



## Solution Brief

Remote IT Management

# Remote Management in Healthcare Settings: Simplification That Brings Relief

As healthcare providers employ more technology to accomplish their mission, remote management of IT assets will play a larger role in containing costs, reducing complexity, and increasing the quality of healthcare. Intel® remote management technologies deliver these benefits across the healthcare enterprise from servers to PCs to medical diagnostic devices.

## Two Trends and a Paradox

Healthcare providers face two conflicting macro trends, and the resolution of this conflict may seem paradoxical. The first trend is market and environmental forces that are increasing the requirements placed on healthcare delivery. Many national populations are aging and requiring increased healthcare services. Regulatory demands are growing and driving the cost of compliance up. And competitive pressures are increasing as delivery models proliferate and healthcare consumers discover wider choices. All of these factors require healthcare providers to deliver more: more performance, more quality, and more client choices.



**The key to substantial cost reduction is the remote management of IT across the healthcare enterprise.**

The second trend is the economic squeeze that healthcare providers are caught in. Underlying dynamics are causing costs to spiral upwards; but competitive pressures and payer resistance are potent forces pushing prices down. As a result of this squeeze, providers must find ways to lower costs in order to at least slow the increase in prices while maintaining financial viability. So not only must providers deliver more, but they must find ways to do it more efficiently with the same (or fewer) resources.

Clearly, technology innovation will play a large role in how healthcare providers meet these basic requirements for better care and lower cost. Many of their challenges – from new therapeutic capabilities to improved compliance to workflow optimization – are fundamentally about being able to connect the right people with the right information at the right time. The good news is that new information technologies and approaches are continually advancing these abilities. But therein lies the healthcare provider's paradox: new technology is required to meet current and evolving requirements, but deploying new technology fundamentally increases costs.

*Or so it seems.* A closer look at IT costs reveals an interesting basic pattern: for the average enterprise, **91% of IT budgets are dedicated to managing and maintaining infrastructure.**<sup>1</sup>

Factors contributing to this figure are the inability to manage systems that are powered down or have a disabled operating system; costly field visits to repair systems; manual security processes; lack of configuration compliance; and assets that are undiscoverable. This massive cost center leaves **only 9% of total IT resources for innovation and the development of new value-added tools** – new tools to meet the increased customer, market, and regulatory demands while lowering costs. The clear corollary is that anything that can reduce the maintenance and management burden will have significant positive impacts on a healthcare provider's ability to innovate – and therefore reduce other costs while improving delivery.

The key to substantial cost reduction is the remote management of IT across the healthcare enterprise. As we'll see, the steady advance of management technologies by Intel has brought the market to a new era of remote manageability – for servers, desktop and notebook PCs, and mobile and clinical devices – that can significantly reduce IT costs and free IT resources for direct application to other critical challenges. At the same time, improved IT management can also significantly increase the quality of healthcare delivery.

# HIPAA Compliance Made Easier

HIPAA Standard and Specification	Description	Intel Remote Management Benefits
Security Awareness and Training HIPAA Section 164.308(a)(5)	Guard against, detect, and report malicious software	<b>Minimize Security Vulnerabilities</b> <ul style="list-style-type: none"> <li>Proactively push software security updates, even when the PC is off or the operating system is disabled</li> <li>Monitor network traffic for malicious network behavior, isolate issues, and report incidents to a centralized management system</li> </ul>
Security Incident Procedures HIPAA Section 164.308(a)(6)	Identify, respond, and report suspected or known security incidents and outcomes	
Contingency Plan HIPAA Section 164.308(a)(7)	Restore loss of data	<b>Remotely Enforce Compliance</b> <ul style="list-style-type: none"> <li>Provision PCs down-the-wire for quicker system restoration to access tools and data</li> <li>Automatically restore security and management agents and settings remotely to resolve non-compliance issues</li> <li>Remotely conduct asset inventory and assess the health of hardware and software from a centralized management console</li> </ul>
Device and Media Controls HIPAA Section 164.310(d)(1)	Monitor removal of EPHI from electronic media for re-use	
Audit Controls HIPAA Section 164.312(b)	Monitor activity of information systems containing EPHI	
Access Control HIPAA Section 164.312(a)(1)	Encrypt and Decrypt EPHI	<b>Protect Data without Compromise</b> <ul style="list-style-type: none"> <li>Encrypt and decrypt EPHI for storage and transmission without affecting end user productivity</li> </ul>
Transmission Security HIPAA Section 164.312(e)(1)	Encrypt EPHI during transmission	

