Windows 7 Review

David Solomon's
Windows OS Internals Class
San Francisco, Sep 28-Oct 2

What a difference a few years makes. When Windows Vista debuted in late 2006, I was full of questions: Windows Vista was a big, messy Windows release, delayed time and again, and suffering from too many features and too little cohesiveness. This time around, things are clearer. Windows 7 is less ambitious than its predecessor, but also a better product. It suffers from none of the aimless feature bloat that plagued Vista upon its release, and none of the aimless uncertainty that followed Vista's five-plus years of development. That the public reaction to Windows 7 has also been universally positive--another sharp contrast with Vista--is also gratifying. Windows 7 deserves the accolades, and it's one of the strongest entries in the Windows family of products ever.

And that makes reviewing Windows 7 difficult. This is a near perfect software release, that rarest of upgrades that improves on virtually everything about its predecessor while losing nothing of serious importance. Yes, there are nits. Sure, I'd have liked to have seen a few components of the OS turn out a bit differently. No software is truly perfect. But you don't have to qualify the successes of Windows 7 as you did with Windows Vista. Windows 7 is just excellent, with no caveats attached. And Windows 7 isn't excellent within the context of its reduced development cycle and the resultant reduced expectations. It's just excellent, plain and simple. No ifs, ands, or buts.

So now that I've completely blown the premise of this review, which will be published over the time leading up to Windows 7's general availability in October, let me at least frame the conversation that will conclude, inevitably, with discussions of unparalleled greatness. Because even though I may have just provided you with a peek at the end of this epic review, there's still a lot to discover.

Here, in Part 1, I'd like to put Windows 7 in perspective. How has the world changed since XP first appeared eight long years ago? Windows 7 is being born into a sharply different environment than its most popular predecessor. But the parallels between XP and Windows 7 are many.

In Part 2, I will examine the all-important task of picking the proper Windows 7 product edition. This is again an issue because Microsoft has saddled its users with too many choices, though there are certainly fewer valid possibilities than before. I've already provided the most thorough and comprehensive Windows 7 product edition comparison available anywhere, but in this review I'll make the decision process simpler than ever, especially for those who don't want to wade through giant charts.

In Part 3, I will explain the various ways in which you can acquire and, if need be, install Windows 7. This includes PC bundles, retail copies, and Windows Anytime Upgrade, but it also includes various installation, upgrading, and migration tasks. I will take the mystery out of moving from your current version of Windows to Windows 7.

Over the next several parts of this review, I will divide up all of the new features in Windows 7 in digestible chunks so you can quickly hop around and find exactly what you need. I've divided up the feature list similarly to how I did so for my Windows Vista review, with subjects like user interface, security, performance, Internet, digital media, and many others.

In the penultimate part of this review, I will examine compatibility--both hardware and software--and explore how Windows 7 sets the stage for a coming generation of Windows products that breaks, finally, with the technological deadwood of the past in ways that are both elegant and seamless.

And then I will attempt to bring it all together with some sort of sweeping conclusion that, again, I assume I'm telegraphing pretty obviously already. As you'll see over the course of this review, there are plenty of small things to complain about. But the big picture with Windows 7 is universally positive. You'd have to be completely clueless--or a deluded Mac fanatic--to think otherwise.

8 years later...

If you're looking for an obvious spiritual predecessor to Windows 7, look no further than Windows XP. That release was basically a more compelling version of its own predecessor, Windows 2000, and featured a new UI, much better compatibility with devices and software, Windows XP also marked the death of the old-fashioned, DOS-based Windows products that had previously dominated the consumer landscape and offered up a number of end-to-end experiences that significantly simplified how users completed certain multi-step tasks (like acquiring digital photos) that we now take for granted. It arrived at the dawn of a new era of wireless home networking.

By comparison, Windows 7 is also a more compelling version of its predecessor, Windows Vista, offering enhanced usability, dramatically better performance, and new seamless compatibility options that were unavailable just a few short years ago. Windows 7 will also mark the death of an increasingly obsolete predecessor, in this case Windows XP, which has been granted an unusually long life cycle because of customer indifference to Vista. It will also usher in an era of pervasive 64-bit computing in a way that was only hinted at with Windows Vista. And like XP, Windows 7 expands on the themes of simplification and experiences, providing users with a finely-tuned UI that simplifies common activities. Windows 7, too, arrives at the dawn of an era of pervasive, anywhere/anytime wireless Internet access via 3G and Wi-Fi networks.

Taken as a slice in time, the October 2001 release of Windows XP was a watershed event. But it didn't take long for hackers to uncover an endemic security hole in the product, and Microsoft spent 2002 and 2003 retrenching and then, finally, halting Windows development so that it could rearchitect both the software and its development process to account for the highly-connected, potentially dangerous world in which XP was really being used. The result of this effort, called Trustworthy Computing, has had enormously positive ramifications across subsequent Windows versions and other Microsoft products. (Including Windows 7.)

[Read my original review of Windows XP for some historical perspective.]

On a more positive note, Microsoft used the time between XP and Vista to ship a bewildering number of platform improvements to Windows, most notably through several versions of Windows XP Media Center Edition--which added home theatre capabilities--and Windows XP Tablet PC Edition--which provided pervasive handwriting recognition and pen computing capabilities. Microsoft also innovated with touch computing during this time and with software for so-called ultra-mobile computers, small PCs that pre-dated the current netbook craze by some years. Not all of these efforts were necessarily successful from a commercial standpoint, but each left an indelible mark on the underlying platform.

By the time Vista finally arrived, Windows had undergone seismic changes. Vista brought with it a number of next-generation technologies that, sadly, remain little used today, though they do at least form the basis for further improvements in Windows 7. And many of the original "Longhorn" technologies that were designed to make Windows Vista such a stunning upgrade were dropped or changed over time, or back-ported to Windows XP.

The changes Microsoft made to Windows Vista meant that Windows, again, was ahead of the hardware curve. The system wouldn't run well on many existing PCs of the day, and its vaunted Aero UI required a class of graphics accelerator that some users--especially those with low-end laptops--simply didn't have. Worse, early compatibility issues, though solved within a year, continued to adversely affect public opinion of the product. Many people who had never even used the product assumed it was a dog thanks to clueless pundits and reviewers who had never bothered to correct their wrong-headed early impressions.

That Microsoft built Windows 7 on top of Windows Vista is a tribute to Vista's true worth, because the underpinnings are solid. It's funny to me that those who damned Vista over the past two years are now praising the very similar Windows 7. Yes, Windows 7 has a tweaked UI. And yes, Windows 7 does offer better performance than its predecessor. But in reality, there's not much of a fundamental difference between the two. Windows Vista and 7 share the same hardware requirements, for example, which I believe to be telling. And Windows Vista and 7 share identical hardware and software compatibility models, though Windows 7 does improve on Vista with an interesting virtualization feature that we'll discuss later in the review.

So is Windows 7 just Vista with a bit of eye candy added and some performance tweaks? The cynical might believe so, but let's not get silly. Windows 7 is the sum of hundreds, perhaps thousands, of tiny tweaks, none of which would be particularly interesting in isolation. But taken as a whole, the result is astonishing. Where Vista felt incomplete and scattered, Windows 7 seems polished. Like an Apple product, it appears to be the result of a singular vision, though I'd be surprised if that were really the case.

This kind of refinement is hard to point to in any general way because it's all over the place. Every nook and cranny in Windows 7 has been given the once-over, and where changes needed to be made, they were made. There are big changes, like the new taskbar and the yet-another-version-of-Windows Explorer. But there are also many, many tiny changes. Nothing was overlooked. Nothing major. And nothing minor.

Asking customers to pay for something that is essentially a Windows Vista mulligan sounds ridiculous on

the surface. But time and again, people who see and use Windows 7 are enchanted, and for good reason. Windows 7 is special, and that fact is obvious to anyone who comes in contact with it. In fact, Windows 7 has been so good for so much of its relatively short development cycle that it's become somewhat boring from my perspective as a reviewer. That should be taken as a good sign, however. It means that Microsoft has exorcised the excesses of the past. It is delivering on its promises.

Put simply, yeah, you want Windows 7. The question then, becomes which Windows 7? Which product edition should you pick? I'll help you figure it out in Part 2 of this review.

Windows 7 Review
Part 2: Picking a Product Edition

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When it comes to the Windows 7 product lineup, I've got good news and bad news. The bad news is that Microsoft is once again burdening its customers with a large and unnecessary mix of product editions. The good news? It's a lot simpler than it was with Windows Vista. No, really.

In the good old days of course--I'm referring to 2001 or so--Microsoft made two versions of Windows, one for consumers and one for businesses. These products had different names over the years, and for a while the consumer line was defined by the buggy and ancient DOS-based Windows versions on which Microsoft rode to fame and fortune. This mix of Windows products was many things. But overall, it was simple.

Not anymore. During the lifetime of Windows XP, Microsoft branched out from the consumer ("Home") and business ("Professional") products that originally defined that release and added a number of specialty releases--"high-end" or "premium" SKUs in Microsoft-speak--that extended Windows into then-new markets like the living room ("Media Center") and a new generation of slate and convertible PCs that used handwriting as a primary form of input ("Tablet PC"). There was a 64-bit version ("x64 Edition"). A version for emerging markets ("Starter.") And so on.

In Windows Vista, Microsoft pulled x64 capabilities and the Media Center and Tablet PC technologies into the core OS, which was a hugely positive move. But the number of Windows product editions paradoxically blossomed and grew, which was unfortunate. Really unfortunate. Depending on how you counted, there were 9 Windows Vista product editions. Or 19. Or 219. Whatever it was really was, it felt like a million.

The Windows Vista product lineup wasn't just big, though, it was also a mess. There was no clear upgrade path from edition to edition. For example, Windows Vista Home Premium included some features, like Media Center, that weren't included in Windows Vista Business. The reverse was also true: Windows Vista Business included useful functionality like Windows ShadowCopy that you couldn't get in the Home Premium edition.

By comparison, the Windows 7 product lineup follows a simpler, more logical model. Each product edition builds on the one before it. The lowest-end edition, Windows 7 Starter, serves as a base of sorts. On top of that, in the US at least, Microsoft has added some features to arrive at Windows 7 Home Premium. Add a few more features and you get Windows 7 Professional. Add some more and you're at the top of the heap: Windows 7 Ultimate.

So don't believe the naysayers. Windows 7 isn't that complicated. You just have to look at it the right way.

A product edition matrix

Of course, you could also look at it the *wrong* way, as Microsoft's detractors will do in a bid to over-sensationalize this release. In the following chart, I've provided one sensible view of the actual Windows 7 product lineup.

Windows 7 product edition	Compare with...	32-bit?	64-bit?	Retail price	Upgrade price
Home Basic	Vista Starter	Yes	No	n/a	n/a
Starter	Vista Home Basic	Yes	No	n/a	n/a
Home Premium	Vista Home Premium	Yes	Yes	$200	$120

Professional	Vista Business	Yes	Yes	$300	$200
Enterprise	Vista Enterprise	Yes	Yes	n/a	n/a
Ultimate	Vista Ultimate	Yes	Yes	$320	$220

Whittling down the choices

This still looks somewhat convoluted. But you don't really have that many choices. The first thing we need to do is remove the product editions that simply don't (or shouldn't) apply to you. These include:

Windows 7 Starter. Microsoft's lowest-end Windows 7 product edition will be sold in mainstream markets like the US, but it will only be bundled with very low-end computers such as netbooks (and will only be made available in a 32-bit version). These low-end computers must meet certain requirements before Microsoft will allow PC makers to ship them with Windows 7 Starter. That is, they must include a low-end Atom or comparable processor, 1 GB of RAM, 256 GB (or smaller) of hard drive storage (or 64 GB or less of SSD storage), and a 10.2 inch (or smaller) screen. That pretty much describes your average netbook today, but even on such machines, it's very likely that you will be given a choice of Windows 7 Starter of Home Premium. You should always choose the latter when possible, as described below.

