

**System Migration Assistant**

***Rapid Restore PC<sup>TM</sup>***

***ThinkVantage Technologies***

**Embedded Security  
Subsystem**

***ImageUltra<sup>TM</sup>***

**Access Connections**

**TECHNOLOGY BUSINESS RESEARCH, Inc**

## **Optimizing Lifecycle Ownership Costs**

A Guide to Immediate Hard Dollar Savings Utilizing IBM's Management Tools Suite



*Management tools are an extremely relevant procurement consideration, especially in today's economic environment.*

*TCO measurements fail to address the full range of needs of the new IT economic reality, especially hard dollar returns on investment.*

*Focus is shifting to reduction of hard costs associated with deployment, support and disposal, resulting in a faster ROI.*

## Background

Over the last several years IBM has developed a number of system and client technologies that were designed to sharply reduce the IT management costs over the lifecycle of the product. To better document these savings and understand the full value of these technologies IBM retained TBR to conduct end-user research and prepare a white paper describing the findings. The research was conducted as part of a three-step process. Initially, two TBR analysts spent a day and a half being briefed by IBM managers for each of the individual management tools offered by IBM. The next step in the process was conducting interviews with IBM users who were employing one or more of the tools to better understand how these tools reduced the lifecycle costs. To insure truly independent findings we then interviewed a number of customers from TBR's own database of users who had switched from another vendor to IBM. Our goal was to determine the influence these tools had upon the decision to switch as well as their experiences with the tools.

## INTRODUCTION

Controlling total cost of ownership (TCO) has been the goal of every good IT manager for the last 10 years. While TCO is a critical element in any procurement decision, traditional TCO measurements fail to address the full range of needs of the new IT economic reality, especially hard dollar returns on investment.

Today's economic constraints and pressures, coupled with product commoditization and sharply lower system costs, have shifted the emphasis of procurement and IT managers to ROI (return on investment) and full lifecycle costs. While TCO tend to address the sum of costs over the life of a system, managers are now striving to achieve a balance between immediate payback and savings during each phase of the system's life.

As hardware costs have fallen, the relative effect of lifecycle costs has continued to escalate due to increased product complexity, proliferation and related management and support issues. Today hardware and software accounts for less than 20% of the TCO; during the next few years that figure is likely to drop to less than 10%. For this reason, focus is shifting to reduce the hard costs associated with deployment, support and disposal and to advance hard dollar savings to the first 90 days to 1 year of ownership, thus resulting in a faster ROI, today's most important TCO measurement.

## KEY WHITEPAPER FINDINGS

After conducting a comprehensive on-site review of IBM's management tools, detailed interviews with seven major IBM customers who had rolled out these tools and discussions with a number of TBR survey participants who had changed vendors due the availability of these tools, TBR believes the findings and data contained in this white paper conclusively indicate:

***Management tools are simply not the same across vendors – IBM leads the industry in management tool spectrum, performance and ease of use.***

***The larger the vendor investment in management tool development, the incrementally higher savings enjoyed by the end user – and nobody has directly invested more than IBM.<sup>1</sup>***

***Management tool innovation results in previously undiscovered savings –***

*IBM's leading-edge management solutions provide users with hard-dollar savings unavailable to competitors' customers.*

*The right tools advance hard-dollar savings – users no longer have to wait years for a reasonable return on investment. IBM customers begin saving hard dollars on the day of deployment.*

*Leading-edge management tools like Access Connections ease the IT integration of critical new technologies such as wireless connectivity – and IBM is the segment leader.*

The availability of a robust suite of management tools significantly improves user productivity, IT support costs, personnel optimization and overall lifecycle costs. In fact, it may be the single most important factor given the commodity nature of the client hardware business. More than anything else, hard-dollar savings and lifecycle costs differentiate one vendor from another, and today IBM leads in this differentiation.

IBM has adopted an overall strategy focused on optimizing a customer's lifecycle operating costs. Rather than concentrate on reducing costs in one phase of the lifecycle, IBM has addressed the needs of each lifecycle phase, integrating a suite of tools that delivers ROI across the entire lifecycle. IBM's suite is balanced by delivering savings throughout the life of the product, but with an emphasis upon earlier ROIs. The savings are not always expressed in dollars as economic pressures now place increased value on "cost avoidance", such as allowing users to do more without increased resource investments.

IBM has also led the industry by delivering management tool value at little or no cost to the user. Tools such as Rapid Restore PC are included at no charge, while others are priced to deliver almost immediate ROIs. Rapid Restore alone can deliver hundreds or even thousands of hours of newly found desk-side time, all at no cost to the user. IBM's Management Tools Suite allows users to do things faster and more efficiently with less hassle and fewer resources than any other vendor. Simply put, IBM's Management Tools Suite delivers on the promise of a more effective, faster ROI. And IBM's continued commitment and investment to offer the most innovative tools in the industry guarantee users will continue to reap the rewards of a management tools strategy keyed to all their needs, not just a few.

## **THINKVANTAGE TECHNOLOGIES FOUNDATION**

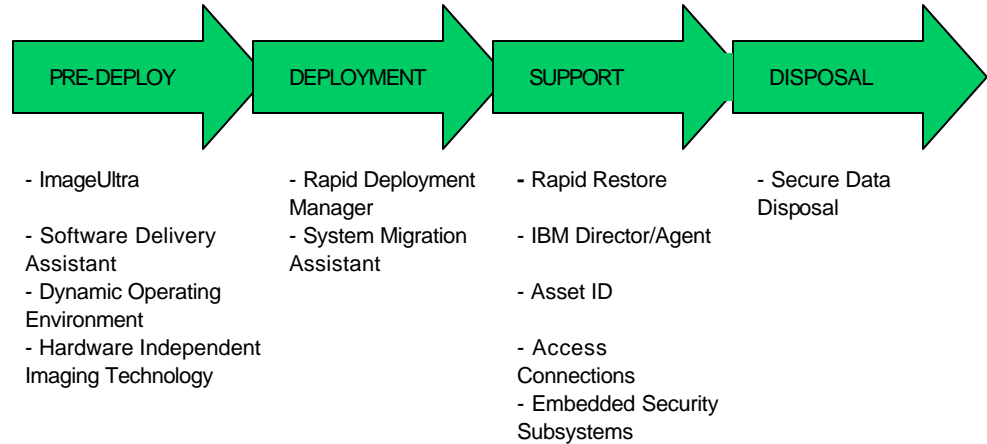
IBM's industry leadership position in IT management solutions is based on a broad array of management technologies under the umbrella name ThinkVantage Technologies. Each of these management technologies responds to real system management problems faced daily by IT managers, whether at small or enterprise-class companies. Each technology, by itself, is important – together they are the foundation for better ROI, reduced TCO and increased user satisfaction. What are each of these technologies and how do they benefit the customer? The following graphic disaggregates the lifecycle into four discrete phases, each with unique needs satisfied by individual ThinkVantage management technologies.

