

# Introducing Windows Vista



**M**icrosoft Windows Vista is by far the most exciting operating system to hit the market since Windows 95 replaced Windows 3.11 back in the summer of 1995.

Vista is the long-awaited and much-anticipated operating system replacement for Windows XP; with more than five years in the making, it demonstrates well that Microsoft has indeed listened to its customers during coding, because the result is a revolutionary new way of converging work and play on the PC of the 21<sup>st</sup> century.

Microsoft has focused a massive development effort on improving our confidence in this operating system, and its integrated suite of applications, with a much improved Windows interface known as Aero and a new focus on connectivity and security (integrated firewall and antispyware applications are just two of the more obvious security enhancements), results in a radical shift away from the Windows XP modus operandi.

Fundamentally, tasks that used to be complicated, confusing, or just plain difficult to achieve with previous versions of Windows are now much simpler and cleaner, and in many cases, your system's configuration will be optimized for you by default. This shift to offer IT as a simple end-user service is an important development in Microsoft's approach, and it offers better out-of-the-box experiences akin with the next-generation Web 2.0 service-oriented approach being adopted by Microsoft's main competitors.

Whether you are an IT professional or a home user, you'll find that the new, simpler, plain-English interfaces for configuring Vista allow you to get much more done in far less time, and the configuration wizards are so far abstracted from the underlying registry and policy settings needed to make things happen that you'll never be more than a few clicks away from making your PC do exactly what you want it to do.

Through the five available variations on the core operating system, Vista offers a solution fit for practically any audience: from the needs of the basic home user who needs secure and seamless access to the Internet for web and email to the most exploitative power user who has equally high demands for both professional and leisure activities. The rest of this chapter takes you on a whistle-stop tour of the editions of Vista, covering the fundamental differences between each and who the target audience of each is. Then we'll go on to appraise the new and improved features of Vista over

Windows XP and look at some of the features that make Vista such an appealing investment for home and business users.

## Vista Editions

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Stock keeping units, or SKUs (phonetically: *skews*) as they are commonly known, are unique product codes assigned to retail products as a way to track the inventory of commercial companies.

For Microsoft, the use of SKUs is no different; however, in the context of Vista, SKUs are being used outside the bean counters' offices to identify the five versions of the product, of which there is a discrete code assigned to each.

The five versions of Vista are as follows:

- Windows Vista Home Basic
- Windows Vista Home Premium
- Windows Vista Business
- Windows Vista Enterprise
- Windows Vista Ultimate

The five Vista SKUs comprise a common code base across all versions of the product. The uniqueness attributed to each version is attained from the last remaining components (only about 5 or 6 percent of the total build) that make each SKU different. For example, Home Basic does not ship with the Media Center component installed, while Home Premium and Ultimate both have it installed.

The differentiation between SKU product codes is largely irrelevant to you as a user; the simple fact that you'll see five different editions of the operating system *is* what's important. What's paramount for you is what each edition does, why each is different, and, most important, which one is appropriate in your case.

In addition, in Vista, deploying applications and functionality such as language packs takes place through a much more componentized approach than previous versions, allowing IT professionals to create Vista deployments that best match their users' needs. This approach mirrors what Microsoft has been doing with Windows CE for years, where modular builds allow you to install the components you need and pay for only the functionality you require.

It might seem, at first glance, like offering five editions of the operating system is somewhat overkill. Why would you possibly need five different versions of what basically is the same code base? However, there is justification, unlike with Windows XP, which offered at least six versions (Home Edition, Professional Edition, Media Center Edition, Tablet PC Edition, Professional x64 Edition, and Starter Edition), with each version being targeted at a different market audience. With Vista, for technology consumers, there are the two Home editions: Home Basic and Home Premium. Home

Basic is the entry-level version (the cheaper of the two), while Home Premium is more feature rich and targeted at power users who require more from their system than simply word processing and Internet connectivity.

■ **NOTE** All versions of Vista are available for both 32-bit and 64-bit PC platforms.

Small-business and enterprise customers also have two choices, the Business and Enterprise editions, where Business applies to practically all small- and medium-sized business needs, and Enterprise is really necessary only when the size and complexity of the organization becomes global. Then there is the Vista Ultimate edition. This edition of Vista contains all the functionality available across all four previously discussed versions of the operating system, including features such as the enterprise security capability called BitLocker Drive Encryption (covered in Chapter 11). In this way, home and small-business users can benefit from the increased tool set and capabilities in Vista Ultimate and be as flexible as required in how they use their PC technology.

■ **NOTE** A sixth Vista SKU is available that doesn't form part of the core five detailed previously. This is known as the Vista Starter edition. There is good reason to differentiate between this SKU and the other five since this edition is aimed at developing countries and other emerging markets. This SKU won't be available to the general public; its distribution is targeted at where the need is greatest. Emerging markets will benefit immensely from this SKU through low-cost licensing (with only a 32-bit option available for low-cost PCs), allowing these markets to receive the educational benefits of getting connected without having to break the bank.

## Home Basic

As the name might suggest, Home Basic is the entry-level version of Vista (still containing 95 percent of the code base); it's aimed at the home user who wants the benefits of the enhanced Vista solution (security, search, better interface, and so on) but does not require some of the Home Premium upgrades, such as Media Center and DVD Maker.