Windows 7 Home Basic. This version of Windows 7 will only be sold with new low-end PCs in emerging markets like India, Mexico, and similar places. You will not run into this version in the United States. So you can simply pretend it does not exist.

Windows 7 Enterprise. This Windows 7 version is not available to the general public but is instead provided only to Microsoft's biggest corporate customers. It is functionally identical to Windows 7 Ultimate edition, however. So if you happen to get an Enterprise-based notebook from work, you can pay attention to the bits about that version: The feature-set is identical.

Windows 7 K, **N**, **and ABC editions**. Microsoft sells special versions of Windows 7 in different markets around the world for antitrust reasons. Consumers in those countries largely ignore these products because they leave out interesting features. You should, too: They're not typically sold in mainstream markets and/or are not readily available from the normal sales channels. Ignore them.

For most people, the choice will come down to two or, at most, three choices, **Windows 7 Home Premium**, which as its name suggests is aimed at consumers, **Windows 7 Professional**, which adds some key business-oriented features, and **Windows 7 Ultimate**, which is of course the "uber" version of Windows 7 and includes every single feature.

Looked at in this way, the Windows 7 product lineup isn't really all that more complicated than the XP lineup was in 2001. However, you still have a decision to make. So let's compare the handful of Windows 7 product editions that you are most likely to run into in the real world and see which is best for you.

How to choose a product edition

When I reviewed Windows Vista three years ago, I provided a massive set of tables that described which features were available in each Windows Vista product edition. This time around, I've created a separate article, Windows 7 Product Editions: A Comparison, which provides the same kind of exhaustive run-down of virtually every feature in Windows 7. For this review, however, I've decided to provide an even simpler way to compare product editions, by simply listing each edition, from top to bottom, and describing the features that are added when you move up the product edition ladder. So let's start at the bottom, literally, with Windows 7 Starter.

Note: I will be describing all major new Windows 7 features in future parts of this review.

[For an in-depth look at several key Windows 7 features, please refer to my Windows 7 Feature Focus.]

Windows 7 Starter

Windows 7 Starter includes the basic Windows 7 feature set. You get the basic user interface, Windows Basic, but not Windows Aero, which provides the "glass" windows and Aero Desktop Enhancements such as Aero Peek, Aero Snaps, Aero Shake, Aero Background, and the like. You get Windows Search, Action Center, Windows Firewall and User Account Control (UAC), Parental Controls, Windows ReadyDrive, Windows Backup with system image capabilities (but not network-based backups), Internet Explorer 8, Windows Gadgets, Games Explorer with basic games only (FreeCell, Hearts, Minesweeper, Purble Palace, Solitaire, and Spider Solitaire), and a basic set of utilities like Calculator, Paint, Windows Fax and Scan, WordPad, and XP Viewer.

On the digital media front, Windows 7 Starter also provides basic functionality, with Windows Media Player, but not Windows Media Center, DVD playback, or Windows DVD Maker. You can join but not create homegroups. There's no IIS web server or remote desktop client or host. The system can't accommodate Tablet PC or multi-touch functionality. And of course there are no business- and enterprise-oriented

features at all.

Windows 7 Starter is a decent, low-end product that will perform similarly to Windows XP Home on netbook class computers and provide most of the core functionality of the Windows 7 platform. But there are few perks, and certainly no eye candy. Indeed, Windows 7 Starter is hobbled in bizarre ways. You cannot change the desktop wallpaper at all, for example, a tedious and unnecessary restriction, especially when you consider that one of the core tenets Microsoft promotes with Windows 7 is how much users love to customize their PC desktops.

Some of the restrictions in Windows 7 Starter are understandable. The inability to create a homegroup is fine, since netbooks are ancillary or secondary PCs anyway, and most people will be running a higher-end Windows 7 version on their main desktop or notebook too. But the desktop wallpaper restriction is inexcusable, and the lack of Aero is troubling: All of today's netbooks are capable of running that UI, and it's not just better looking, it also brings stability and reliability improvements to the table. When you see Windows Aero, you know you're looking at a modern and capable OS. It screams "Windows 7." But the Windows Basic UI is ugly, and it seems like a punishment for those cheap enough to stick with this version of Windows 7. Don't do that to yourself. Skip Windows 7 Starter, even on a low-end netbook.

[For a visual look at Windows 7 Starter, please visit my Screenshot Gallery.]

Windows 7 Home Premium

Moving up to Windows 7 Home Premium, the picture improves dramatically, and I believe that most consumers will be happy with the feature set provided by this version. Windows 7 Home Premium builds on the core feature set from Windows 7 Starter, adding the wonderful Windows Aero user interface as well as all the nice Aero Desktop Enhancements that are unique to this Windows version. You get Windows Flip 3D, Live Taskbar Thumbnails, and live icon previews in Explorer. The net gain here is a user interface that is both more attractive and more efficient than the one provided with Starter. In fact, these UI improvements are, as far as I'm concerned, reason enough to upgrade. But there's more.

Windows 7 Home Premium also provides a set of fun premium games (Internet Backgammon, Internet Checkers, Internet Spades, and Mahjong Titans) and some useful utilities like Snipping Tool, Sticky Notes, and Windows Journal. You get advanced digital media features like a version of Windows Media Player that can be remotely controlled by other instances of Windows Media Player on your home network, Windows Media Center, DVD playback capabilities, and Windows DVD Maker.

Using Windows 7 Home Premium, you can create your own homegroups, for easy PC-to-PC sharing of documents, music, photos, and videos over your home network. It includes the IIS web server and Internet connection sharing capabilities. You get Windows Mobility Center, support for the Windows Sideshow gadget technology, and full Tablet PC and multi-touch functionality.

Windows 7 Home Premium is a winner. It's priced right, it includes the Windows 7 features that consumers want, and it's not shackled by any major functional omissions. Unless you require domain functionality or the handful of other business-oriented features that are unique to Windows 7 Professional, this is the one to get.

[For a visual look at Windows 7 Home Premium, please visit my Screenshot Gallery.]

Windows 7 Professional

The leap from Windows 7 Home Premium to Professional is quite a bit less profound, though of course certain people will simply have to get this version because it includes key business-oriented features like support for Active Directory-based domains. Windows 7 Professional users also gain access to Windows XP Mode, a fully-licensed version of Windows XP with Service Pack 3 that runs in a virtual machine under Windows Virtual PC and lets you solve any lingering compatibility issues caused by the big upgrade to Windows 7.

Additionally, Windows 7 Professional supports more RAM than does Windows 7 Home Premium, at least in 64-bit guise: 192 GB vs. just 16 GB for its lower-end cousin. It provides automated network backup capabilities to Windows Backup (arguably a key differentiator for individuals) as well as support for the Encrypting File System (EFS). It adds Remote Desktop host functionality, so that you can remotely control the PC from another PC, and Offline Files support, so you can access network-based documents while disconnected from that network. And Windows Mobility Center provides a unique presentation mode feature that isn't present in Windows 7 Home Premium.

Windows 7 Professional isn't as much of a slam-dunk as Windows 7 Home Premium, but then you either need it or you don't. Some of the discretionary advantages--I'm particularly fond of automated network backup functionality, for instance--could be a deciding factor. But for those who don't need domain support, Windows 7 Professional is overkill that doesn't really justify the price hike.

[For a visual look at Windows 7 Professional, please visit my Screenshot Gallery.]

Windows 7 Ultimate

As was the case with Windows Vista, Windows 7 Ultimate is the "uber" product edition, and the one that includes every single Windows 7 feature. Compared to Windows 7 Professional, however, there are only a few key functional differences that apply to individuals, making this a pretty uninteresting upgrade.

Windows 7 Ultimate provides support for the BitLocker and BitLocker To Go drive encryption technologies, the latter of which would arguably be quite useful to virtually anyone. But that's about it. The other features that are unique to Windows 7 Ultimate (and Enterprise) are really geared towards Microsoft's managed corporate customers. None are particularly interesting or relevant to individuals.

I recommend Windows 7 Ultimate only in those instances where the price is very compelling: I'm told that PC makers will periodically offer Windows 7 Ultimate at a steep discount, and in such a case it might make sense in order to get BitLocker To Go. If you can live without that however--perhaps by using a third party disk encryption tool, then you can safely ignore Windows 7 Ultimate. There's just not much to recommend it.

[For a visual look at Windows 7 Ultimate, please visit my Screenshot Gallery.]

Other considerations

Aside from Windows 7 Starter, all mainstream Windows 7 product editions will ship with both 32-bit (x86) and 64-bit (x64) discs at retail. Those who buy Windows 7-based PCs, however, will need to pick between 32-bit and 64-bit at the time of purchase. This continuing stratification of the product line seems unnecessary to me, and my expectation (and hope) is that Windows 7 will be the last Windows product to ship in a 32-bit version. I'm not going to waste much time on this discussion beyond noting that the days of 64-bit incompatibilities are mostly over. Most people will not notice any differences between a 32-bit and 64-bit version of Windows 7 aside from one thing. While 32-bit versions of Windows 7 are limited to supporting just 4 GB of RAM (of which only 3.1 to 3.5 GB are actually usable), 64-bit versions can access between 16 GB and 192 GB of RAM, depending on the product edition. For game players, video and multimedia editors, and other high-end users, that fact alone makes 64-bit interesting. But there's no reason for even average consumers to fear 64-bit Windows. Those days are over.

Also take note of the many upgrade opportunities that are available to Windows 7 customers. If you do end up with Windows 7 Starter on a netbook, for example, you can use a feature called Windows Anytime Upgrade to quickly, easily, and inexpensively upgrade to Windows 7 Home Premium. This upgrade takes just ten minutes and doesn't destroy any data. I'll discuss it a bit further in the next part of this review.

Continue to Part 3: Installing, Upgrading, and Migrating...

--Paul Thurrott
August 14, 2009

Windows 7 Review
Part 3: Installing, Upgrading, and Migrating

For the most part, Microsoft's supported methods for installing Windows 7 closely mirror those for Windows Vista. In some cases, such as the interactive Setup routine that very few people will actually use, the process has been simplified, in keeping with the general Windows 7 mantra. Elsewhere, however, life has become more difficult for users, especially those still running Windows XP who wish to upgrade their existing PCs. (This, too, is probably a pretty small crowd, relatively speaking.)

From a technological perspective, the Windows 7 Setup routine is simply the next version of the image-based Setup that debuted with Windows Vista and Windows Server 2008. It features the same basic installation phases, can be serviced and updated in the same ways, and supports in-place product edition upgrading. For this reason, all retail versions of Windows 7 include the code needed to upgrade in-place to a higher-end product edition. The product key included with the retail packaging determines which version you can activate.

Windows 7 installation choices

As was the case with Windows Vista, how you acquire Windows 7 largely determines the way in which you will install this new OS. Confusingly, there is a wide array of choices.

With a new PC beginning October 22, 2009

The simplest way to acquire Windows 7 is with a new PC starting on October 22, 2009, the day that Windows 7 becomes generally available. This will provide you with the absolute best experience, with one caveat: Many PC makers overload their machines with unwanted crapware, and this is absolutely still going to be an issue with Windows 7. Microsoft has made provisions for PC makers to modify the stock Windows 7 install in various ways, and while these controls are more restrictive than with past Windows versions, most of them amount to nothing more than recommendations that many PC makers will simply ignore. My advice here is simple: Take your business to those PC makers that offer crapware-less PCs, preferably those that do not charge extra for this "feature."

With a new PC before October 22, 2009

Those who purchase a new Windows Vista-based PC between June 26, 2009 and January 31, 2010 will typically qualify for a free version of Windows 7 through the Windows 7 Upgrade Option Program. When you buy a PC from a participating PC maker with Windows Vista Home Premium, Business, or Ultimate edition, you will later receive a free copy of the corresponding Windows 7 product edition (Windows 7 Home Premium, Professional, or Ultimate, respectively). The program is global; that is, it is available in all markets in which you can legally buy Windows-based PCs. Check with your PC maker before making a purchase.

