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Windows Vista: The New Frontier

Tom Conti – Walt Disney Imagineering

CM501-2 Have you moved to Windows Vista yet? Are you wondering if you should trade in your old operating system for a shiny, new model? In the new frontier called Windows Vista, we'll kick the tires, slam the doors, and look under the hood of Microsoft's latest offering. Come get the rundown and find out what's what with Windows Vista!

About the Speaker:

Tom is a senior principal CAD systems analyst for Walt Disney Imagineering (WDI) in Glendale, California. He supports over 150 CAD users at multiple locations, and is an expert in system and CAD performance, as well as troubleshooting. Tom has been with WDI for over 18 years, and has over 30 years of computer experience. He is one of the most highly rated speakers at AU.

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It's been 6 years since Microsoft released Windows XP. XP gave us a number of changes from Windows 2000. Windows Vista has a whole new look, and things aren't where we're used to finding them (imagine that!). And finding where things are or how to turn on particular options isn't always easy to do in Vista. I hope that you will find this paper useful when you first use Windows Vista and want to configure it your way.

Hardware Requirements

Every time a new operating system comes out, you can safely bet that it's going to require more hardware resources than the previous one. Here's what Microsoft says are the minimum hardware requirements for Windows Vista.

	Vista Capable	Vista Premium Capable
CPU	800 MHz	1 GHz
Memory	512 MB	1 GB
Graphics Processor	DirectX 9 capable, SVGA	DirectX 9 capable with WDDM driver, 128 MB (minimum) Memory, Pixel Shader 2.0, and 32 bits/pixel
Hard Drive	20 GB, 15 GB free space	40 GB, 15 GB free space
Optical Drive	CD-ROM	DVD-ROM
Audio	Not required	Audio output capability

The minimum requirements help us understand the level of computer that is capable of running Vista. This is usually only useful if you have an existing computer that you're thinking of upgrading to Vista. For anything new you're going to buy, especially if you're buying a CAD station which will be a beefier system than regular home or business systems, all of these will be easily met and more likely exceeded.

You'll want to have at least 2 GB of RAM (4 GB would be best), at least a 60 GB hard drive (nowadays you only find 60GB drives in laptops and even laptops tend to have larger drives), and a good graphics adapter with at least 128 MB of dedicated video memory (again, more is better; graphics adapter with 256 MB and 512 MB, or more, of memory are widely available).

Upgrade paths

You can upgrade from Windows 2000 or Windows XP to a corresponding or better version of Vista. Some upgrades can be installed directly over your existing Windows installation, and others require that you do a clean installation.

U = can upgrade C = Clean installation required

Current Version	Home Basic	Home Premium	Business	Ultimate
Windows 2000	C	C	C	C
XP Home	U	U	U	U
XP Media Center	C	U	C	U
XP Professional	C	C	U	U
XP Tablet PC	C	C	U	U
XP Professional x64	C	C	C	C



What's different between the versions?

Vista comes in a number of flavors, Home Basic, Home Premium, Business, Ultimate, and Enterprise. There's also a sixth edition, Starter, which is not available in developed technology markets such as the United States, the European Union, Australia, or Japan. Starter edition only ships on lower-cost computers sold by OEMs and Microsoft OEM distributors. We'll be talking about the differences between the editions available in the United States.

The Enterprise edition has the same features as Business, plus a few more. According to Microsoft, Enterprise "...provides higher levels of data protection, easier application management, and improved standardization for global operations. Windows Vista Enterprise also offers stronger data protection for a growing, mobile workforce, including more protection for sensitive data if a portable computer is lost or stolen. Windows Vista Enterprise includes Windows BitLocker Drive Encryption, rights to four virtual operating systems, Subsystem for UNIX-Based Applications, Multilingual User Interface, and flexible desktop computing."

The 64-bit version of each edition of Vista has the same features as its 32-bit version with a couple of exceptions. The 64-bit versions support more RAM, and 16-bit applications are not supported.

User Interface

	Home Basic	Home Premium	Business	Ultimate	Enterprise
Windows Vista Standard interface	X				
Windows Aero interface		X	X	X	X
Windows Vista Basic interface	X	X	X	X	X
Windows Classic and Windows Standard interface options	X	X	X	X	X
Ease of Access Center	X	X	X	X	X
Speech recognition	X	X	X	X	X
Support for multiple languages using the Multi-Lingual User Interface (MUI)				X	X

Security

	Home Basic	Home Premium	Business	Ultimate	Enterprise
User Account Control	X	X	X	X	X
Windows Firewall with Advanced Security	X	X	X	X	X
Windows Defender	X	X	X	X	X
Internet Explorer 7 Protected Mode	X	X	X	X	X
Phishing Filter (Internet Explorer 7 and Windows Mail)	X	X	X	X	X
Parental Controls	X	X		X	
Encrypting File System			X	X	X
Windows BitLocker drive encryption				X	X



Digital Media/Entertainment

	Home Basic	Home Premium	Business	Ultimate	Enterprise
Windows Media Player 11	X	X	X	X	X
Share a Media Library with other PCs and devices	X	X	X	X	X
Windows Photo Gallery	X	X	X	X	X
Windows Movie Maker	X	X	X	X	X
Windows Movie Maker HD		X		X	
Windows DVD Maker		X		X	
DVD decoder included *		X		X	
Themed slide shows		X		X	
Windows Media Center		X		X	
Live TV recording and playback		X		X	
Support for Media Center Extenders (including Xbox 360)		X		X	
Premium games		X	X	X	X

* Third-party decoder is required for Home Basic, Business, and Enterprise for watching DVDs.

Hardware

	Home Basic	Home Premium	Business	Ultimate	Enterprise
Tablet PC and touchscreen support		X	X	X	X
Windows SideShow		X	X	X	X
Support for two physical CPUs			X	X	X
Maximum RAM Supported (32-bit)	4 GB	4 GB	4 GB	4 GB	4 GB
Maximum RAM Supported (64-bit)	8 GB	16 GB	128 GB+	128 GB+	128 GB+
Network Projector		X	X	X	X
Windows Mobility Center (full functionality)		X	X	X	X
Centralized power management through Group Policy			X	X	X

Backup

	Home Basic	Home Premium	Business	Ultimate	Enterprise
Back up user files to local disk or DVD	X	X	X	X	X
Scheduled backup of user files		X	X	X	X
Back up user files to a network device		X	X	X	X
Complete PC Backup and Restore			X	X	X
Windows shadow copy (Previous Versions)			X	X	X

Windows Vista Business, Enterprise, and Ultimate editions can create a Complete PC Backup, which creates a restorable image of one or more volumes. These editions can also create conventional file-based backups, either manually or scheduled. Home Basic and Home Premium editions can only create manual file-based backups.



Business Applications

	Home Basic	Home Premium	Business	Ultimate	Enterprise
Presentation Settings		X	X	X	X
Windows Meeting Space *	X	X	X	X	X
Windows Fax and Scan			X	X	X
Small Business Resources			X	X	
Subsystem for UNIX-based apps				X	X
Licensed for use in up to four virtual machines					X

* Windows Vista Home Basic can only join a meeting in Windows Meeting Space.

Advanced Networking and Administration

	Home Basic	Home Premium	Business	Ultimate	Enterprise
Remote Desktop (Client)	X	X	X	X	X
Remote Desktop (Host)			X	X	X
Maximum simultaneous SMB (Server Message Block) connections	5	10	10	10	10
Can join a Windows domain			X	X	X
Desktop deployment tools for managed networks			X	X	X
Policy-based quality of service for networking			X	X	X
Internet Information Services 7.0			X	X	X
Windows Rights Management Services (RMS) Client			X	X	X
Control installation of device drivers			X	X	X
Pluggable logon authentication architecture with integrated smart card management			X	X	X
Roaming user profiles			X	X	X
Folder redirection			X	X	X
Group Policy support			X	X	X
Offline files and folder support			X	X	X
Client-side caching			X	X	X



Windows Vista's Boot Process

Vista's boot process is different from previous versions of Windows. The ntldr and boot.ini files are gone. winload.exe, Windows Boot Manager, and the Boot Configuration Data are new. Here's the rundown.

- When you turn on your computer it performs a power-on self test (POST). If any of your adapter cards have a BIOS, they will also do a POST.
- The system BIOS then reads the master boot record (MBR). The MBR is the first physical sector on the hard drive that's defined as the boot device.
- Control is transferred to the code in the MBR. This code is created by Vista during setup.
- The MBR then reads the boot sector. The boot sector is the first sector of the active partition. The boot sector contains code that starts the Windows Boot Manager program, bootmgr.exe. Windows Boot Manager replaces ntldr.
- Windows Boot Manager reads the contents of the Boot Configuration Data store (this replaces the boot.ini file), which contains configuration information about all operating systems installed on the computer. It uses this data to build and display the boot menu.
- When you select Windows Vista from the boot menu, Windows Boot Manager starts the OS loader, winload.exe, from %SystemRoot%\System32.
- winload.exe core loads the core files, ntoskrnl.exe and hal.dll, reads settings from the registry, and loads drivers.
- Next, Windows Session Manager (smss.exe) starts the Windows Start-Up Application (wininit.exe).
- Windows Start-Up Application starts the Local Security Authority (lsass.exe) and Services (services.exe) processes.
- And you're ready to logon.

Programs that run on startup

By the time you get done installing all of the apps you need, there are lots of things that load up when you start Windows and login. Have you ever tried to find where something is being loaded from? Here are the various ways a program can be configured to run at startup.

Note, HKCU = HKEY_CURRENT_USER HKLM = HKEY_LOCAL_MACHINE

HKCU holds settings for the current user only, while HKLM holds settings that are global to the computer.

- HKLM\Software\Microsoft\Windows\CurrentVersion\Run
Programs listed here will run at startup for all users
- HKCU\Software\Microsoft\Windows\CurrentVersion\Run
Programs listed here will run when the current user logs on.
- HKCU\Software\Microsoft\Windows NT\CurrentVersion\Windows\Run
Programs listed here will run when the current user logs on.
- HKCU\Software\Microsoft\Windows NT\CurrentVersion\Windows
Programs listed in the Load value run when the current user logs on.
- Scheduled tasks

The Windows task scheduler can specify tasks that run at startup. In addition, an administrator can set



up tasks for your computer to run at startup that are listed only on the administrator's system, not your own. Nice, eh?