## Home Premium

Home Premium builds on the Home Basic version with a number of enhancements, such as the introduction of the Windows Aero user interface; compatibility with Tablet PCs; enhanced mobility features, such as multiple PC synchronization; and a variety of new digital media applications, such as Media Center and DVD Maker. Home Premium is really aimed at power users who use their PCs as lifestyle commodities as well as productivity devices; it should be considered by anyone who wants to process and consume a lot of digital media content through this interface.

## Business

Vista Business is the entry-level business SKU and is more powerful than the entry-level home solution, Home Basic, since it has to meet the rigorous demands of business operations. Vista Business can join a Windows domain to attain central control using Group Policy, and it also benefits from enhanced security not available to home users in the shape of a much improved Encrypting File System (EFS). Vista Business is perfect for all business customers who require the improved security, productivity, and collaborative capabilities delivered by Vista.

## Enterprise

Vista Enterprise builds on the Vista Business edition with a number of compatibility enhancements, such as Subsystem for UNIX Applications (SUA) for running a complete UNIX environment that allows UNIX applications to interoperate with Vista (this was originally a Windows 2003 server add-on that has now been ported to Vista). Vista Enterprise also appeals to customers with high security requirements where capabilities such as full disk encryption are essential. The integration of Virtual PC Express also permits you to run multiple operating system environments on a single PC, which is extremely useful for developers and IT professionals who exploit the services of a powerful laptop when on the road.

## Ultimate

Vista Ultimate is the all-singing, all-dancing Big Kahuna of the Vista operating system, containing all the features of all four previously discussed SKUs. In this way, businesses and home users have the choice of installing a single PC operating system that works best for the advanced home user and also integrates well into the business space. Specifically, business customers who have a high demand for consuming digital content (for example, media-oriented companies such as newspapers or television stations) can immediately see the benefit of having DVD authoring and Media Center on the desktop, even though this desktop is integrated into a policy-controlled infrastructure that maintains enterprise management and security control over its workstations.

## Upgrading Vista Versions

The biggest benefit for the consumer of Microsoft's modular approach to the delivery of Vista is that you can upgrade at any time to a higher, more functionally rich version, using Windows Anytime Upgrade. The software supplied on the source disk that was installed on your system when it came will contain the SKUs for all the versions of Vista. If you are running Home Basic, for example, and decide you'd rather have the multimedia capabilities of Home Premium, the software you need is right there on your disk. All you need to do is purchase the upgrade license online and install the top-up modules that turn Home Basic into Home Premium.

Table 1-1 shows all the available upgrade paths.

**Table 1-1** Upgrade Paths Available for Vista SKUs

Current Version	Available Upgrades
Home Basic	Home Premium, Ultimate
Home Premium	Ultimate
Business	Enterprise, Ultimate
Enterprise	Ultimate
Ultimate	

**TIP** To quickly find out which of the SKUs you currently have installed on your PC, open the Welcome Center (Start ► Control Panel ► System and Maintenance ► Welcome Center), and check the top of the screen.

You can start an upgrade whenever you like from the Start menu by clicking Windows Anytime Upgrade and following the on-screen instructions.

**NOTE** You can find the application for running Windows Anytime Upgrade in the Vista %SystemRoot%\System32 folder. The file is WindowsAnytimeUpgrade.exe.

## New and Improved in Vista

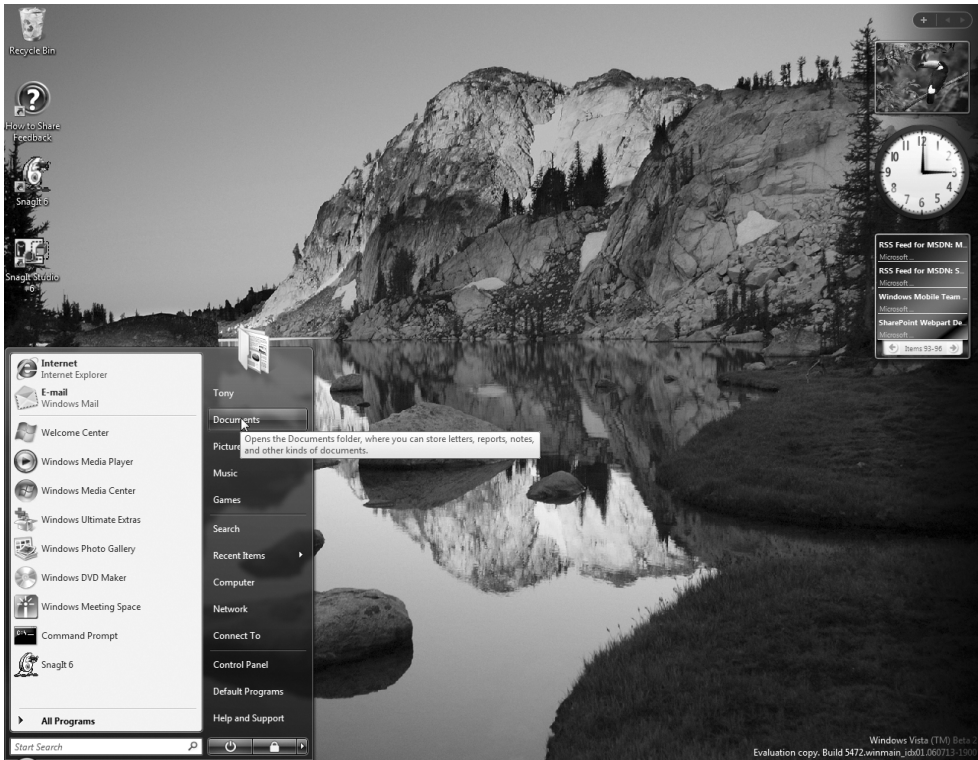
Vista undoubtedly offers a wide variety of new and improved features over its predecessor, Windows XP. However, it would be impossible to cover every feature delivered with Vista in this chapter (that would take a complete book in itself), so instead, the rest of this chapter explains what constitutes the Vista headlines—those features and components of this new operating system that make it stand out from previous versions.

