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The Definitive Guide™ To

Vista Migration

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Introduction to Realtimepublishers

by Don Jones, Series Editor

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Chapter 1: To Migrate or not to Migrate

Today, we are at the crux of a new age in computing and it makes sense, with Windows Vista™, Microsoft is releasing its first true x64 operating system (OS), and x64 processors abound not only on the server, but also, and especially on the desktop. Even better, x64 processors are multi-core, delivering yet more power than the exponential growth we can expect from a move from 32- to 64-bit computing.

In addition, Vista will be Microsoft's first OS to truly support IPv6—the next version of TCP/IP—expanding networked communications from a 32-bit to 128-bit address space. The timing is just right, at least for governmental agencies, with the US government's Office of Management and Budget having set a deadline of June 2008 "…as the date by which all agencies' infrastructures…must be using IPv6…"

> 🕮 More information on this governmental requirement can be found here.

This new age is not going to be a big bang. This time it is quiet revolution—a revolution that we as individuals will feel whenever we use a computer, something we haven't seen for a long time, if ever: speed. Vista includes a host of new features that help speed it up: SuperFetch™, ReadyBoost™, ReadyDrive™, low priority I/O and much more. In addition, running it on x64 hardware grants Vista access to much more memory than ever before. Vista also provides better TCP/IP throughput and removes traditional system bottlenecks. Are you ready for speed?

So what are you waiting for? Have you started the Vista migration process yet? No? Why not? It's true that before you can take advantage of a new OS on the desktop, you need to feel right about the one you are running now. We're in the year 2006, well into the 21st century and IT professionals still don't have complete control over desktops. System upgrades, software updates, security patches, asset management all seem to be out of control, making IT administrators react to issues and problems rather than predict and master them before they occur. If you find yourself in this situation, perhaps it is the ideal time to consider a Vista migration and at the same time, review and enhance the system management strategies you use in your organization.

Why not wipe the slate clean and do it right this time? A migration, by its very nature, offers the ideal opportunity for massive IT change—all the desktops will be involved, new management and deployment features are introduced and the deployment relies on common IT processes—processes that can be reviewed and updated. Why not take advantage of this opportunity and clean house? The benefits far outweigh the disadvantages: reduced diversity is always easier to manage.

If this is what you want, then read on. You aren't alone. According to Jim Allchin, co-president of Microsoft's platforms and services division, industry analysts predict that some 200 million people will be using Windows Vista in the first 24 months after its release. He may be right. In a recent survey which covered 715 IT officials in North America and Europe ranging from 1,000 to 20,000 employees, Cambridge, Mass. research firm Forrester Research found that 40 percent of respondents were planning to deploy Vista within the first year of its release and 11 percent within the first six months.

> 🕮 For more information on the Forrester report, go to http://www.forrester.com/FirstLook/Vertical/Issue/0,6454,673,00.html.

To assist you with your move to Vista, we've put together a complete toolkit for migration support. This toolkit is drawn from the multitude of migration projects we have worked on—ever since Windows 3.1, in fact—projects that have made our clients successful in desktop management.

Here's what you'll find in this and future chapters:

- Chapter 1 starts with the business case, offering a template business case you can adapt to your needs in support of your own deployment project.
- Chapter 2 will provide you with a structured migration strategy, the QUOTE System, which is a system we have been using for almost a decade to help customers manage change in their networks.
- Chapter 3 will outline how to rely on virtualization technology to create migration testing environments so that you can ensure that your solution is completely functional before you put it into production.
- Chapter 4 discusses the various tools you need to build the migration toolkit. This includes both technical and administrative or non-technical tools. In short, everything you need to make the migration to this new operating system as smooth as possible at every level of the organization—end-user, technical, support—and keep it under budget.
- Chapter 5 looks at the changes you need to make in your existing infrastructure to support the deployment. It also identifies all of the security elements of the migration, focusing on the principle of least privilege but still ensuring that this critical project runs efficiently.
- Chapter 6 covers application compatibility and will introduce the concept of software virtualization—a new technology that could very well prove to be the most significant reason for moving to Windows Vista or performing a migration project of this scale.

- Chapter 7 helps you build the system kernel or the core system image you will be deploying to your PCs. This chapter will focus on the creation of a single worldwide image and cover how this image is to be maintained and updated once it is deployed.
- Chapter 8 introduces the concept of personality captures, focusing on making user documents, data and preferences available to them immediately after the deployment. Personality data also includes software applications or the tools users need to properly perform their everyday work. With software virtualization, software becomes just another component of personality captures. This provides better business continuity during the migration.
- Chapter 9 brings it all together linking the different components of the project—system images, applications, personality data and so on—to perform the delivery of Windows Vista to your desktops and mobile PCs.
- Chapter 10 concludes the guide by walking you through the pilot project, identifying all the elements you need to monitor during this first deployment test, then goes on to the actual deployment, focusing on the routine of repetitive tasks you need to perform. This chapter finishes with the post-mortem you should perform at the end of any project of this scale, identifying which project elements need to be transited into production now that your systems infrastructure has been modified.

Together, these chapters form the Desktop Deployment Lifecycle (DDL)—a cycle that you will repeat each time you need to update your desktop infrastructure (see Figure 1.1).

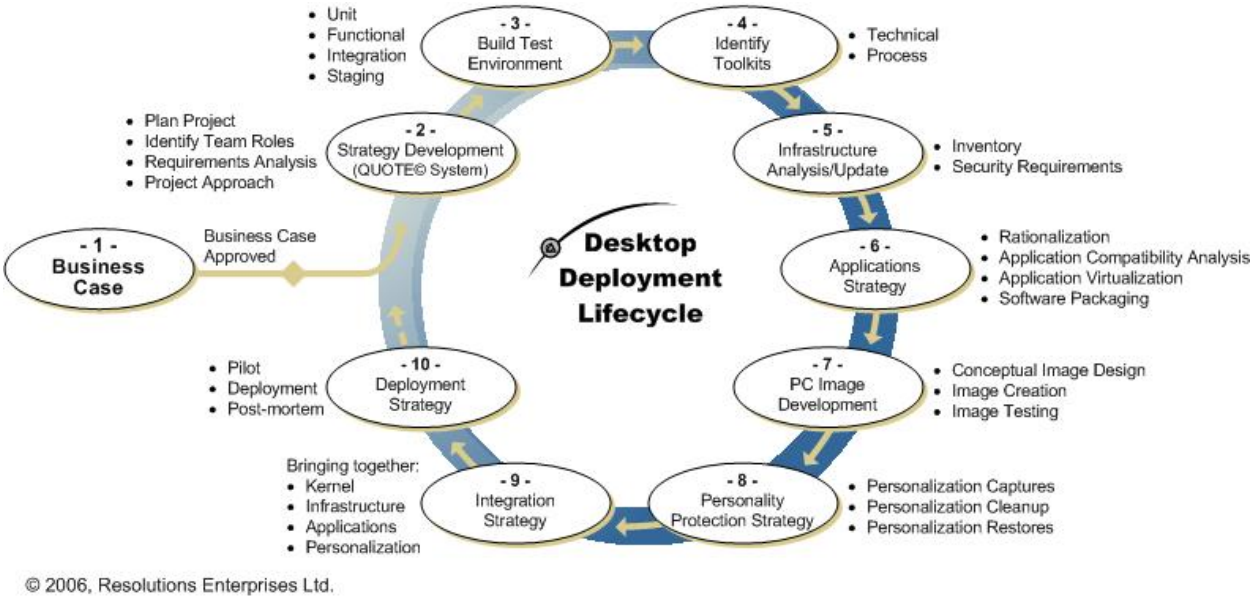

Figure 1.1: The Desktop Deployment Lifecycle.

Our goal is to assist you in getting the ball rolling and to help you avoid pitfalls. After all, with Microsoft releasing new versions of its OS on a regular basis, migrations are just one more IT process you need to master and master well. If you set this project up properly, you should reap automatic benefits, perhaps the most important of which will be the delivery of an infrastructure that provides ongoing management of all systems and provides excellent return on investment (ROI). Now is the time to deploy Vista as it will also help you prepare for the next version of Windows Server Codenamed "Longhorn" which is slated for release late next year.