## Technology Drivers, Technology Solutions

Technology is essential to evolving models of care, and the key question for healthcare IT professionals is not if the infrastructure will evolve, but how. Innovators are constantly developing new diagnostic and therapeutic technologies that are difficult *not* to adopt. Healthcare systems are inherently complex and the healthcare industry is increasingly applying technology to improve information flow. Electronic Health Records (EHR) are being mandated in major markets and are gaining momentum. Information security and portability are increasingly issues of compliance.

But technology brings its own complexities, including the management of disparate and widely distributed components. The proliferation of technologies, work sites, and workflows add to the challenge and cost of managing it all. A typical IT organization has a vast array of management processes and tools to deal with. Most of these tools are point solutions, applicable to one or a few tasks and not integrated with any other tools. The direct costs of such a hodge-podge are high, as complex processes are people intense. The indirect costs can be severe: complication breeds mistakes, and certain missed tasks (such as security updates) or missed opportunities (such as replacing a critical hard drive before it fails) can result in very costly disruptions. And in all cases, since the point of managing IT systems and assets is to make information and therapeutic capabilities available to clinicians and patients, poor asset management can directly translate into limited or low-quality healthcare delivery.

Within this challenging environment, the evolution of remote IT management tools is delivering real help. Over the last few years, advances in integrated tools have radically increased IT's ability to centralize and streamline system and asset management. Today, Intel remote management technologies are enabling powerful management tools in servers, desktop PCs, and notebook and tablet PCs. Increasingly, these technologies are being embedded in portable diagnostic systems, in-room monitors, point-of-care terminals, and therapy systems to further improve overall manageability. Intel works closely with healthcare providers and equipment manufacturers worldwide to effectively integrate these advances into the healthcare information environment.

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# The Power of Advanced Remote Management

As healthcare providers adopt more technology to meet the demands of clients, payers, and regulators, the power of integrated remote management increases. Both the cost reductions and the functional improvements are significant and wide ranging. And because Intel remote management technologies are being scaled across the infrastructure, these benefits are increasingly available from the data center to the desktop in the clinic.

**Increased abilities to monitor, manage, and repair systems and devices.** Intel remote management technologies allow IT to proactively monitor systems for issues, in many cases alerting technicians to issues before they can become problems. When remediation is required, technicians can remotely boot, troubleshoot, repair, and restore systems. For servers and PCs<sup>1</sup>, these capabilities remain available even if the system is powered off or the operating system is down. By eliminating many field visits to fix problems, these remote capabilities reduce costs significantly and get systems and users back to work more quickly. These technologies also keep configuration information available in nonvolatile memory and up-to-date; when a technician visit is needed they can be dispatched with the right parts the first time.

**Less system and device downtime.** In any enterprise, downtime means lost productivity and increased cost. As healthcare providers integrate more and more digital technology, these effects become amplified. In addition, downtime in very critical clinical and hospital settings can have serious negative effects on outcomes. Intel remote management technologies bring multiple capabilities that reduce downtime. Automated configuration management and patching helps ensure that systems are protected at all times, thus greatly reducing the amount of downtime due to viruses and malware and protecting the organization from catastrophic data loss. The ability to maintain and update systems after hours – even systems that are turned off – greatly reduces the number of interruptions during working hours. Greater uptime maximizes the impact that technology has on the healthcare mission, both in terms of quality of outcomes and greater return on investments.

**Increased automation of management processes.** When routine tasks are done manually, they drain IT resources and breed errors such as missed security patches, out-of-date configurations, and incomplete inventory data. Intel remote management technologies automate configuration checking and security and software updates, greatly reducing the workload required and spotting problem areas quickly. In addition,

automated inventories of hardware and software assets replace expensive (and inaccurate) manual inventories. Instead, inventories become a reliable IT planning tool, allowing technicians to locate lost equipment and ensure compliance rapidly. Testing and certification processes can be automated, and configuration tampering can be spotted and remediated quickly.

