Dell PowerEdge 12G Servers with Windows Server 2012: The time to migrate is now

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Introduction

With the arrival of Dell 12th generation servers (12G) and Microsoft Windows Server 2012, your organization can now significantly simplify Windows Server deployment.

Window Server 2012 delivers a number of new enhancements and features over your current Windows Server 2003 or Windows Server 2008 infrastructure. With Windows Server 2012, your organization can benefit from improved virtualization, identity and access control management, graphical interface, storage and networking, and Web and application hosting.

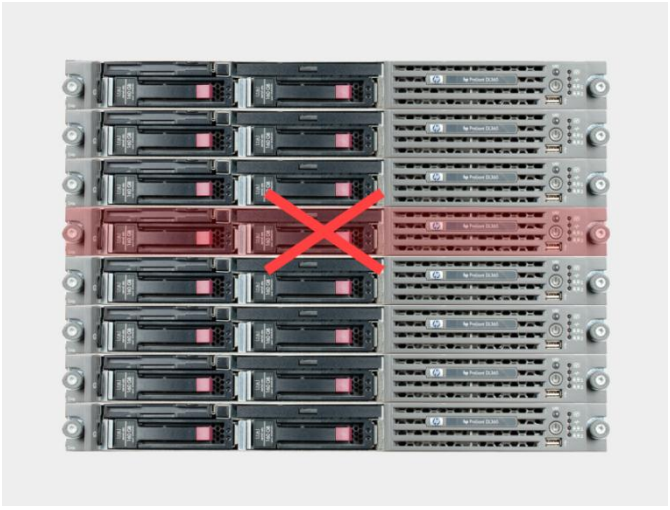
Dell 12G servers provide a powerful platform for Windows Server 2012 and its advanced features, giving your organization better performance, reliability and management, all of which improve return on investment (ROI) and your bottom line. For more information on powering Dell servers with Windows Server 2012, see www.dell.com/ws2012.

Three possible approaches to the question "Should I migrate now?"

Even with a skilled IT staff, a major upgrade is something that your organization should carefully plan and execute to reduce the risk of error and minimize downtime. You need to consider hardware and software licensing costs, hardware and application compatibility and scheduling to maintain high productivity and minimize system downtime during the migration process. In the following sections, we discuss the pros and cons of three possible scenarios: continuing to run legacy hardware and software, performing a partial migration and upgrade and performing a full upgrade.

One approach: Staying put

Figure 1. Aging servers are likely to fail.



Many small-to-medium businesses seem to take the "if it isn't broken, don't fix it" approach when to upgrading server technology. Chances are that somewhere in your office is an old server that your IT staff is afraid to touch lest it break or fail—which is frequently a reasonable concern. As technology

ages, the likelihood increases that an outdated component will fail at some point, possibly causing downtime and preventing employees or customers from accessing important data. Also, as that older server continues to age, the demand for performance and capacity is likely to increase as your business grows, making it more and more difficult for that server to keep up.

In addition to hardware-related concerns, other issues arise as software and operating systems become outdated. As software becomes obsolete and newer and more capable versions become available, software manufacturers begin to phase out support for the older products. For example, Windows Server 2003 is beyond its mainstream support period and is approaching its end-of-life date. In the meantime, Microsoft has phased in multiple newer versions of Windows Server in its place to meet the increasing demands of businesses today, culminating with the latest version, Windows Server 2012. For more information on Microsoft's product lifecycle policy, see http://support.microsoft.com/lifecycle/search/default.aspx?sort=PN&alpha=windows+server&Filter=FilterNO.

Postponing your upgrade is a difficult decision, and organizations often choose to try to wait another year, simply because it means postponing spending on new hardware and software. If your servers are several years old and you decide to delay the move to newer technology, at what point does the decision to put off spending end up costing you more? Lower employee productivity due to a slower server response, decreased server capacity, increased downtime and outdated software can all negatively affect your bottom line. Additionally, the longer you put off upgrading an older server, the more likely you are to end up paying more for IT support to replace these components as they fail and end up with a piecemeal solution that addresses the short-term problem, but does not accommodate for future needs the way a more consolidated solution would.

Although waiting another year might seem like the wisest decision financially, the best plan includes a long-term perspective and has a built-in upgrade strategy for your infrastructure.

The better approach: Partial migration

Figure 2. Partial migration a Dell PowerEdge R720.