*IBM's Management Tools Suite delivers on the promise of a more effective, faster ROI.*

*With hardware no longer offering substantial cost-reduction opportunities, corporate management is now beginning to target personnel cutbacks just when resources are needed the most.*

*ImageUltra can deliver deployment savings in excess of 50% while significantly reducing deployment time. Existing resources are able to do a better job faster without adding a single staff member.*

**SYSTEM LIFECYCLE**



Trying to keep deployment, support and disposal costs in relative proportion to system cost has become an increasingly difficult task as system unit costs continue to drop dramatically and complexity continues to grow. Compounding this problem are current economic pressures on IT departments to reduce costs, even as they are expected to do even more. With hardware no longer offering substantial cost-reduction opportunities, corporate management is now beginning to target personnel cutbacks just when resources are needed the most.

By evaluating needs in each phase of the lifecycle – pre-deployment, deployment, support and disposal – IBM has developed management solutions that deliver better ROIs, help contain or reduce current costs and avoid added costs.

For example: ImageUltra allows the customer to consolidate literally hundreds of images found in the typical large multinational company into a single master image. This master image is later tailored to the individual user’s needs through a set of menu-driven selections. Unused portions of the image are then automatically discarded. ImageUltra can deliver deployment savings in excess of 50% while significantly reducing deployment time. Existing resources are able to do a better job faster without adding a single staff member.

IBM’s early recognition of the need to effectively manage all phases of the lifecycle has resulted in the industry’s most comprehensive set of integrated management tools, providing the end user with unprecedented opportunities for hard-dollar savings. IBM’s tools also help rein in the rapid relative growth of operating costs, thus allowing users to do more with fewer resources.

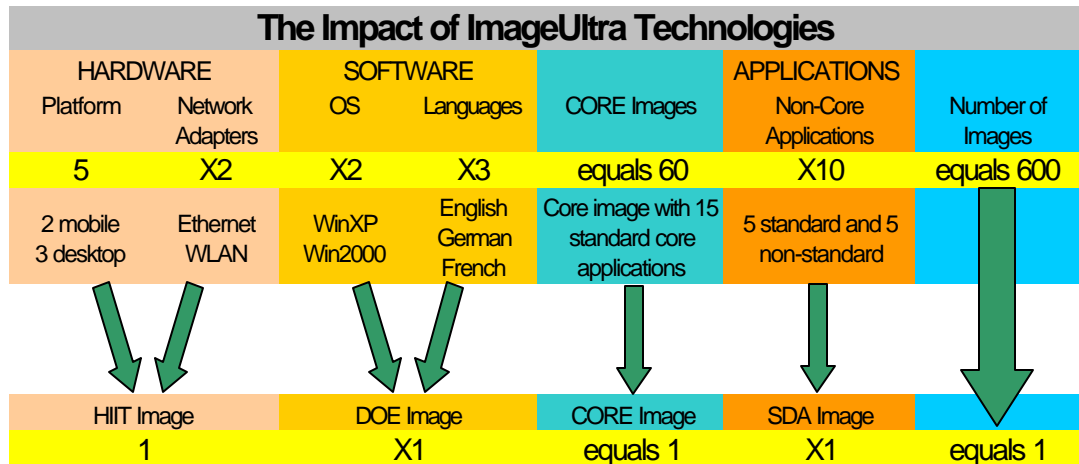
The IBM story is clear, concise and compelling – superior management technologies across all phases of the lifecycle.

**SAVING HARD DOLLARS BEFORE DEPLOYMENT**

**ImageUltra** is the umbrella name for IBM imaging technologies that focus upon simplifying the complexity of developing and distributing corporate images. There are three key technologies that form the ImageUltra suite:

*In large multinational companies with multiple languages, operating systems and applications, as many as 600 or more different images are consolidated into a single master image.*

**Dynamic Operating Environment (DOE)** consolidates multiple images into one super or master image, which is then loaded onto new systems prior to or during deployment. In some cases, especially at large multinational companies with multiple languages, operating systems and applications, as many as 600 or more different images are consolidated into a single master image. During the initial boot of the system, the user customizes the system to match his or her needs from a series of menu screens. This only takes a few minutes, thus reducing both user and tech support time. Because of the simple menu-driven design, help desk requirements are minimized as well. Unused elements of an image (such as another language) are then deleted from the hard drive.



**Software Delivery Assistant (SDA)** is a critical tool that sets up an application image on top of the core system image. Using SDA, an enterprise is able to load all the applications residing in the company network on the system’s local drive and then match and install the most appropriate applications for specific end users. This is accomplished by end user keyed scripts or through answers derived from menu-driven screens filled in by the user during the installation process. Unused applications are then deleted from the disk drive.

By employing SDA, users are able to eliminate the traditional time-consuming and costly network delivery of applications, especially for locations with low-speed links, while significantly improving the quality of the load. Moreover, tracking software licenses is greatly enhanced, as well as the addition of new applications or upgrades to existing applications.

