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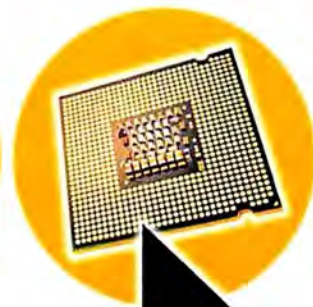


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COVER STORY

96 The Ultimate PC Power Boost

Deciding whether to buy a new system or upgrade your old one? You need to know what upgrade options are available and how much each will improve your current setup. We analyze the most popular upgrades—processor, video card, memory, hard drive, and optical drive—and provide step-by-step installation advice.

Cover photography by Marc Simon.

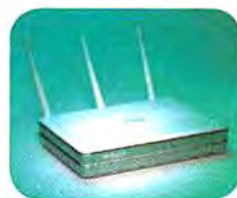


FEATURES

WIRELESS NETWORKING

116 The Truth About Superfast Wi-Fi

Networking products based on a preliminary version of the 802.11n wireless standard claim improved speeds and more-extensive range. We tested several “draft-n” routers and adapters—which may or may not be upgradable to the final specification when it arrives—to see how they perform. Should you take the plunge or wait until certified products arrive next year?

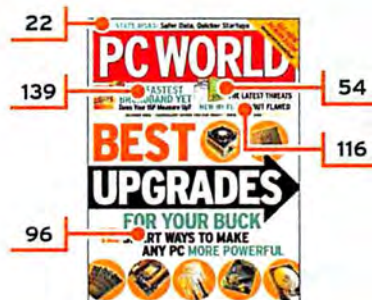


BROADBAND ISPs

139 The Best Broadband in America

High-speed Internet access is getting faster, cheaper, and more accessible all the time. Based on a survey of 9000 readers, we reveal which ISPs provide the best service. We also examine the range of activities that these ever-widening pipes will make possible—including much-improved IPTV, video on demand, and high-def movie downloads.

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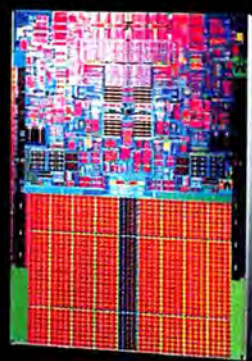
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86 Top 10 Laser Printers

88 Messaging Software

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90 Database Software

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COMING UP IN NOVEMBER

The Future of the PC: Find out how new technologies will affect computing over the next few years.

...of Entertainment: From HDTV to video on demand, we look at the trends changing entertainment.

...of Privacy: We examine the biggest threats ahead and how they will influence the way you live.

...of the Web: The Web is moving fast; we look at developments to expect over the next 18 months.



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In Praise of Older PCs

So your machine isn't the latest and greatest. That doesn't mean it's toast.

JUST HOW AGED is the PC that sits in my home office? It's not just older than my laptop and my work machine. It's also older than my car. Heck, it's older than my house. And the amazing thing is, I'm not itchy to buy a new home system with all the newest trimmings. This one still plays an essential

role in my everyday computing, even as it approaches its fifth birthday.

Time was when a PC that was a couple of years old could feel downright creaky, especially when you threw the latest tasks at it. Today, many computers of my Compaq Presario's vintage are doing just fine. They may not pack the latest and greatest technology, but they can do most of the things that most of us want to do in 2006. Especially with a few well-chosen upgrades.

I thought about that as we were working on this issue's upgrading how-to story, Robert Luhn's "The Ultimate PC Power Boost" (page 96). Don't scrap any machine until you read the article—it's full of hands-on, real-world advice on giving new life to old boxes.

Herewith, a few more tips, drawn from my own life with this Presario, on how to be a happy owner of a computer that's been around the block a few times:

Buy a system you can grow into. Upgrading is a smart move; avoiding the need to upgrade is smarter still. So even in this era of extremely cheap, surprisingly powerful PCs, I recommend springing for a machine with more horsepower and features than you need right now. Way back in early 2002, I bought my Presario with a 1.7-GHz Athlon XP CPU, 1GB of RAM, and a 100GB hard drive—which made it a pretty sweet system back then. Today those specs are mundane at best, but they've extended the PC's useful life.



Upgrade as your work demands it. The best time to invest in an upgrade is when it will provide instant gratification. So I didn't buy a DVD burner until I was ready to start fooling around with video. And there are some seemingly obvious upgrades I still haven't made. (Don't tell anyone, but my Presario has its poky old original USB 1.1 ports.)

Think outside the box. Defined liberally, an upgrade is any piece of new hardware that lets you get more out of a computer you already own. In the old days, most of them were components that lived *inside* the PC. But lately, I'm discovering that it's just as important to pay attention to external infrastructure.

In the time I've owned this PC, for instance, I've gone from no network to a wired one to 802.11b Wi-Fi to 802.11g with a great big networked drive. And

I'm about to get a faster DSL connection. I don't think there's a single internal upgrade that would be as worthwhile as these connectivity upgrades have proved.

Improve the stuff you see and touch. You might notice the speed boost that a replacement processor or additional RAM provides. Or you might not. But upgrades that appeal to the senses are always tangible.

Back when I bought this machine, I held on to the fuzzy-wuzzy CRT I'd used with its predecessor. Big mistake. A couple of years later, I ditched it for a nice LCD, and was instantly more productive. And a decent keyboard and mouse—or a mouse alternative like the Logitech trackball I now use—are high-value, low-cost improvements for aging computers.

Know when to say when. Hanging on to an older PC is wise only so long as it's not crimping your ability to get stuff done. And while upgrades can extend a system's life, they can't keep the machine going forever. So when it comes to postponing new computer purchases, I try to be a realist, not a fanatic.

For my vintage-2002 Presario, *when* will probably arrive around the time that Windows Vista does. I'm thinking that the best route to a good Vista experience will be to buy a powerful new machine designed to run the new operating system.

Then again, my PC is only a modern graphics card away from being a tolerable Vista system, flashy Aero effects and all. Could there be more life in this old PC yet? I just may decide to find out. ■

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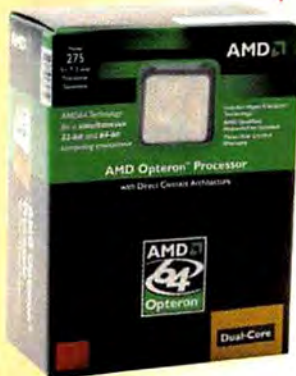
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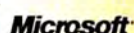
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NEWS & TRENDS

EDITED BY EDWARD N. ALBRO

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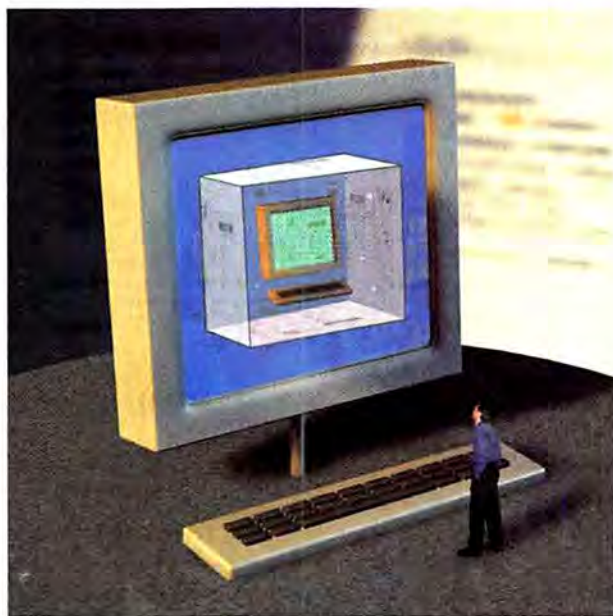
Disarm Net Threats

NEW TYPES OF SECURITY TOOLS PROACTIVELY LIMIT THE POWER OF VIRUSES AND OTHER MALICIOUS SOFTWARE TO INFILTRATE AND DAMAGE YOUR SYSTEM. **BY ERIK LARKIN**

A GROWING NUMBER of security tools are taking a new approach to fighting malicious software. Rather than blocking each virus, they aim to limit malware's power to cause harm even if it gets in.

We looked at five apps that adopt this preventive strategy. Amust's 1-Defender and DropMyRights, two free programs, restrict the ability of software (and malware) to make major changes to your computer, such as in non-user-controlled parts of the Windows Registry. Though basic, these utilities are very effective—especially DropMyRights, which works with any program.

Stronger protection comes from two apps that wall off Internet programs in a "sandbox." Software running in the sandbox is blocked from making system-level changes and



from accessing personal files, like bank documents in your personal finance app. GreenBorder Pro works only with Internet Explorer, though a Firefox version is planned; for

\$30 (the promotional rate at press time), you get a one-user license plus a one-year subscription that covers product updates. Fortres Grand's \$50 Virtual Sandbox works

with any program and must greenlight any process that wants to run on your computer; but its frequent alerts can grow irksome, and its setup is somewhat more complicated than GreenBorder Pro's.

For even more protection, consider the free VMware Player and Browser Appliance. This hefty download supplies a Firefox browser that runs in a fully virtualized environment; it's much like using a separate PC just for the Web. There are some gotchas, but the player is fairly easy to install, and it offers a great deal of safety for systems with the resources to run it.

LIMITING RIGHTS

ALL OF THESE programs exist because Windows needs help handling basic security, particularly with regard to user

accounts. You probably employ a Windows administrator account that gives you full rights to change the Registry, install software, and read all files. A good way to make your home PC safer is to operate it under a limited user account (aka a "least-privileged user account," or LUA) instead of an admin account; the limited user rights carry over to any malicious program that tries to infiltrate your system and thus minimizes the damage it can do. Hardly anyone does this, however, because using such an account can lead to serious inconveniences. If you're a limited user, Windows will frequently balk at a seemingly simple task such as changing time zones or installing legitimate software. To perform these kinds of tasks, you must first log out and then log back on as an administrator.

Not surprisingly, the vast majority of us avoid this headache by choosing not to create

a separate account, which is more convenient but makes for bad security. Any poisoned Web site or corrupt attachment that sneaks through a vulnerability in your browser or e-mail program can launch malware with full rights to embed itself into system directories, kill antivirus programs, and generally wreak havoc. In contrast, if the attacker is not

Attackers with no right to alter your PC are in effect declawed.

empowered to alter your system, it's in effect declawed.

Enter programs such as Amust's 1-Defender. Released in December and updated to version 2.0 in April, it works with Microsoft's Internet Explorer, Outlook, and Windows Messenger. After a brief installation, you'll have the option of creating new desktop and quick-launch icons for

starting each program without administrator privileges, even if you otherwise use an admin account. A splash screen and a slightly different icon in the upper left portion of the window indicate that you're running in SafeInternet mode. With the PC in this mode you (and any malware) can't install many types of software and can't make any hazardous Registry changes.

Links opened from other programs or files start IE in safe mode. You can bypass that behavior by shift-clicking the link, or you can start IE in the regular way by clicking the old icons. Most actions—like opening files on your computer or installing a new toolbar—stay the same.

Like 1-Defender, DropMyRights is a small program that opens selected apps under limited user rights. Developed by Michael Howard, a Microsoft senior security program manager, it has been around since 2004; though How- ▶

IN BRIEF

Product Pipeline



AOL GOES FREE: AOL's software and services are now available to broadband users without charge. AOL's new freebies include firewall, antivirus and antispyware software; 5GB of online storage; and parental control tools. Subscribers to the basic \$15-a-month AOL plan can switch to a free account (and keep their e-mail address) by going to keyword 'change plan'—no phone call required. However, those who convert their accounts will forfeit live AOL customer support and 10 hours of dial-up Internet access.

FINANCE '07: NEW versions of Intuit's Quicken and Microsoft's Money have arrived, but owners of older versions won't need to upgrade unless they face the loss of their ability to download bank transaction data due to the companies' respective sunset policies for online services. New to the lineup: Money Essentials, a \$20 download that will support a single year of online services (compared with two years for other versions of Money and three years for Quicken). For detailed coverage of Money and Quicken 2007, read our online review (find.pcworld.com/54927).



FEATURES COMPARISON

DROPMYRIGHTS: GOOD PROTECTION FOR FREE

THOUGH OTHER APPS provide more-expansive security, DropMyRights gives you simple yet effective protection against malware by limiting user rights—and it works with any program.

PRODUCT	Cost	Type of protection	Works with	Bottom line
Amust 1-Defender find.pcworld.com/54892	Free	Limits system changes by restricting user rights.	Internet Explorer, Outlook, Windows Messenger	1-Defender is a good, easy, and free option if you browse exclusively with Internet Explorer.
DropMyRights find.pcworld.com/54893	Free	Limits system changes by restricting user rights.	Any program	With just a little setup, this is a free winner for all of your programs.
Fortres Grand Virtual Sandbox find.pcworld.com/54895	\$50 ¹	Walls off applications in a "sandbox" to prevent unauthorized system changes.	Any program	Program provides extensive protection, but can be complicated to use and maintain.
GreenBorder Pro find.pcworld.com/54894	\$30 per year ^{1,2}	Walls off applications in a "sandbox" to prevent unauthorized system changes.	Internet Explorer ³	Product offers extensive and easy-to-use protection; but at \$30/year for just IE, it's pricey.
VMWare Player and Browser Appliance find.pcworld.com/54896	Free	Installs a separate browser inside a virtual system to prevent harm to your PC.	Firefox	Installation is large but not difficult; this is your safest option if you have the system resources to run it.

FOOTNOTES: ¹A 30-day free trial is available. ²Pricing is the current promotional rate for a one-user license. ³Firefox support is coming shortly.

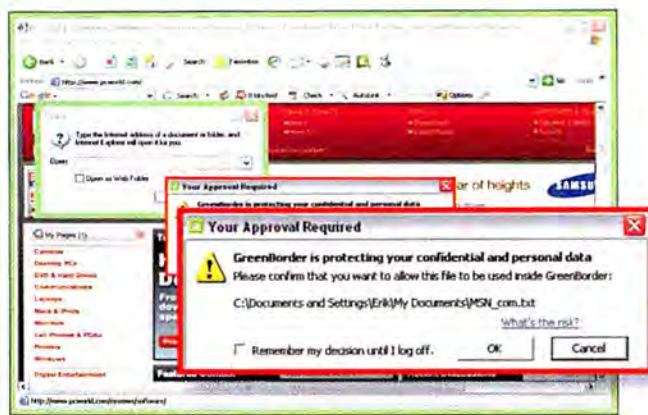
ard works for Microsoft, the company doesn't market the app. It works with any program, but before using it you need to make some quick changes. After installing it, you must create a shortcut for each program that you want to use with it (or you must modify the existing one). Howard provides full instructions with screen shots at his download site (see chart for the URL).

If you click a Web link in another program, such as Word, your default browser will start normally, without DropMyRights protection (unless it is running with DropMyRights, too). To get the extra security, copy and paste the link after starting your browser via the specially prepared shortcut.

Microsoft plans to include a "protected mode" in Vista that will run IE 7 without admin privileges, much as 1-Defender and DropMyRights do. Red-

ing a protected "sandbox" for the browser to work in. The utility blocks attempts by malware to write to system folders and perform various other administrator-type activities, and it blocks access to all your documents. It also offers a more-protected Privacy Zone mode (for online banking and the like) that blocks all access to your browsing history and other data. When running, it puts a noticeable green border around IE. If a toolbar or anything else within IE tries to open a file, you get a pop-up asking whether you want to allow it. Downloaded executables can't run until you remove GreenBorder's protection; if it's unknown to you or unexpected, you can research the app before deciding whether to permit installation of it.

Your bookmarks carry over to and from the sandbox without a hitch, but toolbars and



GREENBORDER PRO BLOCKS any attempt to open files with Internet Explorer until you have given your express permission.

tres Grand, sets up a sandbox, too, but it can do this for any program on your computer. The program scans your system when you install it, and will offer to run all browsers in a sandbox by default. E-mail programs run normally, but any double-clicked attachment runs in a sandbox. It gives you complete control over each program, allowing you to set only the ones you want to run in a sandbox.

Because it works with any program and blocks new apps from running without your permission, Virtual Sandbox affords more protection than GreenBorder. But it's also significantly more demanding. You'll get one or more pop-ups asking how you want to handle any new program, whether you're installing new software or a standard Windows program or process that the utility doesn't know about yet. The configuration menus can be hard to decipher, too.

Users who want added protection but don't want to deal with Virtual Sandbox's complexity may be interested in the free VMware Player and Browser Appliance. This bundle's two-step installation routine is surprisingly easy, and afterward you'll have Firefox running within a fully distinct

Ubuntu Linux operating system (the full download is about 300MB). The combination runs within its own window, completely segregated from the Windows OS. If you come across something that can break through Firefox running under Linux, the malware won't be able to get to anything in Windows. And restoring the isolated browser to a clean state is simple.

It's strong protection for Web surfing, but the player consumes a lot of resources when running—about 300MB of memory with four open tabs in Firefox (after a fresh install). Also, you have to set up a new browser, and you can't simply copy a saved bookmarks file into the virtual player environment.

All of these programs allow you to browse and do e-mail without incident, and all effectively improve your security. But by itself, fixing the admin rights vulnerability stops most current malware cold, according to Joe Stewart, senior security researcher at LURHQ, an Internet security firm. So unless you really need the additional level of protection that sandbox and virtualization apps provide, a rights-limiting tool such as the free DropMyRights may be your best bet.



VMWARE'S BROWSER APPLIANCE uses virtualization to run a PC-within-a-PC setup to keep Internet malware away from Windows.

mond is also trying to take the aggravation out of running day-to-day with a LUA (current Vista betas suggest that it still has some work to do).

WALLED-OFF APPS

GREENBORDER PRO, which works exclusively with IE, goes a step farther than DropMyRights or 1-Defender by creat-

ing a protected "sandbox" for the browser to work in. You must start IE unprotected to install a toolbar if you want it to be permanent.

GreenBorder installs and runs smoothly, and a Firefox version is in development. But given its yearly subscription fee, the protection may cost more than it's worth.

Virtual Sandbox, from For-



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STORAGE

First Tests: Fast 32GB Flash Hard Drive

NEW SOLID-STATE HARD DRIVES MAKE THEIR WAY INTO PORTABLE DEVICES.

ARE YOU READY for laptop storage with no moving parts to spin up, break, drain your battery, add weight, or make noise? That's what you get with Samsung's new 32GB SSD (Solid State Drive). Built using NAND flash memory, the SSD is the first consumer unit with enough capacity to compete against standard notebook drives; 32GB may not satisfy multimedia addicts, but it's plenty for average business users.

We looked at a preproduction model to see how it fared against 5400-rpm Seagate drives using the latest perpendicular recording technology or traditional longitudinal recording. The SSD found files more than twice as fast, and accelerated boot-up. Its cumulative speed advantage

over the other two drives was an impressive 25 percent, though it was slower on two tests that involved accessing the drive many times rather than performing longer sequential reads and writes (see chart).

Shipping now, the 32GB and 16GB drives will initially be sold to equipment makers only. Given flash memory costs (approximately \$63 per 4GB chip module at press time), it will be a while before an SSD matches the cost per gigabyte of a standard notebook drive, which is typically less than \$2 per GB. Samsung already includes the drive in its Japan-only Q30 subnotebook; the company is in discussions with U.S. vendors to bring SSD laptops and portable devices here.

Though the SSD's price is high, its silent operation, light weight, incredible shock resistance, and low level of power



SAMSUNG'S NEW 2.5-INCH 32GB SSD.

consumption bolster its appeal. Our unit weighed just 1.6 ounces, compared to 3.5 ounces for a typical 2.5-inch drive; 1.8-inch SSDs weigh even less. Its shock rating is a whopping 1500G—it can withstand most shocks short of being fired out of a howitzer—far higher than a standard drive's 200G to 300G rating. And it draws a tiny 0.5 watt of power while active and 0.1 watt at idle, far less than common drives.

But don't expect huge battery-life savings. On our system-level test, we saw a boost of about 9 percent in battery life for the test unit when configured with the SSD as opposed to with the Seagate Momentus 5400.3 (4 hours, 25 minutes versus 4 hours, 3 minutes).

HYBRID TECH

TO ENJOY SOME of the benefits of an SSD without shelling out big bucks, consider a hybrid

drive such as one of Seagate's 2.5-inch Momentus 5400 PSD series, which sport 256MB of flash memory cache. Such drives don't offer all the perks of an SSD, but they do save power by letting the drive motor spin down more often, and they cut boot and resume times by retaining the operating system data in the cache. They should also allow faster access to "instant on" multimedia and boost overall performance. Seagate hinted that hybrids will cost about 10 percent more than regular drives.

Vendors should release hybrids close to the ship date of Microsoft's Vista OS, which will include ReadyBoost, a feature that can use flash memory to accelerate system responsiveness. (See *Plugged In*, page 28, for another Samsung flash-based product that will offer hybrid capabilities.)

Still, mobile pros who can deal with the smaller capacity of a pure SSD—and can afford it—will love the 32GB SSD.

—Jon L. Jacobi

TEST REPORT

SAMSUNG SSD SHOWS ITS PERFORMANCE EDGE

SAMSUNG'S SSD PROVIDES a faster boot time and speeds file search, large-file processing.

DRIVE	Drive technology	TEST COMPLETION TIME (SECONDS)					
		Boot up	Copy files & folders	Copy large file	Find file	ACDSee PowerPack 5.0 ¹	Ahead Nero Express 6 ¹
Samsung 32GB SSD (32GB)	Solid-state	35	267	196	58	710	425
Seagate Momentus 5400.3 (160GB) ²	Perpendicular recording	42	270	215	131	647	607
Seagate Momentus 5400.2 (120GB) ²	Longitudinal recording	43	286	223	137	659	638

TEST CENTER CHART NOTES: All drives used the ATA-100 interface. Lower scores are better on all tests. Bold denotes the best score. Tests performed by the PC World Test Center. All rights reserved. **FOOTNOTES:** ¹These tests are part of the PC World Test Center's World-Bench 5 suite. For details on how we test, visit www.worldbench.com. ²This is a 5400-rpm drive with 8MB of cache.



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NO PLAIN VANILLA mapping site knows your favorite haunts as well as you do. New online services tap that information by enabling you to share your knowledge and memories of your most beloved locales—in your hometown or on the other side of the globe—with the rest of the world. I looked at five of these services: *Flagr*, *43 Places*, *Platial*, *Plazes*, and *Wayfaring*.

Built on conventional mapping data from services such as Google Maps, these sites let you add digital pushpins that link to personal descriptions of the locations. While any visitor can peruse the contributions of others on these sites, typically you must register in order to add content. But don't worry about having to provide credit card info: All five sites are free, requiring only that you submit a valid e-mail address. (Note, however, that *Plazes* is still in beta form, and that *43 Places* may eventually charge a fee.)

Looking for New York City's best street art? Want to follow the virtual footsteps of Jack Bauer, protagonist of the TV show *24*? *Wayfaring Media's* *Wayfaring* (www.wayfaring.com) has directions for both. Users can also post comments on other users' maps.

Though most contributors offer a lighthearted look at their locations, some at *Platial* (www.platial.com) tell dark tales, such as those tied to locations of recent shark attacks. The site, which calls itself



A PLATIAL MEMBER'S entry for San Francisco's Ferry Building includes a photo, comments, and its location on Google Maps.

"The People's Atlas," recently added a feature that links its maps to RSS feeds, so you can receive alerts about new annotations for places that interest you, or by other users whom you specify—giving the site a timeliness that the others I looked at lacked. Several of the sites I visited allow you to add images to your text posts, but *Platial* is the only one that supports video uploads.

TRAVELER WISH LISTS

ANYONE WHO HAS ever used Yahoo's popular Flickr photo-sharing service recognizes how tags work: Users assign keywords to categorize images. The same approach is taken by the Robot Co-op's *43*

Places (www.43places.com), which—despite its name—has descriptions of thousands of locales around the world. Along with the usual place names, you'll find tags such as "Hogwarts" and "Pirates of the Caribbean," illustrating that travel is sometimes a state of mind. The site even posts user-assigned "wanderlust ratings" for each mapped location, though it's difficult to find any spot with a rating under 80 percent (100 percent is the highest possible mark).

Plazes (www.plazes.com) ties user-supplied data to network router locations (called *Plazes*), as automatically identified by free, downloadable desktop software that also lets

people (all users or, at your discretion, invited friends) see where you are. You can use the service without the downloaded app to find other *Plazes* and users—but unless you use the software, you can't add a *Plaze* to the service's database, and others won't be able to see your precise location.

The least developed of the five services is *Flagr* (www.flagr.com), self-described as a "Sharewhere" site. It has relatively few annotated locations, and the descriptions I checked lacked detail. *Flagr* demonstrates that, like all sites that rely on community-created content, personal-mapping services depend on attracting a critical mass of participants.

PRIVACY ISSUES

ONE KEY CAVEAT: These and other personal-mapping sites have built-in privacy risks. Though all five of the services I tested offer some ability to control who can see your data, you are entrusting personal information to a Web server. In general, it's a bad idea to post any data you wouldn't feel comfortable writing on a postcard sent via U.S. mail.

Time will tell whether any of these ambitious services will ever become the mapping equivalent of such community powerhouses as MySpace or YouTube. But if you're going to check out just one, head to *Platial*, which seems to have more—and more-detailed—posts than its competitors.

—Dennis O'Reilly

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INTERNET

Employers Crack Down on Personal Net Use

MISUSING E-MAIL OR BROWSING THE WRONG SITES CAN COST YOU YOUR JOB.

TASHA NEWITT WAS aware her employer, the Washington State Department of Labor and Industries, had a policy restricting personal use of work computers, but she believed it focused on Web surfing, not e-mail. So she was stunned when the agency fired her after finding 418 personal e-mail messages received over a period of five months (or about 5 per workday) on her PC.

Newitt isn't alone: Increasingly, managers are cracking down on employee Internet activity by drafting strict usage policies—and enforcing them through use of software that monitors surfing, examines e-mail, and restricts the sites an employee can browse to.

Newitt's employer examined her office's e-mail after a co-worker filed a sexual-harassment complaint against a supervisor. The department ultimately fired 8 employees (including Newitt) and disciplined 16 others for their improper use of agency equipment.

Will Vehrs, who works at the Virginia Department of Business Assistance, received a ten-day unpaid suspension for excessive casual use of the Internet while at work. Vehrs' employer knew he blogged, often about state issues, at the Commonwealth Conservative's

Virginia politics blog (www.vaconservative.com). In fact, Virginia's governor read and sometimes reused his posts; but he was punished after composing humorous captions for photographs as part of a local newspaper's contest. His captions poked fun at a Virginia county and annoyed a local politician.

Whether streaming video is eating into a company's network bandwidth or employees' viewing of adult content is exposing the firm to sexual harassment charges, companies have some legitimate reasons to limit their workers' access to and activity on the Internet.

A 2005 survey of 526 businesses and organizations by the ePolicy Institute and the American Management Asso-

76 percent [of companies surveyed] monitor the sites employees visit.

ciation found that 76 percent of them monitor the sites that their employees visit, and 65 percent block certain sites. At least 55 percent of them review and retain employees' e-mail, and 36 percent track the content on workers' PCs, their keystrokes, and the time that they spend at the keyboard.



ENTERING A HUMOROUS caption contest cost Virginia state employee Will Vehrs ten days' pay.

Massachusetts-based Networks Unlimited audits the Internet activity of its clients' employees and sells equipment for auditing and blocking workers' Internet use. It found that fewer than 100 employees at Balls Food—a supermarket and pharmacy chain based in Kansas City—had Net access at work, but that they spent a total of 686 hours in one year using Web-based e-mail such as Hotmail and Yahoo. By contrast, 120 employees at a New York-based software com-

pany spent an estimated 7700 hours in one year accessing Web-based e-mail, 2400 hours at shopping and sports-related sites, and 250 hours visiting pornographic sites. In total, the employees spent more than 17,000 hours in one year on recreational surfing (roughly 3 hours per employee per

week), which translates into an estimated loss in worker productivity of \$867,000, according to Networks Unlimited.

Fear of viruses, spyware, and other security breaches due to non-work-related Web use is another impetus for employers to limit their workers' Internet activity. Such attacks can disrupt company networks and lead to loss of confidential information. But Nancy Flynn, director of the ePolicy Institute and

author of *Blog Rules* and other books on workplace tech policies, says that concern about potential litigation is the main reason organizations manage their employees' Internet use.

INTERNET LIABILITIES

A COUNTY PUBLIC Works Department office in Nevada attracted embarrassing attention when an employee was arrested after downloading more than 400 images of child pornography to his work computer. The agency discovered the stash only by tracing a virus that crashed the county's network to one of the images.

Flynn of ePolicy insists that companies must take care to explain their Internet policy clearly to employees and be consistent about enforcing it. "There are companies that pick and choose who they terminate. That just confuses employees," says Flynn.

—Kim Zetter

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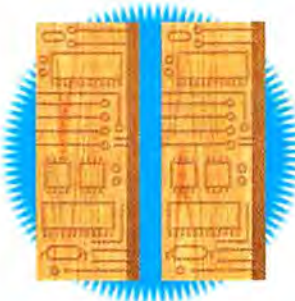
Two CPUs Too Slow? Try Four

PLUS: FLASH DISKS GO MAINSTREAM; THE LEOPARD/VISTA SHOWDOWN.

QUAD-CORE SYSTEMS

The Buzz: What do you do when two CPU cores just aren't enough? You start packing four of them into a system, of course. That's what Intel and AMD are set to do in different ways toward the end of the year. After a successful Core 2 Duo launch, Intel has decided to move up the launch of its Kentsfield chip, which essentially loads a pair of Core 2 Duo dies onto a single package. That chip is now set to ship by the end of the year, which miraculously coincides with the launch window for AMD's 4x4—a high-end, dual-socket platform that delivers four cores in the form of a pair of dual-core Athlon 64 X2 or FX processors.

Bottom Line: Quad-core performance gains are likely to



be small for most applications, though power-hungry creative types and gamers could see some benefit. But I still don't see how AMD gets "4x4" out of two dual-core chips. Maybe we can convince Intel to team up with Home Depot to produce some 2x4s.

LEOPARD HUNTS VISTA

The Buzz: Microsoft just might be in for the fight of its life next year, when Vista finally ships—and runs right

into Apple's latest update to OS X. Apple plans to launch Leopard next spring, and the Intel-based Mac Pro desktop systems that will make it sing are shipping now. Apple previewed Leopard (and tried out some new Microsoft zingers) at its World-Wide Developer Conference in August. Highlights include a fully supported version of Boot Camp that lets you dual-boot Intel Macs into Windows, and some enhancements to iChat that let you share applications and photos. But the most welcome development should be Time Machine, an automatic backup feature that allows you to retrieve old versions of files and restore deleted data via a time-line interface.

Bottom Line: I wouldn't have even dreamed this two years ago, but with Boot Camp on board and OS X looking as good as it does, my next PC may very well be an Apple.

SAMSUNG'S 4GB SSD

The Buzz: Imagine if all your critical apps and OS data could live in a fast, permanent cache. With a 4GB solid-state drive like the one Samsung is getting ready for Vista-based desktop and laptop PCs, that dream could become a reality. Using Vista's ReadyBoost feature, the new SSDs could greatly speed up

HERE\NOW

1 TRIP HUB: Beta Web site helps groups plan vacations. triphub.com

2 X1900 GT: The \$279, 256MB version of ATI's high-end card defines the new sweet spot. find.pcworld.com/54899

3 TOPIX: Revamped news engine looks better than ever. topix.net

4 CUSTOM SEARCH: Like Rolliyo, this Yahoo tool lets you select which sites to search. find.pcworld.com/54898

5 WIRELESS DJ: Logitech's \$249 PC-to-stereo music streamer comes with a nifty LCD-equipped remote. find.pcworld.com/54900



access to critical applications and data while using less power than normal hard drives.

Bottom Line: Big-time SSDs—the kind that could replace a hard drive (see "First Tests: Fast 32GB Flash Hard Drive" on page 22)—will remain expensive for a good long while. Fortunately, at current flash memory prices, the 4-gig models cost \$150 or less. ■

You can contact PC World Senior Editor Eric Dahl at eric_dahl@pcworld.com; visit find.pcworld.com/31643 to read additional Plugged In columns.

FUTURE TECH

300GB-DISC UPDATE

HOLOGRAPHIC STORAGE: It's a neat idea that lets you pack tons of data onto optical media by storing it in three dimensions. When we last checked in on the technology (see find.pcworld.com/54926), Maxell and InPhase hoped to have 300GB discs the size of CDs ready sometime this year. Amazingly, they're still on track. The first models will be well out of the range of consumers, with drives costing upward of \$15,000 and media going for around \$120 each. Wallet-friendlier versions are in the works, though. InPhase expects to develop less-expensive media that can store between 75GB and 100GB in an area the size of a postage stamp.

VoIP Phone System Delivers Top Credit Ratings

AltiGen helps lift CRM Mexicana to number one in credit card call centers

IT IS NOT UNCOMMON FOR HUGO PELAYO TO GET A MESSAGE telling him and his call center to be ready for 25,000 phone calls coming in an hour or so, the result of a customer running a TV ad for a new credit card promotion. But as CEO of CRM Mexicana, the fastest-growing outsourced call center provider in Latin America, Pelayo is not worried by such demands.

"Our AltiGen IP phone system will handle it," Pelayo says with confidence. "If we need to make some quick adjustments or system changes, we can usually take care of them on our own. The system is ultraflexible, which means we can service our customers more effectively than anyone else."

CRM Mexicana has grown dramatically in the past three years, which not coincidentally is as long as the company has been using AltiGen's Call Center solution. After starting in 2003 with its first AltiGen system for just 50 call center agents, CRM Mexicana will grow to more than 2,000 agents by the end of this year, operating in Mexico, Colombia, and Venezuela. The common thread throughout that growth has been corresponding growth of CRM Mexicana's AltiGen systems.

"Their growth was definitely being limited by a proprietary Siemens phone system they had in 2003," recalls Antonio Trevino, CEO of iFone, AltiGen's distributor in Latin America. "Even small changes could take days, and customers just weren't willing to wait that long."

A SMOOTH TRANSITION

Pelayo's main concern with switching to AltiGen was whether his fledgling call center would be shut down for a prolonged period during the system cutover in a business that is inherently 24/7 in nature. The transition was completed with CRM Mexicana's call center agents up and running on the AltiGen phone system in one weekend day.

"We got the AltiGen system installed and running so quickly because it is so versatile and so easy to implement," Pelayo says.



"This was a huge cost savings to us because we did not need to rent another office facility where our agents could work, and then move everyone back into the office after the system was installed."

That was just the beginning. Soon word spread among credit card companies and other call center-centric businesses that CRM Mexicana was able to accommodate changes with the peerless flexibility that IP-based phone systems offer.

The number of agents needed by CRM



AltiGen's IP 710 Phone

Mexicana grew almost geometrically, and additional AltiGen phone systems were added methodically and steadily to support this growth.

"That's one of AltiGen's most impressive features, namely its scalability," says iFone's Trevino. "With CRM Mexicana expanding throughout the region, AltiGen's phone systems have the same proven ease of management and ease of use in all the markets where they are deployed."

Meanwhile, CRM Mexicana has grown from a small firm of 50 call center agents to being the largest call center for servicing credit card requests in all of Latin America.

"AltiGen has been a huge part of our growth," Pelayo concludes. "Self-management, scalability, and VoIP capabilities have all added to our success." ▲

AltiGen Communications, Inc.

AltiGen Communications, Inc. (NASDAQ: ATGN) is a pioneering manufacturer of VoIP business phone systems and call center solutions. Founded in 1994, AltiGen was first to market with self-administration, and recently received *Internet Telephony Magazine's* 2005 Product of the Year for its IP 710 telephone.



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Dell recommends Windows® XP
Media Center Edition.



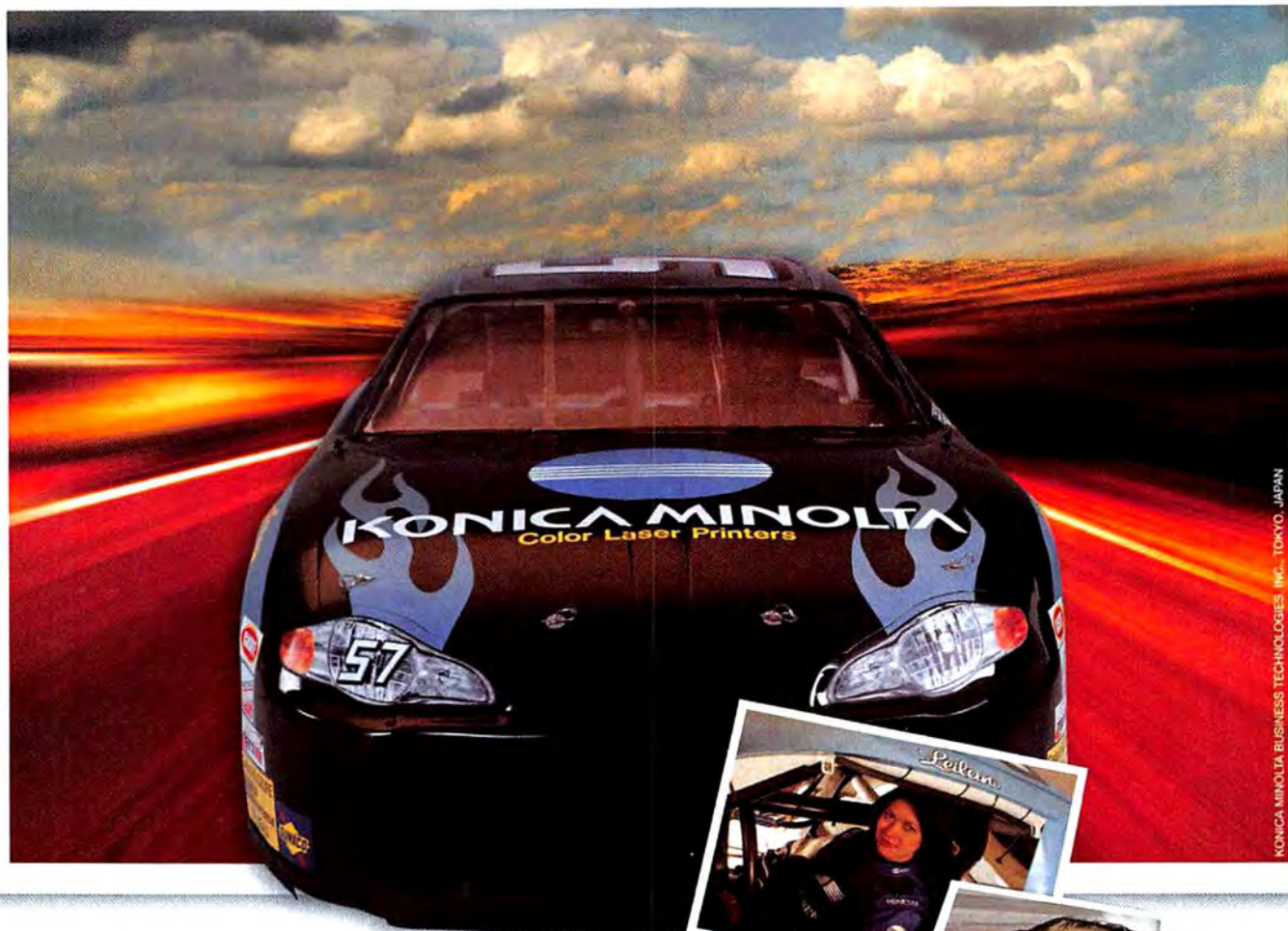
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YOUR TAKE ON NET PHONE SERVICE

THE ARTICLE "Web Phone Woes" [*News and Trends*, August] may leave readers overly cautious about VoIP service. I had a great time trying various VoIP providers. After using VoiceWing, CallVantage, and Lingo, I settled on SunRocket. These companies gave either a free month's service or a refund if the service was canceled during the first month, along with free return shipping of the equipment. All four had customer service that was almost too eager to assist me.