Send us some feedback. If there is something you need and can't find it in this book, write us at vistaguide@reso-net.com.

And as coauthors of the supporting documentation for the Microsoft Solution Accelerator for Business Desktop Deployment 2007, we will also be drawing on this guidance to provide complete, concise documentation on what you need to do to make this project the most successful deployment project you have ever performed. This guide complements the BDD guidance with non-Microsoft processes and practices for deployments, and helps you put it into perspective.

The Microsoft Solution Accelerator for Business Desktop Deployment 2007 can be found at http://www.microsoft.com/technet/desktopdeployment/bdd/2007/default.mspx.

What is Windows Vista and why should I migrate?

The question is not if you will migrate, it is rather *when* you will migrate. In an informal poll, Windows Server News asked over 1,000 readers when they would migrate to Vista. About 15% said they would migrate within the first six months of its release. More than 18% would migrate after the first six months. Another 33.8% said they would use system attrition to perform the migration, for example, upgrading failing systems as they are replaced. The rest said they would wait for the first service pack to be released. This means that the timing of this book, with one chapter released every month over the next ten months is directly in line with the migration plans of over 40% of the organizations deciding to migrate (Source: WServerNews Volume 11, #41 – October 9, 2006 – Issue #597 from http://www.wservernews.com). The timing is just right.

The timing is also right for Windows Vista. As Microsoft's flagship operating system and the first to be delivered under Microsoft's new Trusted Computing Platform (TCP) initiative, Vista may be Microsoft's most secure OS to date. Under TCP, each of the developers working on the Vista code received extensive security training. Microsoft claims this will be its most secure OS ever. It may be true, only time will tell, but with features such as integrated anti-spyware, integrated system protection features, user account control, code execution prevention, network access protection, integrated firewall, Windows service hardening and BitLocker full drive encryption all integrated right into the OS, it seems Vista is on the right track. In addition, Vista sports a brand new version of Internet Explorer, IE 7, that Microsoft claims will herald a new era in safe Web surfing. And with some 5 million potential beta testers, you'd think that Microsoft will have learned its lesson and made sure the code is stable and solid without the need for a service pack. Once again, only time will tell, but if they maintain the record they set with Windows Server 2003 (WS03)—providing a stable platform that did not require a service pack before deployment—then we'll know they are on the right track.

Microsoft also claims that this will be the last 32-bit operating system it develops, heralding a new era in 64-bit computing. As such, Vista for x64 systems will no longer support 16-bit applications, but you can always use virtual machine technology to run legacy operating systems to provide backward compatibility for these applications.

> ☞ More information on manufacturer about CPU and graphic processor capabilities can be found: http://www.microsoft.com/technet/windowsvista/evaluate/hardware/entpguid.mspx.

From the point of view of simple productivity, Vista will sport some impressive speed enhancements, display graphics in 3-D and provide a transparent glass-like interface that is simply a delight to work with—if you have the right hardware of course. Even if you're not considering Vista yet, the very least you should do is consider Vista hardware requirements in all PC purchases moving forward from today, ensuring that the systems you buy today will run Vista tomorrow.

Base hardware requirements for Vista are not too unusual considering the type of hardware available right now. They are outlined in Table 1. Two sets of requirements are defined: Vista Capable and Vista Premium PCs. The first allows you to run the base level Vista editions and the second lets you take advantage of all of Vista's features.

If you want to plan for the future, you should really opt for a Vista Premium PC. You'll be buying new PCs anyway through attrition programs, why not buy the right systems?

Vista Mode	Component	Requirement
Vista Capable PC	Processor	At least 800 MHz
	Minimum Memory	512 MB
	Graphics Processor	Must be DirectX 9 capable
Vista Premium PC	Processor	32-bit: 1 GHz x86 64-bit: 1 GHz x64
	Memory	1 GB
	Graphics Processor	Support for DirectX 9 with a WDDM driver, 128 MB of graphics memory*, Pixel Shader 2.0 and 32 bits per pixel
	Drives	DVD-ROM drive
	Accessories	Audio Output
	Connectivity	Internet access

* If the graphics processing unit (GPU) shares system memory, then no additional memory is required. If it uses dedicated memory, at least 128 MB is required.

Table 1.1 Vista system requirements.

> 🕮 More information on manufacturer about CPU and graphic processor capabilities can be found: http://www.microsoft.com/technet/windowsvista/evaluate/hardware/entpguid.mspx.

Vista is both for home and business use. Microsoft has made this very clear in the various editions to be published for this new OS. For home, Vista includes the Home Basic, Home Premium, and the Ultimate editions. For business, the Business, Enterprise, and once again, Ultimate editions are available. Each of these business editions requires a Vista Premium PC to run and includes:

- **Vista Business Edition**: This is the base edition for small to medium business. It includes the new Aero 3D interface, tablet support, collaboration tools, advanced full disk backup, networking and remote desktop features as well as all of the base features of the OS.
- **Vista Enterprise Edition**: This edition is only available to organizations that have either software assurance or enterprise agreements with Microsoft. It adds full drive encryption, Virtual PC Express, the subsystem for UNIX and full multilingual support.
- **Vista Ultimate Edition**: For small businesses or others that want to access the full gamut of new Vista features, Microsoft is releasing the Ultimate Edition. It includes a host of features including all of those in the Enterprise Edition, but also entertainment tools such as Photo Gallery, Movie Maker and Media Center. Though you might not want these programs on business computers, this edition might be the only choice for any organization that wants full system protection and does not want to enter into a long-term software agreement with Microsoft.

Microsoft is also releasing a Vista Starter Edition; this version will be available to emerging markets because it is designed to give them access to low-cost versions of Windows and avoid piracy.

> 🕮 To learn more about each of the different Vista Editions, go to http://www.microsoft.com/windowsvista/getready/editions/default.mspx.
>
> 🕮 For a fun overview of the different Vista Editions, look up http://blogs.technet.com/james/archive/2006/11/29/explaining-vista-editions-the-fun-way.aspx.

Better yet, test your systems right now. Microsoft offers a new and enhanced Windows Vista Upgrade Advisor (VUA). VUA will scan your systems and tell you whether they are able to upgrade to the new OS. It will also tell you which edition it recommends based on your system capabilities. In addition, it will identify both device driver and application compatibility issues. Vista uses a new file system driver, so don't be surprised if disk-based utilities such as anti-virus or disk defragmentation tools are singled out as requiring upgrades (see Figure 1.2). In order to run VUA, you'll need a version of the .NET Framework as well as MSXML, but if they are not present, it will automatically install them for you.

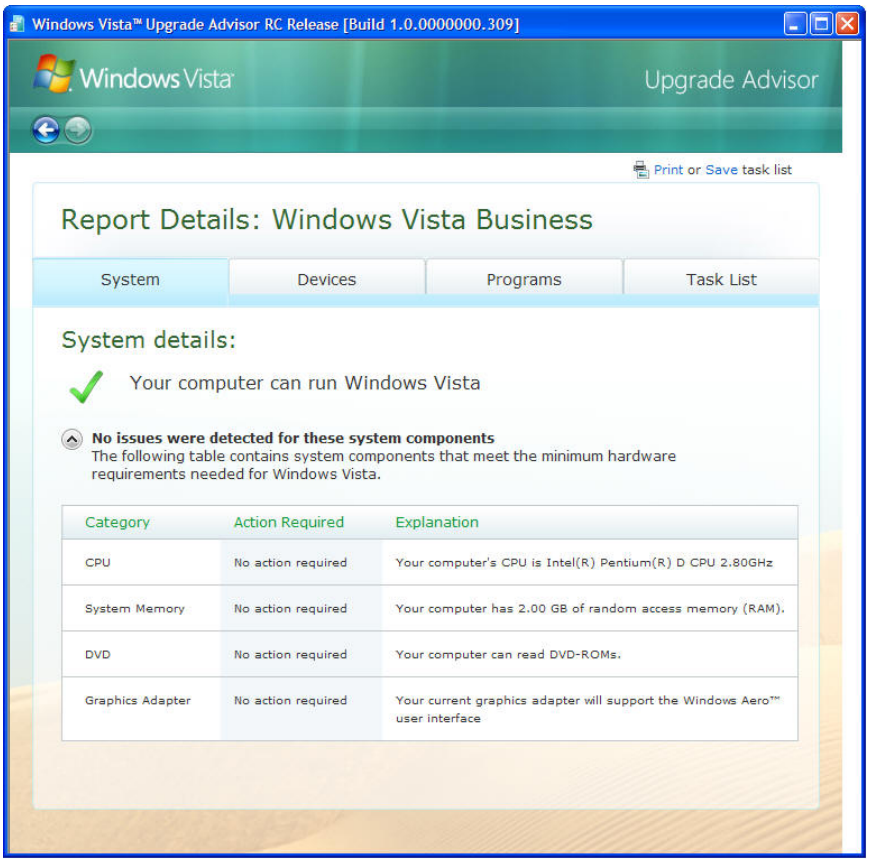

Figure 1.2: The results of a system scan with Windows VUA.

