

Windows 7 Feature Review

Finally, Microsoft releases a successor worthy of Windows XP

For the Windows faithful, it's been a tough eight years. With the launch of Windows XP in 2001, we thought we were poised on a brink of a new world of NT-based goodness—but two years and uncountable exploits later, the future of Windows was grim. Facing a never-ending torrent of new 'sploits, worms, and trojans, Microsoft fired back with the single greatest operating system update of all time—Service Pack 2. In the single fell swoop of SP2, Windows XP went from Swiss cheese to secure, and once again we were poised to enter the promised land with... (wait for it)... Vista.

Of course, we all know how Vista turned out. Haunted by poor performance in everything from games to disk access to networking, Vista is widely considered to be Microsoft's biggest failure. Nonetheless, Vista laid the groundwork for a host of new technologies, all absolutely vital to pushing Windows into the 21st century. Vista's new, modern driver architecture was designed to move core functionality from the kernel (where any instability can bring down the whole system) to user space—an absolutely necessary development. Likewise, Vista's proper enforcement of permissions for both users and applications enhanced security, even though UAC remains very annoying. And once vendors fixed their driver flaws and Microsoft squashed some underlying bugs, Vista morphed into an entirely workable operating system, even if we still wouldn't describe it as "good."



So, as 2009 draws to a close, we find ourselves testing another new Microsoft OS: Windows 7. Building on the now-mature technologies introduced with Vista, but with a renewed focus on performance and ease-of-use, Windows 7 seems poised to succeed where Vista couldn't. We've finally received a final build of Win7, and have run it through the wringer in both the Lab and in the real-world. Here's what we found.

New Features

While support for new hardware and improved security are perfectly valid reasons to upgrade your OS, the sexiest benefits of an operating system upgrade are all the new features. Indeed, from a completely revamped user interface to brand-new features designed to make organizing and sharing your files easier, Windows 7 delivers much more than some new wallpaper and a different color Taskbar. (Though there are lots of new wallpapers.)

User Interface Enhancements

The most obvious changes from previous versions of Windows to Windows 7 can be found in a redesigned user interface. Sure, much of the interface remains the same, but Microsoft has completely overhauled key elements, starting with the Taskbar.

The New Taskbar



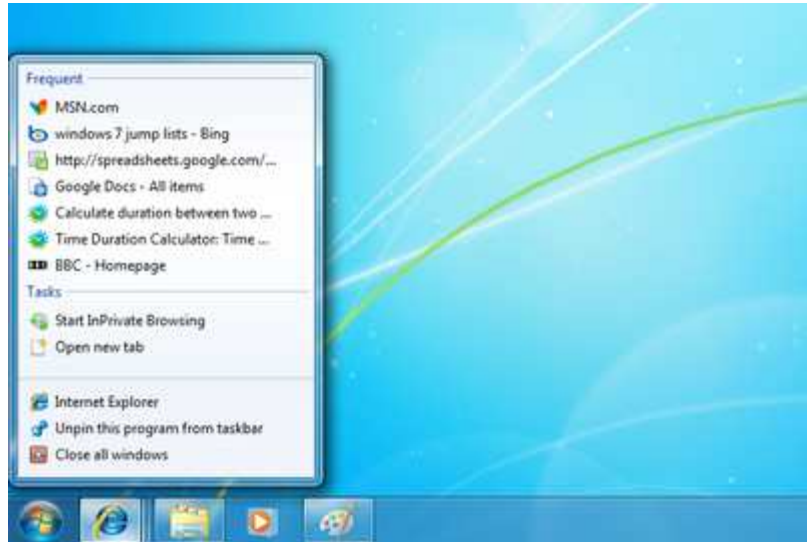
After 14 years of nothing more than cosmetic changes, Microsoft's redesign of the Taskbar combines the pure window organizing power of the classic Taskbar with the application-launching, multi-purpose convenience of Mac OS X's Dock. In addition to showing the applications that you currently have open, the new Windows 7 Taskbar also hosts shortcuts to your most commonly used applications. Click a shortcut when the app is running, and it brings the most recently used window to the foreground. Click the same shortcut when the app is closed, and it will launch the app.



But that's not all. Drag a file onto a shortcut in the Taskbar, and Windows will open the file using that app. Hover your mouse over a running application's icon, and it expands to show live thumbnail previews of all of that app's windows, floating just above the Taskbar. Mouse over a thumbnail, and Windows will bring that particular window to the foreground. You can even close individual windows from the thumbnail previews.

For anyone who regularly finds himself with more than 10 windows open, the new Taskbar is a dream come true.

Jump Lists



Another core enhancement to the OS comes in the form of Jump Lists. In short, Jump Lists put frequently used files in a convenient menu that's a simple click away from the shortcut icon on the Taskbar or on the Start Menu. Apps that support Jump Lists will display the list when you right click on the shortcut, or when you left-click and drag the mouse up away from the Taskbar. Additionally, some apps will automatically populate their Jump List with files you recently opened.