Perhaps you have been postponing the decision to upgrade, but have decided that staying put is no longer an option for your organization. At the same time, you have a restrictive budget or legacy applications that require a more complex or gradual migration process. Even if a full upgrade of your server infrastructure and operating system is not practical for you at this time, your organization has another option.

Windows Server 2012 introduces hardware-based virtualization for your legacy Windows Server 2003 environment. This high-performance virtualization allows you to run multiple self-contained servers on a single Dell 12G server, consolidating legacy servers and saving your organization hardware, management and power costs. Migrating your services and applications to new Windows Server 2012 virtual machines (VMs) using this technology will also grant you significant performance improvements. For more on the performance benefits of server virtualization for your organization, see http://www.principledtechnologies.com/clients/reports/Dell/R720_Consolidation_Migration_Guide_1112.pdf.

In the case of legacy applications that do not run natively on Windows Server 2012, you may be able to use a P2V (physical to virtual) conversion utility to take your older server running Windows Server 2003 or Windows Server 2008 and deploy it as a virtual machine on a Windows Server 2012 host. While this approach does not give your organization all of the benefits that Windows Server 2012 provides, you can still take advantage of the increased performance and reliability of Dell 12G servers, increasing user productivity until you can migrate those applications to Windows Server 2012.

If budget restrictions are your primary concern, the Dell PowerEdge R720 offers a scalable range of configuration options that allow you to begin the upgrade process and add more hardware as you are

able. For more information on the configuration options of the Dell PowerEdge R720 server, see http://www.dell.com/us/business/p/poweredge-r720/fs.

Partial migration is a better alternative to retaining existing server hardware and then replacing your servers one by one as they fail, as hardware support and administrator time for supporting a piecemeal solution can be prohibitively costly.

The best approach: Full upgrade

Figure 3. A complete migration to Windows Server 2012 on the Dell PowerEdge R720.

With a full upgrade of your server infrastructure to Windows Server 2012 on Dell 12G servers, your organization can take advantage of the significant benefits of newer technology and maximum flexibility in your deployment as you move away from legacy servers running Windows Server 2003 or Windows Server 2008.

In addition to virtualization improvements and greater resource scalability, Windows Server 2012 offers many new features. It includes an improved graphical interface to simplify tasks and increase productivity for your IT staff. As a Web and application platform, Windows Server 2012 supports enhanced security features and simplified administration for more efficient and secure application deployment. Windows Server 2012 also includes improvements to authentication and security authorization, supporting more scenarios for remote offices or remote workers to give your organization more flexibility. Dell also provides tools that your IT staff can use to manage Dell 12G servers running Windows Server 2012. For more on these tools, see http://en.community.dell.com/dell-blogs/direct2dell/b/direct2dell/archive/2012/09/04/integrating-for-customer-success-dell-and-windows-server-2012.aspx.

By performing a full upgrade of your server infrastructure, your organization will take advantage of the short-term and long-term benefits of moving to Dell 12G servers powered by Windows Server 2012.

In the short term, this approach allows you maximum flexibility in how you want to perform your upgrade and requires very little down time. One possible upgrade strategy is to perform a P2V conversion of your legacy servers and applications into Windows Server 2012 so that you can immediately phase out all of your legacy hardware. You can then upgrade the OS and applications on the VMs directly. Alternatively, if you wish to move only a subset of files or databases from your legacy servers or a direct upgrade path is not available for your business application, you can create clean VMs on your Dell 12G server and perform a side-by-side migration from your legacy servers to the new VMs.

A full upgrade provides many long-term advantages: immediately lowering IT admin maintenance and management time, decreasing the likelihood of downtime due to hardware failure and saving on power and cooling costs by consolidating your infrastructure into a homogeneous server environment. By upgrading, you also reap greater performance and lower latencies, translating into a better user experience. By consolidating onto Dell 12G servers, you reduce the number of physical servers that your organization needs to power, manage and maintain—which allows you to increase your ROI and reduce your time to pay back the investment. For more information on the total cost of ownership of consolidating legacy servers onto a Dell 12G server, see the Principled Technologies report at [TCO link].

For organizations looking to make the full upgrade to Dell 12G servers and Windows Server 2012, Dell offers comprehensive and powerful solutions for your organization's move. These solutions include reference configurations for virtualized application deployments. For more information on deploying Windows Server on Dell 12G servers, see http://en.community.dell.com/techcenter/os-applications/w/wiki/3458.microsoft-windows-server-2012.aspx.

What does Windows Server 2012 have to offer your organization?

