



# How Windows Server 2008 R2 Helps Optimize IT and Save You Money

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Microsoft Corporation

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## Introduction

Customer feedback is clear: A key goal for the next several years will be to reduce technology costs. At the same time, however, IT technology has become a competitive cornerstone for a broad swath of commercial and non-commercial industries alike. Maintaining that competitive edge in a fast changing business landscape is also a requirement. These goals require a new approach to IT and data center management emphasizing automation and optimization. Windows Server 2008 R2 was designed and built with these goals in mind.

Windows Server 2008 R2 addresses cost savings across a number of areas, including streamlined management, less reliance on expensive third-party software, more scalable application serving and lowered WAN bandwidth costs. Customers have seen server consolidation rates up to 3-to-1 as well as up to an 80% decrease in IT man-hours spent on rote administrative tasks like file system management. Power efficiency is also improved over Windows Server 2008 and again over Windows Server 2003 R2. Early adopters of Windows Server 2008 R2 have documented significant savings in this regard, up to 18% over Windows Server 2003 R2.

IT managers are also provided with new tools to more quickly and easily respond to changing front-line business requirements. Customers have reported software deployment operations using Terminal Server that used to take weeks, can now be performed in less than 30 minutes using the new Remote Desktop Services and Virtual Desktop Infrastructure technologies in Windows Server 2008 R2. New administration tools address ease of management and custom automation of common tasks. Powerful new virtualization capabilities enable rapid response to changes in demand for virtualized workloads—without interruption of service. With R2, virtual servers have been deployed from scratch in under 15 minutes in early customer deployments. In addition, the extension of this virtualization vision to the desktop and individual applications allows even small IT departments to more efficiently roll out entire new application toolkits in a fraction of the time it takes to deploy such suites on every local desktop.

Combining cost savings and increased IT agility means optimizing your IT infrastructure and data center. Windows Server 2008 R2 addresses those needs directly and can quickly set customers on the right path to a competitive IT environment and a streamlined IT budget.

*“Windows Server 2008 R2 with the improved Hyper-V can support more than 30 [workloads]. From a fixed capital asset perspective alone, that’s a savings of \$60,000 to \$80,000 per Hyper-V server.”*

**- Jason Foster, Systems Architect and  
Director of Technology,  
Continental Airlines**

## In IT, Success is Measured Differently

IT priorities are changing fast, and not simply because of a challenging economy. More attention must be paid to IT expenditures in this economic climate, but cost savings across the IT budget have long been a concern to customers. What makes this goal more challenging is that while boardroom business management demands cost savings, they have also grown increasingly dependent on IT infrastructure for both day-to-day operations as well as competitive response. Instead of being merely a support technology for back-end operations, IT has evolved in the last ten years to be a crucial factor across a variety of core business scenarios, including servicing increased customer demand, competitive marketing, reacting to mergers and acquisitions, and more. At the same time that IT managers are tasked with decreasing their expenditures, the successful IT executive is also looking for ways to increase agility and improve response times to better react to changing business needs. Decreasing costs is certainly one priority, but increasing value is just as important.

Windows Server 2008 R2 helps enterprise customers achieve these seemingly conflicting initiatives through new and enhanced features, with special attention paid to addressing three key IT priorities:

- **Reducing costs:** Windows Server 2008 R2 addresses cost savings across the gamut of standard IT expenses, including management, server consolidation, power consumption, and WAN bandwidth.
- **Improved IT Service Levels:** The new server platform also allows IT administrators to increase the reliability of server-based resources by adding new capabilities to features such as Failover Clustering, Server Core, and Active Directory.
- **Enabling new Business Scenarios:** Perhaps the most exciting thing about Windows Server 2008 R2 is the host of new scenarios it enables for IT administrators so that they can offer all-new resources and productivity tools in response to new business requirements.

Faced with the double-edged sword of cost savings and increased functionality, many IT managers might throw up their hands in frustration. But implementing Windows Server 2008 R2 will take customers a long way towards achieving this difficult balance; reliably, and with the same platform their IT workers have been using for years.

## Decreasing TCO with Streamlined Management

IT agility is certainly one half of the new optimized data center vision. However, with today's challenging economy weighing heavily on the minds of all senior business executives, cost savings can be said to have a slight edge in priority, at least in the short term. A recent IDC study of top CIOs and other senior IT managers found a "significant shift toward cost reduction rather than revenue generation"<sup>1</sup> across enterprise data center expectations. Windows Server 2008 R2 focuses heavily on helping customers achieve real costs savings not just with new features, but also through best practice implementation, guidance, and tight synergies with other Microsoft products and technologies.

