
Keeping both feet on the upgrade path

If you’re running an older version of Windows Server in your organization, you are far from alone. According to Microsoft, more than half of the 20 million-plus systems running a Windows Server OS still run the decade-old Windows Server 2003. Most of those implementations are on long-obsolete hardware with limited or no availability of key spare parts. Perhaps more importantly, these aging servers can’t provide the substantial computing, capacity and efficiency advances we’ve seen in the past decade. This upgrade for both Windows Server and the underlying hardware on which it runs, delivers features, benefits and return on investment levels that were unimaginable back in 2003.

This document will offer some of the reasons to consider migrating to Windows Server 2012 R2 as well as best practices for a successful migration.

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Have the goal in sight

It is essential to establish a clear set of benefits and improvement goals that define the need for migration before you start. Even though any one of the benefits can far outweigh the migration cost, you should have your benefit plan in first before you begin. Most frequently cited benefits of migration include:

- **Reduced operational costs** from reduced power usage, improved density and simpler system management
- **Reduction in the number of servers needed** for a set of workloads because more workloads can be supported on a newer server
- ** Increased utilization** of newer hardware and software through virtualization
- **Improved employee productivity** through support for new devices and enhanced mobility
- **Increased business agility and scalability** to support business growth cycles
- **Ability to implement new and cost-effective backup, recovery and business continuity solutions**

You are probably clear on why you are migrating, but make sure the rest of your organization is as well.

Determine your migration path

A number of resources are available to help plan your migration. Here are several from Microsoft that you should refer to up front.

- **Windows Server 2012 Compatibility Cookbook**—Information about new OS features and guidelines regarding application compatibility
- **Microsoft Platform Ready Test Tool**—Helps to test applications for compatibility with the latest Microsoft platforms
- **Windows Server App Certification Test**—Helps test compatibility and security issues, evaluate and test line of business and third party applications
- **Microsoft Assessment and Planning Toolkit**—A readiness assessment tool discussed in detail just below.

You can’t manage what you don’t see

Before starting the migration, take a system and application inventory and assess the existing IT infrastructure to understand exactly what’s on your network. A good first step is to download and run the Microsoft Assessment and Planning (MAP) Toolkit, which provides detailed readiness assessment reports and actionable proposals you can share with your executive team. MAP gathers information on assets that reside within the current
environment including server utilization data, virtualization resources, and offers assessment of hardware readiness for Windows Server 2012. The MAP tool will also offer valuable guidance for virtualizing existing Linux servers as part of your Windows Server 2012 and Hyper-V migration strategy.

No, we can't use the old server hardware

In 2003, RAM cost about $180 per GB. Today's fast DDR3-1600 RAM costs less than $4 per GB. Those 2003 systems weren't designed to handle the amount of memory required for effective workload consolidation and virtualization simply because the memory to do so wasn’t affordable for most server users. Thanks to Moore’s Law and economies of scale, today’s advanced server platforms have many processor cores and gigabytes of memory to support of a broad new range of server-based applications. Decade-old disk drives, network boards, system boards and CPUs will not suffice for today’s advanced computing needs, which include handling the continuing explosion of data, the need to provide new business applications within the existing data center’s capacities for power, cooling and space, the march to mobility and Big Data analytics. Today’s tower and rack-mount servers, especially Lenovo ThinkServer® systems with verified high performance and power efficiency, offer a quicker ROI than their predecessors thanks to their ability to handle more workload per IT dollar efficiently and effectively.

Get the right tool for the migration job

Migrating to new platforms involves lots of moving parts, including Active Directory, IP network servers, policies, validated application stacks, and oh, so many files of every type. Given the preponderance of both hidden and system directories and files, how can you ensure you’re migrating everything you need? Start with the Microsoft migration tools that help you move roles and features from your previous Windows Server 2003 or 2008 deployment to your new Windows Server 2012 system. Make sure you’re not trying to migrate from a server that has multiple roles—in that case you’ll need to manually handle the transition. Otherwise, you can use the migration tools to bring over much of your workloads and OS parameters including:

- Active Directory Federation Services
- Hyper-V installation
- IP Configuration
- Network Policy Server
- Print and Document Services
- Remote Access
- Update Services
Virtualizing your environment is a key first step in enhancing the reliability of your servers.

Not all migrations will require these tools, but when you need them you’ll be glad they’re available.

**Virtualize, virtualize, virtualize**

IT professionals who have already migrated to Windows Server 2012 agree virtualization is the most important new best practice to adopt. If you have a number of active Windows Server 2003 or 2008 systems today that aren’t virtualized, you’ve probably got candidates waiting to gain the benefits that virtualization offers. If you haven’t yet downloaded Hyper-V, do so now, and become familiar with it. It’s not uncommon to find you can combine a handful to even dozens of servers onto one physical server, given the average server utilization runs at an average of just 7% to 15%.

Perhaps most importantly, virtualizing your environment is a key first step in enhancing the reliability of your servers, offering the ability to move virtual server instances between physical servers with relative ease and little, if any, downtime. Don’t think your virtualization has to be limited to Windows Server—your Linux workloads can be hosted as virtual machines under Hyper-V in a mix-and-match Linux and Windows Server world.

In today’s world of cost-conscious computing, there’s a real focus on reducing operational costs. Power and cooling costs continue to climb, so anything that reduces a server’s eco-footprint will pay back month after month in reduced energy and data center infrastructure costs. State-of-the-art server hardware, as in found in Lenovo ThinkServer systems, is virtualization-aware, allowing it to draw more or less power based on the workload it’s handling at any given time. Choosing hardware with these power-saving features enables you to achieve operating savings above and beyond those gained by consolidating physical servers through virtualization.

