Windows Server 2008 Drives Business Value: A Look at Windows Server 2008 in the Field

White Paper

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Executive Summary

The newest server operating system (OS) from Microsoft, Windows Server® 2008, contains significant enhancements and improvements over prior releases. Over the course of interviewing early adopters of Windows Server 2008, Capgemini has gathered evidence that Windows Server 2008 delivers improved value to businesses and the Information Technology (IT) departments that support them when compared with the previous server operating system, Windows Server 2003.

"[Windows Server 2008] contains features that are of keen interest to specific-use models. For example, organizations with remote locations may regard RODCs [read-only domain controllers] as a killer feature; or organizations that use IIS [Microsoft Internet Information Services] fully may regard IIS 7.0 as a killer feature. Gartner encourages organizations to read Microsoft's improvement list to identify any potential killer features."

"Windows Server 2008: Why You Should Care," *John Enck, Gartner, September 25, 2007*

Capgemini spoke to a number of companies and institutions that use Windows Server 2008 in a mix of geographies and industries.[1] What we found was that the new OS quickly and clearly adds value to IT operations through simplified management, security, and reliability, with an average deployment duration of just 10.25 weeks and a resulting average IT cost reduction of U.S.$124,000. Companies attempting to reduce their server footprint were projected to be able to increase their existing hardware capacity by 54 percent simply by deploying Windows Server 2008. Advances in business processes and new opportunities to generate business value were not as apparent. However, we found that Windows Server 2008 gives business applications a superior base upon which to improve business value over time. Moreover, the most consistent feedback we heard was that a long-term strategy was being developed around Windows Server 2008 to utilize more of the features customers had discovered during the limited initial deployment. Many companies foresaw unique, high-value business applications resulting from even minor enhancements of the operating system.

We found that all of the companies we talked to that had implemented a Windows Server 2008–based solution had the same fundamental server needs: agility, reduced cost, simplified management, reliability, foundation for business solutions, and support. In our analysis, this list becomes the business situation or need, Windows Server 2008 is the solution, and our customer evidence shows how the Windows Server 2008 operating system provides business value.

[1] Industries include financial services, education, retail, and high technology. Geographies include the United States, United Kingdom, and Asia Pacific.

Server Value to the Server Customer

In our conversations with customers that have deployed the Windows Server 2008 operating system, we heard consistent feedback on what these customers expect servers to do for them. The value and expectation of a server and its OS is to provide a reliable base infrastructure that enables business solutions without costing too much, slowing things down, or requiring extensive management. We categorized these customer expectations into six fundamental needs:

- **Agility** – A server's ability to react quickly to changing demands and capacity requirements.
- **Reduced Cost** – A lower total cost of ownership (TCO) across the board, from licensing, number of physical servers needed, and IT support through automation and self-service.
- **Simplified Management** – The easing of pain points related to server and client software deployments, and management tools that are powerful and easy to use.
- **Reliability** – A server environment that has little or no down time, is secure, and requires minimal updating.
- **Foundation for Business Solutions** – A platform that provides the server infrastructure to run current and future business applications.
- **Support** – A business that stands behind its products and provides guidance, troubleshooting, updates, and an upgrade path.

"For Verizon Business, a major North American IT services and hosting company, speed of deployment is a top-line contributor as well as a bottom-line reduction. Windows Deployment Service in Windows Server 2008 allowed Verizon to eliminate most of its custom deployment tools and attract new customers by being able to better build out hosted systems. Windows Server 2008 gives Verizon Business a competitive advantage."

Verizon Business case study, Capgemini and Microsoft, January 2008

The insight we gathered from the customers with whom we spoke was surprisingly uniform and related directly to many of the new features of Windows Server 2008. This section details what we learned.

Agility

Capgemini's 2007 Global CIO Survey reported that 93 percent of CIOs believe that an agile IT department leads to an agile business. Conversely, the speed and agility of business are often tied down by the speed of its operations. One of the largest IT problems for a business or organization is the speed of building and deploying new applications. Servers have become a commodity that IT managers expect to be able to exchange, upgrade, build out, build up, and run without impediment. Unfortunately, procuring hardware, installing an operating system, and then configuring the

operating system can be a bottleneck in a process that users of the platform take for granted.