New Shortcuts

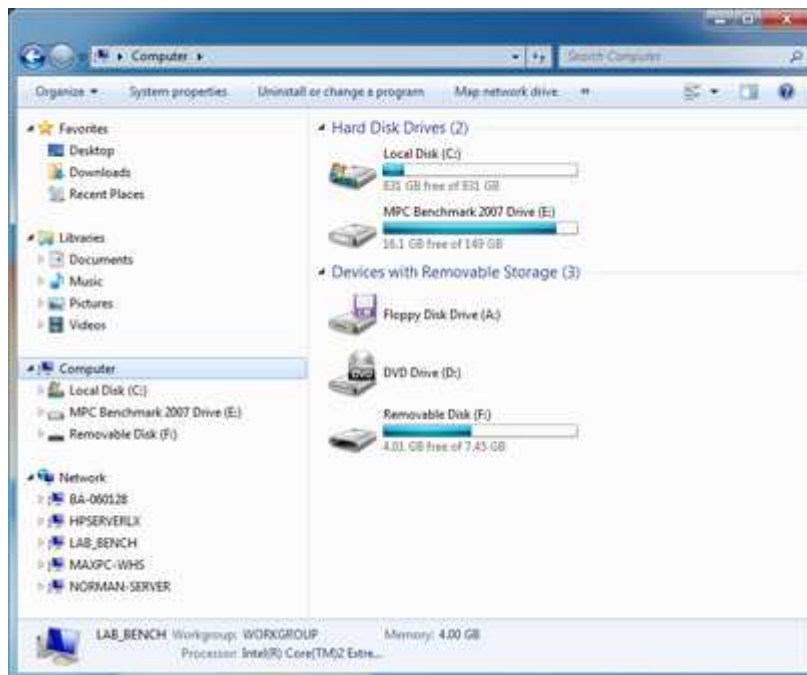


Along with the redesigned UI elements comes a whole new world of user-interface shortcuts. There are really too many to get into here, but the best of the new shortcuts allow you to maximize a window by dragging it to the top of the screen, minimize it by dragging it to the bottom, maximize to half your screen by dragging it to either edge, or (our favorite) minimizing all other windows by shaking the one you want to focus on. Furthermore, enhancements to alt+tab let you immediately find lost windows, and you can use the Windows key and numbers 1 through 0 to launch the first ten shortcuts on your Taskbar. And when those apps are already open, you can cycle through multiple windows by pressing the app's keyboard shortcut again.



Explorer Enhancements

Windows Explorer also receives some much-needed love. The changes since Vista are relatively minor, but they serve to make the left-column of Explorer the quickest way to navigate to any folder on your hard drive, network, or even in the cloud. Furthermore, you can arrange the different categories in any way you want, quickly add special folders to the Favorites section, and even hide sections you don't use.



The other main place to access the file browser is the shortcut bar on the right column of the Start Menu. In Windows 7, there are more folders that you can choose to display there, including Downloads and Recorded TV. However, you still can't place any folder you choose in one of those precious slots.

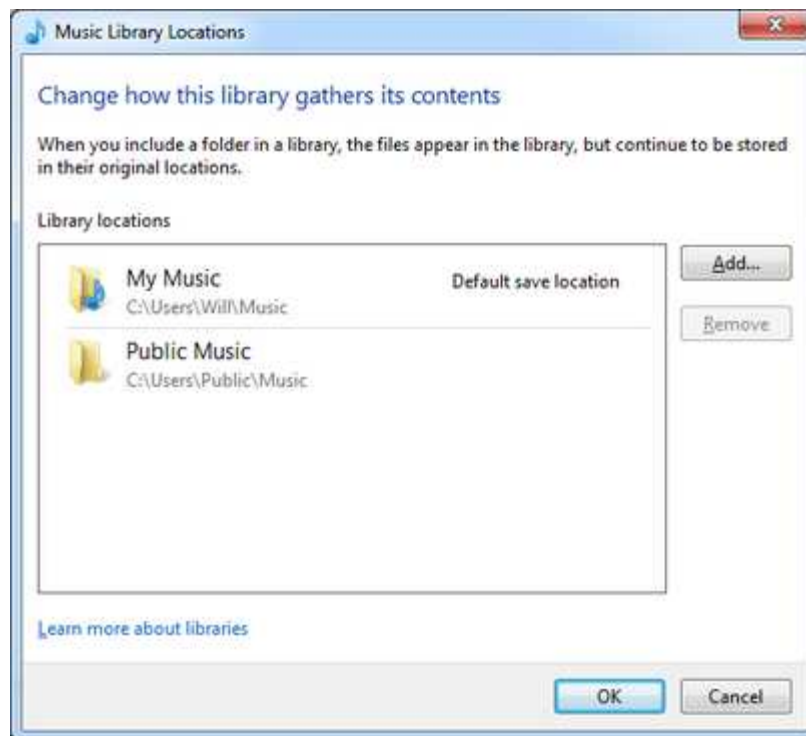
We Hope You Like the Ribbon



The controversial Ribbon, which replaced traditional menus and shortcut bars in Office 2007, is prominently featured in Windows 7. In the applets that ship with the OS, you'll see the Ribbon featured prominently.