When you’ve digested this list of new and improved features, you’ll see for yourself why Vista is such a paradigm shift for Microsoft.

### The Interface

The first feature you’ll notice that’s different in Vista (although not markedly so) is the Start menu, as shown in Figure 1-1. It has not had a complete overhaul; instead, it’s more akin to a makeover, adding only one key change to the Windows XP Start menu—integrated search. Your recently accessed applications still appear on the left

side of the menu, immediately beneath the Internet and E-mail items, and launch Internet Explorer and Windows Mail (the new version of Outlook Express), respectively. Also note that the word *Start* is no longer emblazoned on the Start button; instead, the button is simply a shaded circle with a Windows logo emblazoned upon it. You'll immediately see the interface changes the moment you log in.



**Figure 1-1** *The Vista interface is a graphically rich and easy-to-use improvement on XP.*

The look and feel of the desktop has also changed, with the Aero interface available in all but the Vista Home Basic edition (video card permitting). Aero delivers an increased level of graphical interaction with the Windows desktop (a level that, quite frankly, should have been available in Windows XP) whereby Vista makes better use of modern graphics cards to leverage the same technology game designers are using. In this way, the Aero Glass effect allows better screen drawing and window rendering and provides much improved direct draw capabilities to Windows applications. The Glass effect provides an element of translucency to Window borders that, for no other reason than it looks good, is a must.

On the right side of the desktop is a new active area (akin to the old Active Desktop technology) called the Sidebar. Here, you can implant small applications known as *gadgets*, which run directly on the desktop. Gadgets can uplink to live, dynamic web content, such as RSS feeds, or can provide simple desktop extensions, such as a clock or a picture slide show.

Further improvements in the interface are apparent when you start using Windows Explorer (right-click the Start menu, and select Explore). You'll see the icons displayed in a folder are somewhat bigger and more meaningful than their predecessors, and many appear as thumbnails of the content inside the file rather than simply as fixed images.

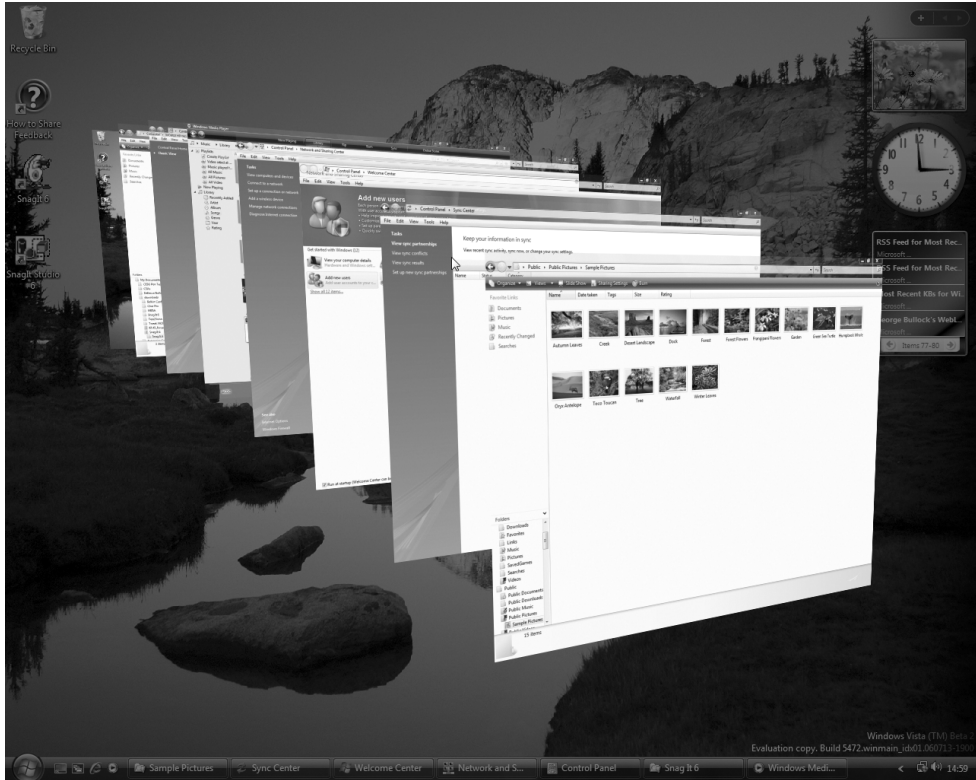
**NOTE** It was always the case that photographs were displayed as thumbnails in Folder view, but thumbnails are now available in many other file formats, showing some of the content from the file itself.