- win.ini

win.ini file is a legacy of the Windows 3.1 era. The Load= and Run= lines in the [Windows] section of this startup file can launch programs.

- HKLM\Software\Microsoft\Windows\CurrentVersion\RunOnce
HKLM\Software\Microsoft\Windows\CurrentVersion\RunOnceEx
HKCU\Software\Microsoft\Windows\CurrentVersion\RunOnce
HKCU\Software\Microsoft\Windows\CurrentVersion\RunOnceEx

This group of registry keys identifies programs that run once and only once at startup. These keys are assigned to the current user account (HKCU) or to the machine (HKLM).

- HKLM\Software\Microsoft\Windows\CurrentVersion\RunServices
HKLM\Software\Microsoft\Windows\CurrentVersion\RunServicesOnce
HKCU\Software\Microsoft\Windows\CurrentVersion\RunServices
HKCU\Software\Microsoft\Windows\CurrentVersion\RunServicesOnce

Your system may or may not have these keys (probably not). They're used to start services (pretty obvious from their names. This is not the usual way for services to be configured. These may be assigned to a specific user account (HKCU) or to a computer (HKLM).

- HKLM\Software\Microsoft\Windows NT\CurrentVersion\Winlogon\Userinit
HKLM\Software\Microsoft\Windows NT\CurrentVersion\Winlogon\Shell

The Winlogon key controls actions that occur when you log on to a computer running Windows Vista. Most of these actions are under the control of the operating system, but you can also add custom actions here.

- Group Policy

The Group Policy console includes two policies called Run These Programs At User Logon that specify a list of programs to be run whenever any user logs on or the current user logs on. The policies for startup programs are stored in

- HKLM\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer\Run
HKCU\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer\Run

- HKLM\System\CurrentControlSet\Control\Session Manager

By default, the multi-string value *BootExecute* is set to *autocheck autochk **. This value causes Windows, at startup, to check the file system integrity of your hard disks if your system has been shut down abnormally. It is possible for other programs or processes to add themselves to this registry value. (Note: Microsoft warns against deleting the default BootExecute value. For information about what to do if your system hangs while Autocheck is running, see Microsoft Knowledge Base article 151376, "How to Disable Autochk If It Stops Responding During Reboot.")

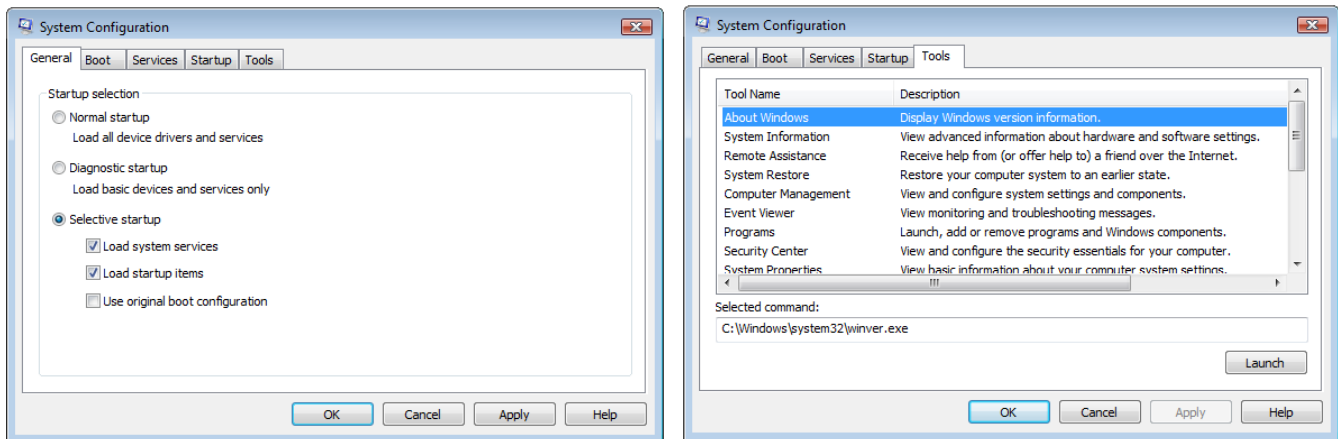
- Shell service objects

Windows loads a number of helper dynamic-link libraries (DLLs) to add capabilities to the Windows shell.

- Logon scripts

Logon scripts, which run automatically at startup, can open other programs. Logon scripts are specified in Group Policy in Computer Configuration\Windows Settings\Scripts (Startup/Shutdown) and User Configuration\Windows Settings\Scripts (Logon/Logoff). And of course your network may run a script when you login.

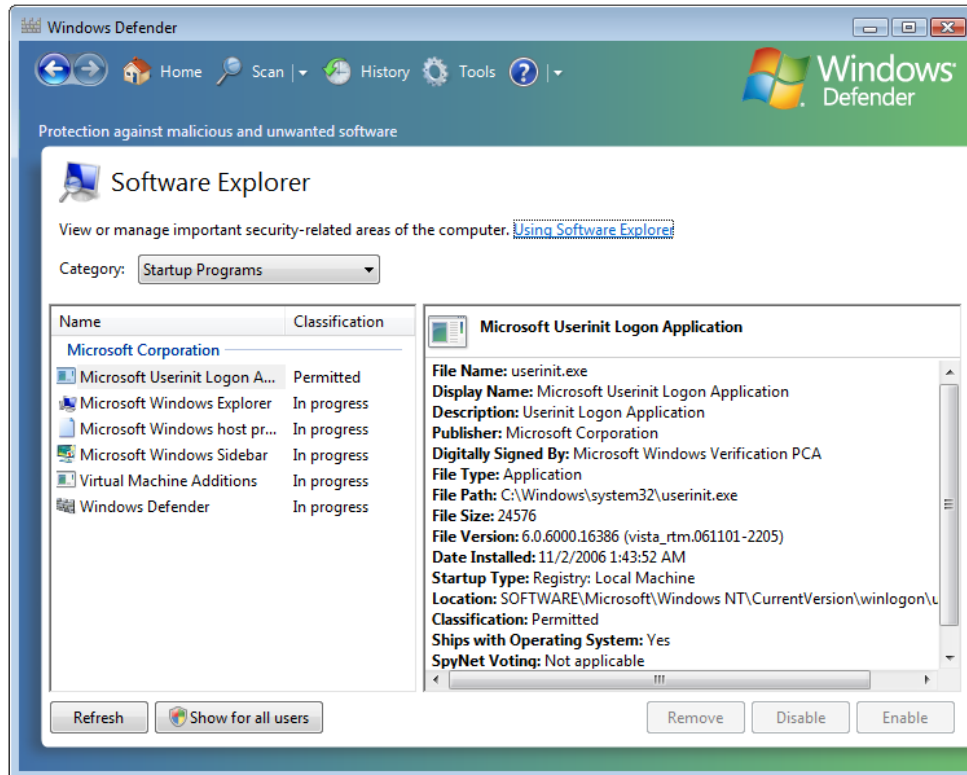
The System Configuration Utility (msconfig.exe) is a handy tool to see what's loading.



If you used this tool in Windows XP, you'll notice the SYSTEM.INI and WIN.INI tabs are gone, and the tab that was BOOT.INI is now Boot. There is a new tab, Tools, that contains quick access to the following useful tools.

- About Windows
- System Information
- Remote Assistance
- System Restore
- Computer Management
- Event Viewer
- Programs
- Security Center
- System Properties
- Internet Options
- Internet Protocol Configuration
- Performance Monitor
- Task Manager
- Disable UAC
- Enable UAC
- Command Prompt
- Registry Editor

In addition to the System Configuration Utility, Vista also has an anti-spyware utility called Windows Defender which will show you most of the startup programs (of course they won't show programs established by policy or scheduled tasks). The Windows Defender list is a bit easier to read and offers more details about each startup program. To see the list of startup programs in Windows Defender, open *Control Panel*, then under *Programs*, click *Change Startup Programs*. Initially, the list shows only those tasks that run in your own user account. To see startup programs that run in other accounts as well, click *Show For All Users*.



Note, you will not see *Programs* and the *Change startup programs* option listed in Control Panel if you are using Classic View.

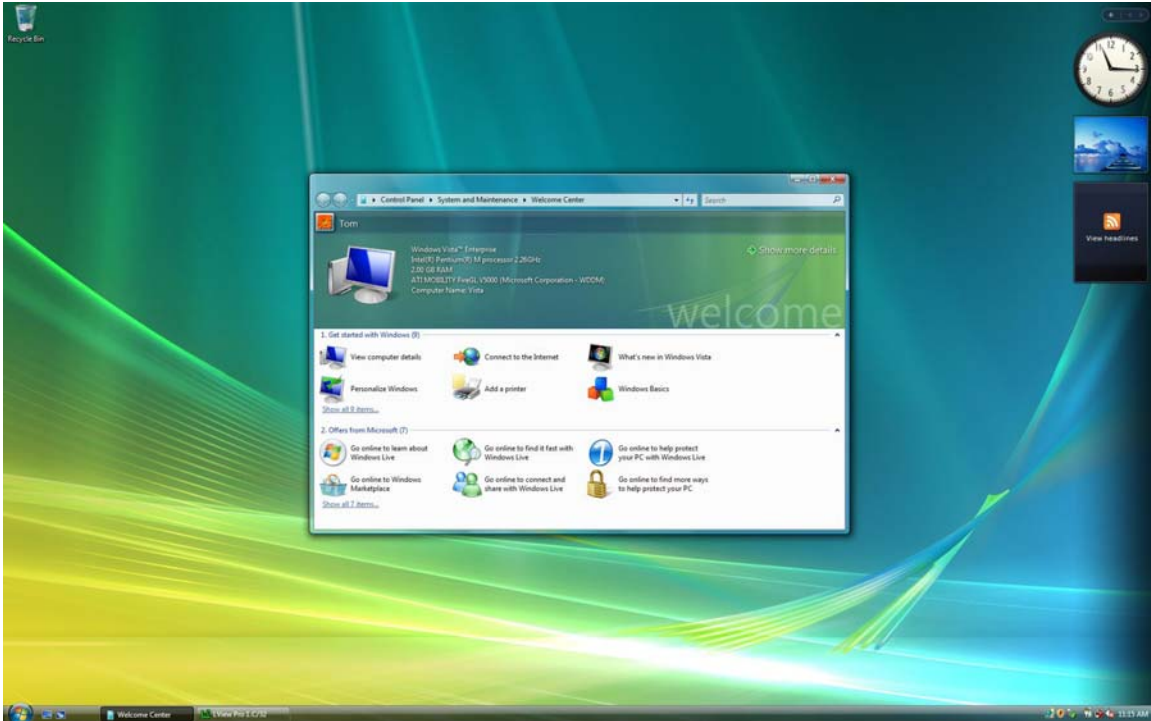
Installing Vista

XP's installer had a definite textural feel and a VGA look to it, and its DOS-based ancestry showed. Vista's installer has a whole new look and feel. While it takes just as long to install it as it did for XP, it's nicer to look at while you're doing it.