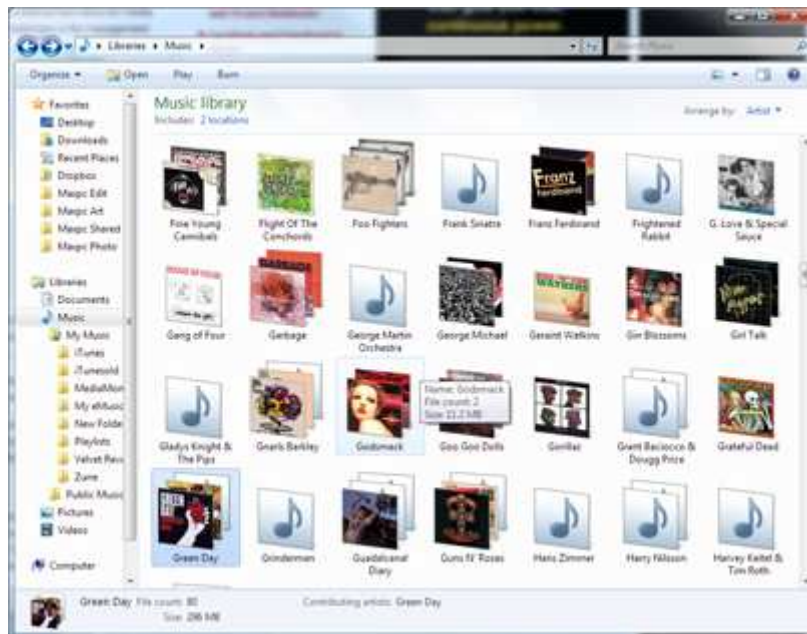
Libraries

The other major new Explorer feature is Libraries. Libraries are simply data buckets (for lack of a better term) that can store content that's similar in nature, but located in different places on the same computer, across a network, or in the cloud. Libraries are handy for organizing and collecting files in one place, because they appear to be normal folders to most applications.



For example, suppose your music is stored in the Music folder on your profile, but your wife's music is stored in the Music folder in her profile. If you want to stream both collections of music using some sort of streaming software, you can either point it to both folders, or you could create a Library that includes both folders and then point your

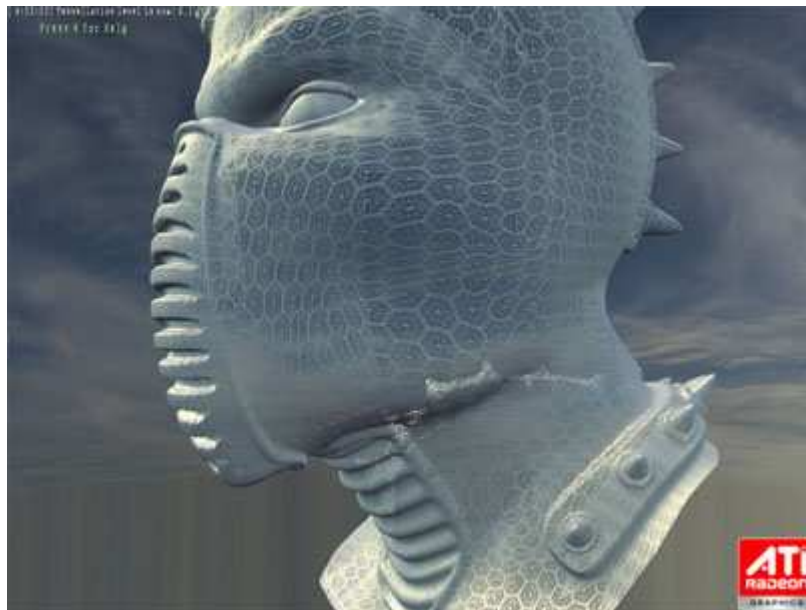
streaming application to that Library. [Libraries become especially useful](#) when you integrate them with your commonly used folders, network shares, and cloud services.



DirectX 11

The latest version of DirectX is more iterative than revolutionary, at least as far as gaming is concerned. However, it does bring some exciting new technology to Windows in the form of the general-purpose GPU computing API known as DirectX Compute.

Gaming



There are three important things to know about DirectX 11 if you're a gamer. First, DirectX 11 is coming to Vista and Windows 7, but not XP. Second, DirectX 11 is

backwards-compatible with DirectX 10-capable videocards, so games that require the new API will still run on older GPUs, although those older GPUs aren't necessarily going to perform well. Third and finally, the feature likely to have the largest impact the soonest in DirectX 11 is hardware tessellation. Tessellation lets the GPU automatically fill in detail on certain types of meshes by procedurally generating more complex (and better looking) triangles to fill in the gaps in the source art. The upshot is simple: Objects that are curved will look better when you render them on a PC equipped with a DirectX 11-capable GPU. There are other DirectX 11 improvements that will enhance performance on DirectX 11 GPUs, but we don't anticipate a visual leap on par with the jump from DirectX 9 to DirectX 10.

Compute Shaders: CPU-Like Functionality

General-purpose GPU computing (GP-GPU) allows developers—specifically, those outside of the gaming arena—to take advantage of the performance potential of today's modern, massively parallel GPUs. Tasks like rendering frames of animated movies, converting RAW photos to TIFFs, encoding H.264 video, and scrubbing video can all be accelerated using GP-GPU technology.

Until recently, in order to take advantage of the computing power of your videocard, you needed to use apps that were specifically coded for the brand of GPU you owned. DirectX Compute (along with the competing OpenCL) aims to change that by providing a common interface for harnessing the power of whatever processors are in your system, be they from AMD, Intel, or Nvidia.

It remains to be seen which GP-GPU API developers will embrace, but the future for the technology is bright.

The HomeGroup



View and print your homegroup password

Password for the homegroup on your network:

65ed1Aa4ap

Use this password to connect other computers running Windows 7 to the homegroup.

On each computer:

1. Click Start, and then click Control Panel.
2. Under Network and Internet, click Choose homegroup and sharing options.
3. Click Join now, and then follow the HomeGroup wizard to enter the password.

Note: Computers that are turned off or sleeping will not appear in the homegroup.