> 🕮 To download the Windows VUA, go to http://www.microsoft.com/windowsvista/getready/upgradeadvisor/default.mspx. You'll need administrative rights on the PC to install and run this tool.

VUA is an interactive tool and only works on one PC at a time. For a corporate-wide scan of all systems, use the Application Compatibility Toolkit (ACT) version 5.0. ACT will be released at the same time as Vista. As its name implies, ACT is designed to focus on applications, but it does include rudimentary hardware assessments.

> 🕮 ACT will be discussed in more detail in Chapters 4 and 6.

Microsoft is also working to release a free Windows Vista Readiness Assessment (VRA), an agent-less network scanning tool that is aimed at small to medium organizations. VRA will let you scan multiple computers from a central location and generate a compatibility report for each of them. VRA is in beta right now but should be available by the time you are ready to move forward.

> 🕮 More on VRA can be found at: http://www.microsoft.com/technet/windowsvista/deploy/readassess.mspx.

In the end, the best tool to use for readiness assessments is a true inventory tool, one that is part of a desktop management suite and one that can help support all aspects of a migration.

Compelling Vista Features

There are a host of new features in Windows Vista, but for the purposes of a migration, especially for the justification of a migration, you'll need to concentrate on just a few to make your point. Three communities are affected by a new desktop OS: users, IT professionals, and developers. Users can take advantage of improvements in productivity and security. IT professionals will focus on new deployment and management features. Developers will want to address new infrastructure components and the application programming interfaces (API) that give them access to those components.

For users, Vista provides key improvements in the following areas:

- Integrated search
- Performance improvements
- Security
- Desktop experience
- Networking experience

For IT professionals, Vista offers improvements in:

- Operating System deployment
- Management technologies
- Security

For developers, Vista includes more than 7000 native APIs linking to three new core feature sets.

- The Windows Presentation Foundation
- The Windows Communication Foundation
- The .NET Framework version 3.0

> 🕮 For a complete list of Vista features, go to http://www.microsoft.com/windowsvista/features/default.mspx.

Compelling Features for End Users

According to Microsoft, Vista heralds a whole new era in user productivity. Heard it before? Think it's a marketing slogan? Well, it is, but for once there may be some truth in it. In the past couple of years, the hot button for users has been search or the ability to find information anywhere at any time. Computer systems and past Windows versions have helped us generate tons of personal, professional and public digital information. Just organizing all of the various files we create ourselves is a task in and of itself. Few people can spend a whole day without searching for at least one thing on the Internet, ergo Google's immense success.

Despite the fact that we've been very good at creating information, we haven't been all that good at teaching our users how to use good storage practices so that they can find what they create. Even showing them how to name files properly would have been a help, but training budgets are usually the first to go during cutbacks. As IT professionals, we're now faced with having to install and deploy third-party search tools—tools that may or may not respect the security descriptors we apply to data within our networks.

To resolve this situation, Microsoft has integrated search into the basic user interface (UI) of Vista. Search is how you access all information on a Vista PC. The Start menu now sports a search tool and provides constant search, the Explorer sports a search tool, and IE sports a search tool—search is everywhere. At least in IE, you can choose which search engine you want to rely on. On the desktop it is a different story. Search indexes everything it has access to: personal folders, system tools, legacy shared folders, removable drives, collaboration spaces and so on—all driven by the PC's capability to index content. When Windows Server Codenamed "Longhorn" is released, search will be able to rely on server-based indices and take a load off of the local PC.

Search is such an integral part of the system that Windows Explorer now boasts new search folders—folders that are virtual representations of data based on search criteria. It's not WinFS—Microsoft's flagship file system due to replace NTFS—but it works and it works really well. Working on a special project such as the Vista migration? All you have to do is create a virtual folder based on these key words and you will always have access to the data so long as you have the proper permissions and you are connected to the data. It's simple, just perform the search, click Save Search, and give the folder a meaningful name. Saved searches are dynamic, so any time new content is added, it will automatically be linked to your virtual folder. Figure 1.3 shows how saved search folders work as well as laying out the new Windows Explorer window.

In addition to having access to indexed content, you have full control over the way you view and organize data in Windows Explorer. New buttons sort information in new ways, new views show extensive previews of document contents, and new filters let you structure information just the way you like it. Even better, you can restore a previous version of any document so long as it existed before the last shadow copy was taken—that's right, Vista now does shadow copies on the desktop. With Vista, there is no reason why anyone would ever lose a document again.

> 🕮 For more information about Volume Shadow Copies and Previous Versions, especially how you can start using them even before you deploy Vista, go to "10 Minutes to Volume Shadow Copies".

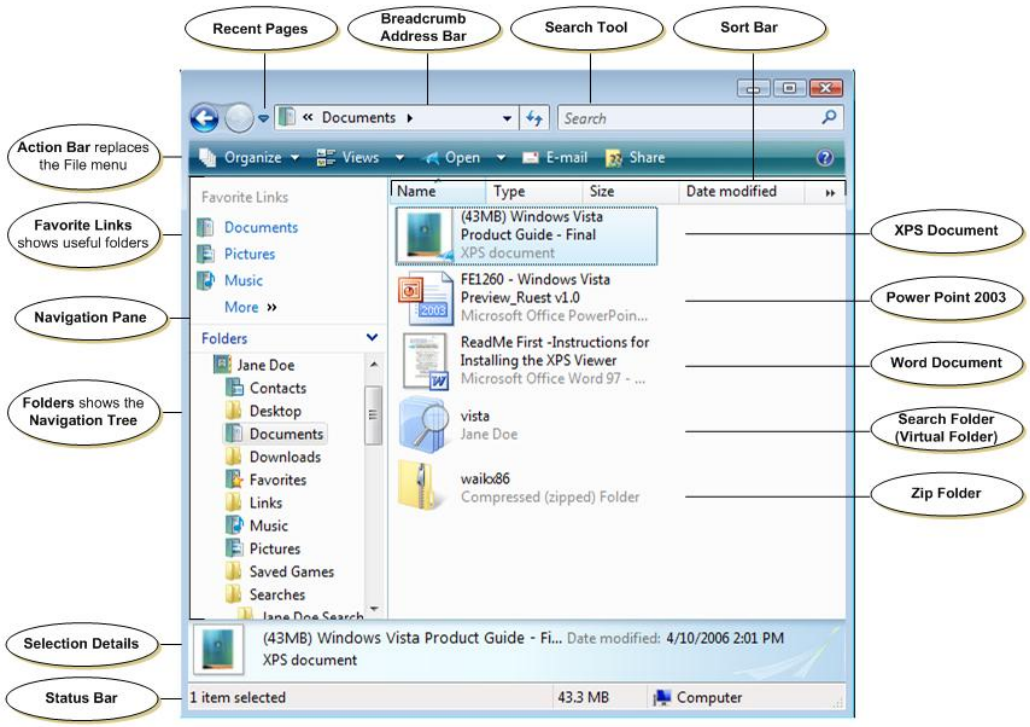

Figure 1.3: The new Windows Explorer in Vista allows you to save searches into virtual folders.