**Hardware Independent Imaging Technology (HIIT)** allows PCs to adjust to the image deployed, thereby not forcing an adjustment of the image to match each hardware platform. This is accomplished at the time of manufacture by loading hardware-dependent code into a hidden hard-drive partition. During the initial boot of the system, the customer’s image is merged with the hardware-dependent code to create the final image for the specific platform on which the image is being deployed. Thus, the customer’s master image is never changed due to variable hardware needs – the change occurs on the hardware and is limited just to the hardware-dependent code.

*Using SDA, an enterprise is able to load all of the applications residing in the company on the systems local drive and then match and install the most appropriate applications for specific end users.*

Gartner has documented the costs associated with the creation of a unique image at over \$5,000 per image/platform.<sup>2</sup> Therefore, it is not unreasonable to expect annual costs in excess \$100,000 to support 20 images needing updates and maintenance. Deployment costs are estimated to range between \$180 and \$350 per client, suggesting an overall annual cost of \$300,000 to \$500,000 for an installed base of 2,500 clients. With proper management and ImageUltra, deployment costs could be slashed by 50% – but if not managed properly costs could double within the next five years.

#### **EXAMPLE: MAJOR IBM OUTSOURCE CUSTOMER**

A major IBM Strategic Outsource Customer told IBM that it had exhausted all sources of voluntary cost reduction, yet support costs had to be reduced by more than \$60 million within two years. By utilizing ImageUltra, RDM, SMA, AssetID with IBM Director Agent, Rapid Restore PC and Secure Data Disposal the customer was able to roll out 20,000 PCs in four months and achieve a 100% ROI by the end of the first year. It will reach the goal of \$60 million in savings by the end of the second year. Move and changes costs dropped from an average of \$270 to \$0 and field support personnel was reduced by greater than 50%.

With three patents covering ImageUltra technologies, it is no wonder this imaging technology is considered a major technical innovation. In fact, IBM is so sure of the savings users will enjoy it is backed by the ImageUltra Guarantee.

There is no doubt ImageUltra technologies deliver substantial benefits, including better resource utilization and more efficient budget usage through the automation of resource-intensive tasks. And because of the simplified process, help desk and desk-side costs are minimized as well.

#### **IMMEDIATE REAL-TIME DEPLOYMENT SAVINGS**

**Remote Deployment Manager (RDM)** is a network-based imaging and system support tool designed to effectively distribute images and update system settings. This allows downloading images and/or updates during initial or subsequent boots, obviating the need to load images centrally. With RDM, users can take advantage of ImageUltra technologies, even when new systems are delivered to remote sites. As system settings or images change over time, RDM can be used to deliver updates to remote systems.

**System Migration Assistant (SMA)** is a migration tool designed to assist medium to enterprise-class organizations by automating the migration of users' personal settings and data from an old system to a new system. SMA collects the end-user's personality and data, including connectivity settings, data files, ID, Windows settings and application-specific settings from their old PC and installs them on the new PC as part of the migration process. The result is the new PC has the same look and feel of the user's old PC, allowing the user to immediately return to work and become fully productive in a minimum amount of time.

#### **EXAMPLE: A MAJOR ENERGY COMPANY**

Progress Energy, a primary energy supplier in the Southeast United States, has benefited significantly from RDM and SMA. After nine years, Progress's Nuclear Division recently decided to switch computer vendors, replacing 2,600 Compaq desktops and 300 Compaq laptops with an equivalent number of IBM systems.

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The Nuclear Division is under a number of operational constraints that are very different from those at traditional enterprises. Most critical is limited system downtime that must not only be carefully scheduled, but also absolutely met to avoid unplanned plant outages.

Using RDM, SMA, Asset ID and IBM Director, the 2,600 desktop units were rolled out beginning on a Friday and the last system was installed and accepted by noon on Sunday – an average of almost 1,200 systems per 24-hour day.

**EXAMPLE: AN IBM PREMIER PARTNER**

Cherbonier, Mayer and Associates (CMA) is an IBM Premier Partner solutions provider located in Louisiana. Not only are IBM tools installed by CMA's customers, the company insists on the installation of some tools, such as Rapid Restore, simply because it reduces costs to the customer when CMA has been contracted for system support.

As a channel, CMA has adopted virtually all ThinkVantage Technology tools to assist the firm when conducting deployments for its clients. ThinkVantage tools also allow CMA to more competitively price its services because it is able to use low-cost technical resources for deployment support. In many cases hourly costs are less than half of those charged by a more experienced support tech.

Using the tools ensures faster rollouts as well. In a recent example, CMA was able to roll out 2,500 systems in 20 workdays utilizing RDM. The same rollout without RDM would have required more than 60 business days. This savings allowed CMA to bid the project substantially lower than its competitors, assuring the win while simultaneously saving the customer more than two months of deployment time and associated costs. And since all the systems are running Rapid Restore PC, future desk-side and help desk time is expected to drop 50% or more.

Both RDM and SMA provide immediate savings through a reduction in tech support requirements at the desk side, as well as reduced help desk inquiries. End-users are more productive sooner and user satisfaction is improved. RDM and SMA are the final steps in a seamless deployment process that, overall, is capable of saving users hundreds of thousands of dollars in direct and indirect costs.

**EXAMPLE: A LARGE MANUFACTURING COMPANY**

Asten-Johnson is a large privately held manufacturing company where compensation is keyed to performance. As a result, cost containment and cost control are critical decision elements in the IT department. It was no surprise therefore that a rollout over twelve locations of IBM X232 servers utilized a number of IBM tools. In fact, the availability of tools, such as IBM Director, RDM and RRPC, was a critical deciding factor to go with IBM.

Asten-Johnson also recently rolled out well over 500 PCs during a refresh cycle. Using RDM, the company reduced the required tech support time per PC from an average of 1.5-2 hours to less than 30 minutes, or more than 66%. Put another way, if hourly tech support time was rated at \$60 per hour, a typical PC would cost \$90 or more to install. With RDM, this cost was reduced to just \$30. Total deployment costs dropped from approximately \$45,000 to less than \$15,000. This was an immediate savings that dropped directly to the bottom line. And the savings did not stop there. The installation period

*Using RDM, SMA, Asset ID and IBM Director, the 2,600 desktop units were rolled out in 54 hours – an average of almost 1,200 systems per 24-hour day.*

*RDM and SMA are the final steps in a seamless deployment process that is capable of saving users hundreds of thousands of dollars in direct and indirect costs.*

was shortened considerably while allowing users to get back to work faster, saving hundreds of end-user hours.