That said, with Windows 7 set for general release in just a few months, you should hold off and wait for a PC that has Windows 7 preinstalled. Those who take part in the Windows 7 Upgrade Option Program will need to do an in-place upgrade as described below, which isn't a great experience. I've recently purchased a new Vista-based PC and will test the Upgrade Option Program upgrade experience when that package arrives.

Clean install: Full retail packaging

As with previous Windows versions, Microsoft is offering retail versions of Windows 7 in two forms, the more expensive Full packaging, which only provides for clean installs of the OS, and Upgrade packaging, which I'll describe below. You would think that the more expensive retail versions would, in fact, offer all of the possible installation capabilities of the system, but this is not the case, so be careful when choosing.

That said, very few people actually walk into a retail store, purchase a Full version of Windows in a box, and then install that product on a new or existing PC.

In case it's not obvious, the Full versions of Windows 7 are aimed at those people who do not, for some reason, qualify for an Upgrade version. This isn't very common, as most people will have some copy of Windows 2000, XP, or Vista lying around, and each of them qualifies for any Upgrade version of Windows 7.

Rarity aside, there are two new wrinkles to the Windows 7 Full versions and both are sure to gain in popularity over time. The first is the ability to buy retail versions of Windows 7 electronically, via Microsoft's online store, the cunningly named Microsoft Store. The second is the ability to install Windows 7 from a bootable USB storage device, like a memory key, instead of a DVD drive. Netbook owners will be able to use these two new bits of functionality together to install the new OS on their machines, which typically lack DVD drives. (Oddly, Windows 7 does not permit installing *to* a USB-based storage device. I'm curious why.)

[Click here to see a step-by-step guide to Windows 7 interactive Setup.]

Upgrade and migration: Upgrade retail packaging

The retail Upgrade versions of Windows 7 are, illogically, the most versatile and can be used to install the OS in a variety of ways. The word "upgrade" probably has a specific connotation for most people--i.e. the ability to run the installer in one OS and upgrade it, in-place, to the new version. And sure enough, the Upgrade versions of Windows 7 do allow for this traditional upgrade type, but only if the OS you're starting with is Windows Vista, and only then if you're upgrading to a compatible version of Windows 7. And that's where the confusion sets in. Not only can the Windows 7 Upgrade packages not upgrade a high-end Windows Vista version (like Ultimate) to a lower-end Windows 7 version (like Home Premium), it is also incapable of upgrading any version of Windows XP to any version of Windows 7.

This latter limitation is, in my mind, arbitrary, since the Windows Vista installer does allow such an upgrade, and the Windows 7 installer is, of course, simply a slightly refined version of that from Vista. After all, the Windows XP installed base is the largest group of Microsoft's customers. Why are they being treated like second class citizens?

Playing devil's advocate, I should at least point out that the number of people running Windows XP--an OS that first debuted 8 long years ago--who want to perform an in-place upgrade to Windows 7 on their aging PC hardware is likely pretty small. Most of these users would indeed be better served by installing Windows 7 on a new PC or simply purchasing a new Windows 7-based PC.

[Learn more about upgrading and migrating in my series, Upgrading to Windows 7.]

In any event, Windows XP users qualify for any Upgrade version of Windows 7, but they must instead perform what's known as a migration. In this type of upgrade, you use a utility called Windows Easy Transfer to copy the settings, documents, and data from your previous Windows install and then transfer them to a new Windows 7 install. This can be on the same PC (where you overwrite your previous XP install, or on a separate partition, in which you can dual-boot between the two OSes) or it can be with a new PC. What Windows Easy Transfer doesn't do, of course, is transfer your installed applications, so be sure you have your install discs and executables ready to go before performing this somewhat complicated procedure.

There is one other upgrade limitation that's worth pointing out since we're still in the midst of a multi-year transition to 64-bit computing. It is impossible to perform an in-place upgrade of any 32-bit version of Windows to any 64-bit version of Windows (and vice versa). So if you stuck with a 32-bit version of Windows Vista but are ready to take the plunge into 64-bit for Windows 7, you will need to do a clean install and then migrate your settings and data over with Windows Easy Transfer. (This is possible with the Upgrade versions, though the details of the process are unknown until I and other reviewers can get our hands on the actual upgrade packaging to test it.)

Working within Microsoft's arbitrary limitations, the following chart can be used to determine whether you can perform an in-place upgrade or must resort to a migration.

Current Windows version	Upgrade or migrate to Windows 7 Home Premium?		Upgrade or migrate to Windows 7 Professional?		Upgrade or migrate to Windows 7 Ultimate?	
	32-bit	64-bit	32-bit	64-bit	32-bit	64-bit
Windows XP (32-bit, any version)	Migrate only					
Windows XP (32-bit, any version)	Migrate only					

Vista Home Basic (32-bit)	Upgrade or migrate	Migrate only	Upgrade or migrate	Migrate only	Upgrade or migrate	Migrate only
Vista Home Basic (64-bit)	Migrate only	Upgrade or migrate	Migrate only	Upgrade or migrate	Migrate only	Upgrade or migrate
Vista Home Premium (32-bit)	Upgrade or migrate	Migrate only	Upgrade or migrate	Migrate only	Upgrade or migrate	Migrate only
Vista Home Premium (64-bit)	Migrate only	Upgrade or migrate	Migrate only	Upgrade or migrate	Migrate only	Upgrade or migrate
Vista Business (32-bit)	Migrate only		Upgrade or migrate	Migrate only	Upgrade or migrate	Migrate only
Vista Business (64-bit)	Migrate only			Upgrade or migrate	Migrate only	Upgrade or migrate
Vista Ultimate (32-bit)	Migrate only				Upgrade or migrate	Migrate only
Vista Ultimate (64-bit)	Migrate only					Upgrade or migrate

*Note: In all cases where an true in-place upgrade is possible, you can optionally choose to do a migration instead as well. The reverse is not true, however.

As you can see, the upgrade picture is somewhat messy. Hopefully, by Windows 8, Microsoft will stop creating both 32-bit and 64-bit versions of its OS and just focus on the 64-bit side, though of course even that won't prevent the kind of bifurcated upgrade situation described above.

Windows 7 Family Pack

For the first time, Microsoft is finally offering consumers a way in which to purchase multiple copies of Windows at a discount. Called the Windows 7 Family Pack, this offering provides you with the ability to install Windows 7 Home Premium on three different PCs. (That is, the packaging offers one Setup disc and three product keys.) The Family Pack is a very reasonable $149.99 in the US.

As is so often the case, however, where Microsoft giveth, it also taketh away. The Family Pack consists of three Upgrade versions of Windows 7 Home Premium, so performing clean installs with this version will be somewhat ponderous. It's not available in all markets, either, and Microsoft says that it is a temporary offer only and could be pulled at any time. All that said, I expect the Windows 7 Family Pack to be quite popular, and hope--and request--that Microsoft make it a permanent offering, and one that is available to all of its customers.

[For more information about the Windows 7 Family Pack, please refer to my article, Windows 7 Availability.]

OEM versions of Windows 7

As with previous Windows versions, you'll be able to purchase so-called OEM versions of Windows 7 Starter, Home Premium, Professional, and Ultimate through online retailers like NewEgg.com. These versions of Windows 7 correspond to the Full retail packaging in that they cannot be used to upgrade existing Windows installs to Windows 7. However, because they are aimed at the system builder market (small businesses that build PCs for individuals), they are typically much less expensive than true retail versions. As always, there are a number of caveats. First, the availability of OEM versions of Windows to individuals is possible only through a loophole in Microsoft's licensing program; you are not actually supposed to purchase such a product for person use, though of course there are no real controls in place to prevent this. Secondly, OEM versions of Windows come with no support at all. So if you buy an OEM version of Windows 7 and run into problems, you're on your own. That said, anyone savvy enough to buy such a product for installation on their own PC can probably handle themselves. But it's good to know.

As of this writing, Windows 7 is not yet generally available, so we don't know exactly how the OEM pricing will compare to the Full and Upgrade retail packaging. If Windows XP and Vista are any indication, there will be serious savings to be had. I will update my Windows 7 Pricing article to address OEM pricing when that becomes known.

Windows Anytime Upgrade

As with Windows Vista, Windows 7 provides a special kind of upgrade called Windows Anytime Upgrade, that lets you take a version of Windows 7 and upgrade it in-place and electronically (i.e. without requiring a Setup disc or other external install point) to a higher-end Windows 7 version. A user with Windows 7 Starter could upgrade to Windows 7 Home Premium, Professional, or Ultimate, for example, while those with Windows 7 Home Premium could choose between Professional and Ultimate, and so on.

Unlike with in-place upgrades, I've found Windows Anytime Upgrade to be a fast and flawless way to upgrade your Windows 7 experience. Those who acquire Windows 7 Starter with a netbook should really look into this utility to upgrade to at least Home Premium. Prices range from $80 to $150, depending on which versions of Windows 7 you're upgrading to and from.

[Discover how Windows Anytime Upgrade works in my Feature Focus article.]

Multi-boot

As with previous versions of Windows dating back many years, Windows 7 supports multi-booting (commonly called "dual booting," though of course you can install multiple copies of Windows on a single PC). Not much has changed here, though of course modern Windows versions like Vista and Windows 7 utilize newer and different boot processes, so the age-old advice still stands: You should always install the oldest OS first and the newest OS last. You should always install each OS to its own hard drive or partition. And while this may be obvious, it's worth noting that there is nothing stopping you from installing multiple copies of the same Windows version on a single PC, which can be valuable for testing purposes.

Multi-boot is, of course, a power user feature and there is some argument to be made that people who boot between an excessive number of Windows installs are probably wasting time and not getting any real work done. But the capability is there if you need it.

Virtualized Windows 7 installs

Finally, it's worth noting that the retail versions of Windows 7--that is, Home Premium, Professional, and Ultimate--are all licensed for installation inside of virtual environments like Windows Virtual PC, VMWare Workstation, and Hyper-V. Actually, Windows 7 Enterprise is also licensed for this use, and that version comes with a special extra bit of functionality: You are licensed to install the same copy of Windows 7 Enterprise in up to four different virtual machines, provided that each is installed on the same PC.

For individuals, virtualized Windows 7 versions will probably see the most use on Macs, where environments like Parallels Desktop and VMWare Fusion allow people to run Mac and Windows apps side-by-side, and in testing scenarios. But with Microsoft making a big virtualization push on the server, virtualized Windows installs will become more and more common in managed corporate environments as well.

Final thoughts

The hundreds of millions of people looking to upgrade to Windows 7 in just the next year or two alone have a lot of decisions to make. As noted previously, for the vast majority of users, the best experience to be had is with Windows 7 Home Premium (or higher) preinstalled on a new PC. But those who purchased a new PC in the past two or three years have ample computing horsepower to handle the new OS as well. The only question is how they will go about upgrading those machines to Windows 7. My sense is that the largest potential group of these customers--Windows XP users--has been left in the lurch, and I find that rather surprising. Those who are already running Windows Vista are in a better place from an upgrade perspective, and can choose between upgrading and migrating. (Most, I'm sure, will prefer an in-place upgrade.)

Looked at broadly, most of these problems are of Microsoft's own making; the company does not allow 32-to-64-bit upgrades across any Windows version, and it will not support in-place upgrades for Windows XP at all. And of course, the sheer number of Windows Vista and Windows 7 product editions makes the upgrade path hard to decipher and understand.

None of this diminishes the value of Windows 7. And these complaints should be taken within the context of the Setup advances Microsoft did make in Windows 7 around simplification and supporting true electronic version-to-version upgrades. But the sheer complexity of the Windows 7 upgrade process does make the very desirable act of moving to that OS a lost less seamless than it could be. And that's a missed opportunity, in my opinion.

Continue to Part 4: User Experience...