Beyond search, Vista will sport several new features aimed at productivity. We already discussed speed and performance; Vista includes several features to improve performance on a PC, 32- or 64-bit:

- SuperFetch will learn from your work habits and preload your most common applications into memory before you call on them. When you actually do call on them, they will launch from RAM and not from disk. They will be lightning fast.
- ReadyBoost will rely on flash memory to extend the reach of normal RAM and reduce hard disk access times. For example, Samsung is releasing a new 4 GB flash drive that is specifically designed for the ReadyBoost feature. This will also vastly increase system speed.
- ReadyDrive will work with new hybrid hard disk drives—drives that also include flash memory—to cache frequently used data and access it from the flash memory while the hard drive takes time to spin up. In addition, sleeping systems will wake up much faster since they will use the flash memory to restore the working state of the PC.

With the exception of ReadyBoost, all performance improvements are completely transparent. Other speed enhancements include self-tuning performance and diagnostics that will detect and attempt to self-correct any performance-related issue. In fact, if you configure it correctly, the Vista PC will be so fast; you'll have to change your habits. If you're used to stepping up to your PC in the morning, turning it on and then going for coffee, you'll have to learn to go for coffee first because you won't have that interminable lag between turning on the power button and actually facing a logon prompt. This is bound to force some habit changes.

> ☞ Our advice: run Vista on a 64-bit PC if you can, especially a multi-core system. Since x64 operating systems are still in their infancy, nobody has figured out how to slow them down yet. Now is the time to take advantage of all of the speed you can get.

Vista also includes a whole series of improvements at the **security** level—improvements that both users and IT professionals can take advantage of. The most significant is User Account Control (UAC). With UAC, Windows Vista will allow administrators to execute most processes in the context of a standard user and only elevate privileges by consent and vice-versa for users. When you are logged on as administrator and a process requires elevation, a dialog box requesting your response is presented. If you agree, the process is allowed, if you disagree, the process is denied. When you are logged on as a standard user, UAC will prompt you for an appropriate administrative account and its password each time an administrative task is performed.

UAC prompts are impossible to miss because the entire desktop is dimmed when UAC is activated and only the UAC dialog box is displayed clearly (see Figure 1.4). UAC will require significant adaptation since it is a completely new way to work as a standard user. When computer systems are properly prepared and managed, corporate end users should very rarely if ever face a UAC prompt, yet they will benefit from the anti-malware protection running as a standard user provides.

In addition to UAC, Vista supports Fast User Switching even in a domain. If someone wants or needs to use a computer that is already in use, there is no need to log off the current user, just switch users, perform your tasks and then log off. The existing user's session is still live and the user may not even know someone else used their computer.

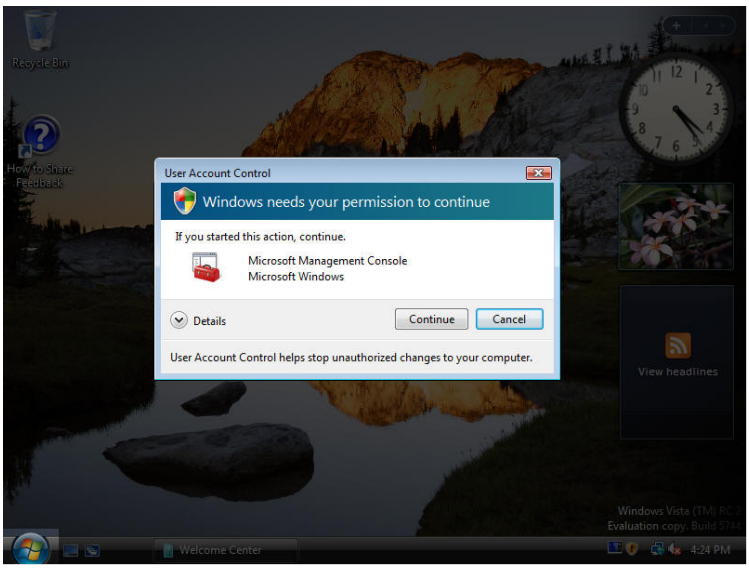

Figure 1.4: Using an application requiring UAC elevation.

Another security element is Windows service hardening. By default, Vista monitors services for abnormal activity in the file system, the registry and network connections. If any untoward behavior occurs, Vista simply shuts down the service. In addition, Vista includes a series of anti-malware technologies such as Windows Defender, an anti-spyware detection and removal engine, a new version of Windows Firewall that users can access and control to some degree, an updated version of the Windows Security Center; and a new engine for security updates. As previously mentioned, it also sports a new version of IE, version 7 which has several improvements in terms of ease of use—tabbed browsing, RSS feed integration and improved Web page printing—but its major improvements are in secure Web browsing. The following list highlights IE 7's new features:

- New phishing Web site identification and reporting tools.
- A clearer way to determine whether you are connected to a Web site using either the Secure Sockets Layer (SSL) or Transport Layer Security (TLS).
- ActiveX opt-in, which will easily let you determine which ActiveX controls are safe to use.
- Single click deletion of all browsing history.
- Automatic protection from domain name spoofing.
- Control of uniform resource locators (URL) processing to avoid URL parsing exploits.
- Protected mode, isolating itself from other applications running in the OS.

As this list shows, this new, sand-boxed version of IE provides safer, cleaner Internet browsing (see Figure 1.5).

The desktop experience is also vastly improved. The new Aero interface provides glass-like windows that show the background desktop when in use. In addition, the integrated support for three-dimensional graphics paves the way for a very high-quality graphical experience. If you're going to use a graphical user interface (GUI), why not make it the best possible experience? That's exactly what Vista delivers.

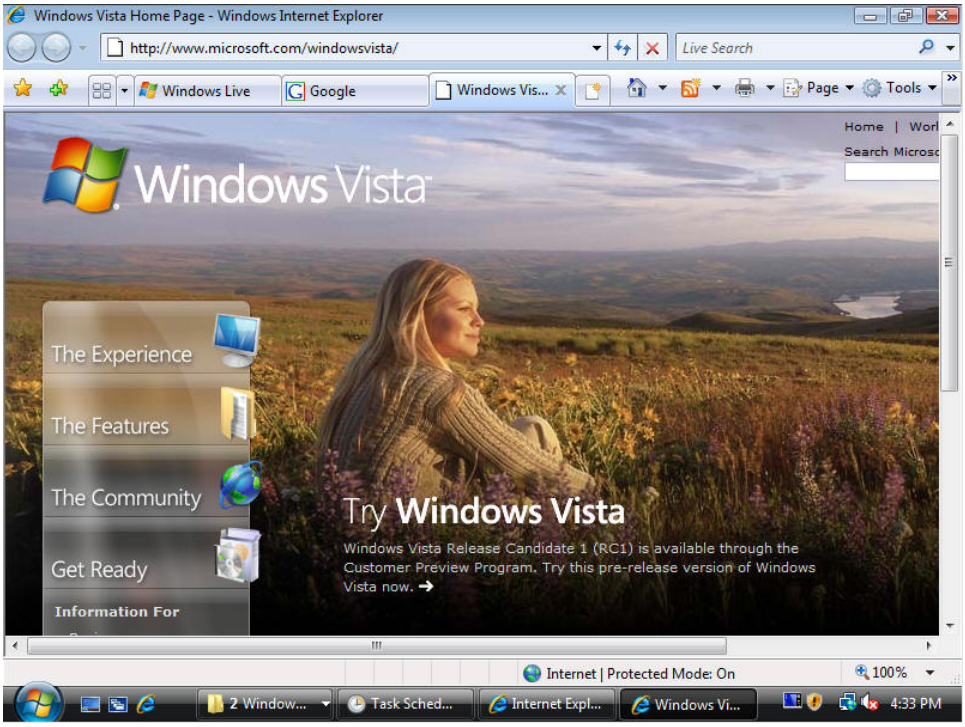

Figure 1.5: Internet Explorer version 7 provides a better experience than any previous version.

