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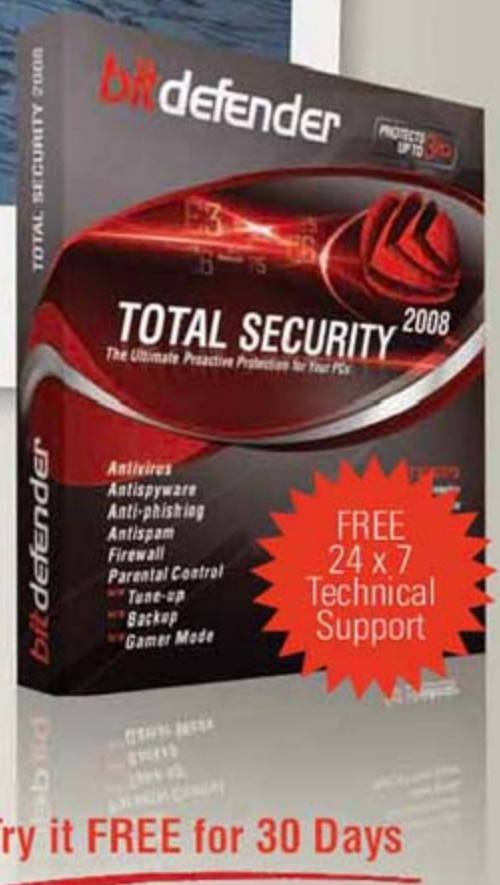
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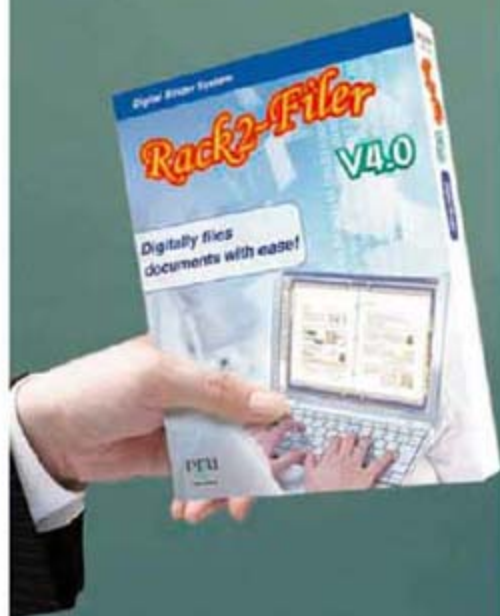
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Microsoft's Copy Protection: Time to Mend It—Or End It

SO HELP ME, I'm not irrevocably opposed to copy protection. Software developers have a right to be compensated for their work, and they're entitled to take steps to protect their intellectual property. I get that.

But Windows Genuine Advantage, Microsoft's antipiracy technology, is enough to turn anyone into a hard-core copy-protection opponent. And never more so than on August 24, when a bug on the company's authentication servers caused WGA to lose its ability to tell a legitimate copy of Windows from an unauthorized copy.

Suddenly, thousands of Microsoft customers saw messages informing them that their paid-for software was fake. Worse, WGA punitively disabled their access to features like Windows Vista's Aero environment and ReadyBoost accelerator—some of the very items that Microsoft had used to induce buyers to pony up for Vista in the first place.

Nineteen hours later, the company fixed the glitch, and users got their lost features back. All in all, though, the

Windows Genuine Advantage isn't just flaky and intrusive. It's an affront to all of us who pay Microsoft for our software.

most Microsoft-hating hacker couldn't have dreamed up a more telling exposé of WGA's fundamental fragility.

This was hardly the first time the technology had caused headaches for innocent Windows owners. It already had a reputation for mistakenly fingering users as running pirated software when they weren't: As posts in Microsoft's own forums show, innocuous activities like adding components to a PC or upgrading its BIOS can lead to trouble.

And when WGA does behave as it's meant to, it's still no picnic. Download Windows-related items from Microsoft, and you'll have to validate your operating system. Download some more, and you'll need to do it again. The process is especially clunky in Firefox.

Even the way Microsoft markets WGA is broken. Its customers deserve a straightforward acknowledgment that

the company is inconveniencing them to protect its profits, not platitudes about WGA existing mostly as a warning system for people who have unwittingly bought counterfeit copies of Windows.

That's not all they deserve. After the August meltdown, WGA senior product manager Alex Kochis blogged about measures the company is taking to lessen the damage "should anything like this happen again." Excuse me? Any copy protection that can accidentally deprive people of features they paid for needs to be rethought from the ground up. Microsoft owes its customers a WGA that's more predictable and less vindictive. It owes them copy protection that stays out of their face.

The Obliteration Option

Of course, the folks in Redmond could eliminate all of WGA's problems simply by eliminating the technology altogether. I don't expect this to happen, but it's not unthinkable. PC history holds multiple examples of software companies discontinuing the use of copy controls, from Lotus in the 1980s to Intuit after the 2003 tax season.

Every past instance of a product losing its shackles has had two things in common: There were unprotected competitors, and users told the developers behind the copy-protected ones that enough was enough. If I were Microsoft CEO Steve Ballmer, I'd take note of the fact that there's no such thing as Mac Genuine Advantage or Linux Genuine Advantage—and I'd listen very carefully to what customers have to say about copy protection in Windows.

Last time I checked, I wasn't Steve Ballmer, but I'm still interested in your thoughts on all this. Drop me a line at harry_mccracken@pcworld.com, with your take on WGA.

Read Editor in Chief Harry McCracken's blog at blogs.pcworld.com/techlog. ●

PICKS OF THE MONTH

AS I WAS finishing this column, the 27-inch TV I've owned for a decade died on me. I didn't mourn a bit, though—it was the excuse I needed to start shopping for a flat-screen HDTV.

I'm still looking, but my old set croaked at an opportune time: The PC World Test Center was wrapping up its examination of models for "LCD vs. Plasma: Which HDTV Is Right for You?" (page 110). Of the units we tested, I'm most intrigued by two from Vizio: the VP42 plasma and the GV42LF LCD. These sets aren't perfect, but they delivered some of the best images our jury saw, at prices much lower than those of most big-name high-def models. Sounds like a winning combination to me.



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Apple recently slashed the price of the iPhone by \$200. After many complaints from early iPhone purchasers, Apple relented, granting them each \$100 in Apple Store credit. Did consumers have a right to be upset, or should they just suck it up? Tell us what you think at find.pcworld.com/58647.



iPhone Price Cuts

Why is Steve Jobs not allowed to run his business and price products as he sees fit? Basically, early adopters paid about a \$2/day premium to have the latest, greatest technology. You crybabies pay more than that for your lattes at Starbucks. I'm glad to see the cuts, and I picked up two iPhones.

rakona, from the PC World forums

The problem with these whiny early adopters is that they invest their relationship with Apple with the same emotions that one would invest in their closest friends or relations. It wasn't about the 200 dollars, it's that their feelings were hurt. It's a corporation. It's not your best friend, nor your mother, nor your significant other. Companies are really just interested only in your money.

tundraboy, from the PC World forums

Apple's price reduction with just a \$100 store credit to early buyers is not justified. Other products are bought purely on their merit, but in the case of the iPhone, it was loyalty toward the brand. This would not have happened with any other phone. Apple's customers have every right to be disappointed.

Apple has truly failed their loyalty. Unless Apple gives them a \$200 cash rebate, they are not going to get the same premium for any of their other product launches.

ssivaprakash, from the PC World forums

Macs vs. PCs

I am a recent Mac convert but still read *PC World*. I would appreciate it if more attention was given to Macs. I realize that *PC World's* main focus is PCs, but I'd like to think you've grown beyond that, especially with the increasing popularity of Apple machines. Your September item on a security hole in QuickTime [*Bugs and Fixes*] never even mentioned if it applied to Macs. This is just one example of totally ignoring an entire market segment.

Alex Cullen, Indian Head, Maryland

Every month I see more and more positive references to Mac computers. It is almost as if some *PC World* editors, who must own Macs, are very subtly

The Wii is fun, and offers something different at a low cost.

Gazbin, from the PC World forums

promoting Mac computers in the magazine. I have nothing against Macs except that I don't own one and have no interest in one. If I was interested in reading more about Mac computers, I would subscribe to *Macworld*. I would appreciate it if *PC World* editors would stick to discussing PCs.

Ray Renfro, Winter Park, Florida

Acronym Confusion

I just tried to read an article in the September issue, "Early IPTV Uses Only a Little of Its Fat Pipe" [*Forward*]. Nowhere in it could I find out what IPTV was. It talked about FiOS and U-verse also. The article could just as well have been written in Chinese. I thought your magazine was aimed at the average computer user, not just the techies. In my experience people who like to use acronyms without explanation are trying to impress others, rather than inform. I expect better from *PC World*.

Louis C. Knoll, Virginia, Minnesota

Coauthor's response: After reading the article again, I think you have a good point. IPTV is not yet a household term, and the definition remains a source of confusion to a lot of people. IPTV usually refers to video delivered in packet form over fiber-optic or hybrid fiber-optic/copper networks using Internet Protocol. IPTV is not Internet video (like Joost or YouTube); it reaches the user through a "closed" IP network that is separate and distinct from the public Internet. U-verse and FiOS are the IPTV services offered by AT&T and Verizon, respectively.

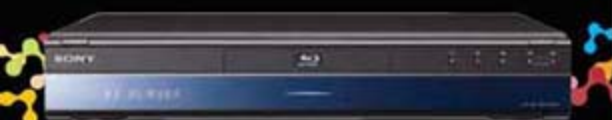
—Mark Sullivan

Sales Help Wanted

I really enjoyed Yarden Arar's September *Skeptical Shopper* column on tech salespeople. I for one have stopped shopping at Circuit City, and I have also encouraged my friends to stop shopping there as well. I think it's ridiculous that the company fired its

SONY.

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experienced salespeople to replace them with cheap labor. I now shop consistently at both Fry's and Best Buy. Keep up the good work.

Paul Hoch, Highland Village, Texas

SSN Privacy

We should prohibit using Social Security numbers as a password (find.pcworld.com/58665)! In a way, knowing my SSN shouldn't be any more valuable than knowing my address or telephone number. But using an SSN to access secure information without also requiring a securely established password should be prohibited. Paradoxically, I think the best way to eventually get there is for as many SSNs as possible to get lost and distributed. Once this really becomes a crisis, Congress will finally have the spur to take proper action.

umopapsidn, from the PC World forums

My bank and my cell phone provider have both asked me to say my SSN out loud in a room full of strangers in order to identify myself. My SSN is required to change service on my utilities. Insurance companies have gone to personal identification numbers and birth dates as identification; what's up with banks and utilities that they so casually expose their customers to ID theft? Do they just not care?

cwillia, from the PC World forums

E-Voting

Every voting system can be manipulated if someone really puts their mind to it. Electronic voting machines are probably safer than most. The integrity of the vote in any precinct is no better or worse than the integrity of the staff running the polling place and the competence of the county officials in setting up the voting machine layouts.

rgreen4, from the PC World forums

If there is an immediate paper trail that would let a voter verify that their vote was counted correctly and that can also be used to verify what the computer tallies come up with, then maybe e-vot-

ing should not be banned. There would also need to be random checks to make sure that the paper trail matches the computers.

smax013, from the PC World forums

It's bad enough that Vista is not backward compatible with older software, but why didn't Microsoft make Virtual PC 2007 compatible with all versions of Vista?

*Chris Matteson,
Hummelstown, Pennsylvania*

Computers are just not secure enough to be used for something like this. If we Americans really care about our country, and really care who runs it, we would realize that we have to have a secure system for choosing who we want as our leader. If that means going back to paper voting, bolting the ballot box to the floor, and having two armed security guards standing next to it, I don't care! Let's do it!

MattMik, from the PC World forums

PC World welcomes your feedback. We reserve the right to edit for length and clarity. Share your thoughts in the Comments area under each story on our Web site, or visit our Forums (find.pcworld.com/55165). Send e-mail to letters@pcworld.com. ●

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RATE THIS ISSUE by going to www.pcworld.com/pcwinput—you could win a \$300 Amazon.com gift certificate. The site explains the official rules and offers an alternate method of entry into the prize drawing.

CORRECTION

SEPTEMBER'S ANSWER LINE tip "How do I tell if my computer is a zombie?" should have said that Symantec's Norton AntiBot Beta was only temporarily free; it now costs \$30 after a 15-day trial. PC World regrets the error.

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¹Requires HDMI connector (sold separately) and compatible HDTV with 1080p display capability. Certain circumstances may limit/prevent Blu-ray Disc or DVD disc playback. Features and specifications are subject to change without notice.

²Based on A.C. Nielsen VideoScan Reporting as of 6/17/07.

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Vista Resistance: Why XP Is Still So Strong

If you still don't see a need to upgrade, you're not alone—many people are opting for XP even on new PCs. We'll show you how the Vista transition will become smoother.

BY ERIK LARKIN

WINDOWS VISTA IS facing stiff competition from an unlikely source: Windows XP.

The six-year-old operating system is showing surprising strength more than half a year after the full launch of its successor. In April, Dell acknowledged continued XP demand and resumed offering XP as an option on new systems. In July, Microsoft chief financial officer Chris Liddell ratcheted up the percentage of OS sales the company expects XP to account for in fiscal year 2008 from 15 percent to 22 percent. Finally, in August, Microsoft announced an XP Service Pack 2c release that does nothing more than add new Windows XP product keys so the company can keep selling the OS to businesses



SOFTWARE DEVELOPER MARK Sanford doesn't see a "must-have kind of feature" in Windows Vista.

through January 31, 2009.

The wait-and-see approach of Mark Sanford, a 40-year-old software developer in San Francisco, seems typical of many users. Sanford's PC—with a 3-GHz CPU, 2GB of memory, and a 256MB video card—could handle Vista, but he says he has no plans to upgrade from XP. Sanford says he's gotten to know XP's idiosyncrasies, and has his network and software running smoothly on the aging OS. "XP is plenty good

enough," he says. So nothing is pushing him away from XP, and likewise nothing is pulling him strongly to Vista.

"The Aero interface is beautiful," he says, but "When I look at Vista, there's really nothing there that's a must-have kind of feature."

Behind the Pace

Certainly sales of Vista aren't blowing away XP in stores. Chris Swenson, director of software industry analysis for the NPD Group, says that,

from January through July of this year, XP sales accounted for a healthy 42.3 percent of online and brick-and-mortar retail OS sales. By contrast, from January through July of 2002, after XP's launch in October the year prior, Windows 98 accounted for just 23.1 percent of retail sales. (Windows Me launched after Windows 98, but it didn't supplant the older OS.)

Of course, retail sales are only part of the story. With PC prices dropping over the

Microsoft has big plans for Vista's first service pack. For more details on the fixes SP1 includes, see find.pcworld.com/58683 or visit our Windows Info Center at www.pcworld.com/ic/windows.

past few years, and with Vista's higher hardware requirements, it's a "no-brainer," according to Swenson, for many people to buy a new PC rather than upgrade an old one. And the large majority of Vista users get the OS on their new systems.

Still, PCWorld.com visitors don't seem to be in any rush to switch to Vista. Our traffic numbers show Vista machines accounting for just 10 percent of the traffic to our site during September (see "Vista vs. XP After 8 Months," on page 28).

Dell, which offers a choice of Vista or XP on its new computers, is staying close-lipped about how many XP computers it sells compared with Vista. But Michelle Percy, manager of the global marketing software team at Dell, confirms that the company is seeing the same trend as Microsoft: XP sales will be higher than expected during its next fiscal year.

Apple Impact?

XP satisfaction might keep many people from picking up a Vista box at the store, but another, more surprising

factor may be leading others to buy a new copy of XP instead of Vista: Apple.

While Windows PCs still outnumber Macs by a large margin, the latter are becoming much more popular. Stephen Baker, another analyst with the NPD Group, notes that more than one in six laptops sold at retail are MacBooks. Those figures don't include direct sales from huge vendors like Dell; if they did, Apple's market share would shrink significantly. Nevertheless, the statistic underscores that many people are buying Macs.

In years past, switching to a Mac meant saying goodbye to all of your Windows software. But today's Intel-based Macs can happily run Vista or XP, either natively with Apple's Boot Camp or in virtualized form with Parallels or VMWare Fusion—if the new Mac buyer also purchases a copy of Windows.

That's just what Sanford's mother did recently, he says, when she bought a new MacBook, intending to run Windows on it as well. Given the choice between a copy of Vista that may or may not run all of her current Windows software, and a cheaper copy of XP that definitely will, she opted for XP.

Hurdles for Gamers

Similarly, many gamers are choosing the supposedly outdated OS for new purchases. Dell's Percy says that a large majority of consumers buying new PCs decide on Vista, but that the choosy gaming crowd is one niche group that seems to prefer XP. One reason, she

says, is the lack of games that take advantage of Vista's DirectX 10. Also, the normal performance and compatibility issues encountered with a new OS might merely annoy an everyday user, but to gamers looking for top speed, they're a killer.

For example, older games that use DirectSound 3D got short shrift in the new OS, since Vista lacks the audio feature entirely. (And without support for that API, sound cards capable of accelerating DirectSound lost much of their utility.)

Newer games that use the OpenAL standard Vista sup-

ports won't suffer, but older favorites such as Blizzard's Diablo 2 require a software workaround from Creative Labs to run with surround-sound effects—or in some cases, to run at all.

Transmuting Sound

Creative's ALchemy software (find.pcworld.com/58643) for older games translates the games' DirectSound output into OpenAL. Having to use ALchemy is a minor annoyance, but absent some compelling reason to switch to Vista, it's one that most gamers would rather avoid.

Michael Gartenberg, >>

PLUGGED IN



PALM FOLDS THE FOLEO: Scary news. If companies stop putting out incredibly silly and ill-advised products, what will we have left to talk about?



IPHONE PRICE CUT: Only Apple could make users complain that prices dropped too far, too quickly. Enjoy your \$100 at the Apple Store, whiners!



GOOGLE PHONE RUMORS: We'll have to see the hardware, but a phone for Google Apps would be sweet. Let's hope it costs less than a share of Google stock.



NBC DUMPS APPLE FOR AMAZON: Guess we'll have to get *Heroes* on our iPods from BitTorrent or friends' ripped DVDs. Just how you planned it—right, NBC?



THE RINGLE: Nice job, music industry! Your hot new concept (ring tones bundled with CD singles) sounds like those chips that come in a tennis ball can.



CAMERAS WITH YOUTUBE MODE: We are all for more clips of people playing the Super Mario Bros. theme song, but are camera vendors this bereft of ideas?



TIMELINE

Key Dates in the XP/Vista Transition

- **JANUARY 2008:** XP no longer sold to consumers
- **FIRST QUARTER 2008:** Vista SP1 release
- **JANUARY 2009:** XP no longer sold to businesses
- **APRIL 2014:** XP extended support cutoff

vice president and research director at Jupiter Research, says that he isn't surprised to see many people still choosing Windows XP over Vista.

"Microsoft's competition is always what their last operating system revision was," he says. "And in this case, XP was pretty good."

Gartenberg doesn't see the same kind of "burning drive" to upgrade from XP that many people had when upgrading from Windows Me, for instance. He notes that people lined up to buy XP; but now, "consumers and businesses have learned to be a little hesitant about adopting new products."

Vista SP1 Is Coming

And businesses are understandably hesitant. Vista's improved security and other features could be a boon to business, but IT staffs that have spent the past six years smoothing out an XP network and training users are loath to consider upgrading to a new OS before it has had much time to settle.

"Any number of people are saying, 'Wait for SP1,'" Gartenberg points out.

Dell officials echo that observation. "We're hearing that from our customers today—that they're waiting for SP1 as a signal of code stability," Dell's Percy says. "That's historically very much in line with what has happened in every major OS transition."

But such waiting now has an end date, since Microsoft announced that it will release a final SP1 for Vista in the first quarter of 2008. That will follow a September release of an SP1 beta, giving on-

Vista vs. XP After 8 Months

HOW IS WINDOWS Vista doing in comparison to XP? Visitors to PCWorld.com are adopting the OS far more slowly, as these numbers from our Web site tracking data indicate.

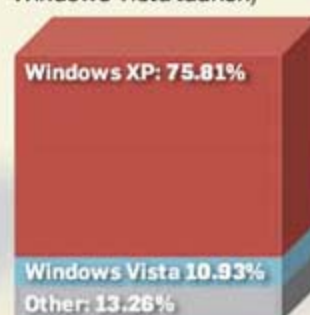
JUNE 2002

(Eight months after the Windows XP launch)



SEPTEMBER 2007

(Eight months after the Windows Vista launch)



the-ball companies time to test its many compatibility and performance fixes.

According to Microsoft's overview document for the SP1 beta, Vista's first service pack will offer improvements for security, reliability, and performance, and more support for emerging hardware and standards. In addition, the company will continue to introduce drivers to support more devices, bumping Vista's count from 1.7 million in January 2008 to 2.2 million in July. But SP1 "does not deliver substantial new operating system features,"

according to the document.

BitLocker Drive Encryption will receive an upgrade, and security companies will get long-awaited programming interfaces to work with the 64-bit version's kernel patch protection. Microsoft also says that SP1 will boost reliability on systems upgraded to Vista from XP, and that it will offer better compatibility with printer drivers.

Performance Tweaks

After the release of SP1, Vista should be faster at copying and extracting files, according to Microsoft, and should

wake more quickly from Hibernate and Resume modes. Company engineers should have corrected a bug involving slow network file-share browsing, too, as well as the occasional 10-second delay before a password prompt pops up when you press <Ctrl>-<Alt>-<Delete> to log in after resuming your PC.

Also, we may see further Vista-focused game development after SP1 adds support for Direct3D 10.1, which expands the API to allow game developers to "better take advantage of a new generation of Direct3D graphics hardware," according to Microsoft's SP1 overview.

So what does all of this mean for Microsoft? Though the company might not have liked adjusting its 2008 forecast to account for more people buying XP, CFO Liddell says that the expected income from OS sales "is still exactly the same," and Redmond's bottom line should be fine. "We tend to get paid either way," Liddell says.

These fixes, along with the many others promised for SP1, may suffice to lure current consumer and business holdouts to the new operating system. But come January, you may not have much of a choice for new computers, even if you're still on the fence. Percy says that for Dell customers, "XP as a readily available OS will come to an end" next January for consumer PCs, in keeping with Microsoft's current plans. Businesses will have a wider window: The new SP2c build of Windows XP will be available through January 2009.



CREATIVE'S ALCHEMY SOFTWARE lets games designed to use DirectSound 3D run under Windows Vista, which doesn't support the API.



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Great images begin with great lenses. But it's not just unparalleled optics that keep Canon at the forefront of imaging. It's inspiration, the inspiration to constantly innovate. To develop technologies that redefine the industry standard, and to create cameras and lenses that inspire photographers to take their photography to the highest level.

Search Evolution: New Ways to Get Better Results

IF YOU'RE READY for a new take on Web searching, a bunch of beta services are set to offer novel ways to search and to organize your results. Imagine stacking those listings on virtual shelves for easy retrieval the next time you need them, or flipping between results via 3D tabs. And now you can even troll for information by speaking your search terms to your cell phone. The beta services that are offering these and other innovations promise to turn conventional Web search on its ear.

Searching for Meaning

Google's relevance rankings have served Web searchers well, but search is more than a numbers game. Technology developed by Hakia (www.hakia.com) attempts to extract meaning from phrases on the Web and in search queries. The service suggests that you search in phrases or questions, and those phrases are highlighted in the results to make them easier to browse. Hakia's Semantic-Rank algorithm is designed

These services add voice recognition and results focused on meaning, but Microsoft's fresh-looking Tafari engine may well make the biggest splash.

to consider the credibility of sources and to enable the engine to learn how to make better choices in the future.

But there are times when entering any text is inconvenient. If you're on the road and need to search via your mobile phone, you can speak your searches using Vlingo (www.vlingo.com; currently available only to Sprint customers). Most phone-based voice-recognition systems accommodate a limited vocabulary, but Vlingo claims that its Hierarchical Language Models allow you to say anything and be understood. The system attempts to predict what a user is likely to say next based on the context of the previous words. Vlingo's technology also adapts to understand new words, and



MICROSOFT HAS USED its Silverlight platform to make Tafari one of the most visually interesting of the new beta search engines.

to improve accuracy by learning individual speech patterns as one uses the system.

Wrangling Results

Enter a term in the search box at Microsoft's Tafari (www.tafari.com), click Go, and the service swirls into action: The search box slides to the top left, and five icons spin into view below it for searching the Web, news sites, images, books, or RSS feeds.

Tafari's animated interface is one of the first apps developed for Microsoft's Silverlight environment (a technology challenging Adobe's ubiquitous Flash player).

Instead of sponsored links on the right side of the results, there are five empty shelves. Drag your results onto a shelf to save them in "stacks"; then log in to a Windows Live, MSN, or Hotmail account to see your saved searches the next time you open your browser. You can give your stacks names, send a stack to someone via e-mail, or post it to your Windows Live Space blog.

Search Gets Personal

If you're looking for someone rather than something, Spock (www.spock.com) may be able to help. After you create an account by providing your name, gender, and e-mail address, you fill out your profile by tagging yourself with your hometown, your interests, your high school or college, and any other information you wish. You can also choose to have a tagless profile, but where's the fun in that?

Of course, you can search for people by name, but you can also search for them by location, interest, age, sex, or other characteristic ("Incarcerated Celebrity" seems to be a favorite). The service keeps a history of your searches, and automatically lists your ten favorites.

There's a definite social aspect to Spock, and the demographic seems to skew to the 20s and 30s. But I'll wait before providing much data in my Spock profile, just to be on the safe side.

—Dennis O'Reilly



HAKIA, A BETA search engine, claims to extract more meaning from phrases and questions than search engines that focus on keywords.



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MTV, Real, and Wal-Mart Shake Up Digital Music

THE DIGITAL MUSIC industry is headed for a crossroads, as more stores and record labels try out DRM-free music sales, and as some of the bigger names in digital music team up to offer a new service.

MTV and Real Networks announced in August that they would create a new music service based on Real's Rhapsody service and MTV's music content and packaging. Verizon will deliver portions of the service through its V Cast music offering.

Verizon will eventually allow for tunes purchased through V Cast to be accessible through a Rhapsody account and for transfer of music from a Rhapsody account to a mobile phone.

At press time, MTV and Real had not set a launch date for the new service.

Meanwhile, Rhapsody and Wal-Mart began selling DRM-free selections from Universal's music catalog, and Real Networks CEO Rob Glaser believes that 2008 will be the year DRM-free goes mainstream for purchased digital music.

Recently, Apple debuted a new iTunes Wi-Fi Music Store that lets iPod Touch and iPhone owners purchase songs directly on their devices. The devices will also enjoy free Wi-Fi access at Starbucks locations in 2008.

—Eric Dahl

GEEKTECH TOM MAINELLI



Virtualize This: The Pleasures of a Virtual PC

I LIKE TRYING out lots of new software. But when I uninstall a stinker, I know it is probably leaving behind chunks of code that will bog down my system over time. So lately I've been trying out new programs on a virtual machine.

A virtual machine (VM) is essentially a stand-alone virtual PC—complete with its own operating system and applications—that runs inside the operating system of your real-world hardware. A VM accesses the processing, memory, storage, graphics, and audio resources of that hardware, but doesn't own it. It's a software

creation, easily disposed of when you are done experimenting with apps you have installed.

Virtualization has been around for years but has only recently become popular with corporate IT types eager to squeeze more work out of pricey, powerful—but often underutilized—servers.

In the past, hardware limitations made virtualization dog-slow and more trouble than it was worth. Fortunately, most current PC CPUs include extensions that make virtualization run more smoothly; these chips also offer more processing power than what all but the most demanding apps require, so typically there are plenty of cycles to go around. Most of today's PCs also have more than enough hard-drive space and memory to accommodate one or more VMs in addition to the host OS.

Viva la VM

The possibilities are numerous. I wanted a test PC to try out new apps without putting my regular system at risk; similarly, you could create specific PCs for specific users, such as your kids. If little Timmy is using a VM, he can't destroy the family tax documents stored on the regular PC—plus, it's much easier to re-create a pristine VM than to clean up a real PC.

Virtualization software is ideal for trying out new software—and keeping your real PC clean.

VM software also allows you to run multiple and different operating systems. For example, if you're interested in trying out Linux, you can run that OS in a VM. Or maybe you'd like to revisit an old program that runs only in Windows 2000. If you still have your Win 2K installation disks, you can set up the OS in your virtual machine—and you're off to the races.

Before you try out a VM, be sure to check the hardware requirements. If your PC's RAM is struggling to keep pace with your current OS demands, it won't like serving additional masters.

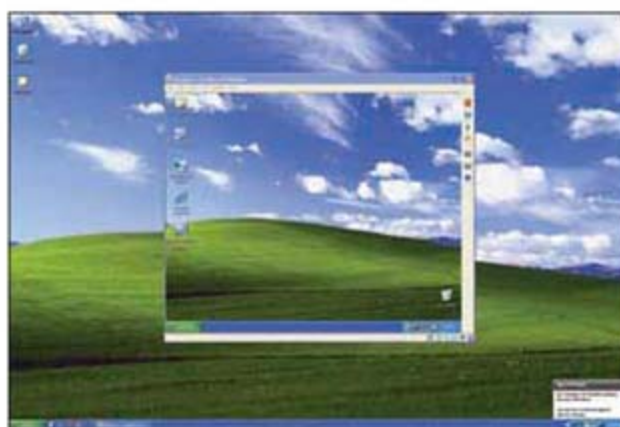
VMWare Player (find.pcworld.com/58659) is a great virtualization starter app.

This free program gives you easy access to no-cost virtual appliances, from security tools to Linux operating systems. However, you can't create your own VM with Player; to do that, you need VMWare Workstation 6, the feature-laden granddaddy of the category with a price to match (\$189 online after a 30-day trial).

Parallels Workstation 2.2 for Windows and Linux (find.pcworld.com/58661) supports a long list of Windows and Linux operating systems and has a free 15-day trial period, after which it costs a reasonable \$50.

Other virtualization apps include Microsoft Virtual PC 2007 (find.pcworld.com/58662), a free download that offers VM support all the way back to Windows 98 and OS/2 Warp (but no Linux), and Symantec's Altiris Software Virtualization Solution 2.1 (find.pcworld.com/58663).

Whichever app you try, expect to spend a bit of time getting it up and running. Then go out and have a little virtualized fun!



WINDOWS IN MY Windows: Parallels Workstation creates a virtual PC for trying out applications and alternative OSs.



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Acer to Buy Gateway—Will PC Prices Rise?

Several well-known PC brands are about to consolidate. Will the decreased competition mean higher prices? Here's what we think will happen.

WITH GATEWAY (AND its budget brand, eMachines) set to be acquired by Acer in a deal approved by U.S. anti-trust regulators this September, you might notice fewer options next time you shop for a PC. We asked industry experts to help us sort out what the proposed deal will mean for anyone looking to buy a new system or to get service on an existing Gateway or eMachines PC.

The full answers to these questions won't emerge for quite a while, but here are our best guesses.

Q: Will decreased competition make prices jump?

A: "PC pricing is not likely to be affected, as brand competition tends not to impact pricing as much as configuration trends and supply costs," says NPD Group analyst Stephen Baker, adding, "Everybody thought that would happen when HP bought Compaq. But we haven't seen anything that would make prices go up." In fact, with Gateway in the fold, Acer could cut better deals with its suppliers.

Q: What happens to support for Gateway and eMachines computers?

A: Details are few regarding plans for melding the firms. Gateway can say only that its immediate operations will not be affected.

Q: Will the Gateway and eMachines brands live on?

A: According to analyst J.P. Gownder of Forrester



Research, Acer will probably employ spiffier designs and faster processors to add cachet to the Gateway and eMachines labels, which are often seen as "bottom dwellers" that specialize in selling low-cost PCs. And Acer's president indicated that the company plans to

keep, and perhaps even expand, the Gateway brand.

All three names will continue to exist somewhere, but it would be costly for Acer to maintain all of them in a single market. HP similarly tries to differentiate between its HP Pavilion products and its Compaq Presario line, but the distinctions among the brands can get a bit messy.

Which Acer brands will prevail will depend on which market you're talking about—and how successful the brand may already be there. For example, Gateway is the fourth-biggest PC brand in the United States and popular among consumers, but Acer currently is stronger in Asia and Europe.

—Melissa J. Perenson

iPhone Unlockers Face Opposition

iPHONE OWNERS eager to unlock Apple's smart phone from AT&T's network and contract now have several software options available, including a free, graphical-interface-based program.

An iPhone Dev Team released the free unlocking application known as AnySIM just one day after several resellers had begun shipping the first commercial software that unlocks the iPhone. Wireless Imports, the one U.S. dealer handling unlocking software developed by iPhoneSIMFree, was charging \$99 for the hack, but wouldn't guaran-

Hackers have unlocked Apple's iPhone—for now. With Apple vowing to fight the unlockers, the cat-and-mouse game has officially begun.



tee that the unlock will survive Apple's next iPhone update. According to the company, "If your handset becomes locked you will be

charged to unlock it again."

And that could become a serious problem, with Apple CEO Steve Jobs confirming that the company will combat iPhone unlocking. "It's a cat-and-mouse game," says Jobs. "We try to stay ahead. People will try to break in, and it's our job to stop them breaking in."

The legal landscape behind these unlocks also grows a bit complicated—Apple and AT&T have a case against unlockers under the U.S.

Digital Millennium Copyright Act. But an exception to the DMCA's anticircumvention provisions allows individual mobile phone users to unlock their devices for use on other networks.

So while unlocking the iPhone yourself is not likely to be a DMCA violation, posting instructions or code online, even for free, may prompt a cease-and-desist letter from an unfriendly lawyer, and selling software or a device that unlocks the phone is inviting trouble, according to many intellectual property lawyers.

