Windows 7: Tips and Best Practices for Simplified Migration
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Abstract

Migration to Windows 7 is a future reality for most. With XP approaching its end of life, and many organizations choosing to skip Vista as an interim step, the new Windows 7 release holds the promise of new features and benefits that include added security, improved manageability and enhanced ease of use. Regardless of the starting point, a migration to Windows 7 is a path that holds as many questions and challenges as it does potential rewards. Advance planning can ensure a smooth transition in 2011.
1.0 Windows 7 Deployment and Operating Improvements

A Lagging Vista Adoption Rate
“The adoption rate of Vista has been markedly less than that of Windows 2000 and XP. By 2009, Vista’s adoption rate was 6%. At the same point of the product lifecycle (18-24 months after release), Windows 2000 had an adoption rate of 12%, while Windows XP had an adoption rate of 14%.”
—Gartner Research, 2009

When it comes to Windows desktops, many organizations are still relying on Windows XP. That’s because the XP release of Windows has proven stable and reliable, which is one reason many organizations decided to skip the migration to Windows Vista. In addition, organizations running XP know that their applications will continue to run, something they can’t guarantee on Vista, or at least, can’t guarantee until they’ve updated and tested the applications—a process that takes considerable time. Vista also didn’t seem to deliver on Microsoft’s promises. While it was a new operating system (OS) built on new core code, it broke too many applications to make it a worthwhile investment for most organizations. Today a very small number of corporate computers run Vista and only because they require specific drivers or the applications running on them have proven stable and offer more functionality. However, with the release of Windows 7 and the upcoming end of life for XP, many will need to migrate to the newest version of Windows.

Microsoft has added a considerable number of new features to Windows 7 making this version the richest version of Windows ever. Many of these features are focused on the user—as they should be—but several are specifically related to the operation and deployment of this operating system. Some of the key features of Windows 7 in this regard include:

- **Windows XP Mode**: This downloadable add-on to Windows 7 is really nothing more than a virtual machine (VM) that runs under Microsoft Virtual PC. The add-on is available for the Professional, Ultimate and Enterprise editions of Windows 7. If you have applications that must run on Windows XP to work, you can install them into the Windows XP virtual machine and then publish them to the Windows 7 desktop. The process is completely transparent to end users. The virtual machine runs in the background and the applications appear as if they are running on Windows 7 while actually running on the XP virtual machine. Note that the target computer must include a processor supporting hardware assisted virtualization such as AMD-V or Intel VT and this feature must be enabled in the system’s BIOS for XP Mode to work.

- **Windows 7 Imaging**: Microsoft has improved the imaging process in Windows 7. It is now possible to image a computer to install a new operating system without damaging existing user data. This means that you could

More Info
To verify if your computer includes hardware assisted virtualization, download this utility from AMD or this one from Intel and run it on your PC.

To learn more on Windows 7 features for deployment and operations, go to the Windows 7 IT Pro Web site.
use an external device such as a USB key to install a new operating system over an existing one without losing the data that resides on the target computer. While this is not an in-place upgrade, it does provide some level of protection for existing data. Note however that this feature is most useful when you do not have the ability to store user data elsewhere during the replacement of the OS. As such, it is not really targeted to corporate users.

- **Windows 7 and VHDs**: Microsoft has integrated the virtual hard disk (VHD) format to Windows 7's disk subsystem. This means that you can mount and operate virtual hard disks directly from within the Windows 7 disk management interface. In addition, you can boot to a VHD, letting you install the operating system within a VHD instead of directly on the disk. This makes the OS much more transportable since you only have to copy the VHD to protect the system’s contents. Virtualization is in your future since it is now built right into the OS. Since VHDs allow the use of a single image across both physical and virtual machines, organizations considering virtual desktop infrastructures, or better yet, a mix of physical and virtual desktops, would do well to give this feature a very close look.

There are several more features that will help and assist IT administrators and technicians when they work with Windows 7—the Problem Steps Recorder will let you record the steps end users go through when they encounter a problem, DirectAccess will let remote users connect to your Intranet without requiring a virtual private network connection, BitLocker now works for remote drives, and much more—but the three features mentioned above: XP Mode, Imaging and VHD support will have an immediate positive impact on how you manage your move to Windows 7.