One of the major improvements of the Windows Server 2008 operating system over previous versions is that it can be quickly set up and configured for a large number of servers. Windows® Deployment Services in Windows Server 2008 makes possible the rapid installation and configuration of the OS over a network without having someone physically located at the server computer. For the first time, Windows Deployment Services allows network boot images so that preconfigured operating systems can be installed over the network with improved performance and multicast deployment (the simultaneous deployment of many servers). In addition, a new management user interface (UI), scripting (Windows PowerShell™ command line interface and Windows Management Instrumentation, or WMI), centralized Web server configuration, and a Server Core option (a bare-bones installation of the OS) give IT administrators tools for maintaining and building out servers faster than ever.

In addition to speed of deployment and management, the performance of Windows Server has also been improved. One customer we spoke to reported doubling its server capacity in the testing environment after migrating to the Windows Server 2008 built-in Web server application, Internet Information Services 7.0 (IIS 7.0). While this big of a capacity increase should not be expected by every company migrating to IIS 7.0, it demonstrates that notable performance increases have been made. IIS 7.0 also helps to read and measure performance in real time through Runtime Status and Control API (RSCA) and through performance counters that collect performance data.

Reduced Cost

The IT costs that make up TCO are all influenced in one way or another by a company's IT infrastructure. Figure 1 illustrates the costs that make up TCO for the IT budget. While server operating systems play a small part in the overall IT landscape, they can make a disproportionately large impact on IT costs since they come into contact with every piece of the IT topology. Windows Server 2008 has many new features and thousands of enhancements that decrease server downtime, restarts, updates, service packs, network errors, third-party software, security holes, manual oversight, network traffic, deployment headaches, server load, and even the physical size of the OS itself. As evidenced, every single category of IT TCO is directly benefited by changes made in Windows Server 2008. Although a 79 percent reduction in the number of Web servers, as we saw at one company that upgraded to Windows Server 2008[2], may not register as 1 percent of a Fortune 100 company's IT budget, it does equate to hundreds of thousands of dollars in hardware, energy, and staff cost reductions—enough to gain notice and even fund new projects and initiatives.

[2] Tesco.com case study, Capgemini and Microsoft, January 2008.

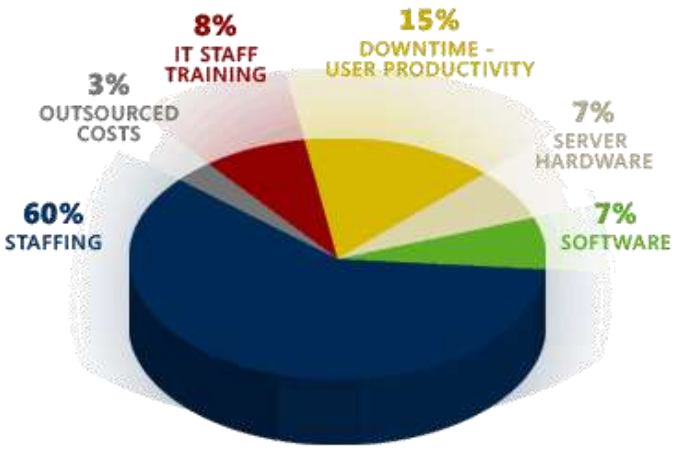

Figure 1. Factors that comprise IT total cost of ownership (TCO).[3]

In our interviews with customers, the biggest projected cost reductions came from the biggest cost category, staffing. None of the early adopters we talked to made headcount or staffing changes during the deployment or subsequent production operation of Windows Server 2008, due to the relatively small scope of the program. What we did conclude, however, was that if Windows Server 2008 continued to make the impact it had made before the official Release to Manufacturing (RTM) or commercial launch of Windows Server 2008, IT staff could recover 0.9 full-time equivalents (FTEs).

Management

We spoke to many IT professionals who were responsible for the day-to-day upkeep and long-term strategy of their company's server infrastructure. We heard their pain regarding server management, "Patch Tuesday" being the number-one issue for most. "Patch Tuesday" is the informal name given to the concept introduced by Microsoft in which security updates are accumulated over the period of a month and then released together on the second Tuesday of each month. The reasoning behind this is to give IT administrators a chance to prepare for updates and to plan the testing of these updates. The paradox with updates is that they are essential to keeping an operating system secure as systems and vulnerabilities evolve, but they also cause chaos in an otherwise stable platform. We heard a number of administrators note that they often take an entire month to evaluate, test, and deploy updates to make sure they don't cause conflicts with existing systems. With the introduction of the Server Core installation option in Windows Server 2008, Microsoft hopes to lessen the need for updates by reducing the footprint of the OS. The Server Core installation option is available for use with Active Directory® Domain Services,

[3] "Demonstrating Business Value" white paper, IDC, April 2007.