—Grant Gross
and Gregg Keizer



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Treo Lite: Palm's \$100 Centro Smart Phone

WHILE FINANCIAL pundits debate Palm's long-term prospects and naysayers point to the failed Foleo, the company's latest handset—the Centro—proves that Palm still knows how to design a pleasing product.

For \$100 (but only after rebates, for a two-year contract and a data plan, that cut the list price of \$400 by three-quarters), the Centro delivers the trusty Palm OS (version 5.4.9) in a petite candy-bar phone that supports Sprint's superspeedy EvDO data network.

Unlimited data runs \$25 or \$30 (depending on messaging options). All in all, it's a promising replacement for an aging Treo 600 or 650.

—Yardena Arar

Camera: 1.3 megapixels with 2X digital zoom and a video capture function.

Colors: Ruby Red (shown) or Onyx Black.

Battery: Removable rechargeable 1150-mAh lithium ion, rated for 3.5 hours talk time and up to 300 hours standby time.

Sideload: A Micro-SD slot (next to the battery) supports cards of up to 4GB.



Dimensions: 4.2 inches high, 2.1 inches wide, 0.7 inch thick; 4.2 ounces.

Display: The 320-by-320 transreflective touch screen supports up to 65,000 colors.

Instant messaging: AIM, MSN, Yahoo; and you can chat in all three at the same time.

Bundled software: Documents to Go, Google Maps, PocketTunes Deluxe—and Palm even throws in Sudoku.

BETA WATCH ED ALBRO



Penelope: New Look for Thunderbird and Eudora

This beta is not so much a full program as it is a free extension that can add new interface elements and features to Mozilla's Thunderbird e-mail app or to Eudora, the grizzled e-mail vet that's now based on Thunderbird. In addition to snazzier icons and shortcuts, you also get nice customizable toolbars so you can add a button that creates a message to a specific person, for example. find.pcworld.com/58639

Animoto: Video From Your Images and Music, Automatically

Animoto has the potential to be seriously addictive. After you upload some pictures from your hard drive and an MP3 file that you think will go well with the images, Animoto puts them together in a video. The site's "creative artificial intelligence" puts clever transitions between the images and matches the movement to your tunes. Thirty-second videos are free; longer ones cost \$3 each, or you can make as many as you want for \$30 a year. Fun! animoto.com



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Like Del.icio.us, Diigo lets you bookmark and tag pages and store those bookmarks on the Web. And as with Ma.gnolia, you can set up groups of like-minded Web wanderers who share bookmarks. But Diigo, which is free, adds some nifty new features, including the ability to add sticky notes to a page, highlight passages of text, or blog your clippings and notes with just a couple of clicks. www.diigo.com



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A New Way to Print Any Document on the Road

FROM MISSING USB ports to not having the right application, plenty of obstacles can prevent you from printing your files on the road. CloudPrint (cloudprint.hpl.hp.com), a free beta app from Hewlett-Packard Labs, aims to solve those problems by taking printing to the Net.

To use CloudPrint (we tested version 0.71), you download and install a new printer driver. Then, when you want to print a document to the service, you select the CloudPrint print driver and enter a document title, your telephone number (which serves as a sort of account ID for retrieving documents later), your name, and any telephone number(s) you want to have the DocID sent to via SMS (you can also opt not to have a text message sent).

The system then uploads the document and assigns an ID code to it. To print a document from CloudPrint, all you need is that code, your telephone number, and a printer attached to a PC with a browser that supports the embedded Adobe Acrobat reader (which should encompass the majority of browsers you'll encounter). Or you can enter your address or zip code at the site and get a directory of available local printers (fee and free).

—Melissa J. Perenson

GADGET FREAK DAN TYNAN



The Sounds of Things to Come

DID SANTA LEAVE an HDTV under the tree last year? If you've been very, very good, he might leave a new surround-sound receiver this time. If he doesn't, you may have to take matters into your own hands.

Your big excuse: high-definition audio. This year, midrange and higher audio video receivers, or AVRs—

costing \$500-plus—will have HD audio decoders built in, so you'll be able to connect a Blu-ray, HD DVD, or high-def cable/satellite box to your receiver via HDMI and enjoy uncompressed audio at higher bit rates.

The difference between HD and stereo audio is like the difference between HD and standard video. Once you go high-def, you won't go back.

If you already have an HD or high-end DVD player plugged into your home theater, the change won't be quite as dramatic, because your player already decodes HD audio. Even so, having this capability built into the receiver will give you better control and a richer sound experience, according to Jeff Talmadge, director of product development at Denon, a manufacturer of audio equipment.

Speaker Overload

Your new AVR is also likely to be a 7.1 system, though you may not have much use for the extra two speaker ports. Nearly all movies are mixed for 5.1, in part because Hollywood hasn't settled on how to use those other two channels, says Craig Eggers, senior product manager for Dolby. He expects the industry to nail down a definition of 7.1 sometime next year.

If your receiver supports Dolby Pro Logic IIx, it can convert a 5.1 soundtrack to 7.1 sound.

Of course, if you have \$5500 to spare, you can buy an 11.2 receiver from Yamaha and be set for the next decade. But unless you have a dedicated home theater room or are a single

guy in a cave, you're unlikely to have all those speakers and wires cluttering your house.

Panasonic and Samsung offer 5.1 systems with wireless rear speakers, which reduces the wiring problem slightly. A bigger trend, though, is virtualization—that is, single-cabinet systems that mimic the effect of surround sound.

Improvements in digital signal processing allow manufacturers to generate surround-sound effects through ever smaller boxes, says Vineet Ganju, marketing manager for Texas Instruments' Performance Audio division. For \$800 to \$1800 you'll find one-box systems from firms like Boston Acoustics, Philips, Polk Audio, and Yamaha that sound as good as many multispeaker setups—minus the clutter.

Tune In All Over

The future of your receiver is connectivity. Denon has a new line of Wi-Fi-enabled receivers that can stream music from your PC, your iPod, or Internet radio stations. These devices start at \$1600, but prices have dropped 20 percent in a year, Talmadge says—and that trend should continue. (See our review of streaming media alternatives at find.pcworld.com/58417.)

As surround sound grows more mainstream, it will move into your car, your handheld media player, and even your phone, says Shawn Hopwood, director of evangelism for Coding Tech-

nologies, developers of the AAC codecs.

Its MPEG Surround format can deliver full six-channel audio in half the bandwidth of a stereo MP3 file. MPEG Surround

codecs are being added to PCs this fall and handhelds next year. Plug in Bluetooth headphones that can do surround-sound virtualization (they're coming), and you'll be able to have a surround-sound experience anywhere—no home theater necessary. Sounds good to me.



RECEIVERS LIKE THIS one from Denon produce high-definition audio and surround sound.



you could if you wanted to

A furniture solution for work sessions that go into the wee hours? Well, actually it's just a whimsical "what if." But it proves that Anthro's built-in modularity helps you do things with furniture you never thought possible. Here, for example, is our extra-strong AnthroBench



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Digital SLRs Go Mainstream

WHAT'S BEHIND THE jump in the number of walkabout photographers toting digital SLR cameras rather than smaller point-and-shoots? Three things: wider availability, lower costs, and better features.

Once confined to the realm of enthusiast or professional photographers, digital SLRs now have greater appeal to more-casual photographers. And fortunately for digital SLR buyers, prices on these models continue to drop. According to imaging market research firm InfoTrends, the average selling price of a digital SLR in 2006 was \$966—and is expected to fall to about \$775 in 2007.

Meanwhile, as digital SLR cameras grow in popularity, midrange units like Nikon's \$1799 D300 (body only) and Canon's \$1299 EOS 40D (body only) have begun to incorporate both high-end features from professional cameras and more user-friendly features from point-and-shoot cameras.

Though both models bring professional-level features to consumers, both aim to attract photo enthusiasts and professionals as well. "[The manufacturers are] trying to make it easy for someone to move up from a point-and-shoot to an SLR by adding scene modes, auto settings, and live view [features]," says David Haueter, an analyst at InfoTrends. Camera makers are also "trying to appeal to some of the pros to use [one of] these mid-range models as a backup camera," Haueter adds.

Here's a look at some innovative features common to new digital SLR cameras.

—Melissa J. Perenson ●

Enhanced autofocus: High-end autofocus features are migrating down from more-expensive cameras. Canon's 40D uses nine high-precision points, while Nikon's D300 has a 51-point system.

More scene modes: As digital SLRs attempt to appeal to a more mainstream audience, they've begun to build in more of the user-friendly scene modes found on lower-cost point-and-shoot cameras, such as night-portrait and sports.

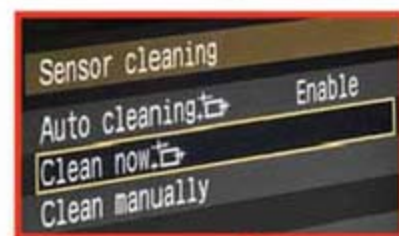


Live LCD preview: Olympus was the first to offer live LCD preview capability, on its eVOLT E-330 digital SLR, introduced a year ago. Both the Canon 40D and the Nikon D300 incorporate live preview, and the feature is rapidly becoming standard on digital SLRs.



Picture style settings: These style settings can cut down on the image editing work normally required to achieve a particular effect, by applying some minimal post-processing within the camera.

Dust reduction: Dust can be a problem on any camera that allows you to change lenses, but most of the newer models can now clean themselves automatically and reduce the effects of dust when it does appear.



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*Subject to the range and capabilities of your wireless router and access to electricity.

Six steps to *Lexmark removes the heavy cost and heavy lifting to help you cut the cord once and for all* **fast and easy** wireless printing

LET'S DEBUNK SOME POPULAR MYTHS.

George Washington had wooden dentures (*they were made of human teeth and ivory*). Wireless printing is expensive (*absolutely not!*). And setting up a wireless printer is very difficult (*can you spell e-a-s-y?*).

Wireless printing enables multiple users to share one printer for optimal efficiency. And the print quality in the wireless world is exactly the same as it is in a hard-wired environment.

Now, thanks to Lexmark and its new line of affordable wireless printers and all-in-one devices, cutting the cord is easier than ever. Just follow these simple steps to quick wireless printing.

STEP 1 – Determine if your computer is wireless-capable. In the last three years many notebook computers were sold this way. If yours is not wireless-capable, it can be made so by adding an inexpensive wireless adapter.

STEP 2 – Install a wireless router to serve as the Wi-Fi access point or hub of the network. During installation you will need to identify this network on each wireless computer and printer or all-in-one device. Wireless routers are easy to install, and their costs have declined in recent years.

STEP 3 – Check to see if you have broadband Internet access. While you can use your wireless router without Internet access, or use dial-up, there is real value in accessing online content via high-speed connections such as cable modems and DSL.

STEP 4 – Purchase a wireless printer or all-in-one device, like the Lexmark X4550 wireless all-in-one for only \$129.99*. To find out more, go to www.cutthecord.com.

STEP 5 – Decide on a security solution that fits your needs, at a minimum looking for Wi-Fi Protected Access (WPA) and WPA2 security to encrypt signals from wireless computers to wireless printers and to set passwords for printer access.

STEP 6 – Follow the intuitive, straightforward instructions that appear on the on-screen software installation guide for your wireless printer, which is fully illustrated. With Lexmark wireless devices, it's easy to choose the right selections. The entire process of setting up your Lexmark wireless printer takes only minutes.



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Consumer Watch

Some Sales Reps Mislead to Sell Backup Discs

BY TOM SPRING

WHEN IAN GRIFFITH of Queens, New York, bought an HP notebook from a Circuit City store in Brooklyn earlier this year, the salesperson urged him to have the chain's in-store Fire Dog technicians create Windows XP recovery discs in case Griffith needed to reinstall the operating system.

"I specifically asked if this was something I could do on my own," Griffith says, and the answer was no. The sales clerk, Griffith says, insisted that there were two ways to obtain such discs: have them made at the store for \$30, or buy them from HP for nearly twice as much.

But these assertions aren't true. Recovery discs aren't hard to make. And if you don't want to burn your own, you can buy them from HP for half what Circuit City charges.

Griffith, who ultimately declined the Fire Dog service following a last-minute consultation with a PC-savvy friend, is one of several laptop and desktop buyers who contacted us after having an experience of this type when attempting to purchase a machine from Best Buy or Circuit City.

But both retailers deny having a policy of telling customers that they can't create recovery discs themselves.

To investigate, we shopped for notebooks at Circuit City and Best Buy stores in the Boston and San Francisco areas.

Test Buys

In our informal tests we found that, though some Circuit City sales reps pushed hard for us to pay the extra \$30 for store-made recovery discs, all of them ultimately acknowledged that we could make them ourselves (and at least one volunteered the information). On the other hand, salespeople at

three of the five Best Buy stores we visited told us we could not make the discs ourselves and would need Best Buy's assistance. Our only alternative, they said, was to buy the discs from the notebook's manufacturer at a higher price—sometimes twice as much as what the store was charging.

At the Best Buy in Watertown, Massachusetts, a sales rep

who sold me an Acer Aspire 5570 notebook told me the system didn't come with backup discs (which is technically true). But the rep also said I'd have to purchase them from Best Buy for \$30 or directly from Acer for upward of \$80. Two cash register clerks confirmed this.

I declined the restore discs and, back at my office, created my own in an hour or so from a hard-drive partition created for that purpose. Both a brochure and the user manual accompanying the laptop recommended making backup discs before beginning regular use of the notebook.

The Vendor Option

I also discovered that paying a PC vendor to make the discs costs a lot less than some sales reps at retail outlets indicated: HP sells recovery discs for most of its notebooks for

\$15 (shipping included) through its technical support services. An Acer representative told me that the company charges \$40 for notebook recovery discs, plus \$10 for shipping.

Best Buy spokesperson Jeff Dudash said my experience at the company's Watertown store may have been due to miscommunication between the sales rep and me. Best Buy doesn't push recovery discs by saying customers can't create them, he added; rather, disc creation is offered as a convenience to customers.

Dudash called creating those discs "a process that, while possible [for customers] to do on their own, can be cumbersome to the average PC buyer." Still, in the wake of my

We found some sales staffers at Best Buy and Circuit City urging PC buyers to pay for store-made recovery discs that they could create themselves.



Recovery discs may return a PC to its factory state—wiping out your data and apps. Go to find.pcworld.com/58441 for instructions on creating a Windows CD that will perform a nondestructive reinstall.

queries, Dudash said Best Buy would try to make clearer to customers that having Best Buy create recovery discs is an option, but that they can do it themselves.

Similarly, Circuit City spokesperson Jackie Forman denied that the company advises its sales reps to tell customers they can't create their own recovery discs. Like Best Buy, Circuit City offers disc-creation service as a convenience to customers who don't want the hassle of doing it themselves. "Many customers are time-constrained and find the service a great value," Forman said.

Up-Sell Pressures

Dudash and Forman said their companies' respective sales staffs don't work on commission and therefore have no incentive to pressure customers to purchase additional hardware and services.

At least at Best Buy, however, sales reps are rewarded for selling more products and services through what is informally called a "score card" system, according to a Best Buy employee who asked not to be identified. The employee told me that sales teams that score well receive the opportunity to work longer shifts (and make more money since they are paid by the hour).

Dudash confirmed the score-card approach to staffing, but denied that it might contribute to a high-pressure sales environment. "Every employee is trained to create a no-pressure sales environment," he says.

If you're shopping for a new laptop or desktop PC, don't let a salesperson talk you into buying recovery discs by claiming that otherwise you won't get them. We checked with Acer, Dell, Gateway, HP, and Lenovo—and all five told us that you can create such discs yourself from the preinstalled software on their retail PCs (if they aren't automatically included with your new system).

If you would prefer to pay for the convenience of having someone else make recovery discs for you, check with the vendor: Most (but not all) will sell them for less than the \$30 or so that the retailers typically charge.

SKEPTICAL SHOPPER YARDENA ARAR



Same Name, Different Product

READING LAST MONTH about new, improved Wi-Fi routers incorporating

draft 2 of the 802.11n technology spec (see find.pcworld.com/58609) reminded me of a pet peeve I have about shopping for tech products: Vendors don't always make it easy to know exactly what you're getting.

For instance, D-Link released one Extreme N Gigabit Router that is based on the original 802.11n draft and may have problems connecting with other 802.11n equipment. Then the company released a second router that is based on draft 2 and is far likelier to be compatible with other manufacturers' equipment. But good luck figuring out which one is which. The first model is called the DIR-655; the second, the D655.

The good news is that original draft-n products are firmware-upgradable to compliance with the second draft. But if you buy an older product, it's up to you to figure out whether you need a firmware update. Generally, if the packaging lacked a Wi-Fi Alliance logo specifying 802.11n certification, you'll need an update.

Looking Under the Hood

At least the draft-n changes affect only firmware: Sometimes vendors tweak the hardware innards of products without notifying customers. Case in point: Sony made more than a dozen versions of its popular PlayStation 2, including some that looked identical but had different features. For example, Sony dropped an IEEE 1394 port in later versions while adding an infrared port for an optional DVD remote. You could tell which model you had only by inspecting the unit or its model number (which appears on the back of the PS2, by the serial number).

Sometimes the specs don't change, but

It pays to know your specs: Product names don't always tell the whole story.

the components do. PC vendors that buy system components in huge quantities may use different suppliers for, say, optical or hard drives over the lifetime of a single desktop or notebook model.

A Dell spokesperson confirmed this practice but said that all components must meet stringent specifications. So even if the model *PC World* reviewed isn't identical to the one you buy, the spokesperson said, your experience should be similar to ours.

My own experience has taught me that this isn't always true for all vendors. My last notebook, an IBM ThinkPad X31, had a built-in Wi-Fi card that usually worked fine but refused to work at all with certain

newer Wi-Fi routers until, with a Wi-Fi engineer's assistance, I tweaked an obscure default router setting. The engineer told me IBM used that Wi-Fi card for only a short time, so the problem was rare.

Educate Yourself

You can't dictate how vendors label their products, so you have to educate yourself before you shop. Find out what's happening with the technology, especially in a field that's changing rapidly.

If you see a price cut, try to determine whether the retailer is unloading older, outmoded technology. Be especially careful when shopping online, where you don't have access to visual cues that you might get by inspecting packaging.

And if you aren't getting enough information, don't be afraid to ask for help. You have a better chance of finding answers while you're still a prospective buyer than when you return as a disgruntled owner looking for tech support.





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1. A HP SC11Xe Host Bus Adapter (\$209) is a required option needed to connect the Ultrium 448 solution to the DL360 G5 server. Prices shown are HP Direct prices; reseller and retail prices may vary. Prices shown are subject to change and do not include applicable state and local taxes or shipping to recipient's address. Offers cannot be combined with any other offer or discount and are good while supplies last. All featured offers available in U.S. only. Savings based on HP published list price of configure-to-order equivalent (\$5125 - \$1426 instant savings = SmartBuy price \$3699). 2. Financing available through Hewlett-Packard Financial Services Company (HPFS) to qualified commercial customers in the U.S. and subject to credit approval and execution of standard HPFS documentation. Prices shown are based on a lease 48 months in term with a fair market value purchase option at the end of the term. Rates based on an original transaction size between \$3,000 and \$25,000. Other rates apply for other terms and transaction sizes. Financing available on transactions greater than \$349 through June 30, 2007. HPFS reserves the right to change or cancel these programs at any time without notice. Intel, the Intel Logo, Xeon and Xeon Inside are trademarks of Intel Corporation in the U.S. and other countries. © 2007 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice.

ON YOUR SIDE AMBER BOUMAN



A FEW MONTHS ago, I purchased an Iomega USB-connected hard drive that had EMC Retrospect Express backup software bundled with it. I installed the drive and the software, but the software interferes with other applications—and my attempts to remove it have been futile because it is “protected.” An EMC representative advised me to get in touch with Iomega, since the package was written expressly for them. But Iomega wanted \$25 for a support phone call to show me how to remove the program. Looks like a lot of space on my hard drive is being held hostage for \$25. Is there any way to get rid of the program for free?

Bill Barham, Raleigh, North Carolina

OYS Responds: Shortly after we contacted EMC on Mr. Barham’s behalf, EMC got in touch with him and helped him uninstall the software. EMC says that customers who get the software for free along with a piece of hardware generally must pay for support for anything beyond basic setup unless they upgrade to an annual service contract, which starts at \$130.

It’s not unusual for software companies to produce limited-edition versions of programs for inclusion with related hardware in hopes that you’ll upgrade to paid versions with more features, or that you’ll pay for better support. In general, if you encounter a problem with this kind of software, you should first get in touch with the company that made the hardware product, since that’s the product you paid for. If the hardware customer service rep directs you to the maker of the software, ask that rep what level of free support you can expect to receive.

More Buggy Batteries

Toshiba notebooks: In August, citing new concerns about battery-related fire hazards, Toshiba recalled about 1400 Satellite and Tecra laptops equipped with rechargeable lithium-ion batteries made by Sony. There have been no reports of injuries but three reports of overheating. The recall, which follows on the heels of a larger recall issued in July, affects Satellite A100, Satellite A105, and Tecra notebooks built between January and April 2006. See the Consumer Product Safety Commission’s Web site (find.pcworld.com/58369) for details on specific models.

If you own one of these notebooks, you



should stop using the battery and contact Toshiba at 800/457-7777 or www.bxinfo.toshiba.com for a replacement. It’s safe to use the AC adapter and power cord to run the system until the replacement battery arrives. Toshiba advises customers to use only batteries obtained from Toshiba or an authorized Toshiba retailer.

Nokia cell phones: Similarly, Nokia is offering to replace 46 million cell-phone batteries that may overheat due to short-circuiting while recharging. Nokia has reported about 100 cases of overheating, but no serious injuries or damage. The affected batteries are Nokia-brand BL-5C units made by Matsushita between December 2005 and November 2006. Find out more about obtaining a replacement battery at batteryreplacement.nokia.com.

Clarion GPS devices: Clarion has recalled 1500 of its N.I.C.E. P200 Navigation and Entertainment Systems due to battery overheating; the August recall of units sold since May 2006 follows a similar recall of 2500 units last December. See the CPSC’s Web site (find.pcworld.com/58370) for additional information.

Judge Orders End to Hoodia Diet Spam

A FEDERAL JUDGE has ordered a Nevada company to stop sending unsolicited e-mail marketing weight-loss and anti-aging products—some containing a frequent spam offering known as hoodia—that allegedly do not work.

Judge Morton Denlow of the Northern District Court of Illinois issued the temporary restraining order against Sili Neutraceuticals and owner Brian McDaid, doing business as Kaycon Ltd., after the Federal Trade Commission sued Sili and McDaid for violations of CAN-SPAM, the antispam law passed by Congress in 2003.

The FTC accuses the defendants of spam-marketing their Web sites, where they allegedly sold products—including pills that contained extracts of the plant *Hoodia gordonii*—based on false or unsubstantiated promises of weight loss and anti-aging benefits.

The agency says that the defendants are the first to be charged under the federal antispam law with having used Web-form-hijacking technology, in which the spammer inserts the marketing message into form fields on an innocent third-party Web site.

With this technology, the offending messages are actually sent by the third party’s e-mail account, thereby making the third party a victim in the scheme.

—Grant Gross ●



ILLUSTRATION: HARRY CAMPBELL (LEFT)

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Version!

Are Your Employees Caught in the Web?

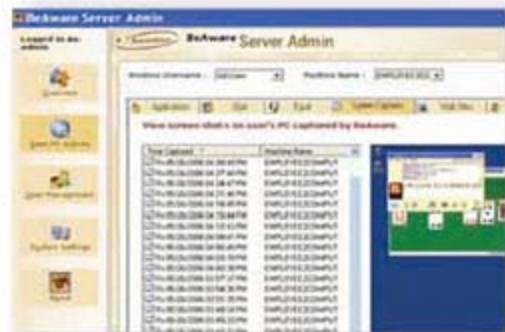
[Find out by monitoring all PC and Internet activity]

Reclaim Lost Productivity

Every day the average employer loses 81 minutes of productivity per employee to Web-based distractions. Most employees don't realize how quickly the stolen minutes add up. But research shows some 13% of workers habitually log two or more hours of internet-based off-task activity per day.



BeAware helps identify problem areas, offenders and frequency so you can coach employees, reduce company risk and help teams reclaim lost productivity.



BeAware allows you to view activity by user, department or enterprise.

How Does It Work?

BeAware tracks all employee PC activity through live, real-time monitoring of E-mails, Web-surfing, Chats and program usage (recording screen shots, time accessed, and content).

"BeAware showed me exactly what my team was doing so I could coach & motivate them toward our goals."

BeAware can be remotely deployed on any networked company PC (local or remote) to monitor specific individuals, departments or an enterprise up to 10,000 employees.

Administrators can view reports of on-line activity from anywhere, and receive automatic notification when select keywords, websites or specific applications are accessed.

Once problem areas are identified, you can resolve them with better policies, access control, employee coaching and motivation for improved focus and productivity.



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Light, compact the IRISCard is the smallest USB 2 color scanner in its category.



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Consecutively scans the front and back sides of your business card, as well as your contact photos. The IRISCard gathers all this information under the same contact name.



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Business Center

How to Switch to VoIP Phone Service

BY MARK SULLIVAN

IF SMALL BUSINESSES are anything, they're cost conscious. And many are looking to Voice over Internet Protocol (VoIP) to help lower the monthly phone bill, often a big expense.

Switching to VoIP can be especially worthwhile if your company spends a lot on long-distance calls to far-flung employees, partners, and contacts. If you're already connected to some of these people via a local or wide area network (LAN/WAN), you might as well be making phone calls to them over the pipe that you're already paying for.

Sending your voice calls through an IP pipe along with your data communications has another set of beneficial side effects. For one thing, your company can use "unified messaging," which lets you manage your voice mail and e-mail in the same place. You can also employ so-called "presence" features to see the status—*on cell*, *busy*, and so on—of coworkers and contacts.

The first step is buying a voice and data connection (or *trunk*) that's big enough to handle both your voice telephony and data traffic. This pipe (usually a T1 line) will be *dynamic*, meaning that it automatically allocates more or less bandwidth to telephony or to Internet access as you need it.

Once connected with a voice and data pipe, you'll decide what sort of

VoIP PBX (private branch exchange) is right for your business, and where it should reside. The VoIP PBX—the modern-day progeny of the old analog PBX—is the software brain that manages your VoIP calling traffic, based on

Even the smallest companies can get in on the cost savings and productivity boosts that VoIP systems make possible.



your commands. You have three major options here, according to John Macario, president of Boston-based business VoIP consultancy Savatar.

Some businesses—especially those in need of advanced calling features—prefer to own their VoIP PBX and house it on-site. Products such as Adtran's NetVanta, Avaya's Quick Edition, Cis-

co's UC500, and TalkSwitch's 24-CA are popular low-priced systems that small organizations can set up and operate in-house without much trouble. An on-site PBX gives you more administrative control over the system—

that is, if you have the time and the know-how (or an IT person) to make changes to it. The downside to owning your PBX is that when your business outgrows it, you will have to buy more hardware, Macario says.

Outsourced Options

Alternatively, a hosted service lets you junk the old analog PBX hiding in your closet and instead pay a service provider—such as SX8, Aptela, M5, or Speakeasy—to manage your company's calls on its IP PBX servers. Since those servers are commercial grade, they give you a lot of VoIP PBX features, including old standards like "hold" and "transfer," as well as new IP-driven features like "find me/follow me." When your business grows, you just buy some additional seat licenses from your VoIP provider, rather than investing in new hardware.

"Hosted VoIP service has come of age over the past few years," says Yankee Group senior analyst Patrick Monaghan. He adds that the technology has improved to the point where value-added resellers (VARs) can sell the service and guarantee a reasonable level of quality and reliability. >>

ILLUSTRATION: JASON GREENBERG

PCWORLD.COM

For more news and analysis of VoIP technology for your company, check out the new Phone Connection blog by Kathryn Vercillo in PCW's Business Center, at blogs.pcworld.com/phoneconnection.

VARs usually sell a bundle that includes the hosted IP PBX service, the data pipe, a long-distance plan (for calling non-VoIP phones), and any other hardware adapters or routers needed.

What About the Phones?

Small businesses usually buy new IP phones (such as those made by Cisco or Polycom) to take full advantage of all the features modern IP PBX systems offer. IP phones typically have better sound quality than their old-line predecessors and have a large display screen that can accommodate contact lists and other information. The good news is that the price of these phones has dropped over the past few years, Savatar's Macario says. Cisco IP office phones now start in the \$200 to \$250 range, while Polycom phones start in the \$140 to \$175 range.

The Hybrid Alternative

You have a third option, as well. If you would prefer not to get rid of your existing PBX and phones, you can still



CISCO'S 7970 SERIES IP phones start as low as \$200.

take a step toward VoIP. You can purchase a *trunking service*—an integrated voice and data pipe that connects to your existing analog system via what's called an Integrated Access Device. "You get [fewer] features, but you can still dramatically lower your voice and data costs," Macario says. Small businesses that pay \$40 to \$80 for their telephony service per employee per month can reduce that cost to as little as \$20 to \$35 using a trunking service from a company such as Bandwidth.com or Cbeyond, Macario says.

Getting at the Bottom Line

When deciding on an investment in new VoIP technologies or services, think in terms of total cost of ownership (TCO). No matter which path you choose—on-premises, hosted, or trunking—you should expect to pay some combination of up-front costs (equipment, networking, and setup charges), monthly costs (service and out-of-network long-distance charges), and yearly costs (training and support). Add together all the costs you'll pay for the length of the contract that your provider offers you. Divide the total by the number of months in the contract, then by the number of employees in your small business.

Once you have that number, compare it with the amount you now pay for voice and data services per employee every month. If you see a savings, converting to VoIP telephony might be a good move for you. Just take the time to do your research, pick the type of solution that best fits your business, and make sure the numbers add up.

HP's New iPaq Phones Come Well Connected

HEWLETT-PACKARD MAY NOT be the first name that comes to mind if you're a business traveler on the prowl for a new smart phone. But a couple of well-connected and feature-rich new iPaqs may change that perception.

Both the iPaq 610 Business Navigator and the iPaq 910 Business Messenger support quad-band GSM voice (so you can use the phones almost anywhere you travel) and high-speed data networks (UMTS for the Messenger and the faster HSDPA for the Navigator). Both devices also support 802.11b/g Wi-Fi, Bluetooth, and assisted GPS (which requires carrier support) for mapping and navigation.

The 610 sports a standard cell phone keypad, but with an unusual design innovation: a touch-sensitive navigation wheel embossed across most of the keys. Its 240-by-320 portrait-mode

screen measures a generous 2.8 inches diagonally. The iPaq 910 features a 2.5-inch, 320-by-240 landscape-mode display atop its full QWERTY keyboard for thumb or index-finger typists.

Both the 610 and the 910 are Windows Mobile 6 smart phones with 3-megapixel cameras, powerful 520-MHz Marvell (formerly Intel) XScale processors, and a slew of business-friendly proprietary HP applications and services. For example, HP's Enterprise Mobility Suite provides device management features for enterprise customers, while the iPaq Device Connect software lets you easily use these phones as wireless modems for connecting notebook PCs.

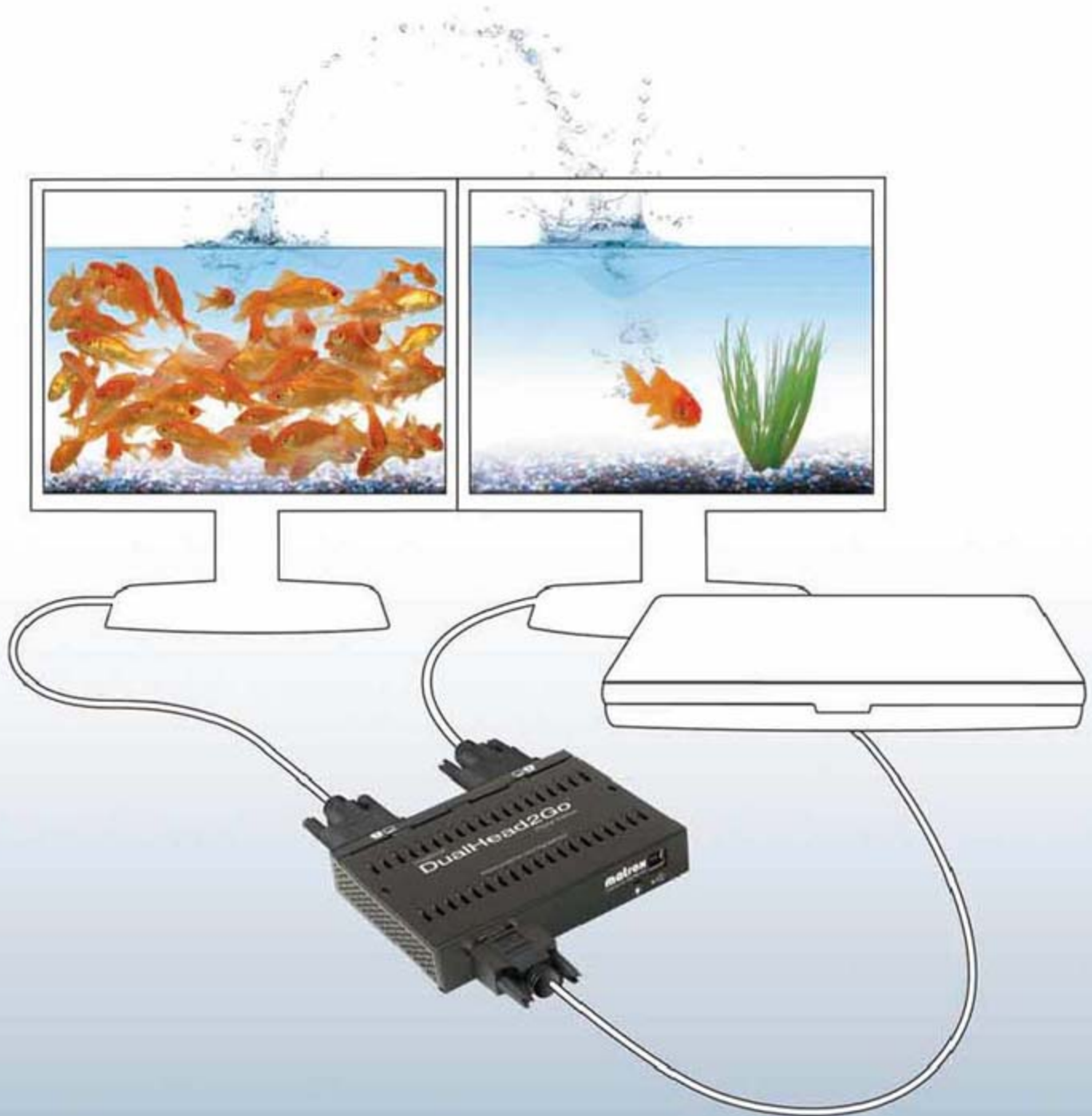
Unlocked for use with any GSM carrier, both iPaq models will sell for around \$600, HP says.