First look

This is what you see the first time you actually get into Windows Vista.



Aero Interface

The Aero interface is available as part of every version of Vista except Home Basic. Some of the features of Aero are...

- Transparent windows frames
- Live previews of icons on the taskbar

When your mouse hovers over a taskbar icon, you'll see a miniature representation of the contents of the window

- Live previews when using *Alt + Tab*
- Flip-3D shows all open windows and the desktop as a three-dimensional stack when you press the *Windows logo key + Tab*
- Smoother window dragging
- Interactive Windows controls

For example, hover over the close button and the button glows

- Animated window openings and closings

Windows Sidebar

One of the new features of Vista is the Sidebar, a repository for mini-programs called gadgets. By default, the Sidebar is at the right edge of your primary monitor, but you can move it to the left or to a secondary monitor. You can make it stay on above all other windows at all times, you can make it start automatically when Windows starts (that's its default behavior), and you can close and open it at will. You can easily add or remove gadgets whenever you feel the need for something new on your



computer screen. Gadgets don't have to stay anchored to the sidebar pane. You can drag them out to the desktop, and many respond to this action by enlarging themselves and making their features more visible and useful.

If you choose not to make Windows Sidebar appear on top of all windows at all times, you can bring it to the foreground at any time by pressing *Windows logo + Spacebar*. This will make all your gadgets visible, even those that you have dragged from the sidebar.

To add a gadget, right-click anywhere in the sidebar and choose *Add Gadgets*. That will open the gadget gallery. Vista ships with eleven gadgets, but there are lots of them available free for download. Click on the *Get more gadgets online* link and you'll be taken to Microsoft's gadget site (<http://vista.gallery.microsoft.com/vista/SideBar.aspx?mkt=en-us>)

To remove a gadget, right-click it and choose *Close Gadget*.

To customize Windows Sidebar (other than to add or remove gadgets), right-click any part of the sidebar other than on a gadget, and choose *Properties*.

New security features

Windows Vista is loaded with new security features.

User Access Control (UAC) is a key element in Vista's new security model. In Windows XP, users commonly have administrative privileges. Vista provides functionality that makes it practical for most users to use a standard login account for their daily computing needs. UAC reduces the inherent danger of using an administrator account for everyday tasks by requesting your consent when an application needs to do something with system-wide effect. Vista is the first version of Windows that all user accounts, except the first account created at initial setup, are created as standard user accounts instead of having administrative rights. Even administrator accounts run as "protected administrator" accounts, in which they run with standard-user privileges except when they need to perform administrative tasks. When a program needs administrative access to do something it will request elevation. If you are logged in with a standard user account, you'll be prompted for an administrator's login and password. If you are logged on with an account that has administrative rights, you'll be prompted with a consent dialog.

Here's an interesting bit of information about UAC. When you see the UAC dialog, the desktop darkens behind it and you can't click on anything except in the UAC dialog. The interesting bit is that what you're seeing behind the dialog is not really the desktop, but rather a picture of it. The UAC dialog box creates a secure desktop, a separate process that no other application can interfere with. It does this so a malicious program can't put another dialog box in front of the UAC dialog box asking you to let the program proceed, or grab your keystrokes and learn your administrator logon password. When UAC invokes the secure desktop, it snaps a picture of the desktop, darkens it, and then displays that image behind the dialog box. Once the secure desktop is displayed, you can't switch tasks or click the windows on the desktop because they're not really there. Pretty darn clever, eh?

Windows Firewall has been changed significantly and monitors outbound traffic as well as inbound traffic, and its advanced configuration console provides greater control over firewall rules and other settings.



Internet Explorer now runs in Protected Mode, which lessens the likelihood of installing malicious code. Effectively, it runs isolated in a “sandbox” with reduced privileges, able to write data only in a temporary files folder unless you grant permission to act outside the protected area.

Another new security feature in Vista is data redirection. While running under a standard user’s account, an application that attempts to write to a protected system folder, like C:\Program Files, or C:\Windows, will be transparently redirected to a virtual file store within the user’s profile. Similarly, if an application attempts to write to system-wide areas of the registry, like the HKEY_LOCAL_MACHINE hive, it gets redirected to virtual keys within the user’s section of the registry. Applications that attempt to read from these protected file and registry locations look first to the virtual stores. File and registry virtualization allows standard users to run older applications, including many of those that required administrator access under Windows XP, while at the same time preventing malicious applications from writing to areas that could bring down the entire system.

In previous versions, when the computer was turned on and Windows loaded, much of the operating system loaded into the same memory location every time. Vista new *Address Space Layout Randomization* (ASLR) feature loads system code in different locations in memory each time the computer boots up. This seemingly simple change stymies a class of well-known attacks in which exploit code attempts to call a system function from a known location.

64-bit editions of Vista only allow digitally signed device drivers to be installed. This feature, called *PatchGuard*, ensures that kernel-level code is from a known source and has not been altered.

The Enterprise and Ultimate editions of Vista offer data encryption, which allows you to encrypt entire hard drives, making the data completely inaccessible to anyone that steals the computer. Bear in mind, if you forget the password, there’s no way to access the drive and it’s adios muchachos!

Through the use of group policies, you can even control the use of removable storage devices to help prevent data theft and the introduction of viruses.

Installer detection technology is a new feature that determines when you launched an installation process, and causes the OS to request credentials at the time the process is launched rather than waiting until the installer actually attempts to write to a protected location. Using this technology, when you are logged on as a regular user and want to install a program, you’ll be prompted with a UAC dialog for administrative credentials. This will also happen when you uninstall a program. And even if your account has administrative rights, you’ll get a confirmation dialog before the installation proceeds.

As mentioned earlier, Windows Vista includes Windows Defender, an anti-spyware program. In addition to its real-time protection for spyware-like behavior, Windows Defender also scans your computer’s files periodically, looking for known spyware. Once installed, most spyware programs are configured to run automatically each time you start your computer. Windows Defender includes a Software Explorer component that provides comprehensive information about all startup programs and other risk-prone program types, along with tools for disabling any of these programs. Windows Defender runs as a service, which allows it to provide protection for all users on your computer. The Windows Defender user interface runs in the context of the current user, and therefore, UAC elevation is required for some actions, but the scanning and spyware removal is done by the service, and without the need for administrative privileges.



The Run command

The Run command is no longer part of the default Start menu. It's not needed because you can type the command into the Start menu's *Start Search* box. If you want the Run command on your Start menu, you can add it by checking the *Run Command* check box in the *Customize Start Menu* dialog box.

You can also get to the Run command by pressing *Windows logo key + R*.

Running programs written for an earlier version of Windows

Vista has the capability to run a program using one of five compatibility modes, Windows 95, Windows 98 / Windows Me, Windows, NT 4.0 (Service Pack 5), Windows 2000, or Windows XP (Service Pack 2). You can either use the Program Compatibility Wizard (*Control Panel... Programs... then, under Programs And Features, click Use An Older Program With This Version Of Windows*), or you can modify the properties of the program's shortcut (right-click the shortcut... *Properties... Compatibility tab...*).

Running in compatibility mode sometimes works, sometimes doesn't. A lot of older programs run just fine in Vista without using compatibility mode. Less complex programs have a much better shot at working than something like a pre-Vista version of AutoCAD (any AutoCAD version before 2008 will not run in Vista).

New Task Manager features

Vista Task Manager has a new feature that allows you to find out which process is associated with a given application. Right-click the application on the Applications tab, and choose *Go To Process* from the shortcut menu.

There are two new tabs in Task Manager, *Services* and *Users*.

The *Services* tab lists all the services running on the computer. And if you right-click a process on the *Processes* tab, you'll see *Go To Service(s)* option. Using this option will take you to the *Services* tab and show you the associated service for that process. If there is no service associated with the process, no service will be highlighted. Conversely, if you right-click a service, there's a *Go To Process* option. Lastly, there is a *Services...* button on this tab that takes you directly to the *Services* console.