Taskbar thumbnails are also a great help to you when you are looking for a particular application that has been minimized to the taskbar. If you hover your mouse pointer over an application minimized on the taskbar, a thumbnail of the application's interface pops up on the desktop and shows you what's happening.

Another great (although gimmicky) feature of the Aero interface is the new application tabbing capability known as Flip and its graphically enhanced older brother, Flip 3D. To cycle through applications you are currently running, you can still press Alt+Tab. This is known as Flip, which displays thumbnails of the application in the same format as they appear as taskbar thumbnails. Flip 3D, on the other hand, displays a radically different 3D stacking effect, as shown in Figure 1-2. We discuss activating and using Flip 3D in Chapter 3.

Windows Explorer has also had a makeover. The interface contains as many as ten discrete areas you can control, including menu bars, the preview pane, a links area, a folders list, file metadata, and the pervasive search box, common throughout all the Vista applications.

Commonly accessed configuration utilities, such as the Control Panel, have also changed, with these changes reflecting the abundance of new and improved functionality you have to control through Windows Vista's interface. For this reason, the Vista Control Panel expands on the old Windows XP category view to offer 10 categories that can allow access to 42 different configuration applets.



**Figure 1-2** *Flip 3D* is a radical new approach to tabbing through applications.

## Instant Search

Search is one of the most important improvements in the Vista interface; it's much more pervasive and powerful than in Windows XP. The Windows Search service is started as a local system service when Vista starts (allowing it to search and index everything on the computer), automatically creating indexes of all sorts of content stored on your hard drive.

Search is embedded into practically every Vista application (take a look at Media Player or Photo Gallery to see what we mean) and has been designed to be immediately accessible from every screen without you needing to hunt through countless menus to locate it.



**NOTE** Search is context based, meaning that the search you perform will return content based on the application from which you searched. In this way, if you search from the Start menu, you will receive hits based on items available through the Start menu; however, if you search on the same term in Photo Gallery, hits will be based on the metadata associated with items in your gallery.

Another big improvement with Search is that it starts working as soon as you start typing. In this way, you can immediately see (through hits on partially defined search criteria) whether you are on the right track. You can also perform more advanced searches using plain-English operands on a wide variety of metadata types, which results in a powerful and extremely versatile approach to locating content on your system.

## Pervasive Metadata

A piece of metadata (known in Vista as a *tag*) is some additional snippet of information about a file that describes something about that file. Examples of metadata are a document's date of creation and the name of the camera used to take a digital photograph.

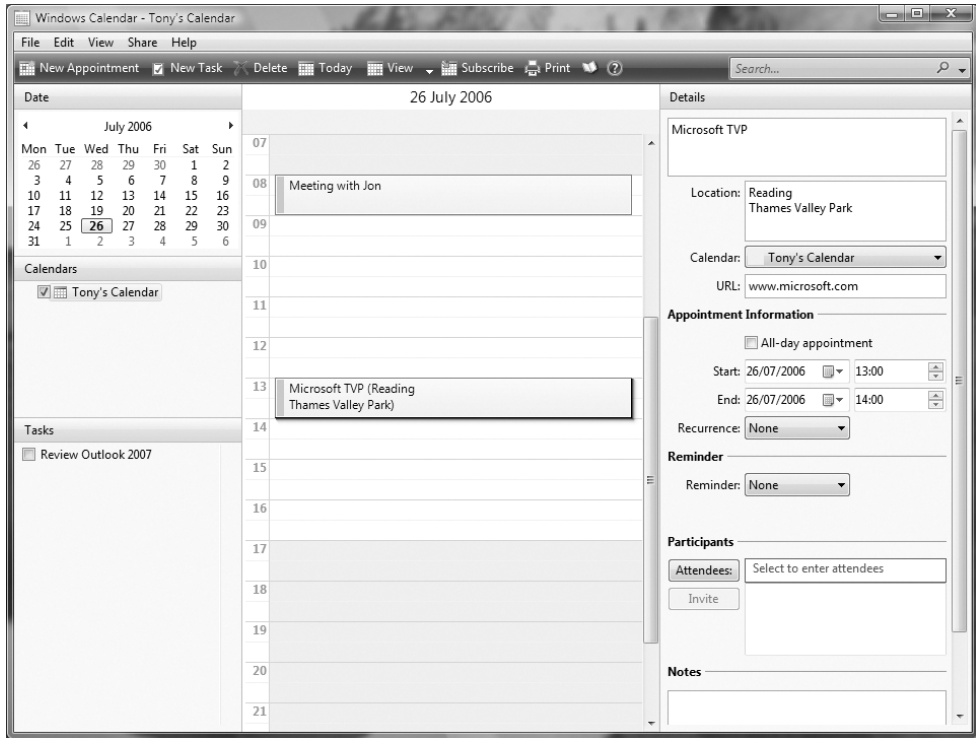
The Windows Search service indexes content on your PC based on these tags and allows the results to be displayed in a variety of ways. Windows Explorer also uses these tags to group items into related stacks whereby, for example, you can group albums from a particular artist, irrespective of where those files actually reside on your physical disk configuration. In this way, folder views can contain content from a number of physical sources, based on the metadata used to describe the files.