Since home networks first became commonplace, we've heard promises about Microsoft making the home networking experience better, easier, faster and safer. These are

admirable goals, but connecting to a network share has been essentially unchanged since the days of Windows NT 4. Enter Windows 7. Now, instead of haplessly navigating a maze of permissions, share settings, and firewall boondoggles, [if you want to share your files or printer with other networked PCs, you simply join a HomeGroup](#). And it's as easy as typing in a password. Once you've created your HomeGroup, sharing files is as easy as right-clicking on a folder or file, clicking Share With, and selecting the option you want. You can exclude individual files or folders the same way.



The only complaint we have with HomeGroups concerns compatibility: Neither earlier versions of Windows nor Windows Home Server machines can join HomeGroups today.

Touch

While Tablet PCs have been around for the better part of a decade now, Windows 7 is the first edition of the mainstream Windows OS to actively support touch. We haven't had the opportunity to test it, because the hardware support is limited right now, but the OS will work with common touch and multi-touch gestures on machines equipped with the appropriate hardware and software.

What Isn't In Windows 7

For the first time that we can remember, Microsoft has removed functionality from Windows. In Windows 7, previously core applets like Windows Movie Maker, Windows Photo Gallery, and Windows Mail are no longer part of the core OS. Instead, they're part of a separate, optional download called **Windows Live Essentials**. We weren't huge fans of these apps when they were part of the OS, and we don't miss them now that they're gone.

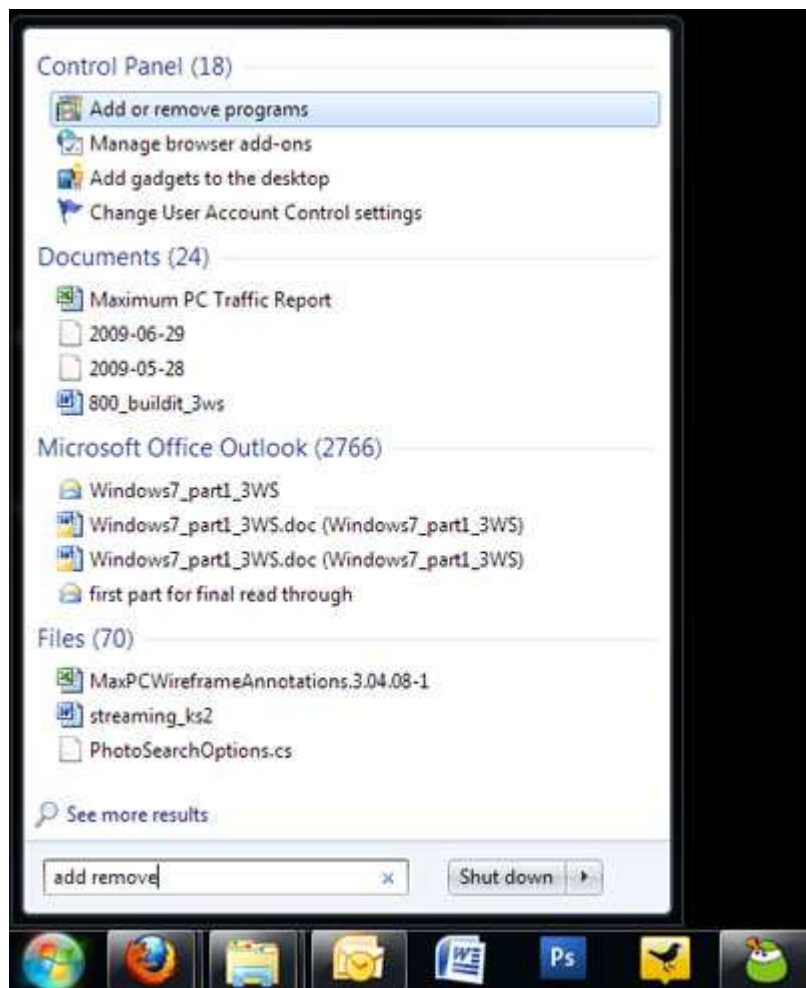


Improvements from Windows Vista and XP

In addition to shiny new features, many legacy features from Vista and XP have been tweaked, touched up, or otherwise improved upon.

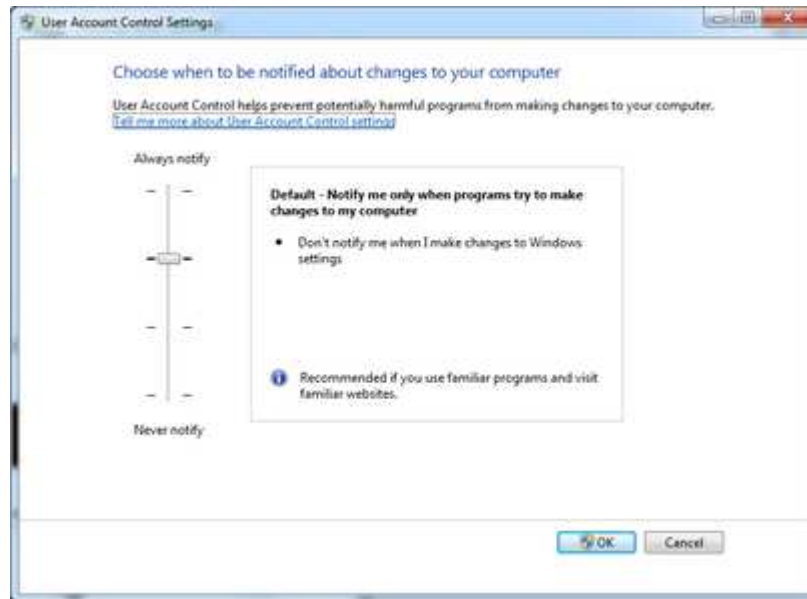
Searching Is Fundamental

Vista was the first Windows version to have deep search features built right in. Does anyone use them? Not enough people do, and so our best advice we can give to the new Windows 7 user is to embrace search. As in Vista, you can use search to launch apps without removing your hands from the keyboard, to find specific settings in the control panel, and to parse through your email, document folders, and even shared folders on your network. Getting started with search is easy—just mash the Windows key on your keyboard and type your query. The Windows 7 search is speedier than Vista's was at launch, and finally allows searching of network shares, assuming they're part of either your HomeGroup or indexed on the server side.