**Embrace mobility**

With an increasingly mobile workforce utilizing an ever-growing array of devices for personal productivity, it’s no surprise users are demanding access to corporate data, applications and websites from outside the firewall. Rather than managing the complexities of a virtual private network (VPN), with Windows Server 2012 you can offer remote users secure, simple access to intranets, file shares, websites and applications with DirectAccess, a feature not available on Windows Server 2003. DirectAccess delivers secure, always-on connectivity that allows IT to manage remote computers outside the office, even when those computers are not connected to the VPN.

Part of any mobility strategy should be to increase productivity, which often means allowing access to centralized resources not just from
laptops but also smartphones, tablets and thin clients. Windows Server 2012 enables access to a centralized virtual desktop from all of those device types, enhancing users’ productivity while they’re on the go.

A growing number of clients will be best served by this sort of virtual desktop infrastructure (VDI) environment. Simplified VDI configuration and management tools in Windows Server 2012 bring IT back to the future, enabling remote access to centralized desktop images from a variety of PC, thin client or mobile devices in the same way that so-called “dumb terminals” were used decades ago to access mainframes. Gone are the character-based green screens, replaced with powerful graphical interfaces that blur the line between server and client. Users get improved performance while all sensitive data stays in the data center.

**Virtualize storage and save**

Modern virtualization began with storage, as organizations tried to enable a number of servers—whether Windows, UNIX or mainframe—to share expensive Fibre Channel-attached storage area networks (SANs). When the virtualization focus shifted to servers, heralding the beginning of cloud computing, storage virtualization took a back seat. Now, it’s come back into the limelight, and in the case of Windows Server 2012 that means Storage Spaces. Storage Spaces allow easy pooling of different storage devices and offers resiliency from device failures through either mirroring or striping with parity across the physical disks. You can add new disks or replace failed disks with no downtime to any of the guest operating systems or applications that reside on your servers. To ensure you get the most out of your storage pool, make sure to utilize the built-in de-duplication feature, which coupled with thin provisioning, maximizes the use you get from every bit and byte in the storage pool.

**Activate your disaster recovery plan**

In today’s 24x7 world, even the smallest of businesses can’t afford downtime. But Windows Server 2012 includes a trio of integrated tools that can help prevent downtime even in the event of a disaster. Hyper-V Replica allows you to inexpensively implement disaster recovery and improve availability by providing asynchronous replication of key virtual machines to another physical server. This provides a continually backed-up system with no additional software required. Additionally, Storage Live Migration enables you to move active, running virtual machines from one physical server to another without impacting application or server availability. Finally, NIC Teaming, a key I/O feature of Lenovo ThinkServers, enables multiple network interface cards (NICs) to be configured as a single interface from the server’s perspective. Should a NIC fail, its traffic automatically moves to the remaining operational NICs in the team. NIC Teaming also increases throughput by enabling bandwidth aggregation, where multiple NICs can be configured to function as a single, larger pipe. Together, these capabilities provide a simple yet comprehensive business continuity and disaster recovery solution.
Fine-tune the WAN

It’s hard to share, and it’s especially hard to share large amounts of data over a broadband WAN connection. If you have branch offices or multiple sites, you probably have to ship business-critical information from one site to another. Windows Server 2012’s BranchCache option accelerates data transfers between sites by caching frequently accessed data at the remote site. It may just obviate the need for you to invest in a WAN optimization appliance.

Think Cloud

Chances are most of your code runs on your own servers, but perhaps you’ve experimented with the Windows Azure cloud environment. Business and seasonality demands may create a need for a hybrid approach to computing where some applications are hosted on premise and others in the cloud. Developing with tools such as Visual Studio and the .NET Framework will allow you the option of deploying your workloads either in Windows Azure or on-premise, thanks to common APIs across Web, application and datacenter tiers for locally deployed applications, as well as for private and public cloud solutions.

Become part of a community

Fortunately you’re not making this migration on your own. Many online communities exist where you can share your experiences and learn from others, such as LinkedIn. Additionally, Microsoft’s TechNet has a vast amount of practical step-by-step information on the procedures and processes that will ease you along the migration path. As you jump in and become part of the Windows Server 2012 community, don’t overlook the experience and help offered by your hardware partners who have invested heavily in your successful Windows Server 2012 deployment.

Choose servers that fit into your migration plans

Lenovo ThinkServer tower and rack servers have several distinctive attributes that make them ideal for your server migration project.

- **Legendary Think quality:** Lenovo is known the world over for the ruggedness and reliability of their ThinkPad laptops. This same dedication to quality is engineered into every ThinkServer system. With virtualization and consolidation putting more mission critical workloads on a single server, such quality and reliability is more important than ever.

- **Performance:** To fully realize the ROI possible from server migration, servers need to deliver unmatched performance and capacity as never before. ThinkServer systems have consistently scored at the top of performance ratings as validated by third party organizations.
• **True openness:** A simpler migration effort maximizes success. Having a straightforward system management approach is vital, whether that means using your OS vendor’s management tools, choosing among the available excellent 3rd party choices, or using the system vendor’s tools. Lenovo ThinkServers have fully industry-standard system management interfaces that support all these choices without requiring any proprietary server management tools.

• **Unmatched value:** Lenovo ThinkServer systems provide more performance, features and options that others charge extra for. What better way to improve ROI than to make the investment more affordable?

Visit our website to learn more about Lenovo ThinkServers.

**Sources**