## HARD-DOLLAR DATA RESTORATION SAVINGS

It's hard to believe, but one-button disaster recovery is here today, and only from IBM.

**Rapid Restore PC (RRPC)** technology, allows a system (desktop or laptop) to recover to the last saved settings of a single file or an entire disk, including applications and operating system. The user simply uses the dedicated RRPC button, awaits recovery and continues working. Moreover, the system will recover even if Windows will not boot.

**Rapid Restore PC** also works remotely by utilizing IBM's alternate boot sequence and does not require any user intervention. This is especially important in centrally managed environments where IT wants to administer the recovery of corporate data images while offering the user separate data backup and recovery capabilities.

### *Reduce IT Support Costs*

By virtually eliminating the need for onsite service technicians, onsite service costs drop dramatically. TBR estimates that a minimum of 10% of enterprise clients need to be re-imaged annually, or 40% of installed clients within a four-year period, at a cost of approximately \$400 per incident. Put another way, in a 1,000 system installation, 400 systems will require re-imaging at a cost of \$160,000-dollars that is simply not available in today's constrained IT budgets. Customers have experienced resource reductions of up to 70% for desk-side support, suggesting **Rapid Restore PC** is one of the most compelling ROIs in the industry.

### **EXAMPLE: A LARGE SCHOOL DISTRICT**

The Lexington School System in South Carolina illustrates the issues facing schools today – severe economic constraints and perhaps the most demanding users in the world. With 21 sites, 18,500 students, 6,500 PCs and 85 servers operating over a Cisco-based WAN, Lexington presents challenges equivalent to a large corporation but without the luxury of a large IT staff. Furthermore, economic realities prevented hiring additional staff to service the growing needs of the system.

Dozens of PC labs consisting of 25 PCs each service thousands of students on a daily basis. Due to the students' limited familiarity with the systems, more than 2,000 re-imaging calls are required each school year. In addition, to prevent potential corruption, all 6,500 systems are re-imaged during the year.

Rapid Restore PC tools were added to the PCs (Lexington is 98% IBM) with truly incredible results. With RRPC, images that typically took two to three hours to rebuild now took less than 10 minutes to restore. The result was far less class disruption and a sharp decrease in the support time.

Rather than attempting to calculate dollar savings, Lexington has to look at manpower utilization. Annual requirements for re-imaging were in excess of 15,000 man-hours. RRPC reduced this requirement to fewer than 1,500 hours, saving 337 man-weeks, or almost 6.5 man-years.

*Annual requirements for re-imaging were in excess of 15,000 man-hours; RRPC reduced this requirement to fewer than 1,500 hours.*

*Deployment time has been reduced to 30 minutes to an hour from the days-long 14-step process, and the rollout of new systems has been accelerated by a factor of two.*

#### **EXAMPLE: A MAJOR CRUISE LINE**

Royal Caribbean Cruise Lines is aggressively refreshing over 2,500 PCs while simultaneously completing proof of concept activities related to the roll-out of a number of IBM tools including ImageUltra, RRPC, RDM, IBM Director, SDA and SMA. With 7 primary sites in the US and another 15 overseas, support resources have become a major issue especially in light of the economic constraints resulting from 9/11.

Since September 11, 2001 the support philosophy has changed from that of a one-stop full service shop to one consisting of more localized self-help activities. For example, over 60% of all support calls involve password related problems such as lost or forgotten passwords. With IBM tools, the vast majority of these calls can be eliminated allowing a downsizing of the support organization without impacting support service.

RCCL expects that they will see significant benefits from IBM tools including much better manageability, reduced support costs and increased resource productivity. Once the tools are rolled out onshore, RCCL plans to roll them out on board all of their ships.

#### ***Reduce End-user Downtime***

**Rapid Restore PC** maximizes users' uptime. Recovery can take as little as 20 minutes for the full image. With user time ranging from \$60 to \$300 per hour, the savings can be dramatic – literally thousands of dollars per incident. And these figures ignore the lost opportunity costs, which could be even more dramatic. Just ask a salesperson who loses a laptop for a day.

#### **EXAMPLE: A MAJOR LAW ENFORCEMENT AGENCY**

A large law enforcement agency (who wishes to remain anonymous to preserve security) has benefited greatly from RRPC. The agency supports 380 sites, each with a server and LAN using a WAN to interconnect sites. There are more than 10,000 users (three shifts) sharing more than 5,000 PC workstations, all running NT4, Office 97 and a number of custom law enforcement applications

Historically, rolling out a new PC has required a 14-step customizing process, involving touches by six different people. The lengthy process is required because each PC is strictly keyed, for security reasons, to individual users. This was accomplished at a central location for efficiency reasons; however, if a system required re-imaging or re-customizing due to a move or reassignment, the system had to be returned to the central location, losing days of useful service in the field.

Rapid Restore allows the agency to overcome this problem. A “vanilla image” is created which includes a customized personnel security package and the setup process is then completed in the field at the PC install site. Now, rather than returning the PC for the 14-step process if there is a required change, Rapid Restore brings up the “vanilla image”, which is then re-customized locally. Using this process has reduced labor costs by 80%. Deployment time has been reduced to 30 minutes to an hour from the days-long 14-step process, and the rollout of new systems has been accelerated by a factor of two.

*With user time ranging from \$60 to \$300 per hour, the savings can be dramatic – literally thousands of dollars per incident.*

Moreover, the use of Rapid Restore has sharply reduced loss of PC use. The “old way” locked out the PC from use if there was a problem. Today the PC reverts to the “vanilla image”, which allows continued access to productivity applications and certain low-security law enforcement applications. This is especially important since few sites have local technical support. In some cases techs have to drive several hours to reach a site, so continued PC utility is critical to local productivity.