## Communications

The communications stack in Vista (known as the *next-generation* TCP/IP stack) has been reengineered from the ground up to cater to advancements in both wired and wireless networking technologies and to improve network performance while cutting down on data transfer times. Vista also provides support for both TCP/IPv4 and the next-generation 128-bit addressing model, TCP/IPv6.

From a user's perspective, faster network access, a more reliable network service, and proactive network monitoring provide an all-round better networked experience, and for nontechnical users, setting up the network has never been easier using the Network and Sharing Center and the Network Map.

User-facing applications, such as Internet Explorer 7 and Windows Mail (formerly Outlook Express), have had a dutiful overhaul from the Windows XP versions, and new collaborative features such as Windows Calendar (see Figure 1-3) allow you to share free/busy information with whomever you choose.

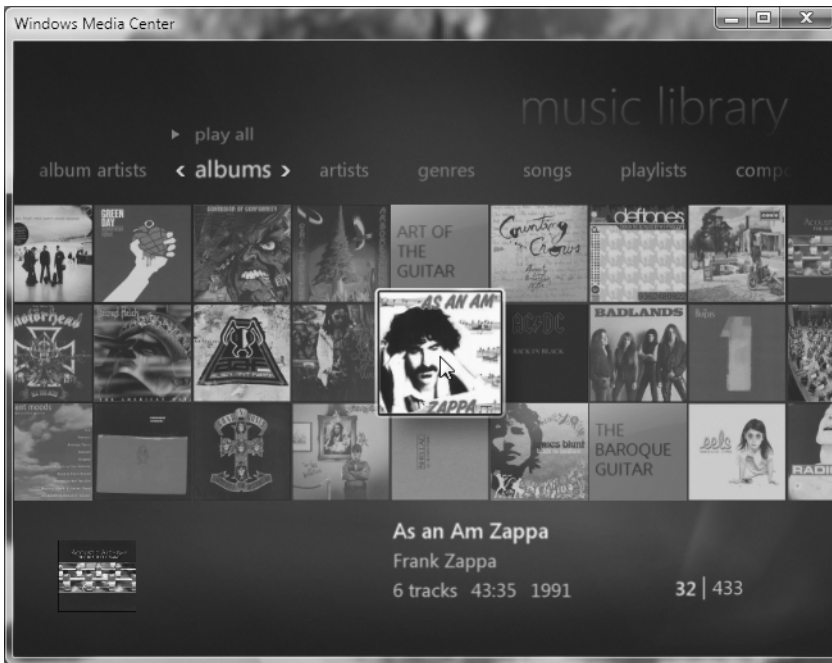


**Figure 1-3** Stay organized with Windows Calendar.

## Digital Media and Gaming

The ability to manipulate and consume digital content has greatly improved in Vista with a new version of Media Center (available in the Home Premium and Ultimate editions), a new application called Photo Gallery, and the ability to author your own DVDs using DVD Maker.

Since its introduction to the general public at the Consumer Electronics Show (CES) in January 2002, Media Center (known then as FreeStyle) has gone from strength to strength. With the advent of Windows XP Media Center Edition 2005, the product became more stable, became functionally rich, and really popped up on the radar of mainstream hardware manufacturers. So much was the success of Media Center that it comes now as an integral part of two of the Vista SKUs and will undoubtedly change the way we look at the role of PCs in the home. The Vista version of Media Center sports a much improved interface that really best uses the size of a large television (see Figure 1-4) and contains support for high-definition (HD) TV and a variety of online resources that start to blur the edges between local content and content sources from the Internet.



**Figure 1-4** Media Center's new interface is a vast improvement on previous versions.

Vista Media Center also integrates well with the Xbox 360, utilizing this consumer gaming machine as a Media Center extender whereby content can be streamed over a network from the Media Center PC to the Xbox where it can be output. Vista's Sleep mode also allows you to start your system (and Media Center) in only a few seconds, aligning your Media Center experience better with that of consumer DVD players.

The Windows DVD Maker is a new application included in Windows Vista Home Premium that allows you to author your own multifaceted DVDs, complete with menu controls, chapters, and so on. DVD Maker can create DVDs of movies you produce using Windows Movie Maker or can create a rolling slide show from your Photo Gallery with overlaid music tracks to create the perfect slide show.

Windows Media Player 11 is the latest version of Media Player and, although developed to be compatible with previous versions of Windows, can release its full potential only when running on Vista, because of its reliance on facilities such as Windows Search.

Another much improved application is the latest Vista version of Movie Maker, with many enhanced transitions and fades as well as support for burning DVDs and creating HD-encoded content.

Photo Gallery is yet another new application in all the Vista SKUs that helps organize your collection of digital photographs, wherever they are stored on your network. Metadata search capabilities built into Photo Gallery allow you to stack and group images, edit photographs in the gallery, and create extremely customizable slide shows based on tags.

**NOTE** A great enhancement (although just a minor touch) to sound playback is per-application volume. This allows you to adjust the volume for individual applications on your system instead of with previous Windows systems where you had much less granularity over this control.

And finally, we'll say a few words about gaming. DirectX 10 is the latest DirectX graphics platform and has been completely redesigned to deliver the most cutting-edge graphics available anywhere on the planet. It might seem a little odd that Microsoft enhanced the PC beyond even the capabilities of its gaming console, the Xbox 360, but the thing is, PCs (with the latest and greatest video cards) are as capable of running complex, graphically rich games as their counterparts in the dedicated world of the console. In fact, with the ability of these new video interfaces to render great-looking 3D graphics at a much higher resolution than what's available on a plain old TV set, we are looking at an imminent revolution—and more than likely an upset—for the console manufacturers in the near future.