L. M. Craig, Knoxville, Tennessee

IN A MAILING, EarthLink TrueVoice offered its VoIP service for about \$25 per month, with the first month free. But when the device for the service arrived, I learned of a \$20 nonrefundable shipping and handling fee (which I paid). A few days later, following my failure to get a dial tone on two different devices and nearly 3 hours with tech support, I canceled the service and requested a mailing label to return the device. Instead, I received a bill for \$55, followed by one for

\$92, while my requests by phone, e-mail, snail mail, and live chat were ignored. Finally, a plea to "ceo@earthlink.net" resulted in a mailing label, an apology, and (apparently) the removal of all the charges.

Fortunately, I had opted not to transfer my telephone number—a decision I strongly advise all others to adopt as well.

Joe O. Marcom, Galena Park, Texas

I'VE HAD VONAGE for nearly a year. It has saved me a fortune in costs over a regular landline. Sure, sometimes there's a scratchy connection; but you just hang up and redial. Those few inconveniences are still worth what Vonage offers. Even in my remote, unincorporated town, I get 911 service. There was no problem in porting over the existing number. I'm confident that, in time, the glitches will be worked out and the service will be as good as a regular landline.

S. Mendelsohn, Tumwater, Washington

MY EXPERIENCE WITH 8x8 almost two years ago was similar to Pamela Stodghill's in your article. After three weeks I canceled my service. Conditions may have changed since, but my complaints at the time were: no 911 capability, poor voice quality, frequent dropped calls, and frequent server outages. I also didn't like having to leave a computer on all the time just to make a phone call.

Rick Cunningham, Oro Valley, Arizona

YOU BRIEFLY MENTIONED the problem of losing a dial tone in a power outage. If VoIP is to be your only phone, get an uninterruptible power supply.

As a security system installer, I have to connect equipment to these VoIP phone systems. Firsthand, I've seen our local cable company (a well-known name) taking phone technology backward many years with pathetic installations. I think it will be years before such installations catch up to anything close to the landline phone companies' standards.

Edward Henning, Macon, Georgia

WHY LOOK AT just three companies, and then imply that everyone is unhappy? I would have hoped that, as a magazine devoted to technology, you would balance your article by pointing out how many people are actually happier with the new technology, rather than feeding the fear generated by the phone companies.

David A. Buckner

Farmington Hills, Michigan

SAFETY TIPS

READING ABOUT ALL of the Internet threats you discussed ["The 10 Biggest Security Risks You Don't Know About," August] reinforced the decision I made several years ago to switch to the Linux operating system. Any concern over the threat of virus attacks on Linux PCs—as described in the section "No Safe Haven: Threats Plague All Platforms"—probably is premature. Linux antivirus software is a treatment looking for a disease.

Barry Garsson, Boca Raton, Florida

WHILE THERE IS no 100 percent effective solution for security, there are things you can do that can help. For example I took an old notebook; reformatted the hard disk; and reinstalled Windows. ►

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security programs, and my financial program. All I use this PC for is banking—my bank is the only site that I visit on this system. If you don't have an extra computer, buy a low-end desktop or notebook for just this purpose.

Richard Cornish, Carson City, Nevada

PROS AND CONS OF HDTV

IN YARDENA ARAR'S article "HDTV: Is Now the Best Time to Buy?" [*Consumer Watch*, August], she states that she has been holding off getting HDTV until she "can have everything else" she'd like in a home entertainment system, such as more desirable high-def programming and more storage on HD DVRs.

These complaints may have been valid six months ago, but they are dated today. Dish Networks' new HDTV programming and HDTV DVR address the limitations. This satellite offering includes 29 HD channels and a ViP622 HDTV DVR that stores 30 hours of HD content. The DVR also has dual tuners for watching one channel while recording another.

Zane Alsabery, Agoura Hills, California

I CONSIDERED BUYING an HDTV, and compared brands and prices in several stores. But I also asked myself one question: Is there anything on TV that would be worth spending thousands of dollars to watch? I think not. I think I'll use my money on an HD vacation instead.

Stephen Liberatori, Tamarac, Florida

HIGH-DEFINITION PROGRAMMING is being broadcast by most TV stations—you may not need a cable or satellite connection. Anyone who has an HDTV set and lives within 10 to 15 miles of a television transmission tower can get marvelous digital and high-definition reception using a small \$30 indoor antenna. I use the Terk HDTV Antenna Pro, and I can receive all the major networks and some local stations beautifully.

Michael R. Treister, Chicago

KEYBOARDS AND PDAs

STEPHEN MANES'S COLUMN on keyboards ["Keyboards: Still the Key to Success," *Full Disclosure*, August] misses one

big point. For all the virtues of Palm PDAs, why should they have a QWERTY keyboard you can type on one only with a stylus? QWERTY is for keyboards where your fingers can touch-type. If you type on such a keyboard with a stylus, however, you are likely to find yourself saying, "Where is that darn P, anyway?"

Stylus keyboards should be A to Z, from left to right, top to bottom. And why does the Palm have little tiny symbols (such as a comma and a period) that can easily be mistaken for each other?

Gerald Wright, San Diego

YEARS AGO I used a Psion, which had a keyboard you could type on at reasonable speed. I once wrote a 22-page memo on it while flying back from a business trip to Africa. The Psion was, in my humble opinion, the very best of the pocket-size PCs, and nothing today can do what that little machine did with text, spreadsheets, and databases. It's shame that device went the way of the Betamax tape.

Paul Ross, Rydal, Pennsylvania

THANKS FOR THE TIPS

STEVE BASS'S "New Uses for Old Hard Drives" [*Hassle-Free PC*, August] made my subscription well worth the price! These tips on accessing and reusing old drives provide solutions that I hadn't dreamed were available. His humor, wit, and solutions make him my favorite contributor to *PC World*.

Dirk Wilder, Portola Hills, California

PC World welcomes letters to the editor. We reserve the right to edit for length and clarity. Send e-mail to letters@pcworld.com. ■

CORRECTIONS

IN SEPTEMBER'S "VIDEO Everywhere," the page 106 chart and page 107 sidebar, "Digital Video Rights and Wrongs," should have said CinemaNow has begun to offer a limited set of mainstream movies you can burn to a DVD that will play on your TV. On page 114, we should have identified the Ourmedia site as Ourmedia.org.

PC World regrets the errors.



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CONSUMER WATCH

YARDENA ARAR

**AT&T'S NEW PRIVACY
POLICY NOT SO PRIVATE**

**PHISHING GETS
STILL CRAFTIER**

**RETAILER WON'T ACCEPT
MILITARY ADDRESSES**

Is Your ISP Helping the Feds Spy on You?

The privacy of your data may depend on how you connect to the Internet.

AS A LONGTIME DSL customer of the ISP now known as AT&T, I've been following with concern the coverage of AT&T's recently revised privacy policy. It seems to indicate that I shouldn't expect much from it in terms of safeguarding my personal information—and I'm seriously debating whether to express my displeasure by jumping ship.

AT&T's reworked privacy policy asserts that the company owns customer records—even the e-mail addresses of people with whom I correspond—and appears to allow considerable leeway in what AT&T can do with this information. Coming in the wake of allegations that the company has been handing over phone records to the National Security Agency, the privacy policy change is troubling.

Company spokesperson Walt Sharp says AT&T isn't doing anything other ISPs aren't. "Our policy is consistent with the policies of other major corporations and with others in the industry," he says.

But I found that not all ISP privacy policies are created equal. As explained below, your best chances for keeping your personal information and online activities private may be to go with a cable operator for Internet access.

AT&T'S CHANGES

AT&T'S CONTROVERSIAL PRIVACY policy change, which took effect in late June, applies only to its broadband Internet access partnership with Yahoo and to its video services. "These kinds of services don't fall under the traditional telecom

privacy law that's in place," says Ari Schwartz, deputy director of the Center for Democracy and Technology. "Telecom [privacy] laws cover only voice, not data." But data is protected if you use a cable Internet provider—laws restrict those companies from disclosing it.

The most startling revision to the policy

is defined as including not just contact data (your name, address, phone number, and e-mail address—info the company needs to send you bills), but records on the services you use, your transactions (such as online purchases) and service charges, the equipment and software you're using, and even "your Social

Security number and/or credit card information, passwords, and usernames." I have difficulty getting my head around the notion that my Social Security number is now an AT&T business record.

Another part of the "Legal Obligations/Fraud" section that sets off alarm bells is a sentence saying that AT&T can use "your information" to "investigate, prevent, or take action regarding illegal activities...or as otherwise required or permitted by law." If all that isn't a blank check to give out my information (especially the "permitted by" part), I don't know what is.

CABLE'S SAFEGUARDS

CONTRAST THIS WITH the privacy policy for Comcast's high-speed Internet service (AT&T Yahoo's

principal competitor in my neck of the woods). Read the policy at find.pcworld.com/54464, and you'll find this sentence: "Comcast considers the personally identifiable information contained in our business records to be confidential." Sure, it's still part of a business record, but the whole tenor of the statement is markedly different from AT&T's pronouncement. And it's followed by a sentence in which Comcast says it can disclose a custom- ▶



is found under the "Legal Obligations/Fraud" heading: "While your Account Information may be personal to you, these records constitute business records that are owned by AT&T. As such, AT&T may disclose such records to protect its legitimate business interests, safeguard others, or respond to legal process."

Elsewhere in the document (read it in all its legalistic glory at find.pcworld.com/54462), your Account Information

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er's personal information only in certain cases—to conduct business related to the customer's services, if "required by law or legal process," or for mailing lists (if the subscriber doesn't opt out).

Time Warner Cable's privacy policy page specifically references several laws that the policy complies with: The Cable Communications Policy Act of 1984, the Electronic Communications Policy Act of 1986, and the Online Copyright Infringement Liability Limitation Act of 1998. In most regards, Time Warner Cable's privacy policy is similar to Comcast's.

"We have all kinds of privacy laws that don't make any sense," Schwartz says of the situation. "They're based on how

the information is being communicated rather than the type of information."

An example of how privacy requirements vary based on the delivery mechanism has to do with video. The confidentiality of records of video rentals from Blockbuster and its competitors is strictly protected by the Video Privacy Protection Act of 1988 (enacted after a newspaper disclosed the video-rental records of Supreme Court nominee Robert Bork). Schwartz says it's likely that law would also apply to DVD rentals from companies such as Netflix. But AT&T's video-on-demand transactions, which the company now classifies as business records, may not be covered by the law. ▶

PRIVACY WATCH

How Bad Guys Exploit Legitimate Sites



YOU'VE HEARD SO many warnings about phishing that you've become wary of any e-mail message purporting to come from your bank or favorite Web store. But if the link in it uses a legitimate Web domain and your phishing filter (see find.pcworld.com/54883 if you don't have one) doesn't complain, the message must be okay, right?

The answer, as you can probably guess, is "Wrong." You can't even trust your eyes anymore, because online scam artists have figured out ways to turn Web sites against themselves. The technique is called cross-site scripting (or XSS), and it exploits a hole that affects hundreds of the largest Web sites. Legitimate Web sites often use a script to help direct visitors to different parts of the site. But bad guys are constantly probing these scripts as a way to bypass antiphishing filters and get you to click a link that delivers your browser—and eventually, your personal data—right into the attacker's lap.

If you were to type <http://www.google.com/url?q=http://www.pcworld.com> into your browser, you might think your destination would be Google, but that's only the first stop. This URL calls a script hosted at Google that tells the search engine you just clicked a link in a search result pointing at *PC World's* Web site. So Google tells your browser, "Go there instead"—and it does.

Most antiphishing tools validate only the first domain name in a URL, which can leave you vulnerable if the second one is a criminal's fake site. Experts have posted alerts about cross-site scripting problems on nearly 300 large Web sites—so far.

So what can you do to avoid the next XSS attack? Lance James, chief scientist at Secure Science, a company that tracks cybercriminals who engage in theft of financial information, recommends using the Netcraft Toolbar (toolbar.netcraft.com), which comes in versions for both Internet Explorer and Firefox. "It's very aware of phishing and has a great repository of phishing sites," he says. Netcraft's Toolbar looks for suspicious URLs anywhere within a Web address.

In general, "If a URL looks really strange, particularly with nontraditional characters on the end of it, you have to be careful," says Netcraft analyst Rich Miller. "You can't count on the fact that your financial institution's site will be secure."

—Andrew Brandt



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ON YOUR SIDE

Online Stores Not Friendly to APO Buyers

I WORK IN Saudi Arabia and have a U.S. military APO address. I know that many Web sites will not ship overseas, but I'm trying to have a gift shipped to a U.S. address. Online retailer NewEgg.com told me after first accepting and then cancelling my order that all orders must be placed within the United States.

James Lillard

Riyadh, Saudi Arabia

On Your Side responds: Newegg.com says that it cancelled Lillard's order because its fraud filters flagged it. The company would not tell us what had caused the order to be flagged, but its FAQ page states that if you specify a shipping address that's different from your billing address, you must call your

credit card issuer and add the shipping address as an alternate address. With most online stores, as long as you enter a billing address—even an APO address—that is the same as the one on your credit card, you shouldn't have a problem shipping to a U.S. recipient. For example, Amazon.com says customers who reside overseas may ship to U.S. addresses without restriction.

Shipping to an APO or FPO address can be stickier. Buy.com says it does not ship to them because some of its suppliers won't, and cites restrictions on exporting certain kinds of technology out of the United States. Amazon won't ship certain products—including most electronics—to APOs or FPOs.

—Amber Bouman

PRIVACY LAWS COMING

U.S. REPRESENTATIVES ED Markey (D-Massachusetts) and Joe Barton (R-Texas) are working on bills to address these contradictions, and Senator Hillary Clinton (D-New York) has called for a privacy bill of rights. Schwartz says the Federal Communications Commission and the Federal Trade Commission are examining the issue. But for now, if you prefer to keep your Internet activities and video-viewing habits private, opt for cable. ■

Yardena Arar is a senior editor, Andrew Brandt is a contributing editor, and Amber Bouman is an editorial assistant for PC World. E-mail them at consumerwatch@pcworld.com, privacywatch@pcworld.com, or onyourside@pcworld.com. To read previously published Consumer Watch, Privacy Watch, or On Your Side columns, visit find.pcworld.com/31703, find.pcworld.com/31706, or find.pcworld.com/31709, respectively.

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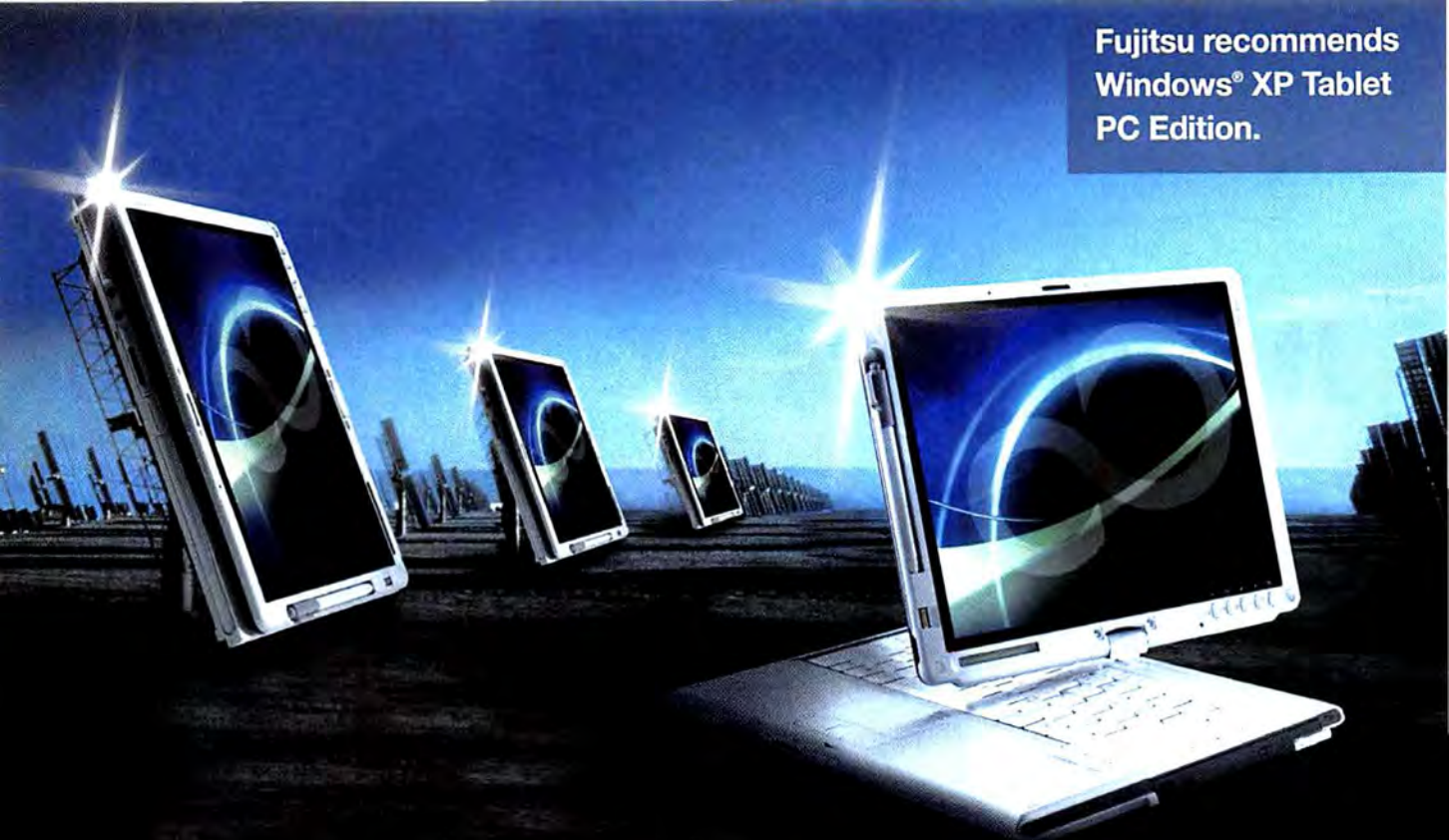
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The Hassle: *I hang on to valuable messages, sometimes for years. The problem is, the subject lines are often worthless. That makes it difficult for me to remember what the e-mail was about.*

The Fix: I have the same pack rat mentality, but I know a quick trick. Just edit the contents of the subject field and add descriptive words. Then save the message for easier sorting and searching. This approach is also good for clarifying a cryptic subject before forwarding a message.

In most e-mail apps, it's easy. Outlook and OE let you edit the subject line in place and save the message. Ditto for Eudora. It's tougher with Web-based services. In Hotmail, for example, you have to open the message, click *Forward* (or *Reply*), change the subject, click *Save as Draft*, and then move the message to another folder. Oy vey.

Quick Bonus Tip: Editing the subject is handy, but get this—some e-mail apps also let you edit the message body, which is useful for proving to your boss that he did authorize your 20 percent raise. [Editor's note: *Fat chance.*] In Outlook, with the message open, choose *Edit>Edit Message*. Then start typing away. As with subject-



line changes, Outlook will prompt you to save before you close the window. In Eudora, click the pencil icon on the toolbar.

The Hassle: *I forgot the password I use to log on as administrator. Now I can't do monthly maintenance, such as dumping useless programs on my home computer.*

The Fix: You have a few ways to retrieve your administrator password. Kelly Theriot's method (detailed at find.pcworld.com/54272) is free, but it's tricky and certain to make you dizzy. The Login Recovery site (find.pcworld.com/54274) will do the dirty work for free, but it takes two

days (if you pay a \$20 fee, the job gets done in 10 minutes). Your best bet is to spring for NT Access (find.pcworld.com/54276), a \$70 app from Sunbelt Software. Next time, write the password on a sticky note. (Just kidding.)

The Hassle: *I need to send CDs filled with sensitive data to coworkers by snail mail. I'm worried about security, so I compress the files and create a password. But this adds a time-consuming step.*

The Fix: EncryptEase (find.pcworld.com/54280) is a smarter-than-average CD-R with embedded software that automatically compresses, encrypts, and protects files with a password of

your choosing, and then burns them onto the disc. You can burn additional files (up to 20 more times) until the disc is full. It's faster than doing the task yourself, because the software handles the entire process. These puppies aren't cheap, though—they cost about \$6 each.

The Hassle: *Whenever I output something on my shared printer, an annoying yellow confirmation bubble pops up to tell me the document printed. It won't go away unless I click on it. Can I turn that option off?*

The Fix: Some people are always kvetching, but this complaint sounds legit. Head over to the 'Printers and Faxes' window, click *File>Server Properties*, and select the *Advanced* tab. Near the bottom of the dialog box, uncheck *Notify when remote documents are printed*. ■

TOOL OF THE MONTH

Slicker Searching in Outlook

GOT MESSAGES YOU know are around but can't find? Use Lookout, a freebie from, of all companies, Microsoft (download it at find.pcworld.com/54282). Lookout is quicker to access than separate search tools—such as Google Desktop Search (find.pcworld.com/49968)—because it becomes part of Outlook's

toolbar. For ferreting out e-mail, Lookout is way faster and smarter than Outlook's Find function. For instance, it pokes into attachments and the content of PDF files; also, it allows you to search with wild cards and Boolean expressions, and to restrict searches to just last week, say, or to attachments only.

Contributing Editor Steve Bass writes the *Tips & Tweaks* blog (find.pcworld.com/50264) and is the author of *PC Annoyances*, published by O'Reilly (find.pcworld.com/43818). Contact him at hasslefreepc@pcworld.com. To read his previous columns and newsletters, go to find.pcworld.com/50268.

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GADGET FREAK

DAN TYNAN

Your Home Surveillance Network

Security systems can keep an eye on your stuff—but be ready for false alerts.

AFTER YEARS OF gadget hoarding, my home office looks like the stock room at an electronics boutique. And while my wife would dearly love for someone to break in and steal all of my beloved gizmos, I feel a little more protective.

The last time I tried to protect my stuff, I looked at the Shell HomeGenie (see find.pcworld.com/54860), but it was too pricey and complicated. This time I tried two products that seem to offer more bang for fewer bucks: SentinelVision's SafeScout and WiLife's LukWerks. These systems use motion sensors, cameras, and the Net to alert you when bad guys come a-prowling. They cost less than traditional surveillance equipment and promise easy installation and operation. But for me they proved to be a little more involved.

OVERLY ALARMING

YOU CAN PLACE SafeScout (\$299 list, www.sentinelvision.com) virtually anywhere because it doesn't require a PC. This Gamecube-size gizmo features a numeric keypad on top, and a camera and motion detector in front. Normally you'd install it in a vacation home or train it on an expensive piece of gear, like a boat. For my tests, I put it on a table in the family room to see how it handled lots of "intruders" in a short time. I plugged it into an AC outlet and a phone jack, and plugged a separate radio-controlled siren in another room.

Step within range of its motion detector, and it snaps five photos, captures 20 seconds of audio, and kicks off a siren, which sounds eerily like a death-ray gun from a fifties sci-fi flick. To disarm it, use a key fob or punch in a code (you can't

schedule it to turn on or off). I quickly learned to carry the key fob at all times.

For \$20 a month SafeScout notifies you via e-mail or phone when the alarm is tripped. For another \$10 it'll call the cops for you, and \$10 more fetches you an alert whenever the alarm is armed or disarmed. Unfortunately, it called me even when I turned the alarm on or off. With a



little tweaking (and tech support) I got SafeScout to stop harassing me. Even so, \$299 and \$20 to \$40 a month seems pricey for what's essentially a burglar alarm.

LUK WARM

THEN I INSTALLED WiLife's LukWerks starter kit (\$300 list, www.wilife.com), which uses a power-line network and your PC. Affix the kit's motion sensor/camera to a wall or window, and plug it into an AC power outlet. Plug its receiver into another AC outlet, and connect it to your PC's USB port. Install the software, and voilà— instant home surveillance system.

Except the setup proved a mite trickier.

First I had to tweak my firewall settings so my PC could find the camera. Then I suction-cupped the camera to a window overlooking my porch, and told the software to send video alerts to my inbox and text messages to my cell. LukWerks proceeded to pummel me with alerts. I got 85 phone alerts in 45 minutes, all false. LukWerks sent me so much e-mail that

Gmail declared me a spammer and temporarily shuttered my account.

Turns out LukWerks occasionally mistakes changes in light for motion, says WiLife CTO Grant Beckman; my porch's gently flickering party lights convinced the camera that there was indeed a party going on. It relaxed after I cranked down the camera's motion sensitivity and defined zones where the camera should look for movement.

LukWerks has some nifty features, though: You can display six cameras at once (\$230 each), watch them from anywhere via the Web, or search through video archives.

Software that limits the frequency of e-mail alerts should be available now.

For the same initial outlay, LukWerks offers a lot more than SafeScout—with no monthly fees. This level of video surveillance from a firm like ADT would cost you \$2000 for a single camera, plus \$20 to \$40 per month for the service.

You could do worse than hire LukWerks to protect a small business or to guard your gear. Then again, maybe it's time to have a garage sale instead. ■

Contributing Editor Dan Tynan is the author of Computer Privacy Annoyances (O'Reilly Media, 2005). You can send him e-mail at gadgetfreak@pcworld.com.

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BUGS & FIXES

STUART J. JOHNSTON

Hackers' Latest Office Target Is PowerPoint

Plus: A critical Flash vulnerability, and a recall of overheating JumpDrives.

A FEW MONTHS ago it was Microsoft Word. Last month it was Excel. Now PowerPoint is under attack through a critical hole. Why so many Office flaws so quickly?

Part of the reason is that "black hat" hackers now have cracking tools called "fuzzers" that can automatically run through thousands of combinations of programming calls to find the one (or the dozens) that will crash a program. Such holes fetch good money from valid security firms that pay bounties, as well as from the Internet black market.

In addition, new vulnerabilities are cropping up at a faster rate in popular applications, such as Web browsers and media players, than in Windows, a fact not lost on crackers. When they find a new hole in Office, for example, they can mix-and-match an exploit that hits it with existing viruses and other malware

for a quick attack that strikes before a patch appears—a bit like adding the latest targeting system to an existing missile.

Attackers did just that with the PowerPoint hole, which affects versions 2000, 2002,



Inspired hackers find additional dangerous Office holes.

and 2003. As with the other Office flaws mentioned here, if you open a poisoned file from a Web site or an e-mail attachment, an attacker can take control of your PC. By the time you read this, Microsoft should have devised a patch for the vulnerability and

sent it via Automatic Updates. For further details, go to find.pcworld.com/54872.

The new PowerPoint hole is much like the Excel holes that I discussed last month, which the last set of Automatic Updates corrected. You can get the Excel fixes and more info at find.pcworld.com/54874.

A second Office patch, also sent via Automatic Updates, eliminates three other holes in the major apps of Office 2000 through 2003. The risk is rated critical only for Office 2000, and important for other Office versions. The difference, however, is just that you get a minimal pop-up warning if you try to open a poisoned file, so get the update regardless of your version. More details are at find.pcworld.com/54873.

Finally, Microsoft has fixed two critical holes involving the way both Office and Works handle the display of certain image formats—specifically, Portable Network Graphics (PNG) and Graphics Interchange Format (GIF). No attacks occurred prior to Microsoft's release of the patch; and again, the patch is critical only for Office 2000. You can get it via Automatic Updates or at find.pcworld.com/54875. ■

Stuart J. Johnston is a contributing editor for PC World. Visit find.pcworld.com/31580 to see more Bugs and Fixes columns.

IN BRIEF

OpenOffice Patched

OFFICE APPS OF all types are feeling the pain: OpenOffice.org has just patched three critical bugs in its free competitor to Microsoft Office. All three holes were discovered by internal audits of OpenOffice, and none have resulted in active attacks, the organization says. OpenOffice.org 1.1.x and 2.0.x are at risk. Get version 1.1.5 or later, or version 2.0.3 or later, at download.openoffice.org.

JumpDrive Recall

LEXAR IS RECALLING 66,000 flash drives—among them all models of its JumpDrive FireFly, with 256KB to 2GB of memory, as well as its 1GB Secure II drives—due to a risk of overheating. No incidents or injuries have been reported. The affected flash drives were sold during April and May of 2006. To exchange a questionable unit for an updated, problem-free one, contact Lexar at www.lexar.com/jdrecall.

BUGGED?

FOUND A HARDWARE or software bug? Tell us about it by sending an e-mail message to bugs@pcworld.com.

CRITICAL FLASH PLAYER BUG FIX

A DOBE JUST PATCHED a critical bug in its incredibly popular Macromedia Flash Player. Exploitation of the flaw could leave your PC completely compromised via memory corruption, according to security researcher Fortinet. When you visit a Web site that contains a Flash movie (an .swf file), Flash Player automatically loads on your PC and plays the file.

All you'd have to do to get hit is visit a booby-trapped site. Once you were there, the file would play with no additional click from you. Versions 8.0.24 and earlier are at risk, according to Fortinet. Don't put off getting Adobe's updated release, version 9.0.16, from find.pcworld.com/54876.

FileMaker Pro to the Rescue

How one small business stopped drowning in data and started delighting its customers, thanks to easy-to-build database solutions

Is your business, like so many today, drowning in data? Swamped by inventory, customer, market, and competitive data? This is the story of how one small business used database software to turn a sea of data into customer knowledge worth its weight in gold.

When Andy Frazier arrived at Baron's Major Brands a year ago, he found a fast-growing appliance retailer that prided itself on providing a positive customer experience in a fiercely competitive market. That meant responding as proactively as possible to customer information, be that praise, complaints, or advice.

Buyers at any of Baron's five stores in New Hampshire were asked to fill out a postcard describing their overall sales experience. But with hundreds of sales monthly, the results of this effort were stacks and stacks of cards and a few weak attempts to produce pie charts for which managers found little use.

"We needed technology to help us turn all this data into real information so our managers could act quickly and decisively," recalls Frazier, IT manager at Baron's. "We needed the magic of FileMaker."

Having used FileMaker solutions in previous jobs going back several years, Frazier was able to quickly build a front end to receive the data. As quickly and easily, he built a back end capable of producing a variety of custom reports at the store managers' discretion, and with nothing more than a few mouse clicks.

Instant information

"It was an amazing revelation," Frazier says of the managers' new experience with FileMaker data. "They now get instant alerts that tell them to call a customer or respond to new ideas or thank a customer personally for a big order. We built in an audit trail to make



sure we follow up on all customer issues. This has been huge for Baron's in fulfilling its mission of keeping the customer experience positive."

Baron's has joined thousands of other businesses worldwide that have harnessed and exploited the tremendous potential of FileMaker Pro to develop solutions that delight the customer, drive loyalty, and boost the bottom line with repeat business. And now FileMaker Pro 8.5, which Frazier is beginning to integrate into Baron's, offers unprecedented power and ease of use in uniting the wide world of Web information with the world's foremost database solutions.

The star new feature in FileMaker Pro 8.5 is the highly acclaimed Web Viewer. This new feature combines FileMaker database functionality with

New FileMaker Pro 8.5's Web Viewer feature displays live Web data within a database, such as this innovative Global Routing solution.



The Web Viewer in the Real World

live Web data to deliver Web data on demand. Web Viewer obviates the need for users to store what is usually instantly obsolete information in their databases because with Web Viewer, users get the very latest Web data within their solutions. (See sidebar, "The Web Viewer in the Real World.")

At Baron's, for example, store managers often have to look up various features and specifications on a very wide variety of appliances, and this data frequently changes. Because much of this data resides on the Web, often in PDF format, the Baron's users have to click to individual Web sites, search for the information they want, copy it, and then paste it into their spreadsheets or other sales tools.

Big plans for FileMaker Pro 8.5

As Frazier deploys FileMaker Pro 8.5 and the new Web Viewer, things could change dramatically. For starters, Frazier is building a unified FileMaker database as a one-stop shop for managers to see the information they want in one place. He (and eventually the managers themselves) will then build links to the Web-based data they want to access. With

Web Viewer, building these links is no more complicated than typing a URL into a dialog box. When a user clicks the link in the future, the most up-to-date information from that link, such as a current set of washing machine specifications, pops up instantly.

Frazier's plans for FileMaker Pro 8.5 at Baron's are almost as limitless as the solution itself. "That's the amazing thing about FileMaker," Frazier says. "It is so easy to use that managers with a mini-

um of computer experience can do incredible things on their own with so little training. With a solution like that, you might think you would hit the bottom of its capabilities pretty quickly. But the truth is, that as you gain more experience with it, you

can dig deeper and deeper and still not hit bottom. It is almost limitless." Looking ahead, Frazier has begun work with the service organization at

Baron's to build a FileMaker Pro database to house service-related information from which managers can extract specialized reports. This project could become the seedbed from which will spring a companywide accounting system based on FileMaker, replacing an aging proprietary system that he says is highly inflexible.

In addition, Frazier is deploying FileMaker Pro to build an intranet containing the company's HR information, ultimately providing employee self-service for monitoring vacation time, reviewing benefits, and so on.

Has he considered solutions other than FileMaker for meeting Baron's information needs? "I had a lot of experience with other solutions and have tried other things," he concludes. "Getting information in and out of them was like pulling teeth. With FileMaker, it couldn't be easier."



Live Web data on demand enables many breakthrough FileMaker Pro solutions: CF0 Dashboard (top) shows up-to-date key metrics. Package Tracker (bottom) grabs tracking info from your preferred shipping sites.

To view a video demonstration of FileMaker Web Viewer and see the Web Viewer Gallery of real-world solutions, visit www.filemakertrial.com/pcworld.

REVIEWS & RANKINGS

EDITED BY LAURA BLACKWELL AND TOM MAINELLI

- 59 **GOOGLE PICASA WEB ALBUMS, YAHOO PHOTOS**
- 64 **LG CHOCOLATE CELL PHONE**
- 66 **CASIO CASSIOPEIA PRO SUPER SLIM XJ-S35**
- 66 **PARALLELS DESKTOP FOR MAC**
- 68 **DATA ENCRYPTION SYSTEMS DESLOCK+ 3.2.4, SJ NAMO INTERACTIVE NAMO FILELOCK 3.10, TRILOGY TOTAL TECHNOLOGY T3 BASIC SECURITY**

Spyware Specialists

Five antispyware apps focus on tackling the latest threats.

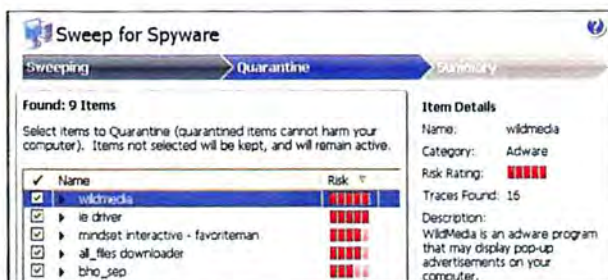
SECURITY

TEST CENTER THE QUESTION IS when, not if, adware and spyware will strike your PC. That's why you need a good antispyware program, and several companies specialize in delivering just that.

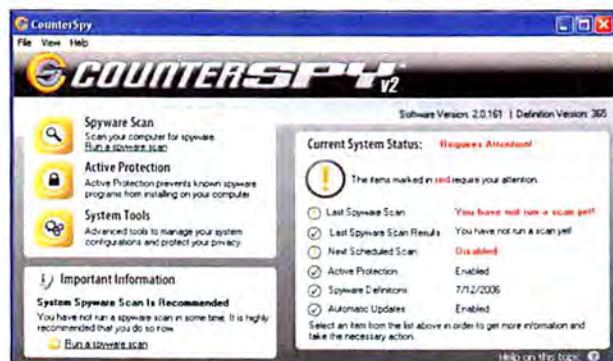
We tested three paid products (two of which were in beta) and two popular free products. The chart on the following page lists the names

and versions of the packages.

To evaluate each program, we looked at price, features, ease of use, and performance. We contracted German research company AV-Test.org to evaluate each product's ability to detect and disinfect 20 adware and spyware applications. AV-Test.org also pitted the apps against nine rootkits, programs that allow malware to install and operate clandestinely. Analysts tested the products' ability to provide real-time defense on contact with threats, as well as their propensity to falsely identify



SPY SWEEPER 5.0, our Best Buy and top performer, categorizes and provides detailed information on potential spyware and adware.



COUNTERSPY 2.0 HAS a well-designed interface and good real-time protection, but the beta we tested produced low disinfection scores.

harmless files. Our chart is a snapshot of the test results. Browse to our online chart at find.pcworld.com/54596 for additional details.

The beta version of Webroot Software's Spy Sweeper 5.0 emerged as our Best Buy. It earned the top scores in our detection and disinfection tests, and it offers protection against rootkits and phishing sites. It also includes conveniences such as the ability to choose between a fast system scan that takes priority over other work and a slower but less intrusive scan.

Spyware Doctor 3.8 came in a close second overall and

in performance. It fought active rootkits the best, and its scanning interface offers results that are easy to read, understand, and act on.

The beta version of CounterSpy 2.0 didn't fare as well as expected. This perennial top contender offers solid malware detection and real-time protection, but it struggled with disinfection.

Of the two free programs, Ad-Aware SE Personal 1.06 produced better results, ranking fourth in performance. As the app lacks real-time protection, however, it makes a great choice for a second opinion but not much more.

- 74 GOOGLE SPREADSHEETS, IROWS,
NUM SUM
- 81 IRIS READIRIS PRO 11
- 83 NUANCE DRAGON NATURALLY-
SPEAKING 9 PREFERRED
- 85 CANON PIXMA IP6700D
- 88 CHATTEREMAIL+ 2.0
- 90 FILEMAKER PRO 8.5
- 90 KENSINGTON NOTEBOOK
EXPANSION DOCK
WITH VIDEO

- 60 TOP 10 CELL PHONES
- 72 TOP 10 DESKTOP PCs
- 78 TOP 5 AUDIO PLAYERS
- 86 TOP 10 LASER PRINTERS



78



66

The popular Spybot did the worst. One of the first anti-spyware programs, it was built in the proverbial home basement. It has deep, detailed settings, but these days it is just not competitive with the other options here.