Finally, end users will find that their networking experience in Windows Vista will also be vastly improved. Not only has the entire TCP/IP stack been rewritten in Vista to significantly increase networking speeds, but also Vista now fully supports IPv6, the next version of the TCP/IP networking protocol. IPv6 automatically gives each computer its own unique IP address—unique in the entire world, that is—and protects it through integrated IP security (IPSec) support. Whether you are running IPv4 or IPv6, the new networking stack will herald vast speed improvements, especially between PCs running Vista. Servers will have to wait for the next version of the Windows Server operating system to access these benefits, but users will notice speed improvements even in mixed networks.

> 🕮 To download a PowerPoint presentation on new Vista features, go to http://www.reso-net.com/download.asp?Fichier=P84.

Despite this new feature set, user training for Vista should be relatively painless because everyone should be already familiar with the standard Windows UI. This doesn't mean that no training is required, but that training could easily be performed through short presentations and demonstrations, either live or online, which take users through each of the new capabilities.

Compelling Vista Features for IT Pros

There are several compelling features in Windows Vista for IT professionals. The first is in operating system deployment. Vista supports three deployment scenarios by default: new computer (even a bare metal system), PC upgrade, and PC replacement. These three scenarios are supported by several technological improvements. All versions of Vista now ship in the new Windows Image Format using the .WIM extension.

WIM images are file-based system images as opposed to some other tools that use a more traditional sector-based disk image. The WIM file-based image uses a single instance store to include only one copy of any shared file between different images. This allows Microsoft to ship multiple editions of Vista, even Windows Server Codenamed "Longhorn" when it becomes available, on the same DVD. The version you install is based on the product identification (PID) number you use during installation. This also means that when you create images for deployment, you can use the same image to deploy to workstations, mobile systems and tablet PCs. WIM images are mountable as NTFS volumes and therefore can be edited without having to recreate reference computers.

> ☞ Microsoft is not the first to use file-based images. Altiris Deployment Solution supports both file- and sector-based images though most users will opt for the file-based .IMG format as it is much easier to manage in the long run.

Microsoft has created several tools to work with WIM images—ImageX, a WIM image generator, Windows System Image Manager, a WIM image editor, and Windows Deployment Services (WDS) which replace the previous Remote Installation Services (RIS) to support bare metal WIM deployment. In addition, Microsoft is releasing Windows Preinstallation Environment (Windows PE) to the general public. Windows PE is not new, but has been updated in support of Vista deployments. Previously, Windows PE was available only to customers acquiring either enterprise licenses of Windows XP or software assurance for the OS.

> 🕮 To learn more on Vista deployment technologies, go to http://www.microsoft.com/technet/windowsvista/evaluate/feat/deplovw.mspx.

Existing disk imaging technologies can still be used to deploy Windows desktops in organizations. Tools such as Symantec Ghost, Altiris Deployment Solution, Arconis True Image, and so on continue to be viable options for OS deployment. One significant advantage some of these tools have over the WIM image format is their support for multicast image deployment. Multicasting allows you to deploy the same image to multiple PCs at the same time using the same data stream. By contrast, unicast deployments send unique copies of the operating system to each target device. If you are deploying to 50 PCs at a time, multicasting will require a single data stream whereas unicasting will require 50 copies of the same data stream. You do the math. Even if you can keep your WIM image as thin as possible, without support for multicasting, it will take longer to deploy than with other imaging tools.

> 🕮 Chapter 7 will provide more information about disk imaging.

Don't get us wrong. WIM imaging is still a boon to organizations that don't have any system management software in place—though you should consider using a massive deployment of this kind to introduce new systems management software. However, if you still aren't ready for a full-fledged management system, go ahead and rely on WIM and the other Microsoft tools which support it. You'll find that most of them are command-line tools that require some scripting expertise to use. You'll also find that each tool is contained within itself and offers little integration to the others. Your best bet is to look for systems management tools that can interact with both WIM and sector-based imaging, then choose which suits your needs best. Several manufacturers will release updated versions of their management suites to fully support Vista in the coming months.

Another area where Vista will assist IT professionals is in management technologies. Once again, Microsoft is investing in Group Policy, its flagship system management technology. Vista sports almost 800 more policy settings than Windows XP, bringing the total number of settings to 2450. In Vista, you can use Group Policy Objects (GPO) to manage everything from the firewall to wireless networks to removable storage devices, diagnostics and power settings. In addition, Vista can support multiple local GPOs, letting you specify different settings for different users on the same computer. This feature is useful for shared computer environments such as kiosks or manufacturing environments.

Microsoft recently purchased Desktop Standard, a provider of advanced Group Policy tools. This acquisition adds a change control system for all Group Policies including roll-back, software update delivery through Group Policy, the ability to create conditional policies, the ability to modify any registry setting, the ability to control non-Microsoft applications through Group Policy, and much more to Microsoft's existing Group Policy toolkit. Microsoft is making these tools along with others available through the Microsoft Desktop Optimization Pack for Software Assurance.

> 🕮 For more information on Microsoft Desktop Optimization Pack for Software Assurance products, go to http://www.microsoft.com/windowsvista/getready/optimizeddesktop.mspx.

Vista also includes a vastly improved Task Scheduler (see Figure 1.6) which is now much more of a job manager than just a scheduler. Tasks can now be configured to launch based on specific events. For example, if a hard disk drive runs out of space, you can automatically launch a task to clean up temporary files and alert desktop support teams. Tasks can also run when a user locks or unlocks the computer, letting you specify custom scripts to execute even if the user does not reboot their machine. Tasks can run when the computer is idle for a specified period of time. Finally, tasks can be conditional, running when another task is activated or when a specific condition is met. These new event-based tasks give you much more power over remote systems.

Backup is also much easier in Vista. Vista sports a brand new backup system that will take complete system images and store them in Microsoft's virtual hard disk drive (.VHD) format. Backup images can now be mounted with either Microsoft Virtual PC or Virtual Server, VMware Workstation or Server, modified if needed and restored to the original system. This is a powerful new backup system that anyone can work with.

Vista includes a new implementation of Windows Remote Management (WinRM), Microsoft's implementation for the Web Service Management standard, letting you manage and administer systems through common HyperText Transport Protocol (HTTP) ports. And of course, Vista relies on the Microsoft Management Console (MMC) version 3.0, providing a much more comprehensive and pliable task-oriented management interface.

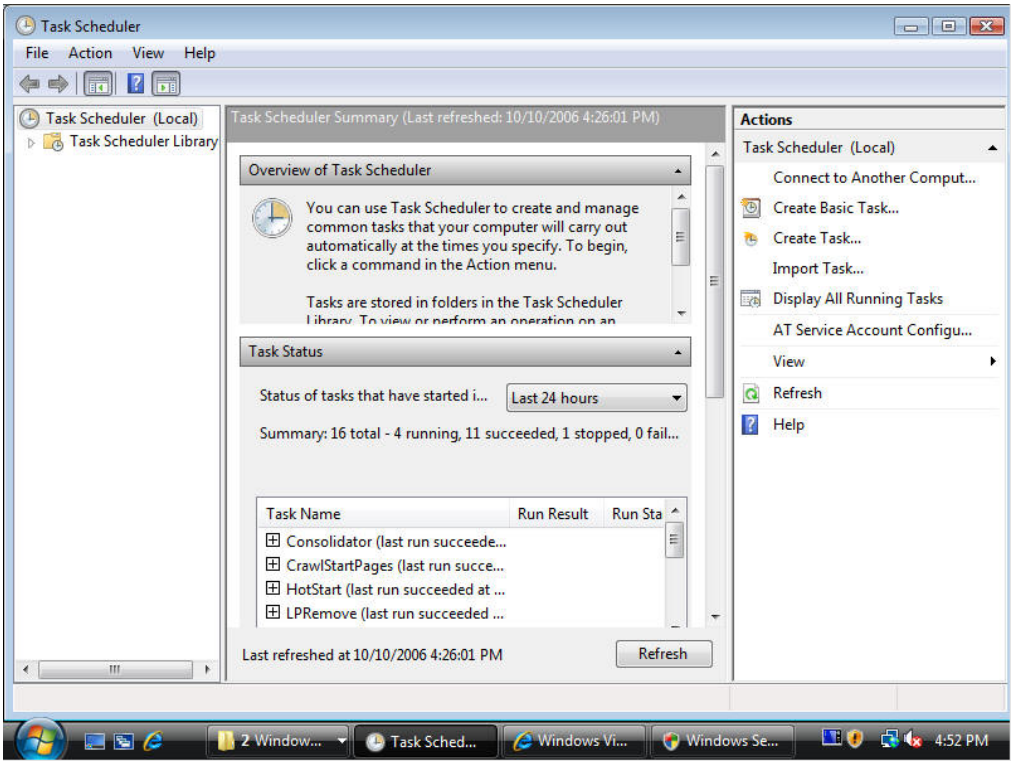

Figure 1.6: The new Task Scheduler provides much more functionality than previous versions.