--Paul Thurrott
August 22, 2009
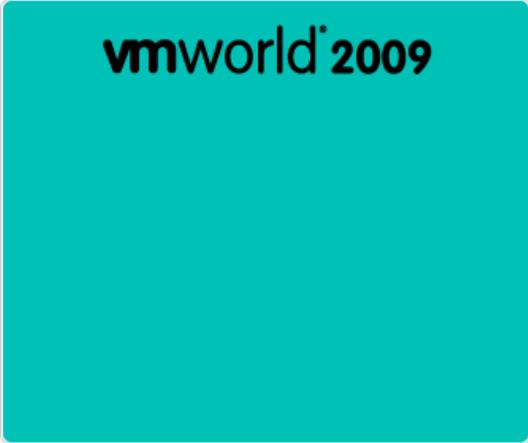
If you're one of the millions of people who use Windows Vista, your very first reaction to Windows 7 may be somewhat mixed. After all, the obvious, up-front user experiences in Windows 7 appear to be simply carried over from its predecessor. But it doesn't take long to notice the differences. Windows 7 installs more quickly than does Vista, and with less effort. It boots up and resumes from sleep and hibernation more quickly. It features major UI innovations in its new taskbar, Jump Lists, and virtualized Libraries. It provides the native ability to interact with the entire system using multi-touch and gesture functionality, the first desktop OS to do so.

Dig a little deeper, and more and more new features become apparent. Microsoft went over virtually the entire Windows OS, fine-tuned every single feature to be simpler, easier, and more efficient, and then made sure it was all as attractive and usable as possible. People have deridingly called Windows 7 "Windows Vista done right," and while there's some truth to that, a better way to look at it is this: Microsoft took the solid foundation it created with Windows Vista and tweaked, prodded, and improved every inch of the damn thing. And what they came up with was Windows 7, the sexiest version of Windows ever created.

That's right, I called Windows *sexy*. Get used to it.

For the first time ever, Windows fans have nothing to be ashamed of. Sure, previous Windows versions provided a number of real world advantages over the competition, but in this release, finally, Microsoft has come up with an upgrade that is simpler, better looking, easier-to-use, and superior in every meaningful way to what Apple has created with the latest version of Mac OS X. Windows 7 is the no compromises version of Windows, and by focusing on what really matters in this release--every single point at which the user interacts with the system--Microsoft has created the superior product. They got the underpinnings right with Windows Vista. And now, Windows 7 is all about dotting the i's and crossing the t's. (Maybe Apple will catch-up with the next version.)

In this part of my review of Windows 7, I will focus on improvements to the overall Windows 7 user experience, with an emphasis on those user interface features that have changed the most. There's a lot here, so buckle up.

Less is more

One of the first things you'll notice when you boot into the Windows 7 desktop for the first time is how pristine things are by default. There's only a single icon on the desktop, Recycle Bin, and Microsoft no longer throws up unwelcome, in-your-face UIs like the Welcome Center, Windows Sidebar, and various notification area balloon pop-ups. The taskbar includes only three buttons by default--Internet Explorer, Windows Media Player, and Windows Explorer--and the notification area has just three, Action Center, Networking, and Volume. (Mobile computers will see a fourth notification icon, for Power Options.
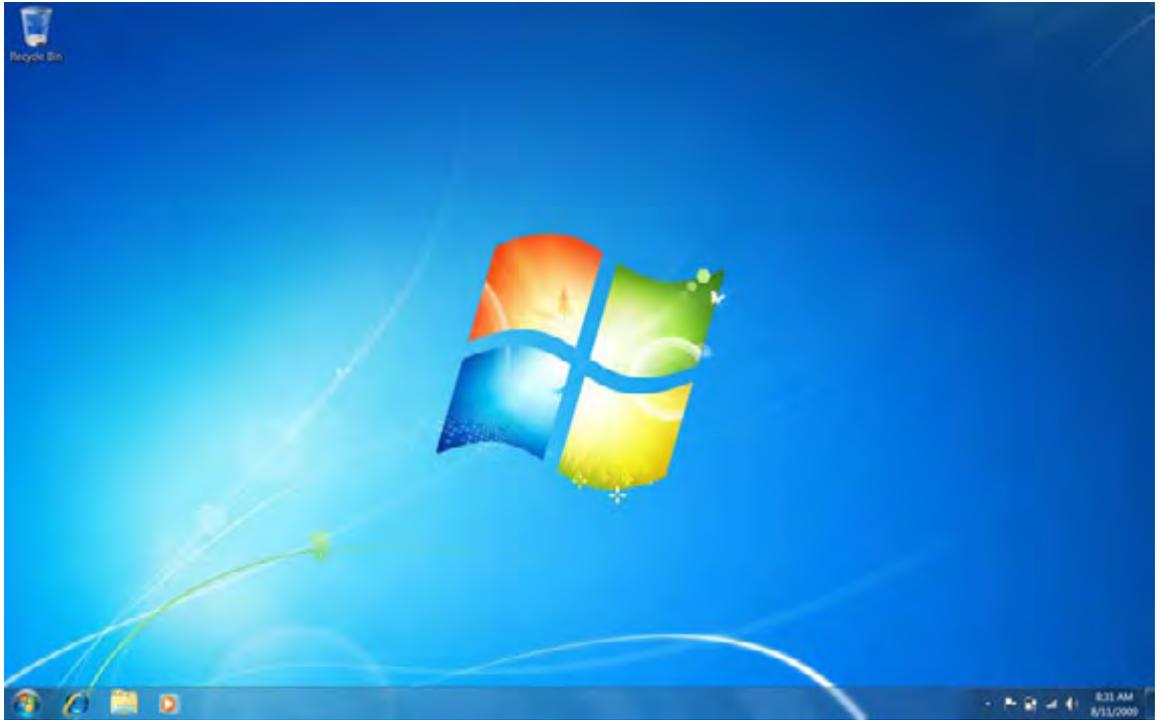
The Windows 7 desktop: Clean, simple, efficient.

Yes, PC makers can and will screw things up with crapware, unwanted icons, numerous startup programs, and other nonsense. But the stock Windows 7 user experience as defined by Microsoft is one of Spartan efficiency and quiet. Over time, Windows will of course prompt for things--Maybe you'd like to consider backing up? Is your anti-virus solution installed and up-to-date?--but that will only happen after a quiet period, providing you with time to get situated.

You are also free to customize the system as you see fit, adding icons to the desktop, pinning shortcuts to the Start Menu and/or taskbar, organizing the notification icons in the notification area. There are pretty new Aero Themes to enable, if desired. Dig a little deeper and a world of customization appears. But unlike with previous Windows versions, nothing is assumed. Finally, your computer acts like it's *your* computer.

The Windows desktop

As noted previously, the default Windows 7 desktop is a sea of open space, with just a single icon planted there. (And you have to think that icon, for Recycle Bin, will simply become part of the taskbar in a future release.) Those that like to populate the desktop with shortcuts are still free to do so, of course. You can also add a selection of Desktop Gadgets to the desktop, if you're so inclined. In Vista, these gadgets were part of an extraneous bit of UI called the Sidebar, and it was enabled by default. This time around, the Sidebar is gone but the gadgets remain. Indeed, the stock collection of gadgets is largely unchanged from that which was offered with Vista, an odd shortcoming.

The bland selection of gadgets from Vista comes over largely unchanged.

Microsoft didn't skimp on desktop customization, however. The familiar right-click desktop menu has been simplified since Vista, with the screen resolution and other personalization options separated for quicker access. The Personalization control panel has been significantly overhauled with support for new Aero Themes which combine wallpaper (or, optionally, constantly rotating sets of wallpaper), an Aero window color, a sound scheme, and a screensaver into a single, savable, and shareable entity. Windows 7 ships with a number of very high quality themes, and you can download more online from a variety of places or make your own.
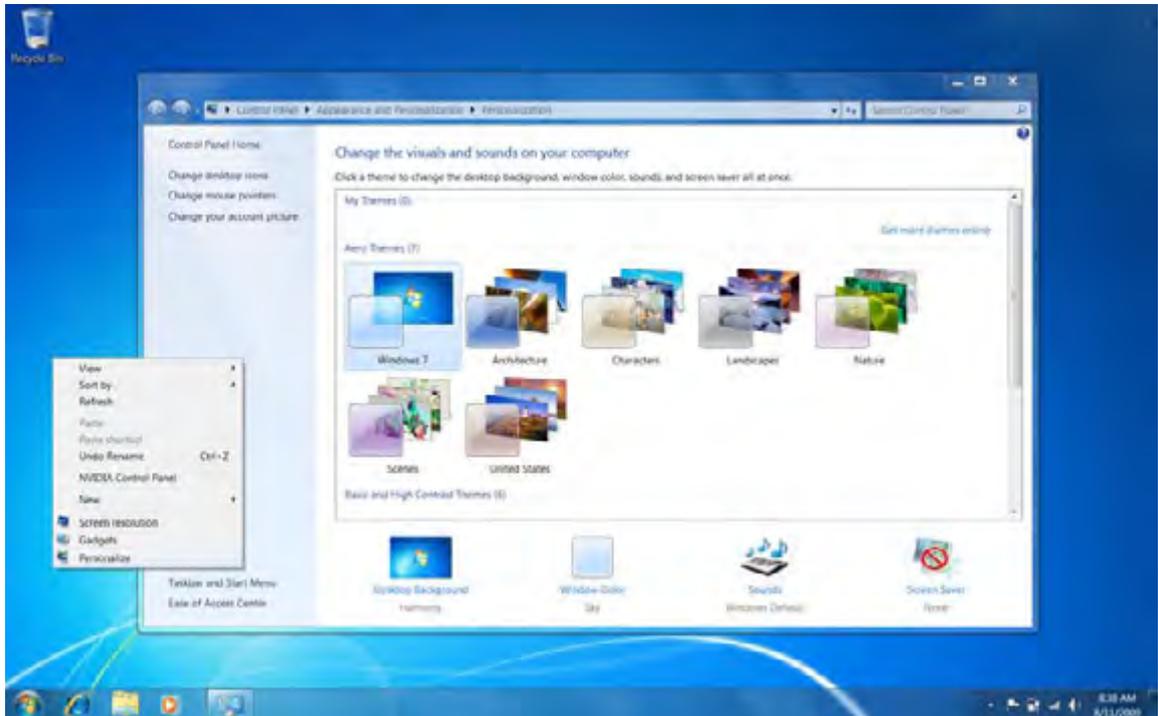
Awesome new Aero Themes make customizing Windows 7 fun and easy.

Windows 7 also includes dramatically better window management than its predecessors. A new Aero Peek function, curiously exposed as an unmovable rectangular glass panel to the right of the system clock, hides any floating windows on mouse-over so you can see icons and gadgets on the desktop.

Aero Peek lets you "peek" under open windows at the desktop.

