IT@Intel White Paper

Intel IT
IT Best Practices
Enterprise Mobility and Mobile Business PC
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PC Lifecycle Management: Boosting Productivity and IT Efficiency

Over the years, we have developed IT best practices for each stage of the PC lifecycle. These best practices enable us to deliver increasing business value to the company.

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Executive Overview

To deliver improved services and invest resources in new infrastructure and business capabilities, Intel IT has streamlined our PC lifecycle management processes, boosting both employee productivity and IT efficiency. We're building a foundation that lets us take advantage of new technology and trends as they emerge.

We treat PCs as a strategic asset, because they are Intel's primary productivity tool. We have standardized on a fully featured mobile business PC platform that simplifies our client landscape and provides employees with the best possible user experience and performance.

Over the years, we have developed IT best practices for each stage of the PC lifecycle. These best practices enable us to deliver increasing business value to the company.

- **Optimal PC refresh.** We determined that a two to four-year PC refresh cycle is optimal, resulting in a lower total cost of ownership.
- **Deployment of new technology.** We try to touch a PC only once, resulting in lower support costs. We also constantly improve our processes to address changing business needs.
- **Inventory management.** A centralized procurement strategy provides economy of scale through distributed licensing. An industry-standard desktop management system improves inventory accuracy, security, and governance.
- **Build and image management.** By using a standard configuration and a single build process, we reduced the time it takes to release a new build from six months to 10 weeks.
- **Service Desk support.** A consolidated approach to IT services frees business groups to concentrate on their core competencies. We also implemented self-service and automated support processes to further increase efficiency.
- **Decommissioning and retirement.** We proactively decommission older systems that no longer deliver adequate performance or provide optimal security protections.

In addition, we create and invest in new technologies that can help simplify our PC lifecycle management processes and reduce support costs. Some examples include client health monitoring tools and remote PC management using the latest generation of Intel® Core™ vPro™ processors, which feature Intel® Active Management Technology (Intel® AMT).

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The IT@Intel program connects IT professionals around the world with their peers inside our organization – sharing lessons learned, methods and strategies. Our goal is simple: Share Intel IT best practices that create business value and make IT a competitive advantage. Visit us today at www.intel.com/IT or contact your local Intel representative if you'd like to learn more.

BACKGROUND

IT departments are under constant pressure to do more with less. Finding a balance between maintaining a secure computing environment, adapting to new trends, and staying within budget is a continual challenge for Intel IT. For example, Intel's employees are highly mobile and increasingly expect to perform their job duties using capable, personally owned devices, such as smartphones and tablets, in addition to using their primary PC. They also expect to be able to connect to Intel's network anytime, anywhere. To deliver improved services and be able to invest resources in new infrastructure and business capabilities, Intel IT focuses on continuously increasing operational excellence and efficiency.

One area in which we have made significant improvements in efficiencies and cost reductions is with our PC lifecycle management practices. As shown in Figure 1, in order for our IT organization to increase efficiency we had to standardize, simplify, and automate the PC lifecycle.

Our PC lifecycle management rests on two foundational concepts.

- As Intel's primary productivity tool, the PC fleet is managed as a strategic asset.
- A simple, standardized client landscape is easier and more cost efficient to manage.

With these two concepts in place, we are able to efficiently perform necessary management tasks, including determining the optimal refresh rate, optimizing the deployment of new technology, improving the accuracy of inventory management, streamlining our build and image management and Service Desk support practices, and taking outdated PCs out of production.

Over the years, we have developed IT best practices for PC lifecycle management that have far-reaching benefits.