Windows Server 2012 contains many enhancements and features to help your organization more easily manage your server infrastructure and get more out of your investment in new Dell 12G servers. For more details on the enhancements and features highlighted in the Table 1, see Appendix A.

Table 1. Windows Server 2012 improvements

Windows Server 2012 improvement	Description
Server application platform	Windows Server 2012 gives you a platform to deploy the latest applications in SQL Server 2012, Exchange 2013 and SharePoint 2012.
Hyper-V	Windows Server 2012 Hyper-V now supports allocating more processor and memory resources to virtual machines, in addition to added support for NIC teaming and a new disk format (.vhdx) that supports larger virtual disks.
Identify and access control	Windows Server 2012 provides more flexibility for deployments with remote offices and remote workers, without the complexity of VPN.
Network and storage systems	Windows Server 2012 has numerous enhancements to make your IT infrastructure more powerful and cost effective, such as deduplication, which reduces storage requirements.
Management and automation	Windows Server 2012 enables your IT staff to be more proactive with improved management interfaces, including an overhauled graphical interface and support for over 2,300 pre-defined cmdlets that can be scripted for automation.
Web and application platform	Windows Server 2012 contains significant improvements in its delivery of Web and Web-driven application content, with enhanced security and simplified management, and the addition of hosting multiple SSL-secured servers on the same IP address.
VDI	With RemoteFX, Windows Server 2012 greatly improves the end-user experience. Your IT staff can also take advantage of added support for direct-attached storage and both USB and multi-touch devices.

Dell powers your infrastructure for the future

Dell PowerEdge 12G servers, powered by the Intel® Xeon® processor E5 family, can deliver up to 61 percent more performance over previous generation Dell servers.[1] Deploying Dell PowerEdge 12G servers with Windows Server 2012 can dramatically improve performance for all of your organization's business applications, while reducing your IT infrastructure footprint and power requirements through consolidation. With the increased performance capacity in Dell PowerEdge 12G servers, your organization can now increase the number of virtual machines per servers, which increases hardware utilization and improves your ROI.

[1] http://content.dell.com/us/en/business/d/campaigns/poweredge-12th-generation-servers.aspx?c=us&l=en&s=bsd&dgc=IR&lid=B1536704&cid

Dell PowerEdge 12G servers include Integrated Dell Remote Access Controller (iDRAC) 7 for agentless management of your servers, even if the operating system is not available. Your IT staff gain direct access to hardware, inventory, configuration status and server alerts. iDRAC7 also enables your IT staff to automate many tasks, increasing your organization's IT efficiency.

For more on Dell PowerEdge 12 servers, see http://content.dell.com/us/en/business/d/campaigns/poweredge-12th-generation-servers.aspx?c=us&l=en&s=bsd&dgc=IR&lid=B1536704&cid.

Conclusion

The time to upgrade is now. Dell PowerEdge 12G servers and Windows Server 2012 offer your organization an opportunity to consolidate servers and take advantage of the latest in hardware and software technology. Making the move now enables your organization to fully control the migration process and improve your ROI and payback time. Windows Server 2012 offers benefits to organizations running either Windows Server 2003 or Windows Server 2008, and Dell 12G servers provide significant performance gains over legacy servers.

Windows Server 2012 represents a significant generational leap in technology and features from Windows Server 2008, and is also an even more compelling upgrade for organizations still running Windows Server 2003. Your organization can benefit from moving to Windows Server 2012 on Dell PowerEdge 12G servers regardless of the number of employees or customers you have. Both Dell and Microsoft provide a wealth of resources to facilitate your organization's planning processor prior to the migration and the migration process itself (see Appendix B).

Appendix A: Windows Server 2012 features (detailed)

Next-generation application platform

Windows Server 2012 provides the reliable, powerful foundation your organization needs to deploy industry-leading software solutions, including SQL Server 2012, Exchange Server 2013, SharePoint Server 2013, and Lync Server 2013. From a bare-metal install on a PowerEdge T420 tower server to a virtualized deployment on a PowerEdge R720 rack server to a full Dell M1000e Blade Enclosure with multiple virtualized Dell PowerEdge M820 blade servers, Windows Server 2012 can power your infrastructure regardless of its size.

Hyper-V

Windows Server 2012 Hyper-V features significant new features and enhancements for both local and remote environments, and also serves as the foundation for a robust cloud solution. Table 2 below shows how the next-generation Hyper-V compares to current deployments based on Windows Server 2003, Windows Server 2008, and Windows Server 2008 R.