Active Directory Lightweight Directory Services, DHCP, DNS, Web (IIS), File, Print, and Hyper-V™ server roles. Many customers we spoke to viewed Server Core as an important solution to a long-term problem. Although Server Core won't eliminate updates entirely, it will help to greatly reduce the number of updates needed, compared to a full installation of Windows Server 2008, because the OS can tell whether a particular update applies to a given computer based on applicability rules.

Microsoft has been noted for its excellent management tools and scripts; Windows Server 2008 continues that trend. With this release, Microsoft is introducing new UI tools, command line tools, modular features, server roles, remote administration tools, WMI enhancements, and more. Powerful new scripting tools such as the Windows PowerShell command line interface make it possible for administrators to automate complex management tasks. Scripted administration, for instance, works especially well with remote administration of Server Core installations via WMI consoles. None of the early adopters of Windows Server 2008 in our survey happened to be using Server Core or Windows PowerShell at the time of our interviews (each was focused on other usage scenarios), but all planned to use the Server Core option in the next year.

One company we spoke to was able to replace in-house reporting tools that monitored the health of its servers with the out-of-the-box tools provided with Windows Server 2008. Replacing custom tools with commercial off-the-shelf products has the obvious benefit of moving support costs to the manufacturer and having a simpler upgrade plan.

Reliability

"All things considered, a security breach can cost you anywhere between $90 and $305 per record. This means that the cost of a single, significant breach may run into millions or even billions of dollars. The cost of the breach will vary significantly based on the public profile of the breach and the regulations that apply to your organization, which varies from industry to industry."

"Calculating the Cost of a Security Breach," Khalid Kark, Forrester, April 10, 2007

When we asked one Windows Server 2008 customer to identify the number one expectation of its servers, the customer responded, "Stay up, don't crash, be able to stay on long-term." This may sound like a pretty easy request to fulfill, but, in reality, maintaining a 99.99 percent server uptime has not always been easy. Servers require routine updates that include security updates, policy changes, and service packs, not to mention reboots required by the applications that run on these servers.

Reliability doesn't end with server uptime either. It also means that the servers are secure, predictable, easy to diagnose, and don't require significant upkeep. The cost of an unreliable server can be significant. Bringing down a server for maintenance can mean lost revenue, but a security penetration can be detrimental.

In developing Windows Server 2008, Microsoft has made a number of significant advances in reliability. High-availability clustering, the epitome of server reliability, has been improved to reduce the number of single points of failure and validation of configurations during setup. Server Core promises to reduce the number of updates as well as the

"With Windows Server 2008, we can provide a better platform for developing applications in the future. This is one area that we look forward to developing."

Jeffrey Sukardi,
Head of IT Security,
Bank of Central Asia

operating system's attack surface. For example, changes to Active Directory (called Active Directory Domain Services with the launch of Windows Server 2008) now require only a restart of Active Directory rather than a reboot of the entire system. All of these improvements make Windows Server 2008 the most reliable server Microsoft has released to date.

One company we talked to has deployed the Windows Server 2008 read-only domain controller (RODC) to improve the reliability and security of its branch office servers. By putting a read-only instance of Active Directory Domain Services closer to the resources that consume its services, the branch offices experience a performance and reliability boost while remaining secure if an intruder gains physical access to the remote server running Active Directory Domain Services because changes cannot be made to an RODC We observed improved reliability such as this example at each company in our survey.

Foundation for Business Solutions

The roles of the servers in a business usually can be categorized as:

- Servers that provide foundational or infrastructure functions such as printing, file services, network services (including security and policy enforcement and network protocol), and infrastructure management.
- Servers that run applications and business solutions.

The servers that run applications are almost always the servers that generate revenue. These are also the servers that run the systems that differentiate one company from the next. At Capgemini, we routinely work with customers that create new value-added offerings that are possible only because of leading-edge technology. Having a server platform with more powerful features inevitably leads to innovation by the people who use it. Windows Server 2008 supports the Microsoft® .NET Framework 3.5 and includes IIS 7.0. These two improvements alone give developers a host of resources with which to create Web applications that weren't possible before. For example, Windows Communication Foundation (WCF) and Windows Workflow Foundation (WWF) technologies, also included in Windows Server 2008, make it possible for developers to build applications that more easily take advantage of Service Oriented Architecture.