Simplifying server management is an important first step in lowering the total cost of ownership (TC) in the data center. Creating a more simplified environment, however, requires several key steps:

- Centralized management and automation tools that cover both physical and virtual server infrastructures,
- Management consoles that can monitor and diagnose problems across multiple server platforms,
- Integrated and granular desktop management,
- More secure and flexible remote access management, and
- Built-in identity and access capabilities accessed and monitored by the same management tool set.

*"With virtualization, we will save about 50 percent of our annual energy budget for cooling and electricity"*  
- Lukáš Kučera, IT Services Manager  
Lukoil Oil Company

Windows Server 2008 R2 addresses all these needs directly. Hyper-V, for example, has an updated management interface and includes powerful new features, in particular, Live Migration, which allows IT managers to move server workloads to different physical hosts in seconds and without interruption of service. Hyper-V also has improved support for PowerShell, which helps simplify remote management of virtual servers as well as enable custom automation of management tasks specific to your business workflow. Additionally, support for the new Hyper-V capabilities has been integrated into System Center Virtual Machine Manager. This combination has allowed early adopter to reduce overall server footprint in their datacenters by an average 3-to-1 ratio, with associated cost savings across

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<sup>1</sup> A Survey of IT Fundamentals: Six Quarters into the Recession, by: Anna Toncheva; IDC, July 2009

power management and reduced IT man-hours. In fact, Hyper-V and System Center Virtual Machine Manager put Microsoft at feature parity with VMWare at 1/3 the cost.<sup>2</sup>

Active Directory, still one of Windows Server customers' most mission-critical features, also sees management updates in Windows Server 2008 R2, while continuing to provide unparalleled identity and access management. New Active Directory Group Policy Objects enables greater control over Windows servers and desktops, while offering new power management capabilities as well. To make these features as easy as possible for IT managers to implement, Windows Server 2008 R2 includes the new Active Directory Administrative Center, which is built in the familiar Windows Server Microsoft Management Console interface, and which consolidates many of the more critical Active Directory consoles and wizards in a single place. Active Directory Administrative Center also includes some new management features, such as the Active Directory Recycle Bin, which allows an administrator to easily recover from accidental objection deletions. Like many of Windows Server 2008 R2's new management consoles, Active Directory Administrative Center is also built entirely on top of the updated Windows PowerShell.

Windows PowerShell is another management feature introduced in Windows Server 2008 that is significantly enhanced in Windows Server 2008 R2, with new functionality added based on customer feedback. Windows PowerShell is a flexible command line shell and scripting language, that allows for customized and automated management of Windows Server in the data center. With Windows Server 2008 R2, Windows PowerShell has been enhanced with a graphical interface, remoting capabilities, and more than 240 new cmdlets aimed at simplifying common management tasks.

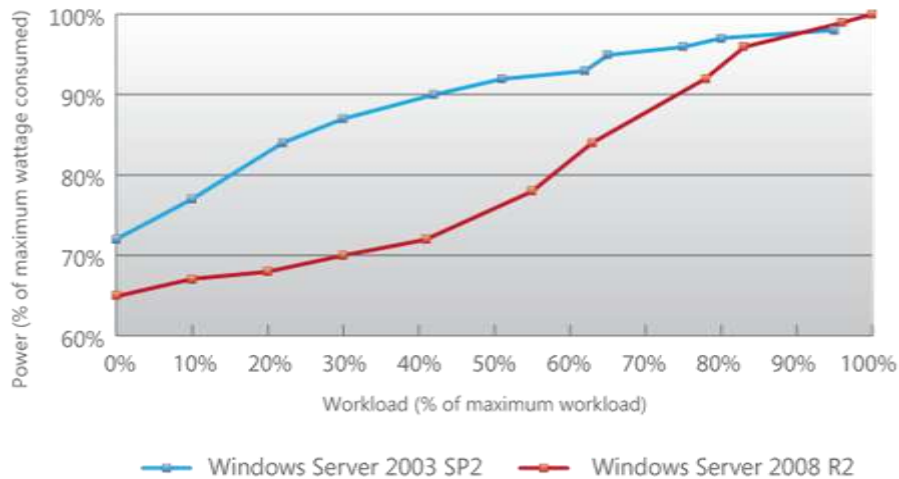
## Data Center Power Management

Windows Server 2008 R2 includes several new features designed to help reduce customers power costs. Microsoft has improved the processor power management engine, introduced new storage power management features, and implemented other processor-level enhancements, which improve power efficiency out-of-the-box without the need for administrator configuration. Windows Server 2008 R2 also includes new power measurement and management capabilities to offer a deeper view into server power usage. Administrators will be able to collect power consumption data via familiar technologies, including the System