SPYWARE, ADWARE, AND ROOTKITS

IN DETECTING ACTIVELY running adware and spyware samples, Spy Sweeper and Spyware Doctor tied for first place, catching 90 percent of our test set. CounterSpy and Spybot brought up the rear, nailing 80 percent. In detecting a collection of inactive adware and spyware (apps that sit dormant on your PC until activated), Ad-Aware scored first by far, detecting 69 percent of 837 samples. At the other end, Spybot caught a mere 2 percent of samples.

Three of the five apps—CounterSpy, Spy Sweeper, and Spyware Doctor—profess to fight an increasingly important category of malware known as rootkits. Spyware Doctor detected all nine of our actively running rootkits, and Spy Sweeper detected four. CounterSpy managed to nab only two. The free tools caught

	ANTISPYWARE PROGRAM ¹	PCW Rating	Performance ²	Features and specifications
1	Webroot Spy Sweeper 5.0 Beta Best BUY \$30 (\$30 renewal price) find.pcworld.com/54905	87 Very Good	<ul style="list-style-type: none"> Rating: Very Good Active sample detection rate: 90% Inactive sample detection rate: 37% Disinfection rate: 53% 	<ul style="list-style-type: none"> Design: Superior Features: Superior Real-time protection: Yes Antiphishing protection: Yes
2	PC Tools Spyware Doctor 3.8 ³ \$30 (\$30 renewal price) find.pcworld.com/54904	85 Very Good	<ul style="list-style-type: none"> Rating: Very Good Active sample detection rate: 90% Inactive sample detection rate: 16% Disinfection rate: 58% 	<ul style="list-style-type: none"> Design: Very Good Features: Superior Real-time protection: Yes Antiphishing protection: Yes
3	Sunbelt Software CounterSpy 2.0 Beta \$26 (\$10 renewal price) find.pcworld.com/54903	76 Good	<ul style="list-style-type: none"> Rating: Good Active sample detection rate: 80% Inactive sample detection rate: 32% Disinfection rate: 35% 	<ul style="list-style-type: none"> Design: Very Good Features: Fair Real-time protection: Yes Antiphishing protection: No
4	Lavasoft Ad-Aware SE Personal 1.06 Free (no renewal price) find.pcworld.com/54906	64 Fair	<ul style="list-style-type: none"> Rating: Fair Active sample detection rate: 85% Inactive sample detection rate: 69% Disinfection rate: 53% 	<ul style="list-style-type: none"> Design: Good Features: Poor Real-time protection: No Antiphishing protection: No
5	Safer Networking Spybot-Search & Destroy 1.4 Free (no renewal price) find.pcworld.com/49400	63 Fair	<ul style="list-style-type: none"> Rating: Poor Active sample detection rate: 80% Inactive sample detection rate: 2% Disinfection rate: 33% 	<ul style="list-style-type: none"> Design: Good Features: Fair Real-time protection: Yes Antiphishing protection: No

FOOTNOTES: ¹Prices and ratings are as of 7/21/06. ²Combined adware and spyware samples. ³Design and Features scores reflect the attributes of Spyware Doctor 4.0.

none. All five programs—regardless of their rootkit capabilities—found one or two inactive rootkits. According to AV-Test.org, the apps' standard code-based scanning can detect inactive rootkits, but they need special routines to find the active ones.

Detecting malware is one thing; cleaning it thoroughly

from your system is another. We tested these products' abilities to remove files and Registry changes caused by ten pieces of adware and ten pieces of spyware.

Disinfecting the spyware proved difficult: To elude security software, spyware writers continually change the way their malware be-

haves. In our spyware disinfection tests, Spy Sweeper and Spyware Doctor ranked first, disinfecting 65 percent of the files. Spybot came in last, disinfecting merely 20 percent of the files. (Our chart combines adware and spyware disinfection results.)

Evaluating the disinfection of adware apps is more ►

complicated, because their changing behavior can cause antispymware firms to modify policies on them. Take the free version of HotBar, an ad-supported toolbar for Internet Explorer. Webroot classifies HotBar as adware; in contrast, PC Tools no longer does and therefore won't disinfect it, as our tests confirmed.

Overall, Spyware Doctor cleaned up adware the best, disinfecting 50 percent of the files and Registry entries. Spybot and Ad-Aware tied for second, disinfecting 45 percent of samples. CounterSpy came in fifth with a 35 percent disinfection rate. Sunbelt Soft-



SPYWARE DOCTOR 3.8 found an alarming 287 infections on our PC, most of which were low-risk tracking and advertising cookies.

bot failed to catch Startup changes. See our online chart for more test details.

EXTRA TOOLS

SPYWARE DOCTOR HAS the best selection of features, with full startup, scheduled, and custom-file scanning options. It lets you set a system restore point in case you accidentally delete important files. It's also the only product to scan within some IM clients. Spyware Doctor's antiphishing protection guards you as well, by preventing access to known bad sites.

The second most feature-rich program, Spy Sweeper, kicks up the antiphishing protection a notch by analyzing suspect Web sites on the fly.

In version 5.0, Webroot has removed Spy Sweeper's ability to set a system restore point and relies instead on the restorative features of the app's Quarantine (where you decide whether to remove questionable files found in scan results). Spy Sweeper also adds itself to the Windows Explorer contextual menu for quick scanning of files and folders.

While CounterSpy lacks a startup scan and antiphishing utilities, it has system restore

features and four privacy tools that we didn't test for this story: My PC Explorer, My PC Checkup, History Cleaner, and Secure File Eraser.

Spybot lacks antiphishing capabilities, but it offers solid scanning, CPU-usage, and system restore options.

GIVING ADVICE

ALL FIVE PRODUCTS proved easy to use, but CounterSpy, Spy Sweeper, and Spyware Doctor did the best job of identifying potential pieces of malware, explaining them, and presenting options for action. I preferred Spyware

One gripe: Spyware Doctor counted 287 doctor-themed "infections" but categorized the vast majority as low-level advertising and tracking cookies. While it took me only a few seconds to realize that most weren't dangerous, the growing count during the scan did quicken my pulse.

CounterSpy also has a good threat classification, explanation, and color-coding system, though this beta software's alert dialog boxes weren't fully complete as of press time.

Spybot's scan results are full of information about potential threats and recent changes in adware policies, but Spybot stops short of the bonehead-simple "Get rid of this" type of advice that the paid applications give you.

Our recommendation is to run Spy Sweeper—our Best Buy and top performer—or Spyware Doctor, which has thorough rootkit protection. However, the results of our disinfection tests suggest that



AD-WATCH REAL-TIME PROTECTION is missing from Ad-Aware's free version.

ware says that CounterSpy's low score is due to the beta status of the program.

All of the products have real-time adware and spyware protection except Ad-Aware, whose Ad-Watch feature is available in Lavasoft's \$27 Ad-Aware SE Plus. Spy Sweeper and CounterSpy detected all changes to HKCU and HKLM Run keys, Windows Startup, and the Hosts file, as well as Internet Explorer Home and Search pages. Spyware Doctor missed some Hosts file and IE Search page changes. Spy-



SPYBOT-SEARCH & DESTROY 1.4 is free and has deep settings, but it did not stack up to the other programs in our performance tests.

Doctor's brightly colored bars and detailed levels of threat classification. Collapsible check boxes reveal the exact names and paths of suspected files and Registry entries. Highlighting the name for a threat brings up its description and advice for action.

one product can't do it all, and that adding a second antispymware product, such as the free Ad-Aware Personal or a spyware scanner in an all-in-one security suite (see find.pcworld.com/53488) makes a nice two-fisted defense.

—Narasu Rebbapragada

Google and Yahoo Embrace Photo Sharing

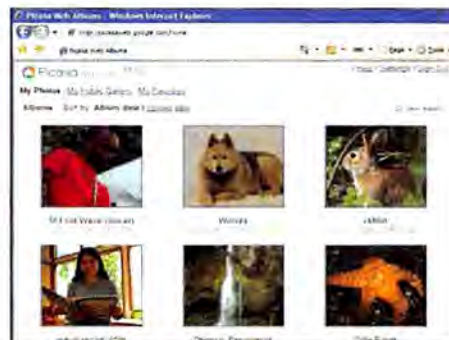
DIGITAL PHOTO SERVICES

THE EASIEST WAY to share photos is to publish them online, and the new **Picasa Web Albums** (from Google) and **Yahoo Photos** make that easier than ever. I liked aspects of both beta services, but I give Yahoo's service the early edge for its solid search features.

In what Google describes as "pre-beta" form, Picasa Web Albums feels as polished as some of its longer-running rivals. Google ties the site to beta version 2.5 of its Picasa software. You edit and organize your photos in Picasa, and then click the Web Album button to post them online. Picasa's defaults make albums public—so anyone with an invitation can browse them—but switching albums to private viewing is easy. You can



YAHOO PHOTOS' INTERFACE (left) is bursting with features—so many that it can get confusing. Google's more streamlined **Picasa Web Albums** is easier to use, but it's light on features and it lacks search.



upload photos at their original resolution or let the service downsize them to save storage space. Google offers 250MB of space free; you can pay \$25 per year for 6GB.

Google's site layout is attractive and functional. You can switch freely among your entire collection, your public albums, and other people's

bookmarked albums. You can also see photo metadata like the camera model and exposure information for a selected image, view slide shows, and download photos (yours or others') to your PC.

Strangely, Picasa Web Albums forgoes Google's search prowess, and the company will not say whether such a function is coming later. Currently you have no way to tag photos or search for images.

In contrast, the single best feature of Yahoo Photos is its search function. You can easily add Flickr-like tags to your images so that you can find specific photos via a search box at the top of the page. And whereas Google's photo editing tools are all in the Picasa software, Yahoo's site includes exposure adjustments, cropping tools, red-eye reduction, and even fancy border effects.

Yahoo Photos' biggest weakness is its design. The interface is cluttered with ads and tiered menus that I had to experiment with—even then, I never really felt at home.

The upload system lacks an organizer application. And Yahoo sets images to private by default—odd, since the Web is all about sharing. Also, it's easy to miss the fact that you can upload images at their full size, because that feature is hidden behind a check box that describes the settings in terms of upload speed. At least for now, Yahoo supplies free, unlimited storage.

What Picasa Web Albums lacks in features it makes up for in polish and charm. On the other hand, Yahoo Photos will appeal to folks who like the idea of sharing and editing their photos, all online.

—Dave Johnson

ASK OUR EXPERTS

OS Restored Sans Disc

MY PC HAS Windows XP Home Edition preinstalled. It came with a recovery CD, but not a stand-alone Windows CD. Is there a way to reinstall Windows without one?

Bill Hsiung, via e-mail



Senior Associate Editor Eric Butterfield responds: You can reinstall Windows XP without a restore disc, and without erasing your files and any applications you have added. You may prefer this method if your PC came

with a Windows XP "restore" CD, which will return your hard drive to its factory state—and erase all your data. You'll need a bootable CD; to create one, *Answer Line* columnist Lincoln Spector recommends using BartPE (go to find.pcworld.com/54877 and scroll down to the download links). For Lincoln's step-by-step instructions, see "Create a Windows CD for PCs That Don't Have One" at find.pcworld.com/51120.

Need information or advice about a buying decision? Drop us a line at askourexperts@pcworld.com.

Picasa Web Albums

Google

Beta product, not rated

Desktop photo organizer combined with Web sharing is elegant, but why is there no search or tagging?

List: Free (250MB storage), \$25 per year (6GB storage)

find.pcworld.com/54620

Yahoo Photos

Yahoo

Beta product, not rated

This powerful but cluttered photo organizer is a virtual replacement for your desktop photo apps—and it has a strong search function.

Free

find.pcworld.com/54622

TOP 10 CELL PHONES

Cell Phones Add Multimedia Capabilities

TEST TWO HANDSETS BY
Center Sony Ericsson stand atop this month's standard cell phones chart. With its superior talk-time battery life and impressive music features, the returning W600i (\$300) jumps from second to first, while the newer W810 (\$500) enters at number two.

Three new phones from other vendors also rank this month: The \$180 Samsung

SGH-d807, with a sleek design, makes its debut in the fifth spot. In seventh place lands the \$275, multimedia-oriented Helio Hero. And the good-looking \$300 Motorola Pebl comes in at number ten.

Notable new cell phones that missed the cut this month include the luxurious Nokia 8801 and the Nokia 7370, a fashionable but hard-to-

use handset. (Note: To see a review of LG's Chocolate cell phone, which arrived too late to be included in this month's chart, turn to page 64.)

—Liane Cassavoy

ONLINE

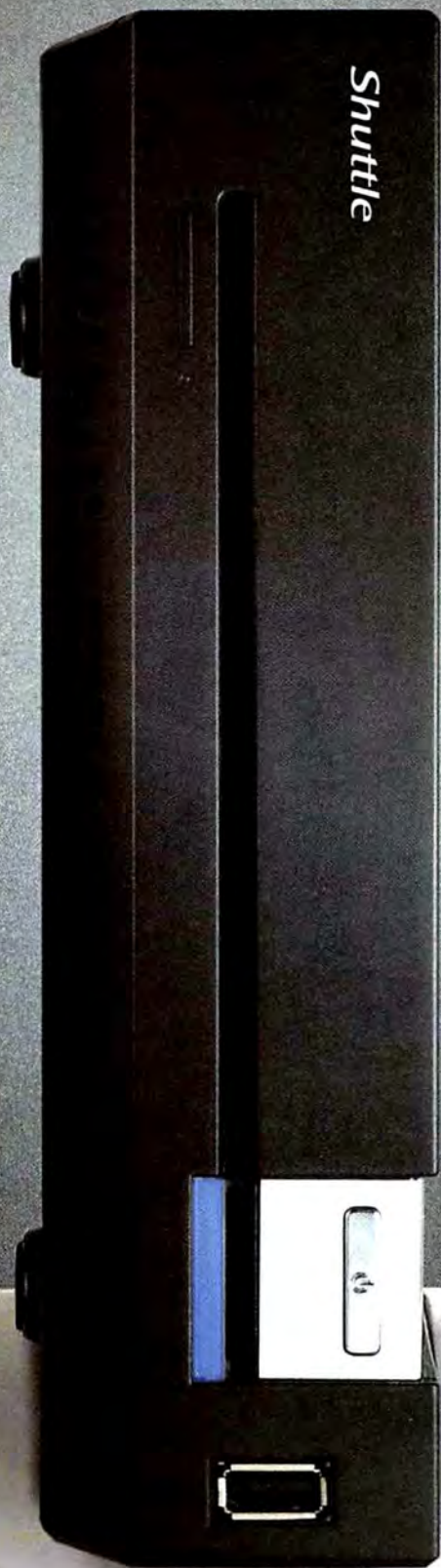
FOR MORE INFORMATION about the cell phones reviewed in this chart, including details about how we tested them, go to find.pcworld.com/54886.



THE W600i EXCELS as both a music player and a camera.

	STANDARD PHONE	PCW Rating	Performance	Features and specifications
1	Sony Ericsson W600i Best \$300 BUY find.pcworld.com/52644	81 Very Good	<ul style="list-style-type: none"> Battery life (hours:minutes): 10:00 Battery-life score: Superior Overall design: Very Good 	<ul style="list-style-type: none"> Carrier: Cingular Form factor: Swivel Weight: 4.2 ounces Camera resolution: 1.3 megapixels
	▶ Bottom line: Bright orange and sporty looking, the W600i is fun to use and ideal for music fans and casual shutterbugs.			
2	Sony Ericsson W810 \$500 NEW find.pcworld.com/54198	80 Very Good	<ul style="list-style-type: none"> Battery life (hours:minutes): 10:00 Battery-life score: Superior Overall design: Very Good 	<ul style="list-style-type: none"> Carrier: Cingular Form factor: Candy bar Weight: 3.5 ounces Camera resolution: 2.0 megapixels
	▶ Bottom line: Sony draws on its Walkman roots to create this impressive cell phone/music player hybrid device.			
3	T-Mobile SDA \$300 find.pcworld.com/52650	79 Good	<ul style="list-style-type: none"> Battery life (hours:minutes): 10:00 Battery-life score: Superior Overall design: Good 	<ul style="list-style-type: none"> Carrier: T-Mobile Form factor: Candy bar Weight: 3.7 ounces Camera resolution: 1.3 megapixels
	▶ Bottom line: This bulky handset offers built-in Wi-Fi, so you can browse the Web and send e-mail and instant messages quickly and easily.			
4	Samsung T509 \$200 NEW find.pcworld.com/53772	77 Good	<ul style="list-style-type: none"> Battery life (hours:minutes): 9:55 Battery-life score: Superior Overall design: Very Good 	<ul style="list-style-type: none"> Carrier: T-Mobile Form factor: Candy bar Weight: 2.5 ounces Camera resolution: 0.3 megapixels
	▶ Bottom line: This sleek-looking phone packs plenty of features—including support for T-Mobile's speedy EDGE network—into its slim frame.			
5	Samsung SGH-d807 \$180 NEW find.pcworld.com/54612	76 Good	<ul style="list-style-type: none"> Battery life (hours:minutes): 10:00 Battery-life score: Superior Overall design: Fair 	<ul style="list-style-type: none"> Carrier: Cingular Form factor: Slide Weight: 3.3 ounces Camera resolution: 1.3 megapixels
	▶ Bottom line: The d807 offers long battery life and an impressive 1.3-megapixel camera in a streamlined, inexpensive package.			
6	Nokia N90 \$500 find.pcworld.com/52640	75 Good	<ul style="list-style-type: none"> Battery life (hours:minutes): 6:53 Battery-life score: Good Overall design: Very Good 	<ul style="list-style-type: none"> Carrier: T-Mobile Form factor: Swivel Weight: 6.1 ounces Camera resolution: 2.0 megapixels
	▶ Bottom line: It's expensive for a phone, but the N90 could substitute for your digital camera and camcorder in a pinch.			
7	Helio Hero \$275 NEW find.pcworld.com/54608	75 Good	<ul style="list-style-type: none"> Battery life (hours:minutes): 5:52 Battery-life score: Fair Overall design: Very Good 	<ul style="list-style-type: none"> Carrier: Helio Form factor: Slide Weight: 4.73 ounces Camera resolution: 2.0 megapixels
	▶ Bottom line: This multimedia-heavy handset packs in plenty of features for the youth market, including mobile access to MySpace.com.			
8	Samsung SGH-ZX10 \$150 find.pcworld.com/52666	74 Good	<ul style="list-style-type: none"> Battery life (hours:minutes): 4:08 Battery-life score: Poor Overall design: Very Good 	<ul style="list-style-type: none"> Carrier: Cingular Form factor: Clamshell Weight: 3.7 ounces Camera resolution: 1.3 megapixels
	▶ Bottom line: Good call quality, fast Web access, and a compact clamshell design make the SGH-ZX10 a solid contender.			
9	Motorola Slvr L7 \$200 find.pcworld.com/52664	73 Good	<ul style="list-style-type: none"> Battery life (hours:minutes): 10:00 Battery-life score: Superior Overall design: Fair 	<ul style="list-style-type: none"> Carrier: Cingular Form factor: Candy bar Weight: 3.4 ounces Camera resolution: 0.3 megapixel
	▶ Bottom line: The skinny cousin of the Razr imports and plays your iTunes tracks, but the syncing process is laborious.			
10	Motorola Pebl Colors \$300 NEW find.pcworld.com/54586	72 Good	<ul style="list-style-type: none"> Battery life (hours:minutes): 9:21 Battery-life score: Superior Overall design: Good 	<ul style="list-style-type: none"> Carrier: T-Mobile Form factor: Clamshell Weight: 3.88 ounces Camera resolution: 0.5 megapixel
	▶ Bottom line: Though the Pebl lacks some bells and whistles, this standard cell phone is fun to use and looks good, too.			

CHART NOTES: Prices and ratings are as of 8/4/06; prices are based on a two-year service agreement.



A photograph of a desktop computer system. It includes a flat-panel monitor mounted on a silver stand, displaying a fiery orange and red abstract image. In front of the monitor is a black keyboard. To the right of the monitor is a black vertical tower unit. In the foreground to the right is a black mouse. The background is a dark, textured surface.

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Go to find.pcworld.com/54414

The image is a black and white advertisement. In the top left corner, the IBM logo is displayed. The main visual is a man with glasses, wearing a white dress shirt and a dark tie, sleeping peacefully with his arms crossed on top of a large, light-colored server cabinet. The server cabinet has a distinctive horizontal-slatted design. The background is a dense, repeating pattern of similar server racks, creating a sense of a vast data center. The lighting is soft, highlighting the man's face and the texture of the server units.

IBM®

PowerExecutive is available on all System x servers except the x3455. The System x3655 shown is expected to be available on October 3, 2006. IBM, the IBM logo, System x, PowerExecutive and Take Back Control are trademarks or registered trademarks of International Business Machines Corporation in the United States and/or other countries. AMD, the AMD logo, and AMD Opteron Processors are trademarks of Advanced Micro Devices, Inc. Other company, product, and service names may be trademarks or service marks of others. ©2006 IBM Corporation. All rights reserved.



_INFRASTRUCTURE LOG

_DAY 28: These slow, inefficient boxes don't have enough power to run my high-end business apps. They can't do anything. Though I guess crashing counts as doing something.

_Need sleep. Will try to dream that I am I.T. King of a distant planet that only produces stupefyingly powerful servers.

_DAY 30: I've taken back control, thanks to the IBM System x™ server with the AMD Opteron™ Processor. It has more power and more efficiency than I ever imagined in a standards-based server. The PowerExecutive™ tool assigns power as needed for each server. It helps optimize our power consumption. Maximize performance. Increase reliability. I can finally sleep in my own bed again.

_I have taken back control. I am Ned, benevolent I.T. King of this...uh, data center.



IBM.COM/**TAKEBACKCONTROL**/X

LG's Tasty Chocolate Cell Phone Sounds Great

MOBILE PHONE

TEST LG'S NEW phone, the **Center Chocolate**, will attract your attention for its high-concept name as much as for its rich looks. While I admired the slick design and amazing sound quality, I was frustrated by the navigational controls.

With its compact form and shiny, piano-black finish, the slider-style Chocolate is eye-catching. The phone lacks the usual complement of buttons on the front, instead offering touch-sensitive controls. The face of the phone features a navigational ring that consists of four programmable buttons for accessing various phone features, plus a fifth button in the center. The front of the phone also presents two additional touch-sensitive but-

tons; their function varies depending on the phone's use. Controls for the music player, camera, and volume, along with a send/end button, ring the sides of the handset.

When the unit is activated, the center controls and the four navigational buttons (which double as controls for the audio player) illuminate in red, causing the phone to glow. The buttons certainly look cool, but in practice they proved to be a mixed bag. Although the sensitivity of the touch controls is adjustable, I often found myself invoking operations I hadn't intended.

FULL OF FEATURES

BUT THE CHOCOLATE is no slouch on features. In fact, it's so chock-full of capabilities

that I'll start by calling out the one glaring omission: It does not have a speakerphone.

If you can get past that detail, you'll find tons of functions inside. The phone supports Web-based e-mail and instant messaging, and it includes support for Verizon Wireless's high-speed EvDO network. It also has a microSD Card slot; video and audio playback; a 1.3-megapixel camera/camcorder that was surprisingly capable even in tricky lighting conditions; and stereo Bluetooth.

While the handset offers some impressive audio (and video) playback features, you will need to purchase extra accessories and services to take full advantage of its capabilities. I tested a basic handset priced at \$150 (with a two-year contract from Verizon Wireless). Verizon is offering a \$200 package that adds a music kit consisting of a stereo headset, Music Manager PC software, and a USB cable. Another bundle, which adds the music kit and a 2GB microSD Card, costs \$250.

If you're interested in using Verizon's V Cast service, you'll have to spend an additional \$15 per month, on top of your voice plan. After paying that surcharge, you can download tunes to your PC for 99 cents (from there you can transfer them to the phone for free) or to the phone directly for \$1.99.

The Chocolate's sound quality on calls was quite impressive. Generally speaking, I found it to be one of the best phones I've heard: virtually crystal clear, with little noticeable background noise. Unfor-



THE CHOCOLATE FEATURES a very finger-friendly keypad.

tunately its talk-time battery life is less admirable. It lasted only 2 hours, 46 minutes in our lab tests, the shortest life span among all standard cell phones we've recently tested. (Note: The Chocolate arrived too late to be tested for this month's *Top 10 Cell Phones* chart on page 60.)

The difficult-to-use navigational controls temper my enthusiasm for the Chocolate and its far-out design. But its sound quality was stellar, and for that alone I can heartily recommend the phone.

—Melissa J. Perenson

More Firmware Updates

FIRMWARE UPDATES FOR PC peripherals are nothing new. But when was the last time you thought to look for a firmware update of your living-room entertainment products? These days, it may be wise to check.

Cases in point: Three high-definition video players recently

tested by *PC World* needed firmware updates to correct serious issues that surfaced after the players shipped to stores. One of them, the \$1000 Samsung BD-P1000 Blu-ray player, requires customers to request an update from the company, which then sends it on a disc. The other two models, both from Toshiba, offer a better alternative: The \$499 HD-A1 and \$799

HD-XA1 high-def DVD players have ethernet ports, so you can download their updates directly. See "An Elegant Player for High-Def Movies" (find.pcworld.com/54882) for details.

—Melissa Perenson



Chocolate

LG Mobile Phones

PCW Rating **7.3 Good**

This slick cell phone looks good and sounds great, but its touch-sensitive controls are finicky. List: \$150 with a two-year contract from Verizon Wireless find.pcworld.com/54907



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Superthin Projector Offers Quality Images

MOBILE PRESENTATIONS

ROAD WARRIORS, take heed: Casio's \$1699 **Cassiopeia Pro Super Slim XJ-S35** is the thinnest business projector I've reviewed. A scant 1.7 inches tall by 10.6 inches wide by 7.8 inches long, this 3.9-pound, 1024-by-768-resolution (XGA) model is the size of a laptop.

Cassiopeia Pro Super Slim XJ-S35

Casio

Preproduction model, not rated

Simple-to-use, compact projector delivers large, bright images for business presentations.

Street: \$1699

find.pcworld.com/54636

The preproduction version I tested impressed me with its portability, usability, and features. Its wide-angle, 2X zoom lens and high brightness of 2000 ANSI lumens let it display a big, clear image under typical indoor lighting. Power zoom and focus controls on both the unit and the remote made adjusting image size and sharpness easy. The XJ-S35 displayed test images well, be they PowerPoint slides, digital photos, or DVD movies.

What I admire most about the XJ-S35, though, is how easily it fits into a briefcase. To achieve the unit's slim design and still provide a good cool-

ing system, Casio developed a small lens and light source and added a quiet cooling technology that includes a heat pipe—a first for a portable projector.

Inputs include VGA and composite video, along with USB connectivity for image projection from a portable USB drive and for use with Casio's pending USB wireless adapter, available as a \$149 option. One limitation: Like many superportable projectors, the XJ-S35 lacks audio support.

Although the XJ-S35 costs more than budget-priced XGA



CASIO'S CASSIOPEIA PRO Super Slim XJ-S35 is very light.

projectors do, it weighs several pounds less. If you're traveling light but need a high-quality projector, the Super Slim XJ-S35 is worth a look.

—Richard Jantz

Parallels Puts Windows Inside the Mac

SYSTEM UTILITY

Parallels Desktop for Mac could compel you to buy an Apple computer. This \$80 software package enables you to run Microsoft Windows—and the apps it supports—as a virtual machine on any Intel-based Mac running Mac OS X 10.4.6 or higher. To get it to work you'll have to purchase a copy of Windows, but it's worth it.

Installing Parallels 1.0 was easy. A wizard and a downloadable PDF manual walk you through creating a new virtual machine. I ran across one problem during this process: The optical drive on a 2-GHz Intel Core Duo MacBook read one Windows XP Professional installation CD but not another, seemingly identical disc. A Parallels spokesperson says that the issue is rare, but that the company will refund



WITH MICROSOFT WINDOWS installed, Parallels lets Intel-based Macs freely switch between Windows and Mac OS X 10.4.6.

your money for its software (not for Windows, however) if you have the same problem.

Running Windows via Parallels was smooth with 1GB of RAM. The OS appears within a fixed-width Finder window; clicking in it gives you access to Windows files, applications, and settings. You can toggle back to the Mac OS by press-

ing the <Control>-<Alt> key combination. I had no trouble using Windows apps such as Adobe Reader, Internet Explorer, and Ulead PhotoImpact.

I obtained mixed results with some hardware and shortcut keys. A USB thumb drive worked, but a Philips MP3 player didn't. Using shortcut keys within Internet Explorer

worked, but <Control>-clicking to eject a CD didn't. (A recent beta update has since improved USB and keyboard support.) Parallels doesn't support 3D accelerated graphics, so don't expect to play many Windows games; the company plans to add that feature later.

The best part about Parallels is that you don't have to dual-boot Windows as you do with Apple's free Boot Camp utility. I switched often between the OSs—the ideal setup for a Mac-loving PC user.

—Narasu Rebbapragada

Parallels Desktop for Mac

Parallels

PCW Rating **90 Superior**

This easy-to-use software lets you run Windows and its apps smoothly on an Intel-based Mac. List: \$80

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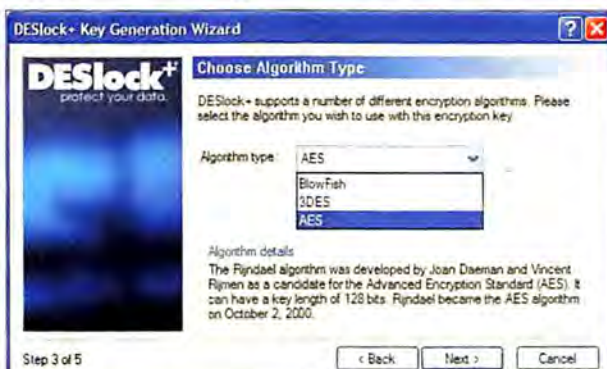
Encryption Apps Keep Files From Prying Eyes

ENCRYPTION SOFTWARE

ENCRYPTION PROGRAMS let you control who has access to your files—ideal when you're working on a shared or exposed PC. The apps use algorithms to scramble text. A password-protected key—software or USB-connected hardware—descrambles the files. Lose this key, and it's adios data.

I reviewed shipping versions of a trio of encryption programs: **DESlock+ 3.2.4 Single User Pack**, **Namo FileLock 3.10**, and **T3 Basic Security**. Of the three, DESlock+ 3.2.4 earned the highest rating; it's the most robust app, but the hardest to use. Namu FileLock 3.10 flips that equation. T3 Basic Security, designed for laptop use, balances strong encryption with a simple interface.

DESlock+ 3.2.4 software, although free for personal use,



DESLOCK+ LETS YOU choose from three strong standard algorithms.

costs \$185 with two USB hardware dongles—one for your daily work and the other for backing up encryption keys. It permits you to assign and share keys with other DESlock users; and unlike the other programs, it allows you to choose your top-grade algorithm, whether 3DES, AES, or Blowfish. Right-clicking a file or folder lets you encrypt

it and create e-mailable encrypted file archives. For automatic creation of e-mail attachments, DESlock+ comes with plug-ins for Microsoft Outlook and Lotus Notes.

Some tasks—like making hardware key backups—aren't intuitive, so keep the 110-page printed manual handy.

The \$40 FileLock 3.10 is a quick one-window application that lets you drag and drop files and folders into a designated, encrypted area. FileLock has no hardware option, but it does permit you to back up your encrypted folder. The packaging doesn't acknowledge that FileLock uses a 96-bit proprietary algorithm as well as a 128-bit SEED algorithm; some experts view proprietary algorithms as inferior to standard algorithms like 3DES, AES, and Blowfish. I experienced a few interface bugs, too. When I tried to allocate more space to the FileLock folder, for example, the application window disappeared.

T3 Basic Security, intended for laptops, includes a USB hardware key and uses the 128-bit CAST standard algorithm for encryption. T3's unique installation process

sent me an e-mail that allowed me to download, through Internet Explorer (Firefox support is expected shortly), the Virtual Vault and Parental Control modules included in the \$80 Basic Security Suite. Extra-cost options, such as laptop insurance, appear grayed out in the interface.

Creating multiple virtual vaults is easy in T3. With the USB key inserted in the PC, you simply make a vault and drag files and folders into it. There is no backup feature.

As a laptop user, I liked T3 Basic Security the best, but for users who have heavy encryption needs I would recommend DESlock+. FileLock is strictly for home use, due to its proprietary encryption.

—Narasu Rebbapragada

DESlock+ 3.2.4 Single User Pack

Data Encryption Systems

PCW Rating **84** Very Good

Scaled-down corporate package is hard to use but offers very strong encryption features.

List: \$185

find.pcworld.com/54856

Namu FileLock 3.10

SJ Namu Interactive

PCW Rating **78** Good

This easy-to-use tool employs a proprietary encryption algorithm but has a few interface glitches.

List: \$40

find.pcworld.com/54852

T3 Basic Security

Trilogy Total Technology

PCW Rating **81** Very Good

User-friendly package designed for laptops takes time to install and lacks backup capability.

List: \$80

find.pcworld.com/54857

TECH TREND

Overclocking Goes Legit

AN OVERCLOCKED CPU can provide better performance than one left at its factory settings—but performing this

enhancement yourself is likely to void your PC's warranty.

Now, however, several computer makers are overclocking PCs at their factories—and covering them with a standard warranty. The reason: Intel's new Core 2 Duo processor makes overclocking safer, thanks to its relatively low power requirements.

Companies such as ABS, Falcon Northwest, and Voodoo offer over-

clocked PCs with warranties, and say demand for them is rising. In contrast, you can't order an overclocked Dell XPS 700 or Gateway FX-510 (both are Core 2 Duo systems). But stay tuned: Gateway has reportedly discussed such an offering.

—Eric Butterfield



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TOP 10 DESKTOP PCs

New Intel Core 2 Duo Systems Reach Top Ranks

TEST CENTER INTEL'S NEW CORE 2 Duo processors are shaking things up on both sides of our *Top 10 Desktop PCs* chart this month.

Four of the five systems we tested that are powered by Core 2 Duo processors made the cut: two models from Dell; and our new Best Buys, CyberPower's Gamer Infinity SLI Ultra in the power category and Velocity Micro's Vector GX Campus Edition among value PCs. The fifth Core 2 Duo model, ABS's Ultimate X9, logged the highest performance ever on our



VELOCITY MICRO'S PC was the top value performer by a mile.

WorldBench 5 tests, with a score of 181, but it missed the chart due to design flaws.

Micro Express's new Athlon 64-based MicroFlex 60B wins a spot on the power list, too, while the value category hosts new models from eMachines, CyberPower, and Shuttle.

—Melissa J. Perenson

ONLINE

FOR MORE INFORMATION about the desktop PCs reviewed in this chart, including details on how we tested them, go to find.pcworld.com/54902.

	POWER DESKTOP	PCW Rating	Performance	Features and specifications
1	CyberPower Gamer Infinity SLI Ultra Best Buy \$3299 NEW find.pcworld.com/54494 Bottom line: The Gamer Infinity SLI Ultra is a powerful, expandable system that delivers high-end dual-GPU graphics at a reasonably low price.	83 Very Good	<ul style="list-style-type: none"> WorldBench 5 score: 167 WorldBench 5 rating: Superior Overall design: Good Graphics: Superior 	<ul style="list-style-type: none"> 2.93-GHz Core 2 Extreme X6800 398GB (RAID) drive capacity 19-inch ViewSonic VX922 LCD 512MB XFX 7950 GX2 Dual-GPU
2	Dell XPS 410 \$2350 NEW find.pcworld.com/54504 Bottom line: A well-built system, this model packs a strong performance punch. It has open drive bays and slots, but none for a hard drive.	82 Very Good	<ul style="list-style-type: none"> WorldBench 5 score: 138 WorldBench 5 rating: Good Overall design: Good Graphics: Very Good 	<ul style="list-style-type: none"> 2.4-GHz Core 2 Duo E6600 640GB (RAID) drive capacity 20-inch Dell Z007WFP LCD 256MB nVidia GeForce 7900GS
3	Dell XPS 700 \$3985 NEW find.pcworld.com/54492 Bottom line: Well-heeled gamers who want the option to expand their machine will find room to grow in this stylish, powerful system.	81 Very Good	<ul style="list-style-type: none"> WorldBench 5 score: 153 WorldBench 5 rating: Very Good Overall design: Very Good Graphics: Superior 	<ul style="list-style-type: none"> 2.67-GHz Core 2 Duo E6700 640GB (RAID) drive capacity 24-inch Dell Z407WFP LCD 1024MB nVidia GeForce 7950 GX2 Dual-GPU
4	Micro Express MicroFlex 60B \$2499 NEW find.pcworld.com/54572 Bottom line: This is a good system for power-hungry tasks like editing video, but its messy interior will hinder future expansion.	80 Very Good	<ul style="list-style-type: none"> WorldBench 5 score: 139 WorldBench 5 rating: Good Overall design: Good Graphics: Very Good 	<ul style="list-style-type: none"> 2.6-GHz Athlon 64 X2 FX-60 500GB (RAID) drive capacity 19-inch LG L1950S LCD 512MB ATI Radeon X1900XT
5	Polywell Poly 939N4-SLI2 FX60 \$3999 find.pcworld.com/51478 Bottom line: Gamers and power users who crave top performance and need easy upgrades will like this system's design and price.	79 Good	<ul style="list-style-type: none"> WorldBench 5 score: 140 WorldBench 5 rating: Good Overall design: Very Good Graphics: Good 	<ul style="list-style-type: none"> 2.6-GHz Athlon 64 FX-60 398GB (RAID) drive capacity 19-inch Hyundai L90D+ LCD 256MB eVGA e-GeForce 7800 GTX (two cards)
	VALUE DESKTOP			
1	Velocity Micro Vector GX Campus Edition Best Buy \$1099 NEW find.pcworld.com/54498 Bottom line: This well-constructed, moderately priced system proves that you don't need to pay much to get a PC with strong performance.	86 Very Good	<ul style="list-style-type: none"> WorldBench 5 score: 117 WorldBench 5 rating: Superior Overall design: Good Graphics: Superior 	<ul style="list-style-type: none"> 2.13-GHz Core 2 Duo E6400 250GB drive capacity 17-inch ViewSonic VA702b LCD 512MB eVGA e-GeForce 7600 GS
2	eMachines T6536 \$540 NEW find.pcworld.com/54570 Bottom line: The low-cost T6536 offers good performance for the price, but its bundled monitor produced disappointing image quality.	84 Very Good	<ul style="list-style-type: none"> WorldBench 5 score: 96 WorldBench 5 rating: Very Good Overall design: Fair Graphics: Fair 	<ul style="list-style-type: none"> 2.4-GHz Athlon 64 3800+ 250GB drive capacity eMachines 19-inch E1915W LCD Integrated nVidia GeForce 6100
3	CyberPower Gamer Ultra 7500SE \$999 NEW find.pcworld.com/54566 Bottom line: A gaming system for those on a budget, this model provides reasonably good performance at a very attractive price.	83 Very Good	<ul style="list-style-type: none"> WorldBench 5 score: 98 WorldBench 5 rating: Very Good Overall design: Good Graphics: Superior 	<ul style="list-style-type: none"> 2-GHz Athlon 64 X2 3800+ 250GB drive capacity 19-inch Optique 09 LCD 256MB eVGA e-GeForce 7600 GS
4	Cisnet NASCAR PC \$699 find.pcworld.com/50490 Bottom line: Kids and die-hard NASCAR fans should enjoy this inexpensive, themed—but otherwise typical—value PC.	81 Very Good	<ul style="list-style-type: none"> WorldBench 5 score: 83 WorldBench 5 rating: Good Overall design: Good Graphics: Fair 	<ul style="list-style-type: none"> 2-GHz Athlon 64 3200+ 160GB drive capacity 17-inch Cisnet NCA-701 LCD Integrated Radeon Xpress 200
5	Shuttle XPC G5 2100 \$1049 NEW find.pcworld.com/54574 Bottom line: This toaster-size model packs a lot of functionality into its highly portable case, but you don't get many options to expand.	78 Good	<ul style="list-style-type: none"> WorldBench 5 score: 104 WorldBench 5 rating: Very Good Overall design: Fair Graphics: Superior 	<ul style="list-style-type: none"> 2.2-GHz Athlon 64 X2 4200+ 200GB drive capacity 17-inch Shuttle XP17 Lite LCD 256MB eVGA e-GeForce 7600 GT

CHART NOTES: Prices and ratings are as of 8/4/06. Drive capacity may represent total space on multiple hard drives.

