on but did not yet have the SMS agent installed, and one PC was disabled.

The technician:

2 min	Directed Microsoft SMS to run three types of inventory polls simultaneously and automatically:	
5 min total	5 min for SMS poll	SMS inventory feature to inventory systems that were powered on and which had an SMS agent installed.
	5 min for Active Directory poll	Microsoft Active Directory inventory feature, to poll systems in the active directory for their hardware assets.
	2 min, 45 sec. for Intel AMT poll	SMS inventory feature on a range of IP addresses to poll Intel AMT-enabled systems, and upload hardware inventory information from the nonvolatile memory in these PCs.
5 min	Used SMS to create an inventory report of hardware assets for all systems.	

The hardware inventory (including all three polls) was completed in less than 12 minutes, and included the full hardware asset list for each PC, regardless of PC power state, OS operability, or the presence of inventory agents.

In contrast, this type of inventory on less-capable PCs would have required deskside visits for the 10 PCs that were powered off, did not have an SMS agent, or were disabled. According to the EDS body of knowledge, this type of manual inventory traditionally takes approximately 20 minutes per asset, which includes travel time, extracting inventory information from the PC, and updating the inventory database.

When managing PCs with Intel vPro technology, EDS expects to eliminate most manual inventories and improve both the accuracy and efficiency of asset tracking.

Diagnosing and repairing a hardware failure

A typical PC problem is an OS that won't boot. EDS can now use the remote-boot and console-redirection capabilities in PCs with Intel vPro technology to more accurately identify hardware problems versus software problems. This helps eliminate the deskside visit traditionally required to determine whether the PC will require a hardware-vendor solution or servicing by an IT outsourcer.

Test case for diagnosing a hardware problem remotely

To test the ability of IT technicians to diagnose a hardware problem remotely, EDS unseated a hard drive in a PC with Intel vPro technology. This simulated a hard-drive failure and prevented the PC from booting. When the user called the help desk, the IT technician attempted to diagnose the problem remotely.

The technician:

1 min	Asked the user questions to identify the problem.
3 min	Used IDE-R to change the boot device for the PC to a boot image at the help desk. The boot image was a DOS/network bootable CD with NTFS-write capabilities and common DLL files stored on the image.
4 min	Watched the boot process, and noted that the hard drive was "missing."
2 min	Read hardware asset info from BIOS as the BIOS booted, and identified the manufacturer and model of hard drive to replace.

The problem was remotely diagnosed from the help desk during the first phone call, and in less than 10 minutes.

With detailed hardware information, the help-desk technician can now make an informed decision as to the most efficient repair course. This might be to swap out the user's PC and replace the hard drive in a service shop, or to image a new hard drive from the help desk and send a technician out to replace the failed drive.

Even if the technician decides to swap out the system instead of replacing the failed component, the first deskside visit for diagnosis could still be eliminated, as could deskside diagnostics, software updating, and configuration rebuilding tasks. EDS estimates conservatively that 25% of all deskside visits for problem resolution could be eliminated for PCs with Intel vPro technology.

In contrast, the same problem on a less-capable PC would have required a 15-minute first-call diagnosis (unsuccessful), followed by a deskside visit to determine whether the problem was a software (IT outsourcer) or hardware (PC-manufacturer) issue. According to the EDS body of knowledge, escalation of the problem to the second level, travel time to the user's desk, deskside diagnosis, PC swap-out, updating, and rebuilding (user configuration) would have taken between two hours and two days, depending on the availability of hardware components and SLA parameters.

For example, if a user calls the help desk because the system won't boot, an IT technician can now remotely change the boot device of a PC with Intel vPro technology to a remote drive, such as a build CD at the help desk. Using console redirection, the technician can watch as the BIOS boots, and can identify the failed component when it doesn't respond during the boot process. Using the remote communication channel built into these PCs, the technician can then upload hardware information from the nonvolatile memory in these PCs, in order to identify the manufacturer and model of the hard drive. In this type of scenario, the technician no longer needs to rely on the user to report error messages, input data, or attempt to put the PC through a troubleshooting session as directed by IT over the phone.