—Yardena Arar



THE IPAQ 610'S on-keypad navigation wheel helps users move about the large display.

More space. Feels good.



Enjoy a bigger desktop with DualHead2Go.

Connect your notebook or desktop system to the Matrox DualHead2Go and enjoy the feeling of more screen space. With this small box you can keep your email application in view while you surf the web, or compare two documents side-by-side. It's a lot simpler than you think.

See more. Do more. Be more productive. Visit www.dualhead2go.com/pcw or call 1-800-844-8302.



NET WORK RICHARD MOROCHOVE

Outsource Your Business Communications

EFFECTIVE communication with customers is important for every business. If you have only a

few customers, it's simple enough to keep in touch on your own through e-mail, postal mail, fax, mobile phone text messages, and of course voice calls. But if you and your staff need to communicate regularly with hundreds or thousands of customers, you may need more than a couple of desktop computers.

You could invest in technology resources—a more powerful, collating printer or a new fax server, perhaps. And many small printers can handle printed mailings.

But if you use several communications media—print, faxes, and e-mail—that you'd like to coordinate through a single service, consider FlyDoc (www.flydoc.com), a Web-based service from Esker, a company that specializes in document delivery services on demand.

You start by entering your mailing list. FlyDoc can import lists from Excel spreadsheets or CSV (Comma Separated Value) text formats. For postal mailings, you'll need to download and install the FlyDoc printer driver, which will format and transmit your completed document to FlyDoc's worldwide network of mail facilities. FlyDoc provides convenient Microsoft Word templates, but you can use any word-processing application you wish. When you're finished, just click *Print* and then choose the FlyDoc icon, which will appear alongside those for your other installed printers.

You can print in either black and white or color, on a single side or on both sides of the paper. You can choose from three standard double-window envelope sizes, but there's only one paper option for your sheets: letter-size, 24-pound white.

FlyDoc can handle your postal mailings, faxes, and electronic business communications via an intuitive Web interface.

Once you've submitted your document, FlyDoc promises to print, stamp, address, and send your documents via first-class mail within 24 hours. The first page costs as little as 36 cents per copy for black-and-white printing and 48 cents for color; subsequent pages cost 18 cents for black and white or 30 cents for color. The largest

envelope available can hold up to 70 pages. Postage and taxes are additional.

One nice aspect of FlyDoc is that it does not require a minimum number of letters. Being able to pay for individual pieces means you can use

FlyDoc to send customer invoices, or personalized letters created using the mail-merge feature in your word processor.

FlyDoc Faxes and E-Mail

Most computers make sending out a few dozen faxes easy. But assigning larger jobs to FlyDoc avoids tying up your fax line for hours. Also, FlyDoc Manager can tell you which faxes were not received and must be resent. Fax service costs from 10 cents a page for recipients in the United States and Canada to \$1.60 a page for far-flung destinations. FlyDoc also supports mass e-mailings. You can either use the printer driver to submit your document or create your piece after logging on to FlyDoc's site.

FlyDoc is fairly easy to use, with helpful multimedia tutorials. You need to install only one piece of software, and its on-demand aspect is handy. Dedicated printing services may offer more paper options, but you may find that the convenience of managing all your communication with one service makes FlyDoc worthwhile. ●



More Business Center Online

TIME FOR A little shameless self-promotion. We've just unveiled a complete makeover of PCW's Business Center online (www.pcworld.com/business), with greatly expanded information for folks who buy, implement, and optimize technology products and services in small to medium-size businesses.

You'll find an array of articles neatly divided into seven key categories—Software and Services, Office Hardware, Security, Servers and Storage, Wireless Phones/VoIP, Operating Systems, and Networking—and tools, too, but we've also gathered useful content from around the Web, including our sibling publications *Computerworld* and *Network World*. And we've created a community: bloggers involved in day-to-day business issues, Expert Advisors who can answer your nagging questions, and a Community Tips section where you can share your knowledge.

Here are a few of the specific resources we've added to the new Business Center, and where to find them:

- **How to Buy Wireless Networking Equipment**
find.pcworld.com/58617
- **How to Buy a Server**
find.pcworld.com/58618
- **How to Buy Collaboration Software**
find.pcworld.com/58619
- **Software Servings blog**
blogs.pcworld.com/software servings
- **Networking Know-How blog**
blogs.pcworld.com/networking

Have comments about the new section, questions for our experts, or expertise to share? We're all ears. Contact us at businesscenter@pcworld.com.



Have you found antivirus isn't enough security?
CDW can get you the protection you need.



Fujitsu LifeBook® T4220 Tablet PC

- Intel® Centrino® Duo Processor Technology
 - Intel® Core™ 2 Duo Processor T7300 (2GHz)
 - Intel® Wireless WiFi Link 4965AGN
- Memory: 1GB
- DVD±RW drive
- 12.1" XGA display
- Windows® XP Tablet PC Edition

FUJITSU

\$1959⁹⁹
CDW 1223464



SonicWALL® TZ 180 Wireless TotalSecure™ 10

- Includes: SonicWALL® TZ 180 network security appliance, one-year subscriptions to Gateway Antivirus, Antispyware and Intrusion Prevention Service, Content Filtering Service, 24 x 7 support and firmware updates, and ViewPoint reporting license

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Security Alert

Five of the Dirtiest Malware Tricks

BY ERIK LARKIN

IF THE CROOKS behind viruses, Trojan horses, and other malicious software were as stupid as they are scummy, we'd have a lot less to worry about. But as protective measures get better at stopping the obvious attacks, online creeps respond with underhanded moves to invade your PC. Here are five of their dirtiest tricks, all based on Trojan horses.

Don't mind me—I'm only here to break your PC: It's like sending in a different scout each time to open the gate for the rest of the invaders. The "Glieder Trojan" and many others use a multi-stage infection process whose first step is a tiny program that the crooks can change constantly so your antivirus watchdog is less likely to recognize it. Once it gets in, the downloader tries to disable your security before pulling down the real payload, which could be a data stealer or anything else the attacker wants.

Locked and encrypted Web sites? No problem: Web sites can and should use secure socket layer (SSL) to encrypt and protect sensitive data such as bank account log-ins. (When a lock icon appears in the address bar, that indicates the site is using SSL.)

But the "Gozi Trojan" and its ilk evade SSL protections by making Windows think they're part of the process, so your data leaves IE and goes through Gozi before it's encrypted and sent out on the network. Instead of spying on your keyboard, which many security programs watch for, these apps roll into the OS as fake layered-service providers (LSPs).

Malware that scans your PC for malware: An extra antivirus scan can only be a good thing, right? Not when it just gets rid of rivals to the "SpamThru Trojan." This nasty introduced a pirated, pared-down version of Kaspersky AntiVirus (which

Kaspersky has since shut down) to delete other malware so it could have the victim PC to itself to use as a spam sender. If the PC had a real antivirus app, SpamThru would attempt to block its updates, preventing it from identifying new threats.

Equal-opportunity encryption: Encrypting sensitive data and protecting it with a password helps shield it from prying eyes.

But the "SpyAgent Trojan" enters the encryption game, too. When installed on a Windows PC with the Encrypting File System (which is included in Windows 2000, XP Pro, 2003 Server, and 2005 Media Center), SpyAgent establishes its own administrator-level user account and uses this account to encrypt its files. You—or your antivirus software—would have to guess the account's random password to decrypt and scan the malicious files to confirm they weren't supposed to be there.

Hi, firewall. I'm Windows Update. Honest: Firewalls protect computers and networks from bad guys' efforts to go in or out. So the "Jowspry Trojan" masquerades as something known and approved—Windows Update. The crafty malware makes its connections look like the Background Intelligent Transfer Service used by Windows Update, and unsuspecting

firewalls let it download more attack programs to your PC.

To pull off these sneaky plays, malware first has to get on your PC. If you keep Windows and other programs up-to-date, avoid opening attachments or clicking links in unsolicited e-mail, and use a good antivirus program, you won't give the crooks a chance to put their Trojan horses to work.

Descriptions based on research and analysis from Peter Gutmann at the University of Auckland, Craig Schmugar and Aditya Kapoor at McAfee's Avert Labs, and Joe Stewart at SecureWorks.

From disguising applets to look like part of Windows to co-opting security tools, Web crooks use a variety of methods to bypass your safeguards.



ILLUSTRATION: TOMER HANUKA

PCWORLD.COM

For an inside look at the way Internet attackers buy and sell their insidious tools, see find.pcworld.com/58594. To ensure that you've closed critical software holes, go to find.pcworld.com/58593.

Free Tool Helps You Root Out Rootkits

ROOTKITS, A STEALTH technology that some malware writers use to hide their creations on your PC, are notoriously difficult to find and purge. McAfee's free Rootkit Detective 1.0 aims to help with that mission. (Get the 1.5MB .zip file at find.pcworld.com/58595.)

Installing the app was a breeze, and it delivered scan results in just 5 minutes on my system. You can choose from five display options covering files, Registry entries, processes, and the like. The data is highly technical, however, with no clues as to whether a hidden file or process might be a rootkit or part of a legitimate application; as McAfee warns on the tool's download page, you shouldn't take action based on what it finds unless you know what you're doing or get knowledgeable help.

If you know that something is malicious, you can deal with it by renaming files, deleting Registry entries, or terminating processes. If you're unsure but suspicious, you can get help from McAfee by selecting the check-box next to a file and then clicking the *Submit* button to send the info to the firm for analysis (this option works only for files, not for other items in the scan).

In the Submit window, enter your e-mail address and anything you might know or suspect about the file; then click *Send*. It took just one business day for a McAfee tech to get back to me.

—Erik Larkin

McAfee®

Rootkit Detective

Scan results

☒ View hidden processes and files ☐ View

☐ View hidden registry keys/values ☐ View

☐ View ☐ View

Process/File name	PID	Process/File path
Antiphishing	n/a	C:\Documents and Settings\All U
CAE33426-F44...	n/a	C:\Documents and Settings\Adm
67298BF9-D54...	n/a	C:\Documents and Settings\All U

McAfee's tool finds everything on a PC, but you'll need help identifying the nasties.

BUGS & FIXES

STUART J. JOHNSTON



Microsoft Plugs a Gallery of Critical Holes

MICROSOFT'S RECENT plus-size patch batch includes six critical fixes, the second-largest number of the year. Most of the holes are as bad as they come, too, allowing an attacker to commandeer an unpatched PC if you so much as view a poisoned site with Internet Explorer.

As yet, no reported attacks have targeted these holes; run Windows Update or download the patches to remain current.

One flaw involves the Microsoft XML Core Services, which runs applets written in Javascript and other languages for several Windows programs.

It's critical for Windows 2000 SP4, XP SP2, and Vista. Office 2003 SP2 and Office 2007 also contain the hole. See the bulletin at find.pcworld.com/58371.

Two other flaws affect the Graphics Rendering Engine, which comes into play when you view images, and OLE (Object Linking and Embedding) automation, which lets Office display an Excel spreadsheet in Word, for example. Windows 2000 SP4 and XP SP2 users are vulnerable; users with Office 2004 for Macs are at risk for the OLE problem as well. Get the graphics patch at find.pcworld.com/58372, and the OLE one at find.pcworld.com/58373.

Fixes four and five are for IE, to repair problems associated with its handling of ActiveX controls and CSS style sheets (find.pcworld.com/58374), and vector mark-up language (find.pcworld.com/58375).

The final critical patch is slated for Excel. Without this fix, opening a doctored Excel file in Office 2000 SP3, Office XP SP3, Office 2003 SP2, or Office 2004 for Macs would free an attacker to take over your PC (find.pcworld.com/58376).

Vista Hot Fixes

Two patches that aren't yet available via Automatic Updates improve Vista's per-

Also: Vista improvements that are unavailable via Automatic Updates.

formance and compatibility. Head to find.pcworld.com/58377 for the compatibility fix, which helps resolve video driver issues and other bugs. The performance update at find.pcworld.com/58378 aims to increase reliability and do away with annoying delays when you copy large files or wake the PC from hibernation, for example.

Symantec Snags IE

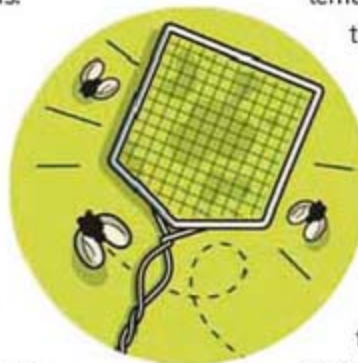
Symantec added to IE's woes with problematic ActiveX controls in Norton Antivirus and Norton Internet Security 2005 and 2006, and in Norton System Works 2006. These controls compromise IE such that a malicious site could run any command on a victim's PC. Use Symantec LiveUpdate to get the fixes, and see find.pcworld.com/58379 for more.

Yahoo Messenger Risk

Versions downloaded prior to August 21 are vulnerable to attacks disguised as invitations to view a Web camera stream (see find.pcworld.com/58591). Get the fixed YM at find.pcworld.com/58380.

Firefox, Thunderbird Updates

Mozilla updated both apps to 2.0.0.6 to correct their handling of uniform resource identifiers (URIs). Without the fix, an attacker may run a command if you click poisoned links starting with 'mailto:', for instance. Select *Help • Check for Updates* in either app to get the latest version.



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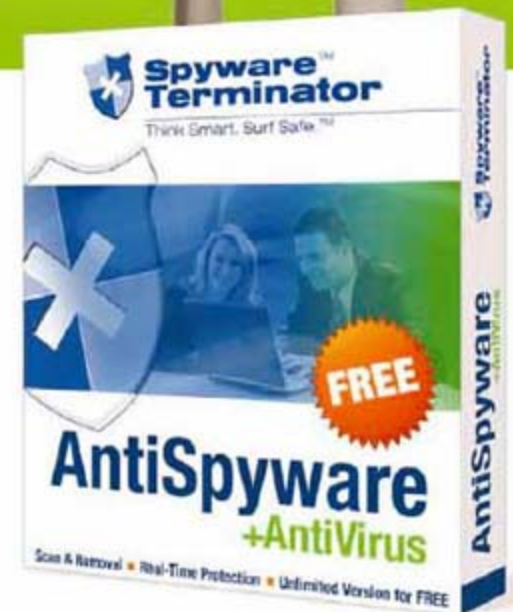
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New Attack Can Evade Antivirus Applications

MALICIOUS HACKERS HAVE hit on a new technique for invading PCs while avoiding antivirus detectors, according to the SANS Institute.

SANS's Internet Storm Center (ISC) came across the attack on a compromised Web site, where an iframe—an inline frame on a Web page that enables content from one site to be embedded in another—was used to deploy pieces of malicious code via Javascript. The trick itself is nothing new, but researchers discovered that the server deploying this Javascript was heavily modifying its content each time a site visitor request-

ed the page, the ISC reported.

"What makes this new is that the hosting Web site generates this code dynamically," wrote the ISC's Bojan Zdrnja in his analysis of the attack code. "Every time you request this Web page it will use completely random names for all variables and functions."

Because common malware scanners rely on signatures—essentially, descriptions of the bad code from previous appearances of the attack—this technique renders the script code undetectable by



such scanners, he wrote. None of the antivirus programs that Zdrnja tested could find the modified code.

The malware code contained what Zdrnja called a "typical" set of exploits, taking advantage of known vulnerabilities in ADOdb (a database abstraction library for PHP and Python),

QuickTime, WinZip, and other software. The code also contained a less well-known, but pernicious exploit for the NCTAudioFile2 ActiveX control.

—Matthew Broersma

PRIVACY WATCH

ERIK LARKIN



Who Best Safeguards the Privacy of Your Web Mail?



SEARCH ENGINE PRIVACY policies are improving, but e-mail contains far more sensitive and personal information than searches do.

To find which free service does the best job of protecting your Web mail privacy, I dug into the policies of the big three—Google, Microsoft, and Yahoo—to see what informa-

tion each company collects, how it uses that information for things like targeted ads, and how long deleting an e-mail really takes.

In terms of what gets saved when you use the service, Microsoft came out on top. It typically doesn't record IP address, log-in time, or other user-specific information in its logs, says Brendon Lynch, its director of privacy strategy. Both Yahoo and Google collect that type of data, along with your browser and what you clicked on the page.

However, Google asks for the least amount of personal information when you sign up: just your name and the country you live in. Yahoo and Microsoft ask for your name, gender, birthday, and zip code. (Of course, you could say that you're 107 and live in Mongolia.)

Yahoo and Microsoft use some of that data to display targeted ads. According to Lynch, Microsoft masks personal information such as your name and e-mail address, and then combines demographic data like your zip code with data from third parties.

Yahoo didn't disclose its full procedure, but it too uses demographic information that has been aggregated with third-party data to send you advertisements. Anne Toth, the company's senior director for privacy policy, says that might mean using census data

A look at privacy policies at Google, Microsoft, and Yahoo reveals your best choice for e-mail.

to determine the median income of people in your zip code before deciding what ads to show you. Neither Yahoo nor Microsoft introduces third-party data into your saved user information.

Google approaches ad selection differently: When you read e-mail, Gmail scans for keywords in the message and displays ads based on those keywords. The one-time scan is automated, and nothing is saved, says Peter Fleischer, global privacy counsel for Google.

But Google may take up to 60 days to completely remove that "Vegas was great" e-mail from its servers after you delete it. In contrast, Microsoft takes three days or less; and Yahoo says that, though removing the actual e-mail content may take a short while, the information becomes dissociated from your account almost as soon as you delete it, such that not even Yahoo could retrieve it.

The time-to-delete can be a factor with subpoenas, for instance. Procedures vary in criminal cases, but all three companies say that they notify customers anytime a civil subpoena (in a divorce case, for example) requests copies of e-mail, and give the user time to respond before handing over the data. For Hotmail, the grace period is two weeks. Google waits 20 days, and Yahoo waits 15.

Since Google asks for less up-front and makes the least use of demographic and personal information, I credit Gmail with having the best Web mail privacy policy. But it's not a hands-down victory, because the company takes so long to eradicate e-mail messages that you want gone. Microsoft, meanwhile, scores points for not saving user-specific data on visits in its Web server logs. ●

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Acer recommends Windows Vista® Ultimate.

October/November 2007



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(ET.D16WP.B04)



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Awards



Spyware Doctor V4.0
October 2006



Spyware Doctor V4.0
November 2006



Anti-spyware installed
Spyware Doctor V5.0
June 2007



Spyware Doctor V5.0
April 2007



Spyware Doctor V5.0
September 2007



Spyware Doctor V5.0
June 2007



Spyware Doctor V4.0
January 2007



Spyware Doctor
with AntiVirus V5.0
June 2007

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Reviews & Rankings

Green PCs: A First Step

PCW Test Center PCs ADORNED with green-certification logos look and work like their nongreen counterparts. But don't expect a single PC to help you rack up huge savings in your energy bill or significantly shrink the size of your computing carbon footprint. Those benefits come from purchasing in bulk. And whether you buy one PC or a thousand, you'll do more for the environment and your finances by adjusting your system's settings.

We learned this by testing five Energy Star 4.0-rated Vista PCs—three desktops and two notebooks. Dell's OptiPlex 755 Mini-Tower and HP's rp5700 Long Life-cycle Desktop are designed for use as business PCs; Enano Computers' EX7200 straddles business and consumer lines. (Enano gained a measure of fame by supplying the PCs that powered the video streaming for the

Energy Star 4.0-rated products can lower your energy bill and reduce the amount of pollutants in the world—but by somewhat less than you might hope.



Al Gore-promoted Live Earth concert.) On the notebook side, we looked at Lenovo's powerful ThinkPad T61p and Toshiba's mainstream Tecra M9-S5514.

In addition to Energy Star certification, HP's rp5700, Dell's OptiPlex 755, and Toshiba's Tecra M9-S5514 earned the stringent Gold certification of the Electronic Product Environmental Assessment Tool (EPEAT). EPEAT rates desktops, laptops, and monitors at Bronze, Silver, and Gold levels, based on the percentage of 23 required and 28 optional criteria the product meets—for example, recycling, reduction

in the use of toxic materials, and energy efficiency. While this story focuses on energy issues, all units underwent regular WorldBench 6 Beta 2 performance benchmark testing as well, and you can find standard PCW-rated reviews of them online. See the box, below left, for additional information.

Realistic Efficiency

Among the new requirements for Energy Star 4.0, which took effect in July 2007, are more-stringent maximum power draws during a PC's idle (on but not active) mode. The specific requirements vary by type

ENANO'S EX7200 (TOP left) was the energy-efficiency king. We also tested HP's rp5700 (bottom left) and Dell's OptiPlex 755.

of PC (notebook or desktop) and performance class (A, B, or C), as determined by the PC's configuration. However, Energy Star 4.0 requirements don't always anticipate day-to-day computer use. When we set out to test power consumption, our goal was not to verify the Energy Star 4.0 certification of these products but to measure their real-world power appetites.

Using our own tests, we found that the power that

MORE ONLINE

Go to find.pcworld.com/56242 to read detailed reviews of these products and see where they rank on our value desktop PC, desktop-replacement laptop, and all-purpose laptop charts.

INSIDE



74 APPLE IPOD NANO



76 HP PAVILION HDX



80 SONY DVDIRECT MC5



86 TOMTOM GO 720

the notebooks drew while in their idle state exceeded the 22 watts specified by Energy Star 4.0. The reason: Our assumptions about notebook use were less conservation-conscious than the ones in the Energy Star 4.0 testing guidelines. For example, we

left the laptops' LCD screens and Wi-Fi radios turned on, but the EPA's testing guidelines say to turn off Wi-Fi and to power down a notebook's screen (a significant draw on power) after 1 minute.

The bottom line: How you use your PC is just as impor-

tant for power consumption as the product you buy. For example, we found that if you want to lower your PC's power consumption further, you can disable overlooked features such as a biometric security chip and some Windows startup tasks during

times you don't need them.

Enano's EX7200, which uses a laptop processor, consumed the least power. When idling, it drew only 24 watts. In a working state, the Enano EX7200 also proved more energy-efficient than the other desktops. The >>

ENERGY STAR 4.0 PCs

VALUE DESKTOP PC	PCWRating	Performance	Real-world energy consumption tests ²		Net energy impact
Dell OptiPlex 755 Mini-Tower ¹ \$1272 find.pcworld.com/58610	82 VERY GOOD	- WorldBench 6 Beta 2 score: 84 Superior - Overall design: Very Good	- System off: 0.7 watt - System sleep: 2.8 watts - System idle: 43.9 watts	- WB6 multitasking test: 6.7 watt-hours - WB6 Photoshop CS2 test: 7.4 watt-hours - Average of both tests: 60 watts	- Electricity cost: \$4.36 per year - CO₂ generated: 72 pounds per year
BOTTOM LINE: EPEAT Gold-certified business PC is easily expandable and offers solid performance; includes remote-management and security features.					
HP rp5700 Long Lifecycle Desktop \$1368 find.pcworld.com/58359	75 GOOD	- WorldBench 6 Beta 2 score: 67 Very Good - Overall design: Good	- System off: 2.4 watts - System sleep: 3.1 watts - System idle: 51.9 watts	- WB6 multitasking test: 10.1 watt-hours - WB6 Photoshop CS2 test: 12.3 watt-hours - Average of both tests: 70 watts	- Electricity cost: \$6.16 per year - CO₂ generated: 101 pounds per year
BOTTOM LINE: EPEAT Gold-certified business PC was the least energy-efficient and least powerful of our desktop competitors, but it has a long five-year warranty.					
Enano EX7200 \$1500 find.pcworld.com/58361	74 GOOD	- WorldBench 6 Beta 2 score: 79 Superior - Overall design: Good	- System off: 1.8 watts - System sleep: 1.7 watts - System idle: 23.9 watts	- WB6 multitasking test: 4.6 watt-hours - WB6 Photoshop CS2 test: 5.2 watt-hours - Average of both tests: 40 watts	- Electricity cost: \$3.47 per year - CO₂ generated: 57 pounds per year
BOTTOM LINE: Mini-PC outfitted with a notebook processor offers the best balance of power consumption and performance, but compact design is not upgrade-friendly.					
POWER LAPTOP	PCWRating	Performance	Real-world energy consumption tests ²		Environmental Impact
Lenovo ThinkPad T61p ¹ \$2303 find.pcworld.com/58351	83 VERY GOOD	- WorldBench 6 Beta 2 score: 81 Superior - Tested battery life (hours:minutes): 4:03	- System off: 1.0 watt - System sleep: 1.2 watts - System idle: 26.2 watts	- WB6 multitasking test: 7.0 watt-hours - WB6 Photoshop CS2 test: 7.2 watt-hours - Average of both tests: 53 watts	- Electricity cost: \$3.28 per year - CO₂ generated: 54 pounds per year
BOTTOM LINE: Desktop replacement expertly combines power, energy efficiency, and battery life; its nVidia Quadro FX570M graphics card also performed well.					
ALL-PURPOSE LAPTOP	PCWRating	Performance	Real-world energy consumption tests ²		Environmental Impact
Toshiba Tecra M9-S5514 \$1799 find.pcworld.com/58349	74 GOOD	- WorldBench 6 Beta 2 score: 73 Very Good - Tested battery life (hours:minutes): 2:48	- System off: 1.4 watts - System sleep: 1.9 watts - System idle: 27.8 watts	- WB6 multitasking test: 6.4 watt-hours - WB6 Photoshop CS2 test: 13.4 watt-hours - Average of both tests: 45 watts	- Electricity cost: \$3.53 per year - CO₂ generated: 58 pounds per year
BOTTOM LINE: Touchpad and buttons on this otherwise full-featured, solid-performing, EPEAT Gold-certified model felt uncomfortable; battery life was so-so.					

CHART NOTES: Prices and ratings are as of 9/12/07. Our power-consumption tests differ from those required for Energy Star 4.0. FOOTNOTES: ¹ This model has a vendor-provided Power Option, which we used (in place of the Balanced setting) in performing our energy tests. ² Watt-hours, the measurement of energy used for a task, can be converted into watts, the rate of energy consumption.

EX7200 and the OptiPlex 755 completed the WorldBench 6 Beta 2 multitasking script in about the same time, but the EX7200 used less power to do so. HP's rp5700 consumed more power across the board compared with the other units. In idle, it consumed 52 watts. But let's keep things in perspective: When we tested the power consumption of an Alienware Area-51 7500, a screaming-fast gaming PC that exhibits no discernible regard for energy efficiency, it consumed a whopping 418 watts while idling (*idling*, as in not doing anything at all).

But how much green will a green PC save? On its own, not much. Using the EPA's model of computer usage and the U.S. Energy Infor-



LENOVO'S THINKPAD T61P (left) was faster and more energy-efficient than Toshiba's Tecra M9-S5514.

mation Administration's statistics on the average retail price of residential electricity, we calculated that the Alienware gaming PC costs \$34.65 per year to run, while HP's rp5700 costs \$6.16, and Enano's PC sets you back \$3.47 annually. But multiply such numbers by a hundred

or a thousand—to reflect all of the PCs in a large company, say—and the savings can add up to a lot. That might be reason enough to choose energy-efficient business PCs when buying in bulk.

That logic also holds true when it comes to a company's environmental foot-

print. Using the EPA conversion figures, we calculated that one Alienware Area-51 7500 is responsible for producing 568 pounds of CO₂ emissions per year, while one Lenovo ThinkPad T61p must answer for just 54 pounds. That means using 20 Area-51 7500 PCs for a year is equivalent to putting one car on the road. You'd need to use 250 T61p's to equal that one car.

Green, But Quick

For mainstream business and consumer users, green PCs perform like other PCs. Dell's OptiPlex 755 earned a WorldBench score of 84—tops among the business PCs we've tested with Windows Vista. The HP rp5700's score of 67 was below average, but the PC scored well enough in other areas to rank third on our value business desktops chart.

Lenovo's ThinkPad T61p, which ranked third in our online desktop replacement notebook chart, earned a stellar WorldBench score of 81, and its battery life of 4 hours, 3 minutes is above average. The T61p produced solid graphics scores, thanks to its nVidia Quadro FX570M discrete mobile workstation graphics. Toshiba's Tecra M9, which we tested for our all-purpose notebook chart, earned a WorldBench score of 73—average for the notebooks we've tested—and an unimpressive battery life result of 2 hours, 48 minutes.

But until we can purchase solar-powered PCs, using an Energy Star-certified computer is the best way to reduce energy use and costs.

—Narasu Rebbapragada

GO LINUX AND GO GREEN

Zonbu's Rental PC

IF YOU WANT a no-fuss, green alternative to a standard PC, consider Zonbu's Linux-based Energy Star 4.0 and EPEAT Gold-rated mini-PC. A preproduction unit we tested was very efficient—but you don't add software to it or store most files locally.

You essentially rent the Zonbu, paying \$99 down plus \$13 per month for 25GB of online storage. Fifteen dollars per month gets you 50GB of storage, and \$20 gets you 100GB. The only internal storage is a 4GB Compact Flash card. Plus, Zonbu is a closed system. The company, not you, is the administrator of your box. It preloads open-source photo, productivity, music, and other applications, and pushes out all software and OS updates automatically. That's low-maintenance, but also limiting.



ZONBU'S ENERGY-EFFICIENT Linux PC.

While idling, the Zonbu consumed only 9.6 watts of power. It felt slow when starting up, but not while running its Linux-based applications. Zonbu's CEO, Grégoire Gentil, says that's because it uses an energy-optimized Linux kernel and applications designed for it.

Zonbu purchases carbon offsets so it can say that its PC is the first "zero-emissions computer." (Companies aim to compensate for or "offset" their greenhouse gas emissions by funding environmental projects that reduce them.)

Whether you believe in carbon offsets or not, you can feel good about the Zonbu's low power consumption. And when you're done with your unit, the company will recycle it responsibly.



Zonbu | Zonbu

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Quicken's Business Tools Help It Edge Out Money Plus

THE 2008 EDITIONS of the leading personal finance packages—Intuit's Quicken and Microsoft's Money—try to simplify money management by making some features accessible even if you don't launch the full application. I looked at the Home & Business versions of the two programs and found that both sport other worthy improvements, too. Users who are looking for one application to manage both their personal and small-business finances will find Quicken's offering more robust, however.

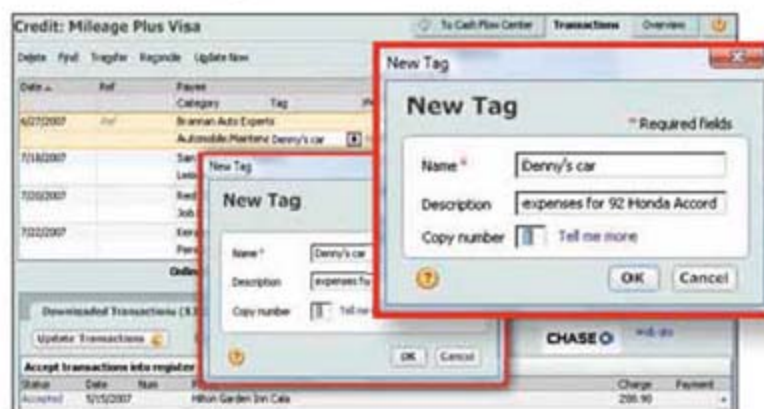
Microsoft has renamed its package Money Plus, the

three categories: Spending, to track expenditures within categories; Cash Flow, for monitoring specific accounts (say, different credit cards); and Bills, for getting reminders of upcoming obligations. You can opt to launch the full application from Insights, but unless you wish to enter a transaction, you don't have to. (And you aren't required to activate the Insights feature if you'd rather not load your system down with yet another background process.)

Money Plus 2008 lets you link transactions with electronic documents such as

check images, something Quicken users have been able to do for a couple of years. Unlike Quicken, Money Plus doesn't add the documents to your data file (which can swell the size of the file quickly);

it simply provides a link to a location on your hard drive. Quicken, however, encrypts the data file—a security measure that Microsoft's



QUICKEN 2008'S TAGGING feature lets you group expenses across categories, so you can see all transactions relating to a business.

approach doesn't offer.

The free and trial versions of financial services—credit reports, a tool for helping children monitor their allowances, investment reports—that Microsoft adds in Money Plus Premium for an extra \$10 aren't overly impressive. The edition I looked at, Money Plus Home & Business, adds a trial for the Web-based payroll service PayCycle (a worthy service for small businesses willing to pay for help with the crushing paperwork associated with paid employees), as well as extra software tools (invoicing and tracking tax-related expenditures) for people who mingle their personal and small-business finances.

Business Budgeting

Quicken 2008 Home & Business, on the other hand, is a meatier choice for small companies thanks to improvements that help you track one or more businesses separately. One useful tool is the new tagging feature, which essentially allows for the grouping of expenses from several cate-

gories. You can easily see all transactions relating to a business or a specific family member, for example.

Like Money Plus, Quicken introduces a system-tray applet, the Billminder Gadget, which lets you view upcoming transactions and bills without running the program. But I suspect more users might be pleased to see PayPal on the list of financial institutions that support downloading of transactions to Quicken account registers.