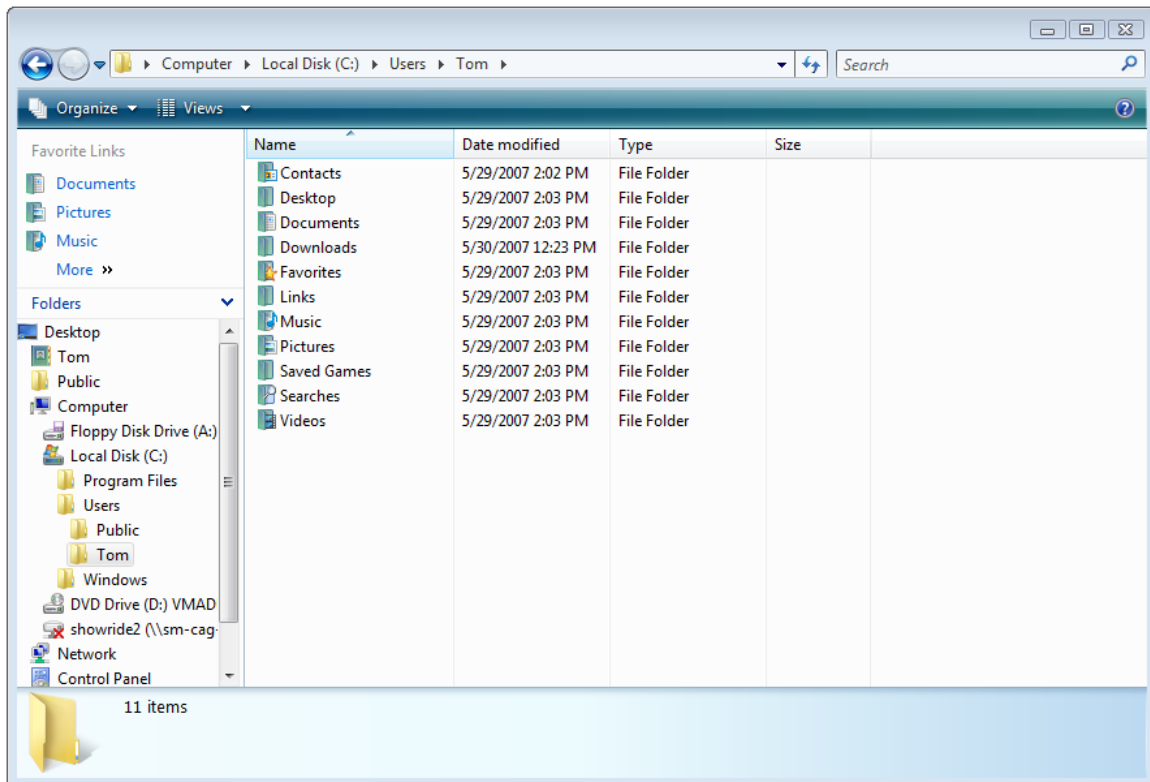
The *Users* tab displays the list of users logged on to the system. This tab gives you the ability, when *Fast User Switching* is enabled, to connect to another login session by selecting a disconnected user and then clicking the *Connect* button. When a computer is used by multiple people, disconnecting the session rather than locking the session, is preferable because the computer is still available to others users. And disconnecting is just as secure as locking the computer. By default, *Fast User Switching* is disabled when the computer is joined to a domain. The feature can be enabled by starting the *Fast User Switching Compatibility* service.

Here's a little extra Task Manager info. When you shut down an application by clicking the *End Task* button on the *Applications* tab, the effect is the same as if you had chosen to shut down the program using its menus or by right-clicking its taskbar button and choosing *Close*. If the program can respond to the shutdown request, it should prompt you for confirmation or give you a chance to save open files,

if necessary. By contrast, the *End Process* button on the *Processes* tab zaps a process immediately and irrevocably, closing any open files without giving you a chance to save them. Whenever possible, you should try the *End Task* option first and reserve the drastic *End Process* option for situations in which you have no alternative.

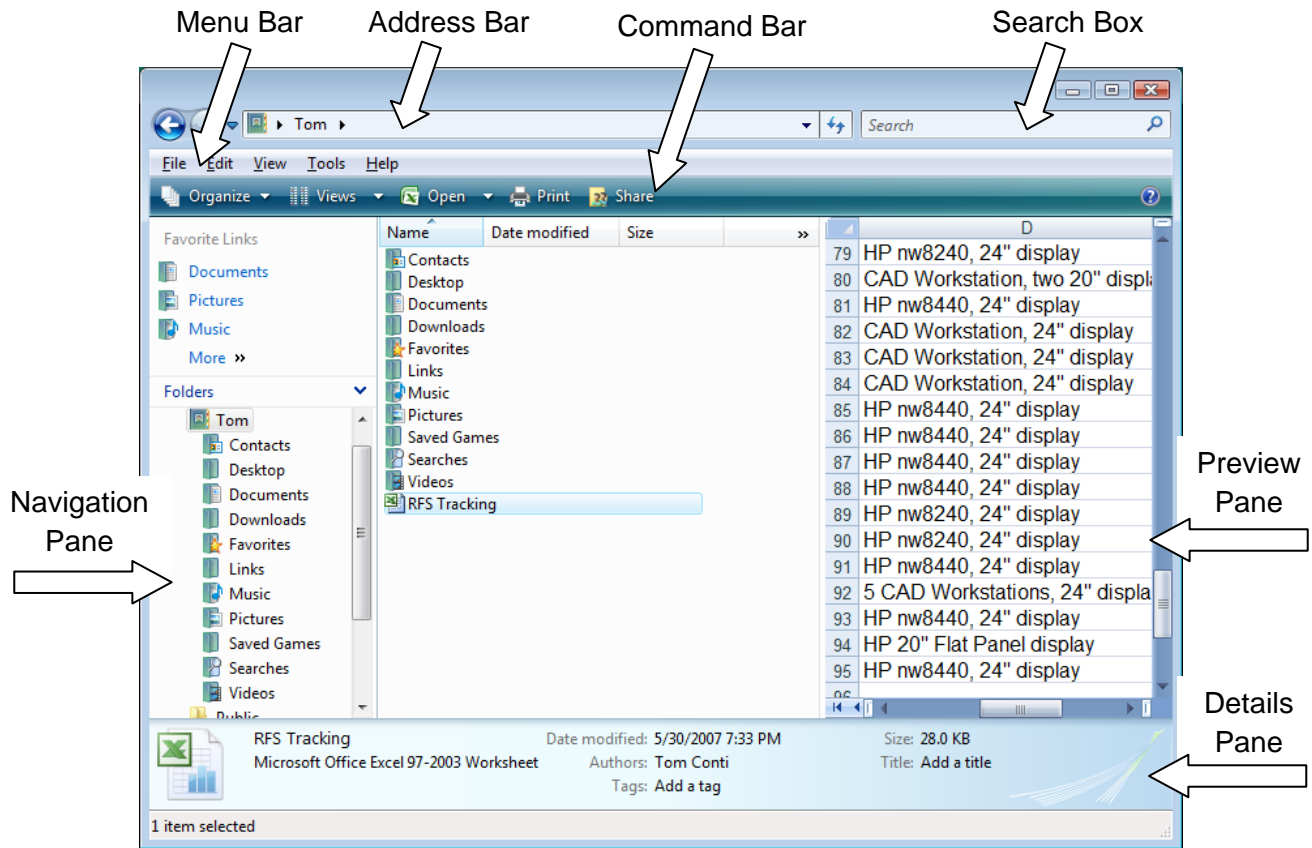
Windows Explorer

Windows Explorer in Vista has a new look and added functionality. Below is the default appearance of Explorer.



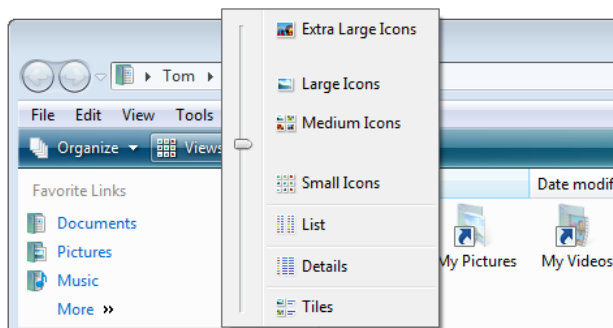
There are a number of optional features you can turn on, including the Menu Bar, Details Pane, and Preview Pane, by going to *Organize*, then *Layout*. The Menu Bar will add the familiar menu items (File, Edit, View, Tools, and Help) that we're used to seeing, although most of the menu choices are available via right-click menus. The Details Pane displays the file name, type, date modified, size, and date created. The Preview Pane lets you view the contents of the selected file without opening it. You'll find that you need the Vista-compatible version of programs for the preview to work.

With everything turned on, Explorer looks like this.



Notice that even though the current view is set to display the contents as a list, the detail columns still show up but are not populated.

As with previous versions of Windows, you can choose between displaying the contents as different size icons or as a list. But Vista gives us a very nice new feature for sizing the icons. Click the *Views* drop-down list and you'll find that you can select the predefined sizes or you can use the slider bar to adjust them to your desired size.

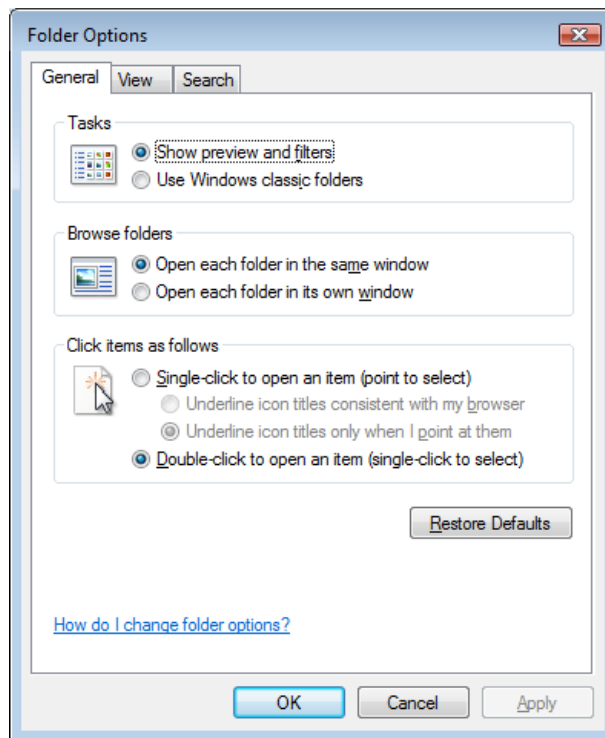


You can have your view options be per folder or the same for all folders. If you want them all to look the same, set one the way you want it then go to *Organize... Folder and Search Options...* (or *Tools...*



Options...), on the *View* tab, turn off the check box for *Remember each folder's view settings*, *Apply*, then *Apply to Folders*. This will apply the settings to all folders of this type. Note that it applies to all folders of *this type*. In Windows XP, if you set your view to show details and then applied the folder settings to all folders, it did indeed do it for all folders, including things like Control Panel, which doesn't make much sense to view details. Vista fixes this. If you want to know which folder type you're in, right-click in the blank space of the folder and choose *Customize This Folder...* on the *Customize* tab of the Properties dialog, you'll see a drop-down list for *Use this folder type as a template:*. The current value will be in the text box. Click the arrow and you'll see your choices, *All Items*, *Documents*, *Pictures and Videos*, *Music Details*, and *Music Icons*. By default the folder type is *All Items*. You can use this dialog to change the folder type. This value is obviously intended for data files, and you will not see this tab available in locations not intended for user data, like C:\, C:\Windows, and C:\Program Files.