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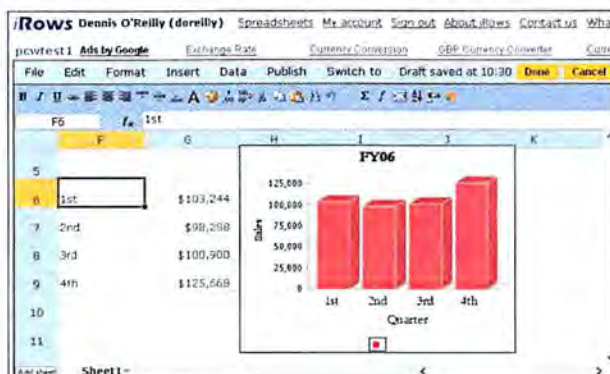
OFFICE APPLICATIONS

LET'S FACE IT—Microsoft Excel is way more spreadsheet application than most of us will ever need. That is part of the appeal of a new breed of Web-based spreadsheet services: They have fewer features, which can make them easier to use for some tasks. I tried out three of the new free services: **Google Spreadsheets**, **iRows**, and **Num Sum**.

Google Spreadsheets offers a typically clean Google interface. A spartan spreadsheet is a welcome change, and the beta service's many formulas, formatting choices, and sorting options are easy to access.

The service lets you import and export spreadsheets as .xls or .csv files, but you can't add tags to make them easier to share the way you can in Num Sum. The service imported my 48KB test .xls file without a hiccup, preserving the formatting remarkably well. You can e-mail your spreadsheet from within the service itself, allowing others to edit or simply view the file.

I missed several features, such as the ability to convert data into charts and the inclusion of a data-entry field at the top of the worksheet. But if



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Atlanta at Carolina			

NUM SUM'S SIMPLE interface best resembles that of a desktop app.

you don't mind seeing your spreadsheet accompanied by ads (Google reserves the right to place text ads in the future), this no-cost service is a great way to make your worksheets easy to access and share.

The charting features in iRows offer more options than Num Sum does: Converting data into bar, pie, and

other chart types requires only a few mouse clicks. The service also makes it easy to import .xls, .ods, and .csv files as large as 500KB, although it enlarged the cells of my imported spreadsheet. The inconvenience is minor, since you can resize them.

iRows' spreadsheet controls are easy to find, and the service

iRows places unobtrusive text ads alongside your spreadsheet. The service reserves the right to charge users for ill-defined "large amounts of data," as well as for future features. But in its current state, this free spreadsheet service is a real bargain.

Trimpath's Num Sum beta service not only shares spreadsheets via e-mail but also allows anyone to comment on those that you mark as public. You can publish them as RSS feeds, too. Num Sum currently displays no ads.

The service lets you import files as large as 500KB: My 48KB test file uploaded instantly, and it retained most of its formatting. The first time you save a file, the service will prompt you to add a description and keywords, which can help others find those files you deem public.

Num Sum's formatting and sorting options are in toolbars at the top of the worksheet. There's a noticeable lag time as you move from cell to cell using the arrow keys, but navigating via the <Page Up> and <Page Down> keys is faster. Num Sum is also the most like a desktop spreadsheet application. Despite its pedestrian performance, its desktop-app-like interface and range of features make it the service many Excel users will prefer.

All three services are great for viewing, editing, and sharing worksheets on the Web, but none has persuaded me to dump Excel yet. Still, of the three, I found Num Sum to be the one that most current Excel users could embrace.

—Dennis O'Reilly

	ONLINE SPREADSHEET	PCW Rating	Features	Comments
1	Num Sum (beta) Best Free find.pcworld.com/54732	86 Very Good	<ul style="list-style-type: none"> Storage limit: None File-size limit: None 	The best interface here; imports documents cleanly and presents the easiest transition from Excel.
2	iRows Free find.pcworld.com/54730	85 Very Good	<ul style="list-style-type: none"> Storage limit: None File-size limit: 500KB 	Features better charting capabilities than Num Sum's, but you could end up paying for large data sets.
3	Google Spreadsheets (beta) Free find.pcworld.com/54728	83 Very Good	<ul style="list-style-type: none"> Storage limit: 2.5GB File-size limit: 400KB 	Service benefits from a simple interface, but it lacks the charting features found in competitors.



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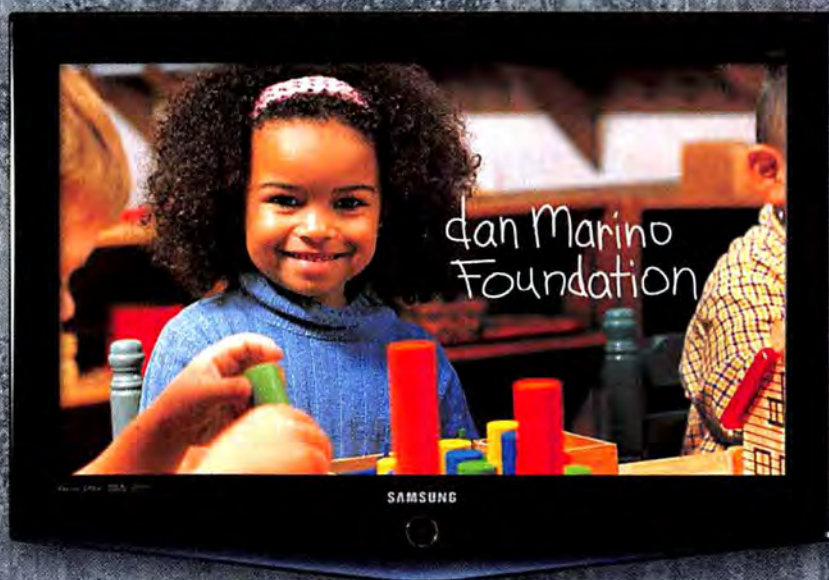
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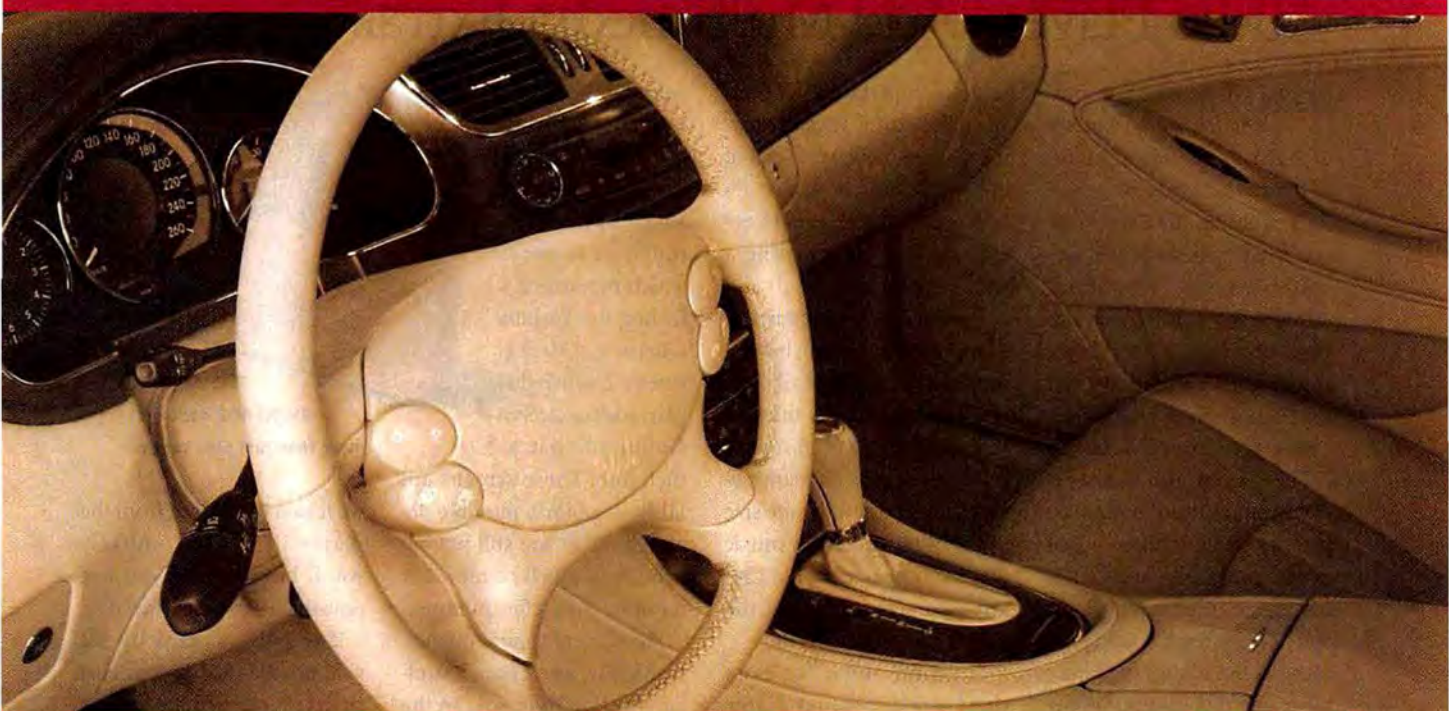




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▲ NBG-415N



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▲ NWD-370N
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TOP 5 AUDIO PLAYERS

Audio Players Add Multimedia Extras

TEST CENTER WHAT IS A camcorder doing in a roundup of hard drive-based audio players? Simply put, the Archos Gmini 402 Camcorder is a terrific music player. Despite its name, the Gmini 402's strong suit isn't its videography skills. But that's a minor gripe considering that the Gmini offers multimedia extras for a reasonable price.

The Gmini 402 won't replace your camcorder (its maximum video resolution is just 448 by 336 pixels), and its 1.2-megapixel photos won't inspire you to ditch your digital camera. But of the ten players we tested this month for our Top 5 chart (complete list and reviews are at find.pcworld.com/54881), the Gmini 402 was the only model to earn a

score of Superior for its overall audio quality. In particular, it delivered the lowest level of cross talk (meaning that its left and right channels remained distinct, creating a wide stereo image).

The 20GB Gmini crams in a lot of entertainment, but the unit isn't outsized at all. Yes, it's roughly twice as thick as the ultrathin 30GB Apple iPod, but despite its many talents, it is almost the same size as the other two 30GB music players on the chart: the Creative Zen VisionM and the Toshiba Gigabeat S30.

Enjoying video for even short periods requires a large screen, and the LCD on most of these players is greater than 2 inches diagonally, though the screen on the budget-

priced Archos 104 is a mere 1.5 inches. The iPod and the Creative Zen VisionM offer the roomiest screens, which measure 2.5 inches; the Toshiba Gigabeat S30 features a 2.4-inch display, and the Archos Gmini 402 has a 2.2-inch one. These screens are fairly large for a portable device, but they are still not big enough to watch comfortably for more than a few minutes.

The players' sound quality, thankfully, won't have a similar effect on your ears. In the PC World Test Center's new audio-quality tests, most models here performed admirably. Keep in mind, however, that



THE ARCHOS GMINI 402 does a lot more than just play songs.

we tested the output from the player itself—it's unlikely you'll be wowed if you use only the included earbuds.

If you like to crank up the volume, the iPod is your best choice: It reached the loudest level before creating 1 percent distortion, an industry-standard measurement. If it's low noise you're after, the Toshiba Gigabeat S30 will please you: In our lab tests the Gigabeat delivered the highest signal-to-noise ratio.

How about TV viewing? Besides serving up photos, video, and FM radio, some players enable you to be a couch potato wherever you go. For example, you can hook up the Creative Zen VisionM to a TV set and display photos or video, using the included adapter. Better yet, the Gigabeat, which runs Microsoft's Windows Mobile operating system, lets you download TV shows from a PC running Windows XP Media Center.

—Eric Butterfield

ONLINE

FOR DETAILS ON how we test audio players, go to find.pcworld.com/53160.

	HARD DRIVE-BASED	PCW Rating	Performance	Features and specifications
1	Archos Gmini 402 Camcorder Best BUY \$290 NEW find.pcworld.com/54506	80 Very Good	<ul style="list-style-type: none"> Overall audio quality: Superior Signal-to-noise ratio: 83 dB Overall design: Very Good 	<ul style="list-style-type: none"> 20GB Windows Media Player 10 software FM tuner, voice recording, photo, video 5.7 ounces
▶ Bottom line: This player doubles as a camcorder, plays video, and delivers top-notch audio. The many buttons can be confusing, though.				
2	Creative Zen VisionM \$300 NEW find.pcworld.com/52236	79 Good	<ul style="list-style-type: none"> Overall audio quality: Very Good Signal-to-noise ratio: 83 dB Overall design: Very Good 	<ul style="list-style-type: none"> 30GB Creative MediaSource software FM tuner, voice recording, photo, video 5.8 ounces
▶ Bottom line: The Zen has a touchpad and delivers great-looking video and high-quality audio. However, it needs an adapter to sync files.				
3	Apple iPod (MA002LL/A) \$299 NEW find.pcworld.com/50078	79 Good	<ul style="list-style-type: none"> Overall audio quality: Very Good Signal-to-noise ratio: 78 dB Overall design: Very Good 	<ul style="list-style-type: none"> 30GB iTunes software Photo, video 4.7 ounces
▶ Bottom line: The iPod offers high audio quality, a high-resolution screen that's great for video, and very intuitive controls.				
4	Toshiba Gigabeat S30 (MES30VW) \$300 NEW find.pcworld.com/54634	78 Good	<ul style="list-style-type: none"> Overall audio quality: Very Good Signal-to-noise ratio: 86 dB Overall design: Very Good 	<ul style="list-style-type: none"> 30GB Windows Media Player 10 software FM tuner, photo, video 4.5 ounces
▶ Bottom line: The S30 offers high audio and video quality, plus TiVo Series2 and Xbox 360 integration. Navigation could be simpler.				
5	Archos 104 \$160 NEW find.pcworld.com/54508	74 Good	<ul style="list-style-type: none"> Overall audio quality: Good Signal-to-noise ratio: 64 dB Overall design: Good 	<ul style="list-style-type: none"> 4GB Windows Media Player 10 software Photo 2.8 ounces
▶ Bottom line: This low-cost model looks chic, but lacks video capabilities and an FM tuner. Photos looked dark on the small, 1.5-inch LCD.				

CHART NOTES: Ratings are as of 7/21/06. Higher signal-to-noise ratios are better (the Toshiba Gigabeat S30 scored highest on this test).

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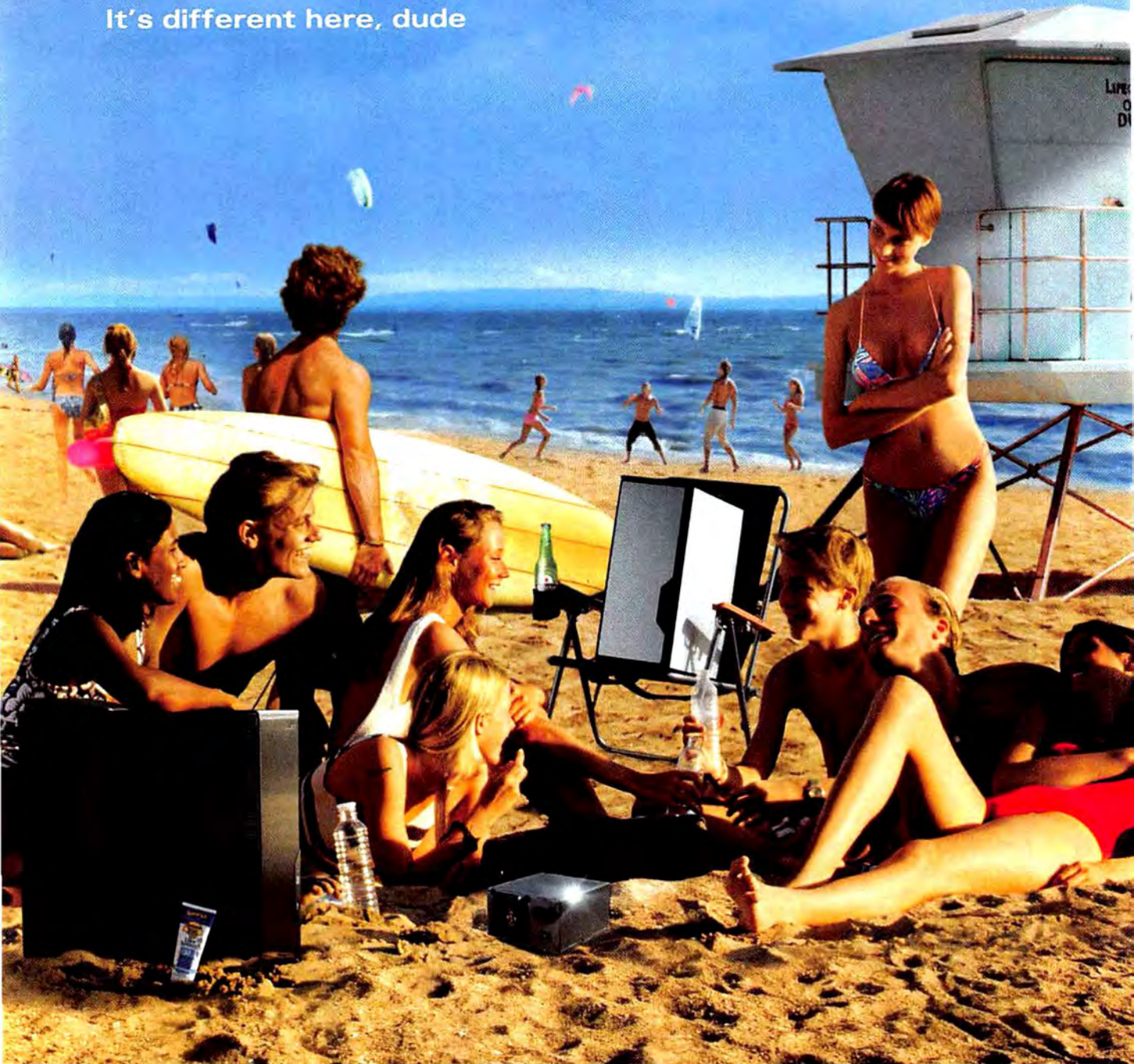
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IRIS Serves Up Snappy, Accurate OCR

DOCUMENT MANAGEMENT

THE NEW IRIS **Readiris Pro 11** optical character recognition software makes fast work of turning paper documents into electronic text files that keep the original formatting and design elements intact. IRIS has improved the app's OCR engine, and in my tests it often delivered notably increased speed and accuracy over previous versions.

I tested a shipping version of the new Readiris Pro (\$110, street) with an HP Scanjet 4890 flatbed scanner and successfully converted a slew of color and monochrome documents, ranging from simple one-column reports to complex multicolumn pages with text and graphics.

The new software recognized and saved one 50-page sample document in half the time that the previous version, Readiris Pro 10, took to perform the same task (90 seconds versus 180 seconds on the same setup). Not all of my tests netted such dramatic results, but most showed at least a modest improvement.

After scanning each document, Readiris Pro automatically identified various text elements—including columns, tables, and bulleted or numbered lists—and quickly

converted them into an editable format with a high degree of accuracy. It also converted graphics (such as photos) and other design elements (rules, color text, and backgrounds), and it recreated the source-document layout in various output formats, including Adobe PDF, Microsoft Word, and Excel document formats.

Like the previous version, this OCR utility can recognize bar codes and some hand-printed notes. However, I found the rules for accurate handwriting recognition (carefully formed numbers and uppercase letters, com-



READIRIS PRO 11 automatically identifies text and converts graphics.

pletely separated from one another) too restrictive and time-consuming for practical use. More helpful is the software's added support for Microsoft Excel HTML and SpreadsheetML, as well as for OpenOffice.org Writer 2.0 and Sun StarOffice 8.0.

If your business regularly involves OCR work, Readiris Pro 11 can significantly boost your productivity. For veteran users, the improvements in performance, accuracy, and document layout retention easily justify the upgrade.

—Richard Jantz

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Readiris Pro 11
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IRIS

PCW Rating **89 Very Good**

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Dragon Voice Recognition Impressively Accurate

VOICE RECOGNITION

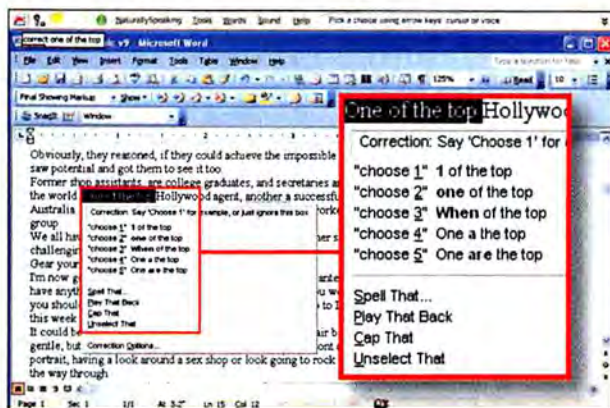
OVER THE YEARS, Dragon NaturallySpeaking voice-recognition software has helped disabled users as well as those in dictation-heavy fields. I looked at the shipping version of the \$200 **Dragon NaturallySpeaking 9 Preferred**, which includes features for command customization as well as full support for popular business programs. While this version shows excellent accuracy in capturing verbal commands, current vendor Nuance's claim of 99 percent accuracy untrained seems a reach, based on my testing.

Despite this claim, Nuance suggests reading training excerpts to adjust Dragon to your voice. I tested the app by dictating a 675-word business article into Microsoft Word.

A new-user file I created in NaturallySpeaking 8 Professional gave me 94 percent accuracy, while NaturallySpeaking 9 Preferred, untrained, showed 96 percent accuracy, not quite the 99 percent Nuance promises. The company says that accuracy varies by sound quality and by how a person talks, but my PC has a top-grade sound card and I enunciated my words. While 96 percent accuracy

falls short of the promised mark, it's still impressive. And consider this: The app put the text on the page at about 150 words per minute. I typed the same article at 71 words per minute—a blue-ribbon typing rate, but slothful compared with dictation.

Version 9 works famously with both Microsoft Word and Excel. Regrettably, my experiences with its new Mozilla Firefox and Thunderbird voice support were fraught with "now-it-works, now-it-doesn't" moments. And dictation accuracy relies partly on the context, which you lose when giving isolated commands like "click link."



WHEN YOU ASK to correct a word, NaturallySpeaking 9 lets you select a change from a box of similar-sounding words and phrases.

Dragon NaturallySpeaking 9 Preferred, in general, is best for writing or dictating. Only practice makes for a genuine hands-off experience. Version

8 users have little need to upgrade. But if you're curious about voice recognition, now is a good time to try it out.

—Jennifer Berger

Dragon NaturallySpeaking 9 Preferred

Nuance

PCW Rating **B6 Very Good**

Though the program takes some getting used to, its accuracy, ease of use, and convenience are worth a bit of effort.

List: \$200, \$150 upgrade from version 7 or 8 Preferred

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Canon Updates Feature-Packed Photo Printer

PHOTO PRINTER

TEST CENTER CANON'S NEW Pixma iP6700D photo printer

is the successor to the company's iP6600D, one of our 100 Best Products of 2006.

The \$200 iP6700D is first and foremost a photo printer. In our tests it produced high-quality prints, worth a Very Good score, on photo paper. Images were vibrant, but skin tones were a bit too bronzed.

The device is less adept at printing text. Unlike the \$230 Canon Pixma iP5200R, it doesn't use pigment black ink; as a result, its text output wasn't as dark. We also saw fuzzy edges on some letters.

Like its predecessor, the iP6700D printed 3.2 full text pages per minute and generated graphics at 1.5 ppm—no challenge to the iP5200R's marks of 8.7 and 2.9 ppm. The iP6700D made a 5-by-7-inch photo in 45 seconds, sluggish next to the \$150 HP Photosmart 8250's 29 seconds.

The iP6700D's stunning 3.5-inch color pop-up display makes light work of menu navigation, image previews, and basic photo touch-ups without the need for a PC. Its infrared interface can receive images from some phones, and an \$80 add-on provides wireless Bluetooth printing.

A direct-print port also lets you use a USB cable to print



CANON'S PIXMA IP6700D printer works well with Canon cameras.

from a PictBridge-compatible digital camera (but unlike some competing models, not from a portable USB drive).

One notable new feature: The iP6700D incorporates what the company dubs the

"Canon-to-Canon Direct Advantage." When you use the printer with select Canon cameras, you can touch up photos, print a contact sheet, and more, all from the camera's controls. The printer's

two media card slots read most common card formats.

The iP6700D adds support for several new paper sizes and Canon's Fine Art Photo Rag paper. The printer uses an underside cassette drawer and an upright sheet feeder that both hold up to 150 sheets of plain paper. An automatic-duplexer setting allows for double-sided prints.

The iP6700D is a good six-inch photo printer with a nice LCD and PC-less printing options. However, iP6600D owners don't need to upgrade unless the improved paper support or Canon-to-Canon feature is on their wish list.

—Danny Allen

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Pixma iP6700D

Canon

PCW Rating **83 Very Good**

Printer offers above-average photo prints, but its text quality and speed are only average.

Street: \$200

find.pcworld.com/54674

TOP 10 MONOCHROME LASER PRINTERS

Put a Laser Printer on Your Network for \$150

TEST CENTER PRICES FOR monochrome lasers continue to fall, as shown by two \$150 network-capable models on our chart. Brother's HL-2070N, in second place, and Lexmark's debuting E120n, ranked third, are ideal for small groups of low-volume users and delivered good text output at respectable speeds.

Meanwhile, Samsung has improved its chart presence with the debut of two units: the \$200, fourth-place ML-2571N and the \$299, seventh-place ML-3051ND.

Both models are network-capable, but the ML-3051ND features a small LCD that



THE NEW LEXMARK E120n is network-capable and produces impressive output for its price.

helps simplify network installation, plus a handy duplexer for two-sided printing. In addition, its speed and print quality approach those of the less expensive (and top-ranked) Brother HL-5250DN.

—Danny Allen

ONLINE

FOR ADDITIONAL INFORMATION about the mono laser printers reviewed in this chart, including testing details, browse to find.pcworld.com/54630.

	MONOCHROME LASERS	PCW Rating	Performance	Features and specifications
1	Brother HL-5250DN Best Buy \$250 find.pcworld.com/51406	83 Very Good	<ul style="list-style-type: none"> Text quality: Very Good Graphics quality: Good Tested speed (ppm): 21.6 text/9.6 graphics 	<ul style="list-style-type: none"> 30 ppm text 300 sheets input (standard) 1200-by-1200-dpi maximum true monochrome resolution
	► Bottom line: Fast printing, fine output quality, and a built-in duplexer make this networked laser a great value for the money.			
2	Brother HL-2070N \$150 find.pcworld.com/48108	82 Very Good	<ul style="list-style-type: none"> Text quality: Good Graphics quality: Poor Tested speed (ppm): 16.6 text/8 graphics 	<ul style="list-style-type: none"> 20 ppm text 250 sheets input (standard) 2400-by-600-dpi maximum true monochrome resolution
	► Bottom line: This network printer performs well for its low price, and it provides good quality in text printing.			
3	Lexmark E120n \$150 NEW find.pcworld.com/54604	81 Very Good	<ul style="list-style-type: none"> Text quality: Good Graphics quality: Good Tested speed (ppm): 16.4 text/8.6 graphics 	<ul style="list-style-type: none"> 22 ppm text 165 sheets input (standard) 600-by-600-dpi maximum true monochrome resolution
	► Bottom line: Built-in networking makes the compact E120n a bargain for sharing among several PCs.			
4	Samsung ML-2571N \$200 NEW find.pcworld.com/54610	79 Good	<ul style="list-style-type: none"> Text quality: Good Graphics quality: Fair Tested speed (ppm): 17.3 text/7.5 graphics 	<ul style="list-style-type: none"> 25 ppm text 250 sheets input (standard) 1200-by-600-dpi maximum true monochrome resolution
	► Bottom line: The ML-2571N is easy to maintain, but its print quality was mixed and its network setup could be simpler.			
5	Brother HL-2040 \$120 find.pcworld.com/48106	79 Good	<ul style="list-style-type: none"> Text quality: Good Graphics quality: Poor Tested speed (ppm): 16.6 text/5.4 graphics 	<ul style="list-style-type: none"> 20 ppm text 250 sheets input (standard) 2400-by-600-dpi maximum true monochrome resolution
	► Bottom line: Light graphics is the only weak spot of this solid performer, which delivers nice speed and text quality at a low price.			
6	Lexmark E240n \$249 find.pcworld.com/51412	78 Good	<ul style="list-style-type: none"> Text quality: Very Good Graphics quality: Poor Tested speed (ppm): 19.9 text/8.2 graphics 	<ul style="list-style-type: none"> 27 ppm text 251 sheets input (standard) 1200-by-1200-dpi maximum true monochrome resolution
	► Bottom line: This no-fuss laser produces good-looking text at a decent pace, but has trouble with graphics.			
7	Samsung ML-3051ND \$299 NEW find.pcworld.com/54606	78 Good	<ul style="list-style-type: none"> Text quality: Very Good Graphics quality: Very Good Tested speed (ppm): 20.1 text/8.8 graphics 	<ul style="list-style-type: none"> 30 ppm text 300 sheets input (standard) 1200-by-1200-dpi maximum true monochrome resolution
	► Bottom line: The networked ML-3051ND is a solid performer that offers good paper handling and a built-in duplexer.			
8	Oki Printing Solutions B4250 \$229 find.pcworld.com/51402	75 Good	<ul style="list-style-type: none"> Text quality: Very Good Graphics quality: Fair Tested speed (ppm): 19 text/9.4 graphics 	<ul style="list-style-type: none"> 23 ppm text 250 sheets input (standard) 1200-by-600-dpi maximum true monochrome resolution
	► Bottom line: The B4250 lacks built-in networking, but it prints high-quality text at a competitive pace.			
9	Dell Laser Printer 1710n \$299 find.pcworld.com/51408	73 Good	<ul style="list-style-type: none"> Text quality: Good Graphics quality: Poor Tested speed (ppm): 19.1 text/7.1 graphics 	<ul style="list-style-type: none"> 27 ppm text 250 sheets input (standard) 1200-by-1200-dpi maximum true monochrome resolution
	► Bottom line: Low toner costs and a bargain-priced 550-sheet paper tray option make this networked printer an economical choice.			
10	Oki Printing Solutions B4350 \$299 find.pcworld.com/44160	73 Good	<ul style="list-style-type: none"> Text quality: Very Good Graphics quality: Good Tested speed (ppm): 20.1 text/11.3 graphics 	<ul style="list-style-type: none"> 23 ppm text 250 sheets input (standard) 1200-by-600-dpi maximum true monochrome resolution
	► Bottom line: The B4350 delivers top-notch performance and prints the first page quickly, but ethernet support remains an expensive extra.			

CHART NOTE: Prices and ratings are as of 8/4/2006.

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ChatterEmail+: Swift Treo E-Mail

MOBILE MESSAGING

PALM'S TREO PDA/phones come with VersaMail software for standard POP and IMAP e-mail. For more-robust features and BlackBerry-like "push" service that delivers messages as soon as they arrive on a corporate server, you used to need costly server software or a less pricey—but

ChatterEmail+ 2.0

ChatterEmail

PCW Rating **87** Very Good

Affordable program pushes e-mail to your Treo, freeing you from IT support or a poky server. List: \$40 (\$60 bundled with Exchange plug-in)

find.pcworld.com/54680

sometimes flaky—desktop redirector. Now Treo 650 and 700p users have a new option: **ChatterEmail+ 2.0**.

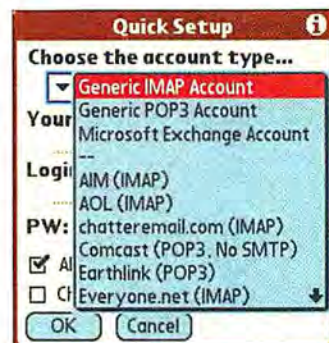
The application needs no server software and costs a reasonable \$40 for use with IMAP accounts, or \$60 if you purchase the Exchange (2000 or later) plug-in, which costs \$25 if bought separately later. ChatterEmail+ supports POP, but without push service.

I tried a shipping copy of version 2.0 (and a preproduction version of the Exchange add-on) on my Cingular Treo 650 and on a Sprint Treo 700p. When I pointed their browsers to get.chatteremail.com, the software installed itself

within a minute or so (within only seconds on the 700p).

Entering settings for my personal IMAP account and my IMAP-enabled Lotus Notes work account took only a few moments more. (Cingular users seeking push service for Exchange e-mail need Cingular's \$40-a-month data plan and a service adjustment.)

Messages from the personal and Exchange accounts began appearing immediately, color-coded according to my preferences (or viewable by account). My Notes messages, though, never showed up—ChatterEmail+'s IMAP push function depends on a server extension called IDLE that



CHATTEREMAIL+'S SETUP IS A snap, even for several accounts.

current Lotus Domino mail servers don't support.

Nevertheless, if your business mail server meets ChatterEmail+'s push requirements, it's a no-brainer if you're willing to pay a modest fee for timely delivery of—and features for managing—work-related mail on a Treo.

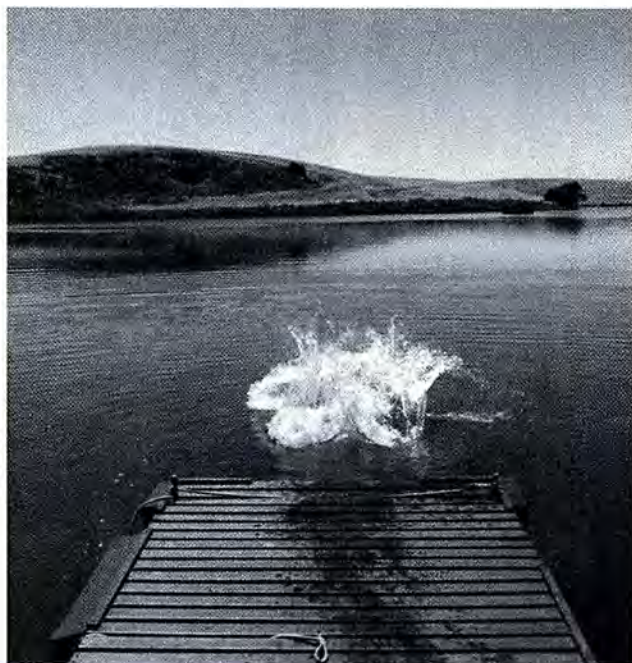
—Yardena Arar

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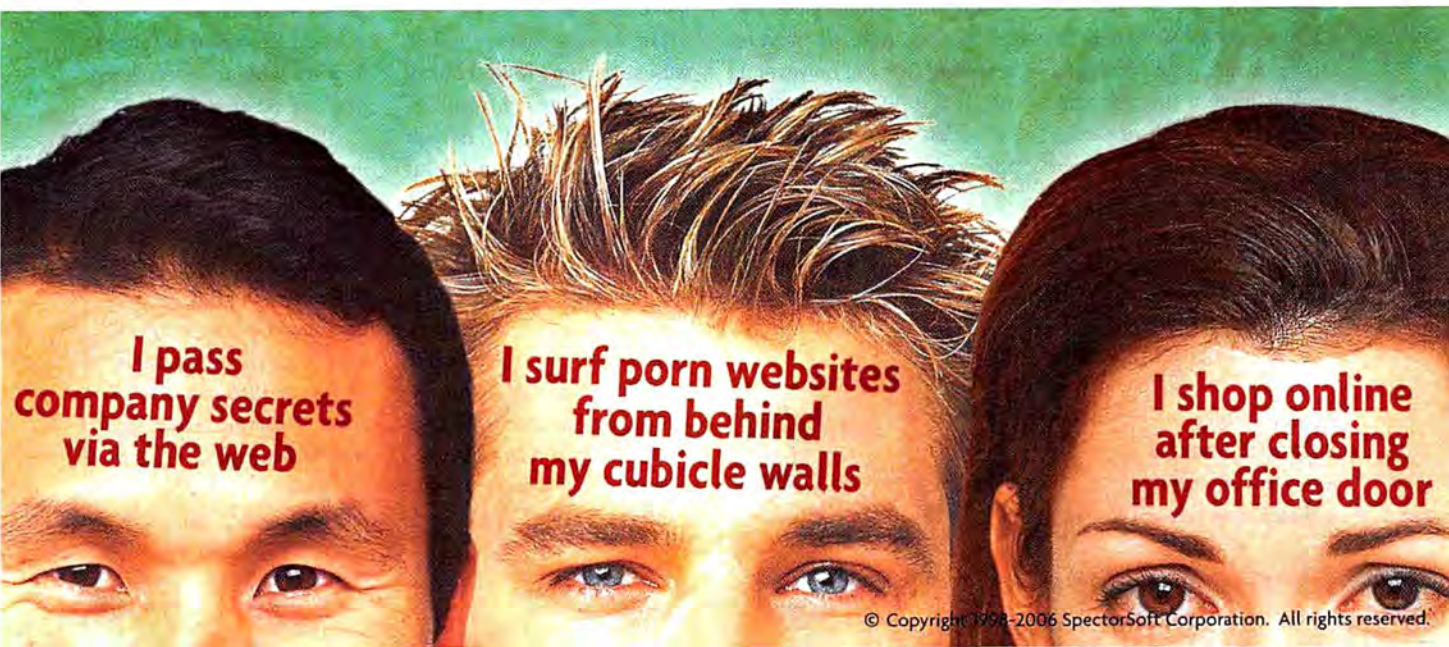
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FileMaker Adds a Window to the Web

DATABASE SOFTWARE

MORE AND MORE, the data we care about—maps, prices, pictures, definitions—lives on the Web. The new version of FileMaker Pro gives your databases a Web viewer, a window on that information. Aside from that big advance, though, there's not much new in **FileMaker Pro 8.5** (\$299, \$99 upgrade from version 8).