Quicken's other innovations are fairly routine, but it maintains its edge over Money Plus in one important way: Intuit still lets you download transaction data to Quicken for three years after you buy, while Microsoft forces you to upgrade Money every two years to maintain online services.

For anyone who needs a full-featured personal finance manager, Money will please if you want quick access, but Quicken continues to offer a slight advantage overall in features—especially if you're a small-business user.

—Yardena Arar



MONEY'S NEW INSIGHTS feature lets you view minireports without opening the full app.

“plus” being a new system-tray applet called Money Insights. Click on its icon, and you can view customizable minireports in any of

83
VERY GOOD

Money Plus Home & Business Microsoft

Worthy upgrade adds easier access to some functions.

List: \$90

find.pcworld.com/58621

84
VERY GOOD

Quicken Home & Business 2008 Intuit

Impressive small-business features, including support for PayPal.

List: \$100

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New Nano Plays Brilliant Video on Bigger Screen

PCW Test Center THE THIRD-GENERATION APPLE iPod Nano has a 2-inch display, which occupies more than half of the device. That's fitting considering one of the big selling points of the Nano is that it can now play video in addition to audio. Also instantly noticeable is its new shape: The original long, thin look has been replaced by a wider, still-pocketable design that accommodates the generous screen and the scroll wheel.

The screen is half an inch bigger than that of the previous model—and that half

inch makes all the difference. Watching video for an extended period of time is tolerable, even though the screen still strikes me as more suitable for quick-hit videos than for full-length movies. The LED-backlit display is beautiful: Photos and videos looked crisp and brilliant—no surprise given the screen's 320 by 240 resolution, at 204 pixels per inch.

The larger screen also accommodates a refreshed iPod interface, which consists of two primary components. The first is Cover Flow, for visually navigating through your album collection, and the second is the repurposing of the white space on the right side of the screen to display visual content previews.



THE NANO STILL measures only a quarter of an inch thick.

Introduced in iTunes earlier this year, Cover Flow does not disappoint. It works best when you're trolling for albums: Slide your finger

around the scroll wheel, and you'll flip through images of album covers, organized alphabetically.

In PC World Test Center evaluations, its sound quality was impressive. Our test equipment measured a very high signal-to-noise ratio, meaning that the player introduces little hum or hiss into the audio. The Nano's overall performance score ranked third among currently tested flash-based music players.

However, the Nano continues to lack features that are common on rival flash media players, such as an FM tuner and a built-in microphone for voice recordings. Those shortcomings dragged down its rating, but the Nano is still a highly capable, eye-catching media player with a lot of flair.

—Melissa J. Perenson

79
GOOD

iPod Nano | Apple

A great, pocket-size player adds video playback. List: \$199 (8GB)
find.pcworld.com/58629

Epson Scanner Is a Winning Performer

PCW Test Center IF YOU WANT the biggest bang for your buck from a scanner, you would be hard-pressed to do better than the new \$100 Epson Perfection V200 Photo. While it offers many of the same features that other low-cost scanners provide—

including the ability to scan both photo prints and 35mm film at a high resolution of 4800 dpi—what distinguishes the V200 from competitors is its impressive speed.

A production model of the V200 was about twice as fast as the identically priced HP G3010 and Microtek Scan-

Maker s450 in several tests. For example, the V200 took just 35 seconds to scan a 2-by-2-inch color print at 1200 dpi, whereas the HP and Microtek scanners each took about a full minute.

The V200 also provides easy-to-use image enhancement tools, including ones for automatic color restoration, backlight correction, and dust removal—all of which did stellar work rejuvenating old images, even those with washed-out color. The bundled software includes a basic image editor (ArcSoft PhotoImpression

6) and an optical character recognition application (Abyy FineReader 6 Sprint) capable of creating editable text and searchable PDFs.

The V200's great price, performance, and image quality should put it on the short list of anyone who is searching for a proficient general-purpose scanner.

—Richard Jantz



THE V200'S ADJUSTABLE lid can accommodate large books.

83
VERY GOOD

Perfection V200 Photo | Epson

Scans photos and film into great images on the quick. List: \$100
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HP's New Extreme Notebook

PCW Test Center

FAR FROM BEING a mere desktop replacement, the HP Pavilion HDX notebook is a multimedia powerhouse with a sleek design and a gorgeous 20.1-inch screen that will bring videos and games vividly to life. This update to the HDX line bumps up the processor from a standard Core 2 Duo to Intel's recently released Core 2 Duo Extreme, but otherwise it changes little of the original design and core features. Our test system came fully decked out to match its high-end CPU—and carried a commensurately steep price tag of \$4300.

The new 2.6-GHz Core 2 Duo Extreme X7800 chip didn't have much impact on the unit's overall performance in our WorldBench 6 Beta 2 tests, as the new laptop earned a score of 85; the

earlier version of the HDX with a 2.4-GHz Core 2 Duo T7700 received a nearly identical score of 86. (The slightly lower score could be attributed to marginal differences in the specs of the two machines.) On the one hand, the new HDX shaved about 2 minutes off the earlier version's time on our Autodesk 3D Studio Max rendering tests, while on the other, it lagged the previously tested model by about a minute on our Nero 7 tests. The new unit delivered a couple of frames per second more on our Far Cry and Doom 3 gaming tests than the earlier laptop did.

Both HDX systems we tested came with 4GB of RAM, Windows Vista Ultimate, an HD DVD drive that



HP'S HDX NOTEBOOK features a big, beautiful 20.1-inch display.

also records multiple standard DVD formats, and an ATI Mobility Radeon HD 2600 XT chip set with 256MB of dedicated graphics memory. In contrast to the single 200GB hard drive in the older version, though, the new system sports two 160GB hard drives, which should please space-hungry video editors and creators. You get good connectivity options, including 802.11n and gigabit ethernet, plus HDMI and eSATA ports. Also in the mix is an HDTV-capable TV tuner that picks up ATSC and NTSC signals.

The shiny black and silver case, embossed with HP's decorative dragon imprint, looks great. The machine is heavy, though (weighing in at 15.5 pounds), and opening the huge, tiltable screen takes both hands. This is not a laptop that you'll actually want on your lap, and you'll need to keep it plugged in, since its tested battery life was only about 90 minutes.

The system packs lots of thoughtful design touches such as a tiltable built-in Webcam, a button that turns off the LEDs for a more cinematic movie-watching experience,

another button that deactivates the touchpad, quick-launch buttons for DVD and TV viewing, and external touch controls to adjust sound and play CDs and DVDs. The embedded dock for the media-center remote is also a plus.

Sound and video playback were terrific, but while the Webcam's video looked good, the built-in microphone wasn't quite up to the task; if you plan to record audio, you're better off getting an external mic.

At \$3000, the earlier HDX model is a better deal given its nearly comparable performance, but if you need extra storage and you work with high-end graphics applications that require an Extreme processor—and price is no object—you'll be happy with this HDX.

—Anush Yeghazarian

78
GOOD

Pavilion HDX | HP

Top-notch features and cool design come with a hefty price tag.

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Concert-Friendly Cameras

? I ATTEND CONCERTS in the Seattle area, and when the lights dim or the sun sets I end up with barely recognizable pictures. I would go with a digital SLR if that is the best choice, but when cameras start to get big, security folks have a tendency not to let them in.

Michael081968, via the PCWorld.com Forums

Executive Editor Alan Stafford responds: You don't need a digital SLR. Look for a point-and-shoot camera that has image stabilization and a high maximum ISO (light sensitivity) setting. Image stabilization can reduce—but not eliminate—blurriness, though its effectiveness diminishes at high zoom. Increasing the ISO helps you keep the shutter speed up, which also reduces blurriness. The downside of bumping up the ISO is that you'll often have grainy images, but grainy is better than blurry.

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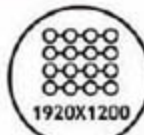
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Laptops for Work, Home, Road, and Runway

AN AFFORDABLE ultraport-

PCW Test Center

able, a corporate convertible, a good mainstream machine, and a designer model—all found places on our chart.

Landing in third place on the ultraportable side, the \$1550 Lenovo 3000 V200 is cheap for its category and has a generous 160GB hard drive. The \$2328 HP Compaq 2710p, a tablet in fifth place, seems expensive but is a good value with the included docking station and an extra battery. The 2710p also has a night light.



HP'S PAVILION DV2500T is stylish, but its battery life is short.

On the all-purpose list is the third-place HP Pavilion dv2500t, which carries HP's glossy imprint casing. Unfortunately, the included battery is not very powerful—you'll want to shell out another \$49 for a 12-cell. Ranked fifth is Toshiba's Satellite A215-S4757. This well-priced laptop is Toshiba's first portable equipped with an AMD processor.

—Carla Thornton

MORE ONLINE

For more information about laptops and details on how we test, see find.pcworld.com/55176.

PC WORLD TOP 10 LAPTOPS

ALL-PURPOSE		PCW Rating	Performance	Features and specifications
1	BEST BUY Gateway E-475M \$1300 find.pcworld.com/57130	87 VERY GOOD	- World Bench 6 Beta 2 score: 83 Superior - Overall design: Very Good - Tested battery life: 5:17	2.2-GHz Core 2 Duo T7500 15.4-inch wide screen 7.2 pounds - DVD±R DL/DVD±RW/-RAM
BOTTOM LINE: Gateway's E-475M is a blazingly fast, stylish unit that will please everyone but audio aficionados.				
2	HP Pavilion dv6500t \$1134 find.pcworld.com/57131	86 VERY GOOD	- World Bench 6 Beta 2 score: 75 Superior - Overall design: Very Good - Tested battery life: 3:57	2-GHz Core 2 Duo T7300 15.4-inch wide screen 6.2 pounds - DVD±R DL/DVD±RW
BOTTOM LINE: Midsize consumer notebook from HP has a gorgeous design, an HDMI port, and backlit media controls.				
3	HP Pavilion dv2500t \$1439 NEW find.pcworld.com/58446	84 VERY GOOD	- World Bench 6 Beta 2 score: 79 Superior - Overall design: Very Good - Tested battery life: 2:34	2-GHz Core 2 Duo T7300 14.1-inch wide screen 5.5 pounds - DVD±R DL/DVD±RW
BOTTOM LINE: Light, affordable multimedia notebook comes in a stylish, glossy case, but its battery life is short.				
4	Lenovo ThinkPad R61 \$1514 find.pcworld.com/57905	83 VERY GOOD	- World Bench 6 Beta 2 score: 80 Superior - Overall design: Very Good - Tested battery life: 3:19	2.2-GHz Core 2 Duo T7500 14.1-inch wide screen 5.8 pounds - DVD±R DL/DVD±RW/-RAM
BOTTOM LINE: Its slim size, light weight, and keyboard illumination make the R61 ideal for taking along on the road.				
5	Toshiba Satellite A215-S4757 \$1000 NEW find.pcworld.com/58445	82 VERY GOOD	- World Bench 6 Beta 2 score: 60 Good - Overall design: Very Good - Tested battery life: 2:23	1.8-GHz Turion 64 X2 TL-56 15.4-inch wide screen 6.2 pounds - DVD±R DL/DVD±RW/-RAM
BOTTOM LINE: Inexpensive laptop could be a good second PC to share with the kids. It has an ineffective volume wheel, though.				
ULTRAPORTABLE		PCW Rating	Performance	Features and specifications
1	BEST BUY Lenovo ThinkPad X61 \$1724 ¹ find.pcworld.com/58289	85 VERY GOOD	- World Bench 6 Beta 2 score: 75 Superior - Overall design: Very Good - Tested battery life: 6:14	2-GHz Core 2 Duo T7300 12.1-inch screen 3.6 pounds - DVD±R DL/DVD±RW
BOTTOM LINE: The optical drive is not integrated, but in all else—especially battery life—this business portable is top-notch.				
2	Lenovo ThinkPad X61t \$2333 ¹ find.pcworld.com/58293	81 VERY GOOD	- World Bench 6 Beta 2 score: 64 Very Good - Overall design: Very Good - Tested battery life: 5:02	1.6-GHz Core 2 Duo L7500 12.1-inch screen 4.5 pounds - DVD±R DL/DVD±RW/-RAM
BOTTOM LINE: Tablet version of the X61 adds a swivel touch screen so the unit doubles as an easy-to-hold note-taking device.				
3	Lenovo 3000 V200 \$1550 NEW find.pcworld.com/58447	79 GOOD	- World Bench 6 Beta 2 score: 79 Superior - Overall design: Good - Tested battery life: 4:04	2.2-GHz Core 2 Duo T7500 12.1-inch wide screen 4.3 pounds - DVD±R DL/DVD±RW
BOTTOM LINE: The Lenovo 3000 V200 is both powerful and affordable, making it a great choice for travelers on a budget.				
4	HP Pavilion tx1000 \$1302 find.pcworld.com/58592	76 GOOD	- World Bench 6 Beta 2 score: 64 Very Good - Overall design: Very Good - Tested battery life: 1:45	2-GHz Turion 64 X2 TL-60 12.1-inch wide screen 4.2 pounds - DVD±RW
BOTTOM LINE: This easy-to-use tablet PC is graced with thoughtful design touches, but it had a short battery life in our tests.				
5	HP Compaq 2710p \$2328 ¹ NEW find.pcworld.com/58450	76 GOOD	- World Bench 6 Beta 2 score: 48 Fair - Overall design: Very Good - Tested battery life: 6:52	1.2-GHz Core 2 Duo U7600 12.1-inch wide screen 3.7 pounds - DVD±R DL/DVD±RW
BOTTOM LINE: This tablet could be faster, but input is supereasy even in full sunlight, and battery life is top-notch.				
CHART NOTES: Prices and ratings are as of 9/12/07. Weight does not include AC adapter, power cord, docking station, or extra batteries.				
FOOTNOTE: ¹ Price includes extra-cost docking station.				

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As acronyms go, USB means more than most. Because this wildly popular technology is how the world holds hands. Or rather, how computers and their supporting peripherals carry on meaningful relationships.

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and-go simplicity. And the sort of reliability that sometimes gets taken for granted. Think about it: Has there ever been a more user-friendly technology?

Now think about how the USB suite of technologies—Certified Hi-Speed USB, Hi-Speed USB On-The-Go or Wireless USB—makes it possible for various technologies to get along. In the world of computers and peripherals and mobile devices, it's love at first sight.



Information brought to you by the USB Implementers Forum

Visit www.usb.org

Go to find.pcworld.com/58467

Burn HD Movies From Camcorder to DVD

THE \$230 MC5 is the latest in Sony's DVDirect series of stand-alone video transfer devices, and for quick burning of photos and video to DVD without using a PC, you can't beat it. The big news is that the MC5 is the first DVDirect model to support high-definition video.

However, the device doesn't create Blu-ray or HD DVD discs, but rather DVDs in AVCHD format, which is basically H.264/MPEG-4 video (still high-definition,

but the discs hold only 95 minutes of video). Nonetheless, the results look good. Other new features include the ability to import a JPEG file to serve as the DVD menu background, or an MP3 file to provide background music for your photo slide shows.

Unlike past versions, though, the MC5 won't talk to a computer—despite having both USB and FireWire ports. You can pick up a DVD burner for \$50 or less, so this is not a huge consideration. The unit immediately recognized the Sony HDR-SR7 camcorder I attached and automatically started the disc-creation wizard.

I burned two test DVDs with the MC5: One was a slide show created from files



SONY'S DVDIRECT MC5 quickly and easily transfers your HD video and photos to a DVD, without requiring you to boot up your system.

on an SD flash memory card (the MC5 also reads Compact Flash, xD-Picture Card, and all Memory Stick media); the other contained HD footage from the camcorder.

To view the AVCHD discs that the MC5 creates, you need PC software like Cyberlink's Power2Go, a Blu-ray player, or a DVD player that supports the format. Both of my projects required virtually no intervention on my

part, burned quickly, and looked great—especially the AVCHD video disc.

The MC5 is easy to work with, but I did have to look for a function hidden in the setup menu to reuse Nero-burned +RW and -RW media. The MC5 does nothing you can't do with a PC and a DVD burner, but for videographers on the go, it's quicker and more convenient.

—Jon L. Jacobi

84
VERY GOOD

DVDirect MC5 | Sony

Great for getting content onto DVD without firing up a PC. List: \$230
find.pcworld.com/58367

TECH TREND

Cheaper TVs on the Way?

FLAT-PANEL TV PRICES continue to fall, especially for sets with screens 40 inches or smaller. But prices on bigger LCD models—those with 46- or 52-inch screens—will likely start dropping too, as a large new manufacturing plant in South Korea has begun pumping the panels out in volume.

The plant's so-called eighth-generation production line makes large sheets of LCD "motherglass" from which bigger TV panels can be cut more efficiently. The previous process allowed the manufacturer to create eight 40-inch panels or six 46-inch panels from a single piece of motherglass; the new process will allow the plant to produce eight 46-inch or six 52-inch panels. Increased production of these larger panels should result in price drops for the TVs that use them.

Since the plant is a joint venture between Samsung and Sony, it will directly affect the cost of those companies' sets, but it should also put pressure on competitors' prices. Meanwhile, Sharp has announced that it will open a tenth-generation factory in 2010. For more information, see find.pcworld.com/58603.

—Martyn Williams

Use an LCD Over USB

LG'S 20-INCH FLATRON

L206WU incorporates technology (developed by a company called DisplayLink) that lets you plug the monitor into a USB 2.0 port on your PC and use it as a secondary display.

If you're out of display ports on your graphics card, the feature might prove useful.

I plugged our test L206WU into a Dell Dimension 8400 that was already hooked up to two displays. For the PC to recognize the unit over USB, I installed LG's USB Easy Connection software—an awkward process that required multiple

restarts and hunts for drivers.

The handy taskbar icon lets you change settings such as resolution and color. At the LCD's defaults, images were bright (though a bit washed out) and text looked crisp. I

saw occasional screen flicker but couldn't pinpoint a specific cause. Stay tuned for a rated review, which we'll publish after formal lab testing.

—Narasu Rebbapragada

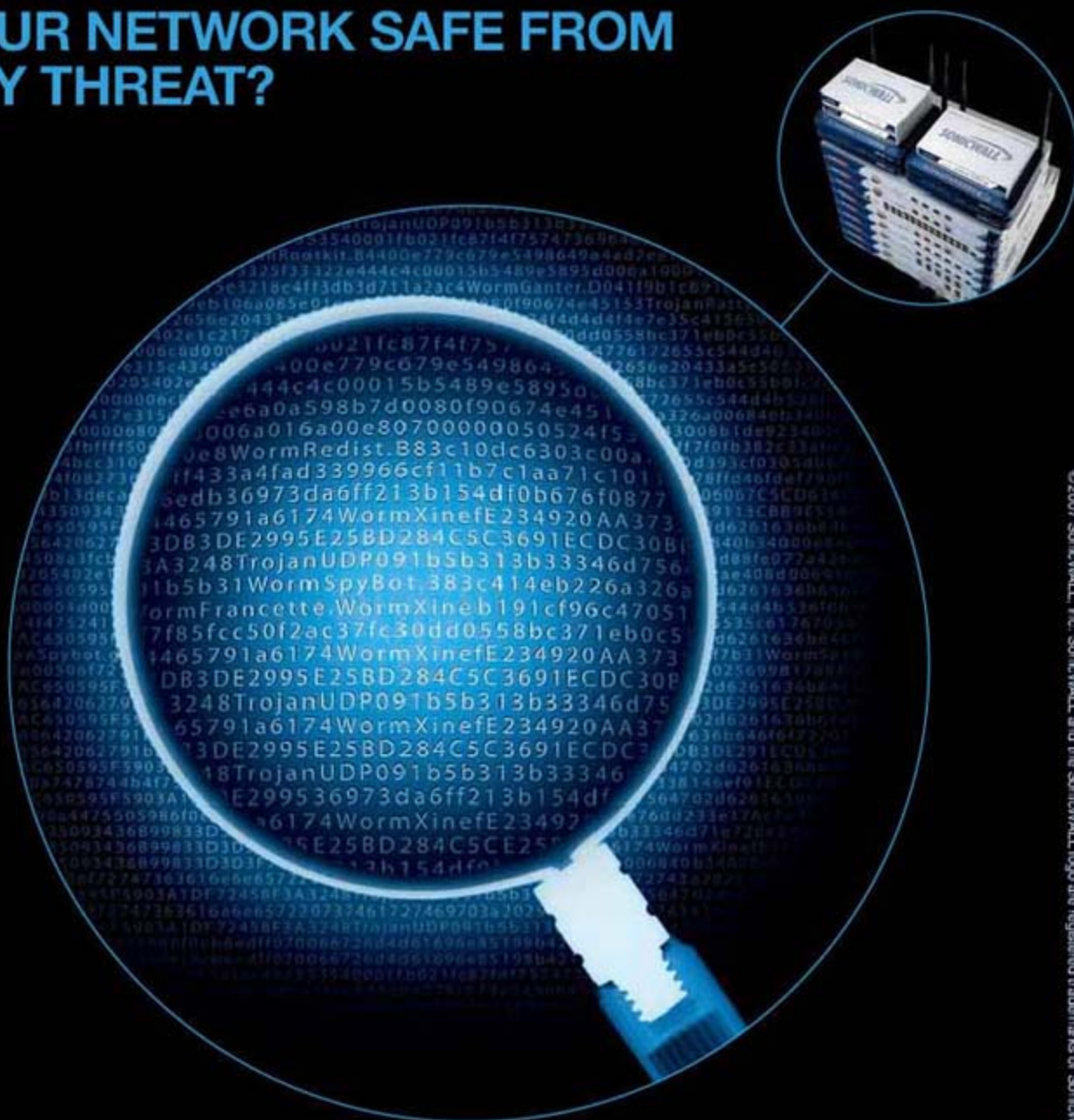
Flatron L206WU | LG

PCW Rating: Pending
Displays decent images over USB.
List: \$350
find.pcworld.com/58631



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Graphics Cards That Do More Than Play Games

WE TESTED 18 DirectX 10/

PCW Test Center

Windows Vista-ready boards from seven different vendors for the power (\$300-and-over) and mainstream (\$150-to-\$299) categories of our chart, and found appealing features for movie buffs and gamers alike. The ATI HD 2900 XT-based Asus and Gigabyte models—ranked first and second on the power side of the chart—ship with DVI-to-HDMI adapters. Relying on



ASUS'S EAH2900XT board.

a single HDMI cable, these HDCP-capable boards can send a high-definition digital image to an HDTV, with 5.1-channel surround sound. So they're quite useful if you need to output protected HD content from your PC.

EVGA cards were the fastest in each category: The 8800GTS Superclocked led all mainstream models, and the \$620 8800Ultra KO fell just short of the power Top 5 because of a weak software and accessory bundle.

—Danny Allen

MORE ONLINE

For more information about these graphic boards and for details on how we test, go to find.pcworld.com/58451.

PC WORLD TOP 10 GRAPHICS BOARDS

POWER BOARD

- BEST BUY** Asus EAH2900XT
\$419 NEW
find.pcworld.com/58436

88
VERY GOOD

• Battlefield 2: 79 fps
• Half-Life 2: 120 fps
• Quake 4: 114 fps

• 512MB ATI Radeon HD 2900 XT
• Two DVI-out, S-Video-in/out, composite-in/out, component-out

BOTTOM LINE: The EAH2900XT balances performance and price, includes HDMI output, and has an excellent software pack.

- Gigabyte Radeon HD2900XT (GA-RX29TS12VH-B)
\$429 NEW
find.pcworld.com/58434

87
VERY GOOD

• Battlefield 2: 78 fps
• Half-Life 2: 121 fps
• Quake 4: 113 fps

• 512MB ATI Radeon HD 2900 XT
• Two DVI-out, S-Video-in/out, composite-in/out, component-out

BOTTOM LINE: This card has HDMI output, 5.1-channel sound, and a coupon for Valve's Half-Life: Black Box Collection.

- XFX GeForce 8800Ultra XXX
\$740 NEW
find.pcworld.com/58432

86
VERY GOOD

• Battlefield 2: 81 fps
• Half-Life 2: 129 fps
• Quake 4: 119 fps

• 768MB nVidia GeForce 8800 Ultra
• Two DVI-out, S-Video-out, composite-out, component-out

BOTTOM LINE: A high price tag hurt this high-performing board's ranking; it ships with the game Tom Clancy's Ghost Recon.

- XFX GeForce 8800GTS 640MB XXX
\$420 NEW
find.pcworld.com/58431

85
VERY GOOD

• Battlefield 2: 81 fps
• Half-Life 2: 124 fps
• Quake 4: 116 fps

• 640MB nVidia GeForce 8800 GTS
• Two DVI-out, S-Video-out, composite-out, component-out

BOTTOM LINE: Gamers who like to play at high resolutions will love the 640MB of memory on this XFX 8800GTS card.

- XFX GeForce 8800GTS 320MB XXX
\$309 NEW
find.pcworld.com/58437

85
VERY GOOD

• Battlefield 2: 80 fps
• Half-Life 2: 125 fps
• Quake 4: 119 fps

• 320MB nVidia GeForce 8800 GTS
• Two DVI-out, S-Video-out, composite-out, component-out

BOTTOM LINE: This 320MB version of XFX's 8800GTS performs well against the pricier 640MB model; Lost Planet is bundled.

MAINSTREAM BOARD

- BEST BUY** Asus EN8600GTS Silent
\$179 NEW
find.pcworld.com/58425

81
VERY GOOD

• Battlefield 2: 67 fps
• Half-Life 2: 79 fps
• Quake 4: 70 fps

• 256MB nVidia GeForce 8600 GTS
• Two DVI-out, S-Video-out, composite-out, component-out

BOTTOM LINE: This affordable, fanless version of Asus's EN8600GTS performed well, but was slower than the number two EVGA.

- EVGA e-GeForce 8800GTS Superclocked
\$290 NEW
find.pcworld.com/58429

80
VERY GOOD

• Battlefield 2: 81 fps
• Half-Life 2: 124 fps
• Quake 4: 120 fps

• 320MB nVidia GeForce 8800 GTS
• Two DVI-out, S-Video-out, component-out

BOTTOM LINE: EVGA's factory-overclocked card delivers superior performance, but it can get quite warm while under load.

- Gigabyte GeForce 8600GTS (GA-NX86S256H)
\$199 NEW
find.pcworld.com/58421

79
GOOD

• Battlefield 2: 66 fps
• Half-Life 2: 78 fps
• Quake 4: 69 fps

• 256MB nVidia GeForce 8600 GTS
• Two DVI-out, S-Video-out, composite-out, component-out

BOTTOM LINE: Another silently cooled card, it performed well and ships with a full copy of the game Supreme Commander.

- Asus EN8600GTS
\$199 NEW
find.pcworld.com/58427

79
GOOD

• Battlefield 2: 66 fps
• Half-Life 2: 78 fps
• Quake 4: 69 fps

• 256MB nVidia GeForce 8600 GTS
• Two DVI-out, S-Video-out, composite-out, component-out

BOTTOM LINE: Average in price and performance, this board includes a full copy of the game Stalker: Shadow of Chernobyl.

- Asus EN8600GT OC Gear
\$169 NEW
find.pcworld.com/58424

78
GOOD

• Battlefield 2: 59 fps
• Half-Life 2: 68 fps
• Quake 4: 57 fps

• 256MB nVidia GeForce 8600 GT
• Two DVI-out, S-Video-out, composite-out, component-out

BOTTOM LINE: You can boost this board's lackluster speed by installing a bundled hardware controller in the PC's 5.25-inch bay.

CHART NOTES: Prices and ratings are as of 9/12/07. All game performance results are in frames per second (fps); higher numbers are better.

WARNING: TAPE BACKUP AND RECOVERY MAY BE HAZARDOUS TO YOUR DATA.



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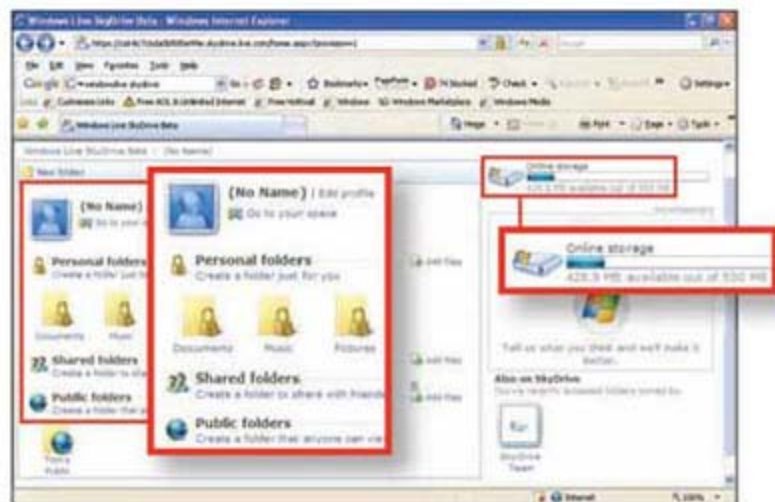
Microsoft's Online Storage Service: Too Simple?

MICROSOFT HAS TAKEN the wraps off a beta version of the Windows Live SkyDrive online storage service. While it has a lot to like, this is clearly still a beta offering.

Windows Live SkyDrive offers 500MB of free online storage (though files can be no bigger than 50MB each), and you can store any type of file to a private, public, or

shared folder. Anyone on the Internet can view your public folders, but only people you invite can see shared folders. You can restrict invitees' access or grant them contributor status for viewing, adding, modifying, and deleting items in a folder. For now, invitees must have a Microsoft user name and password before they can access a shared folder—no problem if they use Hotmail or Windows Messenger. (According to Microsoft, the final version of SkyDrive will support sharing folders with anyone.)

Though the simplicity of



WINDOWS LIVE SKYDRIVE allots you 500MB of online storage space for use in private, public, or shared folders.

SkyDrive makes it easy to use, the service lacks some features that its competitors offer. XDrive allows you to stream stored audio files, for example, and Streamload performs automated backups and synchronizes data between two computers.

The Windows Live SkyDrive beta shows early promise. Even so, we'd like to see more features, such as the ability to save Hotmail e-mail attachments to SkyDrive folders or to create a slide show of images.

—Tom Spring

Auto Movie Creator

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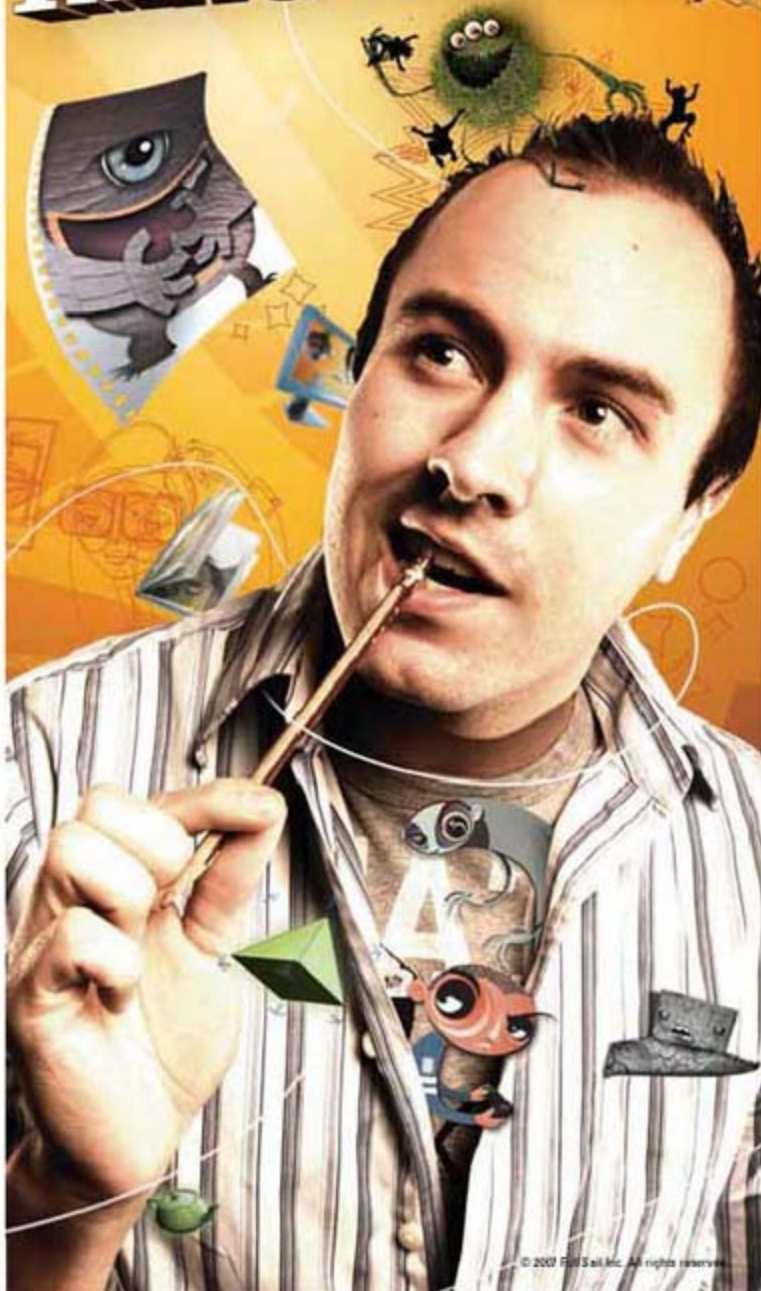
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*Values used for images are approximates based on typical length, compression and resolutions.

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Reviews & Rankings



THE GO 720 displays clear, colorful 3D maps on its 4.3-inch screen.

TomTom Delivers High-End GPS Features

GO DOWN THE roster of top-of-the-line GPS features, and the TomTom Go 720 has them all covered: text-to-speech pronunciation of street names; the ability to play audio files through your car's stereo; and clear 3D maps shown on a big screen. And the cost is pretty reasonable for a device graced with features that you'd usually find on pricier units.

In my tests, the Go 720 delivered accurate directions and suggested sensible routes. If you don't like a suggested route, you can use the device's nifty "Find alternative" option, which allows you to see another route. But you can't see esti-

mated travel times for the alternatives, or use any other methods to assess them.