- Increased employee productivity and improved IT efficiency, while keeping Intel assets secure
- An improved ability to deliver increasing business value to the company
- An improved ability to take advantage of emerging technologies

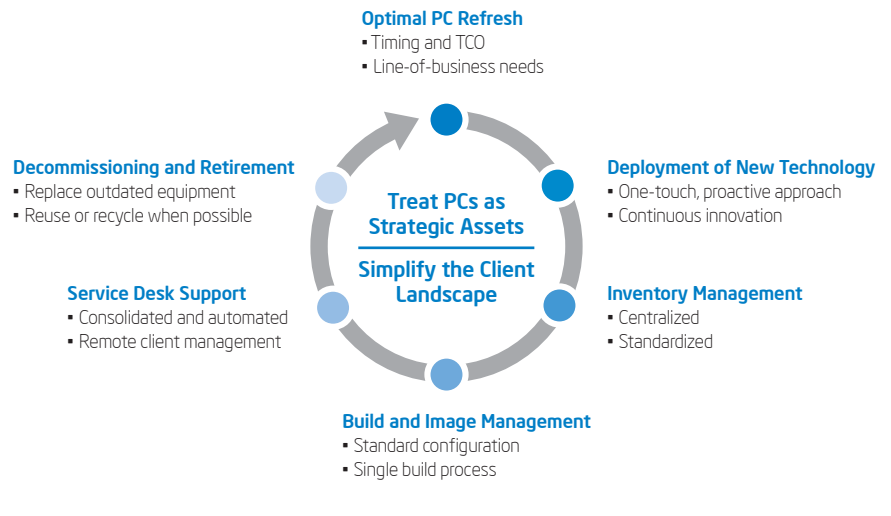

Figure 1. Our PC lifecycle management spans the time from deployment of new technology and PC refresh to PC end-of-life.

An important aspect of our PC lifecycle management strategy is taking advantage of innovative technologies. For example, we have developed tools that support proactive client health management, and we are actively exploring client-aware technologies that will enable us to deliver services to clients in an optimal manner. As another example, deploying the latest generation of Intel Core vPro processors, which feature Intel Active Management Technology (Intel® AMT), also helps us efficiently manage our mobile environments and self-encrypting Intel® Solid-State Drives (Intel® SSDs).

Client Management Helps Prepare for the Future

The following examples illustrate how intelligent, informed decisions about platform choice, combined with good PC lifecycle management strategies, positions Intel IT to quickly take advantage of emerging essential technologies.

CLOUD COMPUTING

We have found that however services are delivered—through Intel's enterprise private cloud or outsourced to a public cloud — having the ability to take advantage of the performance of a fully featured client offers the best user experience with the flexibility to run different types of applications. Only fully featured clients support the wide range of service delivery methods necessary to provide extensive mobile computing capabilities for our employees, including the ability to work offline. Therefore, fully featured mobile business PCs remain an important part of our IT strategy as we work toward migrating services to the cloud, supporting a wider range of client platforms, and enabling client virtualization.

OS IMPROVEMENTS

In our experience, synchronizing our PC upgrades to Microsoft Windows* 7 with our PC hardware upgrades to Intel SSDs and the latest generation of Intel Core vPro processors multiplied the productivity and performance benefits resulting from any one of these new technologies. Because of this, we are re-evaluating our practice of retrofitting older PCs. We now favor aggressive replacement of the older PCs with new ones.

REMOTE MANAGEMENT

We are using Intel® Setup and Configuration Software (Intel® SCS) to automate the process of populating clients equipped with the latest generation of Intel Core vPro processors—including Intel AMT—with the necessary user names, passwords, and network parameters for remote, out-of-band administration. We have deployed Intel AMT on 100 percent of our mobile client base. By providing the ability to readily implement a secure setup and configuration infrastructure for Intel AMT devices, Intel SCS makes it easier to activate this technology across thousands of client devices. To take advantage of additional capabilities, Intel IT is completing an upgrade to the latest release of Intel SCS. Intel® SCS 8 adds new features, including automatic maintenance and discovery enhancements that further improve the ability to remotely monitor, manage, and control mobile PCs equipped with Intel AMT.

LAYING THE FOUNDATION FOR EFFICIENT PC LIFECYCLE MANAGEMENT

We consider Intel's client PC fleet a strategic asset that must meet line-of-business requirements. We provide a standard computing platform that supports high levels of productivity, mobility with the freedom to work from any location, a variety of computing models, and a broad spectrum of device capabilities.

The platform must also satisfy requirements for information security and business continuity while minimizing costs. After investigating various options, Intel IT has selected mobile business PCs as our standard computing platform.