You'll notice when you go to *Folder Options...* that the *File Types* and *Offline Files* tabs aren't there.



To change a file's association, right-click on a file, click *Open With*, then *Choose Default Program...* You could also do it this way in XP. Offline files are enabled by default. You can enable and disable them in *Control Panel*, *Offline Files*. To make a network file or folder available when offline, right-click the file or folder then click *Always Available Offline*.

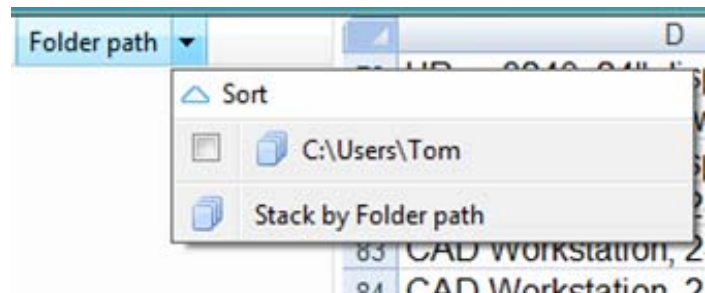
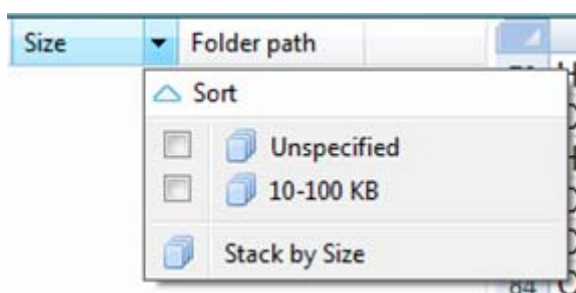
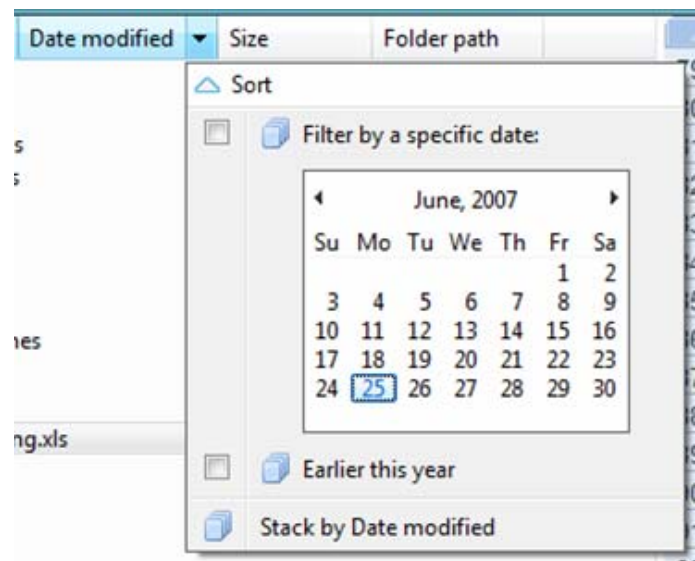
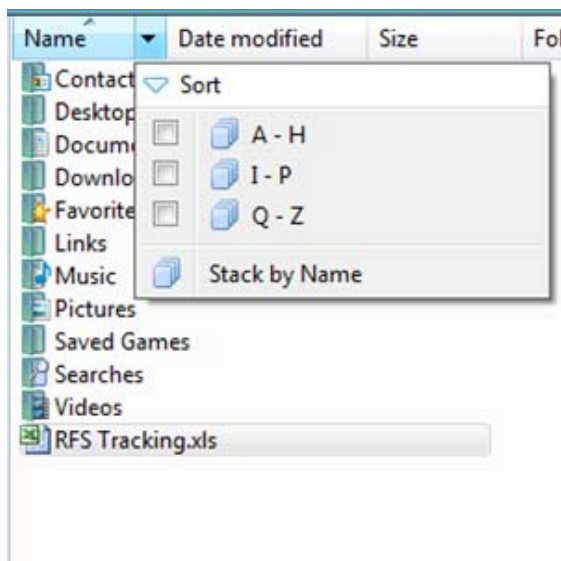
Note, you can also get to the *Folder Options* dialog by typing *Folder* in the Start menu's *Start Search* box.

The address bar no longer shows you the full path of the current folder in the traditional way. If you need to use the traditional full path, right-click in the Address bar and select *Edit Address*. There are

also options to *Copy Address* and *Copy Address as Text*. *Copy Address* will paste in the path as a link, whereas *Copy Address as Text* pastes in the path as text.

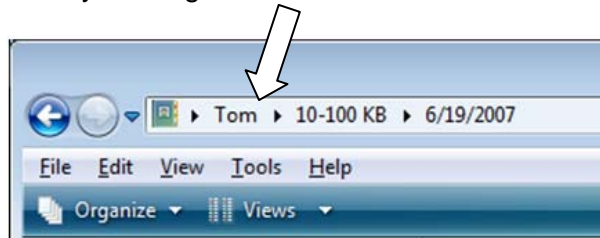
Typing text in the *Search* box will launch a search starting at the current folder. You don't have to press *Enter* for the search to start, it starts as soon as you type something into the *Search* box.

Vista's Explorer has two new capabilities, *Filtering* and *Stacking*. Filtering allows you to group the contents of the folder by common detail groups and/or by file type. To get to the filter dialog, move your mouse over any of the detail column headers, you'll see a down arrow appear to the right of the name. Click the arrow and the filter options for that column will appear.

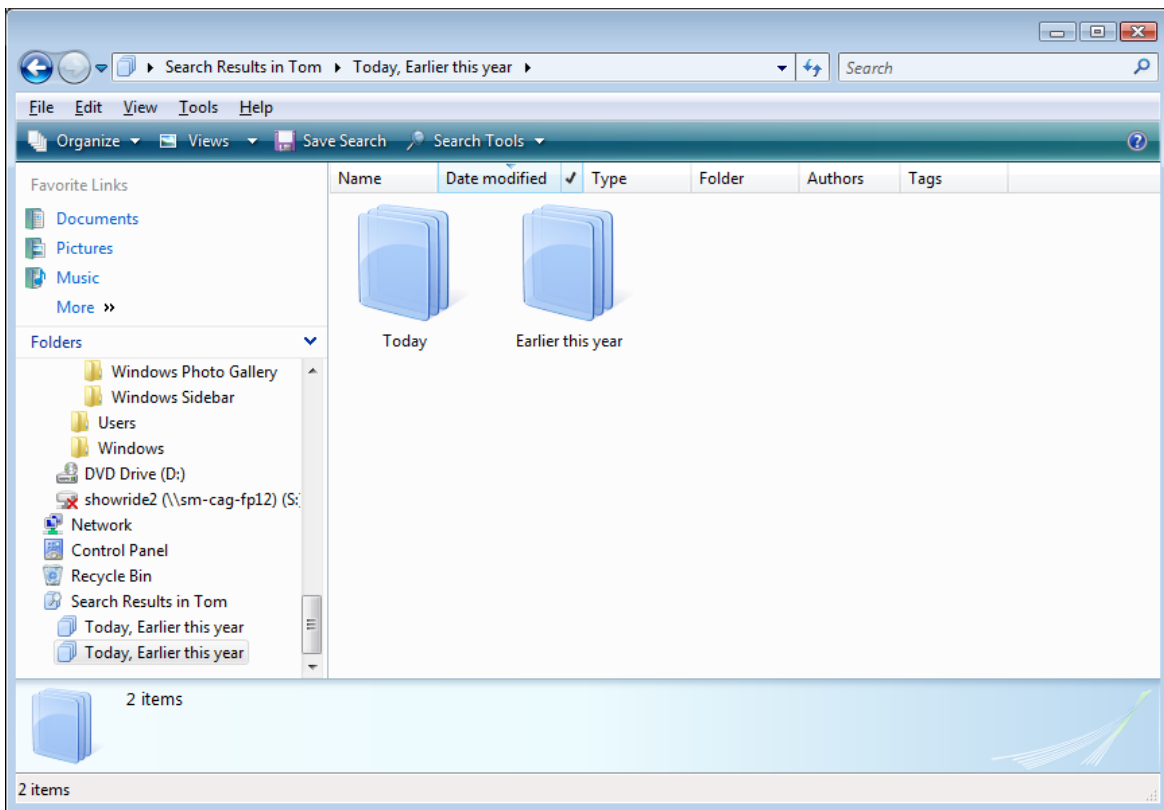


You can also filter by multiple filter options. When you select multiple filter options in one detail heading, Windows displays items that match any of the selected boxes. When you select filter options from multiple columns, Windows displays items that satisfy the criteria applied to each column, doing a Boolean AND for the filter options of each column. Using filters is the same as doing a search using that criteria.

To clear the filter options, you can selectively clear the selection in a particular column heading. You can clear all of the filters at once by clicking to the left of the filter criteria in the Address bar.



Stacking a folder produces a set of virtual folders, each of which contains the results of a separate filtering operation. To create a stack, select the *Stack* option at the bottom of the filter list.



Notice that the Address bar starts with “Search Results”. The next time you open the folder, it will have its usual appearance. You will need to re-do the stack if you want to see it again. You can, however, save the stack using the *Save Search* button on the Command bar.



New Search Features

Speaking of searching, the Windows search has been re-vamped, providing a fast indexed search. If you loved the little search dog (or other search assistant), you'll be sorry to hear he's (they've) been retired.