Table 2. Evolution of Hyper-V across Windows Server versions

Windows Server version	Description
Windows Server 2003	No hypervisor-based virtualization support
Windows Server 2008	First generation Hyper-V, limited migration of virtual machines between hosts; limited graphical fidelity and user experience with no hardware acceleration available.
Windows Server 2008 R2	Support for up to up to 4 vCPUs and 64GB memory per virtual machine and up to 2TB virtual disks; introduced live migration of virtual machines between physical hosts in a clustered environment.
Windows Server 2012	Now supports up to 64 vCPUs and 1TB memory per virtual machine, and up to 64TB virtual disks (with new VHDX virtual disk format); live migration; networking enhancements including virtualization, NIC teaming, and true enterprise-level Layer 2; greatly enhanced graphical capabilities for clients using the server's SLAT-capable processor and GPU.

Identity and access control

Windows Server 2012 also includes a number of enhancements to Active Directory® deployment and management that benefit organizations of all sizes. Most Active Directory tasks are now accessible via PowerShell, greatly increasing the options your IT staff has for scripted management tasks. Through improved virtualization support, Windows Server 2012 enables a much more simplified cloning process for systems already joined to a domain. Now with Windows Server 2012, your IT staff can clone out a virtual machine even if that virtual machine was already joined to a domain.

Windows Server 2012 also features improved cloud deployment and remote connectivity, which greatly increases your organization's efficiency and allows you to put resources toward other tasks. Building upon Windows Server 2008 and Active Directory Domain Services (ADDS), which integrates directory data with communication between users and domains, Windows Server 2012 adds support for deploying one identity and management framework across multiple sites. Remote office deployments also benefit from enhancements to DirectAccess in Windows Server 2012. For organizations using IPv4 or IPv6,

Windows Server 2012 simplifies the DirectAccess deployment process and its infrastructure requirements.

New to Windows Server 2012, Dynamic Access Control (DAC) enables centralized access control, data classification and protection for file servers. DAC integrates with Active Directory Rights Management Services (AD RMS) and enables the classification of file servers based on given parameters for auditing and access control.

For more information on identity and access control changes in Windows Server 2012, see http://download.microsoft.com/download/2/3/F/23FFD7B6-D58C-4270-A5D3-E34AEBEDCF77/WS%202012%20White%20Paper_Identity%20and%20Access.pdf.

Network and storage systems

At the core of Windows Server 2012 are a number of new components and technologies that give your organization greater flexibility when building or upgrading your infrastructure.

Network enhancements

Windows Server 2008 introduced a next-generation TCP/IP stack, with significant under-the-hood changes to the networking layer of the operating system for performance and reliability, including improvements to Network Load Balancing (NLB) and support for iPv6. Table 3 below shows the extensive enhancements to network functionality in Windows Server 2012.

Table 3. Evolution of networking across Windows Server versions

Network enhancements	Description
Network virtualization	Network virtualization in Windows Server 2012 enables true isolation of network traffic without relying on VLANs.
Hyper-V Extensible Switch	The new soft switch built into Hyper-V permits Layer 2 level security, and includes third-party plugin support.
IP Address Management (IPAM)	IPAM in Windows Server 2012 allows your IT staff to discover, monitor, manage, and audit your organization's IP address space and associated servers.
NIC Teaming	NIC Teaming in Windows Server 2012 enables your IT staff to aggregate physical links together for better network performance and fault tolerance.

For more information on the network enhancements in Windows Server 2012, see http://download.microsoft.com/download/7/E/6/7E63DE77-EBA9-4F2E-81D3-9FC328CD93C4/WS%202012%20White%20Paper_Networking.pdf.

Storage enhancements

Windows Server 2008 introduced live disk resizing, enabling your IT staff to resize volumes without taking the disk offline. NTFS-formatted volumes could also silently repair themselves through a background process, again without taking the disk online. As Table 4 shows, Windows Server 2012 adds increased functionality.

Table 4. Evolution of storage across Windows Server versions

Storage enhancements	Description
Data deduplication	Data deduplication in Windows Server 2012 intelligently analyzes data and reduces your organization's disk utilization from 2:1 to 20:1.
iSCSI target server	Provides block-level storage to other servers on your network using iSCSI.
Support for drives with capacities greater than 4 TB	With support for native 4K sector drives, Windows Server 2012 brings new support for greater drive capacities.