One complaint: Sometimes the device issued spoken driving directions late, especially in areas with many street intersections (a fault that many other GPS units share, regrettably). On more than one occasion I heard the instruction to turn when I was already entering the intersection. The on-screen directions do appear much earlier, however.

You can set the device to warn you when you're driving over the speed limit (or faster than a speed you set yourself), or when you're driving near schools or places of worship. You can also choose to be reminded to take breaks at set intervals.

If you're looking for top-of-the-line GPS features at a relatively affordable price, the TomTom Go 720 is well worth considering.

—Dennis O'Reilly

85
VERY GOOD

Go 720 | TomTom

High-end GPS features offered at a moderate price. List: \$500

find.pcworld.com/58465

PHOTOGRAPH: MARC SIMON



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New MFPs at Stand-Alone Printer Prices

INKJET MFPs continue both

PCW Test Center

to proliferate and to drop in price, to the point where buying a stand-alone printer almost doesn't make sense anymore. The two new models (both of them from Canon) that we looked at this month—the Pixma MP210 and the Pixma MP470—cost \$80 and \$100, respectively, and they aren't the only MFPs vying for thrifty buyers in this price range. The Pixma MP210 is best suited for light use, given its spartan design and limited copy functions. For just a little more money, its Pixma MP470 cousin offers a much better design, with a



CANON'S PIXMA MP470 prints nice photos and costs just \$100.

1.8-inch LCD and two media-card slots, so you can print photos without ever firing up your computer.

Want even more? Check out the recently introduced HP Photosmart C5280—it has a bigger LCD plus the ability to print onto CDs and DVDs. With this MFP, HP bundles scanning and photo-editing software that automates common tasks such as scanning to a PDF or creating a greeting card.

—Melissa Riofrio

PC WORLD TOP 10 INKJET MULTIFUNCTION PRINTERS

MODEL	PCWRating	Performance	Features and specifications
1 BEST BUY Canon Pixma MP600 \$180 find.pcworld.com/55863	83 VERY GOOD	- Text quality: Good - Graphics quality: Good - Tested speed (ppm): 11.9 text/3.7 graphics	30 ppm text 24 ppm graphics 9600-by-2400-dpi maximum true-color resolution
BOTTOM LINE: The MP600 prints high-quality text and photos; it has a duplexer and dual paper trays, but no film scanner.			
2 Canon Pixma MP470 \$100 NEW find.pcworld.com/58433	80 VERY GOOD	- Text quality: Good - Graphics quality: Very Good - Tested speed (ppm): 8.7 text/2.1 graphics	22 ppm text 17 ppm graphics 4800-by-1200-dpi maximum true-color resolution
BOTTOM LINE: For \$100 you get full photo capabilities; a 1.8-inch LCD; and good scanning, copying, and printing features.			
3 HP Photosmart C5280 \$150 find.pcworld.com/58163	80 VERY GOOD	- Text quality: Good - Graphics quality: Very Good - Tested speed (ppm): 7.3 text/2.4 graphics	30 ppm text 22 ppm graphics 9600-by-2400-dpi maximum true-color resolution
BOTTOM LINE: This feature-rich inkjet MFP deftly handles everyday copies and scans, as well as photo and CD/DVD printing.			
4 Canon Pixma MP960 \$400 find.pcworld.com/55864	80 GOOD	- Text quality: Fair - Graphics quality: Good - Tested speed (ppm): 11.7 text/3.1 graphics	25 ppm text 17 ppm graphics 4800-by-1200-dpi maximum true-color resolution
BOTTOM LINE: A big LCD and scroll wheel make the MP960 a snap to use. It prints top-quality photos quickly and scans film.			
5 Canon Pixma MP510 \$150 find.pcworld.com/55865	79 GOOD	- Text quality: Fair - Graphics quality: Good - Tested speed (ppm): 8.2 text/3.3 graphics	29 ppm text 19 ppm graphics 9600-by-2400-dpi maximum true-color resolution
BOTTOM LINE: This basic multifunction printer with dual paper trays produces high-quality photos, but its color LCD is small.			
6 Canon Pixma MP530 \$180 find.pcworld.com/57390	78 GOOD	- Text quality: Good - Graphics quality: Good - Tested speed (ppm): 8.9 text/3.2 graphics	35 ppm text 34 ppm graphics 4800-by-1200-dpi maximum true-color resolution
BOTTOM LINE: The MP530 manages several home-office functions, but it can print digital photos only from your PC.			
7 HP OfficeJet Pro L7680 \$399 find.pcworld.com/57391	77 GOOD	- Text quality: Fair - Graphics quality: Fair - Tested speed (ppm): 13.1 text/4.2 graphics	24 ppm text 20 ppm graphics 1200-by-600-dpi maximum resolution
BOTTOM LINE: It has a high price for an inkjet MFP, but you get small-office features for less than a color laser MFP would cost.			
8 Canon Pixma MP210 \$80 NEW find.pcworld.com/58439	77 GOOD	- Text quality: Good - Graphics quality: Very Good - Tested speed (ppm): 8.6 text/2.1 graphics	22 ppm text 17 ppm graphics 4800-by-1200-dpi maximum true-color resolution
BOTTOM LINE: Buy the low-priced Pixma MP210 only if you can tolerate a confusing control panel and scant copy capabilities.			
9 HP Photosmart C5180 \$200 find.pcworld.com/55866	76 GOOD	- Text quality: Fair - Graphics quality: Fair - Tested speed (ppm): 7.3 text/2.8 graphics	32 ppm text 31 ppm graphics 4800-by-1200-dpi maximum true-color resolution
BOTTOM LINE: Priced attractively for a networked MFP, the C5180 delivers nice photos, but it could do better on plain paper.			
10 Epson Stylus Photo RX580 \$120 find.pcworld.com/55867	73 GOOD	- Text quality: Poor - Graphics quality: Poor - Tested speed (ppm): 3.9 text/2.8 graphics	30 ppm text 30 ppm graphics 5760-by-1440-dpi maximum true-color resolution
BOTTOM LINE: This easy-to-use model fails to offer any outstanding features to compensate for its mediocre print quality.			
CHART NOTE: Prices and ratings are as of 9/12/07. Speeds are in pages per minute (ppm); resolutions are in dots per inch (dpi).			

MORE ONLINE For more information about inkjet MFPs and for details on how we test them, go to find.pcworld.com/58645.

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Sleek iMac Offers Modest Upgrades

PCW Test Center

THE 24-INCH IMAC is the big boy of Apple's all-in-one desktop line. Despite a new design and upgraded specs, it constitutes a modest update. But this striking system will surely make you look twice.

We tested the retail-store configuration of the 24-inch iMac: Priced at \$1799, it comes with a 2.4-GHz Intel

Core 2 Duo T7700 processor, 1GB of memory, a 320GB Serial ATA drive, an ATI Radeon HD 2600 Pro graphics card with 256MB of GDDR3 memory, and a slot-loading DVD burner.

The PC World Test Center used Apple Boot Camp 1.4 to load Windows Vista Home Premium onto the iMac. On our WorldBench 6 Beta 2 test suite, the unit turned in a score of 82; that's about 20 percent behind the average power desktop PC score of 103, but still swift. (This model's high price dictates that we match it against power systems.)

As for looks, this iteration

of the iMac dispenses with the kludgy plastic chassis of the earlier iMac line in favor of a sleek anodized aluminum one. Image quality on the 1920-by-1200-pixel-resolution, glossy glass-covered display is significantly better than before as well, thanks to superior contrast and sharpness.

Like its predecessor, this 24-inch iMac comes with a FireWire 800 port for fast data transfers between the computer and devices that use that interface, such as external hard drives.



THE NEW IMAC'S design uses glass and anodized aluminum.

As appealing as the new iMac is, with the Leopard operating system coming soon (at around the time you read this), I'd recommend holding off. If you do, you'll get the new OS preinstalled.

—Melissa J. Perenson

PHOTOGRAPH: MARC SIMON

76
GOOD

iMac | Apple

Supersleek all-in-one system has great image quality. List: \$1799

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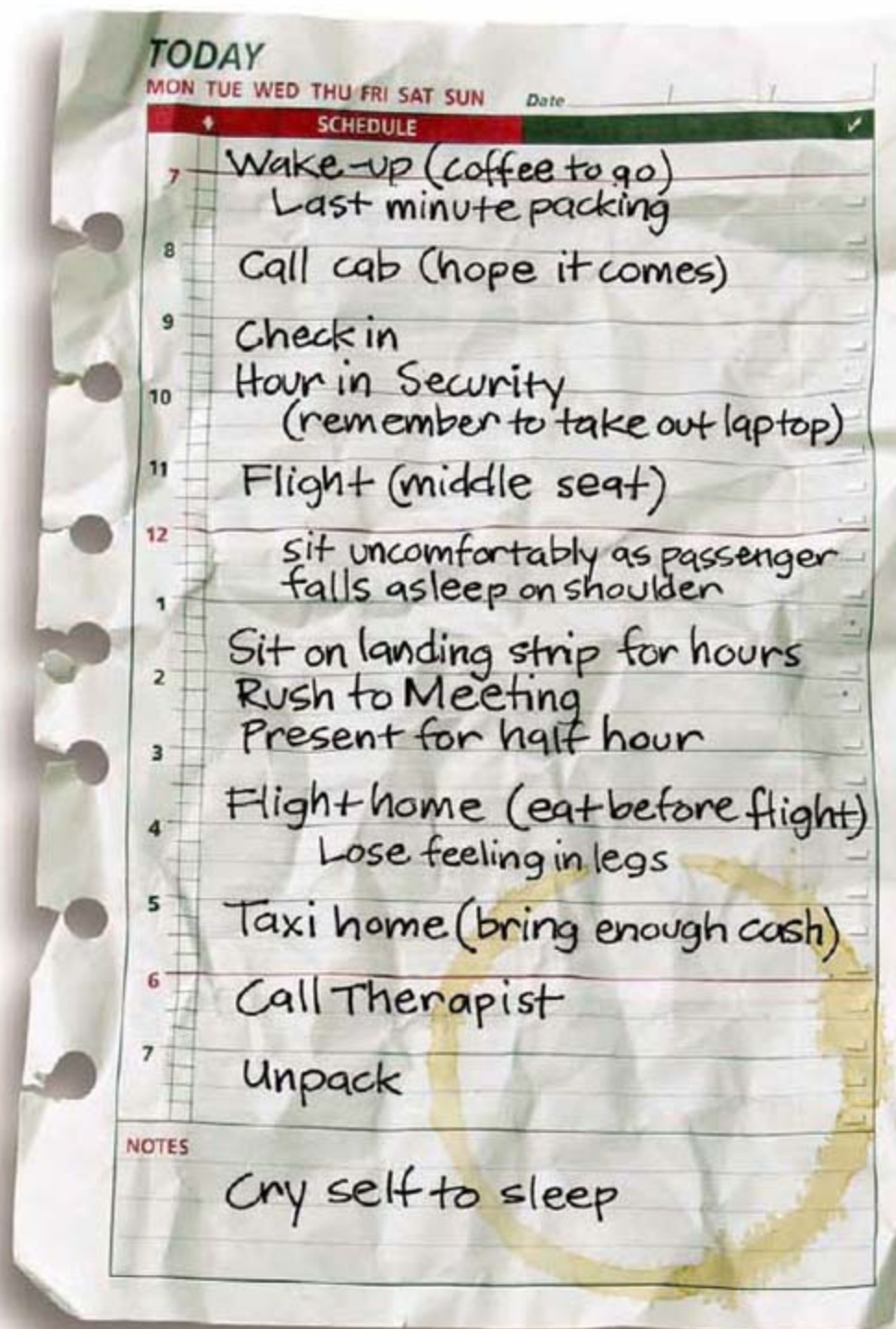
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Paint Shop Gets Paint Job but Needs Body Work

COREL'S PAINT SHOP Pro Photo X2 image editor, with its darker interface, looks better than previous versions did, but the new shade is the only visual tweak. What the interface needs is a complete overhaul—it's so jam-packed with overlapping options that it's hard to wade through.

78

GOOD

Paint Shop Pro Photo X2 | Corel
Powerful image editor is over-stuffed and cluttered. Street: \$99
find.pcworld.com/58357

For example, X2's primary new feature, Express Lab, is supposed to simplify processing lots of images with commonly used tools, such as cropping and red-eye reduction. However, Express Lab itself introduces no new tools, and it isn't a batch processor—you can't tell it to, say, resize ten images at once. (A batch processor resides elsewhere.) If you want a tool outside the small set, you must exit the box.

Corel added a few mostly-for-fun tools, including Thinify, to simulate shaving a few pounds off your subjects,



EXPRESS LAB LETS you work on images with a few common tools.

and Eye Drop, to whiten bloodshot eyes. They're easy to use, but since they don't offer many adjustments, the effects are pretty coarse. You can now apply layer styles, such as drop shadows and glows, to vector layers; surprisingly, they don't allow

much customization either. Paint Shop Pro Photo X2 has plenty of powerful tools to satisfy practically anyone who edits images, but using it feels like trying to row a two-person dingy that's carrying 14 people on board.

—Alan Stafford

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DOWNLOAD THIS LAURA BLACKWELL

Headset Brings the Game to You

HEAD-MOUNTED displays of years past tended to be bulky monstrosities. But Vuzix's new iWear VR920 headset sports a slimmer design. It connects to your PC's VGA output and successfully conveys the sensation of viewing a 62-inch display from 9 feet away.

The VR920 supports resolutions of up to 1024 by 768, and the 60-Hz progressive-scan LCDs don't flicker. The



HEAD TRACKING ENABLED:
Vuzix's iWear VR920 glasses.

glasses feature an integrated noise-canceling microphone, earbuds, and head tracking—the ability to move your head to look around inside games from a limited but growing list, including Flight Simulator X, Half-Life 2: Deathmatch, Second Life, and World of Warcraft.

— Danny Allen



iWear VR920 | Vuzix

Streamlined but pricey headset has cool tools for gamers. List: \$400
find.pcworld.com/58587

Track Power and Bandwidth Usage, Web Habits

YOU CAN'T SOLVE a problem until you recognize it. The following three practical tools—an energy saver, a bandwidth meter, and a procrastination fighter—spotlight common issues. All of them are free.

Save Your Energy

Any running PC—whether it's actually in use or not—slurps up power, contributing to greenhouse gas generation and greenhouse evaporation. The Local Cooling utility integrates into and expands on Windows XP's Power Options Properties.

This freebie from Uniblue enables you to specify how long your PC should remain on full alert before it starts spinning down the disks, switching to system standby, and so forth. In the program's interface, Local Cooling tells you how much energy your graphics board, CPU, and other components consume. You can accept one of three levels of across-the-board settings, or you can input your own numbers. Even minor tweaks—shutting off your monitor a few minutes earlier, for instance—can save precious energy.

To reward your efforts, Local Cooling displays those savings in easily understandable units: kilowatt hours, translated into trees or gallons of oil. You can register all of your PCs on a free Local Cooling account, and you can log in to the Local Cooling Web site to see how other individuals and companies are keeping up with you. Cool indeed. Free, find.pcworld.com/58385.

Do You Have the Bandwidth?

Many ISPs cap the amount of data you can move each month; but when you're in the middle of a cycle, it's hard to tell how much of your allotment you've used. BitMeter II, a free bandwidth meter, can help. Its killer feature is the ISP Restrictions screen, where you can specify your ISP's monthly limit and request an alert when you hit a customizable percentage of it.

From the start, BitMeter II tracks your PC's current download and upload speeds. Once you've used BitMeter for a while, you can appreciate the graphs and spreadsheets that the program uses to chart your data transfer patterns by hour, day, week, and month. Code-



LOCAL COOLING SHOWS you exactly how much power you've saved as a result of your conservation efforts.

Box Software, BitMeter's creator, also includes a calculator for estimating how long a download will take. Free, find.pcworld.com/58386.

Untangle Yourself From the Web

Perhaps you tell yourself that you'll check the latest funny video on YouTube for just a minute, but those minutes can snowball into hours over the course of a week. The free Firefox extension MeeTimer totes up the time you spend (or fritter away) at various Web sites in categories that you define. It can even nudge you if you're about to lapse into a state of indolence.

You decide which category a site belongs in: Procrastination, Search, Work, or one you create and name yourself ("Celebrity Research," say). When you rest the pointer on the MeeTimer symbol in Firefox's status bar, a pop-up gives you a text breakdown of how you've spent your work week. From the program window, you can fine-tune your reporting and view Advanced Stats going back a full year.

If you ask it to, MeeTimer will warn you when you enter a designated Procrastination site. A transparent window reports how much of your work week you've already dedicated to the spirit of Maynard G. Krebs; from there, you can either close the tab or proceed to perdition.

MeeTimer is free to try, but its author at Productive Firefox requests donations to defray costs. Donationware, find.pcworld.com/58387. ●

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SMB Mobility

Productivity Unplugged

MOBILE TECHNOLOGIES are at the vanguard of great potential opportunities for small and medium-sized businesses to greatly extend the power and reach of their relatively limited workforces. The better connected mobile workers are to real-time, business-critical data and files, the more effectively they can serve customers.

But effective, affordable and scalable mobile deployments don't happen accidentally. To the contrary, mobility excellence starts with a mobile strategy, not some random collection of devices, boxes and mobile services. That's called "mobile chaos."

The truth is, it takes some discipline and planning to avoid being swept up by the allure of all the latest and greatest mobile devices and technologies. It is equally important to make sure your company's mobile resources grow logically, and not as a result of individual employees buying the latest, coolest thing on their own and expensing it.

Here is a simple yet effective set of steps to consider when planning a real mobile strategy for the SMB:

- **Think "tool," not "gizmo."** Dispel the frame of mind that these cool-looking mobile devices are toys or signs of status, but rather are tried-and-true productivity tools. Like any other such tool, they should yield a return.
- **Consider what your company needs, not what employees want.** Perhaps nothing is more important in

defining a mobility strategy than a carefully considered assessment of your business requirements. No mobile device or solution should be deployed without being tied directly to some productivity improvement, often measured in time savings.

- **Integration is key.** Mobile technologies do not exist on their own, but rather

must integrate with other systems. The time to determine how well they do is before you deploy, not when the technology is already in the field.

- **Security? Check!** Mobile security can be as effective as security in a hard-walled office. But like integration, it has to be considered beforehand, not after deployment.



You *CAN* take it with you

For people who love the portability and convenience of their laptop computers or tablet PCs, but also want that familiar "newspaper feel" of *The New York Times*, Times Reader* is the digital newspaper that reads like the real thing. Times Reader offers electronic access to *The Times* with the same look and sections of the newspaper. When you sync Times Reader you can have the latest news, photos and access to over 5,000 crossword puzzles, wherever you go.

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Your PC in **2008** and Beyond

BY ROBERT STROHMEYER | ILLUSTRATION BY GEOFF SPEAR

Blindingly fast chips, flexible displays, nanotube cooling, and more: Tomorrow's technologies will change everything about computing, whether you're at home, at work, or on the road. [>>](#)

The pace of everyday living may be hectic, but the pace of innovation is downright frenetic. Technologies barely imagined a few years ago are now poised to change the face of computing, as digital devices continue to burrow into every aspect of daily life.

The world of science fiction is rapidly becoming fact, from tabletops that charge your laptop wirelessly to wall-mounted PCs that recognize your face and gestures. Thanks to breakthroughs in miniaturization, you'll be able to tuck products into your pocket that wouldn't have fit into your briefcase a few years ago, such as projectors and photo printers. The next generation of Internet technology will change everything from TV to Coke machines. And standard computer building blocks are growing ever more powerful, as processor makers squeeze more cores onto each chip and drive makers pack more bits into each platter—guaranteeing that even ordinary PCs of the future will be anything but ordinary.

In the pages that follow, we spotlight a dozen major innovations, from ones right around the corner to a few that won't show up until at least 2012. On multiple fronts, the future you've been waiting for has almost arrived. Here's what you need to know to prepare for it.

Kiss Your Power Cord Good-Bye

You hardly think twice about connecting your wireless laptop to the Internet, but you still have to fumble for a power cord when your battery runs out. How quaint. Soon all those cumbersome power

bricks will be just a footnote

PUT YOUR DEVICES
on a special pad, and
they will charge
without wires.

in your grandchildren's history books, as wireless charging comes to market.

What is it? Currently two ways to accomplish wireless charging exist. Inductive charging works by matching the resonance of the charging pad's electromagnetic field to that of the battery, allowing the battery to charge over a small physical gap. In contrast, conductive charging passes electricity directly between two surfaces in contact. Which method will win out is not yet clear, but in either case you'll be able to simply place your laptop, phone, and music player onto a universal wireless charging pad that will immediately begin juicing them up.

When is it coming? Next year both inductive and conductive charging technologies will emerge onto the market, but most devices will require a \$30 adapter to work with them. WildCharge (www.wildcharge.com) expects to roll out its first conductive-charging notebook product (paired with a compatible notebook) in time for 2008's back-to-school season, while eCoupled (www.ecoupled.com) is pushing to get its inductive technology into cars, countertops, and desk surfaces by 2009. Look for wireless charging to become commonplace in 2010, after major phone and laptop vendors sign on to support it.

Print From Anywhere (and Anything)

Forget about running home to print out your photos or—gasp!—ordering prints online. The next generation of mobile devices will come with their own built-in printers.

What is it? Zink (short for "Zero Ink") Imaging (www.zink.com), a spin-off of Polaroid, has been working on a new way of making photo paper.

Zink paper has a crystal substrate sandwiched between its layers that colorizes as it passes through a slim-profile printer. The printers themselves are so small that you can slip one in your pocket, and they can easily be built into cameras, laptops, or other devices.

When is it coming? In 2008, Zink will partner with a major camera vendor (name not announced) to release the first pocket-size digital camera with a

Tech Beyond 2010

Gigabit Internet (2012): Dogged by the speed of your home broadband service? With a gigabit Internet connection over a fiber-optic line, you'll be able to download the latest movies in less than a minute at speeds up to 1 gbps.

Mobile fuel cells (2013): Now in development, hydrogen fuel cells will power your laptop for a week at a time using store-bought fuel cartridges.

Smart homes (2014): We've heard for years about the smart home—a house chock-full of computer-driven appliances that cater to your every need. As homes with built-in ethernet wiring become more common in several years, central home PCs will control everything from the thermostat to the lighting to the security system.

Probe storage (2015): Code-named Millipede, the probe storage system being developed by IBM will use atomic force microscopy (think itsy-bitsy dots) to store more than a terabyte of data per square inch on a polymer surface. An array of thousands of little probes will be able to read and write large amounts of that data far more quickly than today's drives can.

Nanolightning systems (2015): It has "lightning" right in the name, so you know it's cool, but it's really about cooling off your hardware. Microscopic nanotubes will use an electrical charge to generate tiny wind currents on the surface of your chips to cool them down without the aid of fans.



built-in printer. This early model will produce 2-by-3-inch photos. At the same time, the company will begin selling a tiny handheld printer (probably for about \$99) for camera phones; it'll print adhesive-backed photos that will likely grace the school binders of many eighth-graders. Two or three years after that, the technology may be integrated into laptops and other mobile devices.

Great Graphics Inside

"Integrated graphics" has long been synonymous with "sluggish graphics." But soon the phrase will have a whole new meaning, thanks to new CPUs with powerful graphics hardware built in.

What is it? AMD's acquisition of ATI brought the company's rivalry with Intel—which already made its own basic graphics chips—to a new level. Since then the two competitors each have been working to bridge the gap between CPUs and graphics processors. Building graphics-processing functionality directly into a CPU eliminates the delay you'd otherwise experience as data passes between the CPU and GPU across the system bus. Such combined CPU/GPUs will feature DirectX 10 support and acceleration for Blu-ray and HD-DVD while consuming substantially less power, requiring less space on the motherboard, and performing significantly better than most of today's discrete graphics cards do.

When is it coming? Intel plans to put its graphics-integrated Nehalem processors into production in 2008, beginning with a line of server chips. AMD intends to release its integrated Puma notebook platform about the same time. In 2009, Intel will bring its graphics-integrated chips to desktops and notebooks, while AMD's Puma will likely reach desktops in 2010.

Screens Get the Bends

The smaller and more powerful devices become, the harder they are to use. Tiny screens just don't cut it when you want to do real work. But if your phone or PDA

came with a large roll-out display, you could work in comfort without sacrificing portability. That's where flexible polymers will come in.

What is it? Display manufacturers make traditional LCD screens by sandwiching liquid crystals between layers of glass and then zapping them with electricity. Replacing that glass with plastic makes things a little more malleable. Initially developed by E Ink (www.eink.com) and Philips (www.philips.com), so-called electronic paper compresses organic light-emitting diode (OLED) crystals between very thin layers of polymer, allowing for



FLEXIBLE SCREENS
for phones or other
devices will fold up
until you need them.

tremendous flexibility. Unlike conventional LCD screens, such ultrathin displays are completely shatterproof, and can even be rolled up into tight spools. The result is a wide-screen monitor that you can carry in your pocket and use anywhere. Better still, such screens will be cheaper and easier to manufacture than today's flat panels—they'll simply be printed directly onto sheets of plastic.

When is it coming? First-generation flexible displays are already here—they're just not that flexible yet. E Ink's electronic paper can be found in such nonflexible products as the \$300 Sony Reader and the \$130 Motorola Motofone F3. The first actually rollable displays, created by the labs of Philips's Holland-based spin-off Polymer Vision (www.polymervision.com), will reach the market in 2008: A cell phone from Tele-

com Italia will carry the world's first Polymer Vision roll-up display. Currently under wraps, the phone (pricing not yet available) is expected to offer a 5-inch, 320-by-240-pixel, monochrome rollable display. By 2010, Polymer Vision expects to market larger color displays with much higher resolution.

The First Real Net Phones

Simple wireless calling satisfied users during the first generation of cell phones, but the second generation (2G) made things more interesting with the introduction of SMS messaging and WAP Internet browsing. 2.5G added pictures and video, but at speeds that feel more like dial-up than broadband. (That's the main problem with the iPhone's data service.) With 3G, higher-bandwidth connections have made 2.5G's multimedia capabilities palatable. 4G will be a whole lot cooler.

What is it? The fundamental difference between 4G and 3G is the way in which the networks will be switched. Until now, most phone networks (except for VoIP) have been circuit switched, meaning a dedicated circuit is activated between the callers. This outdated method puts voice calls in a category all their own, distinct from data connections, and prevents cell phones from transmitting voice calls and data simultaneously. 4G networks will be IP switched, just like all the traffic on the Internet. That not only means that you'll be able to talk and text at the same time, but also that your 4G device will be able to do far more on the network than it can today. IP-switched cellular networks will work more as ISPs do, allowing for greater flexibility in running data applications. Just about any device—from a phone to a laptop to a Coke machine—will be able to connect to the network, and you'll be able to do just about anything with it. Another result of this flexibility: Wireless carriers will likely be



Hot Products

IMPATIENT FOR THE future? These items are due in the next few months.

Microsoft Windows Vista SP1: Early in 2008, Microsoft is expected to release its first service pack for Windows Vista. The update will likely include fixes for everything from User Account Control to DirectX 10 performance, as well as a few interface tweaks.

Apple Mac OS X Leopard: It's been a long time coming, but Apple's latest revision of OS X, version 10.5 (\$129), may be available by the time you read this. It includes an enhanced interface with a transparent menu bar, stackable menus, dynamic workspaces, and the Time Machine file-restoration tool.

HP MediaSmart Server: Based on Microsoft's Windows Home Server platform, MediaSmart Server—starting at \$599 and due out late this fall—will deliver pictures, music, and movies to devices around the home.

Super Talent 32GB SSD 2.5-inch SATA: The 32GB Super Talent drive is one of the first flash-based drives. But early adopters beware: The \$500 price tag is likely to drop, particularly after 128GB drives from mainstream makers hit the market next year.

Electronic Arts Crysis: Hitting shelves November 16, the \$59 sequel to *Far Cry* looks to be the most visually stunning PC game ever. Developer Crytek has taken full advantage of DirectX 10 graphics technology, offering realism and detail unlike anything we've seen.

forced to loosen their iron grip on the services customers can use over their networks, giving everyone more freedom to communicate from the road.

When is it coming? The four major U.S. wireless carriers are just scratching the surface of what their 3G networks can do, and most consumers seem uninterested in more-advanced data streaming. But the underlying technology for 4G networks, WiMax, exists now and is slowly growing in large enterprise net-

works and telecom companies. WiMax itself is not a cellular technology, however, and before a fourth-gen cellular network can evolve, the industry will need to find a new telecommunications protocol to base it on. As business users increase their demand for high-end wireless data services, cellular carriers will begin to deploy networks and devices that deliver 4G service. We expect the first handsets and data cards to hit the market in 2011.

Enter the Octagon CPU

Regardless of what Moore's Law has to say, there's not much point in increasing processor speeds or doubling the bit paths in a CPU if the system bus can't carry the traffic anyway. Since problems with transistors leaking current also worsen as clock speeds increase and CPUs shrink, both AMD and Intel have decided to focus on increasing the number of processor cores on a chip instead of increasing processor speeds.

What is it? The centerpiece of any given CPU is the processor core, which is responsible for the actual calculations that make all of your software run. Placing multiple cores on a single chip dramatically increases the number of calculations that can be performed, without having to raise the clock speed of the chip itself. By keeping clock speeds relatively low while increasing the number of calculations performed simultaneously, chip makers overcome the inevitable overheating problems associated with faster clock speeds. And the more cores a manufacturer crams onto a single chip, the faster the CPU can go. The performance boost isn't one-to-one, however: Intel's four-core 2.66-GHz Core 2 Quad Q6700 performs just 26 percent faster than its

same-speed, two-core Core 2 Duo E6700 on certain applications, according to the company (see the results of *PC World* tests at find.pcworld.com/58599). So while you will see improvement with eight-core CPUs, the speedup won't be as dramatic as it might sound.

When is it coming? Before AMD can start selling eight-core chips for the desktop, it needs to get its quad-core Phenom chips to market in 2008. Intel has been selling quad-core desktop processors for about a year now, and it has announced eight-core chips for servers in 2008. Expect OctoCore—or whatever the company ends up calling it—to come to desktops in 2010.

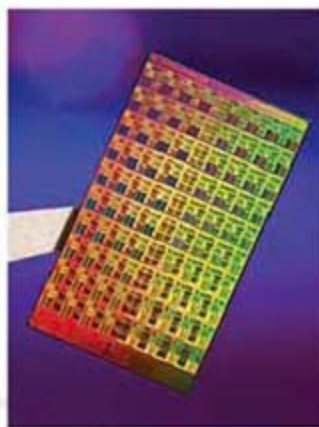
Put Your TV Anywhere

Despite the wireless revolution happening all around your home, your high-def television remains shamefully hardwired in place. Wouldn't it be great if you could put your TV anywhere you wanted, without worrying about where the cable jack was, and still get top-notch video quality? Soon you'll be able to do just that.

What is it? Wireless High-Definition Interface (WHDI) is a cable-free replacement for HDMI that uses a 5-GHz radio transmitter to send an uncompressed 1080p, 30-fps high-def video signal from a WHDI-equipped DVD player, game console, or set-top box, for example, to a WHDI-equipped TV across a distance of up to 100 feet. Because the WHDI signal

is compatible with HDMI, you'll be able to buy HDMI wireless modems for your existing entertainment gear—and that means you can finally rearrange your furniture the way you'd really like it, without having to run additional cables through your walls.

When is it coming? Amimon (www.amimon.com), which manufactures the WHDI chip set, released the technol- ➤



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WHDI ADAPTERS

developed by

Amimon will wirelessly send high-def video from a cable box to a TV.

ogy to electronics makers at the end of August. Now the race is on to

bring WHDI to market. TV makers have already begun demoing new wireless-equipped HDTV models at trade shows, and fans of bleeding-edge tech should be able to get their hands on hardware by the start of the new year. WHDI is expected to add about \$200 to the cost of a new TV, so expect to pay a premium for the technology in 2008. WHDI modems for your existing hardware will likely cost \$300 to \$400 for a pair of adapters (you need at least two—a receiver for the TV and a transmitter for your set-top box, for example—to get started). In a few years, says Amimon vice president of marketing Noam Geri, costs should drop to about \$10 for inclusion in a TV and \$60 for the adapters.

Five Terabytes per Drive

Even if you're not a digital pack rat, you probably still manage to cram a lot of data onto your hard drive. Digital photos, movies, music, and overflowing e-mail folders can pile on the gigabytes before you know it. But don't worry: Way bigger hard drives are on the horizon.

What is it? Heat-Assisted Magnetic Recording, or HAMR (and a nearly identical technology called Thermally Assisted Magnetic Recording), uses

lasers to heat the surface of a drive's platters, making it possible to pack a terabyte of data onto a single square inch of drive surface, roughly twice the current limit. As the drive's read/write head goes about its business, it briefly fires its laser at the surface, destabilizing the iron-platinum particles for reading and writing. With the platter heated, the read/write head can manipulate the surface on a very fine scale—in just tens of nanometers—letting it cram enormous amounts of information into a small space. A few nanoseconds after the work is done, the surface cools for long-term stability. The way data is organized on a disc will change, as well: Rather than having arbitrarily arranged disk sectors, HAMR drives will work with the natural grain of the disk surface, organizing data into self-arranging magnetic arrays that allow the creation of a single bit of data on every grain of the platter's surface.

When is it coming? HAMR is still very much a research project, but it should be coming to market in the next several years. Seagate expects to introduce 5TB HAMR hard drives by 2011, with capacities of up to 37.5TB to follow a few years after that.

A Better Internet

TCP/IP, the technology on which the entire Internet is based, is no spring chicken. The current version of the Internet protocol, IPv4, has been around for more than 25 years. The old technology suffers from some serious limitations—including a shortage of addresses for all the computers that use it. Internet Protocol version 6 will change all that.