**Increased information security and lowered risk.** From legal, ethical and regulatory viewpoints, information security is paramount for healthcare providers. Security threats grow exponentially and breaches can be extremely costly. Increased network traffic compounds the problem. By improving the security profiles of IT assets, Intel remote management technologies bring considerable decreases in both security-related cost and risk exposure. Remote patching and automatic remediation of tampering provide an unprecedented level of asset and data protection. This is paramount with regard to HIPPA and Sarbanes-Oxley requirements. (See HIPPA Compliance Made Easier for details on how this better protects patient health information.)

**Better utilization of IT resources—both people and dollars.** More remote capabilities mean fewer field tasks, which directly reduce the amount of resources needed for management activities. Fewer repair visits and faster remediation reduce real dollar maintenance costs. In addition, Intel remote management technologies increase the ability of technicians and engineers to multitask and thus increase the effectiveness of IT teams.

**Better service levels and greater support for the healthcare mission.** Wherever clinician meets patient, an IT asset is simply a tool; and an unavailable tool can't help, whether it's a portable device performing a diagnostic task or a data center server delivering vital information. Intel remote management technologies result in higher availabilities that in turn deliver more and better healthcare. Clinicians can get more done, know more about the patient, and deliver better therapies and answers – in short, deliver better healthcare.

# Improvements Across the Landscape Now, with More to Come

Intel remote management technologies are delivering these benefits across the IT landscape now, from servers to workstations and from portable clinical devices to medical diagnostic systems. We've used our experience and our relationships with hardware, software, and medical device manufacturers to make these technologies widely available. As a result, healthcare providers can use these tools comprehensively to combat pressures from increasing costs and complexity.

## Proven remote management for data center and remote servers

Intel server management technologies – proven across industries – bring powerful cost- and risk-reduction tools to the challenges faced by healthcare providers. Information management trends driving greater server usage include HIPPA, Sarbanes-Oxley, EHR adoption, and increased digital imaging. New usage models such as multi-site facilities and new digital diagnostic tools are also increasing the amount of servers required. Intel remote server management technologies – built into servers based on Intel® Xeon® processors and Intel® 5000P and 5000V Chipsets – work in conjunction with third-party management console applications to provide robust, cost-reducing remote management capabilities that can maximize server health and availability. Because these abilities reduce the resources that must be spent on server management processes, IT departments gain more potential to provide additional value-added services, capacity, and healthcare delivery tools.

The key elements of Intel server management are:

- IPMI 2.0 conformance that enables remote accessibility, remote boot control, remote monitoring, and basic hardware inventory information through a third-party IPMI 2.0-compliant management console software application.

## As healthcare providers adopt more and more technology, the power of integrated remote management increases.

- Out-of-band (OOB) system management that enables remote management independent of the operating system and regardless of power or operating system state. OOB capabilities include operations such as retrieval of asset IDs, hardware inventory information, and Sensor Event Logs. This enables faster problem resolution by allowing technicians to retrieve hardware inventory data from nonvolatile memory and issue a repair order with details of the failed part, reducing the repair to a single visit.
- Down-the-wire repair of software problems that eliminates many server-side visits.
- Automatic alerts for intermittent failures resulting in erratic operation.
- KVM-r pass-through for remote console viewing and control with a third-party KVM solution.
- IDE media redirection that allows technicians to attach servers to remote IDE devices for remote diagnosis or provisioning resulting in more efficient repairs and configuring.
- Intel Power Tools to help improve power management of servers with power monitoring and estimates of power consumption.

## Remote Management at Providence Health System

Providence Health System in Oregon evaluated the potential for remote management using Intel® vPro™ technology to reduce cost, improve security, and increase productivity across an installed base of 11,000 PCs in its hospitals, clinics, medical groups, and business offices. The test results demonstrated the impressive capabilities of Intel vPro technology to improve manageability, uptime, and cost savings:

- 50% annual savings on software compliance.
- 37% savings on desktside hardware support.
- 33% savings on desktside software support.
- 81% savings on performing hardware inventory.
- USD \$510,000 savings over four years after deploying Intel vPro technology — a 66% ROI.