Treat PCs as Strategic Assets

In the mid-1990s, Intel's PC client policy was based on two assumptions: a four-year depreciation cycle and the belief that lower-cost PCs for general use were the most economical purchasing strategy. However, when we examined the return on investment (ROI) of more powerful client systems, we discovered that we were consistently replacing PCs that had less powerful system requirements much earlier than expected because these low-end PCs could not support the latest OS update, and they rarely lasted the expected life span. Legacy OSs and older versions of web browsers increased security risks and reduced productivity, requiring us to make additional PC purchases. This effectively forced us into a more frequent refresh cycle than we had planned and increased our overall costs. We actually shortened the useful life of our assets by not buying high enough.

This shift in perspective led us to view our client PCs as strategic assets, which must meet the following objectives:

- Enhanced security
- Improved productivity for both employees and IT staff
- Lowered costs

In general, our experience has shown that higher-specification PCs improve security, increase PC lifecycle manageability, and consistently reduce TCO.

By standardizing on a mobile business PC platform for Intel's highly mobile workforce, our employees can work from almost any location, with robust, secure computing capabilities—enhancing Intel's business continuity. For example, after an earthquake damaged an Intel site in Japan, more than 300 employees at Intel's Tsukuba site telecommuted from their homes, worked from alternate workspaces, or worked from other locations with Internet access for eight months while a new Intel facility was prepared for occupancy.

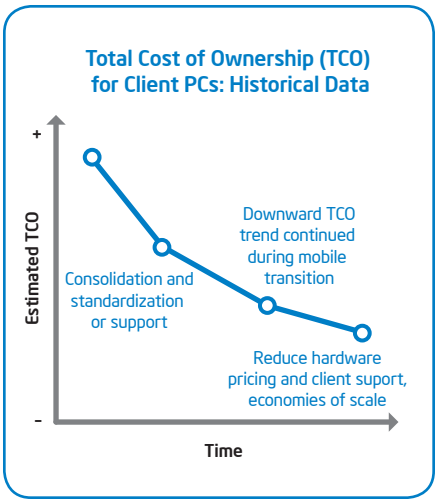

Figure 2. Standardization and centralization lower costs.

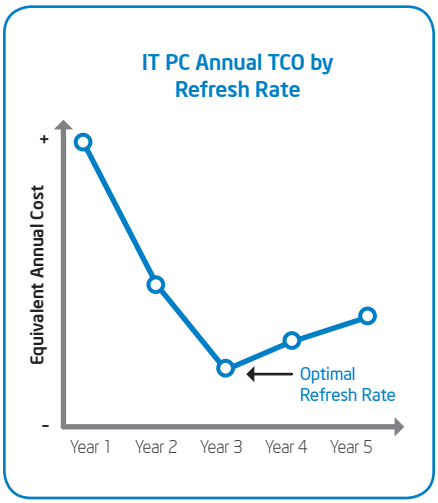

Figure 3. Our analysis consistently showed that a three-year refresh rate is optimal.

Simplify the Client Landscape

Purchasing higher performing PCs allows us to offer a smaller number of standard desktop PC and laptop configurations that apply across broad usage segments. For example, our standard laptop configuration for knowledge workers—which includes Intel Core processors, increased memory, and higher-resolution displays—also scales to engineering users. This eliminates one of the platform configurations we must support.

Simplifying our PC fleet realizes many benefits.

- The reduced complexity of the installed PC base decreases overall costs and improves network security.
- Fewer hardware configurations lower IT support costs by reducing training, documentation, and unique process requirements; and minimize repair costs by requiring fewer system and component inventories.
- IT integration teams can deliver solutions faster and more cost effectively because it takes less time to qualify and test software and updates.
- Bug fixes can be deployed 10 to 30 percent faster, significantly improving network security.

By moving to a fixed set of platforms based on the Intel® Stable Image Platform Program (Intel® SIPP), we were able to move from 14 separate client system builds to a single build image. This had a significant impact on our costs, as shown in Figure 2.

- Our technician build time dropped from two hours to one hour.
- Our build development time decreased from eight person weeks to two person weeks.
- Our build testing time decreased from two person weeks to four person days.
- Having a single build image saved Intel about USD 3 million in costs directly related to the build process and reduced our labor costs per build by 75 percent, from USD 20,000 to USD 5,600, over the period of 2000–2001.