Better UAC

User Account Control was one of the most maligned new features to appear in Vista, and for good reason. We have all been extremely annoyed by UAC's incessant prompts for permission to do anything that requires administrator access. Worse yet, sometimes Vista will prompt multiple times for the same action. All that said, UAC has produced Microsoft's desired effect: In situations where malware has infected Vista PCs, UAC helps contain those infections to a limited portion of the hard drive, typically a single user profile.

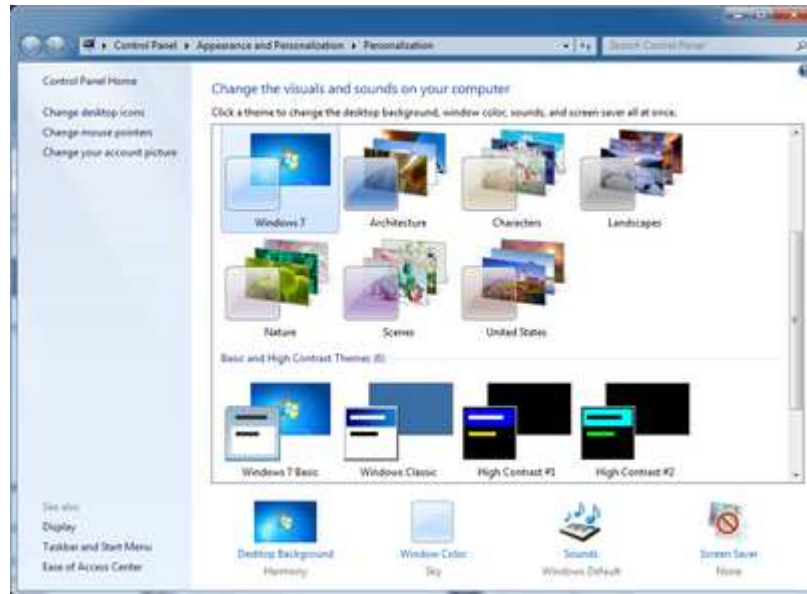


In Windows 7, Microsoft exposes multiple levels of UAC notification control, and has greatly toned down the number of notifications you'll typically see. Whether you want granular control over the actions of each and every application you install, or simply opt not to be bothered, you can choose the setting that's right for you.

UI Speed

Many of the behind-the-scenes improvements to Windows 7 were designed to do one thing: improve the responsiveness of the user interface. Whether it's the result of core kernel improvements that boost the performance of multi-threaded apps on multi-core CPUs, or improvements in the way frequently used applications are cached in memory, the new OS feels snappier in almost every way. Apps seem to load faster, and dialog boxes appear and disappear faster. In general, we found ourselves spending less time waiting for the PC than we do in XP, Vista, or OS X. While we attempted to measure some quantitative benchmarks on app load times and other UI speed tests, we found it very difficult to measure reliably. However, when surveying dozens of users about their Windows 7 experiences, one response was almost universal: Windows 7 feels faster.

Wallpapers



It seems a little goofy to talk about, but Windows 7 includes more awesome desktop wallpapers than any version of Windows we've ever tested. The included window dressing ranges from the standard plain-vanilla Windows logo background to awesome, inspired, and downright creepy images created by artists from around the globe. Windows 7 also includes a utility that automatically swaps your wallpaper at fixed intervals. Still missing, however, is a way to run different backgrounds on multiple monitor rigs.