### ***BacksUp Valuable Data***

Critical and essential files are the cornerstone of business and user productivity. Loss of data in a single file can cost a company thousands, even millions of dollars. Why take a chance? **Rapid Restore PC** backs up essential files on demand and it is reliable because it is entirely automatic. Set it and forget it – the ultimate piece of mind.

Only **Rapid Restore PC** provides the ability to recover from software image corruption, operating system corruption, virus activities, user-caused failures and hard drive failures. **Rapid Restore PC** does not cost you anything. IBM believes it is so critical to cost savings **Rapid Restore PC** is included at no charge on every NetVista and ThinkPad product.

And if you are operating a heterogeneous environment, **Rapid Restore PC** is available for installation on other vendors’ PCs and delivers the same great savings.

It is no wonder **Rapid Restore PC** has been instrumental in user decisions to switch vendors. In fact, in several cases it was the primary consideration in a vendor switch.

## **CONTINUOUS MANAGEMENT SAVINGS**

PC uptime is one of the key ingredients to TCO and lifecycle operating costs. IBM delivers superior hardware management across IBM and non-IBM environments, as well as a variety of operating environments. In addition, AssetID provides key data that helps reduce help desk and desk-side calls.

**IBM Director** provides more universal manageability features than any other manageability solution. Its non-proprietary, open standards approach ensures overall management of a wide range of devices while integrating with other management software. Through IBM Director Agent, more than 5,000 systems can be supported across a broad range of operating systems and non-IBM hardware.

Additional features include extremely robust event management with “in place” Event Action Plans, allowing quick, predictable reactions to an event. IBM Director even provides FRU numbers in alerts to identify needed system replacement parts, ensuring the tech shows up with the right part. This feature is especially important for predictive failure alerts. IBM Director also manages heterogeneous Intel and non-Intel environments, providing an extremely effective and flexible solution (including graphical uptime representation for all managed nodes) in a world where multiple vendor installations place increased pressure on TCO costs. With calendar-based scheduling, users can conduct inventory scans, system power on/off checks and capacity management reporting on a continuing scheduled basis, ensuring regular management updates.

***Only Rapid Restore PC provides the ability to recover from software image corruption, operating system corruption, virus activities, user-caused failures and hard drive failures.***

***IBM Director provides more universal manageability features than any other manageability solution.***

*Using Secure Data Disposal users can scrub existing discs so prior data is absolutely unrecoverable – utilizing a technology that meets U.S. Department of Defense Level 5 secure disposal standards.*

*IBM Director’s Predicative Failure Analysis has eliminated numerous potential server outages and reduced server support tech time by almost 25%.*

And **IBM Director** is integrated with IBM’s other leading ThinkVantage technologies, including RRPC, RDM and Asset ID.

**EXAMPLE: LEXINGTON SCHOOL SYSTEM**

The Lexington School System did not stop with RRPC. Because most sites did not have resident techs, techs generally performed a visual check of each server once a week. IBM’s Director management tool was rolled out on all servers. IBM Director’s Predicative Failure Analysis has eliminated numerous potential server outages. Not only would a system outage require one to two days to rebuild, students also lose valuable instruction time that once lost is lost forever. PFA sharply decreased instruction time, allowing Lexington to more easily meet its educational mission. Moreover, IBM Director’s remote monitoring capabilities reduced server support tech time by almost 25%.

**Asset ID** is an exclusive IBM technology that delivers big dollar savings across the life of a product. Users need only to go to one folder on their PCs to see all the vital information concerning the PC’s configuration. Stored in non-volatile RAM to avoid loss, Asset ID includes the following critical data:

AVAILABLE ASSET ID DATA		
System Model	System Type	System Serial Number
System Board ID	UUID	BIOS Build ID
BIOS Build Date	Network MAC Address	Asset Tag Number
Hard Drive Type and Serial Number	Memory Type and Serial Number	CDROM Type and Serial Number
Video Serial Number	Network Connection	User Device
Pre-Load Profile	User Asset Data	Lease Data
Owner Data		

Centralized data supported by Asset ID eliminates the frustrating, time-consuming user search for information required during help desk calls. By providing specific serial number data for system components, the help desk is able to quickly identify recalled component classes, outdated bios or drivers and upgrade systems accordingly. The sharp reduction in time spent on calls has helped many users decrease call times by 50% or more.

**REDUCING DISPOSAL RISKS**

IBM management technologies go well beyond those of competitive vendors. Recognizing that many companies cascade PCs, IBM has eliminated the costs associated with replacing hard drives to avoid transferring corporate data with the PC. Using IBM’s **Secure Data Disposal** technology, users can now scrub the existing disc so prior data is absolutely unrecoverable. This technology is so secure it meets Department of Defense (DOD) Level 5 and German secure disposal standards.

By eliminating hard drive replacement, users save hundreds of dollars per PC while remaining confident that any residual data has been securely eliminated. As noted, this is especially important when cascading PCs either inside the company or to employees – but it takes on added importance if the PCs are sold to an outside recovery firm likely to refurbish and then resell the systems. Although these third-party companies scrub discs,

the corporation is far better served if sensitive corporate data is irretrievably removed while still under corporate control.

### LEADING WIRELESS TECHNOLOGIES FROM IBM

IBM's mobile products encompass a broad range of systems from Pentium III mobile processors to newly announced Intel Centrino solutions. As a percentage of all corporate systems, mobile platforms are increasingly being adopted due to the added value of additional usage because of their portability. That value is significantly magnified by wireless technologies allowing users to always stay connected. In fact, the return is so compelling wireless usage is growing at rates that will average 42% between now and 2007. By then approximately two-thirds of all notebooks will be shipped with WLAN capability.

Yet concerns linger among IT managers regarding wireless security. As well, the hassle factor associated with reconfiguring a system from one network type to another is frustrating for the typical user, so much so that many users simply live with a default network connection, losing much of the advantage of wireless connectivity. And then there are other considerations, such as possible range limitations typical of RF and power requirements that may limit battery life.