Windows Flip--what most people think of as "ALT + TAB" since that's how you access it--has been updated to provide full-screen previews of the currently selected window only. So as you scroll through the list of open windows, all windows but the currently-selected one will be hidden. It's a nice effect.
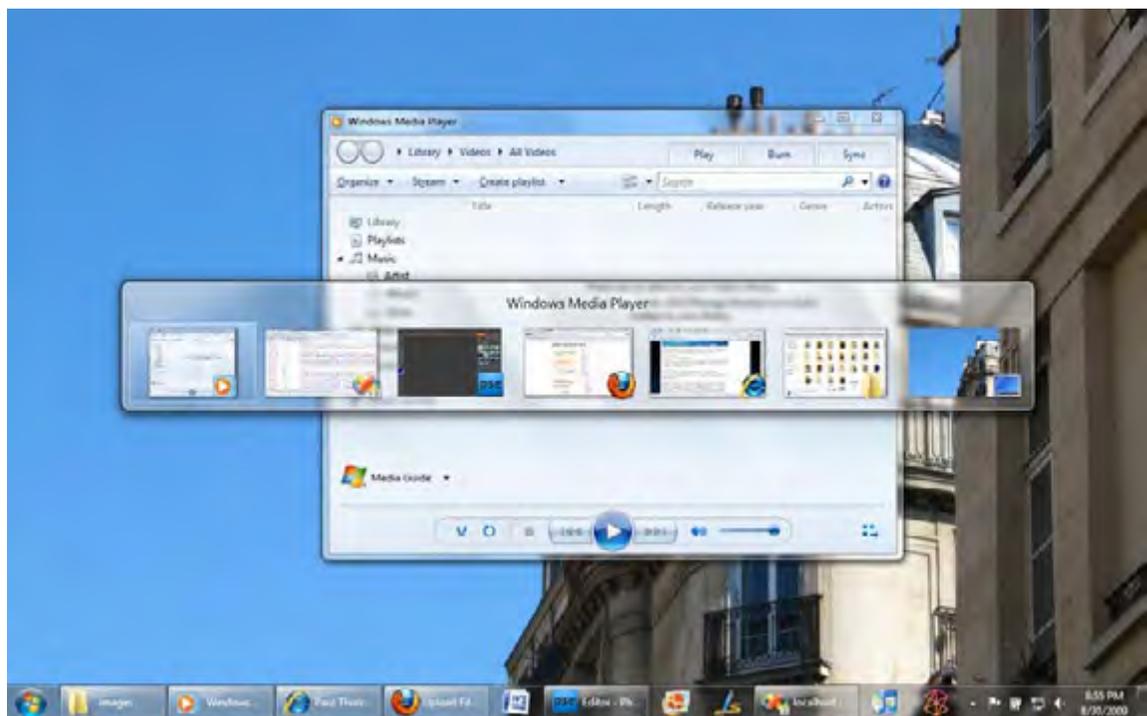
Windows Flip picks up a nice windows preview capability.

A new set of Aero Snap window management features cause windows to snap intelligently to screen edges, making window resizing and placement easier than ever. For example, you can "snap" a floating window into a maximized window simply by dragging it to the top of the screen. Want to snap a window to the left half of the display? Just drag it right to the left edge.
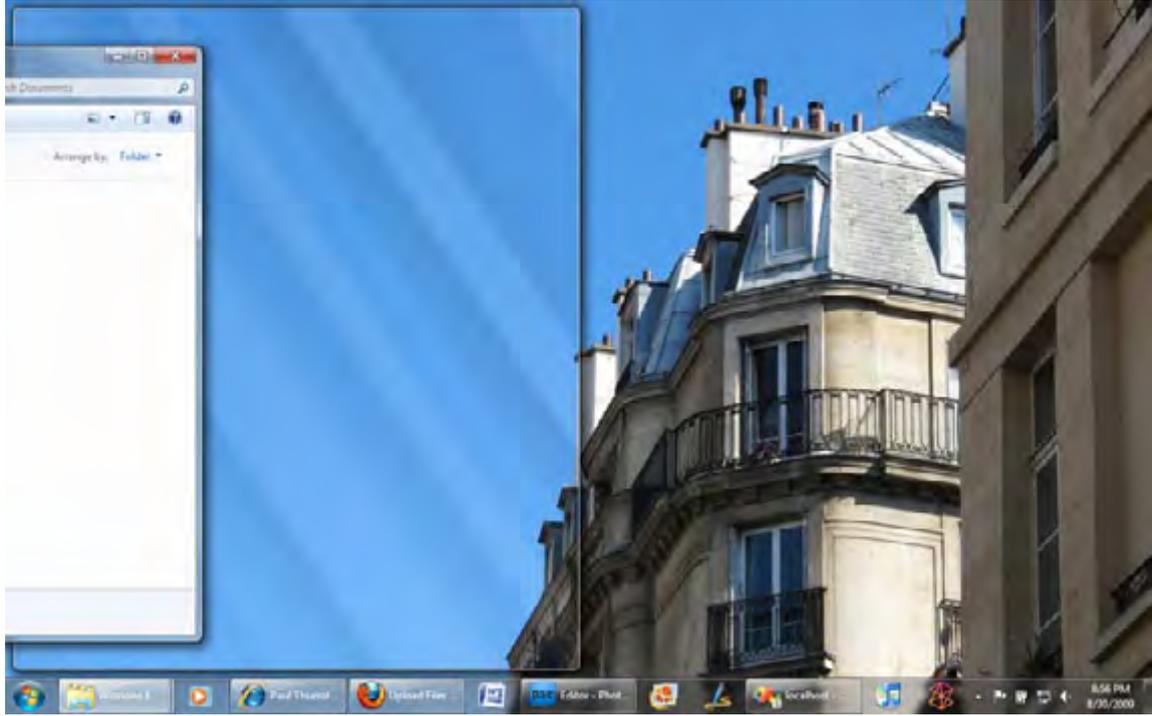
Aero Snap lets you "snap" windows to the edges of screens and perform other window management tasks.

And, yes, there's a frivolous Aero Share feature that minimizes all other windows when you grab onto a floating window and shake it with the mouse. Shake it again to restore all those minimized windows. And you thought the Mac was fun.

New taskbar

In Windows 7, the taskbar has been significantly elevated from its previous pedestrian use as a way to track open windows. Now, it takes on double duty, managing both running and non-running applications (and open and unopened windows). In this way, the taskbar behaves like the Mac OS X Dock, which has been widely derided as a UI disaster. But familiarity does wonders, and after using the Windows 7 taskbar for almost a year now, I'm certainly getting used to it. (That said, I don't feel that the default taskbar configuration is appropriate for most users. A simple configuration change, described below, solves this problem nicely.)

To understand what's changed in the Windows 7 taskbar, consider the taskbar from Windows XP or Vista. Looking at this UI construct, you'll see a Start button, a Quick Launch toolbar, the main taskbar area, and then the notification area and system clock. The Quick Launch toolbar was basically a small toolbar with shortcuts for those applications and shell locations you accessed most often. Some people never used or customized Quick Launch. Others over-populated it dozens of icons, missing the point in my mind. But for those that did use it in previous Windows versions, Quick Launch was an indispensable tool, and it offered far quicker access to much-needed tools than the Start Menu ever could.

So in Windows 7, Microsoft has combined the Quick Launch toolbar right into the taskbar. The goal, Microsoft says, is to improve efficiency: Now, everything you need is right where you want it, "at your fingertips." (This is literally true on Windows Touch-enabled systems.) I guess I buy this. But if you follow Microsoft's new paradigm and stock your taskbar with shortcuts to applications you use the most often, what you're left with is a weird two-tiered system for launching applications. Some are on the taskbar. Others are in the Start Menu.

The new Windows 7 taskbar combines shortcuts for non-running applications with buttons for running applications.

Adding to this weirdness is that shortcuts you've pinned to the taskbar no longer show up in the Start Menu's most recently used list. (Apparently, the list only applies to those items you most recently used from the Start Menu only.) It makes me wonder if the Start Menu's years of application launching functionality are coming to a close.

In any event, it's not a total disaster. The Windows 7 taskbar is bigger by default than previous versions, with bigger, easier-to-see and read buttons. (You can put it back to a smaller size, but you won't want to.) It's pre-populated with the aforementioned IE 8, Windows Media Player, and Windows Explorer shortcuts, but you can pin your own shortcuts there and remove ones you don't want. And finally, you can reorder shortcuts in the taskbar, an oft-repeated request from previous Windows versions.

Finally, it's possible to reorder taskbar buttons using your existing drag and drop skills.

Where the Windows 7 taskbar really falls apart, however, is its new default view style where each shortcut or button only displays an icon, but no text label. Furthermore, taskbar buttons are grouped by default, so if you have, say, three Windows Explorer windows open, there's still only one taskbar button (with a too-subtle graphical treatment that suggests there are multiple windows, but does nothing to tell you how many). This default view is too confusing for most people, I feel, and is inefficient. In cases where you have multiple instances of a single application or window, it would be better to have separate buttons for each window. Fortunately, you change the default behavior to do this: In the Taskbar and Start Menu Properties window, navigate to the Taskbar tab and choose "Combine when taskbar is full" from the Taskbar buttons drop-down list. Voila! Fixed.

A better taskbar: Customize the taskbar to show button labels and separate buttons for each application window.

Regardless of the view style you use, the new taskbar does provide some other interesting new capabilities. If you mouse over the button for an open window or running application, the taskbar displays a handy pop-up thumbnail of the underlying window.

Taskbar thumbnails provide at-a-glance previews at the underlying window.

(In the case of grouped windows, you'll see multiple thumbnails, arrayed horizontally.)

Multiple windows? No Problem: You'll see multiple thumbnails.

To see a full-screen preview of the underlying window, simply mouse-over the thumbnail.

Mouse over a taskbar thumbnail to see a full-sized preview of the underlying window.

And here is where the system falls apart. Most people, I suspect, will discover this thumbnail behavior just by mousing around, and while it's pretty handy, the first reaction of most who mouse over a taskbar button and then mouse over a full-screen preview will be to move the mouse off of the thumbnail to access that window. And when they do--woosh!--the window will simply disappear. The trick is to click the thumbnail. You've been warned.

The taskbar buttons and previews are all live. So if you minimize, say, Windows Media Player while it's playing a video and then mouse over the application's taskbar button, you'll see the video playing in the thumbnail that appears.

Taskbar thumbnails are live: Here, a video continues to play in the thumbnail even though Media Player is minimized.

Likewise, file copy operations and IE 8 downloads will replicate their progress bars (and thus the progress of the operation) right in the taskbar button.

Progress indicators are also exposed via taskbar buttons, a nice (and useful) touch.

This effect is much more attractive and useful if you've enabled the "Combine when taskbar is full" option mentioned above, by the way.

Even better.

Taskbar buttons can also display a useful new UI called a Jump List. We will discuss that feature separately in the next section.

The new taskbar has some weird limitations which highlight, I think, how immature this thing really is. For example, you cannot pin multiple folder shortcuts to the taskbar. Instead, you can only have a single Windows Explorer button; any folders you try to pin to the taskbar will be added to the Windows Explorer button's Jump List. (Again, Jump Lists are discussed below.) That's just dumb, and a very obvious limitation that should never made it through the final version of the OS. And while you can, in fact, pin Control Panel to the taskbar if you look hard enough, it suffers from the same problem as Windows Explorer: Individual control panel buttons are not possible.

Over in the notification area, Microsoft's simplification efforts have, perhaps, gone too far. I love that the notification area is simple and clean by default. After all, we've all seen those PCs with 26 different tray icons. And you can drag and drop notification icons to reorder them, nice. But the Windows 7 notification area has two serious flaws. First, it behaves inconsistently compared to the regular taskbar. And second, the notification area, while clean and simple, does absolutely nothing to prevent the build-up of unwanted notification icons.

The inconsistency issue is particularly bizarre given that Microsoft just completely retrofitted the taskbar. So, where mousing over a taskbar button provides a nice thumbnail, mousing over a notification icon simply displays an old-school tooltip. To get an informational window with thumbnail-like ornamentation, you must click the notification icon. Meanwhile, while right-clicking a taskbar button provides a Jump List (see below), doing so with a notification icon simply displays an old-fashioned text menu.

Inconsistencies are, of course, a hallmark of Windows, though they are far less common in Windows 7 than in previous versions. I think the notification's handling of unwanted icons is, however, far more serious. That is, it doesn't so much "handle" them as hide them. Instead of providing a means for you to permanently prevent applications from adding icons to the notification area (and thus increasing the system's boot time and reducing its available memory and other resources), Windows 7--gets this--simply lets them load and then hides them under the "Show hidden icons" button that appears to the left of the notification area.

As time goes by and you install more and more applications, many of these applications will be adding unnecessary and unwanted icons to the notification area. But you'll never know, because Windows 7 hides that fact from you. It just seems to be contrary to this system's "the user is in charge" mantra. At least Vista had a nice UI--the Software Explorer from Windows Defender--for removing unwanted notification icons. Windows 7 has removed this UI, though I'm told a replacement is scheduled for the next Windows version.
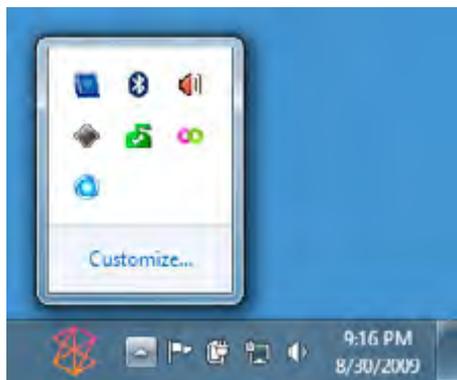
Surprise! The notification area hides icons but does nothing to prevent the problem in the first place.