Because the creation of innovative systems lags behind the release of the enabling technology, we did not see any examples of new applications being built with the new features of Windows Server 2008, but we did hear about future plans to do so. One Indonesian bank, which recently migrated 118 branch offices to Windows Server 2008, plans to use the Windows platform as the backbone of application development and expects that it will dramatically streamline business processes. It has already begun developing new Windows-based applications that handle credit

scoring and loan approval, and in the near future will create an end-user application that will handle daily business transactions such as withdraws and deposits.

Support

A principal advantage of commercial off-the-shelf software is that it is supported by its manufacturer. By keeping ahead of the software-support life cycle, companies reduce the risk that issues will arise that they can't solve themselves and assure that updates will continue to be made to keep systems reliable and secure. A September 2007 Gartner report concluded that, "The end of life of an operating system release is a bigger migration driver than the launch of a new release."[4] Upgrading to the Windows Server 2008 operating system gives a company many new features to take advantage of, but it also extends the lifespan of its server infrastructure.

The majority of the companies we talked to specifically mentioned keeping ahead of the support life cycle as partial motivation for upgrading to Windows Server 2008. For example, one senior engineering manager told us that support from Microsoft was at the top of her list for using Windows Server 2008: "We try to keep up with technology. We try and stay current before we have to pay for support, and to do that we have to look at new products before they come out."

[4] "Windows Server 2008: Why You Should Care," John Enck, Gartner, September 25, 2007.

Windows Server Usage Scenarios

We have heard what early customers of Windows Server 2008 expect from a server platform. Some of these things are drivers of business value and some of them are basic system requirements. We thought it would be interesting to make a comparison of where users of Windows Server 2008 saw value and where Microsoft is expecting its customers to see value. What we noticed was that Microsoft has a refined message of increasing value through its new server OS that goes beyond the basic needs articulated by the customers. A few customers of Windows Server 2008 were overwhelmed by the number of new features rolled out in this latest release and are choosing to focus on one or two of the more significant improvements or on improvements that result in quicker realization of business value.

Many companies are looking to Microsoft for guidance on where to focus first. Microsoft has identified six scenarios in which customers are focusing to take advantage of improvements to the OS. It is worth a quick look at each of these scenarios and what customers thought of them before we jump into the customer evidence.

"Because corporate and individual identity fraud continue to grow at a significant rate, often aided by easy access to personal data, regulators are not likely to relax their efforts for some time to come. Enterprises, therefore, remain awash in a sea of expanding regulations, with little hope the situation will improve."

"Using Security Compliance Software to Improve Business Efficiency and Reduce Costs,"*Charles Kolodgy, Gerry Pintal, and Rose Ryan, Symantec Corporation, June 2006*

Security and Policy Enforcement

Security and policy concerns typically involve such components as event correlation, compliance, security updates, upgrades, identity management, policy management, backups, deployment, health monitoring, and firewall mitigations for client and server computers. Security and policy enforcement are so critical to an enterprise's infrastructure that many IT departments will upgrade their server operating systems with the sole purpose of hardening their systems to make them more impervious to attackers.

Improving security compliance can be achieved through enforceable policy management and standards. However, making such improvements often runs into usability issues, so the solution must be carefully designed to address ease of use for end users as well as IT security administration. As with deployment, the highest cost in developing security compliance is the cost of human resources, so IT and legal departments should strive to automate their security functions through integrated workflows and technology.

Windows Server 2008 improves security and policy enforcement in a number of inventive ways. First, by reducing the operating system's attack surface with a minimal installation, Server Core hardens essential, high-risk targets such as file services, print servers, DHCP servers, and Web (IIS) servers. Fewer files mean fewer updates, fewer avenues for an attacker to take, and reduced management. Microsoft estimates that

Server Core can reduce the number of updates to Windows Server 2008 by as much as 50 percent compared to the full installation.[5]

Second, the addition of Network Access Protection (NAP) helps organizations to ensure compliance with security and policy requirements. NAP provides a platform for ensuring that all computers connecting to a network via a wired or wireless connection meet administrator-defined system health specifications (such as whether the computer has the latest critical updates and antivirus software installed or a firewall enabled). If necessary, a computer can be quarantined to an isolated subnet, where it is given access to remediation servers or other resources necessary to become compliant with the network's health standard. This allows corporate networks to automatically handle system compliance and mitigates the risk of exposing sensitive networks to possible malware carried by connecting computers.

Branch Office

One of the most significant new features in Windows Server 2008, the read-only domain controller increases security for remote domain controllers where physical security cannot be guaranteed. Each branch office can host a read-only replica of its Active Directory database. The RODC holds the same objects and attributes, but without the risk of corrupting the Active Directory forest through locally originating changes. Any changes must be made to the writable domain at the head office location.