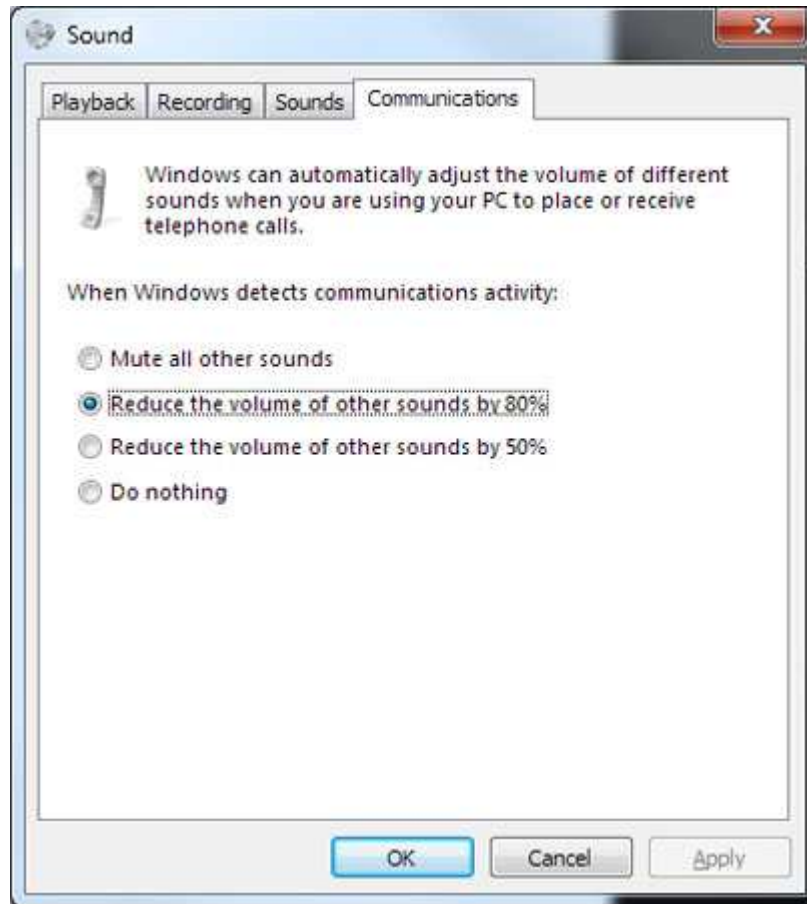
Audio

We also have to give a nod to the polish that Microsoft gave to the audio control panel. Windows 7 handles multiple audio outputs much better than previous iterations of the OS, allowing you to designate your headphone output to communications software, while using your speakers for everything else. The OS will even detect when you're using voice chat software, and automatically mute or lower the volume on other sound sources. We

had some problems with games that included voice chat functionality triggering this feature, but it was relatively easy to fix.



Like Vista, Windows 7 lacks the APIs required to support older DirectSound 3D games. With most modern titles supporting OpenAL (which does work on Windows 7), the omission of 3D hardware sound support is more forgivable this go 'round than it was with Vista.



But it's still not something we're happy about.

Versions, Activation and 64-bit

Like Windows Vista, there are many versions of Windows 7 available. However, unless you're an IT guy at a big company, you really only need to be concerned with four different editions: Starter, Home Premium, Professional, and Ultimate. Yes, Microsoft has simplified the different versions of Windows that are available, but choosing the best OS for your needs still isn't effortless.

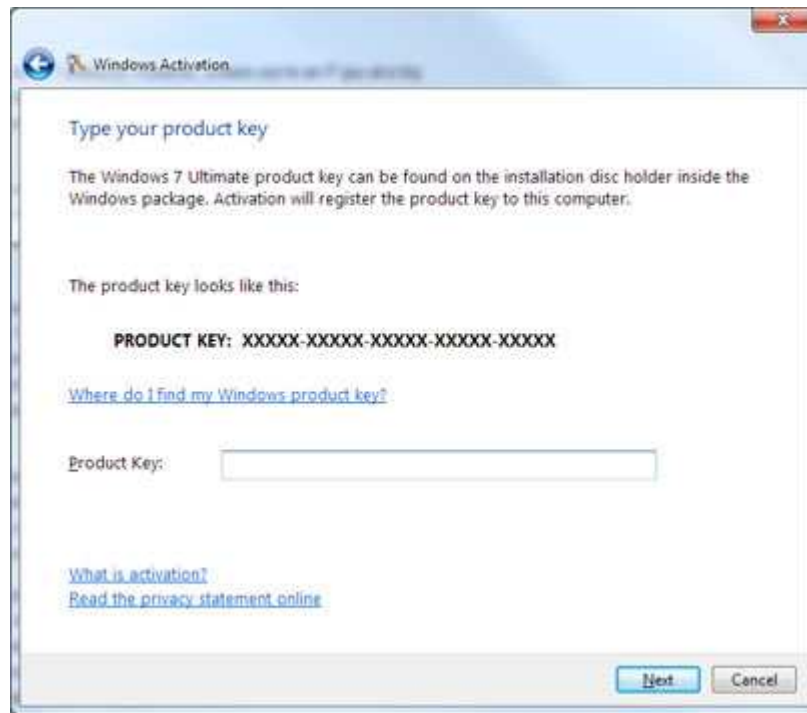
The easiest way to look at the Windows 7 product family is to recognize that each version is superset of the version beneath it. For example, Home Premium includes all the features of Starter, but adds the Aero interface and Media Center. Professional, meanwhile includes all the features of Home Premium (and thus Starter), but a few features oriented toward business users.

Now, with that said, there are really only a few core features that would demand you buy one version over another.

For example, the main difference between Windows 7 Home Premium and Windows 7 Professional is that Pro includes the [virtualized XP compatibility mode](#), the ability to back up your computer to a network drive, a Remote Desktop Connection server, and the ability to connect to corporate networks. Ultimate, meanwhile, includes all the features of

Home Premium and Professional, but adds support for Bit locker drive encryption and the freedom to switch the OS between different languages.

So which version should you buy? We recommend that most home users buy Home Premium, unless you either run a domain controller inside your home, or you want to be able to use Remote Desktop to log into your computer from another PC. Once you choose your OS, you can be secure in the knowledge that each successively more advanced version includes all the features included in simpler versions.



Software activation continues to be a hassle for people who purchase Windows 7. We didn't complain when Microsoft launched Windows XP, but we have grown increasingly irked the unnecessary hassles it creates. For example, upgrading a hard drive or videocard frequently requires a call to Microsoft's phone activation line. While we recognize that Microsoft must protect its OS against piracy, we're not fans of any anti-piracy technology that inconveniences paying customers more than the pirates that it's designed to thwart.