FileMaker Pro 8.5

FileMaker

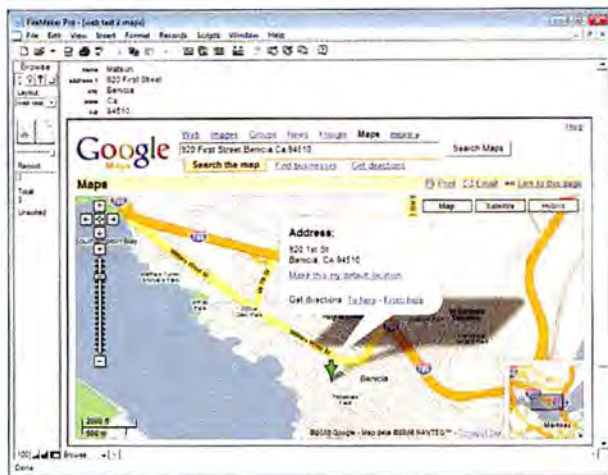
PCW Rating **82** Very Good

New version adds a useful Web page viewer to your databases. Street: \$299, \$99 upgrade from version 8.0

find.pcworld.com/54624

FileMaker's developers have programmed in hooks to popular and open Web databases like Google and Google Maps, MapQuest, FedEx's package tracking database, and Wikipedia and its associated reference sites. Just specify where in your database to find, say, a street address, and you'll receive a map of that address. Change the information, and the page you see changes.

You can add pages from sites of your choice. It's simple to have a data block show the page associated with a URL in your database. Once you learn the correct formatting, you can also construct a specialized URL based on the



FILEMAKER PRO 8.5 connects to Web databases like Google Maps.

info in your database to get a particular page on a Web site.

The "Web viewer" name points to the feature's weakness: You can view Web data, but you can't incorporate it into your database. The Web viewer will show you the FedEx tracking page with the date your package is expected, but

it can't compare it to the original ETA and tell you whether the package will be late, for instance. You'll have to make such calculations yourself.

Version 8.5 is still a worthy update to FileMaker. Owners of 8.0 must decide whether the Web viewer is worth \$99.

—Edward N. Albro

Laptop Dock Works Fine for Light Office Apps

MOBILE COMPUTING

NOTEBOOK DOCKS eliminate the harried feeling you get plugging and unplugging all your peripherals whenever you set down or pick up your notebook. Kensington's **Notebook Expansion Dock with Video** is for laptop owners who can't get a dock to match their model.

Although the device

has some limitations, many users will find it worthwhile.

The \$180 dock hooks up to your notebook via a USB 2.0 connection. It offers four USB 2.0 ports, speaker and headphone/microphone jacks, and an ethernet port. Its most interesting feature, however, is its USB-to-VGA connection, which lets video travel through the dock's VGA port and out to an external monitor.

The device supports 32-bit color at a maximum resolution of 1280 by

1024 pixels—native resolution for 17- or 19-inch standard-format LCD monitors. It can handle Windows' Clone Mode (in which the external monitor mimics the laptop screen) and dual monitor setups.

The dock's display speed was sufficient for scrolling documents; the lag from laptop to external display, though perceptible, was slight. But the external screen took several seconds to update after I opened the Display Properties window. Worse, in a 3D, full-screen Doom 3 test, the monitor showed a black screen while the game ran merrily on the laptop. Kensington says that the dock's lack of DirectX support might be a factor in this failing. Clearly this is a dock

for work apps, not for speed-sensitive games or video.

Proprietary docks often pack in more features, but not every notebook offers a dock. The Kensington Notebook Expansion Dock with Video permits all XP-based notebooks to work with an external display and other peripherals.

—Laura Blackwell



KENSINGTON'S NOTEBOOK DOCK with Video connects your notebook to an external display.

Notebook Expansion Dock with Video

Kensington

PCW Rating **79** Good

Dock offers easy connectivity and additional screen space for office applications, but forget about using it to view video and graphics-laden apps.

List: \$180

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Curb Records counts on Dell servers, storage and firewalls to protect their catalog of 43 years' worth of music recordings – including the latest from Tim McGraw, LeAnn Rimes, Wynonna, Jo Dee Messina and Hank Williams Jr. But that's not the only reason they have a Dell network. There's also the necessity of constant e-mail communication with sales reps, radio stations, distribution companies, artists, street teams, and consumers. It's all part of the storytelling a record label has to do to get the word out about upcoming albums. Because it turns out that recording a song is only the first step in a long journey that ends, for more than a few Curb Records recording artists, at the top of the charts. That's the direct path to growth. That's pure Dell.

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Enterprise-class protection for the SMB

EMC Insignia Solutions automate the work of protecting data assets

LOSING DATA HURTS SMALL BUSINESSES as well as large enterprises. Whether access to your data is lost or destroyed through system failure, natural or manmade disasters, or human error, the loss of access to data for almost any period of time can damage the bottom line of any business, regardless of the size. A recent study found that 60% of companies that lose their data as a result of a disaster will shut down within six months.

It doesn't have to be complete disaster. Short-lived loss of access to any data hurts: email messages, database transactions, customer information, product data, employee information, and so on.

When access to data is lost, worker productivity slows and, in many cases, nearly halts. More importantly, customer service and satisfaction plummet. If customers can't do business with you at the speed they are accustomed to and with the service level they expect, they will take their business elsewhere.

Loss of data access can also impact regulatory compliance and litigation. In this post-Enron era, regulators, auditors, and courtroom judges are increasingly skeptical of claims that data has been lost or can't be retrieved quickly and completely. This is particularly true in cases of email, where multimillion-dollar penalties have resulted from failure to deliver copies of all requested email messages.

EASY-TO-USE BACKUP AND RECOVERY SOLUTIONS

Given the risks, small and medium-sized businesses (SMBs) are no different from the biggest corporations when it comes to protecting data—no matter where it resides. But most SMBs have neither the deep pockets nor the IT staff of the big companies to allocate to data protection.

The innovative EMC Insignia Solution for Data Protection gives the SMB enterprise-class protection with ease of use that is as close as possible to "set it and forget it" operations.

The EMC Insignia Solution combines the renowned speed, performance, and reliability of the new EMC CLARiiON AX150 disk storage array with the convenience of EMC Retrospect 7.5 for Windows backup and recovery software, giving SMBs unmatched speed for backups and rapid restores. The solution gives SMBs automated protection for up to 15 servers or 300 notebook and desktop devices, or some combination thereof. The unique technology of Retrospect adjusts itself for changing network conditions. If some computers are inaccessible during scheduled backups, as

notebooks often are, Retrospect assigns them the highest priority in the next session.

Working with hardware supporting any of the major operating systems, Retrospect rapidly streams backup data to the AX150 to deliver high-capacity disk storage and later transfers data from the AX150 to tape for long-term offsite archival storage.

With the meteoric rise in importance of email data and the need to protect it, SMBs will appreciate that EMC also offers the new EMC Insignia Solution for Exchange. This second EMC Insignia Solution gives the SMB highly efficient managed storage for Exchange data, including the ability to restore individual email messages, a mailbox, or the entire server automatically and without IT staff intervention.

For more information on the EMC Insignia Solutions, visit www.emcinsignia.com.

Today, an organization's data has truly emerged as a critical asset. With access to that data central to worker productivity, customer satisfaction and retention, and regulatory and legal compliance, no business can afford the price of *not* protecting its data through proven data backup and restore processes and systems. Data protection has become essential to business survival.



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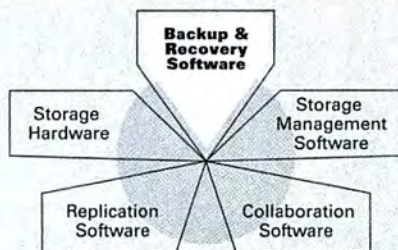
Data recovery matters when bad things happen. **EMC Retrospect[®]**: self-adjusting backup operations, AES encrypted backups.

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A winning team works together. **EMC eRoom[™] SMB Edition** creates secure web-accessible workspaces.



New! Retrospect 7.5

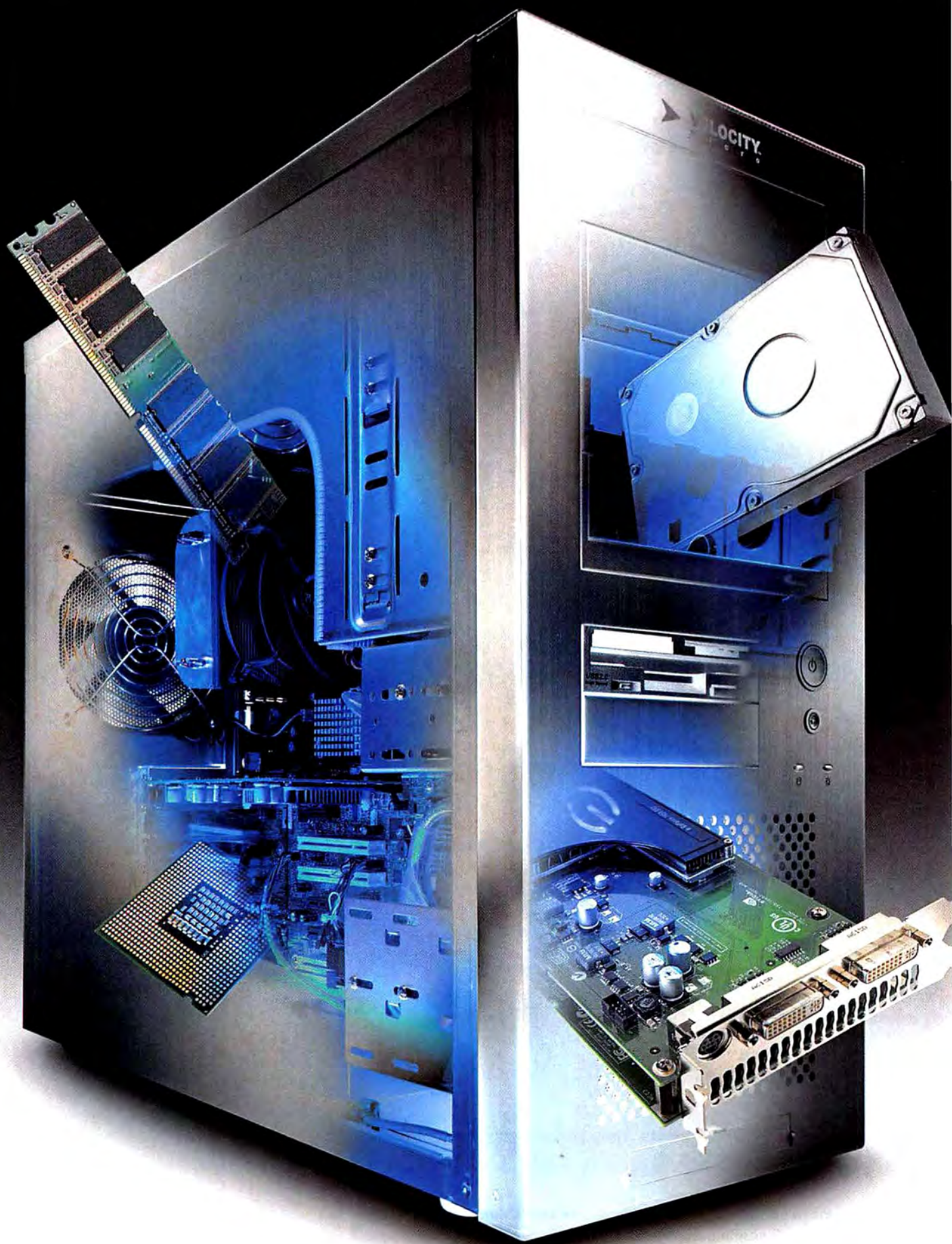
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THE RIGHT UPGRADE can have a big payoff, whether you want the best components for your power PC or another year of productive life from your wheezing workhorse. The key is to know what upgrades you can make, how to do them—and whether they're worth it.

We'll walk you through upgrading strategies, component by component, looking at the latest upgrade options, such as Intel's exciting dual-core CPUs and the new perpendicular-recording hard drives with their huge storage capacity. We'll show you some upgrade options that let yesterday's PC perform today's tasks—all with thorough, step-by-step instructions, plus helpful tools and system utilities. Finally, we'll help you decide when an upgrade is the right choice, and when you're better off with a new PC. ►

BY ROBERT LUHN • PHOTOGRAPHS BY MARC SIMON
TESTING BY TONY K. LEUNG AND CHEN XING WANG

98
CPU

100
GRAPHICS CARD

104
MEMORY

108
HARD DRIVE

110
OPTICAL DRIVE

112
BUILD OR BUY?

CPU

INTEL'S NEW Core 2 Duo chips shook up the CPU market this July. Our first tests of Core 2 Duo systems yielded the highest WorldBench 5 benchmark scores we've ever seen, easily outshining the best marks from systems running on AMD's available dual-core offerings. If you're shopping for a new PC, a dual-core chip is a good idea, whether it's one of Intel's new screamers or an AMD Athlon 64 X2 or FX. But Core 2 Duo is the chip that looks like a breakthrough product.

In our tests of similarly built reference PCs, a system configured with a 2.93-GHz Intel Core 2 Extreme X6800 processor turned in a blazing WorldBench 5 score of 160. An AMD Socket AM2 FX-62 PC equipped with a 2.8-GHz Athlon 64 FX-62 lagged a good distance behind with a score of 137. For further test results on these and other comparable machines, head to find.pcworld.com/54862.

The bad news is that you can't just pop a Core 2 Duo chip into your existing motherboard. The chips use the same socket 775 as existing Pentium 4 and Pentium D processors, but they require additional hardware support in the form of a new chip set and a specially designed motherboard. Meanwhile, AMD's latest dual-core chips use a new socket called AM2,

which means that you can't move up to those chips without either swapping out the motherboard or buying a new PC.

So what can you get that works with your current motherboard? Well, that depends in part on your CPU socket. Older

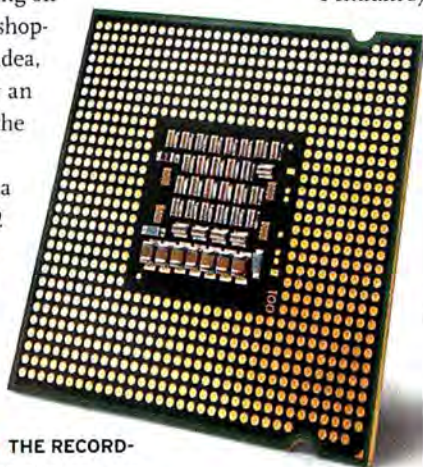
Pentium systems use socket 478 processors. Recent

Athlon systems use either socket 939 or socket 754. Check your system or motherboard manufacturer's documentation or Web site to find out which socket type you have, or download one of the time-saving system utilities we look at on page 108.

Once you know your socket type, you can check to see what compatible options are out there. Good places for shopping include Newegg.com, PC Mall.com, and shopping metasites like DealTime.com and Shopzilla.com: Just remember that the older the chip is, the harder it will be for you to

find a suitable upgrade. Plenty of upgrade processors are available for recent systems using socket 754, 775, or 939.

We tested many different upgrades to see how much life we could wring out of a two-year-old test PC; the CPU swap offered the biggest gains for any single upgrade in our WorldBench 5



● **THE RECORD-SETTING new Core 2 Duo.**

TWEAKING TIPS

MAKE SURE YOU HAVE THE TOOLS YOU NEED

HEAD OFF UPGRADE anguish by having these low-cost tools on hand before you start.

➤ **AN INEXPENSIVE** (\$10 to \$30) precision tool kit can simplify your life. Thin-handled screwdrivers make reaching inconveniently situated screw holes much easier. Tweezers or long-nose pliers are good for picking up fallen screws, and a magnifying glass helps you see small parts. A regular-size Philips-head screwdriver and standard needle-nose pliers will help you get by.

➤ **KEEP A CUP** or small container nearby to hold screws, jumpers, spacers, and

other small parts. A shallow tin with a cover (approximately the size and shape of an Altoids tin) works best.

➤ **USE STICKY LABELS** or a wax pencil to mark every drive, card, bracket, and cable you remove from your PC, to enable you to keep track of which part it is, where it connects, how it should be oriented, and so on. Being methodical is especially hair-saving if an upgrade balks and you need to put everything back the way it was.

➤ **KEEP A CAN**

of compressed air or a computer vacuum brush attachment at the ready. If you're opening your case anyway, take time to remove harmful dust. See "How to Keep Your PC Cool" on page 103.

➤ **TAKE FULL ADVANTAGE** of your collection of old antistatic bags, extra cables, power connector splitters, and other pack rat gear. Having the right miscellaneous extras helps you avoid aggravation.

➤ **USE AN ANTISTATIC** wrist strap. It's good insurance, though it isn't essential if you remember to touch the metal PC chassis frequently and if you take care not to scoot your shoes on the carpet.

➤ **GET INVALUABLE BACKUP** by consulting reliable reference materials. My faves for upgrading include *PC Hacks*, *Windows XP Annoyances for Geeks*, and *Repairing and Upgrading Your PC* (all from O'Reilly Media).



● **MUST-HAVE TOOLS** of the trade for most any PC upgrade job.

tests. If you're thinking about swapping out your CPU, look for an improvement of 1 GHz in clock speed to justify the cost. And whenever possible, buy a retail package kit—not just the CPU—since you'll get a much longer warranty as well as the appropriate heat sink and fan.

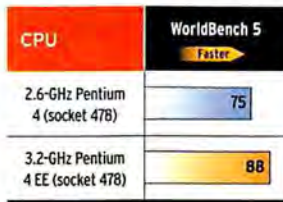
SAVING AN OLD SYSTEM

OUR OLDER CUSTOM-BUILT PC had 512MB of system RAM, a Gigabyte motherboard, and a 2.6-GHz Pentium 4 CPU. The upgrade window on socket 478 Pentium systems is closing rapidly, but we found a 3.2-GHz Pentium Extreme Edition chip that we could plug in.

The \$300 chip we used isn't cost-effective if your CPU already runs at 2.8 GHz or better (though you can save about \$100 by getting a slightly lower-power, non-Extreme Edition 3.2-GHz Pentium 4). But even the 600-MHz increase in our test system provided nice results. The upgraded PC bumped up a healthy 17 percent on WorldBench 5 from a score of 75 to

BEFORE/AFTER

CPU UPGRADE BOOSTS SPEED



TEST CHART NOTE: Our test PC had 512MB of RAM and a Radeon 9600 graphics board with 128MB of memory.

88—comparable to today's all-purpose laptops.

To figure out whether your CPU could use a power boost, hit <Ctrl>-<Alt>-<Delete> in Windows to call up Windows Task Manager (or see "Gauge How Hard Your System Is Working," page 108, for a more advanced performance tool). The green box in the system tray provides running commentary on how hard your processor is chugging away (alternatively, you can look under the Performance tab in the Task Manager window for a more precise display of data). Run through your normal tasks, and keep an eye on the tray icon, especially when your system feels slow. If the processor is regularly running full-bore for extended periods,

you'd likely benefit from a CPU upgrade. Note that some tasks, like running a full virus scan, will push just about any processor. One tip: If you want to keep the Task Manager from cluttering your taskbar, choose *Options•Hide when minimized*. You can bring it back by double-clicking the system tray icon. ▶

STEP-BY-STEP

HOW TO INSTALL A NEW CPU

REPLACING A CPU is a fairly involved PC upgrade; but done right, it's relatively painless. Here's how to proceed:

[1] RUN YOUR PC for about 15 minutes to heat up the thermal paste between the heat sink/fan and the CPU. This should make it much easier to separate the heat sink from the processor.

[2] TURN OFF the PC and remove its cover. Touch a metal part of your PC's case or use an antistatic wrist strap to equalize charge and ground yourself.

[3] DETACH THE power cable connecting the heat sink/fan to the motherboard. Carefully remove the heat sink/fan from the CPU. Some types are locked down with a lever, others are attached with screws, and still others use clips to attach directly to the CPU socket.

[4] REMOVE THE CPU by unlatching and pulling up the little lever handle on the side of the socket, thereby releasing the processor. Label the CPU and tuck it away in the new CPU's box.

[5] A NOTCH or an absence of pins on one corner of your new CPU will show you the one way to line up the new chip

in your CPU socket appropriately. Gently position it in the socket, and then swing the lever handle over and down to lock it into place.

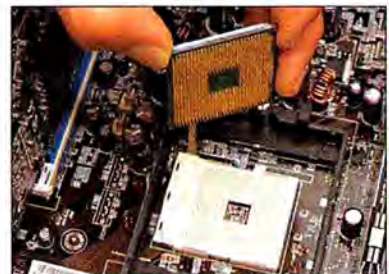
[6] MOST RETAIL CPUs come with thermal grease preapplied to the accompanying heat sink. If yours doesn't, follow the included directions for applying a small amount of thermal compound over the CPU die or the heat spreader on top of the new chip. A small packet of the paste should have been included with your new CPU kit.

[7] IF YOUR kit came with a new heat-sink-and-fan assembly, and you haven't yet upgraded to a more powerful cooling kit, use the new parts. Your faster (and likely hotter) upgraded CPU may require additional cooling. Otherwise, reattach the old heat sink and fan.

[8] TURN ON the PC, and launch your system's setup program (watch the screen to see what key you should press at the start of the boot sequence). Check to see whether the system is running the new CPU at its correct speed. If it isn't, you may need to update your



● **UNLATCH** and pull up the small lever to release the old CPU (step 4).



● **LINE UP** the pin-free corner of the CPU with a similar corner on the socket (step 5).

BIOS version or change some of its settings. For instructions, check the documentation accompanying your motherboard, or consult the maker's Web site.

Graphics Card

A NEW GRAPHICS board is especially worthwhile if you're looking for a performance boost in 3D apps and games. Windows Vista will use the 3D hardware in modern graphics cards to accelerate many of its fancy desktop features, including Flip3D and other cool Aero Glass transition effects. But if you aren't running Vista, the biggest reason to upgrade your graphics board is to enhance your gaming experience.

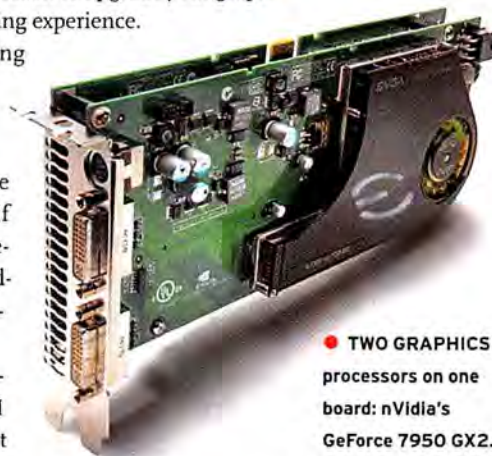
If you want to run eye-popping games like *Elder Scrolls: Oblivion* on an aging PC or to improve their performance on a more recent box, there is no more effective upgrade you can make. If you've been using low-end integrated graphics, even a \$100 mid-range card can boost your graphics performance tremendously.

Today's hottest competing technologies are CrossFire from ATI and SLI from nVidia. Both let pairs of graphics boards work together to produce extraordinary graphics processing power. To use either one, you'll need a motherboard that has two PCI Express slots and that supports either SLI or CrossFire. Compatible graphics cards are by no means cheap, and using two of them can seriously spike your power usage (see "How to Install a New Power Supply" on page 114). But the performance these setups dish out makes enthusiasts drool.

At the extreme cutting edge is Quad-SLI, which uses two

nVidia-based graphics cards, each of which has two graphics processors (GPUs). For \$1200 or so (the price of two GeForce 7950 GX2-based boards), you can luxuriate in superb performance and display quality with even the latest games. That \$1200 doesn't include the cost of the motherboard, of course. And if you're going with a setup like this, you'll need a heavy-

duty power supply (typically over 500 watts) that's rated to handle the load. Slightly less radical gamers can buy one 7950 GX2-based board, which shines at higher resolutions, and use it with a standard PCIe system. See find.pcworld.com/54863 for our latest look at this hot-rod card.



● **TWO GRAPHICS processors on one board: nVidia's GeForce 7950 GX2.**

TESTING THE UPGRADES

A NEW GRAPHICS board can pay huge dividends in 3D performance, even if you don't go high-end. Our tests confirm that an old AGP card or even newer on-board graphics won't cut it with current games. Integrated graphics save cash on a PC purchase; but if you try to run a demand-

ing game, you'll quickly realize what your money didn't buy. And improved performance is only half the story anyway. Older cards can't handle the most realistic graphics effects, or even run some of the most graphics-hungry games, like *Oblivion*.

On our brand-new Polywell 945GX computer with a 3-GHz Intel P4 processor, 1GB of memory, and Intel 950G integrated graphics using main memory, even somewhat older games like *Doom3* crawled along at 9 frames per second at 1024 by 768 ►

STEP-BY-STEP

HOW TO INSTALL A NEW GRAPHICS BOARD

DONE PROPERLY, installing a graphics board is simple. Here's how:

- [1] **DOWNLOAD THE LATEST driver** from ATI (www.ati.com) or nVidia (www.nvidia.com). It's possible to use the driver CD supplied with your card instead; but unless your board doesn't work with the regular ATI or nVidia driver (check your documentation to find out), you're better off heading online to download the most up-to-date driver.
- [2] **UNINSTALL THE OLD driver** using Add or Remove Programs in the Windows Control Panel. It should be conveniently labeled 'nVidia Drivers' or 'ATI Drivers.'
- [3] **POWER DOWN** the computer.
- [4] **OPEN THE CASE**, and disconnect

the power cable (if there is one) from the old video card.

- [5] **REMOVE THE OLD graphics board.** Most AGP and PCIe slots have a small lever or clip at the end of the slot that you'll need to release first.
- [6] **INSERT THE NEW board.** If appropriate, make sure that the lever or clip latches the board in place once more.
- [7] **RECONNECT** the power cable.
- [8] **POWER ON** the PC; but leave the case open for now, in case you need to reseal the graphics board.
- [9] **WHEN WINDOWS FINDS** the new hardware and prompts you to install a driver, choose *Cancel*.
- [10] **DOUBLE-CLICK** the driver that



● **MOST MODERN graphics cards use a dedicated power connector (step 4).**

you downloaded in step 1 (or use the driver CD) and follow the on-screen instructions for installing it.

- [11] **REBOOT**, reconfigure your desktop display settings, and enjoy your card.

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resolution. A \$170 eVGA e-GeForce 7600 GT KO PCIe card, though, generated a respectable 68 fps in Doom3 at 1024 by 768 resolution, and 64 fps at 1600 by 1200. Fear, a newer and more demanding game, showed a huge boost, too (see the accompanying chart). A PNY GeForce 7900 GTX delivered great performance, particularly at higher resolutions, but you'll pay a hefty \$480 premium for the added power.

Though PCIe has become the standard for graphics cards, there's still hope for your older AGP system. Both ATI and nVidia are continuing to make new AGP cards, even if they're usually PCIe cards with AGP translators. On our test computer, we ran through two upgrade scenarios, starting with an older, once-popular 128MB Xtasy ATI 9600 board: a midrange 256MB Sapphire ATI Radeon x1600 Pro card (\$100), and a high-end 256MB eVGA e-GeForce 7800 GS KO (\$380 list).

With the Sapphire ATI Radeon x1600 Pro, performance nearly tripled in Doom3 at 1024 by 768 resolution, from an unpleasant 15 fps to a palatable 44 fps. Fear showed a similar improvement at the same resolution, from 11 fps to 34 fps.

The 256MB eVGA e-GeForce 7800 GS KO packs a bigger punch—for your PC and your wallet. The almost five times faster performance for Fear at 1024 by 786 resolution would make any gamer smile. But unless you're really attached to your AGP system, you're probably better off putting the money toward a new PCIe-equipped computer. ►

BEFORE/AFTER

NEW CARDS IMPROVE PICTURE

A NEW GRAPHICS board can make a huge qualitative difference for games and 3D programs if you're starting with an old card or underpowered built-in graphics.

GRAPHICS BOARD	Price	GAMING TESTS (FRAMES PER SECOND)		
		Fear	Doom3	Far Cry
AGP SYSTEM ¹		1024 by 768 ²	1024 by 768 ²	1024 by 768 ²
VisionTek Xtasy ATI 9600 (128MB)	(Original card)	11	15	26
Sapphire ATI Radeon x1600 Pro (256MB)	\$100	34	44	53
eVGA e-GeForce 7800 GS KO (256MB)	\$380	53	57	55
PCI EXPRESS SYSTEM ³		1600 by 1200 ²	1600 by 1200 ²	1600 by 1200 ²
Integrated Intel 950G ⁴	n/a	2	3	5
eVGA e-GeForce 7600 GT KO (256MB)	\$170	40	64	57
PNY GeForce 7900 GTX (512MB)	\$480	64	68	62

TEST FOOTNOTES: ¹Two-year-old AGP system with 2.6-GHz Pentium 4 CPU and 512MB of RAM. ²Screen resolution used in tests. ³PCIe system with 3.0-GHz Pentium 4 CPU and 1GB of RAM. ⁴On-board graphics, uses system memory. Tests conducted by PC World Test Center. For details on how we test, go to find.pcworld.com/52482. All rights reserved.

STEP-BY-STEP

HOW TO KEEP YOUR PC COOL



● **HEAT IS**
the enemy. Beat it with
system fans and tied-off cables
that don't block airflow (step 2).

IT'S CRITICAL TO keep your system cool, particularly as you add newer—and potentially hotter—upgrades. Overheating can not only crash your system, but permanently damage your CPU and other components.

The solution, aside from your CPU heat sink, is fans, fans, fans. Properly installed, they pull cooler, outside air into your computer and exhaust hot air from near the top of the case.

To figure out how toasty your PC is, Robert Bruce Thompson, author of *Building the Perfect PC* (O'Reilly), recommends starting by measuring ambient room temperature with an ordinary thermometer. Then measure the temperature of air that's being pushed out by the system fan at the back of the case (not the power supply fan). If the exhaust air is at least 9 Fahrenheit degrees hotter than the ambient temperature, it's time to take action.

[1] BLOW THE DUST away. Accumulated fuzz seriously hampers your heat sinks and fans. Use a can of compressed air, a computer brush vacuum attachment (less than \$10), or a minivac (between \$5 and \$15) to get the gunk out.

[2] BUNDLE YOUR CABLES with tie-wraps to make sure that they don't block the flow of air.

[3] IF YOUR PC IS STILL too hot, add more fans. Check Zalmanusa.com, EndPCNoise.com, and Quietpcusa.com for selections. Grab the largest, with the highest rpm, that fits in your case. Quiet fans are spec'd at 30 decibels or lower.

[4] LAST BUT NOT LEAST, the excellent and free Speed-Fan (find.pcworld.com/54866) places a configurable temperature monitor in your system tray.

Memory

COMPUTER MEMORY MAY not get worse with age, but it does get outmoded. Older DDR SDRAM is rapidly being supplanted by DDR2 memory, which in turn will be overtaken by faster DDR3 memory when it becomes available within the next couple of years. As with processors, each type of memory requires a motherboard with a compatible RAM socket, meaning that you can't just pop DDR2 memory into a computer designed for DDR SDRAM memory. But regardless of what type of RAM your system uses, adding more remains one of the cheapest and most effective upgrades.

Faster memory is desirable, but the most important thing is having enough. PCs slow down drastically when they run out of real memory and have to start swapping data into much slower virtual memory on your hard drive. That situation often arises when you run many applications at once, or when you use video-editing or other programs that shuffle a lot of data. Our tests, which involve working with images and using Nero Express to burn CDs, ran one-third faster when we upgraded from 512MB of RAM to 1GB.

Generally, 1GB of memory is enough for Windows XP. But if you want to use Vista with your existing system, you may need more memory. Because of new fea-



● **ADD MORE**
memory for a cheap
and efficient upgrade.

tures like SuperFetch and larger overall memory demands, most analysts agree, Redmond's new OS will be happiest when working with 2GB or more.

For a quick, informal check of your memory needs, open a typical set of applications. Then open the Task Manager and click the *Performance* tab. Look at the line for 'Available' under 'Physical Memory (K).' If things feel sluggish and the reading is near zero, you need to shop for more RAM.

Before you buy, use a tool such as Sandra Lite (see "Gauge How Hard Your System Is Working," page 108) to figure out the type and amount of memory your computer currently has. Or head to a site such as Crucial.com or Kingston.com, enter your motherboard or PC model number, and receive an automatic ID of the type of RAM your system takes. Most PCs being upgraded today use dual-channel memory, which must be installed in pairs for maximum performance; so be sure to buy two matched chips when arranging for your upgrade.

Typically, you'll have to install the RAM in alternating slots—1 and 3, or 2 and 4—to use dual-channel memory access.

Since most motherboards have a maximum of four sockets for memory, you may have to pull out some (or all) of your existing memory before adding new modules. Also, check your current memory's speed with Sandra or another diagnostic program. Though many faster chips may be compatible with your system, they will all operate at the slower speed if you use a mix of slower and faster memory modules.

BEFORE/AFTER

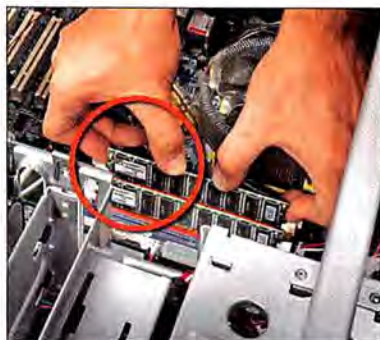
DISCS BURN FASTER

MEMORY ¹	WorldBench 5 ² Faster	Nero Express 6.0.0.3 ³
512MB DDR SDRAM	75	954
1024MB DDR SDRAM	78	617

TEST CENTER FOOTNOTES: ¹Test system with 2.6-GHz Pentium 4 CPU. ²Overall test score; higher is better. ³Timed subtest (in seconds); lower is better.

STEP-BY-STEP

HOW TO INSTALL NEW MEMORY



● **LINE UP** the bottom notch on the chip with the corresponding bump in the socket, and gently push the new memory into place with both hands (step 5).

SWAPPING OUT MEMORY is among the quickest and easiest of PC upgrades. Here's how to do it:

- [1] **POWER DOWN** your PC, open its case, and ground yourself as usual by touching the metal case or using an antistatic wrist strap.
- [2] **FIND OUT** whether and how your memory sockets are paired, and maintain that arrangement for best dual-channel performance. The pairing is often designated by color or a graphic on the motherboard itself.
- [3] **IF YOU NEED** to remove an existing module, gently push down on the clips

on either side of the RAM socket. The module will pop up slightly and should be easy to pull out.

- [4] **TO INSTALL** your new memory, line up the notch at the bottom of the memory chip with the corresponding bump in the memory socket.
- [5] **WITH YOUR** fingers positioned at each end of the module, gently but firmly push down on it until the latches click into place.
- [6] **CLOSE UP** your system, power on, and confirm that the PC recognizes the new RAM. If it doesn't, power down and reseat the modules.

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†AIIM Industry White Paper on Records, Document and Enterprise Content Management for Public Sector, 2005.

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Hard Drive

HARD DRIVES KEEP growing, and we keep finding more ways to fill them up. For data pack rats, a new type of storage technology called perpendicular recording enables users to pack much more information into new drives, by arranging the data bits so that they align perpendicularly to the magnetic media.

Seagate's 750GB Barracuda perpendicular desktop drive costs about \$420; the first 1-terabyte desktop drives should show up next year, along with 500GB laptop drives. These drives require SATA, the preeminent hard-drive interface for desktop systems, but no special drivers.

You'll need to be running Windows Vista to reap the benefits of another new type of drive, called a hybrid hard disk. Such drives mate 128MB or 256MB of high-speed nonvolatile flash memory with the spinning disks of a regular drive. Hybrid hard disks offer speed and power improvements, rather than additional space, and will primarily benefit laptops.

By writing to the drive less frequently and in larger chunks, a hybrid unit can significantly extend a typical laptop's battery life, according to Samsung. In addition, both Vista and Vista-



● SEAGATE'S 750GB Barracuda packs the data in perpendicularly.

optimized applications will be able to load faster with hybrid drives because they'll store part of the OS in flash memory; and disk reads and writes in general will be faster with the hybrids.

SATA FOR YOUR UPGRADE

IF YOU'RE GOING to add a new drive to your system, go with a SATA drive, even if you have to buy a new SATA controller card to accommodate it. The extra \$25 or so for the card will pay off when you move to a new PC and you can easily reconnect your new drive to that machine. SATA drives are generally easier to install than their IDE predecessors, with thinner cables that allow better airflow inside your system. We've seen little performance advantage in using a SATA-300 drive rather than a SATA-150 drive, so take your pick.

When you buy, calculate the price per GB for each of several drives in the capacity range you're considering. The latest, supercapacity drives, like Seagate's 750GB monster, will always carry a significant price premium, but the sweet spot for hard drive value jumps around quite a bit. ▶

ONLINE HANDS-ON: For our step-by-step guide to adding a hard drive, head to find.pcworld.com/54901.

TWEAKING TIPS

GAUGE HOW HARD YOUR SYSTEM IS WORKING

THESE UTILITIES can help you assess your PCs innards without cracking the case.

➤ **SANDRA PROFESSIONAL 2007** (\$30 and up; free Sandra Lite version; www.sisoftware.net) details the BIOS, the motherboard chip set, PCIe slots, and more. It can also run grueling burn-in tests (to see whether a component will fail) and performance analyses.

➤ **CPU-Z** (free; www.cpuid.com/cpuz.php) offers in-depth info on your CPU, motherboard, and memory, from the chip's code name to the motherboard chip set.

➤ **POWERSTRIP** (\$30, free demo, find.pcworld.com/54922) pinpoints a variety of details about your graphics card and



● SANDRA KNOWS it all—about your system, at least.

monitor, and enables you to control a wide range of settings.