Even managing updates has been made easier in Vista through the Restart Manager. During update installations, if a restart is required, Restart Manager will automatically take note of open applications, save their state and restart them once the system is back up and running. This makes the update process completely transparent to end users. Of course, applications have to be written to take advantage of this feature.

Print management has been improved in Vista through the use of a new Print Management console which gives you centralized access to all the printers in your organization, letting you view their status in one single place. Print Management can manage printers for both Vista and Windows XP, letting you manage mixed environments. It also lets you automatically deploy printers to groups of computers through Group Policy. The Print Management console supports delegation of authority; as a result, you can assign aspects of this task to support personnel, providing much needed relief for administrators.

> 🕮 To learn more on Vista management technologies, go to http://www.microsoft.com/technet/windowsvista/mgmntops/default.mspx.

The Event Viewer has also received important upgrades. Many more events are now found in the Windows Event Log, especially events that were previously stored in separate text files. The Event Viewer now supports event forwarding, so you can configure custom events, for example, security events, to be forwarded to a central location. This feature is very useful in support of compliance requirements such as those needed to comply with the Sarbanes-Oxley Act. Events are now much more informative and provide more meaningful resolution information. Events are linked to the Task Scheduler so that you can use an event to generate a new task in one single step. This facilitates event management and troubleshooting for administrators.

Windows Vista also sports several security improvements. Because of UAC, the default administrator account on a Vista PC is disabled by default. This does not mean that it is secure, as every administrative account should have a strong password whether it is disabled or not. UAC also provides registry and file system virtualization to let applications that require machine-level access be automatically redirected to user-level access. This provides better application compatibility than even Windows XP because older applications will run without any changes to their structure. In addition, Vista includes Windows Resource Protection (WRP) which protects both the registry and the file system from unauthorized changes. WRP works in conjunction with UAC to ensure that only authorized changes occur on the PC.

> ☞ Though it is not recommended, you can disable UAC. This can be done in one of two ways. Through the Control Panel | User Accounts, you will find a control to Turn User Account Control on or off. The second way is through the Local Security Policy under Security Settings | Local Policies | Security Options where you will find nine policies that affect UAC (see Figure 1.7). Think long and hard before you decide to do this as it may endanger your systems by exposing them to malicious behavior.
>
> Perhaps the best way to turn this off is to use the setting User Account Control: Behavior of the elevation prompt for standard users: Automatically deny elevation requests. This would also be an excellent opportunity to use multiple Local Security Policies, one for non-technical standard users that have this setting and one for technical staff that allows them to request elevation rights.
>
> To test your applications and determine if they will properly operate in standard user mode, test them with the Standard User Analyzer (SUA) which will tell you which elevated rights the application requires. Obtain SUA from http://www.microsoft.com/downloads/details.aspx?FamilyId=DF59B474-C0B7-4422-8C70-B0D9D3D2F575&displaylang=en.

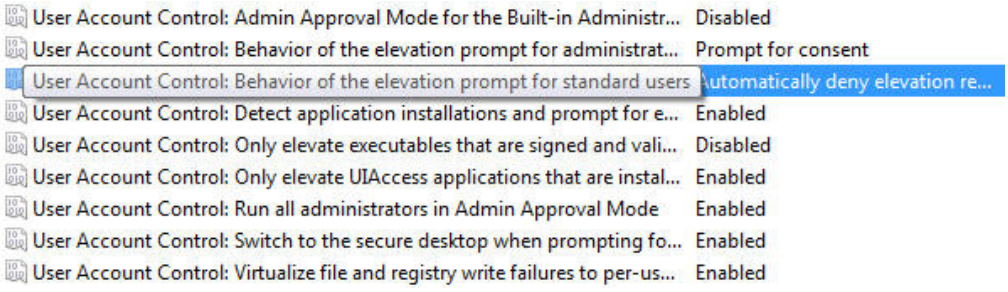

Figure 1.7: Group Policy settings for UAC.

For network protection, Vista relies on the Windows Firewall with Advanced Security (see Figure 1.8). End users only have access to the default Windows Firewall that is found in the Control Panel, but administrators have access to a more advanced version through a custom MMC. This allows you to completely control both inbound and outbound connections on any PC. It also automatically restricts resources if they behave abnormally. For example, if a service that is designed to send messages on a specific port tries to send messages over another port, Windows Firewall will prevent the message from leaving the computer, possibly preventing the spread of malware.

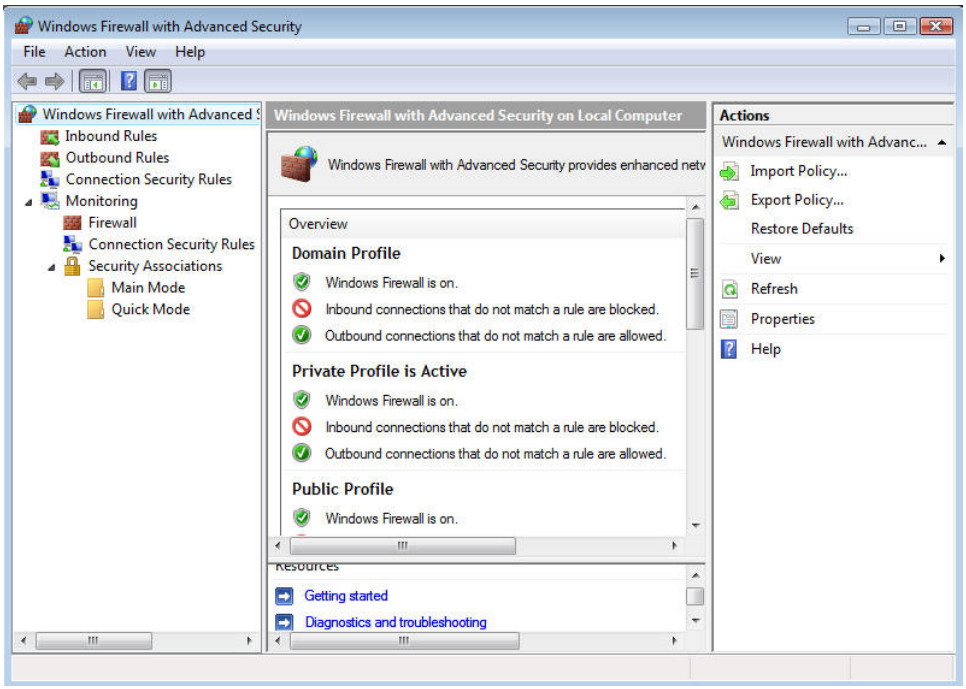

Figure 1.8: Windows Firewall with Advanced Security provides very comprehensive protection for each PC.

One of the most famous security features of Vista is BitLocker Drive Encryption. BitLocker encrypts the entire contents of the system drive, protecting not only user data but also the entire OS. BitLocker relies on the Trusted Protection Module (TPM) version 1.2—a special hardware module—to store decryption keys. If a TPM chip is not available, keys can be stored on USB flash drives, but this is obviously less secure because many users might store both the USB key and the computer in the same bag. Lose the bag and the entire system can be compromised. BitLocker is only available in the Enterprise and Ultimate editions and requires two partitions on the system volume, one for the boot process and one for the encrypted operating system. This consideration will be vital during system preparation for deployment. Considering that according to Times Magazine, 1,600 mobile computers are lost or stolen every day in the U.S., BitLocker will be a boon to businesses of all sizes.