IBM's innovative ThinkPad designs address each of these critical issues with solutions that significantly improve performance and the measurement of a system's ROI.

Take, for example, the UltraConnect™ Antenna. IBM offers an antenna design that locates the antenna in the upper edge of the screen, thus assuring the largest antenna on the highest point of the laptop (when the screen is opened). While this might not sound especially important, IBM ThinkPads have consistently shown greater range and lower signal attenuation than competitive products in head-to-head testing.<sup>3</sup> For the user stronger signals and greater range promise few disconnects, higher data speeds and greater data reliability.

To get the most out of a wireless mobile solution requires comprehensive connectivity that supports multiple wired and wireless access in the home or office or while on the road. IBM's **Access Connections** is the industry's most comprehensive connectivity solution. Either the end user or the IT department creates connection profiles encompassing different settings for wire and wireless LAN(s), default printer(s), VPN(s), and other networks that are accessible via a simple "point and click". In fact, Access Connections can automatically switch between a wired and wireless LAN based on connection speed or priorities set by the user. High-speed connectivity is now achievable while eliminating the hassle factor.

IBM has a complete portfolio of high-speed wireless LAN technologies. There are actually four different wireless LAN adapters that can be integrated into a ThinkPad notebook satisfying the diverse requirements of IBM's customer set:

\* Centrino – Intel's new industry standard 802.11b wireless LAN technology optimized to work with the Pentium-M processor and Intel's 855 chipset resulting in a mobile platform that delivers on cost vs. performance and improved battery life.

*Access Connections is the industry's most comprehensive connectivity solution, providing point-and-click access to WLAN(s), default printer(s), VPN(s), and other networks.*

*Wireless usage is growing at rates that will average 42% between now and 2007 when two-thirds of all notebooks will be shipped with WLANs.*

\* IBM 802.11b – Industry standard 802.11b wireless LAN for non-Centrino platforms providing good wireless performance.

\* Cisco 350 – 802.11b wireless LAN for customers using a Cisco infrastructure and needing the advanced security and manageability capabilities of Cisco.

\* IBM Dual Band – wireless connectivity in both 802.11b and the higher speed 802.11a environments providing customers with flexibility and investment protection.

Even though wireless LAN is experiencing impressive market growth, adoption and deployment in large enterprises is still hampered by concerns with wireless LAN security. IBM recognizes the limitations of the standard 802.11 security features (WEP) and the movement towards 802.1x port-based authentication or the use of VPNs as acceptable alternatives. To enhance these acceptable wireless security alternatives, IBM offers its exclusive Embedded Security Subsystem (ESS), a specially designed security chip and software that provides secure hardware storage of digital keys and certificates. IBM's ESS can help to fortify industry approaches to wireless security. Consider the following three examples.

\* Customer is using 802.1x authentication with EAP-TLS extension. This means that the client security is based on digital certificates. Instead of storing those certificates on hard disk drives, those certificates can be more securely stored by the ESS resulting in stronger 802.1x security. This is doable today from IBM.

\* Customer is standardized on Cisco LEAP authentication, which uses user ID/passwords to authenticate clients. ESS can securely store the keys that are used to encrypt the user IDs and passwords resulting in stronger Cisco LEAP wireless security. This is doable today from IBM.

\* Finally, consider a customer using Virtual Private Networking (VPN) to provide total end-to-end security and thus protection in a wireless environment. Certificates are used for VPN authentication and these can be more securely stored by the ESS resulting in a more robust VPN. In order to accomplish this, the VPN software must support ESS. Intel and Checkpoint have announced the availability of a VPN that will leverage both Centrino and IBM's ESS.

And all of IBM's wireless solutions support the industry standard security features. ESS just allows IBM to deliver on the most secure wireless while still adhering to industry standards.

## **AUTOMATED WIRELESS CONNECTIVITY**

Wireless connectivity has become a very real solution for users who are highly mobile. Additionally, wireless technology is now extremely cost competitive with wired networks, especially in environments where a large number of moves and changes favor wireless solutions due to the labor impact associated with wired systems. Factors such as installation speed, simplicity, redeployment flexibility, elimination of recurring LAN linkage charges, scalability and manageability all contribute to the overall cost savings of a wireless solution.

*Factors such as installation speed, simplicity, redeployment flexibility, LAN linkage charges, scalability and manageability all contribute to the overall cost savings of a wireless solution.*

It should come as no surprise that IBM offers the most comprehensive series of wireless and wired solutions in the industry.

But in today’s environment a single wireless connectivity solution is no longer acceptable. The rapid growth of mobile PCs, coupled with desktop replacement strategies, demand multiple, efficient wireless connectivity solutions. Although Bluetooth, Wi-Fi 802.11-based LANs and cellular are each individually effective, truly removing the wired network tether requires the need to “roam” across not only different wireless networks but also different wireless network types.

Access Connections can automatically switch between a wired and wireless LAN based on connection speed or priority set by the user. Access Connections offers true high-speed connectivity in all the right places, as shown in the table below.

WIRELESS SOLUTIONS			
	Range	Technology Standard	Speed
<b>WPAN – wireless personal area network</b>	Up to 10m	Bluetooth	Up to 1 Mbps
<b>WLAN – wireless local area network</b>	Up to 100m	Wi-Fi IEEE: 802.11b 802.11a 802.11a/b	Up to 11 Mbps Up to 54 Mbps
<b>WWAN – wireless wide area network</b>	Kilometers	Cellular such as the Sprint PCS data modem	Up to 144 Kbps

Mobility has provided substantial productivity gains for users. Studies by a variety of market research firms indicate gains range from more than 5 hours per week (NOP World) to 8 hours (Sage) for single network environment wireless solutions. TBR believes it is reasonable to assume the multiple network environment solutions offered by IBM and managed by Access Connections should offer even greater productivity gains for users by a factor of 20% or more.