Also, concerned parents will be happy to note that Microsoft has paid a lot of attention to the pleas from adults who share their PCs with kids, where the kids could access content that adults want to keep from them. Parental controls have been around in Internet Explorer for a few years, but nothing was in place to stop kids from installing games with adult content and playing them on the PC. However, this has changed in Vista with parental controls. You can instruct Vista to check the rating of a game against your local certification authority (the Entertainment Software Rating board in North America) and allow only specific categories, such as Early Childhood or Teen to play, thereby barring games with Intense Violence or Blood and Gore ratings.

It is also possible to turn off game play altogether. In this way, you can control gaming time, allowing access to installed games only when homework has been finished.

## Mobility

To make Vista a compelling upgrade for Windows XP users, Microsoft has addressed the problems previously endemic with mobility computing, such as the problems keeping files in sync between PCs and mobile devices, problems seamlessly synchronizing files with network servers for offline working, and problems third-party application developers have when creating applications capable of synchronizing across devices.

Sync Center (a new Control Panel applet) is designed to address these synchronization problems, offering a single-user interface for all mobile device synchronization needs.

Windows SideShow is a new technology that allows hardware manufacturers to install an auxiliary display on your computer system (on the screen, keyboard, Bluetooth connected to your cell phone, and so on) and pump content from Vista to this screen. This is possible even when Vista is switched off or sleeping. You can opt to have SideShow display content from Windows Mail whereby any new emails that

come into your system are shown without you having to periodically open your laptop and run the application.

One of the biggest problems facing Windows XP Media Center Edition 2005 was that it didn't have a decent hot-start capability. Media Center is an excellent piece of technology and can really improve your ability to consume and manage digital content; however, penetration into the living room of a Media Center device is possible only when you can access this media content as easily as you can when you use a discrete device such as a DVD player. On a DVD player, you press the On button, insert the movie, and away you go. Simple! Windows XP required a lot more messing around to get to the point where you were ready to watch your content, and people who didn't appreciate the complexity of what was going on under the hood saw this delay only as a failing. Addressing this, Windows HotStart is a new technology that provides a fast system start-up, resuming Vista directly into Media Center or other such applications virtually instantly.

Vista's much improved support for Table PCs, including revisions to touch-screen technology, digital inking, and handwriting recognition, aggregates into a much better, integrated capability that not only works with today's mobility technologies but also remains cognizant of future industry developments.

Finally (although not specifically related to mobility, but you'll see why it's included here), Vista comes with a built-in viewer for Microsoft's new file format, known as the XML Paper Specification (XPS). XPS is Microsoft's answer to the universally accepted Portable Document Format (PDF) and will undoubtedly cause a stirring in the pit of Adobe executives' stomachs. In the same way that PDF files are easily transportable across platforms, XPS is based on an Extensible Markup Language (XML) schema that defines the way documents must be displayed, allowing the components of the document to be rendered on the end-user device, so documents originating in one place will look the same in another. For example, an XPS document viewed in the Vista XPS viewer will look the same, containing the same components in the same places, as when viewed on a Windows Mobile-enabled cell phone (and there it is: the mobility link).

## Security

Across the entire Microsoft spectrum of server and workstation products, IT security has never been so critical to the future of businesses—and Microsoft knows it! This is exactly why initiatives such as Trustworthy Computing (<http://www.microsoft.com/mscorp/twc>) are championing wholly new approaches to code developing and security testing, with security no longer an afterthought to development—instead it's sitting right at the top of the requirements list.

Vista is the first operating system release from Microsoft to benefit from this security-centered pitch shift, meaning, right there under the hood, Vista is doing everything possible to keep out the bad guys, protect your privacy, and make sure you stay up and running even when the most formidable of new viruses are circulating the globe.

One of the most obvious, in-your-face security enhancements in Vista is User Account Control (UAC). At first glance, you'll probably want to switch it off because

you are constantly bombarded with pop-up windows, halting your progress until you authorize Vista to proceed. Even the simplest of processes, such as adding new users, pops up the UAC dialog box, saying “Windows needs your permission to continue.” The thing is, this is probably the single most effective way of stopping covert processes from performing tasks in the background that you don’t know are running. Having you, the user, authorize actions such as account changes means you will always see when something is being modified. If the dialog box suddenly pops up asking you to confirm you want to add a new user but you never started that task yourself, you can be sure that some piece of malware on your system started to do it for its own subversive needs.

Another new feature included in Vista is Windows Defender (previously known as Windows AntiSpyware). This is an extremely effective anti-malware product, residing in memory and scanning for unusual system behavior that might be a result of spyware, adware, or other kinds of privacy-infringing services. In the same way an antivirus product scans your file system on a regular interval, Windows Defender runs full or partial system scans, either looking deep into the registry and file system or performing a more simple scan of your installed services that might reveal potentially malicious code. Windows Defender connects to Microsoft on a regular schedule to check for malware definition updates or engine upgrades, so it keeps up-to-date with the latest exploits.