By default, Windows Vista includes Network Access Protection (NAP) or the ability to quarantine computers that do not meet specific health parameters as outlined by your security policy. In fact, because NAP is really a server-based technology—it requires servers to define the health policy, create and maintain the quarantine network, and provide security and other updates to client computers—Vista really only includes the NAP client. But, because the NAP server components will not be released by Microsoft until Windows Server Codenamed "Longhorn" is released—about a year from now—you might think that this is not much of a feature. You're right, unless of course you rely on another product to provide this level of protection.

Microsoft has worked with Cisco Systems to make sure that its NAP will be fully compatible with the Cisco Network Admission Control (NAC). If system quarantine and system health validation is important to your organization, you can deploy Vista today along with Cisco's NAC server components to protect your network. Because Vista includes a built-in NAP client that is interoperable with Cisco's NAC, it will automatically be able to take advantage of this feature—other client operating systems would require an additional Cisco client to be deployed. Then, when Microsoft releases its new server code, you can simply integrate its features into your already protected network.

> 🕮 To learn more on NAP and NAC, go to http://www.microsoft.com/technet/itsolutions/network/nap/default.mspx or http://www.cisco.com/en/US/netsol/ns466/networking_solutions_package.html.
>
> At press time, it is unclear whether the integrated Vista client is in the original release of Windows Vista. Make sure you have this integrated client before building your NAC environment.

Vista provides a better management story than its predecessors. But simplifying desktop management isn't just a matter of new features in an OS. It requires careful thought and planning, preparations that must be performed during the set up of the migration project. This is just another reason why massive desktop migration projects are an excellent vehicle for a move towards service-oriented management of all your systems.

> 🕮 To learn more on Vista's security features, go to http://www.microsoft.com/technet/windowsvista/security/default.mspx.

Compelling Vista Features for Developers

Windows Vista is built on managed code, relying on a new programming model to provide a completely updated desktop platform. Developers will want to take advantage of the new feature set in Windows Vista to create new, three-dimensional applications that rely on this new model.

> ☞ Developers and IT Professionals alike will want to take a very close look at the Windows Vista Compatibility Cookbook, a document that outlines all of the compatibility changes between Vista and Windows XP. The cookbook can be found at: http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnlong/html/AppComp.asp.
>
> In addition, developers may want to take advantage of the additional resources available on the Innovate on Windows Vista portal. The portal can be found at: http://microsoft.mrmpslc.com/VistaPlatformAdoption/.

Windows Vista is built on three core technologies. The first is the Windows Presentation Foundation (WPF). WPF, formerly codenamed 'Avalon', is a series of components that allow

developers to build high-quality user interface experiences. It blends together documents, media and traditional as well as alternative forms of input such as the Tablet PC. It links to the new Windows Color System Microsoft developed for Vista to produce higher quality output to both the screen and print media and it provides integration points into the Windows shell to enhance the experience of the user. Developers should definitely take the time to examine how WPF can help them provide better information to users.

> 🕮 For more information about Windows Presentation Foundation, go to http://msdn2.microsoft.com/en-us/netframework/aa663326.aspx. Videos on WPF can be found at www.youtube.com by searching for the words 'presentation foundation'.

The second important technology that is included in Vista for developers is the Windows Communication Foundation (WCF). WCF, formerly codenamed 'Indigo' is designed to assist in the construction of connected systems, Microsoft's version of service-oriented architectures (SOA). WCF is built around common Web Services to secure transactions on the Web. It covers transports, security components, messaging patterns, networking topologies, hosting models and software encodings to provide the basis for new transaction models. Although it is being delivered directly in Vista, WCF will also be available for previous versions of Windows, such as XP and Windows Server 2003.

> 🕮 For more information on the Windows Communication Foundation, go to http://msdn2.microsoft.com/en-us/netframework/aa663324.aspx.

Finally, Vista will also include WinFX or as it is now named, the .NET Framework version 3.0. This is Vista's managed code programming model and is an extension of the previous versions of the Framework. In fact, the new version of the Framework brings together all of the components built around WinFX into one single programming model. This includes the Windows Communication Foundation, the Windows Presentation Foundation, the Windows Color System, CardSpace, and Windows Workflow Manager and merges them into one single rapid application development environment. Organizations of all sizes will want to look to this version of the Framework for all Windows-based or Web Service-based development that pertains to Vista. Of course, Vista also supports traditional development through unmanaged code such as C++ or Dynamic HTML and JavaScript. The choice of which language to use will depend on the type of tool or functionality you want to develop.

> 🕮 For more information on the .NET Framework version 3.0, go to http://msdn.microsoft.com/windowsvista/prodinfo/what/about/default.aspx#winfx.

These feature descriptions are by no means exhaustive. They are designed to give you a taste of what Vista will offer your organization. You will need to examine the entire Vista feature set to determine how your organization can benefit most from its expanded feature set, but at least with the features outlined here, you will already have an idea of where to look.

Examining the feature set is one of the most significant aspects of building a business case for migration. This is part of the first task anyone must perform in any migration project. After all, if the business case isn't approved, there won't be much of a migration. This is why business cases are a very important aspect of any migration project and should be your starting point.

Creating the Migration Business Case

Business cases are structured documents that provide technical, financial and management information related to a significant undertaking that will take the form of a project in an organization. One of the purposes of a business case is to assess the readiness of the organization to proceed with the recommended change. The business case structure is fairly stable and should include the following items:

- Executive summary
- Background information
  - Current issues
  - Preparation team
- Description of the upcoming project
- Proposed approaches and alternatives
  - Issues to be addressed
  - Recommended approaches
  - Potential alternatives and expected results
- Impacts of the project on current operations
- Assessments
  - Business environment
  - Technology
  - Risks
- Cost/benefit analysis
- Projected schedule
- Verification mechanisms
- Implementation strategies
- Recommendations
- Required approvals

> ☞ A sample business case for a Vista Migration project can be found here. A one-time registration is required to access this business case. Click on the **New members** button to register.

There are several reasons to introduce change into an organization. The first is that change is constant and is at the very core of the IT world. Therefore introducing change offers the opportunity to control change and adapt it to your needs. The second reason is to reduce risk. For example, the U.S. government's need to move to an IPv6 infrastructure is an excellent example of a change introduced to reduce risk since IPv6 is much more secure than IPv4 because of its very structure and offers single, individual addresses for each host connected to a network. This is much more than IPv4 can ever offer given the need to use private versus public addresses and network address translation (NAT) to connect multiple hosts to the Internet. A third reason is to add value or functionality to the services you offer. If you are a private corporation, then this goal is to increase profits, but if you are an organization that operates without profits, adding value may only mean providing a higher quality service to your clienteles.

The advantage of controlling change before it controls you is that you are in the driver's seat. This is why we recommend migrating to Windows Vista in a structured and controlled manner. As any migration project aims to reduce risk while increasing value, you should consider the following four reasons for moving to Vista:

1. Take advantage of a new, more sophisticated and more secure desktop operating system.
2. (Optional) Take advantage of 64-bit processing, increasing speed and security for the desktops.
3. (Optional) Take advantage of the integrated IPv6 capabilities in Vista and use the migration project as a carrier to migrate to a new generation of TCP/IP.
4. (Optional) Take advantage of the migration project to improve desktop management operations and move to a completely managed infrastructure.

Three of these justifications are optional, but each of them adds significant value and helps organizations move into the 21st century in terms of desktop infrastructures.

Use a structured process to design your business case. We use the IDEA, an eight-step process that helps gather the information required to populate the different sections of the business case document (see Figure 1.9).

Figure 1.9: The Vista IDEA, a structured approach for the elaboration of the Vista Migration Business Case.