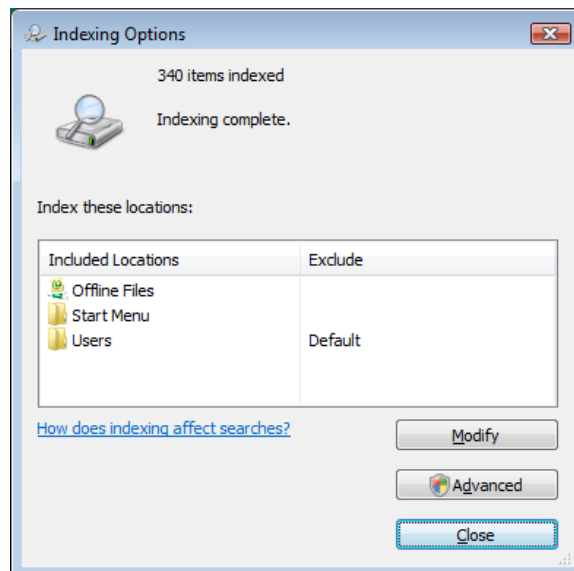
Microsoft introduced indexed searching with Windows Desktop Search for Windows XP, and Windows Vista incorporates indexing into its search.

Indexing keeps track of the files on your computer. In addition to storing information like the file name, date modified, and properties like author, tags, etc., it can also index the contents of your files and emails. Indexing makes searching for files much faster. Instead of looking through your entire hard disk for a file name or file property, Windows scans the index, which allows most results to appear in a small fraction of the time that a search without the index would take.

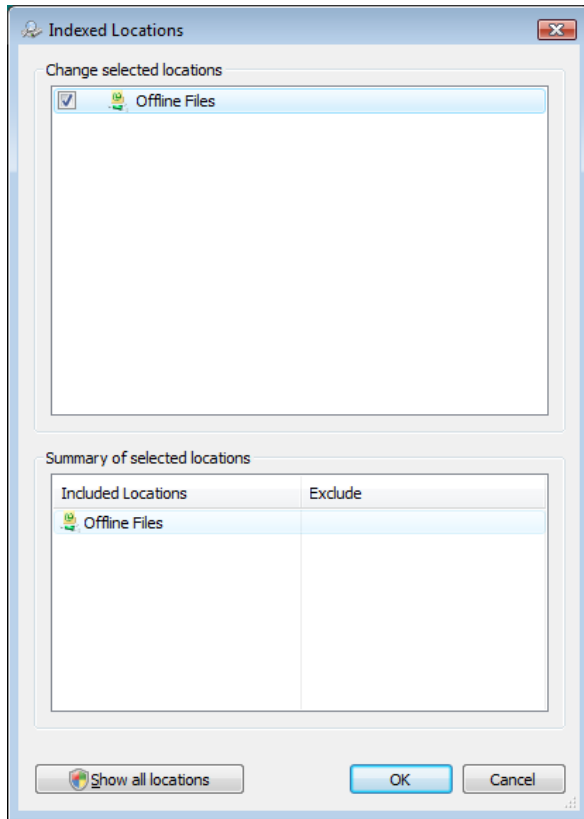
By default, all of the most common user files on your computer are indexed. Indexed locations include all of the files in your personal folder (such as Documents, Pictures, Music, and Videos), as well as e-mail and offline files. Files that are not indexed include program files and system files.

You may think, "Why don't I just index my entire computer?" You only want to index locations that you commonly want to search. Generally speaking, the C:\Windows and C:\Program Files folders, and their sub-folders, are not locations you need to include in your index. They will add thousands of entries to the index, resulting in longer search times. The fewer locations you index, the faster your searches.

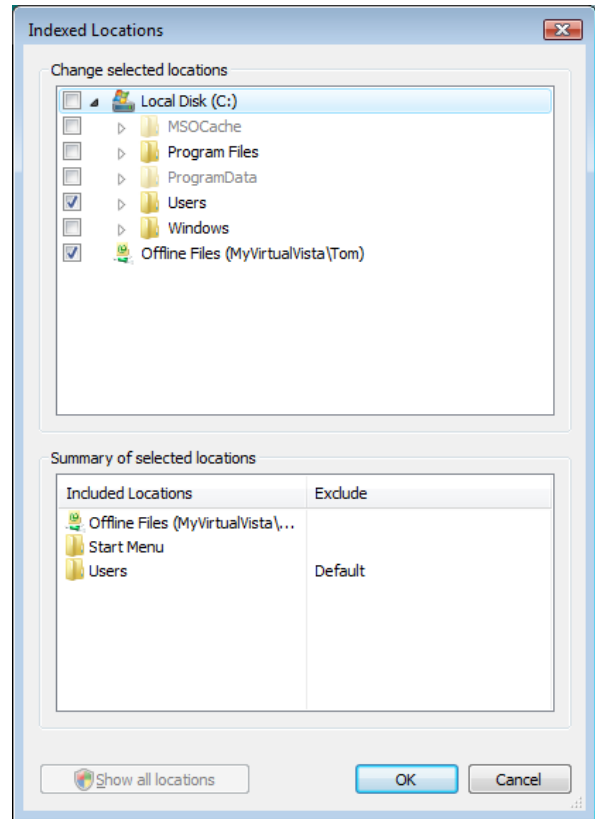
To add more locations to be indexed, go to *Control Panel... Indexing Options*, or enter *index* in the Start menu search box. Once there, click the *Modify* button.



Indexing Options dialog



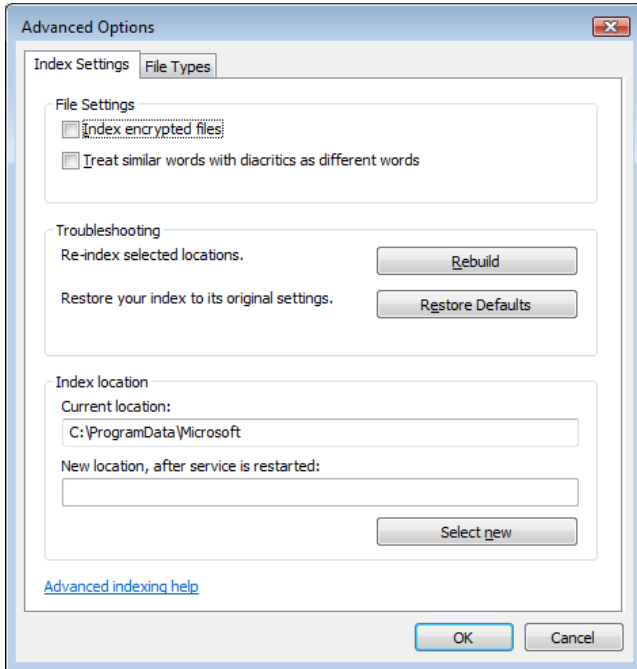
Indexing Options, Modify dialog



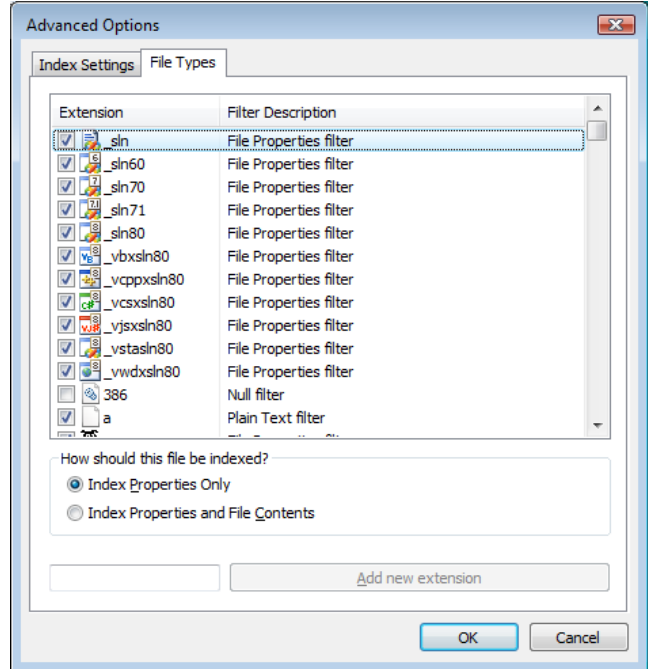
Indexing Options, Modify, Show all Locations dialog

If you don't see all of the locations on your computer in the *Change selected locations* list, click the *Show all locations* button. If you want to include a folder but not all of its subfolders, expand the folder, and then clear the check box next to any folder you don't want to index. These folders will appear in the *Exclude* column of the *Summary of selected locations* list.

If one of your hard drives is faster than the others, configure indexing to keep the index on the fastest disk. By default Vista puts the index in C:\ProgramData\Microsoft. You can change this by going to *Advanced* in *Indexing Options* and enter a new location in the *Index location* section of the dialog.



Indexing Options, Advanced dialog



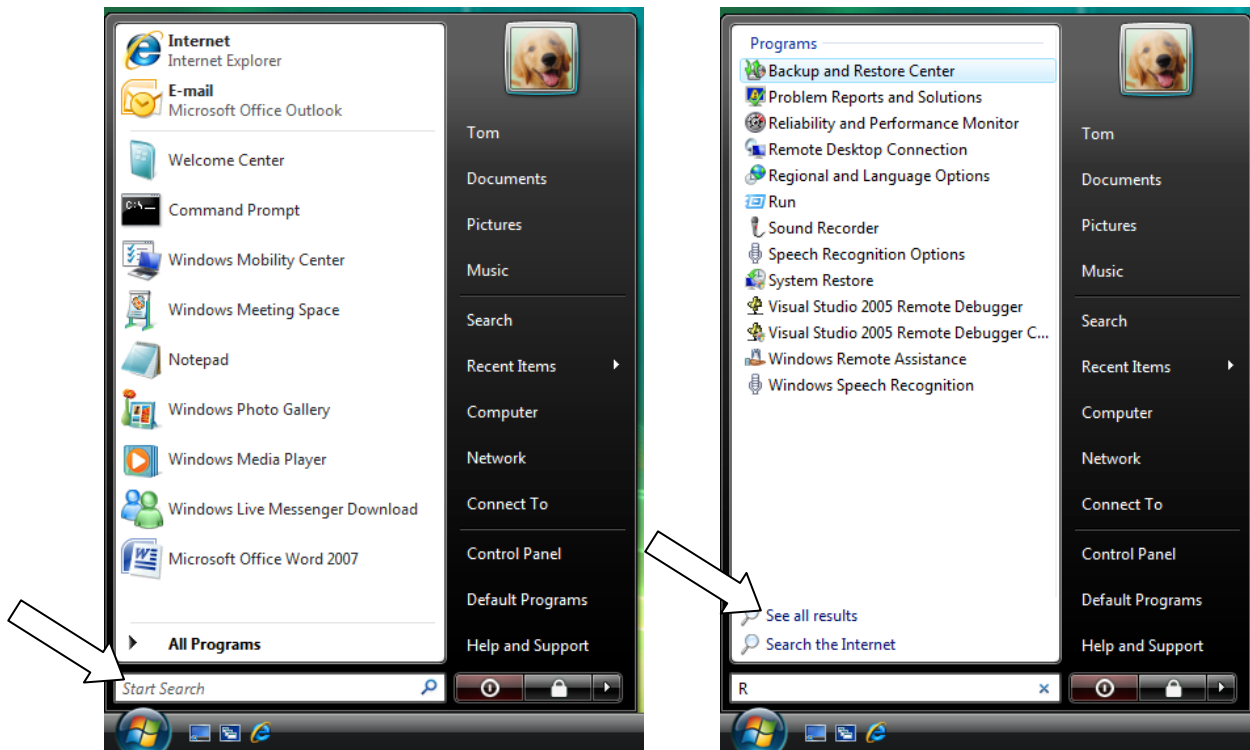
Indexing Options, Advanced dialog, File Types tab