For complete details on the Providence Health System evaluation, see [www.intel.com/business/vpro/casestudies](http://www.intel.com/business/vpro/casestudies).

## Remote management of desktop and notebook PCs that is rewriting the rules

The introduction of Intel® vPro™ technology in 2006 changed the landscape of PC management. Today, companies across industries are using Intel vPro technology to significantly reduce PC management costs while increasing system uptime and data security — and the results are remarkable. By deploying desktop PCs based on Intel® Core™2 processor with vPro™ technology and notebook PCs based on Intel® Centrino® with vPro™ technology in combination with an enabled software management application, organizations are experiencing:

- Hardware-related platform visits reduced by up to 56%.<sup>3</sup>
- Software-related platform visits reduced by up to 52%.<sup>2</sup>
- Up to 49% faster time-to-patch saturation.<sup>2</sup>
- Hardware and software inventories conducted up to 94% faster than manually per PC.<sup>2</sup>

**Intel remote management technologies let clinicians get more done, know more about the patient, and provide better therapies and answers—in short, deliver better health care.**

**Intel is leading the way by not only developing advanced remote management technologies but also working with the healthcare ecosystem of device, hardware, and software providers to scale remote management across the healthcare enterprise.**

Deploying PCs with Intel vPro technology frees significant IT resources for other critical tasks and considerably improves PC security profiles. The remote PC management capabilities of Intel vPro technology (which incorporates Intel® Active Management Technology<sup>4</sup>) in combination with an enabled management console application include:

- **Down-the-wire repair of software problems** that eliminates many desk-side and remote field visits.
- **Out-of-band (OOB) PC management** that enables remote monitoring and remediation even if the PC is powered off or the operating system is down, resulting in faster and less-expensive repairs.
- **Automatic alerts** for memory usage, hard disk health, fan failures, and dozens of other parameters to identify and remediate issues before they become major problems.
- **Proactive security** that better prevents attack and disruption. The hardware-enhanced security capabilities of Intel vPro technology enable proactive protection for PC assets that help guard the IT infrastructure and ensure service continuity.

## Remote PC Management With Intel® vPro™ Technology

Desktop PCs based on the Intel® Core™2 processor with vPro™ technology and notebook PCs based on Intel® Centrino® with vPro™ technology make managing your PC fleet much simpler and more cost effective. When combined with one of the leading PC management software consoles, Intel® vPro™ technology provides unprecedented capabilities that allow you to deliver more business value to your organization.

- Remote diagnosis and repair reduce costly and time-consuming desk-side visits by resolving problems and repairing PCs quickly from the console — even if the PC is powered off or the operating system is down.<sup>2</sup>
- Automated proactive alerts identify issues before they become problems or costly repairs. These include alerts about missing or disabled software, memory usage, hard drive health, fans, and power supplies.<sup>2</sup>
- Secure remote power up and power cycling allow you to perform scheduled maintenance, backups, and monitoring after hours.<sup>2</sup>
- Encrypted, remote security updates ensure that security patches are up to date and speed the deployment of critical patches, even to systems that are off or down.<sup>2</sup>
- Remote asset tracking eliminates time-consuming manual inventory of hardware and software with remote inventory management, even if the system is off or down.<sup>2</sup>

- **Automated security patches and updates.** Security configurations and agents are checked automatically and security patches are deployed remotely, ensuring full compliance. Encrypted remote power-on and update capabilities provide full control and allow PCs to be updated after hours, minimizing disruptions and ensuring rapid compliance.
- **Hardware-based isolation and recovery.** Hardware-based filters examine inbound and outbound network traffic for viruses, stopping attacks before they reach the operating system and providing more protection than software-based anti-virus tools. Off-the-shelf software can be used to set policy for individual filters, making implementation easy, and remediation can be performed using a secure channel isolated from the PC operating system. In addition, problem PCs are isolated before they impact the rest of the network.