OPTIMAL PC REFRESH

While it is commonly believed that delaying PC purchases might conserve cash in the short run, we suspected this approach might actually be more expensive in the long term, producing a higher total cost of the life of a PC. We knew that delaying a PC refresh not only saved money normally spent on acquisition and deployment, but also increased the costs for maintenance and support for the older systems.

To help us determine when rising support costs eclipsed the savings from making the PC purchase last as long as possible, we developed a comprehensive methodology, based on total cost of ownership (TCO), that lets us understand the real cost of deploying and maintaining PCs across varying time horizons. Our methodology and the resulting PC TCO cost model have significantly impacted systems planning and procurement at Intel.

Timing and TCO

Our cost model provides an agreed-upon basis for this important business decision. Our analysis, shown in Figure 3, led Intel to return to a two to four year refresh cycle from longer intervals imposed during the slow economy. Studies demonstrate that keeping PCs longer than an average of three years significantly increases support costs and security exposure, suggesting that a two to four year refresh cycle is optimal.

We've made our Laptop Refresh Savings Estimator available as an online tool (www.intel.com/go/LaptopRefreshEstimator). This tool enables IT decision makers to enter data about their existing client environment to determine their optimal time for PC refresh.

Line-of-Business Needs

In planning refresh cycles at Intel, we take into account strategic line-of-business and PC lifecycle management requirements, which include stability, ordering cycles and asset life, and global availability. Other factors that we consider include:

- **Buying built-in manageability.** We buy PCs that we can integrate into our standard management consoles and manage from day one, eliminating the need to buy additional software or create customized solutions.
- **Planning for tomorrow.** We make sure PCs can meet the demands of tomorrow's computing environment by using multicore processors along with components and applications that can scale for future needs.
- **Selecting standard components.** Using standard components, such as common chipsets, graphics capabilities, and networking hardware across all PCs simplifies engineering, procurement, and support.

DEPLOYMENT OF NEW TECHNOLOGY

As new technology is created, we continue to refine our process for deploying appropriate new technology, such as wireless capability or Intel vPro technology, into our environment. Over time, we have developed a set of IT best practices for deploying new technology. We've learned that implementing a solution that significantly transforms the way we manage and support our PC fleet involves more than simply acquiring and configuring systems that include the technology.

We use a measured, methodical approach to launching a new solution in our environment. This approach includes the following:

- **Initial planning process.** Architectural, engineering, and operations teams assess how the solution integrates into our current environment and what we may need to do differently.
- **Use case roadmap.** We identify and implement use cases that deliver meaningful value with minimal effort. This gives our support agents and end users time to become familiar with the new capabilities and processes, rather than overwhelm them with too many changes all at once.
- **Updated support processes.** Processes, scripts, and tools all need to be aligned with a new solution so that Service Desk technicians can readily resolve issues when they arise.

One-Touch, Proactive Approach

We also considered waiting to upgrade our management tools and support team processes until we had a large pool of systems configured with Intel vPro technology. However, after closer analysis, we realized we could achieve significant ROI by upgrading our tools and processes earlier rather than later. By taking this approach, our support teams have gained experience with the new tools, and we expect to see our returns increase dramatically as we adopt additional use cases.

Managing Personally Owned PCs

Like many enterprise IT organizations, Intel IT originally prohibited the use of personally owned devices in our environment. In January 2010, recognizing that the desire of employees to use their personal devices to access corporate data was not a passing workplace fad but an ongoing consumerization trend, we chose to embrace it. By staying ahead of trends in consumerization, IT is better able to pro-actively manage the security and costs associated with personally owned devices.

After working closely with Intel's Legal, Information Security, and Human Resources groups to enable a solution that aligns with our information security policy, we implemented a new program allowing employees to use their own devices on the job. Employee response was overwhelmingly positive; with more than 3,000 employees signing up to use personally owned devices in the first month.

This year, we are expanding our bring-your-own-device (BYOD) program to include BYO PCs. In the future, as device security matures, we anticipate supporting an increasing variety of personally owned devices and the services available to them using our best practices and policies already in place.