## 2.0 Potential Deployment Pitfalls

While Microsoft has endeavored to make the migration from Windows XP or Windows Vista to Windows 7 as painless as possible, there are still potential pitfalls you must beware of when you decide to move forward with the change.

Migrations focus on three key factors:

- User profiles or the data, application configurations and settings that make up a user’s desktop environment.
- Applications or the core purpose of using a PC: running tools that support your organization’s business operations.
- User skills or the ability of your users to work with and operate a desktop to fulfill their daily tasks.

All of the considerations in your deployment should be built around these three factors since they are the only factors that will actually be migrated. You don’t migrate the operating system, you deploy a new OS. You must however protect user data and you must make sure user applications will operate properly once they are located on the new OS. Finally, you must ensure your user’s skill sets are upgraded to the new OS to continue with the productivity levels you’ve come to expect. Fortunately, many users are already familiar with the Vista interface since they have home computers running this OS and after all, Windows 7 is still Windows, so the change won’t be that overwhelming.

But, even if you only need to focus on three core factors, you should still endeavor to avoid any potential pitfalls. Specifically, you should consider the following:
• Will you be performing an upgrade of the OS?
• How will you protect user data?
• Will you convert your applications or run them in XP Mode?
• Will you be deploying the OS to a physical or a virtual disk?
• How will you run your applications in Windows 7?

The answer to these questions will help you determine just how you will address the migration and where you will invest your deployment efforts.

**More Info**

See the [Windows 7 Upgrade Paths](#) document on the Microsoft Web site for more information.

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### 2.1 Upgrades versus Clean Installs

First, you must be aware of the potential upgrade paths to Windows 7. You cannot perform an in-place upgrade from a legacy version of Windows to the new version. You cannot upgrade from a server OS to the new desktop OS. You cannot upgrade from a different core language and you cannot upgrade from a 32-bit version to a 64-bit version. In fact, the only supported upgrade is from Windows Vista with either service pack 1 or service pack 2 to a corresponding version of Windows 7.

Most organizations won’t perform an upgrade anyway since there is too much negative stigma associated with the concept. In addition, by the time you upgrade, you’ll be past the first decade of the 21st Century. Isn’t it time to move to 64-bit computing across the board? If you deploy a 64-bit version of Windows 7, this means you’ll be doing clean installs only. Remember that a clean install also means a reinstallation of all of the applications. In the long run, clean installs always offer the best results during a migration.

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### 2.2 User Data Protection

Since you cannot upgrade from Windows XP to Windows 7, you must take precautions to provide protection for end user data. While the new Windows 7 imaging mode supports the protection of existing data on the target drive, it is always best to be proactive and capture end user data first, then restore the data should there be a problem affecting user data during the imaging process. In addition, the imaging mode will not integrate the user data with the new OS. In fact, the only way to ensure that user data is properly integrated with the OS is to rely on a tool such as Microsoft’s [User State Migration Tool](#) (USMT) which will properly convert data structures from XP or Vista to Windows 7.

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### 2.3 Relying on XP Mode

If you decide to use XP Mode in Windows 7, you will need to build, and then deploy a Windows XP virtual machine onto target computers. You will also need to install applications that are
incompatible with Windows 7 into the XP VM. This means that you will need to update and maintain two operating systems on each target computer: the physical one on the PC and the virtual XP Mode OS. In addition, you will need to manage applications within two environments on each computer running XP Mode. While XP Mode provides unparalleled application compatibility within Windows 7, it will definitely add to your administrative overhead.

2.4 Physical or Virtual OS Targets
Because Windows 7 supports booting from a VHD, you might consider deploying the operating system directly within a VHD on your reference computer, then capturing this VHD as the original image for deployment. This means that you can create a VHD image and simply copy it to all of your PCs. To back up a PC, simply copy its VHD somewhere. To replace a PC, just move the VHD from one to another. This avoids profile migrations—once you’re on Windows 7—and can really simplify long-term machine management. However, since the VHD support in Windows 7 is a new feature, you might prefer to work with a traditional installation on the reference computer and use traditional imaging tools to perform your deployment. This is a decision you will need to make during your preparation for the deployment.