With more accurate information about the component, EDS can make a more informed decision about whether to swap out the user's system or send a technician deskside with a replacement part. For example, if the problem is a failed hard drive, it may be better for the user to replace the PC than wait for a new hard drive to be remotely imaged, built with the user's configuration, and delivered to the PC. In other cases, it might be faster to replace memory (for example) in the PC than to swap out the system, with all the associated time involved in updating software and pushing the user's build. In both cases, user uptime can be improved, and significant labor and travel costs can be eliminated.

Diagnosing and reimaging for a software problem

According to the EDS knowledge base, 80% to 90% of software problems that require a deskside visit also result in reimaging the system. This causes significant user downtime.

Because EDS can now remotely troubleshoot, diagnose, and repair PCs with Intel vPro technology, EDS can resolve more software problems from the help desk. For example, if an OS is corrupted, an IT technician can remotely boot the PC to a CD at the help desk. The technician can then watch the boot process to identify errors or problems in the boot process. If the problem is that critical files have been corrupted, the technician can push the new files to the PC, and get the user back up and working quickly – without leaving the help desk. The system may no longer need to be swapped out – with all the associated user downtime – for what is actually a fairly simple problem to resolve.

If the system will require reimaging, the user can go to a meeting or work in another area while EDS remotely reimages the system and pushes the user configuration from the help desk. PC maintenance and labor costs are reduced, and user uptime is significantly improved. Based on testing of PCs with Intel vPro technology, EDS expects to reduce desktside reimaging due to software problems by approximately 75%. EDS also expects to reduce the number of PC swap-outs for software replacement or OS reimaging by approximately 75%.

Installing updates – even if PC power is off

When updating PCs with a critical patch, the first challenge for an IT administrator is making sure all machines are powered up and ready to receive the patch. On average, 90% to 95% of machines are powered up at any given time and ready to be remotely patched. Others require a desktside visit to interrupt processes or power up PCs for users who are out of the office, on vacation, and so on. The time involved in traveling desktside, as well as the time it takes to manually go to each desk to power up PCs extends the window of vulnerability and exposes the network to continued risk. A complication to this process is that, even if a PC is powered up and working, users can refuse to allow installation of a critical patch because it might be inconvenient to their work.

PCs with Intel vPro technology now include a remote power-up capability so that EDS can install updates and protect these systems more rapidly and effectively.

Remotely installing a critical patch

When managing PCs with Intel vPro technology, EDS can remotely install a critical patch to the PC even if the system is powered off at the start of the update cycle. The IT administrator first deploys a critical patch to a pilot group – less than 1% of the environment – of powered-on PCs. If the patch is not problematic, the administrator will deploy it to the remainder of the environment.

To prepare the environment for the patch, administrators poll all PCs with Intel vPro technology for their power state. When administrators find a system that is powered down, they can use