System	
Rating:	Windows Experience Index
Processor:	Intel(R) Core(TM)2 Extreme CPU Q6850 @ 3.00GHz 3.00 GHz
Installed memory (RAM):	9.00 GB (6.00 GB usable)
System type:	64-bit Operating System
Pen and Touch:	No Pen or Touch Input is available for this Display
Computer name, domain, and workgroup settings	
Computer name:	wsmith-win7
Full computer name:	wsmith-win7.futureus.net
Computer description:	
Domain:	futureus.net

Our final thought on Windows 7 SKUs concerns the eternal debate between 32-bit and 64-bit support. The debate is essentially moot, as all retail versions of Windows 7 include both 32-bit and 64-bit discs. What's more, your activation key for Windows 7 is good for either a 32-bit install or a 64-bit install, so you can try out whichever version you'd like, without worrying that you're locking yourself into a version of Windows that you may not want. That said, we'll be running 64-bit Windows 7 on our machines, and expect most enthusiasts to do the same.

Performance

To assess Windows 7 performance, we spent more than 30 hours testing Windows 7 Professional x64 in a battery of benchmarks designed to measure application performance, network performance, disk performance, and finally, gaming. Our test rig was equipped with a Intel Core 2 Quad Q9770 Extreme processor, 4GB of DDR2 memory, a 1TB Barracuda 7200.12 drive, and an ATI Radeon 4890 videocard. To test gaming performance with both the ATI and Nvidia's drivers, we used a manufacturer-overclocked GeForce GTX 285.

Applications

As you can see in our application benchmark chart, we saw wildly varying performance of different applications in Windows 7 x64, Windows XP x86 with Service Pack 3, and Windows Vista x64 with Service Pack 2. A few things really stood out, though. First, it seems that the hard drive performance problems that plagued early editions of Vista are solved once and for all in Windows 7. In our tests, Windows 7 was a few percent slower than XP SP3, but faster than Vista SP2.

APPLICATION BENCHMARKS

	Windows XP (x86)	Windows Vista (x64)	Windows 7 (x64)	Percentage Difference: XP to Win 7	Percentage Difference: Vista to Win 7
ProShow Producer (sec)	826	1166	848	-2.66%	+27.27%
Mainconcept Reference (sec)	1649	1657	1653	-0.24%	0.24%
Premiere (sec)	831	739	840	-1.08%	-13.67%
Photoshop (sec)	141	127	140	+0.71%	-10.24%
PC Mark 2005					
CPU	9116	9076	8568	-6.01%	-5.60%
Memory	6459	6371	6463	+0.06%	+1.44%
HDD	8029	6782	7537	-6.13%	+11.13%
PC Mark Vantage					
HDD	WNR	4657	4728	N/A	+1.52%

Best scores in bold. Our test rig uses a Intel Core 2 Quad Q9770 Extreme CPU, 4GB DDR2 RAM, 1TB Seagate Barracuda 7200.12 HD, and an ATI 4890 videocard.

Most of our application benchmarks measure either multi-threaded CPU performance (Main Concept, ProShow), hard drive performance (PC Mark Vantage), or a real-world mixture of the two (Photoshop, Premiere). In all of our application benchmarks, Windows 7's performance was within a stone's throw of XP.

It's also worth noting that in several of our tests Vista was actually a big winner, thanks to performance enhancements that hit in Vista Service Pack 2.

Network

One of the main problems with Windows Vista prior to Service Pack 1 was poor network performance. Well, we're happy to say that the days of waiting for files to copy across a network are done. Check the benchmarks and see for yourself—Windows 7 is stupid-fast at transferring files across a network.

NETWORK BENCHMARKS

	Windows XP (x86)	Windows Vista (x64)	Windows 7 (x64)	Percentage Difference: XP to Win 7	Percentage Difference: Vista to Win 7
File Transfer (small files) (sec)					
Download	46.9	56.3	21.8	+53.52%	+61.28%
Upload	20.5	16.5	16.9	+17.56%	-2.42%
File Transfer (large file) (sec)					
Download	46.2	4.3	4.1	+91.13%	+4.65%
Upload	4.9	4.6	3.9	+20.41%	+15.22%

Best scores in bold. Our test rig uses a Intel Core 2 Quad Q9770 Extreme CPU, 4GB DDR2 RAM, 1TB Seagate Barracuda 7200.12 HD, and an ATI 4890 videocard.

Games

To test gaming performance, we ran a mix of DirectX 9 and DirectX 10 benchmarks on both ATI and Nvidia hardware. It's important to remember when checking these scores, you shouldn't be comparing ATI to Nvidia and vice versa. Instead, you should compare ATI's and Nvidia's respective scores on the different platforms to see who has the best drivers for Windows 7.

GAMING BENCHMARKS - ATI

	Windows XP (x86)	Windows Vista (x64)	Windows 7 (x64)	Percentage Difference: XP to Win 7	Percentage Difference: Vista to Win 7
DX 10 Benchmarks					
Far Cry 2 HQ (fps)	WNR	52.9	53.1	N/A	+0.38%
Far Cry 2 LQ (fps)	WNR	57.8	58.4	N/A	+1.04%
Crysis - Very High - no AA (fps)	WNR	31.4	31.4	N/A	+0.00%
Crysis - Very High - 4xAA (fps)	WNR	27.5	27.6	N/A	+0.36%
DX 9 Benchmarks					
Far Cry 2 HQ (fps)	42	41.6	45.5	+8.33%	+9.38%
Far Cry 2 LQ (fps)	46.5	46	41.2	-11.40%	-10.43%
Crysis - High - no AA (fps)	47.7	44.4	41.6	-12.79%	-6.31%
Crysis - High - 4xAA (fps)	40	36.1	36	-10.00%	-0.28%
Call of Duty 4 (fps)	92.9	95.2	97.8	+5.27%	+2.73%

Best scores in bold. Our test rig uses a Intel Core 2 Quad Q9770 Extreme CPU, 4GB DDR2 RAM, 1TB Seagate Barracuda 7200.12 HD, and an ATI 4890 videocard.