Numerous other improvements have been made in the areas of improved security and network performance. Notably, when coupled with Windows BitLocker™ Drive Encryption technology, Windows Server 2008 provides dramatically bolstered security at insecure locations. While RODCs remove the risk of locally originating changes to Active Directory Domain Services, Windows BitLocker Drive Encryption eliminates the risk associated with an unscrupulous person gaining physical access to the server. If someone does gain physical access to the server, or possibly steals the server hard disk drive, that person must first provide a key before the OS loads, and there is no back door. The key can be either a PIN that must be entered before booting the system, or a USB device that contains the required startup key to boot the protected OS.

Microsoft has also made performance gains in Windows Server 2008 by including Server Message Block (SMB) 2.0, an update to the technology that was first introduced with the Windows Vista® operating system. SMB 2.0 supports an extensible way of compounding operations into a single packet to reduce the number of transmitted packets. With this improvement, some companies have experienced a dramatic decrease in transfer time. In June 2007, a Microsoft commissioned study by The Tully Group found that,

[5] "Introducing Windows Server 2008." Mitch Tulluch, May 2007.

> Just upgrading client PCs to Microsoft's Windows Vista can yield throughput and time-to-completion improvements of up to 2.5X over Windows XP. Complete migration of servers to Windows Server 2008 can yield throughput and time-to-completion improvements of up to 3.5X over Windows XP/Windows Server 2003.[6]

Other SMB 2.0 improvements include expanded buffer sizes and the number of concurrent file handles, which translate into reduced file backup and file-share transfer time. This new technology works only between computers running the Windows Vista or Windows Server 2008 operating system.

Web and Application Platform

Windows Server 2008 comes with seventh iteration of Microsoft's powerful Web server technology, Internet Information Services 7.0. Companies that rely on Web-based services and applications will find great value by implementing the latest version of IIS. Microsoft has built upon reputation of IIS 6.0 for high reliability and security by including new manageability and extensibility features found in the Windows Vista software.

IIS 7.0 performs a primary role in Windows Server 2008, providing companies with a platform for developing and hosting Web applications and services. Web administrators benefit from a completely modular setup that requires only the needed functionality to be installed. This limits the attack surface exposed, boosts performance, and lowers the server footprint and update-related downtime. Each module is fully extensible through managed .NET code, so customers can modify IIS to suit their unique needs. This extensibility also makes it easy for Microsoft to add new features and functionality to IIS through Web server extensions that will be delivered over the Web.

Administrators will also benefit from simplified management tools and new troubleshooting diagnostics. Capgemini observed in customers a 60 to 75 percent reduction in IT time spent configuring IIS 7.0 servers.

Server Management

Powerful new tools make managing Windows Server 2008–based computers throughout an enterprise much easier. The integrated Microsoft Management Console (MMC), Server Manager, is a single, graphical-user-interface source for managing server roles and features and checking server status. A command-line version, ServerManagerCmd.exe, is also available that can quickly and easily add roles and features to a server. The new Windows PowerShell command line interface and scripting language gives administrators an easy and powerful method of managing services, processes, and storage. This scripting language includes more than 130 cmdlets, preprogrammed lightweight commands that can be used to manage server

[6] "Enhanced Network Performance with Microsoft Windows Vista and Windows Server 2008," The Tully Group, June 2007.

roles such as Internet Information Services, Terminal Services, and Active Directory Domain Services.

In addition, new remote management technologies provide administrators with easier remote access to servers. This has allowed some companies to reduce the number of local staff hours assigned to managing servers. Remote provisioning has also made a significant impact in several of the companies that Capgemini interviewed. One company, which provisioned almost all of its servers remotely using Windows Deployment Services, reduced the time it took to provision a server by approximately 60 percent.

Windows Deployment Services, the successor to Remote Installation Services, is a new technology in Windows Server 2008 that streamlines the deployment process. Specifically updated to enable the deployment of the Windows Vista operating system, Windows Deployment Services can also be used to deploy server and client software running on other operating systems. The same Web hosting company saw early benefits by using Windows Deployment Services: The company's IT department is expected to save more than 550 hours per year in image maintenance and has completely eliminated third-party provisioning tools. Using a Pre-Boot Execution Environment (PXE) server and Trivial File Transfer Protocol (TFTP) allows network-based installations, which eliminates the need for an administrator to be physically present at the computer. This capability enabled the Web hosting company to provision Web servers across the world from its central office in the United States.