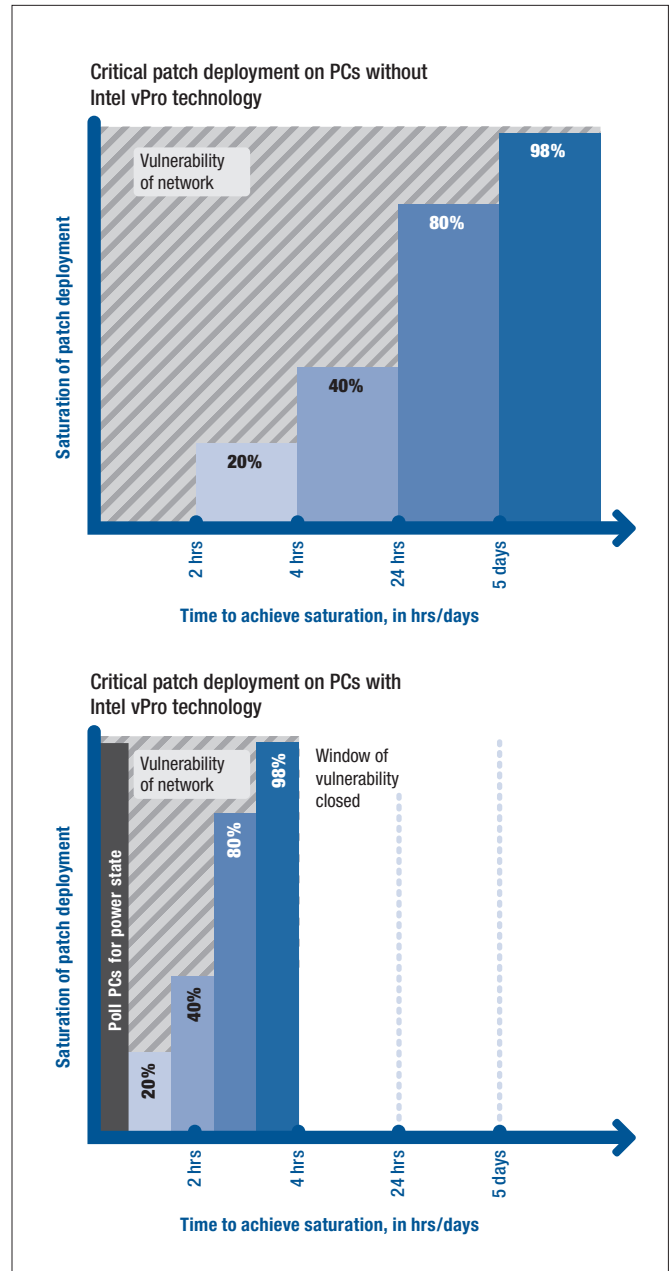


Figure 3: Saturation of patch deployment. EDS has extrapolated test data, and expects to be able to deliver a 98% saturation in approximately four hours for patch deployment on up to 6,000 PCs with Intel vPro technology. Patch deployment on less-capable PCs achieved a saturation of 98% after five days of deployment.

the remote power-up capability of these PCs to wake the systems from the management console. After installing the critical patch, administrators can use the management agent to return the systems to the power state in which users left them: on, off, hibernating or sleeping.

EDS expects that being able to reach PCs regardless of their power state will significantly reduce the time required to enforce compliance with corporate policies. For example, EDS has extrapolated data from test scenarios to demonstrate that patch saturation on PCs with Intel vPro technology could shorten saturation times for critical patches from five days to approximately four hours (refer to Figure 3 on page 9). This could significantly shorten the window of vulnerability to known threats, help reduce remediation requirements, and minimize corporate data loss from malicious attacks.

Updating firmware from the management console

There are few tools available today that allow IT administrators to automatically track and push firmware or BIOS updates to a PC. The result is that BIOS updates are not usually performed, or are performed only on an exception basis.

PCs with Intel vPro technology now allow EDS to communicate with the PC anytime and upload BIOS configuration information from the system. EDS can now use management software to automatically determine the current BIOS version for these PCs, and push updates as required. This gives EDS a method for proactively keeping firmware levels current.

Task	Without Intel® AMT	With Intel® AMT	Estimated improvement
Initial inventory of client assets	Manual inventories, time-consuming and error-prone.	Automated, accurate, remote inventories even for PCs that do not yet have management agents installed.	Eliminate manual inventories by approximately 90%.
Hardware problem diagnostics and resolution	Initial diagnostics call (15 min), desktside visit (average next-day response), diagnose hardware problem desktside (15 min), user replaces PC (30 min), technician dispatched to update and rebuild PC (75 min). Total response time: 1 day Total labor: 2 hrs 15 min	Initial diagnostics call (10 min), user replaces PC (30 min), technician remotely updates and rebuilds (75 min). Total time: 1 hr 55 min	Reduce desktside visits by approximately 50%. User back up and working within 2 hrs, instead of 1 day.
Software problem diagnostics and resolution	Initial diagnostics call (15 min), desktside visit (average next-day response), diagnose software problem desktside (15 min), user swaps PC (30 min), technician dispatched to update and rebuild PC (75 min). Total response time: 1 day Total labor: 2 hrs 15 min	Initial diagnostics call (20 min), technician remotely reimages and rebuilds (75 min). Total time: 1 hr 35 min	Reduce desktside visits by approximately 75%. User back up and working within 2 hrs, instead of 1 day
Critical patch deployment	98% saturation in 5 days.	98% saturation in approximately 4 hrs.	Reduce time to full saturation by approximately 90%.

Table 1: Expected results from extrapolated data for IT tasks performed on PCs with Intel vPro technology.