What is it? Unlike IPv4, which uses 32-bit addresses like 155.54.210.63, IPv6 uses 128-bit addresses like 2001:0ba0:01e0:d001:0000:0000:d0f0:0010. This small, simple change permits every person in the world—and even every computer in the world—to have a unique IP address. In addition, IPv6 features network-layer encryption and authentication, enabling secure communications between parties.

Battles to Watch

HERE ARE THE top technology fights to follow in the coming years.

AMD vs. Intel: Though Intel currently has the performance edge with its Core 2 line and its quad processor, AMD will soon counter with the release of its own quad-core Phenom chips. Expect things to heat up in a big way with the release of consumer graphics-integrated CPUs in 2009.

DRM vs. unrestricted access: Will user outrage prompt entertainment resellers to come up with a sensible copy-protection scheme, or will corporations overrun fair-use rights with pay-per-play media services? We're putting our money on a compromise between the two, as some labels have already begun offering DRM-free music through iTunes and other services in response to consumer demand for more flexible formats.

Windows vs. Mac vs. Linux: IDC estimates Apple's market share at roughly 5 percent in the United States, while Linux is gaining popularity around the world, particularly with governments and educational institutions. Most estimates still peg Linux desktop users at around 1 percent of the market, but the numbers appear to be climbing. This year, Dell and Lenovo gave Linux desktop users a boost by adding to their product lines systems with Linux preinstalled.

Microsoft vs. Google: Microsoft's long-standing dominance in the office-productivity software arena is facing new threats from the likes of Google, which offers its own productivity suite—Google Docs—online. While Docs has yet to make significant inroads against Microsoft Office, Microsoft's efforts to beat Google at its own game with Live.com have yet to bear fruit. CEO Steve Ballmer's July announcement that Microsoft will begin shifting to a "Web-enabled desktop" in the coming years suggests that the company takes Google's threat seriously.



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When is it coming? IPv6 is here right now, and has been for several years, but almost nobody is using it yet because the hardware needed for it remains more expensive than that for IPv4, and few network administrators are trained to manage it. However, the United States government has declared that it will move all of its networks to IPv6 by the summer of 2008, which even at government speeds means the technology should arrive in time to pick up the slack when the pool of available addresses runs out around March 2011. The depletion of addresses should also induce your ISP to update its network before long.

A PC in Every Surface

Though it seems second nature to us now, the idea of manipulating images on a screen by moving around an input device—a mouse—on the desk was revolutionary when Douglas Engelbart introduced it in 1964. But as well as it works, the mouse is still a surrogate for a far more natural human interface, the fingertip. Over the next few years, a new category of PCs will put your fingers in control.

What is it? Tabletop computing (aka surface computing) gets back to basics by letting you gather around a table with some friends for some good old-fashioned interactivity. Accepting a variety of input types simultaneously, tabletop PCs allow multiple users to work with data projected onto the surface of the table by touching on-screen objects with their fingertips. Many companies are working on tabletop computing technologies, but two of the leading efforts are Microsoft's camera-driven Surface PC and Mitsubishi Electronics Research Labs' RF-driven DiamondTouch. Surface PCs use rear projection to present an image on the surface of the table from inside, while five infrared cameras in the table track

finger movements on the screen. DiamondTouch projects the image from above the table and uses capacitive coupling (like that employed in laptop touchpads) to follow your fingertips—with this design, though, you create shadows when you touch it.

When is it coming? MERL's DiamondTouch is still predominantly a research project, but Microsoft's Surface PC will arrive this year at a hotel, casino, or cellular store near you.

First-generation Surface PCs will be strictly for showcasing in public loca-

MICROSOFT'S Surface PC allows numerous people to manipulate files with their fingertips.



tions, but Microsoft expects to offer a conference-room version for businesses by 2010. Home users will get them three to five years from now. Eventually, says Microsoft, you can expect to have Surface PCs built into countertops, mirrors, or just about any other flat spot in your home.

Put Your Data in the Fast Lane

As CPUs grow more powerful and graphics cards rocket toward ever higher levels of realism and detail, a significant bottleneck in your PC's data flow remains: the system bus. When data travels through your PC, it's the system bus—not the processor—that limits overall performance. What you need is a faster bus.

What is it? PCI Express (PCIe) is the leading system bus architecture for

Overhyped Trends

HERE ARE THREE allegedly hot topics we're tired of hearing about.

Microblogging: What are you doing right now? If the answer is "Washing my poodle in the kitchen sink," we'd rather not know. With short attention spans becoming the norm, services like Twitter and Pownce probably aren't going away anytime soon—but they're not very useful, either.

UMPCs: In 2005, Microsoft announced a bold new standard for mobile devices known as the Ultra-Mobile PC. Armed with touch screens, GPS, and Wi-Fi, these not-quite-tablet PCs were supposed to revolutionize how and where people compute. But by delivering a platform that's too small for true productivity and too large for genuine mobility, Microsoft ensured that the UMPC was pretty much dead on arrival, and new designs have done little to arouse consumer interest—Palm recently scrapped plans for the Foleo, a device with similar dimensions.

Kitchen PCs: For a while now, certain trade shows have been annual love-ins for companies hyping a future full of household appliances with built-in computers. In all these years, however, the best thing we've seen is LG's LSC27990, a \$4,000 icebox with a 15-inch LCD screen crammed into the door. It's mildly interesting to be able to watch a ballgame or get birthday reminders and weather reports while you're standing in front of the fridge (assuming you have a cable outlet tucked behind your appliance nook); but these overpriced, barely functional computers amount to little more than amusing proof-of-concept novelties. They're a far cry from the true smart appliances of the future.

high-end hardware such as graphics cards. The current specification, version 2.3, offers a data transfer rate of 5.2 gigabits per second. The next generation, PCI 3.0, will offer a data rate >>

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of 8 gbps. In addition to supporting much higher GPU performance, a key benefit of PCIe 3.0 may be the ability to power graphics cards directly from the system bus, rather than requiring a line into the power supply. But there's a catch: In order to support the higher data rates, the architecture will no longer work with the older 5-volt hardware used on PCIe versions 1.1 and 2.0. Whereas PCIe 2.3 supports both 5V and 3.3V cards, PCIe 3.0 will be 3.3V only. That means most current 5V hardware will be obsolete when PCIe 3.0 debuts.

When is it coming? PCI-SIG, the group that oversees PCI architecture specifications, expects to release the final PCIe 3.0 spec in 2009. PCIe 3.0 graphics cards should hit the market in 2010.

Pocket Presentations

Watching video on a cell phone is a pain. Even if you find the content you want, the tiny screen makes enjoying the program difficult. Before long, however, you'll be seeing shows right-sized again, thanks to your projector-equipped cell phone.

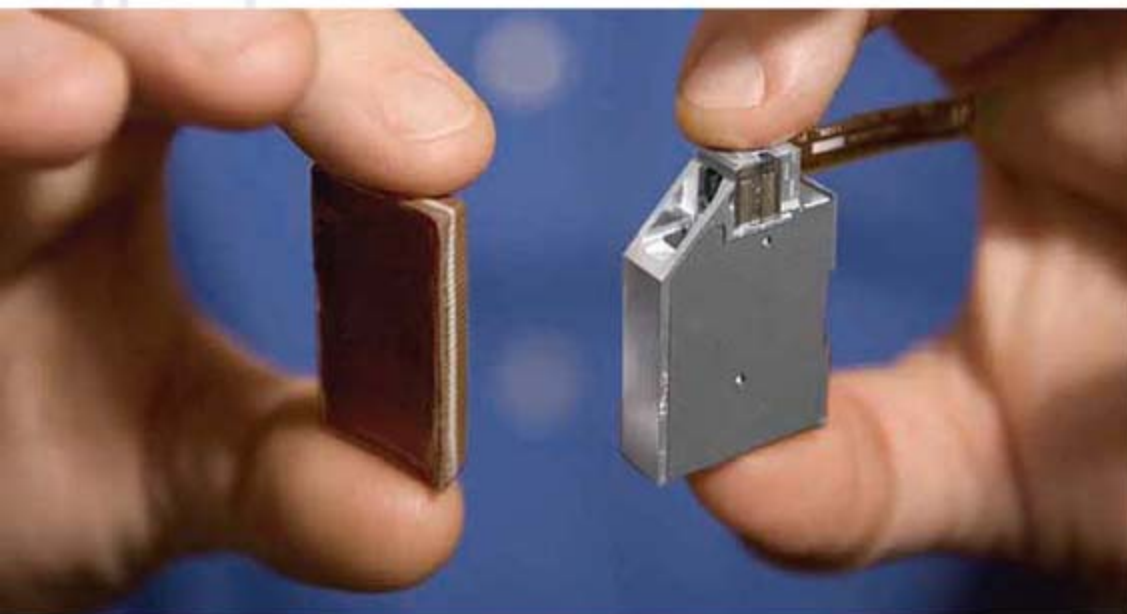
What is it? Microvision Pico projectors (www.microvision.com) employ light scanning technology to generate a complete, full-color image from a beam of

scanning mirror that oscillates vertically and horizontally to render the image pixel by pixel, producing a larger picture that projects onto a wall or other surface (as large as 120 inches, from 12 feet away in a darkened room). Controlling the scanner, the light source, and the optics is the PicoP engine, which coordinates the various components to control the intensity of each beam of light to create thousands of colors. By using a single beam of light rather than three beams, Microvision is able to make the projectors small enough to fit into cell phones without appreciably increasing the size of the phones. And the company even expects the integrated projectors to play a feature-length movie on just one cell phone charge.

When is it coming? Microvision has partnered with Motorola to build Pico projectors into mobile phones, and the first projector-equipped model is expected to debut in 2009. Meanwhile, the company is designing a projector accessory for PCs and game consoles that should be available by the end of 2008. Built-in projectors can be expected to add as much as \$150 to the price of a phone, while accessory projectors will likely cost around \$200, says Avi Greengart, principal analyst for mobile devices at Current Analysis and editor of the Home Theater View blog (www.hometheaterview.com). ●

THE PICO projector, about the size of a mint, will fit in a cell phone.

light. Within the device it's embedded in, a single red, green, or blue laser bounces off a tiny



Overdue Tech

AFTER YEARS OF waiting for these promising technologies, we think they're still far from mainstream.

WiMAX: Back in 2003, WiMax was heralded as the ultimate solution to the world's connectivity problems, capable of covering an entire city with ubiquitous broadband. WiMax today, however, is little more than an IT backbone for long-distance line-of-sight wide-area networks, largely because it's not very effective for the kinds of mobile devices that most people use for wireless Internet service. The basic technology of WiMax may yet evolve as part of future 4G cellular networks, but that's still a long way off.

IPTV: Oh, how we've hungered for the video nirvana that IPTV has been promising. But while Verizon's FiOS TV and AT&T's U-Verse are finally rolling out, they've yet to produce the amazing lineup of HD channels, on-demand shows, integrated gaming, and digital voice calling the companies claimed would come, and they're still anything but ubiquitous. Meanwhile, digital cable has evolved enough to take some of the wind out of IPTV's sails.

RFID: If early predictions were to be believed, today you would be walking through the grocery store filling up your cart as tiny radio frequency identification (RFID) tags announced the contents of the cart and an RFID-enabled credit card automatically paid the bill. Ummm, nope. The biggest holdup has come from the very companies attempting to roll out the technology, with industry infighting over standardization keeping RFID on the shelf.

Virtual reality: Second Life boasts a 3D space in which users can buy and sell property, create objects, and socialize, but its relatively crude graphics still feel more virtual than real. Virtual reality as folks imagined it in the 1990s isn't likely to emerge until someone invents a wearable display that people will actually wear. At least we have World of Warcraft.



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LCD vs. Plasma: Which HDTV Is Right for You?

LCD TVs may be sexy, but our lab tests show that plasma screens still have an edge—and you can get a surprisingly pleasing picture without splurging.

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SHOULD YOU BUY an LCD set or a plasma set? According to conventional wisdom, plasmas cost less and provide a better picture. Our tests indicate that these assumptions are generally true: Three of the four top-scoring sets for image quality in our roundup were plasmas (the only LCD among the four was Vizio's). Three of the four least-expensive TVs we reviewed were also plasmas, but so was the most expensive one (Pioneer's).

Our test group consisted of five plasma televisions and seven LCD TVs; in our lab testing, we found that most of the sets were capable of producing superb pictures (as a result, their performance scores didn't differ by much), making design, features, and price more important. For various reasons, two sets—Pioneer's PDP-4280HD plasma and Toshiba's 42HL167 LCD—failed to make our *Top 10 40- and 42-Inch HDTVs* chart (see page 114), but you can find reviews of them at find.pcworld.com/58463.

For a cheat sheet on new HDTV technologies, see "HDTV Technologies to Look For" (find.pcworld.com/58462). For details on our testing methodology, watch our online video (find.pcworld.com/58461). >>







Samsung LN-T4061

BEST BUY Even without the Samsung brand name, you would know that this television and the HP-T4264 came from the same manufacturer. This model is a bit smaller, supports 1080p, and uses an LCD panel instead of a plasma screen; but the physical design, menus, remotes, and just

about everything else are identical. It's no surprise that the two sets earned very similar marks.

The LN-T4061 scored slightly above the group average in most of our jury tests, though it struggled with standard-def content, whether over the air or on DVD. For the most part the set handled high-def chores well, but it rendered slightly washed-out flesh tones on the only test performed in 1080p, which used the *Mission: Impossible III* Blu-ray disc.

You shouldn't have any trouble getting the LN-T4061 up and running. Every connector that you might want to plug something into points outward. The majority of these connectors are located on the back, but you can find a few extra ones on the side for easy access.

The menus are compact and quite legible. If you find that you can't read them easily enough, you can make the background opaque. When you select sources, the LN-T4061 skips the ones that have nothing plugged into them; these appear grayed out on the Sources menu. You can rename your sources if you feel that *DVD* or *VCR* tell you more than *HDMI 1* or *S-Video 2*, but you must select names from the supplied list—you can't enter ones of your own devising.

This well-equipped TV set has a freeze button and picture-in-picture for displaying content from two different sources (though not from two different channels, because it has only one tuner). The television also has a headphone jack and a USB port that you can use if you want to view JPEG image files or listen to MP3 audio files from an external device.

All things considered, this is an excellent LCD television.

REMOTE REVIEW:

Very Good

Samsung's LN-T4061 comes with a long and slightly clumsy remote. It's programmable, and some of the buttons light up.



Samsung HP-T4264

Ease of use and a low price, along with great specifications and some nice features, earn the Samsung HP-T4264 second place on our chart—despite a picture that, while not bad, wasn't quite as good as on the other plasma sets we tested.

The HP-T4264's color rendering was only fair, but everything else about the picture was pretty good. And in most other ways this set is a gem and (at \$1400) a bargain. For one thing, it's easy to set up. The inputs—most are on the back panel—stick outward instead of down. The selection of side inputs is especially nice, with a headphone jack, a USB port for viewing pictures and listening to MP3s from an external device, a second S-Video port, and even an extra HDMI connector.

The menus are compact and readable. Like most TVs' on-screen menus, they're transparent, but you can shut off the transparency to increase readability. When you scroll through sources, the set skips those with nothing plugged into them.

Other cool features include a still button and picture-in-picture; you can't watch two channels at once, however, because the HP-T4264 has only one tuner.

We looked at four plasma televisions with native 720p resolution, and three of them handled a 1080p signal by down-converting it and displaying it as best they could. In contrast, the Samsung HP-T4264 refused to handle the signal at all. In the real world, this shouldn't be too much of a problem, since you can set any Blu-ray or HD DVD player to output content at a lower resolution. But because we couldn't make our test equipment simultaneously output 720p for the HP-T4264 and 1080p for the other sets, it failed that test, which dragged down its performance score.

Nevertheless, overall this is a very appealing plasma set that clearly earns its ranking on price and features.

REMOTE REVIEW:

Very Good

This long, programmable remote, with several buttons that light up, is the same one that comes with the LN-T4061.



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HP PL4272N

The PL4272N's pictures weren't the best-looking ones in our tests, but they weren't bad, and the TV carries an excellent price. The set's worst problem? Skin tones on the *Mission: Impossible III* Blu-ray disc we looked at seemed a bit pinkish.

Like those on its LCD cousin (the LC4276N), the PL4272N's on-screen menus are small and colorful, yet easy to read.



REMOTE REVIEW:

Good

The PL4272N uses the same large, non-programmable remote as HP's LC4276N. Its few buttons are easy to find and use. The buttons don't light up.

One menu option on the PL4272N that you won't find on an LCD is White Wash, a utility for fixing burn-in problems. Despite supplying the utility, HP doesn't seem too wor- >>

1080p, Plasma: Look for One—or Both—to Obtain the Best Picture

40- OR 42-INCH HDTV	PCWRating	Performance	Features and specifications	Bottomline
1 BEST BUY Samsung LN-T4061 \$1600 find.pcworld.com/58338	79 GOOD	• HDTV: Good • SDTV: Good • Blu-ray/HD DVD/DVD: Good • Overall design: Very Good	• Screen: 1920 by 1080 pixels • Tuner: ATSC • Inputs: Three HDMI, two component • Panel: 40-inch LCD	Above-average HD disc and TV image quality make this well-equipped, 40-inch, 1080p LCD set the Best Buy. Its cabinet and remote are identical to those of the HP-T4264.
2 Samsung HP-T4264 \$1400 find.pcworld.com/58337	79 GOOD	• HDTV: Good • SDTV: Good • Blu-ray/HD DVD/DVD: Fair • Overall design: Very Good	• Screen: 1024 by 768 pixels • Tuner: ATSC • Inputs: Three HDMI, two component • Panel: 42-inch plasma	Samsung's plasma TV combines a low price with some nice features. It doesn't accept 1080p input, so you'll have to set your Blu-ray or HD DVD player to output 720p or 1080i.
3 HP PL4272N \$1200 find.pcworld.com/58331	77 GOOD	• HDTV: Good • SDTV: Good • Blu-ray/HD DVD/DVD: Good • Overall design: Fair	• Screen: 1024 by 768 pixels • Tuner: ATSC • Inputs: Three HDMI, two component • Panel: 42-inch plasma	This 42-inch, 720p plasma set earned average scores in most image tests, and it has very little in the way of extras, but its superb price helped it climb the chart.
4 Vizio VP42 \$1000 find.pcworld.com/58342	77 GOOD	• HDTV: Good • SDTV: Very Good • Blu-ray/HD DVD/DVD: Good • Overall design: Fair	• Screen: 1024 by 768 pixels • Tuner: ATSC • Inputs: Two HDMI, two component • Panel: 42-inch plasma	The VP42's picture earned very high marks, as did its bargain price. Be forewarned that it's a bare-bones set, with a very basic remote and no burn-in prevention features.
5 Philips 42PFL7432D/37 \$1700 find.pcworld.com/58334	75 GOOD	• HDTV: Good • SDTV: Good • Blu-ray/HD DVD/DVD: Good • Overall design: Good	• Screen: 1920 by 1080 pixels • Tuner: ATSC • Inputs: Three HDMI, two component • Panel: 42-inch LCD	This set has many extras, including Philips's unique Ambilight backlighting. Its overall image quality, however, was slightly subpar compared with the rest of the test group.
6 LG Electronics 42LB5D \$1800 find.pcworld.com/58332	74 GOOD	• HDTV: Good • SDTV: Good • Blu-ray/HD DVD/DVD: Good • Overall design: Good	• Screen: 1920 by 1080 pixels • Tuner: ATSC • Inputs: Three HDMI, two component • Panel: 42-inch LCD	Promising specs—including 1080p, a fast pixel response time, and HDMI 1.3—failed to add up to a superb picture, and we didn't like the disorganized menu system.
7 Vizio Gallevia GV42LF \$1400 find.pcworld.com/58341	73 GOOD	• HDTV: Good • SDTV: Good • Blu-ray/HD DVD/DVD: Very Good • Overall design: Fair	• Screen: 1920 by 1080 pixels • Tuner: ATSC • Inputs: Two HDMI, two component • Panel: 42-inch LCD	The least-expensive LCD television in our review earned the best image-quality score of any LCD set, and it's inexpensive. You'll have to settle for a plain remote, though.
8 Panasonic TH-42PV700U \$1800 find.pcworld.com/58333	73 GOOD	• HDTV: Good • SDTV: Good • Blu-ray/HD DVD/DVD: Very Good • Overall design: Good	• Screen: 1920 by 1080 pixels • Tuner: ATSC • Inputs: Two HDMI, two component • Panel: 42-inch plasma	The first 42-inch plasma 1080p set is great where it counts—in the picture. It earned very good marks for high-def content. You can display slide shows from its media slots.
9 HP LC4276N \$1600 find.pcworld.com/58329	73 GOOD	• HDTV: Good • SDTV: Good • Blu-ray/HD DVD/DVD: Good • Overall design: Good	• Screen: 1920 by 1080 pixels • Tuner: ATSC • Inputs: Three HDMI, two component • Panel: 42-inch LCD	The LC4276N doesn't show an exceptional picture, and it has few extras to make up for that shortcoming. However, other TV makers could take cues from its port layout.
10 Sony Bravia KDL-40W3000 \$2070 find.pcworld.com/58339	73 GOOD	• HDTV: Good • SDTV: Good • Blu-ray/HD DVD/DVD: Good • Overall design: Very Good	• Screen: 1920 by 1080 pixels • Tuner: ATSC • Inputs: Three HDMI, two component • Panel: 40-inch LCD	This top-notch set earned high marks for image quality and design, and it has a nice freeze-image function. Too bad its price is out of line with comparably configured sets.

CHART NOTES: Prices and ratings are as of 8/29/07. For more information on the TVs in this chart, including testing details, go to find.pcworld.com/58463.

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ried about burn-in. The PL4272N is one of only two plasmas we looked at (the other one being Vizio's VP42) that lacks an option for displaying gray sidebars in 4-by-3 mode—a good precaution for plasmas if you like to watch standard-definition programs in their original aspect ratio because it will allow more-even phosphor aging. In the documentation for their respective plasma sets, HP and Vizio don't provide the ominous burn-in warnings found in the other plasmas' manuals.

Like its LCD cousin, the PL4272N omits many appealing features. For example, it has no headphone jack, no picture-in-picture, and no media slots. Despite the lack of extras, the PL4272N provides a good picture at a very good price.

Your Next Cable Box: Smart and Fast



UPCOMING CABLE SET-TOPS will soon sport significant improvements to deal with HDTVs.

Time Warner is introducing boxes that are Open Cable Access Platform-compatible, which means that they permit two-way communication. But the boxes still use one-way CableCards; other components handle two-way communication for guide info and pay-per-view.

Scientific Atlanta says it is working on a line of set-top boxes carrying faster CPUs, more memory, and operating software based on a Linux kernel; the boxes will accept multistream CableCards, too, so you won't have to rent more than one card.

Comcast says that it should roll out set-top boxes that run TiVo software across the country by year's end, but customers will pay extra for the TiVo interface. The company is also focusing on implementing MPEG-4 support, since more content companies (including HBO) are using that format. Like Scientific Atlanta, Motorola is looking to use Linux in its boxes, too, plus HDMI 1.3 for higher bandwidth between the box and your TV.

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Vizio VP42

Who knew you could get an image this good for a mere grand? Though it cost less than any other set in the roundup, the Vizio VP42 finished second in our image-quality tests.

Such quality is all the more amazing when you consider the set's lack of 1080i or 1080p capabilities. Usually I can easily recognize a true 1080p picture, but the VP42 had me fooled. Our jury gave this television high marks straight down the line. Aside from a bit of shimmering on facial stubble in one test, I didn't see anything I didn't like.

Unfortunately I can't say the same for the VP42's setup and menu system, which were identical to those of Vizio's Gallevia GV42LF LCD set. Without exception, the television's inputs are difficult to get to, and the on-screen menus—which present you with small, blue text against a blue background—are needlessly hard to read. Another inconvenience: Once you've run the setup wizard, you can never run it again.

Nor are there many extra features beyond a convenient program guide—and even this failed to identify a number of the channels the set was receiving. You get no headphone jack, and no USB port for displaying photos or porting MP3s from an external device. The set does provide picture-in-picture, but since the remote has no PiP button, the feature isn't particularly convenient to use.

Because this model uses plasma technology, burn-in may be an issue. Yet the VP42 is the only plasma television set we looked at for this roundup that doesn't include any burn-in prevention features. A Vizio representative assured me that burn-in wasn't an issue; let's hope that he's right.

At a price like this, it's probably a chance worth taking. >>

REMOTE REVIEW:

Fair

The VP42's modest-size remote control offers many small, difficult-to-find buttons. It isn't programmable and has no PiP button, and the buttons don't glow in the dark.



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Philips 42PFL7432D/37

The Philips 42PFL7432D/37 has the company's Ambilight—two LEDs behind the set that bounce light off your back wall to create a visual setting around the screen. You can select the color of this light, or have the TV choose colors to complement the on-screen image. Too bad Philips wasn't as clever about the light that comes out of the front of the set.

Not that the images it displayed were awful. It handled high-def details—from facial stubble to brick walls—as well as any set in our roundup. But its color management fell short of the best-performing sets', and images looked dark overall.

Those results are somewhat disappointing, given that the 42PFL7432D/37 is one of only two LCD sets we looked at to have a 5ms response time (other sets specified 8ms), and that it had the best out-of-the-box setup wizard (Philips calls it the "settings assistant") in the group. The PC World Test

Center didn't use this setup wizard, which shows you split pictures and has you select which half looks better; instead, our lab relied on the same calibration routine that it used for all the other sets. If you are inexperienced with TV configuration or don't want to spend a lot of time on it, however, the wizard may lead you to a better image with the 42PFL7432D/37 than you'd get from many other sets.

The Ambilight and the superb setup wizard aren't the only extras. The 42PFL7432D/37 has a

headphone jack, so you can watch it late at night without waking up your kids (or your parents), and a USB port for attaching a camera (for viewing photos) or an audio player (for playing music). On the downside, it has just one tuner and doesn't support picture-in-picture capability.

The extras help the Philips set climb to the middle of the chart, but other sets we tested have better pictures.



REMOTE REVIEW:

Good

Philips's remote is long, thin, and backlit, and it has plenty of empty space around its few buttons. But that ease of use comes at a cost: The remote isn't programmable.



LG Electronics 42LB5D

Despite its extremely fast (5ms) pixel response time, the LG 42LB5D LCD television finished in eighth place out of twelve in our image quality tests. Nevertheless, it outperformed our other 5ms contestant, Philips's 42PFL7432D/37.

By the time you've finished with LG's on-screen menus, however, you may be too tired to care about the image quality. The small, centered, transparent menus are reasonably legible, but no one seems to have thought out the organization.

The Set Up menu, for instance, covers setting up channels—and nothing else. If you want to set up input labels, say, you have to ransack the other menus for the appropriate command (hint: it's under Options).

The 42LB5D comes with a brief (32-page) printed manual and a CD-ROM containing a 110-page electronic

REMOTE REVIEW:

Fair

The LG 42LB5D's programmable remote is fairly well laid-out, but it's a little heavy, and it lacks a few buttons that other units provide.



manual so exhaustive that it even mentions a picture-in-picture feature the TV doesn't have.

A USB port on the front of the 42LB5D permits you to connect an external media device so you can view photos or listen to music stored on it. The television supports HDMI's CEC (Consumer Electronics Control) feature—though LG calls it SimLink—which enables a single remote to control all CEC-compatible home-theater devices, and allows the devices themselves to send control commands to one another through the HDMI cable. For instance, the act of placing an HD DVD disc in a CEC-compatible player might cause your TV to switch on and set itself to the correct input.

On paper, LG seems to be doing a lot of things right with this television: It has 1080p capability, HDMI 1.3, and a fast response time. Somehow, though, those advantages don't translate into as much as you'd expect in the real world. »



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Vizio Gallevia GV42LF

This LCD finished third in our image-quality judging, just behind Panasonic's TH-42PZ700U and Vizio's VP42 plasma. Our jury reported that it was particularly good at handling DVDs and blue-laser/high-def discs, though it did a fine job with everything else, too. I was particularly impressed with

the vivid colors it produced when handling a standard-definition TV signal.

REMOTE REVIEW:

Fair

The backlighting on Vizio's GV42LF remote makes finding buttons in the dark a breeze. But the unit is not programmable, and the absence of a PiP button may be a serious shortcoming (depending on your viewing habits).

This television had the best picture of the LCDs we tested, and it's the cheapest non-plasma in our roundup. What do you sacrifice for that kind of a bargain? Well, the set has picture-in-picture, but since the remote offers no PiP button, you have to access this feature through the on-screen menus—and you can't watch two channels simultaneously.

The Gallevia GV42LF isn't an easy TV to set up or use. All of the inputs are located on the back, and they all face down. They're placed unusually low, too, which makes them especially difficult to access if the TV isn't wall-mounted. The set has no side inputs for easy access. The on-screen menus display small, blue text against a blue background. Vizio provides a setup wizard to help you get started, but once you run it, you can never run it again. (You can reach all of the settings that the setup wizard covers through the menus, but some of them aren't easy to find.)

On the positive side, Vizio ships this model with a nice program guide for browsing through the channels, though it didn't have information on every channel we received.

Otherwise, the GV42LF is pretty basic. But if you're leery about plasma models and you care primarily about finding the best image or the best price (or both), this set is for you.



Panasonic TH-42PZ700U

You might expect the only 1080p plasma in our roundup—and the first 42-inch 1080p plasma ever—to outshine its 11 competitors in image quality. It did: *PC World's* jury rated its picture higher than that of any other TV, with high marks for overall picture quality in high-definition broadcasts and in disc-based content (Blu-ray, HD DVD, and DVD).

The TH-42PZ700U's performance wasn't quite as strong in our standard-def broadcast test. Colors here didn't pop out of the screen as vividly as they did on the top-scoring set in this measure, the Vizio VP42, but the overall image was certainly acceptable.

But the TH-42PZ700U's unintuitive on-screen menus complicate setup. For instance, in the Language section, with only 'English' displayed, I clicked OK. Nothing happened. I clicked the left arrow to go back to the previous menu, and the language selection switched to 'French'. After using the right arrow to return to 'English', I had to click the tiny Return button off to the side to go back a menu.

Fortunately, the menu for labeling input devices gives you the option of skipping them, which makes going from one input to another easier. (It would have been easier still if the TV automatically skipped the unoccupied ports.)

Most of the inputs on the back face outward. The exception is the single coaxial connector, which faces down. A flap on the front conceals extra component video and S-Video inputs, plus controls. Another front flap hides a smart-card reader for viewing photos right out of the camera.

At \$1800, the TH-42PZ700U isn't cheap, and you don't get a lot of neat extra features for your money. Those considerations and the price hold this model's overall rating down, but it does supply an excellent picture.

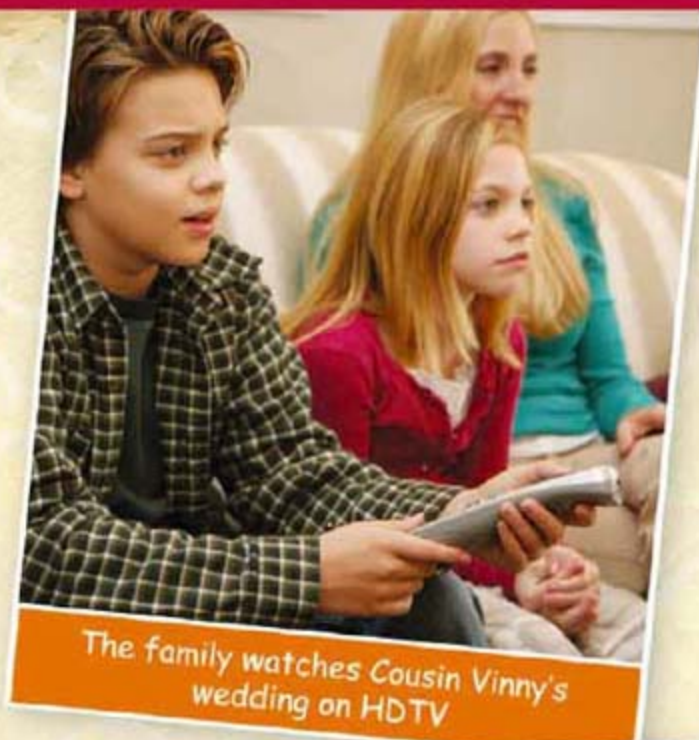
REMOTE REVIEW:

Good

Panasonic's large, heavy, programmable remote feels clunky, and the lower half has too many buttons, but your fingers go to the channel-surfing and volume controls naturally.