The IDEA begins with a review of the current situation. For example, one excellent source of information for this review is a collection of desktop-related issues reported to the help desk. It then moves on to a market analysis, or a review of the market press and advisory sources on their opinion of Vista. Step three is the definition of the goals of the project. Step four focuses on risk analysis and mitigation. Step five looks at possible infrastructure changes to support the project. Step six outlines the deployment approach. Step seven lists required resources—human, financial and technical. Step eight looks to the future beyond the implementation of the requested change. Each of these is taken into consideration in the template business case you will find online.

Migration Strategies

As you move forward with your migration project, you'll need to consider different migration approaches. Several are available:

- *Let's just install, users be damned!* Surprisingly, organizations actually use this approach in many migration projects. This is especially evident in projects that are completely driven by IT and do not include feedback or input from other parts of the organization. Unfortunately, these projects are doomed to fail because of their naive approach.
- *Hardware Refresh*. The hardware refresh approach is a better approach because it relies on attrition to make the change. Organizations normally have three to four year PC replacement programs and can rely on these programs to carry the migration. Unfortunately, too many organizations who choose this approach don't do a better job than the "Let's just install" approach because there is little structure in the approach to replacement. Just look at organizations that buy new servers with Windows Server 2003 R2 pre-installed, only to replace it with the previous version of Windows Server. Given the small differences between the functionality of R2 versus WS03, it is really surprising that anyone would even assign any resources to this effort. If these organizations fear the small changes in WS03 R2, then how will they fare with the massive changes in Windows Vista?
- *Gradual Migrations*. This approach looks at specific workloads and addresses increasing performance demands by migrating them to the new operating system. This way, only key user populations are migrated, one at a time, making the project more manageable because it runs in specific chunks. Because of this, this approach is much more viable than the first two.

- *Forklift Migrations*. This approach tends to be the best for several reasons. A forklift migration means that every single desktop and mobile system in the organization is migrated in the same timeframe. This vastly reduces the need to manage mixed environments and reduces the strain on the help desk as well as operations teams. The management of mixed environments is controlled by the project and lasts only for a specific time. In addition, forklift projects because of their very nature, are often much more structured than gradual or hardware refresh projects. For this reason, they include more comprehensive communications and training programs—two tools that can either make or break massive change management projects. Also, because a forklift project changes everything at the same time, they often tend to be architected more thoroughly. This is because massive changes need more comprehensive forethought and planning than gradual changes.
- *Carrier Projects*. This approach relies on carriers—key functionality upgrades in the IT infrastructure—to introduce new changes. x64 computing or IPv6 are excellent examples of carriers that could support the introduction of a new OS within your organization. Both require careful planning and architecting to provide the promised benefits. Carrier projects are very similar to forklift migrations in nature because everything is changed at once.

The best recommendation is to use a combination of the last two approaches if possible. Consider your user base. You have to prepare for a Vista migration in the next year or so, otherwise users will start asking for it and you won't have a ready response for them. User sophistication increases exponentially with time as more and more users grow up with access to computer systems. Better to be prepared and have your answers ready when users start grumbling for the Vista features they have at home. Using a combination approach allows you to be prepared ahead of time and control user expectations rather than react to them.

No organization can reliably expect any migration approach based on attrition to work properly unless they have performed a proper forklift migration beforehand. This is because forklift migrations, by their very nature, allow organizations to clean house and implement proper management structures. Most organizations that invest in these types of migrations and maintain a stable client network once the project is complete will be able to profitably use other migration strategies for Vista.

If you haven't performed a proper forklift beforehand and you still want to use an approach based on attrition, then make sure the design and engineering portions of your migration project are fully completed before starting to deploy Vista PCs. This guide will assist you in both these aspects no matter which migration strategy you choose.

Making a case for a flexible infrastructure

Migrating to Vista should also be the time to upgrade and modify your PC management infrastructure. If you already have a proper management infrastructure, you'll be good to move forward with a migration because it will already be an integrated process in your normal operations. But if you don't, consider this.

According to Gartner, an independent research firm, organizations implementing a well-managed PC platform can reduce costs by up to 40 percent. Organizations using some form of management, save 14 percent over unmanaged systems (see Figure 1.10).

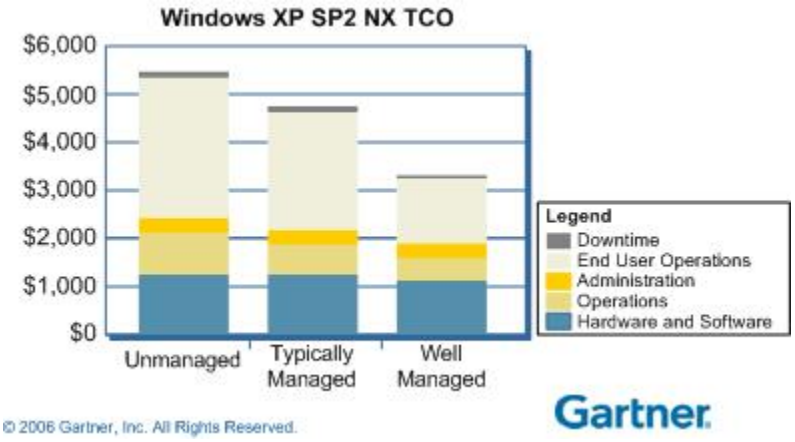

Figure 1.10: According to Gartner, well-managed PCs can bring a 40 percent reduction in costs.

> 🕮 Gartner Research note entitled "Use Best Practices to Reduce Desktop PC TCO, 2005-2006 Update" by Michael A. Silver and Federica Troni, published 8 December, 2005.

Well-managed PCs are locked-down PCs, and users only have access to standard user accounts. Vista makes great strides in this area because it includes a complete revision of what is and what isn't locked down for standard users. Two examples are the fact that standard users can now control the time zone on their PCs as well as control the different power modes the PC is running under; two areas that are completely locked out from them in Windows XP. The Gartner results were compiled for Windows XP Service Pack 2 (SP2) running on microchips supporting the no execute (NX) instruction set to protect against malicious code.

In the same paper, Gartner also claims that according to their research, the ideal attrition rate for PC replacement should be three years as organizations running well-managed PCs reap the most benefits and the best return on investment (ROI) when replacing one third of their PCs every year. This is a very good argument for making a significant PC purchase for the Vista migration, selecting new x64 systems running multi-core microchips and the latest in video hardware.

Well-managed infrastructures involve the use of a complete PC management toolkit as well as a reliance on properly trained resources both in operations and at the end user level. Locking down PCs is a significant challenge as many organizations still allow users to run with administrative rights. There are no justifications for doing so today, unless, of course, you have money to throw away. Surprisingly, lots of organizations do. According to a report conducted in 2006 by Applied Research West Inc. for Symantec, 48 percent of American IT managers say concern about disabling or reconfiguring of security systems by employees is increasing. Does this mean that 48 percent or more of employees are running with administrative rights? If so, you need to learn to just say 'no'.

Surely we don't have to spell out that the best way to manage desktops is to rely on three year leases, frequent renewals and less diversity in computer models. Doing this is just common sense. If you're not, then you should seriously consider it. And if you're not doing this because of some resistance in upper management then show them this chapter. It's time to get it right. As one of our customers would say, "If it's in print, it's got to be true, right?"

> ☞ In one of our most successful forklift migration projects, the client organization reduced PC-related support calls by a factor of seven through the implementation of a well-managed and locked down environment. This is just one example of the benefits you can reap from a well-organized and planned migration.

At the expense of repeating ourselves, if you want to move to the new Vista feature set and at the same time reap the benefits of locked-down systems and well-managed infrastructures, stay tuned. We will provide you with the tools we have relied on to make all of our migration projects a complete success. The toolkit provided in this guide will of course be focused on Vista but will also be useful for any migration. It will include processes, sample documents, management tool recommendations, structured and detailed instruction sets, and everything else you'll need to finally make migrations just like any other process in your IT operations. If you already have proper desktop management systems in place, then you can also profit from this guide, reviewing your own practices to make sure they are best of breed. Migrations should never be at issue again.

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