### The next wave: remote management of clinical and therapeutic devices

It was a natural progression for Intel remote management technologies to move from servers to PCs, and that trend can continue for specific-use devices in clinical settings. As the use of handheld and cart-based diagnostic and therapeutic devices increases, effectively managing them becomes more and more important to containing overall costs and maintaining workflow productivity.

Currently, maintenance of specialized devices requires either a field or a depot visit and a high-cost technician. Many of these devices can utilize Intel® Active Management Technology<sup>4</sup> (Intel® AMT), and in each case the positive impacts of remote management – lower cost, greater uptime, increased productivity, and better compliance – will grow with the proliferation of these devices:

- Tablet PCs for clinicians, driven by productivity gains and EMR adoption.
- Operating room patient displays showing patient medical history.
- CAT scanners benefiting from remote software updates.
- Bedside monitors and point-of-care terminals increasingly populating the 18 million hospital beds worldwide and requiring software update compliance.
- Cart-based ultrasound with patient data storage and wireless networking.
- Respiratory and infusion therapy devices often used outside of hospital and clinic settings, making it even more difficult to access the unit, ensure compliant operation, and journal remote software updates with date and time stamps.



# Delivering New Tools for the Healthcare Mission

The basic trend for healthcare providers is clear: more technology. The future of healthcare includes evolved IT infrastructures that enable pervasive information exchange to empower clinicians and patients and deliver better outcomes. As information management plays a larger and larger role in healthcare and as the number and type of digital devices expands, the ability to effectively manage these disparate infrastructure elements becomes more critical. Intel is leading the way by not only developing advanced remote management technologies but also working with the healthcare ecosystem of device, hardware, and software providers to scale remote management across the healthcare enterprise. The results – lower cost and improved healthcare delivery – are at the heart of the healthcare mission.

## For More Information

What's your strategy for lowering the cost and increasing the effectiveness of management across your IT infrastructure? To learn more about how other healthcare leaders are using remote management to succeed, contact your Intel representative or see the following Web sites.

For more information on Intel's comprehensive involvement in the transformation of healthcare, visit [www.intel.com/healthcare](http://www.intel.com/healthcare) and [www.intel.com/go/medical](http://www.intel.com/go/medical).

For more information on Intel server management technologies and the remote management of servers, visit [www.intel.com/products/server](http://www.intel.com/products/server).

For more information on Intel vPro technology and the remote management of PCs, visit [www.intel.com/vpro](http://www.intel.com/vpro).

<sup>1</sup> Source: IT Spending and Staffing Survey, Gartner, November 2005

<sup>2</sup> Intel® Active Management Technology requires the computer system to have an Intel® AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. It may also require modifications of implementation of new business processes. With regard to notebooks, Intel AMT may not be available or certain capabilities may be limited over a host OS-based VPN or when connecting wirelessly, on battery power, sleeping, hibernating or powered off. For more information, see [www.intel.com/technology/manage/iamt/](http://www.intel.com/technology/manage/iamt/)

<sup>3</sup> Results shown are from the 2007 EDS Case Studies with Intel® Centrino® Pro and the 2007 EDS case studies with Intel® vPro™ processor technology, by LeGrand and Salamasick, 3rd party audit commissioned by Intel, of various enterprise IT environments and the 2007 Benefits of Intel® Centrino® Pro Processor Technology in the Enterprise, Wipro Technologies study commissioned by Intel. The EDS studies compare test environments of Intel® Centrino® Pro and Intel® vPro™ processor technology equipped PCs vs. non-Intel® vPro™ processor technology environments. The Wipro study models projected ROI of deploying Intel® Centrino® Pro processor technology. Actual results may vary. The studies are available at [www.intel.com/vpro](http://www.intel.com/vpro), [www.wipro.com](http://www.wipro.com), and [www.eds.com](http://www.eds.com)

<sup>4</sup> Intel® Active Management Technology (Intel® AMT) requires the computer system to have an Intel® AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. It may also require modifications of implementation of new business processes. For more information, see [www.intel.com/technology/platform-technology/intel-amt/index.htm](http://www.intel.com/technology/platform-technology/intel-amt/index.htm).

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