With this new usage model, IT also has to change its standard management practices. It is not just about managing devices anymore; now we must manage services and containers on devices Intel does not own. This means IT's management footprint is becoming more complex, but it also offers flexibility we have not experienced in the past. Now we can tier our services, and instead of providing everything to every device, we simply supply the services and management layers to each device as appropriate.

Continuous Innovation

Intel IT is always seeking ways to improve our processes. During the last few years, we have changed our Intel AMT configuration console multiple times, ultimately settling on Intel SCS as the best choice. Intel SCS allows us to establish an efficient, reliable Intel AMT configuration process, either pushed down the wire as part of the build or run on-demand at a user's request. An important benefit of Intel SCS is that it allows us to use Intel vPro technology in a mobile wireless environment.

We have also streamlined the process for providing PCs to new employees. Employees now collect a pre-configured PC in a 90-second handover, rather than having to attend a 90-minute introductory class where they configure it themselves.

INVENTORY MANAGEMENT

Centralized standards and procurement, along with proactive software license management, can have a profound effect on TCO. We have learned from our historical experience with embedded IT, where each Intel group made its own PC and software purchasing decisions, that a fragmented approach to inventory management made it difficult to take advantage of purchasing power and control software costs. Also, security concerns are raised when employees independently install software on their systems.

Centralizing and standardizing the IT environment—and therefore our inventory processes—enabled us to reduce costs, improve security, and improve productivity—always our goals.

Centralize

Recognizing these problems, we implemented a centralized procurement strategy that helps achieve economy of scale through distributed licensing. We streamlined our software acquisitions and deployments, aligning them with hardware release dates to create predictable, cyclical transitions from one generation of software and PC technology to the next. We coordinated hardware manufacturing schedules to create stable configurations for 15 months, taking advantage of programs such as Intel SIPP.

Standardize

To manage an array of focus areas, we use an industry-standard, large-scale desktop management system and a combination of in-house tools and third-party enterprise management software packages, as summarized in Table 1.

BUILD AND IMAGE MANAGEMENT

Intel IT helps control build costs by developing a single gold software image client build for our selected stable platforms. This consequently improves security because we can update the fleet quickly, without compatibility problems.

We need to efficiently manage the thousands of laptop and desktop PCs—and more than 2,000 software applications—used by Intel's 100,000-plus employees. Before developing our current IT client build (ITCB) process, it took us six months to release a new build because we had to manually create builds for each platform we supported. Now,

Table 1. Benefits of an Integrated PC Asset Management System

Focus Area	Results
Asset Management ▪ Asset inventory or discovery ▪ Software distribution ▪ Patch management ▪ Endpoint device power consumption management and mobile computing	▪ Increased PC asset inventory registration by 25 percent to improve inventory accuracy to over 97 percent ▪ Conducted regular software audits to help ensure purchasing was in compliance with our procurement policies ▪ Reduced average PC power footprint consumption by 95 percent
Security ▪ Security vulnerability ▪ Detection and remediation ▪ Security policy enforcement	▪ Minimized the impact of many major security threats by keeping our PCs current at the latest patch levels of software; reduced overall time to patch systems through improved tools and employee awareness programs ▪ Reduced data vulnerability by requiring encryption on PCs and through an improved hard drive destruction and disposal process
Governance ▪ IT compliance reporting ▪ Software license management	▪ Expanded audits of client systems and automated our processes to help ensure we meet current and future Intel compliance policies ▪ Used automated software audits to regularly scan for installed software and poll and verify for appropriate licenses to address Intel legal requirements ▪ Defined, deployed, and enhanced electronic discovery processes to preserve and collect PC-located data and to reply to regulatory and legal requests more quickly and efficiently

with our streamlined ITCB process, we can release a build—including changes to the application stack—every 10 weeks.

Standard Configuration

In our dynamic global enterprise environment, we need to efficiently integrate our core applications—those applications that are by default included with each new build—with a wide variety of hardware platforms. By using a standard configuration of mobile business PCs featuring the latest generation of Intel Core vPro processors, Intel SSDs, and Windows 7, we have created a stable computing environment that supports our streamlined ITCB process.