Presentation Virtualization

With Terminal Services, also known as Remote Desktop Protocol (RDP), a relatively lightweight desktop computer can connect to applications or entire Windows sessions running on a remote server and see them presented as if they were running on the desktop computer. With Terminal Services Gateway in Windows Server 2008, Microsoft has evolved previous releases of RDP to work without the requirement of virtual private networks (VPNs) when connecting to internal corporate or private networks over the Internet. With Windows Server 2008 Terminal Services RemoteApp™, individual applications can run from a terminal server while the graphical presentation of the application is shown on the user's desktop, without the hassle and confusion of virtualizing the entire desktop. Application virtualization has benefited several companies that support many remote employees. For example, one such company in a developing nation was able to virtualize its business-critical applications by transferring the processing to central servers rather than running the applications on otherwise incompatible hardware. Further, practical improvements in printing and file sharing have been added to allow users to work with local printers and files.

Terminal Services is now much easier to use. Companies using Terminal Services RemoteApp programs have experienced as many as 75 percent fewer help-desk calls relating to user confusion. Remotely located or travelling employees gain greater

access to company resources with Terminal Services Gateway and Terminal Services Web Access, which allows users to connect from a Web browser using an HTTPS connection instead of opening a new port and installing Terminal Services client software. File and Printer Redirection solves a common complaint of administrators by redirecting file system and print requests to the local desktop, allowing local printing from remote servers.

High Availability

Every IT department commands the role of ensuring that critical applications and services are available with as little interruption and downtime as possible. Clustering servers mitigates the risk of a single server failing—a single point of failure—and bringing down business-critical applications or services. Failover clustering, formerly known as server clustering, involves configuring a group of servers to act in a standby capacity for each other. If a server fails, for one reason or another, the other servers in the cluster will immediately and invisibly take over the load. With failover clustering, customer-serving applications such as a Microsoft SQL Server® database or an e-commerce solution, can be guaranteed the highest possible uptime. Lost revenues due to server downtime would be reduced or eliminated.

"A reliable IT infrastructure directly equates to business success. The Center for Information Systems Research (CISR) at the MIT Sloan School of Management found that a reliable infrastructure can 'lower costs of goods sold, increase profit and innovation, and help [boost] market value."

"Evaluating IT Reliability: Prerequisite to CIO Success," CIO2CIO Perspectives

The configuration and setup of failover clusters has been dramatically restructured. Previously requiring very experienced IT personnel to set them up, clusters can now be created quickly and easily by inexperienced staff with a new management and configuration interface. The Cluster Validation Wizard guides administrators through a predeployment verification process of the cluster's system, storage, and network configuration. Other improvements include the ability to better support Storage Area Networks and Direct Attached Storage. For example, administrators can now bring a new hard disk online within the cluster without interrupting service. Network Load Balancing (NLB) is also improved in Windows Server 2008. NLB fully supports IPv6 in node-to-node and node-to-client communications.

Capgemini observed that companies that implemented failover clusters in Windows Server 2008 experienced a reduction in maintenance and administration costs. Companies that previously employed a cluster expert could use the improved management tools instead and refocus resources to more value-added activities. This shift in efforts directly translated into savings in support costs and implementation times. One company was able to achieve 100 percent availability of its e-mail servers, and another was able to deploy new servers to its cluster in days instead of weeks.

Customer Evidence

Through the Microsoft Rapid Deployment Program, select companies deployed the Windows Server 2008 operating system before its official release. Our collecting of evidence from companies that used Windows Server 2008 was two-pronged: Statistical evidence was gathered through a Benefits Framework survey tool sent to a large number of customers, and anecdotal evidence was gathered by interviewing key individuals involved in deploying, managing, and using Windows Server 2008. We then attempted to relate the value companies got from Windows Server 2008 back to the requirements and usage scenarios described in the preceding sections.

The customers that participated in the Benefits Framework survey span all major industries and geographies. The Benefits Framework tool takes in observed data before and after the deployment of Windows Server 2008 in order to compare and contrast how Windows Server 2008 affected the company. The framework assigns a monetary cost or value to a number of activities, tasks, and issues.

Whereas the Benefits Framework tool focused on assigning a dollar figure to the value of Windows Server 2008, our customer interviews picked up on subjective, personal, and intangible value. The benefits of saving two hours in setting up a server cluster may not be significant, but ask your server administrator what it took to set up a cluster prior to Windows Server 2008 and you'll hear the benefit loud and clear.