**NOTE** You should think of Windows Defender as a complementary product to your overall PC defense system. You’ll still need to have an antivirus product installed, such as McAfee’s VirusScan (<http://www.mcafee.com>) or Trend Micro’s Internet Security 2007 (<http://www.trendmicro.com>).

Windows Firewall has also been revamped for Vista, no longer being constrained to monitoring only inbound connections (probably the biggest drawback of previous versions and the main reason why Windows XP users installed products such as ZoneAlarm); it is now as capable as many of its rivals in protecting against unauthorized outbound connections from your system that might come from worms, Trojans, or other such malware.

Internet Explorer has a whole bunch of new security features and improvements. Switching on Internet Explorer Protected Mode when surfing the Web prohibits web pages from writing to anywhere on your system but the Temporary Internet Files folder. In this way, malicious executable code cannot be dumped into the Windows Startup folder to run the next time you reboot (a typical exploit instigated from adware- or malware-containing sites). ActiveX Opt In allows you to completely control the use of ActiveX code on your system, offering you a toolbar that allows you to authorize its use when you need it rather than having it enabled all the time. The Phishing Filter will check against an online database of registered web sites where phishing attacks have come from in the past and will warn you that the site is dangerous.

Windows Mail (the replacement for Outlook Express) incorporates a new Junk Mail Filter akin to the one installed in Office Outlook. This provides you with complete control over what does and does not make it into your inbox, with safe

sender and blocked sender filters and an email phishing filter that protects your inbox from emails trying to lure you to a site.

Windows Service Hardening is a new paradigm determining how service accounts are utilized by the system. Accounts attributed to services are derived on a least-privilege basis rather than, as with Windows XP, service accounts running in an administrative context that can be more dangerous if compromised. In this way, a hacker could still compromise a service, but the hacker would no longer be able to take administrative control of your system as a result of this.

Vista also incorporates one of the most-asked-for requirements that security-oriented customers wanted: full disk encryption. Unlike the EFS, BitLocker Drive Encryption encrypts and protects your entire system partition, including the operating system files that you could not protect with EFS. BitLocker can use a Trusted Platform Module (TPM) to increase security further since this TPM is a physically separate hardware module for recording security keys that might be easier compromised in the operating system.

Network Access Protection (NAP) is another new service used to keep an eye on the patch state and security settings of Vista, warning you when you are falling behind with your patching or when your antivirus signatures are out-of-date.

Enhancements to the file system in the form of the new Transactional NTFS (TxFS) allow Vista to roll back files where problems have been encountered during a file system operation.

Finally, as mentioned, parental controls have been enhanced to allow concerned parents to place restrictions on kids' accounts, block access to inappropriate web sites, stop the installation and playing of inappropriate games, and much, much more.

## Deployment

Vista is far ahead of its predecessors, with some new modularization and imaging technologies built right in that allow administrators to better deploy and patch PCs under their control. The old problem with multilingual infrastructures where a separate build was required for each language you shipped (and each patch had to be engineered individually for each version) is no longer an issue; Vista's modular approach means you can add the language pack onto the core build, installing whatever bits are necessary for your audience.

For home and small-business users, upgrading to Vista—or specifically, transferring users to a newly built Vista workstation—is easy using Windows Easy Transfer. This technology replaces the Windows XP Files and Settings Transfer Wizard and is compatible with transferring in files and settings from Windows XP or Windows 2000 workstations. It has been improved significantly from previous versions of this facility; it now supports a broader range of media devices (USB drives, DVD, and so on), and it can export your entire system (including all user account and associated files and settings) and re-create it exactly on the target device.

The Windows Preinstallation Environment (PE) is a new feature of Vista that helps you with installation, troubleshooting, and system recovery. Windows PE is a bootable shell of the operating system that collects information about the installation you are intending to do; it can also analyze your Vista installation and report and fix

problems with the operating system files already installed. Windows PE is a direct replacement for the MS-DOS environment that was always used in previous versions of Windows and, unlike these previous versions, can access NTFS partitions as well as FAT partitions. Windows PE comes with a collection of useful system administration tools for managing partitions, administering devices, and tweaking network connectivity, as well as the old favorite `net` command with all its powerful abilities to manage users, groups, permissions, services, and shares.

Deploying the base operating system and additional modules (language packs and version top-ups) is much easier and cleaner than in previous versions of Windows. This is because of a new component of the Vista deployment suite known as Windows Imaging (WIM). WIM allows you to modify operating system images offline (you can even modify the content in a folder format if required), individualizing them to suit your target audience and adding patches and applications where required. When you've finished testing your new image, you can ship either the entire image or simply what has changed.

XML answer files are a significant improvement in deployment technology over the previously obscure answer files that were such a fundamental part of Windows XP unattended installations. With this format of answer file, only a single file is necessary (rather than the multiple files required with Windows XP), and you can easily create an answer file from scratch using the Windows System Image Manager (SIM) tool.

## Performance and Stability

There is no denying that Vista is faster at starting than Windows XP. This, put simply, is because Vista is better engineered. You still have to wait for applications to become available, but these applications' initialization routines do not effect Vista since it partitions its own start-up routines asynchronously from that of other applications and scripts, having them execute in their own time as system background tasks. So, they do not have any impact on the start-up and login process. Coupled with the new Sleep state shutdown option (taking the best parts of Standby and Hibernate), Vista can easily start from a seemingly off state (disk has stopped spinning, and so on) to fully operational in less than five seconds. Quite impressive really!