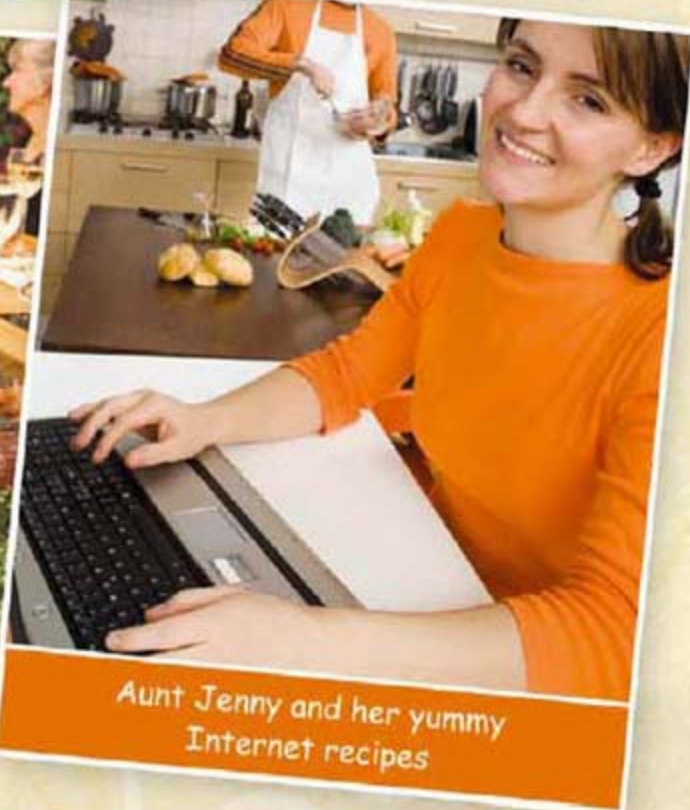
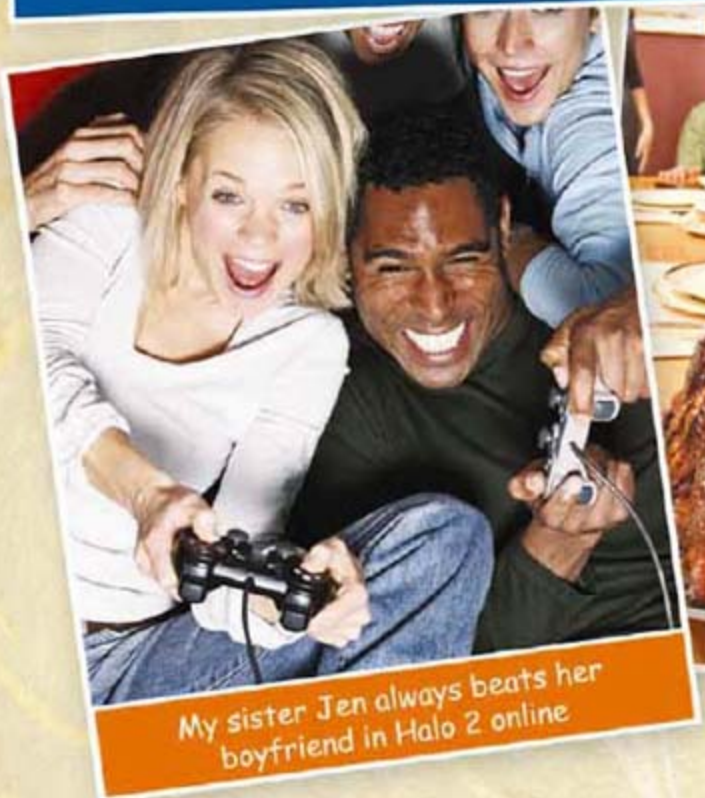
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HP LC4276N

You get a pleasant surprise when you set up HP's 42-inch LC4276N LCD television. Most of the set's inputs, though located behind the screen, are on the left side rather than on the back of the unit, and they face outward, making them relatively easy to get to. Thanks to its on-screen controls, setting up and using the LC4276N are reasonably uncomplicated, too. The menus are small and colorful, with 'Simple Menu' and 'Full Menu' options to satisfy novices and geeks. Graphics help you select the aspect ratio you want.

The PC inputs and audio outputs are situated on the back, facing down—a difficult configuration to reach unless you mount the panel onto a wall. And the set has no truly easy-to-access inputs on the front or side of the screen.

The LC4276N's picture isn't bad, but it falls short of what we expect from a \$1600 set in 2007. Its worst performance, to my eyes, came in our over-the-air-TV tests, which used both standard- and high-definition clips. On these tests it managed some pleasing colors in a scene from *The George Lopez Show*,

but much of the clip appeared washed out. Meanwhile, the standard-definition clip looked pixelated and had poor color.

Image quality improved considerably, though, when we watched HD DVD, Blu-ray, or plain old DVD movie discs. The brick wall in chapter 7 of *Mission: Impossible III* (the scene that tests the p in 1080p) looked clear and solid.

The LC4276N omits many extras that would have made

it more convenient. The set doesn't support picture-in-picture, and it has neither a headphone jack nor a

USB port for handling photos and music. The lack of features isn't enough in itself to make you want to drop the LC4276N from your list of likely TVs. But the below-average picture quality should give you pause.



REMOTE REVIEW:

Good

The surprisingly few buttons on HP's large (but not programmable) remote are sensibly placed and easy to find—at least when the room isn't too dark.



Sony Bravia KDL-40W3000

There's not much wrong with Sony's Bravia KDL-40W3000 LCD set that a good price reduction wouldn't cure. I noticed some lackluster details in our high-definition broadcast tests, but overall the images looked good (the Sony model took fourth place in our picture-quality tests). If I had not been scrutinizing the image in a formal testing environment, I probably wouldn't have found anything wrong with it.

The KDL-40W3000 combines a freeze button and picture-in-picture in the coolest way possible. Press 'Freeze', and the television goes into PiP mode, with the big picture frozen and the little one continuing to display a live feed. Because the set has only one tuner, however, you can't use PiP to watch two broadcast channels at once. Sony includes a headphone jack on the set for your late-night viewing pleasure.

Rather than put the controls on the side, as most manufacturers do these days, Sony places them on the top of the unit. The arrangement is convenient if you're not mounting the TV too high. Most of the inputs are on the back facing outward, and they're positioned well over to one side for easy access; only the coaxial connector faces down.

If only the on-screen controls had been as carefully thought out. The menus seem to have been designed to look cool and different rather than to be useful, and they often left us wondering which direction we should scroll in to find an unseen option. Some choices require you to push too many buttons.

But that will cease to be a problem once you get the hang of the menus—or once everything is set up and you don't use the menus much anymore. In the KDL-40W3000, Sony has made a very good set, but not a bargain one. ●

REMOTE REVIEW:

Very Good

Sony's remote is very long, which makes some buttons difficult to access. On the other hand, it's programmable and backlit.



Junkbusters!

BY JON L. JACOBI
TESTING BY ELLIOTT KIRSCHLING



PCW Test Center

New PCs come littered with demoware and ads you never asked for. Does all that stuff affect performance? You bet. Here's how to get rid of the crud—or avoid it in the first place. [»](#)

ILLUSTRATIONS BY GREG CLARKE

You spend hard-earned money when you buy a new PC; why, then, should the vendor treat it like a billboard to sell you more stuff? Or, even more annoyingly, siphon off computing power to add punch and persistence to those marketing messages?

Unfortunately, most systems these days ship with a desktop littered with links, trialware, adware, and other software that you may find worthless—and that may noticeably impact your ability to be productive. Adding insult to injury, major electronics retailers such as Best Buy and Circuit City are cashing in on this trend by offering to remove the junk (a service they call PC optimization or setup)—for a price.

To gauge the extent of the problem, we cataloged all non-Windows items on 15 new desktop and laptop PCs (we also checked out a Mac). We then ran our WorldBench 6 Beta 2 test suite on a dozen of the non-Mac machines—first as they were shipped, and again with all of the non-Windows items removed. On average, we counted seven to eight nonstandard desktop icons; four to five non-Windows applets in the system tray; five or so Welcome Center icons that Windows didn't create; and additional lurkers in the Start menu and Windows Registry.

Some of the software can be useful, but much of it deserves the derogatory terms many people employ: junkware, shovelware, and plain old crap. The WorldBench 6 scores improved 2 to 8 percent after we disabled the preloaded stuff, which is pretty impressive considering the speed of baseline performance on a current PC (see "Cluttered Computers," opposite page). Read on for details, including advice on how to minimize the gunk when you shop—and, if you can't avoid it, a Clip & Save Guide (page 140) on how to get rid of it.

A Persistent Problem

Junkware isn't new, but it has become so pervasive that many buyers of new PCs have started to complain. Jason York, a Detroit-area electrical engineer, didn't stop there: He created the PC Decrapifier, a handy little program that automates the uninstall process for many trial- and adware titles and also cleans out various startup entries (get it at find.pcworld.com/58607). York got the idea for the Decrapifier after helping a friend set up a new Dell laptop a couple of years ago. "I was appalled at how much effort was involved just to get the PC into a usable state out of the box," York recalls. Most computer technicians and recent PC buyers have similar tales.

"I bought a Dell PC for my wife and was horrified at the



JASON YORK
wrote the PC
Decrapifier, a tool
for removing
unwanted apps
from a new PC.

amount of time she wasted killing never-say-die craplets," says supercomputer specialist Lee Higbie of Fairbanks, Alaska. He adds, "I've heard that Dell now allows a no-trialware installation...without that option, I wouldn't consider Dell again."

We discovered that Dell does indeed allow PC purchasers to opt out of a lot of third-party extras when we recently bought a couple of Inspiron 530 desktops online. The computers arrived with far fewer non-Windows extras on them than the Dell-supplied Inspiron 531 we initially tested (for a comparison, see the screen shots on page 138). To achieve that relative state of cleanliness, however, we had to carefully uncheck a lot of boxes as we went through Dell's lengthy customization wizard. Because we made no special effort to order gunk-free systems from the other vendors, we decided to keep the Inspiron 531 on our chart.

It's worth noting that some preloaded programs are quite convenient. Many people use Acrobat Reader, or the Roxio or Nero CD/DVD-burning software that comes with some systems. But most such extras are not so worthwhile.

Crapware Compendium

By far the most irritating junk is adware—eBay ads, online games, music services, and anything else that sends you to a Web site where you may purchase stuff or sign up for a service. (Read about the financial underpinnings of PC junk in "The Junk Software Economy" on page 138.)

Then there's trialware, or preloaded software that functions only for a set period, generally 30 to 90 days. McAfee Antivirus, Microsoft Office 2007, and Norton Internet Security are among the more common trialware titles. Trialware can tide you over until you set up the products you intend to use, »

Cluttered Computers: Which PCs Have the Most Annoying Junk?

A SONY DESKTOP and a Toshiba notebook earned the worst junk ratings, which are based on the quantity and quality of preinstalled non-Windows software and its impact on a system's performance (see the footnote at the bottom of this chart). Conversely, a high-end PC from Alienware and a desktop from Polywell earned the lowest junk ratings.

SYSTEM	Junk rating ¹	Cleanup results	Crud count	Comments
Sony VAIO VGC-LS30E (desktop)	162 INFURIATING	- Processes removed: 30 out of 63 - WorldBench 6 Beta 2 improvement: 3.7%	- Desktop icons: 11 - Start menu items: 4 - Welcome Center icons: 27 - Startup wizards: 3 - System-tray applets: 5	From its Spider-Man desktop to an amazing 27 Welcome Center icons, the VGC-LS30E—like many multimedia PCs—is a crapware horror show.
Toshiba A205-S4639 (notebook)	118 INFURIATING	- Processes removed: 34 out of 81 - WorldBench 6 Beta 2 improvement: 1.4%	- Desktop icons: 17 - Start menu items: 0 - Welcome Center icons: 6 - Startup wizards: 2 - System-tray applets: 9	Toshiba dishes out a heapin' helpin' of both third-party and proprietary junk on this laptop. Its 17 desktop icons was the high for our roundup.
Dell Inspiron 531 (desktop)	113 INFURIATING	- Processes removed: 46 out of 78 - WorldBench 6 Beta 2 improvement: 5.9%	- Desktop icons: 9 - Start menu items: 3 - Welcome Center icons: 5 - Startup wizards: 3 - System-tray applets: 6	Dell has taken a lot of flack for clutter, but it's not the worst offender for third-party items. However, there's a ton of Dell-branded "extras."
HP Pavilion dv9500t (notebook)	100 INFURIATING	- Processes removed: 34 out of 69 - WorldBench 6 Beta 2 improvement: 8.2%	- Desktop icons: 14 - Start menu items: 4 - Welcome Center icons: 5 - Startup wizards: 2 - System-tray applets: 4	From the proprietary first-boot configuration wizard, which tries to sell you stuff, to the 14 desktop icons, the dv9500t is impolite in a big way.
Acer Aspire 5920 (notebook)	94 INFURIATING	- Processes removed: 45 out of 76 - WorldBench 6 Beta 2 improvement: 6.5%	- Desktop icons: 9 - Start menu items: 4 - Welcome Center icons: 1 - Startup wizards: None - System-tray applets: 5	Like Sony, Toshiba, and Lenovo, Acer tries too hard to be helpful. Too many utilities duplicate Vista tools and create a bad case of sensory overload.
eMachines T5602 (desktop)	93 INFURIATING	- Processes removed: 37 out of 68 - WorldBench 6 Beta 2 improvement: 5.5%	- Desktop icons: 4 - Start menu items: 1 - Welcome Center icons: 6 - Startup wizards: 1 - System-tray applets: 5	Gateway-owned eMachines loads its system with trialware and adware—though not quite on the scale of the PCs in the top five.
Lenovo T61 (notebook)	70 MILDLY ANNOYING	- Processes removed: 52 out of 87 - WorldBench 6 Beta 2 improvement: 1.4%	- Desktop icons: 3 - Start menu items: 5 - Welcome Center icons: 0 - Startup wizards: 1 - System-tray applets: 3	A deluge of "helpful" utilities and a first-boot wizard that tries to sell things irked us mightily. But you can ditch the third-party junk by reinstalling the OS.
Gateway DX430X (desktop)	69 MILDLY ANNOYING	- Processes removed: 46 out of 80 - WorldBench 6 Beta 2 improvement: 2.2%	- Desktop icons: 4 - Start menu items: 0 - Welcome Center icons: 3 - Startup wizards: 2 - System-tray applets: 7	But for the parade of system-tray applets, this PC might have scored a Polite. It didn't, and Gateway could come up with a more subtle desktop logo.
Polywell Poly P3503 (desktop)	22 POLITE	- Processes removed: 11 out of 45 - WorldBench 6 Beta 2 improvement: 3.3%	- Desktop icons: 6 - Start menu items: 2 - Welcome Center icons: 4 - Startup wizards: None - System-tray applets: 1	Polywell's desktop may not be squeaky clean, but everything you find is full, not trial, software. Once upon a time, this was the norm.
Alienware Area-51 7500 (desktop)	10 POLITE	- Processes removed: 9 out of 40 - WorldBench 6 Beta 2 improvement: 2.4%	- Desktop icons: 1 - Start menu items: 0 - Welcome Center icons: 2 - Startup wizards: 0 - System-tray applets: None	Alienware knows it's charging top dollar for its high-performance PCs and treats its customers accordingly. Pristine.

FOOTNOTE: ¹The higher the junk rating, the worse the score. We calculated the ratings by adding the number of third-party desktop items, Start menu items, system-tray applets, Sidebar gadgets, Welcome Center icons (multiplied by 2), and boot wizards (multiplied by 3), and then adding the WorldBench 6 Beta 2 performance percentage gain (multiplied by 2). We also added points if we couldn't restore the OS cleanly using the vendor-supplied recovery discs or partition.

ALIENWARE'S desktop (left) was the cleanest we saw; Sony's was the most cluttered.



but it can also become very annoying, especially if it keeps nagging you to convert to a paid version each time you log on.

Logoware such as Google Desktop and Picasa may be free and fully functional, but it's still designed to push advertising at you, or at least raise brand awareness.

Some computer vendors throw in their own utilities and software, typically to address perceived deficiencies in Windows or to attempt to intervene before you call tech support. Dell's Customization Wizard (which basically walks you through the setup procedure for certain Windows features and third-party applications) and Acer's toolbar may be useful to some folks, but annoying to others.

Hidden Gunk

Not all non-Windows gunk is visible. Background services and startup apps lengthen boot times and steal CPU cycles while you're working; consider disabling those you don't use.

One particularly sneaky form of subsurface junk is what

you might call help-the-hog-over-the-fence-ware. Applications such as Adobe Reader, iTunes, and QuickTime Player are so bloated that they preload portions of themselves when Windows first starts so they won't seem so sluggish when you actually run them. But this action wastes precious time when you don't use these applications.

It All Bogs Down

For this story, we looked at an assortment of laptops and desktops from Acer, Alienware, Dell, eMachines, Fujitsu, Gateway, Hewlett-Packard, Lenovo, Polywell, Sony, and Toshiba (for space reasons, we put only ten on our "Cluttered Computers" chart; we left out the Mac because we had no WorldBench 6 score to use in determining its junk rating).

Unfortunately, our tests showed that gunk can impose a performance penalty. The primary culprits: hidden services and "helpful" tools, which can be part of trialware installations or not-so-helpful utilities from PC vendors. »

The Best and Worst Preinstalls

NOT ALL PREINSTALLED non-Windows software and links are created equal. Here are the least offensive items—and the worst—that we encountered.

The Most Useful

Adobe Reader: Though it lets you view PDF-format system documentation, it's extraordinarily slow. The equally free and substantially leaner and faster FoxIt Reader would make a better bundled item.

Disc-burning software: While not as full-featured as their paid versions, limited editions of Roxio and/or Nero DVD- and CD-burning software are generally more useful and user-friendly than the Windows features for these tasks.

Office 2007 60-day trial: Okay, so they want to sell it to you—it's still a very nice productivity suite to use until you get around to buying and installing your own. That said, we find the desktop and Welcome Center shortcuts too pushy, and OpenOffice.org is a free alternative.

The Most Annoying

Online game links: These items vary in their presentation from machine to machine, but many users will believe the games are installed on their PC until they click on the shortcut and are directed to Wild Tangent's online gaming center. This



is nothing but trialware with an hour of free play.

Google Desktop: Vista's improved indexing and search functionality largely remove the need for this program, and its high profile on the system tray and sidebar is irritating, to say the least.

Travelocity Search Sidebar gadget: This tool might be useful for travel agents, but we just plopped down cash for a new PC, so we're staying home for a while. Basically this is a service that we would rather surf to when we need it.

MOST PC GAME bundles are simply 1-hour trials.

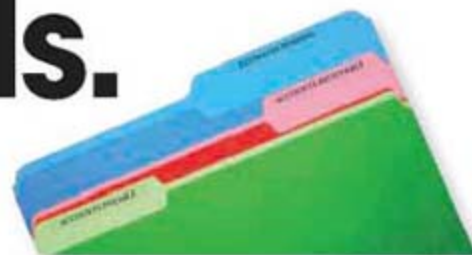
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As shipped, nearly all of the 15 PCs we tested had more than 80 processes—tasks from the OS or from applications—running. After we disabled all of the nonessential junk on each test machine, the number of processes dropped to the mid-thirties. Each process uses memory and system resources, and even if not actively performing a task, requires periodic attention from the operating system.

To measure shovelware's impact on performance, we ran WorldBench 6 Beta 2 on each system, first with the shipping software intact (sans antivirus software, because it often interferes with WorldBench; this is the way we test for our ranked reviews charts), and then again after using the Windows System Configuration Utility (msconfig.exe) to disable all startup items and non-Microsoft services.

The most dramatic changes we saw: The HP Pavilion notebook's WorldBench 6 Beta 2 score rose by 8.2 percent (we generally find that gains of 5 percent or more translate to a perceptible difference for normal business tasks), and the Acer Aspire notebook's score improved by 6.5 percent. Note-

books from Lenovo and Toshiba exhibited the lowest gains.

Desktop models showed far more consistent improvement, averaging a gain of 4 percent overall. In addition, our subjective impressions were that boot-up and program launch times improved noticeably, especially on slower systems.

Apple's Better Behavior?

Apple's "Stuffed" ad features an actor in a fat suit representing an overloaded PC facing off against a slim, hip youngster claiming that Macs "only come with the stuff you need." Sure enough, when we booted up a new 24-inch iMac, we saw only the registration/configuration wizard and a pristine desktop.

Even so, we found an icon for a 60-day trial of Apple's .Mac online services on the Dock (the bar of icons on a Mac screen), and a Microsoft Office 2004 test-drive and a 30-day trial for Apple's own iWork in the Applications folder.

Though the iMac does harbor marketing material, it offers less gunk than the average Vista desktop does—and the additions are more graciously presented. »

Dodging the Junk

LOOKING TO ESCAPE PC gunk? You have ways to dodge some or all of it—if you're willing to switch vendors or simply pay more for a cleaner PC.

Ditching the big names in favor of a boutique brand, such as Polywell or the Dell-owned Alienware, can considerably reduce the amount of trialware and adware you'll have to contend with. In the Poly P3503, for instance, all of the software installs were full versions, not trialware. And the pricey, performance-oriented Alienware Area-51 7500 was pristine—the company even removed the adware links that Microsoft itself puts in the Vista Welcome Center.

If you need the comfort factor of a market-leading brand, you still have ways to dodge the marketing deluge. The first is to opt for business-targeted PCs. Both Dell and HP freely admit to preloading less junk in their business and corporate lines, such as Dell's Vostro and HP's Compaq systems.

The downside to this approach: These products cost more than their consumer-targeted equivalents. Multimedia PCs like Sony's VAIO VGC-LS30E are particularly prone to junk software, so avoid these unless you really need TV recording features; alternatively, consider adding multimedia options

to a more mainstream model.

Even if you buy a consumer-targeted PC, you may be able to minimize the software pollution. On request and for free, technicians at a Sony Style store will remove all trial- and adware from any Sony computer you purchase at the store, or that you bring in after buying online. And Dell has recently altered its online purchasing process to allow users to opt out of several types of software.

Unfortunately, though, we've yet to encounter a way to avoid the not-always-helpful utilities that most companies are prone to putting on their PCs.

Creative Complaining

So far we've described the polite strategies for avoiding crapware. But if you're willing to go the squeaky-wheel route, anything's possible—even a perfectly clean desktop. Complain to the vendor about the crap on a system you're contemplating buying, or ask salespeople for the machine with the least



junk on it. Better yet, tell them you'll take your business elsewhere if you don't get a clean install of Vista—for free.

Vendors will get the message if enough buyers squawk. If you're unsuccessful in your bargaining, don't needlessly pay for a retailer's "setup" or "optimizing" service; instead, read "How to Clean Your New PC," our Clip & Save Guide on [page 140](#).

Keeping your PC free of gunk once you start using it is difficult enough; the less of it you get with a new system, the less you will have to sweep out yourself.

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A DELL Inspiron 530 with all extras declined (top), and an Inspiron 531 submitted for testing.

Throw in AOL and Travelocity Sidebar gadgets, and the VGC-LS30SE ran away with the number one spot on our chart. As brazen as the appearance of its desktop was, the Sony actually had slightly less junk running

in the background than the average machine does, but it still scored a whopping 162 points on the junk-rating scale.

After the Sony, all the other PCs seemed tame, though the Acer, Dell, HP, and Toshiba all surpassed the Annoying mark. The amount of junkware on Gateway and on Gateway-owned eMachines PCs was tolerable, though we're still waiting for the company's BigFix background app to actually fix something. Other than the Alienware, only the Polywell earned a Polite mark. It was a bit cluttered, but it had no adware or trialware, and what software there was served a purpose.

After two weeks of staring at cluttered desktops, adware, trialware, and utilities, we concluded that PC vendors, under tremendous competitive pressure to keep prices down, are seeking new revenue sources (or, in the case of vendor-branded support aids, ways to cut their own costs). They sell ad space on their desktops for cash, try to distinguish themselves by providing utilities that frequently duplicate or simply manage Windows features, and have generally allowed their products to be used to sell those of others. When we asked vendors about this trend, they responded with various explanations—the favorite being that users appreciate having the additional software—but in the end most of the justifications sounded to us like poor excuses for bad behavior.

It doesn't have to be this way. Microsoft has done a pretty good job of making the initial boot-up of an unadulterated Vista PC pleasant. It's the computer vendors who muck things up. With the exception of Alienware and Polywell, all the companies whose PCs we tested could take a hint from Apple and sell their extras with a modicum of dignity. ●

Rating PC Junk

Because performance numbers don't tell the whole story, we developed a junk rating that integrates the WorldBench 6 improvement with the quantity and quality of the junk. We then tied the numbers to word scores ranging from Polite (little or no junk) to Mildly Annoying, Irritating, and Infuriating.

The most junkware-free system, scoring an impressively low 10 points, was Alienware's Area-51 7500 desktop, which didn't even display the Alienware name on its screen.

At the other end of the spectrum: Sony's VAIO VGC-LS30E multimedia desktop, which came with *Spider-Man 3* wallpaper and 27 nonstandard Vista Welcome Center icons hawking everything from online games to CNN to e-books. Booting up the PC for the first time simultaneously activated setup for a trial of Norton Internet Security; we also saw an ad for a trial of QuickBooks and an invitation to a Sony feedback survey.

The Junk Software Economy

IT'S FAIRLY CLEAR that PC vendors receive money for loading your computer with junk. But few people are willing to talk about this business. Nearly all of the system vendors we contacted—Acer, Apple, Gateway, HP, Toshiba, and Sony—declined to comment. Alienware was the only vendor to state emphatically that it takes no money to install software.

Service and software vendors eBay and Symantec freely admitted to having "relationships" with a number of vendors, but declined to comment on the specifics.

Symantec did say it had a revenue-sharing model, implying that its payments to PC vendors might be based on the number of customers who pay for a license when the free trial ends. Google, which provided its Desktop and Toolbar software on almost every PC we tested, declined comment.

Vendors told us repeatedly that they are providing a service to the user by bundling trial versions of McAfee Antivirus, Microsoft Office 2007, or Norton Internet Security. But customers might be better served if the PCs came with full versions of free

alternatives such as OpenOffice.org and Grisoft's AVG antivirus application.

While preloading software may help subsidize prices for consumer PCs, it has also created a burgeoning cottage industry for "optimizing" new systems—that is, removing the junk. (This is a large part of what a retailer does in the PC-setup service that most stores offer at a cost of \$90 to \$150.)

You can do this yourself for free: See "How to Clean Your New PC" on [page 140](#). And vote with your dollars. If enough people ask for clean PCs, vendors will notice.



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Servers	2nd Floor
Servers	3rd Floor
Servers	4th Floor
Servers	5th Floor
Servers	6th Floor
Servers	7th Floor
Servers	8th Floor
Servers	9th Floor



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How to Clean Your New PC

AS IRRITATING AS the idea may seem, one of the best ways to rid a new PC of junkware is to reinstall the operating system right away, using the vendor-supplied recovery discs or partition (see [page 43](#) for more on this subject). Unfortunately, a reinstall won't work with every PC—the Fujitsu, HP, and Toshiba laptops we tested integrated the junkware into the OS install.

In June, Dell started shipping a third-party software removal utility with its Dimension and Inspiron PCs. But it's buried in Start/All Programs/Dell/Dell Software & Utilities/Product Documentation, and it doesn't touch Dell-branded apps.

If an OS reinstall doesn't help, download PC Decrapifier (find.pcworld.com/58607). This dandy little utility automatically scans your PC for useless software and startup items, and then lets you choose from a list the ones you want to remove. PC Decrapifier makes some judgment calls, and it can't distinguish between trial and paid versions of some software. But anything that you might conceivably need is deselected by default, so it's safe even for neophytes.

Still got junk? Open Control Panel and select *Programs and Features* (in Windows Vista) or *Add/Remove Programs* (Windows XP). For most applications, you'll see an entry here for uninstalling the program and its accompanying files. In addition, suites such as

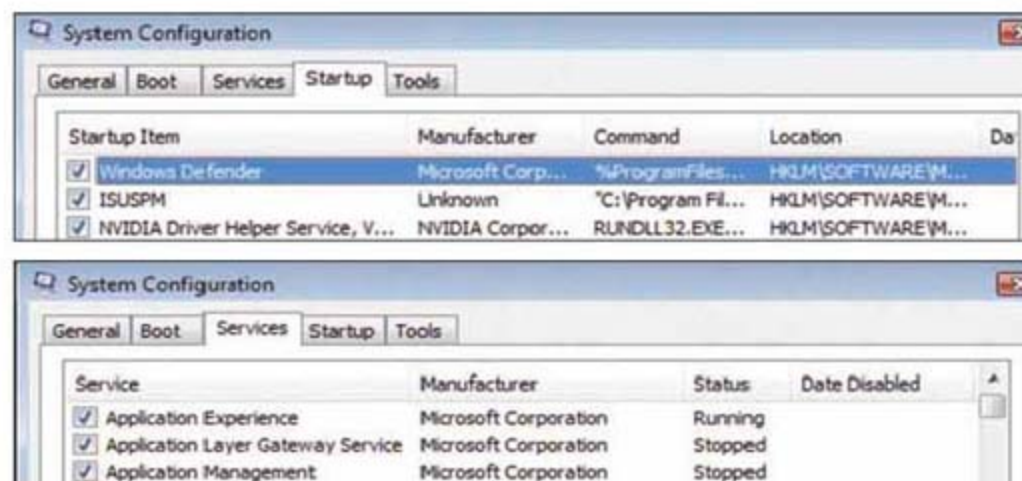
Microsoft Office permit you to remove any components you don't need. Scan the folders in Start/All Programs for uninstall utilities that might not appear in the Control Panel list.

Hobbling the Helper Apps

Some vendors try to make their applications appear faster by preloading portions of them (via the Start menu or the Registry)

surprise—there will be quite a few entries. We don't have space to describe every startup item you might uncover, or tell you which you'll want to disable, but applets such as automatic updaters and audio trays are likely candidates.

Next, switch to the Services tab. Services are Windows background programs that generally are invisible to the user. Check the box that says 'Hide Microsoft Services', and see what you have left. You'll probably



when you boot up Windows. They may also run a background service to check for updates or connecting devices, or they may create a system-tray applet to offer access to functions available elsewhere. These items are rarely necessary, and they all take a toll on boot times and performance.

To weed out this less obvious stuff, use the Windows System Configuration Utility (msconfig.exe), which lets you disable startup items and background services, and—more importantly—reenable them should you make a mistake.

Before you start pruning, fire up your Web browser so you can research anything you don't recognize. A general search on the program or file name usually turns up good info, but www.bleepingcomputer.com and www.file.net are good places to find unbiased information.

To start trimming the bloatware, type **msconfig** in Vista's Start menu search pane or in XP's Run command and press **Enter**. Select the *Startup* tab and prepare for a

find fewer unnecessary services than useless startup items, but you might discover the occasional updater or helper that you

can ditch. For more-granular information on a particular service, right-click *My Computer* (Computer under Vista), select *Manage*, expand the *Services and Applications* tree, select *Services*, and look for the service that you're investigating.

When you close the System Configuration Utility, Windows will offer to restart your computer. You don't have to say yes, as the changes will take effect the next time you start Windows—assuming you don't crash. This doesn't happen often, but if disabling something does interfere with some vital Windows process, reboot, press **F8** as the BIOS info disappears, choose *Safe Mode*, and then use the same Msconfig utility to reenable the items you disabled. ●

DELL PCs SHIP with a utility for removing apps, but it's rather difficult to find.



RUN WINDOWS' Msconfig utility to disable services and startup items selectively.

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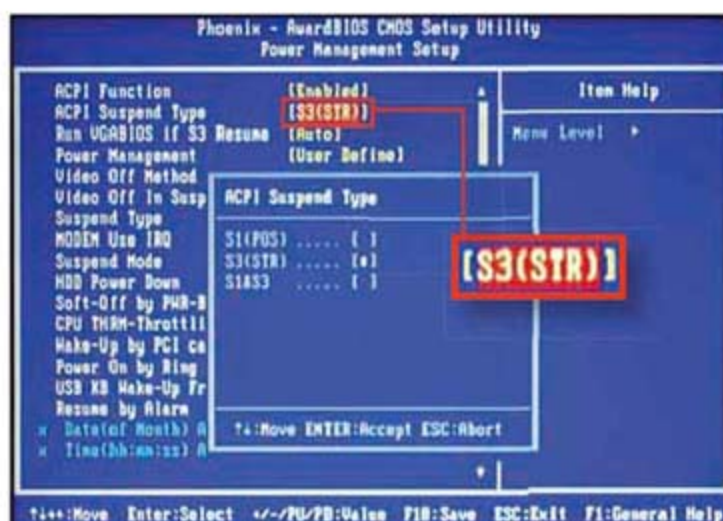
A few simple tweaks to the BIOS and to Windows' power settings can cut your PC power bill by more than half.

BY SCOTT MUELLER

AS ENERGY COSTS rise, PC power conservation can trim \$100 or more from your total electric bill each year. That's enough for a nice dinner with your spouse—or if you're not the romantic type, it can get you a few months closer to purchasing a new, faster (and more energy-efficient) system.

Depending on their age

and design, a desktop computer and monitor consume from under 150 watts to greater than 800 watts when in use, and from fewer than 50 watts to more than 400 watts while turned on but idle. For this article I used a watt meter to measure the power consumed at the outlet by a 3.4-GHz Pentium 4 system with 1GB of RAM, an 8X AGP video card, two internal hard drives, an optical drive, and a 19-inch LCD monitor. This is not a high-end machine by any means; I selected it because it demonstrates how a few simple tricks can help reduce the amount of electricity an



SET THE ACPI Suspend Type in your BIOS to S3 (Suspend to RAM).

average system uses by more than 50 percent. This relatively modest PC varied from a minimum of 195 watts while idling at the

Windows desktop, with no applications running, to 305 watts with the processor and graphics under 100 percent load; its average power rate was 250 watts.

Such figures may not seem substantial when you consider that dual- and quad-core processors consume 130 watts or more each at full load (however, new CPUs manage power more efficiently when they're not running under full load, so they may consume less power than older, slower processors). Also, high-end graphics cards use nearly 200 watts each. Still, if you were to allow this system to operate continuously, it would easily run up more than \$200 in energy costs over the course of a year. Fortunately, you can apply changes to several configuration settings to bring the

Change Settings to Conserve PC Energy

DEPENDING ON THE Advanced Configuration and Power Interface (ACPI) settings in your PC's BIOS, the machine may be running up your energy bill even when you're not using it.