In theory it should never happen ('course in theory you should never get the Blue Screen Of Death, either), but if your index stops working for any reason (for example, if searches that are ordinarily quick are taking a long time), click *Rebuild on the Index Settings* tab of the Advanced Options dialog box. Then give your system time to recreate the index. This can take quite a while if you have a lot of data and especially if you're indexing file contents.

You can add file types to be indexed by going to *Advanced* in Indexing Options, go to the *File Types* tab, type in the extension and click *Add new extension*.

You can also specify which file types will have the only file properties indexed or the properties and the contents of the files indexed. This is also done on the *File Types* tab.

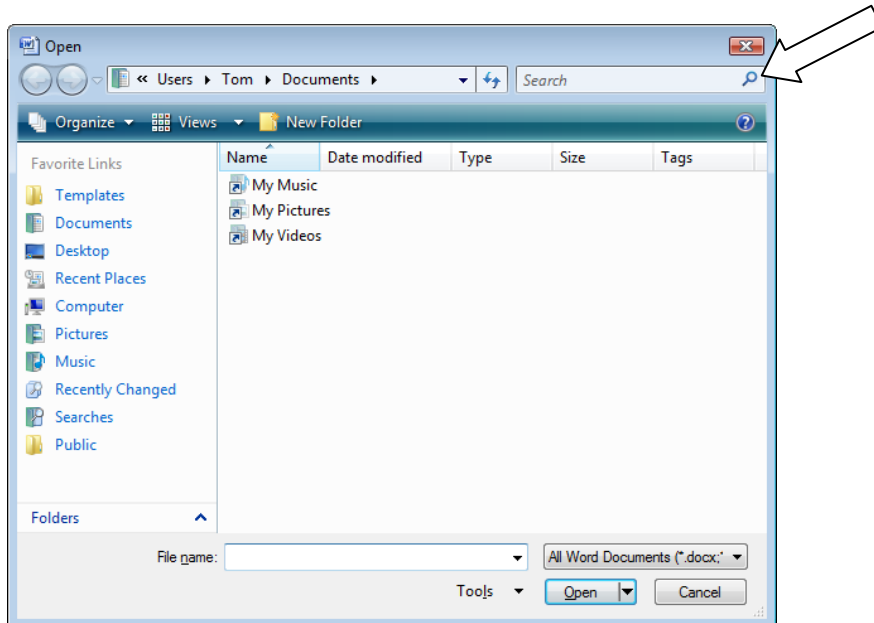
You can search from a number of places in Vista. One is the *Start* menu's *Start Search* box.



Start menu Search box

Just start typing what you're looking for. The Start menu search is designed to find programs in your *Start* menu, and initial results will only show those. Search keeps refining the results for every character you type. You can click *See all results* if you want to see the index search results.

As mentioned earlier, you can search using the search box in Windows Explorer. The same search box is incorporated into many other Vista dialogs, like the common dialogs (like Open and Save).





And of course you can open the Search dialog by going to *Search* on the *Start* menu. From anywhere in Windows you can also go directly to the Search dialog by pressing the *Windows logo key + F*. From Windows Explorer or the desktop, you can also get there by pressing *F3*. The two shortcuts are not the same, however. *Windows logo key + F* sets the search scope to the Indexed Locations. *F3* sets the scope to whatever folder you were in when you pressed it (or to the desktop, if you started there).

Search ignores capitalization, accents, umlauts, etc. If you need to distinguish, for example, between *fur* and *für*, go to *Indexing Options, Advanced*, and turn on the check box for *Treat Similar Words With Diacritics As Different Words*.

Another really nice feature is the ability to refine the search based on the results. Say you do a search that results in several hundred matches. You can add a second criterion using the *AND* conjunction and quickly narrow it down. You can also specify criteria based on different properties, like author or subject. To search using a properties the syntax is *propertyname:value*. For example, you could do a search using

`author:tom AND subject:budget`

You can also use *OR* and *NOT* when doing multiple criteria. *OR* is assumed if you enter multiple criteria without a conjunctive.

`author:tom subject:budget` is the same as `author:tom OR subject:budget`

Conjunctives must be entered in upper case or they'll be treated as additional search criteria.

Let's say you want to search for `author:bill`. To not get back results with authors Billy, Billie, or Newbill, put double quotes around Bill, i.e., `author:"Bill"`. Enclosing in double quotes is also used for searching for phrases.

You can search for files based upon the file's date. For example, you could use...

`date modified:6/1/07`

Or you can use the *<* or *>* signs to search for files with dates before or after the date specified.

`date modified:>6/1/07`

...would give you files modified after 6/1/07.

What if you're not sure which property you need to search? No worries. Using the examples above, you could do a search using...

`budget AND date modified:>6/1/07`

...and the results will be files that were modified after 6/1/07, and had any property that contained *budget* or, assuming that you're searching content, too, has *budget* anywhere in the file.

Remember that, by default, file types like *.xls* and *.doc* are configured to index file properties and contents. This often produces more matches than anticipated. If you want to search for a particular file type, searching for *doc* will result in files that have *doc* anywhere in the name or in the contents, whereas **.doc* will result only in file names that end in *.doc*.

There is a *Save Search* button that appears on the Command bar of the search results dialog to preserve the search specification for later reuse. The saved search is stored in `%UserProfile%\Searches`, and one of the default shortcuts in the Favorite Links list (at the top of the Navigation pane in Windows Explorer) points to this folder.



Previous Versions

This new feature in Windows Vista keeps daily iterations, called shadow copies, of your documents and folders, recording a change history at periodic intervals and allowing you to turn back the calendar if you delete a file or damage it beyond repair. To configure this option, go to *Control Panel... System... System Protection*. This feature is not available in Windows Vista Home Basic or Windows Vista Home Premium.

Drivers

Always remember. Good drivers are the key to happiness for your computer! They're more important than lots of memory, a fast processor, etc. Without good drivers, your system will not be stable.

An interesting note. The Windows Vista DVD includes more than 19,500 drivers, and there are over 10,000 more signed drivers available through Windows Update. You'd think that be enough, but there are still lots and lots of things without Vista drivers. We'll talk more about that later.

In Windows Vista, you do not have to be an administrator to install drivers. Windows will check the current driver installation policy to determine whether installation is permitted. When you install a new Plug and Play-compatible device, Windows checks the driver store first. If it finds a suitable driver, installation proceeds automatically. If no compatible driver is available, you're prompted to search for driver software.

By default, Windows Vista installs drivers from trusted publishers without prompts and never installs drivers from publishers that the user has chosen not to trust. Domain administrators can override these settings using group policy.

So how does Vista handle different types of drivers?

- The highest level of trust is assigned to drivers that are signed by Microsoft's Windows Hardware Quality Lab (WHQL) through the Windows Logo Program. WHQL-signed drivers can be installed by any user, on any 32- or 64-bit version of Windows Vista, without any warnings or request for consent.
- Drivers can also be signed by third parties using Authenticode signatures, which use a certificate that is issued by a Certificate Authority whose certificate is stored in the Trusted Root Certification Authorities store. If an Administrator has added the publisher's certificate to the Trusted Publishers store, the driver can be installed with no prompts by any user.
- If a driver is signed by a publisher whose certificate is not in the Trusted Publishers store, it can be installed by an administrator only. Installation will fail silently for users who are not members of the Administrators group. An administrator can also choose to add this type of signed driver to the driver store, after which it can be installed by any user with no prompts.
- Drivers that are unsigned, or with a signature that is invalid or cannot be verified by a trusted Certificate Authority, or with a digital signature that has been altered, can be installed by an administrator on 32-bit (x86) versions of Windows Vista but cannot be installed on any 64-bit (X64) version of Windows Vista.

If you do not have a Vista driver, you can try a Windows XP or Windows Server 2003 driver. Drivers written for any earlier version of Windows have very little likelihood of working. Just say no!



Have you ever wanted to get a list of all installed drivers? You could go through all the devices in Device Manager and make notes about each one. Or you can use a command line utility called *driverquery*. Enter *driverquery* with no options and a list of all installed drivers, including their names, display names, driver type, and link dates, will go scrolling by. Type *driverquery /?* at a command prompt for options and syntax examples. To re-direct the output to a file, enter *driverquery > [path\filename]*.

Windows Vista no longer has hardware profiles. Pretty much all modern hardware devices are capable of installing and uninstalling dynamically, making hardware profiles unnecessary.

Allow me to reiterate one point. Good drivers are the key to happiness for your computer! They're more important than lots of memory, a fast processor, etc.

System Restore

By default, Windows uses up to 15 percent of a drive's available space to save restore points. The minimum space required is 300 MB. In Windows XP, the amount of space set aside for System Restore was configurable on the *System Restore* tab of the *System Properties* dialog box. This option is no longer offered in Windows Vista. You can, however, reduce the amount of space used by System Restore by opening Registry Editor (*regedit.exe*) and navigate to the key `HKLM\SOFTWARE\Microsoft\WindowsNT\CurrentVersion\SystemRestore\Cfg`. In the right hand pane, double-click the *DiskPercent* value and adjust it from the default setting of 15 to a number you find more reasonable. Note that this percentage applies to all monitored drives and cannot be configured individually.