2.5 Installing or Virtualizing Applications
While Microsoft has done a lot of work to add application compatibility support within Windows 7, you will still need to test and possibly convert some of your applications before moving them to the new OS. This means revisiting each and every one of your applications, unless you decide to run the application in XP Mode; note that you won’t run all of your applications in this mode because it is not a long-term solution. If you need to revisit each application, then consider moving to application virtualization instead of relying on the traditional application installation process.

Application virtualization creates a protection layer around the OS. This means that the OS is not modified by an application installation. Instead, application virtualization captures the running state of an application. Virtual applications can then be copied or streamed to the target desktop instead of installed. In addition, virtualizing an application will avoid having to perform regression testing or creating custom scripts for installation customizations, two activities which form a large part of the application deployment process.
Virtual applications also support the injection of better management capabilities into the application administration process. For example, you gain immediate application metering capabilities when you deploy a virtual application. Knowing who actually uses an application and how they use it in real time lets you know exactly who needs the application.

Finally, virtual applications are sandboxed and isolated from the operating system. This means that you can run multiple versions of the same application on the same machine at the same time when you need to. This provides an unparalleled ability to provide your users with exactly what they need when they need it.

In many ways, virtual applications are much easier to manage in the long run than virtual desktops such as the one in XP Mode.

3.0 Preparing for Windows 7 Deployment

Moving to a new operating system is a time-consuming task which can be fraught with potential pitfalls. This is why you need to rely on two key measures to make the transition as smooth as possible:

- Rely on industry best practices to ease the transition.
- Rely on the right tools to support your migration.

These two caveats will go a long way in making your transition to Windows 7 as easy and as simple as possible when you decide to make the move.

3.1 Best Practices

When planning for a move to Windows 7, consider the following best practices to help simplify your migration:

1. **Perform proper inventories**: The only way you will be able to migrate successfully is if you know what your starting point is. Your inventories will need to capture the hardware characteristics of your existing PCs, including support for hardware assisted virtualization if you want to use XP Mode; the applications you run on your network and who uses them; and the amount of valid data your users store on their desktops.

   Inventory data must be obtained in real-time so that it is not stale when you need to rely on it to make the decisions that will have a direct impact on the success or failure of your project. It also must be sufficiently detailed to provide the hardware and software information you need to plan migration.

2. **Rationalize content as much as possible**: Rationalization means reduction of the content of your desktop network, getting rid of obsolete and unused applications, removing unused content and unused hardware components. It is really easy to have obsolete and outdated tools, applications and data in your desktop network. All you have to do is forget to remove an application when it is no longer needed, an oversight that can become costly at the time of a migration. Why migrate something that is no longer needed?
Reducing content through rationalization simplifies the migration because you have fewer elements to migrate. This is why this part of the process is so important. What’s better is that the rationalization can be performed at any time, even before you even think of performing the migration.

3. **Categorize your applications**: Once you have your final application inventory, you can proceed to the application preparation process. You will need to categorize applications according to target deployment methods and environments. Your categories should include:

   - Applications for Windows 7 Conversion
   - Applications for XP Mode
   - Applications for Virtualization

   Once your applications are categorized, you can consider your application packaging strategies. Ideally, you will opt for application virtualization mostly because by virtualizing applications, you will greatly reduce your long-term application management efforts.

4. **Select the proper imaging target**: Will you be using traditional imaging strategies or will you take advantage of the new Windows features? Will you be performing upgrades or clean installations? Whichever mode you choose, you should ensure that proper and extensive imaging testing is performed before you proceed with OS distribution. Be aware however, that very few organizations use in-place upgrades and since many of you will be starting from Windows XP, you won’t have a choice since you can’t upgrade from XP to Windows 7. Clean installations will give you the opportunity to get rid of any lingering ‘garbage’ on your desktops and provide you with a pristine OS to work with once the migration is complete.