Single Build Process

The primary components of the ITCB process are as follows:

- Boot media that is used to bootstrap the build process
- An image that contains the base OS and core applications that apply to the majority of the user population
- An extensive device driver library
- A set of platform packs, each containing drivers, utilities, and firmware specific for each make and model of PC running on a supported platform

Our streamlined client build process increases IT efficiency and velocity—our ability to quickly deliver solutions. It helps us manage our global PC fleet so we can efficiently update all supported platforms. We can also, when required, use the same process to successfully build platforms that are not officially supported by Intel IT, such as engineering prototypes and evaluation units.

Our single-build approach facilitates more rapid updates and OS upgrades, allowing us to quickly and easily integrate new security patches into the build process. Therefore, new systems are better protected from intrusion and computer vandalism. We can also improve the protection of existing systems by pushing security patches.

SERVICE DESK SUPPORT

Our previous practice of embedding IT services in each Intel group created isolated silos of IT activity. This redundant approach did not allow groups to take advantage of each other's improvements and discoveries.

It was also very expensive for individual business groups to embed IT support; plus this focus on IT distracted groups from their core business and planning functions.

Consolidate and Automate

We decided to move toward consolidating IT services, so that different business groups would no longer need to deploy or support their own PCs. Intel IT's consolidation offered a clear financial advantage to these groups by transferring the support and planning responsibility to the central PC management organization.

And like all IT organizations, Intel IT constantly strives to deliver better support and reduce the cost of online service calls. As part of our online support strategy, Intel IT developed a self-service PC Health Check utility to deliver better customer support, improve response time, and increase employee satisfaction—while reducing operating costs.

Remote Support

We also recently developed a series of use cases that take advantage of Keyboard-Video-Mouse (KVM) Remote Control, a hardware-based feature of PCs with the latest generation of Intel Core vPro processors and Intel® HD Graphics. Unlike software-based KVM solutions, hardware-based KVM can give our Service Desk technicians full control of users' computers along with the ability to see what is on the monitor—even if the OS crashes—thus allowing our technicians the ability to remotely perform many tasks.

We are currently in the process of implementing the Fast Call For Help (FCFH) capability, which will allow usage of KVM and other Intel vPro technology capabilities over the Internet, not just on Intel campuses. FCFH supports our overall goal of increased IT support for our highly mobile workforce.

DECOMMISSIONING AND RETIREMENT

Technology advances, and parts wear out. As a PC nears the end of its useful life, we incur additional costs related to repair. Therefore, we have established processes for disposing of PCs in a secure and environmentally responsible way.

Whether we are removing a PC from our environment due to physical failure or planned refresh, we examine whether the PC has any residual resale value or if it should be recycled.

Replace Outdated Equipment

We proactively decommission older systems that no longer deliver adequate performance, cannot provide sufficient security protection, or require frequent repairs. This reduces costs related to patch management, repair, and help desk usage, which generally increase significantly over time. In addition, newer PCs deliver additional cost savings opportunities with improved manageability features and lower power consumption.

Reuse or Recycle When Possible

Older PCs that may not be usable for standard office or engineering computing may be repurposed for single task work or as a secondary system. However, in most cases there is residual value in the PCs and resale in bulk is the best financial option. As part of our asset disposition process, hard drives are typically removed and destroyed—we have a strict policy that no hard drive leaves Intel premises. The rest of the PC is then sold or recycled through a certified recycler or system reseller.

USING NEW TECHNOLOGY TO ENHANCE CLIENT MANAGEMENT EFFICIENCY

Intel IT creates and invests in innovative new technologies that can help simplify our PC lifecycle management processes and reduce our support costs. Some examples include client health monitoring tools and remote PC management technologies.

Enabling Proactive Client PC Management

In the past, Intel IT, like most IT organizations, relied on a reactive approach to solving PC issues. The user experienced a problem, contacted the Service Desk, and support staff attempted to find a solution. We realized that if we could transition to a more proactive approach—identifying and fixing issues in the environment before employees contacted the Service Desk—we could achieve considerable benefits, such as improved employee satisfaction and productivity, as well as reduce IT support costs. We knew that even greater benefits could result from a preventative approach—identifying and addressing potential problems before they occur in the IT environment and affect users.