To see how much space System Restore is currently using, open a Command Prompt window and enter the following command...

```
vssadmin list shadowstorage
```

Note, you need to run this command using elevated administrator privileges. Here's the type of information you'll get back when running this command.

```
vssadmin 1.1 - Volume Shadow Copy Service administrative command-line tool  
(C) Copyright 2001-2005 Microsoft Corp.
```

```
Shadow Copy Storage association  
For volume: (C:)\?\Volume{07728e81-0e16-11dc-a3bd-806e6f6e6963}\  
Shadow Copy Storage volume: (C:)\?\Volume{07728e81-0e16-11dc-a3bd-806e6f6e69  
63}\  
Used Shadow Copy Storage space: 2.508 GB  
Allocated Shadow Copy Storage space: 2.79 GB  
Maximum Shadow Copy Storage space: 3.222 GB
```

The default location for System Restore data is *d:\System Volume Information*, where *d* is the letter of each drive. Each restore point is stored in its own subfolder, under a name that includes a unique 32-character alphanumeric identifier called a GUID (Globally Unique Identifier). This location cannot be changed. On an NTFS drive, these files are not accessible to users, even those in the Administrators group; the default NTFS permissions grant access only to the System account.

If you've set up a dual-boot system with Windows XP and Windows Vista on the same system, you should be aware of one unfortunate side effect caused by this configuration. When you boot into



Windows XP, the system wipes out all restore points created by Windows Vista. This unfortunate state of affairs is caused because Windows XP doesn't recognize the format of the newer restore points; assuming they're corrupt, it deletes them and creates new ones.

XML Paper Specification (XPS)

Going head-to-head with Adobe's .PDF format is Microsoft's new .XPS format, XML Paper Specification. Like PDF, XPS is a non-editable version of your document. XPS is included in Windows Vista and Microsoft Office 2007. You can create XPS documents with Windows XP if you have Microsoft .NET 3.0 installed. Microsoft also offers a free XPS viewer (<http://www.microsoft.com/whdc/xps/viewxps.mspx>).

You create XPS docs from any application by printing using the XPS Document Writer. There is also a free download (<http://www.microsoft.com/downloads/details.aspx?FamilyID=4d951911-3e7e-4ae6-b059-a2e79ed87041&DisplayLang=en>) that allows you to *Save As XPS* directly from Office 2007 programs.

XPS documents feature support for high-fidelity text and graphics. When the document is magnified, the text always appears smooth, clear, and accurate at any size.

You also can digitally "sign" XPS documents to ensure their integrity as they travel from point A to point B. For example, in a corporate environment that supports document signing certificates, you can digitally sign an XPS document directly within the XPS Viewer. In many countries, these digital signatures are considered to be legally valid signatures. If the document is modified or tampered with by a malicious individual, recipients viewing the changed document are notified that the signature is no longer valid.

If your company has already deployed Microsoft Windows Rights Management Services (RMS), you can use those services to add an additional layer of protection to your XPS documents. With built-in RMS support, you can set specific access permissions to any XPS document, allowing you to protect sensitive information even after the document is published and shared. You can use the XPS rights management capabilities to designate who can read your document, copy text from it, or print it. With XPS Rights Management Services, you can even set an expiration date after which access to the document is no longer enabled.

XPS is the basis for Vista's new printing infrastructure. Microsoft says that pairing with an XPS-enabled printer will yield greatly improved performance and quality (I haven't seen this so I can't say yes or no).

A closing note on XPS. You'll find that many of the white papers on Microsoft's site are now only available in XPS format.

Misc. Information (also known as "Did you know...?")

When you format a volume, you are warned that you will no longer be able to access the data. This is a true statement. However, whatever data is on the volume when you format it is really still there. So how can you make sure the data is really gone? The *format.com* command in Windows Vista has a new option, */P*. Using this option causes the *format* command to zero out every sector on the volume. The syntax for this option is */p:x*, where *x* is the number of passes. You cannot use */P* with */Q* (quick format). You can also wipe the disk after you format it, use *cipher.exe* with the */W* option, which will



remove data from available unused disk space on the entire volume. If you run this immediately after formatting the volume, it will remove everything. And keep in mind that using the `/P` option will greatly increase the time it takes to format the drive.

Windows *SuperFetch* enables programs and files to load much faster than they would on Windows XP–based PCs. When you're not actively using your computer, background tasks—including automatic backup programs and antivirus scans—run when they will least disturb you. These background tasks can take up system memory space that your programs had been using. On Windows XP–based PCs, this can slow progress to a crawl when you attempt to resume work. *SuperFetch* monitors which applications you use the most and preloads these into your system memory so they'll be ready when you need them. Windows Vista also runs background programs, like disk defragmenting and Windows Defender, at low priority so that they can do their job but your work always comes first.

If you receive an error message indicating a damaged system file while you are running Windows and you have an account with administrative privileges (or access to elevated credentials), try running the command-line utility *sfc*. Open the *Start* menu... *All Programs*... *Accessories*, right-click *Command Prompt*, and choose *Run As Administrator*. Respond to the UAC prompt. Then, in the Command Prompt window, type `sfc /scannow`. The utility will scan your system files and attempt to repair any damage that it finds. It might prompt you for Windows Vista distribution media in order to carry out its repairs.

There's a new performance feature called *ReadyBoost*. *ReadyBoost* technology takes advantage of the fact that flash memory offers lower seek times than hard disks. Essentially that means that your system can get to a given location on a flash disk more quickly than it can to a corresponding spot on a hard disk. Hard disks are faster for large sequential reads; flash disks are quicker for small, random reads. When a supported external memory device is available, *ReadyBoost* caches small chunks in flash memory and is thus able to retrieve those chunks, when needed, more quickly than it could if it relied only on the hard disk. Because an external memory device can be removed without warning to the system, all data cached via *ReadyBoost* is encrypted and backed up on the hard disk (as well as being compressed). Encryption ensures that the data can't be read on another system, and backup enables Windows to revert to the hard disk cache in the event that the *ReadyBoost* drive is removed. *ReadyBoost* does not support external card readers. If Windows Explorer shows a volume letter for a drive without media (as it does, for example, for card-reader drives or floppy drives), inserting flash media for that volume letter will not give you a *ReadyBoost* drive. In addition, Windows Vista does not support multiple *ReadyBoost* drives. Windows Vista supports the following form factors for *ReadyBoost*:

- USB 2.0 flash disks
- Secure Digital (SD) cards
- CompactFlash cards

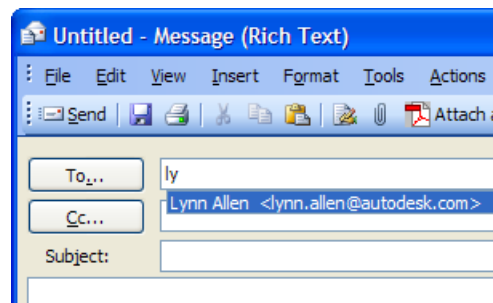
AutoCAD uses `.scr` files for script files. Windows uses `.scr` for screen saver files. If you don't have AutoCAD installed, you can double-click a `.scr` file and launch the screen saver. When you install AutoCAD, it changes the file association for `.scr` files to AutoCAD scripts. If you want to change this back, go into the Registry Editor (`regedit.exe`) and delete the key `HKEY_CURRENT_USER\Software\Classes\.scr`.



And here are a couple of Outlook tips (no extra charge!).

Do you know that you can make the Outlook icon show up in the System Tray instead of on the Taskbar? Simply right-click the Outlook button in the Taskbar and click *Hide When Minimized*.

And do you like using the autocomplete functionality when addressing an email? Have you ever got a new computer and had to rebuild your autocomplete list? You can copy the autocomplete list from one computer to another. The file is *Outlookprofilename.nk2*, and is located in `C:\Documents and Settings\username\Application Data\Microsoft\Outlook`.



Do you know that a personal folder file (.PST) has a maximum size of 2GB? And if it reaches that size, end of story. You can't access it any more. So what do you do then? I'll tell you what you do. You buy a program called Easy File Recovery (<http://www.ontrackdatarecovery.com/file-recovery-software/>). If you run into this problem, this program is a lifesaver.

The Wrap-Up

So in the end, the question is, "Is Vista ready for primetime?"

Some of what makes Vista better is what makes Vista worse. Everyone wants Windows to be more secure and less susceptible to virus and malicious attacks, but the price for this is stricter control over what gets installed and what's allowed to run.

That includes drivers. Vista comes with thousands of drivers, but there are still many hardware devices that aren't supported. Before moving to Vista make sure your critical hardware is supported or the manufacturer has Vista drivers. And try to only use drivers that are WHQL-signed drivers. Don't try to use a driver intended for an earlier version of Windows. While it is possible to use unsigned and un-certified drivers, you should do so only if you are 100% sure of their reliability and safety.

You may want to use Vista only on new systems you purchase. Unless you special order your computers with XP, they're going to come with Vista and hopefully were fully tested. If you're thinking about putting Vista on your existing computers, think of it this way, the older the computer, the more likely you're going to run into problems.

And you'll find that there are lots of applications that will need to be upgraded to be able to use them in Vista. Take AutoCAD. The only version that works in Vista is 2008. Before moving to Vista, make sure you can run all the software you need to run.



Vista's UAC is a key element in its defense against viruses and other attacks, but it'll be very tempting to turn this off. As annoying as the UAC elevation and consent dialogs can be, they're your first line of defense for your computer.

And finally, Microsoft has Vista Service Pack 1 (SP1) coming out in 2008. Windows has millions of lines of code. Will it ever be perfect? Nope. So there will always be fixes and improvements. In Microsoft's own words, "Windows Vista SP1 is an update to Windows Vista that addresses feedback from our customers. In addition to previously released updates, SP1 will contain changes focused on addressing specific reliability and performance issues, supporting new types of hardware, and adding support for several emerging standards. SP1 also addresses some management, deployment, and support challenges." If you're not in a hurry, waiting for SP1 may be the way to go for you.