We found that Windows Server 2008 reduces time spent on server deployment, management, and maintenance but—because most customers were upgrading from its already reliable predecessor, Windows Server 2003—the numbers weren't always staggering. However, even small timesavings add up when done thousands of times. For example, one customer saw a 60 percent reduction of deployment time with Windows Deployment Services. This equated to 5 hours saved per deployment, if done by non-specialized staff. But, since this company does hundreds of server deployments a year, it will be able to save an estimated 1,500 hours annually—a little less than one dedicated human resource.

Interestingly, many customers told us that cost savings from reducing server administrative time was not one of their main objectives for using Windows Server 2008. While this cost savings was appreciated, they were more interested in the improvements in security, increased functionality, staying ahead of the support life cycle, or eliminating in-house or third-party solutions. For example, one customer will be able to reduce maintenance of server images used for server deployments by over 550 hours in 2008. This savings was insignificant compared to the business value they saw in not having to worry that "there was a risk that our whole house of cards will come down" because so many distinct pieces previously had to come together into that image. By using Windows Server 2008 instead of a collection of in-house and third-party tools, this customer's risk of losing its "whole house of cards" was eliminated.

We also saw that users of Windows Server 2008 often achieve real business value even if it doesn't result in increased revenue or reduction in cost. A university that uses the new Network Access Protection (NAP) feature in Windows Server 2008 summed up this phenomenon with an analogy:

> Most of the benefits we see are qualitative. To use a military analogy, the Australian Army has just replaced its fleet of aging Leopard II tanks with M1A1 Abrams tanks. The Leopard IIs completely failed to show a profit. There was negative return on investment in purely financial terms. The new tanks are superior in every way that counts, however they will still earn absolutely no profit. The business value is not really defined in dollar terms. We do see great benefits from Windows Server 2008 and NAP, but they are not really quantifiable in dollar terms either. Like the tanks, we will have better tools for the job, but they are never going to make money for us and we can't really say how many dollars they will save.[7]

Although most of the companies that participated in the Microsoft Rapid Deployment Program did not list cost savings or revenue generation as one of their goals for using Windows Server 2008, empirical evidence showed that they achieved cost savings whether or not they set out to do so. The following highlights and statistics were taken from a group of twenty early adopters of Windows Server 2008.

Windows Server Usage Scenarios	Business Value Benefits
Security and Policy Enforcement	• Reduced help-desk calls regarding client-side security by 70% • Raised network compliance to 85% through auto-remediation • Moved two FTEs from paper-based compliance checking to new technology initiatives: cost avoidance of $157,000 • Reduced help-desk calls regarding client-side security by 75% in the 6 months after deployment • Reduced management of IT security by 14% • Reduced risk of data loss by 10%
Branch Office	• Reduced number of domain controller servers at main office by 80% by implementing read-only domain controllers in branch offices • Saved $70,000 by using server consolidation and virtualization technology
Web and Application	• Reduced number of required IIS servers by 70% due to increased capacity gained by upgrading to IIS 7.0 from IIS 6.0

[7] David Hird, Systems Architect, La Trobe University

Platform	• Saved 1,000 hours per year in maintenance time • Reduced time spent deploying new sites or making changes to existing sites by 66% • Reduced time spent provisioning Web server by 75% • Reduced time spent configuring and load-balancing Web server by 80% • Increased Web site's performance by 40%
Server Management	• Reduced time to deploy Windows Server 2008 and Windows Server 2003 by 60% • Accelerated integration of mergers and acquisitions without the need for VPNs by using Terminal Services • Eliminated three third-party tools and applications by replacing them with Windows Deployment Services, saving $73,000 on annual licensing costs • Saved 588 hours per year formerly spent on image maintenance by using Windows Deployment Services • Reduced server management time by 93% by handling complex task automation through Windows PowerShell, which resulted in an estimated $500,000 cost savings
Presentation Virtualization	• Stopped sending sensitive data to offshore desktops and remote employees by using Terminal Services with Terminal Services Gateway • Eliminated need for costly leased lines and VPNs by using Terminal Services Gateway • Reduced infrastructure and IT staff, resulting in $24,000 cost savings • Reduced number of physical servers by 60% • Reduced support time by 80%
High Availability	• Accelerated file access rates by as much as 40% over the rate experienced with Windows Server 2003 • Deployed new servers in days instead of weeks • Experienced 100% e-mail availability

Windows Server 2008 was directly responsible for an aggregate savings of approximately U.S$124,000 per year as part of the surveyed companies' participation in the Microsoft Rapid Deployment Program. This number is influenced by the fact that Rapid Deployment Program deployments are limited in scope to specific usage scenarios and to a subset of the companies' entire Windows Server infrastructure.