The entire Windows Update experience has been significantly improved using Restart Manager, which is a lot more intelligent than previous operating system-patching technologies. The Restart Manager significantly cuts down on the number of reboots required when you install a patch and makes patch integration seamless and immediate (great news from a security standpoint).

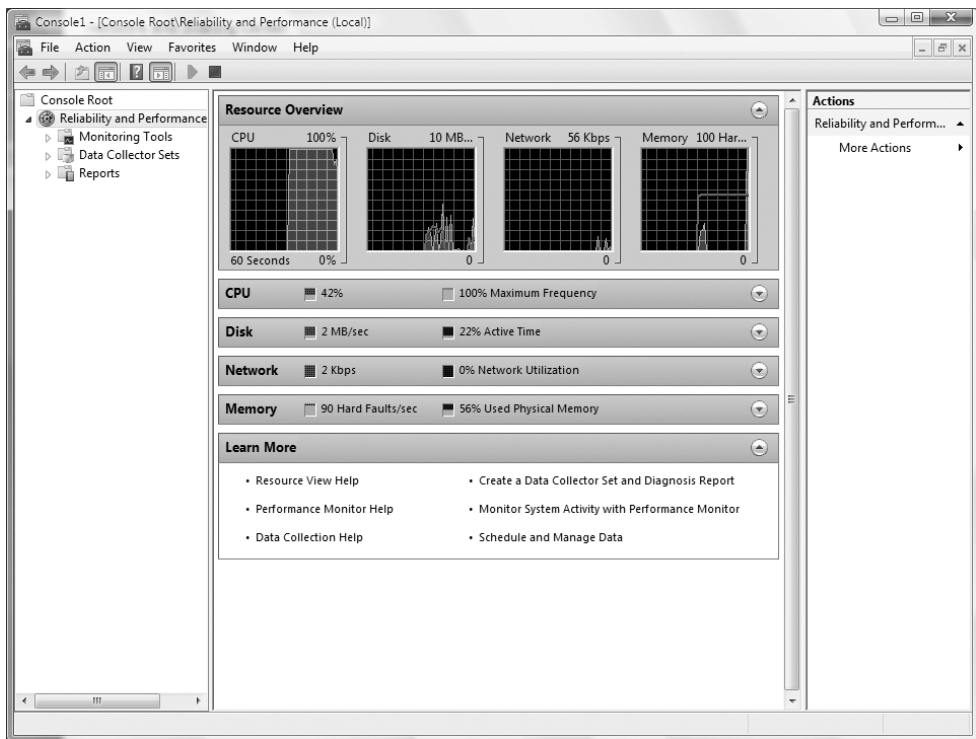
One of the best performance enhancements in Vista is the Superfetch service (resident and operating by default as a Windows service) that preempts users' working practices by learning how a user works and then keeping one step ahead in preloading files before they are requested.

Improved input/output (I/O) cancellation support allows developers to better capture and deal with an application service error; where previously I/O issues might have frozen the operating system, I/O cancellation cannot eliminate the need for a reboot to release the blockage.



Vista also includes a whole arsenal of tools for administrators and users for diagnosing disk, memory, and application problems, as well as the reliability monitoring services that send application problems to Microsoft to be analyzed and fixed in collaboration with the application developer. Figure 1-5 shows the new Reliability and Performance monitoring interface, with a much cleaner view of exactly what's going on under the hood.

Lastly (but by no means least), the Startup Repair Tool (SRT) can automatically fix many common Windows start-up problems without rebooting; however, if it cannot remedy the problem automatically, it starts Windows and runs the SRT in an enhanced mode, allowing comprehensive diagnostic utilities to scan the Windows event logs for the source of the problems before offering a fix.



**Figure 1-5** Reliability and Performance monitoring offers insight into how a system is running.

## For Developers

Vista comes with an all-new development set of application programming interfaces (APIs) known collectively as the Windows .NET Framework version 3.0 (code-named WinFX in Vista beta versions).

A number of essential components form the basis of the Windows .NET 3.0 Framework, namely:

- Windows Presentation Foundation (WPF)
- Extensible Application Markup Language (XAML)
- Windows Communications Foundation (WCF)
- Windows Workflow Foundation (WF)
- Mobile PC
- Windows CardSpace

The WPF APIs provide developers with the foundation for developing applications capable of exploiting the content-rich environment that comes as part of Vista. APIs are available for all of Vista's interfaces and applications.

XAML is simply a more abstracted version of WPF, allowing simple .NET functionality to be developed using this markup language rather than delving into the complicated depths of .NET. You can use XAML to create application plug-ins for Vista components, such as for Media Center.

The WCF is the .NET Framework component that provides networking APIs for developers. Its paradigm is more centered on web services than previous versions of .NET, and it provides great functionality for developers grasping Web 2.0 development principles.

The Windows Workflow Foundation has been developed to provide developers with the tools for creating workflow-enabled applications, containing an in-process workflow engine and the ability to work in Visual Studio 2005 to develop graphical workflows.

Mobile PC APIs are included to allow the development of applications that are mobile enabled to run on Windows Mobile devices, personal digital assistants (PDAs), and smart phones.

Windows CardSpace is the next-generation user identity management solution whereby developers are able to develop consistent and secure identity management paradigms within their applications.