Simply put, the gains that could be expected for a professional salaried at \$64,000 per year would be between and \$8,000 and \$13,000 per year using a single wireless solution. With Access Connections’ multiple wireless solutions and “roaming” capabilities, these figures could rise to between \$9,600 and \$15,600 per year per user or more.

But why rely on someone else’s numbers? IBM has created the WLAN Benefits Calculator to aid customers to determine the monetary payback from implementing a WLAN. The tool assesses productivity gains in key three areas. The tool first evaluates productivity increases due to ubiquitous connectivity: at home, throughout the office or campus, and while traveling. The second area quantifies additional savings due to IBM’s UltraConnect Antenna: staying connected at faster speeds further away from the access point. The third area identifies the savings accruing from using Access Connections: getting connected quicker and resolving connectivity problems in less time. The tool is designed to accept customer data instead of relying on industry estimates. In addition to the WLAN Benefits Calculator, IBM also has a Wired vs. Wireless Benefits Calculator that is just as customizable. For more information about these and other tools talk to your IBM marketing representative.

**EXAMPLE: SOFTWARE DEVELOPMENT COMPANY**

*TBR believes the multiple network environment solutions offered by IBM and managed by Access Connections should offer a 20% productivity gain for users.*

Access Connections was a major influencing factor for a software development company that switched to IBM ThinkPads. The user has installed a wireless LAN in conference and training rooms to support customers and technical training. But equally important is network access while on the road – technical support staff, developers and sales management all utilize Access Connections for wireless connectivity to documentation and applications used in the home office. Although only installed for six months there has been a noticeable increase in productivity and improved satisfaction with wireless functionality. Gone are the hassles associated with phone calls, resetting connectivity settings and limited access while on the road.

Even if you are the most demanding IT manager, there is no reason to be concerned about wireless security. All IBM’s wireless solutions support the standard 802.11 security features and many VPNs and will support the Wi-Fi Protected Access standard and IEEE 802.11i standard once they are announced. To protect your WLAN today IBM fully supports the IEEE 802.1x port-based authentication standard. To augment the security of 802.1x, authentication credentials, such as the encryption key for ID/PW for LEAP or digital certificates for TLS can be securely stored via the IBM Embedded Security Subsystem.

**A HIGHER LEVEL OF CLIENT SECURITY**

Security has become the No. 1 concern of IT manager across large accounts. This is certainly no surprise in the post Sept. 11 world where the term cyber-terrorism has taken on real meaning. But security concerns also fall much closer to home; the simple theft of a notebook might not sound serious, but in 2001 more than 500,000 units were stolen and, along with them, highly confidential and sensitive corporate data. The increase in denial of service attacks, outside penetration of systems, employee Internet abuse and the increased use of wireless technologies all suggest the need for sharply increased security disciplines. And it is unlikely that security threat growth will slow anytime soon.

Today IT managers need to address four primary security areas as illustrated in the table below:

CLIENT SECURITY ISSUES AND SOLUTIONS				
Category	Asset Protection	User Authorization and Access	Data Protection	Data Communications Integrity
Issue	Lost or Stolen PCs	Unauthorized User Access Restriction	Hard Drive Data Compromise Risks	E-mail, Cable DSL and Wireless Risks
IBM Solution	Assurant PC Protection and Absolute SW PC Tracking and Loss Control	User Verification Manager (UVM) and Embedded Security Subsystem supporting supplemental pass phrases, biometrics and proximity badges	Digital IDs encrypted by ESS, HD folders and files encrypted by ESS, and support of RSA SecurID and Entrust SW	ESS secures wireless by supporting VPN technology and using 802.1x transport layer services. Also supports MS Outlook and OE e-mail encryption

IBM addresses all these critical security needs, and more, with its Embedded Security Subsystem, providing significantly increased levels of security through an innovative

*IBM addresses critical security needs with its Embedded Security Subsystem, an innovative combination of hardware- and software-based technologies.*

*Gone are the hassles associated with phone calls, resetting connectivity settings and limited access while on the road.*

*The simple theft of a notebook might not sound serious but in 2001 more than 500,000 units were stolen – and, along with them, highly confidential and sensitive corporate data.*

combination of hardware- (embedded security chip on select NetVista and ThinkPad models) and software-based technologies.

Asset protection is accomplished through a combination of Assurant Comprehensive Protection and software PC tracking using Computrace. Not only are users financially protected from loss or damage but there is also a sharply increased likelihood of stolen PC recovery, thus protecting valuable corporate assets such as critical data

IBM's User Verification Manger (UVM) and ESS work together supporting user selectable pass phrases, biometrics and proximity access, providing the highest possible level of control over system logon and encryption/decryption of e-mail and files.

Resident hard drive data is protected by ESS, which encrypts digital IDs and supports file and folder encryption as well as RSA SecurID and Entrust software. By providing the highest level of hard drive protection, digital keys and certificates, IBM customers can substantially reduce security costs by eliminating the need for "hard" security devices such as smart cards, badge, etc.

ESS preserves datacom integrity by supporting VPN technologies and using 802.1x transport layer services. ESS also supports MS Outlook and Outlook Express e-mail encryption. Customers are thus assured of the best possible protection of LAN credentials and strong e-mail protection.

IBM's security solutions adhere to industry standards, including MSCAPI and PKCS#11 cryptographic interfaces, the TCPA (Trusted Computing Platform Alliance) standard and IEEE 802.1x. In fact, IBM's approach to security is so complete it is the only PC granted "Common Criteria Certification" by the Federal Government.

It should come as no surprise that customers recognize IBM's client security leadership position. A major pharmaceutical company in the process of rolling out tens of thousands of systems is moving from smart cards to ESS, improving its wireless LAN security, gaining stronger user authentication and improving file encryption. And all at substantially lower cost with an ROI of more than 100%, a figure supported by Gartner's ROI model.

## WHO SHOULD BE USING IBM MANAGEMENT TOOLS?

Whether you are a one-man shop or a major multinational with thousands of systems there are IBM management tools that will deliver you improved productivity, lower costs and reduce resource requirements. The table below provides an overview of the applicability of individual tools relative to roll out plans or installed base.