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<sup>2</sup> Costs are based on a comparison of Windows Server® 2008 Enterprise with Hyper-V™ and Microsoft® System Center Server Management Suite Enterprise with VMware's VMware Infrastructure Enterprise with VMware vCenter Server. Includes 2 years support costs for both. Based on Microsoft estimated retail prices and published VMware prices available at [www.vmware.com/vmwarestore](http://www.vmware.com/vmwarestore) as of 02/04/2009. Actual reseller prices may vary. Additional comparison information is available at <http://www.microsoft.com/virtualization/compare/vmware-cost-comparisons.aspx>

Center suite of products, Windows PowerShell scripts, and also third party tools. Working together, these features can help improve power efficiency by up to 18% over Windows Server 2003 R2.



With Windows 7, Windows Server 2008 R2 can extend these power savings out of the data center and all the way to the desktop. Windows Server 2008 introduced this capability with Windows Vista, and Windows Server 2008 R2 includes new Active Directory Group Policy Objects that enable even more granular control over Windows 7 desktop power consumption.

### Increased Reliability Without Increased TCO

Cost savings are important to the new optimized data center vision, but a big part part of reducing costs is the prevention of expensive problems. Increasing uptime and IT infrastructure reliability will be a key concern for IT managers in the coming year. Windows Server 2008 R2 helps by including several features aimed at this requirement. Windows PowerShell is a key enabler for IT managers looking to improve the service level agreements (SLA) they can offer to their businesses. With 240 additional built-in cmdlets, the new Windows PowerShell Integrated Scripting Environment (ISE) , and remote Windows PowerShell capabilities, administrators can now manage and troubleshoot multiple servers remotely – without the need to visit those servers or establish separate remote connections. This means less effort required to manage and maintain servers, and better overall server performance and reliability.

Tight integration with the Microsoft System Center suite of management products further extends an administrator's ability to offer improved IT performance levels. First, it means shallower learning curves for IT staff and improved analysis and reporting across disparate server platforms. That decreases implementation and day-to-day operation cost, and also ensures your existing IT administration resources can offer better up-time and reliability SLAs

than ever before. Second, the new reporting and analysis tools in System Center mean IT administrators are forewarned earlier and with more detail on potential problems.

Third, Windows Server 2008 R2 has new features that offer guidance on management and implementation, so IT administrators can optimize new server infrastructures and deployments more efficiently. Microsoft introduced Best Practices Analyzers (BPAs) in Windows Server 2008 timeframe. This guidance tool automatically analyzed specific features in Windows Server 2008 and compared the server configuration with a Microsoft knowledge base related to the subject. The resulting report clearly defined problem areas and suggested fixes to help keep the infrastructure running with up-to-the-minute expertise. Windows Server 2008 R2 has added BPAs across all server roles for the best possible guidance on Windows Server 2008 R2 best practices and configuration. Microsoft is also planning to introduce new BPAs in other Microsoft enterprise products, such as Exchange Server 2010 and SQL Server 2008 R2.

## Exciting New Scenarios

Windows Server 2008 R2 gives customers flexible and robust new tools to manage and control their IT infrastructure. This enables not just cost savings and increased reliability, but also enables IT administrators to quickly and reliably offer brand new tools and resources in response to new business requirements. In short, Windows Server 2008 R2 offers more IT agility than any previous Windows Server platform.

New virtualization tools, Web resources and management enhancements can help save time, reduce costs, and provide a platform for a dynamic and more efficiently-managed data center. The new IIS 7.5, for example, includes a streamlined new management interface as well as support for PHP and .NET applications on Server Core. This lets IT managers run a single, simplified Web server across multiple app platforms. The updated Server Manager console and Windows PowerShell 2.0, work on top of these new feature platforms to give customers greater control, increased efficiency and the ability to react to front-line business needs faster than ever before.

Windows Server 2008 R2 also adds powerful enhancements to Hyper-V, Microsoft's in-box virtualization platform introduced in Windows Server 2008 and already one of our customers' most popular new features. With Windows Server 2008 R2, Hyper-V includes Live Migration – the ability to move virtual servers across physical hosts in the data center with no perceived down-time for users, so IT can restructure the data center as business needs demand without stopping important work streams. That's a huge benefit to under-resourced IT departments, given that it is included as one of the readily available roles with Windows Server 2008 R2. Using Hyper-V in R2, early adopters like Lionbridge Technologies have decreased virtual server management time from hours to minutes, while simultaneously saving server space and power costs.