Metric	Value
Average deployment duration	10.25 weeks
IT cost reduction	U.S.$124,000/year
Potential staff reduction	0.91 Full-time equivalents
Potential server reduction	63%

Conclusion

Companies rely on their IT systems to deliver business value. Whether by reducing costs or increasing revenue, Windows Server 2008 makes increased business value possible. Capgemini's viewpoint is that Windows Server 2008 performs better than its predecessor in every way and that both major and minor improvements have resulted in an operating system that has delivered observable business value to the customers we surveyed.

Based on the empirical data collected on the value of Windows Server 2008 and anecdotal evidence from the customers we spoke to, we see that IT departments can benefit from Windows Server 2008 by reducing the time IT staff must spend on managing servers; as we noted, many of the companies we spoke to did not set out to reduce costs or staff time spent managing servers. Business users will see less initial value as customers port existing applications onto the new OS. As companies begin to expand into new functionality, however, business users will start to gain from improved availability and applications made possible by the new features of Windows Server 2008.

Although Windows Server 2008 clearly demonstrated value, the cost to transition from Windows Server 2003 may not always be the most practical. For example, enterprises with rudimentary applications that cannot or will not take advantage of the features of Windows Server 2008 are unlikely to gain much value. We observed this in the case of one customer that did a straight migration from IIS 6.0 to IIS 7.0 without updating code or configurations to take advantage of the upgrade's improvements. Similarly, another customer moved a single application from an older server operating system to Windows Server 2008 without updating the application to use any of the features debuting in Windows Server 2008 and didn't see the value that other customers saw.

Due to the expeditious nature of the Microsoft Rapid Deployment Program, in which companies had a limited amount of time to plan and deploy Windows Server 2008, we observed that planning a Windows Server 2008 implementation is not something to be rushed. A number of the companies we spoke to ran into a common issue in which the scope of the implementation ballooned as new features were observed. Project managers became overwhelmed as IT engineers went giddy with a wish list of new projects that could take advantage of the new features. This caused the project team to lose focus as it added new features into its scope, only to scratch these items as time ran out.

Another issue we saw was that departments involved in the Windows Server 2008 Rapid Deployment Program tended to maintain focus on their piece of the IT landscape without full realization of the benefits Windows Server 2008 could have on the rest of the company. We recommend that companies find a balance between running wild with new features and taking too narrow of an approach. In our research, we found that we weren't the only ones to come to this conclusion, as IDC

reported: "In reality, most customers will need to step back and look at the larger picture and determine their architectural plans for configuring next-generation Windows deployments."[8]

Although a company can elect to plan and implement Windows Server 2008 on its own, often the preferable option is to engage the vendor or a third-party professional services organization in determining the solution. The Microsoft Rapid Deployment Program provided the companies we talked to with consultants to help them succeed, and everyone we talked to said that they couldn't have done their deployment as well without this added help. We highly recommend engaging a Microsoft Certified Partner in planning and deploying any major Windows Server 2008 implementation. These partners have practical experience in deploying solutions and understand both the most expedient way to implement systems as well as the areas of risk and change management that need to be addressed. Partners typically have their own rigorous implementation methodology, based on their own client implementation experiences, which incorporate leading practices and optimize the value from the investment. Therefore, talk to your local Microsoft representative or Microsoft Certified Partner to learn more about the role that technology can play in improving your IT operations while delivering business value to your enterprise.

8 "Worldwide System Infrastructure Software 2008 Top 10 Predictions," IDC, December 2007.

About Capgemini and the Collaborative Business Experience

Capgemini, one of the world's foremost providers of Consulting, Technology, and Outsourcing services, has a unique way of working with its clients, called the Collaborative Business Experience. Backed by over three decades of industry and service experience, the Collaborative Business Experience is designed to help our clients achieve better, faster, more sustainable results through seamless access to our network of world-leading technology partners and collaboration-focused methods and tools. Through commitment to mutual success and the achievement of tangible value, we help businesses implement growth strategies, leverage technology, and thrive through the power of collaboration. Capgemini employs approximately 83,500 people worldwide and reported 2007 global revenues of €8.7 billion (U.S.$13.1 billion).

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