➤ **NERO'S INFOTOOL** (free, find.pcworld.com/54921) finds out everything about your CD and/or DVD drive,

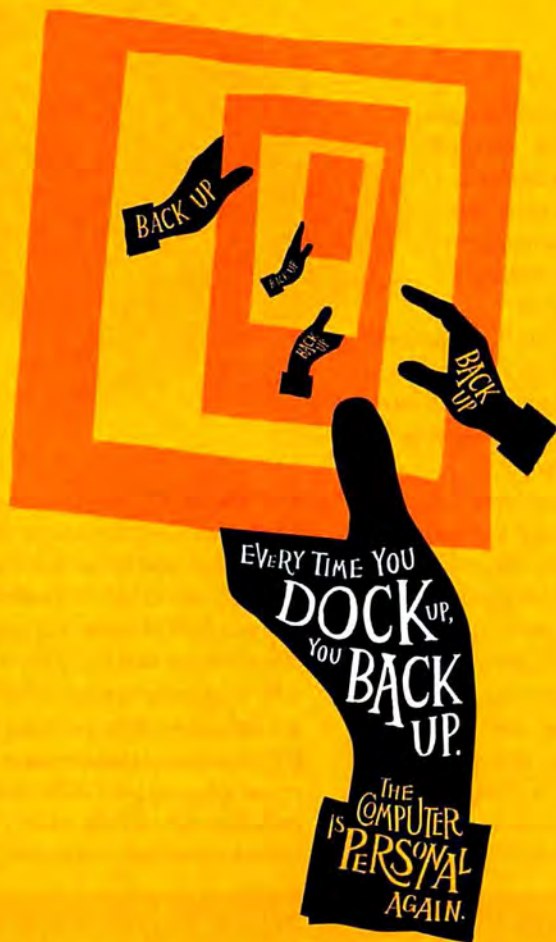
such as firmware versions and supported speeds and media.

➤ **SPINRITE** (\$89, www.grc.com) analyzes your hard drive and controller right down to the bits, and can even revive some damaged drives.

➤ **SYSINTERNAL'S PROCESS EXPLORER** (free; www.sysinternals.com) is like Windows Task Manager but with more muscle. Dig into your CPU and memory usage, and get details on every running process.

➤ **FREERAM XP PRO** (free/donation; yourwaresolutions.com) displays a running total of your memory usage as a system tray icon. It can also free up physical memory by forcing programs into virtual memory.

HP recommends Windows® XP Professional



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Optical Drive

YOU'VE PROBABLY HEARD about the ongoing format battle between Blu-ray Disc and HD DVD, two competing (and incompatible) high-capacity blue-laser technologies. Both promise to pack far more data onto optical storage media than older technologies do—25GB or 50GB onto a single disc for existing PC-ready Blu-ray drives, and 15GB, 20GB, or 30GB for HD DVD discs when rewritable drives arrive. Dell, Philips, Pioneer, Sony, and a slew of consumer electronics makers are backing Blu-ray technology; Intel, Microsoft, and Toshiba are promoting HD DVD.

Living-room players for high-definition movies have been released in both formats, as have dozens of movie titles. But right now the only high-density drives you can get for your PC are rewritable Blu-ray. One of those will set you back a whopping \$750 or so, with correspondingly expensive media as well. And until the format war is decided, any given drive has the potential to become the next Betamax. If you're a graphics artist or someone else who has heavy storage needs, this option might well be worth pursuing. Otherwise, this is one hot technology you'll want to let simmer awhile. As a hedge, some vendors are talking about making drives that can handle both formats. But none has yet announced any definite plans.



● **HUGE STORAGE,**
huge price: I-O
Data's external Blu-ray drive.

There are other alternatives for an optical drive upgrade, though, particularly if you don't already have a rewritable DVD drive installed (or if your current drive is several years old). For less than \$50, you can purchase a newer optical drive capable of writing at 16X speed to 8.5GB dual-layer media. Plex-

tor's internal PX-760A drive is relatively expensive at \$100, but it's also one of the few current models that claim 18X write-once DVD speed, and it was quick to install and burn in our tests. Working with its bundled software, it took the drive 16 minutes to burn a 2.15GB movie, and less than 4 minutes to write 7.66GB of various-size data files from the hard drive.

Here's a burning tip: If you frequently back up to optical storage and you want the best bang for the byte, use plain old 4.7GB DVD-R media. At today's prices, you'll pay just 13 cents per GB, versus 22 cents per GB for dual-layer DVD+R storage. Seemingly dirt-cheap CD-Rs actually run 56 cents per GB, and 25GB Blu-ray BD-R discs cost 80 cents per GB. ▶

TWEAKING TIPS

SET UP YOUR PC FOR MULTIMEDIA ENTERTAINMENT

YOU'VE UPGRADED FOR POWER, but what about for pleasure? Go for pure entertainment with these upgrades.

➤ **BRING HDTV TO YOUR PC.** A TV tuner card such as the \$99 ADS Tech Instant-HDTV Pro (find.pcworld.com/54558)



delivers high-def TV to your desktop by capturing analog and digital over-the-air TV signals. The bundled BeyondTV Express software automatically records shows for later viewing. ATI's new TV Wonder 650 (\$129; find.pcworld.com/54920) captures analog and digital TV signals, and has an FM radio tuner.

➤ **STEP UP TO BIG-LEAGUE SOUND.** Hearing TV audio on a PC over standard speakers is like listening to wet cardboard get whacked with a stick. Klipsch's \$100 ProMedia 2 Ultra speakers (find.pcworld.com/54560) are a big improvement. The two-speaker set lacks the vein-busting bass of more-expensive models equipped with subwoofers, but

● **KLIPSCH'S**
PROMEDIA 2 Ultra
speakers are an
effective upgrade.

they generate clear, sharp sound. You'll still need a decent sound card (most integrated

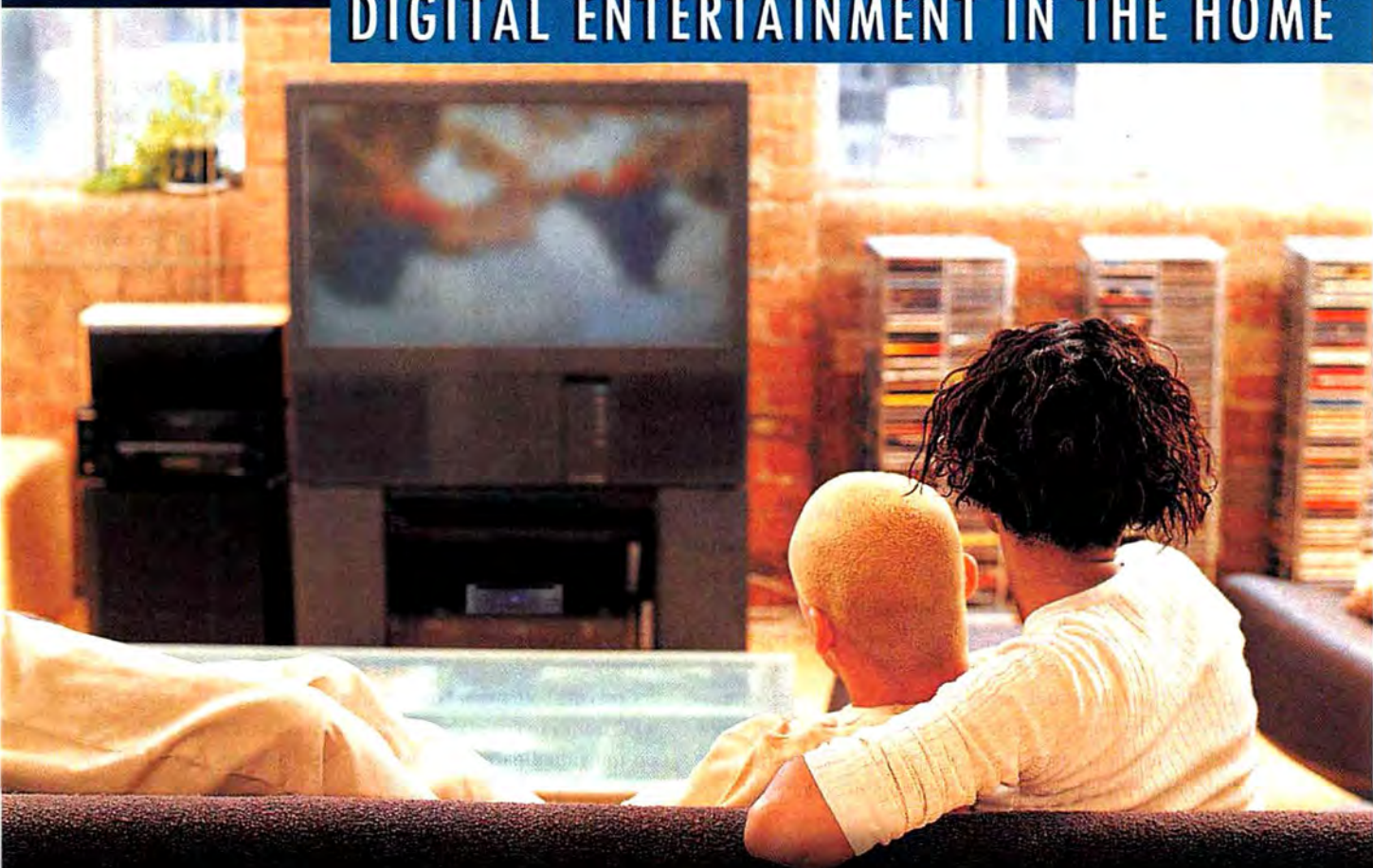
PC sound devices don't qualify). The \$79 Turtle Beach Audio Advantage Roadie (find.pcworld.com/54562) is a USB audio card the size of a playing card that can drive up to 7.1-channel surround-sound speakers. It also supplies digital connectors to use with a home theater system.

➤ **GET SURROUND SOUND** (almost) without antagonizing others. If you want surround sound but some people you share your life with don't, LTB's USB M headphones (find.pcworld.com/54564) will help you coexist: The six speakers built into the \$79 headphones don't work as well as a true surround-sound speaker set, but they won't have people banging on the walls, either. And since they plug straight into a USB port, they act as their own sound card. An included microphone allows you to use the headphones to make VoIP phone calls.

—Richard Baguley

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Upgrade, Build, or Buy?

THE QUESTION IS almost as old as the original IBM PC: Should you upgrade an aging computer or get a new one? And for the willing and able, there's a follow-up: Are you better off buying a ready-made PC or building your own custom machine?

Consider these four queries: Is the cost of the upgrade reasonable? How long will the upgrade take? Do you have the technical expertise to perform the required work? And will your tinkering yield a fair payoff in increased performance? Upgrading a single component is usually a lot quicker and cheaper than buying a new PC, setting it up on your network, moving all your data, and reinstalling and reconfiguring all of your programs. But if you're looking at a complete overhaul—with, say, a new processor, memory, graphics card, and hard drive—the time and money you'll invest might be better spent on a new PC.

TARGET YOUR UPGRADE

IF YOU JUST want to improve an aging PC's performance, a well-targeted upgrade can go a long way toward extending its life. The difference between too little RAM and enough RAM is like night and day, and adding memory is often the cheapest and easiest upgrade option. A new graphics card can make your games purr (and may be necessary for playing the latest and greatest titles). And if you have enough memory—and a compatible motherboard—a new CPU can provide a welcome boost, for a lot less than you'd spend on a brand-new PC.

But a component upgrade will take you only so far. Ultimately, you're limited by performance constraints on the motherboard, such as bus speeds. And as noted previously, your motherboard's chip set, sockets, and interfaces limit the type of upgrade you can make and the availability of new parts. Socket 478 CPUs, like the one on our older test computer, are rapidly becoming scarce. And AGP graphics cards are a dying breed, though you can still find some good ones.

Here's a rule of thumb for the average PC: If you're thinking of replacing three parts that have a combined cost of \$400 or more, put the money toward a new system instead. To help you make more-specific decisions, we've assembled a chart listing the cost and performance of the upgrades we made to our two-year-old test system versus the cost and performance of a new PC (see the chart at right). Just keep in mind that the scores reported reflect general performance, rather than the specific type of upgrade you might need (like a graphics board for games).



● BUYING A PC?

Velocity's Micro Vector GX packs in Core 2 Duo performance for a reasonable price.

If upgrading doesn't seem worth it, the critical decision to make in selecting a new PC involves the motherboard. One approach is to decide on the CPU and the memory type you want, and then pick a matching motherboard (Intel's Core 2 Duo wouldn't be a bad choice right now). The motherboard should be the latest model from a name manufacturer like Asus, Gigabyte, or MSI, with a name chip set such as ATI, Intel, nVidia, SiS, or Via. Make sure it supports any technology you may want to use now or down the road, like RAID for your hard drives or SLI for graphics.

Equipped with this information, you're ready to tackle the question of whether to build or buy your next computer. Cost is an important factor to consider, as is time. But the decision ultimately comes down to whether you like to tinker.

Cost cuts both ways. You can shop around and get a bargain on a PC from a major manufacturer, but you can also get good deals on individual parts. The debate rages back and forth as to ►

CUMULATIVE RESULTS

ADD-ONS MAKE A DIFFERENCE

TO GAUGE THE value of an upgrade, we compare the running cost and performance boost of three consecutive upgrades against the cost of a brand-new PC.

SYSTEM UPGRADE	WorldBench 5 Faster	Cost
BASE SYSTEM • 2.6-GHz Pentium 4 • 512MB DDR-400 RAM • VisionTek Xtasy ATI 9600	75	n/a
CPU • 3.2-GHz Pentium 4 EE	88	\$300
CPU + RAM • 1024MB of DDR SDRAM	91	\$360
CPU + RAM + GRAPHICS • Sapphire ATI Radeon x1600 Pro	91	\$460
NEW SYSTEM	WorldBench 5 Faster	Cost
Velocity Micro Vector GX ¹	117	\$1100
eMachines T6532 ²	91	\$870

TEST CENTER CHART NOTES: ¹ 2.13-GHz Core 2 Duo E6300 CPU, 1GB of DDR2-800 RAM, eVGA GeForce 7600GS graphics board. ² 2.2-GHz Athlon 64 3500+ CPU, 1GB of DDR-400 RAM, integrated nVidia GeForce 6100 graphics. Tests conducted by PC World Test Center. For details on how we test, go to find.pcworld.com/52482. All rights reserved.

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● **BUILD YOUR own and you can choose your case, like the quiet P180 from Antec.**

port, and you won't be able to buy an extended warranty.

But what do you do if you want the benefits of build-your-own customization, and yet don't feel qualified (or don't have the time) to build your own PC? Simple: You cheat, and let someone else do the work.

With your motherboard and CPU type chosen, head to a PC site like Cyberpowerpc.com, lbuypower.com, or Polywell.com. Each of these sell-

whether you'll obtain more computing power for the money in a ready-made or a custom-built. But in the end, a difference of \$100 either way is less important than whether getting exactly the PC you want justifies the extra time and effort you'll invest.

If it does, and you already know or are willing to learn how to build your own PC, the payoff can more than match the time expenditure. The perfect (for you) case alone can make a big difference in how much you'll enjoy your new computer, and everything inside will be exactly what you want. You can tailor your PC to be a hot-rod gaming box or a high-capacity family media center PC. And you can load Windows without all those obnoxious free offers and desktop icons. Of course, you'll also forfeit the right to call one number for all your technical sup-

ers lets you select the various components of a system that the company will then build for you. Bounce between a few sites to see which ones offer the component choices you want and also to compare prices. Then pay online and wait for delivery.

You might not be able to specify all the custom parts you want, and you'll pay more than you would if you bought all the parts at optimum price and did the assembly yourself. But to get most of the benefits of build-your-own with the just-give-it-to-me advantages of buying a ready-built model, this is the way to go. ■

Robert Luhn is an El Cerrito, California-based technology and science writer who enjoys uninstalling Windows. Richard Baguley is a freelance writer based in Vallejo, California.

STEP-BY-STEP

HOW TO INSTALL A NEW POWER SUPPLY

AS YOU ADD BEEFY graphics boards and other energy-hungry upgrades, you can easily bring your stock power supply to its knees. If that happens, say hello to system crashes, the dreaded Blue Screen of Death, and sluggish performance in general.

To figure out whether your power supply can keep up with your planned upgrade, check out Outervision Extreme's excellent power calculator (find.pcworld.com/54867). If you need more juice, take heart: Swapping in a new power supply is easier than you might think.

The majority of today's PCs use standard ATX power supplies. The important thing is to match the design you currently have. The online supply selector at find.pcworld.com/54868 shows diagrams of different power-supply designs

as you work through it, so you'll know what to buy.

When you've nailed that, shop for a supply that tops the suggested wattage by 50 or 100 watts so you'll have some room for future upgrades. Then, to install the power supply, follow these steps:

- [1] DISCONNECT the main AC power cord.
- [2] OPEN YOUR CASE, and disconnect all of the power connectors. Trace all of the cables coming from the power supply to confirm that you haven't missed any.
- [3] UNSCREW THE OLD power supply (see picture), slide it out, slide in the new supply, and screw it in.



- TO REMOVE your old power supply, unscrew just the outside screws connecting it to the case (step 3).

- [4] REATTACH the power connectors.
- [5] CHECK THE VOLTAGE switch on the back of the power supply. It should be set to 110/115v.
- [6] RECONNECT the power cord, and you're juiced!

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The Truth About Superfast Wi-Fi

BY BECKY WARING
TESTING BY ELLIOTT KIRSCHLING

New wireless networking equipment **promises** big speed and coverage improvements. But our lab tests show that the new products have **drawbacks**—and that older ones are still the best performers.

“TWELVE TIMES THE SPEED!” “Four times the range!” “Faster than wired!” Like barkers at a carnival, home-network equipment vendors are touting the revolutionary performance of the latest and greatest Wi-Fi standard, 802.11n. And yes, its promise is great: 802.11n networks should enable superior range and data speeds of up to 270 megabits per ►



second (and eventually 600 mbps). Although (as with previous Wi-Fi standards) real-world performance won't be nearly as fast, 802.11n products should deliver more than enough throughput and range to support high-quality video streaming and Voice-over-IP phone service, graphics-intensive online games, and other bandwidth-hogging goodies throughout a typical home. We can hardly wait to buy the gear. Problem is, that's not what the vendors are selling.

Instead of products based on a final standard—which should appear by early 2008 and will be Wi-Fi Alliance-certified for interoperability—what we have now is a flood of “draft” 802.11n products based on a preliminary and incomplete version of the standard. These products might be—but are not guaranteed to be—firmware upgradable to the final spec.

ERRATIC PERFORMERS

WE WOULDN'T COMPLAIN if the products worked as advertised. But in our tests, four draft-n router and PC Card lines—Belkin's N1, Buffalo's AirStation Nfiniti, Linksys's Wireless-N, and Net-



ASUS 240
MIMO router:
Fast, few frills.

gear's RangeMax Next—were generally outperformed by two older product lines (Netgear's RangeMax 240 and Asus's 240 Wireless MIMO) based on nonstandard technology from Airgo Networks (see find.pcworld.com/53514).

We also found that routers based on different draft-n chips (the Belkin uses Atheros chips, while the other three are

Draft-n: An early and incomplete Wi-Fi standard.

based on Broadcom chips) do not interoperate at high speed. Buying products from the same vendor doesn't always ensure that all of them will use the same draft-n chips, either: At least one company, Netgear, is selling similarly named routers and PC Cards that are based on different draft-n chips, and you can determine which chip a product uses only by checking its model number and/or the chip logo on its packaging (see “Draft-N Product Look-Alikes” on page 130).

Finally, we found that at long range especially (in our tests, about 60 feet, from a router in a suburban home office to a notebook located in the backyard), the draft-n products were generally erratic

in coverage and performance—particularly the Atheros-based Belkin line. (Atheros attributes the irregular performance results to its implementation of technology that is designed to prevent interference with neighboring Wi-Fi networks.)

On the other hand, the two older product lines, both based on Airgo's True MIMO

Gen3 chips, have a couple of significant drawbacks: They will never be upgradable to the final 802.11n standard, and will interoperate with 802.11n (draft or final) products only at poky 802.11g (54-mbps theoretical maximum) speeds.

Vendors are aggressively addressing draft-n performance problems, bugs, and compatibility issues with frequent firm-

ware updates (even as we tested, we were receiving updates to shipping devices). In fact, we plan to revisit one draft-n product—D-Link's shipping Atheros-based RangeBooster 650 line—on our Web site (see find.pcworld.com/54924), by the time you read this, to see if updates improve performance. (We dropped the product from this review because it could not complete our tests.) But we'd rather vendors didn't use paying customers to do their alpha and beta testing. You shouldn't have to install multiple firmware updates to see promised performance on a brand-new product.

Faced with a choice between work-in-progress draft-n products on one hand and products that perform better but use proprietary technology that can never be upgraded to 802.11n on the other, we chose not to name a PC World Best Buy.

We did, however, assign each product our usual PC World Rating based on our lab tests of performance and other key features (see chart, page 120). We particularly looked for QoS (quality of service) and UPnP (Universal Plug and Play), two technologies essential to running the coming wireless video and entertainment applications that are among the main reasons to buy a high-speed router.

FEATURES TO LOOK FOR

QOS HELPS ENSURE smooth streaming media and VoIP calls by prioritizing multimedia packets on the network. All but the Netgear lines had this feature when we tested, and Netgear planned to add it via firmware updates. (Note that QoS support must be present in both your router and your adapters to work.) ▶



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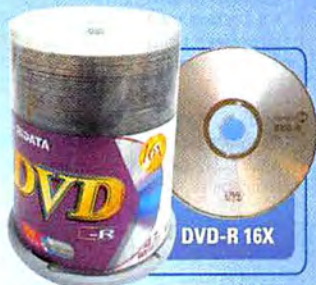
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UPnP enables automatic peer-to-peer connectivity of networked computers, hard drives, game consoles, streaming-media players, and even kitchen appliances, so that they can recognize one another and share data intelligently. We were pleased to see that all the tested routers had this capability.

Note, however, that in calculating the PCW Ratings we did not give draft-n products extra points for upgradability potential, since without vendor guarantees the value is uncertain at best.

Indeed, our bottom-line advice is to hold out for certified 802.11n products (turn to "What's Ahead for 802.11n" on

page 122 for more on the standard's progress), unless you just can't wait to get the added bandwidth for entertainment applications and large file transfers.

WAIT IF YOU CAN

REMEMBER THAT UNLESS you upgrade all your adapters to match, you won't see the true benefits of any of these high-speed network technologies; this requirement adds nearly \$100 per device to your investment in potentially nonstandard equipment. Just upgrading one adapter doesn't work well, since using older 802.11b/g devices at the same time can seriously affect router performance.

Also, older adapters are unlikely to support WPA2 encryption, which is needed to get the maximum out of draft-n. Finally, consider that for now new adapters are primarily for notebooks—only a few vendors also offer desktop cards, and most consumer electronics vendors are expected to hold off on products with fast Wi-Fi support until 802.11n is ratified.

If you must have added range now, consider the Netgear RangeMax 240, which earned the top rating in this group for its combination of performance, design, and features. If you're willing to take a performance hit in order to gamble on upgradability to the eventual stan- ▶

FEATURES COMPARISON

TEST Center Older, Proprietary MIMO Gear Outpaces Draft-N Lines

BUT PRODUCTS BASED on fast Airgo Networks technology will never be upgradable to 802.11n, so we named no Best Buy.

WIRELESS ROUTER AND ADAPTER	PCW Rating	Wireless chip type	Features score and supported security	Performance rating and average throughput (mbps)	Bottom line
Asus 240 MIMO Wireless Router (WL-566gM) \$120 PC Card (WL-106gM) \$89 find.pcworld.com/54889	88 Very Good	Airgo True MIMO Gen3	• Good • 128-bit WEP and WPA/WPA2 Personal encryption with Radius support	• Superior • Medium range: 68 • Long range: 28	The Asus offers top-rated performance and nice design at a great price, but is hampered by setup and encryption problems and subpar documentation.
Belkin N1 Wireless Router (F5D8231-4) \$120 PC Card (F5D8011) \$100 find.pcworld.com/54890	73 Good	Atheros XSpan (draft-n)	• Very Good • 128-bit WEP and WPA/WPA2 Personal and Enterprise encryption with Radius support	• Fair • Medium range: 43 • Long range: 13	This router is far and away the best in design and ease of use, and it has excellent features. But it stumbled badly in our long- and midrange performance tests.
Buffalo AirStation Nfiniti Wireless-N Router/Access Point (WZR-G300N) \$149 PC Card (WLI-CB-G300N) \$119 find.pcworld.com/53544	65 Fair	Broadcom Intensi-fi (draft-n)	• Fair • 128-bit WEP and WPA Personal encryption	• Fair • Medium range: 55 • Long range: 10	The Buffalo matched the mediocre test performance of other draft-n routers. It also lacks important features such as WPA2 encryption and DDNS support.
Linksys Wireless-N Broadband Router (WRT300N) \$150 PC Card (WPC300N) \$120 find.pcworld.com/53546	71 Good	Broadcom Intensi-fi (draft-n)	• Very Good • 128-bit WEP and WPA/WPA2 Personal and Enterprise encryption with Radius support	• Fair • Medium range: 50 • Long range: 8	This draft-n router has the best features of the bunch, plus excellent documentation and setup. Its test performance, however, did not live up to its billing.
Netgear RangeMax 240 Wireless Router (WPNT834) \$119 PC Card (WPNT511) \$100 find.pcworld.com/54888	89 Very Good	Airgo True MIMO Gen3	• Good • 128-bit WEP and WPA/WPA2 Personal encryption	• Superior • Medium range: 70 • Long range: 32	The Netgear 240 is a great router, with excellent performance and very good features, usability, and design. But its Airgo technology will never be upgradable to the 802.11n standard.
Netgear RangeMax Next Wireless Router (WNR834B) \$129 PC Card (WN511B) \$120 find.pcworld.com/53548	77 Good	Broadcom Intensi-fi (draft-n)	• Good • 128-bit WEP and WPA/WPA2 Personal encryption	• Good • Medium range: 60 • Long range: 9	If you want to buy a draft-n router now, the RangeMax Next is the best choice, with very good features, setup, and ease of use, plus reasonable performance.

HOW WE TEST: We tested all routers with their corresponding client cards by running a script containing a series of uploads and downloads of a 106MB file using the Windows FTP client. All tests were run multiple times over several days in a suburban home. In the medium-range tests, the router was in a home office while the client was two rooms away. In the long-range tests, the router remained in the office while the client was set up in the backyard, about 60 feet away. For details, see find.pcworld.com/54925.

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dard, look at Netgear's draft-n-compliant RangeMax Next line, the only one in our tests that could approach the range of the Airgo-based products.

Though the Belkin N1 Wireless and Linksys Wireless-N routers had top-rated features, design, and usability, they fal-

tered in performance. The Buffalo AirStation Nfiniti line performed similarly to the Belkin and Linksys products, but it suffered some serious flaws, such as a lack of strong WPA2 encryption—a must-have for this class of router.

Another option—if you are on a strict

budget and are primarily concerned with improved range (as opposed to top speed)—is to invest in even older and cheaper Airgo-based gear, such as Belkin's Wireless G-Plus MIMO router (find.pcworld.com/54884). This unit's range is nearly as good, and its price is much lower. ►

TECHNOLOGY

What's Ahead for 802.11n

GIVEN THE RELATIVELY mediocre performance and the interoperability problems we found with draft-n products, it's worth asking why vendors have rushed them to market. Two wireless companies that have chosen to stay out of the draft-n fray (at least for now)—Wi-Fi chip maker Airgo Networks and network equipment vendor USRobotics—say they don't want to ship products that may not be upgradable to the final standard, a guarantee none of the current crop can make. Instead, Airgo says it will have chips ready for 802.11n compliance testing as soon as the specification is ratified.

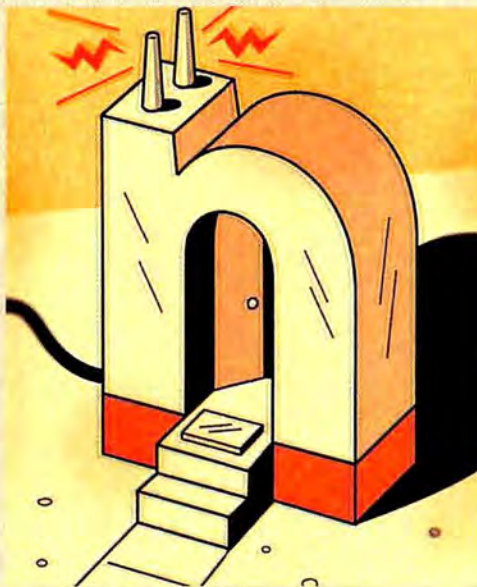
The rest of the wireless universe, however, doesn't seem to be waiting—and customers aren't either. "Our Wireless-N family offers customers technology they can immediately take advantage of to get the most out of their networks," Linksys said in a statement, noting that in June its Wireless-N router came in third on the best-seller list for all home networking products.

DRAFT-N TIMETABLE: PRODUCTS IN 2007?

MEANWHILE, THE STANDARDS process is moving, albeit slowly. Voting is set for January on Draft 2.0 of 802.11n, which could possibly be ratified as final—but most observers expect a third draft to appear later in 2007, followed by ratification and certified products by the end of the year or early 2008.

While 802.11n will include a host of enhancements to the current 802.11g standard, the most notable are theoretical data

speeds that will range from 270 to 600 mbps, depending on the device (PDAs, for example, are likely to stick to lower rates to conserve power consumption). The zippy data rates, like those of the non-draft-n routers in our review, are made possible by MIMO (multiple-input, multiple-output) antenna technology that Airgo Networks pioneered a couple of years ago. That's why you typically see three antennas poking up from these routers.



High speed Wi-Fi also uses channel bonding, which combines two side-by-side 20-MHz Wi-Fi channels into one wide 40-MHz pipe. Channel bonding, however, can blast out neighboring 802.11b or g networks since it takes over virtually the entire 2.4-GHz spectrum that these products use. Clear Channel Assessment (CCA) technology to protect nearby networks is included in the first 802.11n draft, but it's not clear whether CCA will be mandatory.

A fix for spectrum overcrowding is available, thanks to 802.11n's support for both the 2.4-GHz and 5-GHz frequencies. Most experts expect the broader 5-GHz band (currently used by 802.11a) to

emerge as the unimpeded fast lane for high-bandwidth applications. And by next year most vendors will likely introduce dual-band routers, although some of them may not simultaneously support 5-GHz and 2.4-GHz devices.

Networks based on 802.11n will also slow down if one or more clients use older WEP or WPA security. Only WPA2 encryption (which began appearing in the last year or so) supports certain performance-enhancing techniques specified in the standard. Netgear says to expect about a 5 percent performance drop with WPA and an even bigger hit with WEP—issues that will persist until you retire all legacy devices lacking WPA2 support.

Expect to see several draft-n gigabit ethernet routers for customers who also want faster wired networks. Netgear already sells the RangeMax Next Gigabit Edition, and Linksys should ship a gigabit draft-n router by the time you read this.

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Asus 240 MIMO Wireless Router (WL-566gM)

THE ASUS 240 MIMO is based on the same Airgo Gen3 chip set as the Netgear RangeMax 240 (with which it shared top performance honors), but otherwise it's quite different. Some of its features are better, such as a three-year warranty, support for authentication by a Radius server (an important feature for many enterprise customers), and a tool for wireless-encryption setup. In other respects the Asus suffers by comparison.

For example, its installation is essentially a manual affair, with no PC-based setup wizard or automatic settings detection. The quick-start guide's pictures are too small to decipher, and the Web-based quick-setup mode doesn't explain any of the required choices; we had to refer back to the printed quick-start guide for help.

Our chief complaint, however, has to do with the router's main configuration

precaution—and, for WEP, the resulting hexadecimal key. But because you aren't asked to enter the passphrase in a confirmation window, you can't know for sure whether you've input a long passphrase correctly. Even worse, we couldn't find any way to retrieve the current key information from within the router, a common task. The Asus does have an encryption setup utility, eliminating the need to enter codes on the client side, but it works only with Asus adapter cards.

We also had problems with this product's client card and connection utility. While equipment based on Airgo Networks' True MIMO Gen3 technology is supposed to be interoperable, the Asus card would not connect to the Netgear RangeMax 240 router with WPA2 encryption.

The utility showed the encryption for the connection as WEP, and wouldn't let us specify WPA2. The same thing happened when we tried to use Windows to set up wireless encryption on the Asus card, and we had no way to resolve the issue without changing to the less secure WPA on the Netgear router (Asus says that its latest drivers, released as we neared press time, correct the problem). Another concern was that both the Asus and Netgear adapters connected to the Asus router only with WPA, even though we set the router to use WPA-PSK/WPA2-PSK (it does not have WPA-PSK-only or WPA2-PSK-only modes); we would have preferred to use the stronger WPA2-PSK scheme.

We liked the nicely designed white plastic Asus case, with its band of indicator lights on the front edge. It's superficially like the Netgear RangeMax 240's, but bigger and heavier, and it has taller and beefier antennas that might account for its performance edge. The case also includes wall-mount holes. However, the Asus model's great price and performance do not completely com-

pensate for its usability issues, and inexperienced users especially will be better served by the Netgear RangeMax 240.

Belkin N1 Wireless Router (F5D8231-4)

IN ALMOST EVERY measure besides performance, where it unfortunately hangs around the rear of the bunch, the Belkin N1 is the star of this review. It is head and



shoulders above the rest of the products in design and usability, with Apple-like attention to detail in the packaging, manuals, interface, and help files. It also has top-notch features, a lifetime warranty, and excellent support.

On opening the Belkin box, the first thing you see is a large card completely illustrating all the physical connection possibilities and detailing the order in which they should be made. Cables are numbered to match the card. The setup CD worked flawlessly, detecting our DSL modem settings correctly and automatically connecting us to the Internet. It then directed us to the Web utility to set up wireless encryption.

The N1's 103-page PDF manual was the longest and most comprehensive in the bunch. Every setting option was clearly explained, along with its implications.

As for features, the N1 is one of only two routers in the group to support WPA/WPA2 Enterprise encryption and Radius server authentication for use in office and educational environments. It also has a full complement of router capabilities, including QoS support. ▶



screen. Context-sensitive help comes solely in the form of roll-over pop-ups, which makes quick comparisons of options difficult. Also, when you type in an encryption passphrase, you see a series of asterisks—a common security

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But while the N1's speed at close range is several times that of an 802.11g router, its overall performance simply wasn't as good as that of the other products in this group (especially the Airgo-based lines). Performance in our long-range tests was particularly erratic, even compared with that of the Broadcom-based draft-n lines.

Buffalo AirStation Nfiniti Wireless-N Router and Access Point (WZR-G300N)

THE BUFFALO AIRSTATION Nfiniti has some unique features, such as an external switch that toggles between router and access-point modes; Buffalo's AOSS one-touch encryption setup for easy Buf-

falo client-card connections; and an upright-oriented antenna cluster. But it also lacks important specs we've come to expect in a high-end router, such as WPA2 encryption support (though Buffalo said it planned to make this available via a firmware update that it expected to post by the time you read this). ►

WIRED OPTION

Power-Line Networking: A Brewing Standards War

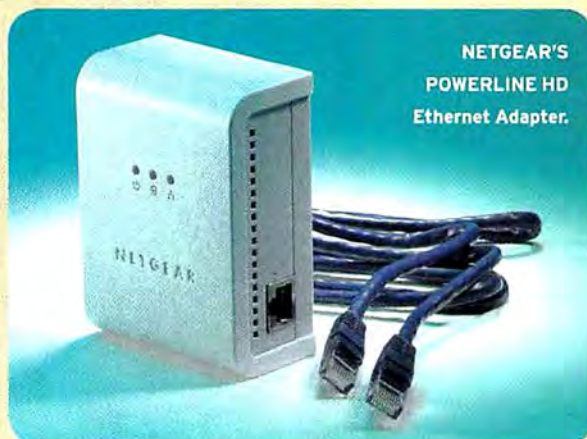
WIRELESS ISN'T THE only networking technology that's speeding up. The power-line networking industry is also stepping up to the plate with ethernet adapters that use your home's electrical circuits to send data at up to 200 megabits per second, much faster than the 25 to 30 mbps required for streaming high-def video. And while draft-n Wi-Fi adapters are so far available only for notebooks and desktop PCs, you can use power-line products with any PC or consumer electronics device with an ethernet port.

Netgear, for example, recently introduced its Powerline HD Ethernet Adapters (\$250 for a kit with two, or \$130 sold separately), small boxes with plugs that connect to standard wall outlets and ports for included ethernet cables. I tried them out by plugging one unit into an ethernet port on my router and the other into my desktop computer's ethernet port. This got me on the Internet immediately, and it took only a few seconds more for me to add security (so neighbors on my grid wouldn't be able to hop on my network) by changing the network name through the included desktop software.

ALTERNATIVE 200-MBPS OPTIONS

HOWEVER, THE SAME software indicated that data between the adapters was moving at only 20 to 40 mbps (Netgear says this could be because of the many other devices plugged into power outlets near the adapters). A more important concern: Netgear's product is based on chip maker DS2's technology, which is trying to gain traction as the basis for the Universal Powerline Association's Digital Home Standard. (UPA previously developed technology for the use of utility power lines for broadband services.) But so far, no other vendors have announced Digital Home Standard chips or products.

Netgear's aren't the first high-speed power-line networking



products. Last spring, Panasonic launched adapters similar to Netgear's but based on its own HD-PLC technology. Panasonic says that other consumer electronics companies will be using HD-PLC in products due later this year or in early 2007.

Meanwhile, several companies, led by Intellon, are making chips based on the competing HomePlug AV spec introduced by the HomePlug Powerline Alliance, which developed the 14-mbps HomePlug 1.0 standard that is the basis for today's power-line networking products. (Regrettably, neither Digital Home Standard nor HomePlug AV will interoperate with legacy HomePlug 1.0 products—you need to plug separate adapters into your router for each standard you want to support.)

At least one major vendor—Linksys—has indicated it plans to have HomePlug AV consumer products by year's end. But Netgear notes that so far no specific HomePlug AV gear has been announced for North America. "Netgear doesn't want to wait," Netgear product line manager Kartik Gada says, adding that HomePlug AV products are likely to cost more than DS2 gear.

For the time being, those consumers who wish to use electrical wiring for high-bandwidth networking have a good option in Netgear's product, but also no sure standard in sight.

—Yardena Arar

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In addition, the AirStation is the only router of the group that is missing Dynamic DNS support, which allows cable and DSL customers who don't have fixed IP addresses—the vast majority—to host Web sites or mail servers. Also absent are WPA Enterprise or Radius support, putting the AirStation at the bottom of the features heap in this group.

Designwise, the antenna cluster means you can use the Nfiniti only in an upright position, and you get no wall-mount option. With this model we had the same problem as with the Netgear RangeMax Next, as our many ethernet cables toppled the router (although this happened less frequently with the Buffalo product since it weighs more than the Netgear).