In DirectX 10 benchmarks, both ATI and Nvidia chalked up almost identical scores in Vista and Windows 7. That's to be expected, given that both companies are using a universal driver in Vista and Windows 7. That is, the driver in Windows 7 and Windows Vista are essentially the same.

However, everything changes when you get to DirectX 9 benchmarks. Depending on the benchmark, Windows 7 ranged from about 10% faster to about 10% slower than Windows Vista. What you gain in one benchmark, you lose in another. And, over the entire range of our DirectX 9 tests, everything ended up even.

GAMING BENCHMARKS - NVIDIA

	Windows XP (x86)	Windows Vista (x64)	Windows 7 (x64)	Percentage Difference: XP to Win 7	Percentage Difference: Vista to Win 7
DX10					
Benchmarks					
Far Cry 2 HQ (fps)	WNR	62.7	62.8	N/A	+0.016%
Far Cry 2 LQ (fps)	WNR	69.5	68.6	N/A	-1.29%
Crysis - Very High - no AA (fps)	WNR	30.1	30.1	N/A	+0.00%
Crysis - Very High - 4xAA (fps)	WNR	25.6	25.7	N/A	+0.39%
DX 9					
Benchmarks					
Far Cry 2 HQ (fps)	47.5	50.5	46	-3.16%	-8.91%
Far Cry 2 LQ (fps)	52	46	51.4	-1.15%	+11.74%
Crysis - High - no AA (fps)	50.7	49.5	49.5	-2.37%	+0.00%
Crysis - High - 4xAA (fps)	39.7	39.7	40	+0.76%	+0.76%
Call of Duty 4 (fps)	121.4	114.9	116.9	-3.71%	+1.74%

Best scores in bold. Our test rig uses a Intel Core 2 Quad Q9770 Extreme CPU, 4GB DDR2 RAM, 1TB Seagate Barracuda 7200.12 HD, and a Nvidia Geforce GTX 285 videocard.

For gamers, especially those currently using Windows XP, there's a strong reason to upgrade to Windows 7. You may sacrifice a little performance in some games, but you'll gain some in others, and you'll have the ability to run DirectX 10 and 11 apps in their full glory, which will never be possible in Windows XP. We're also confident that both ATI and Nvidia will continuously work to improve gaming performance in the future, as both companies have for every other new OS Microsoft has released.

The Verdict

Whether you're coming from XP or Vista, Windows 7 offers a massive leap forward in usability, security, and support for new hardware and technology, especially for enthusiasts and power users. For anyone who regularly keeps many windows open at once time, the new Taskbar is worth the price of admission alone. For XP users, the

security improvements are equally worthy of praise, while Vista users will be thrilled with the much improved, much less annoying UAC. Add in support for new hardware technologies, more new features, and the kernel improvements that should allow you to get more from your multi-core CPU, and Windows 7 becomes a tidy, compelling package to all Windows users.

Best of all, the new OS simply feels faster than Vista or even XP. As one editor said after a session testing the OS, it's the best of both worlds—the user interface speed of XP and the features and security of Vista and more. That's something to be lauded.



We're happy with the changes Microsoft has made to Windows 7 as a product line. By making the more expensive SKUs supersets of the less capable versions, choosing the right version of Windows 7 is as simple as it was picking a version of XP (and exponentially easier than navigating the almost incomprehensible SKU structure for Vista). However, we still don't see any benefit to Microsoft fielding more than two SKUs of Windows—without Aero, Starter edition is unnecessarily crippled, as it was with Vista. Who should buy Ultimate? In our eyes, no one should, unless you desperately need multiple language support in the UI. As with Vista, the extras in Ultimate don't justify the added cost. For most of our users, we'll simply recommend Windows 7 Professional if you need to connect to a domain or use [XP mode](#), and Home Premium if you don't.

As with Vista and XP before it, we remain unhappy with the activation process. As enthusiasts who frequently upgrade hardware and reinstall our operating systems, we're tired of being punished with increasingly obnoxious reactivation processes. As paying customers, we shouldn't have to get on the phone every time we need to reinstall Windows, whether our behavior triggers piracy flags or not. The music industry has already figured out that the best way to drive your paying customers to thievery is to treat them like thieves. Hopefully, Microsoft will get the memo between now and the launch of Windows 8.

Moral objections to product activation aside, Windows 7 is unquestionably the best version of Windows that Microsoft has ever released, and is the true successor to Windows XP. If you're an enthusiast or power user, Windows 7 is well worth your money, whether for an upgrade today or on your next new machine.

We expect that this new OS will mark the beginning of the end for Windows XP, which is highest praise we can give the latest version of Windows.

Windows 7



Pros:

Unquestionably the best version of Windows to date. Snappier UI and kick-ass new features.

Cons:

Activation process continues to suck. Multiple product SKUs create unnecessary confusion.



[Microsoft](#)

Note: Taken from a review done by Maximum PC magazine 8-12-09

http://www.maximumpc.com/article/reviews/windows_7_review?page=0%2C0&EMC-R3A917316679=

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