In 2006, we deployed a PC health check tool that enables employees to proactively run basic diagnostic tests and fix problems without the help of a support technician.

We also focused on reducing blue-screen PC crashes. In 2009, we built a tool to collect crash dump data from users' PCs. We then analyzed the data to identify the root cause of crashes and to develop and deploy solutions. As a result, we were able to reduce the number of blue-screen crashes by more than 50 percent.

Following these initial successes, we expanded our efforts and now use a combination of in-house and third party tools to extend our proactive and preventative capabilities. For example, we can profile PCs and installed software, as well as monitor PC performance and stability events such as application crashes and unexpected shutdowns, boot time, and more. The synergy between PC performance data and PC profile data provides us with better visibility into PC health and improves PC health and and performance.

Proactively managing client PCs with the right technologies, like our PC health check tool, has resulted in cumulative savings of over USD 3M since 2006.

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Using Intel vPro Technology to Manage Wireless and Mobile Environments

To improve our ability to use certain remote management features of Intel AMT, a component of Intel vPro technology, Intel IT worked with Intel's software development team to develop ways to enhance Intel SCS, a tool used with Intel AMT. By combining the updated version that resulted, Intel SCS 8, with our existing client management console, we created a highly available, agile configuration and maintenance environment for our mobile systems. This solution improves our ability to configure and maintain mobile PCs on demand with Intel AMT and keep them configured throughout their on-the-go lifecycles for our customers.

One of the key benefits of this new solution is the mechanism we devised to resolve hostname mismatches using the built-in capabilities of Intel SCS. This mechanism provides a significant improvement in managing mobile fleets, eliminating the need to unconfigure and then reconfigure the client on a wired connection.

We also now have a customized, fast configuration tool—Intel AMT Configuring On-Demand—that technicians can download onto systems and run. We are including this tool in our client build process, allowing us to quickly deliver a configured system to our customers and reducing our dependency on network and LAN connections.

We have also created tools that enable technicians to troubleshoot and fix Intel AMT configuration issues. As part of our proactive PC management strategy, this data is being collected and analyzed to help reduce and eliminate potential future problems.

We are now looking into ways to use Intel AMT's remote out-of-band capabilities to improve support to our worldwide customers and continue reducing operating costs. For increased security and flexibility, we plan to implement these capabilities through web services and manage them through web portals.

In order to take full advantage of Intel AMT, we're working to enable FCFH infrastructure in our environment. This will enhance our management capabilities by supporting KVM, self-encrypting drive management, remote unlocking of disk encryption passwords, and virtual private network issue resolution over the Internet. The FCFH feature of Intel AMT enables a secure connection to a gateway server residing in the enterprise demilitarized zone. Using FCFH, clients can be managed remotely by the IT administrator, even when the client system is located outside the corporate network.

For example, employees can currently use a manual process to recover their disk encryption passwords while disconnected from the Intel network, but must reconnect to the Intel network after manual recovery to finalize the process. However, as we continue our efforts to implement FCFH in our Intel AMT environment, we're examining our options to provide password recovery capabilities outside of the Intel network.

Our success in keeping mobile PCs continuously configured for remote management with Intel AMT is leading us to look into more use cases for Intel vPro technology, increasing its value to Intel and our Service Desk.

Managing Intel® Solid-State Drives Using Intel vPro Technology

Intel IT has conducted a successful pilot project that combines two Intel® technologies to create a hardware-based whole-disk encryption (WDE) solution to replace our current software-based WDE solution. The new solution is based on a combination of self-encrypting Intel SSDs and Intel AMT.

The new encryption solution addresses many of the operational and business challenges we have experienced with software-based WDE, and offers several benefits.

- Improved performance, which can lead to greater employee productivity and job satisfaction
- Integrated encryption process with our client build process, which will contribute to reaching our goal of 100-percent mobile platform encryption
- Reduced Service Desk calls relating to encryption due to an automated, easy-to-use, instant encryption process and self-service password recovery
- Increased return on investment for Intel technologies already in use in our environment, as well as avoided the purchase of additional licenses and reduced ongoing maintenance costs for our software-based encryption solution

Although our long-term encryption and data protection roadmap includes drives and solutions based on the Opal* Security Subsystem Class Specification (Opal standard), in the near term, our new hardware-based WDE solution offers valuable benefits today and for several years to come.