In performance, the Buffalo was in the closely bunched bottom group of draft-n models, which all suffered on our long-range tests. But our biggest issue with the Buffalo was with its Web configura-

tion tool, which was decidedly subpar. Explanations in the pop-up help on each page weren't very helpful, and the poor graphics and confusing division of functions into Basic and Advanced pages just made things difficult to find, even when we knew what we were looking for.



NETGEAR RANGEMAX
240: top performer.

Another annoyance is the wireless-card utility, which cannot distinguish between

Linksys Wireless-N Broadband Router (WRT300N)

encryption types, so you have to know what type of encryption the network is using and select it from the menu before entering your key (unless you use the AOSS system, of course).

THE LINKSYS WIRELESS-N is a very good all-rounder in design and features; like the Belkin N1, it seriously stumbles only in performance, although not as badly. It has QoS, WPA/WPA2 Enterprise encryption, Radius server support, and truly comprehensive routing capabilities, making it our features champ. The installation experience was very good. A CD setup utility led us through the physical connections and then took us to the router's Web-based Smart Wizard for Internet setup. The 90-page PDF manual was nearly as good as Belkin's, but the context-sensitive help within the Web configuration tool was not. It offered no information on the 802.11n features of the router and looked like it was simply copied from another Linksys model. Even a firmware update did not address this shortcoming in the router setup software.

The Linksys has a flat antenna situated in between two pole antennas, a departure from the usual three-pole design. It has no wall-mount bracket, but you can stand the router horizontally or vertically. The case sticks to Linksys's trademark purple and black color scheme, which we wish the company would ditch in favor of more decor-friendly choices like the white, black, and silver of the other routers. On top of the device is a big button that doesn't do anything, but is "reserved" for future use. Maybe one-touch encryption setup? Linksys isn't saying.



LINKSYS WIRELESS-N: TOP features, middling performance.

What about speed and range? As we did for the Belkin and Buffalo draft-n products, we gave the overall performance of the Linksys Wireless-N line a Fair rating due to its poor throughput at long range (60 feet through house walls) and multiple failures to complete file transfers, a symptom of its lesser range. Even at close and midrange distances, the two tested non-draft-n routers did better.

Netgear RangeMax 240 Wireless Router (WPNT834)

NETGEAR'S AIRGO-BASED RangeMax 240 topped our medium-range performance tests and came a close second in the long-range shootout. The RangeMax 240 also sports excellent router features and has the best Web-based configuration tool of the bunch, thanks in no small part to the ever-present and very thorough context-sensitive help.

Installation using the included CD and the Web-based SmartWizard was straightforward and without incident. The process leads you through the cable connections that vendors generally recommend for setup, basic configuration, and then security. We had an equally good experience with the adapter card, as the setup wizard offered to help configure the first connection after installing the drivers and Wireless Assistant connection utility. While the utility could confuse a first-time user, it provides lots of practical information about your connection, such as traffic graphs and statistics.

Designwise, we really like the unit's mod white plastic case with glowing icon indicator lights that let you check the router status from afar. The Range-

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Max 240 also has a label on the bottom detailing the functions of all the ports and lights, as well as the default IP address and log-in information you need for browser-based configuration after a router reset—data we wish all vendors would make so handy.

The one design flaw is the model's lack of wall-mount holes, although you can orient the router horizontally or vertically on a desk or other flat surface.

Other nitpicks concern the product's lack of QoS support (Netgear says it will come soon in a firmware update) and the failure of the router firmware's "check for updates" feature to find a firmware update that was available on Netgear's Web site. (To be fair, no router in this review successfully located and installed firmware updates—we had to get all updates manually from support sites.) Overall, however, the RangeMax 240 has the best combination of performance, features, design, and usability here. Its only major drawback is that it will never be upgradable to the 802.11n standard.

Netgear RangeMax Next Wireless Router (WNR834B)

AMONG THE DRAFT-N routers, only the RangeMax Next, based on Broadcom's Intensi-fi draft-n technology (as opposed

to the newer but identically named WNR834M model based on Marvell's TopDog chip, which we did not test), came close to the Asus and Netgear RangeMax 240 models in short and midrange performance. However, it faltered in our long-range tests, indicating a smaller coverage area than that of its top-rated RangeMax 240 sibling.

In other respects the RangeMax Next is much like the RangeMax 240, offering the same straightforward setup and advanced client-card connection utility, although its cost is a little higher. Only a few settings differ significantly, mostly those having to do with draft-n. For example, the RangeMax Next is the only draft-n router in this group that does not support WEP encryption when in high-speed 40-MHz channel-bonding mode, since that would result in poor performance for draft-n adapters.

The most visible difference between

the RangeMax Next and RangeMax 240 is in case design. The RangeMax Next is a slim upright box with internal antennas,

as opposed to the typical external design. While attractive, it has no wall-mount option, and we found it hard to use in the upright position since our cables kept pulling the lightweight box over. You can place the unit flat, but then the internal antennas will likely not be oriented optimally since, unlike external antennas, they cannot be flipped to accommodate the box orientation.

If you want to purchase a draft-n router now and bet on the product's being upgradable to the final standard, Netgear's RangeMax Next is our top choice, with the only major disadvantage being its long-range performance. ■

Becky Waring is a Berkeley, California-based technology journalist. Yarden Arar is a senior editor for PC World.



SHOPPING TIP

Draft-N Product Look-Alikes

DRAFT-N EQUIPMENT BASED on different chips may not interoperate at full speeds. But it isn't always easy to tell which chips products use—even products with similar names from the same vendor.

Netgear, for example, has two RangeMax Next Wireless Routers, the WNR834B (which we tested for this review) based on Broadcom's Intensi-fi draft-n chips, and the newer WNR834M, which uses

Marvell's TopDog technology (also used in Netgear's RangeMax Next Gigabit Edition router). Similarly, the RangeMax Next Gigabit Edition PC Card (WN511T) employs TopDog chips, but the RangeMax Next PC Card (WN511B) uses Intensi-fi technology.

Netgear says it will ship products based on only one draft-n technology to any given retailer, and product packages include chip logos. The company also says new firmware upgrades fix interoperability issues. But we recommend that buyers stick to same-chip products to be safe.

—Yarden Arar



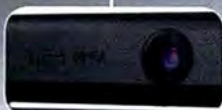
LOGO LOOKOUT: CHECK the logos on Netgear packages for different draft-n chips—the boxes otherwise look alike.

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- One-year limited warranty⁴



Ferrari 5005WLMi

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(LX.FR506.119)

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\$ 1,999

(LX.FR606.041)



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- 5ms response time
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\$229
(ET.1916B.0DF)

Acer AL1916 Fbd

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- Internal power adapter
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2MS RESPONSE TIME



Acer AL1916W Ab
\$195
(ET.1916B.W08)

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5MS RESPONSE TIME



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(EYJ2901.012)

PD726W

NEW MODEL



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\$732

(EYJ3401.006)

PD311

NEW MODEL



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- XGA (1024 x 768) native resolution
- SXGA (1280 x 1024) maximum resolution
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- PC and Mac compatible
- 4.8 lb. (2.2kg)

Acer PD120D Multipurpose Projector

\$809

(EYJ2201.012)

PD120D



- 2000 ANSI lumens
- SVGA (800 x 600) native resolution
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- 2000:1 contrast ratio
- 16.7 million displayable colors
- PC and Mac compatible
- 4.8 lb. (2.2kg)

Acer PD100 Multipurpose Projector

\$669

(EYJ2101.006)

PD100

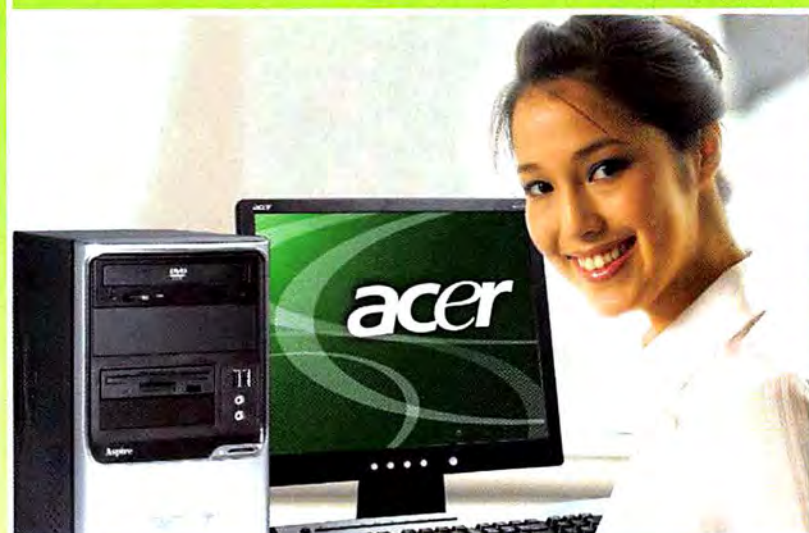


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- 15.4" WXGA (1280 x 800) TFT display, Acer CrystalBrite Technology
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- One-year limited warranty⁴



Acer Aspire 3102WLMi

\$599

Mobile AMD Sempron™ Processor 3200+
Genuine Windows® XP Home Edition
(LX.ABK05.071)

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¹ Depends on availability of PC-supported connections and location.

² Enhanced Virus Protection (EVP) is enabled by Microsoft® Windows® XP Service Pack 2. By default, EVP will protect the user's Windows operating system only. Users must enable the protection of their applications and associated files to be protected from memory buffer overrun attacks. AMD and Microsoft strongly recommend that users use third-party anti-virus software as part of their security strategy.

³ When referring to storage capacity, GB stands for one billion bytes and MB stands for one million bytes. Some utilities may indicate varying storage capacities. Total user-accessible capacity may vary depending on operating environments.

⁴ For a free copy of the standard limited warranty end-users should see a reseller where Acer products are sold or write to Acer America Corporation, Warranty Department, P.O. Box 6137, Temple, TX 76503.

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The Best Broadband in America

BY JEFF BERTOLUCCI

Both cable and DSL connections are getting faster and cheaper, but new services such as fiber optics and wireless are giving them a run for their money. To find out how your ISP rates, see what our readers say about their providers.

SOARING BANDWIDTHS, LOWER prices, innovative applications: Good broadband Internet service has become cheap and ubiquitous, and it's only going to get better. Within a few years, today's "high-speed" service will seem as slow as yesterday's 9600-bps modems. Some cable providers already

offer 30-megabits-per-second connections, and with the advent of high-speed fiber-optic connections to the home, 100 mbps may not be far off.

Which raises the question: What will you do with all that bandwidth? Certainly, e-mail and Web browsing work just fine via today's broadband, ►

but burgeoning consumer services—including high-definition television programming, on-demand video, VoIP telephone service, online gaming, video-conferencing, and online file backup—benefit from a wider pipe. According to industry experts, in the next five years cable and DSL (Digital Subscriber Line) will continue to dominate Internet access to the home, with lower-cost DSL ultimately taking the lead, though they'll both be challenged by fiber optics and wireless. Antiquated dial-up service will

fade away. Other broadband technologies, including satellite, power-line, and cellular, will remain minor players, though a few will find a niche market.

In addition to exploring the future of connection technologies, we examined today's broadband and dial-up offerings. We surveyed more than 9300 *PC World* readers and PCWorld.com site visitors to find out which providers offer the best performance, features, customer service, and overall satisfaction. (For complete survey results, see the chart below.)

SURVEY'S KEY FINDINGS

- Fiber-optic Internet service is a runaway hit. Respondents who have it—a relatively small group—reported they are very satisfied with the service.
- Cablevision Systems, which serves more than 3 million customers in the New York metropolitan area, was the overall reader favorite, earning top marks on nearly every measure. EarthLink and BellSouth rated best for DSL service, but still just average.

ISPs

Cable, Fiber-Optic Providers Give the Best Internet Service

OUR SURVEY OF more than 9000 *PC World* subscribers and site visitors shows that cable Internet giants Cablevision, Time Warner, and Cox are impressing customers. Fiber-optic service is a winner, too. But dial-up users are an unhappy lot as a whole.

ISP	Service type	Overall satisfaction	Connection reliability	Customer service	Technical support	Download speed	Upload speed	Entertainment features
Cablevision	Cable	Above average	Above average	Above average	Above average	Above average	Above average	Above average
Verizon FIOS	Fiber	Above average	Above average	Above average	Above average	Above average	Above average	Average
Time Warner	Cable	Above average	Above average	Average	Average	Above average	Above average	Average
Cox	Cable	Average	Average	Average	Average	Above average	Above average	Average
EarthLink	Cable	Above average	Average	Average	Average	Above average	Above average	Below average
EarthLink	DSL	Average	Average	Average	Average	Average	Average	Average
Insight	Cable	Average	Average	Average	Average	Average	Average	Average
BellSouth	DSL	Average	Average	Average	Average	Average	Average	Below average
Comcast	Cable	Average	Below average	Below average	Below average	Above average	Above average	Average
Adelphia	Cable	Below average	Below average	Average	Average	Average	Average	Average
AOL	DSL	Average	Below average	Below average	Below average	Average	Average	Above average
Qwest	DSL	Average	Average	Average	Average	Below average	Below average	Average
AT&T Yahoo	DSL	Average	Average	Below average	Below average	Below average	Below average	Above average
EarthLink	Dial-up	Below average	Average	Average	Average	Below average	Below average	Average
AOL	Cable	Below average	Below average	Below average	Below average	Average	Average	Average
MSN	Dial-up	Below average	Below average	Insufficient data	Insufficient data	Below average	Below average	Average
Verizon	DSL	Below average	Above average	Below average	Below average	Below average	Below average	Average
Charter	Cable	Below average	Below average	Below average	Below average	Average	Average	Below average
PeoplePC	Dial-up	Below average	Average	Below average	Insufficient data	Below average	Below average	Below average
AOL	Dial-up	Below average	Below average	Below average	Below average	Below average	Below average	Average
AT&T Worldnet	Dial-up	Below average	Below average	Below average	Below average	Below average	Below average	Average
NetZero	Dial-up	Below average	Below average	Below average	Insufficient data	Below average	Below average	Below average

CHART NOTES: Services are ranked by the total number of positive and negative ratings, and in case of a tie, alphabetically. Source: Survey of 9321 *PC World* readers and PCWorld.com visitors from June 7 to June 30, 2006.

- When asked about specific features of their ISP, respondents said they were least pleased with providers' ability to block spam; they also scored customer service and tech support poorly.

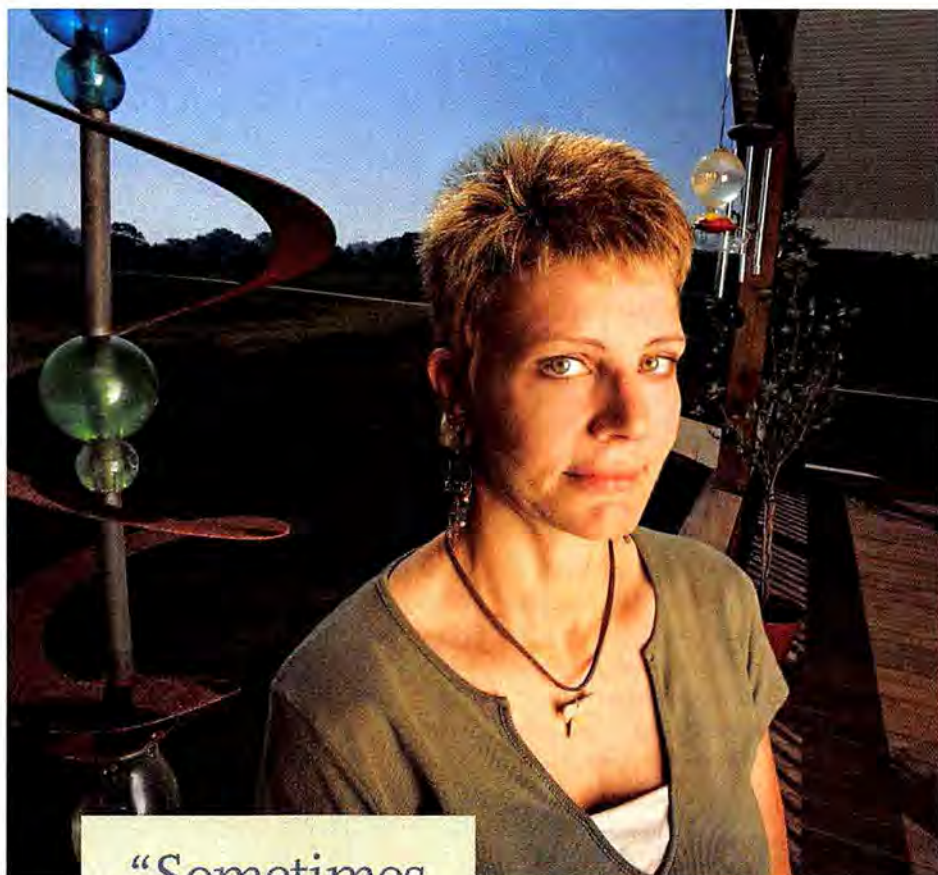
- Verizon and Charter rated worst among broadband providers—ironic, as Verizon scored well for its fiber-optic service. Dial-up providers fared worst, though.

The technology behind each service is the biggest factor affecting customer satisfaction. So we've organized the latest data, with results from our survey, into sections on each of the most common connection methods.

CABLE: BIGGER PIPES

FOR MOST U.S. homes, the cable modem is the primary means of Internet access. However, its dominance will fade in coming years, say industry analysts. Currently more than 28 million U.S. households access the Net via cable, a number expected to climb to 37 million by 2011. By comparison, DSL, which currently serves about 22 million U.S. homes, will have nearly 39 million subscribers within five years, according to JupiterResearch.

Cable's advantage today is its wide pipe. Downstream speeds (the rate of data traveling from the Internet to a local computer) of 6 megabits per second are commonplace, and many cable providers offer even faster connections. Top-ranked Cablevision, for instance, supplies downstream speeds of 15 or 30 mbps. This superfast link appeals to Bob Murdoch, a flooring salesperson in Brielle, New Jersey, who pays \$65 per month for Cablevision's Optimum Online Boost service, which costs \$10 to \$15 more than basic service. "They're blowing everybody's doors away with the speed and quality. I don't think I've had an outage in a year," says Murdoch, who reports getting 26 to 30 mbps downstream and 1.5 mbps upstream. In contrast, Murdoch's DSL connection at work tops out at 3 mbps



"Sometimes
you can
connect,
sometimes
you can't."

—Ralf Cross, a BellSouth DSL user in
Charleston, Tennessee

downstream, roughly the average speed reported by DSL users in our survey.

Cablevision's megaspeedy service is more the exception than the rule. "You're not going to see anywhere near 15 mbps for 50 percent of U.S. households over the next five years," predicts Matt Davis, director of Consumer Multiplay Services for research firm IDC. "We're still struggling to get to a megabit [per second] in a lot of households in the U.S."

But other cable providers are boosting bandwidth. Comcast, the nation's leading cable ISP with more than 9 million broadband customers, recently intro-

duced PowerBoost, a service that automatically doubles its users' bandwidth—from 6 to 12 mbps, or from 8 to 16 mbps—when necessary, for no extra charge. For most of the day, when the cable network isn't operating at peak capacity, the provider "uncaps" the user's modem via software commands, according to Comcast. The result is additional speed for downloading videos, games, and other hefty files.

"You'll get a boost of speed when downloading a large file or anything that would tax the capacity of a good connection," says Mitch Bowling, general manager of Comcast's online division. Bowling adds that Comcast may eventually offer a 30-mbps connection (at extra cost), but notes that extreme speeds may be overkill for the infrequent user. Our survey respondents already rate Comcast's speed highly—much higher than they rate the company on most other measures.

Cable's weakness? It's relatively expensive. For example, Comcast charges, on average, \$43 a month for its 6-mbps service. DSL is often much cheaper. ►

PC WORLD SURVEY

AT&T Yahoo charges new subscribers as little as \$13 a month for one year of DSL, albeit with downstream speeds that max out at 1.5 mbps. You must sign up for local phone service to get the killer DSL deal, too. (For a month-to-month contract, AT&T Yahoo charges \$35 per month.)

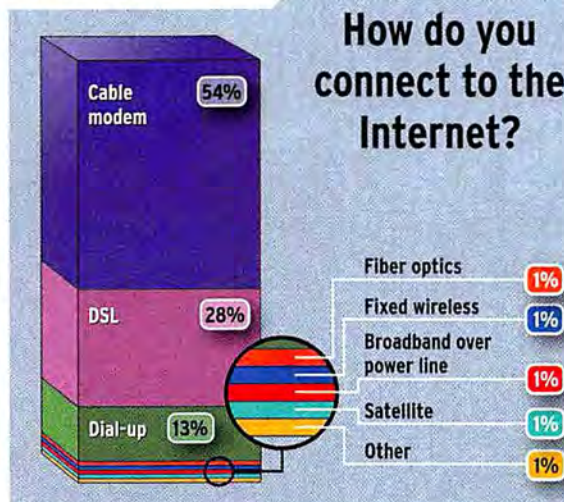
But don't expect to see a price war between cable and DSL. Introductory offers aside, "the deals may get a little bit worse if all you want from a provider is Internet access," says Joseph Laszlo, JupiterResearch senior broadband analyst. Rather, the good deals for customers will come in the form of bundled services.

Most cable and telephone companies offer bundles of two or more services.

Comcast's Triple Play bundle, for instance, delivers phone, Internet, and digital TV service for \$99 a month for the first year (but then the cost increases to \$118 to \$143, depending on the area).

Nearly 70 percent of the people who responded to our survey said that they

How do you connect to the Internet?



purchase one or more other services from their ISP. And according to IDC, the number of U.S. customers buying bundles will nearly double from 43 million last year to more than 85 million in 2010.

DSL: BROADBAND BARGAIN

DSL SERVICE IS slower than cable on average, with home users typically getting downstream speeds that max out at

6 mbps—about where cable begins. Dirt-cheap prices, however, make DSL an ever more popular choice.

With DSL often costing as little as—or even less than—dial-up, will prices continue to drop? No. "They're pretty much at the threshold of what's doable from ▶

TECHNOLOGIES

Cable and Fiber Optics Are Fastest; DSL and Dial-Up Are Cheapest

INTERNET SERVICE PROVIDERS are boosting download speeds, but not all of our survey respondents are taking advantage of them, either because faster speeds aren't yet available in their areas, or because they aren't willing to pay a premium for them.

CONNECTION TYPE	Download speeds offered ¹	Survey respondents' average stated download speed ²	Survey respondents' average monthly cost ³	Availability ⁴	Comments
Broadband over Power Line (BPL)	256 kbps-3 mbps	Insufficient data	Insufficient data	IN, OH, PA, VA	BPL allows high upload speeds, but unshielded power lines used to carry Internet communications may cause interference with radio communications.
Cable	3 mbps-30 mbps	5.7 mbps	\$42.45	Nationwide	Cable providers have boosted speeds of late, but they haven't cut prices to compete with DSL.
Dial-up	56 kbps	56 kbps	\$22.00	Nationwide	Subscriptions are nose-diving in favor of broadband—but it's still the most widely available service.
DSL	768 kbps-7.1 mbps	2.9 mbps	\$32.30	Nationwide	Available for as little as \$13 per month, DSL costs considerably less than cable, but it's significantly slower, too.
Fiber optic	6 mbps-50 mbps	9.6 mbps	\$36.35	CA, CN, DE, FL, GA, IN, MD, MA, NH, NJ, NY, OR, PA, RI, TX, VA, WA	Though still far less common than cable or DSL, the technology is catching on quickly with subscribers, and it has plenty of room to grow.
Fixed wireless	256 kbps-3 mbps	1.6 mbps	\$43.80	CA, NM, PA, TX	While you can find a wireless connection in almost any coffee shop, using one to connect directly to an ISP is a relatively new concept. A few municipalities offer inexpensive access.
Satellite	512 kbps-1.5 mbps	720 kbps	\$63.10	Nationwide	You no longer have to use a dial-up modem for uploads over satellite, and it's available where no other broadband option is, but it's still pricey and relatively slow.

FOOTNOTES: ¹Range of connection speeds offered nationwide. ²Connection speed as promised by provider—not tested speeds. ³Costs are for home Internet service. ⁴Service in several states is still considered in the trial stage; states listed are ones in which providers offer connections to new customers.



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a business perspective," says JupiterResearch's Laszlo.

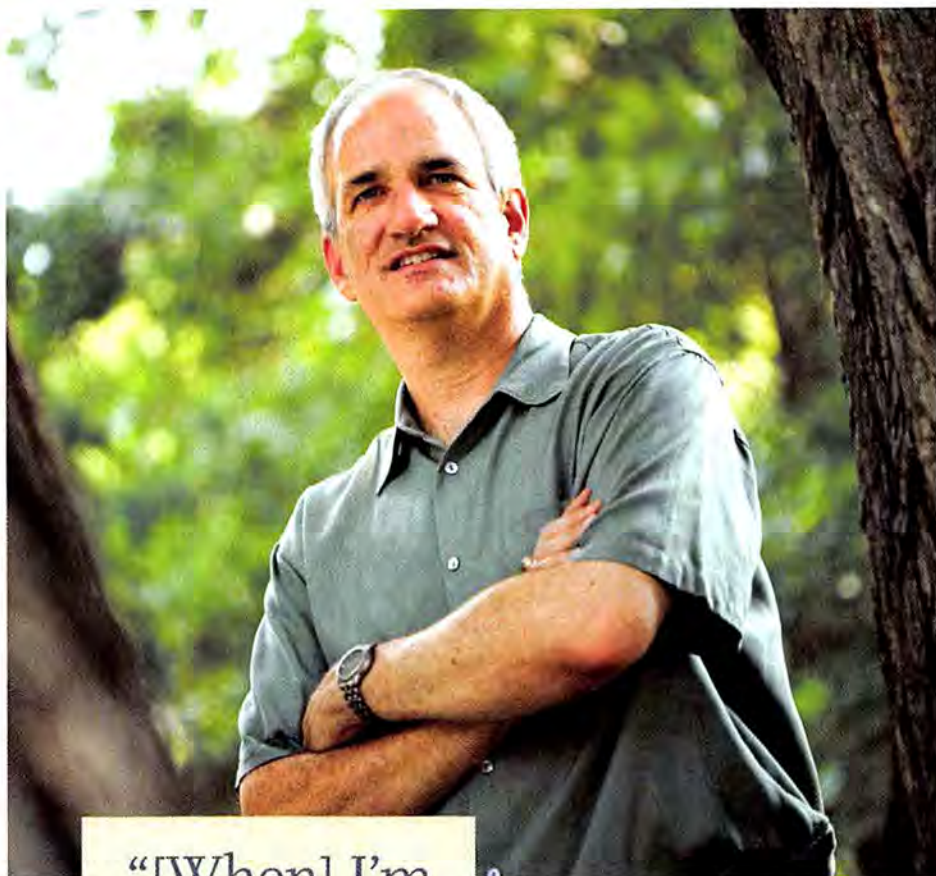
Corey Smith, an electrophysiologist at Case Western Reserve University in Cleveland, has been an AT&T Yahoo customer for a little over two years. He pays \$18 a month for the AT&T Yahoo Pro package, which tops out at 3 mbps. "It's been reliable, easy, and cheap, and it's a great deal for the price," Smith says. For him, DSL is the best broadband option, particularly because he doesn't have or want cable TV. Smith now pays \$11 less per month than he did when he first subscribed to AT&T Yahoo—and his connection is faster.

But in some regions, DSL is far from perfect. Ralf Cross is a computer systems administrator in Charleston, Tennessee, a tiny town near Chattanooga with fewer than 800 people. Cross pays about \$40 a month for BellSouth DSL, which delivers what she calls "intermittent" broadband service. "Sometimes you can connect, sometimes you can't," complains Cross, who believes the town's old phone lines are to blame. "You just kind of hobble along and say, 'Well, this is better than dial-up.'" But if cable broadband comes to Charleston, she says she'll switch ISPs in a second. BellSouth subscribers who answered our survey were, on average, satisfied with the service; however, the provider may soon merge with AT&T Yahoo, whose subscribers weren't nearly as happy in our survey.

Three-fourths of our survey respondents said it was "unlikely" that they would switch to a new ISP in the next six months. But of those who said they might, nearly a third, like Cross, said they want a more reliable connection.

FIBER: THE FUTURE

EARLIER THIS YEAR, David Heyman of Bethesda, Maryland signed up for Verizon's Fiber Optic Service (FiOS), which replaced his Verizon DSL line. For every-



"[When] I'm uploading pictures, it moves a lot faster."

—David Heyman, Verizon fiber-optics customer in Bethesda, Maryland

day Web surfing, his 5-mbps (downstream) FiOS connection is quite a bit faster than his DSL one (which offered 3 mbps downstream), and Heyman notices the improvement especially when moving large files. "If I'm downloading something, it's definitely very fast," says Heyman, who works in AOL's marketing department. "And it's 2 megabits upstream. So once a year when I get back from vacation, and I'm uploading pictures, it moves a whole lot faster." By comparison, his DSL connection had a slow 128-kbps upstream capability.

Today's top DSL providers are spend-

ing billions of dollars to upgrade their infrastructures to fiber-optic technology, which utilizes thin strands of glass fiber to carry massive amounts of data. A fiber-optic connection to the home can easily transmit all of your data—Internet, telephone, and TV—with room to spare for applications not yet imagined. "If tomorrow you come out with new electronics that can do ten times the speed, the fiber doesn't have to be replaced," says Chris Pizzirani, Verizon vice president of broadband product management.

Verizon is running fiber-optic cable to homes in its 30-state territory; FiOS could easily bring 100-mbps broadband to the home, Pizzirani says, though its current version of the service is more modest. In Connecticut, New Jersey, and New York, for instance, FiOS customers can get a 30-mbps downstream, 5-mbps upstream connection for \$55 a month with a one-year contract. Verizon plans to have FiOS wiring installed in 3 million homes in 16 states by the end of this year. But the technology isn't yet challenging the cable/DSL duopoly—in fact, just over ►

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1 percent of our survey respondents get their broadband via fiber optics. Respondents who use Verizon's fiber-optic service—the only service with enough responses to rate—ranked it much higher than the people who were using the company's DSL and dial-up services.

In 13 states AT&T is running fiber-optic lines to neighborhoods, and then

using existing copper wiring for the last leg into the home. (The company is conducting fiber-optics-to-the-home tests in Houston and northern Nevada as well.) The technology, dubbed Project Light-speed, brings fiber optics to within 3000 feet of customers' homes, on average; though much faster than today's DSL, it is not as fast as fiber optics going directly

to the home. In tests, the company says it is seeing speeds of 20 to 25 mbps per second. "This gives us more than enough bandwidth to provide four streams of high-quality video (including one high-definition stream), high-speed Internet access, and, in the future, consumer Voice-over-IP services," states AT&T spokesperson Brad Mays.

Expect high-definition television programming delivered over the Internet to gobble up a big chunk of the new bandwidth. Using current video compression methods, "a high-definition stream already takes up about 16 mbps of bandwidth," says Jeff Heynen, broadband and IPTV analyst for research firm Infonetics. Add two standard-definition TV streams (for watching television in other rooms) at 4 mbps each, and that raises the total demand to 24 mbps. Tack on a 6-mbps link for browsing, e-mail, online gaming, and other Internet uses, and you've reached 30 mbps. Heynen points out, however, that MPEG-4 compression technology, which providers will start using in the near future, should cut video bandwidth requirements in half.

SATELLITE: STILL OUT THERE

IF YOU LIVE in an area where cable, DSL, or fiber-optic service is available, Internet via satellite dish makes little sense. It's pretty slow compared with everything except dial-up, and it's relatively expensive. "Satellite is still the last-resort broadband technology for a lot of people in very rural parts of the U.S.," says JupiterResearch's Joseph Laszlo. Only 1 percent of those surveyed reported using this technology; no provider had sufficient responses to be ranked.

Then again, satellite is improving. Speeds are faster, and today's dishes provide two-way transmission, so users no longer need a separate dial-up modem to upload data, as in the recent past.

Satellite broadband provider WildBlue, for instance, offers 512-kilobits-per-second downstream/128-kbps upstream service for \$50 per month. A faster 1.5-mbps downstream service is \$80 a month. ▶

USE YOUR CONNECTIONS

Better Broadband Begets Better Services

IF YOU HAVE a big Internet pipe, start making the most of it. Here are some services that take advantage of as much bandwidth as you can bring.

Movie downloads: Sites like CinemaNow (www.cinemanow.com) and Movieline (www.movieline.com) offer movie downloads that you can buy or rent, a service that cries out for an ultrafast fiber-optic connection. Via a 1.5-mbps cable or DSL link, a movie takes an hour and a half to download. High-definition movies require even more bandwidth to download or stream in an acceptable amount of time. CinemaNow already sells some HD content, but its future plans call for HD movies in the 1080p format (the best HD format available); such files will take more than 4 hours to download if you have a 512-kbps pipe, which will be the minimum required connection. With a 6-mbps connection, you can cut that to about half an hour.

Video streaming: ESPN360 (www.espn360.com) is an online video player that shows live sporting events. Your ISP must offer this service, however; otherwise you're limited to brief clips. It specifies a connection speed of at least 450 kbps—

higher than most other online video services.

HD television: MatrixStream Technologies' IPTV set-top box can deliver live 1080p HDTV via 6-mbps broadband. "Unlike cable or satellite, there's no limit as to the number of HD channels somebody could have," says Aaron Keogh, Matrix-

Stream's director of business development. A service provider, which could be an ISP or a video-on-demand site, installs MatrixStream servers on its end, and then sells or rents set-top boxes to consumers. Field trials are under way, Keogh says.

Videoconferencing: Today's consumer-grade videoconferencing hardware, such as 8x8's Packet8 \$20-per-month VideoPhone, requires about 640 kbps for both upload and download streams to achieve full-motion, 30-frames-per-second video. Many of today's cable and DSL connections offer slower upload speeds—often as little as 128 kbps—so a wider upstream pipe is necessary for good two-way video. The newer H.264 codec, just now being implemented by videophone makers, should ease upstream requirements. Full-motion video via H.264 will require bandwidth of 128 kbps to 512 kbps, says Karen Hong, 8x8 director of product marketing.



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In addition, you have to buy \$300 of equipment to get started. At press time, both Dish Network and DirecTV had announced plans to offer WildBlue service to their customers, but neither had disclosed pricing details.

For Kenneth Mann, a computer repair technician in Meherrin, Virginia—"a little post office and a few stores," he says—satellite works. With no cable or DSL available, Mann subscribes to HughesNet, a satellite provider that charges \$59 a month for a 700-kbps downstream link. Mann had to purchase \$600 of satellite equipment, as well. But despite those steep costs, Mann says that he is pleased with the service. "It's a high-speed society now, and dial-up is not going to cut it," he adds.

WIRELESS: THE NEW ALTERNATIVE

FIXED-WIRELESS SERVICES employ the same technology used for wireless networking to provide Internet access throughout a town, a city, or a specified location within a city. Local governments may act as providers, though only a few thus far have begun offering service. With this type of service, a Wi-Fi-enabled laptop, cell phone, PDA, or other device has anywhere, anytime access—from home, school, work, or even a park bench. Speeds typically are on a par with those of basic DSL. EarthLink, for example, supplies 1-mbps symmetrical (downstream and upstream) service for \$22 a month in several cities, and it's currently building Wi-Fi networks in Milpitas, California (to be complete this fall); sections of New Orleans (to be finished by the end of 2006); and Philadelphia (to be ready in the third quarter of 2007). In San Francisco, EarthLink has partnered with Google to build a hybrid free/pay network; service up to 300 kbps will be free, but a faster connection will require a \$20 monthly fee. We did not receive enough survey responses to rate any single wire-

less provider, but EarthLink fared pretty well with its other broadband customers.

EarthLink sees wireless as a migration path for its large but rapidly dwindling base of dial-up users, many of whom pay about \$22 a month for access. "We give them a free wireless modem, and it's the same price as they're paying now," says Cole Reinwand, EarthLink's director of next-generation broadband.

But wireless service often costs a lot

instance, says it installed 30 to 36 Wi-Fi nodes per square mile in Anaheim, California; a WiMax setup would require far less hardware.) Last summer Intel and Motorola announced plans to invest \$900 million in Clearwire, a wireless broadband provider, to develop WiMax service. Clearwire offers wireless broadband (but not WiMax) service in 27 U.S. metropolitan areas, with a 1.5-mbps downstream, 256-kbps upstream plan that costs \$50 per month. Sprint Nextel recently announced that it will begin deploying a WiMax network that reaches as many as 100 million people in 2008.

CELLULAR: PRICEY FOR HOME

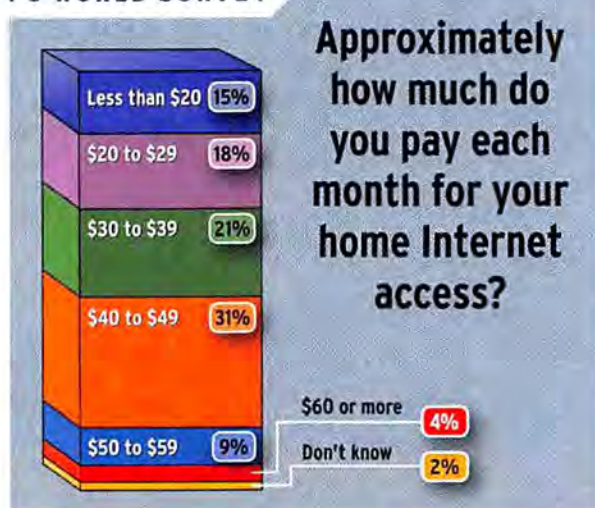
MAJOR CELLULAR CARRIERS offer wireless data service to their subscribers, with speeds that range from 128 kbps to 700 kbps, for \$60 to \$80 per month. Though cellular service is expensive for everyday home use, it's really designed for the mobile professional who needs quick access to

e-mail, Web sites, and video clips.

The mobility component could diminish in importance, however. "As these services get cheaper, there's a segment of online consumers—assuming they get a strong enough wireless signal in their homes—that might see benefits in anywhere/anytime Internet access," says JupiterResearch's Joseph Laszlo. In addition, wired and wireless ISPs may join forces in innovative ways. "You'll pass off cellular data traffic to your wireless LAN, which will ease the strain on the cellular networks," predicts IDC's Matt Davis. Phones that allow such activity have been demonstrated but have not yet shipped in the United States.

Today, though, cellular broadband serves a very narrow niche. Jim Heinen, a retired Federal Aviation Administration manager who travels the country in his RV, uses a Cingular AirCard, which provides a maximum download speed of ▶

PC WORLD SURVEY



more, particularly when it's the only broadband available. Randolph Cotton, who lives 6 miles outside of Holdenville, Oklahoma, pays \$79 a month to Plainsnet.net, a local wireless provider. "They've got cable in town, but not out here," says Cotton, a retired Marine pilot who finds wireless faster than satellite, which he tried before switching to Plainsnet. The plan he subscribes to offers downstream speeds of up to 800 kbps, and Cotton says he's pleased with the service: "A megabyte [download] goes pretty quick."