For more information on the storage systems of Windows Server 2012, see http://download.microsoft.com/download/A/B/E/ABE02B78-BEC7-42B0-8504-C880A1144EE1/WS%202012%20White%20Paper_Storage.pdf.

Management and automation

Windows Server 2012 increases your IT staff's efficiency with new management and automation features. The improved Server Manager in Windows Server 2012 enables group management of servers from a single console. Your IT staff can provision servers and offline virtual disks without requiring physical or Remote Desktop access, and can also remotely deploy roles and features to multiple servers, regardless if those servers are physical, virtual, local, or remote.

PowerShell 3.0 in Windows Server 2012 now features over 3,200 cmdlets, including support for common Active Directory and storage tasks. Your IT Staff can use PowerShell to manage server roles and executive scripts, while monitoring those scripts with session connectivity.

For more information on Windows Server 2012 management and automation features, see http://download.microsoft.com/download/D/4/3/D43132A6-DE21-4B10-8D2E-B49A7CFEEA89/WS%202012%20White%20Paper_Server%20Management%20and%20Automation.pdf.

Web and application platform

Windows Server 2012 also contains a number of new features and enhancements for how your organization delivers Web and Web-driven application content. Table 5 shows the evolution of Internet Information Service (IIS) from Windows Server 2003 to Windows Server 2012.

Table 5. Evolution of Web and application support across Windows Server versions

Windows Server version	Description
Windows Server 2003	IIS 6.0; added support for IPv6, security and reliability enhancements.
Windows Server 2008	IIS 7.0; significant overhaul of IIS codebase with significantly improved security and performance; centralized management for Web sites and applications across farms; forms-based authentication; support for HTTP-based load balancing; dynamic caching and compression; integration with ASP.NET and PHP support.
Windows Server 2008 R2	IIS 7.5; improvements to FTP and WebDAV modules; improvements to ASP.NET and PHP-based application hosting; configuration via Windows PowerShell; security enhancements.
Windows Server 2012	IIS 8.0; CPU throttling for multi-tenant sandbox environments to prevent a single tenant from monopolizing server resources; dynamic IP address restrictions based on administrator-defined parameters; centralized SSL certificate support; Server Name Indication (SNI) enables assigning a virtual domain as part of SSL negotiation, reducing the number of fixed IP addresses required to host multiple secure sites; improved Web application performance; improved FTP security; NUMA hardware support.

Virtual desktop infrastructure

With RemoteFX, Windows Server 2012 brings next-generation Virtual desktop infrastructure (VDI) to your organization with the ability to deliver a rich media experience to end users anywhere on any connection. RemoteFX includes improvements to the network protocols and server-side graphics capabilities used by Hyper-V. Windows Server 2012 gives your IT staff one point of control to configure, deploy, and manage multiple virtual desktops and sessions.

Support for direct-attached storage can lower storage costs for VDI deployments, and added client support for USB and multi-touch devices improves user experience. For more on VDI in Windows Server 2012, see http://download.microsoft.com/download/F/E/D/FED8C1A8-B146-4434-BE2E-A82CA9F26079/WS%202012%20White%20Paper_VDI.pdf.

Appendix B: Technical resources for your upgrade

Both Dell and Microsoft provide a wealth of resources to help your organization as you plan and make the move to Dell PowerEdge 12G servers and Windows Server 2012.

Table 6. Technical resources

Resource	Link
Microsoft Assessment and Planning (MAP) toolkit	http://technet.microsoft.com/en-us/solutionaccelerators/dd537566.aspx
Evaluation versions and upgrade options for Windows Server 2012	http://technet.microsoft.com/en-us/library/jj574204
Windows Server 2012 Overview	http://www.microsoft.com/en-us/server-cloud/windows-server/overview.aspx
Install and deploy Windows Server 2012	http://technet.microsoft.com/en-us/library/hh831620
Windows Server 2012 Support	http://support.microsoft.com/ph/1163#tab3
Dell PowerEdge 12th Generation Servers Enable Customers to Maximize Benefits of Microsoft Windows Server 2012	http://www.dell.com/us/corp/p/d/secure/2012-09-04-dell-poweredge-windows-server-2012
Maximizing Microsoft Windows Server 2012 with Dell PowerEdge 12th Generation Servers	http://www.migrationexpertzone.com/c/a/Windows-Server-Migration/Maximizing-Windows-Server-2012-with-Dell-12G-PowerEdge/