## A New Networking Experience

Networking also has seen exceptional improvements in Windows Server 2008 R2, with the result that IT managers are now much better able to offer more flexible, streamlined and secure connections to remote workers and branch offices. Much of this is due to the tight synergy between Windows Server 2008 R2 and the new client operating system, Windows 7. With these two platforms working better together, Microsoft is able to offer exciting new features that expand the IT administrator's arsenal, while reducing the organization's bottom line.

DirectAccess is a robust new networking technology that automatically provides users with a security-enhanced connection to the corporate network regardless of which network they're currently connected to. That means that the corporate network and the intranet can follow users no matter where they go—to their home, to a coffee shop or an airport, or even to a customer's network—automatically. With Windows Server 2008 R2 and Windows 7, there may be no longer any need for an organization to implement a potentially expensive virtual private network (VPN). Furthermore, this technology is bi-directional, which means not only do users see the corporate network without any additional connection required, but administrators can see and manage these remote users...*as if they were local clients*. This can reduce the need for additional management cycles and dollars spent on managing remote users and local users differently—drafting remote management policies, architecting remote software deployment or patching scenarios, and more. Clients are simply clients and Windows Server 2008 R2 can manage them no matter where they're connected.

BranchCache is another "Better Together" networking technology. This feature allows Windows 7 clients in branch offices to access locally cached data from the corporate network. This data can be stored across a number of Windows 7 desktops at the branch (distributed mode) or on a Windows Server 2008 R2 server located at the branch (hosted mode). Either configuration provides users much faster access to data since it's cached locally while maintaining security and also minimizing the amount of traffic traveling across potentially expensive WAN links, resulting in significant cost savings of up to 40% in early customer deployments. Using both BranchCache and DirectAccess companies like Convergent Computing have reduced weekly IT management time by 60% or more, while simultaneously saving up to \$40,000 in bandwidth costs per year.

## Remote Desktop Services and VDI

One of the most exciting new features in both Windows Server 2008 R2 and Windows 7 is the evolution of Terminal Services into Remote Desktop Services (RDS) and how it takes advantage of the virtual desktop infrastructure (VDI) suite of technologies, including Microsoft App-V, which offers application virtualization. The combination has become central to the Microsoft virtualization vision, and enables IT administrators to offer virtualized resources, applications and even entire desktops to users across local or wide area networks, and with new protocol improvements such that users may not be able to tell whether their applications are running locally or in the data center.

Administrators host specific applications or entire desktop environments on a server and provide access to these resources to specific users or groups of users. Improvements in the protocol architecture around RDS and VDI mean that users will have a much-improved experience with remote applications, including support for high-end graphics and sound, multiple displays and more. Tight integration with Windows 7 means these applications and desktops will simply show up in each user's Start Menu, and will often run as fast as locally installed applications – that adds up to faster and simpler application deployment for IT administrators and a better experience for end users.

## Conclusion

Windows Server 2008 R2 is the right server platform for today's resource-constrained enterprises as well as small and medium-sized businesses. It combines tools and features made familiar in Windows Server 2008 with new, powerful features and easier implementation. It leverages technologies like Hyper-V and Remote Desktop Services to provide new productivity tools for end users, while simultaneously consolidating software and hardware expenditures to save IT budgets. Windows Server 2008 R2 also includes numerous power saving features designed to increase efficiency and decrease costs. In addition, Windows Server 2008 R2 provides a tight synergy with Windows 7. This means IT administrators can offer users new work enhancements and resources, while using those features to decrease TCO at the same time.

The synergy of these new capabilities help make Windows Server 2008 R2 the best platform for enterprises looking to streamline IT costs while simultaneously increasing IT flexibility, response time and reliability. Windows Server 2008 R2 is truly the beating heart of the new optimized data center.

## Additional Resources

### Windows Server 2008 R2

Windows Server 2008 R2 offers a host of new management and productivity features. Learn more at [www.microsoft.com/windowsserver2008](http://www.microsoft.com/windowsserver2008).

### System Center

System Center solutions help IT professionals manage the physical and virtual IT environments across data centers, client computers, and devices. Learn more at [www.microsoft.com/systemcenter](http://www.microsoft.com/systemcenter).

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