PC ACTIVITY	ACPI Global/ Sleep State	Windows XP/ Vista state	Typical power consumed
100 percent CPU/graphics load	G0	Power on	Running 305W
3D screen saver	G0	Power on	Running 225W
Simple screen saver	G0	Power on	Running 195W
Idle; Windows desktop	G0	Power on	Running 195W
Monitor and hard drives powered down	G0	Power on	Blank screen 160W
Monitor and hard drives powered down, CPU halted, fans and other devices running	G1/S1	Power on suspend (POS)	Standby/Sleep 135W
Context saved in RAM, everything except RAM powered off	G1/S3	Suspend to RAM(STR)	Standby/Sleep 10W
Context saved to disk (hiberfil.sys), system powered off	G1/S4	Suspend to disk(STD)	Hibernate 9W
System powered off	G1/S5	Soft-off	Shut Down 9W
System unplugged	G3	Mechanical off	Shut Down 0W

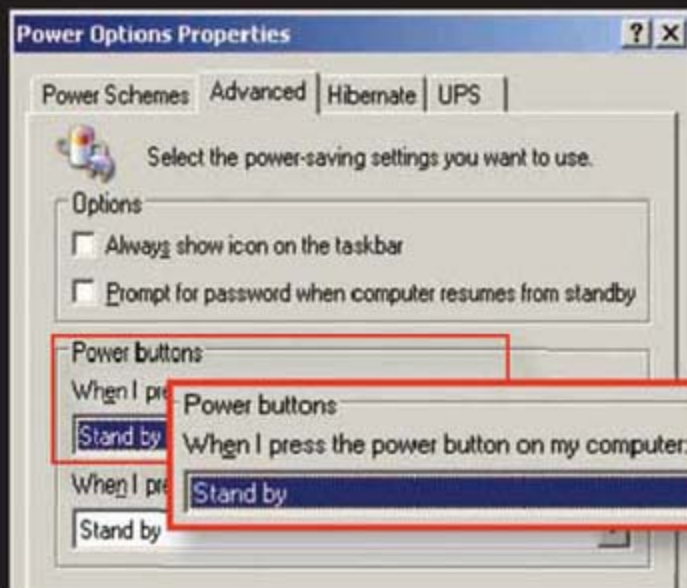
Tweak Windows' Power Settings to Cut Your PC's Energy Use

IF YOUR SYSTEM is using the default power settings in Windows, it may be adding unnecessarily to your electric bill. Find the right balance between cost and convenience when deciding how quickly your machine's components should enter their

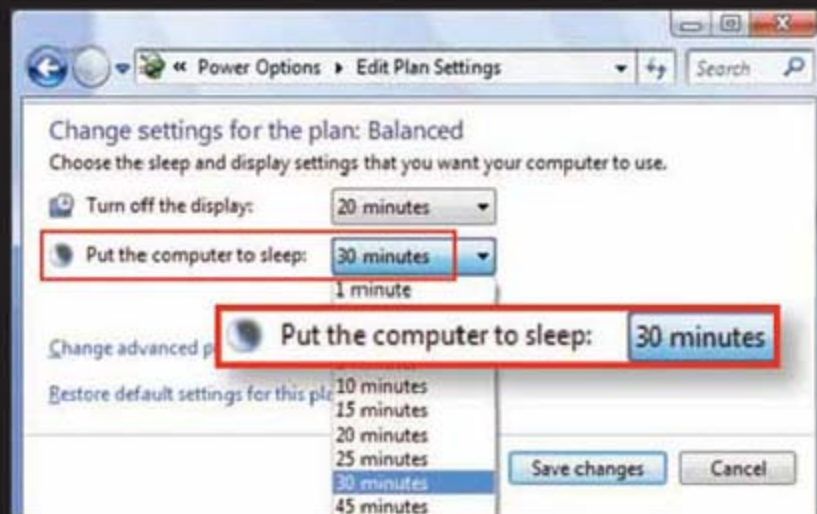
sleep mode. To access the Power Options in XP, click *Start • Control Panel • Power Options* (*Start • Settings • Control Panel • Power Options* if you use XP's Classic menu). In Vista, click the *Start* button, type **power options**, and press **<Enter>**.



UNDER XP'S POWER Schemes tab, click the drop-down menus to have your monitor and hard drive enter standby more quickly.



RESTART XP FASTER via this option to put your PC to sleep rather than shutting it off when you press the power button.



CUSTOMIZE VISTA'S PRESET power options to reduce the amount of energy your PC consumes when it's not in use, without causing inconvenience.



SAVE TIME BY setting Vista to sleep rather than to shut off entirely when you press the power button.

power consumption and operating costs of any system down significantly.

Save as Your PC Sleeps

Modern PCs incorporate a power-management standard called the Advanced Configuration and Power

Interface (ACPI), which allows the operating system, BIOS, and hardware to co-operate in reducing power consumption. ACPI defines several global power and sleeping states; the chart on the previous page lists the relevant ACPI states and corresponding Windows XP/

Vista modes, along with the power used by each mode on the example system.

You've probably put your laptop into hibernation or sleep hundreds of times, but people typically ignore these features on desktops. As the chart shows, power use in the S3 state (Standby in XP,

and Sleep in Vista) is nearly equal to that used when the PC is powered off. The S3 state drops PC power down to 10 watts or less when idle even if the system consumes considerably more power than average while active. Unfortunately, most PCs I encounter are not config- ➤

ured to use this mode. Some older boards and peripherals may not play nice with S3, sound cards being particularly troublesome.

To tweak power management settings in Windows XP and Vista, open the Power Options applet in Control Panel. The three preset schemes are:

- Turn off monitor and/or hard disks only
- Standby/Sleep mode
- Hibernate mode

While Hibernate mode uses the least amount of power, it takes the longest time to suspend and resume, which involves writing and reading the entire contents of RAM to and from the hard disk (using a file named hiberfil.sys). The more RAM you have, the longer the process takes. On the other hand, the Standby/Sleep mode (S3) uses only slightly more power than Hibernate does, yet its suspend and resume times are virtually instantaneous no matter how much RAM is installed.

A BIOS setting called ACPI Suspend Type, ACPI Suspend State, or something similar controls which sleep state (S1 or S3) Windows uses. Many systems are set to S1 by default, which keeps the CPU and RAM powered. Enter your BIOS, navigate to the *Power Management* menu, and change the ACPI Suspend setting to S3, which cuts power to the CPU and RAM. The screen on [page 144](#) shows this setting on a Phoenix/Award BIOS. Enable any settings labeled 'USB KB Wake-Up From S3' (the wording varies), and set the Power On

How Much Will You Save?

REDUCE YOUR ELECTRIC bill—and your PC's environmental impact—by setting Windows to standby or hibernate.

PC CONDITION	Annual cost	Savings
3D screen saver while inactive	\$213.17	\$0.00
S1 Standby while inactive	\$155.12	\$58.05
S3 Standby while inactive	\$74.50	\$138.67
Off or Hibernate while inactive	\$73.86	\$139.31

Function to *AnyKey* to let the keyboard and mouse wake the PC from standby.

Windows Power Tweaks

I set Windows to enter standby after 30 minutes or an hour, which strikes a balance for me between too often and not often enough. I also recommend that you open the Power Options Control Panel applet to configure the power button on your system to invoke standby or sleep mode rather than to turn the PC off. In XP, choose the *Advanced* tab, and under 'When I press the power button on my computer', select *Stand by*. In Vista, click *Change when the computer sleeps* or *Change plan*

settings. In the Edit Plan Settings dialog box, choose the idle time before turning your monitor off and putting the computer to sleep. Next, select *Change advanced power settings*, click the plus sign next to 'Power button and lid', choose the plus sign next to 'Power button action', click the current option to make the drop-down menu appear, and select *Sleep* on that menu.

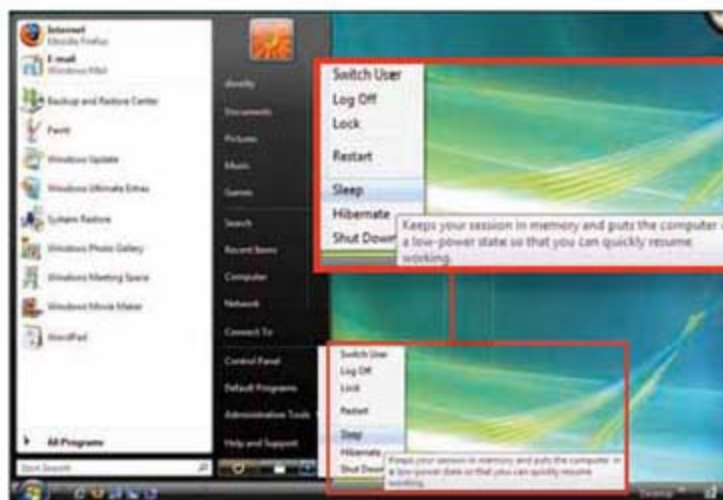
You can also invoke Windows' sleep mode manually: In Windows XP, click *Start • Turn Off Computer • Stand By*. In Vista, click the Start button, choose the right arrow in the bottom-right corner of the Start menu, and select *Sleep*. (Note that Vista may have standby selected by

default.) To resume, press the power button or any key on the keyboard, or simply move your mouse.

Save a Little, Save a Lot

How much money can these changes save you? That depends on what you pay per watt for electricity, multiplied by the number of watts consumed when the system is inactive. According to the United States Energy Information Administration's June 2007 Electric Power Monthly report (the most recent report is at find.pcworld.com/58305), the average price of electricity to residential customers for the year ending in March 2007 was 10.47 cents per kilowatt-hour. If your PC is powered on continuously but runs actively only 10 hours a day, five days a week, and it uses a 3D screen saver during periods of inactivity, it will be in use 2600 hours each year, and will consume 250 watts on average. This drops to 225 watts during the 6160 hours of the year it is powered on but inactive. Running this system for a year would cost \$213.17, but an energy diet brings its annual power costs down to just \$73.86, representing a savings of nearly \$140 (see the chart above).

Of course, your mileage will vary, but the savings are significantly greater for power-hungry high-end systems. Simply switching from S1 Suspend to S3 offers virtually the same savings as you would realize from manually turning the machine off when it's not in use.



YOU DON'T HAVE to wait for Vista's sleep mode to kick in; save energy by activating it manually via this option on the Start menu.

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Keep Data Safe by Reorganizing Windows' Folders

EACH TIME YOU create a user profile, Windows makes a bunch of folders for it. Some, like 'My Documents' in XP and 2000 and 'Documents' in Vista, serve as storage areas for your documents, music, pictures, and other files. Others, like 'Application Data' (in XP) or 'AppData' (in Vista), contain the configuration data for your user profile.

Windows plops all of these folders on the same drive or disk partition ("volume" in Vista) that holds Windows itself. Moving the folders where you store data to a separate drive or partition/volume simplifies backing up and restoring work files (which change frequently) by avoiding unneeded backups of system files (which don't change as often).

Move (My) Documents: In Windows 2000 and XP, right-click *My Documents* on the desktop or in Explorer, and then choose *Properties*. With the *Target* tab active, type the path to the desired drive and folder, and click *OK*. When asked whether you would like to move all of your documents to the new location, choose *Yes*.

If you use Vista, right-click *Documents* and choose *Properties*. (You'll find the Documents folder inside the folder labeled with your user name.) Click the *Location* tab in the Properties dialog box, type the path to the desired drive and folder, and click *Move*. When Windows prompts you to move your existing files to the new

storage folder, select *Yes*.

To move Vista's special folders, open Control Panel's Folder Options applet (you may have to click *Appearance and Personalization* on the Control Panel Home screen), click the *View* tab, make sure that both *Do not show hidden files and folders* and *Hide protected operating system files (Recommended)* are checked, and click *OK*. This ensures that you won't move the wrong file or folder. Now click *Start*, and choose your user account to open the folder containing its special folders. Open a second Explorer window, and select the folder that will be the



YOU CAN MOVE 11 OF VISTA'S SPECIAL FOLDERS to a location of your choice by dragging this single folder to their new folder home.

new home of your special folders. In your user-account folder, choose the folders you want to move; right-drag them out of that win-

dow and into the new folder in the other Explorer window (see the image above), and click *Move Here*.

—Scott Dunn

ANSWER LINE

What do I do when a major application messes up or slows down my PC regularly? *Joel R. Hall, San Jose, California*

IF YOUR WORD processor or other application repeatedly crashes Windows or slows it to a crawl, use the program's own repair tools. Uninstall and reinstall the application only after all of your efforts at repair fail to correct the issue.

Before you change anything, back up your Registry: Go to find.pcworld.com/58381 and scroll to "Back Up the Registry in XP and Vista."

Next, check the app's menus for an update option, or search the vendor's site. If you have the latest version already or if the update doesn't solve the problem, enter the program name and any appropriate keywords in a

search engine—something like "adobe reader" & "slow down". You may find a fix or a workaround.

If your only option is reinstallation, use the program's own uninstaller, which may be on its Start menu submenu. If no such option exists, find the program's listing in Control Panel's Add/Remove Programs applet (called 'Programs and Features' in Vista).

I recommend using HoverDesk's free Reg-Seeker (find.pcworld.com/43638) to clear the Registry of the program before you reinstall it.

Keep in mind that the culprit may be another program that conflicts with the one you've been blaming. Close all of your other applications, load the one you've just uninstalled and reinstalled, and see whether the problem persists. If it doesn't, try methodically running it with each of the other programs one at a time to find the works-gummer-upper.

—Lincoln Spector



LOOK FOR AN update option in the problem app's settings before seeking an external solution.

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It's Not Too Late: How to Recover Almost Any File

A SINGLE KEYSTROKE or mouse click can change your life. One false move, and an hour, day, or even lifetime of work can slip into digital oblivion. But not everything that vanishes is lost forever.

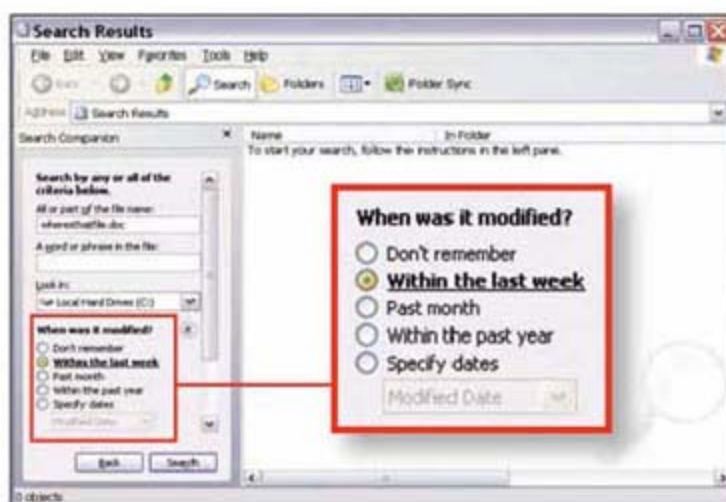
Recover a missing or deleted file: If you're certain that you deleted the file, refrain from running any software that saves to the hard drive, the USB flash drive, or the memory card that the file was stored on; doing so may overwrite recoverable data.

If the file isn't in the Recycle Bin, click *Start•Search* and use Windows' 'When was it modified?' option (if you don't see this option, click *View•Explorer Bar•Search* and in the left pane select *All files and folders*). In Vista, choose *Start•Search*, click the down arrow next to

Advanced Search, and select *Date modified* in the Date drop-down menu on the left. Look for any recently created, altered, or renamed files. If you find the lost file, be sure to save it to at least two different locations.

If you come up empty, you may be able to recover the file with an undelete utility. Two freebies—PC Inspector File Recovery (find.pcworld.com/58391) and FreeUndelete (find.pcworld.com/58392)—are well worth a try.

Repair Word and Excel files: If a Word or Excel file becomes garbled or won't open at all, you may be able to fix it with Microsoft's built-in file-repair tools. Click *File•Open*, and locate and select the damaged file. Then click the arrow on the right side of the Open button and select



USE WINDOWS SEARCH to find lost files that you've changed within a specified time period via the tool's 'When was it modified?' option.

Open and Repair from the resulting drop-down menu.

Repair a Word or Excel installation: When Word or Excel misbehaves, it's tempting to uninstall and then reinstall the program. But running Microsoft's repair utility may be quicker and simpler. Open Control Panel and select *Add or Remove Programs* in XP, or *Uninstall a program* in Vista (in Control Panel's Classic view, double-click *Programs and Features*). Find the entry

for Word, Excel, or Microsoft Office. In XP, click *Change*, select either *Reinstall* or *Repair*, and follow the prompts. In Vista, click *Repair* at the top of the window, and then work through the wizard.

Recover a lost password: It's embarrassingly simple to bypass Windows XP's log-on password: Simply restart your PC and press the <F8> key just before Windows starts. At the Advanced Options menu, select the first option, *Safe Mode*. XP will boot into Safe Mode and display a log-on screen showing icons for already-established user names, as well as an icon for Administrator. Log on to the Administrator account—leaving the password blank unless you've previously assigned a password for it. Once you're back in Windows, open Control Panel and select *User Accounts*. Reset the passwords for any account.

Microsoft finally realized what a tremendous security breach this was, so Vista hides and disables its built-in Administrator account, and you can't use it to bypass the OS's log-in.

—Lincoln Spector

—Kirk Steers

Identify Tracking Cookies in Firefox

NOBODY LIKES HAVING someone always looking over their shoulder, but you may get that feeling after you've browsed a while and

then take a peek inside your Cookies folder.

Most of the Web-tracking cookies that violate your privacy are owned not by the sites you visit but by companies that advertise on them. Though Internet Explorer doesn't offer you an easy way to identify third-party cookies, Mozilla Firefox does: Open the program and click *Tools•Options•Privacy•Show Cookies*. Close the Options dialog box, but keep the Cookies dialog box open.

Select a cookie under 'Site' to see more information about it (including the domain that owns it, and when it expires) in the text box below. To identify which sites are placing third-party cookies, clear your cookies, and then keep the Cookies dialog box visible as you surf. The cookies placed by the current page will appear at the bottom of the list.



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Run Apps on a USB Thumb Drive Automatically

THE EVER-INCREASING capacity of USB flash drives lets you bring along not only your files but also the applications that open them. Windows Vista makes it easy to set programs on USB thumb drives to run automatically when you insert the drive: Put the program you want to run in the device's root directory, and create a two-line `autorun.inf` file (see below for instructions) that points to the program. With the drive inserted, check *Always do this for software and games*, and select the *Run This Program* option. From now on, that program will run whenever you insert the drive.

Though the `autorun` feature of the U3 USB standard in XP is enticing, you can't edit the U3 `autorun.inf` file for your own purposes.

Some U3 hacks exist, but you needn't bother with them, thanks to the great little Autorun USB utility (find.pcworld.com/58355). To use Autorun USB, install it on your PC, insert your thumb drive, right-click the drive's entry in Explorer, select *Properties*, and click the *Autoplay* tab. From the drop-down menu, select each content type that you want to place on the drive, check *Select an action to perform*, and click *Autorun USB Drive* from the list of options. Once configured, Autorun USB works like a charm. Unlike other tools I've tried, it runs only when the media is properly inserted—and it disables the Windows 'What should



SET VISTA'S AUTOPLAY option to run programs on a USB drive automatically whenever you plug it in.

I do with this drive?' query.

To work, Autorun USB must find an `autorun.inf` file in the root directory of your thumb drive. Open Notepad and type the two lines below in an otherwise blank document:

```
[autorun]
open=winword.exe
```

Change the name of the executable file at the end of the second line (unless you want Microsoft Word to open automatically, in which

case you can leave the text as it is). Finally, save the file to the thumb drive's root directory with the name `autorun.inf`. Note: Though `autorun.inf` works with Windows XP, Vista's security may cause it to fail, so use Vista's

built-in `autorun` function (described above) instead.

Encrypt a USB Drive by Switching to NTFS

By default, Windows allows you to format USB thumb drives to use only the FAT file system. But formatting the drive as NTFS rather than FAT lets you encrypt folders and access other NTFS file-management features. To reformat a flash drive as NTFS, right-click the drive's icon in Explorer, choose *Properties*, click the *Hardware* tab, select the drive from the list, choose *Properties* again, select the *Policies* tab, and check *Optimize for Performance*. NTFS will now appear as an option in the drive format dialog box. After reformatting, repeat the process, but this time select *Optimize for Quick Removal* so you don't have to deal with the Safe Hardware Removal dialog box to avoid losing cached writes when you remove the device.

Caveat: NTFS isn't designed to work with removable media, so after selecting the Quick Removal option, you might lose data if you remove the drive too soon after writing data to it.

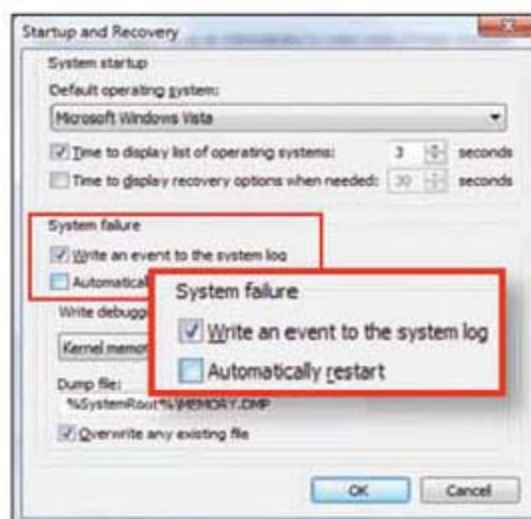
—Jon L. Jacobi

Make Random Reboots Tell What's Up

THERE YOU ARE, working at your computer, minding your own business and doing nothing untoward, when suddenly—bam! The system starts rebooting. If you experience random reboots that have no apparent cause, here's a little trick that might take you a step closer to solving the mystery.

In Windows 2000 or XP, right-click *My Computer* and choose *Properties*; click the *Advanced* tab. In Vista, click the *Start* button, type `SystemPropertiesAdvanced`, and press **<Enter>**. Click *Continue* if the operating system's User Account Control prompts you to.

In all versions of Windows, click the *Settings* button in the 'Startup and Recovery' section near the bottom of the dialog box. Uncheck the *Automatically restart* option, and click *OK* twice. The next time the problem occurs, instead of getting the automatic reboot, you'll likely see a text screen reporting a system error. Jot down any information it contains—



UNCHECK THE OPTION to restart your PC automatically for a clue about the problem's source.

regardless of how cryptic it may be—and see whether you can find related information from your favorite support guru or Web site.

—Scott Dunn

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Separate Your Old and New Wi-Fi Networks

UPGRADING TO A draft-n wireless router? Don't toss out your old network quite yet. For some time to come, you'll probably be stuck with a few legacy 802.11b or g clients, especially devices such as Wi-Fi-enabled game consoles, cell phones, and music players. But running a mixed network of 802.11b/g and 802.11n clients can seriously degrade performance—especially when it comes to streaming video, making VoIP calls, and performing the other high-bandwidth tasks that you bought the new router for in the first place.

Instead of cramming every device onto the same Wi-Fi network, maintain your old router for use with b/g devices and move your shiny new draft-n notebook into the fast lane by restricting access to your draft-n router to 802.11n clients. This set-up also lets you use stronger encryption on the draft-n network than legacy clients may be capable of, and it reduces the number of clients that are sharing Wi-Fi bandwidth on either network.

Running two networks in the same location, however, requires you to set them up carefully to avoid interference and routing problems.

First, switch your old router to access-point mode so that it doesn't perform NAT routing (see your router's manual or check the vendor's Web site for instructions). Next, plug the old router into the new one via ethernet, preferably using a long cable so that you can place the two routers

at opposite ends of the room. (Your new router will be connected to your broadband modem and will perform routing for both of the wireless networks.)

Next, choose channels for your two networks that are as far apart as possible: Set the draft-n channel as high as your router will permit, and set the b/g channel at the bottom, or vice versa. Configure the draft-n router to allow only 802.11n devices to connect, and then set the encryption level for each network at the highest level that your devices will support. For example, you might want to use 128-bit WPA on your b/g network and WPA2 on your draft-n network.

Finally, make sure that you



KEEP YOUR NEW draft-n Wi-Fi network operating at its best by restricting it to devices that run at the standard's faster speeds.

have different SSIDs for the two access points so you don't accidentally log on to the b/g network with your draft-n notebook.

For troubleshooting your wireless network, I recommend Network Magic (find.pcworld.com/58627).

The free version may meet your needs, but for \$23 to \$40 (depending on the size of your network), you get remote access and several other advanced features.

—Becky Waring

ANSWER LINE

Could Windows Genuine Advantage cause problems after I upgrade my hard drive? *Brian Vaughan, Alameda, California*

IT'S POSSIBLE. Naming this legal spyware an "Advantage" is a bit like calling the official Soviet newspaper *Pravda* ("Truth")—putting a word in the title doesn't make it so. Windows Genuine Advantage checks your Windows installation to confirm that its license key matches your hardware. If the key turns out to be registered for a different computer, WGA objects and generally makes your life miserable.

In theory, WGA can distinguish between a new hard drive and a new PC. In reality, though, it sometimes gets confused and asks you to reactivate Windows—usually a painless chore. If reactivation fails, call Microsoft's Activation hotline at 888/571-2048. To speak with a human being, say "agent" when asked which option you want,

and don't waver when the automated phone system attempts to convince you that you would be better off talking to a machine. The hotline is open around the clock.

Matters grow complicated if your copy of Windows came with your PC and if WGA thinks your new hard drive is a new computer. An "OEM" copy of Windows isn't supposed to be transferred to a new PC. If you had multiple partitions on your old drive, create the same partitions, in the same order, on the new one. If that doesn't work, call the vendor's technical support. And don't blame WGA if your computer won't boot after a hard-drive upgrade; your BIOS probably can't recognize the new drive. See *Techlog* on [page 15](#) for more on WGA.

—Lincoln Spector





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readers, but the Google Gears add-on makes it easier than ever to access Web information—without the Web.

—Scott Spanbauer



1. TO START the installation, log in to Google Reader at reader.google.com and click the *Offline* link at the top of the screen next to your user account e-mail address; or you can browse to gears.google.com.



2. GOOGLE GEARS is definitely beta software. If you're willing to take the risk, click the *Install Google Gears (BETA)* button to download the installer. After installation, exit and restart the browser.



3. NEXT, BROWSE to gears.google.com or open the *Tools* menu in your browser, and look for a Google Gears Settings option to confirm that the program is installed on your system.



4. LOG IN to Google Reader and click the small green icon next to your user account e-mail address to cache feeds for reading offline. (Not all feeds contain the full article text for offline reading.)



5. ONCE YOU'RE back online, click the button next to your user account e-mail address (it's now a blue arrow) again to synchronize your cached reading history with the Google Reader server.



6. TO DISABLE Google Gears, click *Tools•Add-ons* (in Firefox) or *Tools•Manage Add-ons•Enable or Disable Add-ons* (in IE 7). Or uninstall it via the Control Panel Add/Remove Programs applet.

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providing a fun entry into subjects that are often taught in a lackluster way.

Dr. Benjamin assumes you have no more than a distant memory of high school math. He believes that it is his job to fan those embers into a burning interest in the subject he loves so much—and in which he takes such exquisite joy.

About Your Professor

Arthur T. Benjamin is Professor of Mathematics at Harvey Mudd College, where he has taught since 1989. He earned a Ph.D. in Mathematical Sciences from Johns Hopkins University. The Mathematical Association of America honored him with national awards for distinguished teaching in 1999 and 2000 and named him the George Pólya Lecturer for 2006–08.

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STEVE BASS'S HASSLE-FREE PC

Get Your Geek On: Ten Terrific Troubleshooting Tricks and Tools

When bad tech stuff happens, fight back with one of these great PC life-savers.

THE BAD NEWS: PCs have been around for 30 years, and they're still coming up with new and unusual ways of breaking. The good news: I've discovered a kit bag full of tools that troubleshoot and fix perplexing tech problems.

The Hassle: *The last time I manually updated Windows (by clicking Start•All Programs•Windows Update), my operating system responded with the dreaded 'Initialization Error 0x80040FF2' pop-up.*

The Fix: Of course, you could read Microsoft's engrossing Windows Update Troubleshooter page (find.pcworld.com/58315; the page requires Internet Explorer). But instead of plowing through that blizzard of links, whip out DjLizard's Dial-a-fix (find.pcworld.com/58316), a multipurpose utility that repairs all sorts of PC problems. For instance, the program deals with Windows Update woes, corrects installer errors, restores missing Registry entries, and fixes Secure Sockets Layer glitches. If Windows' Defragger, System Restore, or even Internet Explorer stops running, Dial-a-fix can reinstall it. Behind the scenes, the utility massages the Registry to make it run more efficiently. Dial-a-Fix is free, but the authors do request a \$5 donation if you find it useful—and you will.

The Hassle: *Every now and then, when you install a new USB gadget, another USB device cries foul and stops working.*

The Fix: To find out why, run USBInfo, a utility that identifies and tests every USB port on your system and each device plugged into it. The \$20 program works with Windows 98 and XP; grab a 15-day trial version at find.pcworld.com/58317.

Extreme nerd alert: If your USB devices aren't recognized, or if a USB driver insists on reinstalling when you reboot, have I got some software for you! DevCon, which you launch from a command line, is Microsoft's free device-management tool for XP and Vista. Using Rob van der Woude's RenewUSB.bat



IF WINDOWS UPDATE stops working, or if you encounter problems downloading updates, Dial-a-Fix will do its best to make it right.

file, DevCon will erase all of your USB device drivers, making your PC just like new. Then it will scan to relocate the devices and reinstall their drivers. The program is hard to use—don't try it if you think "hash code" is something you eat with your eggs. And back up your PC first: This trick can restore a sick system to health, but it can also flatline it. Browse to find.pcworld.com/58319 for instructions on how to use the script file (and for a disclaimer on potential damage to your OS).

Bad Codecs Bring Down the Curtain

The Hassle: *Figuring out why some videos won't play on my PC is my new least-favorite pastime.*

The Fix: I cut to the chase by using CodeInstaller (find.pcworld.com/58320). This free utility (donations are accepted) checks my system and tells me which codecs—the programs needed to view videos—are missing. Then it suggests safe, reliable download sources. If CodeInstaller doesn't keep your videos rolling, try the shotgun approach: Download and install K-Lite Codec Pack (find.pcworld.com/58322), which contains gazillions of codecs; you get a handy video viewer, too.

The Hassle: *I recently went 15 rounds with an erratic power button on my PC; every other day or so, it would refuse to work, stalling Windows in the middle of shutdown and forcing me to remove the power cord in order to turn off the machine.*

The Fix: If replacing the power button doesn't help, a \$10 power-supply tester from PC Power and Cooling (find.pcworld.com/58323) will reveal if the power supply is a goner. Handy (and cautious) users may want to review its guide to troubleshooting a power supply as well (find.pcworld.com/58325).

For folks who like to track down ornery problems on their own, What's Running (find.pcworld.com/58326) offers a look at every active element of a PC: services, processes, drivers, and other modules. What sets What's Running apart from similar tools is its clever way of saving snapshots of settings; compare a shot taken when the system was working with a shot from when it wasn't to hone your troubleshooting skills. ●

TOOL OF THE MONTH: SQUELCH THE REBOOT NAG

EVERY WEEK, WINDOWS automatically downloads and installs Microsoft's slew of updates (unless you've changed the default update settings; see find.pcworld.com/58363 for more). That's usually a good thing. The bad thing is having Windows ask you every 20 minutes or so (depending on the type of update) whether you want to reboot now or wait until later. (Later, I said!) I used to wait until late in the day before getting the updates. Then I discovered Auto Reboot Remover (go to find.pcworld.com/58327 and scroll down the page). It allows me to disable—or to change my mind and re-enable—Windows XP's Automatic Reboot annoyance.

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- Toolless mounting increases speed of deployment



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Products That Change Without Permission



These days, companies can change the stuff in your home at any time, for any reason. How convenient—for them.

IF YOU HOPPED into your car one morning and discovered that the pedal on the right had mysteriously become the brake and the one on the left had become the accelerator, you might not just be angry. You might be in the hospital.

It wasn't quite that hairy, but for the first time in my experience, a stand-alone consumer product recently used my Internet connection to change its own essential behavior without warning. One day the device worked one way—a way I'd come to know and understand, even when it didn't work entirely right. The next day, *caramba!* It had a whole new user interface that was significantly worse than the one I had grown accustomed to. The device? The DVR I lease from Comcast. I'm just glad the company doesn't make cars.

On computers, such behavior isn't unprecedented. AOL, for instance, has long presented users with new features and updates without asking. But I don't recall its ever automatically handing users an entirely new interface; and even Windows Automatic Update, which sometimes pushes fixes that can cause trouble, asks whether you really want Internet Explorer 7 before sticking you with its new look and feel.

I can't remember another product that woke up one morning with a hangover quite like the one this DVR had. Here in Seattle, Comcast's Motorola DVRs had run on software by Microsoft, with the usual Microsoft collection of bugs such as recorded shows that seemed to have lost their audio until

you restarted the machine. But at least the user interface was relatively polished.

The replacement Guideworks software is unwieldy in so many ways that I can't count them all. A few minor examples: While you're searching for programs, it won't show live TV in a small-screen inset along with listings. There's no way to see your scheduled recordings in a single list. And some of the series that I had programmed into the old system didn't transfer properly to the new one.

Here's how utterly lame the box is: As delivered, it won't let you change channels by using the number keys to tune single- and double-digit channels directly, without pressing one or two zeros first—you know, the way you can on practically every other TV remote

in the world. That default is so stupid that Comcast included a last-minute folder largely devoted to explaining how to fix it. All you have to do is go several menu levels deep, find an entry called 'Channel Entry Behavior', and change it to 'Auto-Tune'. Hey, Comcast, here's a better idea: Push software to the box that changes the default to the one people expect!

Like any local monopoly, Comcast holds its customers captive. An obvious reason for the change is that Guideworks is a joint venture of Comcast and Gemstar-TV Guide, so using it means that Comcast doesn't have to pay royalties to a third-party provider like Microsoft. Instead of renting Comcast's DVR, you could buy a CableCard-based box like the mostly estimable TiVo, but current CableCards can't handle on-demand programming, which may be cable's best feature.

With so much of the tech in our lives tied to services that companies can control remotely, expect more and more of these kinds of changes to the way things work. Take Google, which just shuttered its for-pay video service—rendering the videos that customers had bought from it unwatchable. When consumers squawked, Google offered them refunds. But they couldn't get back the time they'd wasted.

Call it a trend: Don't hold your breath for amends or even apologies from the next hardware or software provider that screws up a minor portion of your life with inferior "improvements" focused on the company's interests, not yours. ●



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