Technical hurdles remain, though. Signals can be blocked by tree leaves, stucco walls, and windows with metallic coatings to shield against heat. A newer, more advanced wireless technology called WiMax may resolve these problems, though the jury is still out on its real-world success. Whereas Wi-Fi's range is about 150 feet, a WiMax signal can carry over several miles. (EarthLink, for



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128 kbps. The service is mostly reliable, Heinen says, but latency (the lag time between the entry of a command and the appearance of a result) is often a problem for him. Sometimes data traffic "just suddenly stops, and about 30 seconds to a minute later, it starts up again. It drives me nuts," says Heinen, who pays about \$80 a month for the service.

POWER-LINE: THE WILD CARD

BROADBAND OVER POWER line, or BPL—using existing electrical wiring to access the Internet—is an idea that has been around for at least a decade. In Texas, BPL provider Current Communications Group has teamed up with TXU Electric Delivery to offer power-line Internet service to 2 million homes in the Dallas-Fort Worth area. According to EarthLink, which is participating in the Texas project, the service offers 5-mbps symmetrical speeds for about \$30 a month.

But analysts are skeptical. "Companies are wasting their efforts by focusing on [power-line service in the United States]," JupiterResearch's Laszlo says. It's too expensive to implement the technology, he notes, and both ham radio users and

public safety agencies have raised concerns that running data over power lines, which are usually unshielded, creates interference with their radio communications.

IDC's Davis says, "If you're going to come late to market, you're going to have to have a disruptive price point or a disruptive technology." Unfortunately, he says, power-line service is neither faster nor cheaper than existing technologies.

Supporters point out that BPL has advantages. "A symmetrical service (like power-line technology) will appeal to some people," says Kevin Brand, EarthLink's vice president of product management. Asymmetrical broadband services like cable and DSL have slower upload speeds, which causes problems for such functions as videoconferencing and online backup. And power lines are everywhere, giving anyone with electricity a shot at getting broadband.

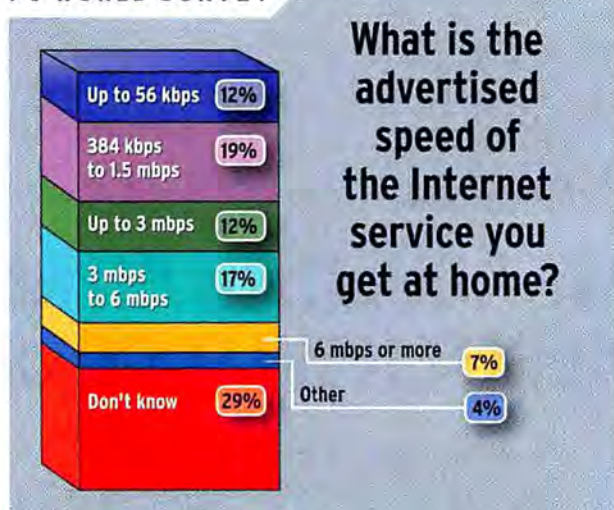
MORE ONLINE

Broadband Abroad



HOW DOES INTERNET access in the United States compare to other parts of the world? We asked editors from *PC World* publications around the globe, from Bulgaria to Thailand, about connections in their respective countries, and we found that the U.S. is still playing catch-up in some respects. For more on international Internet connections, browse to find.pcworld.com/54854.

PC WORLD SURVEY



What is the advertised speed of the Internet service you get at home?

dwindle to less than 12 million by 2009, while the number of broadband users will grow to more than 70 million. Even dial-up dinosaur AOL is in the process of evolving into an ad-based Internet portal, à la Google and Yahoo, and will soon offer much of its formerly proprietary content for free. And it's not trying to garner new dial-up accounts.

Kevin Lund, an AOL user "since it pretty much started," ditched dial-up years ago, though he still runs the AOL client software on his AT&T Yahoo broadband connection. Why? Lund, who manages inventory control for Fry's Electronics stores in the San Francisco Bay Area, likes AOL's security features, content selection, and parental controls. He has been paying AOL only \$9 a month, but AOL's new strategy means he soon won't have to pay that fee anymore.

"The AOL software has some pretty good proprietary software for child protection. And since I have a couple kids at home, I can lock down their computers pretty tightly as to where they go," Lund says. Among our survey respondents, more AOL users said they use parental controls than subscribers to any other service, and a much higher percentage of AOL users said they were "extremely satisfied" with its parental controls.

Of course, you don't have to settle for dial-up anymore. Broadband rules—and it's getting faster all the time. ■

Jeff Bertolucci is a freelance writer based in Southern California.

DIAL-UP: R.I.P.

AH, DIAL-UP, THE rotary phone of Internet access. It's painfully slow—a woeful 56 kbps—but it's also cheap and still surprisingly popular, with more than 34 million people still using it in the United States, according to research firm IDC. (That's down from more than 42 million last year, though.) PeoplePC, EarthLink's value dial-up division, has 1.4 million dial-up subscribers, many of whom pay only \$11 a month. "Dial-up customers are more task-based. They tend to spend less time surfing," says Hilary Jensen, PeoplePC vice president of product management. In our survey, people who use the PeoplePC service rated it lower than EarthLink subscribers did.

Still, dial-up is doomed. Only 13 percent of our survey respondents use dial-up to access the Internet. Analysts predict that the number of dial-up users will

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EDITED BY ERIC DAHL AND DENNIS O'REILLY



INTERNET TIPS

SCOTT SPANBAUER

Safeguard Your Reputation While Socially Networking

TEENAGERS HAVE LONG been the vanguard of popular culture, which explains why so many adults are only now taking a close look at the social-network sites that young folks have been flocking to in recent years. The MySpace personal Web page service boasts more than 90 million accounts, primarily registered by teens. Similarly, college students account for most of the 7.5 million users of Facebook (www.facebook.com), though the service is expanding to include other schools,

companies, and geographical regions.

Social networks are far from the sole province of youngsters, however. Services such as LinkedIn (www.linkedin.com) and Ryze (www.ryze.com) have a clear business focus. But whether for work, fun, or a combination of the two, it's vital that you maintain strict control over your various online personae.

Turning traditionally private pursuits into public events often comes back to haunt online revelers. Just as companies

create a corporate image that conveys their core purpose and virtues, individuals project an online image through social networking sites, blogs, e-mail, photo and video sharing, and other online activities. Your image can have an immediate impact on how friends, family, strangers, and prospective employers view you. You want to express your individuality, but you also want to get hired. By following the proper steps, you accomplish both.

YOUR ONLINE DEMEANOR

FIRST, CONSIDER YOUR online image: Does your blog, MySpace, or Facebook page delve into areas that you may not want to have to explain later on? (Sex, drug, and booze-related topics, for example, could come back to haunt their authors.) Does your personal e-mail address contain unprofessional or suggestive terms? Thanks to Google's cache and the Internet Archive's Wayback Machine (find.pcworld.com/54474; see **FIGURE 1**), some of the online tracks people leave today (even as a lark) will remain fresh for decades to come.

Profiles on sites like MySpace, Facebook, and even Friendster probably won't show up in a search engine query, but they will appear when members of those services track you down. So expect current and future employers, paramours, and other gumshoes to be determined enough to find your online contributions. Remove potentially embarrassing photos and posts to make your wild years less likely to come back and haunt you.

GO INCOGNITO

EVEN A STELLAR online image deserves privacy, and fortunately MySpace and most other social-networking sites give

152 INTERNET TIPS

Avoid future embarrassment by keeping your online activities private; old-style browsing returns.

156 WINDOWS TIPS

Defrag your disks automatically via Windows' Scheduled Tasks utility; a freebie makes disk cleaning easy.

158 HARDWARE TIPS

Plan ahead to maximize the life span of your PC and peripherals; recover files on damaged CDs and DVDs.

160 ANSWER LINE

Use Windows' Briefcase utility to synchronize data on two PCs; copy audio files from a DVD to your PC.

162 IPOD TIPS

Extend your iPod's battery life by adjusting the device's own settings; convert your iPod into an FM radio.



FIGURE 1: PERSONAL PAGES REMAIN in the Internet Archive's Wayback Machine long after they're deleted.

you quite a bit of control over who can and can't see and find your posts. To hide your MySpace page from anyone who's not already a MySpace friend, click *Account Settings* on your main page, and choose *Change Settings* next to 'Privacy Settings.' Check *Require email or last name to add me as a friend* under My Privacy Settings to prevent people who don't know you from trying to add you as a friend, and select *My Friends Only* under 'Who Can View My Full Profile.' Click the *Change Settings* button to enable the changes (see **FIGURE 2**).

Visitors to your MySpace page will see only your photo, display name, and location. Replace these with versions that do not reveal your identity, and you'll be nearly anonymous except to people you approve as MySpace friends (see **FIGURE 3**).

To prevent others from knowing you even have a MySpace account, make sure that your real name doesn't appear in the First Name and Last Name search fields under your profile's Name section, nor in your MySpace User Name/URL (such as 'www.myspace.com/scottspanbauer'). You can't alter a User Name/URL once

you've created it, so your only option in that situation is to cancel the account (an option included under Account Settings) and then create a new one.

KEEP YOUR ONLINE PROFILES PRIVATE

BY DEFAULT, THE only people who can view your Facebook profile are members of your school, region, or business network (similar settings are available in Friendster). As

your name and picture. Alternatively, you can allow friends of friends to see it, or you can open it to anyone in the network. Other options let you control who sees your e-mail and home addresses, phone numbers, interest groups, courses, visitor comments, and other individual profile elements (see **FIGURE 4**).

Enter home addresses, phone numbers, and other sensitive information only when necessary. The more identity thieves, stalkers, and other criminals can find out about you online, the easier they will find it to locate you—so avoid listing your real city, age, and other vital stats.

TEACH KIDS NOT TO SHARE

KEEPING PERSONAL INFORMATION private is especially crucial for teens. Personal references scattered around a teenager's MySpace page could help a predator lure the youngster into a face-to-face meeting. Fortunately, MySpace kids are creative about obfuscating their online particulars. MySpace doesn't request or set aside room for members' addresses and phone numbers; nobody, regardless of age, should post such information on a blog or social network. MySpace does ask members for their location and age, but almost none of my middle-school son's friends report their true location, instead listing their home towns as "Hippietown, Uzbekistan," "Antarctica, Zimbabwe," and other unlikely burgs. This doesn't interfere with the social interaction they signed up for.

Officially, MySpace prohibits anyone under the age of 14 from creating an account, and it forbids anyone 18 or older from viewing the profiles of anyone 17 or younger. In addition, MySpace now has a setting that allows 14- and 15-year-

with MySpace, you can control who is able to access your Facebook page.

For a summary of who can see what about you, log in to your Facebook account and click *My Privacy*. Choose *Edit Settings* beneath a profile to indicate what content the network's members can access. You can prevent anyone—except people already accepted as friends—from seeing your profile at all; they'll see only



FIGURE 2: KEEP MYSPACE strangers at bay by restricting potential contacts to your friends and your real-world acquaintances.

olds to block other members from seeing their sites. But there's no way to confirm age online: My son and his friends are mostly 12 or 13 years old, but they often list their ages as 100. And nothing pre-

communication. I offered general advice on how to talk to kids about online safety in last October's *Internet Tips* column (find.pcworld.com/54484). Explain your family's values and expectations regard-

ing sexuality and violence online. If you can talk with your children about difficult subjects like sex—and especially if they feel comfortable talking about these topics with you—offering guidance in their online activities will be easier.

If you end up in a battle with your child over MySpace, forget about it—you've already lost. You can reject, forbid, and banish all you want, but a teen who is set on using MySpace will do so, regardless of whether you have a computer in the house.

If your child uses a computer at home, I recommend keeping it out in the open. You may also want to install some of the monitoring and filtering tools I described last October. It's up to you to decide what

level of autonomy you want to offer your child online. At the hands-off extreme, you could simply cross your fingers and hope that everything works out. At the high-surveillance extreme, you could create your own MySpace account and use it to keep tabs on your child's page and friends (though you won't see any of the e-mail they send and receive). Razorcom's ad-supported MyspaceWatch (www.myspacewatch.com) monitors one MySpace profile of your choice for you; the service visits the monitored profile twice a day and sends you a report via e-mail detailing log-ins, changes, and as many as 25 friends. For \$6 per month, MyspaceWatch Pro monitors up to five profiles and 100 friends four times a day.

In my judgment, this invasive level of monitoring is justified only if you have already tried just about everything else and are convinced your child's MySpace usage constitutes a serious problem. In our family, we were lucky—our son first

asked us if he could have a MySpace account. We agreed, provided that he would allow us to monitor it occasionally (including a glance at his e-mail messages). The result of this arrangement is that we know who he's talking to and what kinds of conversations are going on. Because we live in a small town and are interested in his day-to-day activities, we already know most of his MySpace friends offline. This trust-but-verify system has reassured us that our son is using MySpace responsibly; and as a result, over time, we've been willing to relax our vigilance and give him a little more privacy.

At the very least, ask your child to use MySpace's privacy features (as described above) to block friendship requests from strangers and to exclude people who aren't friends from viewing his or her MySpace profile. Parents and children should browse the excellent "Don't Believe the Type" Web site created by the National Center for Missing & Exploited Children (find.pcworld.com/54486) for tips and information on avoiding online



FIGURE 3: GO INCOGNITO online by substituting fictitious data for all potentially identifying real-world information about yourself on your MySpace profile.

vents a 40-year-old from creating an account as a 14-year-old. So listing yourself as 14, 40, or 84 doesn't prove anything.

PARENTING, PLEASE

GIVEN THE WIDE-OPEN nature of the medium, what should parents do to provide protection and guidance for their MySpace-loving teens? Start with good

BROWSE LIKE YOU USED TO

REMEMBER WHEN THE Web was young? As the Internet becomes the venue of mundane tasks like banking, e-mail, and socializing, new online discoveries occur less frequently. Sometimes it seems as if the old magic is gone. The StumbleUpon toolbar for Firefox and IE brings back the wonder of the new by serving up fascinating Web sites you wouldn't have found otherwise. After specifying your areas of interest, you simply click the Stumble button whenever you feel understimulated, and you'll embark on a new Internet tangent. You can recommend sites you find rewarding to the StumbleUpon community by clicking the toolbar's 'I like it!' button. Browse to find.pcworld.com/54490 to get the Firefox toolbar, and to find.pcworld.com/54632 for the IE version.



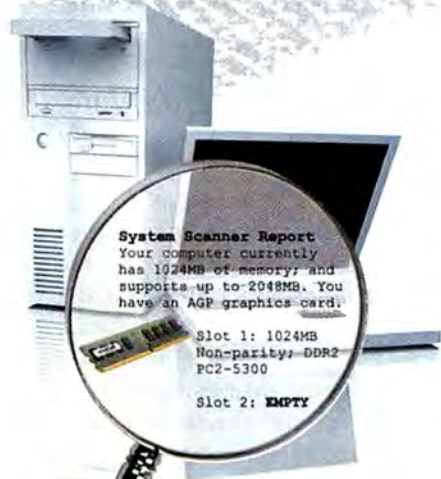
FIGURE 4: PRIVATIZE YOUR FACEBOOK, and limit contact to friends, fellow students, and coworkers, by taking advantage of the site's various privacy settings.

predators. The FBI publication "A Parent's Guide to Internet Safety" (find.pcworld.com/54488), which the agency says is based on information received from actual child victims and predator sting operations, is another good resource. ■

Send your questions and tips to nettips@spanbauer.com. We pay \$50 for published items. Go to find.pcworld.com/31523 for more Internet Tips. Scott Spanbauer is a contributing editor for PC World.



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WINDOWS TIPS

SCOTT DUNN

The Fast, Simple Way to Defragment Your Disks

YOU SAY YOU'D defragment your hard drive if only doing so weren't so time-consuming? Well, have I got a batch file for you. (Before you defragment, you should scan your disk for errors. For tips on automating your disk scans in Windows XP, read my September 2003 column at find.pcworld.com/54304.)

First, the manual defragging approach: Click **Start•Programs** (or **All Programs**)•**Accessories•System Tools•Disk Defragmenter•Defragment** (see **FIGURE 1**). You can defrag only one drive at a time this

so type a space and **-f** to force Windows to defrag it anyway. Windows can also generate a report on the defrag when it's done: Type a space and **-v** to get all the details available. Next, enter **>** (a greater-than symbol), followed by the path to a text file that will log the results. (Note: If a text file of that name in that location already exists, it will get overwritten.) Be sure to place quotation marks around your path if it contains any spaces, or if it uses long file or folder names.

So after all that, your command line might look like this: `defrag.exe c: -f -v >"e:\doc\defrag report.txt"` (your path and file name may differ, of course). Finally, press **<Enter>**.

If you want to defrag more than one drive, create a command line for each one, changing the drive letter and the file name and path as necessary (see **FIGURE 2**). When you're done, choose **File•Save**, and save the file to a convenient location. Make sure to use the **.bat** or **.cmd** file extension.

Now any time you want to defragment the drives, just double-click the **.bat** or **.cmd** file you created. (Or drag the file's icon from Windows Explorer or any folder window and drop it onto your Start menu to create a shortcut there.)

Finally, Windows' Scheduled Task utility lets you defragment automatically at the time of your choice. To open this tool, click **Start•Programs** (or **All Programs**)•

Accessories•System Tools•Scheduled Tasks. Double-click the **Add Scheduled Task** icon, and click **Next**. When prompted for the program to run, click **Browse** and locate your batch file. Select it and click **Open**. Follow the remaining prompts to make the disk defragmenting occur whenever you want (see **FIGURE 3**).

Scheduled Tasks requires that you log on using a password-protected account; you supply your Windows log-in password as part of the scheduling process. For a way to work around this, see Lincoln Spector's *Answer Line* column from January 2003 (find.pcworld.com/54308). ■

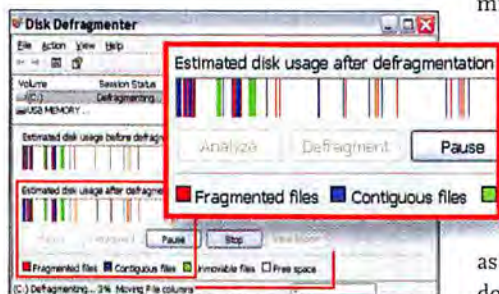


FIGURE 1: WINDOWS' DEFRAGMENTER tool uses a four-color graph to represent the disk space that can be recovered on your drives.

way, but Windows' defragging tool shows the drive's fragmentation graphically and lists all your drives, so you can defragment one after another without a lot of clicking through dialog boxes.

It's always best to defrag a disk when it's not in use. To set up Windows to defrag a drive automatically at such a time, start by opening Notepad or another text editor, and type **defrag.exe** followed by a space, the drive letter, and a colon.

A drive that's low on disk space may balk at defragging,

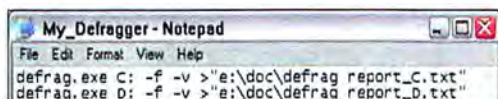


FIGURE 2: SET CUSTOM DEFRAG COMMANDS for each of the drives on your system with a simple batch file.



FIGURE 3: USE WINDOWS' SCHEDULED Task tool to automate your disk defrags by launching the defrag batch file you created.

Send your Windows-related questions and tips to scott_dunn@pcworld.com. We pay \$50 for published items. Visit find.pcworld.com/31607 for more Windows Tips. Scott Dunn is a contributing editor for PC World.

WINDOWS TOOLBOX

Waste Less Space, Get More Privacy With Disk Cleaner

WINDOWS' DISK-CLEANING TOOL is handy for removing useless or outdated files from your hard drives: Choose **Start•Programs** (or **All Programs**)•**Accessories•System Tools•Disk Cleanup**. But the program fails to empty some key temporary files and doesn't protect your privacy as well as it could. The free Disk Cleaner utility can hide the names of the files you use and the Web sites you visit. It also removes many more unneeded files from your system. Command-line switches let you automate your disk-mapping chores. Browse to find.pcworld.com/54310 to download your copy.

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CISCO SYSTEMS



HARDWARE TIPS

KIRK STEERS

Plan Ahead to Extend the Life of Your Hardware

COMPUTERS ARE IN transition: Technologies such as the PCI Express bus and all-digital video connectors are supplanting their predecessors. More important, Microsoft's new Windows Vista is right around the corner. Anyone who's thinking of buying PC hardware in the next few months must keep an eye on the future.

If the transition to Windows XP is any lesson, the biggest potential hassle of a Vista upgrade is lack of support for legacy hardware and peripherals. Before moving to the new OS, check with your printer, scanner, and other peripheral manufacturers to learn whether they plan to offer Vista drivers for your product.

To help ease the move, Microsoft has created the Windows Vista Upgrade Advisor, a free program that examines your system's hardware and attached peripherals to identify possible driver and hardware conflicts, as well as other compatibility problems. Browse to find.pcworld.com/54172 for the download.

If you're ready to buy a PC now, with an eye toward upgrading to Vista down

the road, stick to a Vista Premium Ready machine rather than choosing one that supports only Vista Basic (browse to find.pcworld.com/54861 for a description of the various Vista releases). And no matter



FIGURE 1: ADD SATA ports to a non-SATA PC with Adaptec's DuoConnect 5020 card.

which version of Vista you plan to run, don't buy any less than 1GB of RAM.

The following tips will help you get the most out of your hardware—current and future—for many years to come.

Leave room for RAM: Make sure that you have space for future memory upgrades. Your new PC should have at least one free RAM socket (check with the vendor to determine expandability options for systems with dual-channel memory setups). Also, leave some room for expansion when you upgrade: Don't install two modules if you can get the same amount of RAM on one. Always consult your motherboard manual before buying memory, however, as some systems require that

the RAM modules be installed in pairs.

Avoid PCI cards: If your machine has both an open PCI Express slot and a PCI slot available, use a PCI Express card rather than its PCI equivalent for such internal components as a wired or wireless network adapter. If PCI Express isn't an option, add an external USB 2.0 version of the device. It may cost a bit more, but USB devices are easy to transfer to other computers, and USB should be around long after the PCI bus is history.

Choose SATA, not PATA: Make sure that your new PC has at least two Serial ATA connectors. Some budget systems offer only older Parallel ATA connectors, and others come with a single SATA slot. If you're adding a new internal hard drive, make it a SATA drive, which is easier to install, has slimmer cabling to help cooling air circulate in the case, and can be transferred to future PCs, which are likely not to have PATA connectors at all.

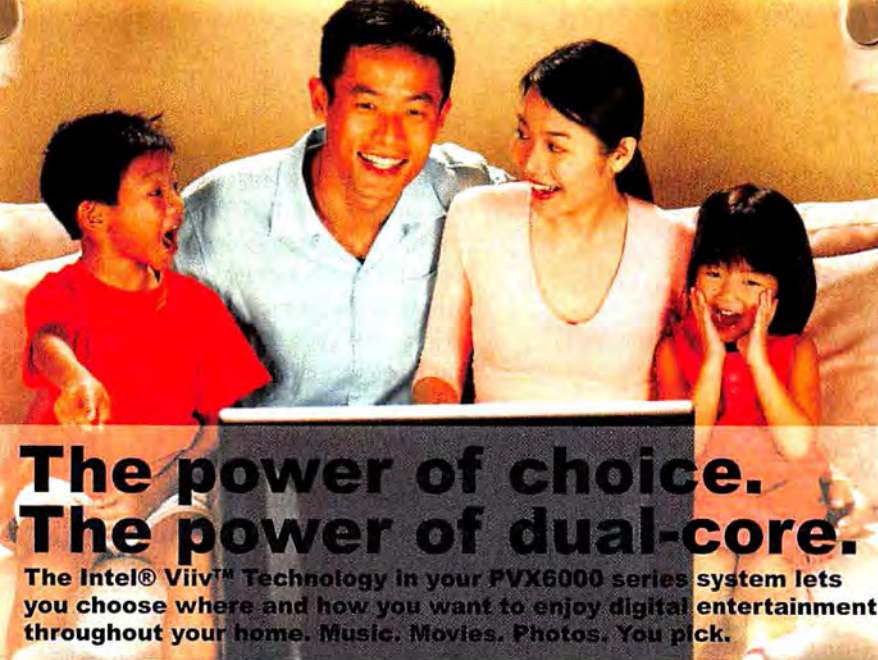
If your current system lacks a SATA connector, use Addonics' \$30 Serial ATA to IDE converter (find.pcworld.com/54174) to link a SATA drive to your IDE port. Or add multiple SATA ports via Adaptec's \$80 DuoConnect 5020 PCI card (find.pcworld.com/54176; see **FIGURE 1**), which includes two SATA ports and five USB 2.0 ports. Always get the highest-capacity drive you can afford; eventually you'll use the space. Microsoft requires a whopping 15GB of free disk space just for Vista.

Go digital: Some hard-core gamers still prefer the quick response and clarity of analog CRT displays, but most users today want an LCD equipped with an all-digital connection through a DVI port. If you're buying a new monitor or graphics card, check that it provides a DVI connection. If necessary, use VGA-to-DVI and DVI-to-VGA adapters (available at any computer store for less than \$10) to support your current hardware. ■

Go to find.pcworld.com/31511 for past Hardware Tips columns. Send your tips and questions to kirk_steers@pcworld.com. We pay \$50 for published items. Kirk Steers is a PC World contributing editor and the author of *PC Upgrading and Troubleshooting Quicksteps* from McGraw Hill/Osborne Press.

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ANSWER LINE

LINCOLN SPECTOR

Synchronize Files Easily With Windows' Briefcase

I WANT TO use Windows' Briefcase utility to sync data between two computers, but the instructions are unclear. How do you do this?

George Brown, St. Petersburg, Florida

BRIEFCASE CAN EITHER store your shared data on a USB flash drive or other portable storage device, or move your files between, say, a desktop PC and a laptop via a network. Unless you edit the files directly in the briefcase, you can sync a briefcase with only one other system.

To set up a briefcase to work with a USB thumb drive, insert the device into a USB port, open Windows Explorer, and select the drive. Right-click a blank spot in the window, choose **New•Briefcase**, and give the briefcase a name. Double-click the briefcase to open it, click **Finish** in the useless wizard, and then drag the files and folders you want to sync into the briefcase. Close Windows Explorer and properly remove the USB drive.

When you use these files on another PC, *don't* put them on the hard drive. Instead, just insert the USB drive, open the briefcase in Windows Explorer, and

then use the files as you normally would.

When you return to the first PC, insert the USB drive, open the briefcase in Windows Explorer, and click **Briefcase•Update All** (in Windows XP, just right-click the briefcase and select **Update All**). A dialog box will display the files that don't match between the briefcase and the hard drive,

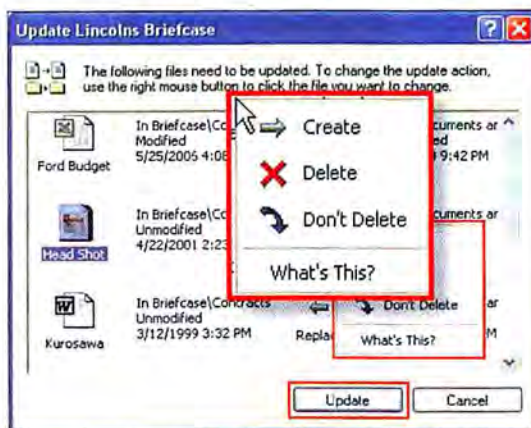


FIGURE 1: DECIDE FOR YOURSELF which files to update whenever you sync your files using Windows' Briefcase.

and it will show you which items should be replaced with which. If you disagree with an action, right-click the file to change its options. When you're satisfied, click the **Update** button (see **FIGURE 1**).

You can sync the briefcases on a notebook and a desktop PC if the systems are networked: Create a folder in the notebook's My Documents folder called **Holds Briefcase**, right-click it, select **Sharing and Security**, and click **Share this folder•OK**. This lets others change the files. On the desktop PC, create a briefcase in the notebook's Holds Briefcase folder.

Use the files in the notebook's briefcase. When you connect it to the network, sync the briefcase as described above, using the notebook as the flash drive.

RIP MUSIC OFF A DVD

IS THERE A way to rip audio from a DVD onto a PC? I record songs to tape, and from there to a PC.

Tommy Kikuchi, Woodside, New York

UNFORTUNATELY, THE Digital Millennium Copyright Act calls into question the legality of convenient DVD rippers such as Handbrake. But I know of a better solution than recording to tape first (and it's legal), although because of a DVD's copy protection, it still entails some loss of sound quality. Simply connect one end of a stereo audio cable to your PC's Line Out jack (where you plug in the speakers) and the other end to the PC's Line In jack (where you attach the tape player or turntable). This requires a stereo audio cable with one-eighth-inch miniplugs on both ends. If you don't already have one, you can buy such a cable for less than \$5 at any electronics store.

Once you're connected, rip the music with your choice of recording software. The PC will be silent until you plug the speakers back in, but your recording program's VU meter will tell you that there's sound. Remember that selling or giving away your digital recordings of any copyrighted material is illegal. ■

Send your questions to answer@pcworld.com. Answer Line pays \$50 for published items. See find.pcworld.com/31577 for additional Answer Line tips. You'll find Contributing Editor Lincoln Spector's humorous and other writings at www.thelinkinspector.com.

FIX MICROSOFT WORD'S DOUBLE-DIGIT NUMBERING GLITCH

MICROSOFT WORD'S NUMBERING option (for numbering lists and paragraphs) works wonderfully until you reach 10. The double digits mess up the indentation after the numbers because the extra digit pushes the text to the next tab setting. The result: ugly. To fix the spacing, move the first tab—along with

the hanging indent—a bit to the right. Highlight all of the ugly, numbered text, and select **Format•Bullets and Numbering**. Click the **Customize** button. Increase the setting slightly for the 'Tab space after' and 'Indent at' fields. These two fields should have the same number—0.7" will probably do. Finally, click **OK**.

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IPOD TIPS

MICHAEL S. LASKY

Play On: Get More Battery Power From Your Player

THERE ARE MILLIONS of iPod stories in the *Naked City*, and many of them involve dead or dying batteries.

Apple faced one of its biggest public-relations brouhahas when users of first-, second-, and third-generation iPods complained en masse about the relatively short life of the music players' lithium ion batteries. After only a few months (sometimes weeks) of use, they could no longer hold a charge. Even notebook batteries go south after a time, but at least you can replace a laptop's battery—you can't swap out an iPod battery (although Apple replaces out-of-warranty iPods containing failed batteries for \$59, plus \$7 for shipping; browse to find.pcworld.com/54452 for more).

A quick and humbled learner, Apple improved the battery life of its latest hard-disk-based players—up to 20 hours on one charge for the 60GB model. Still, several tricks will let you extend the life of your iPod battery, both for daily use and for the long haul. Note that while some of the following tips will work on the iPod Nano and Shuffle, which use flash memory, they are intended specifically for hard-disk iPod models.

Pausing vs. standby: Because much of the power consumed by hard-disk iPods (not the Nano or Shuffle) spins the disk, press *Pause* when you leave the player unattended. Left playing in default mode, the iPod will run until the battery is drained.

But did you know... You can think you've turned off the iPod when you've actually entered a standby mode. The way Play/Pause is engineered on the click dial, if you press down until the screen

goes dark, the iPod may be in a paused standby mode (not *Pause*), which uses more power. To verify that the unit is in *Pause* mode, press the middle button. When the screen lights up, look in the upper-left corner for dual bars (*Pause*),

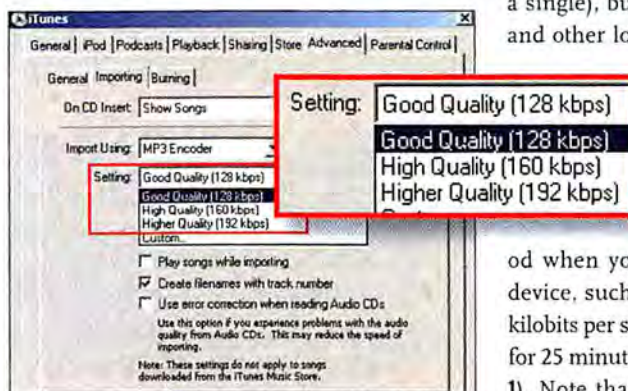


FIGURE 1: COMPRESSING LONGER TRACKS at a lower rate can help increase your iPod's battery life.

not the triangle (*Play*). To cut power totally, flip the *Hold* switch on the top.

Backlighting vs. equalizer: The backlighting on portable devices eats up battery power faster than a piranha gobbles up a goldfish. To do without the backlight, choose *Settings>Backlight Timer>Off*.

But did you know... Turning off the

iPod's sound equalizer will also preserve battery life. It takes processing power to transform a Madonna dance track into an acoustic tone poem. To disable the equalizer, select *Settings>EQ>Off*.

Changing tracks vs. making tracks: Rewinding or fast-forwarding uses extra energy, but so does changing tracks via the *Previous/Next* buttons, as the hard drive turns on to find and open the songs. Similarly, using the device's *Shuffle* or *Random* modes, which require frequent hard-disk accesses, will put a bigger dent in your player's battery life.

But did you know... The iPod sends tracks to its memory cache so it can seamlessly play them while powering down the hard drive. That's great for tracks that are 7MB or smaller (the average length of a single), but podcasts, audiobooks, and other long files need sustained

hard-disk access, which can run down your battery. An alternative is to use a lower-sound-fidelity compression method

when you load tracks onto the device, such as AAC or MP3 at 128 kilobits per second (the cache can play for 25 minutes at this level; see **FIGURE 1**). Note that while compressing in AAC is likely to give you better sound quality than MP3 at the same bit rates, few non-iPod players support AAC.

Also, keep in mind that spoken content can be compressed much more heavily than music, so don't hesitate to use lower bit rates for talk-radio-style podcasts or recompressed audiobooks. ■

Michael S. Lasky is a freelance writer and PC consultant in San Francisco.

HANDY DEVICE CONVERTS YOUR IPOD INTO AN FM RADIO

SEVERAL VENDORS OFFER add-on FM transmitters for the iPod: Set the transmitter and your home or car radio to an unused frequency, and your iPod audio tracks play through the radio. Kensington's Digital FM Radio/FM Transmitter for iPod (about \$70 online) adds a receiver, so you can attach it to the iPod's

dock connector and plug your headphones into the transmitter to serve as the radio antenna. I was amazed at how great the product's reception was. And with the push of a button, the device toggles into a transmitter for iPod broadcasting. Browse to find.pcworld.com/54154 for more information.



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Toolbar Review

There has never been a better time to use a toolbar with your Internet browser. Toolbars can provide users with numerous features such as Pop-up Blocking, Driving Directions, Adult Content Filtering, Security Features, Spyware Detection, Games and more. Toolbars are a convenient and powerful addition to your browser, making it easier than ever to navigate the Internet.

The comparison chart below will help you decide which toolbar is right for you.

Toolbar Comparison Chart				
Toolbar Features:	Advanced Toolbar	Google	YAHOO!	msn
Search Engines	100+	1	1	1
Search Tabs	✓			
Blocks Pop-Up Ads	✓	✓	✓	✓
Calendar Application	✓			
RSS News Reader w/Ticker	✓			
Auto Form Filler	✓	✓		✓
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Spyware Remover	✓		✓	
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Browser Tracks Eraser/Cleaner	✓			
File Shredder	✓			
Add Buttons for Software	✓			
Add Buttons for Webpages	✓	✓	✓	
Screensaver Launcher	✓			
Games Links	70	0	10	10
E-mail Provider Links	52	0	1	1
News Provider Links	88	0	1	0

With its vast array of features and incredible ease of use, the Advanced Toolbar stands out from the competition. It's a powerful web tool that allows you to choose from over 100 search engines, 80 plus news sources, 50 plus email providers and can be completely customized to meet your needs. The Advanced Toolbar does not record any user data, has a very straight forward privacy policy and is totally spyware and adware free. You can get a free copy of the Advanced Toolbar at <http://www.advancedtoolbar.com> and take advantage of everything this incredible toolbar has to offer.



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Evelyn Leller	West Entrance	03/20/2004 08:12:16 AM	
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‘Always On?’ Not in This World!

BACK IN THE dial-up era, the advent of broadband seemed like nirvana. “Blazing speed”—in computerdom it’s always called “blazing” even when the improvement is a teensy one—wouldn’t be the only boon. There would also be the joy of having a PC that was connected 24/7—or as the saying went, “always on.”

Now that broadband is everywhere, including kinda-sorta in mobile phones, people increasingly behave as though we really do live in an always-on, always-connected world. The reality, of course, is that we don’t—and assuming otherwise causes real problems.

Examples are endless. The Web service you rely on for crucial tasks like e-mail suddenly goes “down for routine maintenance” or simply doesn’t respond for hours. Your DSL or cable connection disappears when somebody accidentally slices through a line with a backhoe. You wander out of your phone provider’s service area and watch the bars disappear. Your computer crashes—or is just powered off. And often it’s you who has logged off—say, to catch up on sleep.

Yet the world expects you and your PC to be available all the time. Ignore an IM or e-mail while you’re trying to concentrate on something important, and you’re likely to get a phone call that interrupts you once more. Turn off your phone to carve out a little thinking time, and when you turn it back on, you’ll get a barrage of voice mail wondering where the heck you’ve been. Hey, I’m as guilty of this impatience as anybody.

But lately the biggest mistaken assumptions about perpetual connectedness seem to be made by software vendors whose products need to phone home for assistance. Turn on your notebook after not using it for several weeks, and the screen will light up with complaints and cajolery that amount to “Where you been?”

Upon first booting up on a recent trip—on an airplane with no Internet access—I received messages from my antivirus and antispyware software announcing that the packages needed updating. Windows itself insisted that I download some specific new upgrades; apparently it had

Downtime remains a reality, no matter how connected you are.

been too lazy to notify me about them the last time my machine was connected. And none of the software noticed that the connection it supposedly needed right that minute was nonexistent.

When I got home a few days later, my desktop computer went through the same routine, though at least it was connected. Still, my online backup software insisted on wasting cycles and slowing my system by jumping right in to perform an “overdue” backup. What it didn’t remember was that it had taken care of all my files the last time I’d shut down.

How many times have you tried to log on via Wi-Fi, received a message about a connection failure, and then realized you’d forgotten to flip the switch that turns the radio on? If smart phones can prompt you to turn them on when you ask them to do something they can’t do with their radio off, why can’t PCs?

It’s time for the software we run to understand and manage the state of the machine—whether it’s on or off, connected or not—with significantly more cleverness than it currently displays. And it’s time to recognize that slow-to-respond friends and colleagues may be asleep, out enjoying the wilderness, offline, or deliberately ignoring us—in other words, behaving like not-always-on human beings. ■

Contributing Editor Stephen Manes is cohost of PC World’s Digital Duo (www.pcworld.com/digitalduo) on public TV. Visit find.pcworld.com/31595 for more Full Disclosure columns.



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