5. **Reduce long-term support costs**: Each and every strategy you consider during this deployment should target cost reductions in regards to long-term support. For example, if you move to application virtualization, then you should be able to reduce application support costs. When you choose your imaging mode, you should test extensively to make sure every step—and especially the end user data and profile protection mechanism—will work as expected. This is what you can expect when you rely on Microsoft’s USMT to migrate profile information. USMT has been designed to support imaging tools during a migration. However, this might be the right time to consider using a central profile management policy, relying on Windows’ built-in features to centralize all end user data. This will reduce long-term user data protection costs because centralized data can be backed up more easily and is always available no matter which PC the end user connects with.

Following these caveats will greatly simplify your move to Windows 7. But best practices alone won’t make your migration a success. You also need the right tools to make it work.

### 3.2 Get the Right Tools

Migrations simply can’t occur if you don’t have the right systems management tools in place to support them. You need a systems management tool to perform your inventories, to help rationalize content by telling you who uses what in your network, to help categorize applications by creating groupings of users relying on them, to support the imaging process and to help reduce long-term support costs.
Make sure you take the time to verify that your systems management tool will provide support for each of these critical aspects of your migration. This might mean obtaining the right tool and may even mean acquiring a new tool. It’s true that you can obtain and work with several free tools for the deployment—from Microsoft and others—but you may also discover that obtaining the right commercial tool will save you a lot in the end because it streamlines the entire deployment operation and provides ongoing administrative support once the migration is complete.

For example, if you use free tools such as Microsoft’s Deployment Toolkit, you’ll find that you will need to get up to speed to learn and understand how they work. Many rely on the command line only and because of this, may require extensive preparation for you to generate the right command structures to obtain exactly what you want in terms of results. In addition, the Microsoft Deployment Toolkit only supports the deployment operation.

Commercial tools, on the other hand, will not only streamline and simplify the process by providing graphical interfaces for each task, but they will also minimize error due to improper inventory audits, improve end user experience, minimize business interruptions, standardize configuration and improve security.

Automated commercial systems enable IT managers to quickly and easily implement industry best practices when planning a Windows 7 Migration. Not only do commercial tools quickly audit both hardware and software to provide a comprehensive view of an entire organization, they provide critical information as to which systems can support Windows 7 as is and which systems need to be upgraded or replaced entirely.

Policy based migration, offered by commercial tools, not only improve standardization and compliance, but also simplify migration by eliminating unsupported files and software from being transferred all while maintaining individual user data and settings. Automated commercial tools allow IT managers to define system images and installation scripts across hundreds of users and to group Windows 7 deployment by user group improving the speed of migration and minimizing errors.

Well-developed commercial tools will allow an IT manager to migrate to users offline, as well as feature direct software driver feeds that are agentless and work with systems offline. Offline migration should preserve documents and settings, without having the old operating system running. Automated direct driver feeds eliminate manuals steps and decision points that increase deployment time

Automated commercial tools support long-term management and administration of the workstations once your deployment is complete. Because of this, they are worth considering and evaluating. While they are not free, commercial tools are integrated and can often be much more cost effective when you factor in time saved and on-going support and management.

Migrations hold many questions and challenges. Beginning your planning at this time and relying on industry best practices and caveats as well as getting the right tools in place now will help ensure that your transition to Windows 7 will go as smoothly as possible when you’re ready to make the move.
About the Authors
Danielle Ruest and Nelson Ruest are technology futurists focused on datacenter optimization and continuous service availability. They are authors of multiple books, notably "Training Kit 70-652: Configuring Windows Server Virtualization with Hyper-V" published by Microsoft Press and "Virtualization, A Beginner’s Guide" published by McGraw-Hill Osborne.

Dell KACE Corporate Background
Dell (NASDAQ: DELL) creates, enhances and integrates technology and services customers count on to provide them reliable, long term value. Dell provides systems management solutions for customers of all sizes and system complexity. The award-winning Dell KACE family of appliances delivers easy-to-use, comprehensive, and affordable systems management capabilities.

Dell KACE is headquartered in Mountain View, California. To learn more about Dell KACE and its product offerings, please visit http://www.kace.com or call 1-877-MGMT-DONE.

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- KACE Systems Deployment Appliances
- KACE Virtual Appliances

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