CONCLUSION

By standardizing, simplifying, and automating Intel's PC lifecycle, we have improved IT efficiency and achieved cost reductions. At the same time, our PC lifecycle management strategy supports enhanced employee productivity, business continuity, and the ability to take advantage of emerging technologies—all of which deliver increasing business value to the company.

We manage our client PCs as strategic assets and use well-defined metrics to measure progress and guide decisions so that we can provide a mobile, cost-effective, and productive environment for Intel employees. Our PC lifecycle management processes span the entire PC lifecycle, including determining the optimal PC refresh cycle, deploying new technology, managing inventory, streamlining build and image management, enhancing and automating Service Desk support, and decommissioning PCs as they become outdated.

IT management is not a static field—technologies and users' needs constantly change. That is why we continue monitoring workforce changes, performance demands, environmental concerns, and cost considerations, with an increasing emphasis on collaboration to determine how they may affect PC lifecycle management. Looking ahead, we also identify and take advantage of new innovations in technology and new opportunities in computing trends to accelerate and deliver additional business value to Intel through PC lifecycle management strategies.

FOR MORE INFORMATION

Use the following table to find more information about the topics covered in this paper.

Topics	Available Resources
▪ Client Management Helps Prepare for the Future	▪ "Preparing the Enterprise for the Impact of Alternative Form Factors" (July 2011) ▪ "Better Together: Rich Client PCs and Cloud Computing" (March 2009)
▪ Treat PCs as a Strategic Asset ▪ Simplify the Client Landscape ▪ Optimal PC Refresh ▪ Deployment of New Technology ▪ Inventory Management ▪ Decommissioning and Retirement	▪ "Increasing Productivity with Mobile PCs" (May 2010) ▪ "Achieving Long-term Business Value with Intel® vPro™ Technology" (October 2010) ▪ "Evolving Centralized IT PC Management" (July 2009) ▪ "Using TCO to Determine PC Upgrade Cycles" (May 2009) ▪ "Client PCs as Strategic Assets" (May 2007)
▪ Build and Image Management	▪ "Creating a Dynamic Client Build Using Driver Management" (March 2012)
▪ Service Desk Support	▪ "Evaluating Hardware-based Keyboard-Video-Mouse (KVM) Remote Control" (June 2010) ▪ "Improving Client Stability with Proactive Problem Management" (September 2009) ▪ "Proactive PC Support Improves Service and Lowers TCO" (January 2009)
▪ Managing Personally Owned PCs	▪ "Improving Security and Mobility for Personally Owned Devices" (February 2012) ▪ "Computing: Preparing for the Compute Continuum" (May 2011) ▪ "Enabling Device-Independent Mobility with Dynamic Virtual Clients" (November 2009)
▪ Enabling Proactive Client PC Management	▪ "Transforming PC Management with a Preventative Client Health Strategy" (January 2011) ▪ "Improving Client Stability with Proactive Problem Management" (September 2009) ▪ "Proactive PC Support Improves Service and Lowers TCO" (January 2009)
▪ Using Intel® vPro™ Technology to Manage Wireless and Mobile Environments	▪ "Configuration Tips for Managing Mobile PCs with Intel® vPro™ Technology" (April 2012) ▪ "Managing a Factory IT Environment with Intel® vPro™ Technology" (September 2011) ▪ "Achieving Long-term Business Value with Intel® vPro™ Technology" (October 2010)
▪ Managing Intel® Solid-State Drives Using Intel® vPro™ Technology	▪ "Managing Intel® Solid-State Drives with Intel® vPro™ Technology" (May 2012) ▪ "Full Deployment of Solid-State Drives" (July 2012)

ACRONYMS

FCFH	Fast Call For Help
Intel® AMT	Intel® Active Management Technology
Intel® SCS	Intel® Setup and Configuration Software
Intel® SIPP	Intel® Stable Image Platform Program
ITCB	IT client build
KVM	Keyboard-Video-Mouse
ROI	return on investment
SSD	solid-state drive
TCO	total cost of ownership
WDE	whole-disk encryption

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