The inconsistencies and weirdnesses of the Windows 7 taskbar suggest to me that there will be improvements aplenty in future Windows versions. But even in this nascent stage, the changes are generally appreciated.

Jump Lists

Though the Start Menu has lost some of its mojo to the new taskbar in Windows 7, one long-time bit of Start Menu functionality is being made more broadly available in this system courtesy of a new feature called Jump Lists. Whereas the global Start Menu was a central jumping off point for all applications and documents, however, Jump Lists are like mini, application- and control panel-specific Start Menus. They

appear, attached to applications (and control panel) shortcuts, in both the Start Menu and on the new taskbar. And like the Start Menu itself, Jump Lists are highly customizable, by both application developers and users.

Jump Lists exhibit two types of behaviors: Those that are automatic and those that are customized. By default, application Jump Lists will display a list of the most-recently-used documents that are associated with that application. In the Start Menu, those lists appear like so, expanding out into the right-hand side of the Start Menu:
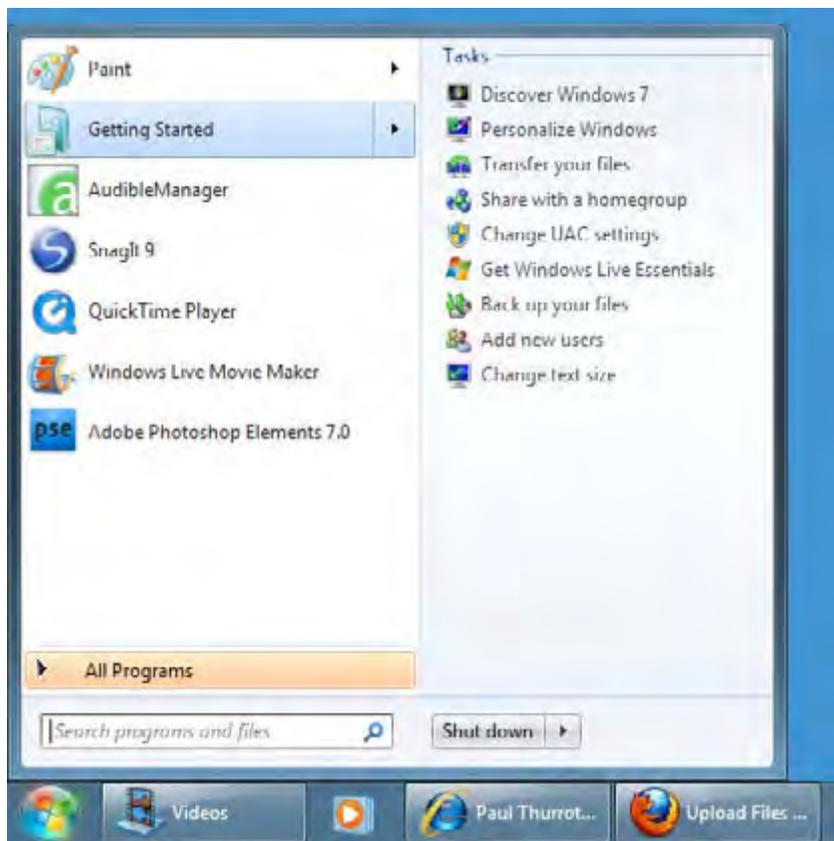
A Jump List in the Start Menu.

To display a shortcut's Jump List via the taskbar, a little more work is required. Instead of just mousing over the button, you have to right-click the button to display the underlying application or control panel's Jump List.
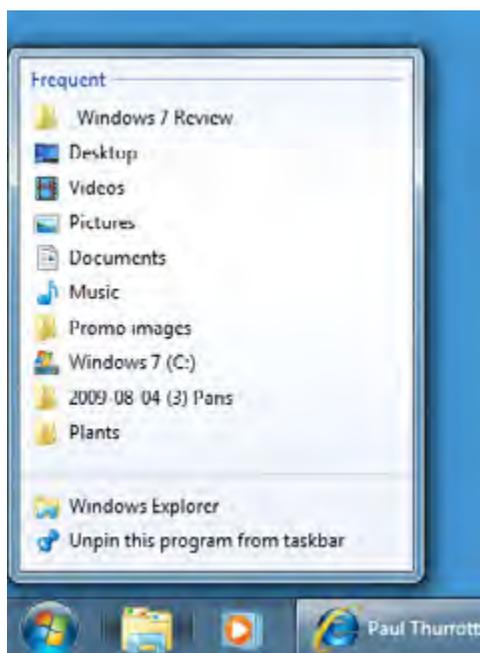
In the taskbar, Jump Lists appear as pop-up menus.

At first, you won't see much in an application's Jump List: Just the name of the application (which can be

clicked to launch a new instance of that application, or window) and a Close window option. If you have pinned the shortcut to the Start Menu or taskbar and enable the Jump List from that location, you'll also see an option related to unpinning it. Document-based applications will auto-populate their Jump Lists with links to the 10 most-recently-used documents.
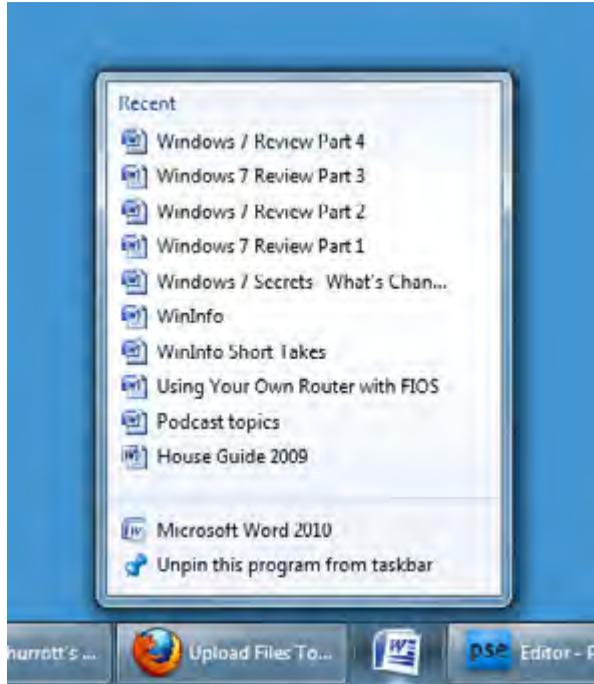
The Jump List for Microsoft Word displays the ten most recently-accessed documents.

Developers are free to customize their application Jump Lists, and Microsoft has provided a few examples in Windows 7. The Jump List for Internet Explorer 8 lists frequently accessed sites, of course, but also some IE 8-specific tasks, such as opening a new tab and starting an InPrivate browsing session. Windows Media Player Play all music and Resume previous list tasks in addition to a list of previously-accessed content.

The best part of Jump Lists is that you're not relegated to accepting what the application (or the system) gives you. You can also pin items to Jump Lists, just as you can pin them to the Start Menu and taskbar. These pinned items can be documents (attached to applications like Microsoft Word), Internet URLs (IE 8), folder locations (Windows Explorer), and the like.

Windows Explorer and Libraries

Windows XP, Vista and now Windows 7 have all included completely new versions of Windows Explorer, each in turn offering a variety of advantages of their predecessors but confusing users with new layouts and capabilities. In the case of Windows 7, the Explorer rev is almost universally good news, however. First, Explorer windows in Windows 7 pretty much retain their size, position, and customization options, a feat that was well beyond the capabilities of the Explorer version in Windows Vista. (And one of the most annoying shortcomings in that system.)

Second, Explorer benefits greatly by Microsoft's simplification jihad in Windows 7. There's a weirdly bland new light blue toolbar and a super-simple (but easily customized) navigation pane. Icon view styles, as before, are intelligently picked based on the content of the current folder. The windows are just simple and elegant looking.
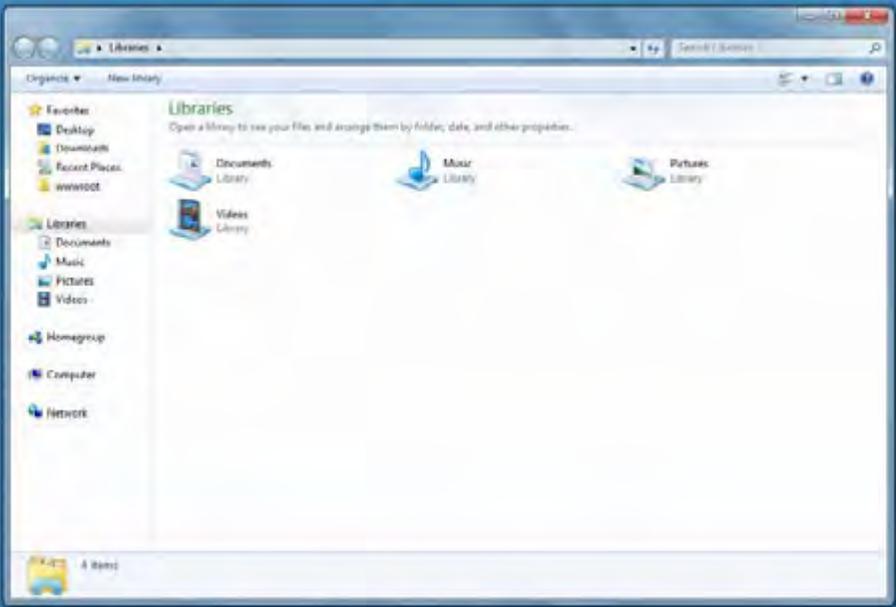
Like much in Windows 7, Explorer is simpler, cleaner, and more efficient.

And then there are the Libraries, the glorious, wonderful Libraries. In previous Windows versions, we had special shell folders like My Documents and My Music that mapped to specific locations in the shell hierarchy. In Windows 7, these locations still exist--that is, each user has their own My Documents folder--but they've been deprecated. Instead, Microsoft provides four virtual folders, or Libraries--Documents, Music, Photos, and Videos--which aggregate content from a variety of shell locations and provide the basis for Windows 7's document and media sharing capabilities.

So when you click Documents in the Start Menu, the window that opens up is a library not a folder. By default, it displays content from your own My Documents folder as well as from Public Documents. But you can customize this (and other Libraries) to aggregate content from any local or network-based location(s) you prefer. So if you keep your video collection on a Windows Home Server, you can configure the Videos library to automatically display items from that share too. Nice.
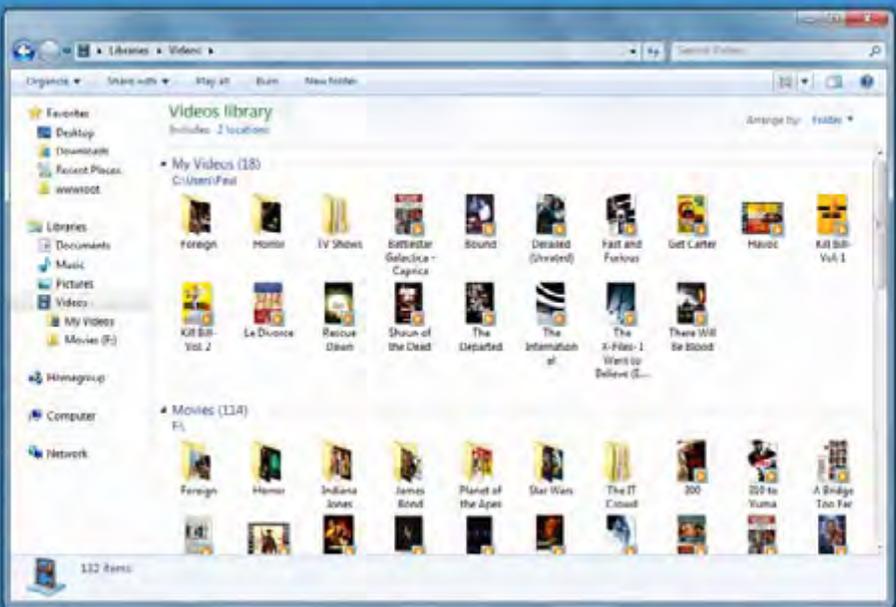
Libraries make it easier to documents, music, photos, and videos scattered around your PC and home network.