*Whether you are a one-man shop or a multinational, IBM management tools deliver improved productivity, lower costs and reduced resource requirements.*

*IBM's security solutions adhere to industry standards, including MSCAPI and PKCS#11 cryptographic interfaces, the TCPA, and IEEE 802.1x.*

*For the customer, IBM's proven ROI and lower lifecycle costs should be a major factor in procurement decisions, especially in today's financially constrained IT environments.*

*For financially demanding and knowledgeable customers, IBM commands a leadership position across the spectrum of management tools.*

IBM MANAGEMENT TOOL APPLICABILITY				
Technology	1s to 10s	10s to 100s	100s to 1000s	Multiple 1000s
Rapid Restore				
Secure Data Disp				
Director				
Asset ID				
Director Agent				
ImageUltra Build				
- DOE				
- HIIT				
- SDA				
- RDM				
- SMA				
Image Ultra Svcs				

Note: Shaded area indicates technology applicability in reference to company size.

Regardless of size, IBM delivers significant ROI to users while simultaneously reducing the hassle factor. Because of IBM's industry-leading management tools, individuals and IT managers alike are satisfied knowing that whatever phase of a product's life, there are solutions to their management problems. Whether you have one system, a hundred or thousands of systems, IBM's management tools deserve consideration in these financially constrained times.

**WHAT THIS MEANS FOR CUSTOMERS**

Based on the data presented throughout this white paper there can be no doubt IBM delivers the most advanced management tools in the industry. More importantly these tools have been designed to work equally effectively together and individually.

For financially demanding and knowledgeable customers, IBM commands a leadership position across the spectrum of management tools. Users who switched to IBM products due to the ROI of IBM's tools underscore IBM's leadership.

As part of this white paper TBR contacted 42 users who had recently switched from another vendor to IBM PCs. A total of 10, or 23.8%, indicated IBM's system management tools had positively impacted their decision to go with IBM. These respondents ranged from a major insurance company that equipped 22,000 desktops with Rapid Restore to small businesses utilizing IBM Director on more than 40 servers. Each planned to implement more tools over time and each felt the tools implemented to date were providing savings either in direct dollars or indirect savings, such as reduced headcount or cost avoidance.

For the customer serious about reducing ownership costs and improving its company's profitability, IBM's proven ROI and lower lifecycle costs should be a major factor in procurement decisions, especially in today's financially constrained IT environments.

In today's corporate environment where success is measured by profit, reducing costs is the most effective way to increase margins. It is clear from the users we talked with that each is addressing strategic initiatives to reduce costs – and with its large share of corporate spending (4.5% to 12% depending upon the industry) IT is a significant target for cost reduction. IBM's management tools directly address this pressure upon the IT

manager, allowing cost reductions and savings without compromising IT departments' mandates to deliver the best performance possible.

## IN SUMMARY

Frankly, we at Technology Business Research were surprised during customer interviews by the magnitude of savings encountered by those customers that utilize IBM management tools. While we believe IBM has good tools, so then do some of the other vendors. What sets IBM apart, however, is the scope and level of innovation of its tools. In many cases, such as ImageUltra and Rapid Restore, similar tools are simply not available elsewhere. Other IBM tools, while similar to other offerings, are just better.

We attribute these findings to three key factors.

First, IBM recognizes more than any other vendor that, given the commodity nature of technology, differentiation depends more on the ability to manage technology than the technology itself. This view is critical since it virtually guarantees the customer that IBM will continue to distinguish itself by offering leading-edge management tools over the long term.

Second, the broad spectrum of tool offerings, more than those of any other competitor, can be applied to every segment of the product lifecycle, thus assuring ROIs in each phase. No longer do customers have to wait for indirect savings to accrue over a product's life. Now direct hard-dollar savings can be expected even in the pre-deployment phase

Finally, there is IBM's commitment to continuous development of new tools and the addition of features and new capabilities to existing tools. While this commitment is clearly driven by customer and industry needs, IGS, IBM's system integration and outsourcing division, is also a major user of these tools, helping it become the largest outsourcing provider in the world. Thus, customers rest assured that they would benefit from the continued innovation that characterizes IBM's current management tool products.

IBM's committed focus to deliver the industry's broadest array of innovative, leading-edge management tools with ThinkVantage Technologies offers significant benefits to the customer in the form of improved reliability, lower system operating costs and increased user satisfaction. As IT resource costs continue to escalate and IT infrastructure continues to become more complex and a larger corporate cost element, IT managers owe it to themselves to evaluate IBM's most compelling product offerings: management tools.

*What sets IBM apart, however, is the scope and level of innovation of its tools. In many cases, such as ImageUltra and Rapid Restore, similar tools are simply not available elsewhere.*

### **ABOUT TECHNOLOGY BUSINESS RESEARCH**

Technology Business Research, Inc. (TBR), headquartered in Hampton, N.H., is recognized as one of the leading high-tech market research and consulting firms specializing in analyses of computer and networking equipment companies and their products in the high-technology market. Servicing an international clientele of high-technology manufacturers, IT professionals, end users and investors, the company has continually distinguished itself in the marketplace by providing timely, accurate, high-quality information and market research in a format that is uniquely responsive and tailored to clients' needs.

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<sup>1</sup> IBM has invested significant resources and development dollars that TBR estimates exceeds \$200 million over the last several years. We believe this surpasses IBM's next closest rival.

<sup>2</sup> Gartner research note #TG10-027: *PC Installation Setup: How to Save a Bundle* by Kevin Knox, January 12, 2000.

<sup>3</sup> As reported by the VeriTest division of Lionbridge Technologies, Inc.: *IBM: 802.11b Distance and Performance Testing*; Sept. 2002. [http://www.etestinglabs.com/clients/reports/ibm/ibm\\_wireless.pdf](http://www.etestinglabs.com/clients/reports/ibm/ibm_wireless.pdf)