Performing updates off-hours

Because EDS can now reach PCs with Intel vPro technology from the management console regardless of PC power state, many updates and other maintenance processes can be automated. EDS can now schedule back-ups, critical patches, and other IT tasks off-hours, when they do not interrupt users, decreasing network traffic during peak hours.

Results and extrapolating the data

After examining the results from test scenarios, EDS extrapolated the data (refer to Table 1 on page 10) to understand how Intel AMT capabilities could improve IT tasks in a practical environment. Based on the extrapolated data and using PCs with Intel vPro technology, EDS expects to be able to remotely inventory a higher percentage of machines in a given inventory cycle. EDS also expects to reduce deskside visits by an estimated 50% for hardware problems and 75% for software problems. EDS believes Intel vPro technology could help improve both management and security service offerings for desktop PCs.

Looking into the future

As new capabilities are added to Intel AMT, EDS expects to offer customers the benefits of this technology to improve management and security even further:

- **Automatic presence checking for software agents.** Built-in, hardware-based “heartbeats” and programmable “watchdog” timers help make sure software management and security agents remain present. If an agent misses its predetermined check-in, the system immediately logs the event in nonvolatile memory and sends an alert to the management console, based on EDS policy. The PC itself now helps make sure that critical security and other agents remain active.
- **Hardware-based filtering of network traffic.** Programmable hardware filters check inbound and outbound network communication for known threats to help identify potential problems faster. IT administrators can now define the packet behavior conditions that will trip a hardware filter and trigger an alert and/or event. Because filters are hardware-based, they are

active even if the OS is down or an agent is disabled. They can also be used to help automate containment and remediation processes. For example, automated responses could include sending an alert to the management console, applying isolation policies, launching a virus scan, or running an executable that takes a particular remediation action.

- **Containing threats quickly.** An embedded, hardware-based switch (a “circuit breaker”) for rapid threat containment can be triggered off the built-in hardware filters. When a filter is tripped, the switch can disconnect the network data path at the OS software stack – even if the OS is compromised or down. Network traffic is then halted before it is passed into or out of the OS. The PC can now help isolate itself from the network. Or, the system can set a policy-based rate-limit for its own inbound and outbound network traffic, to give IT administrators more time to investigate a threat.

These advanced capabilities will help EDS reach all PCs in a network to perform more tasks remotely and more efficiently.

Summary

EDS is taking advantage of the new, hardware-based capabilities in PCs with Intel vPro technology to improve IT tasks, even for systems that are powered off, whose OS is down, or whose management agents are missing. EDS can now improve the accuracy and thoroughness of PC and hardware asset inventories, from initial deployment through the end of the lease agreement. This will help EDS achieve greater visibility of a client’s assets. In turn, that can help corporations update maintenance services and software licensing to better match actual corporate and user needs.

Deskside visits can be reduced for problem resolution, while critical updates can achieve greater saturation more quickly. This will help EDS further streamline processes and increase user uptime for clients. And, by testing Intel AMT capabilities now, EDS will be well-positioned to offer customers the benefits of this technology as it moves into the business environment.

For more information

PCs with Intel vPro technology give authorized IT administrators critical, hardware-based security and manageability capabilities not available in software-only solutions. When provisioned with third-party software, these PCs can be managed directly from the management console, regardless of their power state or the health of their OS.²

For more information about Intel vPro technology, visit www.intel.com/vpro

For more information about EDS Workplace Management Services, visit www.eds.com

Company information

EDS is a leading worldwide IT outsourcer, which manages over 3 million desktop and laptop PCs, and over 200,000 servers for government and commercial organizations, providing comprehensive management of the total computing environment.

¹ All information regarding EDS Workplace Management Services was provided by EDS.

² PCs with Intel vPro technology include Intel® Active Management Technology (Intel® AMT). Intel AMT requires the computer to have an Intel AMT-enabled chipset, network hardware and software, connection with a power source, and a network connection.

³ Source: Based on data in the EDS knowledge base and data from the 2006 EDS Study of Intel AMT Capabilities, which was conducted in February and March, 2006, at the EDS test site. Copyright © 2006 Intel Corporation. All rights reserved. Intel, the Intel logo, Intel vPro, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

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