Aside from the organizational capabilities--and the evolution away from drive letters and reliance on physical shell locations that it facilitates--Libraries also provide some unique arrangement views that are

not available in normal folder views. These arrangements are particularly good for displaying picture collections.
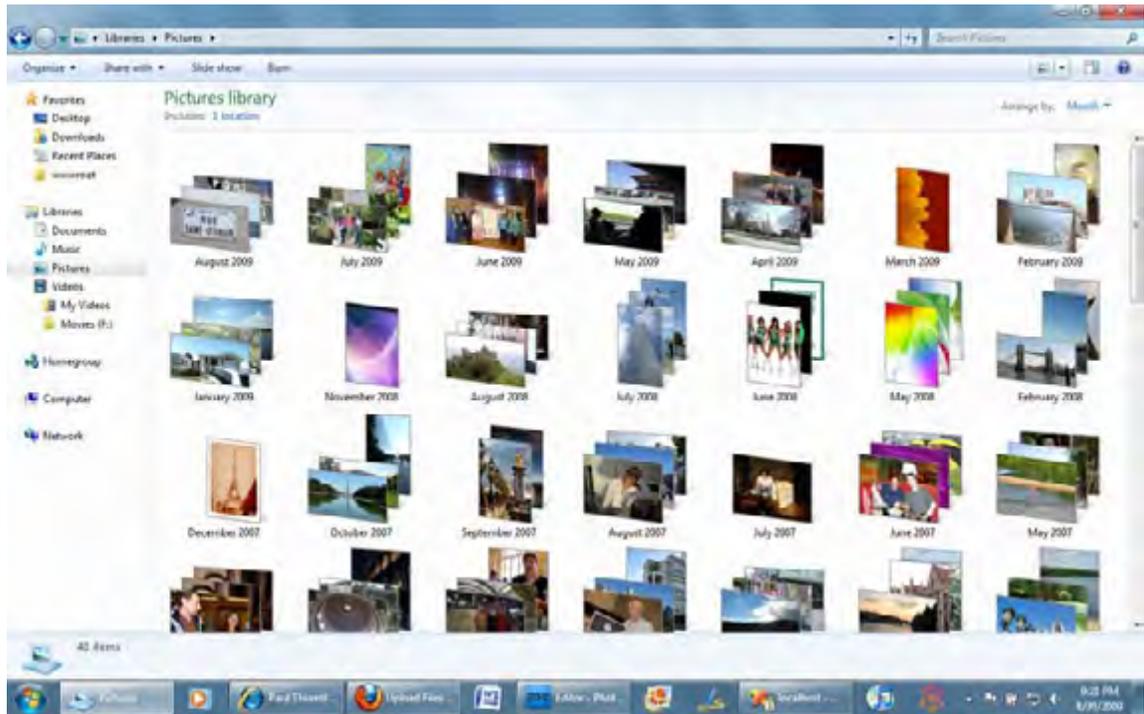
Some unique arrangement views are available only in Library windows.

Final thoughts

Overall, the Windows 7 user experience is clean and simple, and more Mac-like than any previous Windows version. But in making the transition to a more Spartan UI, Microsoft has had to make some tradeoffs, and some changes--like the new taskbar--appear to be half-realized. Still, the new UI stuff is one of Windows 7's primary draws, and anyone using Windows XP or Vista today will be blown away by the new visuals. As for you Mac users, sorry. Your time in the sun is over: Windows 7 is better looking and more efficient than anything coming out of Cupertino this year.

Coming soon, Part 5: Security...

--Paul Thurrott
August 30, 2009

Windows 7 Review
Part 5: Security

With Windows 7, the security pain of the past decade comes to a decisive close. This is the most secure Windows version ever created, one that builds on the solid and proven foundation of Windows Vista while removing some of the heft and monolith intransience of its predecessor. Perfect? No, Microsoft still bows to the industry machinery that prevents it from just protecting Windows users across the board and bundling core anti-malware functionality into the OS. But it's still better than ever, and let's face, there isn't a PC sold today that doesn't come with some form of additional security software. And Microsoft's unfortunately separate (but free) Security Essentials package completes the picture. Let's take a look.

## Security for the next decade

Back in late 2001, Microsoft shipped the initial version of Windows XP, and it was almost immediately hacked in a high-profile and embarrassing episode that eventually caused the company to completely halt development of its most important products and retool around a security-first process that came to be known as Trustworthy Computing. The ramifications of this initiative are enormously and provably positive, as most recently evidenced by Windows Vista and Windows Server 2008, the generation of Windows products upon which Windows 7 is based. These systems introduced a highly componentized design that, among other things, helps segregate different parts of the system from each other, making intra-process security flaws more unlikely.

New and improved security features in Windows 7

Windows 7 builds on the security foundation that debuted with its predecessors. And this time around, those security features--so disruptive at the time but now obviously essential--are being enhanced to make them simpler and more manageable. From a security standpoint, everything good from Windows Vista was brought forward, but much of it has been enhanced based on end user requests and real world experience.

Action Center

While Action Center isn't solely a security feature, it does offer a centralized notification system that is largely security-based. It replaces the Security Center that debuted in Windows XP Service Pack 2 (and was later improved for Windows Vista), adding access to Windows 7's various maintenance tools, including the troubleshooting infrastructure and Windows Backup. But aside from the addition non-security functionality, the best thing about Action Center is that it's quiet. Unlike its predecessor, Action Center doesn't throw out a dozen annoying balloon windows every 15 minutes. (There is one exception: For some reason, it feels the need to tell you about the fact that Windows Update will periodically check for updates; clicking that balloon window will cause an unwanted Windows Help window to appear. Thanks for the info, Action Center.)
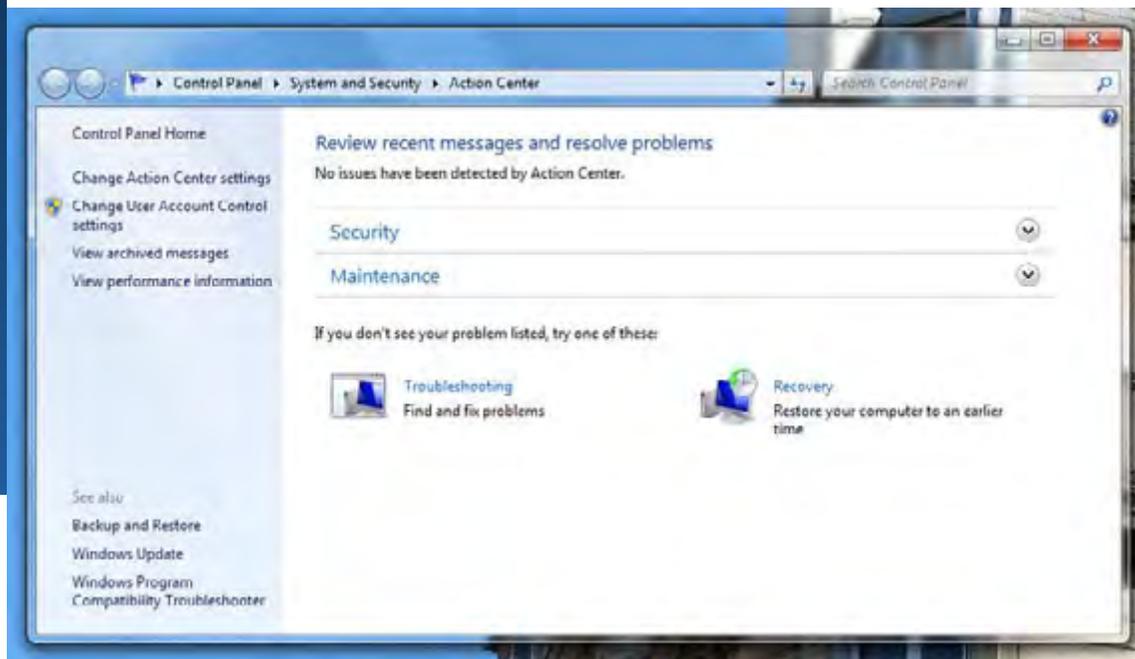

Action Center.

User Account Control

If there's one feature that defines Windows Vista for a huge percentage of users, it's gotta be User Account Control (UAC). But it still amazes me that this feature caused any outcry, since Mac OS X and Linux have had their own annoying UAC-like pop-ups for years and, more important, perhaps, those UAC pop-ups in Windows Vista get less and less annoying over time. (And are, incidentally, less annoying than they are in, say, Mac OS X. Yes, I know, it's shocking.) But perceptions are what they are. And for many people, UAC was a problem, real or imagined.

Well, bad news, UAC haters. Thanks to this and other security features in Windows Vista, Microsoft was able to cut down on malware infections by a whopping 60 percent when compared to the UAC-less Windows XP with Service Pack 2. So UAC is back in Windows 7.

Microsoft improved UAC in two obvious ways in Windows 7. First, it's not as annoying, by which I mean that fewer actions trigger UAC consent prompts in Windows 7 than was the case in Windows Vista. That required a simple examination of the system, seeing which actions triggered UAC prompts, and then deciding whether they were really dangerous. The innocuous ones were taken off the list.

Secondly, Microsoft has created a very simple UI for managing how UAC works in Windows 7. Now, there is a slider with four possible settings, ranging from "Always notify" (what I think of as "Windows Vista mode") to "Never notify" ("Windows XP mode"). By default, Windows 7's UAC is set to run one notch down from "Windows Vista mode" (called "Notify me only when programs try to make changes to my computer"), and it's a common sense setting that is secure but less annoying.
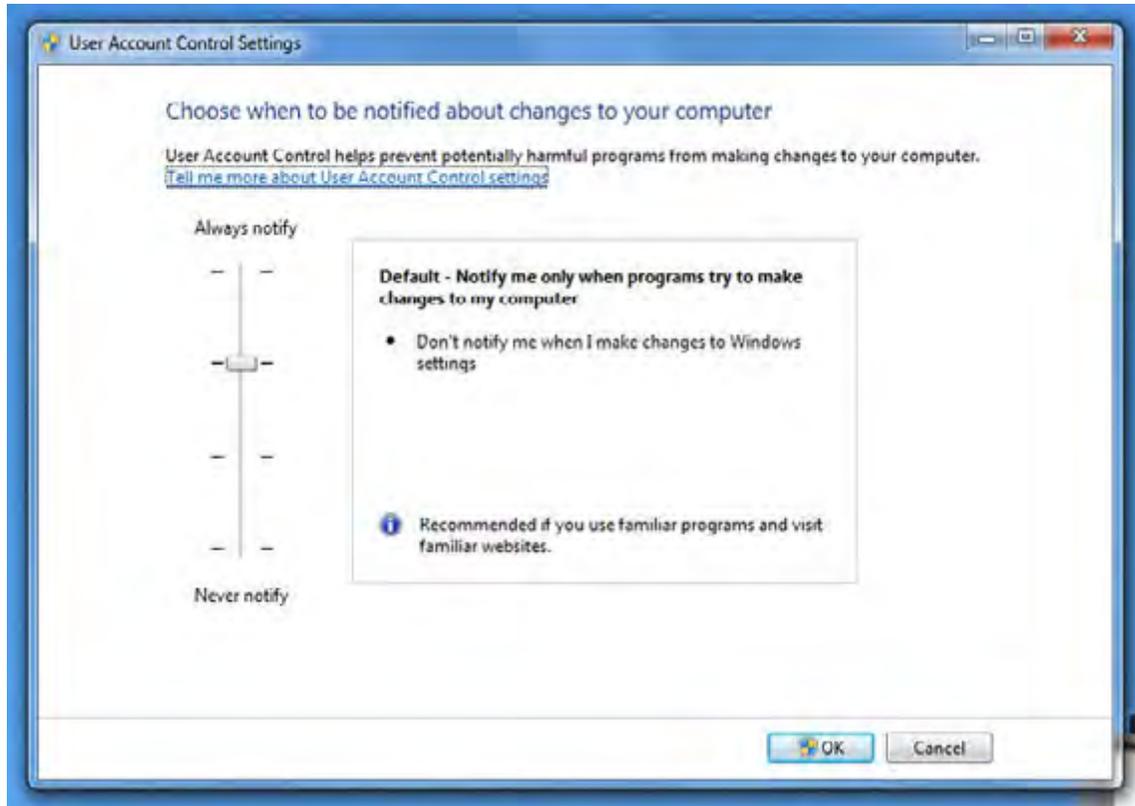
The new User Account Control management interface.

Those that wish to ratchet up the security can do so. Likewise, those that foolishly believe UAC is nothing but an annoyance can turn it off. And unlike with Vista, where various technical workarounds were required to turn off UAC, you won't get any silly notification-based warnings popping up repeatedly if you do so. You're free to make your own stupid mistakes.

To me, UAC is like the middle brake light on a car: It's just another level of defense, and one that is a bit more likely to catch your eye. You're free to ignore it, to your own detriment. But for those who actually care whether their PCs are infected with malware, UAC has proven to be a wonderful tool. And it's even better now.

Windows Defender

Microsoft debuted its Windows Defender anti-spyware utility as an add-on for Windows XP and it was previously included in Windows Vista. Sadly, this is one example of where Microsoft's simplification jihad in Windows 7 has ended up making the system a bit less useful than its predecessor. In Windows XP and Vista, Windows Defender includes an incredibly valuable (if little-known) utility called Software Explorer that lets you easily prevent applications from auto-running at boot time and adding icons to your notification area. In Windows 7, this capability was removed from Windows Vista because, in Microsoft's words, "it's not integral to spyware detection and removal." Baloney, I say. But I've been told that a planned replacement for Software Explorer was not completed in time for Windows 7. It should appear at a later date.

Beyond this unfortunate omission, Windows Defender has evolved somewhat in Windows 7. It now features a more streamlined UI and provides alerts through the centralized Action Center notification system. Microsoft has also worked to ensure that Windows Defender's real-time monitoring consumes fewer resources and thus impacts PC performance less than before. I've always found this to be a very low-impact anti-spyware solution, so while these changes are welcome, Windows Defender was never particularly annoying before.

Note: A newer generation of the Windows Defender technology is included in Microsoft Security Essentials, as described below. When you install MSE, it replaces Windows Defender.

Parental Controls

As with Windows Defender, the Parental Controls functionality in Windows 7 has been detuned somewhat since its debut in Windows Vista. Now, you can apply controls for time limits, games, and application usage to any standard user account. But activity reporting and web filtering--

features of the Windows Vista version of Parental Controls--are gone. This seems like a major limitation, but in truth, Microsoft has simply created a framework that allows third-party security tools makers to add this functionality to Windows 7. And if you're looking for a free solution, look no further than Microsoft's Windows Live Family Safety, part of Windows Live Essentials. Windows Live Family Safety adds web filtering, activity reporting, contact management, and permission request capabilities to the core Windows 7 Parental Controls functionality.

Internet Explorer 8 security features

While Internet Explorer 8 (IE 8) provides a number of interesting functional changes (see my Internet Explorer 8 review), Microsoft's latest browser also works in tandem with the underlying operating system to provide a more secure web experience as well. For example, the browser includes the InPrivate browsing mode, which hides your virtual tracks while online, and improved ActiveX restrictions, though one can help but think that Microsoft should simply be moving towards a more secure method of extending browser functionality. The new SmartScreen Filter (really an improved version of the anti-phishing filter from IE 7) provides protection from malicious web sites that masquerade as legit sites and silently try to deliver malware to your PC.
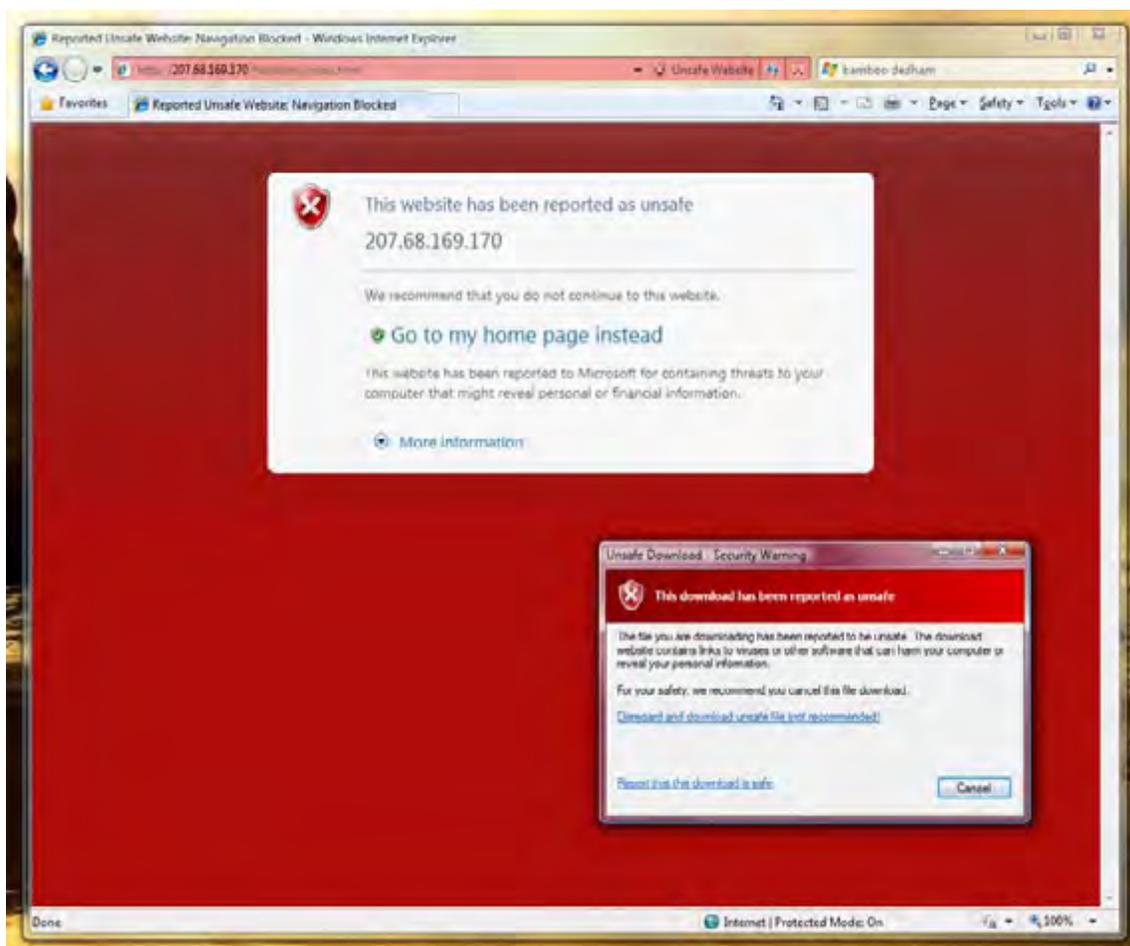
IE 8 SmartScreen Filter.

Microsoft Security Essentials

Microsoft Security Essentials is one of the best security features in Windows 7, even though it doesn't technically come with Windows 7. And while I've been lobbying Microsoft for years to simply include pervasive antivirus and anti-malware functionality with Windows 7, giving it away for free isn't bad. Microsoft Security Essentials is basically the security parts of the product that used to be called Windows Live OneCare. It's absolutely free, will be widely available via the Microsoft web site by the time Windows 7 ships, and doesn't appear to impact system performance at all. It is what one might call baseline anti-malware functionality, and if you're using any modern Windows version, you need to skip out on the bloated security suites and just pick up this little wonder. It works great, and you'll almost never even notice it's there.
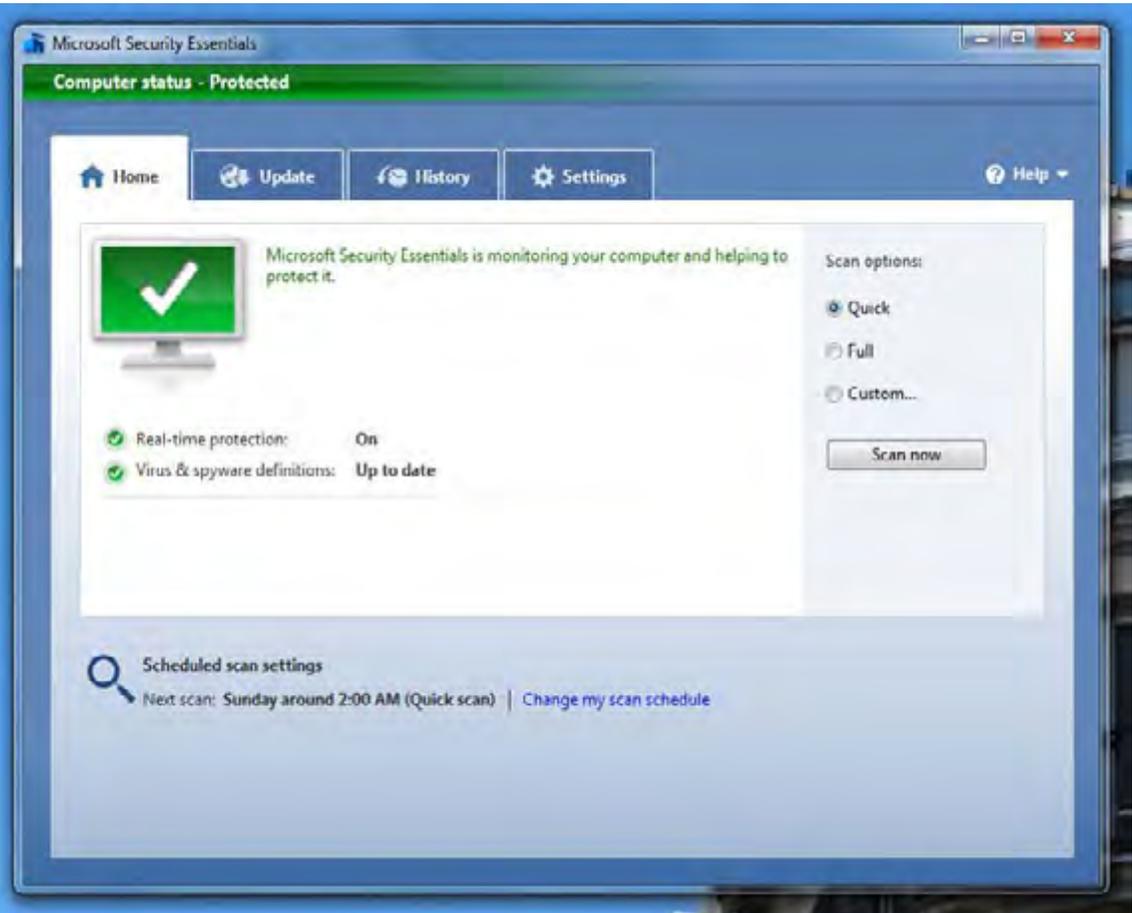
Microsoft Security Essentials.

Final thoughts

While the security improvements in Windows Vista were somewhat revolutionary, this time around we get evolutionary improvements to those features. And that's exactly what Windows users need right now, since Microsoft got it so right in the previous version. From a security standpoint, Windows 7 really is a better Vista. It's more secure, but easier to manage, and with better performance and fewer interruptions.